Large-Scale Restoration of the Rice Lake Plains: A Landscape Conservation Approach

Todd Farrell[1]*, John L Riley[2], Lisa M. McLaughlin[3]

[1]Nature Conservancy of Canada
380 Armour Rd, Suite 263-2, Peterborough, Ontario K9H 7L7
Todd.Farrell@natureconservancy.ca

[2]Nature Conservancy of Canada
110 Eglinton Ave. West, Suite 400, Toronto, Ontario M4R 1A3

[3]Nature Conservancy of Canada
RR#5, 5420 Highway 6 North, Guelph, Ontario N1H 6J2

* Corresponding author

Abstract

In Ontario, tallgrass prairies and savannas are estimated to have once covered 70 000 hectares (ha) of which approximately 3% or 2 100 ha remains today. Based on historical information, the easternmost extent of this unique habitat was on the Rice Lake Plains, covering between 15 384 ha and 30 300 ha. In 2002, the Nature Conservancy of Canada (NCC) purchased 316 ha on the Rice Lake Plains and has initiated restoration plans. Bringing together multiple partners, NCC is leading the Rice Lake Plains Joint Initiative. The goal of the partnership is to raise the awareness of, and restore, the globally rare and provincially significant habitats. Currently, three years of funding for this initiative has been secured. Restoration, mapping and inventories of private and public land are taking place. Management plans are being developed and this information is being used to generate a landscape conservation plan for the Rice Lake Plains.

Keywords: *tallgrass prairie, oak savanna, restoration, Rice Lake Plains Joint Initiative, Nature Conservancy of Canada*

Introduction

Tallgrass prairie and savanna are unique communities that have been reduced across their range. In Ontario, the current extent of prairie and savanna has been drastically reduced. Less than 3 % of the original prairie still exists.

In Southern Ontario prairies were scattered across the south part of the province from Windsor to north of Lake Ontario. Records from early botanical explorations and land surveyors have documented the range of prairie and savanna. One pioneer, Catharine Parr Traill who is a noted Canadian botanist and writer, lived on and wrote extensively about the Rice Lake Plains (RLP). The Rice Lake Plains is on the eastern edge of the Oak Ridges Moraine south of the Canadian Shield and 100 km east of Toronto, north of Lake Ontario, and south of Rice Lake. The Oak Ridges Moraine and the Rice Lake Plains contained vast areas of prairies and savanna.

Today, three core areas provide anchor properties for conservation of the Rice Lake Plains: Alderville Woods, secured as part of a partnership between Lower Trent Conservation and Nature Conservancy of Canada (NCC) in 2001; Burnley Carmel, purchased by NCC in December 2002 as part of a partnership with Ontario Parks; and the extensive Northumberland County Forest. These anchor properties have similar characteristics and share common challenges, therefore discussions were started regarding these properties – as well as private land – within the Rice Lake Plains.

NCC took a lead role in bringing groups together to discuss partnerships and planning the needs and requirements for Rice Lake work. These partners are Ontario Parks, Wildlife Habitat Canada/Wetland Habitat Fund, Ganaraska Conservation Authority, the Lower Trent Conservation Authority and the County of Northumberland. Discussions resulted in the signing of the Rice Lake Plains Joint Initiative (RLPJI). The goal of this partnership is the protection and enhancement of globally and provincially threatened tallgrass prairie and savanna within the Rice Lake Plains. Funding for three years was applied for and received from the Oak Ridges Moraine Foundation.

In the initial phase of the RLPJI, the three anchor properties will be inventoried and assessed for tallgrass prairie and savanna vegetation, with the resulting information integrated into the site conservation plan. In addition, private (non-anchor) land will be assessed with the goal of increasing the awareness of landowners to this unique community. These landowners will be eligible to apply for funds through the RLPJI partners to restore and rehabilitate tallgrass prairie and savanna.

Historical Extent of Prairie in Southern Ontario

Tallgrasss prairie and savanna occurred across southern Ontario. Estimates of the extent and amount of prairie and savanna in Ontario are based on early land surveys, historical collections, and pioneer writings (Bakowsky and

Riley, 1994). This information has been documented in various sources. Development, European settlement, clearing and lack of management have all reduced the prairie and savanna. It is estimated that there were originally 70 000 hectares (ha), or 173 000 acres of such habitat (Bakowsky, 1993).

Current Status of Prairie in Southern Ontario

In 1992, the Ministry of Natural Resources commissioned a survey of the tallgrass prairies of southern Ontario. This survey identified approximately 2 100 ha (5 189 acres) of tallgrass communities remaining in this region (Bakowsky and Riley, 1994; Bakowsky, 1993). This is less than 3% of the original extent (Bakowsky, 1999).

Rice Lake Plains-Historical Extent

Rice Lake Plains is the high ground south of Rice Lake on the eastern end of the Oak Ridges Moraine. This glacial moraine covers 195 000 ha (481 855 acres) and occurs in 34 municipalities (Ontario Ministry of Municipal Affairs and Housing, 2002). It acts as a recharge area for groundwater and provides significant natural habitat for sensitive and threatened plant and animal species.

Historically, tallgrass communities made up 10 to 20% of the Oak Ridges Moraine (Ontario Ministry of Natural Resources, 2001). The eastern end of the moraine, the Rice Lake Plains, based on these early land surveys and writings and collections from early botanists, was dominated by vast prairie and savanna habitats extending over an area of at least 17 200 hectares (42 500 acres) and perhaps as much as 30 000 ha (74 000 acres) (Catling *et al.* 1992).

Numerous early land surveyors and botanists recorded the vegetation of the Rice Lake Plains (Catling *et al.* 1992). One of these botanists has a direct connection with the Rice Lake Plains. Catharine Parr Traill emigrated from England in 1832 and moved to the Rice Lake area. She and her family lived as pioneers on the plains. She wrote, botanized, and traveled around Rice Lake, presented in part in her book *Backwoods of Canada* (Traill, 1836). In it, she writes about the Rice Lake Plains and the landscapes and plants that she sees:

> *We now ascended the plains – a fine elevation of land for many miles scantily clothed in oaks, and here and there bushy pines…*

In addition to her observations on the prairie on the Rice Lake Plains, she

also noted the long-time connection to the prairie by First Nations of the region:

> *Rice Lake is still called in First Nation language "Lake of the Burning Plain."*

Significance of the Rice Lake Plains

Due to development, succession, and conversion to agriculture, the vast majority of the prairies and savannas in Ontario and Rice Lake have disappeared. As a result, these plant communities, and the animal and insect communities associated with them, have disappeared. The black oak savanna, tallgrass prairie, oak woodland, and sand barren communities on the Rice Lake Plains are globally and provincially significant. Species such as the Karner blue butterfly (*Lycaeides melissa samuelis*) were historically found on the Rice Lake Plains (Catling and Brownell, 1999). Recent discoveries on the Rice Lake Plains include the white tiger beetle (*Cicindela lepida*), demonstrating that many new, unrecorded species may still be found on the Rice Lake Plains.

Rice Lake Plains Joint Initiative

The vision of the Rice Lake Plains Joint Initiative is as follows:

> *The restoration and protection of sustainable tallgrass prairie and oak savanna habitat through co-operative efforts in conservation science, land stewardship, public outreach, and legal protection of land.*
>
> *This vision will be achieved in harmony with Oak Ridges Moraine legislation, policies and strategies, striking an appropriate balance between natural processes and human activities, and will lead to the long-term protection and enhancement of native species bio-diversity on the Rice Lake Plains while fostering awareness and understanding of the significance of the area.*

Based on the vision, components and workplans were developed for the RLPJI. These components are:

1) Inventory and Assessment;
2) Management Planning and Implementation;
3) Site Conservation Plan; and,
4) Communication Plan.

Three core areas of conservation opportunity make up significant portions of the eastern end of the Oak Ridges Moraine within the Rice Lake Plains.

In 2001, the 46 ha (114 acres) Alderville woods property located south of Rice Lake was secured as part of a partnership between Lower Trent Conservation Authority and the NCC. In 2002 NCC purchased the 317 ha (784 acres) Burnley Carmel property located south of Alderville woods and Rice Lake. In addition, within the Rice Lake Plains the County of Northumberland owns 1 052 ha (2 600 acres). These large anchor properties contain significant amounts of globally threatened prairie and savanna that are in need of restoration. These properties contain similar management, stewardship and restoration issues.

The initial phase of the project includes an inventory and assessment of these anchor properties. Site visits will confirm the boundaries of tallgrass communities and classify communities according to the Ecological Land Classification Methodology (Lee *et al.* 1998). Species lists are being compared to tallgrass indicator species lists developed for the Oak Ridges Moraine and Rice Lake. Percent cover, tallgrass quality and restoration potential are also noted. Photos in combination with photo monitoring at some sites will be used to document the condition (Horn and Horn, 1996). This information will be incorporated into the management and restoration plans. Information on the natural features of the County of Northumberland Forest will be collected and provided as input into Northumberland County's forest land management planning process.

In addition to inventory on the anchor properties, private landowners (non-anchor properties) are being approached. Air photo interpretation, previous studies (Brownell and Blaney, 1995; Catling *et al.* 1992), personal knowledge, and information from local experts are being used to map these properties. Visits to interested landowners with tallgrass prairie and savanna on their property are taking place in 2004-2006.

Information collected from the anchor and non-anchor properties will form the scientific basis for a Site Conservation Plan for the Rice Lake Plains, which will dictate the restoration on the site. Site Conservation Plans assess information about a site (natural systems, conservation targets, threats, and stresses) and generate conservation strategies and measures of conservation success. Information from each property will be entered into the site conservation plan.

High-quality communities, with an emphasis on tallgrass communities, linkage areas, and restoration areas, will be identified as targets for securement through easements, donations, and strategic purchases. The Site Conservation Plan will assist the Rice Lake Initiative Partners in the identification of

areas that are sensitive and provide direction for future planning and habitat management decisions for each of the three core properties.

The long-term stewardship of the secured properties is essential to maintain the quality and diversity of the sites. Conservation targets and restoration needs and activities will be identified. Management and the stewardship of sites and restoration activities could include non-native species removal, trail barrier erection, garbage removal, prescribed burning, planting, flora and fauna monitoring, seed collection, signage, gates, and thinning or removal of plantations. In particular, challenges to the restoration of the anchor and non-anchor land include the removal of large amounts of planted scotch pine (*Pinus sylvestris*) and recent invaders such as white sweetclover (*Melilotus alba*), Louis' swallow-wort (*Cynanchum louiseae*), lesser knapweed (*Centaurea nigra*), and brownray knapweed (*Centaurea jacea*). Inappropriate use of the public areas and dumping of material are issues that will also be addressed.

Communicating the results of the vegetation surveys, restoration activities, and raising the awareness of this unique community to landowners and local citizens is a major component of the RLPJI. Opportunities for volunteer and landowner participation and input will occur throughout the duration of the project

Conclusion

The Rice Lake Plains contain significant amounts of globally rare tallgrass prairie and savanna. This community has been reduced across North America, Southern Ontario, and the Rice Lake Plains. Historical information shows that prairie and savanna occurred in numerous locales across southern Ontario. Vast prairie and savanna areas were known to occur on the Rice Lake Plains on the eastern flank of the Oak Ridges Moraine. Early explorers noted the prairie and savanna in their writings and by their botanical field collections and land surveyor notes. One pioneer, Catharine Parr Traill, wrote extensively about the prairie and savanna of the Rice Lake Plains.

Currently, tallgrass in Ontario has been reduced to less than 3% of its original extent. There are several larger areas, but many of the other remnants are scattered and small. The Rice Lake Plains contains globally and provincially significant communities, plants and animals, and was the location for the extirpated Karner Blue Butterfly.

RLP contains significant amounts of public land, with prairie and savanna vegetation, including recent acquisitions by the NCC and the Lower Trent

and the large amount of public land containing prairie and savanna vegetation. A partnership between organizations and governments was created and the Rice Lake Plains Joint Initiative was begun. The goal of this Initiative is to raise awareness of the habitat among citizens and landowners and to help restore this habitat. Components of this initiative include inventory and assessment of private (non-anchor) and public (anchor) property. Tasks include management and implementation plans for public lands, landowner site visits, and assessment for private land. Funds are available through the partnership for long-term restoration of properties by landowners. Communication of the ongoing restoration and volunteer activities and the results are important components of this project.

Future activities include the completion of the management plans, restoration and implementation plans, and the tasks associated with each of these. Information from the processes above will be incorporated into an overall Site Conservation Plan.

The Rice Lake Plains Joint Initiative will be a showcase for collaborative efforts in the conservation of imperilled habitat. In addition, it will demonstrate how partners can work together to restore and manage large-scale ecosystems. Protecting and restoring the Rice Lake Plains to their former glory, communicating our work and message, and increasing the interest and awareness of landowners and local citizens are key components of the RLPJI.

As a model the Joint Initiative is being used as a template for the Ganaraska Plains Intiative, directly to the west. In the future, tallgrass areas from each initiative could link up across the Oak Ridges Moraine and restore the larger scale connections of this globally and provincially rare habitat to its former glory.

For volunteer activities and current information on the Rice Lake Plains visit NCC's website at www.natureconservancy.ca and go to the Ontario Region site.

Acknowledgments

Thank you to the Oak Ridges Moraine Foundation for supporting this project and our Rice Lake Plains Joint Initiative Partners for their assistance.

References

Bakowsky, W.D. 1993. *A Review and Assessment of Prairie, Oak Savannah and Woodland in Site Regions 7 and 6 (Southern Region)*. Report prepared by Gore and Storrie Ltd. for Ontario Ministry of Natural Resources, Southern Region: Aurora.

Bakowsky, W.D. 1999. Rare vegetation of Ontario: tallgrass prairie and savanna. *NHIC Newsletter*, Spring 1999. pp 3-5. Natural Heritage Information Center. http://www.mnr.gov.on.ca/MNR/nhic/documents/spring1999/spring99.htm

Bakowsky, W. and J. Riley. 1994. A survey of the prairies and savannas of southern Ontario. In, R. Wickett, P. Dolan Lewis, A. Woodliffe, and P. Pratt (eds.) *Proceedings of the Thirteenth North American Prairie Conference: Spirit of the Land, Our Prairie Legacy*. Aug. 6-9, 1992. Windsor, Ontario: City of Windsor. pp. 7-16,

Brownell, V.R., and C.S. Blaney. 1995. *Lower Trent Region Natural Areas - Volume 1: A Biological Inventory and Evaluation of 20 Natural Areas in the Lower Trent Region*. Lower Trent Region Conservation Authority: Trenton, Ontario.

Catling, P.M. and V.R. Brownell. 1999. An overlooked locality for Karner Blue (*Lycaeides Melissa samuelis*) in Ontario. In: *Butterflies of Ontario & Summaries of* Lepidoptera *Encountered in Ontario in 1999*. Toronto Entomologists' Association Publication #32-2000: Toronto.

Catling, P.M., V.R. Catling and S. M. McKay-Kuja. 1992. The extent, floristic composition and maintenance of the Rice Lake Plains, Ontario based on historical records. *Canadian Field-Naturalist*. 106(1):73-86.

Lee, H.T., W.D. Bakowsky, J. Riley, J. Bowles, M. Puddister, P. Uhlig and S. McMurray. 1998. *Ecological land classification for Southwestern Ontario: first approximation and its application*. Ontario Ministry of Natural Resources, South Central Region, Science Development and Transfer Branch. Technical Manual ELC-005. Toronto.

Ontario Ministry of Municipal Affairs and Housing, 2002. *Oak Ridges Moraine Conservation Plan*. http://www.mah.gov.on.ca/userfiles/HTML/nts_1_6846_1.html

Ontario Ministry of Natural Resources, 2001. *Natural Heritage Features of the Oak Ridges Moraine*. Ontario Ministry of Natural Resources, Aurora District: Aurora, Ontario. 161pp.

Traill, C.P. 1836. *The Backwoods of Canada*. Charles Knight: London. (Reprinted 1989 by MacClelland and Stewart Inc.: Toronto.)

Van Horn, M. and K. Van Horn. 1996. Quantitative photomonitoring for restoration projects. *Restoration & Management Notes*. 14:30-34.