



the Bluestem Banner



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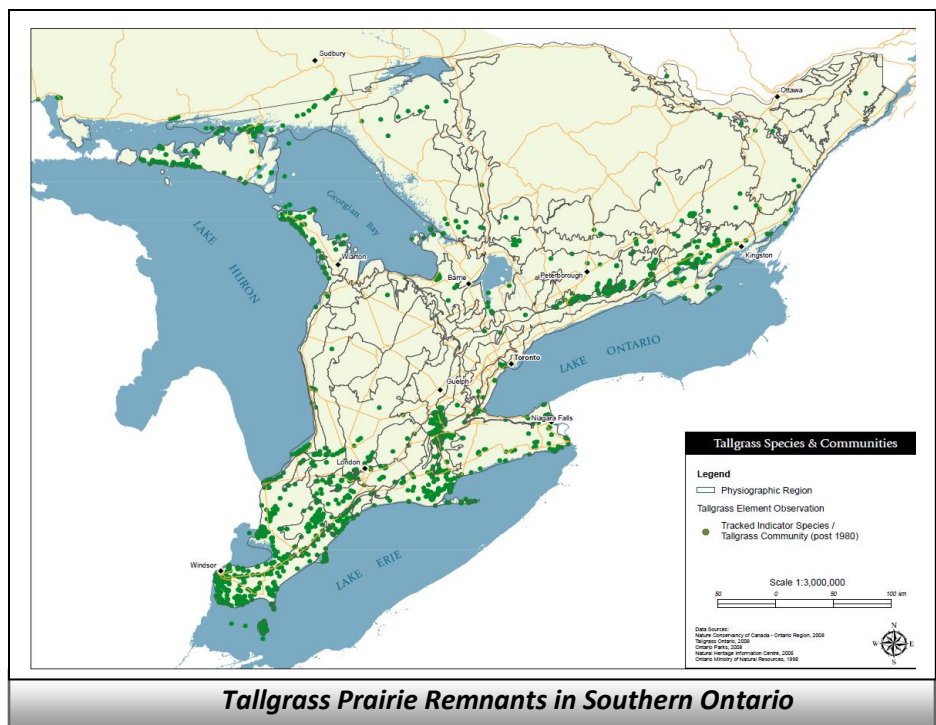
Tallgrass Ontario will identify and facilitate the conservation of tallgrass communities by coordinating programs and services to provide assistance to individuals, groups and agencies.

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Effects of Fragmentation on Prairie Habitat - or why size matters - Elizabeth Reimer

In today's landscape tallgrass prairie remnants come in all shapes and sizes. Perhaps one of the best-known examples locally is Ojibway prairie complex in Windsor. Remnant patches of this prairie are spread out across nearly 350 hectares (ha) within the Ojibway Nature Centre's lands, the Ojibway Provincial Nature Reserve, and Spring Garden Area of Natural Scientific Interest (ANSI). This complex is a mosaic of prairie patches, savanna remnants, and woodlands intersected with roads and residential subdivisions.

Outside of the Ojibway prairie complex some of the highest quality prairie remnants are found at Walpole Island. Natural areas on Walpole Island (including prairie and savanna) were found to cover 638 ha in a study conducted in 1985 and 1986. However here, as in Ojibway prairie complex, the remnants on Walpole Island are intersected with evidence of human inhabitation such as roads and drainage features.

Outside of Ontario, a similar situation exists. The Flint Hills of Oklahoma and Kansas contain some of the largest remaining area of unplowed tallgrass prairie. Within this region, the Konza Prairie Preserve covers 3,487 ha jointly owned by The Nature Conservancy and Kansas State University, and the Tallgrass Prairie Preserve, located in Osage County, Oklahoma contains 15,000 ha owned by the Conservancy. Across North America, it is estimated that 1.5 million ha of tallgrass prairie exist today in scattered remnants.



Konza Prairie Preserve – Edwin Olsen/ [CC-BY-SA-3.0](#)

The current situation for tallgrass prairie stands in sharp contrast to reports of landscapes prior to European settlement of the North American prairie region. In Ontario, the [Ojibway Nature Centre website](#) reports that as late as the mid-1800s prairies still

covered approximately 400 square kilometers of Essex, Lambton, and Chatham-Kent. Across North America, tallgrass prairie is once thought to have covered a continuous swath about 90 million ha in size.

The loss, however, goes much deeper than a sharp decline in total area. Tallgrass prairie remnants that still exist today are often found in small isolated patches, surrounded by roads, drains, towns, and farms. To the casual observer these small remnant parcels, with their showy wildflowers and waving grasses, may look like healthy prairies. A substantial body of scientific literature suggests the presence of prairie indicator species like big bluestem and Indian grass does not tell the whole story. Fragmented parcels of prairie are often missing key ingredients that are vital to a functioning prairie community.

One well-documented effect of fragmentation is the loss of area-sensitive species that rely on interior habitat with limited edge effects. Ontario has seen dramatic declines of Henslow's Sparrow due to the loss of large grassland patches that this species requires for nesting. In fact, these declines prompted the Committee on the Status of Species at Risk in Ontario (COSSARO) to list this species as Endangered in Ontario. In Ontario where local populations are small, continuous patches of grassland of at least 30 ha and perhaps up to 100 ha are thought to be needed for Henslow's Sparrow populations to reproduce successfully.



Henslow Sparrow - Dominic Sherony [\(CC BY-SA 2.0\)](#)

Evidence suggests that smaller patches with more edges joining to other habitat types (e.g. forests and shrubland) contribute to declines by providing habitat more favourable to nest predators and nest brood parasites like cowbirds. This in turn leads to a decrease in nesting success.

Fragmentation is frequently a result of linear man-made features such as roads, trails, and drainage features. These types of features are documented to

serve as dispersal corridors for non-native species. This effect can be easily observed by looking out the window at the Phragmites while travelling down the 400 series highways in southern Ontario. Invasive species can displace native vegetation and make areas less suitable as habitat for native insects, birds, and mammals. This overall loss of biodiversity has a negative effect on a prairie's ability to adapt to changes and natural disturbances over time.

Small scattered parcels of prairie remnants are often separated by great distances. These distances can be barriers to dispersal, and therefore prevent gene flow from isolated populations. Dispersal of genes can happen in a number of ways. For animals, typically gene flow results from the movement of individuals. Depending on the species even small distances can inhibit gene flow if the intervening space obstructs movement. For example, to reptiles and amphibians, four-lane highways are a virtually impenetrable barrier to passage. However, even plants that employ bumblebees as pollinators cannot rely on bumblebees to cross much more than 200 metres of resource-depleted areas. Therefore, two plants on opposite sides of a moderately sized corn field would be genetically isolated from one another.



Kenesserire Tallgrass Praire (Chatham-Kent) surrounded by Rail and Hydro corridors. Photo- Steve Rankin

The effects of genetic isolation have important consequences for many species. Small population size in plants is demonstrated to lead to an inability to attract pollinators and increased inbreeding depression in a number of species. Small populations of animals may have to travel further to find suitable mates, and increased exploratory behaviour may put individuals at greater risk of death due to predation or road mortality. The vulnerability of small populations can be further complicated by small areas of occupancy, which in turn increase the risk of being wiped out in a catastrophic event such as a drought or fire. Isolated populations experience adverse effects due to habitat fragmentation and are therefore also

more likely to become locally extinct because of both genetic and demographic factors.

The implications of the effects of patch size have consequences for prairie restoration efforts. Small patches of prairies can be valuable, but large separation distances between patches can hamper the ecological integrity of these small sites. This is by no means meant to imply that only large contiguous sites are worthy of conservation or restoration efforts, rather that there is benefit to identifying ways to connect or expand these small patches to create movement corridors and more interior habitat. In fact, scientific literature suggests that small parcels, despite the absence of area sensitive species, can be important refuges for prairie plants and animals, and sources of genetic variability and material for restoration efforts.

Elizabeth Reimer is currently a Species at Risk Biologist with the Ministry of Natural Resources. In the past, she has worn many hats, including a summer as a field assistant at the Manitoba Tallgrass Prairie Preserve, Project Biologist at the Manitoba Conservation Data Centre, Mycology Technician at the ROM, and Species at Risk Data Technician with Parks Canada. Elizabeth is a Director at Tallgrass Ontario.

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