Canadian National Vegetation Classification (CNVC)
Classification nationale de la végétation du Canada

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Central Lowlands Tallgrass Prairie

Macrogroup M054

Prairies à graminées hautes des basses terres centrales

Temperate Grassland & Shrubland

D023 Central North American Grassland & Shrubland

CM051 Great Plains Mixedgrass Prairie

CM332 Great Plains Rough Fescue Prairie

M054 Central Lowlands Tallgrass Prairie

Concept

This factsheet describes the Canadian expression of North American tallgrass prairie, found primarily in the Red River valley and adjacent parkland areas of southern Manitoba. Tallgrass prairie occurs as extensive grasslands south and west of the limit of tree growth in the eastern prairies, and also forms the grassland patches that occur between forest/woodland groves in this part of the Parkland CNVC vegetation zone. M054 is dominated by tall (up to 2 m) perennial grasses, such as big bluestem (*Andropogon gerardii*), prairie dropseed (*Sporobolus heterolepis*), yellow Indiangrass (*Sorghastrum nutans*) and old switch panicgrass (*Panicum virgatum*). Other important grasses include plains porcupine grass (*Hesperostipa spartea*), mat muhly (*Muhlenbergia richardsonis*), little bluestem (*Schizachyrium scoparium*), prairie junegrass (*Koeleria macrantha*) and slender wildrye (*Elymus trachycaulus*). Prairie cordgrass (*Spartina pectinata*), bluejoint reedgrass (*Calamagrostis canadensis*), slim-stemmed reedgrass (*C. stricta*) and sedges (*Carex* spp.) often occur on moist sites. Forbs can be abundant and often have high local diversity. Common forbs in the Canadian range include downy false indigo (*Amorpha canescens*), prairie pasqueflower (*Anemone patens*), purple prairie-clover (*Dalea purpurea*), narrow-leaved purple coneflower (*Echinacea angustifolia*), sunflower (*Helianthus* spp.), eastern yellow stargrass (*Hypoxis hirsuta*), blazing star (*Liatris* spp.), black-eyed Susan (*Rudbeckia hirta*), blue-eyed-grass (*Sisyrinchium* spp.), goldenrod (*Solidago* spp.), aster (*Symphyotrichum* spp.) and golden alexanders (*Zizia aurea*).

In Canada, soils associated with stands of M054 are primarily developed in deep fine-textured sediments within the basin of glacial Lake Agassiz in southern Manitoba. However, tallgrass prairie also occurs on dry, shallow rocky sites and coarse-textured sands and gravels in southwestern Ontario and near Lake of the Woods in northwestern Ontario. Tallgrass prairie, in its broad definition, ranges southward to Texas and eastward to Michigan and Ohio. Historically, grazing, fire and periodic drought influenced species composition and distribution of native tallgrass prairie, but most has been converted to agriculture so very few unaltered examples persist on the landscape.

Mesic tallgrass prairie with yellow Indiangrass (*Sorghastrum nutans*), plains porcupine grass (*Hesperostipa spartea*), downy false indigo (*Amorpha canescens*), rough blazing-star (*Liatris aspera*) and stiff sunflower (*Helianthus pauciflorus*). Felton Prairie State Scientific and Natural Area, Minnesota.
Source: Minnesota Department of Natural Resources

Dry tallgrass prairie, including stiff goldenrod (*Solidago rigida*) and wild bergamot (*Monarda fistulosa*), with bur oak (*Quercus macrocarpa*), chokecherry (*Prunus virginiana*) and saskatoon (*Amelanchier alnifolia*) in a parkland landscape. Huntley State Wildlife Management Area, Minnesota.
Source: Minnesota Department of Natural Resources

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Vegetation

Physiognomy and Structure

Tallgrass prairie is characterized by dense stands of tall (up to 2 m) perennial grasses. Beneath the tall grasses, or in gaps within the stands, are shorter grasses (approximately 10-40 cm). Interspersed among the graminoids is a perennial forb component with high species diversity; some stands are dominated by forbs. In the Parkland CNVC vegetation zone of central and southeastern Manitoba, tallgrass prairie forms the grassland patches between groves of *Populus tremuloides* and/or *Quercus macrocarpa.*

Floristics

In the Canadian range of M054, tallgrass species such as *Andropogon gerardii*, *Sporobolus heterolepis*, *Sorghastrum nutans* and *Panicum virgatum* dominate this vegetation. Other important grasses include *Hesperostipa spartea*, *Muhlenbergia richardsonis*, *Schizachyrium scoparium*, *Koeleria macrantha* and *Elymus trachycaulus*. *Spartina pectinata*, *Calamagrostis canadensis*, *C. stricta* and *Carex* spp. often occur on moist sites. On sand dunes, tallgrass prairie stands often include *Andropogon hallii* and *Calamovilfa longifolia*. Forbs can be abundant and stands often have high local species diversity. Common forbs include *Amorpha canescens, Anemone patens, Dalea* spp., *Echinacea angustifolia*, *Helianthus* spp., *Hypoxia hirsuta, Liatris* spp., *Rudbeckia* spp., *Sisyrinchium* spp., *Solidago* spp., *Symphyotrichum* spp. and *Zizia aurea*. Woody vegetation is rare, but clumps of trees and tall shrubs can often be found along the boundary between tallgrass prairie and wetlands.

Dynamics

Most of the historic range of tallgrass prairie has been cultivated, leaving only small remnant stands of M054 on the landscape, primarily in parkland areas in Manitoba and on xeric sites in Ontario. Historically, fires occurred frequently in tallgrass prairie but have been greatly reduced with agricultural settlement. Where stands of M054 occur in the parkland landscape, proportions of forest/woodland and grassland fluctuated over the years in a dynamic balance. Compared to mixedgrass prairie (CM051 [Great Plains Mixedgrass Prairie]), M054 occurs in a moister climate that is conducive to woody encroachment and invasion by exotic plant species. In the prolonged absence of fire, shrubs, such as *Symphoricarpos occidentalis,* and trees, such as *Populus tremuloides, Pinus banksiana* or *Quercus macrocarpa,* tend to encroach into patches of tallgrass prairie from adjacent forest or woodland stands. If this is not checked by fire or land management practices, grassland may be converted to forest or woodland (e.g. M151 [Great Plains Forest & Woodland]).

Stands of M054 that are exposed to sources of seeds from exotic plants (e.g., hayfields, roadsides) are often invaded by species such as *Poa pratensis, Bromus inermis* and *Agrostis stolonifera.* Invasion of these exotics is fostered by disturbance (e.g., grazing), but these species are persistent once established.

Prior to agricultural settlement, intermittent grazing by native herbivores was an important aspect of prairie grassland dynamics. Bison (*Bison bison*), elk (*Cervus canadensis*) and other animals grazed an area and then moved elsewhere. In the process they fertilized stands and dispersed seeds. Under current conditions, tallgrass prairie stands are often used for livestock grazing, which tends to reduce the dominant tallgrasses and increase the spread of exotic plant species.

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Environment

Climate

In Canada, the primary range of tallgrass prairie is in the subhumid continental temperate climate of southern Manitoba. Winters are cold and summers are warm; mean annual temperatures average approximately 2.8˚C, with extreme minimum temperatures below -40˚C. Growing degree days above 5˚C (GDD) vary between about 1780 and 1950. Annual precipitation is approximately 525 mm. In its primary range, tallgrass prairie occurs in a climate that is relatively wet and warm compared to other Great Plains grasslands but, in spite of the higher precipitation, evapotranspiration is high enough to produce a moisture balance that supports grassland vegetation rather than forest. In parkland areas north and east of the primary range, as well as in the Lake of the Woods area of northwestern Ontario, the climate is typically cooler (GDD approximately 1550 to 1840) or wetter, thus more conducive to growth of trees and shrubs.

Physiography, Geology, Topography and Soils

The primary range of Canadian tallgrass prairie lies on the Manitoba Plain, a subdivision of the Interior Plains physiographic region, which is underlain by level Mesozoic and Tertiary sedimentary rocks. Elevations are <300 mASL. During the late Pleistocene glaciation, this entire area was inundated by glacial Lake Agassiz and the contemporary land surface is mainly a level plain of thick glaciolacustrine silts and clays. Local relief is provided by postglacial valley complexes and Lake Agassiz beach and delta features, as well as associated sand dunes. Upland soils are predominantly Humic Vertisols and Black Chernozems, but Gleysols are also widespread in poorly drained areas.

Outside of the core Manitoba range in Canada, tallgrass prairie communities also occur in northwestern Ontario near Lake of the Woods and in southwestern Ontario near Lake Huron. In these parts of the range, stands of M054 occupy dry, shallow rocky sites or coarse-textured glacial (e.g., eskers) or eolian (e.g., sand dunes) deposits where, historically, more frequent fires and periodic drought have restricted colonization by woody species.

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Distribution and Geographic Range

In Canada, tallgrass prairie is mostly restricted to the Red River basin of southern Manitoba. Historically, the primary Canadian range of tallgrass prairie was considered to include about 6,000 km^2 of grassland south of the Assiniboine River, and from the Red River valley west to the Manitoba escarpment. Tallgrass prairie also occurs in the parkland areas to the north and east of this core area and as isolated patches in northwestern and southwestern Ontario. Similar communities to those described here occur in North and South Dakota, Minnesota, and Iowa. The Canadian range is the northern portion of the global range of North American tallgrass prairie (broadly defined), which extends southward to Texas and eastward to Michigan and Ohio.

Related Concepts

USNVC M054 [Central Lowlands Tallgrass Prairie] describes the rangewide characteristics of tallgrass vegetation in North America. This factsheet describes the Canadian expression of this vegetation, which includes conditions treated (at least in part) in USNVC Groups G075 [Northern Tallgrass Prairie] and G333 [Central Tallgrass Prairie].

Comments

CNVC may recognize subtypes of M054 in the future (e.g., the southern Ontario condition), but this is pending development of Associations from ground plot data.

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Source Information

Number of Source Plots for M054:
Information Sources (data):
Concept Authors: Ken Baldwin, Lorna Allen, USNVC
Description Authors: Ken Baldwin, Jeff Thorpe
Date of Concept: February, 2015
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