

## Great Plains Parkland



### General Description

The *Great Plains Parkland* zone covers an area of approximately 243,000 km<sup>2</sup> along the northern edge of the North American Great Plains. It extends for over 1300 km in a broad band, up to 200 km wide, from Edmonton to the international border southeast of Winnipeg. This zone marks the transition between temperate grasslands and boreal forests. The majority of the contemporary landscape supports crop cultivation and livestock grazing.

### Vegetation

Natural landscape structure is a parkland mosaic of grassland patches with groves of forests, woodlands and shrublands. On level terrain, grassland and treed patches may be interspersed with no obvious site differences. On rolling terrain, forests and woodlands tend to occur on northerly aspects and in topographic depressions (i.e., cooler, moister sites), while grassland vegetation occurs on southerly aspects and ridges (i.e., warmer, drier sites). At the southern edge of the zone, forest and woodland stands are more restricted to landscape depressions, often forming rings around wetlands. The treed component of landcover gradually expands northward; at the northern edge of the zone forests and woodlands occupy most topographic positions while grasslands are restricted to steep south aspects. Livestock grazing and crop cultivation have altered the species composition of most of these communities.

Shrubs and trees are primarily cold-deciduous, broad-leaved species. The largest proportion of

forest/woodland occurrences comprises pure stands of trembling aspen (*Populus tremuloides*), sometimes accompanied on moist lower slopes by balsam poplar (*Populus balsamifera*), Manitoba maple (*Acer negundo*) or red ash (*Fraxinus pennsylvanica*). At the eastern end of the zone, bur oak (*Quercus macrocarpa*) also becomes important, especially on drier sites. Alluvial forests dominated by balsam poplar, trembling aspen, plains cottonwood (*P. deltoides* ssp. *monilifera*), Manitoba maple and, in the east, red ash, bur oak and American elm (*Ulmus americana*) occur on stable floodplain terraces.

Understory vegetation includes a diverse suite of shrub and herb species adapted to partial shade. Common species include saskatoon (*Amelanchier alnifolia*), chokecherry (*Prunus virginiana*), pin cherry (*P. pensylvanica*), hazelnuts (*Corylus* spp.), snowberries (*Symphoricarpos occidentalis*; *S. albus*), Canada gooseberry (*Ribes oxycanthoides*), Woods' rose (*Rosa woodsii*), vetchlings (*Lathyrus* spp.), American vetch (*Vicia americana*), star-flowered false Solomon's seal (*Maianthemum stellatum*), wild lily-of-the-valley (*M. canadense*), meadow-rues (*Thalictrum* spp.), rough-fruited fairy bells (*Prosartes trachycarpa*), spreading dogbane (*Apocynum androsaemifolium*), Maryland sanicle (*Sanicula marilandica*), wild sarsaparilla (*Aralia nudicaulis*), slender wildrye (*Elymus trachycaulus*), purple false melic (*Schizachne purpurascens*), rough-leaved mountain rice (*Oryzopsis asperifolia*), dry-spike sedge (*Carex siccata*) and Sprengel's sedge (*C. sprengelii*).

In Alberta and most of Saskatchewan, the grassland component of the parkland mosaic is dominated by plains rough fescue (*Festuca hallii*), together with mixedgrass species, including needle-and-thread grass (*Hesperostipa comata*), northern porcupine grass (*H. curtisetata*), plains porcupine grass (*H. spartea*), thick-spike wildrye (*Elymus lanceolatus*), slender wildrye (*E. trachycaulus*), mat muhly (*Muhlenbergia richardsonis*), prairie junegrass (*Koeleria macrantha*) and western wheatgrass [*Pascopyrum smithii*]. Blue grama (*Bouteloua gracilis*) is common on dry sites, and prairie sandreed (*Sporobolus rigidus* var. *rigidus*) and sand dropseed (*S. cryptandrus*) are common on sand dunes. In Manitoba, tallgrass species become increasingly important, including big bluestem (*Andropogon gerardii*), prairie dropseed (*Sporobolus heterolepis*), yellow Indiangrass (*Sorghastrum nutans*), old switch panicgrass (*Panicum virgatum*) and little bluestem (*Schizachyrium scoparium*).

Forb/dwarf shrub species in grassland communities include three-flowered avens (*Geum triflorum*), prairie pasqueflower (*Pulsatilla nuttalliana*), prairie sagebrush (*Artemisia frigida*), prairie sage (*A. ludoviciana*), Lewis' wild blue flax (*Linum lewisii*), common yarrow (*Achillea millefolium*) and northern bedstraw (*Galium boreale*). On well-drained moist sites, shrub communities are often transitional to forest, including species such as prickly rose (*Rosa acicularis*), snowberries, saskatoon and silverberry (*Elaeagnus commutata*).

Wetlands and small water bodies are fairly common on the landscape, typically occurring in poorly drained topographic depressions. They often dry up during the summer, and small alkali wetlands sometimes occur.

Deeper marshes dominated by broad-leaved cattail (*Typha latifolia*), hard-stemmed bulrush (*Schoenoplectus acutus*) and common reed (*Phragmites australis*) occur on the margins of water bodies. Non-saline shallow marshes and occasional fens are dominated by a variety of graminoids, including sedges (e.g., water sedge [*Carex aquatilis*], wheat sedge [*Carex atherodes*], northern beaked sedge [*Carex utriculata*]), grasses (e.g., prairie cordgrass [*Sporobolus michauxianus*], bluejoint reedgrass [*Calamagrostis canadensis*], slim-stemmed reedgrass [*C. stricta*], tall mannagrass [*Glyceria grandis*]) and common spikerush (*Eleocharis palustris*). Non-saline wet meadows are dominated

by woolly sedge (*Carex pellita*), tufted hairgrass (*Deschampsia cespitosa*), fowl bluegrass (*Poa palustris*) or a wide variety of forbs.

Saline wet meadows and shallow marshes dominated by alkali saltgrass (*Distichlis stricta* var. *stricta*), foxtail barley (*Hordeum jubatum*), Baltic rush (*Juncus balticus*), northern reedgrass (*Calamagrostis stricta* ssp. *inexpansa*) or Nuttall's alkaligrass (*Puccinellia nuttalliana*) occur on seasonally flooded sites where evaporation concentrates salts, especially in the western portion of the range where the climate is drier.

Shrub communities dominated by willows (e.g., Bebb's willow [*Salix bebbiana*], starved willow [*Salix famelica*], meadow willow [*Salix petiolaris*]) often line small watercourses and margins of waterbodies where water tables remain near the surface throughout the year.

## Climate

The *Great Plains Parkland* zone occurs in the subhumid continental temperate macroclimate of Alberta, Saskatchewan and Manitoba. It reflects an ecoclimatic transition between temperate grasslands to the south, and boreal forests to the north. Here, the climate is moist enough to support tree growth on cooler moister sites, while grasslands occupy the warmer drier parts of the landscape.

In general, winters are cold and summers are warm; mean annual temperatures average approximately 2°C. In Alberta and western Saskatchewan, growing degree days above 5°C vary between about 1300 and 1600, with annual precipitation between approximately 350 and 500 mm. In eastern Saskatchewan and Manitoba, the zone is generally warmer and wetter (GDD approximately 1550 to 1840; annual precipitation between 400 and 540 mm).

## Physiography, Geology, Topography and Soils

The *Great Plains Parkland* zone occupies portions of the Alberta, Saskatchewan and Manitoba Plains, subdivisions of the Interior Plains physiographic region. Elevations are <1000 mASL.

The zone is underlain mostly by level Mesozoic and Tertiary sedimentary rocks. The terrain is generally an undulating plain, but local relief is provided by low bedrock hills, postglacial valley complexes, hummocky moraines and sand dunes.

The entire zone was affected by late Pleistocene glaciation. The predominant surficial material is weakly calcareous glacial till. Glaciolacustrine and glaciofluvial sediments are present in Alberta and Saskatchewan, mainly in lower and mid-valley positions, however virtually the entire Manitoba portion of the zone was inundated by glacial Lake Agassiz and is dominated by glaciolacustrine silts and clays, as well as sandy beach ridges and dunes. Soils are mainly Chernozems, with Gleysols in poorly drained locations.

## Notes

To the north and west, the *Great Plains Parkland* zone is bounded by the *West-Central Boreal Forest*. In Saskatchewan it borders the *Great Plains Mixedgrass Grassland* to the south. In Alberta, the *Great Plains Fescue Grassland*, the *Rocky Mountain Foothills Fescue Grassland* and the *Rocky Mountain Foothills Parkland* lie to the south. In Manitoba, this zone adjoins the *Eastern Temperate Mixed Forest* and *Eastern Boreal Forest* to the east. Here, the southern boundary is the international border; similar ecological conditions occur in the adjacent United States. The *Central Tallgrass Grassland* occurs in south-central Manitoba, surrounded by this zone.

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