

Great Plains Fescue Grassland



General Description

The *Great Plains Fescue Grassland* zone covers an area of over 16,000 km² at the northwestern edge of the Great Plains grasslands, east of the Rocky Mountain foothills. The majority of this zone occurs in Alberta, extending from near Drumheller to just east of the Alberta – Saskatchewan border. The climate is influenced by both its northern latitude and proximity to the Rocky Mountains. The majority of the contemporary landscape supports crop cultivation and livestock grazing.

Vegetation

Natural upland vegetation is characterized by dense stands of vigorous mid-height (approximately 20-40 cm) bunchgrasses, strongly dominated by plains rough fescue *Festuca hallii*. On well-drained hilltops and southerly aspects, stands are often co-dominated by plains rough fescue and northern porcupine grass (*Hesperostipa curtisetata*). Forbs and shrubs may be interspersed within stands, but the fescue tussocks can be so dense that few other species are present. The persistent, upright leaf litter of plains rough fescue adds to the density of stands. Shrub and tree-dominated communities only occur on moist sites. Shrubs and trees are primarily cold-deciduous, broad-leaved species. Species composition and abundance in native grasslands can shift dramatically with grazing impacts, changes in fire regime or invasion by non-native species. Grazing or fire can also result in more open grass stands with a greater proportion of forb cover.

Stands of plains rough fescue prairie may occur in a variety of upland or valley settings but are increasingly restricted to warm southerly aspects at the northern edge of the zone, and to moist northerly aspects at the southern edge. Stands also occur on sandy soils, but these sites usually have higher proportional abundance of needle grasses (*Hesperostipa* spp.) and prairie sandreed (*Sporobolus rigidus* var. *rigidus*).

Other common graminoids include needle-and-thread grass (*Hesperostipa comata*), plains porcupine grass (*H. spartea*), thick-spike wildrye (*Elymus lanceolatus*), slender wildrye (*E. trachycaulus* ssp. *subsecundus*), western wheatgrass (*Pascopyrum smithii*), Hooker's oatgrass (*Avenula hookeri*), prairie junegrass (*Koeleria macrantha*), mat muhly (*Muhlenbergia richardsonis*) and upland sedges such as blunt sedge (*Carex obtusata*), needle-leaved sedge (*C. duriuscula*) and long-stolon sedge (*C. inops* ssp. *heliophila*). Blue grama (*Bouteloua gracilis*) is common on dry sites.

A variety of forbs and shrubs occur but may be restricted in abundance by dense grass thatch. Forb/dwarf shrub species 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*).

Shrub communities often establish on well-drained moist sites, including species such as prickly rose (*Rosa acicularis*), snowberries (*Symphoricarpos albus*, *S. occidentalis*), saskatoon (*Amelanchier alnifolia*) and silverberry (*Elaeagnus commutata*).

Alluvial forests dominated by balsam poplar (*Populus balsamifera*), trembling aspen (*P. tremuloides*) and plains cottonwood (*P. deltoides* ssp. *monilifera*) occur on stable floodplain terraces. These stands often have shrub-rich understories.

Wetlands and small water bodies are fairly common on the landscape. They are mainly confined to poorly drained topographic depressions and often dry up during the summer; small alkali wetlands are common occurrences.

Deeper marshes dominated by broad-leaved cattail (*Typha latifolia*) and hard-stemmed bulrush (*Schoenoplectus acutus*) occur on the margins of water bodies. Non-saline shallow marshes are dominated by a variety of graminoids, including sedges (e.g., wheat sedge [*Carex atherodes*], northern beaked sedge [*Carex utriculata*]), grasses (e.g., common rivergrass [*Scolochloa festucacea*]) 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*), alkali cordgrass (*Spartina gracilis*), Nuttall's alkaligrass (*Puccinellia nuttalliana*) or northern reedgrass (*Calamagrostis stricta* ssp. *inexpansa*) occur on seasonally flooded sites where evaporation concentrates salts.

Shrub communities dominated by willows (e.g., Bebb's willow [*Salix bebbiana*]) or water birch (*Betula occidentalis*) often line small watercourses and margins of water bodies where water tables remain near the surface throughout the year.

Climate

The *Great Plains Fescue Grassland* zone occurs in the subhumid continental temperate macroclimate of central Alberta and west-central Saskatchewan. It

lies outside the primary area influenced by Chinook winter winds and, on average, is the coldest of the grassland vegetation zones in Canada. Winters are cold and summers are warm; mean annual temperature is approximately 2.5°C. Growing degree days above 5°C vary between about 1300 and 1600. Mean annual precipitation is between 350 and 500 mm, with the majority falling in summer months; winter snowfall is generally low.

Physiography, Geology, Topography and Soils

This zone occupies portions of the Alberta and Saskatchewan Plains, subdivisions of the Interior Plains physiographic region. Elevations are generally <1000 mASL, although some western areas reach nearly 1100 mASL.

The zone is underlain 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 prominent in lower and mid-valley positions. Dune complexes are also significant in some locations. Soils are primarily deep Chernozems with loamy to clayey textures, but Solonchic soils with an impervious hardpan layer caused by excess sodium (Na⁺) occur in some locations.

Notes

To the north, the *Great Plains Fescue Grassland* zone borders the *Great Plains Parkland* and, to the south, the *Great Plains Mixedgrass Grassland*. On its western edge, it adjoins the *Rocky Mountain Foothills Fescue Grassland*.