1149 WESTERN GREAT PLAINS SHORTGRASS PRAIRIE (CES303.672)

CLASSIFIERS

Conf.: 1 - Strong **Classification Status:** Standard
Primary Division: Western Great Plains (303)
Land Cover Class: Herbaceous
Spatial Scale & Pattern: Matrix
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Non-Diagnostic Classifiers: Herbaceous; Loam Soil Texture; Ustic; F-Landscape/Low Intensity
FGDC Crosswalk: Vegetated, Herbaceous / Nonvascular-dominated, Herbaceous - grassland, Perennial graminoid grassland
National Mapping Codes: EVT 2149; ESLF 7122; ESP 1149

CONCEPT

Summary: This system is found primarily in the western half of the Western Great Plains Division in the rainshadow of the Rocky Mountains and ranges from the Nebraska Panhandle south into Texas and New Mexico, although grazing-impacted examples may reach as far north as southern Canada where it grades into Northwestern Great Plains Mixedgrass Prairie (CES303.674). This system occurs primarily on flat to rolling uplands with loamy, ustic soils ranging from sandy to clayey. In much of its range, this system forms the matrix system with *Bouteloua gracilis* dominating this system. Associated graminoids may include *Aristida purpurea, Bouteloua curtipendula, Bouteloua hirsuta, Buchloe dactyloides, Hesperostipa comata, Koeleria macrantha (= Koeleria cristata), Pascopyrum smithii (= Agropyron smithii), Pleuraphis jamesii, Sporobolus airoides*, and *Sporobolus cryptandrus*. Although mid-height grass species may be present, especially on more mesic land positions and soils, they are secondary in importance to the sod-forming short grasses. Sandy soils have higher cover of *Hesperostipa comata, Sporobolus cryptandrus*, and *Yucca elata*. Scattered shrub and dwarf-dwarf species such as *Artemisia filifolia, Artemisia frigida, Artemisia tridentata, Atriplex canescens, Eriogonum effusum, Gutierrezia sarothrae*, and *Lycium pallidum* may also be present. Also, because this system spans a wide range, there can be some differences in the relative dominance of some species from north to south and from east to west. Large-scale processes such as climate, fire and grazing influence this system. High variation in amount and timing of annual precipitation impacts the relative cover of cool- and warm-season herbaceous species.

In contrast to other prairie systems, fire is less important, especially in the western range of this system, because the often dry and xeric climate conditions can decrease the fuel load and thus the relative fire frequency within the system. However, historically, fires that did occur were often very expansive. Currently, fire suppression and more extensive grazing in the region have likely decreased the fire frequency even more, and it is unlikely that these processes could occur at a natural scale. A large part of the range for this system (especially in the east and near rivers) has been converted to agriculture. Areas of the central and western range have been impacted by the unsuccessful attempts to develop dryland cultivation during the Dust Bowl of the 1930s. The short grasses that dominate this system are extremely drought- and grazing-tolerant. These species evolved with drought and large herbivores and, because of their stature, are relatively resistant to overgrazing. This system in combination with the associated wetland systems represents one of the richest areas for mammals and birds. Endemic bird species to the shortgrass system may constitute one of the fastest declining bird populations.

Classification Comments: In Texas, this system occurs on the Llano Estacado and ranges to but does not include the Stockton Plateau.

Similar Ecological Systems:
- Madrean Juniper Savanna (CES301.730)
- Southern Rocky Mountain Juniper Woodland and Savanna (CES306.834)
- Western Great Plains Mesquite Woodland and Shrubland (CES303.668)
- Western Great Plains Sand Prairie (CES303.670)

Related Concepts:
- Black Grama - Alkali Sacaton (702) (Shiflet 1994) Finer
- Black Grama - Sideoats Grama (703) (Shiflet 1994) Finer
- Blue Grama - Buffalograss (611) (Shiflet 1994) Finer
- Blue Grama - Galleta (705) (Shiflet 1994) Finer
- Blue Grama - Sideoats Grama (706) (Shiflet 1994) Finer
- Blue Grama - Sideoats Grama - Black Grama (707) (Shiflet 1994) Finer
- Blue Grama - Western Wheatgrass (704) (Shiflet 1994) Finer
- Galleta -Alkali Sacaton (712) (Shiflet 1994) Finer
- Grama - Buffalograss (715) (Shiflet 1994) Finer
- Grama - Feathergrass (716) (Shiflet 1994) Finer
- Vine Mesquite - Alkali Sacaton (725) (Shiflet 1994) Intersecting
- Wheatgrass - Saltgrass - Grama (615) (Shiflet 1994) Intersecting

DESCRIPTION

Environment: This system is located on primarily flat to rolling uplands. Soils typically are loamy and ustic and range from sandy to clayey. Climate is continental with mean annual precipitation generally about 300 mm ranging to 500 mm to the south in Texas. Most

of the annual precipitation occurs during the growing season as thunderstorms. Precipitation events are mostly <10 cm with occasional larger events.

Vegetation: This system spans a wide range and thus there can be some differences in the relative dominance of some species from north to south and from east to west. This system is primarily dominated by *Bouteloua gracilis* throughout its range with various associated graminoid species depending on precipitation, soils and management. Associated graminoids may include *Achnatherum hymenoides, Aristida purpurea, Bouteloua curtipendula, Bouteloua hirsuta, Buchloe dactyloides, Carex filifolia, Hesperostipa comata, Koeleria macrantha (= Koeleria cristata), Muhlenbergia torreyana, Pascopyrum smithii (= Agropyron smithii), Pleuraphis jamesii, Sporobolus airoides*, and *Sporobolus cryptandrus*. Although mid-height grass species may be present especially on more mesic land positions and soils, they are secondary in importance to the sod-forming short grasses. Sandy soils have higher cover of *Hesperostipa comata, Sporobolus cryptandrus*, and *Yucca elata*. Scattered shrub and dwarf-dwarf species such as *Artemisia filifolia, Artemisia frigida, Artemisia tridentata, Atriplex canescens, Eriogonum effusum, Gutierrezia sarothrae*, and *Lycium pallidum* may also be present. High annual variation in amount and timing of precipitation impacts relative cover of herbaceous species. Cover of cool-season grasses is dependant on winter and early spring precipitation.

Dynamics: Climate, fire and grazing constitute the primary processes impacting this system. Drought-tolerant shortgrass species have root systems that extend up near the soil surface where they can utilize low precipitation events (Sala and Lauenroth 1982). Fire is less important in this system compared to other Western Great Plains prairie systems, especially in the western portion of its range. Previous comments in the literature citing *Opuntia* spp. increasing with overgrazing may not be borne out by more recent research (R. Rondeau pers. comm.). Conversion to agriculture and pastureland with subsequent irrigation has degraded and extirpated this system in some areas of its range.

MEMBERSHIP

Associations:

- *Aristida purpurea* Herbaceous Vegetation (CEGL005800, GNR)
- *Bouteloua curtipendula - Bouteloua (eriopoda, gracilis)* Herbaceous Vegetation (CEGL002250, G4)
- *Bouteloua eriopoda - Bouteloua gracilis* Herbaceous Vegetation (CEGL001748, G2)
- *Bouteloua gracilis - Bouteloua curtipendula* Herbaceous Vegetation (CEGL001754, G5)
- *Bouteloua gracilis - Bouteloua hirsuta* Herbaceous Vegetation (CEGL001755, G3G4)
- *Bouteloua gracilis - Buchloe dactyloides - Pleuraphis jamesii* Herbaceous Vegetation (CEGL002271, GNR)
- *Bouteloua gracilis - Buchloe dactyloides* Herbaceous Vegetation (CEGL001756, G4)
- *Bouteloua gracilis - Buchloe dactyloides* Xeric Soil Herbaceous Vegetation (CEGL002270, G3G5)
- *Bouteloua gracilis - Pleuraphis jamesii* Herbaceous Vegetation (CEGL001759, G2G4)
- *Bouteloua gracilis* Herbaceous Vegetation (CEGL001760, G4Q)
- *Bouteloua hirsuta - Bouteloua curtipendula* Herbaceous Vegetation (CEGL001764, G4)
- *Bouteloua hirsuta* Herbaceous Vegetation [Placeholder] (CEGL002673, GNR)
- *Hesperostipa neomexicana* Mixed Prairie Herbaceous Vegetation (CEGL001711, GU)
- *Sporobolus airoides* Southern Plains Herbaceous Vegetation (CEGL001685, G3Q)
- *Yucca glauca / Calamovilfa longifolia* Shrub Herbaceous Vegetation (CEGL002675, G4)

Alliances:

- *Aristida purpurea* Herbaceous Alliance (A.2570)
- *Bouteloua curtipendula* Herbaceous Alliance (A.1244)
- *Bouteloua eriopoda* Herbaceous Alliance (A.1284)
- *Bouteloua gracilis* Herbaceous Alliance (A.1282)
- *Bouteloua hirsuta* Herbaceous Alliance (A.1285)
- *Hesperostipa neomexicana* Herbaceous Alliance (A.1272)
- *Sporobolus airoides* Herbaceous Alliance (A.1267)
- *Yucca glauca* Shrub Herbaceous Alliance (A.1540)

SPATIAL CHARACTERISTICS

Adjacent Ecological Systems:

- Northwestern Great Plains Mixedgrass Prairie (CES303.674)
- Western Great Plains Tallgrass Prairie (CES303.673)

Adjacent Ecological System Comments: Some examples may reach as far north as southern Canada where it grades into Northwestern Great Plains Mixedgrass Prairie (CES303.674).

DISTRIBUTION

Range: This system is found primarily in the western half of the Western Great Plains Division east of the Rocky Mountains and ranges from the Nebraska Panhandle south into the panhandles of Oklahoma and Texas and New Mexico, although some examples may reach as far north as southern Canada where it grades into Northwestern Great Plains Mixedgrass Prairie (CES303.674).

Divisions: 303:C

Nations: US

Subnations: CO, KS, NE, NM, OK, TX, WY

Map Zones: 22:C, 24:?, 25:C, 26:C, 27:C, 28:C, 29:C, 30:C, 31:P, 33:C, 34:C, 35:P, 38:P

USFS Ecomap Regions: 315A:CC, 315B:CC, 315F:CC, 321A:CC, 331B:CC, 331C:CC, 331F:CC, 331H:CC, 331I:CC, 332C:CC, 332E:CC, 332F:CC, M313B:CC, M331F:CC, M331I:CC

TNC Ecoregions: 26:P, 27:C, 28:C, 33:P

SOURCES

References: Barbour and Billings 1988, Comer et al. 2003, Dick-Peddie 1993, Lauenroth and Milchunas 1992, Milchunas et al. 1989, Ricketts et al. 1999, Rondeau pers. comm., Sala and Lauenroth 1982

Full References:

See www.natureserve.org/explorer/servlet/NatureServe?searchSystemUid=ELEMENT_GLOBAL.2.722986#references

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Version: 11 Nov 2003 **Stakeholders:** Midwest, Southeast, West

Concept Author: S. Menard and K. Kindscher **ClassifResp:** Midwest

