Pascopyrum smithii - Bouteloua gracilis - Carex filifolia Herbaceous Vegetation

COMMON NAME	Western Wheatgrass - Blue Grama - Threadleaf Sedge Herbaceous Vegetation
SYNONYM	Western Wheatgrass - Blue Grama - Threadleaf Sedge Prairie
PHYSIOGNOMIC CLASS	Herbaceous Vegetation (V)
PHYSIOGNOMIC SUBCLASS	Perennial graminoid vegetation (V.A)
PHYSIOGNOMIC GROUP	Temperate or subpolar grassland (V.A.5)
PHYSIOGNOMIC SUBGROUP	Natural/Semi-natural (V.A.5.N)
FORMATION	Medium-tall sod temperate or subpolar grassland (V.A.5.N.c)
ALLIANCE	PASCOPYRUM SMITHII HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Terrestrial

RANGE

Badlands National Park

Extensive areas of western wheatgrass - blue grama vegetation are found throughout the Park and the project environs. Associations of this type occupy clay, silt, loam, and sandy soils of flats, swales, drainages, hills, and slopes. The type adjoins little bluestem stands in drainages and on steeper slopes and silver sagebrush shrublands along drainages. In some areas stands of western wheatgrass has been converted to exotic perennial grasses, including smooth brome, Kentucky bluegrass, and crested wheatgrass, or stands have been grazed heavily enough that blue grama is the dominant species.

Globally

This community is found in Colorado, Wyoming, Montana, North Dakota, South Dakota, and Saskatchewan.

ENVIRONMENTAL DESCRIPTION

Badlands National Park

Western wheatgrass - blue grama stands occur in a wide variety of habitats throughout the Park. Sites generally are flat to moderately steep in slope and occur on all aspects. This type is more heavily grazed in the South Unit where it may become more heavily dominated by blue grama and threadleaf sedge on drier soils, and Kentucky bluegrass on more mesic sites.

Globally

This community is found on flat or gently sloping terrain. Many stands are on floodplains or gentle valley slopes, others are on uplands. Surface layers of soils are usually clay loams, although stands of this type may also be found on loams, silt loams, silty clays and clays (Hanson and Whitman 1938, Hansen and Hoffman 1988). In Alberta and Saskatchewan this association grows on solonetzic soils (with an elluvial horizon above a dense clay horizon high in sodium salts) developed on thin glacial till over Cretaceous shale (Coupland 1961). This community does not appear to be found in mountain valleys (Hanson and Dahl 1956, Jones 1992).

MOST ABUNDANT SPECIES

Badlands National Park

Stratum	Species
Herbaceous	*Bromus japonicus*, *Poa pratensis*, *Nassella viridula*, *Bouteloua gracilis*, *Pascopyrum smithii*

Globally

Stratum	Species
Graminoid	*Bouteloua gracilis, Carex filifolia, Elymus lanceolatus, Pascopyrum smithii*

CHARACTERISTIC SPECIES

Badlands National Park

Pascopyrum smithii, *Bouteloua gracilis*, *Nassella viridula*, *Bromus japonicus*

Globally

Bouteloua gracilis, Buchloe dactyloides, Carex filifolia, Elymus lanceolatus, Pascopyrum smithii

OTHER NOTABLE SPECIES

Globally

Stratum	Species
Graminoid	*Bromus inermis, Bromus tectorum, Poa pratensis*

VEGETATION DESCRIPTION

Badlands National Park

Stands of the western wheatgrass - grama type range from moderate to complete herbaceous cover, between 40-100%. Western wheatgrass (*Pascopyrum smithii*) is strongly dominant in ungrazed stands, less so in stands subjected to annual grazing by livestock. Species dominance can vary locally within a stand, dependent on soils and land use factors. Dominant graminoids are western wheatgrass, blue grama (*Bouteloua gracilis*), buffalograss (*Buchloe dactyloides*), and Japanese brome (*Bromus*

japonicus). Other common herbaceous species include green needlegrass (*Nassella viridula*), wild alfalfa (*Psoralidium tenuiflorum*), poverty cactus (*Opuntia polyacantha*), and white sagebrush (*Artemisia ludoviciana*).

In western wheatgrass - grama stands within Badlands NP, species dominance varies within the stand. Western wheatgrass, blue grama, and buffalograss all can be locally dominant, often to the exclusion of other species. For this reason, multiple sample points were taken to characterize this vegetation type.

Globally
This community is dominated by medium and short graminoids. Total vegetation cover is usually high (Hanson and Dahl 1956, Hansen *et al.* 1984). *Pascopyrum smithii* or *Elymus lanceolatus* or both (the two species are similar both morphologically and ecologically) and *Bouteloua gracilis* usually contribute the most cover; however, *Bouteloua gracilis* may contribute little cover and it may be absent locally. *Carex filifolia, Carex duriuscula (=Carex eleocharis), and Carex pensylvanica* often are secondary species, but in many stands they contribute little cover and they may be absent locally. *Stipa comata* usually is present as a secondary species, but it often codominates on sandy loam soils.. In Alberta and Saskatchewan, *Stipa spartea* var. *curtiseta* may be as common as *Stipa comata. Koeleria macrantha* is present in most stands and may contribute substantial cover. The forbs most likely to be found in this association are *Phlox hoodii, Sphaeralcea coccinea, Polygonum ramosissimum, Plantago patagonica, Opuntia polyacantha, Artemisia frigida, Antennaria microphylla*, and *Hedeoma hispida*. In southeastern Montana, western North Dakota, and northeastern Wyoming, stands of this association often contain *Artemisia tridentata ssp. wyomingensis*. Exotic brome grasses, especially *Bromus commutatus* and *B. tectorum*, are present in many stands of this association and they commonly contribute substantial cover (Hanson and Dahl 1956, Coupland 1961, Hansen *et al.* 1984, Hansen and Hoffman 1988).

CONSERVATION RANK G4. The G4 rank is based on the broad geographic range of this type, and its status as a common vegetation type within that geographic range.

DATABASE CODE CEGL001579

MAP UNITS The Western Wheatgrass - Blue Grama - Threadleaf Sedge Herbaceous Vegetation type is included under Map Class 16 (Western wheatgrass Grassland Alliance) on the Badlands NP vegetation map. This map unit includes all western wheatgrass associations. The Western Wheatgrass - Green Needlegrass Herbaceous Vegetation association is mapped separately under Map Class 19 only when it was directly observed during field data collection.

SIMILAR ASSOCIATIONS
Pascopyrum smithii - Bouteloua gracilis Herbaceous Vegetation (is similar to this type but occurs in the southern portion of the Great Plains (where *Carex filifolia* is not as prevalent.)
Pascopyrum smithii - Nassella viridula Herbaceous Vegetation (Drier graminoids, such as *Bouteloua gracilis* or *Carex filifolia* are rare or absent in this type.)
Pascopyrum smithii - Stipa comata Central Mixedgrass Herbaceous Vegetation
Stipa comata - Bouteloua gracilis - Carex filifolia Herbaceous Vegetation (*Stipa comata* contributes more cover than do *Pascopyrum smithii* or *Elymus lanceolatus*, and the association grows on soils of loam or coarser textural classes.)

COMMENTS
Badlands National Park
Western wheatgrass stands are extensive and many sites were visited in preparing the vegetation map. It's possible that other western wheatgrass associations could be recognized at Badlands NP. However, this type and the Western wheatgrass - Green Needlegrass Herbaceous Vegetation association (CEGL001583) appear to be the main ones.

The western wheatgrass - blue grama type ranges from very low diversity on clay flats to high diversity on clay-loam and sandy-loam soils. Where this type intergrades with little bluestem, Kentucky bluegrass, and silver sagebrush, it can become very difficult to classify. Difficulty in classification can also occur on sites grazed annually, because the cool-season western wheatgrass is grazed initially, resulting in warm-season grasses like blue grama appearing to be the stand dominant. During some years, this type will be covered with very tall yellow sweetclover (*Melilotus officianalis*) plants, which have invaded the un-/lightly-grazed North Unit.

Globally
The coverage of *Pascopyrum smithii* varies more with use than geographic range. *Bouteloua gracilis* and *Buchloe dactyloides* have been observed to increase with grazing as *Pascopyrum smithii* decreases. This type, as currently understood by MRO, is equivalent to the *Pascopyrum smithii / Carex filifolia* Herbaceous Vegetation in the Western Region's 1994 classification (Bourgeron and Engelking 1994). Fire was likely a common event in this type historically.

REFERENCES
Bourgeron, P. S., and L. D. Engelking, eds. 1994. A preliminary vegetation classification of the western United States. Unpubl. rep. The Nature Conservancy, West. Heritage Task Force. Boulder, Colo. 175 p. plus app.
Hansen, P. L., G. R. Hoffman, and A. J. Bjugstad. 1984. The vegetation of Theodore Roosevelt National Park, North Dakota: A habitat type classification. U. S. Dep. Agric., For. Serv., Rocky Mt. For. and Range Exp. Sta., Gen. Tech. Rep. RM-113. Fort Collins, Colo. 35 p.

Hansen, P.L. 1985. An ecological study of the vegetation of the Grand River/Cedar River, Sioux, and Ashland Districts of the Custer National Forest. Unpublished dissertation, South Dakota State University. 257 pp.

Hansen, P.L. and G.R. Hoffman. 1988. The vegetation of the Grand River/Cedar River, Sioux, and Ashland Districts of the Custer National Forest: a habitat type classification. USDA Forest Service General Technical Report RM-157, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO.

Hanson, H. C, and E. Dahl. 1956. Some grassland communities in the mountain-front zone in northern Colorado. Vegetatio 7:249-270.

Hanson, H. C., and W. Whitman. 1938. Characteristics of major grassland types in western North Dakota. Ecol. Monogr. 8(1):57-114.

Johnston, B. C. 1987. Plant associations of region two: potential plant communities of Wyoming, South Dakota, Nebraska, Colorado, and Kansas. Edition 4. USDA Forest Service, Rocky Mountain Region. R2-Ecol-87-2. 429 pp.

Jones, G. 1992. Wyoming plant community classification (Draft). Wyoming Natural Diversity Database, Laramie, WY. 183 pp.

Ode, D. 1997. Personal communication. South Dakota Natural Heritage Program, Pierre, South Dakota. March 17,1998.

Steinauer, G. and S. Rolfsmeier. 1997. Terrestrial natural communities of Nebraska. Draft - October 28, 1997. Nebraska Game and Parks Commission, Lincoln, NE. 117 p.

Weaver, J. E. and F. W. Albertson. 1956. Grasslands of the Great Plains: their nature and use. Johnsen Publishing Company, Lincoln, Nebraska. 395 pp.