

**APPENDIX E: NVCS Association Descriptions for Lacreek NWR.**

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## Blacktailed Prairie Dog Town Grassland Complex

COMMON NAME	Blacktailed Prairie Dog Town Grassland Complex
SYNONYM	Blacktailed Prairie Dog Town Grassland Complex
PHYSIOGNOMIC CLASS	(n/a)
PHYSIOGNOMIC SUBCLASS	(n/a)
PHYSIOGNOMIC GROUP	(n/a)
PHYSIOGNOMIC SUBGROUP	(n/a)
FORMATION	(n/a)
ALLIANCE	
CLASSIFICATION CONFIDENCE LEVEL	3
USFWS WETLAND SYSTEM	Terrestrial

### RANGE

#### *Lacreek National Wildlife Refuge*

Black-tailed prairie dog (*Cynomys ludovicianus*) towns are widespread within Lacreek and its environs, where soils are deep enough and have sufficient structure to support burrowing activity. Towns may range in size from less than one hectare to several hundred hectares; the largest occur adjacent to and contiguous with the Conata Basin. A black-footed ferret (*Mustela nigripes*) reintroduction program is underway within Lacreek, to help return this predator of prairie dogs to portions of its former range.

#### *Globally*

The blacktailed prairie dogs (*Cynomys ludovicianus ludovicianus*) occur on the Great Plains and the whitetailed prairie dogs (*Cynomys leucurus*) occur in the Great Basin (Knight 1994). Prairie dog towns historically covered millions of hectares in the Great Plains; currently their towns range in size from tens to hundreds of hectares, with an average density of 10 to 55 animals/ha (Whicker and Detling 1988). Blacktailed prairie dog towns occur widely throughout the short and mixed-grass regions of the Great Plains of the United States and Canada, and this complex ranges from Saskatchewan in Canada south to the southern Great Plains states, including Colorado and Kansas

### ENVIRONMENTAL DESCRIPTION

#### *Lacreek National Wildlife Refuge*

Prairie dog towns are located on clay, clay loam, silty loam and some sandy loam soils deposited following erosion from adjacent uplands, including badlands formations. The soils are primarily derived from the Brule, Chadron, and Pierre Shale formations. Soils are deep, structured and not easily eroded. This type is found on level sites along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and flats on tables and buttes.

#### *Globally*

Prairie dog towns are located on a wide variety of soils, including clay, clay loam, silty loam and some sandy loam soils deposited following erosion from adjacent uplands, including badlands formations. Soils are deep, structured and not easily eroded. This type is found on level sites along drainages, in broad valleys, on gentle to moderately sloping hillslopes, and flats on tables and buttes (Von Loh *et al.* 1999). Prairie dogs create extensive burrows in their towns. Large volumes of soil are moved, improving filtration, hastening the incorporation of organic matter,

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facilitating nutrient cycling, and increasing the spatial heterogeneity of vegetation, soils, and other ecosystem components (Knight 1994).

### MOST ABUNDANT SPECIES

#### **Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Verbena bracteata</i> , <i>Conyza ramosissima</i> , <i>Hedeoma hispida</i> , <i>Dyssodia papposa</i> , <i>Aristida purpurea</i> , <i>Buchloe dactyloides</i> , <i>Pascopyrum smithii</i>

#### **Globally**

<u>Stratum</u>	<u>Species</u>
Short Shrub	<i>Artemisia frigida</i>
Forb	<i>Dyssodia papposa</i>
Graminoid	<i>Aristida purpurea</i> , <i>Bouteloua gracilis</i> , <i>Buchloe dactyloides</i> , <i>Pascopyrum smithii</i>

### CHARACTERISTIC SPECIES

#### **Lacreek National Wildlife Refuge**

*Pascopyrum smithii*, *Aristida purpurea*, *Dyssodia papposa*, *Hedeoma hispida*, *Conyza ramosissima*, *Verbena bracteata*

#### **Globally**

*Aristida purpurea*, *Artemisia frigida*, *Bouteloua gracilis*, *Conyza ramosissima*, *Dyssodia papposa*, *Hedeoma hispida*, *Pascopyrum smithii*, *Verbena bracteata*

### OTHER NOTABLE SPECIES

### VEGETATION DESCRIPTION

#### **Lacreek National Wildlife Refuge**

The prairie dog towns are extremely variable in their vegetation characteristics, which are dependent largely on age of town, soil type, and population density (as it relates to grazing frequency). Vegetation cover averages between 30-80% with frequent patches of 100% cover. The vegetation sometimes occurs in relatively concentric zones, relating to outward expansion of town boundaries over time. Abandoned towns, towns with sparse prairie dog populations, and the outer edges of most towns are typically dominated by western wheatgrass (*Pascopyrum smithii*), blue grama (*Bouteloua gracilis*), and/or buffalograss (*Buchloe dactyloides*). Vegetation is typically patchy in distribution, and towns may encompass other plant associations as they expand, including emergent wetlands and badlands complex vegetation (no burrows are dug in these types, they merely become surrounded). The more common patches of vegetation within towns include purple three-awn (*Aristida purpurea*), fetid dogweed (*Dyssodia papposa*), dwarf conyza (*Conyza ramosissima*), field bindweed (*Convolvulus arvensis*), and large-bract verbena (*Verbena bracteata*).

#### **Globally**

Blacktailed prairie dog towns are located in open mixedgrass or shortgrass prairie habitat, and their activity has both direct and indirect effects on the vegetation. The blacktailed prairie dogs keep the surrounding vegetation clipped close to the ground, presumably to improve their ability to detect stalking predators. This clipping gives the impression of a mowed lawn, or overgrazed

rangeland. Cover averages between 30 and 80%, but some patches may be 100%. Prairie dogs repeatedly clip and graze plants, rarely allowing shoots to reach full size. Thus, canopy height within the colony is about 5-10 cm, compared to 20-50 cm in nearby, uncolonized grassland (Whicker and Detling 1988). Changes in plant species composition may begin as early as 2 or more years after colonization. Shortgrass species, such as *Bouteloua gracilis* and *Buchloe dactyloides*, and annual forbs become abundant and replace mid-height or tall grasses, such as *Pascopyrum smithii*. Continued heavy grazing may eventually result in complete dominance by a few species of forbs or dwarf shrubs, such as *Artemisia frigida*, *Dyssodia papposa*, and *Aristida purpurea* (Whicker and Detling 1988). Grazing may even cause genetic shifts within species. The shorter, more prostrate, growth forms of *Pascopyrum smithii* on prairie dog towns have been shown to be more abundant than those away from towns, suggesting that some genotypes within the species may tolerate grazing better than others (Jaramillo and Detling 1988, Whicker and Detling 1988).

Bison may be attracted to the prairie dog towns, and a series of studies found that bison preferentially graze them (Coppock et al. 1983, Coppock and Detling 1986, Day and Detling 1990). The forage on the colonies is more nutritious than off, with higher nitrogen content and younger shoots, apparently because the animal waste products are deposited there. In turn, the presence of bison waste products further increases the soil fertility and forage quality (Knight 1994). Pronghorns may also prefer the prairie dog towns (Knight 1994). Plant species diversity is increased by the small-scale disturbances caused by the digging of prairie dogs, and animal species diversity may also increase because of the habitat provided for the badger, rattlesnake, burrowing owl, black-footed ferret, and cottontail, in addition to the bison and pronghorn (Knight 1994).

Prairie dog towns also move over time, expanding and contracting, and, as larger towns can cover thousands of hectares at a time, the effect on the prairie landscape is substantial. The plant community types on a prairie dog colony are roughly indicative of the extent of herbivore disturbance and reflect the cumulative impact of grazing intensity, grazing duration, activities of other animals, soil characteristics, and weather (Whicker and Detling 1988). Early stages of the town may have a typical mixed grass or shortgrass prairie type. With continued grazing and age of the town, the composition may shift to a mix of annual species and dwarf-shrubs. These latter stages have not been classified, but are treated here as a complex. Species richness appears to be highest under moderate levels of disturbance, because grass species have not yet begun to disappear, but forb species have begun to increase.

**CONSERVATION RANK** G4. This rank has been assigned based on the G4 rank that is currently assigned to the Blacktailed prairie dog itself. However, more careful review of the rank from a community perspective is needed.

**DATABASE CODE** CECX002003

### SIMILAR ASSOCIATIONS

*Pascopyrum smithii* - *Bouteloua gracilis* - *Carex filifolia* Herbaceous Vegetation

*Pascopyrum smithii* - *Nassella viridula* Herbaceous Vegetation

COMMENTS

*Lacreek National Wildlife Refuge*

The disturbance-related vegetation occurs on the naturally-disturbed soils of prairie dog towns. Prairie dog town disturbed vegetation is quite patchy in distribution, and variable in terms of species distribution, with dominance varying locally within a stand. This is typical of early successional species on disturbed sites. The Prairie Dog Town Complex was well-surveyed during the preparation of the vegetation map.

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**Calamovilfa longifolia - Carex inops ssp. heliophila Herbaceous Vegetation**

COMMON NAME Prairie Sandreed - Long-stolon Sedge Herbaceous Vegetation  
SYNONYM Prairie Sandreed - 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 Tall sod temperate grassland (V.A.5.N.a)  
ALLIANCE CALAMOVILFA LONGIFOLIA HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

The prairie sandreed type is found primarily in the sandhills portion of the Refuge, although small stands sometimes occur in coarse textured soils along the northern margin of pool #10.

**Globally**

This community is found in 3 ecoregional sections in Wyoming, Montana, North Dakota, South Dakota, and Saskatchewan.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

The more developed stands of prairie sandreed grassland are found on sandy deposits along the northern border of the sandhills. Extensive stands occur primarily in the northeast corner of the sandhills. These species are also common components of many of the sandhill communities.

**Globally**

Stands are found on gently rolling uplands with little to moderate slopes (typically between 0 and 20%, but occasionally as high as 39%, Hirsch 1985, Hansen and Hoffman 1988). The soils are sand, sandy loam, or loamy sand and there is rarely substantial soil horizon development (Hanson and Whitman 1938). The parent material is sandstone (USFS 1992). Moisture levels may be high deep in the profile.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Yucca glauca</i>
Herbaceous	<i>Calamovilfa longifolia</i> , <i>Carex inops ssp heliophila</i> , <i>Hesperostipa comata</i> , <i>Poa pratensis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Calamovilfa longifolia</i> , <i>Carex filifolia</i> , <i>Carex inops ssp heliophila</i>

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### CHARACTERISTIC SPECIES

#### **Lacreek National Wildlife Refuge**

*Calamovilfa longifolia*, *Hesperostipa comata*

#### **Globally**

*Calamovilfa longifolia*, *Carex filifolia*, *Carex inops* ssp. *heliophila*

### OTHER NOTABLE SPECIES

#### **Globally**

##### Stratum

##### Species

Graminoid      *Koeleria macrantha*, *Schizachyrium scoparium*, *Hesperostipa comata*

### VEGETATION DESCRIPTION

#### **Lacreek National Wildlife Refuge**

Small stands of prairie sandreed grasslands are fairly common throughout the sandhills. Many are below the minimum mapping unit of 0.5 hectares. Foliar cover is usually sparse, ranging from 20-40%. The dominant grass is prairie sandreed (*Calamovilfa longifolia*), with needle-and-thread (*Hesperostipa comata*) and Kentucky bluegrass (*Poa pratensis*) as common secondary species.

#### **Globally**

The vegetation structure is somewhat open, with cover averaging 65 percent in parts of its range (USFS 1992). The vegetation is dominated by graminoids, with two strata, one of mid- to tall-grasses, the other of dense short sedges. In the taller grass layer, the most abundant species is *Calamovilfa longifolia*. Other species found in this layer include *Koeleria macrantha*, *Schizachyrium scoparium*, and *Hesperostipa comata*. *Pascopyrum smithii* may be present on some stands with finer soil textures. The short graminoid layer is composed chiefly of *Carex filifolia* and *Carex inops* ssp. *heliophila*, which may have high cover values. Other upland Carices, such as *Carex duriuscula* (= *Carex eleocharis*), as well as *Bouteloua gracilis* and *Muhlenbergia pungens*, may also be present. Forb species diversity is moderate, but they do not contribute greatly to the cover (Hanson and Whitman 1938, USFS 1992). The forbs that are typical of this community include *Artemisia dracunculus*, *Artemisia frigida* (a shrub to some), *Artemisia ludoviciana*, *Chenopodium album*, *Chenopodium leptophyllum*, *Lathyrus* spp., *Liatris punctata*, *Lygodesmia juncea*, *Phlox hoodii*, and *Psoralidium lanceolatum*. Shrubs are uncommon. When shrubs are present they are short shrubs such as *Yucca glauca*, *Rosa* spp., and *Artemisia frigida* (a forb to some).

**CONSERVATION RANK** G3. No occurrences have been documented, but the community is reported in 3 ecoregional subsections in Wyoming, Montana, North Dakota, South Dakota, and Saskatchewan. It is a very uncommon community in Badlands National Park, South Dakota.

**DATABASE CODE** CEGL001471

### SIMILAR ASSOCIATIONS

*Calamovilfa longifolia* - *Hesperostipa comata* Herbaceous Vegetation

COMMENTS

***Lacreek National Wildlife Refuge***

*Calamovilfa longifolia* - *Hesperostipa comata* Herbaceous Vegetation (CEGL001473) may be an equally good fit.

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**Calamovilfa longifolia - Hesperostipa comata Herbaceous Vegetation**

COMMON NAME	Prairie Sandreed - Needle-and-thread Herbaceous Vegetation
SYNONYM	Prairie Sandreed - Needle-and-thread Prairie
NE	Sandhills Dry Valley Prairie; Eastern Sandhills Needlegrass 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	Tall sod temperate grassland (V.A.5.N.a)
ALLIANCE	CALAMOVILFA LONGIFOLIA HERBACEOUS ALLIANCE
CLASSIFICATION CONFIDENCE LEVEL	2
USFWS WETLAND SYSTEM	Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

The prairie sandreed type is found primarily in the sandhills portion of the Refuge, although small stands sometimes occur in coarse textured soils along the northern margin of pool #10.

**Globally**

This prairie sandreed grassland community type occurs in the central and northern Great Plains region of the United States, ranging from Colorado and Nebraska, north to Wyoming and South Dakota.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

The more developed stands of prairie sandreed grassland are found on sandy deposits along the northern border of the sandhills. Extensive stands occur primarily in the northeast corner of the sandhills. These species are also common components of many of the sandhill communities.

**Globally**

Stands occur on stabilized sand dunes, as well as in interdunal valleys or draws, colluvial sands, and, less commonly, silty terraces of intermittent streams. Soils are medium to fine sands formed either from eolian or colluvial processes. For example, in Nebraska stands occur below sandstone outcrops and escarpments. More rarely, stands occur on floodplain terraces of intermittent streams, where soils are moderately deep, poorly drained, silty loams and loams (Heerwagen 1958, USDI 1979, Barnes et al. 1984, Steinauer and Rolfsmeier 2000). Blowouts caused by drought and wind may occur in this type. The type probably represents a later successional stage. Earlier stages may be dominated by *Andropogon hallii* (e.g. CEGL001467). Heavy grazing may increase the likelihood of blowouts.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Yucca glauca</i>
Herbaceous	<i>Calamovilfa longifolia</i> , <i>Carex inops ssp heliophila</i> , <i>Hesperostipa comata</i> , <i>Poa pratensis</i>

**Globally**

Stratum

Species

Graminoid     *Calamovilfa longifolia*, *Carex filifolia*, *Carex inops* ssp *heliophila*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Calamovilfa longifolia*, *Hesperostipa comata*

**Globally**

*Calamovilfa longifolia*, *Carex filifolia*, *Carex inops* ssp *heliophila*

OTHER NOTABLE SPECIES

Globally

Stratum

Species

Graminoid                     *Koeleria macrantha*, *Schizachyrium scoparium*, *Hesperostipa comata*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Small stands of prairie sandreed grasslands are fairly common throughout the sandhills. Many are below the minimum mapping unit of 0.5 hectares. Foliar cover is usually sparse, ranging from 20-40%. The dominant grass is prairie sandreed (*Calamovilfa longifolia*), with needle-and-thread (*Hesperostipa comata*) and Kentucky bluegrass (*Poa pratensis*) as common secondary species.

**Globally**

The vegetation has an open canopy, dominated by mid to tall grasses. *Calamovilfa longifolia* is the most conspicuous grass. Other common grasses include *Bouteloua gracilis*, *Bouteloua gracilis*, *Koeleria macrantha*, *Achnatherum hymenoides* (= *Oryzopsis hymenoides*), *Sporobolus cryptandrus*, and *Hesperostipa comata*. *Pascopyrum smithii* and *Nassella viridula* may occur on more level sites at the base of slopes (Barnes et al. 1984, Steinauer and Rolfsmeier 2000). *Andropogon hallii* may also be present. Sedges are rare but could include *Carex inops* ssp. *heliophila*. Forb diversity ranges from low to moderate, depending on the site. Dry valley sand prairies may be particularly forb-rich. Silty terraces of intermittent streams may contain *Artemisia frigida*, *Artemisia ludoviciana*, *Gutierrezia sarothrae*, *Psoralidium tenuiflorum*, and *Yucca glauca* (Steinauer and Rolfsmeier 2000). Shrubs are scattered and infrequent to absent, with *Rhus trilobata* the most common species. These areas are highly susceptible to invasion by exotic brome grasses (*Bromus japonicus*, *Bromus squarrosus*, *Bromus tectorum*) and may be quite weedy (Heerwagen 1958, USDI 1979, Steinauer and Rolfsmeier 2000).

CONSERVATION RANK

G3. No occurrences have been documented, but the community is reported in 2 ecoregional sections in Wyoming, Colorado, and Nebraska. It is restricted primarily to stabilized sand dunes, as well as in interdunal valleys or draws, colluvial sands, and intermittent streams, but it has a moderately wide distribution in the central to northern Great Plains. Stands are typically less than a few hectares in size, but larger stands are found in interdunal valleys in Nebraska, some reaching 100 acres or more (G. Steinauer pers. comm.

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1999). In Nebraska, this community can be heavily grazed and subsequently invaded by exotic species (Steinauer and Rolfsmeier 2000).

DATABASE CODE           CEGL001473

### SIMILAR ASSOCIATIONS

*Calamovilfa longifolia* - *Carex inops ssp. heliophila* Herbaceous Vegetation

### COMMENTS

**Lacreek National Wildlife Refuge**

#### **Globally**

This type may perhaps be differentiated from other types, such as *Calamovilfa longifolia* –*Carex inops ssp. heliophila* Herbaceous Vegetation (CEGL001471), by the absence or low abundance of *Carex filifolia* and *Carex inops ssp. heliophila*, though why those species are not abundant in this type is not clear. Further floristic comparisons need to be made to help make the distinction clear between that type and this type. Some floristic variability is to be expected in this type, based on successional patterns following dune blowouts. Steve Kettler (pers. comm. 1998) says they don't have this type in Colorado. It sounds like a version of a locally described *Andropogon hallii* - *Stipa comata* type, of which Colorado is also not very confident. Kettler suspects that a lot of the variation in grass dominance is from different management (grazing) over the years. The silty terrace stands are reported from the White River drainage in northwestern Nebraska and Badlands National Park, South Dakota (Von Loh et al. 1999, Steinauer and Rolfsmeier 2000).

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**Note:**

This association is found in two different map classes:

- 1) Needle-and-Thread / Soapweed Yucca Herbaceous Vegetation
- 2) Prairie Sandreed - Needle-and-Thread Herbaceous Vegetation

**Schizachyrium scoparium - Bouteloua (curtipendula, gracilis) - Carex filifolia  
Herbaceous Vegetation**

COMMON NAME Little Bluestem - (Sideoats Grama, Blue Grama) - Threadleaf  
Sedge Herbaceous Vegetation

SYNONYM Northern Great Plains Little Bluestem 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 SCHIZACHYRIUM SCOPARIUM - BOUTELOUA  
CURTIPENDULA HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 2

USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

Little bluestem grasslands in the Refuge are generally restricted to small patches on the slopes and shoulders of the sandhills.

**Globally**

This community is found in western North Dakota, western South Dakota, eastern and northern Wyoming, central and eastern Montana, southern Saskatchewan, and southern Manitoba.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Little bluestem stands typically occur on slopes and shoulders of variable steepness and aspect. The sites appear to be more stable (less susceptible to blowouts, but appear more prone soil creep) compared to some of the surrounding sandhills types.

**Globally**

This community is usually found on gentle to steep slopes with variable aspects (Hansen *et al.* 1984, Johnston 1987, Hansen and Hoffman 1988). The soil may be loamy sand, sandy loam, loam, or clay loam. There may be a substantial component of gravel. Hansen *et al.* (1984) found 7-36% gravel by weight in 16 stands in western North Dakota. The soils are typically shallow and occur over sandstone or limestone (Johnston 1987, Thilenius *et al.* 1995).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Schizachyrium scoparium</i> , <i>Andropogon hallii</i> , <i>Calamovilfa longifolia</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Bouteloua curtipendula</i> , <i>Bouteloua gracilis</i> , <i>Schizachyrium scoparium</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Schizachyrium scoparium*, *Calamovilfa longifolia*, *Yucca glauca*

**Globally**

*Bouteloua curtipendula*, *Bouteloua gracilis*, *Carex filifolia*, *Schizachyrium scoparium*

OTHER NOTABLE SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Poa pratensis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Bromus inermis</i> , <i>Bromus tectorum</i> , <i>Poa pratensis</i>

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Little bluestem grasslands typically have moderate to dense cover that ranges between from 40 to 70%, with much of the soil surface covered by litter. Little bluestem (*Schizachyrium scoparium*) is strongly dominant with prairie sandreed (*Calamovilfa longifolia*) as a common associate. Few forbs are usually present. A few soapweed plants (*Yucca glauca*) are sometimes scattered within the stand.

**Globally**

This community is predominantly composed of graminoid species less than 1 m tall. Occasional *Pinus ponderosa* are scattered throughout the type. The vegetation cover is moderate to high. Thilenius *et al.* (1995) found that vegetation cover was 44 percent in Wyoming, and Hansen and Hoffman (1988) found 75 percent cover in North Dakota. The dominant species is *Schizachyrium scoparium*, with *Bouteloua curtipendula*, *Bouteloua gracilis*, and *Carex filifolia* as associates or codominants. *Andropogon gerardii*, *Carex inops* ssp. *heliophila*, *Carex duriuscula* (= *Carex eleocharis*), *Koeleria macrantha* and *Calamovilfa longifolia* are often present. *Calamovilfa longifolia* may be abundant on sandier soils. *Muhlenbergia cuspidata*, *Hesperostipa comata*, *Pascopyrum smithii*, and *Nassella viridula* may also be present. *Pseudoroegneria spicata* may be found in the western portions of this community (Jones 1992). In Manitoba, the graminoids *Festuca ovina* and *Elymus trachycaulus* and the lichen *Selaginella densa* are more abundant (Greenall 1995). Forbs do not contribute greatly to the canopy, but many species may be found in this community (Hanson and Whitman 1938). Among the forbs that may be found are *Echinacea angustifolia*, *Aster oblongifolius*, *Aster ericoides*, *Gaura coccinea*, *Lygodesmia juncea*, *Helianthus pauciflorus* ssp. *pauciflorus*, *Rosa arkansana*, *Liatris punctata*, *Pediomelum argophyllum* (= *Psoralea argophyllum*), *Dalea purpurea*, *Phlox hoodii*, and *Campanula rotundifolia*. There are very few woody species; those that are present are usually short shrubs such as *Artemisia frigida*, *Juniperus horizontalis*, and *Yucca glauca*. Litter often accumulates and may cover more than 50 percent of the ground (Hirsch 1985).

CONSERVATION RANK G3G4.

DATABASE CODE CEGL001681

SIMILAR ASSOCIATIONS (n/a)

COMMENTS

***Lacreek National Wildlife Refuge***

Little bluestem vegetation is relatively uncommon in the Refuge.

***Globally***

This type occurs on variable aspects throughout its range. Hansen *et al.* (1984) and McAdams *et al.* (1998) report this type on southerly aspects for western South Dakota and southwestern North Dakota. In southeast Montana and the Cheyenne River Basin, Butler *et al.* (1986) found that, in a ravine in western North Dakota, the most abundant species on a south-facing footslope were *Bouteloua curtipendula* and *Carex filifolia*. Other species that were abundant were *Schizachyrium scoparium*, *Calamovilfa longifolia*, *Hesperostipa comata*, and *Artemisia frigida*. *Pascopyrum smithii*, *Bouteloua gracilis*, and *Koeleria macrantha* were also present. Fire probably played a major role in this type, whereby periodic fires would increase graminoid production and deter tree growth.

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## **Lacreek National Wildlife Refuge Vegetation Mapping Project**

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**Yucca glauca / Calamovilfa longifolia Shrub Herbaceous Vegetation**

COMMON NAME Soapweed Yucca / Prairie Sandreed Shrub Herbaceous Vegetation  
SYNONYM Soapweed / Prairie Sandreed Shrub Prairie  
PHYSIOGNOMIC CLASS Herbaceous Vegetation (V)  
PHYSIOGNOMIC SUBCLASS Perennial graminoid vegetation (V.A)  
PHYSIOGNOMIC GROUP Temperate or subpolar grassland with a sparse shrub layer (V.A.7)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (V.A.7.N)  
FORMATION Medium-tall temperate grassland with a sparse xeromorphic (often thorny) shrub layer (V.A.7.N.h)  
ALLIANCE YUCCA GLAUCA SHRUB HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

Yucca shrub grasslands occupy sandy ridges and undulating sand dunes within the sandhills region of the Refuge.

**Globally**

This type is found in the northwestern Great Plains, including eastern Wyoming and Montana, and western South Dakota.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Yucca shrub grasslands occur most commonly as sparse shrublands in the sandhills region. These shrublands are also associated with sand hill complexes, where they occupy the lower sandy ridges as the dominant shrub, but also intergrade with other soapweed yucca types on sandy slopes and hills.

**Globally**

Stands dominated by *Hesperostipa comata* are more typically found only along sandstone outcrop ridge tops and a short distance down the adjacent slopes (the *Yucca glauca* / *Hesperostipa comata* association of Thilenius *et al.* 1995). Soils are relatively deep (> 1 m), pure sands, with medium to coarse-textured lower horizons. The substrate is well-drained, but not xeric. Stands with *Calamovilfa longifolia* occur on a broader range of ridge tops and upper slopes (*Yucca glauca* / *Calamovilfa longifolia* association of Thilenius *et al.* 1995).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Yucca glauca</i>
Herbaceous	<i>Bromus tectorum</i> , <i>Carex filifolia</i> , <i>Sporobolus cryptandrus</i> , <i>Bouteloua gracilis</i>

**Globally**

Stratum

Species

Short Shrub *Yucca glauca*

Graminoid *Bouteloua gracilis*, *Calamovilfa longifolia*, *Carex filifolia*, *Hesperostipa comata*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Yucca glauca*, *Bouteloua gracilis*, *Sporobolus cryptandrus*, *Calamovilfa longifolia*, *Carex filifolia*

**Globally**

*Bouteloua gracilis*, *Calamovilfa longifolia*, *Hesperostipa comata*, *Yucca glauca*

OTHER NOTABLE SPECIES

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Yucca shrub grasslands have a sparse cover of yucca (*Yucca glauca*) shrubs, typically between 15-25%, but they usually have good cover in the herbaceous stratum. This plant association rarely has other shrubs present; rather, the understory species change relative to soil types. On silty clay to clay soils, threadleaf sedge (*Carex filifolia*) dominates, while on sandy-clay soils needle-and-thread (*Hesperostipa comata*) provides dense understory cover. Sandy ridges dominated by yucca also support prairie sand-reed grass (*Calamovilfa longifolia*), sand dropseed (*Sporobolus cryptandrus*), sand bluestem (*Andropogon hallii*), and purple three-awn (*Aristida purpurea*) in abundance.

**Globally**

Stands contain an open to moderately dense (at least 10% cover), low-shrub layer above a species-rich herbaceous layer. Dominance of the shrub layer by *Yucca glauca* is characteristic (average cover in 6 stands was 9.8%). *Artemisia tridentata* ssp. *wyomingensis* and *Artemisia cana* ssp. *cana* may be present but are sparse and contribute little cover. In the herbaceous layer, *Hesperostipa comata* and *Calamovilfa longifolia* codominate (16% cover and 8% cover, respectively), and *Bouteloua gracilis* and *Carex filifolia* often are present but contribute much less cover than do *Hesperostipa* or *Calamovilfa*. Forbs are common but contribute little cover; *Artemisia frigida* (dwarf shrub-like) has the highest constancy, but no forb is characteristic of the association. Litter covers up to about half of the ground surface, and most of the rest of the ground surface is bare soil.

CONSERVATION RANK G4.

DATABASE CODE CEGL002675

SIMILAR ASSOCIATIONS

*Calamovilfa longifolia* – *Hesperostipa comata* Herbaceous Vegetation

COMMENTS

***Lacreek National Wildlife Refuge***

Soapweed yucca is common in the sandhills region of the Refuge and forms discrete map units based on density and associated species.

***Globally***

In Badlands National Park, South Dakota vegetation cover varies with soil conditions. Sandy soils have characteristic dominants, but on more silty clay soils, *Carex filifolia* and *Pascopyrum smithii* may dominate.

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**Note:**

This association is found in two different map classes:

- 1) Soapweed Yucca (Sparse Understory) Shrub Herbaceous Vegetation
- 2) Soapweed yucca / Needle-and-Thread Shrub Herbaceous Vegetation

**Agropyron cristatum - (Pascopyrum smithii, Hesperostipa comata) Semi-natural Herbaceous Vegetation**

COMMON NAME Crested Wheatgrass - (Western Wheatgrass, Needle-and-Thread Grass) Semi-natural Herbaceous Vegetation  
SYNONYM Crested Wheatgrass Semi-natural Grassland  
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 bunch temperate or subpolar grassland (V.A.5.N.d)  
ALLIANCE AGROPYRON CRISTATUM SEMI-NATURAL HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 3  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

Introduced, exotic grasslands occur throughout the Refuge and are sometimes associated with disturbances such as roadsides, abandoned farm fields, and areas that were interseeded with exotic grasses. However, these exotic grasslands can and do invade intact native communities.

**Globally**

This type occurs most commonly in the northern Great Plains of the United States and Canada.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Crested wheatgrass grasslands are usually found on relatively level to gently rolling sites accessible to farming equipment. Typically the soils are silt and/or clay loams, which probably supported western wheatgrass (*Pascopyrum smithii*) grasslands in the past.

**Globally**

This type can occur in a wide variety of human-disturbed habitats, including highway rights-of-way, jeep trails, etc. It is also widely planted to revegetate pastures and rangelands.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Agropyron cristatum</i> , <i>Poa pratensis</i> , <i>Bromus inermis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Agropyron cristatum</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Agropyron cristatum*, *Poa pratensis*, *Bromus inermis*

**Globally**

*Agropyron cristatum*, *Pascopyrum smithii*

OTHER NOTABLE SPECIES

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Stands typically have moderate herbaceous cover that ranges from 30-60%. Litter cover on the soil surface is often fairly dense.. The sites are dominated by crested wheatgrass (*Agropyron cristatum*), often with a host of invasive species such as Kentucky bluegrass (*Poa pratensis*) or smooth broom (*Bromus inermis*). The forb component is usually sparse.

**Globally**

The vegetation is dominated by medium-tall (0.5 - 1 m) graminoids. The dominant grass is *Agropyron cristatum*, a naturalized species from Europe. Other weedy species may occur as well, but native species are generally less than 10% cover. Native species may include mixed-grass prairie grasses, such as *Pascopyrum smithii* and *Hesperostipa comata*, as well as others.

CONSERVATION RANK GW. This is a naturalized type from Europe, widely planted to revegetate roadsides and pastures.

DATABASE CODE C EGL005266

SIMILAR ASSOCIATIONS (n/a)

COMMENTS

**Lacreek National Wildlife Refuge.**

The introduced grassland group occupies previously disturbed sites that include roadsides, abandoned agricultural fields, and interseeded rangeland.

**Globally**

Hansen and Hoffman (1988, p 6, Fig. 6) show a seral stand of *Agropyron cristatum*, with signs of succession leading to the *Hesperostipa comata* / *Carex filifolia* habitat type.

REFERENCES

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.

**Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus  
Herbaceous Vegetation**

COMMON NAME Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous  
Vegetation  
SYNONYM Central Wet-mesic Tallgrass 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 Tall sod temperate grassland (V.A.5.N.a)  
ALLIANCE ANDROPOGON GERARDII - (CALAMAGROSTIS CANADENSIS,  
PANICUM VIRGATUM) HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

This unit is widely scattered on mesic sites throughout the Refuge.

**Globally**

This big bluestem sandhills community type occurs in the central Great Plains of the United States, particularly in the Sandhills region of Nebraska and adjacent South Dakota.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Distribution of this type is throughout the Refuge in mesic sites such as swales, and shallow bottoms. The dominant species are often patchy within a stand, with associated species such as sawtooth sunflower (*Helianthus grosseserratus*), prairie cordgrass, smooth brome, and switchgrass occupying the interstitial spaces.

**Globally**

This community occurs mostly in interdunal valleys and floodplains of streams and rivers, and on level ground where drainage is poor. Soils are poorly drained sandy loams and sands with considerable organic matter (but no peat accumulation) and are formed in eolian sand or alluvium. These sites are rarely, if ever, flooded but are constantly supplied by high groundwater levels (about 1 m below the surface) (Steinauer and Rolfsmeier 2000).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Yucca glauca</i>
Herbaceous	<i>Andropogon gerardi</i> , <i>Panicum virgatum</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Andropogon gerardi</i> , <i>Panicum virgatum</i> , <i>Sorghastrum nutans</i> , <i>Calamagrostis canadensis</i> , <i>Spartina pectinata</i> , <i>Agrostis stolonifera</i> , <i>Phleum pratense</i> , <i>Poa</i>

*pratensis*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Andropogon gerardi*, *Panicum virgatum*

**Globally**

*Andropogon gerardi*, *Panicum virgatum*, *Sorghastrum nutans*

OTHER NOTABLE SPECIES

**Globally**

Stratum

Species

Herbaceous *Euthamia gymnospermoides*, *Helianthus nuttallii*, *Rudbeckia hirta*, *Solidago canadensis*, and *Solidago gigantea*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

It is often closely associated with prairie cordgrass (*Spartina pectinata*) and switchgrass (*Panicum virgatum*) map units. Big bluestem also appears to be a common constituent of many prairie restoration efforts on the Refuge. Typical stands of this association have moderate to dense herbaceous cover with typical foliar cover values ranging from 50 to 100%. Big bluestem is the dominant species, becoming more prominent later in the growing season.

**Globally**

This community is dominated by a dense layer of mesophytic tall grasses 1-2 m tall, with *Andropogon gerardii* and *Sorghastrum nutans* most abundant in undisturbed sites. In moist swales and wetter areas along the margin of this community, *Calamagrostis canadensis* and *Spartina pectinata* may be abundant. Cool-season Eurasian grasses such as *Agrostis stolonifera*, *Phleum pratense*, and *Poa pratensis* are commonly seeded in these sites and may dominate. Forbs are usually common, but are seldom mentioned in the literature. Conspicuous forb species include *Euthamia gymnospermoides*, *Helianthus nuttallii*, *Rudbeckia hirta*, *Solidago canadensis*, and *Solidago gigantea*. Woody plants are uncommon, though scattered thickets of *Salix exigua* may be present. In the eastern portion of its range, this community often contains forbs typical of tall-grass prairie to the east, such as *Sisyrinchium campestre* and *Viola pedatifida*. Species diversity is relatively high in undisturbed sites, and often much lower in sites seeded to exotic cool-season grasses (Steinauer and Rolfsmeier 2000).

CONSERVATION RANK G3? Many sites in the eastern portion of the range of this community have been converted to cropland. Excessive center-pivot irrigation may lower the water table enough to convert some remaining sites to dry prairie communities. Most remaining sites have been seeded to exotic grasses and legumes.

DATABASE CODE C EGL002023

SIMILAR ASSOCIATIONS

*Andropogon hallii* - *Calamovilfa longifolia* Herbaceous Vegetation

COMMENTS

***Lacreek National Wildlife Refuge***

(n/a)

***Globally***

This type is geographically defined to include areas of the Nebraska (and adjacent South Dakota) Sandhills region.

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**Bromus inermis - (Pascopyrum smithii) Semi-natural Herbaceous Vegetation**

COMMON NAME Smooth Brome - (Western Wheatgrass) Semi-natural Herbaceous Vegetation

SYNONYM Smooth Brome Semi-natural Grassland

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 bunch temperate or subpolar grassland (V.A.5.N.d)

ALLIANCE BROMUS INERMIS SEMI-NATURAL HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Terrestrial

**RANGE**

***Lacreek National Wildlife Refuge***

Introduced, exotic grasslands occur throughout the Refuge and are associated with disturbances such as roadsides, abandoned farm fields, and areas that were interseeded with exotic grasses to "improve" the range for grazing. Areas especially noted are adjacent to the Refuge roads and facilities and abandoned or reclaimed agricultural fields.

***Globally***

This type occurs widely throughout the northern Great Plains, and perhaps more widely in the Midwest, depending on how the type is defined.

**ENVIRONMENTAL DESCRIPTION**

***Lacreek National Wildlife Refuge***

Introduced grasslands are on relatively level sites accessible to farming equipment. Typically the soils are silt and/or clay loams, which historically supported western wheatgrass (*Pascopyrum smithii*) alliance grasslands.

***Globally***

This type can occur in a wide variety of human-disturbed habitats, including highway rights-of-way, jeep trails, etc. It is also widely planted for cover, pasture, and hay, and has escaped into a variety of habitats.

**MOST ABUNDANT SPECIES**

***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Bromus inermis</i>

***Globally***

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Bromus inermis</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Bromus inermis*, *Pascopyrum smithii*, *Bromus japonicus*, *Psoraleidium tenuiflorum*

**Globally**

*Bromus inermis*, *Pascopyrum smithii*

OTHER NOTABLE SPECIES

(n/a)

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Stands of introduced grasses typically have moderate herbaceous cover, ranging from 40-90%, and very dense litter over the ground surface. Along roadsides, smooth brome (*Bromus inermis*) is strongly dominant, with alfalfa (*Medicago sativa*) and yellow sweetclover (*Melilotus officianalis*) included in the plantings along some highways. Many species of forbs and occasional shrubs are also found in the type.

**Globally**

The vegetation is dominated by medium-tall (0.5 - 1 m) graminoids. The dominant grass is *Bromus inermis*, a naturalized species from Europe and Asia. Other weedy species may occur as well, but native species are generally less than 10% cover. Native species may include mixed-grass prairie grasses, such as *Pascopyrum smithii* and *Hesperostipa comata*, as well as others.

CONSERVATION RANK GW. This is a naturalized type from Europe and Asia, widely planted for cover, pasture, and hay, and has escaped into a variety of habitats.

DATABASE CODE CEGL005264

SIMILAR ASSOCIATIONS

COMMENTS

**Lacreek National Wildlife Refuge**

The introduced grassland group occupies previously disturbed sites, including roadsides, abandoned agricultural fields, and interseeded rangeland. Stands of brome grass tend to be monotypic. They tend to have dense litter layers.

**Globally**

This type could be defined very broadly to include almost any *Bromus inermis* dominated stand, in which case the variability of the minor species associated with the type may be very high.

REFERENCES

(n/a)

**Hesperostipa comata - Bouteloua gracilis - Carex filifolia Herbaceous Vegetation**

COMMON NAME Needle-and-Thread - Blue Grama - Threadleaf Sedge Herbaceous Vegetation

SYNONYM Needle-and-Thread - Blue Grama Mixedgrass 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 STIPA COMATA - BOUTELOUA GRACILIS HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 1

USFWS WETLAND SYSTEM

RANGE

***Lacreek National Wildlife Refuge***

This type was limited to a few sites in the northern portion of the Refuge.

***Globally***

This community is common in Montana, Wyoming, and is in Nebraska, North Dakota, South Dakota, southern Saskatchewan, and southern Manitoba. In Nebraska it is apparently absent from extreme northwestern and east-central regions (Steinauer and Rolfsmeier 1997).

ENVIRONMENTAL DESCRIPTION

***Lacreek National Wildlife Refuge***

Stands occurred on flat terraces and moderate sloping foot and toe slopes.

***Globally***

Stands occur on flat to rolling topography with deep (40- 100 cm) sandy loam to loam soils. They are typically associated with uplands, though they may also occur lower in the landscape, such as coulee and draw bottoms, if soils are sufficiently coarse (usually sandstone derived). Even though it is a major association in the Northern Plains, it does not occur in areas dominated exclusively by shale and mudstone parent materials, from which heavy soils are derived. This type is found at elevations ranging from 2000 to 5500 feet; average annual precipitation associated with these elevation parameters ranges from slightly less than 10 to slightly more than 20 inches. This association and the *Pascopyrum smithii - Bouteloua gracilis - Carex filifolia* association could be considered the most common plant associations in the Northern Great Plains (Martin et al. 1998). These two associations, cited by many authors as the climatic climax communities for this region, are manifested by matrix or large patch occurrences frequently found dominating whole landscapes. The *Hesperostipa comata* defined community is more associated with uplands and the *Pascopyrum smithii* defined type characterizes sites with higher moisture status, generally occurring at lower positions in the landscape.

MOST ABUNDANT SPECIES

**Globally**

Stratum

Species

Graminoid     *Bouteloua gracilis*, *Carex filifolia*, *Hesperostipa comata*

CHARACTERISTIC SPECIES

**Globally**

*Bouteloua gracilis*, *Carex filifolia*, *Hesperostipa comata*

OTHER SPECIES

**Globally**

Stratum

Species

Graminoid     *Calamovilfa longifolia*, *Koeleria macrantha*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Needle-and-thread, blue grama, and threadleaf sedge (*Carex filifolia*) are the major species, while sand dropseed and western wheatgrass are common secondary species. Total cover ranges from 40-70% depending primarily on the abundance of threadleaf sedge and blue grama. Japanese brome is a common invader on these sites.

**Globally**

The vegetation is dominated by graminoids that are usually between 0.5 and 1 m tall. Total cover is moderate. On 19 stands in west-central Montana the cover by the different strata was as follows: shrubs 6 percent, graminoids 67 percent, forbs 11 percent, bryophytes 14 percent, litter 55 percent, rock 4 percent, bare soil 9 percent (Mueggler and Stewart 1978). Thilenius et al. (1995) found that the average cover on 14 stands in eastern Wyoming was 42 percent. Tolstead (1942) described this community as the climax on the level lands of the northern part of Cherry County, Nebraska. *Hesperostipa comata* is the tallest of the dominant species, sending seed heads to a maximum height of approximately 1 m. The rhizomatous graminoids, *Bouteloua gracilis* and *Carex filifolia*, the other two dominant/codominant species, do not usually exceed 0.5 meter. *Calamovilfa longifolia* is often found with high cover values on sandier soils and *Koeleria macrantha* cover increases on degraded sites. There are regionalized expressions of variability with *Carex inops* var. *heliophila* surpassing *Carex filifolia* in Colorado and *Calamagrostis montanensis* being at least as important as the diagnostic species in north-central Montana. *Pascopyrum smithii* is consistently present and reaches the same height as *Hesperostipa comata*. For woody species, subshrub forms (*Artemisia frigida*, *Gutierrezia sarothrae*, *Rosa arkansana*) have the highest cover and constancy but their total cover does exceed more than 5 percent, except on overgrazed sites. Regardless of the geographic region of this broadly distributed type, cover values for forbs are low (the exception being *Selaginella densa*), though geographic setting does influence forb composition to some degree. *Sphaeralcea coccinea*, *Phlox hoodii*, *Heterotheca villosa*, *Gaura coccinea*, and *Liatris punctata*, at least in the northern distribution of this type, have high constancy values; the constancy of *Lygodesmia juncea*, *Opuntia polyacantha*, *Artemisia dracuncululus* and *Ratibida columnifera* seems to increase to the eastern and southern portions of the type's distribution.

ENVIRONMENTAL CONDITION

***Lacreek National Wildlife Refuge***

Stands occur primarily on loam soils of terraces and moderate slopes.

***Globally***

Stands occur on flat to rolling topography with deep (40- 100 cm) sandy loam to loam soils. They are typically associated with uplands, though they may also occur lower in the landscape, such as coulee and draw bottoms, if soils are sufficiently coarse (usually sandstone derived). Even though it is a major association in the Northern Plains, it does not occur in areas dominated exclusively by shale and mudstone parent materials, from which heavy soils are derived. This type is found at elevations ranging from 2000 to 5500 feet; average annual precipitation associated with these elevation parameters ranges from slightly less than 10 to slightly more than 20 inches. This association and the *Pascopyrum smithii* - *Bouteloua gracilis* - *Carex filifolia* association could be considered the most common plant associations in the Northern Great Plains (Martin et al. 1998). These two associations, cited by many authors as the climatic climax communities for this region, are manifested by matrix or large patch occurrences frequently found dominating whole landscapes. The *Hesperostipa comata* defined community is more associated with uplands and the *Pascopyrum smithii* defined type characterizes sites with higher moisture status, generally occurring at lower positions in the landscape.

CONSERVATION RANK G5. This is an exceedingly common type, manifesting any number of permutations, some of which are related to disturbance and some of which appear to be related to the expected geographic distinctions in such a broadly distributed type. The only reason to consider it a G4 is that it has received, and continues to receive, significant grazing pressure which, combined with the surge in alien weed populations, pose a significant threat to its quality.

DATABASE CODE C EGL002037

SIMILAR ASSOCIATIONS

*Bouteloua gracilis* - *Buchloe dactyloides* Xeric Soil Herbaceous Vegetation (On degraded sites, or on intermediate habitats, this type can be confused with C EGL002037.)

*Pascopyrum smithii* - *Hesperostipa comata* Central Mixedgrass Herbaceous Vegetation

COMMENTS

***Lacreek National Wildlife Refuge***

This type was probably more prevalent before agricultural and management disturbance.

***Globally***

Vast (singly and in the aggregate) prairie dog (*Cynomys ludovicianus*, *C. leucurus*) "towns" once developed on the favorable substrates of this type and exploited its vegetation. Prairie dog populations have undergone a precipitous decline since settlement, so much of this type could be in various states of secondary succession, returning from a somewhat denuded state and altered composition created by the prairie dogs (and attendant bison that found nutritious forage here). Fire, both aboriginal- and lightning-caused, was a regular part of this landscape. Fire-return intervals have been considerably lengthened since settlement by European-Americans.

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**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

**Lacreek National Wildlife Refuge**

Areas of western wheatgrass - blue grama vegetation are found throughout the Refuge and the project environs on mesic sites. 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. In some areas stands of western wheatgrass has been converted to exotic perennial grasses, including smooth brome, Kentucky bluegrass, and crested wheatgrass.

**Globally**

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

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Sites are found on flat to moderately steep slopes and occur on all aspects. Blue grama and threadleaf sedge may appear 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 solonchic soils (with an alluvial 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

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Bromus japonicus</i> , <i>Poa pratensis</i> , <i>Nassella viridula</i> , <i>Bouteloua gracilis</i> , <i>Pascopyrum smithii</i>

**Globally**

Stratum

Species

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

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*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

**Lacreek National Wildlife Refuge**

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 (*Psoraleidum tenuiflorum*), poverty cactus (*Opuntia polyacantha*), and white sagebrush (*Artemisia ludoviciana*). In western wheatgrass - grama stands within Lacreek, 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. *Hesperostipa comata* usually is present as a secondary species, but it often codominates on sandy loam soils.. In Alberta and Saskatchewan, *Hesperostipa spartea* var. *curtiseta* may be as common as *Hesperostipa 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

#### 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* - *Hesperostipa comata* Central Mixedgrass Herbaceous Vegetation  
*Hesperostipa comata* - *Bouteloua gracilis* - *Carex filifolia* Herbaceous Vegetation (*Hesperostipa comata* contributes more cover than do *Pascopyrum smithii* or *Elymus lanceolatus*, and the association grows on soils of loam or coarser textural classes.)

#### COMMENTS

##### ***Lacreek National Wildlife Refuge***

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 and Kentucky bluegrass it can become very difficult to classify. Difficulty in classification can also occur on sites grazed, 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.

##### ***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.

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**Poa pratensis - (Pascopyrum smithii) Semi-natural Herbaceous Vegetation**

COMMON NAME Kentucky Bluegrass - (Western Wheatgrass) Semi-natural Herbaceous Vegetation  
SYNONYM Kentucky Bluegrass Semi-natural Grassland  
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 bunch temperate or subpolar grassland (V.A.5.N.d)  
ALLIANCE POA PRATENSIS SEMI-NATURAL HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 3  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

Introduced, exotic grasslands occur throughout the northern portion of the Refuge and are associated with disturbances such as roadsides, abandoned farm fields, and areas that were interseeded with exotic grasses to "improve" the range for grazing.

**Globally**

This type is potentially widespread throughout the Great Plains and into the Midwest, depending on how the type is defined.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Introduced grasslands are on relatively level sites accessible to farming equipment. Typically the soils are silt and/or clay loams, which historically supported western wheatgrass (*Pascopyrum smithii*) alliance grasslands.

**Globally**

This type can occur in a wide variety of human-disturbed and native habitats.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Poa pratensis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Poa pratensis</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Poa pratensis*, *Pascopyrum smithii*, *Bromus japonicus*, *Psoraleidium tenuiflorum*

**Globally**

*Pascopyrum smithii*, *Poa pratensis*

OTHER NOTABLE SPECIES (n/a)

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Stands of introduced grasses typically have moderate herbaceous cover, ranging from 40-90%, and very dense litter over the ground surface. Many abandoned agricultural fields and selected range interseeding sites are strongly dominated by Kentucky bluegrass (*Poa pratensis*). In some cases, a few plants of western wheatgrass (*Pascopyrum smithii*) and fairly large stands of ragweed (*Ambrosia psilostachya*) may also be present. Many species of forbs and occasional shrubs are also found in the type.

**Globally**

The vegetation is dominated by medium-tall (0.5 - 1 m) graminoids. The dominant grass is *Poa pratensis*, considered to be both a native and naturalized species from Eurasia (Great Plains Flora Association 1986, Gleason and Cronquist 1991). Other native species may occur as well, but they are generally less than 10% cover. Native species may include mixed-grass prairie grasses, such as *Pascopyrum smithii* and *Hesperostipa comata*, as well as others.

CONSERVATION RANK GW. This is primarily a naturalized type from Europe and Asia, widely planted for lawns and pasture, and it has escaped into a variety of habitats (Great Plains Flora Association 1986, Gleason and Cronquist 1991). Although native populations do exist, and may be integral parts of some prairie and other native habitats, most stands that are thoroughly dominated by *Poa pratensis* are a result of human modifications to the habitat.

DATABASE CODE C EGL005265

SIMILAR ASSOCIATIONS

COMMENTS

**Lacreek National Wildlife Refuge**

The introduced grassland group occupies previously disturbed sites, including roadsides, abandoned agricultural fields, and interseeded rangeland. Stands of Kentucky bluegrass tend to be monotypic. They tend to have dense litter layers that impede other species establishment and also serves to store moisture following precipitation events.

**Globally**

(n/a)

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**Thinopyrum intermedium Semi-natural Herbaceous Vegetation**

COMMON NAME Intermediate Wheatgrass Semi-natural Herbaceous Vegetation

SYNONYM

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 THINOPYRUM INTERMEDIUM SEMI-NATURAL

HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM TERRESTRIAL

RANGE

***Lacreek National Wildlife Refuge***

The intermediate wheatgrass semi-natural type is only represented on a few sites in the Refuge.

***Globally***

ENVIRONMENTAL DESCRIPTION

***Lacreek National Wildlife Refuge***

Stands of intermediate wheatgrass typically have moderate herbaceous cover that ranges from 30 to 60%. Litter cover on the soil surface is often dense.

***Globally***

This community is most common on dry, medium-textured soils, but has adapted to a broad range of soil textures and moisture conditions.

MOST ABUNDANT SPECIES

***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Thinopyrum intermedium</i>

***Globally***

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Thinopyrum intermedium</i>

CHARACTERISTIC SPECIES

***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Thinopyrum intermedium</i>

***Globally***

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Thinopyrum intermedium</i>

## Lacreek National Wildlife Refuge Vegetation Mapping Project

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### VEGETATION DESCRIPTION

#### ***Lacreek National Wildlife Refuge***

The sites are dominated by intermediate wheatgrass with other invasive species such as Kentucky bluegrass and/or smooth brome. The forb component is usually very sparse.

#### ***Globally***

*Thinopyrum intermedium* (= *Agropyron intermedium*) often contributes 90% of the cover for this community; however, other exotics such as *Bromus inermis* can invade into these areas. Native species almost never reestablish in areas dominated by *Thinopyrum intermedium* and contribute less than 20% cover.

### OTHER NOTEWORTHY SPECIES

CONSERVATION RANK GW.

DATABASE CODE C EGL002935

### COMMENTS

#### ***Lacreek National Wildlife Refuge***

(n/a)

#### ***Globally***

(n/a)

### REFERENCES

Ode, Dave. Personal communication. South Dakota Natural Heritage Program, Pierre, SD.

**Polygonum spp. (amphibium) – Mixed Forbs Permanently Flooded**

**Herbaceous Alliance**

COMMON NAME Water Smartweed Permanently Flooded Herbaceous Alliance  
SYNONYM Water Smartweed Wetland  
PHYSIOGNOMIC CLASS Herbaceous Vegetation (V)  
PHYSIOGNOMIC SUBCLASS Hydromorphic rooted vegetation (V.C)  
PHYSIOGNOMIC GROUP Temperate or subpolar hydromorphic rooted vegetation (V.C.2)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (V.C.2.N)  
FORMATION Permanently flooded temperate or subpolar hydromorphic rooted vegetation (V.C.2.N.a)  
ALLIANCE POLYGONUM AMPHIBIUM PERMANENTLY FLOODED HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 1  
USFWS WETLAND SYSTEM PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

This association is common to drawdown and mudflat areas around the Refuge.

**Globally**

This alliance is found primarily in the western United States, Great Plains, and Canada, but may extend further east.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

The soils are usually saturated and support mixed weedy or annual forbs with little graminoid species.

**Globally**

This wetland occurs in shallow water around the edges of ponds and lakes in western North America. Elevation varies depending on geographical location. Stands reported along the Columbia River and in the Great Plains are located just above sea level, in Montana between 640-1080 m, in northeastern Utah at 1420 m, and in Colorado from 2050-2700 m. Sites include oxbow lakes and backwater areas of the Columbia floodplains, seasonally flooded basins in the floodplains of the Green River, in glacial ponds or prairie potholes in northern Montana, in shallow lakes in the mountains of Colorado, and in flooded basins in South Dakota and possibly the Sandhills of Nebraska. Stands are located in standing water that is permanent or present at least during the growing season. The pond bottoms are composed of finer sediments, organic muck, clay, or silt.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
FORB	<i>Polygonum amphibium</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
FORB	<i>Polygonum amphibium</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
FORB	<i>Polygonum amphibium</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
FORB	<i>Polygonum amphibium</i>

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Overall diversity is low with only few annual forb or weedy species.

**Globally**

This wetland vegetation type occurs in shallow water along the edges of ponds and lakes. Floating-leaved aquatic forbs cover at least 30% of the water's surface (Kunze 1994). *Polygonum amphibium* often forms dense, nearly monotypic stands. *Lemna minor*, *Potamogeton natans*, *Sagittaria* spp., *Spirodela polyrrhiza*, and *Wolffia* spp. are occasionally present.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G5.

DATABASE CODE CEGL2430 (CEGL002002)

MAP UNITS

COMMENTS

**Lacreek National Wildlife Refuge**

This type likely occurs as a result of pool management and fluctuating water levels.

**Globally**

This vegetation type is only classified to the alliance level. More work is needed to describe associations. In South Dakota, the species dominating this vegetation type is *Polygonum amphibium* var. *emersum* (denoted as *Polygonum coccineum* in South Dakota). In contrast to *Polygonum amphibium* var. *amphibium*, an obligate wetland plant, this species is a facultative wetland plant. It is very well adapted to fluctuating water levels and even able to climb out into the upland margins of prairie wetlands (D. Ode, personal communication). Almost pure stands of *Polygonum amphibium* var. *emersum* can occur in areas originally dominated by a mixture of *Eleocharis palustris* and *P. amphibium* var. *emersum* and sometimes *Hordeum jubatum* (D. Ode, personal communication). This occurs with a flooding of these basins during which *Eleocharis palustris* would decompose, leaving the basin with 50% coverage by *Polygonum*. In the first

year of drawdown following the flooding, the *Polygonum* community would persist; however, by the second year, the *Eleocharis* would reestablish and cause a shift back to the original mixed species community type (D. Ode, personal communication). Further review is needed to determine if those stands dominated by *Polygonum amphibium* var. *emersum* need to be separate types from those dominated by *Polygonum amphibium* var. *amphibium* and/or a *Eleocharis palustris* - *Polygonum amphibium* type.

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- Von Loh, J. 2000. Draft local descriptions of the vegetation associations of Ouray National Wildlife Refuge. USGS Bureau of Reclamation, Remote Sensing and GIS Group, Denver Federal Center, Denver.

**Distichlis spicata - Hordeum jubatum - Puccinellia nuttalliana - Suaeda calceoliformis Herbaceous Vegetation**

COMMON NAME Saltgrass - Foxtail Barley - Nuttall's Alkali Grass - Sea-blite  
Herbaceous Vegetation

SYNONYM Northern Great Plains Saltgrass Saline Meadow

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 Temporarily flooded temperate or subpolar grassland (V.A.5.N.j)

ALLIANCE DISTICHLIS SPICATA - (HORDEUM JUBATUM)  
TEMPORARILY FLOODED HERBACEOUS ALLIANCE

CLASSIFICATION CONFIDENCE LEVEL 3

USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

These units occupy flat, alkaline, silt loam soils near the Refuge pools on sites that are poorly to moderately well-drained.

**Globally**

This inland saltgrass wet meadow is found in the northeastern and north-central Great Plains and tallgrass prairie regions of the United States and adjacent Canada, ranging from Minnesota and the Dakotas to Manitoba.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

These units occupy flat, alkaline, silt loam soils near the Refuge pools on sites that are poorly to moderately well-drained. The fluctuating water table is probably within the rooting zone of the vegetation for most of the growing season.

**Globally**

This community is found on terraces, floodplains, swales and other low sites where drainage is poor. The soils are moderately to strongly saline, fine-textured, and moderately deep to deep (Redmann 1972, USFS 1992). Hirsch (1985) found this community on a variety of soil textures, including sandy clays, clay loam, sandy loams, and sandy clay loams. Periodic flooding is common, and this may result in soil deposition and consequent poor soil development (Hanson and Whitman 1938). The water table is often high, and salt encrustations may be present on the surface (Hirsch 1985).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Distichlis spicata</i> , <i>Hordeum jubatum</i> , <i>Puccinellia nuttalliana</i> , <i>Suaeda calceoliformis</i>

**Globally**

Stratum

Species

Herbaceous *Distichlis spicata*, *Hordeum jubatum*, *Puccinellia nuttalliana*, *Suaeda calceoliformis*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Distichlis spicata*, *Hordeum jubatum*

**Globally**

*Distichlis spicata*, *Hordeum jubatum*

OTHER NOTABLE SPECIES

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

In many cases, this association is fairly monotypic and dominated by inland saltgrass (*Distichlis spicata*). Total foliar cover is usually less than 50% and vegetation height is often less than 15 cm. The most common secondary species is Kentucky bluegrass. Small depressions often contain nearly pure stands of foxtail barley (*Hordeum jubatum*).

**Globally**

This community has low species diversity and is dominated by salt-tolerant graminoids. Total vegetation cover is sparse to moderate, and bare ground is common (Hanson and Whitman 1938, Redmann 1972). Graminoids dominate the stand. The dominant species are *Distichlis spicata* and *Hordeum jubatum*. Other common species include *Muhlenbergia asperifolia*, *Muhlenbergia richardsonis*, *Puccinellia nuttalliana*, *Suaeda calceoliformis*, and *Spartina gracilis*. *Pascopyrum smithii* and *Bouteloua gracilis* can be common on relatively dry inclusions within this community (Hirsch 1985), and *Elymus lanceolatus* may be found on the upland border (Hanson and Whitman 1938). *Carex hallii*, *Carex praegracilis*, and *Sporobolus compositus* (= *Sporobolus asper*) can also be found. *Andropogon gerardii*, *Schizachyrium scoparium*, *Panicum virgatum*, and other tall grasses can be a component of these wet meadows. Common forbs include *Ambrosia psilostachya* (= *Ambrosia coronopifolia*), *Symphyotrichum ericoides* (= *Aster ericoides*), *Chenopodium leptophyllum*, *Grindelia squarrosa*, *Melilotus officinalis*, *Plantago elongata*, *Plantago eriopoda* (western Minnesota), *Plantago patagonica*, and *Salicornia rubra*. Shrubs are very rare. *Artemisia frigida*, *Atriplex nuttallii*, and *Sarcobatus vermiculatus* are the only shrubs that have been noted from the western part of the type's range (Hirsch 1985, USFS 1992, R. Dana pers. comm. 1999).

CONSERVATION RANK G2G3. This type is fairly restricted in distribution and occurs in relatively localized salinedepressions. Many sites have been heavily grazed (R. Dana pers. comm. 1999).

DATABASE CODE CEGL002273

SIMILAR ASSOCIATIONS

*Hordeum jubatum* Herbaceous Vegetation

COMMENTS

***Lacreek National Wildlife Refuge***

Extensive areas naturally dominated by switchgrass are rare in the Great Plains and this type is unique in that regard. The swales and drainages which the type dominates are sometimes saturated throughout much of the growing season, or in the case of the sandhills, the stands are subirrigated.

***Globally***

The relationship between this community and *Hordeum jubatum* Herbaceous Vegetation (CEGL001798) is unclear. Both communities usually contain *Distichlis spicata* and *Hordeum jubatum*. *Hordeum* may be more common on heavily grazed sites (R. Dana pers. comm. 1999). The presence of *Puccinellia nuttalliana* or *Suaeda calceoliformis* may be distinguishing factors. They appear to be more characteristic of strongly saline areas while *Hordeum jubatum* can dominate on less saline sites (Redmann 1972). Classification problems may arise on intermediate sites when *Hordeum jubatum* is the dominant species and *Distichlis spicata*, *Puccinellia nuttalliana*, and *Suaeda calceoliformis* are present in minor amounts. Compare type with *Sporobolus airoides* Northern Plains Herbaceous Vegetation (CEGL002274), found in western North Dakota.

REFERENCES

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**Note:**

- This association is found in two different map classes:
- 1) Foxtail Barley Herbaceous Vegetation
  - 2) Saltgrass Herbaceous Vegetation Alliance

**Panicum virgatum – (Pascopyrum smithii) Herbaceous Vegetation**

COMMON NAME Switchgrass – (Western wheatgrass) Herbaceous Vegetation  
SYNONYM Switchgrass Wet-mesic Tallgrass 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 Tall sod temperate grassland (V.A.5.N.a)  
ALLIANCE ANDROPOGON GERARDII - (CALAMAGROSTIS CANADENSIS,  
PANICUM VIRGATUM) HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 3  
USFWS WETLAND SYSTEM Terrestrial

RANGE

**Lacreek National Wildlife Refuge**

The switchgrass type is found as relatively small, sometimes pure stands throughout the Refuge. The most naturally occurring communities are found as isolated patches in some of the swales and depressions in the sandhills portion of the Refuge. Stands found in the upland grassland areas and adjacent to the wetland communities appear to be the result of seeding efforts.

**Globally**

This type has been reported from eastern Wyoming and western South Dakota, but its range is not well understood.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Switchgrass is an infrequent but common component of many of the more mesic; however it rarely forms large continuous stands..

**Globally**

Switchgrass is a common component of many wetlands and mesic sites, but becomes dominant in wetter parts of drainages and wetland basins (Von Loh et al. 1999)

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Glycyrrhiza lepidota</i> , <i>Pascopyrum smithii</i> , <i>Panicum virgatum</i> , <i>Andropogon gerardii</i> , <i>Poa pratensis</i> , <i>Bromus inermis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Aster ericoides</i> , <i>Glycyrrhiza lepidota</i> , <i>Sporobolus heterolepis</i> , <i>Schizachyrium scoparium</i> , <i>Pascopyrum smithii</i> , <i>Panicum virgatum</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Panicum virgatum*, *Andropogon gerardii*, *Glycyrrhiza lepidota*

**Globally**

*Panicum virgatum*, *Pascopyrum smithii*, *Schizachyrium scoparium*, *Glycyrrhiza lepidota*

OTHER NOTABLE SPECIES

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

The switchgrass herbaceous vegetation type often provides fairly dense ground cover of between 50 to 80%. Switchgrass (*Panicum virgatum*) and big bluestem (*Andropogon gerardii*) are the dominant species in more mesic areas while western wheatgrass (*Pascopyrum smithii*) is more abundant on somewhat drier elevated sites. Common associated species include wild licorice (*Glycyrrhiza lepidota*), Kentucky bluegrass (*Poa pratensis*), and smooth brome (*Bromus inermis*). Where the switchgrass type occurs in the sandhills, the distribution often becomes "patchy" with most stands bordered by prairie sandreed (*Calamovilfa longifolia*), needle-and-thread (*Hesperostipa comata*), and soapweed (*Yucca glauca*).

**Globally**

In Badland National Park, South Dakota, the switchgrass grassland type provides dense ground cover, typically between 50-80%. *Panicum virgatum* is the dominant species in more mesic areas, *Pascopyrum smithii* is more abundant on elevated sites within the drainages and basins, and *Schizachyrium scoparium* is the dominant species along the upper margin of the type.

Where this type is found in drainages, the distribution often becomes "patchy" and *Calamovilfa longifolia* replaces *Schizachyrium scoparium* on the upper type margin. Commonly associated species include *Glycyrrhiza lepidota*, *Aster ericoides*, and stems of *Populus deltoides*.

CONSERVATION RANK G2Q.

DATABASE CODE C EGL001484

SIMILAR ASSOCIATIONS

COMMENTS

**Lacreek National Wildlife Refuge**

Extensive areas naturally dominated by switchgrass are rare in the Great Plains and this type is unique in that regard. The swales and drainages which the type dominates are sometimes saturated throughout much of the growing season, or in the case of the sandhills, the stands are subirrigated.

**Globally**

The concept of this type is still under review, as well as its alliance placement. Other candidate alliances include *Panicum virgatum* Temporarily Flooded Herbaceous Alliance (A.1343), which is currently reported only from the southern United States, and the *Pascopyrum smithii* Temporarily Flooded Herbaceous Alliance (A.1354), which has many floristic affinities with stands in this type.

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Von Loh, J., D. Cogan, D. Faber-Langendoen, D. Crawford, and M. Pucherelli. 1999. USGS-NPS Vegetation Mapping Program, Badlands National Park, South Dakota (Final Report). Technical Memorandum No. 8260-00-02. U.S. Bureau of Reclamation Technical Service Center. Denver Colorado.

**Phragmites australis Western North America Temperate Semi-natural  
Herbaceous Vegetation**

COMMON NAME	Common Reed Western North America Temperate Semi-natural Herbaceous Vegetation
SYNONYM	Western Reed Marsh
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	Semipermanently flooded temperate or subpolar grassland (V.A.5.N.1)
ALLIANCE	PHRAGMITES AUSTRALIS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE
CLASSIFICATION CONFIDENCE LEVEL	3
USFWS WETLAND SYSTEM	Terrestrial

RANGE

***Lacreek National Wildlife Refuge***

This is a rare association at LNWR that only occurs in a few small stands.

***Globally***

This reed marsh type is found across the west-temperate regions of the United States and Canada, ranging from western North Dakota and Saskatchewan to Oregon, south to California and Texas. Its distribution is somewhat incomplete as not all states have listed semi-natural types in their state.

ENVIRONMENTAL DESCRIPTION

***Lacreek National Wildlife Refuge***

The association is characterized by having dense cover of common reed and little overall species diversity.

***Globally***

This association is widespread in the western U.S. and Canada. Elevation ranges from 640-1980 m. Stands occur in temporarily to semipermanently flooded marshes, ditches, impoundments, pond and lake margins, swales, and wet meadows that often have been disturbed by human activity. Sites are usually flooded during the growing season, but the soil surface may dry out in late summer. Soils are often fine-textured silts and clays. In Colorado and Utah, this reed marsh often occurs in small wet patches in seeps and backwater areas of large floodplains, around the fringes of irrigation ponds, ditches, and along railroad embankments that have poor drainage.

MOST ABUNDANT SPECIES

***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
HERBACEOUS	<i>Phragmites australis</i> , <i>Typha latifolia</i>

**Globally**

Stratum

GRAMINOID

Species

*Phragmites australis*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Phragmites australis*, *Typha latifolia*

**Globally**

*Phragmites australis*

OTHER NOTABLE SPECIES (n/a)

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Small stands of this type typically have very little associated species.

**Globally**

The vegetation is often variable, as *Phragmites australis* will often invade into existing natural or semi-natural communities present on the site. Once firmly established, this community is usually strongly dominated by *Phragmites australis*, with few or no other vascular plants present. Stands have a dense, 1- to 3-m tall herbaceous layer dominated by the perennial graminoid *Phragmites australis* usually with over 80% cover. Associates include *Agrostis stolonifera*, *Carex* spp., *Conyza canadensis*, *Glycyrrhiza lepidota*, *Iva axillaris*, *Mentha arvensis*, *Schoenoplectus acutus* (= *Scirpus acutus*), and *Typha latifolia*. Introduced species such as *Lepidium latifolium* and *Cirsium arvense* may be present and compete well against *Phragmites australis* in disturbed sites.

CONSERVATION RANK G2Q.

DATABASE CODE CEGL001484

SIMILAR ASSOCIATIONS

*Phragmites australis* Eastern North America Temperate Semi-natural Herbaceous Vegetation (CEGL004141)

COMMENTS

**Lacreek National Wildlife Refuge**

(n/a)

**Globally**

This vegetation has variable hydrology and is often treated as part of other marshes and meadows. The geographic distribution of the type is arbitrarily limited to Bailey's Dry and Humid Temperate Domain in western North America (Bailey 1997, 1998). Compare with *Phragmites australis* Eastern North America Temperate Semi-natural Herbaceous Vegetation

(CEGL004141). The two types need to be better distinguished, both conceptually and nomenclaturally.

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**Spartina pectinata - Carex spp. Herbaceous Vegetation**

COMMON NAME Prairie Cordgrass - Sedge species Herbaceous Vegetation  
SYNONYM Prairie Cordgrass - Sedge Wet Meadow  
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 Temporarily flooded temperate or subpolar grassland (V.A.5.N.j)  
ALLIANCE SPARTINA PECTINATA TEMPORARILY FLOODED  
HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM Palustrine

RANGE

**Lacreek National Wildlife Refuge**

The prairie cordgrass wetland is restricted to the margins of linear wetlands with a perennial hydrologic regime.

**Globally**

This type is found in the northwestern Great Plains in eastern Montana and western North and South Dakota.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Prairie cordgrass wetland stands occur in drainage bottoms, along perennial stream courses, forming a patchy mosaic with other wetland species.

**Globally**

At Wind Cave NP in South Dakota, stands occur in drainage bottoms where the soil is wet for at least part of the growing season. At Theodore Roosevelt and Badlands National Parks, stands occur in poorly drained depressions within floodplains of major rivers.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

Stratum      Species  
Herbaceous    *Scirpus americanus*, *Carex* spp., *Spartina pectinata*

**Globally**

Stratum      Species  
Graminoid    *Spartina pectinata*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Spartina pectinata*, *Carex* spp., *Scirpus americanus*, *Eleocharis palustris*

**Globally**

*Spartina pectinata*

OTHER NOTABLE SPECIES

**Globally**

Stratum

Species

Graminoid     *Carex nebrascensis*, *Hordeum jubatum*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Prairie cordgrass stands within Lacreek are small, but dense. Aerial cover of the entire herbaceous layer is typically estimated at 75-100%. Prairie cordgrass (*Spartina pectinata*) is the dominant species. The stands occupy moist soils and occur adjacent to spikerush (*Eleocharis palustris*), water smartweed (*Polygonum amphibium*), cattails (*Typha angustifolia*, *Typha latifolia*), and bulrush (*Scirpus americanus* (= *Scirpus pungens*)) stands, these latter stands occupying saturated to inundated soils. Adjacent uplands are typically vegetated by western wheatgrass (*Pascopyrum smithii*) grasslands.

**Globally**

At Wind Cave NP in South Dakota, this type has dense herbaceous cover, greater than 75 percent. Species dominance is patchy within stands, with various graminoids locally abundant, often to the exclusion of other species. In the single sampled stand, *Spartina pectinata*, *Carex nebrascensis*, and *Eleocharis palustris* were locally dominant. *Epilobium ciliatum* was common in shallow water (H. Marriott pers. comm. 1999). At Theodore Roosevelt National Park in North Dakota *Spartina pectinata* is the dominant species. Species richness is generally low. *Hordeum jubatum* and *Pascopyrum smithii* are the most prominent secondary species (J. Butler personal communication 1999). At Badlands National Park in South Dakota, Prairie cordgrass stands are small, but dense. Aerial cover of the entire herbaceous layer is typically estimated at 75-100%. *Spartina pectinata* is the dominant species. The stands occupy moist soils and occur adjacent to spikerush *Eleocharis palustris*, *Polygonum amphibium*, *Typha angustifolia*, *Typha latifolia*, and *Scirpus americanus* (= *Scirpus pungens*) stands, these latter stands occupying saturated to inundated soils. Adjacent uplands are typically vegetated by *Pascopyrum smithii*.

CONSERVATION RANK    G3?. This type has a relatively restricted distribution, and occurs in somewhat specialized wetland habitats in an arid climate. In addition, many such wetland sites are subject to heavy grazing pressure by cattle, who favor these moist locations. No element occurrences have been documented for this type, but at least several stands occur within three National Parks in the western Dakotas.

DATABASE CODE C EGL001477

SIMILAR ASSOCIATIONS

*Spartina pectinata* - *Calamagrostis stricta* - *Carex* spp. Herbaceous Vegetation (This is the northern tallgrass region equivalent of 1477.)

*Spartina pectinata* - *Scirpus pungens* Herbaceous Vegetation (This association may simply need to be split between a *Scirpus pungens* association and a *Spartina pectinata* association.)

COMMENTS

***Lacreek National Wildlife Refuge***

Prairie cordgrass stands or patches only occur along perennial flowing waters of slow-moving and along irrigation and water collection ditches.

***Globally***

Sites may occasionally flood from rivers or ponding up of depressions.

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### **Carex nebrascensis Herbaceous Vegetation**

COMMON NAME Nebraska Sedge Herbaceous Vegetation  
SYNONYM Nebraska Sedge Wet Meadow  
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 (V.A.5.N.k)  
ALLIANCE CAREX NEBRASCENSIS SEASONALLY FLOODED  
HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM

#### RANGE

##### ***Lacreek National Wildlife Refuge***

Cattail wetlands occur throughout the Refuge, occupying depressions, drainages, seeps, springs, and ponds where saturated soils or shallow standing water is present on a more-or-less permanent basis. This type is especially prevalent around the Refuge pools.

##### ***Globally***

This sedge meadow type is widely distributed from the western Great Plains into the western mountains of the United States, ranging from South Dakota and Montana to possibly as far west as Washington, south to California and east to New Mexico.

#### ENVIRONMENTAL DESCRIPTION

##### ***Lacreek National Wildlife Refuge***

Cattail wetlands occupy flats, slow-flowing drainages, sidehill and toeslope seeps and springs, and the edges of ponds, pools, and reservoirs.

##### ***Globally***

In Nebraska and Colorado, this community occurs as bands parallel to streams and is dominated by medium-tall (<1 m) herbaceous species. This community is also found in nearly level, poorly drained sites that are wet or saturated for much of the year (Jones 1992). In eastern Wyoming and the panhandle of western Nebraska, soils were gleyed sandy, silty loam, clay loam, or clays (Jones and Walford 1995, Steinauer and Rolfsmeier 2000). In Colorado, these wetlands form open meadows that occur along the margins of stream banks, lakes and seeps on the plains. The soils are generally saturated for much of the growing season and are subject to compaction by livestock.

#### MOST ABUNDANT SPECIES

##### ***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Hordeum vulgare</i> , <i>Juncus</i> spp., <i>Scirpus americanus</i> , <i>Scirpus validus</i> , <i>Typha angustifolia</i> , <i>Typha latifolia</i>

**Globally**

Stratum

Species

Herbaceous *Scirpus acutus*, *Scirpus tabernaemontani*, *Typha angustifolia*, *Typha latifolia*

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

Stratum

Species

Herbaceous *Typha angustifolia*, *Scirpus americanus*

**Globally**

Stratum

Species

Herbaceous *Scirpus acutus*, *Scirpus tabernaemontani*, *Typha angustifolia*

OTHER NOTABLE SPECIES

**Globally**

Stratum

Species

Graminoid *Eleocharis palustris*, *Leersia oryzoides*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Naturally occurring, emergent wetlands growing along slow-moving creeks are dominated by prairie cordgrass (*Spartina pectinata*), spikerush, three-square bulrush (*Scirpus americanus* or *Scirpus pungens*), and softstem bulrush (*Scirpus validus*). Vegetative cover for emergent wetlands established along streams is dense, between 75-100% in most cases. Emergent wetlands that have formed around and in constructed pools and reservoirs are dominated by species of cat-tail (*Typha angustifolia* and *Typha latifolia*) and bulrush (*Scirpus validus* and *Scirpus americanus*). These sites may also support some wetland shrubs such as sandbar willow (*Salix exigua*). Typically, vegetative cover in emergent wetlands of disturbed sites ranges from approximately 50-90%.

**Globally**

Woody species are rare. Stands are dominated by the perennial graminoid *Carex nebrascensis*, a widespread species that generally forms small to medium-sized meadows. In Nebraska, common species include *Agrostis stolonifera*, *Carex hystericina*, *Carex pellita* (= *Carex lanuginosa*), *Eleocharis erythropoda*, *Equisetum* spp., *Juncus balticus*, *Schoenoplectus pungens* (= *Scirpus pungens*), and *Triglochin* spp. (Steinauer and Rolfsmeier 2000).

CONSERVATION RANK G4. This type is widely distributed, but many examples have been heavily grazed by cattle, lowering their floristic quality.

DATABASE CODE C EGL001813

SIMILAR ASSOCIATIONS

*Scirpus acutus* - *Typha latifolia* - (*Scirpus tabernaemontani*) Sandhills Herbaceous Vegetation

*Typha latifolia* Southern Herbaceous Vegetation (southeastern states)

*Typha latifolia* Western Herbaceous Vegetation (western states)

*Typha spp.* - *Scirpus spp.* - Mixed Herbs Great Plains Herbaceous Vegetation (A more species diverse association.)

COMMENTS

***Lacreek National Wildlife Refuge***

An effort was made to split this type into two map units based on hydrologic patterns, semipermanently and seasonally flooded.

***Globally***

In the Black Hills, classification of stands was problematic due to identification problems with *Carex nebrascensis* and *Carex aquatica*. The two are difficult to distinguish based on available keys and written descriptions (Marriott and Faber-Langendoen 2000).

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## **Lacreek National Wildlife Refuge Vegetation Mapping Project**

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### **Juncus balticus Herbaceous Vegetation**

COMMON NAME Baltic Rush Herbaceous Vegetation  
SYNONYM Baltic Rush Wet Meadow  
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 Seasonally flooded temperate or subpolar grassland (V.A.5.N.k)  
ALLIANCE JUNCUS BALTICUS SEASONALLY FLOODED  
HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 1  
USFWS WETLAND SYSTEM PALUSTRINE

#### RANGE

##### ***Lacreek National Wildlife Refuge***

Baltic rush (*Juncus balticus*) stands are rare and patchy within the Refuge.

##### ***Globally***

This Baltic rush wet meadow community is found widely throughout the western United States, ranging from South Dakota and Montana west to Washington, south to possibly California, and east to New Mexico.

#### ENVIRONMENTAL DESCRIPTION

##### ***Lacreek National Wildlife Refuge***

Stands are usually less than 0.5 ha in size and occur in poorly drained sites where the soil is saturated for most of the growing season.

##### ***Globally***

This widespread herbaceous wetland community is found throughout western North America. Elevation ranges from 1420-3500 m. Stands usually occur as small, dense patches on flat to gently sloping sites near seeps and streams. Stream channels are highly variable in size and type ranging from narrow to moderately wide, and deeply entrenched to very sinuous (Kittel et al. 1999). Soils are also variable and range from alluvial sandy and well-drained, to poorly drained silty clay loam, to organic; however, soils tend to be finer-textured, alkaline and may be saline (Brotherson and Barnes, Kittel et al. 1999, Padgett et al. 1989). Cobbles and gravel are common on many sites, and gleyed and mottled horizons are often present because of flooding or high water tables (Kittel et al. 1999).

#### MOST ABUNDANT SPECIES

##### ***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Carex nebrascensis</i>

## Lacreek National Wildlife Refuge Vegetation Mapping Project

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### **Globally**

#### Stratum

#### Species

GRAMINOID *Carex nebrascensis, Carex praegracilis, Juncus balticus*

### CHARACTERISTIC SPECIES

#### **Lacreek National Wildlife Refuge**

#### Stratum

#### Species

GRAMINOID *Carex nebrascensis*

### **Globally**

#### Stratum

#### Species

GRAMINOID *Carex nebrascensis, Carex praegracilis, Juncus balticus*

### VEGETATION DESCRIPTION

#### **Lacreek National Wildlife Refuge**

The stands are characterized by a dense cover of Baltic rush with cattail species and prairie cordgrass as minor components of the association.

### **Globally**

This association is characterized by a low (<50 cm), dense graminoid layer dominated by the rhizomatous perennial *Juncus balticus*. Minor cover of *Carex* species, including *Carex aquatilis*, *Carex praegracilis*, *Carex nebrascensis* or *Carex utriculata*, is often present. Other common graminoids include *Deschampsia caespitosa*, *Distichlis spicata*, *Glyceria striata*, *Hordeum jubatum*, *Muhlenbergia asperifolia*, *Phleum alpinum*, and *Sporobolus airoides*. Forb cover is generally low but may include *Caltha leptosepala*, *Glaux maritima*, *Maianthemum stellatum*, and *Dodecatheon pulchellum*. Shrubs are not common, but occasional *Salix* spp. may occur. Some stands may be codominated by the introduced perennial sod grasses *Poa pratensis* or *Agrostis stolonifera*. Other introduced species, such as *Taraxacum officinale*, *Trifolium* spp., *Cirsium arvense*, *Lactuca serriola*, *Phleum pratense*, and *Thinopyrum intermedium*, may occur in disturbed stands.

### OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G5.

DATABASE CODE CEGL001838

### COMMENTS

#### **Lacreek National Wildlife Refuge**

(n/a)

### **Globally**

(n./a)

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**Schoenoplectus acutus - Typha latifolia - (Schoenoplectus tabernaemontani)  
Sandhills Herbaceous Vegetation**

COMMON NAME	Hardstem Bulrush - Broadleaf Cattail - (Softstem Bulrush) Sandhills Herbaceous Vegetation
SYNONYM	Sandhills Bulrush Marsh
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	Semipermanently flooded temperate or subpolar grassland (V.A.5.N.1)
ALLIANCE	TYPHA (ANGUSTIFOLIA, LATIFOLIA) – (SCHOENOPLECTUS SPP.) SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE
CLASSIFICATION CONFIDENCE LEVEL	2
USFWS WETLAND SYSTEM	PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

The vast majority of the stands that characterize this type at LNWR are less than 0.5 ha in size.

**Globally**

This community is found in floodplains and interdunal valleys of the sandhills regions of the central Great Plains in the United States.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Stands of this community type occur in small, isolated depressions where the water table intersects the surface. The soils are intermittently saturated; however, the amount of moisture probably fluctuates considerably from one year to the next. Because this community is restricted to very small, isolated depressions, the size of the stands probably fluctuates seasonally as well as from one year to the next.

**Globally**

This community occurs where the regionally high water table of the Sandhills intersects the land surface in interdunal valleys, and is commonly associated with lakes, though it may occur in smaller depressions as well. Soils are deep, very poorly drained, and contain much organic matter (peat or muck) and are formed in eolian sand or alluvium. Soils are flooded or waterlogged through much of the season. The water is usually slightly alkaline, and surface water levels fluctuate seasonally with groundwater levels (Steinauer and Rolfsmeier 2000).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Schoenoplectus acutus</i> , <i>Schoenoplectus pungens</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Carex lacustris</i> , <i>Eleocharis erythropoda</i> , <i>Phragmites australis</i> , <i>Schoenoplectus acutus</i> , <i>Schoenoplectus pungens</i> , <i>Sparganium eurycarpum</i> , <i>Typha latifolia</i>
FORB	<i>Polygonum amphibium</i> var. <i>emersum</i> , <i>Sagittaria latifolia</i>
SUBMERSED	<i>Ceratophyllum demersum</i> , <i>Lemna trisulca</i> , <i>Zannichellia palustris</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Schoenoplectus acutus</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Phragmites australis</i> , <i>Schoenoplectus acutus</i> , <i>Typha latifolia</i>
FORB	<i>Sagittaria latifolia</i>

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

The vegetation is typically 1 to 2 m in height with foliar cover approaching 100%. Cattail (*Typha latifolia*) is the most common secondary species.

**Globally**

The vegetational composition of this community varies in response to water depth and other factors. This community is dominated by tall, emergent, hydrophytic graminoids. In areas flooded most of the season *Schoenoplectus acutus* (= *Scirpus acutus*) is usually dominant, with *Typha latifolia* increasingly common in areas of deeper water. Scattered patches of *Phragmites australis* may be present, but are seldom common. *Sagittaria latifolia* frequently forms a sparse understory layer, but is often dense in openings in the overstory and in deeper water with *Typha latifolia* at the margin of the permanent water line. Other species found in openings include *Carex lacustris*, *Polygonum amphibium* var. *emersum* (= *Polygonum coccineum*), and *Sparganium eurycarpum*. In areas which experience a more frequent fluctuation in the water level, *Phragmites australis* dominates, and may spread extensively during extended periods of low water. Scattered *Carex lacustris*, *Polygonum amphibium* var. *emersum* (= *Polygonum coccineum*), and *Schoenoplectus acutus* are found with *Phragmites australis* in these sites. Species diversity is low (Steinauer and Rolfsmeier 2000).

The vegetation may form two intergrading zones, a bulrush/cattail zone where areas are flooded most of the season and dominated by a mixture of species, and a reed zone where areas are seasonally flooded and dominated by *Phragmites australis*. *Phragmites* may spread extensively during periods when the water table is low. Understory vegetation is usually sparse in the denser stands, though scattered *Typha* and *Schoenoplectus* may be present along with other plants of the bulrush/cattail zone.

OTHER NOTEWORTHY SPECIES

CONSERVATION RANK G4. Many unmodified marshes remain, though many more have been drained, particularly in the eastern portion of the range of this community. These sites are vulnerable to invasion by *Lythrum salicaria*.

DATABASE CODE CEGL002030

COMMENTS

***Lacreek National Wildlife Refuge***

(n/a)

***Globally***

(n/a)

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**Schoenoplectus pungens Herbaceous Vegetation**

COMMON NAME Threesquare Herbaceous Vegetation  
SYNONYM Bulrush Wet Meadow  
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 Semipermanently flooded temperate or subpolar grassland (V.A.5.N.1)  
ALLIANCE SCHOENOPECTUS PUNGENS SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 2  
USFWS WETLAND SYSTEM PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

This rare unit is comprised of stands that are less than 0.5 ha in size.

**Globally**

This community is found in the western United States in the intermountain basins, as well as in western parts of the Great Plains, from Montana south to Colorado, and west into Nevada, Utah, and Wyoming.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Stands of this community type occur in small, isolated depressions where the water table intersects the surface. Hydrologic conditions are very similar to those of the Hardstem bulrush type.

**Globally**

Stands of this widespread association are found throughout much of the western U.S. in appropriate wetland habitat. Elevations range from 1000-2400 m. Stands occur along low-gradient, meandering, usually perennial streams, around the margins of ponds and marshes, in low-lying swales, and abandoned or overflow channels where the soils remain saturated. (Hansen et al. 1995, Kittel et al. 1999, Jones and Walford 1995, Walford 1996). It also occurs on silt and sand bars within the active channel. Soils are generally derived from alluvium and are fine-textured, black, alkaline, organic anoxic with gleying. Soils range from normal to saline with pH ranging from 7.4-9.1.

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
GRAMINOID	<i>Schoenoplectus pungens</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
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## Lacreek National Wildlife Refuge Vegetation Mapping Project

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GRAMINOID      *Schoenoplectus pungens*

### CHARACTERISTIC SPECIES

#### **Lacreek National Wildlife Refuge**

Stratum                      Species  
GRAMINOID      *Schoenoplectus pungens*

#### **Globally**

Stratum                      Species  
GRAMINOID      *Schoenoplectus pungens*

### VEGETATION DESCRIPTION

#### **Lacreek National Wildlife Refuge**

The vegetation is typically 0.5 to 2 m in height with foliar cover approaching 100%. Other wetland species common to LNWR are usually present in low abundance.

#### **Globally**

This widespread wetland association is characterized by a dense, 0.3- to 0.6-m tall herbaceous vegetation layer that is dominated by *Schoenoplectus pungens* (= *Scirpus pungens*). Associated species include *Schoenoplectus maritimus* (= *Scirpus maritimus*), *Spartina gracilis*, *Hordeum jubatum*, *Pascopyrum smithii*, *Juncus balticus*, *Eleocharis palustris*, *Lemna minor*, *Sagittaria latifolia*, and *Typha* spp. Stands of this association contain no tree or shrub layer, but a few scattered trees and shrubs may be present, most commonly *Populus deltoides*, *Salix amygdaloides*, *Salix exigua*, *Symphoricarpos occidentalis*, or *Sarcobatus vermiculatus*.

### OTHER NOTEWORTHY SPECIES

CONSERVATION RANK    G3G4.

DATABASE CODE    CEGL001587

### COMMENTS

#### **Lacreek National Wildlife Refuge**

(n/a)

#### **Globally**

(n/a)

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## **Typha spp. Great Plains Herbaceous Vegetation**

COMMON NAME	Cattail species Great Plains Herbaceous Vegetation
SYNONYM	Northern Great Plains Cattail Marsh
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	Semipermanently flooded temperate or subpolar grassland (V.A.5.N.1)
ALLIANCE	TYPHA (ANGUSTIFOLIA, LATIFOLIA) - (SCIRPUS SPP.) SEMIPERMANENTLY FLOODED HERBACEOUS ALLIANCE
CLASSIFICATION CONFIDENCE LEVEL	2
USFWS WETLAND SYSTEM	

### RANGE

#### ***Lacreek National Wildlife Refuge***

Cattail wetlands occur throughout the Refuge, occupying depressions, drainages, seeps, springs, and ponds where saturated soils or shallow standing water is present on a more-or-less permanent basis. This type is especially prevalent around the Refuge pools.

#### ***Globally***

This community ranges broadly over the northern Great Plains of the United States.

### ENVIRONMENTAL DESCRIPTION

#### ***Lacreek National Wildlife Refuge***

Cattail wetlands occupy flats, slow-flowing drainages, sidehill and toeslope seeps and springs, and the edges of ponds, pools, and reservoirs.

#### ***Globally***

Stands occur in basin-like depressions, backwater areas of floodplains and shallow margins of lakes or ponds. Hydrology varies from seasonally flooded to semipermanently flooded.

### MOST ABUNDANT SPECIES

#### ***Lacreek National Wildlife Refuge***

<u>Stratum</u>	<u>Species</u>
Herbaceous	<i>Hordeum vulgare</i> , <i>Juncus</i> spp., <i>Scirpus americanus</i> , <i>Scirpus validus</i> , <i>Typha angustifolia</i> , <i>Typha latifolia</i>

#### ***Globally***

<u>Stratum</u>	<u>Species</u>
Graminoid	<i>Scirpus acutus</i> , <i>Scirpus tabernaemontani</i> , <i>Typha angustifolia</i> , <i>Typha latifolia</i>

### CHARACTERISTIC SPECIES

#### ***Lacreek National Wildlife Refuge***

*Typha angustifolia*, *Scirpus americanus*

**Globally**

*Scirpus acutus*, *Scirpus tabernaemontani*, *Typha angustifolia*

OTHER NOTABLE SPECIES

**Lacreek National Wildlife Refuge**

**Globally**

Stratum

Species

Graminoid     *Eleocharis palustris*, *Leersia oryzoides*

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

Naturally occurring, emergent wetlands growing along slow-moving creeks are dominated by prairie cordgrass (*Spartina pectinata*), spikerush, three-square bulrush (*Scirpus americanus* or *Scirpus pungens*), and softstem bulrush (*Scirpus validus*). Vegetative cover for emergent wetlands established along streams is dense, between 75-100% in most cases. Emergent wetlands that have formed around and in constructed pools and reservoirs are dominated by species of cat-tail (*Typha angustifolia* and *Typha latifolia*) and bulrush (*Scirpus validus* and *Scirpus americanus*). These sites may also support some wetland shrubs such as sandbar willow (*Salix exigua*). Typically, vegetative cover in emergent wetlands of disturbed sites ranges from approximately 50-90%.

**Globally**

The vegetation is dominated by relatively pure stands of *Typha* spp., either *Typha latifolia* or *Typha angustifolia* or both. Many associates could occur. This type may simply be a less diverse variation of *Typha* spp. - *Scirpus* spp. Mixed Herbs Great Plains Herbaceous Vegetation (CEGL002228).

CONSERVATION RANK    G4G5. Type is widespread throughout the plains, but most examples show evidence of disturbance. It is possible that the type originates primarily from human-related disturbances, and perhaps the rank should be GW.

DATABASE CODE    CEGL002389

SIMILAR ASSOCIATIONS

*Scirpus acutus* - *Typha latifolia* - (*Scirpus tabernaemontani*) Sandhills Herbaceous Vegetation

*Typha latifolia* Southern Herbaceous Vegetation (southeastern states)

*Typha latifolia* Western Herbaceous Vegetation (western states)

*Typha* spp. - *Scirpus* spp. - Mixed Herbs Great Plains Herbaceous Vegetation (A more species diverse association.)

COMMENTS

**Lacreek National Wildlife Refuge**

An effort was made to split this type into two map units based on hydrologic patterns, semipermanently and seasonally flooded.

***Globally***

Cattail - bulrush wetlands represent a regulated resource and are a valuable wildlife habitat. The presence of wetlands and ponded water controls the movement of livestock and many wildlife species, particularly bison, the largest grazing mammal on the park.

**REFERENCES**

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

**Note:**

This association is found in two different map classes:

- 1) Cattail spp. Great Plains Herbaceous Vegetation (Semipermanently Flooded)
- 2) Cattail spp. Great Plains Herbaceous Vegetation (Seasonally Flooded)

**Symphoricarpos occidentalis Shrubland**

COMMON NAME Western Snowberry Shrubland  
SYNONYM Western Snowberry Shrubland  
PHYSIOGNOMIC CLASS Shrubland (III)  
PHYSIOGNOMIC SUBCLASS Deciduous shrubland (III.B)  
PHYSIOGNOMIC GROUP Cold-deciduous shrubland (III.B.2)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (III.B.2.N)  
FORMATION Temporarily flooded cold-deciduous shrubland (III.B.2.N.d)  
ALLIANCE SYMPHORICARPOS OCCIDENTALIS TEMPORARILY  
FLOODED SHRUBLAND ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 3  
USFWS WETLAND SYSTEM PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

Western snowberry shrublands are rare within the Refuge. Only a few small stands (less than 0.5 ha in size) were recorded in the northernmost portion of the Refuge.

**Globally**

This western snowberry shrubland is found in the western tallgrass and northern Great Plains of the United States and Canada.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Western snowberry is generally found on sites that receive some form of supplemental moisture. Consequently, they are usually associated with small depressions in the uplands.

**Globally**

This community is found in mesic swales, depressions, ravines and floodplains. Some examples of this community experience intermittent and brief flooding. The soils are fertile and well-drained to imperfectly drained silts and loams. The upper soil horizon is usually deep, although a thin layer of sand may be present if the site has been recently flooded (Jones and Walford 1995).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
SHORT SHRUB	<i>Symphoricarpos occidentalis</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
SHORT SHRUB	<i>Symphoricarpos occidentalis</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
SHORT SHRUB	<i>Symphoricarpos occidentalis</i>

**Globally**

## Lacreek National Wildlife Refuge Vegetation Mapping Project

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Stratum                      Species  
SHORT SHRUB                *Symphoricarpos occidentalis*

### VEGETATION DESCRIPTION

#### **Lacreek National Wildlife Refuge**

At the Refuge, the stands are often intermixed with, a wide variety of vegetation types such as western wheatgrass and other upland grasses.

#### **Globally**

Throughout its range this community is dominated by shrubs approximately 1 m tall. Shrub cover is typically greater than 50%, and in places it can approach 100%. These shrubs form dense clumps that exclude most other species. *Symphoricarpos occidentalis* is the most common shrub, but *Rhus aromatica* (or *Rhus trilobata*) and *Prunus virginiana* can be locally abundant and can grow to 2-3 m in places. *Toxicodendron rydbergii* may also be present. Herbaceous species and smaller shrubs are most abundant at the edges of this community and in gaps between the clumps of taller shrubs where the shading is less complete. *Rosa woodsii* is a typical smaller shrub. Common graminoids include *Pascopyrum smithii* and *Poa pratensis*. *Achillea millefolium*, *Artemisia ludoviciana*, *Galium boreale*, and *Solidago* spp. are common forbs of this community. Woody vines sometimes occur, including *Parthenocissus vitacea*.

This shrubland type occurs throughout its range as thickets surrounded by grasslands or occasionally by tall shrublands (e.g., *Prunus virginiana*).

### OTHER NOTEWORTHY SPECIES

**CONSERVATION RANK** G4G5. This type is common throughout the northern Great Plains. Historically, it may never have been very extensive. It has been observed to grow out from forest or woodland edges and shade out the grasses. It is tolerant of both grazing and fire (Hansen and Hoffman 1988), and is under no threat from human activities. In some cases, heavily grazed pastures may favor this types. Many examples are somewhat weedy; thus the type is not demonstrably secure.

**DATABASE CODE**                C EGL001131

### COMMENTS

#### **Lacreek National Wildlife Refuge**

(n/a)

#### **Globally**

(n/a)

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**Salix exigua / Mesic Graminoids Shrubland**

COMMON NAME Sandbar Willow / Mesic Graminoids Shrubland  
SYNONYM Coyote Willow / Mesic Graminoids Shrubland  
PHYSIOGNOMIC CLASS Shrubland (III)  
PHYSIOGNOMIC SUBCLASS Deciduous shrubland (III.B)  
PHYSIOGNOMIC GROUP Cold-deciduous shrubland (III.B.2)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (III.B.2.N)  
FORMATION Temporarily flooded cold-deciduous shrubland (III.B.2.N.d)  
ALLIANCE SALIX (EXIGUA, INTERIOR) TEMPORARILY FLOODED SHRUBLAND ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 1  
USFWS WETLAND SYSTEM PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

Sandbar willow shrubland stands are usually quite small and widely scattered within the Refuge. They are usually found associated with dikes and levees.

**Globally**

This association is found primarily in the central Great Plains, but also parts of the Rocky Mountains and Intermountain Semi-desert regions, ranging from Wyoming west to possibly Idaho, south to Utah, and east to Oklahoma.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Sandbar willow shrubland stands occur as patches adjacent to several wetland communities. These sites are nearly level and well-supplied with near-to-surface ground water.

**Globally**

In Nebraska, this community is found on sandbars, islands and shorelines of stream channels and braided rivers. Soils are poorly developed and composed of sand with lesser amounts of clay, silt and gravel formed in alluvium. Drainage varies with texture and height above the river surface (Steinauer and Rolfsmeier 2000).

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Salix exigua</i>
Herbaceous	<i>Spartina pectinata, Phragmites australis, Typha</i> sp.

**Globally**

<u>Stratum</u>	<u>Species</u>
Shrub	<i>Salix exigua</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Salix exigua*, *Spartina pectinata*

**Globally**

*Salix exigua*

OTHER NOTABLE SPECIES

(n/a)

VEGETATION DESCRIPTION

**Lacreek National Wildlife Refuge**

The majority of the mature sandbar willow shrublands typically have dense cover of between 60-90%. The understory is usually relatively sparse with composition similar to the adjacent communities.

**Globally**

The vegetation is dominated by shrubs with a fairly dense ground layer (at least 30% cover) of mesic graminoids and forbs. In Nebraska, the vegetation is quite variable and is dominated by perennial shrubs and grasses about 1 m tall. *Salix exigua* is the common shrub. Others include saplings of *Populus deltoides* or *Salix amygdaloides*, *Salix eriocephala*, *Salix lutea*, and *Amorpha fruticosa*. Tall perennial grasses can appear to codominate the stand, with *Spartina pectinata* the dominant. Other herbaceous species include *Bidens* spp., *Eleocharis* spp., *Juncus* spp., *Lobelia siphilitica*, *Lycopus americanus*, *Lythrum alatum*, *Polygonum* spp., *Schoenoplectus pungens* (= *Scirpus pungens*), *Sphenopholis obtusata*, and *Xanthium strumarium* (Steinauer and Rolfsmeier 2000). Lauver et al. (1999) note that *Andropogon gerardii* can be present.

CONSERVATION RANK G5. This type is widespread and common throughout its range.

DATABASE CODE C EGL001203

SIMILAR ASSOCIATIONS

*Salix exigua* / Mesic Graminoids Shrubland (These two types may be essentially the same.)

COMMENTS

**Lacreek National Wildlife Refuge**

Sandbar willow shrubland stands are small and nearly insignificant in cover value for the park. Only a few stands were visited during the course of the study, particularly along Sage Creek and the White River near the Visitor's Center.

**Globally**

In Nebraska, Steinauer and Rolfsmeier (1997) report that *Amorpha fruticosa*, *Cornus sericea*, and *Salix lutea* are also present in the shrub layer. In the herbaceous layer they report the following species: *Ambrosia artemisiifolia* and *Aster lanceolatus*.

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**Salix amygdaloides Woodland**

COMMON NAME Peachleaf Willow Woodland  
SYNONYM Peachleaf Willow Woodland  
PHYSIOGNOMIC CLASS Woodland (II)  
PHYSIOGNOMIC SUBCLASS Deciduous woodland (II.B)  
PHYSIOGNOMIC GROUP Cold-deciduous woodland (II.B.2)  
PHYSIOGNOMIC SUBGROUP Natural/Semi-natural (II.B.2.N)  
FORMATION Temporarily flooded cold-deciduous woodland (II.B.2.N.b)  
ALLIANCE SALIX AMYGDALOIDES TEMPORARILY FLOODED  
WOODLAND ALLIANCE  
CLASSIFICATION CONFIDENCE LEVEL 1  
USFWS WETLAND SYSTEM PALUSTRINE

RANGE

**Lacreek National Wildlife Refuge**

Wooded areas are rare and widely scattered in small stands throughout the Refuge, except for the sandhills portion.

**Globally**

The peachleaf willow woodland type is found in the Northern Rocky Mountains, ranging from Idaho to Montana and possibly into parts of the western Great Plains.

ENVIRONMENTAL DESCRIPTION

**Lacreek National Wildlife Refuge**

Many of the stands are less than 0.5 ha in size and occupy a range of mesic sites. The peachleaf willow association typically occurs as three to six trees clustered together to form a dense canopy. These clusters sometimes appear to have coalesced to form a larger stand.

**Globally**

MOST ABUNDANT SPECIES

**Lacreek National Wildlife Refuge**

<u>Stratum</u>	<u>Species</u>
CANOPY	<i>Salix amygdaloides</i>

**Globally**

<u>Stratum</u>	<u>Species</u>
CANOPY	<i>Salix amygdaloides</i>

CHARACTERISTIC SPECIES

**Lacreek National Wildlife Refuge**

*Salix amygdaloides*

**Globally**

*Salix amygdaloides*

VEGETATION DESCRIPTION

***Lacreek National Wildlife Refuge***

in close association with wetland communities dominated by prairie cordgrass, cattail, and Nebraska sedge (*Carex nebrascensis*). Total foliar cover values range from 60 to 100%. The lower values occur where canopies between the stands do not overlap. Individual trees were generally large (10-15 m tall) and mature. Understory shrubs were not common.

***Globally***

(n/a)

OTHER NOTEWORTHY SPECIES

(n/a)

CONSERVATION RANK G3.

DATABASE CODE CEGL000947

COMMENTS

***Lacreek National Wildlife Refuge***

(n/a)

***Globally***

(n/a)

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