

*Saskatchewan Rangeland Ecosystems*  
*Publication 8*

# Communities on the Gravelly Ecosite

Version 2

A project of the Saskatchewan Prairie Conservation Action Plan



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Canada



## NOTES

- This publication describes native rangeland communities found on the Gravelly Ecosite in the Mixed Grassland and Aspen Parkland Ecoregions of Saskatchewan. Almost no data were available for this ecosite in the Dry Mixed Grassland, and its extent there is not known.
- In each region, a reference community, typical of ungrazed to lightly grazed areas, and a series of other communities related to increasing grazing impact, are described.
- In assessing rangeland health, this information can be used to pick the community that best fits the area being assessed. The degree of alteration of that community from the reference community can be used to answer Question 1 of the Saskatchewan Rangeland Health Assessment. This may require interpretation, because the area being assessed may not exactly match any of the described types.
- Another approach is to calculate the percent similarity of the area being assessed to the reference community, as a measure of the degree of alteration due to grazing impact. This measure is similar in both concept and result to the traditional range condition scale.
- State-and-transition diagrams are used to show that there may also be transitions related to factors such as exotic invasion or fire regime. These transitions should not be confused with grazing impacts.
- More detailed discussion of the above points can be found in *Publication 1: Ecoregions and Ecosites*.

**PHOTO CREDIT:** Front cover – gravelly soil profile, Moose Mountain Creek (Photo by Darwin Anderson).

### SUGGESTED CITATION

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**OBTAINING PUBLICATIONS:** *Saskatchewan Rangeland Ecosystems* publications are available on the Prairie Conservation Action Plan website ([http://www.pcap-sk.org/?s=9.resources\\_literature](http://www.pcap-sk.org/?s=9.resources_literature)).

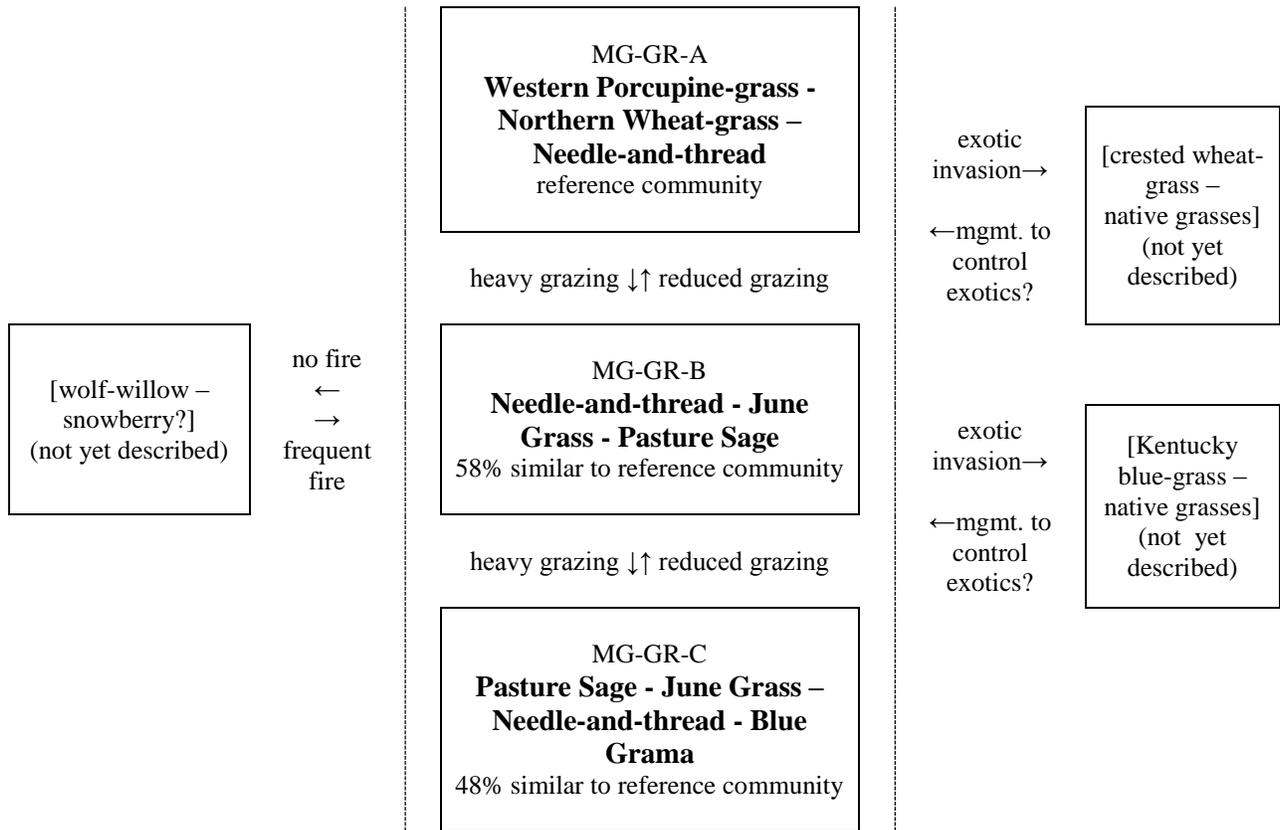


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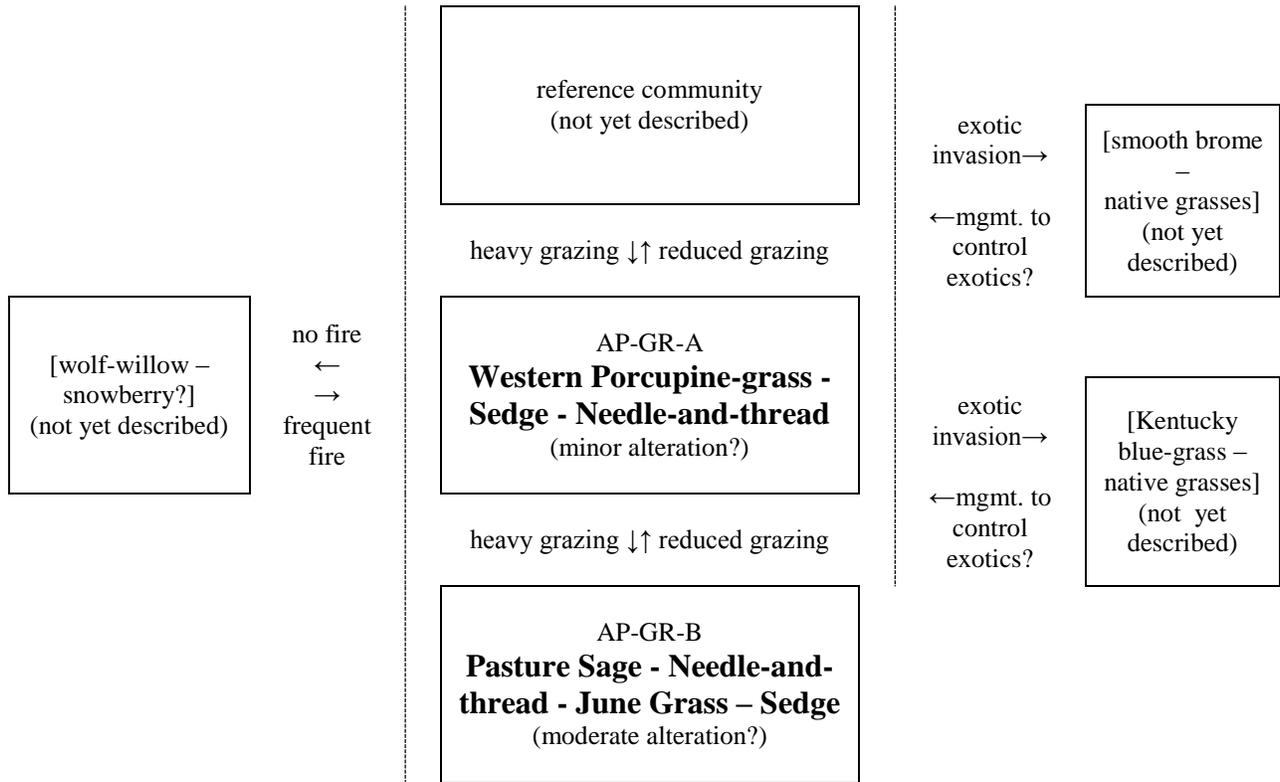
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**STATE-AND-TRANSITION DIAGRAMS**  
**Mixed Grassland: Gravelly Ecosite**



## Aspen Parkland: Gravelly Ecosite



## COMMUNITY DESCRIPTIONS

### MG-GR-A

### Western Porcupine-grass - Northern Wheat-grass - Needle-and-thread Mixed Grassland: Gravelly Ecosite

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, with lesser amounts of shortgrasses, half-shrubs, and forbs. Shrub cover usually low. **Reference community** for Gravelly Ecosites in the Mixed Grassland. In the Dry Mixed Grassland, the reference community would probably be dominated by needle-and-thread rather than western porcupine-grass, but more data are needed to define such a community.

#### STRUCTURE

herbaceous cover (n=6)	70% (44 – 102)	clubmoss cover (n=6)	28% (12 – 47)
- midgrasses	approx. 45%	litter cover (n=5)	49% (23 – 69)
- shortgrasses	approx. 15%	bare soil (n=6)	1% (0 – 2)
- half-shrubs	approx. 5%		
- forbs	approx. 5%		

#### SPECIES COMPOSITION

#### % biomass (n=35)

<b>Major graminoids</b>	
western porcupine-grass ( <i>Hesperostipa curtiseta</i> )	24% (0 - 48)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	13% (0 - 30)
needle-and-thread ( <i>Hesperostipa comata</i> )	13% (0 - 30)
western wheat-grass ( <i>Pascopyrum smithii</i> )	9% (0 - 20)
sedge ( <i>Carex spp.</i> )	7% (0 - 14)
june grass ( <i>Koeleria macrantha</i> )	6% (0 - 15)
green needle grass ( <i>Nassella viridula</i> )	3% (0 - 6)
blue grama ( <i>Bouteloua gracilis</i> )	2% (0 - 6)
plains reed grass ( <i>Calamagrostis montanensis</i> )	2% (0 - 9)
Hooker's oat-grass ( <i>Avenula hookeri</i> )	2% (0 - 5)

#### Major forbs and half-shrubs

pasture sage ( <i>Artemisia frigida</i> )	6% (0 - 10)
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#### Minor graminoids

3%

#### Minor forbs and half-shrubs

10%

#### SIMILARITY TO REFERENCE COMMUNITY

ref. comm.

#### PRODUCTION

insufficient data

#### RECOMMENDED STOCKING RATE

0.43 AUM/ha

0.18 AUM/ac

**MG-GR-B**  
**Needle-and-thread - June Grass - Pasture Sage**  
**Mixed Grassland: Gravelly Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie with midgrasses dominant and shortgrasses subdominant, and with lesser amounts of half-shrubs and forbs. Some cover of short shrubs. Interpreted as showing **moderate alteration** from the reference community as a result of grazing impact. Probably develops from MG-GR-A by decrease of western porcupine-grass and wheat-grasses and increase of needle-and-thread, june grass, blue grama, and pasture sage.

**STRUCTURE**

herbaceous cover (n=9)	46% (42 – 53)	short shrub cover (n=9)	2% (0 – 6)
- midgrasses	approx. 20%	clubmoss cover (n=9)	26% (12 – 43)
- shortgrasses	approx. 15%	lichen cover (n=9)	4% (0 – 15)
- half-shrubs	approx. 5%	bare soil (n=9)	10% (0 – 20)
- forbs	approx. 5%		

**SPECIES COMPOSITION** **% biomass (n=65)**    **% foliar cover (n=9)**

<b>Major short shrubs</b>		
rose ( <i>Rosa spp.</i> )		2% (0 - 3)
snowberry ( <i>Symphoricarpos spp.</i> )		1% (0 - 3)

<b>Major graminoids</b>		
needle-and-thread ( <i>Hesperostipa comata</i> )	23% (10 - 37)	13% (12 - 15)
june grass ( <i>Koeleria macrantha</i> )	17% (5 - 28)	7% (2 - 15)
sedge ( <i>Carex spp.</i> )	9% (1 - 16)	6% (0 - 15)
blue grama ( <i>Bouteloua gracilis</i> )	9% (2 - 15)	5% (0 - 15)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	8% (0 - 21)	1% (0 - 1)
western wheat-grass ( <i>Pascopyrum smithii</i> )	5% (0 - 18)	1% (0 - 1)
western porcupine-grass ( <i>Hesperostipa curtipetala</i> )	4% (0 - 13)	2% (0 - 5)
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 2)	
Sandberg's blue-grass ( <i>Poa secunda</i> )	1% (0 - 3)	

<b>Major forbs and half-shrubs</b>		
pasture sage ( <i>Artemisia frigida</i> )	10% (3 - 21)	3% (0 - 5)
cut-leaved anemone ( <i>Anemone multifida</i> )	1% (0 - 6)	0% (0 - 0)
crocus anemone ( <i>Pulsatilla patens</i> )	1% (0 - 3)	1% (0 - 3)
goldenrod ( <i>Solidago spp.</i> )	1% (0 - 3)	
alumroot ( <i>Heuchera richardsonii</i> )	1% (0 - 3)	
broomweed ( <i>Gutierrezia sarothrae</i> )	1% (0 - 1)	
moss phlox ( <i>Phlox hoodii</i> )		3% (0 - 5)

<b>Minor graminoids</b>	3%	1%
<b>Minor forbs and half-shrubs</b>	6%	3%

<b>SIMILARITY TO REFERENCE COMMUNITY</b>	58%
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<b>PRODUCTION</b>	insufficient data	
<b>RECOMMENDED STOCKING RATE</b>	0.35 AUM/ha	0.14 AUM/ac

**MG-GR-C**  
**Pasture Sage - June Grass - Needle-and-thread - Blue Grama**  
**Mixed Grassland: Gravelly Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie dominated by shortgrasses, but with significant amounts of midgrasses and half-shrubs, and lesser amounts of forbs. Shrub cover usually low. Interpreted as showing **significant alteration** from the reference community as a result of grazing impact. Probably develops from MG-GR-B by decrease of needle-and-thread and wheat-grasses and increase of pasture sage.

**STRUCTURE**

herbaceous cover (n=6)	63% (45 – 76)	short shrub cover (n=6)	1% (0 – 2)
- midgrasses	approx. 15%	clubmoss cover (n=6)	28% (8 – 50)
- shortgrasses	approx. 25%	lichen cover (n=6)	13% (3 – 26)
- half-shrubs	approx. 10%	bare soil (n=6)	2% (0 – 3)
- forbs	approx. 10%		

**SPECIES COMPOSITION**

**% biomass (n=9)    % foliar cover (n=6)**

<b>Major short shrubs</b>	
wolf-willow ( <i>Elaeagnus commutata</i> )	1% (0 - 2)

<b>Major graminoids</b>	
june grass ( <i>Koeleria macrantha</i> )	18% (3 - 27)      10% (0 - 26)
needle-and-thread ( <i>Hesperostipa comata</i> )	15% (7 - 22)      11% (2 - 15)
blue grama ( <i>Bouteloua gracilis</i> )	12% (4 - 20)      6% (0 - 15)
western wheat-grass ( <i>Pascopyrum smithii</i> )	8% (4 - 12)
sedge ( <i>Carex spp.</i> )	7% (0 - 14)      6% (0 - 15)
western porcupine-grass ( <i>Hesperostipa curtiseta</i> )	2% (0 - 7)      1% (0 - 2)
mat muhly ( <i>Muhlenbergia richardsonis</i> )	1% (0 - 1)
plains rough fescue ( <i>Festuca altaica ssp. hallii</i> )	1% (0 - 1)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	1% (0 - 2)
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 2)

**Major forbs and half-shrubs**

pasture sage ( <i>Artemisia frigida</i> )	20% (6 - 33)	13% (9 - 15)
broomweed ( <i>Gutierrezia sarothrae</i> )	2% (0 - 10)	1% (0 - 2)
dotted blazingstar ( <i>Liatriis punctata</i> )	1% (0 - 2)	
golden bean ( <i>Thermopsis rhombifolia</i> )	1% (0 - 2)	
crocus anemone ( <i>Pulsatilla patens</i> )	1% (0 - 2)	
hairy golden-aster ( <i>Heterotheca villosa</i> )	1% (0 - 2)	3% (0 - 8)
moss phlox ( <i>Phlox hoodii</i> )	1% (0 - 1)	7% (3 - 15)
pale comandra ( <i>Comandra umbellata</i> )		1% (0 - 2)
skeletonweed ( <i>Lygodesmia juncea</i> )		1% (0 - 2)
tufted fleabane ( <i>Erigeron caespitosus</i> )		1% (0 - 2)
Lewis wild flax ( <i>Linum lewisii</i> )		1% (0 - 2)
slender milk-vetch ( <i>Astragalus flexuosus</i> )		1% (0 - 2)
goldenrod ( <i>Solidago spp.</i> )		1% (0 - 2)

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<b>Minor forbs and half-shrubs</b>	8%	1%
<b>SIMILARITY TO REFERENCE COMMUNITY</b>	48%	
<b>PRODUCTION</b>	insufficient data	
<b>RECOMMENDED STOCKING RATE</b>	0.26 AUM/ha	0.11 AUM/ac

**AP-GR-A**  
**Western Porcupine-grass - Sedge - Needle-and-thread**  
 Aspen Parkland: Gravelly Ecosite

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, but with a significant proportion of shortgrasses, and lesser amounts of half-shrubs and forbs. Shrub cover usually low. Probably shows **minor alteration** from the reference community, as shown by the high proportions of sedges and june grass. More data needed to better define the reference community for this ecosite.

**STRUCTURE** - insufficient data

**SPECIES COMPOSITION** **% biomass (n=8)**

**Major graminoids**

western porcupine-grass ( <i>Hesperostipa curtiseta</i> )	26% (0 - 46)
sedge ( <i>Carex spp.</i> )	14% (5 - 27)
needle-and-thread ( <i>Hesperostipa comata</i> )	12% (0 - 34)
june grass ( <i>Koeleria macrantha</i> )	10% (1 - 19)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	10% (0 - 24)
plains rough fescue ( <i>Festuca altaica ssp. hallii</i> )	9% (0 - 21)
Sandberg's blue-grass ( <i>Poa secunda</i> )	2% (0 - 5)
blue grama ( <i>Bouteloua gracilis</i> )	1% (0 - 4)
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 4)
Hooker's oat-grass ( <i>Avenula hookeri</i> )	1% (0 - 2)
crested wheat-grass ( <i>Agropyron cristatum</i> )	1% (0 - 1)

**Major forbs and half-shrubs**

pasture sage ( <i>Artemisia frigida</i> )	6% (0 - 13)
cut-leaved anemone ( <i>Anemone multifida</i> )	2% (0 - 5)
crocus anemone ( <i>Pulsatilla patens</i> )	1% (0 - 4)
three-flowered avens ( <i>Geum triflorum</i> )	1% (0 - 3)
hairy golden-aster ( <i>Heterotheca villosa</i> )	1% (0 - 2)
goldenrod ( <i>Solidago spp.</i> )	1% (0 - 1)
umbrella plant ( <i>Eriogonum spp.</i> )	1% (0 - 1)

**Minor graminoids**

1%

**Minor forbs and half-shrubs**

2%

**SIMILARITY TO REFERENCE COMMUNITY**

unknown

**PRODUCTION**

graminoids 900 kg/ha

**RECOMMENDED STOCKING RATE**

drier parts of Aspen Parkland	0.66 AUM/ha	0.27 AUM/ac
moister parts of Aspen Parkland	1.01 AUM/ha	0.41 AUM/ac

AP-GR-B

Pasture Sage - Needle-and-thread - June Grass - Sedge

Aspen Parkland: Gravelly Ecosite

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, but with significant proportions of shortgrasses and half-shrubs, and lesser amounts of forbs. Some shrub cover. Probably shows **moderate alteration** as a result of grazing impact, but more data are needed to better define the reference community for this ecosite. Probably develops from AP-GR-B by decrease in western porcupine-grass and plains rough fescue and increase in pasture sage.

**STRUCTURE** - insufficient data

**SPECIES COMPOSITION**

**% biomass (n=11)**

**Major graminoids**

needle-and-thread ( <i>Hesperostipa comata</i> )	15% (0 - 25)
june grass ( <i>Koeleria macrantha</i> )	12% (6 - 17)
sedge ( <i>Carex spp.</i> )	10% (5 - 17)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	8% (3 - 13)
western porcupine-grass ( <i>Hesperostipa curtiseta</i> )	5% (0 - 15)
blue grama ( <i>Bouteloua gracilis</i> )	5% (0 - 15)
Sandberg's blue-grass ( <i>Poa secunda</i> )	3% (0 - 11)
plains reed grass ( <i>Calamagrostis montanensis</i> )	2% (0 - 5)
crested wheat-grass ( <i>Agropyron cristatum</i> )	1% (0 - 6)
plains rough fescue ( <i>Festuca altaica ssp. hallii</i> )	1% (0 - 6)
western wheat-grass ( <i>Pascopyrum smithii</i> )	1% (0 - 3)
Hooker's oat-grass ( <i>Avenula hookeri</i> )	1% (0 - 3)

**Major forbs and half-shrubs**

pasture sage ( <i>Artemisia frigida</i> )	24% (10 - 41)
crocus anemone ( <i>Pulsatilla patens</i> )	3% (0 - 10)
cinquefoil ( <i>Potentilla spp.</i> )	1% (0 - 3)
broomweed ( <i>Gutierrezia sarothrae</i> )	1% (0 - 2)
golden bean ( <i>Thermopsis rhombifolia</i> )	1% (0 - 2)
field chickweed ( <i>Cerastium arvense</i> )	1% (0 - 1)
northern bedstraw ( <i>Galium boreale</i> )	1% (0 - 0)
woolly yarrow ( <i>Achillea millefolium</i> )	1% (0 - 1)

**Minor shrubs**

1%

**Minor graminoids**

0%

**Minor forbs and half-shrubs**

3%

**SIMILARITY TO REFERENCE COMMUNITY**

unknown

**PRODUCTION**

insufficient data

**RECOMMENDED STOCKING RATE**

AUM/ha

AUM/ac

drier parts of Aspen Parkland

0.53

0.21

moister parts of Aspen Parkland

0.81

0.33