

*Saskatchewan Rangeland Ecosystems*  
*Publication 7*

# Communities on the Solonetzic 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 Solonetzic Ecosite in the Dry Mixed Grassland and Mixed Grassland regions of Saskatchewan. No classification was possible for the Aspen Parkland because of insufficient data.
- More research is needed on the variability within this ecosite. For example, the extent of burnouts is variable, with implications for forage composition and productivity, but insufficient data were available to differentiate sites on this basis.
- 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.
- More detailed discussion of the above points can be found in *Publication 1: Ecoregions and Ecosites*.

**PHOTO CREDITS:** Front Cover – Solonetzic Ecosite, Grasslands National Park (photo by Jeff Thorpe). Page 12 – Solonetzic Ecosite, Oakdale Rural Municipality (photo by Bob Godwin).

## SUGGESTED CITATION

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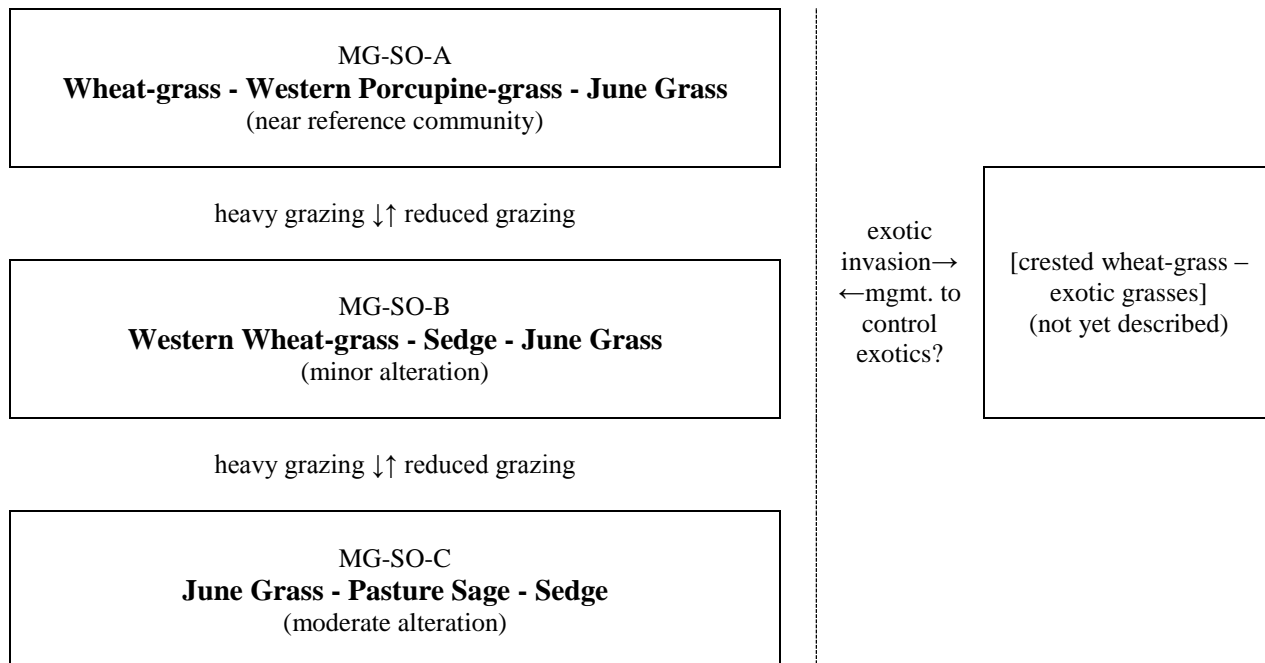


## STATE-AND-TRANSITION DIAGRAMS

### Dry Mixed Grassland: Solonetzic Ecosite



## **Mixed Grassland: Solonetzic Ecosite**



## COMMUNITY DESCRIPTIONS

DMG-SO-A

### Northern Wheat-grass - Needle-and-thread - June Grass

Dry Mixed Grassland: Solonetzic Ecosite

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, but with a significant proportion of shortgrasses, and lesser amounts of forbs and half-shrubs. Shrub cover usually low. Interpreted as being the **reference community** for the Solonetzic Ecosite in the Dry Mixed Grassland. However, this community probably represents the more productive areas within the Ecosite, rather than strongly Solonetzic areas with extensive burnouts.

#### STRUCTURE

herbaceous cover (n=5)	32% (21 - 42)
- midgrasses	approx. 20%
- shortgrasses	approx. 10%
- half-shrubs	approx. 3%
- forbs	approx. 2%

clubmoss cover (n=5)	48% (35 - 58)
litter cover (n=5)	15% (8 - 23)
bare soil (n=6)	8% (0 - 17)

#### SPECIES COMPOSITION (% biomass, n=22)

##### Major graminoids

northern wheat-grass ( <i>Elymus lanceolatus</i> )	25% (13 - 39)
needle-and-thread ( <i>Hesperostipa comata</i> )	16% (4 - 33)
june grass ( <i>Koeleria macrantha</i> )	12% (5 - 22)
western wheat-grass ( <i>Pascopyrum smithii</i> )	10% (0 - 21)
blue grama ( <i>Bouteloua gracilis</i> )	10% (3 - 15)
sedge ( <i>Carex</i> spp.)	5% (2 - 8)
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 5)
Sandberg's blue-grass ( <i>Poa secunda</i> )	1% (0 - 4)
green needle grass ( <i>Nassella viridula</i> )	1% (0 - 3)

##### Major forbs and half-shrubs

pasture sage ( <i>Artemisia frigida</i> )	7% (1 - 13)
scarlet mallow ( <i>Sphaeralcea coccinea</i> )	3% (0 - 7)
winter fat ( <i>Krascheninnikovia lanata</i> )	1% (0 - 4)
Nuttall's atriplex ( <i>Atriplex gardneri</i> )	1% (0 - 2)
moss phlox ( <i>Phlox hoodii</i> )	1% (0 - 2)
American vetch ( <i>Vicia americana</i> )	1% (0 - 2)
hairy golden-aster ( <i>Heterotheca villosa</i> )	1% (0 - 1)

##### Minor graminoids

1%

##### Minor forbs and half-shrubs

1%

#### SIMILARITY TO REFERENCE COMMUNITY

ref. comm.

#### PRODUCTION

insufficient data

#### RECOMMENDED STOCKING RATE

- strongly Solonetzic	0.32 AUM/ha	0.13 AUM/ac
- weakly Solonetzic	0.44 AUM/ha	0.18 AUM/ac

DMG-SO-B

**Northern Wheat-grass - June Grass - Pasture Sage - Blue Grama**  
**Dry Mixed Grassland: Solonetzic Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, but with shortgrasses subdominant, and with lesser amounts of half-shrubs and forbs. Shrub cover usually low. Interpreted as showing **minor alteration** from the reference community as a result of grazing impact. Probably develops from DMG-SO-A by decrease of northern wheat-grass and needle-and-thread and increase of june grass and pasture sage.

**STRUCTURE**

herbaceous cover (n=5)	32% (20 - 50)	clubmoss cover (n=5)	45% (27 - 66)
- midgrasses	approx. 15%	moss cover (n=5)	0% (0 - 1)
- shortgrasses	approx. 10%	bare soil (n=6)	6% (0 - 16)
- half-shrubs	approx. 4%		
- forbs	approx. 2%		

**SPECIES COMPOSITION** (% biomass, n=39)

<b>Major graminoids</b>	
northern wheat-grass ( <i>Elymus lanceolatus</i> )	22% (2 - 35)
june grass ( <i>Koeleria macrantha</i> )	16% (6 - 30)
blue grama ( <i>Bouteloua gracilis</i> )	11% (2 - 25)
needle-and-thread ( <i>Hesperostipa comata</i> )	10% (3 - 21)
western wheat-grass ( <i>Pascopyrum smithii</i> )	9% (0 - 21)
sedge ( <i>Carex spp.</i> )	5% (2 - 10)
plains reed grass ( <i>Calamagrostis montanensis</i> )	3% (0 - 9)
Sandberg's blue-grass ( <i>Poa secunda</i> )	2% (0 - 5)
green needle grass ( <i>Nassella viridula</i> )	1% (0 - 1)

<b>Major forbs and half-shrubs</b>	
pasture sage ( <i>Artemisia frigida</i> )	11% (4 - 19)
scarlet mallow ( <i>Sphaeralcea coccinea</i> )	2% (0 - 5)
moss phlox ( <i>Phlox hoodii</i> )	1% (0 - 3)
winter fat ( <i>Krascheninnikovia lanata</i> )	1% (0 - 3)

<b>Minor graminoids</b>	1%
<b>Minor forbs and half-shrubs</b>	2%

<b>SIMILARITY TO REFERENCE COMMUNITY</b>	85%
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<b>PRODUCTION</b>	insufficient data	
<b>RECOMMENDED STOCKING RATE</b>		
- strongly Solonetzic	0.32 AUM/ha	0.13 AUM/ac
- weakly Solonetzic	0.44 AUM/ha	0.18 AUM/ac

DMG-SO-C

**June Grass - Northern Wheat-grass - Pasture Sage - Blue Grama**

**Dry Mixed Grassland: Solonetzic Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie dominated by shortgrasses, but with midgrasses subdominant, and with lesser amounts of half-shrubs and forbs. Shrub cover usually low. Interpreted as showing **moderate alteration** from the reference community as a result of grazing impact. Probably develops from DMG-SO-B by decrease of wheat-grasses and increase of june grass, pasture sage, and blue grama.

**STRUCTURE** - insufficient data

**SPECIES COMPOSITION** (% biomass, n=30)

**Major short shrubs**

silver sagebrush ( <i>Artemisia cana</i> )	1% (0 - 0)
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**Major graminoids**

june grass ( <i>Koeleria macrantha</i> )	22% (13 - 33)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	19% (4 - 28)
blue grama ( <i>Bouteloua gracilis</i> )	13% (6 - 18)
needle-and-thread ( <i>Hesperostipa comata</i> )	8% (4 - 12)
western wheat-grass ( <i>Pascopyrum smithii</i> )	5% (0 - 20)
sedge ( <i>Carex</i> spp.)	5% (2 - 8)
plains reed grass ( <i>Calamagrostis montanensis</i> )	4% (0 - 9)
Sandberg's blue-grass ( <i>Poa secunda</i> )	2% (0 - 8)

**Major forbs and half-shrubs**

pasture sage ( <i>Artemisia frigida</i> )	13% (9 - 19)
moss phlox ( <i>Phlox hoodii</i> )	2% (0 - 5)
scarlet mallow ( <i>Sphaeralcea coccinea</i> )	1% (0 - 3)
broomweed ( <i>Gutierrezia sarothrae</i> )	1% (0 - 3)
hairy golden-aster ( <i>Heterotheca villosa</i> )	1% (0 - 3)
Nuttall's atriplex ( <i>Atriplex gardneri</i> )	1% (0 - 2)
winter fat ( <i>Krascheninnikovia lanata</i> )	1% (0 - 1)

**Minor graminoids**

1%

**Minor forbs and half-shrubs**

2%

**SIMILARITY TO REFERENCE COMMUNITY**

74%

**PRODUCTION**

insufficient data

**RECOMMENDED STOCKING RATE**

- strongly Solonetzic	0.26 AUM/ha	0.11 AUM/ac
- weakly Solonetzic	0.36 AUM/ha	0.14 AUM/ac

**DMG-SO-D**  
**June Grass - Pasture Sage - Blue Grama - Northern Wheat-grass**  
**Dry Mixed Grassland: Solonetzic Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie dominated by shortgrasses, with significant amounts of midgrasses and half-shrubs and lesser amounts of forbs. Shrub cover usually low. Interpreted as showing **moderate alteration** from the reference community as a result of grazing impact. Probably develops from DMG-SO-C by decrease of wheat-grasses and increase of pasture sage and blue grama.

**STRUCTURE** - insufficient data

**SPECIES COMPOSITION (% biomass, n=26)**

<b>Major graminoids</b>	
june grass ( <i>Koeleria macrantha</i> )	23% (11 - 35)
blue grama ( <i>Bouteloua gracilis</i> )	16% (7 - 23)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	10% (2 - 19)
needle-and-thread ( <i>Hesperostipa comata</i> )	9% (3 - 17)
sedge ( <i>Carex spp.</i> )	3% (1 - 7)
plains reed grass ( <i>Calamagrostis montanensis</i> )	3% (0 - 9)
Sandberg's blue-grass ( <i>Poa secunda</i> )	3% (0 - 10)
western wheat-grass ( <i>Pascopyrum smithii</i> )	2% (0 - 5)

<b>Major forbs and half-shrubs</b>	
pasture sage ( <i>Artemisia frigida</i> )	20% (13 - 29)
moss phlox ( <i>Phlox hoodii</i> )	2% (0 - 6)
scarlet mallow ( <i>Sphaeralcea coccinea</i> )	1% (0 - 2)
winter fat ( <i>Krascheninnikovia lanata</i> )	1% (0 - 0)

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

<b>SIMILARITY TO REFERENCE COMMUNITY</b>	60%
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<b>PRODUCTION</b>		insufficient data	
<b>RECOMMENDED STOCKING RATE</b>			
-	strongly Solonetzic	0.26 AUM/ha	0.11 AUM/ac
-	weakly Solonetzic	0.36 AUM/ha	0.14 AUM/ac



MG-SO-A

**Wheat-grass - Western Porcupine-grass – June Grass**

**Mixed Grassland: Solonchik Ecosite**

**GENERAL DESCRIPTION:** Mixed prairie dominated by midgrasses, but with significant amounts of shortgrasses, and lesser amounts of half-shrubs and forbs. Shrub cover usually low. **Reference community**, or with minor alteration as a result of grazing impact, for the Solonchik Ecosite in the Mixed Grassland. The reference community may have greater dominance by northern wheat-grass; also note that there is some potential for confusion between northern and western wheat-grass in field surveys.

**STRUCTURE**

herbaceous cover (n=19)	62% (47 – 80)	clubmoss cover (n=19)	15% (3 – 27)
- midgrasses	approx. 35%	litter cover (n=19)	60% (30 – 80)
- shortgrasses	approx. 20%	bare soil (n=19)	4% (0 – 9)
- half-shrubs	approx. 3%		
- forbs	approx. 5%		

**SPECIES COMPOSITION (% biomass, n=31)**

<b>Major graminoids</b>		<b>Major forbs and half-shrubs</b>	
western wheat-grass ( <i>Pascopyrum smithii</i> )	18% (3 - 29)	pasture sage ( <i>Artemisia frigida</i> )	5% (1 - 10)
western porcupine-grass ( <i>Hesperostipa curtipetala</i> )	13% (0 - 25)	crocus anemone ( <i>Pulsatilla patens</i> )	2% (0 – 3)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	12% (0 - 22)	woolly yarrow ( <i>Achillea millefolium</i> )	1% (0 - 3)
june grass ( <i>Koeleria macrantha</i> )	11% (4 - 18)	white prairie aster ( <i>Symphyotrichum falcatum</i> )	1% (0 - 3)
sedge ( <i>Carex</i> spp.)	10% (5 - 15)	scarlet mallow ( <i>Sphaeralcea coccinea</i> )	1% (0 - 2)
blue grama ( <i>Bouteloua gracilis</i> )	4% (0 - 10)	American vetch ( <i>Vicia americana</i> )	1% (0 - 1)
green needle grass ( <i>Nassella viridula</i> )	4% (0 - 12)	northern bedstraw ( <i>Galium boreale</i> )	1% (0 - 2)
needle-and-thread ( <i>Hesperostipa comata</i> )	4% (0 - 12)	silver-leaved psoralea ( <i>Pedimelum argophyllum</i> )	1% (0 - 2)
Sandberg's blue-grass ( <i>Poa secunda</i> )	3% (0 - 11)		
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 2)		
awned wheat-grass ( <i>Elymus trachycaulus</i> ssp. <i>subsecundus</i> )	1% (0 - 2)		
Canby's blue-grass ( <i>Poa secunda</i> )	1% (0 - 0)		
Kentucky blue-grass ( <i>Poa pratensis</i> )	1% (0 - 2)		
salt grass ( <i>Distichlis spicata</i> var. <i>stricta</i> )	1% (0 - 3)		
		<b>Minor shrubs</b>	1%
		<b>Minor graminoids</b>	3%
		<b>Minor forbs and half-shrubs</b>	4%

**SIMILARITY TO REFERENCE COMMUNITY**

reference community

**PRODUCTION**

graminoids 1000 kg/ha, forbs 300 kg/ha

**RECOMMENDED STOCKING RATE**

- strongly Solonchik	0.47 AUM/ha	0.19 AUM/ac
- weakly Solonchik	0.65 AUM/ha	0.26 AUM/ac

MG-SO-B

Western Wheat-grass - Sedge - June Grass

Mixed Grassland: Solonchic Ecosite

**GENERAL DESCRIPTION:** Mixed prairie with midgrasses dominant and shortgrasses subdominant, with lesser amounts of forbs and half-shrubs. Shrub cover usually low. Interpreted as showing **minor alteration** from the reference community as a result of grazing impact. Probably develops from MG-SO-A by decrease of northern wheat-grass and western porcupine-grass.

STRUCTURE

herbaceous cover (n=19)	61% (54 – 67)	clubmoss cover (n=19)	13% (1 – 27)
- midgrasses	approx. 25%	litter cover (n=19)	60% (48 – 73)
- shortgrasses	approx. 20%	bare soil (n=19)	6% (0 – 15)
- half-shrubs	approx. 3%		
- forbs	approx. 10%		

SPECIES COMPOSITION (% biomass, n=52)

<b>Major graminoids</b>		<b>Major cactus</b>	
western wheat-grass ( <i>Pascopyrum smithii</i> )	18% (5 - 28)	prickly-pear ( <i>Opuntia spp.</i> )	1% (0 - 0)
sedge ( <i>Carex spp.</i> )	13% (4 - 19)	<b>Major forbs and half-shrubs</b>	
june grass ( <i>Koeleria macrantha</i> )	12% (5 - 20)	pasture sage ( <i>Artemisia frigida</i> )	4% (0 - 11)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	7% (0 - 14)	woolly yarrow ( <i>Achillea millefolium</i> )	3% (0 - 6)
needle-and-thread ( <i>Hesperostipa comata</i> )	5% (0 - 14)	crocus anemone ( <i>Pulsatilla patens</i> )	1% (0 - 5)
western porcupine-grass ( <i>Hesperostipa curtipetala</i> )	5% (0 - 11)	gumweed ( <i>Grindelia squarrosa</i> )	1% (0 - 4)
blue grama ( <i>Bouteloua gracilis</i> )	4% (0 - 11)	hairy golden-aster ( <i>Heterotheca villosa</i> )	1% (0 - 3)
Sandberg's blue-grass ( <i>Poa secunda</i> )	4% (0 - 12)	goldenrod ( <i>Solidago spp.</i> )	1% (0 - 2)
green needle grass ( <i>Nassella viridula</i> )	2% (0 - 7)	scarlet mallow ( <i>Sphaeralcea coccinea</i> )	1% (0 - 3)
Kentucky blue-grass ( <i>Poa pratensis</i> )	1% (0 - 4)	broomweed ( <i>Gutierrezia sarothrae</i> )	1% (0 - 2)
plains reed grass ( <i>Calamagrostis montanensis</i> )	1% (0 - 4)	white prairie aster ( <i>Symphyotrichum falcatum</i> )	1% (0 - 2)
salt grass ( <i>Distichlis spicata</i> var. <i>stricta</i> )	1% (0 - 2)	northern bedstraw ( <i>Galium boreale</i> )	1% (0 - 2)
Hooker's oat-grass ( <i>Avenula hookeri</i> )	1% (0 - 2)	prairie sage ( <i>Artemisia ludoviciana</i> )	1% (0 - 1)
<b>Minor shrubs</b>	1%		
<b>Minor graminoids</b>	3%		
<b>Minor forbs and half-shrubs</b>	6%		

SIMILARITY TO REFERENCE COMMUNITY 82%

PRODUCTION

insufficient data

RECOMMENDED STOCKING RATE

- strongly Solonchic	0.47 AUM/ha	0.19 AUM/ac
- weakly Solonchic	0.65 AUM/ha	0.26 AUM/ac

MG-SO-C  
**June Grass - Pasture Sage – Sedge**  
Mixed Grassland: Solonetzic Ecosite

**GENERAL DESCRIPTION:** Mixed prairie dominated by shortgrasses, with significant amounts of midgrasses and lesser amounts of half-shrubs and forbs. Shrub cover usually low. Interpreted as showing **moderate alteration** from the reference community as a result of grazing impact. Probably develops from MG-SO-B by decrease of western wheat-grass and increase of pasture sage, june grass, and blue grama.

**STRUCTURE – insufficient data**

**SPECIES COMPOSITION** (% biomass, n=15)

<b>Major graminoids</b>	
june grass ( <i>Koeleria macrantha</i> )	15% (7 - 27)
sedge ( <i>Carex spp.</i> )	13% (4 - 26)
blue grama ( <i>Bouteloua gracilis</i> )	8% (0 - 22)
western wheat-grass ( <i>Pascopyrum smithii</i> )	8% (1 - 13)
northern wheat-grass ( <i>Elymus lanceolatus</i> )	5% (0 - 14)
plains reed grass ( <i>Calamagrostis montanensis</i> )	5% (0 - 11)
needle-and-thread ( <i>Hesperostipa comata</i> )	4% (0 - 10)
green needle grass ( <i>Nassella viridula</i> )	3% (0 - 7)
western porcupine-grass ( <i>Hesperostipa curtipetala</i> )	2% (0 - 6)
crested wheat-grass ( <i>Agropyron cristatum</i> )	1% (0 - 2)
Canby's blue-grass ( <i>Poa secunda</i> )	1% (0 - 1)
Nuttall's alkali grass ( <i>Puccinellia nuttalliana</i> )	1% (0 - 2)
Sandberg's blue-grass ( <i>Poa secunda</i> )	1% (0 - 2)

<b>Major short shrubs</b>	
western snowberry ( <i>Symphoricarpos occidentalis</i> )	1% (0 - 3)

<b>Major forbs and half-shrubs</b>	
pasture sage ( <i>Artemisia frigida</i> )	15% (5 - 21)
woolly yarrow ( <i>Achillea millefolium</i> )	3% (0 - 7)
scarlet mallow ( <i>Sphaeralcea coccinea</i> )	2% (0 - 6)
gumweed ( <i>Grindelia squarrosa</i> )	2% (0 - 6)
broomweed ( <i>Gutierrezia sarothrae</i> )	1% (0 - 4)
pygmy-flower ( <i>Androsace septentrionalis</i> )	1% (0 - 5)
common silverweed ( <i>Argentina anserina</i> )	1% (0 - 1)
crocus anemone ( <i>Pulsatilla patens</i> )	1% (0 - 3)
geranium ( <i>Geranium spp.</i> )	1% (0 - 0)
yellow coneflower ( <i>Ratibida columnifera</i> )	1% (0 - 1)

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

**SIMILARITY TO REFERENCE COMMUNITY** 60%

<b>PRODUCTION</b>	insufficient data	
<b>RECOMMENDED STOCKING RATE</b>		
- strongly Solonetzic	0.38 AUM/ha	0.15 AUM/ac
- weakly Solonetzic	0.52 AUM/ha	0.21 AUM/ac

