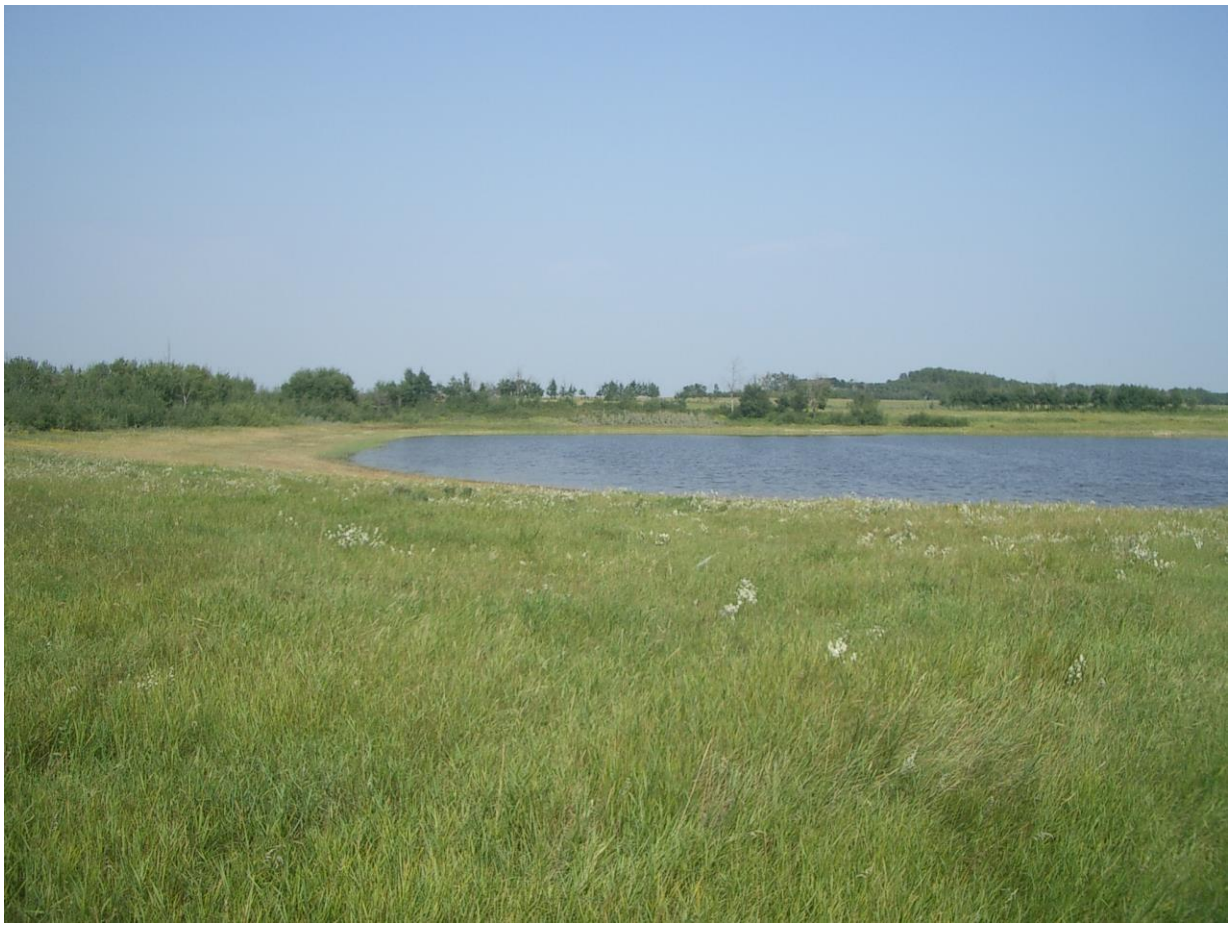
Saskatchewan Rangeland Ecosystems
Publication 14

Communities on Saline Ecosites



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Government of Saskatchewan

NOTES

- This publication describes native grasslands and shrublands found on saline ecosites in the Prairie Ecozone of Saskatchewan.
- The publication includes communities on several ecosites: Saline Upland, Saline Overflow, Saline Subirrigated, Saline Wet Meadow, Saline Shallow Marsh, and Saline Deep Marsh.
- Because of the complexity within these ecosites, different communities are shown depending on the degree of salinity: somewhat saline (2-5 mmho/cm), moderately saline (5-15 mmho/cm), and saline (>15 mmho/cm).
- More detailed discussion of the underlying ecosystem classification can be found in *Publication 1: Ecoregions and Ecosites*.

PHOTO CREDITS: Cover photo – saline pond with surrounding Saline Wet Meadow in the Aspen Parkland (Jeff Thorpe).

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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)

COMMUNITY SUMMARY AND STATE-AND-TRANSITION DIAGRAMS

Saline Upland Ecosite

Aspen Parkland Ecoregion

Somewhat saline areas:

AP-UPSA-A
Western Porcupine-grass – Slender wheat-grass – Sedge – Salt Grass – Pasture Sage
(reference community)

Mixed Grassland and Dry Mixed Grassland Ecoregions

Somewhat saline areas:

MG-UPSA-A
Northern Wheat-grass – June Grass – Pasture Sage
(reference community)

heavy grazing
→
←
reduced grazing

MG-UPSA-B
Blue Grama – Northern Wheat-grass – Western Wheat-grass
(moderate alteration)

Saline Subirrigated and Overflow Ecosites

Aspen Parkland Ecoregion

Somewhat saline areas:

AP-SUBSA-A
Slender Wheat-grass – Salt Grass
(reference community)

heavy grazing
→
←
reduced grazing

AP-SUBSA-B
Blue-grass – Salt Grass – Forbs
(moderate alteration)

Moderately saline areas:

AP-SUBSA-C
Salt Grass – Slender Wheat-grass
(reference community)

heavy grazing
→
←
reduced grazing

AP-SUBSA-D
Salt Grass
(minor alteration)

heavy grazing
→
←
reduced grazing

AP-SUBSA-E
Salt Grass – Forbs
(moderate alteration)

Mixed Grassland and Dry Mixed Grassland Ecoregions

Somewhat saline areas:

MG-SUBSA-A **Sedge – Western Wheat-grass – Needle-and-thread** (reference community)	heavy grazing → ← reduced grazing	MG-SUBSA-B **Western Wheat-grass – Blue Grama** (minor alteration)

Moderately saline areas:

MG-SUBSA-C
Salt Grass – Sedge
(grazing status?)

Shrub/grassland in Dry Mixed Grassland Ecoregion

Somewhat saline areas:

DMG-SUBSA-A
Greasewood – Northern Wheat-grass
(reference community)

Moderately saline areas:

[Greasewood – Salt Grass?]
(not yet described)

Saline Wet Meadow Ecosite

Somewhat saline areas:

PEZ-WMDSA-A **Northern Reed-grass – Salt Grass** (reference community)	heavy grazing → ← reduced grazing	PEZ-WMDSA-B **Salt Grass – Northern Reed-grass** (minor alteration)
		PEZ-WMD-K * **Baltic Rush** (grazing status?)

Moderately saline areas:

PEZ-WMDSA-C **Salt Grass – Northern Reed-grass** (reference community)	heavy grazing → ← reduced grazing	PEZ-WMDSA-D **Salt Grass** (minor alteration)

Saline areas:

PEZ-WMDSA-E
Nuttall's Alkali-grass – Salt Grass – Foxtail Barley
(reference community)

Saline Shallow Marsh Ecosite

Somewhat saline areas:

PEZ-SMH-B*
Awned Sedge
(reference community)

PEZ-SMH-C*
Creeping Spike-rush
(reference community)

PEZ-SMH-D*
Spangletop
(reference community)

Moderately saline areas:

PEZ-SMHSA-A
Three-square Bulrush
(reference community)

Saline areas:

PEZ-SMHSA-B
Nevada Bulrush
(grazing status?)

PEZ-SMHSA-C
Red Samphire
(grazing status?)

Saline Deep Marsh Ecosite

Somewhat saline areas:

PEZ-DMH-B*
Hardstem and Softstem Bulrush
(reference community)

? → ← ?

PEZ-DMH-C*
Hardstem Bulrush – Foxtail Barley
(minor alteration)

PEZ-DMH-D*
Common Reed
(reference community

Moderately saline to saline areas:

PEZ-DMHSA-A
Prairie Bulrush
(reference community)

*Asterixed communities occur in both fresh and somewhat saline wetlands, and are described in Publications 13 and 14.

AP-UPSA-A

Western Porcupine-grass – Slender Wheat-grass – Sedge – Salt Grass – Pasture Sage

Aspen Parkland: Saline Upland (somewhat saline)

GENERAL DESCRIPTION: This community represents grasslands on Saline Upland Ecosite in the Aspen Parkland Ecoregion. The description must be regarded as tentative, as it is based on a small sample size. This community is interpreted to be only somewhat saline, based on the relatively low proportion of salt-tolerant species such as salt grass. The successional status of this community is uncertain; a community closer to the reference state could have a higher proportion of plains rough fescue and lower proportions of pasture sage and other weedy species.

STRUCTURE - no information

SPECIES COMPOSITION (% biomass, n=4)

Major graminoids	
western porcupine-grass (*Hesperostipa curtiseta*)	16% (8 - 22)
slender wheat-grass (*Elymus trachycaulus ssp. trachycaulus*)	12% (4 - 22)
sedge (*Carex* spp.)	10% (7 - 14)
salt grass (*Distichlis spicata var. stricta*)	10% (8 - 13)
June grass (K*oeleria macrantha*)	7% (2 - 11)
blue grama (*Bouteloua gracilis*)	7% (5 - 8)
western wheat-grass (*Pascopyrum smithii*)	4% (0 - 9)
awned wheat-grass (*Elymus trachycaulus* ssp. *subsecundus*)	3% (1 - 7)
green needle-grass (*Nassella viridula*)	3% (0 - 7)
northern wheat-grass (*Elymus lanceolatus*)	3% (0 - 5)
needle-and-thread (*Hesperostipa comata*)	3% (0 - 7)
mat muhly (*Muhlenbergia richardsonis*)	1% (0 - 4)
alkali cord-grass (*Spartina gracilis*)	1% (0 - 4)
blue-grass (*Poa* spp.)	1% (0 - 3)
plains rough fescue (*Festuca altaica* ssp. *hallii*)	1% (0 - 3)
plains reed-grass (*Calamagrostis montanensis*)	1% (0 - 1)

Major short shrubs	
western snowberry (*Symphoricarpos occidentalis*)	1% (0 - 2)

Major forbs and half-shrubs	
pasture sage (*Artemisia frigida*)	10% (6 - 14)
saltbush (*Atriplex* spp.)	2% (1 - 3)
white sweet-clover (*Melilotus alba*)	1% (0 - 3)
anemone (*Anemone* spp.)	1% (0 - 3)
pussytoes (A*ntennaria* spp.)	1% (0 - 3)
prairie crocus (*Pulsatilla patens*)	1% (0 - 1)
aster (*Symphyotrichum* spp.)	1% (0 - 1)

Minor forbs and half-shrubs	2%

SIMILARITY TO REFERENCE COMMUNITY	unknown

RECOMMENDED STOCKING RATE		
- drier part of region	0.77 AUM/ha	0.31 AUM/ac
- moister part of region	1.17 AUM/ha	0.47 AUM/ac

MG-UPSA-A, MG-UPSA-B

Northern Wheat-grass – June Grass – Pasture Sage – Salt Grass

Mixed Grassland: Saline Upland (somewhat saline)

GENERAL DESCRIPTION: These communities represent grassland on Saline Upland Ecosite in the Mixed Grassland and Dry Mixed Grassland Ecoregions. MG-UPSA-A is interpreted to be the **reference community**, but the description must be regarded as tentative because it is based on a small sample size. MG-UPSA-B shows **moderate alteration** due to grazing impact. These communities are interpreted to be only somewhat saline, based on the relatively low proportions of salt-tolerant species such as salt grass. MG-UPSA-A is similar to the reference community for the Clay Ecosite (MG-CY-A Northern Wheat-grass), but with a higher proportion of salt grass and other halophytic species.

	MG-UPSA-A **Northern Wheat-grass – June Grass – Pasture Sage – Salt Grass**	MG-UPSA-B **Blue Grama - Northern Wheat-grass – Western Wheat-grass – Salt Grass**
STRUCTURE	(n=1)	(n=1)
herbaceous cover	48%	91%
clubmoss cover	5%	0%
litter cover	57%	62%
bare soil	20%	0%
SPECIES COMPOSITION (% biomass)	(n=5)	(n=12)
Major short shrubs		
western snowberry (*Symphoricarpos occidentalis*)	3% (0 - 10)	
silver sagebrush (*Artemisia cana*)		1% (0 - 2)
Major graminoids		
northern wheat-grass (*Elymus lanceolatus*)	20% (6 - 35)	11% (0 - 22)
June grass (*Koeleria macrantha*)	10% (4 - 16)	6% (0 - 12)
sedge (*Carex* spp.)	8% (3 - 13)	5% (0 - 8)
needle-and-thread (*Hesperostipa comata*)	7% (0 - 19)	6% (0 - 15)
salt grass (*Distichlis spicata var. stricta*)	7% (0 - 14)	9% (5 - 15)
western wheat-grass (*Pascopyrum smithii*)	6% (0 - 15)	10% (0 - 25)
blue grama (*Bouteloua gracilis*)	2% (0 - 5)	18% (0 - 39)
green needle-grass (*Nassella viridula*)	2% (0 - 4)	2% (0 - 5)
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)	1% (0 - 4)	1% (0 - 5)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	1% (0 - 3)	1% (0 - 5)
western porcupine-grass (*Hesperostipa curtiseta*)	3% (0 - 7)	
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	2% (0 - 6)	
awned wheat-grass (*Elymus trachycaulus* ssp. *subsecundus*)	2% (0 - 4)	

	MG-UPSA-A	MG-UPSA-B
blue-grass (*Poa* spp.)	2% (0 - 5)	
crested wheat-grass (*Agropyron cristatum*)	1% (0 - 3)	
Baltic rush (*Juncus arcticus var. balticus*)	1% (0 - 1)	
quack grass (*Elymus repens*)	1% (0 - 2)	
Rocky Mountain fescue (*Festuca saximontana*)	1% (0 - 1)	
Kentucky blue-grass (*Poa pratensis*)		1% (0 - 0)
plains reed-grass (*Calamagrostis montanensis*)		3% (0 - 0)
Major forbs and half-shrubs		
pasture sage (*Artemisia frigida*)	10% (2 - 19)	9% (0 - 14)
prairie crocus (*Pulsatilla patens*)	2% (0 - 5)	1% (0 - 3)
common yarrow (*Achillea millefolium*)	2% (0 - 3)	1% (0 - 3)
northern pygmyflower (*Androsace septentrionalis*)	1% (0 - 2)	1% (0 - 3)
sea-milkwort (*Glaux maritima*)	3% (0 - 10)	
golden bean (*Thermopsis rhombifolia*)	1% (0 - 2)	
prairie sage (*Artemisia ludoviciana*)		4% (0 - 10)
curly-cup gum-weed (*Grindelia squarrosa*)		2% (0 - 5)
American wild licorice (*Glycyrrhiza lepidota*)		1% (0 - 0)
common broomweed (*Gutierrezia sarothrae*)		1% (0 - 5)
Missouri goldenrod (*Solidago missouriensis*)		1% (0 - 2)
winterfat (*Krascheninnikovia lanata*)		1% (0 - 0)
Minor short shrubs		1%
Minor graminoids		2%
Minor forbs and half-shrubs	3%	5%
SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	61%
RECOMMENDED STOCKING RATE		
- **Dry Mixed Grassland**	0.35 AUM/ha 0.14 AUM/ac	0.28 AUM/ha 0.11 AUM/ac
- **Mixed Grassland**	0.50 AUM/ha 0.20 AUM/ac	0.40 AUM/ha 0.16 AUM/ac

AP-SUBSA-A, AP-SUBSA-B

Slender Wheat-grass – Salt Grass

Aspen Parkland: Saline Subirrigated Ecosite (somewhat saline)

GENERAL DESCRIPTION: These communities represent grasslands on somewhat Saline Subirrigated and Overflow Ecosites in the Aspen Parkland Ecoregion. They are considered only somewhat saline because salt-tolerant species such as salt grass and Nuttall's alkali grass make up a relatively low proportion of the biomass. AP-SUBSA-A is interpreted to be the **reference community**, while AP-SUBSA-B shows **moderate alteration** as a result of grazing impact.

	AP-SUBSA-A **Slender Wheat-grass – Salt Grass**	AP-SUBSA-B **Blue-grass – Salt Grass - Forbs**
STRUCTURE		
herbaceous cover (n=1, n=0)	22% (22 - 22)	
clubmoss cover (n=1, n=0)	0% (0 - 0)	
moss cover (n=1, n=0)	0% (0 - 0)	
litter cover (n=7, n=14)	32% (13 - 63)	14% (5 - 15)
bare soil (n=6, n=13)	10% (4 - 15)	10% (2 - 25)
SPECIES COMPOSITION (% biomass)	(n=15)	(n=17)
Major short shrubs		
western snowberry (*Symphoricarpos occidentalis*)	2% (0 - 5)	2% (0 - 7)
Major graminoids		
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	13% (0 - 27)	9% (0 - 13)
salt grass (*Distichlis spicata var. stricta*)	12% (6 - 19)	10% (2 - 18)
sedge (*Carex* spp.)	9% (2 - 15)	7% (2 - 12)
mat muhly (*Muhlenbergia richardsonis*)	6% (0 - 21)	2% (0 - 1)
June grass (*Koeleria macrantha*)	6% (0 - 15)	7% (0 - 15)
blue-grass *(Poa* spp.)	6% (0 - 10)	24% (1 - 36)
western wheat-grass (*Pascopyrum smithii*)	4% (0 - 11)	4% (0 - 13)
northern reed-grass (*Calamagrostis stricta* ssp. *inexpansa*)	3% (0 - 9)	1% (0 - 3)
fox-tail barley (*Hordeum jubatum*)	1% (0 - 4)	1% (0 - 2)
northern wheat-grass (*Elymus lanceolatus*)	5% (0 - 20)	
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)	2% (0 - 8)	
alkali cord-grass (*Spartina gracilis*)	1% (0 - 5)	
blue grama (*Bouteloua gracilis*)	1% (0 - 1)	
rush (*Juncus* spp.)	1% (0 - 3)	
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	1% (0 - 3)	
plains reed-grass (*Calamagrostis montanensis*)		1% (0 - 0)
smooth brome (*Bromus inermis*)		1% (0 - 2)

	AP-SUBSA-A	AP-SUBSA-B
Major forbs and half-shrubs		
pasture sage (*Artemisia frigida*)	3% (0 - 9)	4% (0 - 0)
perennial sow-thistle (*Sonchus arvensis*)	2% (0 - 10)	1% (0 - 2)
common yarrow (*Achillea millefolium*)	1% (0 - 4)	1% (0 - 3)
pussytoes (*Antennaria* spp.)	1% (0 - 4)	3% (0 - 8)
aster (*Symphyotrichum* spp.)	1% (0 - 3)	2% (0 - 8)
curly-cup gum-weed (*Grindelia squarrosa*)	1% (0 - 3)	3% (0 - 7)
tufted white prairie aster (*Symphyotrichum ericoides var. pansum*)	1% (0 - 3)	1% (0 - 3)
ragweed (*Ambrosia* spp.)	1% (0 - 3)	1% (0 - 3)
goldenrod (*Solidago* spp.)	2% (0 - 5)	
white sweet-clover (*Melilotus alba*)	1% (0 - 5)	
saltbush (*Atriplex* spp.)	1% (0 - 2)	
flat-spine bur-ragweed (*Ambrosia acanthicarpa*)		1% (0 - 3)

Minor graminoids	1%	1%
Minor forbs and half-shrubs	8%	15%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	63%

RECOMMENDED STOCKING RATE		
- **drier part of region**	1.15 AUM/ha 0.47 AUM/ac	0.92 AUM/ha 0.37 AUM/ac
- **moister part of region**	1.76 AUM/ha 0.71 AUM/ac	1.41 AUM/ha 0.57 AUM/ac

AP-SUBSA-C, AP-SUBSA-D, AP-SUBSA-E

Salt Grass – Slender Wheat-grass

Aspen Parkland: Saline Subirrigated Ecosite (moderately saline)

GENERAL DESCRIPTION: These communities represent grasslands on moderately Saline Subirrigated and Overflow Ecosites in the Aspen Parkland Ecoregion. They are interpreted to be more saline than AP-SUBSA-A and AP-SUBSA-b because salt-tolerant species such as salt grass and Nuttall's alkali grass make up a higher proportion of the biomass. AP-SUBSA-C is interpreted to be the **reference community**, and AP-SUBSA-D and AP-SUBSA-E show **minor** and **moderation alteration**, respectively, as a result of grazing impact.

	AP-SUBSA-C **Salt Grass – Slender Wheat-grass**	AP-SUBSA-D **Salt Grass**	AP-SUBSA-E **Salt Grass - Forbs**
STRUCTURE			
herbaceous cover (n=8, n=3)	5% (0 - 19)	43% (20 - 73)	
clubmoss cover (n=2, n=2)		5% (1 - 9)	
litter cover (n=12, n=8, n=10)	18% (0 - 64)	42% (15 - 74)	21% (13 - 24)
bare soil (n=12, n=8, n=10)	5% (0 - 12)	20% (6 - 43)	26% (6 - 47)
SPECIES COMPOSITION (% biomass)	(n=26)	(n=26)	(n=21)
Major short shrubs			
western snowberry (Symphoricarpos occidentalis)		1% (0 - 4)	
Major graminoids			
salt grass (*Distichlis spicata var. stricta*)	22% (13 - 30)	30% (18 - 42)	33% (15 - 47)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	18% (0 - 33)	9% (0 - 20)	5% (0 - 13)
sedge (*Carex* spp.)	6% (1 - 10)	4% (0 - 11)	2% (0 - 6)
western wheat-grass (*Pascopyrum smithii*)	6% (0 - 13)	5% (0 - 13)	7% (0 - 19)
mat muhly (*Muhlenbergia richardsonis*)	3% (0 - 13)	4% (0 - 11)	3% (0 - 13)
fox-tail barley (Hordeum jubatum)	3% (0 - 9)	2% (0 - 8)	2% (0 - 7)
June grass (*Koeleria macrantha*)	3% (0 - 6)	6% (0 - 14)	3% (0 - 5)
alkali cord-grass (*Spartina gracilis*)	2% (0 - 8)	1% (0 - 4)	1% (0 - 2)
northern reed-grass (*Calamagrostis stricta* ssp. *inexpansa*)	2% (0 - 7)	1% (0 - 2)	1% (0 - 9)
blue-grass (*Poa* spp.)	2% (0 - 4)	3% (0 - 10)	6% (0 - 21)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	7% (0 - 19)	2% (0 - 7)	
northern wheat-grass (*Elymus lanceolatus*)	4% (0 - 21)	2% (0 - 7)	
western porcupine-grass (*Hesperostipa curtiseta*)	1% (0 - 3)	1% (0 - 1)	
little bluestem (*Schizachyrium scoparium*)	1% (0 - 4)	1% (0 - 2)	
blue grama (Bouteloua gracilis)	1% (0 - 2)	1% (0 - 3)	
rush (*Juncus* spp.)	1% (0 - 1)		
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)		1% (0 - 6)	
plains reed-grass (*Calamagrostis montanensis*)		2% (0 - 1)	2% (0 - 6)

	AP-SUBSA-C	APSUBSA-D	APSUBSA-E
nooth brome (*Bromus inermis*)			1% (0 - 0)
nada blue-grass (*Poa compressa*)			1% (0 - 0)
ajor forbs and half-shrubs			
curly-cup gum-weed (*Grindelia squarrosa*)	3% (0 - 7)	3% (0 - 9)	3% (0 - 10)
tufted white prairie aster (Symphyotrichum ericoides var. pansum)	2% (0 - 4)	2% (0 - 7)	2% (0 - 5)
pasture sage (*Artemisia frigida*)	1% (0 - 5)	3% (0 - 6)	2% (0 - 12)
ragweed (A*mbrosia* spp.)	1% (0 - 5)	1% (0 - 4)	1% (0 - 5)
common yarrow (*Achillea millefolium*)	1% (0 - 4)	1% (0 - 3)	1% (0 - 3)
goldenrod (*Solidago* spp.)	1% (0 - 3)	1% (0 - 3)	1% (0 - 3)
saltbush (*Atriplex* spp.)	1% (0 - 1)	1% (0 - 2)	1% (0 - 2)
perennial sow-thistle (*Sonchus arvensis*)	2% (0 - 7)	1% (0 - 1)	
sea-milkwort (*Glaux maritima*)	1% (0 - 3)	1% (0 - 3)	
plantain (Plantago spp.)	1% (0 - 3)		
great blanket-flower (Gaillardia aristata)	1% (0 - 2)		
pussytoes (Antennaria spp.)		1% (0 - 3)	2% (0 - 6)
flat-spine bur-ragweed (*Ambrosia acanthicarpa*)		1% (0 - 0)	1% (0 - 4)
saline plantain (*Plantago eriopoda*)		1% (0 - 3)	1% (0 - 2)
aster (*Symphyotrichum* spp.)			1% (0 - 3)
Minor graminoids	2%	1%	1%
Minor forbs and half-shrubs	6%	8%	15%
SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	75%	60%
RECOMMENDED STOCKING RATE			
- **drier part of region**	0.58 AUM/ha 0.23 AUM/ac	0.58 AUM/ha 0.23 AUM/ac	0.46 AUM/ha 0.19 AUM/ac
- **moister part of region**	0.88 AUM/ha 0.36 AUM/ac	0.88 AUM/ha 0.36 AUM/ac	0.70 AUM/ha 0.28 AUM/ac

MG-SUBSA-A, MG-SUBSA-B

Sedge – Western Wheat-grass – Needle-and-thread – Salt Grass

Mixed Grassland: Saline Subirrigated Ecosite (somewhat saline)

GENERAL DESCRIPTION: These communities represent grasslands on somewhat Saline Subirrigated and Overflow Ecosites in the Mixed Grassland and Dry Mixed Grassland Ecoregions. They are interpreted to be only **somewhat saline**, because salt-tolerant species such as salt grass and Nuttall's alkali grass make up a relatively low proportion of the biomass. MG-SUBSA-A is interpreted to be the **reference community**, while MG-SUBSA-B shows **minor alteration** as a result of grazing impact.

	MG-SUBSA-A **Sedge – Western Wheat-grass – Needle-and-thread – Salt Grass**	MG-SUBSA-B **Western Wheat-grass – Blue Grama – Salt Grass**
STRUCTURE		
short shrub cover (n=1, n=3)		1% (1 - 1)
herbaceous cover (n=4, n=3)	42% (21 - 62)	36% (19 - 55)
clubmoss cover (n=3, n=3)	0% (0 - 1)	20% (2 - 42)
litter cover (n=3, n=1)	58% (33 - 80)	46% (21 - 70)
bare soil (n=3, n=1)	10% (4 - 16)	2% (0 - 3)
SPECIES COMPOSITION (% biomass)	(n=7)	(n=12)
Major short shrubs		
western snowberry (*Symphoricarpos occidentalis*)	1% (0 - 3)	
Major graminoids		
sedge (*Carex* spp.)	27% (3 - 44)	7% (0 - 13)
western wheat-grass (*Pascopyrum smithii*)	13% (1 - 27)	13% (0 - 25)
needle-and-thread (He*sperostipa comata*)	11% (0 - 28)	8% (0 - 24)
northern wheat-grass (*Elymus lanceolatus*)	7% (0 - 18)	2% (0 - 4)
June grass (*Koeleria macrantha*)	6% (0 - 11)	2% (0 - 7)
salt grass (*Distichlis spicata var. stricta*)	5% (0 - 10)	7% (0 - 15)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	4% (0 - 12)	3% (0 - 5)
blue grama (*Bouteloua gracilis*)	3% (0 - 8)	12% (0 - 25)
alkali cord-grass (*Spartina gracilis*)	3% (0 - 8)	5% (0 - 15)
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)	2% (0 - 6)	1% (0 - 0)
blue-grass (*Poa* spp.)	1% (0 - 3)	2% (0 - 5)
plains reed-grass (*Calamagrostis montanensis*)	1% (0 - 3)	
sand-grass (Calamovilfa longifolia)	2% (0 - 5)	
sand dropseed (*Sporobolus cryptandrus*)	1% (0 - 2)	
tufted hair-grass (*Deschampsia cespitosa*)	1% (0 - 2)	
western porcupine-grass (*Hesperostipa curtiseta*)	1% (0 - 1)	
Canada blue-grass (*Poa compressa*)		1% (0 - 0)

	MG-SUBSA-A	MG-SUBSA-B
crested wheat-grass (*Agropyron cristatum*)		1% (0 - 0)
fox-tail barley (*Hordeum jubatum*)		7% (0 - 0)
rush (J*uncus* spp.)		5% (0 - 15)
rough hairgrass (*Agrostis scabra*)		3% (0 - 1)

Major forbs and half-shrubs		
pasture sage (*Artemisia frigida*)	6% (0 - 13)	7% (0 - 17)
American wild licorice (Glycyrrhiza lepidota)	1% (0 - 2)	2% (0 - 7)
common yarrow (*Achillea millefolium*)	1% (0 - 2)	
leafy spurge (Euphorbia esula)	1% (0 - 2)	
prairie sage (*Artemisia ludoviciana*)		3% (0 - 5)

Minor short shrubs		1%
Minor graminoids	1%	3%
Minor forbs and half-shrubs	4%	7%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	58%

RECOMMENDED STOCKING RATE		
- **Dry Mixed Grassland**	0.52 AUM/ha 0.21 AUM/ac	0.52 AUM/ha 0.21 AUM/ac
- **Mixed Grassland**	0.75 AUM/ha 0.31 AUM/ac	0.75 AUM/ha 0.31 AUM/ac

MG-SUBSA-C

Salt Grass - Sedge

Mixed Grassland: Saline Subirrigated Ecosite (moderately saline)

GENERAL DESCRIPTION: This community represents grasslands on moderately Saline Subirrigated and Overflow Ecosites in the Mixed Grassland and Dry Mixed Grassland Ecoregions. It is interpreted to be more saline than MG-SUBSA-A and MG-SUBSA-B, because salt-tolerant species make up a higher proportion of the biomass. Its status with respect to grazing impact is not clear.

STRUCTURE

herbaceous cover (n=4)	22% (16 - 32)
clubmoss cover (n=4)	1% (0 - 2)

litter cover (n=1)	67% (67 - 67)
bare soil (n=1)	13% (13 - 13)

SPECIES COMPOSITION (% biomass, n=17)

Major graminoids	
salt grass (*Distichlis spicata var. stricta*)	26% (14 - 36)
sedge (*Carex* spp.)	11% (1 - 23)
western wheat-grass (*Pascopyrum smithii*)	9% (0 - 25)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	6% (0 - 19)
June grass (*Koeleria macrantha*)	5% (2 - 10)
northern wheat-grass (*Elymus lanceolatus*)	4% (0 - 11)
blue grama (*Bouteloua gracilis*)	3% (0 - 8)
alkali cord-grass (*Spartina gracilis*)	3% (0 - 10)
blue-grass (*Poa* spp.)	3% (0 - 10)
needle-and-thread (*Hesperostipa comata*)	2% (0 - 9)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	2% (0 - 9)
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)	1% (0 - 6)
plains reed-grass (*Calamagrostis montanensis*)	1% (0 - 5)
mat muhly (*Muhlenbergia richardsonis*)	1% (0 - 3)

Major forbs and half-shrubs	
pasture sage (*Artemisia frigida*)	7% (1 - 19)
curly-cup gum-weed (*Grindelia squarrosa*)	3% (0 - 8)
common yarrow (*Achillea millefolium*)	2% (0 - 5)
hairy golden-aster (*Heterotheca villosa*)	1% (0 - 3)
pussytoes (*Antennaria* spp.)	1% (0 - 2)
goldenrod (*Solidago* spp.)	1% (0 - 2)

Minor graminoids	2%
Minor forbs and half-shrubs	6%
Minor cactus	1%

SIMILARITY TO REFERENCE COMMUNITY unknown

RECOMMENDED STOCKING RATE

- Dry Mixed Grassland	0.26 AUM/ha	0.11 AUM/ac
- Mixed Grassland	0.38 AUM/ha	0.15 AUM/ac

DMG-SUBSA-A

Greasewood – Northern Wheat-grass

Dry Mixed Grassland: Saline Subirrigated Ecosite (somewhat saline)

GENERAL DESCRIPTION: This community represents open shrub/grasslands found on somewhat saline Subirrigated and Overflow Ecosites in the Dry Mixed Grassland Ecoregion. It also occurs to a limited extent in the Mixed Grassland Ecoregion. The community as described is only somewhat saline, as shown by the prominence of non-halophytes such as northern wheat-grass. More saline variants also occur, with sparser vegetation dominated by greasewood and salt grass.

Greasewood – Northern Wheat-grass is considered to be the **reference community** for somewhat saline greasewood stands. Heavy grazing impact is expected to reduce the wheat-grasses and increase the proportions of salt grass, fox-tail barley and forbs.

STRUCTURE

tree cover (n=8)	0% (0 - 0)	herbaceous cover (n=8)	32% (19 - 49)
tall shrub cover (n=8)	0% (0 - 0)	clubmoss cover (n=8)	1% (0 - 2)
short shrub cover (n=8)	5% (3 - 8)	lichen cover (n=8)	9% (1 - 25)
prostrate shrub cover (n=8)	0% (0 - 0)	litter cover (n=8)	61% (50 - 76)
cactus cover (n=8)	1% (0 - 2)	bare soil (n=8)	16% (8 - 28)

SPECIES COMPOSITION (% foliar cover, n=8)

Major short shrubs	
greasewood (*Sarcobatus vermiculatus*)	3% (1 - 5)
silver sagebrush (*Artemisia cana*)	2% (0 - 4)
western snowberry (*Symphoricarpos occidentalis*)	1% (0 - 2)

Major forbs and half-shrubs	
pasture sage (*Artemisia frigida*)	2% (1 - 3)
rubber rabbit-brush (Er*icameria nauseosa var. nauseosa*)	1% (0 - 1)
low pussytoes (*Antennaria parvifolia*)	1% (0 - 1)
saline plantain (*Plantago eriopoda*)	1% (0 - 2)

Major graminoids	
northern wheat-grass (*Elymus lanceolatus*)	14% (5 - 31)
salt grass (*Distichlis spicata var. stricta*)	3% (0 - 7)
Sandberg's blue-grass (*Poa secunda* ssp. *secunda*)	2% (0 - 4)
western wheat-grass (*Pascopyrum smithii*)	2% (1 - 2)
low sedge (*Carex duriuscula*)	1% (0 - 3)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	1% (0 - 3)
tufted hair-grass (*Deschampsia cespitosa*)	1% (0 - 3)
fox-tail barley (*Hordeum jubatum*)	1% (0 - 3)
blue grama (*Bouteloua gracilis*)	1% (0 - 2)
needle-and-thread (*Hesperostipa comata)*	1% (0 - 2)

Major cactus	
plains prickly-pear (*Opuntia polyacantha*)	1% (0 - 2)

Minor graminoids	1%
Minor forbs and half-shrubs	1%

SIMILARITY TO REF. COMM.	ref. comm.

RECOMMENDED STOCKING RATE	0.26 AUM/ha 0.11 AUM/AC

PEZ-WMDSA-A, PEZ-WMD-B

Northern Reed-grass – Salt Grass

Prairie Ecozone: Saline Wet Meadow Ecosite (somewhat saline)

GENERAL DESCRIPTION: These communities represent grasslands on somewhat Saline Wet Meadow Ecosite. They can be found anywhere in the Prairie Ecozone. They are interpreted to be only somewhat saline because salt-tolerant species such as salt grass and Nuttall's alkali grass make up a relatively low proportion of the biomass. PEZ-WMDSA-A is interpreted to be the **reference community**, while PEZ-WMDSA-B represents **minor alteration** as a result of grazing impact. PEZ-WMD-K (Baltic Rush) can develop with **moderate alteration** as a result of grazing impact.

	PEZ-WMDSA-A **Northern Reed-grass – Salt Grass**	PEZ-WMD-B **Salt Grass – Northern Reed-grass**
STRUCTURE		
herbaceous cover (n=1, n=2)	18% (18 - 18)	72% (71 - 72)
litter cover (n=44, n=23)	42% (18 - 60)	34% (15 - 67)
bare soil (n=44, n=23)	18% (0 - 42)	17% (4 - 39)
SPECIES COMPOSITION (% biomass)	(n=45)	(n=24)
Major graminoids		
northern reed-grass (*Calamagrostis stricta* ssp. *inexpansa*)	36% (22 - 52)	15% (2 - 28)
salt grass (*Distichlis spicata var. stricta*)	19% (6 - 28)	23% (13 - 34)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	9% (3 - 17)	7% (0 - 14)
sedge (*Carex* spp.)	5% (0 - 12)	5% (0 - 17)
blue-grass (*Poa* spp.)	3% (0 - 7)	6% (0 - 18)
fox-tail barley (*Hordeum jubatum*)	2% (0 - 4)	9% (0 - 21)
rush (*Juncus* spp.)	1% (0 - 3)	1% (0 - 2)
June grass (*Koeleria macrantha*)	1% (0 - 5)	1% (0 - 2)
western wheat-grass (*Pascopyrum smithii*)	1% (0 - 0)	
Nuttall's alkali-grass (*Puccinellia nuttalliana*)		1% (0 - 2)
Major forbs and half-shrubs		
aster (*Symphyotrichum* spp.)	3% (0 - 10)	2% (0 - 4)
ragweed (*Ambrosia* spp.)	2% (0 - 7)	2% (0 - 7)
tufted white prairie aster (*Symphyotrichum ericoides var. pansum*)	2% (0 - 8)	4% (0 - 14)
flat-spine bur-ragweed (*Ambrosia acanthicarpa*)	2% (0 - 7)	3% (0 - 10)
perennial sow-thistle (Sonchus arvensis)	2% (0 - 6)	3% (0 - 8)
curly-cup gum-weed (Grindelia squarrosa)	1% (0 - 3)	2% (0 - 5)
pussytoes (Antennaria spp.)	1% (0 - 3)	2% (0 - 4)
goldenrod (*Solidago* spp.)	1% (0 - 3)	1% (0 - 2)
sweet-clover (*Melilotus* spp.)		1% (0 - 2)

	PEZ-WMDSA-A	PEZ-WMDSA-B
common yarrow (*Achillea millefolium*)		1% (0 - 2)
violet (*Viola* spp.)		1% (0 - 0)

Minor short shrubs	1%	
Minor graminoids	2%	1%
Minor forbs and half-shrubs	7%	11%

PERCENT SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	70%

RECOMMENDED STOCKING RATE	2.20 AUM/ha 0.90 AUM/ac	2.20 AUM/ha 0.90 AUM/ac

PEZ-WMDSA-C, PEZ-WMDSA-D

Salt Grass – Northern Reed-grass

Prairie Ecozone: Saline Wet Meadow Ecosite (moderately saline)

GENERAL DESCRIPTION: These communities represent grasslands on moderately Saline Wet Meadow Ecosite. They can be found anywhere in the Prairie Ecozone. They are interpreted to be more saline than PEZ-WMSA-A and PEZ-WMDSA-B because of the higher percentage of salt-tolerant plants. PEZ-WMDSA-C is interpreted to be the **reference community**, while PEZ-WMDSA-D represents **minor alteration** as a result of grazing impact.

	PEZ-WMSA-C **Salt Grass – Northern Reed-grass**	PEZ-WMSA-D **Salt Grass**
STRUCTURE		
litter cover (n=29, n=29)	29% (13 - 47)	23% (8 - 42)
bare soil (n=29, n=27)	26% (4 - 55)	34% (10 - 64)
SPECIES COMPOSITION (% biomass)	n=40	n=31
Major graminoids		
salt grass (*Distichlis spicata var. stricta*)	32% (14 - 47)	40% (28 - 50)
northern reed-grass (*Calamagrostis stricta* ssp. *inexpansa*)	15% (0 - 30)	5% (0 - 11)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	9% (1 - 17)	7% (0 - 14)
fox-tail barley (*Hordeum jubatum*)	5% (0 - 9)	5% (0 - 13)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	5% (0 - 16)	2% (0 - 9)
alkali cord-grass (*Spartina gracilis*)	5% (0 - 30)	1% (0 - 0)
sedge (*Carex* spp.)	3% (0 - 8)	2% (0 - 7)
blue-grass (*Poa* spp.)	2% (0 - 5)	2% (0 - 6)
rush (*Juncus* spp.)	1% (0 - 5)	
Major forbs and half-shrubs		
curly-cup gum-weed (*Grindelia squarrosa*)	3% (0 - 6)	6% (0 - 17)
tufted white prairie aster (*Symphyotrichum ericoides var. pansum*)	3% (0 - 8)	3% (0 - 8)
perennial sow-thistle (*Sonchus arvensis*)	2% (0 - 6)	4% (0 - 10)
seaside arrow-grass (*Triglochin maritimum*)	2% (0 - 9)	1% (0 - 6)
aster (*Symphyotrichum* spp.)	1% (0 - 4)	2% (0 - 7)
flat-spine bur-ragweed (*Ambrosia acanthicarpa*)	1% (0 - 4)	2% (0 - 5)
red samphire (*Salicornia rubra*)	1% (0 - 1)	2% (0 - 6)
ragweed (*Ambrosia* spp.)	1% (0 - 4)	1% (0 - 4)
saltbush (*Atriplex* spp.)	1% (0 - 0)	1% (0 - 0)
pussytoes (*Antennaria* spp.)	1% (0 - 3)	1% (0 - 4)

Minor graminoids	2%	1%
Minor forbs and half-shrubs	4%	10%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	75%

RECOMMENDED STOCKING RATE	1.11 AUM/ha 0.45 AUM/ac	1.11 AUM/ha 0.45 AUM/ac

PEZ-WMDSA-E

Nuttall's Alkali-grass – Salt Grass – Foxtail Barley

Prairie Ecozone: Saline Wet Meadow Ecosite (saline)

GENERAL DESCRIPTION: This community represents grasslands on Saline Wet Meadow. Nuttall's alkali-grass can also occur on the Saline Shallow Marsh Ecosite, but this community is placed in Saline Wet Meadow because the other species are predominantly associated with Wet Meadow. The dominant Nuttall's alkali-grass is considered to be a decreaser species, so the community is interpreted to be a **reference community** for Saline Wet Meadow. Nuttall's alkali-grass is highly salt-tolerant, and the community is interpreted to be more saline than PEZ-WMDSA-A and PEZ-WMDSA-C, in which the main decreaser species are reed-grasses and wheat-grasses.

STRUCTURE

litter cover (n=7)	14% (0 - 33)	bare soil (n=7)	21% (0 - 53)

SPECIES COMPOSITION (% biomass, n=15)

Major graminoids		**Major forbs and half-shrubs**	
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	33% (20 - 49)	tufted white prairie aster (*Symphyotrichum ericoides var. pansum*)	2% (0 - 8)
salt grass (*Distichlis spicata var. stricta*)	16% (4 - 27)	red samphire (*Salicornia rubra*)	2% (0 - 9)
fox-tail barley (*Hordeum jubatum*)	11% (0 - 22)	perennial sow-thistle (*Sonchus arvensis*)	2% (0 - 7)
slender wheat-grass (*Elymus trachycaulus* ssp. *trachycaulus*)	5% (0 - 13)	curly-cup gum-weed (*Grindelia squarrosa*)	2% (0 - 5)
alkali cord-grass (*Spartina gracilis*)	4% (0 - 9)	seaside arrow-grass (*Triglochin maritimum*)	2% (0 - 4)
northern reed-grass (*Calamagrostis stricta* ssp. *inexpansa*)	3% (0 - 14)	dock (*Rumex* spp.)	1% (0 - 1)
blue-grass (*Poa* spp.)	3% (0 - 10)	aster (*Symphyotrichum* spp.)	1% (0 - 4)
sedge (*Carex* spp.)	3% (0 - 10)	saltbush (*Atriplex* spp.)	1% (0 - 1)
little bluestem (*Schizachyrium scoparium*)	1% (0 - 2)	poverty-weed (*Iva axillaris*)	1% (0 - 0)
		saline plantain (*Plantago eriopoda*)	1% (0 - 2)
		ragweed (*Ambrosia* spp.)	1% (0 - 2)

Minor graminoids	1%
Minor forbs and half-shrubs	7%

SIMILARITY TO REFERENCE COMMUNITY	reference community

RECOMMENDED STOCKING RATE	0.56 AUM/ha	0.23 AUM/ac

PEZ-SMHSA-A

Three-square Bulrush

Prairie Ecozone: Saline Shallow Marsh Ecosite (moderately saline)

GENERAL DESCRIPTION: This community represents moderately Saline Shallow Marsh. It can occur anywhere in the Prairie Ecozone, and is considered to be a **reference community** for Saline Shallow Marsh.

The description is derived from Tables 80 and 81 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

STRUCTURE - no information

SPECIES COMPOSITION (% canopy cover)

Major graminoids	
three-square bulrush (*Schoenoplectus pungens*)	81% (20 - 98)
creeping spike-rush (Eleocharis palustris)	3% (0 - 50)
fox-tail barley (*Hordeum jubatum*)	2% (0 - 60)
Baltic rush (*Juncus arcticus var. balticus*)	2% (0 - 20)
prairie cord-grass (*Spartina pectinata*)	1% (0 - 20)
Kentucky blue-grass (*Poa pratensis*)	1% (0 - 20)

Major forbs and half-shrubs	
perennial sow-thistle (*Sonchus arvensis*)	1% (0 - 31)
red samphire (*Salicornia rubra*)	1% (0 - 40)
cocklebur (*Xanthium strumarium*)	1% (0 - 30)
wild mint (*Mentha arvensis*)	1% (0 - 20)
aster (*Symphyotrichum* spp.)	1% (0 - 20)
seaside arrow-grass (*Triglochin maritimum*)	1% (0 - 20)
silverweed (*Argentina anserina*)	1% (0 - 10)
lamb's-quarters (*Chenopodium album*)	1% (0 - 10)

Minor trees	0%
Minor tall shrubs	0%
Minor short shrubs	0%
Minor graminoids	2%
Minor forbs and half-shrubs	3%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.

RECOMMENDED STOCKING RATE	insufficient data

PEZ-SMHSA-B

Nevada Bulrush

Prairie Ecozone: Saline Shallow Marsh Ecosite (saline)

GENERAL DESCRIPTION: This community occurs on saline Shallow Marsh. It can occur anywhere in the Prairie Ecozone, and is considered to be a **reference community**.

STRUCTURE (n=6)

tree cover (%)	0% (0 - 0)
tall shrub cover (%)	0% (0 - 0)
short shrub cover (%)	0% (0 - 0)
prostrate shrub cover (%)	0% (0 - 0)
cactus cover (%)	0% (0 - 0)
herbaceous cover (%)	38% (4 - 73)
clubmoss cover (%)	0% (0 - 0)

SPECIES COMPOSITION (% foliar cover, n=6)

Major graminoids	
Nevada bulrush (*Scirpus nevadensis*)	23% (3 - 50)
inland salt grass (*Distichlis spicata var. stricta*)	3% (0 - 9)
alkali cord-grass (*Spartina gracilis*)	3% (0 - 9)
fox-tail barley (*Hordeum jubatum*)	2% (0 - 3)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	1% (0 - 3)

Major forbs and half-shrubs	
rayless aster (*Symphyotrichum ciliatum*)	3% (0 - 8)
buttercup (*Ranunculus* spp.)	1% (0 - 3)

Minor graminoids	1%
Minor forbs and half-shrubs	2%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.

RECOMMENDED STOCKING RATE	insufficient data

PEZ-SMHSA-C

Red Samphire

Prairie Ecozone: Saline Shallow Marsh Ecosite (saline)

GENERAL DESCRIPTION: This community occurs on sparsely vegetated areas on Saline Shallow Marsh Ecosites. The succulent annual herb red samphire is the only widespread species on sites at this level of salinity.

The description is derived from Table 75 in Thompson and Hansen (2001), which includes some data from outside Saskatchewan.

STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

Major graminoids	
fox-tail barley (*Hordeum jubatum*)	1% (0 - 3)
Nuttall's alkali-grass (*Puccinellia nuttalliana*)	1% (0 - 3)

Major forbs and half-shrubs	
red samphire (*Salicornia rubra*)	69% (30 - 90)
western sea-blite (*Suaeda calceoliformis*)	1% (0 - 20)

Minor graminoids	0%
Minor forbs and half-shrubs	0%
Minor cactus	0%

SIMILARITY TO REFERENCE COMMUNITY	unknown

RECOMMENDED STOCKING RATE	none

PEZ-DMHSA-A

Prairie Bulrush

Prairie Ecozone: Saline Deep Marsh Ecosite (moderately saline to saline)

GENERAL DESCRIPTION: This community represents moderately saline to saline Deep Marsh. It can occur anywhere in the Prairie Ecozone, and is interpreted to be a **reference community** for Saline Deep Marsh.

The description is derived from Tables 78 and 79 in Thompson and Hansen (2001), which includes some data from outside Saskatchewan.

STRUCTURE - no information

SPECIES COMPOSITION (% canopy cover)

Major graminoids	
prairie bulrush (*Bolboschoenus maritimus* ssp. *paludosus*)	85% (60 - 98)
creeping spike-rush (*Eleocharis palustris*)	3% (0 - 20)
fox-tail barley (*Hordeum jubatum*)	3% (0 - 20)
three-square bulrush (*Schoenoplectus pungens*)	2% (0 - 20)
northern manna-grass (*Glyceria borealis*)	1% (0 - 10)
hardstem bulrush (*Schoenoplectus acutus*)	1% (0 - 3)

Major forbs and half-shrubs	
saltbush (*Atriplex* spp.)	1% (0 - 10)
field horsetail (Equisetum arvense)	1% (0 - 10)
wild mint (*Mentha arvensis*)	1% (0 - 10)
golden dock (*Rumex fueginus*)	1% (0 - 10)

Minor tall shrubs	1%
Minor graminoids	1%
Minor forbs and half-shrubs	2%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.

RECOMMENDED STOCKING RATE	non-use areas