

Saskatchewan Rangeland Ecosystems
Publication 12

**Communities on the Overflow and
Subirrigated Ecosites**



Jeff Thorpe
Saskatchewan Research Council
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NOTES

- This publication describes native grassland, shrubland and woodland communities found on the Overflow and Subirrigated Ecosites in the Prairie Ecozone of Saskatchewan.
- Most communities are shown as occurring on both Overflow and Subirrigated Ecosites. While these ecosites can be distinguished in the field, the resolution of the available vegetation data was usually not sufficient to distinguish the communities occurring on them. The exceptions were sagebrush-grassland communities, which are mainly on the Overflow Ecosite, and willow-dogwood communities, which are mainly on the Subirrigated Ecosite.
- For forest communities in the Moose Mountain and Cypress Uplands, refer to McLaughlan et al. (2010).
- More detailed discussion of the underlying ecosystem classification can be found in *Publication 1: Ecoregions and Ecosites*.

PHOTO CREDITS: Front cover – Sagebrush and snowberry on floodplain in Grasslands National Park (Jeff Thorpe); Page 13 – low-density sagebrush on alluvial fan in Grasslands National Park (Jeff Thorpe); Page 35 – balsam poplar/dogwood on Subirrigated Ecosite in the Aspen Parkland (Bob Godwin).

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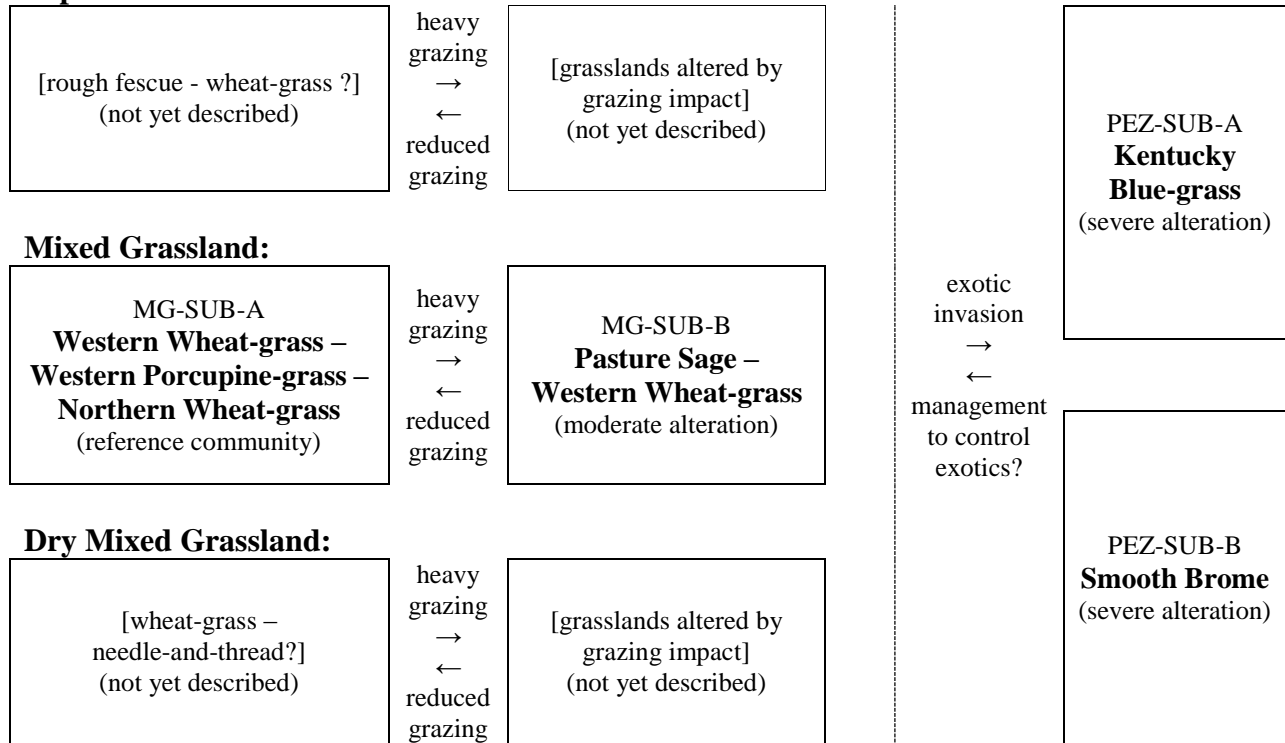


COMMUNITY SUMMARY AND STATE-AND-TRANSITION DIAGRAM

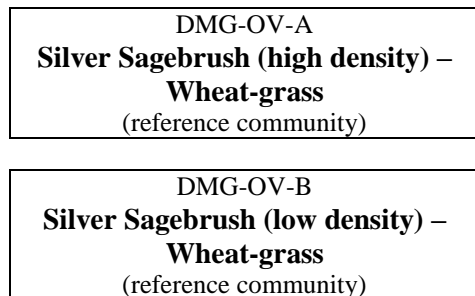
Subirrigated and Overflow Ecosites

Grassland communities:

Aspen Parkland:



Shrub-grasslands in the Dry Mixed Grassland Ecoregion:



Shrubland communities:

PEZ-SUB-C
Western Snowberry
(grazing status?)

PEZ-SUB-D
Choke-cherry – Saskatoon
(reference community)

PEZ-SUB-E
**Thorny Buffalo-berry /
Snowberry / Kentucky Blue-
grass**
(grazing status?)

PEZ-SUB-F
**Basket Willow –
Dogwood**
(ref. comm.)

heavy
grazing
→
←
reduced
grazing

PEZ-SUB-G
**Basket Willow –
Dogwood / Rose /
Smooth Brome**
(moderate alteration)

heavy
grazing
→
←
reduced
grazing

PEZ-SUB-H
**Basket Willow /
Smooth Brome**
(moderate alteration)

PEZ-SUB-I
**Beaked Willow –
Dogwood**
(reference community)

heavy
grazing
→
←
reduced
grazing

PEZ-SUB-J
**Beaked Willow –
Dogwood / Smooth
Brome**
(minor alteration)

heavy
grazing
→
←
reduced
grazing

PEZ-SUB-K
Beaked Willow
(moderate alteration)

PEZ-SUB-L
**Yellow Willow –
Dogwood / Rose**
(reference community)

heavy
grazing
→
←
reduced
grazing

PEZ-SUB-M
**Yellow Willow –
Dogwood – Sandbar
Willow / Western
Snowberry / Smooth
Brome**
(moderate alteration)

heavy
grazing
→
←
reduced
grazing

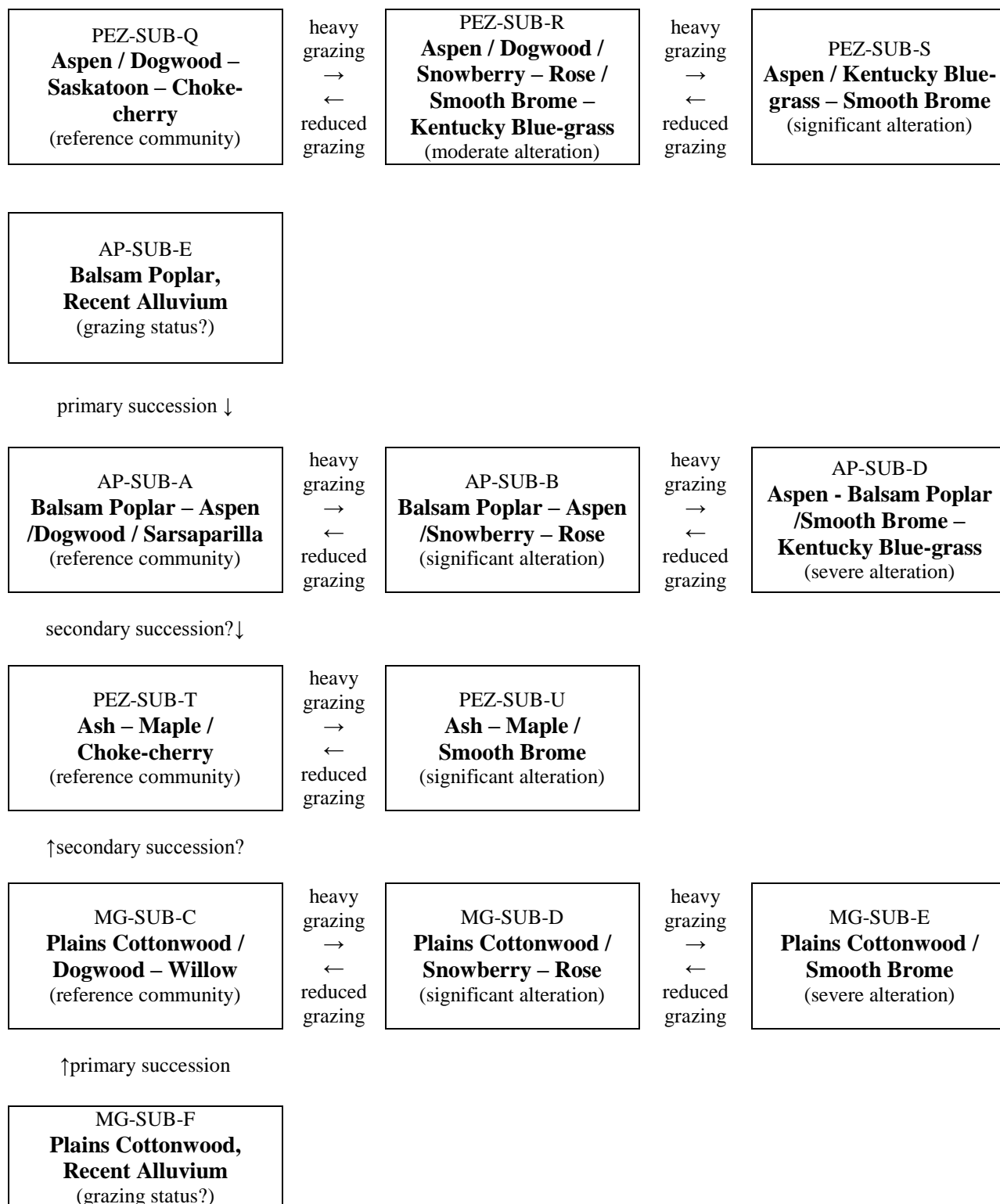
PEZ-SUB-N
**Yellow Willow –
Sandbar Willow**
(significant alteration)

Shrublands on subirrigated sand:

Prostrate shrub stands
PEZ-SUB-O
**Creeping Juniper – Bearberry
/ Wild Licorice**
(grazing status?)

Erect shrub stands
PEZ-SUB-P
**River Birch / Wolf-willow
/ Creeping Juniper –
Bearberry**
(grazing status?)

Woodland communities:



Woodlands on subirrigated sand:

Aspen Parkland:

<p>AP-SUB-C</p> <p>Balsam Poplar – Aspen / Willow – River Birch</p> <p>(grazing status?)</p>

Mixed Grassland:

<p>MG-DN-F</p> <p>Aspen / Choke-cherry / Snowberry / Sedge</p> <p>(description in Pub. 9: Dunes Ecosite; probably subirrigated)</p> <p>(reference community)</p>

Dry Mixed Grassland:

<p>DMG-SD-H</p> <p>Aspen / Creeping Juniper / Awned Wheat-grass – Wild Licorice</p> <p>(description in Pub. 5: Sand and Sandy Loam Ecosites; probably subirrigated)</p> <p>(grazing status?)</p>	<p>DMG-DN-G</p> <p>Aspen / Creeping Juniper / Reed-grass – Wheat-grass</p> <p>(description in Pub. 9: Dunes Ecosite; probably subirrigated)</p> <p>(grazing status?)</p>
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MG-SUB-A

Western Wheat-grass – Western Porcupine-grass – Northern Wheat-grass
Mixed Grassland: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: These communities represent grasslands on the Subirrigated and Overflow Ecosites in the Mixed Grassland Ecoregion. MG-SUB-A represents the **reference community**, while MG-SUB-B shows **moderate alteration** as a result of grazing impact. Grasslands on these ecosites in the Dry Mixed Grassland are expected to be similar, but with needle-and-thread replacing western porcupine-grass. Those in the Aspen Parkland and Cypress Upland are expected to have significant proportions of plains rough fescue and awned wheat-grass. However, much of the grassland on Overflow and Subirrigated Ecosites in these moister regions is invaded by Kentucky blue-grass and smooth brome.

MG-SUB-A Western Wheat-grass – Western Porcupine-grass – Northern Wheat-grass	MG-SUB-B Pasture Sage – Western Wheat-grass
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STRUCTURE – no information

SPECIES COMPOSITION (% biomass)	(n=10)	(n=15)
Major short shrubs		
shrubby cinquefoil (<i>Dasiphora fruticosa</i>)		1% (0 – 4)
Major graminoids		
western wheat-grass (<i>Pascopyrum smithii</i>)	19% (0 - 60)	12% (0 - 26)
western porcupine-grass (<i>Hesperostipa curtipetala</i>)	19% (0 - 35)	9% (0 - 10)
northern wheat-grass (<i>Elymus lanceolatus</i>)	13% (0 - 30)	7% (0 - 16)
blue grama (<i>Bouteloua gracilis</i>)	4% (0 - 8)	10% (0 - 18)
sedge (<i>Carex</i> spp.)	4% (2 - 5)	9% (2 - 13)
June grass (<i>Koeleria macrantha</i>)	9% (2 - 18)	7% (2 - 13)
needle-and-thread (<i>Hesperostipa comata</i>)	5% (0 - 12)	8% (0 - 28)
plains reed-grass (<i>Calamagrostis montanensis</i>)	2% (0 - 6)	3% (0 - 11)
Sandberg's blue-grass (<i>Poa secunda</i> ssp. <i>secunda</i>)	3% (0 - 11)	
Hooker's oat-grass (<i>Avenula hookeri</i>)	3% (0 - 6)	
blue-grass (<i>Poa</i> spp.)	2% (0 - 4)	2% (0 - 4)
Kentucky blue-grass (<i>Poa pratensis</i>)		2% (0 - 7)
early blue-grass (<i>Poa cusickii</i>)		1% (0 - 0)
green needle-grass (<i>Nassella viridula</i>)		1% (0 - 5)
rush (<i>Juncus</i> spp.)		1% (0 - 0)
smooth brome (<i>Bromus inermis</i>)		1% (0 - 0)

	MG-SUB-A	MG-SUB-B
Major forbs and half-shrubs		
pasture sage (<i>Artemisia frigida</i>)	6% (0 - 11)	16% (4 - 27)
forb increasers	6% (0 - 11)	8% (0 - 20)
prairie crocus (<i>Pulsatilla patens</i>)	1% (0 - 1)	
scarlet mallow (<i>Sphaeralcea coccinea</i>)		2% (0 - 8)
prairie sage (<i>Artemisia ludoviciana</i>)		1% (0 - 0)
prairie-clover (<i>Dalea</i> spp.)		1% (0 - 0)
sweet-clover (<i>Melilotus</i> spp.)		1% (0 - 2)
hairy golden-aster (<i>Heterotheca villosa</i>)		1% (0 - 2)

Minor short shrubs		0%
Minor cactus	0%	
Minor graminoids	0%	1%
Minor forbs and half-shrubs	1%	2%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	66%
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RECOMMENDED STOCKING RATE		
- described communities in Mixed Grassland Ecoregion	0.90 AUM/ha 0.36 AUM/ac	0.72 AUM/ha 0.29 AUM/ac
- [comparable communities in Dry Mixed Grassland]	0.62AUM/ha 0.25 AUM/ac	0.49 AUM/ha 0.20 AUM/ac
- [comparable communities in drier part of Aspen Parkland]	1.37AUM/ha 0.55 AUM/ac	1.10 AUM/ha 0.44 AUM/ac
- [comparable communities in moister part of Aspen Parkland]	2.09 AUM/ha 0.85 AUM/AC	1.67 AUM/ha 0.68 AUM/ac

PEZ-SUB-A
Kentucky Blue-grass
Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: This community represents grassland dominated by Kentucky blue-grass on the Subirrigated and Overflow Ecosites. It can occur anywhere in the Prairie Ecozone, but is most widespread in the Aspen Parkland and Cypress Upland Ecoregions. Note that Kentucky blue-grass communities on upland ecosites are shown separately (e.g. AP-LM-E, CU-LM-B in Publication 4). This community is interpreted as showing **severe alteration** from the reference community (e.g. MG-SUB-A) as a result of heavy grazing coupled with exotic invasion. Kentucky blue-grass is particularly abundant on Overflow and Subirrigated Ecosites where it is favoured by moisture availability, may be restricted to these ecosites in the drier climates of the Mixed Grassland and Dry Mixed Grassland. Kentucky blue-grass tends to persist once established. Relief of grazing pressure does not return the community to natural composition, because the high litter cover in idled grasslands creates a moist microclimate which favours Kentucky blue-grass.

STRUCTURE

short shrub cover (n=5)	0% (0 – 0)	litter cover (n=4)	26% (16 – 38)
herbaceous cover (n=7)	66% (38 – 86)	bare soil (n=4)	3% (1 – 5)
clubmoss cover (n=4)	0% (0 – 1)		

SPECIES COMPOSITION

	% biomass (n=5)	% foliar cover, (n=5)
Major graminods		
Kentucky blue grass (<i>Poa pratensis</i>)	21% (17 - 27)	31% (15 - 43)
western wheat-grass (<i>Agropyron smithii</i>)	7% (0 - 19)	2% (0 - 6)
sedge (<i>Carex</i> spp.)	6% (1 - 12)	4% (0 - 11)
smooth brome (<i>Bromus inermis</i>)	4% (0 - 9)	1% (0 - 2)
june grass (<i>Koeleria macrantha</i>)	3% (0 - 10)	1% (0 - 2)
western porcupine-grass (<i>Hesperostipa curti-seta</i>)	1% (0 - 2)	1% (0 - 2)
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)	8% (1 - 12)	
quack grass (<i>Elymus repens</i>)	6% (0 - 16)	
mat muhly (<i>Muhlenbergia richardsonis</i>)	6% (0 - 13)	
foxtail barley (<i>Hordeum jubatum</i>)	3% (0 - 7)	
northern reed-grass (<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>)	2% (0 - 7)	
Baltic rush (<i>Juncus arcticus</i> var. <i>balticus</i>)	2% (0 - 6)	
rough hair grass (<i>Agrostis scabra</i>)	2% (0 - 5)	
inland salt grass (<i>Distichlis spicata</i> var. <i>stricta</i>)	1% (0 - 3)	
prairie dropseed (<i>Sporobolus heterolepis</i>)	1% (0 - 2)	
needle-and-thread (<i>Hesperostipa comata</i>)		7% (0 - 19)
crested wheat-grass (<i>Agropyron cristatum</i>)		4% (0 - 12)
plains rough fescue (<i>Festuca altaica</i> ssp. <i>hallii</i>)		3% (0 - 9)
green needle grass (<i>Nassella viridula</i>)		3% (0 - 9)
blue grama (<i>Bouteloua gracilis</i>)		2% (0 - 5)
awned wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>subsecundus</i>)		1% (0 - 2)

	% biomass	% foliar cover
Major short shrubs		
prairie rose (<i>Rosa arkansana</i>)	1% (0 - 2)	
Major forbs and half-shrubs		
woolly yarrow (<i>Achillea millefolium</i>)	4% (1 - 9)	
common dandelion (<i>Taraxacum officinale</i>)	3% (0 - 8)	
everlasting (<i>Antennaria</i> spp.)	3% (0 - 8)	
horsetail (<i>Equisetum</i> spp.)	2% (0 - 5)	
hairy golden-aster (<i>Heterotheca villosa</i>)	2% (0 - 5)	
pale comandra (<i>Comandra umbellata</i> ssp. <i>pallida</i>)	1% (0 - 4)	
plantain (<i>Plantago</i> spp.)	1% (0 - 4)	
milk-vetch (<i>Astragalus</i> spp.)	1% (0 - 3)	
Nuttall's yellow violet (<i>Viola nuttallii</i>)	1% (0 - 3)	
gumweed (<i>Grindelia squarrosa</i>)	1% (0 - 2)	
aster (<i>Symphyotrichum</i> spp.)	1% (0 - 1)	
thistle (<i>Cirsium</i> spp.)	1% (0 - 2)	
goldenrod (<i>Solidago</i> spp.)	1% (0 - 2)	
ambrosia (<i>Ambrosia</i> spp.)	1% (0 - 1)	
northern bedstraw (<i>Galium boreale</i>)		1% (0 - 3)
pasture sage (<i>Artemisia frigida</i>)		1% (0 - 3)
crocus anemone (<i>Anemone patens</i>)		1% (0 - 2)
hairy-fruited parsley (<i>Lomatium foeniculaceum</i>)		1% (0 - 2)
Minor graminoids	1%	
Minor forbs and half-shrubs	2%	
SIMILARITY TO REFERENCE COMMUNITY	16%	
RECOMMENDED STOCKING RATE	insufficient data	

PEZ-SUB-B
Smooth Brome

Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: This community represents grassland dominated by smooth brome on the Subirrigated and Overflow Ecosites. This community can occur on these sites anywhere in the Prairie Ecozone, but is most widespread in the Aspen Parkland and Cypress Upland Ecoregions. Note that this community does not include smooth brome stands on upland ecosites. This community is interpreted as showing **severe alteration** from the reference community (e.g. MG-SUB-A) as a result of heavy grazing impact coupled with exotic invasion. Smooth brome invades aggressively into native communities, usually spreading from disturbed sources such as road ditches or tame pasture. It is particularly aggressive on Overflow and Subirrigated Ecosites where it is favoured by moisture availability, and may be restricted to these ecosites in the drier climates of the Mixed Grassland and Dry Mixed Grassland. There is a wide range in smooth brome abundance, from native grassland with a few patches of brome, to nearly complete brome domination as in the description here.

This description is derived from Table 57 in Thompson and Hansen (2001), which includes some data from outside Saskatchewan.

STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

Major short shrubs

rose (*Rosa* spp.) 1% (0 - 10)

western snowberry (*Symphoricarpos occidentalis*) 1% (0 - 10)

Major graminoids

smooth brome (*Bromus inermis*) 96% (90 - 98)

Major forbs and half-shrubs

American wild licorice (*Glycyrrhiza lepidota*) 1% (0 - 10)

water smartweed (*Persicaria amphibia*) 1% (0 - 10)

Minor graminoids

0%

Minor forbs and half-shrubs

2%

SIMILARITY TO REFERENCE COMMUNITY

insufficient data

RECOMMENDED STOCKING RATE

insufficient data

DMG-OV-A, DMG-OV-B
Silver Sagebrush / Wheat-grass
Dry Mixed Grassland: Overflow Ecosite

GENERAL DESCRIPTION: These communities represent sagebrush grasslands on the Overflow Ecosite in the Dry Mixed Grassland Ecoregion. They also occur to a limited extent in the Mixed Grassland Ecoregion. DMG-OV-A represents high-density sagebrush stands, which tend to be found on floodplain deposits. DMG-OV-B represents low-density sagebrush stands, which tend to be found on gently sloping alluvial fans. Either would be considered a **reference community**, as the herbaceous layer is dominated by decreaser grasses. The dominant grass is northern wheat-grass in some stands and western wheat-grass in others. While silver sagebrush is listed as an increaser in many references, its abundance is mainly controlled by site conditions. Silver sagebrush is unpalatable to cattle, and the recommended stocking rates are relatively low, but sagebrush is important winter browse for pronghorns, as well as providing habitat for sage grouse and other species.

STRUCTURE	DMG-OV-A Silver Sagebrush (high density) / Wheat-grass	DMG-OV-B Silver Sagebrush (low density) / Wheat-grass
short shrub cover (n=13, n=10)	10% (6 - 14)	5% (2 - 10)
cactus cover (n=13, n=8)	0% (0 - 1)	
herbaceous cover (n=13, n=10)	30% (11 - 47)	22% (8 - 38)
clubmoss cover (n=13, n=9)	5% (0 - 13)	15% (0 - 46)
moss cover (n=0, n=2)		1% (1 - 1)
lichen cover (n=13, n=9)	11% (1 - 30)	15% (1 - 33)
litter cover (n=13, n=8)	73% (56 - 96)	51% (28 - 74)
bare soil (n=13, n=8)	5% (0 - 9)	19% (1 - 61)

SPECIES COMPOSITION (% foliar cover)	(n=13)	(n=10)
Major short shrubs		
silver sagebrush (<i>Artemisia cana</i>)	8% (5 - 13)	3% (2 - 4)
western snowberry (<i>Symphoricarpos occidentalis</i>)	2% (0 - 6)	1% (0 - 3)

Major prostrate shrubs		
creeping juniper (<i>Juniperus horizontalis</i>)		1% (0 - 1)

Major graminoids		
northern wheat-grass (<i>Elymus lanceolatus</i>)	10% (0 - 27)	4% (0 - 10)
western wheat-grass (<i>Pascopyrum smithii</i>)	3% (0 - 3)	3% (0 - 4)
blue grama (<i>Bouteloua gracilis</i>)	4% (0 - 12)	2% (0 - 5)
needle-and-thread (<i>Hesperostipa comata</i>)	4% (0 - 10)	1% (0 - 3)
low sedge (<i>Carex duriuscula</i>)	2% (1 - 3)	2% (0 - 4)
June grass (<i>Koeleria macrantha</i>)	1% (0 - 1)	1% (0 - 2)
green needle-grass (<i>Nassella viridula</i>)	1% (0 - 2)	1% (0 - 2)
plains reed-grass (<i>Calamagrostis montanensis</i>)	1% (0 - 2)	1% (0 - 1)

	DMG-OV-A	DMG-OV-B
Major forbs and half-shrubs		
pasture sage (<i>Artemisia frigida</i>)	2% (1 - 2)	1% (0 - 3)
American wild licorice (<i>Glycyrrhiza lepidota</i>)		1% (0 - 1)
Minor short shrubs	0%	0%
Minor graminoids	1%	1%
Minor forbs and half-shrubs	2%	4%
Minor cactus	0%	0%
SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	ref. comm.
RECOMMENDED STOCKING RATE	0.30 AUM/ha 0.12 AUM/ac	0.44 AUM/ha 0.18 AUM/ac



PEZ-SUB-C
Western Snowberry
Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: This community represents snowberry stands on the Subirrigated and Overflow Ecosites in the Prairie Ecozone. This community is widespread in all ecoregions, and may be the only riparian shrub type on smaller streams, especially in the drier ecoregions. The extent of snowberry stands and other shrub types increases with prolonged absence of fire, and is affected to only a limited extent by grazing impact. Snowberry stands are often invaded by Kentucky blue-grass and other exotic herbs, which benefit from the partial shade. Snowberry density varies widely. Dense stands produce little palatable forage, but provide important cover for wildlife.

STRUCTURE

tall shrub cover (n=10)	1% (0 - 4)	clubmoss cover (n=10)	1% (0 - 0)
short shrub cover (n=10)	30% (15 - 40)	lichen cover (n=5)	4% (0 - 10)
prostrate shrub cover (n=10)	2% (0 - 2)	litter cover (n=3)	78% (64 - 93)
cactus cover (n=10)	0% (0 - 1)	bare soil (n=3)	1% (0 - 3)
herbaceous cover (n=10)	29% (18 - 44)		

SPECIES COMPOSITION (% foliar cover, n=10)

Major tall shrubs		Major prostrate shrubs	
choke-cherry (<i>Prunus virginiana</i>)	1% (0 - 3)	creeping juniper (<i>Juniperus horizontalis</i>)	2% (0 - 2)
Major short shrubs		Major forbs and half-shrubs	
western snowberry (<i>Symphoricarpos occidentalis</i>)	22% (15 - 38)	pasture sage (<i>Artemisia frigida</i>)	1% (0 - 2)
silver sagebrush (<i>Artemisia cana</i>)	3% (0 - 9)	stiff-leaved goldenrod (<i>Solidago rigida</i>)	1% (0 - 1)
Wood's rose (<i>Rosa woodsii</i>)	1% (0 - 3)	Canada goldenrod (<i>Solidago canadensis</i>)	1% (0 - 3)

Major graminoids

Kentucky blue-grass (<i>Poa pratensis</i>)	8% (0 - 38)	slender wheat-grass (<i>Elymus tra. ssp. trachycaulus</i>)	1% (0 - 3)
northern wheat-grass (<i>Elymus lanceolatus</i>)	4% (0 - 12)	crested wheat-grass (<i>Agropyron cristatum</i>)	1% (0 - 1)
needle-and-thread (<i>Hesperostipa comata</i>)	3% (0 - 8)	western wheat-grass (<i>Pascopyrum smithii</i>)	1% (0 - 2)
low sedge (<i>Carex duriuscula</i>)	3% (0 - 4)	green needle-grass (<i>Nassella viridula</i>)	1% (0 - 3)

Minor tall shrubs	1%	Minor graminoids	3%
Minor short shrubs	1%	Minor forbs and half-shrubs	6%

RECOMMENDED STOCKING RATE

- Dry Mixed Grassland	0.31 AUM/ha	0.13 AUM/ac
- Mixed Grassland	0.45 AUM/ha	0.18 AUM/ac
- Aspen Parkland	0.69 AUM/ha	0.28 AUM/ac

PEZ-SUB-D

Choke-cherry – Saskatoon

Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: This community represents tall shrub stands on the Subirrigated and Overflow Ecosites. It can occur anywhere in the Prairie Ecozone, but is most widespread in the Aspen Parkland Ecoregion. Some stands are dominated by choke-cherry and some by saskatoon. Hawthorn (*Crataegus* spp.) is also important in some stands. Production of palatable browse is high, but production of herbage is very low.

STRUCTURE

tree cover (n=9)	0% (0 - 0)	herbaceous cover (n=9)	10% (3 - 19)
tall shrub cover (n=9)	53% (18 - 90)	clubmoss cover (n=4)	0% (0 - 0)
short shrub cover (n=9)	9% (2 - 19)	moss cover (n=7)	1% (0 - 2)
prostrate shrub cover (n=9)	1% (0 - 3)	lichen cover (n=4)	0% (0 - 0)
cactus cover (n=9)	0% (0 - 0)		

SPECIES COMPOSITION (% foliar cover, n=9)

Major tall shrubs		Major graminoids	
choke-cherry (<i>Prunus virginiana</i>)	47% (15 - 70)	Kentucky blue-grass (<i>Poa pratensis</i>)	1% (0 - 4)
saskatoon (<i>Amelanchier alnifolia</i>)	13% (0 - 43)	slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)	1% (0 - 3)
red-osier dogwood (<i>Cornus sericea</i> ssp. <i>stolonifera</i>)	1% (0 - 3)	little-seed rice-grass (<i>Piptatherum micranthum</i>)	1% (0 - 3)
		northern wheat-grass (<i>Elymus lanceolatus</i>)	1% (0 - 1)
Major short shrubs		Major forbs	
western snowberry (<i>Symphoricarpos occidentalis</i>)	8% (0 - 23)	western Canada violet (<i>Viola canadensis</i>)	2% (0 - 4)
northern gooseberry (<i>Ribes oxycanthoides</i>)	1% (0 - 3)		
low juniper (<i>Juniperus communis</i>)	1% (0 - 2)		
poison-ivy (<i>Toxicodendron rydbergii</i>)	1% (0 - 3)		
skunk-bush (<i>Rhus trilobata</i>)	1% (0 - 3)		
Wood's rose (<i>Rosa woodsii</i>)	1% (0 - 1)		
Major prostrate shrubs		Minor trees	
creeping juniper (<i>Juniperus horizontalis</i>)	2% (0 - 4)		0%
		Minor tall shrubs	1%
		Minor short shrubs	0%
		Minor graminoids	3%
		Minor forbs and half-shrubs	6%
		Minor cactus	0%

SIMILARITY TO REFERENCE COMMUNITY

unknown

RECOMMENDED STOCKING RATE

none to low

MG-SUB-E

Thorny Buffalo-berry / Western Snowberry / Kentucky Blue-grass
Dry Mixed Grassland and Mixed Grassland: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: Open tall shrub stands found on Subirrigated and Overflow Ecosites in the Dry Mixed Grassland and Mixed Grassland Ecoregions. This community may be somewhat more saline than other shrub communities on these ecosites, although the proportion of salt-tolerant plants is low. The community as described appears to have been altered by grazing impact or other disturbances, as shown by the high proportion of exotic species such as Kentucky blue-grass and smooth brome. However, no reference community has been described for this type.

This description is derived from Table 47 in Thompson and Hansen (2001), which includes some data from outside Saskatchewan.

STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

Major tall shrubs		Major forbs and half-shrubs	
thorny buffalo-berry (<i>Shepherdia argentea</i>)	76% (40 - 98)	common yarrow (<i>Achillea millefolium</i>)	4% (0 - 40)
choke-cherry (<i>Prunus virginiana</i>)	2% (0 - 30)	Canada thistle (<i>Cirsium arvense</i>)	3% (0 - 40)
red-osier dogwood (<i>Cornus sericea</i>)	1% (0 - 10)	northern bedstraw (<i>Galium boreale</i>)	2% (0 - 30)
Major short shrubs		cleavers (<i>Galium aparine</i>)	2% (0 - 20)
western snowberry (<i>Symphoricarpos occidentalis</i>)	37% (1 - 80)	Pennsylvania pellitory (<i>Parietaria pensylvanica</i>)	11% (0 - 80)
golden currant (<i>Ribes aureum</i>)	5% (0 - 60)	late goldenrod (<i>Solidago gigantea</i>)	1% (0 - 30)
rose (<i>Rosa</i> spp.)	12% (0 - 70)	star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	1% (0 - 3)
wild red raspberry (<i>Rubus idaeus</i>)	1% (0 - 20)	prairie sage (<i>Artemisia ludoviciana</i>)	1% (0 - 3)
wild black currant (<i>Ribes americanum</i>)	1% (0 - 20)	pasture sage (<i>Artemisia frigida</i>)	1% (0 - 3)
Major graminoids		wild bergamot (<i>Monarda fistulosa</i>)	1% (0 - 20)
Kentucky blue-grass (<i>Poa pratensis</i>)	22% (0 - 80)	strawberry-blite (<i>Chenopodium capitatum</i>)	1% (0 - 20)
smooth brome (<i>Bromus inermis</i>)	5% (0 - 80)	stinging nettle (<i>Urtica dioica</i>)	1% (0 - 10)
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)	3% (0 - 20)	poison-ivy (<i>Toxicodendron rydbergii</i>)	1% (0 - 10)
redtop (<i>Agrostis stolonifera</i>)	2% (0 - 60)	lesser burdock (<i>Arctium minus</i>)	1% (0 - 10)
Japanese chess (<i>Bromus japonicus</i>)	2% (0 - 40)	nodding stickseed (<i>Hackelia deflexa</i> var. <i>americana</i>)	1% (0 - 10)
Virginia wild-rye (<i>Elymus virginicus</i>)	1% (0 - 30)	Canada goldenrod (<i>Solidago canadensis</i>)	1% (0 - 10)
western wheat-grass (<i>Pascopyrum smithii</i>)	1% (0 - 3)		

Minor trees	0%	Minor prostrate shrubs	0%
Minor tall shrubs	1%	Minor graminoids	1%
Minor short shrubs	1%	Minor forbs and half-shrubs	6%

SIMILARITY TO REFERENCE COMMUNITY	unknown
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RECOMMENDED STOCKING RATE			
-	Dry Mixed Grassland	0.31 AUM/ha	0.13 AUM/ac
-	Mixed Grassland	0.45 AUM/ha	0.18 AUM/ac

PEZ-SUB-F, PEZ-SUB-G, PEZ-SUB-H

Basket Willow - Dogwood

Prairie Ecozone: Subirrigated Ecosite

GENERAL DESCRIPTION: These communities represent willow-dogwood stands on the Subirrigated Ecosite. They can occur anywhere in the Prairie Ecozone. PEZ-SUB-F is interpreted to be a **reference community**, while PEZ-SUB-G and PEZ-SUB-H show **moderate alteration** resulting from grazing impact and exotic invasion. The dense shrub stands of PEZ-SUB-F provide little herbaceous forage, but are good sources of palatable browse. The altered communities (PEZ-SUB-G and PEZ-SUB-H) are more open and the exotic grasses provide more herbaceous forage.

While separate communities dominated by basket willow, beaked willow, and yellow willow are shown here, many stands are mixtures of willow species. Willow communities occur at the wetter end of the Subirrigated Ecosite, and may overlap with the Wet Meadow Ecosite. The Basket Willow / Awned Sedge community is shown under Wet Meadow.

This description is derived from Tables 34, 35, and 36 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

	PEZ-SUB-F Basket Willow - Dogwood	PEZ-SUB-G Basket Willow – Dogwood / Rose / Smooth Brome	PEZ-SUB-H Basket Willow
STRUCTURE – no information)			
SPECIES COMPOSITION (% canopy cover)			
Major tall shrubs			
basket willow (<i>Salix petiolaris</i>)	87% (80 - 90)	70% (20 - 98)	73% (30 - 98)
red-osier dogwood (<i>Cornus sericea</i>)	23% (0 - 50)	13% (0 - 60)	
beaked willow (<i>Salix bebbiana</i>)	2% (0 - 3)	1% (0 - 3)	
yellow willow (<i>Salix famelica</i>)	1% (0 - 3)		
sandbar willow (<i>Salix interior</i>)		10% (0 - 60)	
plane-leaf willow (<i>Salix planifolia</i>)		1% (0 - 3)	
river birch (<i>Betula occidentalis</i>)			2% (0 - 10)
thorny buffalo-berry (<i>Shepherdia argentea</i>)			1% (0 - 3)
Major short shrubs			
western snowberry (<i>Symphoricarpos occidentalis</i>)	7% (0 - 20)	5% (0 - 30)	6% (0 - 30)
rose (<i>Rosa</i> spp.)		13% (0 - 70)	1% (0 - 3)
wild red raspberry (<i>Rubus idaeus</i>)		4% (0 - 30)	
northern gooseberry (<i>Ribes oxycanthoides</i>)		1% (0 - 3)	
wolf-willow (<i>Elaeagnus commutata</i>)			1% (0 - 3)
Major graminoids			
smooth brome (<i>Bromus inermis</i>)	2% (0 - 3)	33% (0 - 90)	19% (0 - 70)
awned sedge (<i>Carex atherodes</i>)	1% (0 - 3)		
many-headed sedge (<i>Carex sychnocephala</i>)	1% (0 - 3)		
Kentucky blue-grass (<i>Poa pratensis</i>)		7% (0 - 30)	6% (0 - 20)

	PEZ-SUB-F	PEZ-SUB-G	PEZ-SUB-H
fowl blue-grass (<i>Poa palustris</i>)		4% (0 - 20)	1% (0 - 3)
common timothy (<i>Phleum pratense</i>)		1% (0 - 10)	1% (0 - 3)
redtop (<i>Agrostis stolonifera</i>)		4% (0 - 20)	
marsh reed-grass (<i>Calamagrostis canadensis</i>)		1% (0 - 10)	
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)		1% (0 - 10)	
Baltic rush (<i>Juncus arcticus</i> var. <i>balticus</i>)			12% (0 - 30)
woolly sedge (<i>Carex pellita</i>)			8% (0 - 30)
graceful sedge (<i>Carex praegracilis</i>)			1% (0 - 3)
tufted hair-grass (<i>Deschampsia cespitosa</i>)			1% (0 - 3)
giant reed-grass (<i>Phragmites australis</i>)			1% (0 - 3)

Major forbs and half-shrubs			
sow-thistle (<i>Sonchus</i> spp.)	1% (0 - 3)	4% (0 - 20)	6% (0 - 20)
chamisso's arnica (<i>Arnica chamissonis</i>)	1% (0 - 3)		
Canada thistle (<i>Cirsium arvense</i>)		1% (0 - 3)	3% (0 - 10)
veiny meadow-rue (<i>Thalictrum venulosum</i>)		3% (0 - 10)	2% (0 - 10)
Canada goldenrod (<i>Solidago canadensis</i>)		4% (0 - 10)	
American wild licorice (<i>Glycyrrhiza lepidota</i>)		3% (0 - 20)	
water smartweed (<i>Persicaria amphibia</i> var. <i>emersum</i>)		1% (0 - 10)	
yellow avens (<i>Geum aleppicum</i>)		1% (0 - 3)	
western dock (<i>Rumex occidentalis</i>)		1% (0 - 3)	
common dandelion (<i>Taraxacum officinale</i>)		1% (0 - 3)	
white sweet-clover (<i>Melilotus alba</i>)			2% (0 - 10)
graceful cinquefoil (<i>Potentilla gracilis</i>)			2% (0 - 10)
silverweed (<i>Argentina anserina</i>)			2% (0 - 10)
pink wintergreen (<i>Pyrola asarifolia</i>)			2% (0 - 10)
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)			1% (0 - 3)
wild mint (<i>Mentha arvensis</i>)			1% (0 - 3)
blue-bur (<i>Lappula squarrosa</i>)			1% (0 - 3)
slender blue beardtongue (<i>Penstemon procerus</i>)			1% (0 - 3)
rush aster (<i>Symphotrichum boreale</i>)			1% (0 - 3)
seaside arrow-grass (<i>Triglochin maritimum</i>)			1% (0 - 3)

Minor tall shrubs		1%	1%
Minor short shrubs	1%		
Minor graminoids		1%	1%
Minor forbs and half-shrubs	2%	7%	3%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	58%	59%
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RECOMMENDED STOCKING RATE	insufficient data
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PEZ-SUB-I, PEZ-SUB-J, PEZ-SUB-K

Beaked Willow – Dogwood

Prairie Ecozone: Subirrigated Ecosite

GENERAL DESCRIPTION: These communities represent willow-dogwood stands on the Subirrigated Ecosite. They can be found anywhere in the Prairie Ecozone. PEZ-SUB-I is interpreted to be a **reference community**, while PEZ-SUB-J and PEZ-SUB-K show **minor and moderate alteration**, respectively, resulting from grazing impact and exotic invasion. The dense shrub stands of PEZ-SUB-I provide little herbaceous forage, but are good sources of palatable browse. The altered communities (PEZ-SUB-J and PEZ-SUB-K) are more open and the exotic grasses provide more herbaceous forage.

While separate communities dominated by basket willow, beaked willow, and yellow willow are shown here, many stands are mixtures of willow species. Willow communities occur at the wetter end of the Subirrigated Ecosite, and may overlap with the Wet Meadow Ecosite. The Beaked Willow / Awned Sedge community is shown under Wet Meadow.

This description is derived from Tables 24, 25, and 26 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

STRUCTURE - no information

PEZ-SUB-I Beaked Willow - Dogwood	PEZ-SUB-J Beaked Willow – Dogwood / Smooth Brome	PEZ-SUB-K Beaked Willow
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SPECIES COMPOSITION (% canopy cover)

Major trees			
white birch (<i>Betula papyrifera</i>)	1% (0 - 10)		
Major tall shrubs			
beaked willow (<i>Salix bebbiana</i>)	61% (30 - 90)	60% (10 - 90)	56% (20 - 98)
red-osier dogwood (<i>Cornus sericea</i>)	33% (10 - 70)	21% (3 - 40)	
basket willow (<i>Salix petiolaris</i>)	1% (0 - 10)	3% (0 - 20)	1% (0 - 20)
false mountain willow (<i>Salix pseudomonticola</i>)	3% (0 - 30)		2% (0 - 20)
saskatoon (<i>Amelanchier alnifolia</i>)	2% (0 - 10)		
choke-cherry (<i>Prunus virginiana</i>)	1% (0 - 3)		
sandbar willow (<i>Salix interior</i>)		1% (0 - 10)	
plane-leaf willow (<i>Salix planifolia</i>)		6% (0 - 50)	2% (0 - 20)
yellow willow (<i>Salix famelica</i>)		1% (0 - 20)	1% (0 - 20)
myrtle-leaved willow (<i>Salix myrtillifolia</i>)			2% (0 - 20)
Major short shrubs			
rose (<i>Rosa</i> spp.)	6% (0 - 20)	5% (0 - 20)	2% (0 - 10)
western snowberry (<i>Symphoricarpos occidentalis</i>)	5% (0 - 20)	7% (0 - 30)	3% (0 - 50)
northern gooseberry (<i>Ribes oxycanthoides</i>)	1% (0 - 10)	1% (0 - 3)	2% (0 - 20)
wild red raspberry (<i>Rubus idaeus</i>)		1% (0 - 10)	2% (0 - 40)

	PEZ-SUB-I	PEZ-SUB-J	PEZ-SUB-K
Major prostrate shrubs			
creeping juniper (<i>Juniperus horizontalis</i>)		4% (0 - 60)	

Major graminoids			
redtop (<i>Agrostis stolonifera</i>)	3% (0 - 20)	3% (0 - 20)	1% (0 - 10)
Kentucky blue-grass (<i>Poa pratensis</i>)	3% (0 - 10)	7% (0 - 30)	8% (0 - 30)
smooth brome (<i>Bromus inermis</i>)	3% (0 - 10)	16% (0 - 90)	5% (0 - 80)
manna-grass (<i>Glyceria</i> spp.)	3% (0 - 20)	7% (0 - 60)	2% (0 - 40)
marsh reed-grass (<i>Calamagrostis canadensis</i>)	2% (0 - 20)	4% (0 - 20)	4% (0 - 40)
common timothy (<i>Phleum pratense</i>)	2% (0 - 10)	2% (0 - 10)	7% (0 - 50)
reed canary-grass (<i>Phalaris arundinacea</i>)	7% (0 - 30)	1% (0 - 10)	
awned sedge (<i>Carex atherodes</i>)	5% (0 - 30)	1% (0 - 10)	
fowl blue-grass (<i>Poa palustris</i>)	1% (0 - 10)		3% (0 - 50)
Bebb's sedge (<i>Carex bebbii</i>)	1% (0 - 10)		
American slough grass (<i>Beckmannia syzigachne</i>)		2% (0 - 20)	
Torrey's rush (<i>Juncus torreyi</i>)		1% (0 - 10)	
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)		1% (0 - 10)	
western wheat-grass (<i>Pascopyrum smithii</i>)		1% (0 - 10)	
Baltic rush (<i>Juncus arcticus</i> var. <i>balticus</i>)			6% (0 - 80)
fringed brome (<i>Bromus ciliatus</i>)			1% (0 - 10)
mountain sedge (<i>Carex scopulorum</i>)			1% (0 - 20)

Major forbs and half-shrubs			
field horsetail (<i>Equisetum arvense</i>)	4% (0 - 20)	2% (0 - 20)	3% (0 - 30)
Canada goldenrod (<i>Solidago canadensis</i>)	2% (0 - 10)	2% (0 - 10)	1% (0 - 20)
stinging nettle (<i>Urtica dioica</i>)	1% (0 - 3)	1% (0 - 10)	1% (0 - 10)
common dandelion (<i>Taraxacum officinale</i>)	1% (0 - 3)	1% (0 - 10)	2% (0 - 20)
smooth wild strawberry (<i>Fragaria virginiana</i>)	1% (0 - 3)	1% (0 - 3)	1% (0 - 3)
veiny meadow-rue (<i>Thalictrum venulosum</i>)	2% (0 - 10)	1% (0 - 10)	
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	2% (0 - 10)	1% (0 - 10)	
water-hemlock (<i>Cicuta maculata</i>)	1% (0 - 10)	1% (0 - 10)	
Missouri goldenrod (<i>Solidago missouriensis</i>)	6% (0 - 40)		1% (0 - 10)
hairy hedge-nettle (<i>Stachys pilosa</i>)	2% (0 - 10)		1% (0 - 10)
wild mint (<i>Mentha arvensis</i>)	2% (0 - 10)		1% (0 - 10)
western meadow-rue (<i>Thalictrum occidentale</i>)	1% (0 - 10)		1% (0 - 20)
geranium (<i>Geranium</i> spp.)	1% (0 - 3)		2% (0 - 10)
cut-leaf avens (<i>Geum macrophyllum</i>)	1% (0 - 3)		1% (0 - 10)
American vetch (<i>Vicia americana</i>)	1% (0 - 3)		1% (0 - 3)
western Canada violet (<i>Viola canadensis</i>)	2% (0 - 20)		
common fireweed (<i>Chamerion angustifolium</i>)	2% (0 - 10)		
Lindley's blue aster (<i>Symphotrichum ciliolatum</i>)	1% (0 - 10)		

	PEZ-SUB-I	PEZ-SUB-J	PEZ-SUB-K
northern bedstraw (<i>Galium boreale</i>)	1% (0 - 3)		
perennial sow-thistle (<i>Sonchus arvensis</i>)		4% (0 - 20)	2% (0 - 50)
Canada thistle (<i>Cirsium arvense</i>)		1% (0 - 10)	1% (0 - 10)
sweet-scented bedstraw (<i>Galium triflorum</i>)		1% (0 - 10)	
tufted white prairie aster (<i>Symphyotrichum ericoides</i>)		1% (0 - 10)	
pink wintergreen (<i>Pyrola asarifolia</i>)		1% (0 - 10)	
long-headed anemone (<i>Anemone cylindrica</i>)		1% (0 - 10)	
northern willow-herb (<i>Epilobium ciliatum</i>)		1% (0 - 10)	
sow-thistle (<i>Sonchus</i> spp.)		1% (0 - 10)	
small yellow water buttercup (<i>Ranunculus gmelinii</i>)		1% (0 - 10)	
white clover (<i>Trifolium repens</i>)			3% (0 - 50)
cow-parsnip (<i>Heracleum maximum</i>)			3% (0 - 20)
small enchanter's-nightshade (<i>Circaea alpina</i>)			2% (0 - 40)
smooth blue aster (<i>Symphyotrichum laeve</i>)			1% (0 - 10)
small bedstraw (<i>Galium trifidum</i>)			1% (0 - 20)
tall buttercup (<i>Ranunculus acris</i>)			1% (0 - 20)
tall lungwort (<i>Mertensia paniculata</i>)			1% (0 - 10)

Minor trees			1%
Minor tall shrubs		1%	2%
Minor short shrubs	2%	2%	2%
Minor graminoids	3%	2%	4%
Minor forbs and half-shrubs	8%	9%	11%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	69%	59%
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RECOMMENDED STOCKING RATE	insufficient data		
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PEZ-SUB-L, PEZ-SUB-M, PEZ-SUB-N
Yellow Willow – Dogwood
 Prairie Ecozone: Subirrigated Ecosite

GENERAL DESCRIPTION: These communities represent willow-dogwood stands on the Subirrigated Ecosite. They can be found anywhere in the Prairie Ecozone. PEZ-SUB-L is interpreted to be a **reference community**, while PEZ-WMD-M and PEZ-WMD-N show **moderate** and **significant alteration**, respectively, resulting from grazing impact and exotic invasion. The dense shrub stands of PEZ-SUB-L provide little herbaceous forage, but are good sources of palatable browse. The altered communities (PEZ-SUB-M and PEZ-SUB-N) are more open and the exotic grasses provide more herbaceous forage.

While separate communities dominated by basket willow, beaked willow, and yellow willow are shown here, many stands are mixtures of willow species.

This description is derived from Tables 29, 30, and 31 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

STRUCTURE – no information

PEZ-SUB-L Yellow Willow – Red-osier Dogwood / Rose	PEZ-SUB-M Yellow Willow – Dogwood – Sandbar Willow / Western Snowberry / Smooth Brome	PEZ-SUB-N Yellow Willow – Sandbar Willow
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SPECIES COMPOSITION (% canopy cover)

Major trees			
plains cottonwood (<i>Populus deltoides</i>)	1% (0 - 3)	0% (0 - 1)	
balsam poplar (<i>Populus balsamifera</i>)		1% (0 - 3)	
Major tall shrubs			
yellow willow (<i>Salix famelica</i>)	59% (30 - 80)	27% (10 - 60)	37% (10 - 80)
red-osier dogwood (<i>Cornus sericea</i>)	34% (10 - 70)	18% (3 - 40)	
sandbar willow (<i>Salix interior</i>)	3% (0 - 10)	14% (0 - 50)	25% (0 - 90)
western river alder (<i>Alnus incana</i> ssp. <i>tenuifolia</i>)	1% (0 - 10)	2% (0 - 30)	1% (0 - 3)
river birch (<i>Betula occidentalis</i>)		4% (0 - 60)	
plane-leaf willow (<i>Salix planifolia</i>)		2% (0 - 30)	
choke-cherry (<i>Prunus virginiana</i>)		1% (0 - 10)	
thorny buffalo-berry (<i>Shepherdia argentea</i>)		1% (0 - 10)	
basket willow (<i>Salix petiolaris</i>)		1% (0 - 10)	
saskatoon (<i>Amelanchier alnifolia</i>)		3% (0 - 20)	1% (0 - 10)
shining willow (<i>Salix lucida</i>)			5% (0 - 20)
beaked willow (<i>Salix bebbiana</i>)			1% (0 - 10)

	PEZ-SUB-L	PEZ-SUB-M	PEZ-SUB-N
Major short shrubs			
rose (<i>Rosa</i> spp.)	10% (0 - 30)	9% (0 - 40)	7% (0 - 40)
western snowberry (<i>Symphoricarpos occidentalis</i>)	3% (0 - 10)	10% (0 - 20)	4% (0 - 20)
northern gooseberry (<i>Ribes oxyacanthoides</i>)	1% (0 - 3)	1% (0 - 3)	
golden currant (<i>Ribes aureum</i>)		1% (0 - 10)	
wolf-willow (<i>Elaeagnus commutata</i>)			3% (0 - 30)

Major graminoids			
smooth brome (<i>Bromus inermis</i>)	2% (0 - 10)	21% (0 - 70)	1% (0 - 10)
northern wheat-grass (<i>Elymus lanceolatus</i>)	4% (0 - 30)		
Sprengel's sedge (<i>Carex sprengelii</i>)	3% (0 - 20)		
western wheat-grass (<i>Pascopyrum smithii</i>)	1% (0 - 10)		
slender wedge-grass (<i>Sphenopholis intermedia</i>)	1% (0 - 10)		
Kentucky blue-grass (<i>Poa pratensis</i>)		3% (0 - 20)	4% (0 - 20)
Baltic rush (<i>Juncus arcticus</i> var. <i>balticus</i>)		2% (0 - 20)	1% (0 - 3)
redtop (<i>Agrostis stolonifera</i>)		1% (0 - 20)	3% (0 - 20)
fowl blue-grass (<i>Poa palustris</i>)		1% (0 - 3)	5% (0 - 20)
marsh reed-grass (<i>Calamagrostis canadensis</i>)		1% (0 - 3)	2% (0 - 10)
quack grass (<i>Elymus repens</i>)		1% (0 - 10)	
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)		1% (0 - 10)	
reed canary-grass (<i>Phalaris arundinacea</i>)			3% (0 - 30)
rough hairgrass (<i>Agrostis scabra</i>)			2% (0 - 10)
small-fruited bulrush (<i>Scirpus microcarpus</i>)			1% (0 - 10)

Major forbs and half-shrubs			
Canada thistle (<i>Cirsium arvense</i>)	2% (0 - 10)	2% (0 - 10)	1% (0 - 3)
Canada goldenrod (<i>Solidago canadensis</i>)	1% (0 - 10)	1% (0 - 3)	1% (0 - 3)
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	2% (0 - 3)	2% (0 - 10)	
goldenrod (<i>Solidago</i> spp.)	1% (0 - 3)	2% (0 - 10)	
western Canada violet (<i>Viola canadensis</i>)	4% (0 - 30)		
northern bedstraw (<i>Galium boreale</i>)	3% (0 - 20)		
dogbane (<i>Apocynum</i> spp.)	1% (0 - 10)		
spiny-leaved annual sow-thistle (<i>Sonchus asper</i>)	1% (0 - 10)		
wild sarsaparilla (<i>Aralia nudicaulis</i>)	1% (0 - 10)		
marsh skullcap (<i>Scutellaria galericulata</i>)	1% (0 - 10)		
wild mint (<i>Mentha arvensis</i>)	1% (0 - 3)		
American wild licorice (<i>Glycyrrhiza lepidota</i>)		2% (0 - 10)	1% (0 - 3)
field horsetail (<i>Equisetum arvense</i>)		1% (0 - 10)	2% (0 - 3)
American vetch (<i>Vicia americana</i>)		2% (0 - 20)	
western white clematis (<i>Clematis ligusticifolia</i>)		2% (0 - 20)	

	PEZ-SUB-L	PEZ-SUB-M	PEZ-SUB-N
stinging nettle (<i>Urtica dioica</i>)		1% (0 - 20)	
late goldenrod (<i>Solidago gigantea</i>)		1% (0 - 10)	
fringed loosestrife (<i>Lysimachia ciliata</i>)		1% (0 - 10)	
common tansy (<i>Tanacetum vulgare</i>)		1% (0 - 10)	
white sweet-clover (<i>Melilotus alba</i>)			2% (0 - 10)
common plantain (<i>Plantago major</i>)			1% (0 - 10)
silverweed (<i>Argentina anserina</i>)			1% (0 - 10)
northern willow-herb (<i>Epilobium ciliatum</i>)			1% (0 - 10)
western willow aster (<i>Symphotrichum lanceolatum</i> var. <i>hesperium</i>)			1% (0 - 10)
Major bryophytes			
sphagnum moss (<i>Sphagnum</i> spp.)	8% (0 - 60)		
Minor tall shrubs	2%	1%	1%
Minor short shrubs	1%	1%	0%
Minor graminoids	3%	1%	4%
Minor forbs and half-shrubs	4%	5%	4%
SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	49%	41%
RECOMMENDED STOCKING RATE	insufficient data		

PEZ-SUB-O, PEZ-SUB-P
Shrub Communities on Subirrigated Sand
Prairie Ecozone: Subirrigated Ecosite (Sand)

GENERAL DESCRIPTION: These are distinctive communities occurring on Subirrigated sand flats, which are usually associated with dunesand complexes. Prostrate shrubs make up the highest ground cover in both communities. PEZ-SUB-P also has tall and short shrub layers, with river birch, beaked willow, and wolf-willow often prominent. Herbaceous species are sparse, and productivity for livestock grazing is low. The species composition indicates some salinity. The status of these communities with respect to grazing impact is uncertain.

PEZ-SUB-O Creeping Juniper – Bearberry / Wild Licorice	PEZ-SUB-P River Birch / Wolf-willow / Creeping Juniper – Bearberry
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STRUCTURE	(n=6)	(n=7)
tree cover		1% (0 - 3)
tall shrub cover	1% (0 - 2)	12% (0 - 39)
short shrub cover	4% (1 - 8)	19% (0 - 30)
prostrate shrub cover	53% (30 - 81)	41% (15 - 59)
herbaceous cover	12% (6 - 24)	17% (5 - 40)
clubmoss cover	1% (0 - 2)	
moss cover		3% (0 - 7)
lichen cover	1% (1 - 1)	
litter cover	11% (11 - 11)	

SPECIES COMPOSITION	(n=6)	(n=7)
Major trees (% foliar cover)		
trembling aspen (<i>Populus tremuloides</i>)		1% (0 - 3)

Major tall shrubs (% foliar cover)		
river birch (<i>Betula occidentalis</i>)		3% (0 - 10)
beaked willow (<i>Salix bebbiana</i>)		3% (0 - 10)
choke-cherry (<i>Prunus virginiana</i>)		1% (0 - 3)

Major short shrubs (% foliar cover)		
wolf-willow (<i>Elaeagnus commutata</i>)	2% (0 - 5)	13% (0 - 26)
western snowberry (<i>Symphoricarpos occidentalis</i>)	2% (0 - 3)	3% (0 - 10)
rose (<i>Rosa</i> spp.)		4% (0 - 11)

Major prostrate shrubs (% foliar cover)		
creeping juniper (<i>Juniperus horizontalis</i>)	34% (15 - 59)	24% (3 - 50)
bearberry (<i>Arctostaphylos uva-ursi</i>)	19% (0 - 56)	17% (0 - 43)

	PEZ-SUB-O	PEZ-SUB-P
Major graminoids (% biomass)		
sand grass (<i>Calamovilfa longifolia</i>)	5% (0 - 14)	8% (0 - 20)
little bluestem (<i>Schizachyrium scoparium</i>)	6% (0 - 12)	4% (0 - 10)
sun-loving sedge (<i>Carex inops</i>)	3% (0 - 9)	5% (0 - 13)
graceful sedge (<i>Carex praegracilis</i>)	6% (0 - 19)	1% (0 - 4)
june grass (<i>Koeleria macrantha</i>)	4% (1 - 8)	4% (0 - 12)
western wheat-grass (<i>Pascopyrum smithii</i>)	5% (0 - 13)	1% (0 - 3)
alkali cord grass (<i>Spartina gracilis</i>)	3% (1 - 7)	2% (0 - 5)
blue grass (<i>Poa</i> spp.)	1% (0 - 4)	3% (0 - 9)
needle-and-thread (<i>Hesperostipa comata</i>)	3% (0 - 8)	1% (0 - 2)
Kentucky blue grass (<i>Poa pratensis</i>)	2% (0 - 6)	2% (0 - 4)
sedge (<i>Carex</i> spp.)	3% (0 - 6)	1% (0 - 2)
northern reed grass (<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>)	2% (0 - 5)	1% (0 - 4)
rush (<i>Juncus</i> spp.)	1% (0 - 2)	1% (0 - 2)
blue grama (<i>Bouteloua gracilis</i>)	7% (0 - 21)	
low sedge (<i>Carex duriuscula</i>)	5% (0 - 14)	
baltic rush (<i>Juncus arcticus</i> var. <i>balticus</i>)	1% (0 - 3)	
thread-leaved sedge (<i>Carex filifolia</i>)	1% (0 - 3)	
salt grass (<i>Distichlis spicata</i> var. <i>stricta</i>)	1% (0 - 3)	
awned wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>subsecundus</i>)	1% (0 - 2)	
northern wheat-grass (<i>Elymus lanceolatus</i>)	1% (0 - 2)	
unknown graminoid (<i>unknown graminoid</i>)	1% (0 - 2)	
hay sedge (<i>Carex siccata</i>)		11% (0 - 36)
blunt sedge (<i>Carex obtusata</i>)		4% (0 - 12)
muhly (<i>Muhlenbergia</i> spp.)		3% (0 - 8)
marsh reed grass (<i>Calamagrostis canadensis</i>)		2% (0 - 7)
sheep fescue (<i>Festuca saximontana</i>)		2% (0 - 7)

Major forbs and half-shrubs (% biomass)		
wild licorice (<i>Glycyrrhiza lepidota</i>)	14% (0 - 41)	8% (0 - 25)
pasture sage (<i>Artemisia frigida</i>)	9% (0 - 22)	9% (0 - 28)
horsetail (<i>Equisetum</i> spp.)	2% (0 - 5)	6% (0 - 19)
goldenrod (<i>Solidago</i> spp.)	3% (0 - 8)	3% (0 - 8)
purple prairie-clover (<i>Dalea purpurea</i>)	3% (0 - 10)	2% (0 - 6)
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	1% (0 - 3)	1% (0 - 4)
prairie sage (<i>Artemisia ludoviciana</i>)	1% (0 - 2)	1% (0 - 2)
hairy golden-aster (<i>Heterotheca villosa</i>)	1% (0 - 4)	
golden bean (<i>Thermopsis rhombifolia</i>)		3% (0 - 10)
everlasting (<i>Antennaria</i> spp.)		2% (0 - 6)
low goldenrod (<i>Solidago missouriensis</i>)		2% (0 - 5)
harebell (<i>Campanula rotundifolia</i>)		2% (0 - 5)

	PEZ-SUB-O	PEZ-SUB-P
smooth wild strawberry (<i>Fragaria virginiana</i>)		1% (0 - 3)
lance-leaved psoralea (<i>Psoralidium lanceolatum</i>)		1% (0 - 3)
narrow-leaved puccoon (<i>Lithospermum incisum</i>)		1% (0 - 3)
pale comandra (<i>Comandra umbellata</i> ssp. <i>pallida</i>)		1% (0 - 3)
Minor short shrubs (% foliar cover)	1%	0%
Minor graminoids (% biomass)	3%	2%
Minor forbs and half-shrubs (% biomass)	4%	4%
SIMILARITY TO REFERENCE COMMUNITY	unknown	unknown
RECOMMENDED STOCKING RATE	none to low	none to low

PEZ-SUB-Q, PEZ-SUB-R, PEZ-SUB-S
Aspen/Dogwood Communities
 Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: These communities represent aspen stands on the Overflow and Subirrigated Ecosites. They occur in the Aspen Parkland, Mixed Grassland and Cypress Upland Ecoregions. PEZ-SUB-Q is interpreted to be a **reference community**, while PEZ-SUB-R and PEZ-SUB-S show **moderate** and **significant alteration**, respectively, resulting from grazing impact and exotic invasion. PEZ-SUB-Q is similar in understory composition to the balsam poplar-dominated AP-SUB-A, described for the Subirrigated Ecosite in the Aspen Parkland. Recommended stocking rates for aspen communities are assumed to be the same as for balsam poplar-aspen communities. Note that aspen stands on upland ecosites (e.g. AP-LM-F on Loam, AP-SD-G on Sand) are not included here.

The description is derived from Tables 16, 17, and 18 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

	PEZ-SUB-Q Aspen / Dogwood – Saskatoon – Choke-cherry	PEZ-SUB-R Aspen / Dogwood / Snowberry – Rose / Smooth Brome – Kentucky Blue-grass	PEZ-SUB-S Aspen / Kentucky Blue-grass – Smooth Brome
Major trees			
trembling aspen (<i>Populus tremuloides</i>)	44% (10 - 60)	64% (10 - 90)	86% (60 - 98)
balsam poplar (<i>Populus balsamifera</i>)	8% (0 - 50)	4% (0 - 60)	
narrow-leaved cottonwood (<i>Populus angustifolia</i>)	1% (0 - 10)		

Major tall shrubs			
red-osier dogwood (<i>Cornus sericea</i>)	15% (3 - 20)	13% (0 - 60)	
saskatoon (<i>Amelanchier alnifolia</i>)	11% (3 - 20)	5% (0 - 20)	
choke-cherry (<i>Prunus virginiana</i>)	10% (0 - 30)	4% (0 - 20)	
beaked willow (<i>Salix bebbiana</i>)	1% (0 - 10)	8% (0 - 50)	
low bush-cranberry (<i>Viburnum edule</i>)	2% (0 - 10)		
beaked hazelnut (<i>Corylus cornuta</i>)	1% (0 - 3)		
round-leaved hawthorn (<i>Crataegus chrysocarpa</i>)		1% (0 - 10)	

Major short shrubs			
wild red raspberry (<i>Rubus idaeus</i>)	6% (0 - 20)	7% (0 - 30)	1% (0 - 10)
rose (<i>Rosa</i> spp.)	6% (1 - 20)	12% (0 - 30)	4% (0 - 10)
western snowberry (<i>Symphoricarpos occidentalis</i>)	3% (0 - 10)	16% (0 - 50)	3% (0 - 10)
northern snowberry (<i>Symphoricarpos albus</i>)	1% (0 - 3)	1% (0 - 10)	
wild black currant (<i>Ribes americanum</i>)	1% (0 - 10)		
Canada buffalo-berry (<i>Shepherdia canadensis</i>)	1% (0 - 3)		
northern gooseberry (<i>Ribes oxycanthoides</i>)		3% (0 - 10)	1% (0 - 3)

	PEZ-SUB-Q	PEZ-SUB-R	PEZ-SUB-S
Major graminoids			
Kentucky blue-grass (<i>Poa pratensis</i>)	3% (0 - 10)	10% (0 - 40)	19% (0 - 98)
smooth brome (<i>Bromus inermis</i>)	1% (0 - 10)	23% (0 - 90)	12% (0 - 90)
marsh reed-grass (<i>Calamagrostis canadensis</i>)	1% (0 - 3)	1% (0 - 10)	6% (0 - 70)
reed-grass (<i>Calamagrostis</i> spp.)	1% (0 - 10)		
Sprengel's sedge (<i>Carex sprengelii</i>)	1% (0 - 3)		
common timothy (<i>Phleum pratense</i>)		1% (0 - 10)	9% (0 - 30)
Virginia wild-rye (<i>Elymus virginicus</i>)		1% (0 - 10)	
awned sedge (<i>Carex atherodes</i>)		1% (0 - 20)	
western wheat-grass (<i>Pascopyrum smithii</i>)		1% (0 - 10)	
fowl blue-grass (<i>Poa palustris</i>)			4% (0 - 30)
quack grass (<i>Elymus repens</i>)			4% (0 - 30)
woolly sedge (<i>Carex pellita</i>)			2% (0 - 20)
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)			1% (0 - 3)
narrow reed-grass (<i>Calamagrostis stricta</i> ssp. <i>stricta</i>)			1% (0 - 3)
Major forbs and half-shrubs			
northern bedstraw (<i>Galium boreale</i>)	2% (0 - 10)	2% (0 - 3)	1% (0 - 3)
Richardson's geranium (<i>Geranium richardsonii</i>)	1% (0 - 10)	1% (0 - 3)	2% (0 - 10)
field horsetail (<i>Equisetum arvense</i>)	1% (0 - 3)	2% (0 - 20)	1% (0 - 10)
smooth wild strawberry (<i>Fragaria virginiana</i>)	1% (0 - 3)	2% (0 - 3)	1% (0 - 10)
American vetch (<i>Vicia americana</i>)	1% (0 - 1)	1% (0 - 10)	1% (0 - 3)
western Canada violet (<i>Viola canadensis</i>)	3% (0 - 10)	2% (0 - 10)	
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	1% (1 - 3)	4% (0 - 20)	
purple clematis (<i>Clematis occidentalis</i>)	1% (0 - 3)	1% (0 - 3)	
wild sarsaparilla (<i>Aralia nudicaulis</i>)	5% (0 - 10)		
tall lungwort (<i>Mertensia paniculata</i>)	1% (0 - 3)		
baneberry (<i>Actaea rubra</i>)	1% (0 - 3)		
veiny meadow-rue (<i>Thalictrum venulosum</i>)		2% (0 - 10)	1% (0 - 10)
Canada thistle (<i>Cirsium arvense</i>)		2% (0 - 20)	1% (0 - 3)
common dandelion (<i>Taraxacum officinale</i>)		1% (0 - 3)	2% (0 - 10)
smooth blue aster (<i>Symphyotrichum laeve</i>)		1% (0 - 10)	1% (0 - 3)
common fireweed (<i>Chamerion angustifolium</i>)		1% (0 - 20)	
pink wintergreen (<i>Pyrola asarifolia</i>)		1% (0 - 10)	
grooved agrimony (<i>Agrimonia striata</i>)		1% (0 - 10)	
cow-parsnip (<i>Heracleum maximum</i>)			4% (0 - 40)
Lindley's blue aster (<i>Symphyotrichum ciliolatum</i>)			1% (0 - 10)
Canada goldenrod (<i>Solidago canadensis</i>)			1% (0 - 10)

	PEZ-SUB-Q	PEZ-SUB-R	PEZ-SUB-S
Minor tall shrubs	1%	1%	1%
Minor short shrubs	2%	1%	0%
Minor graminoids	1%	3%	2%
Minor forbs and half-shrubs	7%	7%	7%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	53%	28%
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RECOMMENDED STOCKING RATES (AUM/ha)			
closed stands (>50% canopy closure)	0.42 AUM/ha	0.22 AUM/ha	0.50AUM/ha
	0.17 AUM/ac	0.09 AUM/ac	0.20 AUM/ac
open stands (<50% canopy closure)	0.62 AUM/ha	0.32 AUM/ha	0.74 AUM/ha
	0.25 AUM/ac	0.13 AUM/ac	0.30 AUM/ac

AP-SUB-A, AP-SUB-B, AP-SUB-C

Balsam Poplar / Dogwood Communities

Aspen Parkland: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: These communities represent balsam poplar-dominated stands on the Subirrigated and Overflow Ecosites. They occur mainly in the Aspen Parkland, although they may occur to a lesser extent in the Mixed Grassland.

AP-SUB-A is interpreted to be the **reference community**. It provides a mix of palatable graminoids, forbs, and shrubs. Recommended stocking rates are based on average yields in open and closed stands of reference communities.

AP-SUB-B shows **significant alteration** as a result of grazing impact. Palatable tall shrubs such as dogwood, choke-cherry, and saskatoon have decreased, while the short shrub layer of snowberry and rose has increased. Recommended stocking rates are based on average yields in closed shrubby stands that have been altered by grazing; rates in open stands are estimated. The transition to a low shrub type results in lower recommended stocking rates compared to the reference community

AP-SUB-C shows **severe alteration** as a result of grazing impact and exotic invasion. Smooth brome, Kentucky blue-grass and other exotics invade stands in which the native species have been weakened by heavy grazing. Production of palatable forage appears to be higher than in the reference community, mainly because of the increased proportion of grass. Recommended stocking rates are based on average yields in open grassy stands that have been altered by grazing; rates in closed stands are estimated. While the ecological status of this community is low, reducing stocking rates will probably not reverse the invasion of exotic herbs. Therefore, recommended stocking rates are higher than for the reference community. Fire may kill exotic herbs and encourage resprouting of native shrubs, so may aid the transition back to a native community.

The descriptions for AP-SUB-A and AP-SUB-B are based on analysis of Saskatchewan data, and were originally shown as AP-MO-A and AP-MO-B in Thorpe and Godwin (2008). The description for AP-SUB-C is derived from Table 9 in Thompson and Hansen (2001), which includes some data from outside Saskatchewan. Balsam poplar – aspen stands in the Moose Mountain Upland, which is mapped within the Aspen Parkland Ecoregion, are more boreal in character than the type described here, and some of them also differ in having an understory of green ash. For classification of these stands, please refer to: *PR8 Balsam poplar – trembling aspen – green ash* (McLaughlan et al. 2010).

AP-SUB-A Balsam Poplar – Aspen / Dogwood / Sarsaparilla	AP-SUB-B Balsam Poplar – Aspen / Snowberry - Rose	AP-SUB-C Balsam Poplar / Smooth Brome – Kentucky Blue-grass
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STRUCTURE

tree cover (n=19, n=5)	54% (27 - 79)	37% (19 - 53)	[no data]
tall shrub cover (n=22, n=8)	28% (15 - 54)	4% (0 - 9)	
short shrub cover (n=22, n=8)	17% (1 - 39)	28% (15 - 39)	
prostrate shrub cover (n=22, n=8)	2% (0 - 0)	0% (0 - 0)	
herbaceous cover (n=22, n=8)	24% (1 - 41)	17% (4 - 29)	
moss cover (n=4, n=4)	1% (1 - 2)	0% (0 - 0)	
litter cover (n=3, n=1)	90% (90 - 90)	50% (50 - 50)	
bare soil (n=4, n=4)	0% (0 - 0)	2% (0 - 5)	

SPECIES COMPOSITION	% foliar cover, n=22	% foliar cover, n=8	% canopy cover
Major trees			
balsam poplar (<i>Populus balsamifera</i>)	31% (0 - 63)	27% (10 - 38)	58% (30 - 98)
trembling aspen (<i>Populus tremuloides</i>)	20% (0 - 63)	11% (0 - 29)	1% (0 - 3)
white birch (<i>Betula papyrifera</i>)	2% (0 - 0)		
jack poplar (<i>Populus X jackii</i>)	2% (0 - 0)		
Manitoba maple (<i>Acer negundo</i>)	1% (0 - 0)		
Major tall shrubs			
red-osier dogwood (<i>Cornus sericea</i>)	14% (0 - 20)		
pin cherry (<i>Prunus pensylvanica</i>)	2% (0 - 14)		
high bush-cranberry (<i>Viburnum opulus</i>)	2% (0 - 3)		
European buckthorn (<i>Rhamnus cathartica</i>)	1% (0 - 0)		
choke-cherry (<i>Prunus virginiana</i>)	4% (0 - 15)	1% (0 - 1)	
saskatoon (<i>Amelanchier alnifolia</i>)	3% (0 - 15)	1% (0 - 2)	
beaked hazelnut (<i>Corylus cornuta</i>)	3% (0 - 15)	3% (0 - 9)	1% (0 - 10)
willow (<i>Salix</i> spp.)	1% (0 - 5)		2% (0 - 20)
Major short shrubs			
rose (<i>Rosa</i> spp.)	5% (0 - 15)	10% (3 - 16)	1% (0 - 3)
wild red raspberry (<i>Rubus idaeus</i>)	3% (0 - 15)	1% (0 - 2)	1% (0 - 10)
western snowberry (<i>Symphoricarpos occidentalis</i>)	2% (0 - 6)	12% (4 - 18)	2% (0 - 10)
Canada buffalo-berry (<i>Shepherdia canadensis</i>)	1% (0 - 0)	2% (0 - 5)	
northern snowberry (<i>Symphoricarpos albus</i>)	1% (0 - 3)		
poison-ivy (<i>Toxicodendron rydbergii</i>)	1% (0 - 0)		
northern gooseberry (<i>Ribes oxycanthoides</i>)		2% (0 - 5)	
wolf-willow (<i>Elaeagnus commutata</i>)			1% (0 - 10)
Major prostrate shrubs			
common bearberry (<i>Arctostaphylos uva-ursi</i>)	1% (0 - 0)		
creeping juniper (<i>Juniperus horizontalis</i>)	1% (0 - 0)		
Major graminoids			
Kentucky blue-grass (<i>Poa pratensis</i>)	1% (0 - 0)	2% (0 - 5)	11% (0 - 50)
sedge (<i>Carex</i> spp.)	1% (0 - 0)		1% (0 - 3)
rough-leaved rice-grass (<i>Oryzopsis asperifolia</i>)	2% (0 - 2)	1% (0 - 1)	
false melic grass (<i>Schizachne purpurascens</i>)	1% (0 - 1)		
smooth brome (<i>Bromus inermis</i>)			26% (0 - 90)
common timothy (<i>Phleum pratense</i>)			8% (0 - 60)
rough hairgrass (<i>Agrostis scabra</i>)			1% (0 - 20)

	AP-SUB-A	AP-SUB-B	AP-SUB-C
quack grass (<i>Elymus repens</i>)			1% (0 - 10)
marsh reed-grass (<i>Calamagrostis canadensis</i>)			1% (0 - 10)
fox-tail barley (<i>Hordeum jubatum</i>)			1% (0 - 10)
reed canary-grass (<i>Phalaris arundinacea</i>)			1% (0 - 10)
fowl blue-grass (<i>Poa palustris</i>)			1% (0 - 10)
western wheat-grass (<i>Pascopyrum smithii</i>)			1% (0 - 10)

Major forbs and half-shrubs			
wild sarsaparilla (<i>Aralia nudicaulis</i>)	11% (0 - 38)	6% (0 - 15)	2% (0 - 30)
Canada thistle (<i>Cirsium arvense</i>)	1% (0 - 0)		1% (0 - 10)
dewberry (<i>Rubus pubescens</i>)	1% (0 - 3)		
Violet (<i>Viola</i> spp.)	1% (0 - 2)		
raspberry (<i>Rubus</i> spp.)	1% (0 - 0)		
meadow horsetail (<i>Equisetum pratense</i>)	1% (0 - 0)		
wild lily-of-the-valley (<i>Maianthemum canadense</i>)	1% (0 - 2)		
smooth wild strawberry (<i>Fragaria virginiana</i>)		1% (0 - 2)	
northern bedstraw (<i>Galium boreale</i>)		1% (0 - 2)	
purple vetchling (<i>Lathyrus venosus</i>)		1% (0 - 2)	
Richardson's geranium (<i>Geranium richardsonii</i>)			2% (0 - 10)
stinging nettle (<i>Urtica dioica</i>)			1% (0 - 20)
wavy-leaved thistle (<i>Cirsium undulatum</i>)			1% (0 - 20)
star-flowered solomon's-seal (<i>aianthemum stellatum</i>)			1% (0 - 10)
common dandelion (<i>Taraxacum officinale</i>)			1% (0 - 10)
field horsetail (<i>Equisetum arvense</i>)			1% (0 - 10)
Canada goldenrod (<i>Solidago canadensis</i>)			1% (0 - 10)
cow-parsnip (<i>Heracleum maximum</i>)			1% (0 - 10)
American wild licorice (<i>Glycyrrhiza lepidota</i>)			1% (0 - 3)
sweet-scented bedstraw (<i>Galium triflorum</i>)			1% (0 - 10)
late goldenrod (<i>Solidago gigantea</i>)			1% (0 - 10)
butter-and-eggs (<i>Linaria vulgaris</i>)			1% (0 - 10)
western sweet-cicely (<i>Osmorhiza berteroi</i>)			1% (0 - 10)
tall coneflower (<i>Rudbeckia laciniata</i>)			1% (0 - 10)
meadow-rue (<i>Thalictrum</i> spp.)			1% (0 - 10)
western Canada violet (<i>Viola canadensis</i>)			1% (0 - 3)

Minor tall shrubs	1%	1%	1%
Minor short shrubs	1%	1%	1%
Minor graminoids	1%	1%	1%
Minor forbs and half-shrubs	5%	3%	9%

	AP-SUB-A	AP-SUB-B	AP-SUB-C
SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	41%	19%

RECOMMENDED STOCKING RATES (AUM/ha)			
closed stands (>50% canopy closure)	0.42 AUM/ha 0.17 AUM/ac	0.22 AUM/ha 0.09 AUM/ac	0.50AUM/ha 0.20 AUM/ac
open stands (<50% canopy closure)	0.62 AUM/ha 0.25 AUM/ac	0.32 AUM/ha 0.13 AUM/ac	0.74 AUM/ha 0.30 AUM/ac



MG-SUB-C, MG-SUB-D, MG-SUB-E
Plains Cottonwood Communities

Mixed Grassland and Dry Mixed Grassland: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: Plains cottonwood stands on Subirrigated and Overflow Ecosites in the Dry Mixed Grassland and Mixed Grassland Ecoregions. May also occur in a few locations in the Aspen Parkland Ecoregion. These stands are usually on alluvial deposits, but have been stable long enough for full establishment of the understory vegetation. Open cottonwood stands also occur occasionally on subirrigated sand flats within dunesand complexes. **AP-SUB-C** represents the **reference community** in stands that are ungrazed or lightly grazed. Under the usually open tree canopy there is a dense tall shrub stratum. **AP-SUB-D** shows **significant alteration** from the reference community as a result of grazing impact. Palatable tall shrubs have been reduced, leaving a short shrub layer of snowberry and rose. **AP-SUB-E** shows **severe alteration** as a result of grazing impact. Most shrub cover has been eliminated, leaving an open, grassy stand with substantial invasion of exotic species.

The description is derived from Tables 12, 13, and 15 in Thompson and Hansen (2001), which include some data from outside Saskatchewan. Recommended stocking rates are assumed to be the same as for the balsam poplar-dominated communities described for the Aspen Parkland (AP-SUB-A, AP-SUB-B, AP-SUB-D).

MG-SUB-C Plains Cottonwood / Dogwood – Willow	MG-SUB-D Plains Cottonwood / Snowberry - Rose	MG-SUB-E Plains Cottonwood / Smooth Brome
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STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

Major trees			
plains cottonwood (<i>Populus deltoides</i>)	56% (0 - 90)	51% (20 - 90)	65% (40 - 98)
lance-leaved cottonwood (<i>Populus x acuminata</i>)	9% (0 - 90)		
balsam poplar (<i>Populus balsamifera</i>)	5% (0 - 40)	2% (0 - 20)	
narrow-leaved cottonwood (<i>Populus angustifolia</i>)	2% (0 - 20)	1% (0 - 20)	
peach-leaved willow (<i>Salix amygdaloides</i>)		1% (0 - 10)	

Major tall shrubs			
red-osier dogwood (<i>Cornus sericea</i>)	50% (3 - 98)		
yellow willow (<i>Salix famelica</i>)	17% (0 - 60)	4% (0 - 60)	
sandbar willow (<i>Salix interior</i>)	8% (0 - 80)	7% (0 - 80)	1% (0 - 10)
thorny buffalo-berry (<i>Shepherdia argentea</i>)		5% (0 - 90)	
choke-cherry (<i>Prunus virginiana</i>)	5% (0 - 40)	2% (0 - 30)	
riverbank grape (<i>Vitis riparia</i>)		2% (0 - 20)	
western river alder (<i>Alnus incana</i> ssp. <i>tenuifolia</i>)	1% (0 - 10)		

Major short shrubs			
western snowberry (<i>Symphoricarpos occidentalis</i>)	1% (0 - 3)	25% (0 - 80)	2% (0 - 10)
rose (<i>Rosa</i> spp.)	10% (0 - 30)	18% (0 - 98)	

	MG-SUB-C	MG-SUB-D	MG-SUB-E
Major graminoids			
smooth brome (<i>Bromus inermis</i>)	8% (0 - 50)	7% (0 - 60)	14% (0 - 70)
western wheat-grass (<i>Pascopyrum smithii</i>)	1% (0 - 10)	9% (0 - 70)	5% (0 - 30)
Canada wild-rye (<i>Elymus canadensis</i>)		4% (0 - 20)	7% (0 - 20)
quack grass (<i>Elymus repens</i>)	2% (0 - 20)	1% (0 - 10)	6% (0 - 20)
marsh muhly (<i>Muhlenbergia racemosa</i>)		1% (0 - 20)	5% (0 - 20)
Kentucky blue-grass (<i>Poa pratensis</i>)		5% (0 - 60)	3% (0 - 20)
northern wheat-grass (<i>Elymus lanceolatus</i>)	5% (0 - 50)		
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)			3% (0 - 40)
fowl blue-grass (<i>Poa palustris</i>)		2% (0 - 40)	2% (0 - 20)
fox-tail barley (<i>Hordeum jubatum</i>)	2% (0 - 20)	1% (0 - 20)	
blue-grass (<i>Poa</i> spp.)		2% (0 - 20)	
redtop (<i>Agrostis stolonifera</i>)		2% (0 - 40)	
downy brome (<i>Bromus tectorum</i>)		1% (0 - 20)	
prairie cord-grass (<i>Spartina pectinata</i>)			1% (0 - 10)
sand-grass (<i>Calamovilfa longifolia</i>)			1% (0 - 3)

Major forbs			
Canada goldenrod (<i>Solidago canadensis</i>)	13% (0 - 60)	1% (0 - 20)	3% (0 - 20)
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	7% (0 - 40)	2% (0 - 20)	
American wild licorice (<i>Glycyrrhiza lepidota</i>)	2% (0 - 20)	2% (0 - 20)	4% (0 - 20)
poison-ivy (<i>Toxicodendron rydbergii</i>)		4% (0 - 20)	
perennial sow-thistle (<i>Sonchus arvensis</i>)		3% (0 - 80)	
white sweet-clover (<i>Melilotus alba</i>)	2% (0 - 20)	1% (0 - 30)	2% (0 - 20)
Indian hemp (<i>Apocynum cannabinum</i>)			2% (0 - 10)
field horsetail (<i>Equisetum arvense</i>)			2% (0 - 20)
leafy spurge (<i>Euphorbia esula</i>)	2% (0 - 20)	2% (0 - 40)	
western white clematis (<i>Clematis ligusticifolia</i>)		2% (0 - 40)	
Canada thistle (<i>Cirsium arvense</i>)		2% (0 - 20)	
late goldenrod (<i>Solidago gigantea</i>)		1% (0 - 20)	1% (0 - 10)
absinthe (<i>Artemisia absinthium</i>)			1% (0 - 10)
golden bean (<i>Thermopsis rhombifolia</i>)		1% (0 - 20)	1% (0 - 10)
long-headed anemone (<i>Anemone cylindrica</i>)	1% (0 - 10)		
wild sarsaparilla (<i>Aralia nudicaulis</i>)	1% (0 - 10)		
fringed loosestrife (<i>Lysimachia ciliata</i>)	1% (0 - 10)		
yellow sweet-clover (<i>Melilotus officinalis</i>)		1% (0 - 20)	
spreading dogbane (<i>Apocynum androsaemifolium</i>)		1% (0 - 20)	
alfalfa (<i>Medicago sativa</i>)		1% (0 - 20)	
curled dock (<i>Rumex crispus</i>)		1% (0 - 20)	
American vetch (<i>Vicia americana</i>)	1% (0 - 3)		

	MG-SUB-C	MG-SUB-D	MG-SUB-E
Minor trees	1%	0%	1%
Minor tall shrubs	0%	1%	2%
Minor short shrubs	1%	2%	1%
Minor graminoids	1%	3%	1%
Minor forbs	3%	3%	4%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	29%	22%
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RECOMMENDED STOCKING RATES (AUM/ha)			
closed stands (>50% canopy closure)	0.42 AUM/ha	0.22 AUM/ha	0.50AUM/ha
	0.17 AUM/ac	0.09 AUM/ac	0.20 AUM/ac
open stands (<50% canopy closure)	0.62 AUM/ha	0.32 AUM/ha	0.74 AUM/ha
	0.25 AUM/ac	0.13 AUM/ac	0.30 AUM/ac

AP-SUB-E, MG-SUB-F
Poplar Communities on Recent Alluvium
Mixed Grassland and Aspen Parkland: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: These communities represent poplar stands developed on recent alluvial deposits. AP-SUB-E represents balsam poplar communities, and is largely found in the Aspen Parkland Ecoregion, although it may also be found in the Mixed Grassland Ecoregion. MG-SUB-F represents plains cottonwood stands, and is largely restricted to major river valleys in the Mixed Grassland and Dry Mixed Grassland Ecoregions. Plant cover is not as fully developed as in communities that have been stable longer, and a number of weedy and/or exotic species are present. However, this weedy component reflects the early stage of primary succession, rather than grazing or disturbance impacts. Therefore, the status of these communities with respect to grazing impact is unknown.

These descriptions are derived from Tables 10 and 14 in Thompson and Hansen (2001), which include some data from outside Saskatchewan.

AP-SUB-E Balsam Poplar, Recent Alluvium	MG-SUB-F Plain Cottonwood, Recent Alluvium
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STRUCTURE – no information

SPECIES COMPOSITION (% canopy cover)

Major trees		
balsam poplar (<i>Populus balsamifera</i>)	43% (10 - 80)	
plains cottonwood (<i>Populus deltoides</i>)		31% (3 - 60)
narrow-leaved cottonwood (<i>Populus angustifolia</i>)	3% (0 - 20)	2% (0 - 30)
peach-leaved willow (<i>Salix amygdaloides</i>)		4% (0 - 40)

Major tall shrubs		
sandbar willow (<i>Salix interior</i>)	6% (0 - 20)	13% (0 - 60)
yellow willow (<i>Salix famelica</i>)	3% (0 - 20)	1% (0 - 10)
western river alder (<i>Alnus incana</i> ssp. <i>tenuifolia</i>)	4% (0 - 20)	
shining willow (<i>Salix lucida</i>)	2% (0 - 10)	
river birch (<i>Betula occidentalis</i>)	1% (0 - 3)	
wolf-willow (<i>Elaeagnus commutata</i>)	1% (0 - 3)	
Scouler's willow (<i>Salix scouleriana</i>)	1% (0 - 3)	

Major short shrubs		
Wood's rose (<i>Rosa woodsii</i>)	1% (0 - 3)	

Major graminoids		
redtop (<i>Agrostis stolonifera</i>)	1% (0 - 3)	1% (0 - 10)
marsh reed-grass (<i>Calamagrostis canadensis</i>)	8% (0 - 40)	
fowl blue-grass (<i>Poa palustris</i>)	3% (0 - 20)	

	AP-SUB-E	AP-SUB-F
northern wheat-grass (<i>Elymus lanceolatus</i>)	2% (0 - 10)	
smooth brome (<i>Bromus inermis</i>)	1% (0 - 3)	
quack grass (<i>Elymus repens</i>)	1% (0 - 1)	
western wheat-grass (<i>Pascopyrum smithii</i>)		4% (0 - 70)
three-square bulrush (<i>Schoenoplectus pungens</i>)		4% (0 - 60)
reed canary-grass (<i>Phalaris arundinacea</i>)		3% (0 - 50)
Canada wild-rye (<i>Elymus canadensis</i>)		2% (0 - 20)
barnyard grass (<i>Echinochloa crusgalli</i>)		2% (0 - 20)
marsh muhly (<i>Muhlenbergia racemosa</i>)		1% (0 - 20)
sand dropseed (<i>Sporobolus cryptandrus</i>)		1% (0 - 20)
slender wheat-grass (<i>Elymus trachycaulus</i> ssp. <i>trachycaulus</i>)		1% (0 - 10)

Major forbs		
field horsetail (<i>Equisetum arvense</i>)	1% (0 - 3)	1% (0 - 20)
Canadian bunchberry (<i>Cornus canadensis</i>)	7% (0 - 40)	
western meadow-rue (<i>Thalictrum occidentale</i>)	7% (0 - 40)	
cow-parsnip (<i>Heracleum maximum</i>)	3% (0 - 20)	
white sweet-clover (<i>Melilotus alba</i>)	2% (0 - 10)	
star-flowered solomon's-seal (<i>Maianthemum stellatum</i>)	2% (0 - 3)	
Indian hemp (<i>Apocynum cannabinum</i>)	1% (0 - 3)	
fireweed (<i>Chamerion angustifolium</i>)	1% (0 - 3)	
late goldenrod (<i>Solidago gigantea</i>)	1% (0 - 3)	
clasping-leaf twisted-stalk (<i>Streptopus amplexifolius</i>)	1% (0 - 3)	
western willow aster (<i>Symphyotrichum lanceolatum</i> var. <i>hesperium</i>)	1% (0 - 3)	
common dandelion (<i>Taraxacum officinale</i>)	1% (0 - 1)	
cocklebur (<i>Xanthium strumarium</i>)		4% (0 - 50)
graceful cinquefoil (<i>Potentilla gracilis</i>)		2% (0 - 30)
prostrate knotweed (<i>Polygonum aviculare</i>)		1% (0 - 20)
water smartweed (<i>Persicaria amphibia</i>)		1% (0 - 3)
Canada thistle (<i>Cirsium arvense</i>)		1% (0 - 10)
American wild licorice (<i>Glycyrrhiza lepidota</i>)		1% (0 - 10)

Minor trees	0%	0%
Minor tall shrubs	1%	0%
Minor short shrubs	0%	0%
Minor graminoids	1%	2%
Minor forbs	3%	3%

SIMILARITY TO REFERENCE COMMUNITY	unknown	unknown
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RECOMMENDED STOCKING RATE	insufficient data	insufficient data
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PEZ-SUB-T, PEZ-SUB-U
Ash-Maple Communities
 Prairie Ecozone: Subirrigated and Overflow Ecosites

GENERAL DESCRIPTION: Stands of green ash and/or Manitoba maple stands on the Subirrigated and Overflow Ecosites. These may occur in the Aspen Parkland and Mixed Grassland Ecoregions. Note that green ash is dominant in some stands, and Manitoba maple in others. Stands of American elm (*Ulmus americana*) also occur on similar sites in a few locations, but most have succumbed to Dutch Elm Disease. PEZ-SUB-T represents the **reference community** in stands that are ungrazed or lightly grazed. It contains a mix of palatable shrubs and herbs, but shrub layers are not as dense as in poplar stands because of the shadier tree canopy. PEZ-SUB-U shows **significant alteration** from the reference community as a result of grazing impact. Palatable shrubs and herbs have decreased, allowing invasion of exotic grasses. Productivity for livestock grazing is probably lower than that of poplar communities on comparable sites.

PEZ-SUB-T Ash – Maple / Choke-cherry	PEZ-SUB-U Ash – Maple / Smooth Brome
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STRUCTURE

	n=11	n=12
tree cover	50% (19 - 100)	34% (15 - 51)
tall shrub cover	35% (0 - 78)	19% (3 - 53)
short shrub cover	7% (0 - 15)	10% (0 - 22)
prostrate shrub cover	0% (0 - 0)	1% (0 - 0)
cactus cover	0% (0 - 0)	0% (0 - 0)
herbaceous cover	27% (8 - 58)	28% (9 - 60)
clubmoss cover	0% (0 - 0)	0% (0 - 0)
moss cover		2% (0 - 6)
lichen cover		1% (0 - 2)

SPECIES COMPOSITION (% foliar cover)

	n=11	n=12
Major trees		
green ash (<i>Fraxinus pennsylvanica</i>)	25% (0 - 63)	14% (0 - 36)
Manitoba maple (<i>Acer negundo</i>)	21% (0 - 63)	15% (0 - 35)
balsam poplar (<i>Populus balsamifera</i>)	2% (0 - 3)	
trembling aspen (<i>Populus tremuloides</i>)	1% (0 - 0)	
jack poplar (<i>Populus X jackii</i>)		3% (0 - 14)

Major tall shrubs

choke-cherry (<i>Prunus virginiana</i>)	13% (0 - 38)	5% (0 - 14)
saskatoon (<i>Amelanchier alnifolia</i>)	3% (0 - 15)	5% (0 - 14)
high bush-cranberry (<i>Viburnum opulus</i>)	2% (0 - 3)	2% (0 - 3)
red-osier dogwood (<i>Cornus sericea</i> ssp. <i>stolonifera</i>)	1% (0 - 0)	3% (0 - 14)
pin cherry (<i>Prunus pensylvanica</i>)	8% (0 - 15)	
willow (<i>Salix</i> spp.)	3% (0 - 0)	
European buckthorn (<i>Rhamnus cathartica</i>)	2% (0 - 3)	

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beaked hazelnut (<i>Corylus cornuta</i>)	1% (0 - 0)	
yellow willow (<i>Salix famelica</i>)		1% (0 - 0)
sandbar willow (<i>Salix interior</i>)		1% (0 - 0)
wolf-willow (<i>Elaeagnus commutata</i>)		1% (0 - 2)

Major short shrubs		
western snowberry (<i>Symphoricarpos occidentalis</i>)	5% (0 - 15)	7% (0 - 18)
poison-ivy (<i>Toxicodendron rydbergii</i>)	1% (0 - 0)	2% (0 - 3)
northern gooseberry (<i>Ribes oxycanthoides</i>)		1% (0 - 3)
Wood's rose (<i>Rosa woodsii</i>)		1% (0 - 2)

Major prostrate shrubs		
creeping juniper (<i>Juniperus horizontalis</i>)		1% (0 - 0)

Major graminoids		
Sprengel's sedge (<i>Carex sprengei</i>)	6% (0 - 3)	1% (0 - 3)
blue wild-rye (<i>Elymus glaucus</i>)	1% (0 - 1)	
Kentucky blue-grass (<i>Poa pratensis</i>)		4% (0 - 3)
smooth brome (<i>Bromus inermis</i>)		16% (0 - 58)

Major forbs and half-shrubs		
western Canada violet (<i>Viola canadensis</i>)	7% (0 - 15)	1% (0 - 2)
stinging nettle (<i>Urtica dioica</i>)	1% (0 - 0)	1% (0 - 2)
wild sarsaparilla (<i>Aralia nudicaulis</i>)	3% (0 - 15)	
sweet-scented bedstraw (<i>Galium triflorum</i>)	1% (0 - 0)	
black snakeroot (<i>Sanicula marilandica</i>)	1% (0 - 0)	
Pennsylvania pellitory (<i>Parietaria pensylvanica</i>)	1% (0 - 3)	
Fremont's goosefoot (<i>Chenopodium fremontii</i>)	1% (0 - 3)	
lesser burdock (<i>Arctium minus</i>)		1% (0 - 0)
leafy spurge (<i>Euphorbia esula</i>)		1% (0 - 0)
Canada goldenrod (<i>Solidago canadensis</i>)		1% (0 - 2)

Minor trees	1%	0%
Minor tall shrubs	0%	1%
Minor short shrubs	1%	0%
Minor prostrate shrubs	0%	0%
Minor graminoids	2%	1%
Minor forbs	4%	4%
Minor cactus	0%	0%

SIMILARITY TO REFERENCE COMMUNITY	ref. comm.	38%
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RECOMMENDED STOCKING RATE	insufficient data	
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AP-SUB-C

Balsam Poplar - Aspen / Willow - River Birch

Aspen Parkland: Subirrigated Ecosite (Sand)

GENERAL DESCRIPTION: Grazed community found in open poplar stands with a distinct tall shrub layer on Subirrigated sands in the Aspen Parkland Ecoregion. This community may also be found to a limited extent in the Mixed Grassland Ecoregion. It is similar in understory composition to the shrubby stands on subirrigated sands described earlier (PEZ-SUB-H and PEZ-SUB-I). While the relatively low abundance of decreaser species suggests grazing impact, the ecological status of this community is unclear. No yield data were available, but the cover of palatable species suggests that recommended stocking rates should be lower than in AP-SUB-A (Balsam Poplar – Aspen / Dogwood / Sarsaparilla), so they were set at half of the value for that type.

This community was originally described as AP-MO-C in Thorpe and Godwin (2008).

STRUCTURE (n=10)

tree cover	39% (15 – 54)
tall shrub cover	34% (15 – 54)
short shrub cover	10% (0 – 18)

prostrate shrub cover	0% (0 – 0)
herbaceous cover	15% (1 – 34)

SPECIES COMPOSITION (% foliar cover, n=10)

Major trees	
balsam poplar (<i>Populus balsamifera</i>)	28% (14 - 39)
trembling aspen (<i>Populus tremuloides</i>)	11% (0 - 20)

Major graminoids	
sedge (<i>Carex</i> spp.)	2% (0 - 3)
smooth brome (<i>Bromus inermis</i>)	2% (0 - 1)
fowl manna grass (<i>Glyceria striata</i>)	2% (0 - 1)

Major tall shrubs	
willow (<i>Salix</i> spp.)	15% (0 - 38)
river birch (<i>Betula occidentalis</i>)	15% (0 - 38)
saskatoon (<i>Amelanchier alnifolia</i>)	2% (0 - 2)
red-osier dogwood (<i>Cornus sericea</i> ssp. <i>stolonifera</i>)	1% (0 - 3)

Major forbs	
wild sarsaparilla (<i>Aralia nudicaulis</i>)	4% (0 - 4)
smooth wild strawberry (<i>Fragaria virginiana</i>)	1% (0 - 1)

Major short shrubs	
rose (<i>Rosa</i> spp.)	5% (0 - 15)
western snowberry (<i>Symphoricarpos occidentalis</i>)	4% (0 - 8)
wolf-willow (<i>Elaeagnus commutata</i>)	2% (0 - 2)

Minor graminoids	1%
Minor forbs	4%

SIMILARITY TO REFERENCE COMMUNITY	unknown
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RECOMMENDED STOCKING RATES	0.31 AUM/ha	0.13 AUM/ac
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