

United States Department of Agriculture Natural Resources Conservation Service

Ecological Site Description

Site Type: Rangeland

Site Name: Subirrigated 15-19" Foothills and Mountains East Precipitation Zone,

Site ID: R043BY374WY

Major Land Resource Area: 43B – Central Rocky Mountains

Physiographic Features

This site normally occurs on nearly level bottomlands and adjacent to perennial streams, springs and ponds.

Landform: Alluvial fans, stream terraces, & bottomlands

Aspect: N/A

	<u>Minimum</u>	<u>Maximum</u>
Elevation (feet):	6000	9000
Slope (percent):	0	6
Water Table Depth (inches):	12	40
Flooding:		
Frequency:	rare	occasional
Duration:	brief	very brief
Ponding:		
Depth (inches):	0	0
Frequency:	None	None
Duration:	None	None
Runoff Class:	negligible	low

Climatic features

Annual precipitation ranges from 15-19 inches per year. June is generally the wettest month. July, August, and September are somewhat less with daily amounts rarely exceeding one inch.

Snowfall is quite heavy in the area. Annual snowfall averages about 150 inches.

Because of the varied topography, the wind will vary considerably for different parts of the area. The wind is usually much lighter at the lower elevations and in the valleys as compared with the higher terrain. The average winter wind velocity is 8.5 mph while the summer wind velocity averages 7.5 mph. Winds during storms and on ridges may exceed 45 mph.

Growth of native cool-season plants begins about May 1 to May 15 and continues to about October 10.

The following information is from the "Crandall Creek" climate station, at the lower end of this precipitation zone:

	<u>Minimum</u>	<u>Maximum</u>	<u>5 yrs. out of 10 between</u>
Frost-free period (days):	16	80	July 8 – August 20
Freeze-free period (days):	37	120	June 17 – September 5

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Mean Annual Precipitation (inches): 10.24 21.23

Mean annual precipitation: 14.90 inches

Mean annual air temperature: 38.16 °F (21.88°F Avg. Min. to 54.66°F Avg. Max.)

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at <http://www.wcc.nrcs.usda.gov/> website. There are no other climate station(s) known to be representative of this precipitation zone.

Influencing Water Features

Wetland Description:	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
None	None	None	None	None

Stream Type: C (Rosgen)

Representative Soil Features

The soils of this site are moderately deep to very deep, poorly drained to moderately well-drained and formed in mixed alluvium. These soils have slow to rapid permeability. These soils are nonsaline and/or nonalkaline and with a water table within reach of the herbaceous species (usually less than three feet) through most of the growing season. These areas may have water over the surface from run-in but only for short periods. The soil characteristics having the most influence on the plant community are depth to a water table during the growing season.

Parent Material Kind: alluvium

Parent Material Origin: sandstone, shale

Surface Texture: loam, clay loam, clay, fine sandy loam, sandy loam, loamy sand, very fine sandy loam, silt loam, silty clay

Surface Texture Modifier: none is most common, but gravelly or cobbly may occur.

Subsurface Texture Group: loam

Surface Fragments ≤ 3" (% Cover): typically 0, occasionally up to 10

Surface Fragments > 3" (%Cover): typically 0, occasionally up to 10

Subsurface Fragments ≤ 3" (% Volume): typically 0, occasionally up to 10

Subsurface Fragments > 3" (% Volume): typically 0, occasionally up to 10

	<u>Minimum</u>	<u>Maximum</u>
Drainage Class:	well drained	poorly drained
Permeability Class:	slow	rapid
Depth (inches):	20	>60
Electrical Conductivity (mmhos/cm) ≤20":	0	8
Sodium Absorption Ratio ≤20":	0	10
Soil Reaction (1:1 Water) ≤20":	6.6	8.4
Soil Reaction (0.1M CaCl2) ≤20":	NA	NA
Available Water Capacity (inches) ≤30":	2.8	6.2
Calcium Carbonate Equivalent (percent) ≤20":	0	5

Plant Communities

Ecological Dynamics of the Site:

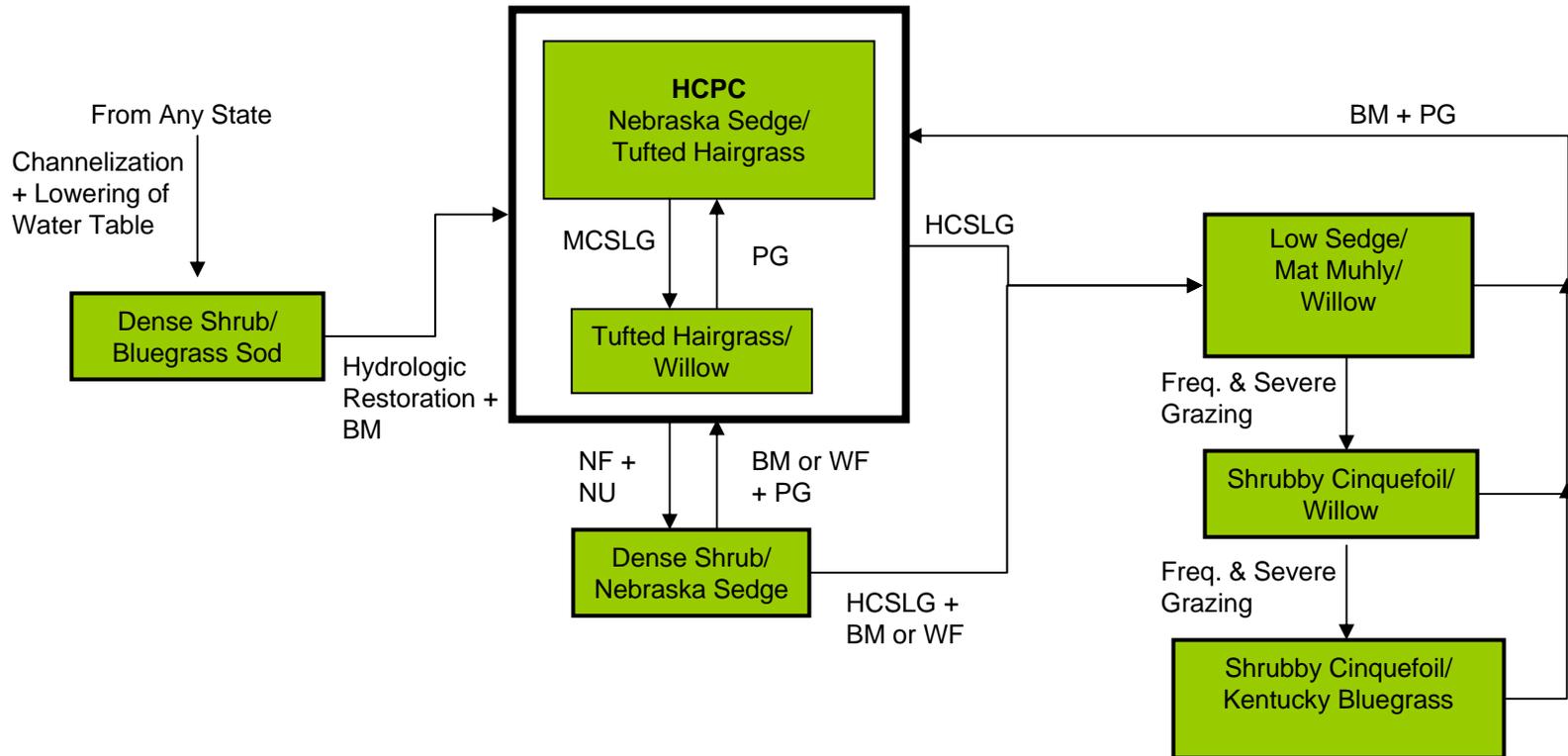
Potential vegetation on this site is dominated by plants that can tolerate soils that have a water table near the surface for most of the growing season. Significant vegetation includes tall and mid cool season grasses, grass-like species, and a variety of riparian shrubs and forbs. The expected potential composition for this site is about 70% grasses, 15% forbs and 15% woody plants. The composition and production will vary naturally due to historical use, fluctuating precipitation and fire frequency.

As this site deteriorates, species such as willows and forbs increase. Grasses and grasslikes such as tufted hairgrass, Nebraska sedge and northern reedgrass will decrease in frequency and production. As conditions continue to deteriorate species such as Kentucky bluegrass and annuals will invade.

Beaver can play a critical role in the maintenance or development of this site located along perennial streams. By modifying the water level through dams, the water table of an area is significantly increased and diverted water can replenish off channel areas such as oxbows, which can enhance subirrigation. Modifying water levels also promotes hydrophilic species while controlling upland species. Removal of beaver in areas has resulted in lowering of the water tables and channelization of waterways. Recently, reintroducing beaver to areas to stabilize riparian areas and create wet areas has gained popularity.

The Historic Climax Plant Community (description follows the plant community diagram) has been determined by study of rangeland relic areas, or areas protected from excessive disturbance. Trends in plant communities going from heavily grazed areas to lightly grazed areas, seasonal use pastures, and historical accounts have also been used.

The following is a State and Transition Model Diagram that illustrates the common plant communities (states) that can occur on the site and the transitions between these communities. The ecological processes will be discussed in more detail in the plant community narratives following the diagram.



- BM** – Brush Management (fire, chemical, mechanical)
- Freq. & Severe Grazing** – Frequent and Severe Utilization of the Cool-season Mid-grasses during the Growing Season
- GLMT** – Grazing Land Mechanical Treatment
- LTPG** – Long-term Prescribed Grazing
- MCSLG** – Moderate, Continuous Season-long Grazing
- HCSLG** – Heavy, Continuous Season-long Grazing
- NU, NF** – No Use and No Fire
- PG** – Prescribed Grazing (proper stocking rates with adequate recovery periods during the growing season)
- VLTPG** – Very Long-term Prescribed Grazing (could possibly take generations)
- Na** – Moderate Sodium in Soil
- WF** - Wildfire

**Plant Community Composition and Group Annual Production
Reference Plant Community (HCPC)**

COMMON NAME/GROUP NAME	SCIENTIFIC NAME	SYMBOL	Annual Production (Normal Year)		
			Group	lbs./acre	% Comp.
			Total: 3800		
GRASSES AND GRASS-LIKES					
GRASSES/GRASSLIKES					
Nebraska sedge	Carex nebrascensis	CANE2	1	570 - 950	15 - 25
Tufted hairgrass	Deschampsia caespitosa	DECA18	2	380 - 760	10 - 20
Basin wildrye	Leymus cinereus	LECI4	3	190 - 570	5 - 15
Northern reedgrass	Calamagrostis stricta	CAST13	4	0 - 380	0 - 10
Alpine timothy	Phleum alpinum	PHAL2	5	0 - 380	0 - 10
Slender wheatgrass	Elymus trachycaulus	ELTR7	6	0 - 380	0 - 10
			7	0 - 380	0 - 10
MISC. GRASSES/GRASSLIKES					
Baltic rush	Juncus balticus	JUBA	7	0 - 190	0 - 5
Big bluegrass	Poa ampla (syn. P. secunda)	POAM	7	0 - 190	0 - 5
Idaho fescue	Festuca idahoensis	FEID	7	0 - 190	0 - 5
Inland sedge	Carex interior	CAIN11	7	0 - 190	0 - 5
Mat muhly	Muhlenbergia richardsonis	MURI	7	0 - 190	0 - 5
Meadow barley	Hordeum brachyantherum	HOBR2	7	0 - 190	0 - 5
Other low growing sedges	Carex spp.	CAREX	7	0 - 190	0 - 5
other rushes	Juncus spp.	JUNCA	7	0 - 190	0 - 5
other perennial grasses (native)		2GP	7	0 - 190	0 - 5
			8	380 - 570	10 - 15
FORBS					
Alpine avens	Geum rossii	GERO2	8	0 - 190	0 - 5
American bistort	Polygonum bistortoides	POBI6	8	0 - 190	0 - 5
American licorice	Glycyrrhiza lepidota	GLLE3	8	0 - 190	0 - 5
Aster	Eucephalus spp.	EUCEP2	8	0 - 190	0 - 5
Buttercup	Ranunculus spp.	RANUN	8	0 - 190	0 - 5
Clovers	Trifolium spp.	TRIFO	8	0 - 190	0 - 5
Cow parsnip	Heracleum maximum	HEMA80	8	0 - 190	0 - 5
Dock	Rumex spp.	RUMEX	8	0 - 190	0 - 5
Flax	Linum spp.	LINUM	8	0 - 190	0 - 5
Fleabane	Erigeron	ERIGE2	8	0 - 190	0 - 5
Fragrant bedstraw	Galium triflorum	GATR3	8	0 - 190	0 - 5
Geranium	Geranium ssp.	GERAN	8	0 - 190	0 - 5
Goldenpea	Thermopsis spp.	THERM	8	0 - 190	0 - 5
Groundsel	Tephrosia spp.	TEPHR3	8	0 - 190	0 - 5
Horsetails	Equisetum spp.	EQUIS	8	0 - 190	0 - 5
Milkvetch	Astragalus spp.	ASTRA	8	0 - 190	0 - 5
Mint	Mentha spp.	MENTH	8	0 - 190	0 - 5
Mountain bluebells	Mertensia ciliata	MECI3	8	0 - 190	0 - 5
Plantain	Plantago major	PLMA2	8	0 - 190	0 - 5
Tall mountain larkspur	Delphinium occidentale	DEOC	8	0 - 190	0 - 5
Twisted stalk	Streptopus amplexifolius	STAM2	8	0 - 190	0 - 5
Violets	Viola spp.	VIOLA	8	0 - 190	0 - 5
Water hemlock	Cicuta spp.	CICUT	8	0 - 190	0 - 5
Western yarrow	Achillea lanulosa	ACHIL	8	0 - 190	0 - 5
Wild strawberry	Fragaria vesca	FRVE	8	0 - 190	0 - 5
other perennial forbs (native)		2FP	8	0 - 190	0 - 5
TREES/SHRUBS					
Willow	Salix ssp.	SALIX	9	0 - 380	0 - 10
			10	0 - 380	0 - 10
MISC. SHRUBS/TREES					
Boxelder	Acer negundo var. interius	ACNE12	10	0 - 190	0 - 5
Chokecherry	Prunus virginiana	PRVIV	10	0 - 190	0 - 5
Currant	Ribes spp.	RIBES	10	0 - 190	0 - 5
Redosier dogwood	Cornus sericea	COSE16	10	0 - 190	0 - 5
Rose	Rose woodsii var. woodsii	ROWOW	10	0 - 190	0 - 5
Shrubby cinquefoil	Dasiphora floribunda	DAFL3	10	0 - 190	0 - 5
Thinleaf alder	Alnus incana	ALIN2	10	0 - 190	0 - 5
Water birch	Betula occidentalis	BEOC2	10	0 - 190	0 - 5
other shrubs & half shrubs (native)		2SHRUB	10	0 - 190	0 - 5

This list of plants and their relative proportions are based on near normal years. Fluctuations in species composition and relative production may change from year to year dependent upon precipitation or other climatic factors.

Plant Community Narratives

Following are the narratives for each of the described plant communities. These plant communities may not represent every possibility, but they probably are the most prevalent and repeatable plant communities. The plant composition tables shown above have been developed from the best available knowledge at the time of this revision. As more data is collected, some of these plant communities may be revised or removed, and new ones may be added. None of these plant communities should necessarily be thought of as "Desired Plant Communities". According to the USDA NRCS National Range and Pasture Handbook, Desired Plant Communities (DPC's) will be determined by the decision-makers and will meet minimum quality criteria established by the NRCS. The main purpose for including any description of a plant community here is to capture the current knowledge and experience at the time of this revision.

Nebraska Sedge/Tufted Hairgrass Plant Community

The interpretive plant community for this site is the Historic Climax Plant Community. This site evolved with grazing by large herbivores, a water table within reach of the herbaceous plants through most of the growing season, and periodic fires. Potential vegetation is about 70% grasses or grass-like plants, 15% forbs and 15% woody plants. The major grasses and grasslikes include Nebraska sedge, tufted hairgrass, northern reedgrass, basin wildrye, and alpine timothy. Woody plants are mainly willows but other riparian shrubs and tree species occur. A variety of forbs occurs in this state as well and plant diversity is high (see Plant Composition Table).

This state produces between 3000 and 4500 pounds annually, depending on the growing conditions.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	10	35	30	10	10	0	0	0

(Monthly percentages of total annual growth)

The state is extremely resilient and well adapted to the Central Rocky Mountains climatic conditions. The diversity in plant species allows for high drought resistance. This is a healthy and sustainable plant community (site/soil stability, watershed function, and biologic integrity).

Transitions or pathways leading to other plant communities are as follows:

- Moderate, continuous season-long grazing will convert the plant community to the *Tufted Hairgrass/Willow Plant Community*.
- Heavy, continuous, season-long grazing will convert this plant community to Low Sedge/Mat Muhly/Willow *Plant Community*.
- No fire and No Use will convert the HCPC to the *Dense Shrub/Nebraska Sedge Plant Community*.
- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Tufted Hairgrass/Willow Plant Community

Historically, this plant community evolved under grazing by large ungulates, a water table within reach of the herbaceous plants through most of the growing season, and a low fire frequency. Currently, this site is normally found under a moderate, season-long grazing regime and will be exacerbated by prolonged drought conditions. In addition, the fire regime for this site has been modified and extended periods

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without fire is now common. Willows are an important component of this plant community. Cool-season grasses and grasslikes make up the majority of the understory with the balance made up of miscellaneous forbs.

Mid grass-like species and cool season tall and mid-grasses dominate this state. The major grasslike and grasses include tufted hairgrass, slender wheatgrass, alpine timothy, and of less frequency northern reedgrass, basin wildrye, and Nebraska sedge. Grasses and grasslikes of secondary importance include inland sedge, meadow barley, Baltic rush, big bluegrass, and Idaho fescue. Willows and other riparian shrubs comprise from 20% to 25% of the total annual production.

When compared to the Historical Climax Plant Community, willows and other riparian shrubs, forbs, and bluegrasses have increased. Northern reedgrass, basin wildrye, and Nebraska sedge have decreased, often occurring only where protected from grazing by the shrub canopy. Some annual grasses and forbs may have invaded the site but are in small patches.

This state produces between 2800 and 4300 pounds annually, depending on the growing conditions.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	10	35	30	10	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change. The herbaceous species present are well adapted to grazing; however, species composition can be altered through long-term overgrazing. The herbaceous component is mostly intact and plant vigor and replacement capabilities are sufficient. Water flow patterns and litter movement may be occurring but only on steeper slopes. Incidence of pedestalling is minimal. Soils are mostly stable and the surface shows minimum soil loss. The watershed is functioning and the biotic community is intact.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing over the long-term will result in a plant community very similar to the *Historic Climax Plant Community*.
- Heavy, continuous, season-long grazing will convert this plant community to a *Low Sedge/Mat Muhly/Willow Plant Community*.
- No fire and No Use will convert the HCPC to the *Dense Shrub/Nebraska Sedge Plant Community*.
- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Dense Shrub/Nebraska Sedge Plant Community

This plant community results from little or no use and no fires over an extended period in the HCPC. Shrubs are a significant component of this plant community. Mid grasslikes and tall and mid cool-season grasses make up the majority of the understory, however, the shrub component has become so dominant that the area occupied by herbaceous species has been significantly reduced. Preferred grasses are still present but the frequency and production have been reduced.

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Dominant grasslikes and grasses include Nebraska sedge, tufted hairgrass, northern reedgrass, basin wildrye, and alpine timothy. Grasses and grass-likes of secondary importance include inland sedge, meadow barley, Baltic rush, big bluegrass, and Idaho fescue. Forbs commonly found in this plant community include American bistort, American licorice, buttercup, mint, clovers, geranium, fragrant bedstraw, wild strawberry, violets, alpine avens, and water hemlock. A wide variety of shrubs can be present and will exceed 30% of the total production. Shrubs include mainly willows as well as others such as dogwood, chokecherry, currant, wild rose, water birch, thinleaf alder, and boxelder.

When compared to the Historic Climax Plant Community, shrubs have significantly increased. Most of the preferred grasses and grasslikes are present in areas not dominated by shrubs. The increase in shrub production has offset some of the loss in the herbaceous production.

Annual production ranges from 2800 to 4300 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	10	35	30	10	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change as the shrubs become more abundant. The herbaceous component is as diverse and plant vigor and species regeneration capabilities of preferred species are sufficient. Some plants may become overly mature especially some of the shrubs. Browsing may increase the opening for the preferred herbaceous plants, however, over grazing is possible if prescribed grazing is not implemented.

Water flow patterns and litter movement is normal. Incidence of pedestalling is not occurring. Soils are stable and the surface shows minimum or no soil loss. The watershed is functioning and the biotic community is intact.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing and wildfire or brush management will convert this plant community to the *HCPC*. The probability of this occurring is high especially if brush management is used with rotational grazing along with deferred grazing as part of the prescribed method of use. In addition, the removal of fire suppression will allow a somewhat natural fire regime to reoccur to more easily transition between this plant community and the *HCPC*.
- Brush management or Wildfire with Heavy, continuous, season-long grazing will convert this plant community to the *Low Sedge/Mat Muhly/Willow Plant Community*.
- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Low Sedge/Mat Muhly/Willow Plant Community

This plant community currently is found under heavy continuous season-long grazing by livestock. Shrubs are a significant component of this plant community. Mid grasses and low sedges make up the majority of the understory, but some of the preferred grasses and grasslikes have been reduced or absent.

Dominant grasslikes and grasses include low sedge, mat muhly, Idaho fescue, big bluegrass, and Baltic rush. Grasses and grasslikes of less frequency are Nebraska sedge, tufted hairgrass, northern

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reedgrass, basin wildrye, and alpine timothy. Forbs commonly found in this plant community include American bistort, American licorice, buttercup, mint, clovers, geranium, fragrant bedstraw, wild strawberry, violets, alpine avens, and water hemlock. Other weedy annual species may include cocklebur, sowhistle, prickly lettuce, curly dock, common milkweed, stickseed, and a variety of thistles. A wide variety of shrubs can be present and will exceed 20% of the total production. Shrubs include mainly willows and others such as dogwood, chokecherry, currant, wild rose, water birch, thinleaf alder, and boxelder.

When compared to the Historic Climax Plant Community, shrubs, bluegrasses, low sedges, and mat muhly have increased. Most of the preferred grasses and grasslikes have been reduced or removed. The increase in shrub production has offset some of the loss in the herbaceous production.

Annual production ranges from 2300 to 3500 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	10	35	30	10	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change as the shrubs become more abundant. The herbaceous component is not as diverse and plant vigor and species regeneration capabilities of some cool-season perennials and mid sedges are deficient. The removal of grazing does not seem to affect the plant composition or structure of the plant community.

Soil erosion may be accelerated because of increased bare ground. In areas where sod forming plants have become more dominant water infiltration has decreased. While these patches of sod protect the area itself, off-site areas are affected by excessive runoff that can cause rills and gully erosion. Water flow patterns are obvious in the bare ground areas and pedestalling is apparent along these sodded edges and around shrubs. Hummocks may be noticeable. In general, infiltration is reduced and runoff is increased as the soils become more compacted. Rill channels may be noticeable in the interspaces on steeper areas and gullies may be establishing where rills have concentrated down slope.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing plus brush management will convert this plant community to near HCPC. If prescribed fire is used as a means to reduce or remove the shrubs, sufficient fine fuels will need to be present. This may require deferment from grazing prior to treatment. Post management is critical to ensure success. This can range from two or more years of rest to partial growing season deferment, depending on the condition of the understory at the time of treatment and the growing conditions following treatment. Seeding will often be required regardless of the brush treatment to reestablish the major cool-season grasses.
- Frequent and severe grazing will convert this plant community to the *Shrubby Cinquefoil/Willow Plant Community*.
- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Shrubby Cinquefoil/Willow Plant Community

This plant community is the result of frequent and severe grazing and protection from fire. Shrubby cinquefoil, willows and a variety of other shrubs can dominate this plant community as the annual production will exceed 30%. The preferred cool season grasses have been eliminated or greatly reduced. A sod of bluegrass and rhizomatous grasses can dominate the interspaces between shrubs. On areas without this sod, interspaces are usually bare ground.

The dominant grasses are bluegrass such as big and Kentucky. Weedy annual species such cocklebur, sowhistle, prickly lettuce, curly dock, common milkweed, stickseed, and a variety of thistles can occupy the site. Noxious weeds such as Canada thistle, white top, and leafy spurge may invade the site, if a seed source is available. When compared with the HCPC, the annual production is less as the major grasslikes and grasses are reduced and replaced by lower growing sod grasses and sedges. The shrub composition has changed as more preferred shrubs have either been removed or significantly altered and replaced with shrubby cinquefoil and other less preferred species. In general, total production by shrubs have increased, which compensates for some of the decline in the herbaceous production.

Annual production ranges from 1800 to 2800 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	15	40	20	10	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change as the stand becomes more decadent and the sodded areas, which are extremely resistant to change, expand. Continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. The herbaceous component is not as diverse and plant vigor and species regeneration capabilities of cool-season perennials are deficient.

Soils are unstable on areas where bare ground has increased and erosion is accelerating. Soil compaction is apparent and hummocks are noticeable. Likewise, on areas where sod forming plants become more dominant, water infiltration is restricted. While these patches of sod protect the area itself, off-site areas are affected by excessive runoff that can cause rills and gully erosion. Water flow patterns are obvious in the bare ground areas and pedestalling is apparent along these sodded edges and bushes. In general, infiltration is reduced and runoff is increased as the soils become more compacted. The rill channels may be noticeable in the interspaces on steeper areas and gullies may be establishing where rills have concentrated down slope.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing plus brush management will convert this plant community to near HCPC. If prescribed fire is used as a means to reduce or remove the shrubs, sufficient fine fuels will need to be present. This may require deferment from grazing prior to treatment. Post management is critical to ensure success. This can range from two or more years of rest to partial growing season deferment, depending on the condition of the understory at the time of treatment and the growing conditions following treatment. Seeding will often be required regardless of the brush treatment to reestablish the major cool-season grasses.
- Frequent and severe grazing will convert this plant community to the *Shrubby Cinquefoil/Kentucky Bluegrass Plant Community*.

- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Shrubby Cinquefoil/Kentucky Bluegrass Plant Community

This plant community is the result of frequent and severe grazing and protection from fire. Shrubby cinquefoil, and a variety of other shrubs can dominate this plant community as the annual production will exceed 30%. Willows have been severely browsed and may have been removed. The preferred grasses have been eliminated. A sod of bluegrass dominates the interspaces between shrubs. On areas without this sod, interspaces are usually bare ground.

The dominant grasses and grasslikes are bluegrasses and foxtail barley. Weedy annual species such as cocklebur, sowhistle, prickly lettuce, curly dock, common milkweed, stickseed, and a variety of thistles can occupy the site. Noxious weeds such as Canada thistle, white top, and leafy spurge may invade the site if a seed source is available. When compared with the HCPC, the annual production is significantly less as the major grasslikes and grasses are removed and replaced by less productive species. The shrub composition has changed as more preferred shrubs have either been removed or significantly altered and replaced with shrubby cinquefoil and other less preferred species. In general, total production by shrubs have increased, which compensates for some of the decline in the herbaceous production.

Annual production ranges from 1800 to 2800 pounds.

The following is the growth curve of this plant community expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	15	40	20	10	10	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change as the shrubs and sod grasses become denser. Continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. Weedy species and bare ground compromise the biotic integrity. Plant diversity is poor and the potential for native grasses to reproduce is absent. The shift in the vegetative structure and function is extreme and the biotic integrity is lost.

Soils are unstable on areas where bare ground has increased and erosion is accelerating. Soil compaction is apparent and hummocks are noticeable. Likewise, on areas where sod forming plants become more dominant, water infiltration is restricted. While these patches of sod protect the area itself, off-site areas are affected by excessive runoff that can cause rills and gully erosion. Water flow patterns are obvious in the bare ground areas and pedestalling is apparent along these sodded edges. In general, infiltration is reduced and runoff is increased as the soils become more compacted. The rill channels are noticeable in the interspaces and gullies are typical where rills have concentrated down slope.

Transitions or pathways leading to other plant communities are as follows:

- Prescribed grazing plus brush management will convert this plant community to near HCPC. If prescribed fire is used as a means to reduce or remove the shrubs, sufficient fine fuels will need to be present. This may require deferment from grazing prior to treatment. Post management is critical to ensure success. This can range from two or more years of rest to partial growing season deferment, depending on the condition of the understory at the time of treatment and the growing conditions following treatment. Seeding will often be required regardless of the brush treatment to reestablish the major cool-season grasses.

- Channelization and lowering of the Water Table will result in a *Dense Shrub/Bluegrass Sod Plant Community*.

Dense Shrub/Bluegrass Sod Plant Community

This plant community evolved as a result of channelization or down cutting of an adjacent water course. The disruption in the natural hydrologic regime is either directly caused by humans, such as dams or dikes, or indirectly through accelerated erosion and channelization. Extended periods of drought will exacerbate this situation. Upland plants are more pronounced and deep-rooted shrub species, which can benefit from the deeper water table, dominate. Big and/or silver sagebrush and/or rubber rabbitbrush occur on drier warmer sites and a mixture of sagebrush and isolated patches of riparian species occur on cooler wetter sites.

Tall and medium cool season grasses and grasslikes such as mid sedges have been reduced or eliminated. Dense sod patches of grasses, mostly Kentucky bluegrass, occur amongst the shrubs and bare ground. The annual grasses and upland forbs are more prevalent along with noxious weeds such as leafy spurge, Canada thistle and Russian knapweed. Total annual production is mostly from shrubs and sod forming grasses. Shrubs can be greater than 40% of the total annual production. When compared with the HCPC, the annual production is significantly reduced but the dense shrub component makes up for some of this loss in total production.

Annual production ranges from 700 to 1000 pounds.

The following is the growth curve expected during a normal year:

Growth curve number:

Growth curve name:

Growth curve description:

JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
0	0	0	5	20	30	20	10	15	0	0	0

(Monthly percentages of total annual growth)

This plant community is resistant to change as the shrub stand and the sod become denser. Continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. Weedy species and bare ground compromise the biotic integrity. Plant diversity is poor and the potential for preferred species to reproduce is absent. The shift in the vegetative structure and function is extreme and the biotic integrity is lost.

The hydrologic integrity of the site has been severely altered as the water table is now below the rooting depth of the herbaceous species. The soil of this state is somewhat protected where the sod patches are located and the dense shrubs occur, but erosion has accelerated in places between the patches where bare ground may be common. Water flow patterns and pedestaling are obvious and may be numerous. Remnant hummocks may be present. Infiltration is reduced and runoff is increased. Rill channels are noticeable in the interspaces and gullies and head cuts are typical.

Transitions or pathways leading to other plant communities are as follows:

- Hydrologic restoration and brush management will convert this plant community in to the *HCPC*. Restoring the hydrological function of an area is usually very expensive and may take many years. This may require reintroducing both periodic flooding and an overflow regime. If practical and if the habitat is favorable, reintroducing beaver may be a part of the solution. Brush management typically is necessary to remove shrubs and specifically upland shrubs if they have encroached.

Ecological Site Interpretations

Animal Community – Wildlife Interpretations

Nebraska Sedge/Tufted Hairgrass Plant Community (HCPC):

The predominance of grasses and grasslikes in this plant community favors grazers and mixed-feeders, such as deer, moose, bison, elk, and antelope. Suitable thermal and escape cover for these species may be limited due to the low quantities of woody plants. These sites are also important corridors within the foot slopes of mountains and between valuable water sources for many wildlife species. When found adjacent to sagebrush dominated states, this plant community may provide brood rearing/foraging areas for sage grouse, as well as lek sites. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur here including water species such as muskrat, beaver and river otter.

Tufted Hairgrass/Willow Plant Community:

The combination of an overstory of shrubs and an understory of grasses, grasslikes, and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter habitat for sage grouse. Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur here including water species such as muskrat, beaver and river otter.

Dense Shrub/Nebraska Sedge Plant Community:

The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important winter foraging habitat for sage grouse. Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers can be found frequenting the site. Many small mammals occur here including water species such as muskrat, beaver and river otter.

Low Sedge/Mat Muhly/ Willows Plant Community:

The combination of an overstory of shrubs and an understory of grasses and forbs provides a very diverse plant community for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. Consequently, many large mammals use this state for foraging and cover year-round. These sites are also important corridors within the foot slopes of mountains and between upland sites and valuable water sources. It provides important foraging habitat for sage grouse. Other birds that would frequent this plant community include nesting species, blue grouse, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald eagles, Wilson's phalarope, sandhill crane, great blue heron, and waterfowl can be found

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frequenting the site. Many small mammals occur here including water species such as muskrat, beaver and river otter.

Shrubby Cinquefoil/Willow Plant Community:

The increase in the overstory of shrubs provides for increase in year round cover and browsing selections for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. However, due to the lack of herbaceous production and diversity of mid cool season grasses and grasslikes, this site is less beneficial to grazers. These sites are important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include nesting species, American kestrel, hawks, and golden eagle. As these sites are adjacent to water, bald eagles, Wilson's phalarope, sandhill crane, great blue heron, and waterfowl can be found frequenting the site. Many small mammals occur here including water species such as muskrat, beaver and river otter.

Shrubby Cinquefoil/Kentucky Bluegrass Plant Community:

The lack of tall or mid growing shrubs does not provide cover for many species and the only shrub is not used by most large mammals. As these areas tend to greens-up sooner in the spring, these sites provide early new growth for foraging large and small mammals. Generally, these are not target plant communities for wildlife habitat management.

Dense Shrub/Bluegrass Sod Plant Community:

The increase in the overstory of shrubs provides for an increase in year round cover and browsing selections for wildlife. The shrubs tend to break up hard crusted snow and many of these provide important sources of food for many wildlife species. However, due to the lack of herbaceous production and diversity of mid cool season grasses and grasslikes, this site is less beneficial to grazers. These sites are important corridors within the foot slopes of mountains and between upland sites and valuable water sources for many wildlife species. It provides important winter, nesting, brood-rearing, and foraging habitat for sage grouse. However, as the hydrology of the area has been significantly altered less water dependent species frequent the site. In addition, with the shift to more upland plants more upland species may be present.

Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 43BY, 15-19 inch Foothills and Mountains East

COMMON NAME/ GROUP NAME	SCIENTIFIC NAME	SCIENTIFIC SYMBOL	Cattle	Sheep	Horses	Mule Deer	Antelope	Elk	Moose	Mtn. Sheep
GRASSES/GRASSLIKES										
Alpine timothy	Phleum alpinum	PHAL2	PPPP	PPPP	PPPP	DDDD	UUUU	PPPP	DDDD	DDDD
Baltic rush	Juncus balticus	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	UUUU	UUUU
Big bluegrass	Poa ampla (syn. To Poa secunda)	POAM (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Bluebunch wheatgrass	Pseudoroegneria spicata	PSP6	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Bluejoint reedgrass	Calamagrostis canadensis	CACAM	PPPP	DDDD	PPPP	UUUU	UUUU	PPPP	DDDD	DDDD
Bottlebrush squirreltail	Elymus elymoides	ELELE	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
California oatgrass (danthonia)	Danthonia californica	DACA3	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Canby bluegrass	Poa canbyi (syn. to Poa secunda)	POCA (POSE)	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Columbia needlegrass	Achnatherum nelsonii	ACNE9	PPPP	PPPP	DDDD	DDDD	DDDD	PPPP	DDDD	DDDD
Dunehead sedge	Carex phaeocephala	CAPH2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Idaho fescue	Festuca idahoensis	FEID	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Indian ricegrass	Achnatherum hymenoides	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Letterman needlegrass	Achnatherum lettermanii	ACLE9	PPPP	PPPP	DDDD	DDDD	DDDD	PPPP	DDDD	DDDD
Low growing sedges (low sedge)	Carex spp.	CAREX	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Mat mulch	Muhlenbergia richardsonis	MURI	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Meadow barley	Hordeum brachyantherum	HOB2	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Montana wheatgrass (Griffiths wheatgrass)	Elymus albicans	ELAL7	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Mountain brome	Bromus marginatus	BRMA4	PPPP	PPPP	DDDD	DDDD	UUUU	PPPP	DDDD	DDDD
Mountain mulch	Muhlenbergia montana	MUMO	DDDD	DDDD	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD
Mutton bluegrass	Poa fendleriana	POFE	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Nebraska sedge	Carex nebrascensis	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Needleandthread	Hesperostipa	HESPE11	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP	PPPP
Nodding brome	Bromus anomalus	BRAN	PPPP	PPPP	DDDD	DDDD	UUUU	PPPP	DDDD	DDDD
Northern reedgrass	Calamagrostis stricta ssp. inexpansa	CAST13	PPPP	DDDD	PPPP	UUUU	UUUU	PPPP	DDDD	DDDD
One-spike oatgrass	Danthonia unispicata	DAUN	DDDD	PPPP	DDDD	PPPP	DDDD	DDDD	DDDD	DDDD
Prairie junegrass	Koeleria macrantha	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Pumpelly brome	Bromus inermis ssp. pumpellianus	BRINP5	PPPP	PPPP	DDDD	DDDD	UUUU	PPPP	DDDD	DDDD
Sandberg bluegrass	Poa secunda	POSE	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Slender wheatgrass	Elymus trachycaulus	ELTR7	PPPP	DDDD	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Slough sedge	Carex obnupta	CAOB3	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Spikefescue	Leucopoa kingii	LEK12	PPPP	DDDD	PPPP	PPPP	DDDD	PPPP	DDDD	DDDD
Spike trisetum	Trisetum spicatum	TRSP2	PPPP	DDDD	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Tall mannagrass	Glyceria elata (syn. G. striata)	GLEL (GLST)	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	DDDD	DDDD
Thickspike wheatgrass	Elymus lanceolatus ssp. lanceolatus	ELLAL	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Timber oatgrass (danthonia)	Danthonia intermedia	DAIN	DDDD	DDDD	DDDD	UUUU	UUUU	DDDD	DDDD	DDDD
Tufted hairgrass	Deschampsia caespitosa	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD	PPPP	DDDD	DDDD
Upland sedges	Carex spp.	CAREX	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Western wheatgrass	Pascopyrum smithii	PASM	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
FORBS										
American bistort	Polygonum bistortoides	POB16	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Arnica	Arnica	ARNIC	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU
Asters	Eucephalus spp.	EUCEP2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Chickweed (field chickweed)	Cerastium arvense	CEAR4	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Docks	Rumex spp.	RUMEX	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Fleabanes	Erigeron spp.	ERIGE2	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Goldenrod	Oligoneuron	OLIGO3	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Iris	Iris spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Larkspur (poisonous in spring before flowering)	Delphinium spp.	DELPH	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Lupine (may be poisonous after seedpots mature)	Lupinus spp.	LUPIN	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Mule-ears wyethia	Wyethia	WYETH	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Pale agoseris	Agoseris glauca	AGGL	DDDD	PPPP	DDDD	PPPP	DDDD	DDDD	DDDD	DDDD
Phlox	Phlox spp.	PHLOX	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Pussytoes	Antennaria spp.	ANTEN	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Sandwort	Arenaria spp.	ARENA	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Stonewort	Sedum spp.	SEDUM	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Water hemlock	Cicuta spp.	CICUT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Waterleaf	Hydrophyllum	HYDRO4	DDDD	PPPP	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Water sedge	Carex aquatilis	CAAQ	DDDD	UUUU	DDDD	UUUU	UUUU	DDDD	DDDD	UUUU
Western yarrow	Achillea millefolium	ACMIO	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Wild strawberry (false strawberry)	Fragaria vesca	FRVE	DDDD	PPPP	DDDD	PPPP	PPPP	DDDD	PPPP	PPPP
TREES, SHRUBS & HALF-SHRUBS										
Antelope bitterbrush	Purshia tridentata	PUTR2	PPPP	PPPP	DDDD	PPPP	PPPP	PPPP	PPPP	PPPP
Alpine laurel (bog kalmia)	Kalmia microphylla	KAMI	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT	TTTT
Big sagebrush	Artemisia tridentata	ARTR2	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	DDDD	DDDD
Black sagebrush	Artemisia nova	ARNO4	DDDD	DDDD	UUUU	DDDD	DDDD	DDDD	DDDD	DDDD
Bog birch	Beula pumila	BEPU4	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Boxelder	Acer negundo L. var. Interius	ACNE12	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Chokecherry (leaves are poisonous in sheep & cattle)	Prunus virginiana	PRVIV	DDDD	DDDD	DDDD	UUUU	UUUU	DDDD	DDDD	DDDD
Limber pine	Pinus flexilis	PIFL2	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Mountainmahogany	Cercocarpus spp.	CERCO	PPPP	PPPP	DDDD	PPPP	UUUU	PPPP	PPPP	DDDD
Ponderosa pine	Pinus ponderosa	PIPO	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Rabbitbrush	Chrysothamnus spp.	CHRS9	UUUU	PPPP	UUUU	DDDD	PPPP	UUUU	UUUU	DDDD
Redosier Dogwood	Cornus sericea	COCA16	UUUU	UUUU	UUUU	PPPP	UUUU	PPPP	PPPP	UUUU
Serviceberry	Amelanchier alnifolia	AMAL2	DDDD	PPPP	UUUU	PPPP	UUUU	DDDD	DDDD	DDDD
Shrubby cinquefoil	Dasiphora floribunda	DAFL3	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU	UUUU
Silver sagebrush	Artemisia cana	ARCA13	DDDD	DDDD	DDDD	PPPP	PPPP	DDDD	DDDD	DDDD
Snowberry	Symphoricarpos occidentalis	SYOC	UUUU	UUUU	UUUU	DDDD	UUUU	UUUU	UUUU	UUUU
Snowbrush ceanothus	Ceanothus velutinus	CEVE	PPPP	DDDD	DDDD	DDDD	UUUU	PPPP	DDDD	DDDD
Three-tip sagebrush	Artemisia tripartita	ARTR4	UUUU	DDDD	UUUU	UUUU	DDDD	UUUU	DDDD	DDDD
Water birch	Beula occidentalis	BEOC2	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD	DDDD
Willow	Salix spp.	SALIX	DDDD	PPPP	DDDD	PPPP	UUUU	DDDD	PPPP	DDDD

N = not used; U = undesirable; D = desirable; P = preferred; T = toxic

Animal Community – Grazing Interpretations

The following table lists suggested stocking rates for cattle under continuous season-long grazing under normal growing conditions. These are conservative estimates that should be used only as guidelines in the initial stages of the conservation planning process. Often, the current plant composition does not entirely match any particular plant community (as described in this ecological site description). Because of this, a field visit is recommended, in all cases, to document plant composition and production. More precise carrying capacity estimates should eventually be calculated using this information along with animal preference data, particularly when grazers other than cattle are involved. Under more intensive grazing management, improved harvest efficiencies can result in an increased carrying capacity. If distribution problems occur, stocking rates must be reduced to maintain plant health and vigor.

Plant Community	Production (Lb./ac)	Carrying Capacity* (AUM/ac)
Nebraska Sedge/Tufted Hairgrass	3000-4500	2.0
Tufted Hairgrass/Willow	2800-4300	1.7
Dense Shrub/ Nebraska Sedge	2800-4300	1.5
Low Sedge/Mat Muhly/Willow	2300-3500	1.5
Shrubby Cinquefoil/Willow	1800-2800	1.0
Shrubby Cinquefoil/Kentucky Bluegrass	1800-2800	.6
Dense Shrub/Bluegrass Sod	700-1000	.4

* - Continuous, season-long grazing by cattle under average growing conditions.

Grazing by domestic livestock is one of the major income-producing industries in the area. Rangeland in this area may provide forage for cattle, sheep, or horses. During the dormant period, the forage for livestock use needs to be supplemented with protein because the quality does not meet minimum livestock requirements.

Hydrology Functions

Climate is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group D. Infiltration and runoff potential for this site varies from moderate to high depending on soil hydrologic group and water table. Runoff will be high on this site since the soil is usually saturated. (Refer to Part 630, NRCS National Engineering Handbook for detailed hydraulic information.)

Rills and gullies should not typically be present. Water flow patterns should be barely distinguishable if at all present. Pedestals are only slightly present in association with bunchgrasses. Litter typically falls in place, and signs of movement are not common. Chemical and physical crusts are rare to non-existent. Cryptogamic crusts are present, but only cover 1-2% of the soil surface.

Recreational Uses

This site provides hunting opportunities for upland game and water species. Sites adjacent to perennial stream provide opportunities for fishing and water activities. The wide varieties of plants that bloom from spring until fall have an esthetic value that appeals to visitors. Other recreational uses may include hiking, camping, mountain biking, and in the winter snowshoeing and cross-country skiing.

Wood Products

No appreciable wood products are present on the site.

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**Subirrigated (Sb) 15-19" East P.Z.
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Other Products

None noted.

Supporting Information

Associated Sites

Wetland	043BY378WY Foothills and Mountains East P.Z.
Overflow	043BY330WY Foothills and Mountains East P.Z.

Similar Sites

() – Subirrigated 10-14" Foothills and Basins East P.Z., 032XY374WY has lower production.

Inventory Data References (narrative)

Information presented here has been derived from NRCS clipping data and other inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Chris Krassin, Range Management Specialist, James Haverkamp, Range Management Specialist, Steven Gullion, Range Management Specialist, James Mischke, District Conservationist, and Everet Bainter, State Range Management Specialist. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, and USDA NRCS Soil Surveys from various counties.

Inventory Data References

Site Correlation

Type Locality

Field Offices

Cody, Dubois, Fort Washakie, Greybull, Lander, Powell, Riverton, Thermopolis, Worland

Relationship to Other Established Classifications

Other References

Site Description Approval

State Range Management Specialist

Date