

## United States Department of Agriculture Natural Resources Conservation Service

### Ecological Site Description

**Site Type:** Rangeland

**Site Name:** Wetland (WL) 5-9” Big Horn Basin Precipitation Zone

**Site ID:** 032XY178WY

**Major Land Resource Area:** 32 – Northern Intermountain Desertic Basins

### Physiographic Features

This site normally occurs on level to nearly level bottomlands near springs, seeps and sloughs.

**Landform:** drainageways, oxbows, and stream terraces. **Aspect:** N/A

	<u>Minimum</u>	<u>Maximum</u>
<b>Elevation (feet):</b>	3700	6000
<b>Slope (percent):</b>	0	6
<b>Water Table Depth (inches):</b>	0	18
<b>Flooding:</b>		
<b>Frequency:</b>	occasional	frequent
<b>Duration:</b>	very brief	long
<b>Ponding:</b>		
<b>Depth (inches):</b>	0	12
<b>Frequency:</b>	frequent	frequent
<b>Duration:</b>	brief	very long
<b>Runoff Class:</b>	negligible	medium

### Climatic Features

Annual precipitation ranges from 5-9 inches per year. The normal precipitation pattern shows peaks in May and June and a secondary peak in September. This amounts to about 50% of the mean annual precipitation. Much of the moisture that falls in the latter part of the summer is lost by evaporation and much of the moisture that falls during the winter is lost by sublimation. Average snowfall is about 20 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

Temperatures show a wide range between summer and winter and between daily maximums and minimums, due to the high elevation and dry air, which permits rapid incoming and outgoing radiation. Cold air outbreaks from Canada in winter move rapidly from northwest to southeast and account for extreme minimum temperatures. Chinook winds may occur in winter and bring rapid rises in temperature. Extreme storms may occur during the winter, but most severely affect ranch operations during late winter and spring.

High winds are generally blocked from the basin by high mountains, but can occur in conjunction with an occasional thunderstorm.

Growth of native cool-season plants begins about April 1 and continues to about July 1. Cool weather and moisture in September may produce some green up of cool season plants that will continue to late October.

The following information is from the “Emblem” climate station:

	<u>Minimum</u>	<u>Maximum</u>	<u>5 yrs. out of 10 between</u>
<b>Frost-free period (days):</b>	98	171	May 13 – September 19
<b>Freeze-free period (days):</b>	120	184	May 1 – October 5
<b>Mean Annual Precipitation (inches):</b>	3.22	10.97	

Mean annual precipitation: 7.42 inches

Mean annual air temperature: 45.01°F (31.2°F Avg. Min. to 58.7°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. Other climate station(s) representative of this precipitation zone include “Basin”, “Deaver”, “Lovell” and “Worland”.

## Influencing Water Features

<b>Wetland Description:</b>	<u>System</u>	<u>Subsystem</u>	<u>Class</u>	<u>Sub-class</u>
<b>Stream Type:</b> C (Rosgen)	Palustrine	None	Emergent Wetland	Persistent

## Representative Soil Features

This site consists of deep to very deep poorly drained soils formed in alluvium with a water table above the surface for part but not all of the growing season. They are on nearly level to slightly depressed areas with poor surface drainage. In some places the surface layers have high organic matter content. The soil characteristics having the most influence on the plant community are depth to a water table at or near the surface for all of the growing season.

Major Soil Series correlated to this site include: Fluvaquents

Other Soil Series in MLRA 32 correlated to this site include:

**Parent Material Kind:** alluvium

**Parent Material Origin:** sandstone, shale

**Surface Texture:** clay, clay loam, loam, silty clay, silty clay loam, silt loam

**Surface Texture Modifier:** mucky

**Subsurface Texture Group:** loam

**Surface Fragments ≤ 3” (% Cover):** 0

**Surface Fragments > 3” (%Cover):** 0

**Subsurface Fragments ≤ 3” (% Volume):** 0

**Subsurface Fragments > 3” (% Volume):** 0

	<u>Minimum</u>	<u>Maximum</u>
<b>Drainage Class:</b>	poorly drained	very poorly drained
<b>Permeability Class:</b>	slow	moderate
<b>Depth (inches):</b>	20	>60
<b>Electrical Conductivity (mmhos/cm) ≤20”:</b>	4	16
<b>Sodium Absorption Ratio ≤20”:</b>	0	15

Site Type: Rangeland  
MLRA: 32XY – Northern Intermountain Desertic Basins

**Wetland (WL) 5-9 BH**  
**R032XY178WY**

<b>Soil Reaction (1:1 Water) <math>\leq 20''</math>:</b>	6.6	8.4
<b>Soil Reaction (0.1M CaCl<sub>2</sub>) <math>\leq 20''</math>:</b>	NA	NA
<b>Available Water Capacity (inches) <math>\leq 30''</math>:</b>	2.2	6.6
<b>Calcium Carbonate Equivalent (percent) <math>\leq 20''</math>:</b>	5	15

## Plant Communities

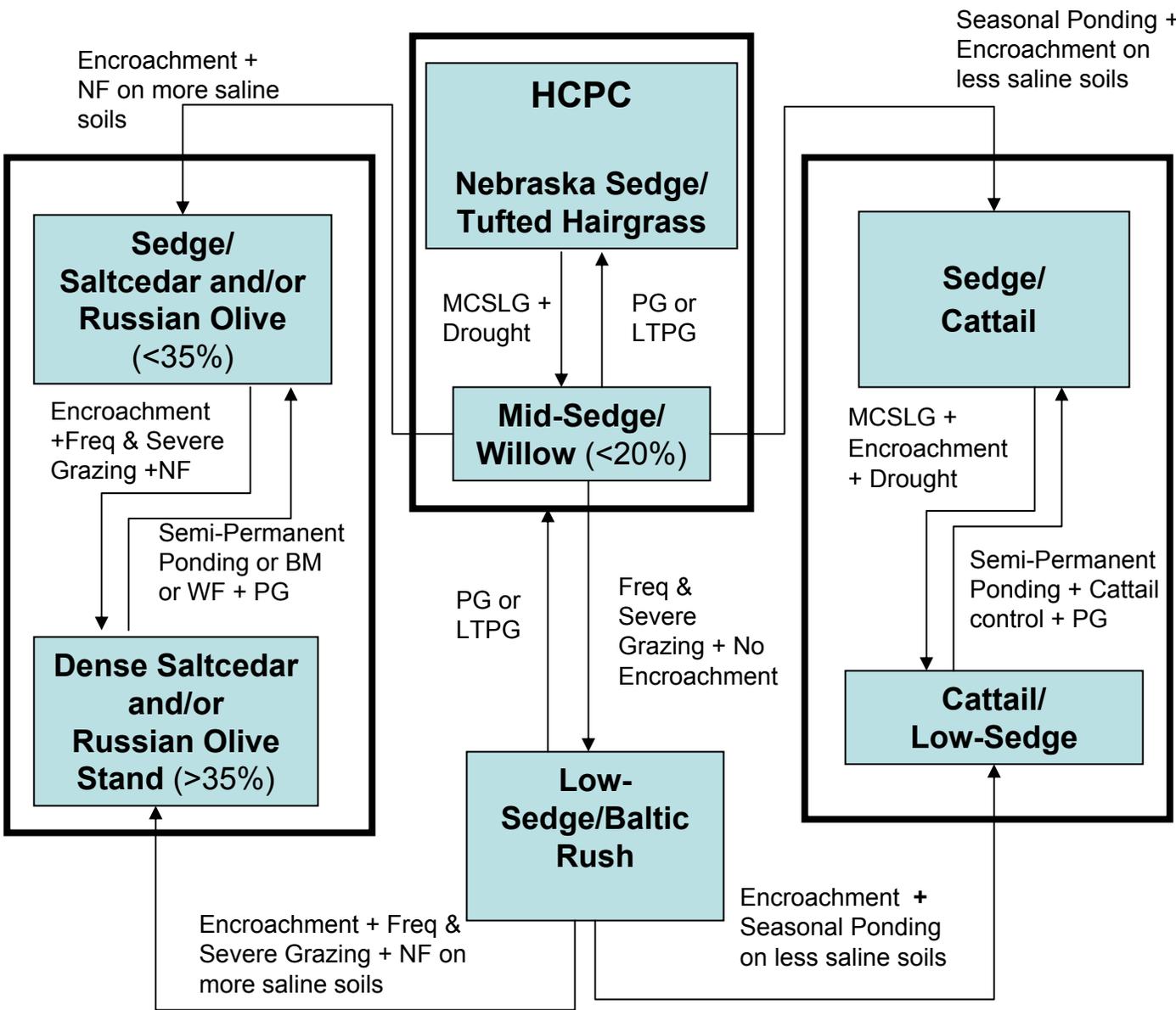
### Ecological Dynamics of the Site:

Potential vegetation on this site is dominated by plants that can tolerate soils which have a water table near the surface for most of the growing season and are slightly saline. The expected potential composition for this site is about 80% grasses, 10% forbs and 10% 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, rushes, and bulrush increase. Grasses such as Nebraska sedge and tufted hairgrass will decrease in frequency and production.

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
- 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)
- 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.
			<b>Total: 4500</b>		
<b>GRASSES AND GRASS-LIKES</b>					
<b>GRASSES/GRASSLIKES</b>					
Nebraska sedge	Carex nebrascensis	CANE2	1	1125 - 1575	25 - 35
Water sedge	Carex aquatilis	CAAQ	2	450 - 1125	10 - 25
Beaked sedge	Carex rostrata	CARO6	3	450 - 1125	10 - 25
Tufted hairgrass	Deschampsia caespitosa	DECA18	4	225 - 675	5 - 15
<b>MISC. GRASSES/GRASSLIKES</b>			<b>5</b>	<b>225 - 675</b>	<b>5 - 15</b>
Alkali cordgrass	Spartina gracilis	SPGR	5	0 - 225	0 - 5
American sloughgrass	Beckmannia syzigachne	BESY	5	0 - 225	0 - 5
Baltic rush	Juncus balticus	JUBA	5	0 - 225	0 - 5
Bluegrasses	Poa spp.	POA	5	0 - 225	0 - 5
Bluejoint reedgrass	Calamagrostis spp.	CALAM	5	0 - 225	0 - 5
Bulrush	Scirpus spp.	SCIRP	5	0 - 225	0 - 5
Fowl mannagrass	Glyceria striata	GLST	5	0 - 225	0 - 5
Northern reedgrass	Calamagrostis stricta	CAST13	5	0 - 225	0 - 5
other hydrophilic sedges	Carex spp.	CYPER	5	0 - 225	0 - 5
other rushes	Juncus spp.	JUNCA	5	0 - 225	0 - 5
other upland sedges	Carex spp.	CYPER	5	0 - 225	0 - 5
Reed canarygrass	Phalaris arundinacea	PHAR3	5	0 - 225	0 - 5
other perennial grasses (native)		2GP	5	0 - 225	0 - 5
<b>FORBS</b>			<b>6</b>	<b>225 - 450</b>	<b>5 - 10</b>
Alkali buttercup	Ranunculus cymbalaria	RACY	6	0 - 225	0 - 5
Blue-eyed grass	Sisyrinchium spp.	SISYR	6	0 - 225	0 - 5
Bugleweeds	Lycopus spp.	LYCOP4	6	0 - 225	0 - 5
Common mint	Mentha arvensis	MEAR4	6	0 - 225	0 - 5
Common plaintain	Plantago major	PLMA2	6	0 - 225	0 - 5
Marsh hedgenettle	Stachys palustris	STPA	6	0 - 225	0 - 5
Rocky Mountain iris	Iris missouriensis	IRMI	6	0 - 225	0 - 5
Rough bugleweed	Lycopus asper	LYAS	6	0 - 225	0 - 5
Sagebrush buttercup	Ranunculus glaberrimus	RAGL	6	0 - 225	0 - 5
Seaside arrowgrass	Triglochin maritimum	TRMA4	6	0 - 225	0 - 5
Silverweed cinquefoil	Argentina anserina	ARAN7	6	0 - 225	0 - 5
Smooth horsetail	Equisetum laevigatum	EQLA	6	0 - 225	0 - 5
other perennial forbs (native)		2FP	6	0 - 225	0 - 5
<b>TREES/SHRUBS</b>					
<b>MISC. SHRUBS</b>			<b>7</b>	<b>225 - 675</b>	<b>5 - 15</b>
Coyote willow	Salix exigua	SAEX	7	0 - 225	0 - 5
other willows	Salix spp.	SALIX	7	0 - 225	0 - 5
Wild rose	Rosa woodsii	ROWO	7	0 - 225	0 - 5
other shrubs & half shrubs (native)		2SHRUB	7	0 - 225	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 state evolved with grazing by large herbivores and a perched water table. Potential vegetation is about 80% grasses or grass-like plants, 10% forbs, and 10% woody plants. The major grasses/grass-likes include Nebraska sedge, water sedge, beaked sedge, and tufted hairgrass. Grasses/grasslikes of lesser importance are Baltic rush, reed canarygrass and alkali cordgrass. A variety of forbs also occurs in this state and plant diversity is high (see Plant Composition Table).

The total annual production (air-dry weight) of this state is about 4500 pounds per acre, but it can range from about 3000 lbs. /acre in unfavorable years to about 6000 lbs. /acre in above average years.

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

Growth curve number: WYO503

Growth curve name: 5-9BH, FREE WATER SITES

Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

The state is well adapted to the Northern Intermountain Desertic Basins climatic conditions. It is a critical state providing water and habitat for the surrounding area. The diversity in plant species provides a variety of habitats for wildlife. It is resistant to drought due to a dependable water supply. This is a 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 this plant community to the *Mid-sedge/Willow Plant Community*.

**Mid-Sedge/Willow Plant Community**

Historically, this plant community evolved under moderate grazing by large ungulates and low fire frequency. Currently, this site is normally found under a moderate, season-long grazing regime and in the absence of fire or brush control. Prolonged drought can also play an important role and will exacerbate these conditions. Flood tolerant perennial plants make up the dominant species in this plant community.

Dominant grasses include water and beaked sedges, reed canarygrass, alkali cordgrass, bulrush and rushes. Willows comprise the majority of the shrubs, but wild rose can also be found near the dryer edges of this state. Forbs commonly found in this plant community include blue-eyed grass, smooth horsetail, seaside arrowgrass, and common plaintain. Some annuals as well as cattails may have invaded the site, but are in isolated pockets.

When compared to the Historical Climax Plant Community, Nebraska sedge and tufted hairgrass have decreased. Lower growing sedges, bulrush, and rush have increased. Total production shows only minimal reduction as willows offset the reduction in some perennial species.

The total annual production (air-dry weight) of this state is about 4250 pounds per acre, but it can range from about 2750 lbs. /acre in unfavorable years to about 5500 lbs. /acre in above average years.

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

Growth curve number: WYO503

Growth curve name: 5-9BH, FREE WATER SITES

Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

The state is reasonable stable but certain weedy species can quickly invade with minimal disturbance. This site is protected from excessive erosion and the biotic integrity of this plant community is intact. The watershed is functioning.

Transitional 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*.
- Frequent and Severe grazing plus no encroachment of cattails, saltcedar or Russian olive will convert this plant community to the *Low-Sedge/Baltic Rush Plant Community*.
- Encroachment plus no fire on more saline soils will convert this plant community to the *Sedge/Saltcedar and/or Russian Olive Plant Community*. Frequent and severe or moderate season long grazing may increase the likelihood of this occurring but is not necessary for this to occur.
- Seasonal ponding plus encroachment on less saline soils will convert this plant community to the *Sedge/Cattail Plant Community*. Frequent and severe grazing or moderate season long grazing may increase the likelihood of this occurring. Drought will exacerbate this occurrence.

**Low-Sedge/Baltic Rush Plant Community**

This plant community is the result of long-term improper grazing use. Baltic rush and low growing sedges plus a host of forbs dominate this state. These forbs include both native and introduced. Shrubs are not a significant component of this state.

The main grasses or grass-like plants are Baltic rush, low growing sedges, alkali cordgrass, bulrush, and rushes. Forbs are pervasive and include both native and introduced species. The kind of forb species present depends on the available seed source and the soluble salt content of the soil. Native forb species can include American licorice, wild iris, seaside arrowgrass, smooth horsetail, and silverweed cinquefoil. Introduced forb species include curly dock, swainsonpea, and smartweed. Cattails may be encroaching on the site but have not yet become established. This is especially true on less saline soils. If a seed source is available recruits of saltcedar and Russian olive may begin establishing on the more saline sites. Plant diversity is moderate to poor.

When compared to the Historic Climax Plant Community, the mid-sedges and tall and medium grasses are significantly reduced or absent. Forbs and weedy annuals have significantly increased. Production has decreased and bare ground has increased.

The total annual production (air-dry weight) of this state is about 2000 pounds per acre, but it can range from about 1200 lbs. /acre in unfavorable years to about 2500 lbs. /acre in above average years.

The following is the growth curve expected during an average year.  
 Growth curve number: WYO503  
 Growth curve name: 5-9BH, FREE WATER SITES  
 Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

This plant community is susceptible to change and species composition can be altered through long-term overgrazing and encroachment by weedy species. The herbaceous component is unstable and plant vigor and replacement capabilities may or may not be sufficient. The biotic community may or may not be intact as some of the mid sedges may be absent. Plant diversity is moderate to low.

Soils are mostly stabilized and soil loss is minimal. Incidence of pedestalling is evident. The watershed may or may not be functional.

Transitional pathways leading to other plant communities are as follows:

- Prescribed Grazing over the long-term and possibly seeding will return this state to near *Historic Climax Plant Community*. If a seed source for saltcedar, Russian olive, or cattails are available or plants exist on adjacent lands or in small patches on site this will require vigilant treatment to reduce the likelihood of colonization of the site.
- Encroachment plus seasonal ponding on less saline soils will convert this plant community to the *Cattail/Low-Sedge Plant Community*. Frequent and severe or moderate long-term grazing may increase the likelihood of this occurring.
- Encroachment plus frequent and severe grazing plus no fire on more saline soils will convert this plant community to the *Dense Saltcedar and/or Russian Olive Stand Plant Community*.

**Cattail/Low-Sedge Plant Community**

This plant community occurs where cattails encroach into a Low-Sedge Baltic Rush Plant Community and become established. This encroachment occurs on less saline soils and is exacerbated by

seasonal ponding or fluctuating water levels. Encroachment occurs with or without grazing and is the result of conditions conducive to the colonization by this plant. Increase in bare ground is likely to increase the potential for colonization. However, areas that have been deferred or removed from grazing and had a relatively healthy stand of sedges can be infested. Flood tolerant plants make up the dominant understory species in this plant community.

Dominant grasses and grass-like plants include cattails, mid and/or low sedges, alkali cordgrass, bulrush, reedgrasses, and Baltic rush. Forbs commonly found in this plant community include alkali seepweed, silverweed, American licorice, seaside arrowgrass, and smooth horsetail. Willows comprise the majority of the woody species and make up less than 35% of the annual production.

When compared to the Historical Climax Plant Community, the mid-sedges have been reduced. Cattails, low growing sedges, and forbs have increased. Willows have probably increased. Total production is lower as the mid sedges have decreased but the increase in cattails compensates for some of the loss.

The total annual production (air-dry weight) of this state is about 3250 pounds per acre, but it can range from about 2750 lbs. /acre in unfavorable years to about 4000 lbs. /acre in above average years.

The following is the growth curve expected during a normal year:  
 Growth curve number: WYO503  
 Growth curve name: 5-9BH, FREE WATER SITES  
 Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

This plant community is mostly resistant to change, but species composition will be altered through semi-ponding and flooding but can be exacerbated by drought and improper grazing. The herbaceous component may or may not be stable and plant vigor and replacement capabilities may or may not be sufficient. The biotic community is not intact due to the encroachment of these invasive species. Plant diversity is moderate.

The state is stable and protected from excessive erosion as cattails are good soil stabilizers. Only minimal occurrences of water flow patterns and litter movement is evident. Incidence of pedestalling is minimal. Soils are mostly stable and the surface shows minimum soil loss. The watershed may or may not be functional.

Transitional pathways leading to other plant communities are as follows:

- Semi-permanent ponding plus chemical control of cattails and possibly seeding plus prescribed grazing will convert the plant community to a *Sedge/Cattail Plant Community*. Control of cattails is the key to this occurring and may require continued treatments to reduce the stand to allow other wetland plants to establish.
- Recovery to near *Historic Climax Plant Community* condition is impractical and continued suppression or containment of cattails is optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species and other weeds.

### **Sedge/Cattail Plant Community**

This plant community occurs where control of cattails has been successful and the cattails are confined to localized patches. Mid-sedges and other perennial grasses have been allowed to reestablish. Flood tolerant plants make up the dominant understory species in this plant community.

Dominant grasses and grass-like plants include mid and low sedges, tufted hairgrass, reedgrasses, alkali cordgrass, and Baltic rush. Forbs commonly found in this plant community include blue-eyed grass, alkali seepweed, silverweed, American licorice, seaside arrowgrass, and smooth horsetail. Willows comprise the majority of the woody species and make up less than 35% of the annual production.

When compared to the Historical Climax Plant Community, the production of mid-sedges and perennial grasses are only slightly less. Cattails, low growing sedges, and forbs have increased. Willows may or may not have increased. Total production is only slightly lower.

The total annual production (air-dry weight) of this state is about 4000 pounds per acre, but it can range from about 3000 lbs. /acre in unfavorable years to about 5000 lbs. /acre in above average years.

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

Growth curve number: WYO503

Growth curve name: 5-9BH, FREE WATER SITES

Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

This plant community is mostly resistant to change, but species composition can be altered through a change in water levels and improper grazing. The herbaceous component is stable, but does not comprise the composition of HCPC. Plant vigor and replacement capabilities are sufficient. The biotic community is not intact because of the cattail infestation. Plant diversity is moderate.

Soils are mostly stable and recent soil loss is minimal. Water flow patterns and litter movement is stable. Incidence of pedestalling is improving. The watershed may or may not be functioning

Transitional pathways leading to other plant communities are as follows:

- Moderate continued season long grazing plus encroachment will convert this plant community to the *Cattail/Low-Sedge Plant Community*. Drought will exacerbate this conversion.
- Recovery to near *Historic Climax Plant Community* condition is impractical and continued suppression or containment of cattails is optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species and other weeds.

### **Sedge/Saltcedar and/or Russian Olive Plant Community**

This plant community occurs where saltcedar and/or Russian olive encroaches into a wetland site and becomes established. This encroachment occurs mostly on mildly to moderately saline soils. Encroachment occurs with or without grazing and is the result of conditions conducive to the colonization of these two plants. Increase in bare ground is likely to increase the potential for colonization. However, areas that have been deferred or removed from grazing and had a healthy

stand of sedges can be infested. Flood tolerant and mild to moderate saline perennial plants make up the dominant understory species in this plant community.

Dominant grasses and grass-like plants include mid and/or low sedges, alkali cordgrass, Bulrush, reedgrasses, and Baltic rush. Forbs commonly found in this plant community include alkali seepweed, silverweed, American licorice, seaside arrowgrass, and smooth horsetail. Saltcedar and/or Russian olive comprise the majority of the woody species and make up less than 35% of the annual production. Invasion of saltcedar or Russian olive should be considered serious and should be controlled. Weedy herbaceous species are likely present.

When compared to the Historical Climax Plant Community, the mid-sedges have been reduced. Low growing sedges and forbs have increased. Saltcedar and Russian olive have invaded. Willows have been replaced. Total production is slightly lower as the mid sedges have decreased but the wood species have increased.

The total annual production (air-dry weight) of this state is about 3000 pounds per acre, but it can range from about 2750 lbs. /acre in unfavorable years to about 4000 lbs. /acre in above average years.

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

Growth curve number: WYO503

Growth curve name: 5-9BH, FREE WATER STIES

Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

This plant community is mostly resistant to change, but species composition will be altered through further encroachment by saltcedar and/or Russian olive and long-term overgrazing can exacerbate this occurrence. The herbaceous component is or is not stable and plant vigor and replacement capabilities may or may not be sufficient. The biotic community is not intact due to the encroachment of these invasive species. Plant diversity is moderate.

Soils are mostly stabilized. Only minimal occurrences of water flow patterns and litter movement is evident. Incidence of pedestalling is minimal. Soils are mostly stable and the surface shows minimum soil loss. The watershed may or may not be functional.

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

- Further encroachment plus frequent and severe grazing plus no fire will convert the plant community to the *Dense Saltcedar and/or Russian Olive Stand Plant Community*.
- Recovery to near *Historic Climax Plant Community* condition is impractical and suppression or containment of these two species optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species and other weeds.

**Dense Saltcedar and/or Russian Olive Stand Plant Community**

This plant community evolved under frequent and severe grazing with the absence of fire and encroachment of saltcedar and/or Russian olive. Saltcedar and/or Russian olive dominate this plant community. Most of the tall and medium grasses are eliminated and an understory of weedy

herbaceous plants is prevalent. The interspaces between the woody plants have expanded, leaving more bare ground and more soil surface exposed to erosive elements or invaders.

The weedy plants, such as foxtail barley, curly dock, kochia, halogeton, swainsonpea, and Russian knapweed, make up the dominant understory. Total annual production is mostly from shrubs and these weedy plants. Saltcedar and/or Russian olive make up greater than 35% of the total annual production. When compared with the HCPC, the annual production is slightly less due to the removal of the perennial grass and amount of bare ground. The increase in woody species, however, compensates for some of this loss.

The total annual production (air-dry weight) of this state is about 2000 pounds per acre, but it can range from about 1750 lbs. /acre in unfavorable years to about 2500 lbs. /acre in above average years.

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

Growth curve number: WYO503

Growth curve name: 5-9BH, FREE WATER SITES

Growth curve description: WL, SB, SS, FREE WATER SITES

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

(Monthly percentages of total annual growth)

This plant community is resistant to change as the stand becomes more decadent. These areas may actually be more resistant to fire as less fine fuels are available and the bare ground between the shrubs is increased. Continued frequent and severe grazing or the removal of grazing does not seem to affect the plant composition or structure of the plant community. Saltcedar, Russian olive, annual grasses, 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.

The soil of this state is not protected as erosion has accelerated because of increased bare ground. Water flow patterns and pedestalling are obvious. Infiltration is reduced and runoff is increased. Rill channels may be noticeable in the interspaces and gullies may be establishing where rills have concentrated. The watershed is not functional due to excessive runoff, erosion and bare ground.

Transitional pathways leading to other plant communities are as follows:

- Semi-permanent ponding or Brush management and prescribed grazing will result in a *Sedge/ Saltcedar and/or Russian Olive Plant Community*. Controlling both saltcedar and Russian olive is a priority if these species have invaded.
- Recovery to near *Historic Climax Plant Community* condition is impractical and suppression or containment of these two species is optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species.

## Ecological Site Interpretations

### Animal Community – Wildlife Interpretations

**Nebraska sedge/Tufted Hairgrass Plant Community:** The predominance of grasses in this plant community favors grazers and mixed-feeders, such as bison, elk, and antelope. Suitable thermal and escape cover for deer may be limited due to the low quantities of woody plants. This plant community

may provide brood rearing/foraging areas for upland game birds. Other birds that would frequent this plant community include red-wing blackbirds, sand hill cranes, Wilson snipe, western meadowlarks, and golden eagles. Many small mammals would occur here.

**Mid-Sedge/Willow Plant Community:** The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer, and whitetail deer. This plant community is useful for the same large grazers that would use the Historic Climax Plant Community. The increase in willow production makes this even more attractive to some wildlife due to the increase in thermal and escape cover. It can provide foraging and nesting opportunities for upland game birds and songbirds.

**Low-Sedge/Baltic Rush Plant Community:** The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer and whitetail deer. This plant community may be useful for the same large grazers that would use the Historic Climax Plant Community. However, the plant community composition is less diverse, and thus, less apt to meet the seasonal needs of these animals. It may provide some foraging opportunities for upland game birds and songbirds, when it occurs proximal to woody cover.

**Cattail/Low Sedge Plant Community:** The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer, and whitetail deer. This plant community is useful for the same large grazers that would use the Historic Climax Plant Community. The increase in cattail production makes this even more attractive to some wildlife due to the increase in thermal and escape cover. It can provide foraging and nesting opportunities for upland game birds and songbirds.

**Sedge/Cattail Plant Community:** The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer, and whitetail deer. This plant community is useful for the same large grazers that would use the Historic Climax Plant Community. The increase in cattail production makes this even more attractive to some wildlife due to the increase in thermal and escape cover. It can provide foraging and nesting opportunities for upland game birds and songbirds.

**Sedge/Saltcedar and/or Russian Olive Plant Community:** The abundant production and proximity to water make this state important for livestock and wildlife such as birds, mule deer, and whitetail deer. This plant community is useful for the same large grazers that would use the Historic Climax Plant Community. The increase in tall shrub production makes this even more attractive to some wildlife due to the increase in thermal and escape cover. It can provide foraging and nesting opportunities for upland game birds and songbirds. Some species utilize the Russian olive berries for food and are attracted to these colonized areas.

**Dense Saltcedar and/or Russian Olive Stand Plant Community:** The proximity to water makes this state important for wildlife such as birds, mule deer, and whitetail deer. This is useful for the same large grazers that would use the Historic Climax Plant Community. The low production of herbaceous understory of this plant community decreases the foraging potential and cover for many wildlife species. The increase in tall shrubs, however, makes this an attractive site for thermal and escape cover for large grazers and upland birds. It can provide foraging and nesting opportunities for songbirds. Some species utilize the Russian olive berries for food and are attracted to these colonized areas.

**Animal Preferences (Quarterly - 1,2,3,4) for commonly occurring plants in MLRA 32, 5-9 inch Bighorn Basin**

COMMON NAME/ GROUP NAME	SCIENTIFIC NAME	SCIENTIFIC SYMBOL	Cattle	Sheep	Horses	Deer	Antelope
<b>GRASSES/GRASSLIKES</b>							
Alkali bluegrass	<i>Poa juncifolia</i> (syn. <i>P. secunda</i> )	POJU (POSE)	DDDD	PPPP	DDDD	PPPP	PPPP
Alkali cordgrass	<i>Spartina gracilis</i>	SPGR	DDDD	UUUU	DDDD	UUUU	UUUU
Alkali sacaton	<i>Sporobolus airoides</i>	SPA1	PPPP	DDDD	PPPP	DDDD	DDDD
Baltic rush	<i>Juncus balticus</i>	JUBA	DDDD	UUUU	DDDD	UUUU	UUUU
Basin wildrye	<i>Leymus cinereus</i>	LECI4	PPPP	PPPP	PPPP	DDDD	DDDD
Beaked sedge	<i>Carex rostrata</i>	CAR06	DDDD	UUUU	DDDD	UUUU	UUUU
Blue grama	<i>Bouteloua gracilis</i>	BOGR2	DDDD	DDDD	DDDD	DDDD	DDDD
Bluebunch wheatgrass	<i>Pseudoroegneria spicata</i>	PSSF6	PPPP	PPPP	PPPP	DDDD	DDDD
Bottlebrush squirreltail	<i>Elymus elymoides</i>	ELEL5	DDDD	DDDD	DDDD	UUUU	DDDD
Canada wildrye	<i>Elymus canadensis</i>	ELCA4	PPPP	PPPP	PPPP	DDDD	DDDD
Golden sedge	<i>Carex aurea</i>	CAAU3	DDDD	DDDD	DDDD	UUUU	UUUU
Indian ricegrass	<i>Achnatherum hymenoides</i>	ACHY	PPPP	PPPP	PPPP	PPPP	PPPP
Inland saltgrass	<i>Distichlis spicata</i>	DISP	UUUU	UUUU	UUUU	UUUU	UUUU
Inland sedge	<i>Carex interior</i>	CAIN11	DDDD	DDDD	DDDD	UUUU	UUUU
Nebraska sedge	<i>Carex nebrascensis</i>	CANE2	PPPP	PPPP	PPPP	DDDD	DDDD
Needleandthread	<i>Hesperostipa comata</i>	HECO26	PPPP	PPPP	PPPP	PPPP	PPPP
Nuttall's alkaligrass	<i>Puccinellia nuttalliana</i>	PUNU2	PPPP	PPPP	PPPP	PPPP	PPPP
Prairie junegrass	<i>Koeleria macrantha</i>	KOMA	DDDD	DDDD	DDDD	DDDD	DDDD
Prairie sandreed	<i>Calamovilfa longifolia</i>	CALO	PPPP	UUUU	PPPP	UUUU	UUUU
Red threeawn	<i>Aristida purpurea</i>	ARPUL	UUUU	UUUU	UUUU	UUUU	UUUU
Sand dropseed	<i>Sporobolus cryptandrus</i>	SPCR	DDDD	DDDD	DDDD	UUUU	UUUU
Sandberg bluegrass	<i>Poa secunda</i>	POSE	DDDD	DDDD	DDDD	DDDD	DDDD
Slender wheatgrass	<i>Elymus trachycalyx</i>	ELTR7	PPPP	DDDD	PPPP	DDDD	DDDD
Streambank wheatgrass	<i>Elymus lanceolatus</i>	ELLA3	DDDD	DDDD	DDDD	DDDD	DDDD
Thickspike wheatgrass	<i>Elymus lanceolatus</i> ssp. <i>lanceolatus</i>	ELLAL	DDDD	DDDD	DDDD	DDDD	DDDD
Threadleaf sedge	<i>Carex filifolia</i>	CAFI	DDDD	DDDD	DDDD	DDDD	DDDD
Threeawns	<i>Aristida</i> spp.	ARIST	UUUU	UUUU	UUUU	UUUU	UUUU
Tufted hairgrass	<i>Deschampsia caespitosa</i>	DECA18	PPPP	PPPP	PPPP	DDDD	DDDD
Upland sedge	<i>Carex</i> spp.	CAREX	DDDD	DDDD	DDDD	DDDD	DDDD
Water sedge	<i>Carex aquatilis</i>	CAAQ	DDDD	UUUU	DDDD	UUUU	UUUU
Western wheatgrass	<i>Pascopyrum smithii</i>	PASM	DDDD	DDDD	DDDD	DDDD	DDDD
<b>FORBS</b>							
Alkali seepweed	<i>Suaeda</i> spp.	AGOSE	UUUU	UUUU	UUUU	UUUU	UUUU
Arrowgrass	<i>Triglochin</i> spp.	TRIGL	TTTT	TTTT	TTTT	TTTT	TTTT
Asters	<i>Eucephalus</i> spp.	EUCEP2	UUUU	UUUU	UUUU	UUUU	UUUU
Biscuitroot	<i>Lomatium</i> spp.	LOMAT	DDDD	DDDD	UUUU	DDDD	DDDD
Blue-eyed grass	<i>Sisyrinchium</i> spp.	SISYR	UUUU	UUUU	UUUU	UUUU	UUUU
Buckwheats	<i>Eriogonum</i> spp.	ERIOG	UUUU	DDDD	UUUU	UUUU	UUUU
Dock	<i>Rumex</i> spp.	RUMEX	UUUU	UUUU	UUUU	UUUU	UUUU
Evening primrose	<i>Oenothera caespitosa</i>	OECA10	UUUU	UUUU	UUUU	UUUU	UUUU
False carrot	<i>Turgenia</i> spp.	TURGE	UUUU	DDDD	UUUU	UUUU	UUUU
Fleabanes	<i>Erigeron</i> spp.	ERIGE2	DDDD	DDDD	DDDD	DDDD	DDDD
Horsetails	<i>Equisetum</i> spp.	EQUIS	UUUU	UUUU	TTTT	UUUU	UUUU
Iris	<i>Iris</i> spp.	IRIS	UUUU	UUUU	UUUU	UUUU	UUUU
Larkspur (poisonous in spring before flowering)	<i>Delphinium</i> spp.	DELPH	DDDD	DDDD	DDDD	DDDD	DDDD
Milkvetch	<i>Astragalus</i> spp.	ASTRA	DDDD	DDDD	DDDD	DDDD	DDDD
Nailwort	<i>Paronychia</i> spp.	PARON	UUUU	UUUU	UUUU	UUUU	UUUU
Paintbrush	<i>Castilleja</i> spp.	CAST	DDDD	DDDD	DDDD	DDDD	DDDD
Penstemons	<i>Penstemon</i> spp.	PENST	PPPP	PPPP	PPPP	PPPP	PPPP
Phlox	<i>Phlox</i> spp.	PHLOX	UUUU	UUUU	UUUU	UUUU	UUUU
Princesplume	<i>Stanleya</i> spp.	STANL	TTTT	TTTT	TTTT	TTTT	TTTT
Pussytoes	<i>Antennaria</i> spp.	ANTEN	UUUU	UUUU	UUUU	UUUU	UUUU
Salsify	<i>Tragopogon porrifolius</i>	TRPO	UUUU	UUUU	UUUU	UUUU	UUUU
Scarlet globemallow	<i>Sphaeralcea coccinea</i>	SPCO	DDDD	DDDD	DDDD	DDDD	DDDD
Stemless hymenoxys	<i>Tetraeneuris acaulis</i>	TEACA2	UUUU	UUUU	UUUU	UUUU	UUUU
Stonecrop	<i>Sedum</i> spp.	SEDUM	UUUU	UUUU	UUUU	UUUU	UUUU
Toadflax	<i>Comandra umbellata</i>	COUMP	UUUU	UUUU	UUUU	UUUU	UUUU
Wild onion	<i>Allium textile</i>	ALTE	DDDD	DDDD	DDDD	DDDD	DDDD
Woody aster	<i>Xylorhiza</i> spp.	XYLOR	TTTT	TTTT	TTTT	TTTT	TTTT
<b>TREES, SHRUBS &amp; HALF-SHRUBS</b>							
Big sagebrush	<i>Artemisia tridentata</i>	ARTR2	DDDD	DDDD	UUUU	DDDD	DDDD
Birdfoot sagebrush	<i>Artemisia pedatifida</i>	ARPE6	UUUU	UUUU	UUUU	UUUU	UUUU
Black sagebrush	<i>Artemisia nova</i>	ARNO4	UUUU	PPPP	UUUU	PPPP	PPPP
Bud sagebrush	<i>Picrothamnus desertorum</i>	PIDE4	PPPP	PPPP	DDDD	PPPP	PPPP
Cottonwoods (sprouts)	<i>Populus</i> spp.	POPUL	PPPP	PPPP	PPPP	PPPP	UUUU
Fourwing saltbush	<i>Atriplex canescens</i>	ATCA2	PPPP	PPPP	PPPP	PPPP	PPPP
Gardners saltbush	<i>Atriplex gardneri</i>	ATGA	PPPP	PPPP	DDDD	PPPP	PPPP
Greasewood (toxic in large amounts)	<i>Sarcobatus vermiculatus</i>	SAVE4	DDDD	DDDD	UUUU	DDDD	DDDD
Junipers	<i>Juniperus scopulorum</i>	JUSC2	UUUU	UUUU	UUUU	DDDD	UUUU
Green rabbitbrush	<i>Chrysothamnus viscidiflorus</i>	CHV18	DDDD	DDDD	UUUU	PPPP	PPPP
Rubber rabbitbrush	<i>Ericameria nauseosa</i>	ERNA10	UUUU	PPPP	UUUU	DDDD	PPPP
Shadscale	<i>Atriplex confertifolia</i>	ATCO	UUUU	UUUU	UUUU	UUUU	UUUU
Silver buffaloberry	<i>Shepherdia argentea</i>	SHAR	UUUU	UUUU	UUUU	UUUU	UUUU
Silver sagebrush	<i>Artemisia cana</i>	ARCA13	DDDD	DDDD	DDDD	PPPP	PPPP
Skunkbush sumac	<i>Rhus trilobata</i>	RHTR	DDDD	DDDD	UUUU	DDDD	DDDD
Spiny hopsage	<i>Grayia spinosa</i>	GRSP	UUUU	UUUU	UUUU	UUUU	UUUU
Wildrose	<i>Rosa woodsii</i> var. <i>woodsii</i>	ROWOW	DDDD	DDDD	UUUU	DDDD	DDDD
Willows	<i>Salix</i> spp.	SALIX	PPPP	PPPP	DDDD	PPPP	UUUU
Winterfat	<i>Krascheninnikovia lanata</i>	KRAL2	PPPP	PPPP	PPPP	PPPP	PPPP
Yucca	<i>Yucca</i> spp.	YUCCA	DDDD	DDDD	UUUU	DDDD	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.

<b>Plant Community</b>	<b>Production (lb. /ac)</b>	<b>Carrying Capacity* (AUM/ac)</b>
Historic Climax Plant Community	3000-6000	2.5
Mid-Sedge/Willow	2750-5500	1.8
Low-Sedge/Baltic Rush	1200-2500	0.8
Cattail/Low Sedge	2750-4000	1.0
Sedge/Cattail	3000-5000	1.2
Sedge/Saltcedar and/or Russian Olive	3000-5000	1.2
Dense Saltcedar and/or Russian Olive Stand	1750-2500	0.5

\* - 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 yearlong 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 rate is slow and runoff potential high for the soils of this site due to a high water table and saturated soil conditions. However, high forage production on this site diminishes runoff potential as long as site is managed for maintaining adequate residual vegetation. (Refer to Part 630, NRCS National Engineering Handbook for detailed hydraulic information).

Rills and gullies should not typically be present. Water flow patterns may be present if associated with a perennial flowing stream. Litter typically falls in place, and signs of movement are not common unless associated with a perennial flowing stream. Chemical and physical crusts are rare to non-existent.

## Recreational Uses

This site provides hunting opportunities for upland game species. The wide varieties of plants which bloom from spring until fall have an esthetic value that appeals to visitors.

## Wood Products

No appreciable wood products are present on the site.

## Other Products

None noted.

## Supporting Information

### Associated Sites

Saline Subirrigated	032XY144WY
Saline Lowland	032XY138WY
Lowland	032XY128WY

### Similar Sites

() – Wetland 10-14” Foothills and Basins East P.Z., 032XY378WY has higher production.

### Inventory Data References (narrative)

Information presented here has been derived from NRCS inventory data. Field observations from range trained personnel were also used. 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

<u>Data Source</u>	<u>Number of Records</u>	<u>Sample Period</u>	<u>State</u>	<u>County</u>
SCS-RANGE-417	19	1965-1986	WY	Park & others

### State Correlation

This site occurs entirely within Wyoming.

### Type Locality

### Field Offices

Cody, Greybull, Lovell, Powell, Thermopolis, Worland

### Relationship to Other Established Classifications

### Other References

### Site Description Approval

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State Range Management Specialist

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Date