USDA Natural Resources Conservation Service

Ecological site R032XY242WY
Saline Subirrigated (SS) 5-9” Wind River Basin Precipitation Zone

Last updated: 4/30/2024
Accessed: 05/06/2024

General information

Provisional. A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

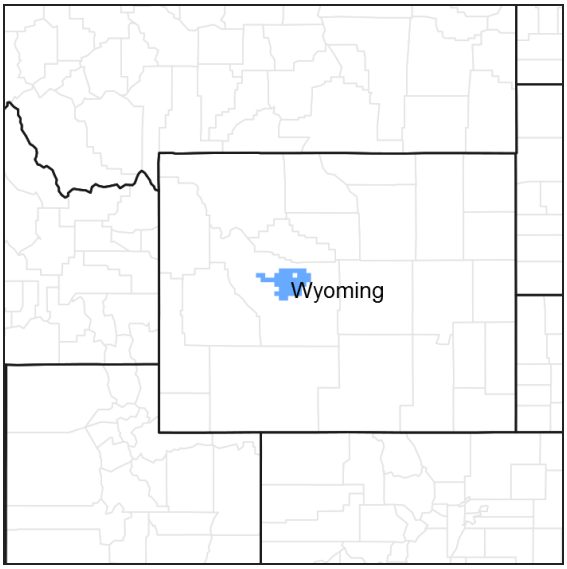


Figure 1. Mapped extent

Areas shown in blue indicate the maximum mapped extent of this ecological site. Other ecological sites likely occur within the highlighted areas. It is also possible for this ecological site to occur outside of highlighted areas if detailed soil survey has not been completed or recently updated.

Associated sites

R032XY228WY	**Lowland (LL) 5-9” Wind River Basin Precipitation Zone**
R032XY238WY	**Saline Lowland (SL) 5-9” Wind River Basin Precipitation Zone**
R032XY278WY	**Wetland (WL) 5-9” Wind River Basin Precipitation Zone**

Similar sites

R032XY342WY	**Saline Subirrigated (SS) 10-14" East Precipitation Zone** Saline Subirrigated 10-14" East P.Z. has higher production.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

This site occurs on gently undulating rolling land.

Table 2. Representative physiographic features

Landforms	(1) Alluvial fan (2) Stream terrace
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to occasional
Ponding duration	Brief (2 to 7 days)
Ponding frequency	None to frequent
Elevation	1,372–2,012 m
Slope	0–6%
Ponding depth	0–8 cm
Water table depth	30–102 cm
Aspect	Aspect is not a significant factor

Climatic features

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 “Pavillion” climate station:
Minimum Maximum 5 yrs. out of 10 between
Frost-free period (days): 95 175 May 19 – September 19
Freeze-free period (days): 98 185 May 6 – October 3
Mean Annual Precipitation (inches): 2.50 12.54

Mean annual precipitation: 7.85 inches
Mean annual air temperature: 44.53 F (30.5 F Avg. Min. to 58.5 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” Riverton”, “Arminto”, and “Lost Cabin”.

Table 3. Representative climatic features

Frost-free period (average)	175 days
Freeze-free period (average)	185 days

Precipitation total (average)	229 mm

Influencing water features

Stream Type: C (Rosgen)

Soil features

Representative Soil Features
The soils of this site are moderately deep to very deep (greater than 20”to bedrock) poorly drained to moderately well drained soils formed in alluvium. These soils have water tables below the surface for all of the growing season. These areas may have water over the surface from run-in but only for short periods of time. The soil characteristics having the most influence on the plant community are depth to a water table during the growing season and the amount of soluble salts.

Table 4. Representative soil features

Surface texture	(1) Loam (2) Clay loam (3) Silt loam
Family particle size	(1) Clayey
Drainage class	Poorly drained to well drained
Permeability class	Moderately slow to moderately rapid
Soil depth	51–152 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	7.11–15.75 cm
Calcium carbonate equivalent (0-101.6cm)	0–15%
Electrical conductivity (0-101.6cm)	4–16 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	8–16
Soil reaction (1:1 water) (0-101.6cm)	7.4–9
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

Plants that can tolerate soils which are saline and alkaline and have a water table near the surface for most of the growing season, dominate the potential vegetation on this site. 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.

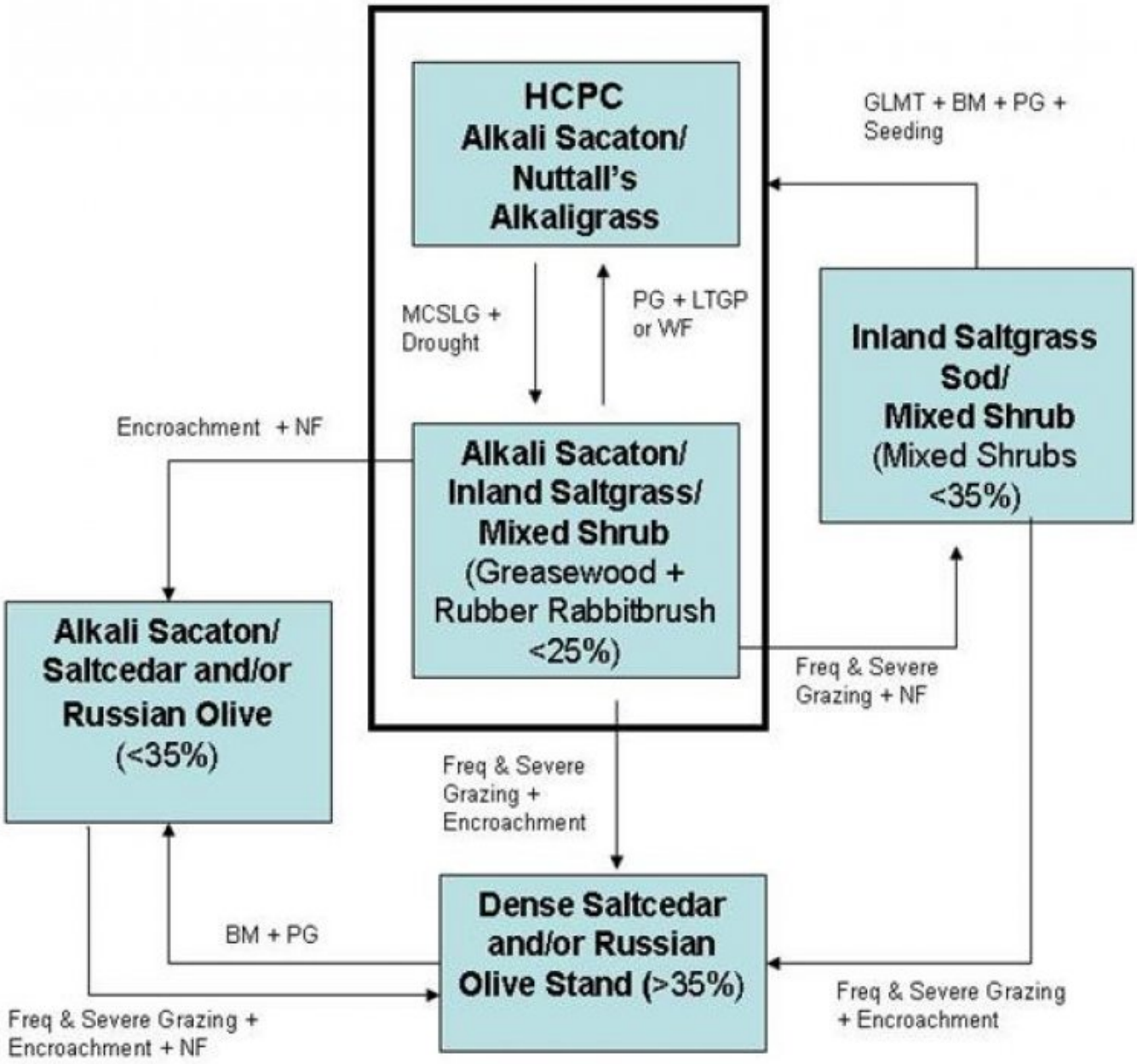
As this site deteriorates, species such as inland saltgrass and greasewood increase and species such as Russian olive, saltcedar, foxtail barley, and a host of weedy forbs invade the site. Grasses such as alkali sacaton, Nuttall’s alkaligrass, and basin wildrye will decrease in frequency and production.

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.

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

State and transition model



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

State 1
Alkali Sacaton/ Nuttall's Alkaligrass

Community 1.1
Alkali Sacaton/ Nuttall's Alkaligrass

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores, periodic fires, supplemental moisture, and saline and/or alkali soils. Potential vegetation is about 80% grasses or grass-like plants, 10% forbs and 10% woody plants. The major grasses include alkali sacaton, Nuttall's alkaligrass, and basin wildrye. Grasses of lesser importance are Baltic rush, western wheatgrass, alkali cordgrass, inland saltgrass, and tufted hairgrass. Woody plants are primarily rubber rabbitbrush and greasewood. 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 2400 pounds per acre, but it can range from about 1800 lbs./acre in unfavorable years to about 2600 lbs./acre in above average years. The state is stable and well adapted to the Northern Plains climatic conditions. The diversity in plant species and the reliable water table allow for high drought resistance. 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 Alkali Sacaton/Inland Saltgrass/Mixed Shrub Plant Community. Prolonged Drought will exacerbate this transition.

Figure 3. Plant community growth curve (percent production by month). WY0803, 5-9WR 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

State 2
Alkali Sacaton/Inland Saltgrass/ Mixed Shrub

Community 2.1
Alkali Sacaton/Inland Saltgrass/ Mixed Shrub

Historically, this plant community evolved under moderate grazing by domestic livestock with 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. Saline and flood tolerant perennial plants make up the dominant species in this plant community. Dominant grasses include alkali sacaton, inland saltgrass, western wheatgrass, alkali cordgrass, and Baltic rush. Forbs commonly found in this plant community include alkali seepweed, silverweed, American licorice, seaside arrowgrass, and smooth horsetail. Greasewood and rubber rabbitbrush comprises the majority of the woody species and make up less than 25% of the annual production. When compared to the Historical Climax Plant Community, basin wildrye, Nuttall's alkaligrass, and tufted hairgrass have decreased. Inland saltgrass, forbs, greasewood, and rubber rabbitbrush have increased. Annual herbaceous weedy plants have increased, but occur in small patches. Invasion of saltcedar or Russian olive should be considered serious and should be controlled. The total annual production (air-dry weight) of this state is about 2000 pounds per acre, but it can range from about 1500 lbs./acre in unfavorable years to about 2500 lbs./acre in above average years. This state is stable and protected from excessive erosion. The herbaceous component is mostly intact and plant vigor and replacement capabilities are sufficient. 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 is functioning and the biotic community is intact. Transitional pathways leading to other plant communities are as follows: • Prescribed grazing and possible long-term prescribed grazing will result in a plant community very similar to the Historic Climax Plant Community, except that greasewood will persist without a return to a normal fire regime or some form of brush control. • Frequent and Severe grazing plus no fire will convert this plant community to the Inland Saltgrass Sod/Mixed Shrub Vegetation State. • Encroachment and no fire will convert this plant community to the Alkali Sacaton/ Saltcedar and/or Russian Olive Vegetative State. • Frequent and Severe grazing plus encroachment will convert this plant community to a Dense Saltcedar and/or Russian Olive Stand Vegetative State. Invasion of saltcedar or Russian olive should be consider serious and should be controlled.

Figure 4. Plant community growth curve (percent production by month).

WY0803, 5-9WR 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

State 3
Inland Saltgrass sod/ Mixed Shrub

Community 3.1
Inland Saltgrass sod/ Mixed Shrub

This plant community is the result of frequent and severe grazing with periodic overflows and no fire or brush control. This plant community is dominated by a dense short grass sod and includes a mosaic shrub overstory. Shrubs comprise less than 35% of the annual production, and are kept in check by the herbaceous sod understory. The dominant grasses are inland saltgrass, mat muhly, big bluegrass, Baltic rush and Chairmaker's bulrush. Forbs such as seaside arrowgrass, licorice root, curly dock, and smooth horsetail are common. Greasewood and rubber rabbitbrush are the primary overstory species in this plant community. Noxious weeds such as saltcedar, Russian olive, Russian knapweed and Canada thistle probably have invaded the site, especially if a seed source is available. Plant diversity is moderate to poor. When compared to the Historic Climax Plant Community, the tall and medium grasses are significantly reduced or absent. Short warm season grasses are dominant and weedy annuals are common. Shrubs will have increased as a percentage of the total production, but will not dominate as the sod prevents a homogeneous shrub cover. Areas of bare ground may have increased in patches, and total production has decreased as the short grasses have replaced the tall and mid grasses. The total annual production (air-dry weight) of this state is about 1200 pounds per acre, but it can range from about 800 lbs./acre in unfavorable years to about 1600 lbs./acre in above average years. The sod component of this plant community is extremely resistant to change and 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 biotic integrity of this state is generally not functional as plant diversity is poor, especially the amount of herbaceous species. The vegetative structure has shifted as the shrubs and short grasses now occupy the majority of the site. This sod bound plant community is very resistant to water infiltration. While this sod protects the site itself, excessive runoff increases erosion on bare ground and can cause rill channels and gully erosion. Water flow patterns are obvious in the bare ground areas and shrubs and sod patches are pedestalled. Rill channels are noticeable in the interspaces and gullies may be establishing where rills have concentrated. The watershed may not be functioning, as runoff is excessive and erosional processes are accelerated. Transitional pathways leading to other plant communities are as follows: • Grazing land mechanical treatment (chiseling, etc.) and brush management followed by prescribed grazing and if necessary seeding will return this plant community to near Historic Climax Plant Community. • Frequent and severe grazing plus encroachment will convert this plant community to the Dense Saltcedar and/or Russian Olive Stand Vegetative State. Prolonged Drought will exacerbate this transition. Invasion of saltcedar or Russian olive should be consider serious and should be controlled.

Figure 5. Plant community growth curve (percent production by month). WY0803, 5-9WR 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

State 4
Alkali Sacaton/ Saltceder and or Russian Olive

Community 4.1
Alkali Sacaton/ Saltceder and or Russian Olive

This plant community occurs where saltcedar and/or Russian olive encroaches into a saline subirrigated site and becomes established. This 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 alkali sacaton can be infested. Saline and flood tolerant perennial plants make up the dominant understory species in this plant

community. Dominant grasses include alkali sacaton, inland saltgrass, western wheatgrass, alkali cordgrass, 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 consider serious and should be controlled. When compared to the Historical Climax Plant Community, basin wildrye, Nuttall's alkaligrass, and tufted hairgrass have decreased. Inland saltgrass, forbs, saltcedar and Russian olive have increased. Total production is similar to the Alkali Sacaton/Mixed Shrub plant community. The total annual production (air-dry weight) of this state is about 1200 pounds per acre, but it can range from about 800 lbs./acre in unfavorable years to about 1800 lbs./acre in above average years. This plant community is mostly resistant to change, but species composition can be altered through long-term overgrazing and further encroachment of saltcedar and Russian olive. The herbaceous component is stable and plant vigor and replacement capabilities are 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: • Frequent and severe grazing plus Encroachment and 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 is optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species and other weedy plants.

Figure 6. Plant community growth curve (percent production by month). WY0803, 5-9WR 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

State 5
Dense Saltcedar and or Russian Olive stand

Community 5.1
Dense Saltcedar and or Russian Olive stand

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 are prevalent. The interspaces between 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, Russian knapweed, and Russian thistle 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 less due to the remove of the perennial grass and amount of bare ground. The increase in woody species, however, compensate for some of this loss. The total annual production (air-dry weight) of this state is about 1200 pounds per acre, but it can range from about 800 lbs./acre in unfavorable years to about 1600 lbs./acre in above average years. This plant community is resistant to change as the stand becomes more dense. 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: • Brush management and prescribed grazing will result in an Alkali Sacaton/ 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 optimal. Any methods of control should be followed by revegetation to reduce regeneration of these two species.

Figure 7. Plant community growth curve (percent production by month). WY0803, 5-9WR 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

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
1				1076–1345	
	alkali sacaton	SPAI	*Sporobolus airoides*	1076–1345	–
2				0–135	
	alkali cordgrass	SPGR	*Spartina gracilis*	0–135	–
3				135–404	
	basin wildrye	LECI4	*Leymus cinereus*	135–404	–
4				404–673	
	Nuttall's alkaligrass	PUNU2	*Puccinellia nuttalliana*	404–673	–
5				135–404	
	Grass, perennial	2GP	*Grass, perennial*	0–135	–
	saltgrass	DISP	*Distichlis spicata*	0–135	–
	mat muhly	MURI	*Muhlenbergia richardsonis*	0–135	–
	western wheatgrass	PASM	*Pascopyrum smithii*	0–135	–
	chairmaker's bulrush	SCAM6	*Schoenoplectus americanus*	0–135	–
Forb					
6				135–404	
	Forb, perennial	2FP	*Forb, perennial*	0–135	–
	silverweed cinquefoil	ARAN7	*Argentina anserina*	0–135	–
	smooth horsetail	EQLA	*Equisetum laevigatum*	0–135	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–135	–
	povertyweed	IVAX	*Iva axillaris*	0–135	–
	common plantain	PLMA2	*Plantago major*	0–135	–
	curly dock	RUCR	*Rumex crispus*	0–135	–
	Pursh seepweed	SUCA2	*Suaeda calceoliformis*	0–135	–
Shrub/Vine					
7				0–135	
	rubber rabbitbrush	ERNA10	*Ericameria nauseosa*	0–135	–
8				0–135	
	greasewood	SAVE4	*Sarcobatus vermiculatus*	0–135	–
9				27–269	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–135	–
	narrowleaf cottonwood	POAN3	*Populus angustifolia*	0–135	–
	Woods' rose	ROWOW	*Rosa woodsii var. woodsii*	0–135	–
	silver buffaloberry	SHAR	*Shepherdia argentea*	0–135	–

Animal community

Historic Climax 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. However, topographical variations could provide some escape cover. This plant community may provide brood rearing/foraging areas for sage grouse. Other birds that would frequent this plant community include western meadowlarks, horned larks, and golden eagles. Many grassland obligate small mammals would occur here.

Alkali Sacaton/Inland Saltgrass/Mixed Shrub: 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 sage grouse when it occurs proximal to woody cover. Good grasshopper habitat equals good foraging for birds.

Inland Saltgrass Sod/Mixed Shrub: 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 sage grouse when it occurs proximal to woody cover. Good grasshopper habitat equals good foraging for birds.

Alkali Sacaton/Saltcedar and/or Russian Olive: This plant community may be useful for the same large grazers that would use the Historic Climax Plant Community. However, the plant community is less productive, and thus, less apt to meet the seasonal needs of these animals. The shrub cover does provide good thermal and escape cover for both large animals and upland birds. Russian olive may provide a good source of food for some upland game birds and large animals. Many grassland obligate small mammals would occur here.

Dense Saltcedar and/or Russian Olive Stand Plant Community: This plant community can provide important winter cover for mule deer and antelope during that time but little foraging value. The plant community composition is less diverse, and thus less apt to meet the seasonal needs of large grazers. The dense shrub cover does provide good thermal and escape cover for both large animals and upland birds. Russian olive may provide a good source of food for some upland game birds and large animals. Many grassland obligate small mammals would occur here.

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 Carrying Capacity* (lb./ac)	(AUM/ac)
Historic Climax Plant Community	1800-2600	1.2
Alkali Sacaton/Inland Saltgrass/Mixed Shrub	1500-2500	1.0
Inland Saltgrass/Mixed Shrub	800-1600	0.6
Alkali Sacaton/Saltcedar and/or Russian Olive	800-1800	0.8
Dense Saltcedar and/or Russian Olive Stand	800-1600	0.2

* - 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.

Hydrological functions

Climate is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group B and C, with localized areas in hydrologic group D. Infiltration ranges from moderately slow to moderately rapid. Runoff potential for this site varies from moderate to high depending on soil hydrologic group and ground cover. In many cases, areas with greater than 75% ground cover have the greatest potential for high infiltration and lower runoff. An example of an exception would be where short-grasses form a strong sod and dominate the site. Areas where ground cover is less than 50% have the greatest potential to have reduced infiltration and higher runoff (refer to Part 630, NRCS National Engineering Handbook for detailed hydrology 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 species. The wide variety 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.

Inventory data references

Information presented here has been derived from NRCS inventory data. Field observations from range trained personnel were also used. Those involved in developing this site include: Chris Krassin, Range Management Specialist, NRCS and Everet Bainter, Range Management Specialist, NRCS. Other sources used as references include USDA NRCS Water and Climate Center, USDA NRCS National Range and Pasture Handbook, USDI and USDA Interpreting Indicators of Rangeland Health Version 3, and USDA NRCS Soil Surveys from various counties.

Contributors

C. Krassin

Approval

Kirt Walstad, 4/30/2024

Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

Author(s)/participant(s)	
Contact for lead author	
Date	07/01/2005
Approved by	Kirt Walstad

Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rills should not be present

2. **Presence of water flow patterns:** Barely observable

3. **Number and height of erosional pedestals or terracettes:** Essentially non-existent

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground is 10-20% occurring in small areas throughout site

5. **Number of gullies and erosion associated with gullies:** Active gullies should not be present

6. **Extent of wind scoured, blowouts and/or depositional areas:** None

7. **Amount of litter movement (describe size and distance expected to travel):** Little to no plant litter movement. Plant litter remains in place and is not moved by erosional forces.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Plant cover and litter is at 80% or greater of soil surface and maintains soil surface integrity. Soil Stability class is anticipated to be 4 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Use Soil Series description for depth and color of A-horizon

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Grass canopy and basal cover should reduce raindrop impact and slow overland flow providing increased time for infiltration to occur. Healthy deep rooted native grasses enhance infiltration and reduce runoff. Infiltration is moderately slow to moderate.

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** No compaction layer is present. Some surface crusting of salts due to fluctuation of water table.

12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

    Dominant:

    Sub-dominant:

    Other:

    Additional: Mid stature Bunch Grasses > Mid stature rhizomatous Grasses > Shrubs > Forbs > Short Grasses/Grasslikes

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Very Low

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14. **Average percent litter cover (%) and depth (in):** Average litter cover is 30-40% with depths of 0.25 to 1.0 inches

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 2400 lbs/ac

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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** Inland saltgrass, Greasewood, Russian olive, Saltcedar, Annuals, Foxtail barley,other exotics, and Species found on Noxious Weed List

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17. **Perennial plant reproductive capability:** All species are capable of reproducing

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