USDA Natural Resources Conservation Service

Ecological site EX043B23B130
Overflow (Ov) Absaroka Upper Foothills

Last updated: 10/04/2019
Accessed: 05/10/2025

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.

MLRA notes

Major Land Resource Area (MLRA): 043B–Central Rocky Mountains

Major Land Resource Unit (MLRA) 43B: Central Rocky Mountains

43B – Central Rocky Mountains – The Central Rocky Mountains extends from northern Montana to southern extent of Wyoming and from Idaho to central Wyoming. The southern extent of 43B is comprised of a combination of metamorphic, igneous, and sedimentary mountains and foothills. Climatic changes across this extent are broad and create several unique breaks in the landscape.

Further information regarding MLRAs, refer to: United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296.
Available electronically at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/ref/?cid=nrcs142p2_053624#handbook.

LRU notes

LRU Notes:

Land Resource Unit (LRU) 43B23B: Absaroka Upper Foothills

Based on the shifts in geology, precipitation patterns and other climatic factors, as well as elevations and vegetation, the Absaroka Range was divided into LRU 23. Further division of this LRU is necessary due to the gradient moving from the foothills to the summit, as well as aspect shifts (north/east face versus south/west face). Subset B is set for the higher elevations within the foothills, with 15 to 19 inches of precipitation. To verify or identify Subset B (the referenced subset for this ecological site), refer to the Wyoming LRU matrix key contained within the Ecological Site Key.

This particular LRU/Subset occurs along the eastern foothills of the Absaroka Range. This LRU starts north of Clark, WY and runs to the Thermopolis, WY area. Once the foothills cross into the Northern Beartooth Range, the climatic patterns and elevational changes shifts the plant community and allows for a break in LRU's near the Montana state line. As the LRU follows to the south and then tracks east to the intersection of the Absaroka Range and the Owl Creek Range, the face changes aspect and geology creating a shift in plant dynamics and a break in the LRU.

The extent of soils currently correlated to this ecological site does not fit within the digitized boundary. Many of the noted soils are provisional and will be reviewed and corrected in mapping update projects. Other map units are correlated as small inclusions within other MLRA’s/LRU’s based on elevation, landform, and biological references.

Moisture Regime: Typic Ustic
Temperature Regime: Frigid

Dominant Cover: Rangeland – Sagebrush Steppe (major species is Mountain Big Sagebrush)
Representative Value (RV) Effective Precipitation: 15-19 inches (381 – 483 mm)
RV Frost-Free Days: 37 - 80 days

Classification relationships

Relationship to Other Established Classification Systems:

National Vegetation Classification System (NVC):
2 Shrub & Herb Vegetation Class
2.B Temperate & Boreal Grassland & Shrubland Subclass
2.B.2 Temperate Grassland & Shrubland Formation
2.B.2.Na Western North American Grassland & Shrubland Division Division
M048 Central Rocky Mountain Montane-Foothill Grassland & Shrubland Macrogroup
G273 Central Rocky Mountain Lower Montane, Foothill & Valley Grassland Group

Ecoregions (EPA):
Level I: 10 North American Deserts Level II: 10.1 Cold Deserts
Level III: 10.1.18 Wyoming Basin
Level IV: 10.1.18.b Big Horn Basin and
10.1.18.d Foothills and Low Mountains

Ecological site concept

• Site receives significant additional effective moisture as overland flow.
• Slope is < 6%
• Soils are:
o Textures range from loamy sand to clay in top 4” (10 cm) of mineral soil surface
o All subsurface horizons in the particle size control section have a weighted average of > 18% clay but < 35% clay. (The particle size control section is the segment of the profile from either the start of an argillic horizon for 50 cm’s or from 25-100 cm’s).
o Moderately deep to very deep (20-80+ in. (50-200+ cm)
o <3% stone and boulder cover and occasionally up to 10% cobble and gravel cover
o Not skeletal (<35% rock fragments) within 20” (50 cm) of mineral soil surface
o None to Slightly effervescent throughout top 20” (50 cm) of mineral soil surface
o Non-saline, sodic, or saline-sodic

Associated sites

R043BY322WY	**Loamy (Ly) 15-19” Foothills and Mountains East Precipitation Zone**
R043BY374WY	**Subirrigated (Sb) 15-19” Foothills and Mountains East Precipitation Zone**
R043BY378WY	**Wetland (WL) 15-19” Foothills and Mountains East Precipitation Zone**

Similar sites

R032XY330WY	**Overflow (Ov) 10-14" East Precipitation Zone** Overflow 10-14

Table 1. Dominant plant species

Tree	Not specified
Shrub	(1) *Prunus virginiana* (2) *Symphoricarpos occidentalis*
Herbaceous	(1) *Leymus cinereus* (2) *Elymus trachycaulus*

Legacy ID

R043BX630WY

Physiographic features

This site occurs on areas that receive additional water from overflow of intermittent streams, snow depositional areas, or runoff from adjacent slopes.

Table 2. Representative physiographic features

Landforms	(1) Foothills > Alluvial fan (2) Foothills > Stream terrace (3) Foothills > Drainageway
Runoff class	Negligible to low
Flooding duration	Very brief (4 to 48 hours)
Flooding frequency	Frequent
Elevation	6,000–9,000 ft
Slope	0–6%
Aspect	Aspect is not a significant factor

Climatic features

Annual precipitation and modeled relative effective annual precipitation ranges from 15 to 19 inches (381 – 483 mm). The normal precipitation pattern shows peaks in June tapering into September. This amounts to about 50% of the mean annual precipitation. Average snowfall is about 150 inches annually. Wide fluctuations may occur in yearly precipitation and result in more dry years than those with more than normal precipitation.

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.

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. High winds are generally blocked by high mountains but occur in conjunction with thunderstorms, which are common in late summer. Growth of native cool-season plants begins about May 1 to May 15 and continues until about October 15.

For detailed information visit the Natural Resources Conservation Service National Water and Climate Center at http://www.wcc.nrcs.usda.gov/. Historically, “Crandall Creek" was the representative weather stations within this subset. However, "Sunshine 3NE" is the only available weather station within a close proximity in location and characteristics for this subset. The following graphs and charts are a collective sample representing the averaged normals and 30-year annual rainfall data for the selected weather stations from 1981 to 2010.

Table 3. Representative climatic features

Frost-free period (characteristic range)	40 days
Freeze-free period (characteristic range)	84 days
Precipitation total (characteristic range)	14 in
Frost-free period (actual range)	40 days
Freeze-free period (actual range)	84 days
Precipitation total (actual range)	14 in

Frost-free period (average)	40 days
Freeze-free period (average)	84 days
Precipitation total (average)	14 in

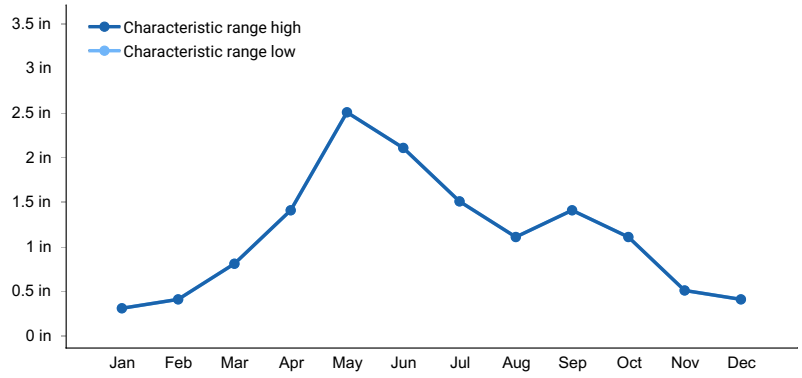


Figure 1. Monthly precipitation range

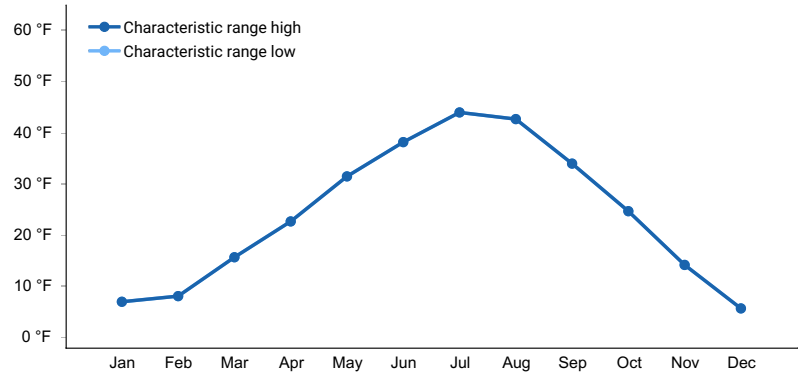


Figure 2. Monthly minimum temperature range

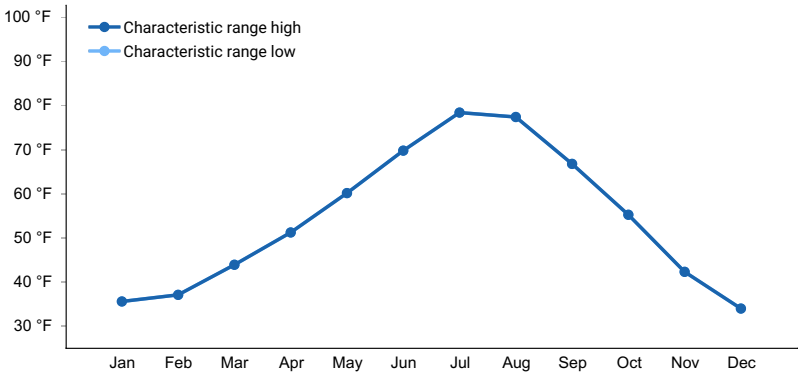


Figure 3. Monthly maximum temperature range

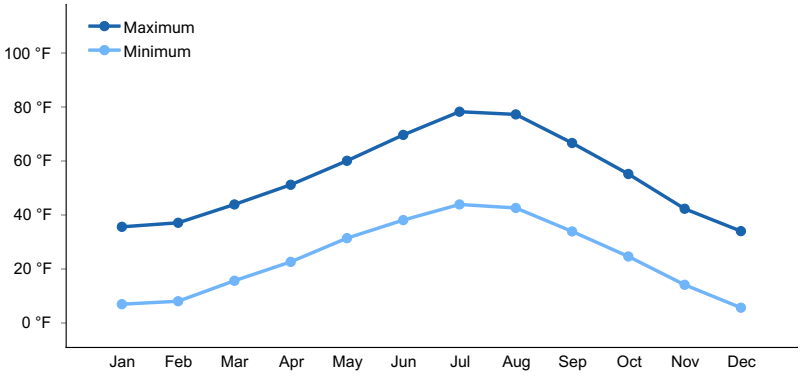


Figure 4. Monthly average minimum and maximum temperature

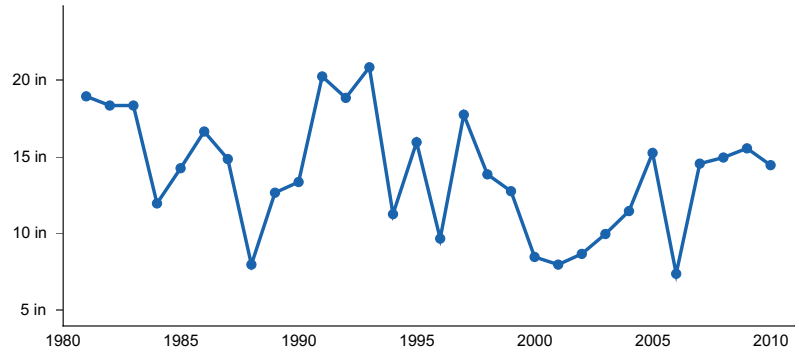


Figure 5. Annual precipitation pattern

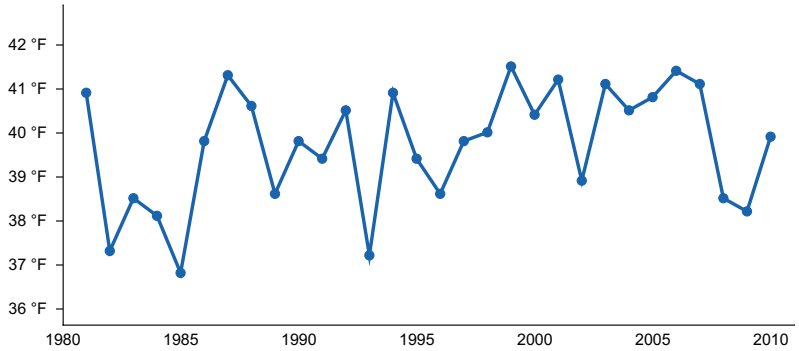


Figure 6. Annual average temperature pattern

Climate stations used

- (1) SUNSHINE 3NE [USC00488758], Meeteetse, WY

Influencing water features

The characteristics of these soils have no influence from ground water (water table below 60 inches (150 cm)) and but do have significant influence from surface water/overland flow. Isolated features that are affected by snow pack that persists longer than surrounding areas due to position on the landform (shaded/protected pockets) will create this site in non-typical locations.

Soil features

The soils of this site are deep (greater than 20”to bedrock), well drained and moderately permeable. Topsoil may vary from a sandy loam through light silty clay loams. Coarser or finer textured surface soils may also be present provided they are less than 2 to 4 inches thick. These areas receive additional water from overflow of intermittent streams or runoff from adjacent slopes. The soil characteristic having the most influence on the plant community is the additional available moisture.

Table 4. Representative soil features

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Cobbly, gravelly loam (2) Silt loam (3) Fine sandy loam (4) Clay loam (5) Loamy sand (6) Clay
Family particle size	(1) Fine-loamy
Drainage class	Moderately well drained to excessively drained
Permeability class	Moderate to rapid

Soil depth	20–60 in
Available water capacity (0-40in)	2–6.2 in
Calcium carbonate equivalent (0-40in)	0–5%
Electrical conductivity (0-40in)	0–8 mmhos/cm
Sodium adsorption ratio (0-40in)	0–10
Soil reaction (1:1 water) (0-40in)	6.6–8.4

Ecological dynamics

Ecological Dynamics of the Site:
Potential vegetation on this site is dominated by tall and mid cool-season perennial grasses. Other significant vegetation includes serviceberry, chokecherry, and a variety of forbs. The expected potential composition for this site is about 75% grasses, 15% 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 silver sagebrush, forbs and rhizomatous wheatgrasses increase. Cool season grasses such as basin wildrye and Columbia needlegrass will decrease in frequency and production. As conditions continue to deteriorate, annual forbs and grasses such as cheatgrass will invade.

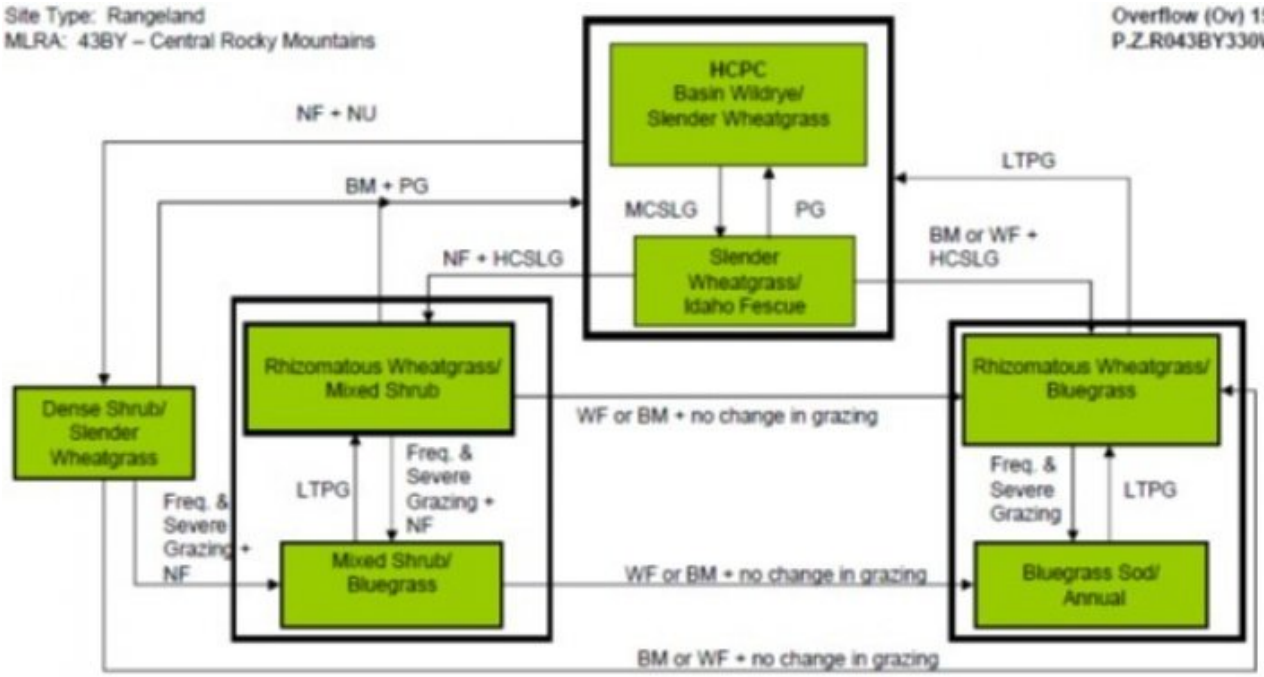
Shrubs may become dominant on areas with an absence of fire and no use. Wildfires are actively controlled in recent times and as a result old decadent stands of woody species persist. Mechanical control has replaced the historic role of fire on this site. Recently, prescribed burning has regained some popularity.

Typically, many of these overflow sites have been significantly altered or modified, due to its productive features and proximity to water. Consequently, the original habitat for this site has been reduced or lost. On sites that have been cultivated and now remain fallow, the plant community is typically altered to such a degree that the vegetative structure and composition are lost. Reclaiming these sites to their native characteristics is not viable.

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.

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
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

State 1
Basin Wildrye/Slender Wheatgrass Plant Community

Community 1.1
Basin Wildrye/Slender Wheatgrass Plant Community

The interpretive plant community for this site is the Historic Climax Plant Community. This state evolved with grazing by large herbivores, additional overflow moisture, and periodic fires. The cyclical nature of the fire regime and/or browsing in this community prevented shrubs from being the dominant landscape. This plant community can be found on areas that are properly managed with grazing and/or prescribed burning. The potential vegetation is about 75% grasses or grass-like plants, 15% forbs, and 10% woody plants. Cool season tall and mid-grasses dominate this state. The major grasses include basin wildrye, Columbia needlegrass, and slender wheatgrass. Serviceberry, chokecherry, and silver sagebrush are conspicuous elements of this state and occur in a mosaic pattern. A variety of forbs also occurs in this state and plant diversity is high (see Plant Composition Table). This state produces between 1350 and 2100 pounds annually, depending on the growing conditions. The state is extremely resilient and well adapted to the Central Rocky Mountains climatic conditions. The diversity in plant species allow 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 Slender Wheatgrass/Idaho Fescue Plant Community. • No fire and No Use will convert the HCPC to the Dense Shrub/Slender Wheatgrass Plant Community.

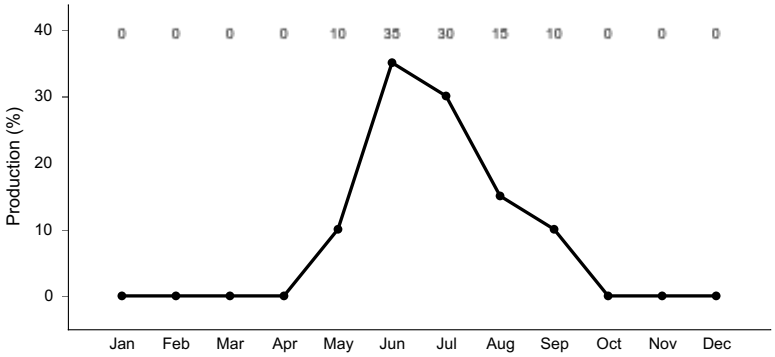


Figure 8. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

State 2
Slender Wheatgrass/Idaho Fescue Plant Community

Community 2.1
Slender Wheatgrass/Idaho Fescue Plant Community

Historically, this plant community evolved under grazing by large ungulates, 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 without fire is now common. Shrubs are an important component of this plant community. Cool-season grasses make up the majority of the understory with the balance made up of miscellaneous forbs. Dominant grasses include slender wheatgrass, Idaho fescue, mountain brome, rhizomatous wheatgrasses, and of less frequency basin wildrye and Columbia needlegrass. Grasses of secondary importance include prairie junegrass, bluegrasses, nodding brome, and bottlebrush squirreltail. Forbs commonly found in this plant community include agoseris, American licorice, buttercup, groundsel, geranium, fragrant bedstraw, wild strawberry, pussytoes, phacelia, paintbrush, lupine, and western yarrow. Shrub species present will depend on the texture of the soils and can include serviceberry, chokecherry, currant, wild rose, willow, and silver sagebrush. Shrubs will comprise up to 20% of the total annual production. When compared to the Historical Climax Plant Community, shrubs, rhizomatous wheatgrasses, and bluegrasses and forbs have increased. Basin wildrye and Columbia needlegrass have decreased and may occur only where protected from grazing by the shrub canopy. Kentucky bluegrass and some annual forbs may have invaded the site but are in small patches. This state produces between 1200 and 2000 pounds annually, depending on the growing conditions 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 will convert this plant community to the HCPC. The probability of this occurring is high especially if rotational grazing along with short deferred grazing is implemented 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. A prescribed fire treatment can be useful to hasten this transition if desired. • Heavy, continuous, season-long grazing plus no fires will convert the plant community to the Rhizomatous Wheatgrass/ Mixed Shrub Plant Community. The probability of this occurring is high. This is especially evident on areas where drought or heavy browsing does not adversely impact the shrub stand. • Heavy, continuous, season-long grazing plus wildfire or brush management will convert the plant community to a Rhizomatous Wheatgrass/Bluegrass Plant Community. The probability for this is high especially on areas where the shrubs have been heavily browsed or removed by natural or human causes. Drought can also exacerbate this transition. • No fire and No Use will convert the HCPC to the Dense Shrub/Slender Wheatgrass Plant Community.

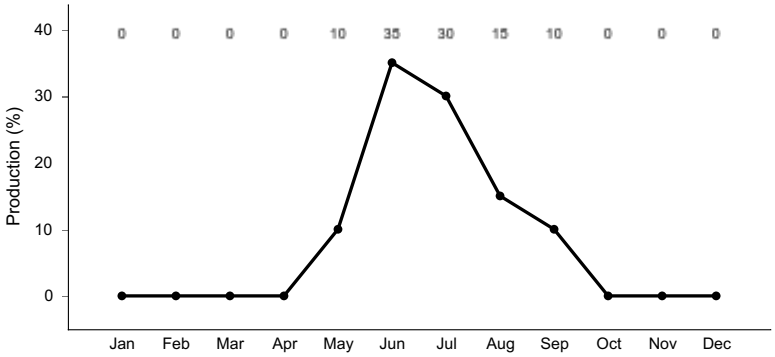


Figure 9. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

State 3
Dense Shrub/Slender Wheatgrass Plant Community

Community 3.1
Dense Shrub/Slender Wheatgrass 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. Cool-season grasses make up the majority of the understory but 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. Dominant grasses include slender wheatgrass, Columbia needlegrass, basin wildrye, rhizomatous wheatgrass, mountain brome, and Idaho fescue. Grasses of secondary importance include prairie junegrass, nodding brome, bottlebrush squirreltail, and bluegrasses. Forbs commonly found in this plant community include agoseris, American licorice, buttercup, groundsel, geranium, fragrant bedstraw, wild strawberry, pussytoes, phacelia, paintbrush, lupine, and western yarrow. A wide variety of shrubs can be present depending on the texture of the soils. Shrubs will exceed 30% of the total production and can include serviceberry, chokecherry, currant, wild rose, snowberry, silver buffaloberry, silver sagebrush and willow. When compared to the Historic Climax Plant Community, shrubs have significantly increased. Most of the preferred grasses 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 1200 to 2000 pounds. 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 some cool-season perennials is 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 brush management is used with if 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. • Frequent and severe grazing plus no fires will convert the plant community to the Mixed Shrub/Bluegrass Plant Community. • Brush management or Wildfire with no change in grazing management will convert this plant community to the Rhizomatous Wheatgrass/Bluegrass Plant Community.

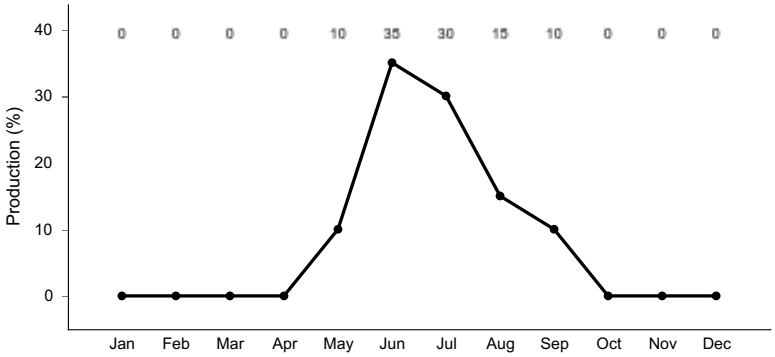


Figure 10. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

State 4
Rhizomatous Wheatgrass/Mixed Shrub Plant Community

Community 4.1
Rhizomatous Wheatgrass/Mixed Shrub Plant Community

This plant community currently is found under heavy continuous season-long grazing by livestock and protection from fire. Shrubs are a significant component of this plant community. Cool-season grasses make up the majority of the understory, but some of the preferred grasses have been reduced or are absent. Dominant grasses include rhizomatous wheatgrass, mountain brome, Idaho fescue, and of less frequency slender wheatgrass, Columbia needlegrass, and basin wildrye. Grasses of secondary importance include prairie junegrass, nodding brome, bottlebrush squirreltail, and bluegrasses. Forbs commonly found in this plant community include agoseris, American licorice, buttercup, groundsel, geranium, fragrant bedstraw, wild strawberry, pussytoes, phacelia, paintbrush, lupine, and western yarrow. A wide variety of shrubs can be present depending on the texture of the soil. Shrubs can make up to 30% of the total production and may include serviceberry, chokecherry, currant, wild rose, snowberry, silver buffaloberry, silver sagebrush and willow. When compared to the Historic Climax Plant Community, shrubs, especially silver sagebrush, forbs, bluegrasses, and rhizomatous wheatgrasses have increased. Most of the preferred grasses have been reduced and some are absent. Some annuals, such as cheatgrass, have invaded the site, but are not yet abundant. The increase in shrub production has offset some of the loss in the herbaceous production. Annual production ranges from 1000 to 1800 pounds. 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 are deficient. The removal of grazing does not seem to affect the plant composition or structure of the plant community. Soil erosion can be accelerated because of increased bare ground although areas may be very resistant to water infiltration as sod forming plants become more dominant. 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. Water flow patterns and pedestalling is more 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 is often needed regardless of the brush treatment to reestablish the major cool-season grasses, breakup the sodded areas, and decrease soil compaction. • Frequent and severe grazing plus no fires will convert the plant community to the Mixed Shrub/Bluegrass Plant Community. • Brush management or Wildfire with no change in grazing management will convert this plant community to the Rhizomatous Wheatgrass/Bluegrass Plant Community.

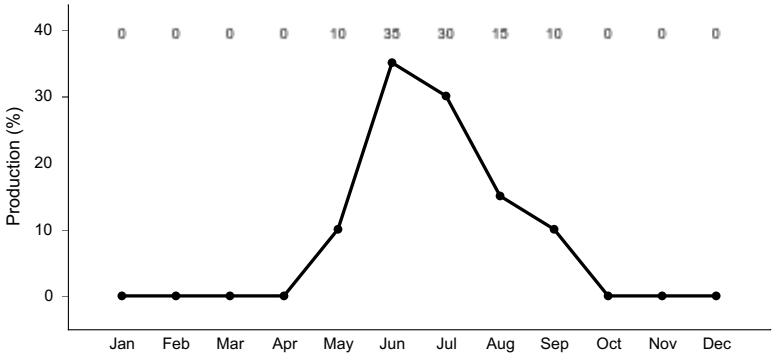


Figure 11. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

State 5
Mixed Shrub/Bluegrass Plant Community

Community 5.1
Mixed Shrub/Bluegrass Plant Community

This plant community is the result of frequent and severe grazing and protection from fire. Silver sagebrush and a variety of other shrubs can dominate this plant community as the annual production can 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 bluegrasses such as big, and Kentucky as well as rhizomatous wheatgrasses. Weedy annual species such as cheatgrass, stickseed, gumweed, and a variety of mustards may occupy the site. Noxious weeds such as Canada thistle 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 cool-season grasses are reduced and replaced by lower growing sod grasses. The shrub composition has changed as more preferred shrubs have either been removed or significantly altered and replaced with silver sagebrush and other less preferred species. In general, total production by shrubs has increased, which compensates for some of the decline in the herbaceous production. Annual production ranges from 1000 to 1800 pounds. This plant community is resistant to change as the stand becomes more decadent and the sodded areas, which are extremely resistant to change, are expanded. 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. 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. 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: • Long Term Prescribed Grazing will convert this plant community to the Rhizomatous Wheatgrass/Mixed Shrub Plant Community. • Brush management or Wildfire with no change in grazing management will convert this plant community to the Bluegrass Sod/Annual Plant Community.

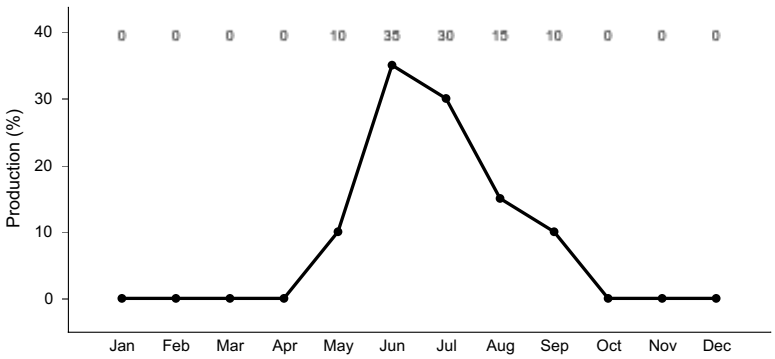


Figure 12. Plant community growth curve (percent production by month).

State 6
Rhizomatous Wheatgrass/Bluegrass Plant Community

Community 6.1
Rhizomatous Wheatgrass/Bluegrass Plant Community

This plant community currently is found under heavy continuous season-long grazing by livestock and is perpetuated by either brush management or a wildfire, which removes the shrubs from this plant community. Regeneration of silver sagebrush is possible if fire is the only altering source of brush control. Silver sagebrush is a strong resprouter and can remain a significant component of this plant community. Some of the major cool-season bunchgrasses associated with this site have been reduced and some may have been removed. Dominant grasses include rhizomatous wheatgrasses, slender wheatgrass, Idaho fescue, bluegrasses, prairie junegrass, mountain brome, and of less frequency Columbia needlegrass, and basin wildrye. Forbs commonly found in this plant community include agoseris, American licorice, buttercup, groundsel, geranium, fragrant bedstraw, wild strawberry, pussytoes, phacelia, paintbrush, lupine, and western yarrow. Silver sagebrush can comprise as much as 15% of the total production. When compared to the Historical Climax Plant Community, silver sagebrush, rhizomatous wheatgrass, bluegrasses, and forbs have increased. Columbia needlegrass, basin wildrye, and non resprouting shrubs have decreased or been removed. Willows, although good resprouters, will usually not be a significant part of this plant community as heavy browsing of new shoots is likely and this site is only marginally suitable for willows. Production of the preferred cool-season grasses has been reduced. Sod grasses such as Kentucky bluegrass and annual grasses and forbs such as cheatgrass can be common and in large patches, but most invaded areas are relatively small. Noxious weeds such as leafy spurge and Canada thistle may have invaded. Annual production ranges from 1000 to 1800 pounds. This plant community is resistant to change as the herbaceous species present are well adapted to grazing. If silver sagebrush becomes the dominant shrub it is difficult for other shrubs to become established. However, species composition can be altered through long-term overgrazing. The herbaceous component is mostly intact, but some cool-season bunchgrasses associated with the site have been reduced or removed. Plant vigor and replacement capabilities are sufficient for some species but not all. Water flow patterns and litter movement is occurring but only on steeper slopes or adjacent to sodded areas. Incidence of pedestalling is moderate to slight. Soils are mostly stable and the surface shows minimum soil loss. The watershed is functioning and the biotic community is partially intact. Transitions or pathways leading to other plant communities are as follows: • Long Term Prescribed Grazing may eventually convert this plant community to near HCPC. Controlling silver sagebrush, if present, is difficult as it is a strong resprouter. Reestablishing the shrub component may be difficult and may take many years. Seeding may be required to reestablish any of the lost major bunchgrasses. • Frequent & Severe grazing will convert this plant community to a Bluegrass/Annual Plant Community. If silver sagebrush is present more than likely it will persist in varying degrees as it is difficult to control and usually not browsed heavily.

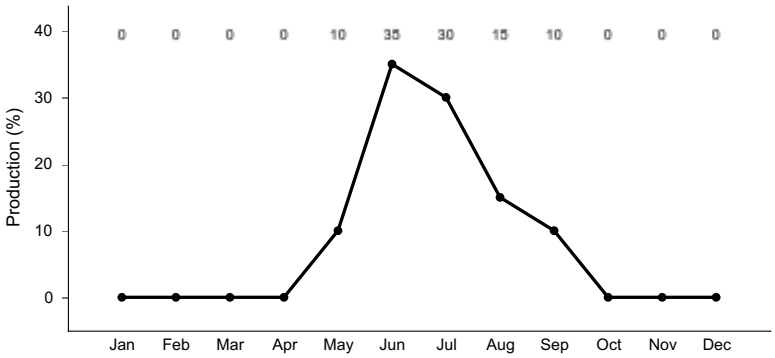


Figure 13. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

State 7
Bluegrass Sod/Annual Plant Community

Community 7.1

Bluegrass Sod/Annual Plant Community

This plant community evolved under frequent and severe heavy grazing and shrub components have been removed by heavy browsing, wildfire or human means. Weedy annuals and bluegrasses, especially Kentucky bluegrass, and other sod formers are the most dominant plants and occupy any open bare ground area. Silver sagebrush may or may not be present. However, it is common for this shrub to occur in patches as it is a strong resprouter and may quickly re-establish after a disturbance. Compared to the HCPC, weedy annual species and bluegrasses are widespread and virtually all of the major cool-season mid-grasses are absent or severely decreased. Most shrubs have been removed. Weedy annuals may include cheatgrass, and a variety of mustards and other forbs. Kentucky bluegrass is usually dominant, but other bluegrasses such as Sandberg, mutton, Canby, and big will occur. Noxious weeds such as leafy spurge, Canada thistle, and white top will likely have invaded the site, if a seed source is available. Bare ground is prevalent between the sodded areas and more soil surface is exposed to erosive elements. Annual production ranges from 500 to 800 pounds. This plant community is resistant to change, as the stand becomes more decadent and the sodded areas, which are extremely resistant to change, are expanded. 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. Soil erosion is accelerating because of increased bare ground although areas may be very resistant to water infiltration as sod forming plants become more dominant. 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. 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: • Long Term Prescribed Grazing will eventually convert this plant community to the Rhizomatous Wheatgrass/Bluegrass Plant community.

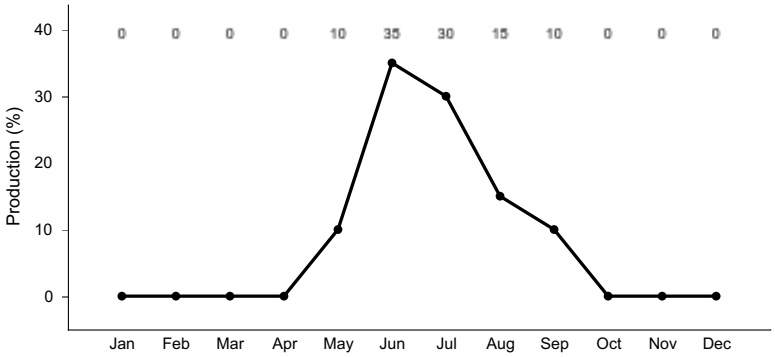


Figure 14. Plant community growth curve (percent production by month). WY0602, 15-19E Extra water sites - LL, Ov, CyO, SL.

Additional community tables

Table 5. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1				263–438	
	basin wildrye	LECI4	*Leymus cinereus*	263–438	–
2				175–350	
	slender wheatgrass	ELTR7	*Elymus trachycaulus*	175–350	–
3				88–263	
	Columbia needlegrass	ACNE9	*Achnatherum nelsonii*	88–263	–
4				0–175	
	mountain brome	BRMA4	*Bromus marginatus*	0–175	–
5				0–175	
	western wheatgrass	PASM	*Pascopyrum smithii*	0–175	–
6				0–175	

	Idaho fescue	FEID	*Festuca idahoensis*	0–175	–
7				0–175	
	Grass, perennial	2GP	*Grass, perennial*	0–88	–
	nodding brome	BRAN	*Bromus anomalus*	0–88	–
	timber oatgrass	DAIN	*Danthonia intermedia*	0–88	–
	squirreltail	ELEL5	*Elymus elymoides*	0–88	–
	prairie Junegrass	KOMA	*Koeleria macrantha*	0–88	–
	Sandberg bluegrass	POSE	*Poa secunda*	0–88	–
Forb					
8				88–263	
	lupine	LUPIN	*Lupinus*	0–88	–
	beardtongue	PENST	*Penstemon*	0–88	–
	phacelia	PHACE	*Phacelia*	0–88	–
	phlox	PHLOX	*Phlox*	0–88	–
	buttercup	RANUN	*Ranunculus*	0–88	–
	dock	RUMEX	*Rumex*	0–88	–
	stonecrop	SEDUM	*Sedum*	0–88	–
	goldenrod	SOLID	*Solidago*	0–88	–
	groundsel	TEPHR3	*Tephroseris*	0–88	–
	Forb, perennial	2FP	*Forb, perennial*	0–88	–
	yarrow	ACHIL	*Achillea*	0–88	–
	agoseris	AGOSE	*Agoseris*	0–88	–
	rosy pussytoes	ANRO2	*Antennaria rosea*	0–88	–
	Indian paintbrush	CASTI2	*Castilleja*	0–88	–
	fleabane	ERIGE2	*Erigeron*	0–88	–
	buckwheat	ERIOG	*Eriogonum*	0–88	–
	aster	EUCEP2	*Eucephalus*	0–88	–
	Virginia strawberry	FRVI	*Fragaria virginiana*	0–88	–
	fragrant bedstraw	GATR3	*Galium triflorum*	0–88	–
	geranium	GERAN	*Geranium*	0–88	–
	American licorice	GLLE3	*Glycyrrhiza lepidota*	0–88	–
	stoneseed	LITHO3	*Lithospermum*	0–88	–
Shrub/Vine					
9				88–175	
	Saskatoon serviceberry	AMAL2	*Amelanchier alnifolia*	88–175	–
10				88–175	
	chokecherry	PRVIV	*Prunus virginiana var. virginiana*	88–175	–
11				0–175	
	Shrub (>.5m)	2SHRUB	*Shrub (>.5m)*	0–88	–
	silver sagebrush	ARCA13	*Artemisia cana*	0–88	–
	water birch	BEOC2	*Betula occidentalis*	0–88	–
	snowbrush ceanothus	CEVE	*Ceanothus velutinus*	0–88	–
	currant	RIBES	*Ribes*	0–88	–
	Woods' rose	ROWOW	*Rosa woodsii var. woodsii*	0–88	–

	[illegible]	[illegible]	[illegible]	[illegible]	
	willow	SALIX	*Salix*	0–88	–
	silver buffaloberry	SHAR	*Shepherdia argentea*	0–88	–
	western snowberry	SYOC	*Symphoricarpos occidentalis*	0–88	–

Animal community

Animal Community – Wildlife Interpretations

Basin Wildrye/Slender Wheatgrass Plant Community (HCPC): The predominance of grasses 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. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present.

Slender Wheatgrass/Idaho Fescue 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 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 many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present.

Dense Shrub/Slender Wheatgrass 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 species 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, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present.

Rhizomatous Wheatgrass/Mixed Shrub 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, nesting, brood-rearing, and foraging habitat for sage grouse. Other birds that would frequent this plant community include many nesting species, blue grouse, American kestrel, hawks, and golden eagle. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present.

Mixed Shrub/Bluegrass 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, 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 many nesting species, blue grouse, American kestrel, hawks, and golden eagles. If adjacent to water, the site may be frequented by bald Eagles, Wilson's phalarope, sandhill crane, great blue heron, waterfowl, and kingfishers. Many small mammals occur here and if adjacent to water, species such as muskrat, beaver and river otter may be present.

Rhizomatous Wheatgrass/Bluegrass Plant Community: The production of herbaceous species provided for good foraging for grazers. However, the lack of tall or mid growing shrubs does not benefit browsers nor provides cover for many species. As these areas tend to greens-up sooner in the spring, these sites provide early new growth for foraging large and small mammals. If located adjacent to shrub dominated sites, It provides good foraging habitat for sage grouse. Other birds which may be present include American Kestrel, hawks, and nesting birds.

Bluegrass/Annual Plant Community: These communities provide limited foraging for elk and other grazers. These may be used as a foraging site by sage grouse if proximal to woody cover. Generally, these are not target plant communities for wildlife habitat management.

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)
Basin Wildrye/Slender WG 1350-2100 .8
Slender WG/Idaho Fescue 1200-2000 .7
Dense Shrub/Slender WG 1200-2000 .5
Rhizomatous WG/Mixed Shrub 1000-1800 .6
Mixed Shrub/Bluegrass 1000-1800 .4
Rhizomatous WG/Bluegrass 1000-1800 .6
Bluegrass Sod/Annual 500-800 .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 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

Water is the principal factor limiting forage production on this site. This site is dominated by soils in hydrologic group C, with localized areas in hydrologic group B and D. Infiltration ranges from moderately slow to moderate. Runoff potential for this site varies from low to moderate 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 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 included hiking, camping, mountain biking, and in the winter snowshoeing and cross-country skiing.

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 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.

Contributors

J. Haverkamp

Approval

Scott Woodall, 10/04/2019

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)	Ray Gullion, E. Bainter
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Date	05/01/2008
Approved by	E. Bainter
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Rare to nonexistent.

2. **Presence of water flow patterns:** Water flow patterns sometimes evident in ephemeral floodplain zone where this site occurs.

3. **Number and height of erosional pedestals or terracettes:** Rare to nonexistent.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Bare ground can range from 5-10%.

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:** Minimal to nonexistent.

7. **Amount of litter movement (describe size and distance expected to travel):** Herbaceous litter expected to move in water flow patterns.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil Stability Index ratings range from 3 (interspaces) to 6 (under plant canopy), but average values should be 3.0 or greater.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Describe A-horizons are up to 30 inches (76 cm) with a dark gray color (10YR 4/1) and weak to moderate granular structure. Organic matter is typically 3 to 6%.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Plant community consists of 65-80% grasses, 20% forbs, and 0-15% shrubs. Dense plant canopy (75-95%) and litter plus moderate infiltration rates result in minimal runoff. Basal cover is typically greater than 5% for this site and effectively reduces runoff on this site.

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 exists.

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: mid-size, cool season bunchgrasses tall, cool season bunchgrasses

    Sub-dominant: cool season rhizomatous grasses = perennial forbs

    Other: perennial shrubs short, cool season bunchgrasses

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Minimal decadence, typically associated with shrub component.

14. **Average percent litter cover (%) and depth (in):** Litter ranges from 1-20% of total canopy measurement with total litter (including beneath the plant canopy) from 80-95% expected. Herbaceous litter depth typically ranges from 15-30 mm. Woody litter can be up to several inches (>8 cm).

15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** English: 1350-2100 lb/ac (1725 lb/ac average); Metric: 1512-2352 kg/ha (1932 kg/ha average).

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:** Bare ground greater than 20%, noxious weed invasion, and/or presence of Kentucky bluegrass are the most common indicators of a threshold being crossed. Mountain silver sagebrush, Sandberg bluegrass, rhizomatous wheatgrass, and snowberry are common increasers. Common dandelion, thistles, cheatgrass and Kentucky bluegrass are common invasive species on disturbed sites.

17. **Perennial plant reproductive capability:** All species are capable of reproducing, except in drought years.