

Ecological site R070BY661TX Breaks 12-18" PZ

Last updated: 9/12/2023

Accessed: 05/21/2025

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.



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.

MLRA notes

Major Land Resource Area (MLRA): 070B—Pecos and Canadian River Basins

MLRA 70B is characterized by broad, rolling piedmonts, plains, and tablelands broken by drainageways and tributaries of the Pecos River. Native vegetation is mid- to short-grass

prairie species in the lowlands, with pinyon and juniper in the higher elevations and on steeper north-facing slopes. Current land use is predominantly livestock grazing. The soils formed in material weathered from sedimentary rocks of Cretaceous age.

Ecological site concept

This site occurs on escarpments, which are usually littered with large rock fragments. Soils are less than 20 inches to lithic contact. Textures are variable. Parent material is red bed sediments.

Associated sites

R070BY664TX	Red Shale 12-18" PZ Occurs on footslopes located below the breaks site's position.
R070BY665TX	Shallow Sandstone 12-18" PZ Occurs on more level terrain along the tops of mesas and and gentle side slopes along drainages.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

The Breaks ecological site occurs as moderately sloping to steep ridges, knolls, side slopes, and erosional remnants on severely dissected landscapes below major escarpments, along canyon slopes, and on steep side slopes below mesa tops. Slopes primarily range from 15 to 45 percent. There is limited soil development on these steeper slopes and rock cover can vary from 10 to 50 percent.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Escarpment (3) Scarp slope
Flooding frequency	None
Ponding frequency	None
Elevation	1,800–3,000 ft
Slope	3–80%
Water table depth	60 in

Aspect	NE, SW
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Climatic features

The climate of this area can be classified as “semi-arid continental”. Summers are hot with winters being generally mild with numerous cold fronts that drop temperatures into the single digits for 24 to 48 hours. Temperature extremes are the rule rather than the exception. Humidity is generally low and evaporation high. Wind speeds are highest in the spring and are generally southwesterly. Canadian and Pacific cold fronts come through the region in fall, winter and spring with predictability and temperature changes can be rapid.

Total annual precipitation averages 12 to 18 inches. Most of the precipitation comes in the form of rain during the period from May through October. Snowfall averages around 15 inches but may be as little as 8 inches or as much as 36 inches. Rainfall in the growing season often comes as intense showers of relatively short duration. Long term droughts occur on the average of once every 20 years and may last as long as five to six years (during these drought years moisture during the growing season is from 50 to 60 % of the mean). Based on long term records, approximately 60% of years are below the mean rainfall and approximately 40% are above the mean. May, June and July are the main growth months for perennial warm season grasses. Forbs make their growth somewhat earlier.

Air temperatures vary from a monthly mean of 20 degrees F in January to 64 degrees F in July. Daily high temperatures average in the 80’s and low 90’s during the summer months. Winter low temperatures fall below the freezing mark much of the time from November through March with daily lows sometimes reaching 10 degrees F in December and January. Dates of the last killing frost may vary from April 15th to April 22nd, and the first killing frost from October 15th to October 24th.

Winds prevail from the south and southwest, with an average velocity of 12 miles per hour. Generally, March is the windiest month. Strong winds during the spring cause rapid drying of the soil surface.

Table 3. Representative climatic features

Frost-free period (average)	200 days
Freeze-free period (average)	205 days
Precipitation total (average)	18 in

Influencing water features

None.

Soil features

The soils for the Breaks ecological site are steeply sloping, poorly developed, very shallow, well-drained to excessively drained, reddish soils formed in loamy to clayey red bed sediments. Surface textures range from fine sandy loams to silty clays. In most areas, the surface is littered with rock fragments of various sizes, or in some cases, moderately large to large sandstone boulders. Vegetative cover is generally sparse, runoff is very high, and inherent fertility is low. Rooting depth is shallow. Aspect, rock cover, and degree of slope are all important influencing factors for plant community development.

Major Soil Taxonomic Units correlated to this site include Burson loam and Rock Outcrop.

Table 4. Representative soil features

Surface texture	(1) Gravelly silty clay loam (2) Stony clay loam (3) Loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate to very rapid
Soil depth	4–20 in
Surface fragment cover ≤3"	10–30%
Surface fragment cover >3"	25–50%
Available water capacity (0–40in)	0.5–1 in
Calcium carbonate equivalent (0–40in)	0–5%
Electrical conductivity (0–40in)	0–2 mmhos/cm
Sodium adsorption ratio (0–40in)	0
Soil reaction (1:1 water) (0–40in)	7.9–8.4

Ecological dynamics

This site is unique and somewhat variable in the range and diversity of the native plant community it supports. Climate, soils, parent material, slope, aspect, and rock cover are the major factors influencing plant communities on the site. Natural fire is also an influencing factor. Herbivory is of minimal influence on most Breaks areas. In order to describe a historic climax plant community for the site as a whole, it is necessary to use a broader range when addressing species and plant groupings because of the variations

found from one location to another, and the different aspects of the Breaks site. Plant communities are generally similar, but there are some subtle differences that need to be defined.

In most instances, the HCPC (Historic Climax Plant Community) would fit within the categories of grassland/shrub with few to moderate forbs and few trees. In some cases, the production of shrubs may be almost equal with that of grasses. For the purposes of this ecological site description, short-growing woody species including the shrubby growth form of mesquite are considered to be shrubs. Oneseed juniper is considered a tree.

There is definitely a more xeric as well as a more mesic community phase for the Breaks site. The phase depends mostly on aspect, and perhaps to a lesser extent, amount of rock cover and degree of slope. When observing this site, it is evident that there is a larger shrub component present on the north- and northeast-facing slopes (mesic phase) than on south- and southwest-facing slopes (xeric phase). Also, the diversity of species is greater on the more mesic slope, and the total community production is also somewhat greater there. These differences in plant community are aspect-driven. Mesic slopes have less exposure to the intense rays of summer sunlight, and this translates to lower soil temperature, lower heat reflection from the soil surface back to the plant, and lower rates of evaporation. Mesic slopes are shaded for a greater percent of the daylight hours during the hottest part of the year.

The presence of large and medium sized rock or boulders and their orientation creates a micro environment of its own. Moderate cover of larger rocks increases shading effect on individual plants, traps moisture underneath the rocks, and acts as a mini watershed for the area that is immediately adjacent. There also exists an element of heat transfer wherein the rock itself absorbs and reflects some of the heat that would normally be absorbed directly into the soil. And lastly, the rock cover decreases soil erosion by absorbing raindrop energy and slowing the runoff process by interrupting flow patterns. Slopes with a south and west facing aspect (xeric) tend to have sparser cover, more shortgrass species, and more drought-tolerant half shrubs. The degree of slope is also a factor and works in conjunction with aspect and rock cover. Steeper slopes tend to have less soil formation and more rapid runoff. The plant communities found on the breaks site can best be described by addressing both the mesic and the xeric phases independently.

The plant community composition typical of the mesic (north- and east-facing slopes) portion of the Breaks site is grasses shrubs or = forbs trees. The main grasses are sideoats grama (*Bouteloua curtipendula*), little bluestem (*Schizachyrium scoparium*), sand bluestem (*Andropogon hallii*), Canada wildrye (*Elymus canadensis*), blue grama (*Bouteloua gracilis*), New Mexico feathergrass (*Hesperostipa neomexicana*), hairy grama (*Bouteloua hirsuta*), sand dropseed (*Sporobolus cryptandrus*), and occasionally Indiangrass (*Sorghastrum nutans*). The major forb species include Mexican sagewort (*Artemisia ludoviciana*), halfshrub sundrop (*Calylophus serrulata*), dotted gayfeather (*Liatris punctata*), broom nailwort (*Paronychia jamesii*), blacksamson echinacea (*Echinacea angustifolia*), plains actinia (*Tetraneuris scaposa*), baby white aster (*Chaetopappa ericoides*), and broom snakeweed (*Gutierrezia sarothrae*). Shrubs most

commonly found are skunkbush sumac (*Rhus trilobata*), feather dalea (*Dalea formosa*), Mormon tea (*Ephedra* sp.), and occasionally grape (*Vitis* sp.), plains greasebush (*Glossopetalum planitierum*), and winterfat (*Krascheninnikovia lanata*). Trees are limited to hackberry (*Celtis laevigata*), western soapberry (*Sapindus saponaria*), and oneseed juniper (*Juniperus monosperma*). Trees are infrequent with the exception of juniper, which occurs in pockets or in scattered stands depending on local situations. In general, grasses make up 40 to 50 percent of total production; forbs make up 15 to 25 percent; shrubs make up 20 to 35 percent, and trees make up 5 to 10 percent.

The plant community composition typical of the xeric (south- and west-facing slopes) portion of the Breaks site is grasses forbs = shrubs trees. The main grasses are sand dropseed (*Sporobolus cryptandrus*), hairy grama (*Bouteloua hirsuta*), black grama (*Bouteloua eriopoda*), slim tridens (*Tridens muticus*), perennial threeawn (*Aristida wrightii*), hairy tridens (*Erioneuron pilosum*), blue grama (*Bouteloua gracilis*), galleta (*Pleuraphis jamesii*), New Mexico stipa (*Hesperostipa neomexicana*), and sideoats grama (*Bouteloua curtipendula*). The majority of the grasses are drought-tolerant short-grass species. The major forb species include baby white aster (*Chaetopappa ericoides*), plains actinia (*Tetrandeum scaposa*), sand lily (*Mentzelia nuda*), Wright's buckwheat (*Eriogonum wrightii*), plains zinnia (*Zinnia grandiflora*), Gordon's bladderpod (*Lesquerella gordonii*), and broom snakeweed (*Gutierrezia sarothrae*). Shrubs most commonly found are feather dalea (*Dalea formosa*), catclaw mimosa (*Mimosa biuncifera*), occasional skunkbush (*Rhus trilobata*), prickly pear (*Opuntia phaeacantha*), mesquite (*Prosopis glandulosa*), plains greasebush (*Glossopetalum planitierum*), and occasional winterfat (*Krascheninnikovia lanata*). The only tree species found is oneseed juniper (*Juniperus monosperma*), which may occur in scattered stands. In general, grasses make up 55 to 65 percent of total production; forbs make up 10 to 20 percent; shrubs make up 10 to 20 percent; and trees make up 5 to 10 percent. There are some breaks sites where juniper has become dominant over many decades, but even in these cases, the xeric phase will usually not have as thick a stand of juniper as will the mesic phase of community. Historical records indicate that in the HCPC the juniper was not nearly as extensive as it is now in many localities. The amounts of juniper referred to in this section are ranges thought to have been present in the HCPC.

The increased total production potential and the increased diversity for the mesic community phase can be attributed to the moisture related factors addressed in previous paragraphs.

Unlike most of the ecological sites in this MLRA, historic grazing by domestic livestock is not a major issue in the development of and change within plant communities over time on the Breaks site. Steep slopes often render the site largely inaccessible to cattle, although some light use of the foot slopes occurs. Sheep (and/or goats) would be more likely to access this site than cattle. There was periodic grazing of sheep by Mexican pastores for a time in the late 1800's but it is not likely that this grazing has left any visible effects on the site. There is little grazing by sheep or goats in this region at present. Browsing use by mule deer can be observed, but is generally light.

If the deer population is locally heavy, it is possible that some preferred browse species might receive enough browsing pressure to affect the composition of the shrub component. In pristine times, elk probably grazed in this region, but only token amounts of elk remain on a local basis. Although herbivory has probably had some minor effect on plant communities over time, it is unlikely that this was a major influence.

Natural fire did influence the historic plant community development on many of the breaks sites in this MLRA. It is believed that fire suppressed some of the woody vegetation that is now dominant on many portions of this site. Oneseed juniper is especially susceptible to damage by fire, and this species has greatly increased from HCPC populations, largely due to natural fire being suppressed by various factors and for various reasons. Although the terrain characterizing this site is such that some local areas may have been protected from naturally occurring fire, it is certainly likely that portions of this site did burn with some regularity. The orientation of the slopes, amount of fuel, and the direction of the wind during a given fire would be determining factors. In observing wildfires in rough country, it can be noted that although the burns may appear somewhat patchy, some very rough areas often burn. Juniper has increased over widespread areas in this MLRA and now occupies many sites that are basically smooth terrain. When fires regularly occurred, the juniper tended to be more confined to the rougher terrain having sparse fuel loads where protection from fire was more likely. When considering prescribed fire as a management tool, it is essential to plan well in advance of the burn – and to consider all environmental factors and necessary safety preparations.

NOTE: Rangeland Health Reference Worksheets have been posted for this site on the Texas NRCS website (www.tx.nrcs.usda.gov) in Section II of the eFOTG under (F) Ecological Site Descriptions.

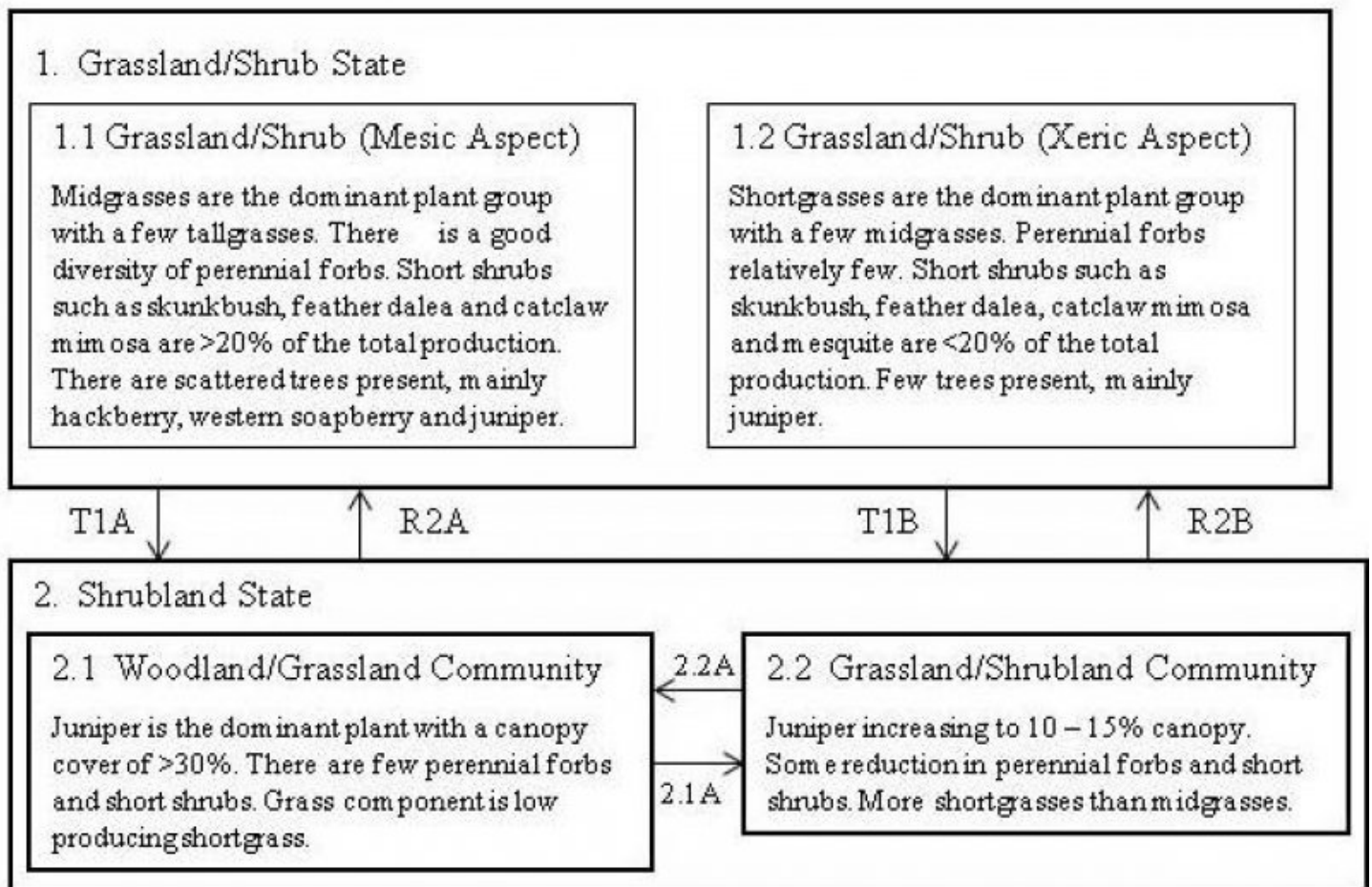
STATE AND TRANSITIONAL PATHWAYS : (DIAGRAM)

Narrative:

The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this would happen the same way in every instance. Local professional guidance should always be sought before pursuing a treatment scenario.

State and transition model

Breaks 12-18" PZ
R070BY661TX



LEGEND

- T1A (Mesic) - No natural fire over a 20 year period, No Brush Management. Moderate increase in juniper.
 R2A - Prescribed burn (2 or more burns) over a 15 – 20 yr. period, Prescribed Grazing or Prescribed Burn combined w/IPT. 1/
 T1B (Xeric) - No Natural or Prescribed burn over a 50 year period, No Brush Management. Dramatic invasion of juniper.
 R2B - Prescribed burn (single burn); follow-up IPT Brush Management and Prescribed Grazing over 5 – 6 yrs. 1/
 2.1A - No natural or Prescribed Burn; No Brush Management.
 2.2A - Prescribed Burn or IPT Brush Management; Prescribed Grazing 1/

1/ If prescribed burning is not a valid option because of logistical problems, or liability concerns, then selective IPT brush management may be a better alternative on smoother terrain. In some cases it may be practical or feasible to manipulate plant communities on this site because of stability concerns or because of cost/return and aesthetic considerations.

State 1
Grassland/Shrub State

The plant community composition most prevalent on the xeric (south and west facing

slopes) aspect of breaks site is grasses forbs = shrubs trees. The majority of the grasses are drought-tolerant short-grass species. In general, grasses make up 55 to 65 percent of total production; forbs make up 10 to 20 percent; shrubs make up 10 to 20 percent; and trees make up 5 to 10 percent. Juniper is often the only tree species present and is usually scattered. The reference plant community constitutes a diverse mixture of grasses, forbs, and shrubs found on a north-facing slopes of about 35 to 40 percent. This would be the assumed HCPC for the mesic aspect of the Breaks site (1.1). Sandstone boulders comprise approximately 35-40 percent of surface cover. Production is high for this site and the site is very stable. There is a notable absence of juniper on this particular area. However, there are some small colonies of juniper close by. Total annual production ranges from 395 to 480 pounds per acre. Natural fire did influence the historic plant community development on many of the Breaks areas in this MLRA. It is believed that fire suppressed some of the woody vegetation that is now dominant in many of these areas. Oneseed juniper is especially susceptible to damage by fire, and this species has greatly increased from HCPC populations, largely due to natural fire being suppressed by various factors and for various reasons. The Grassland/Shrub Community (1.2) is representative of the xeric aspect of the Breaks site. This is a southwest facing slope of approximately 35 percent that is dominated by short- and mid-grasses with few forbs and scattered shrubs. A few trees (oneseed juniper) may be present. No natural fire over a period of 20 or more years will tend to shift the mesic plant community (1.1) towards the Woodland/Grassland Community (2.1).

Community 1.1

Grassland/Shrub Community (Mesic Aspect)



Figure 4. 1.1 Grassland/Shrub Community (Mesic Aspect)

The plant community (the reference community) shown in this photo depicts the diverse mixture of grasses, forbs, and shrubs found on a north-facing slopes of about 35 to 40 percent. This would be the assumed HCPC for the mesic aspect of the Breaks site (1.1). Sandstone boulders comprise approximately 35 to 40 percent of surface cover. Production is high for this site and the site is very stable. Note the absence of juniper on

this particular area. However, there are some small colonies of juniper close by. Total annual production ranges from 395 to 480 pounds per acre. Unlike most of the ecological sites in this MLRA, historic grazing by domestic livestock is not a major issue in the development of and change within plant communities over time on the Breaks site. Steep slopes and rocky surfaces often render the site largely inaccessible to cattle, although some light use of the foot slopes occurs. Sheep (and/or goats) would be more likely to access this site than cattle. Natural fire had the greatest influence on the HCPC development on many of the Breaks areas in this MLRA. It is believed that fire suppressed some of the woody vegetation such as oneseed juniper that is now dominant in many of these areas. No natural fire over a period of 20 or more years will tend to shift the mesic plant community (1.1) towards the Woodland/Grassland Community (2.1).

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	160	320	480
Shrub/Vine	120	160	200
Forb	80	120	160
Tree	20	50	80
Microbiotic Crusts	15	22	30
Total	395	672	950

Figure 6. Plant community growth curve (percent production by month). TX0258, Grassland/Shrub Community (Mesic). Warm-season grasses, forbs and shrubs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	4	7	22	23	15	7	9	7	3	1

Community 1.2

Grassland/Shrub Community (Xeric Aspect)



Figure 7. 1.2 Grassland/Shrub Community (Xeric Aspect)

The Grassland/Shrub Community (1.2) is representative of the xeric aspect of the Breaks site. This is a southwest-facing slope of approximately 35 percent that is dominated by short- and mid-grasses with few forbs and scattered shrubs. A few trees (oneseed juniper) may be present. The plant community is stable and production is consistent with site potential. There are fewer shrubs and forbs present in this community phase compared to the mesic phase (previously described), and there is less total diversity of plant species. Total annual production ranges from 380 to 845 pounds per acre. As mentioned earlier, grazing by domestic livestock is not a major factor in the development of and change within plant communities over time on the Breaks site. The south- and southwest-facing slopes are warmer and droughtier than the north and northeast slopes. These factors have the greatest impact on the plant community. Natural fire does have similar influence on woody plants on the xeric aspect as it did on the mesic aspect. With no natural or prescribed burning over a period of 50 or more years, the HCPC will move towards the Grassland/Shrub Community (2.2). Once the woody plant canopy reaches 15 percent in cover, a threshold is crossed to the Grassland/Shrubland (2.2) State.

Table 6. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	250	375	500
Shrub/Vine	65	112	160
Forb	40	70	100
Tree	20	40	60
Microbiotic Crusts	5	15	25
Total	380	612	845

Figure 9. Plant community growth curve (percent production by month).

TX0259, Grassland/Shrub Community (Xeric Aspect). Warm-season grasses, shrubs, and forbs..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	2	4	7	22	23	15	7	9	7	3	1

State 2
Shrubland State

Grassland State has been converted to a Shrubland State. Juniper has increased from 10 to 15 percent to greater than 30 percent canopy cover. There is a reduction of perennial forbs and short-grasses. There are more short-grasses than mid-grasses present. The dominant grasses are black grama and hairy grama, with a lesser amount of sideoats grama on the lower slopes. The densest canopies occur on the north/northeast slopes. Once juniper canopy exceeds 30 percent, prescribed burning will be ineffective due to the lack of fine fuel. Prescribed burning must be performed before juniper canopies reach 30 percent.

Community 2.1
Woodland/Grassland Community



Figure 10. 2.1 Woodland/Grassland Community

The photo below illustrates the difference in mesic and xeric aspect phases in terms of the amount of tree cover. There are nearly always more woody plants present on the more mesic aspect. In this photo, oneseed juniper is much thicker on these north/northeast-facing slopes. With invasion and no natural fire, juniper can dominate the site. When juniper reaches approximately 20 percent canopy cover, there starts to be a reduction in other woody shrubs and in forbs and grasses. Once the canopy becomes greater than 30 percent, juniper completely dominates. Total annual production ranges from 475 to 895 pounds per acre with juniper production equal to or exceeding total grass production. Due to slope and the likelihood of erosion, mechanical removal of these junipers is not wise or

practical. Individual Plant Treatment (IPT) is the recommended method. Prescribed fire cannot be used safely without extensive preparation. The lack of fine fuel makes prescribed burning questionable. Due to the significant increase in juniper, the overall production of grasses, forbs, and shrubs is lowered. This plant community may be best suited for wildlife loafing areas and cover at this point.

Table 7. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Tree	200	250	350
Grass/Grasslike	200	250	300
Shrub/Vine	25	50	75
Forb	40	50	60
Microbiotic Crusts	10	10	10
Total	475	610	795

Figure 12. Plant community growth curve (percent production by month). TX0261, Juniper/Grassland Community. Thirty percent and more woody canopy of Juniper along with shortgrass understory..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	5	5	6	20	20	10	5	10	14	3	1

Community 2.2

Grassland/Shrubland Community



Figure 13. 2.2 Grassland/Shrubland Community

The photo below depicts a grassland with a moderate amount of oneseed juniper. There is visible evidence of a past fire on the upper slope in the background. A portion of this site

burned a few years ago and some limited juniper mortality occurred. The dominant grasses are black grama and hairy grama, with a lesser amount of sideoats grama on the lower slopes. A limited amount of forbs and short shrubs are also present. Total annual production ranges from 345 to 705 pounds per acre with short-grasses producing 50 to 60 percent of the total production. Slope ranges from 30 to 45 percent. Rock cover averages approximately 30 percent. With the continued lack of natural fire or prescribed burning along with no brush management, this plant community will transition to the Woodland/Grassland phase (2.1) with greater than 30 percent canopy cover of juniper. The densest canopies occur on the north/northeast slopes. Once juniper canopy cover exceeds 30 percent, prescribed burning will be ineffective due to the lack of fine fuel. Prescribed burning must be used before juniper canopies reach 30 percent. As mentioned in the plant community narrative (2.1), no type of mechanical brush management is wise or practical due to the steep slopes and potential for excessive erosion. Individual Plant Treatment (IPT) is a less invasive approach.

Table 8. Annual production by plant type

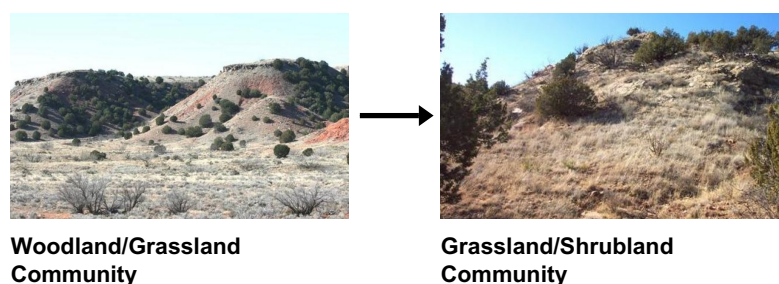
Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	200	300	400
Tree	70	115	160
Forb	40	50	60
Shrub/Vine	30	45	60
Microbiotic Crusts	5	12	25
Total	345	522	705

Figure 15. Plant community growth curve (percent production by month). TX0260, Grassland/Shrubland Community. Warm-season shortgrasses with moderate amounts of evergreen trees (15-30% woody canopy)..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	5	5	6	20	24	10	5	10	10	3	1

Pathway 2.1A

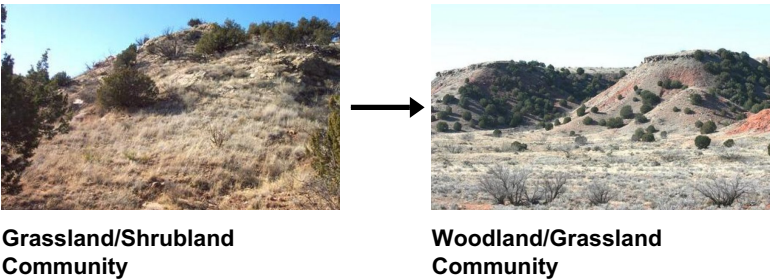
Community 2.1 to 2.2



This community phase pathway would shift from the Woodland/Grassland Community to

the Grassland/Shrubland Community. This occurs where there is no Natural Fire or Prescribed Burns and No Brush Management.

Pathway 2.2A
Community 2.2 to 2.1



This community phase pathway would shift from the Grassland/Woodland Community to the Woodland/Grassland Community. Prescribed Burning, Brush Management (IPT), and Prescribed Grazing are applied.

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Transition T1A
State 1 to 2

This transition occurs from 1.1 Grassland/Shrub (Mesic Aspect) to the 2.1 Woodland/Grassland Community. The lack of natural fires over a 20 year period, as well as the lack of brush management treatments, have allowed for a moderate increase in juniper.

Transition T1B
State 1 to 2

This transition occurs from 1.2 Grassland/Shrub (Xeric Aspect) to the 2.2 Grassland/Woodland Community. No natural fires or prescribed burns over a 50 year period and no brush management treatments has allowed for a dramatic invasion of juniper.

Restoration pathway R2A
State 2 to 1

This restoration occurs from 2.1 Woodland/Grassland Community (Mesic) to the 1.1 Grassland/Shrubland (Mesic Aspect). Prescribed Burning (2 or more burns over a 15 to 20

year period), Prescribed Grazing, or Prescribed Burning combined with Brush Management (Individual Plant Treatments).

Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

Restoration pathway R2B State 2 to 1

This restoration occurs from 2.2 Grassland/Shrubland with 10-15% woody canopy (Xeric Aspect) to the 1.2 Grassland/Shrubland (Xeric Aspect). Prescribed Burning (single burn over a 5-6 year period), follow up Brush Management (Individual Plant Treatment) and Prescribed Grazing over a 5-6 year period.

Additional community tables

Table 9. Community 1.2 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Shortgrasses			115–230	
	slim tridens	TRMU	<i>Tridens muticus</i>	25–55	–
	black grama	BOER4	<i>Bouteloua eriopoda</i>	25–40	–
	hairy grama	BOHIH	<i>Bouteloua hirsuta</i> var. <i>hirsuta</i>	25–40	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	15–30	–
	James' galleta	PLJA	<i>Pleuraphis jamesii</i>	10–25	–
	sand dropseed	SPCR	<i>Sporobolus cryptandrus</i>	5–10	–
	hairy woollygrass	ERPI5	<i>Erioneuron pilosum</i>	5–10	–
	Wright's threeawn	ARPUW	<i>Aristida purpurea</i> var. <i>wrightii</i>	5–10	–
2	Midgrasses			115–230	
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	70–135	–
	little bluestem	SCSCS	<i>Schizachyrium scoparium</i> var. <i>scoparium</i>	30–55	–
	New Mexico feathergrass	HENE5	<i>Hesperostipa neomexicana</i>	15–40	–

3	Tallgrasses			20–40	
	sand bluestem	ANHA	<i>Andropogon hallii</i>	10–15	–
	Indiangrass	SONU2	<i>Sorghastrum nutans</i>	5–15	–
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	5–10	–
Forb					
4	Forbs			40–100	
	white sagebrush	ARLUM2	<i>Artemisia ludoviciana</i> ssp. <i>mexicana</i>	10–25	–
	stemmy four-nerve daisy	TESC2	<i>Tetrameuris scaposa</i>	5–15	–
	rose heath	CHER2	<i>Chaetopappa ericoides</i>	5–15	–
	broom snakeweed	GUSA2	<i>Gutierrezia sarothrae</i>	5–15	–
	stiffleaf false goldenaster	HEST3	<i>Heterotheca stenophylla</i>	1–2	–
	needleleaf bluet	HOAC	<i>Houstonia acerosa</i>	1–2	–
	trailing krameria	KRLA	<i>Krameria lanceolata</i>	1–2	–
	dotted blazing star	LIPU	<i>Liatris punctata</i>	1–2	–
	bractless blazingstar	MENU	<i>Mentzelia nuda</i>	1–2	–
	James' nailwort	PAJA	<i>Paronychia jamesii</i>	1–2	–
	white milkwort	POAL4	<i>Polygala alba</i>	1–2	–
	slimflower scurfpea	PSTE5	<i>Psoralidium tenuiflorum</i>	1–2	–
	Drummond's skullcap	SCDR2	<i>Scutellaria drummondii</i>	1–2	–
	blacksamson echinacea	ECAN2	<i>Echinacea angustifolia</i>	1–2	–
	longleaf buckwheat	ERLO5	<i>Eriogonum longifolium</i>	1–2	–
	Olancho Peak buckwheat	ERWRO	<i>Eriogonum wrightii</i> var. <i>olanchense</i>	1–2	–
	shaggy dwarf morning-glory	EVNU	<i>Evolvulus nuttallianus</i>	1–2	–
	Rocky Mountain zinnia	ZIGR	<i>Zinnia grandiflora</i>	1–2	–
	yellow sundrops	CASE12	<i>Calylophus serrulatus</i>	1–2	–
Shrub/Vine					
5	Shrubs/Vines			65–160	
	skunkbush sumac	RHTR	<i>Rhus trilobata</i>	15–40	–

	featherplume	DAFO	<i>Dalea formosa</i>	15–30	–
	catclaw mimosa	MIACB	<i>Mimosa aculeaticarpa</i> var. <i>biuncifera</i>	5–20	–
	honey mesquite	PRGL2	<i>Prosopis glandulosa</i>	5–15	–
	plains pricklypear	OPPO	<i>Opuntia polyacantha</i>	5–10	–
	vine jointfir	EPPE	<i>Ephedra pedunculata</i>	5–10	–
	winterfat	KRLA2	<i>Krascheninnikovia lanata</i>	5–10	–
	fourwing saltbush	ATCA2	<i>Atriplex canescens</i>	5–10	–
	grape	VITIS	<i>Vitis</i>	0–5	–
Tree					
6	Trees			20–60	
	oneseed juniper	JUMO	<i>Juniperus monosperma</i>	15–45	–
	netleaf hackberry	CELAR	<i>Celtis laevigata</i> var. <i>reticulata</i>	5–10	–
	western soapberry	SASAD	<i>Sapindus saponaria</i> var. <i>drummondii</i>	0–5	–

Animal community

This site provides browse, bedding cover, and protection for mule deer. Small animals such as ringtails, raccoons, coyotes, bobcats, and a variety of song birds also utilize this site for food and cover.

Plant preference by animal kind:

This rating system provides general guidance as to animal preference for plant species. It also indicates possible competition between kinds of herbivores for various plants.

Grazing preference changes from time to time, especially between seasons, and between animal kinds and classes. Grazing preference does not necessarily reflect the ecological status of the plant within the plant community. For wildlife, plant preferences for food and plant suitability for cover are rated.

Legend: P=Preferred D=Desirable U=Undesirable N=Not Consumed T=Toxic X=Used, but not degree of utilization unknown

Preferred – Percentage of plant in animal diet is greater than it occurs on the land.

Desirable – Percentage of plant in animal diet is similar to the percentage composition on the land.

Undesirable – Percentage of plant in animal diet is less than it occurs on the land.

Not Consumed – Plant would not be eaten under normal conditions. Plants are only consumed when other forages not available.

Hydrological functions

Runoff is rapid due to steep slopes and limited infiltration. Lower-lying sites receive runoff during any significant rainfall event.

Recreational uses

Hunting, Camping, Hiking, Bird watching, Photography, Horseback Riding

Wood products

Sometimes larger junipers are utilized for fence posts.

Other products

None.

Other information

None.

Inventory data references

NRCS FOTG – Section II of the FOTG Range Site Descriptions and numerous historical accounts of vegetative conditions at the time of early settlement in the area were used in the development of this site description. Vegetative inventories were made at several site locations for support documentation.

Inventory Data References (documents):

NRCS FOTG – Section II - Range Site Descriptions

NRCS Clipping Data summaries over a 20 year period

Other references

Natural Resources Conservation Service - Range Site Descriptions

USDA-Natural Resources Conservation Service - Soil Surveys & Website soil database

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Approval

Kendra Moseley, 9/12/2023

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)	Stan Bradbury, Zone RMS, NRCS, Lubbock, Texas
Contact for lead author	806-791-0581
Date	04/21/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** Due to percent slopes, rills will be common.

2. **Presence of water flow patterns:** Due to percent slopes, water flow patterns will be common.

3. **Number and height of erosional pedestals or terracettes:** Due to percent slopes, pedestals/terraces will be common.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** 25-35% mineral soil.
-
5. **Number of gullies and erosion associated with gullies:** Due to the percent slopes, gullies will be common.
-
6. **Extent of wind scoured, blowouts and/or depositional areas:** Slight to moderate.
-
7. **Amount of litter movement (describe size and distance expected to travel):** Slight to moderate.
-
8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Not very resistant to surface erosion.
-
9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Very gravelly loam; friable surface; low SOM.
-
10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Lack of vegetative cover and slope increase erosion potential. This site is a moderately permeable soil, rapid runoff, and available water holding capacity is low.
-
11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** None.
-
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: Warm-season shortgrasses > Warm-season midgrasses >

Sub-dominant: Shrubs/Vines > Forbs >

Other: Trees > Warm-season tallgrasses

Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Grasses due to their growth habit will exhibit some mortality and decadence, though minimal.
-
14. **Average percent litter cover (%) and depth (in):** Litter is primarily herbaceous.
-
15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 380 to 845 pounds per acre.
-
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:** Juniper can be invasive.
-
17. **Perennial plant reproductive capability:** All plant species should be capable of reproduction except during periods of prolonged drought conditions, heavy natural herbivory or intense wildfires.
-