

# Ecological site R080AY001OK Alkali Bottomland

Last updated: 9/19/2023  
Accessed: 04/23/2024

## General information

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

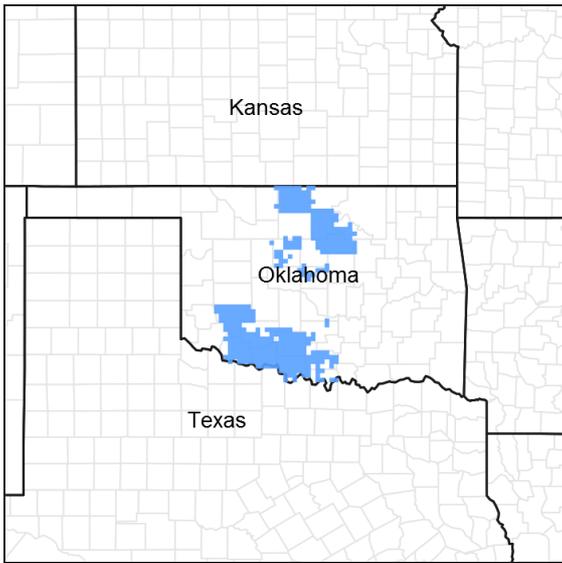


Figure 1. Mapped extent

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

## MLRA notes

Major Land Resource Area (MLRA): 080A–Central Rolling Red Prairies

MLRA 80A is characterized by dark red Permian rocks that are exposed on gently sloping plains. These plains are dissected by rivers that flow from northwest to southeast. Major rivers of this MLRA include the Chickaskia and Bluff rivers in KS, the Salt Fork, Cimarron, North and South Canadian, Washita, Cache, Red River in OK, and branches of the Wichita River in TX. Soils are generally well drained, loamy or clayey deposits overlying Permian sandstones or shales.

## Classification relationships

This ecological site is correlated to soil components at the Major Land Resource Area (MLRA) level which is further described in USDA Ag Handbook 296.

## Ecological site concept

These sites occur along floodplains of streams and tributaries and are often mapped in complexes with other soils/ecological sites. The vegetation may vary depending on the local sodium content and overall salinity of the specific site. Occasionally, these sites may be dominated by Alkali Sacaton *Sporobolus airoides*, Inland saltgrass *Distichlis spicata*, or other salt tolerant species. Historically, the reference plant community was dominated by

primarily herbaceous plant due to the frequency of fires on the prairie.

## Associated sites

R080AY050OK	<p><b>Loamy Bottomland</b> Alkali Bottomland intermingles with Clay and Loamy Bottomland ecological sites. It is difficult to separate these intermingled ecological sites into individual management units.</p>
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## Similar sites

R080AY091OK	<p><b>Slickspot</b> Slickspot vegetation can vary due to differences in salt content and to the degree of compaction of the clay loam subsoil. Vegetation is primarily alkali sacaton, blue grama and buffalograss along with the various combinations of sideoats grama, windmillgrass, silver bluestem, tumblegrass, fall witchgrass, gummy lovegrass, and Texas grama. During extremely cool, wet spring years, Japanese brome (introduced), prairie threeawn and western ragweed increase to more than normal levels. Some Slickspots are so salty and droughty that vegetation will not grow. Conversely, other sites can support several different plant communities. Slickspots in Comanche county are associated with Hinkle soil series. In other areas of MLRA 80A, Slickspots are associated with Buttermilk, Wing and Drummond soil series.</p>
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) <i>Sporobolus airoides</i> (2) <i>Cleomella angustifolia</i>

## Physiographic features

Nearly level to gently sloping bottomlands that support inland saltgrass, alkali sacaton, and other alkali tolerant plants. Some small areas are barren. Often, the alkali bottomlands are interspersed within more productive loamy bottomland.

**Table 2. Representative physiographic features**

Landforms	(1) Alluvial plain > Flood plain (2) Alluvial plain > Backswamp (3) Alluvial plain > Terrace
Runoff class	Low to high
Flooding duration	Very brief (4 to 48 hours) to brief (2 to 7 days)
Flooding frequency	Rare to frequent
Ponding frequency	None
Elevation	700–1,500 ft
Slope	0–2%
Ponding depth	0 in
Water table depth	36–72 in
Aspect	Aspect is not a significant factor

## Climatic features

The climate is characterized by moist, cool, springs; hot, often dry summers; mild autumns; and mild to cold winters. Variation in timing and amounts of precipitation from year to year is quite common. Drought cycles range from three to five years duration with occasionally longer periods occurring at unpredictable intervals. Above normal rainfall cycles are usually just as random, but shorter in duration.

Data was collected from the El Reno, Chickasha, Wichita Falls, and Anthony climate stations.

**Table 3. Representative climatic features**

Frost-free period (characteristic range)	186-193 days
Freeze-free period (characteristic range)	204-216 days
Precipitation total (characteristic range)	31-36 in
Frost-free period (actual range)	183-197 days
Freeze-free period (actual range)	200-225 days
Precipitation total (actual range)	30-37 in
Frost-free period (average)	189 days
Freeze-free period (average)	211 days
Precipitation total (average)	33 in

### Climate stations used

- (1) EL RENO 1 N [USC00342818], El Reno, OK
- (2) CHICKASHA EXP STATION [USC00341750], Chickasha, OK
- (3) WICHITA FALLS MUNI AP [USW00013966], Sheppard AFB, TX
- (4) ANTHONY [USW00013980], Anthony, KS

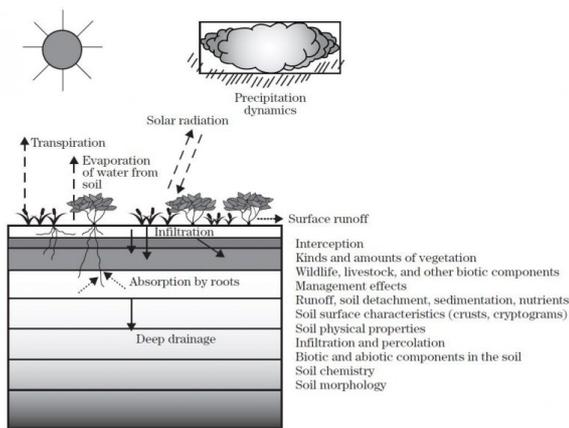
### Influencing water features

Alkali Bottomlands are rarely flooded to frequently flooded. They may receive some run on water from adjacent sites uphill. However, the soil properties on these sites greatly affect hydrological processes.

### Wetland description

NA

**Figure 7-1** The hydrologic cycle with factors that affect hydrologic processes



**Figure 8.**

### Soil features

Alkali Bottomland soils are deep alluvial soils with crusty-loamy to clayey surface horizons and dense loamy to clayey subsoils. Subsoil density, combined with surface crusting, results in very slow infiltration. Very slow infiltration results in vegetation lacking subsoil moisture during drouthy periods.

Representative soils:

Drummond, Miller, Oscar and Slickspots.

**Table 4. Representative soil features**

Parent material	(1) Alluvium–sandstone and shale
Surface texture	(1) Clay (2) Loam (3) Silt loam
Family particle size	(1) Clayey
Drainage class	Somewhat poorly drained to moderately well drained
Permeability class	Very slow to slow
Soil depth	60–80 in
Surface fragment cover <=3"	0–1%
Surface fragment cover >3"	0–1%
Available water capacity (0-40in)	2.8–6.2 in
Electrical conductivity (0-40in)	0–16 mmhos/cm
Sodium adsorption ratio (0-40in)	0–80
Soil reaction (1:1 water) (0-40in)	5.6–9
Subsurface fragment volume <=3" (Depth not specified)	0–1%
Subsurface fragment volume >3" (Depth not specified)	0–1%

## Ecological dynamics

This ecological site consists of deep, nearly level to very gently sloping soils on flood plains. Concentrations of salts, primarily sodium, along with the compacted subsoils limit vegetation varieties to drought resistant and salt-tolerant plants. Due to extreme variations in salt content, plant presence and vegetation amounts can vary drastically. This site is usually intermingled in complexes with loamy bottomland that has narrow transition zones. These zones will manifest themselves by abrupt changes in vegetation. Nearly bare areas can occur on 10 to 75% of this site.

The most significant plant communities occurring on this site are midgrass/tallgrass alkali sacaton dominated, inland saltgrass dominated and rhombopod dominated. In the mid-south to southern extremities of the MLRA (southern Oklahoma and northern Texas), mesquite may dominate the site.

When this site becomes mesquite or salt cedar dominated, it has crossed a threshold. It will be extremely difficult, and probably economically unfeasible, to return this particular site to the reference state (Everitt, 1980).

### STATE AND TRANSITIONAL PATHWAYS (DIAGRAM):

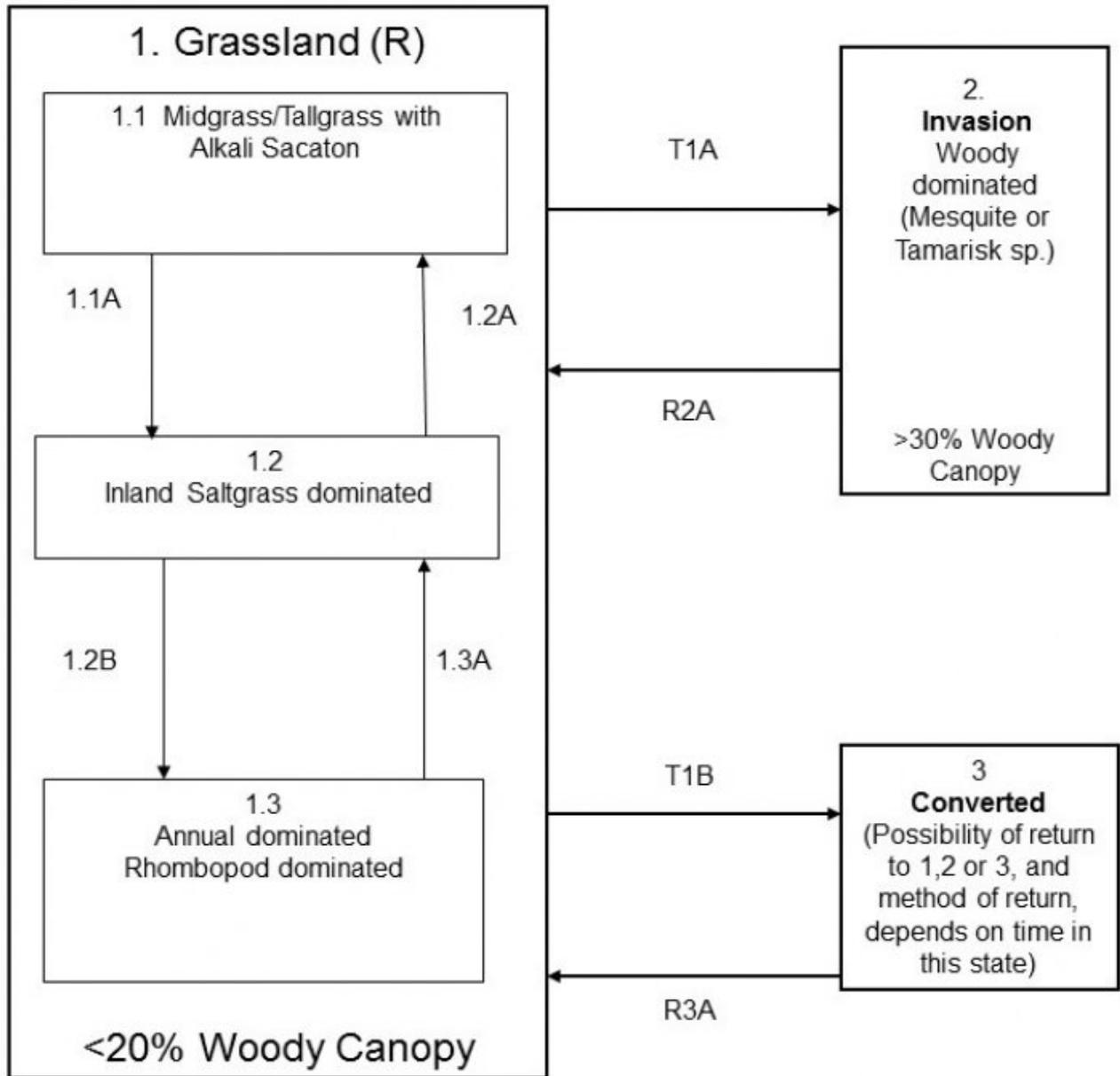
The following diagram suggests some pathways that the vegetation on this site might take. There may be other states not shown on the diagram. This information is intended to show what might happen in a given set of circumstances; it does not mean that this will happen the same way in every instance.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

As a site changes in the structure and makeup of the plant community, the changes may be due to management, or to natural occurrences, or both. At some point in time, thresholds may be crossed. This means that once plant community changes have progressed to a certain point, the balance of the community has been altered to the extent that a return to the former state is not possible, that is, not possible unless some form of outside energy is applied to make it happen. These changes take place on all ecological sites, but some sites support communities that are more resistant to change. Also, some sites are more resilient, that is, they tend to heal or restore

themselves more easily. Changes in management practices alone, such as prescribed grazing, will not be sufficient to restore former plant communities. An example of an outside energy input might be the implementation of prescribed chemical brush management to decrease the amount of woody shrubs and increase the amount of grasses and forbs. This shift in plant community balance could not be brought about with prescribed grazing alone. The amount of energy required to bring about a change in the plant community balance may vary a great deal depending on the present plant community state and the desired community state.

## **State and transition model**

## State and Transition Diagram



- Legend:**
- 1.1A – Long term overgrazing(Exceeding carrying capacity)
  - 1.2A – Prescribed Grazing(Deferment)
  - 1.2B – Long term overgrazing(Exceeding carrying capacity)
  - 1.3A – Prescribed Grazing(Deferment)
  - T1A – Woody Invasion; No Fire; Long term overgrazing(Exceeding cc)
  - T1B – Tillage & Seeding
  - R2A – Brush Management; Prescribed Burning; Prescribed Grazing
  - R3A – Range Seeding

### State 1 Reference

#### Dominant plant species

- alkali sacaton (*Sporobolus airoides*), grass

## Community 1.1 Midgrass/Tallgrass Alkali Sacaton Dominated



Figure 9. Alkali Bottomland #1, HPC

This community is open midgrass/tallgrass bottomland dominated by alkali sacaton. Other important grasses are inland saltgrass, switchgrass, meadow dropseed, whorled dropseed, eastern gamagrass, western wheatgrass, and white tridens. This site also supports a variety of forbs including narrowleaf rhombopod, catclaw sensitivebrier, yellow neptunia, dotted gayfeather, ironweed, curlycup gumweed, curly dock, seacoast sumpweed, western ragweed and others. Shrub and woody plants are honey mesquite, American elm, black willow, willow baccharis and prickly pear. This plant community evolved through the collective influence of extremes of soil salinity, temperature, rain, wind, drought, fire and seasonal migration and herbivory of bison. Long-term overgrazing usually decreases grasses such as alkali sacaton, eastern gamagrass, switchgrass, western wheatgrass and palatable forbs. Inland saltgrass, honey mesquite, western ragweed, annual grasses, perennial grasses, forbs and woody plants will gradually increase. The rate of vegetation flux on this site is dependent upon management practices and climate. Range management that includes prescribed grazing, prescribed burning, fencing, water development, salt placement, mineral placement, brush control and weed control can restore and maintain this plant community. Within the Alkali Bottomland site, regardless of community phase there may be areas of high sodium concentrations that have very sparse vegetation. The area may be dominated by narrowleaf rhombopod or some other annual species. These areas are usually small and not connected. The production data given herein is based upon years of personal field observations and clipping data. Sometimes, clipping data may be limited, but it is the intent of the authors to give their best account of the vegetative makeup and production of the ecological site. The groupings of plant species is intended to give a general overview of production for particular groups of plants. However, because of ecological site dynamics, upon inspection, a particular species or group of species may exceed or fall below the production figures given. The production of a group has been divided equally among the member species. This is done to show the usual relativity of a plant to all other plants within the community.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	1530	2720	3400
Forb	252	448	560
Tree	14	23	32
Shrub/Vine	4	6	8
<b>Total</b>	<b>1800</b>	<b>3197</b>	<b>4000</b>

Figure 11. Plant community growth curve (percent production by month). OK0001, Native, Warm Season Grasses. Typically, the summer growing season for warm season grasses begins April 5 to 15 and ends October 15 to 25. Nearly three-fourths of the season production will occur before the first of July. This varies from year to year depending upon temperatures and precipitation..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	10	20	30	10	5	10	6	2	1

## Community 1.2 Inland Saltgrass Dominated



Figure 12. Inland Saltgrass Dominance

This site is dominated by inland saltgrass. Inland saltgrass can comprise 50 to 75% of the total annual production. Additional small percentages of other perennial grasses such as alkali sacaton, whorled dropseed, meadow dropseed and white tridens can also be present. Continuous heavy grazing contributes to the dominance of inland saltgrass. Applying prescribed grazing and prescribed burning will usually shift the competitive balances and allow switchgrass, alkali sacaton and other more palatable grasses and forbs to increase. Within the Alkali Bottomland site, regardless of community phase there may be areas of high sodium concentrations that have very sparse vegetation. The area may be dominated by narrowleaf rhombopod or some other annual species. These areas are usually small and not connected.

Figure 13. Plant community growth curve (percent production by month). OK0001, Native, Warm Season Grasses. Typically, the summer growing season for warm season grasses begins April 5 to 15 and ends October 15 to 25. Nearly three-fourths of the season production will occur before the first of July. This varies from year to year depending upon temperatures and precipitation..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	10	20	30	10	5	10	6	2	1

## Pathway 1.1A Community 1.1 to 1.2



Midgrass/Tallgrass Alkali Sacaton Dominated



Inland Saltgrass Dominated

With abusive grazing practices, the community may shift towards and inland saltgrass dominated community.

**Context dependence.** Long term abusive grazing damages more palatable species and leads to the increase in inland saltgrass.

## Pathway 1.2A Community 1.2 to 1.1



Inland Saltgrass Dominated



Midgrass/Tallgrass Alkali  
Sacaton Dominated

With adequate rest and favorable moisture, the community has the potential to shift back towards a midgrass/alkali sacaton community.

**Context dependence.** If abusive grazing has persisted for many years, it may be a longer recovery period.

### Conservation practices

Prescribed Grazing

## State 2

### Invasion Woody Dominated (Mesquite or Tamarisk)

#### Dominant plant species

- tamarisk (*Tamarix*), shrub
- honey mesquite (*Prosopis glandulosa*), shrub
- threeawn (*Aristida*), grass

## Community 2.1

### Mesquite Dominated



Figure 14. Mesquite Dominance

Picture of southern R080AY001OK Alkali Bottomland. The southern portion of MLRA 080AY in mesquite country. This plant community is predominately mesquite. The site also contains other low order annual grasses and forbs such as Japanese brome (introduced) and common broomweed, and perennial grasses and forbs such as whorled dropseed, fall witchgrass, windmillgrass, Texas wintergrass, western ragweed, curlycup gumweed, narrowleaf rhombopod and prickly pear cactus. Significant brush control using chemicals and/or mechanical methods must be utilized to control mesquite. If mesquite control can be attained (economically, highly improbable), then perhaps, reseeding with native grasses in conjunction with prescribed grazing and other prescribed management techniques can return this site to optimum grass production

Figure 15. Plant community growth curve (percent production by month). OK0001, Native, Warm Season Grasses. Typically, the summer growing season for warm season grasses begins April 5 to 15 and ends October 15 to 25. Nearly three-fourths of the season production will occur before the first of July. This varies from year to year depending upon temperatures and precipitation..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	1	5	10	20	30	10	5	10	6	2	1

## Community 2.2 Tamarisk Dominant



Figure 16. Kansas Alkali Bottomland

Alkali Bottomland photo in Harper County Kansas. This photo depicts a typical site in the northern portions of R080AY MLRA. These northern sites are usually dominated by inland saltgrass and/or alkali sacaton. Unlike the southern areas of MLRA R080AY where mesquite is the primary woody invader, woody invaders in the north are usually various shrubs and trees that are resistant to salt. Salt cedar (*Tamarisk* spp.) is seen in the background of this photo.

## State 3 Cropland

Alkali Bottomland sites are usually not intentionally cultivated. But, even though an Alkali Bottomland site was cultivated for a substantial period of time (State 5, S&T), it is not always impossible for the site to return to something resembling the reference state. Cultivation is definitely not a one-way street for an ecological site. The return of a cultivated field to the HPC depends on the length of time in cultivation, erosion, loss of organic matter, soil type, and precipitation zone (and probably others). Remnant terraces usually reveal the fact that the fields were cultivated at some time in the past. Sometimes, it is very difficult to determine if fields were cultivated. Some of these sites were probably reseeded, others were not. If the soil resource has not been heavily degraded and given enough time, the site could get back to the HPC or something very close to it. The soil resource is the primary factor. Alkali bottomland sites are usually small inclusions in larger cropland areas. So, these areas themselves, are usually not intentionally cultivated. Because of the topography of this site (0% to very little slope) there are no Alkali Bottomland eroded soils mapped in the state of Oklahoma at the time of this revision writing (4/2006).

## Transition T1A State 1 to 2

Lack of fire and brush encroachment can lead to a woody dominated site.

**Constraints to recovery.** Some brush species are extremely difficult to eradicate but may be managed at an acceptable level.

**Context dependence.** The more severe the woody invasion and longer time since fire may increase the inputs needed to attempt control.

## Transition T1B State 1 to 3

This transition occurs as the result of cultivation for crop production. The soil structure and hydrology are altered.

**Constraints to recovery.** With the soil structure, chemistry, and hydrology altered through cultivation, it will be very difficult for the site to be returned to reference conditions.

## Restoration pathway R2A

### State 2 to 1

Through and program of prescribed fire, managed grazing, and potential chemical brush management, the woody state may be restored to the reference state.

**Context dependence.** The overall level of infestation and time since fire play a major role in determining the level of inputs required for the restoration.

### Conservation practices

Brush Management
Prescribed Burning
Prescribed Grazing

## Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
<b>Grass/Grasslike</b>					
1				810–1800	
	alkali sacaton	SPAI	<i>Sporobolus airoides</i>	810–1800	–
2				180–400	
	switchgrass	PAVI2	<i>Panicum virgatum</i>	180–400	–
	eastern gamagrass	TRDA3	<i>Tripsacum dactyloides</i>	180–400	–
3				270–600	
	saltgrass	DISP	<i>Distichlis spicata</i>	270–600	–
4				90–200	
	Canada wildrye	ELCA4	<i>Elymus canadensis</i>	15–33	–
	vine mesquite	PAOB	<i>Panicum obtusum</i>	15–33	–
	composite dropseed	SPCOC2	<i>Sporobolus compositus</i> var. <i>compositus</i>	15–33	–
	white tridens	TRAL2	<i>Tridens albescens</i>	15–33	–
	longspike tridens	TRST2	<i>Tridens strictus</i>	15–33	–
5				180–400	
	dropseed	SPORO	<i>Sporobolus</i>	34–50	–
	pricklypear	OPUNT	<i>Opuntia</i>	10–38	–
	prairie threeawn	AROL	<i>Aristida oligantha</i>	17–25	–
	sideoats grama	BOCU	<i>Bouteloua curtipendula</i>	17–25	–
	blue grama	BOGR2	<i>Bouteloua gracilis</i>	17–25	–
	hairy grama	BOHI2	<i>Bouteloua hirsuta</i>	17–25	–
	Texas grama	BORI	<i>Bouteloua rigidiseta</i>	17–25	–
	silver bluestem	BOSA	<i>Bothriochloa saccharoides</i>	17–25	–

	tumble windmill grass	CHVE2	<i>Chloris verticillata</i>	17-25	-
	gummy lovegrass	ERCU	<i>Eragrostis curtipedicellata</i>	17-25	-
	little barley	HOPU	<i>Hordeum pusillum</i>	17-25	-
	tumblegrass	SCPA	<i>Schedonnardus paniculatus</i>	17-25	-
	Carrizo Creek globemallow	SPOR	<i>Sphaeralcea orcuttii</i>	17-25	-
<b>Forb</b>					
6				180-400	
	narrowleaf rhombopod	CLAN	<i>Cleomella angustifolia</i>	180-400	-
7				72-160	
	common yarrow	ACMI2	<i>Achillea millefolium</i>	9-20	-
	Cuman ragweed	AMPS	<i>Ambrosia psilostachya</i>	9-20	-
	yellowspine thistle	CIOC2	<i>Cirsium ochrocentrum</i>	9-20	-
	Texas croton	CRTE4	<i>Croton texensis</i>	9-20	-
	dotted blazing star	LIPU	<i>Liatris punctata</i>	9-20	-
	littleleaf sensitive-briar	MIMI22	<i>Mimosa microphylla</i>	9-20	-
	white heath aster	SYER	<i>Symphotrichum ericoides</i>	9-20	-
	Baldwin's ironweed	VEBA	<i>Vernonia baldwinii</i>	9-20	-
<b>Shrub/Vine</b>					
8				4-8	
	pricklypear	OPUNT	<i>Opuntia</i>	4-8	-
<b>Tree</b>					
9				16-32	
	willow baccharis	BASA	<i>Baccharis salicina</i>	4-8	-
	black willow	SANI	<i>Salix nigra</i>	4-8	-
	American elm	ULAM	<i>Ulmus americana</i>	4-8	-

## Animal community

Cattle, deer, turkey, quail and various other animals and birds frequent this site. There is grazing plants for cattle, browse for deer, food for quail and birds and cover for all. This site is, however, usually less desirable habitat because of its salinity than the surrounding associated sites. Individual species habitat quality is generally determined by the salinity of the site. There can be a wide variation of desirable habitat present on individual sites for different species. Therefore, Alkali Bottomland animal and bird species habitat quality is site specific .

## Hydrological functions

Surface crusting is common. Medium to high runoff is common. Infiltration to lower profiles is usually very poor, therefore long-term drouth resistance is poor.

## Wood products

Mesquite is cut for cooking (logs) and, occasionally, heating wood. Mesquite is also commercially processed into mesquite chips that are added to charcoal cookers to add mesquite flavor to foods. There are few other, if any, wood products produced on this site.

## Inventory data references

Information presented here has been derived from SCS clipping data done in Jefferson County, Oklahoma in 1959 by Chester Fry, Robert Maples and Phillip Hager, and the field observations of rangeland trained personnel.

## References

. 2021 (Date accessed). USDA PLANTS Database. <http://plants.usda.gov>.

Everitt, B. 1980. Ecology of Saltcedar- A Plea for Research.

Frost, C.C. 1998. Presettlement Fire Frequency Regimes of the United States: A First Approximation. Plant Conservation Program. North Carolina Department of Agriculture and Consumer Services, Raleigh, NC.

## Other references

This site was included in an update project during 2013. A vegetative name was added and PE was dropped. Climate data was also updated and the S&T model was formatted. The concepts and vegetative data contained therein was not altered. The entire ESD will be reviewed, updated, and subjected to the QC/QA processes as part of a future project. CW

## Contributors

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Edits by Colin Walden, Soil Survey Region 9

## Approval

Bryan Christensen, 9/19/2023

## Acknowledgments

Site Development and Testing Plan:

Future work, as described in a Project Plan, to validate the information in this Provisional Ecological Site Description is needed. This will include field activities to collect low, medium and high intensity sampling, soil correlations, and analysis of that data. Annual field reviews should be done by soil scientists and vegetation specialists. A final field review, peer review, quality control, and quality assurance reviews of the ESD will be needed to produce the final document. Annual reviews of the Project Plan are to be conducted by the Ecological Site Technical Team.

## 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)	Mark Moseley, Harry Fritzler, Steve Glasgow, Jack Eckroat
Contact for lead author	
Date	04/01/2005
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

1. **Number and extent of rills:** There are few, if any, rills and there is no active headcutting and sides are covered with vegetation.

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2. **Presence of water flow patterns:** There is some evidence of soil deposition or erosion, particularly after significant rain events, but water generally flows evenly over the entire landscape.

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3. **Number and height of erosional pedestals or terracettes:** There should not be any evidence of erosional pedestals or terracettes on this site.

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4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** These sites are complexes comprised of loamy bottomland soils with slickspots occupying 10-25% of the area. There should generally be <10% bare ground. In the more saline portions, bare ground varies due to sodium content, but may range from 10% to 50%.

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5. **Number of gullies and erosion associated with gullies:** None, drainages are represented as natural stable channels; vegetation is common with no signs of erosion.

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

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7. **Amount of litter movement (describe size and distance expected to travel):** Uniform distribution of litter. Litter rarely moves >6 inches on flatter slopes and may be as much as doubled on steeper slopes, then only during high intensity storms.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Surface soil is moderately stabilized (Stability Score 4 or greater). Stability scores based on a minimum of 6 samples tested.

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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** A horizon 0 to 5 inches; light brown silt loam, dark brown, weak fine platy structure in the upper part, massive in lower part. Btn horizon: 5 to 12 inches; reddish brown silt clay loam, dark reddish brown, moderate coarse prismatic structure.  
  
Refer to specific description for component sampled.

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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Infiltration and runoff are not affected by any changes in plant community composition and distribution. (Midgrass dominated). Any changes in infiltration and runoff can be attributed to other factors (e.g. compaction).

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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** There is usually no compaction layer within the surface soil, but a compaction layer can occur in the subsoil, which can have an impact on water movement, root penetration and plant growth.
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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: Midgrasses, Tallgrasses
- Sub-dominant: Shortgrasses, Forbs
- Other: Shrubs, Annuals
- Additional:
- 
13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** There is some plant mortality and decadence on the perennial grasses, especially in the absence of fire and herbivory, but usually <5%.
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14. **Average percent litter cover (%) and depth ( in):** Litter should cover 50 - 75% of the area between plants with accumulations of .25 - 1 inch deep.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** Normal production is 1800 – 4000 pounds per year.
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16. **Potential invasive (including noxious) species (native and non-native). List species which BOTH characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is NOT expected in the reference state for the ecological site:** No invasive species. Invasives might include: mesquite, salt cedar, annuals and non-natives.
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17. **Perennial plant reproductive capability:** All plants capable of reproducing at least every 3 years. Seed stalks, stalk length, and seedheads are numerous and what would be expected. Overall health of plants is what would be expected.
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