Ecological site R150AY537TX
Lowland

Last updated: 9/22/2023
Accessed: 04/29/2024

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): 150A–Gulf Coast Prairies

MLRA 150A is in the West Gulf Coastal Plain Section of the Coastal Plain Province of the Atlantic Plain in Texas (83 percent) and Louisiana (17 percent). It makes up about 16,365 square miles (42,410 square kilometers). It is characterized by nearly level plains that have low local relief and are dissected by rivers and streams that flow toward the Gulf of Mexico. Elevation ranges from sea level to about 165 feet (0 to 50 meters) along the interior margin. It includes the towns of Crowley, Eunice, and Lake Charles, Louisiana, and Beaumont, Houston, Bay City, Victoria, Corpus Christi, Robstown, and Kingsville, Texas. Interstates 10 and 45 are in the northeastern part of the area, and Interstate 37 is in the southwestern part. U.S. Highways 90 and 190 are in the eastern part, in Louisiana. U.S. Highway 77 passes through Kingsville, Texas. The Attwater Prairie Chicken National Wildlife Refuge and the Fannin Battleground State Historic Site are in the part of the area in Texas.

Classification relationships

USDA-Natural Resources Conservation Service, 2006.
-Major Land Resource Area (MLRA) 150A

Ecological site concept

As named, the Lowland ecological site occurs on the lowest part of the landscape. It receives excess water from surround landforms and may stay wet for extended periods throughout the year. This site is not similar in soils, landscape positions or vegetation to any other sites in MLRA 150A.

Associated sites

R150AY526TX	**Southern Blackland** The Southern Blackland ecological site shows an intact grass community with small clumped dispersal of woody species. The soils are very deep, richly black in color, and characterized by their shrink-swell nature. The sites are widely distributed across the uplands and terraces throughout the region. This site has a heavier surface texture and is higher in the landscape.
R150AY741TX	**Northern Loamy Prairie** The Northern Loamy Prairie is characterized by very deep loamy soils occurring on uplands. The site is correlated to areas with mean annual rainfall from 48 to 57 inches. They are vegetatively productive and provide good grazing for livestock. This site has similar surface textures but not in a depressional landform.
R150AY740TX	**Northern Blackland** The Northern Blackland ecological site shows an intact grass community with small clumped dispersal of woody species. The soils are very deep, richly black in color, and characterized by their shrink-swell nature. The sites are widely distributed across the uplands and terraces throughout the region. The site is correlated to areas with mean annual rainfall that ranges from 41 to 57 inches.
R150AY639TX	**Clay Loam** The Clay Loam ecological site has very deep clay loam soils and has high vegetative production.
R150AY535TX	**Southern Loamy Prairie** The Southern Loamy Prairie is characterized by very deep loamy soils occurring on uplands. They are vegetatively productive and provide good grazing for livestock. This site has similar surface textures but not in a depressional landform.

Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	(1) *Panicum virgatum* (2) *Panicum hemitomon*

Physiographic features

The site was formed in loamy fluviomarine deposits of the Beaumont and Lissie Formation from the Pleistocene age. These soils are in relic stream meander depressions on the coastal prairie. Landform shapes are round, oval, or linear depressions 6 to 18 inches deep. Slope is usually less than 0.5 percent but range up to 1 percent. Elevation is 10 to 250 feet.

Table 2. Representative physiographic features

Landforms	(1) Coastal plain > Depression (2) Coastal plain > Flat (3) Coastal plain > Meandering channel
Runoff class	Negligible to high
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to occasional
Ponding duration	Brief (2 to 7 days) to very long (more than 30 days)
Ponding frequency	Occasional to frequent
Elevation	3–76 m
Slope	0–1%

Ponding depth	0–46 cm
Water table depth	152 cm
Aspect	Aspect is not a significant factor

Climatic features

The climate of MLRA 150A is humid subtropical with mild winters. The average annual precipitation in the northern two-thirds of this area is 45 to 63 inches. It is 28 inches at the extreme southern tip of the area and 30 to 45 inches in the southwestern third of the area. The precipitation is fairly evenly distributed, but it is slightly higher in late summer and midsummer in the western part of the area and slightly higher in winter in the eastern part. Rainfall typically occurs as moderate intensity, tropical storms that produce large amounts of rain during the winter. The average annual temperature is 66 to 72 degrees F. The freeze-free period averages 325 days and ranges from 290 to 365 days, increasing in length to the southwest.

Table 3. Representative climatic features

Frost-free period (characteristic range)	234-255 days
Freeze-free period (characteristic range)	273-365 days
Precipitation total (characteristic range)	1,143-1,524 mm
Frost-free period (actual range)	225-266 days
Freeze-free period (actual range)	223-365 days
Precipitation total (actual range)	1,067-1,549 mm
Frost-free period (average)	244 days
Freeze-free period (average)	324 days
Precipitation total (average)	1,321 mm

Climate stations used

- (1) VICTORIA FIRE DEPT #5 [USC00419361], Victoria, TX
- (2) PORT LAVACA [USC00417183], Port Lavaca, TX
- (3) BAY CITY WTR WKS [USC00410569], Bay City, TX
- (4) DANEVANG 1 W [USC00412266], El Campo, TX
- (5) EL CAMPO [USC00412786], El Campo, TX
- (6) NEW GULF [USC00416286], Boling, TX
- (7) COLUMBUS [USC00411911], Columbus, TX
- (8) SEALY [USC00418160], Sealy, TX
- (9) HOUSTON CLOVER FLD [USW00012975], Pearland, TX
- (10) HOUSTON HOOKS MEM AP [USW00053910], Tomball, TX
- (11) HOUSTON SAN JACINTO DA [USC00414328], Houston, TX
- (12) ANAHUAC [USC00410235], Anahuac, TX
- (13) BEAUMONT CITY [USC00410611], Vidor, TX
- (14) PORT ARTHUR SE TX AP [USW00012917], Port Arthur, TX
- (15) LAKE CHARLES [USW00003937], Lake Charles, LA
- (16) JENNINGS [USC00164700], Jennings, LA
- (17) EUNICE [USC00162981], Eunice, LA
- (18) CROWLEY 2 NE [USC00162212], Crowley, LA

Influencing water features

These soils receive water from surrounding soils and are ponded for periods of several days to more than a month in duration. The ponding commonly occurs during the winter and spring in most years. These sites may be wetlands, but onsite delineations are required to determine official status.

Wetland description

This site has hydric soils. Onsite investigation is necessary to determine exact local conditions.

Soil features

The site consists of very deep, poorly drained, very slowly permeable soils. The soil profile characteristically consists of an ochric horizon and then an argillic horizon. The ochric can measure 3 to 20 inches thick with an average of 10 inches. Crayfish krotovinas are found within the upper 60 inches. Surface horizon reaction ranges from strongly acid to neutral. Soil correlated to this site include: Aris, Cieno, Clodine, Gessner, Leton, Prairieland, Rexville, and Tomball.

Table 4. Representative soil features

Parent material	(1) Fluviomarine deposits–igneous, metamorphic and sedimentary rock
Surface texture	(1) Silt loam (2) Loam (3) Fine sandy loam
Family particle size	(1) Fine-silty (2) Fine-loamy
Drainage class	Somewhat poorly drained to poorly drained
Permeability class	Moderately slow to very slow
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-152.4cm)	17.78–35.56 cm
Calcium carbonate equivalent (0-152.4cm)	0–5%
Electrical conductivity (0-152.4cm)	0–2 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0–2
Soil reaction (1:1 water) (0-101.6cm)	4.5–7.3
Subsurface fragment volume <=3" (0-152.4cm)	0%
Subsurface fragment volume >3" (0-152.4cm)	0%

Ecological dynamics

The Coastal Prairie was historically described as being covered by tall and coarse grasses. The land was noted as a level prairie with open grasslands by travelers in the 1800's. The Lowland site is distinct from surrounding prairie because of its wetness. However, it developed as part of the mid/tallgrass complex on the coastal prairie. The reference community is a mid/tallgrass/sedge-dominated grassland, heavily influenced by fluctuating water regimes, as well as grazing and fire. During wet cycles, more wet-tolerant species dominate, while during dry cycles species adapted to drier conditions dominate.

The tallgrass species common throughout the site are switchgrass (*Panicum virgatum*), eastern gamagrass (*Tripsacum dactyloides*), maidencane (*Panicum hemitomon*), giant cutgrass (*Zizaniopsis miliacea*), and Florida paspalum (*Paspalum floridanum*). Midgrasses, flat sedges, and sedges are important species, making up as much as 50 percent of herbaceous production during wet cycles. These include longtom paspalum (*Paspalum denticulatum*), knotroot bristlegrass (*Setaria parviflora*), green flatsedge (*Cyperus virens*), jointed flatsedge

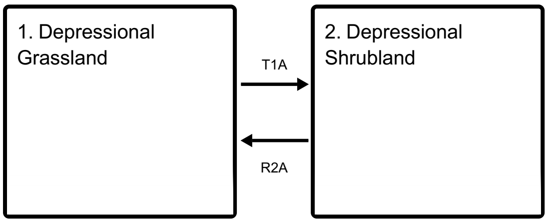
(*Cyperus articulatus*), and spikerush (Eleocharis spp.). Perennial forbs such as bundleflower (Desmanthus spp.) and button snakeroot (Liatris spp.) are a minor component of the vegetation. Annual forbs like sumpweed (Iva spp.) and ragweed (Ambrosia spp.) are seasonally abundant in response to drought-cycles. During wet cycles, species like arrowhead (*Sagittaria longiloba*), water clover (*Marsilea macropoda*), dock (Rumex spp.) and other wet-tolerant forbs become more prevalent.

The introduction of domestic livestock and subsequent heavy grazing reduces the preferred tallgrass component allowing midgrasses and sedges to dominate. The midgrass community may be dominated by longtom paspalum. The Lowland site is preferred by cattle over adjacent upland areas and tends to be heavily used. Heavy forage removal also removes fuel for fire. This reduces the incidence and intensity of wildfire allowing more change in the vegetative composition. Continued heavy grazing and reduction of fire over time remove the tall and midgrass components. A shortgrass/forb/woody plant community develops. Invasive exotic grasses such as smutgrass (Sporobulus indicus), bahiagrass (*Paspalum notatum*), and common bermudagrass (*Cynodon dactylon*) are likely occupants of this community. A few woody species like sennabean (*Sesbania drummondii*), mesquite (*Prosopis glandulosa*), huisache (*Acacia farnesiana*), baccharis (Baccharis spp.), wax myrtle (Myrica cerifera.), and Chinese tallow tree (Sapium sebiferum) make up a substantial part of annual production.

Grassland community trends may be reversed through prescribed grazing and the judicious use of fire. Since the site is preferred by cattle, prescribed grazing is necessary to protect the site and rest the grasses from overuse. Once the grassland to brushland threshold is crossed, a combination of practices will be necessary to restore the grassland state. Brush management and seeding are possibilities. Animal impact can cause compaction layers to develop disrupting the water cycle so ripping, aerating, and disking may also be necessary to repair the system. Combining these with prescribed grazing and fire are necessary for restoration processes to proceed.

State and transition model

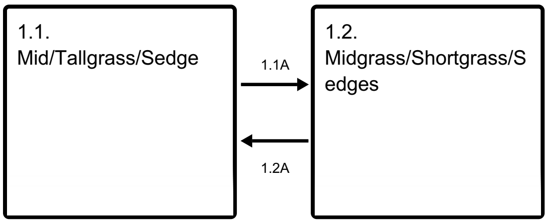
Ecosystem states



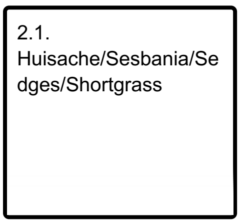
T1A - Absence of disturbance and natural regeneration over time

R2A - Reintroduction of fire and regular disturbance return intervals

State 1 submodel, plant communities



State 2 submodel, plant communities



State 1
Depressional Grassland

Dominant plant species

- panicgrass (*Panicum*), grass

Community 1.1
Mid/Tallgrass/Sedge

This site is interspersed within the upland prairie sites on the Coastal Prairie. It is part of the tall/midgrass prairie complex that developed under intermittent grazing by bison and frequent winter and summer fires. The potential plant community on the site is a wet prairie dominated by tall and midgrasses. However, it varies between wet and dry cycles. During dry periods, tallgrasses such as switchgrass, eastern gamagrass, maidencane, and Florida paspalum can make up as much as 50 percent of the total herbaceous vegetation with the remainder composed of various mid and shortgrass species. During wet cycles, the tallgrasses decrease except around the edges of the site, while longtom paspalum, sedges, and knotroot bristlegrass dominate. Maidencane and giant cutgrass can be common, depending on the depth of the depression. Forbs are a small component, but annual forbs may be seasonally abundant in response to drought sequences. Abusive grazing by domestic livestock removes the tallgrass components, reduces fire and allows species such as longtom paspalum to increase. Woody plants are absent in the reference community.

Table 5. Annual production by plant type

Plant Type	Low (Kg/Hectare)	Representative Value (Kg/Hectare)	High (Kg/Hectare)
Grass/Grasslike	5548	6809	8070
Forb	616	785	897
Shrub/Vine	–	–	–
Tree	–	–	–
Total	**6164**	**7594**	**8967**

Figure 9. Plant community growth curve (percent production by month). TX7611, Mid/Tallgrass/Sedge Community. Warm-season midgrasses, tallgrasses, and sedges occupy the plant community..

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2	2	6	10	18	18	3	6	15	10	6	4

Community 1.2
Midgrass/Shortgrass/Sedges

Abusive grazing removes the tallgrass component from the reference community driving a shift to mid and shortgrasses. Once again, wet and dry cycles play a major role in which plant community dominates the site. During wet cycles, longtom paspalum, giant cutgrass, or maidencane becomes the dominant midgrass as sedges and knotroot bristlegrass increase. During prolonged dry periods in the southwestern range of the site, the plant community changes with a reduction in longtom paspalum and increasing numbers of flatsedge, spikerush, low panicums, paspalums, brownseed paspalum, broomsedge (*Andropogon virginicus*), bushy bluestem (*Andropogon glomeratus*), and longspike tridens (*Tridens strictus*). Removal of herbage by grazing shifts the composition to less productive grasses. Cessation of fire, combined with drought, followed by wet sequences encourages the invasion of forbs. Increases in forb composition further weaken the grass components driving further site change. Community dynamics can be reversed and close to reference community vegetation restored by prescribed grazing and fire if a seed source is still present. Fencing may be required to properly graze.

Pathway 1.1A
Community 1.1 to 1.2

Abusive grazing and lack of fire will cause the community to shift to 1.2.

Pathway 1.2A
Community 1.2 to 1.1

Prescribed grazing and the return of fire will transition the community back to 1.1.

State 2
Depressional Shrubland

Dominant plant species

- sweet acacia (*Acacia farnesiana*), shrub
- baccharis (*Baccharis*), shrub

Community 2.1
Huisache/Sesbania/Sedges/Shortgrass

As the mid and shortgrass community deteriorates the site is occupied by needlegrass rush (*Juncus roemerianus*) and common carpetgrass (Axonopus affinis). Introduced species that often invade include vaseygrass (Paspalum urville), smutgrass (Sporobulus indicus), and torpedograss (*Panicum repens*). Seasonal aspects of cool-season annual grasses such as canary grass (Phalaris spp.) and aquatic forbs occur. Grass cover is usually lacking with large amounts of exposed soil surface. Hardpans and compaction layers are generally present. Woody plants like sennabean, baccharis, wax myrtle, and Chinese tallow tree will invade as conditions allow. Scattered huisache (Acacia smallii) trees may be present. The current range of huisache is west of Houston. Restoration of this site will generally require brush and weed management practices. Prescribed grazing and rest are necessary. Seeding may also be required if a natural seed source is not available. Once adequate fuel has accumulated, prescribed fire should be used.

Transition T1A
State 1 to 2

Continued heavy grazing, lack of fire, and no brush management will transition the reference state to State 2.

Restoration pathway R2A
State 2 to 1

Prescribed grazing, brush management, and return of fire can restore State 2 back to the reference state.

Additional community tables

Table 6. Community 1.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Kg/Hectare)	Foliar Cover (%)
Grass/Grasslike					
0	**Midgrass**			2466–3587	
1	**Tallgrasses**			3391–4932	
	switchgrass	PAVI2	*Panicum virgatum*	1726–2511	–
	eastern gamagrass	TRDA3	*Tripsacum dactyloides*	1726–2511	–
	giant cutgrass	ZIMI	*Zizaniopsis miliacea*	1726–2511	–
	Florida paspalum	PAFL4	*Paspalum floridanum*	897–1681	–
	maidencane	PAHE2	*Panicum hemitomon*	897–1681	–
2	**Grass/Grasslikes**			616–897	
	sedge	CAREX	*Carex*	0–560	–
	jointed flatsedge	CYAR4	*Cyperus articulatus*	0–560	–
	green flatsedge	CYVI2	*Cyperus virens*	0–560	–
	spikerush	ELEOC	*Eleocharis*	0–560	–
	marsh bristlegrass	SEPA10	*Setaria parviflora*	0–560	–

	gaping grass	STHI3	*Steinchisma hians*	0–560	–
3	**Midgrasses**			308–448	
	bushy bluestem	ANGL2	*Andropogon glomeratus*	0–280	–
	broomsedge bluestem	ANVI2	*Andropogon virginicus*	0–280	–
	brownseed paspalum	PAPL3	*Paspalum plicatulum*	112–280	–
	longspike tridens	TRST2	*Tridens strictus*	112–280	–
4	**Midgrasses**			308–448	
	panicgrass	PANIC	*Panicum*	168–336	–
	crowngrass	PASPA2	*Paspalum*	168–336	–
Forb					
5	**Forbs**			308–448	
	spiny chloracantha	CHSP11	*Chloracantha spinosa*	168–336	–
	southern annual saltmarsh aster	SYDI2	*Symphyotrichum divaricatum*	168–336	–
6	**Forbs**			370–538	
	Cuman ragweed	AMPS	*Ambrosia psilostachya*	56–112	–
	bundleflower	DESMA	*Desmanthus*	56–112	–
	button eryngo	ERYU	*Eryngium yuccifolium*	56–112	–
	blue mudplantain	HELI2	*Heteranthera limosa*	56–112	–
	bigfoot waterclover	MAMA9	*Marsilea macropoda*	56–112	–
	yellow puff	NELU2	*Neptunia lutea*	56–112	–
	Pennsylvania smartweed	POPE2	*Polygonum pensylvanicum*	56–112	–
	dock	RUMEX	*Rumex*	56–112	–
	violet wild petunia	RUNU	*Ruellia nudiflora*	56–112	–
	longbarb arrowhead	SALO2	*Sagittaria longiloba*	56–112	–
7	**Forbs**			62–90	
	prairie broomweed	AMDR	*Amphiachyris dracunculoides*	28–56	–
	sneezeweed	HEAM	*Helenium amarum*	28–56	–
	annual marsh elder	IVAN2	*Iva annua*	28–56	–

Animal community

The Coastal Prairie communities support a wide array of animals. Cattle and many species of wildlife make extensive use of the site. White-tailed deer may be found scattered across the prairie and are found in heavier concentrations where woody cover exists. Feral hogs are present and at times abundant. Coyotes are abundant and fill the mammalian predator niche. Rodent populations rise during drier periods and fall during periods of inundation. Attwater's pocket gophers are abundant and have an important impact on the ecology of the site. The badger is present but not abundant in locations at the southern extent of the site. Locally unique species alligators and bullfrogs.

The region is a major flyway for waterfowl and migrating birds. Hundreds of thousands of ducks, geese, and sandhill cranes abound during winter. Two important endangered species occur in the area, the whooping crane and Attwater's prairie chicken. Many other species of avian predators including northern harriers, ferruginous hawks, red-tailed hawks, white-tailed kites, kestrels, and, occasionally, swallow-tailed kites utilize the vast grasslands. Many species of grassland birds use the site, including blue grosbeaks, dickcissels, eastern meadowlarks, several sparrows, including, vesper sparrow, lark sparrow, savannah sparrow, grasshopper sparrow, and Le Conte's sparrow.

Hydrological functions

This site is part of the extensive wetland systems of the Gulf Coast Prairie which functions in both flood control and aquifer recharge. These sites, when dry, serve as reservoirs to capture excessive precipitation during high-intensity rainfall events. When in pristine condition this site is important in aquifer recharge. In impaired condition (low organic matter, compaction layers, etc.) the site loses more water through evaporation and transpiration than it delivers to aquifer recharge.

Recreational uses

This site is frequently used for hunting ducks and geese during wet cycles in winter months. The site is also extensively used for bird watching.

Inventory data references

Information presented here has been derived from former range site descriptions for Lowland and Lakebed Sites and from the current draft of the Lakebed Ecological Site Description. Field visits were done in Victoria, Refugio, Jefferson, Chambers, Harris, Waller, and San Patricio Counties. Personal contacts and communications with range-trained personnel were used extensively.

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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)	Mike Stellbauer, Zone RMS, NRCS, Bryan, TX
Contact for lead author	
Date	06/08/2004
Approved by	Bryan Christensen
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:** None.

2. **Presence of water flow patterns:** Water flow patterns should not be evident on this depressional site.

3. **Number and height of erosional pedestals or terracettes:** None.

4. **Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** Less than 15 percent bare ground randomly distributed throughout.

5. **Number of gullies and erosion associated with gullies:** None.

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

7. **Amount of litter movement (describe size and distance expected to travel):** Little litter movement can be expected.

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** Soil surface is resistant to erosion. Stability class range is expected to be 5 to 6.

9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** Soil surface structure is about 8 inches thick with dark grayish brown clay loam subangular blocky structure. SOM is 1 to 4 percent.

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** Little effect in this depressional landscape position.

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 tallgrasses/grass-likes

    Sub-dominant: Forbs

    Other: Cool-season grasses/grass-likes

    Additional:

13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** Some plant mortality can be expected for perennial warm-season grasses (FACU, UP) or perennial warm-season forbs (FAC, FW, OB) depending on the length of ponding during the growing season.

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14. **Average percent litter cover (%) and depth (in):**

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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** 4,000 pounds per acre for below average moisture years to 7,000 pounds per acre for above average moisture years.

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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:** Potential invasive species include bahiagrass, bermudagrass, and Chinese tallow tree.

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17. **Perennial plant reproductive capability:** All perennial plants should be capable of reproducing, except for periods of prolonged drought conditions, heavy herbivory, or intense wildfires.
