

Ecological site F134XY306LA West Central Well Drained Loamy Ridge - PROVISIONAL

Accessed: 05/11/2025

General information

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

MLRA notes

Major Land Resource Area (MLRA): 134X–Southern Mississippi Valley Loess

MLRA 134, Southern Mississippi Valley Loess, is in Mississippi (39 percent), Tennessee (23 percent), Louisiana (15 percent), Arkansas (11 percent), Kentucky (9 percent), Missouri (2 percent), and Illinois (1 percent). It makes up about 26,520 square miles (68,715 square kilometers). The northern part of the area includes Paducah and Murray, Kentucky; Paragould, Jonesboro, and Forrest City, Arkansas; and Memphis, Dyersburg, Bartlett, and Germantown, Tennessee. The southern part includes Yazoo City, Clinton, and Jackson, Mississippi, and Baton Rouge, Opelousas, Lafayette, and New Iberia, Louisiana. This portion is the central western part of the MLRA in Louisiana and Arkansas. It is in the Macon Ridge Section of the EPA Ecoregions in sub-section 73j. The dissected plains in this MLRA have a loess mantle that is thick at the valley wall and thins rapidly as distance from the valley wall increases. This portion of the MLRA is distinct from other portions of the MLRA because of the influences of the Mississippi River and its series of entrenchments and adjacent old channels of the Arkansas River, such channels as Bayou Bartholomew, Bayou Bonne Idee, Boeuf River, and segments of the Ouachita River. The Macon Ridge has been inhabited prior to European Settlement, Poverty Point is located on the east central portion of the Macon Ridge and has earthworks dating back to 1700-1100 BC.

Classification relationships

Major Land Resource Area (MLRA) and Land Resource Unit (LRU) (USDA-Natural Resources Conservation Service, 2006)

The Natural Communities of Louisiana - (Louisiana Natural Heritage Program - Louisiana Department of Wildlife and Fisheries)

EPA Level IV Ecoregion

Ecological site concept

Very deep, well drained, moderately permeable soils that formed in loamy sediments on stream braid bars within the Macon Ridge Loess with little to no loess influence. These sites are found on long narrow slight rises on terraces where thin loess deposits are mixed throughout with loamy underlying braided stream material. Slopes are 5% or less. Soils limitations could include high exchangeable Al (Aluminum). This soil chemistry limitation is significant because, Aluminum (Al) toxicity limits production on strongly acidic soils, pH values at or below 5, toxic forms of Al solubilized into the soil solution, inhibiting root growth and function (Kochian, 2005). Common species on this site are Cherrybark oak, Loblolly pine, Pecan, Eastern Cottonwood and Sweetgum.

Associated sites

F134XY304LA	West Central Somewhat Poorly Drained Flats - PROVISIONAL The Somewhat Poorly Drained Flats sites will be at a lower level on the landscape.
F134XY305LA	West Central Somewhat Poorly Drained Loess Terrace - PROVISIONAL The Somewhat Poorly Drained Loess Terrace sites will be at a lower level on the landscape.

F134XY307LA	West Central Loess Ridge - PROVISIONAL The Loess Ridge site will be found at a higher landscape position.
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Similar sites

F134XY307LA	West Central Loess Ridge - PROVISIONAL The West Central Loess Ridge is found at higher landscape position.
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Table 1. Dominant plant species

Tree	Not specified
Shrub	Not specified
Herbaceous	Not specified

Physiographic features

Macon Ridge in extreme northeastern Louisiana and southeastern Arkansas is a 135-mile long prominent ridge that lies between the Boeuf and Tensas Basins (Saucier, 1994). Macon Ridge is a terrace that features level to gently undulating topography with steep scarps of uplands, floodplains, depressions, and drainageways. The entire area is located within the Mississippi Alluvial Valley section of the Coastal Plain Province of the Atlantic Plain. It reaches a maximum width of about 25 miles in northeastern Louisiana about 30 miles north of Sicily Island (Saucier, 1994). Elevation ranges from 50 to 150 feet (15 to 46 m). The ridge is consistently higher on its eastern side where elevations are 20 to 30 feet higher than in the adjacent Tensas Basin (floodplain). It is bounded on the eastern edge by Bayou Macon. On the western side, bounded by the Boeuf River, elevations of the ridge are approximately the same as those in the Boeuf Basin, and it is sometimes difficult to distinguish the two at the surface (Saucier, 1994). Both Bayou Macon and Boeuf River are underfit streams occupying ancient Arkansas River meanders. The entire Macon Ridge is underlain by Pleistocene-aged loamy and clayey braided stream alluvium from the “old” Arkansas River. Macon Ridge consists almost entirely of Early Wisconsin age glacial outwash and is a continuation of the valley train in the Western Lowlands (Saucier, 1994). The area mantled by loess on the eastern edge of the terrace rises 10 to 30 feet above the floodplains. The loess thins toward the west, and elevation decreases. The loess in the western part of Macon Ridge contains small mixtures of the older underlying braided-stream terrace alluvium, and in even lower elevations, the loess contains mixtures of recent clayey alluvium or is buried completely beneath recent alluvium (Allen, 1993).

This PES occurs on silty and loamy elongated, narrow convex ridges on nearly level to gently sloping stream terraces on the loess-mantled Macon Ridge in Louisiana. Slopes are nearly level to gently sloping (0 to 5 percent). These sites include ridges of stream terraces of the Boeuf River and other former channels and distributaries of the Arkansas River such as: Big and Little Colewa Creeks, Big Creek, Bee Bayou, Turkey Creek, Muddy Bayou, and Pine Bayou.

Table 2. Representative physiographic features

Landforms	(1) Ridge (2) Terrace
Flooding frequency	None
Ponding frequency	None
Elevation	60–100 ft
Slope	0–5%
Ponding depth	0 in
Water table depth	72 in
Aspect	Aspect is not a significant factor

Climatic features

The climate of North East Louisiana and South East Arkansas is warm and humid with a monthly precipitation that is well distributed throughout the year. The monthly precipitation mean is between 2.9 and 5.3 inches, with the lowest rainfall occurring from June through November. The following climatic data are averages from the three weather stations listed below. Temperature and precipitation may vary considerably from that listed for each month. Site specific weather data should be used for land management decisions. For site specific weather conditions, obtain data from a weather station close to the site.

Table 3. Representative climatic features

Frost-free period (average)	227 days
Freeze-free period (average)	263 days
Precipitation total (average)	59 in

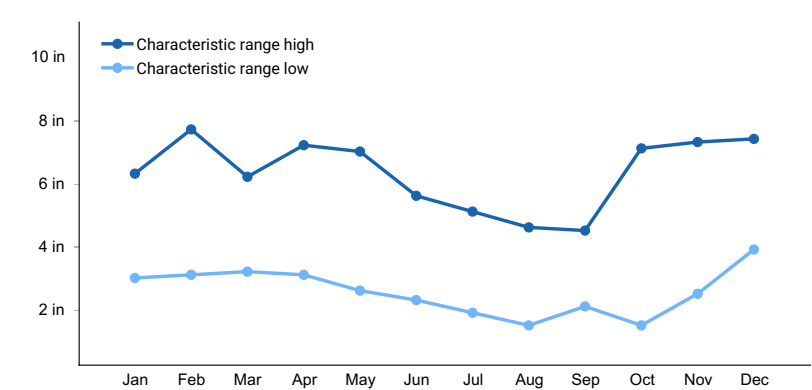


Figure 1. Monthly precipitation range

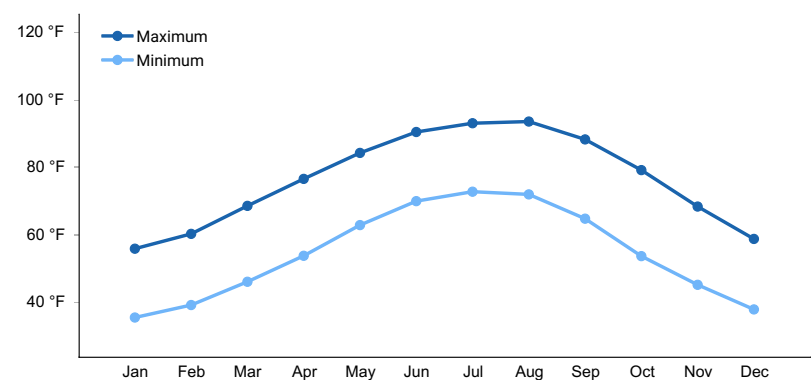


Figure 2. Monthly average minimum and maximum temperature

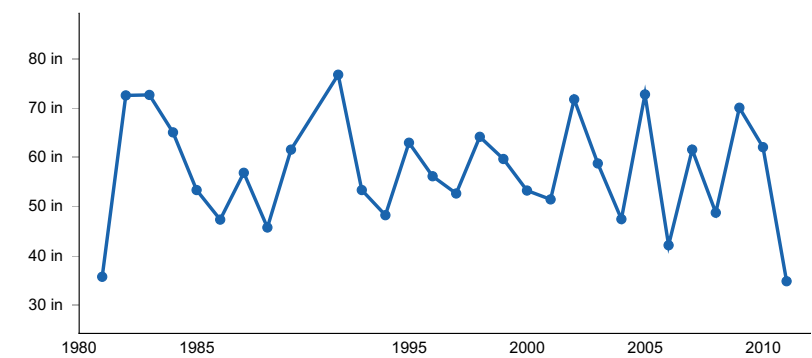


Figure 3. Annual precipitation pattern

Climate stations used

- (1) WINNSBORO 5 SSE [USC00169806], Winnsboro, LA
- (2) EUDORA [USC00032355], Eudora, AR

- (3) RAYVILLE [USC00167691], Rayville, LA

Influencing water features

This site is well drained, sheds runoff and the soils are moderately permeable. There is limited amounts of water that influence the site other than the rainfall that is intercepted and allowed to percolate into the soil profile.

Soil features

Soils are well drained, Ultic Hapludalfs (Dexter and Liddieville). These soils formed from mixed loess and loamy and sandy sediments of late Pleistocene Age. Slopes range from 0 to 5 percent. These very deep, moderately permeable soils are found on elongated, narrow convex ridges on nearly level to gently sloping uplands and stream terraces. These soils are not considered hydric and have a water table deeper than 6 feet. These soils are not subject to flooding.

Table 4. Representative soil features

Surface texture	(1) Silt loam
Family particle size	(1) Loamy
Drainage class	Well drained
Permeability class	Moderate
Soil depth	60–80 in
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-40in)	0.08–0.24 in
Electrical conductivity (0-40in)	0 mmhos/cm
Sodium adsorption ratio (0-40in)	0
Soil reaction (1:1 water) (0-40in)	4.5–7.3
Subsurface fragment volume <=3" (Depth not specified)	0%
Subsurface fragment volume >3" (Depth not specified)	0%

Ecological dynamics

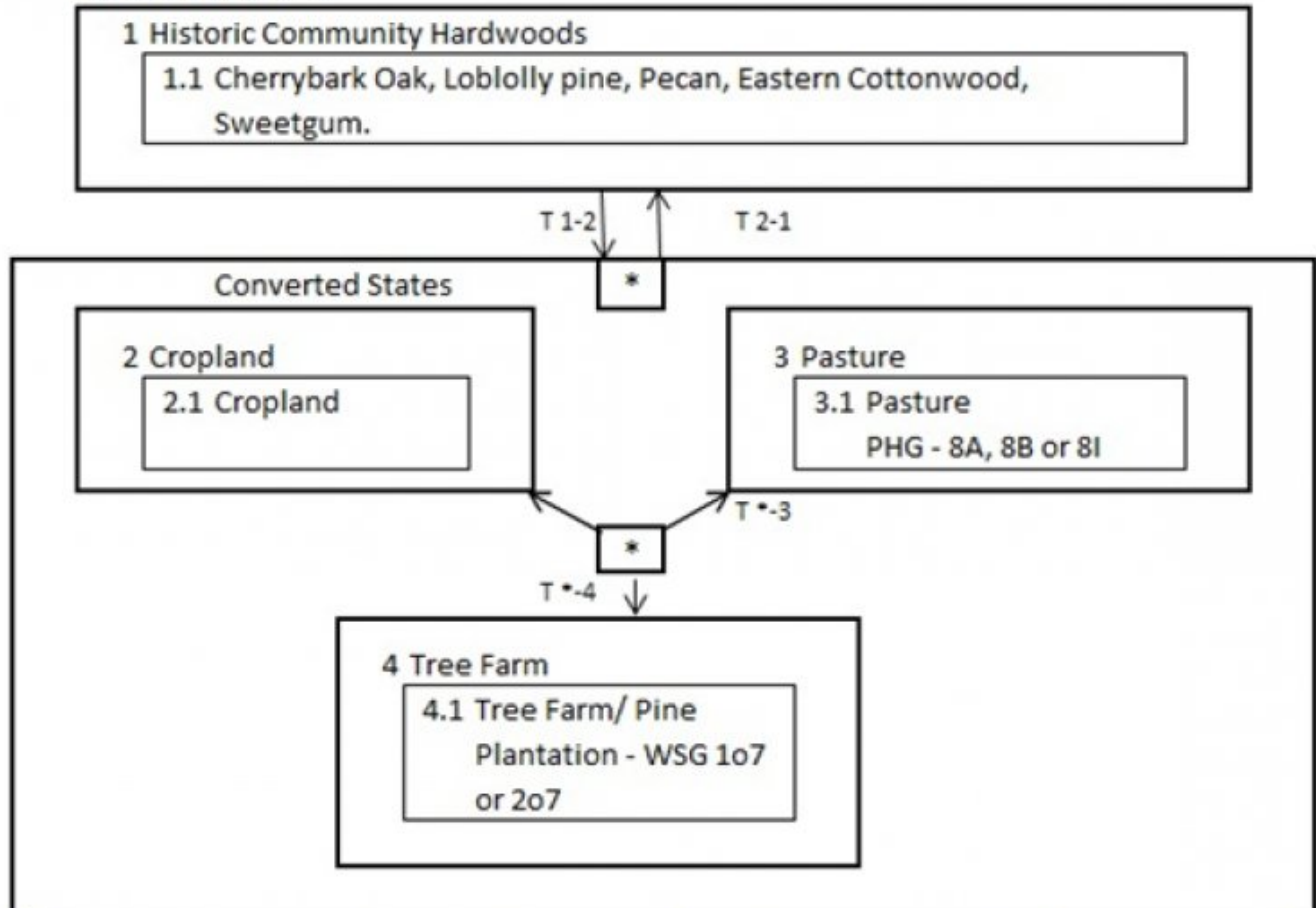
The pre settlement plant community of this site would have been dominated by hardwood species. Some trees can be uprooted by climatic events, such as strong winds or floods. With these events, openings in the canopy can occur which will set back succession and allow herbaceous and woody shrub species to colonize, these low stature communities are generally short lived and the upper canopy will close as tall growing trees mature. There is generally an age gradient within a forest stand from the herbaceous openings to mature hardwoods.

This site has been altered by human activity and is utilized for multiple production systems such Cropland, Pasture and Tree Farms. Within the alternative uses of the site the transitions will be very similar and require the input of resources such as installation of infrastructure needs and establishment of the desired species.

This PES occurs on Well drained ridges in braided stream terraces of the Loess Plain. Located on the Macon Ridge in Louisiana and Arkansas.

State and transition model

STM - 134XY306



*To reduce clutter and confusion, additional arrowed transitions from and to State 1 are not pictured. Transitions are possible to and from this states as depicted by the transition arrows, consider the starred box every other converted state and transistions will be explained in detail in the appropriate state/community sections.

Diagram Legend

T 1-2	Clear and established the desired Community
T 2-1	Replant to historic community.
T *-2	Establish and manage crop rotation.
T *-3	Establish desired forage species and manage for grazing.
T *-4	Plant or regenerate desired tree species.

Figure 5. 134XY306 West Central Well Drained Loamy Ridge PES

State 1 Historic Community - Hardwoods

Historically hardwoods Cherrybark Oak, Loblolly Pine, Pecan, Eastern Cottonwood and Sweetgum.

Community 1.1 Hardwood

Cherrybark Oak, Loblolly Pine, Pecan, Eastern Cottonwood and Sweetgum.

State 2

Cropland

Cropland

Community 2.1
Cropland

Row Crop Production

State 3
Pastureland

Managed Pasture - PHG 8A, 8B or 8I

Community 3.1
Pasture

Pasture or Grassland This phase is characterized by a monoculture of or mixture of Forage species planted or allowed to establish from naturalized species, managed for forage production or as herbaceous ground cover. This Site fits into multiple Pasture & Hayland Groups: 8A, 8B or 8I • 8-Upland, deep, medium-textured soil • A – soils having few limitations for the growth of the commonly grown plants except for slope • B – low available water capacity, usually sandy and have deep rooting depths From these bullet descriptions of the Groups this site would generally be described as a Deep, Medium textured soil on Uplands and has a range of limiting factors from few limitations to low water holding capacity. 8A - Deep, poorly drained, clayey bottomland soils with clayey surface layers. Natural fertility is medium to high. 8B - Loamy soils of the uplands and stream terraces. Well drained and moderately well drained, acid and have loamy surface layers and loamy subsoils. Available water capacity is high or moderate. 8I - Upland and terrace soils with silty surface layers and subsoils. Poorly drained and somewhat poorly drained, droughty, alkaline soils that have a concentration of sodium in the subsoil. Natural fertility is low or medium. 0-3% slopes. Most slopes are 0-1%. All soils need nitrogen fertilization for production when grasses are grown alone. To prevent extreme acidity in the subsoil when high rates of acidifying nitrogen is used, the surface soil should not be allowed to become more acid than 5.0 pH and lime should be applied at more frequent intervals. Adapted Grasses and Legumes 8A - Bahia, common and hybrid bermuda are the better adapted warm season perennials. Ball, arrowleaf, and crimson are good cool season legumes to use. Take cattle off legumes as they begin to seed and graze grass close in fall so that the legumes can germinate. Without fertilization these soils will normally support a cover of pinehill bluestem, slender bluestem, threeawns, broomsedge, carpet and bermudagrass. Periodic brush control is needed to keep pasture from reverting to woodland. 8B - These soils have a moderate productive potential for bahia, common bermuda, hybrid bermuda, ball clover, crimson clover, and Arrowleaf clover. In grass-legume mixtures, graze the grass close in early fall to allow the legume to germinate. Remove cattle when legumes begin to mature and allow the legumes to reseed. Without fertilization, these soils will normally support Pinehill bluestem, slender bluestem, threeawns, broomsedge, carpet and common bermudagrass. 8I - Bahia and common bermuda are adapted. The adapted cool season legumes are white clover, winter peas, and vetch. White clover requires a higher level of calcium and phosphorus than peas or vetch. Tall fescue does well on these soils if good management is applied. Fescue should not be grazed in the summer. Without fertilization, these soils will normally support a cover of little bluestem, slender bluestem, threeawns, broomsedge and carpetgrass.

Table 5. Annual production by plant type

Plant Type	Low (Lb/Acre)	Representative Value (Lb/Acre)	High (Lb/Acre)
Grass/Grasslike	2600	6000	13000
Total	2600	6000	13000

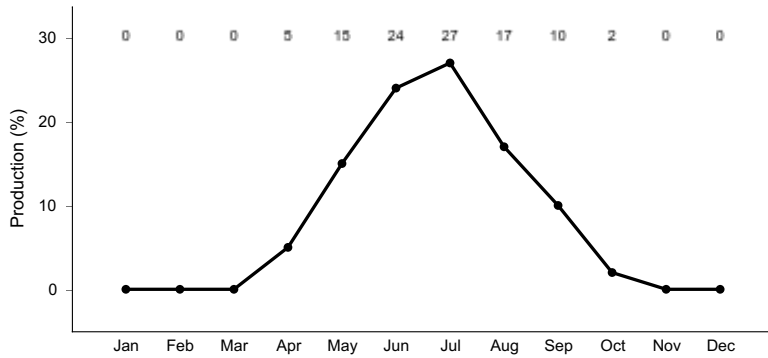


Figure 7. Plant community growth curve (percent production by month). LA0012, Bahia. Bahiagrass.

State 4 Tree Farm

Tree Farm

Community 4.1 Tree Farm

Hardwood or Pine Plantation: This phase is characterized by few or a monoculture of Hardwood or Pine species planted or allowed to regenerate from seed trees managed for wood production. This Site fits into multiple Woodland Suitability Groups (1o7, 2o7) depending on the soil Mapunit. The first part of the symbol indicates potential productivity of the soils for important trees, very high (1), high (2). The second part, a letter, indicates the major kind of soil limitation, the letter "o" indicates that limitations or restrictions are insignificant. The third part of the symbol, a numeral, indicates the kind of trees for which the soils are best suited and the severity of the hazard or limitation. The numeral 7 indicate slight limitations, and suitability for both needle leaf and broadleaf trees. These groups would generally describe this site as very high to high productivity with slight limitations for the production of broadleaf and needle leaf species. WSG 1o7 Well drained loam soils suitable for either pines or southern hardwoods with very high potential productivity; no serious management problems. Potential is high for management of turkey and quail, and moderately high for squirrels and deer. WS 2 o 7 Well drained, loamy soils with high potential productivity; no serious management problems; well suited for either pine or southern hardwoods. Site index for loblolly and slash pine 90, oaks and sweetgum 90. Potential is high for management of quail and turkey, and moderately high for squirrels and deer.

Additional community tables

Table 6. Community 3.1 plant community composition

Group	Common Name	Symbol	Scientific Name	Annual Production (Lb/Acre)	Foliar Cover (%)
Grass/Grasslike					
1	Warm Season Perennials			2600–13000	
	Bermudagrass	CYDA	<i>Cynodon dactylon</i>	2600–13000	–
	bahiagrass	PANO2	<i>Paspalum notatum</i>	3300–6500	–

Animal community

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Hydrological functions

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Recreational uses

Wood products

Other products

Other information

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Contributors

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Acknowledgments

The Macon Ridge Technical Team did an outstanding job of utilizing existing data and knowledge to develop site concepts. They also provided the needed sections of the descriptions, review and comments of them.

Rangeland health reference sheet

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

Author(s)/participant(s)	
Contact for lead author	
Date	
Approved by	
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

Indicators

1. **Number and extent of rills:**

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

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

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

5. **Number of gullies and erosion associated with gullies:**

6. **Extent of wind scoured, blowouts and/or depositional areas:**

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

8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):**

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

10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:**

11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):**

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

Dominant:

Sub-dominant:

Other:

Additional:

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

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

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

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:**

17. **Perennial plant reproductive capability:**
