USDA Natural Resources Conservation Service

Ecological site F119XY013AR
Loamy Floodplain

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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): 119X–Ouachita Mountains

This ecological site is found in MLRA 119: Ouachita Mountains.
This area is in the Ouachita Mountains Section of the Ouachita Province of the Interior Highlands. The steep mountains are underlain by folded and faulted sedimentary and metamorphic rocks. Most of the stream valleys are narrow and have steep gradients, but wide terraces and flood plains border the Ouachita River in western Arkansas. Elevation ranges from 330 feet (100 meters) on the lowest valley floors to 2,625 feet (800 meters) on the highest mountain peaks. Local relief is generally 100 to 200 feet (30 to 60 meters), but it can exceed 980 feet (300 meters).

Classification relationships

South-Central Interior Large Floodplain
Summary: This floodplain system is found in the Interior Highlands as far west as eastern Oklahoma, as well as throughout the Interior Low Plateau, Cumberlands, Southern Ridge and Valley, and Western Allegheny Plateau, and lower elevations of the Southern Blue Ridge. Examples occur along large rivers or streams where topography and alluvial processes have resulted in a well-developed floodplain. A single occurrence may extend from river's edge across the outermost extent of the floodplain or to where it meets a wet meadow or upland system. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands resulting, in part, from beaver activity. A variety of soil types may be found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates in combination

with different flooding regimes that creates the mix of vegetation. Most areas, except for the montane alluvial forests, are inundated at some point each spring; microtopography determines how long the various habitats are inundated. Although vegetation is quite variable in this broadly defined system, examples may include Acer saccharinum, Platanus occidentalis, Liquidambar styraciflua, and Quercus spp. Understory species are mixed, but include shrubs, such as Cephalanthus occidentalis and Arundinaria gigantea ssp. gigantea, and sedges (Carex spp.). This system likely floods at least once annually and can be altered by occasional severe floods. Impoundments and conversion to agriculture can also impact this system.

Ecological site concept

This site is frequently flooded with udic moisture and thermic temperature regimes. It has very deep loamy soils.

Table 1. Dominant plant species

Tree	(1) *Platanus occidentalis*
Shrub	Not specified
Herbaceous	(1) *Carex*

Physiographic features

Table 2. Representative physiographic features

Landforms	(1) Flood plain
Flooding duration	Brief (2 to 7 days)
Flooding frequency	None to frequent
Ponding frequency	None
Elevation	91–608 m
Slope	0–3%
Ponding depth	0 cm
Water table depth	0–122 cm
Aspect	SE

Climatic features

Table 3. Representative climatic features

Frost-free period (average)	189 days
Freeze-free period (average)	212 days
Precipitation total (average)	1,422 mm

Climate stations used

- (1) MT IDA 3 SE [USC00034988], Mount Ida, AR
- (2) TUSKAHOMA [USC00349023], Tuskahoma, OK
- (3) WILBURTON 9 ENE [USC00349634], Red Oak, OK
- (4) BLAKELY MTN DAM [USC00030764], Mountain Pine, AR
- (5) BATTIEST [USC00340567], Bethel, OK

Influencing water features

Soil features

The soil series associated with this site are: Rexor, Kenn, Dela. They are very deep, Moderately well drained to Well drained, and Moderate to Moderately rapid permeable soils, with very acidic to slighlty acidic soil reaction, that formed in Alluvium.

Table 4. Representative soil features

Surface texture	(1) Cobbly fine sandy loam (2) Gravelly loam (3) Silt loam
Family particle size	(1) Loamy
Drainage class	Moderately well drained to well drained
Permeability class	Moderate to moderately rapid
Soil depth	203 cm
Surface fragment cover <=3"	0%
Surface fragment cover >3"	0%
Available water capacity (0-101.6cm)	9.14–20.07 cm
Calcium carbonate equivalent (0-101.6cm)	0%
Electrical conductivity (0-101.6cm)	0 mmhos/cm
Sodium adsorption ratio (0-101.6cm)	0
Soil reaction (1:1 water) (0-101.6cm)	5–6.2
Subsurface fragment volume <=3" (Depth not specified)	1–30%
Subsurface fragment volume >3" (Depth not specified)	0–24%

Ecological dynamics

Information contained in this section was developed using historical data, professional experience, field reviews, and scientific studies. The information presented is representative of very complex vegetation communities. Key indicator plants, animals and ecological processes are described to help inform land management decisions. Plant communities will differ across the MLRA because of the naturally occurring variability in weather, soils, and aspect. The Reference Plant Community is not necessarily the management goal. The species lists are representative and are not botanical descriptions of all species occurring, or potentially occurring, on this site. They are not intended to cover every situation or the full range of conditions, species, and responses for the site.

The reference plant community is a forest dominated by an overstory of eastern cottonwood, American elm and hackberry with sycamore, green ash and other early successional species scattered throughout. Canopy height is normally 85 to 110 feet and canopy closure 80 to 100 percent.

Loamy Floodplains are widely distributed throughout the Ouachita Mountains. They occur on natural levees and low floodplains that flood frequently. Flooding of these ecological sites commonly occurs annually or at least once every 3 years. Loamy sediments, originating from the loess and weathered residuum in the surrounding uplands, make up a significant portion of the alluvium in these floodplains.

The forest is dominated by flood tolerant, tree species such as elm, hackberry, sycamore, cottonwood and green ash. Young stands of these species tend to stabilize the low floodplain and continue to accumulate loamy materials. Consequently, these developing ecological sites tend to be near even aged. Young stands are often dense with a sparse understory and ground flora.

Over the long term, these floodplains may become elevated and/or isolated and begin to accumulate more fine sediments, becoming more stable and enduring. Oaks, shellbark hickory and black walnut begin to accumulate in these later stages of succession. Catastrophic floods will often partially or completely knock down the earlier species and regenerate this site creating a mosaic of early to late successional floodplain forests.

These sites are very productive. Today most of these ecological sites have been cleared and converted to agriculture. While some cleared fields have retained a narrow strip of forest along the river, other sites are often cleared right up to the bank. In such cases, flooding may cause severe stream bank erosion.
Uncontrolled grazing by domestic livestock in the remaining strips of forest is not uncommon and can cause significant damage, killing trees and removing the ground cover, resulting in further de-stabilization and degradation of this ecological site as well. Carefully planned timber harvests can be tolerated in this system, but high grading of the timber will eventually degrade the ecological site.

Loamy Floodplains, generally occurring as a rather narrow band of forests traversing the river edge, are the most abundant remaining floodplain forest type in the Ouachita Mountains. These bands of forest still play an important role as a source of food and shelter for migrating birds and as a source for course woody debris for the adjacent stream systems.

A State and Transition Diagram is depicted in Figure 1. Detailed descriptions of each state, transition, plant community, and pathway follow the model. This model is based on available experimental research, field observations, professional consensus, and interpretations. It is likely to change as knowledge increases.

State and transition model

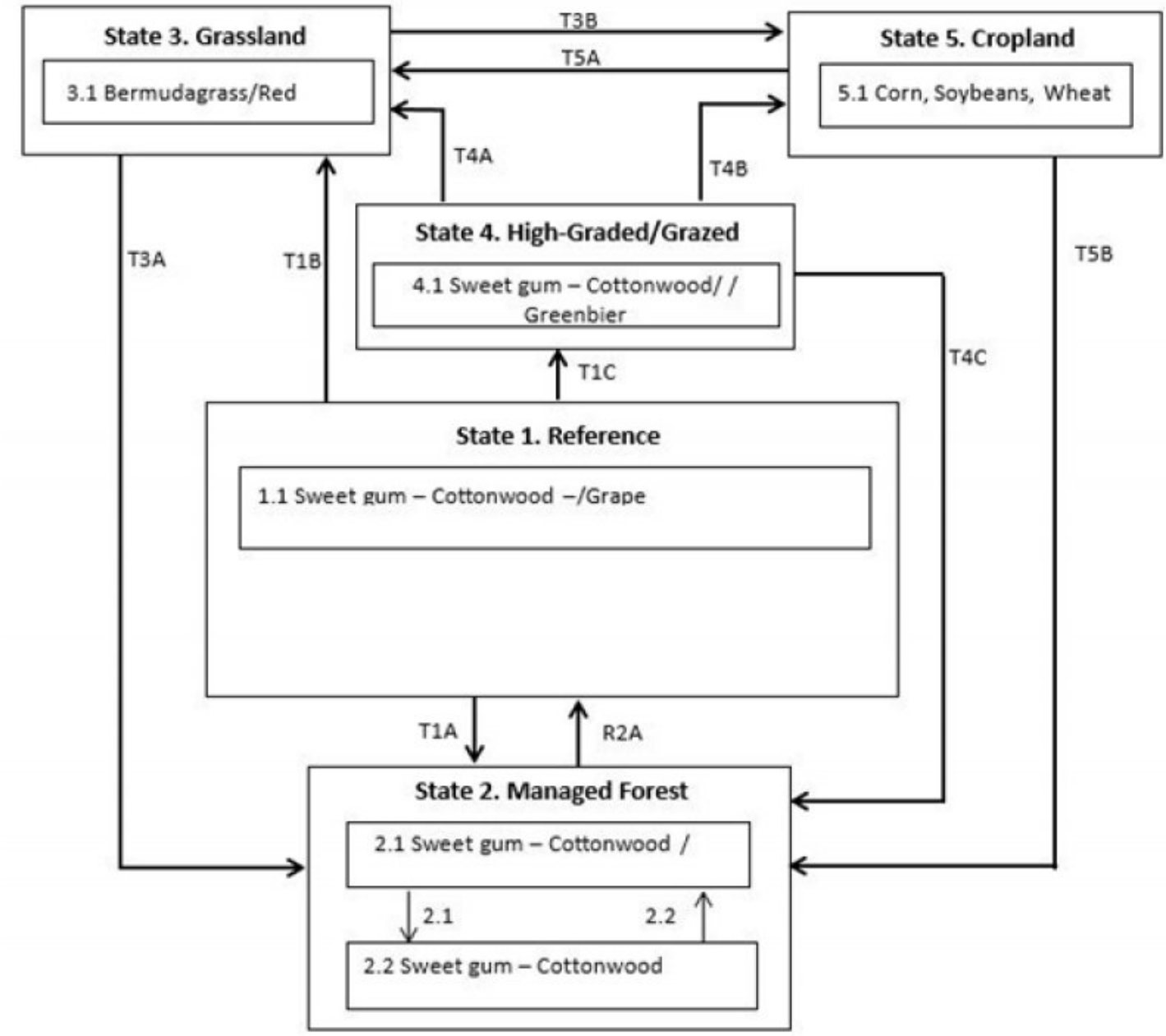

Figure 6. F119XY013AR, Loamy Floodplain

Code	Event/Activity/Process
T1A	Uneven-age timber management; harvesting
T1B, T4A	Clearing; pasture planting; prescribed grazing
T5A	Pasture planting; prescribed grazing
T1C	Poorly planned harvest (high-grading); uncontrolled grazing
T3B	Tillage; conservation cropping system
T4B	Clearing ; tillage; conservation cropping system
T3A, T5B	Tree planting; long-term succession (+30-50 years); forest stand improvement; access control
T4C	Forest stand improvement; access control
R2A	Forest stand improvement; long term succession (+10-20 years)
1.1A	Long term succession (+10-30 years); sediment accumulation
2.1A	Crop Tree Release; little to no harvesting (10-20 years)
2.2A	Uneven-age timber management; harvesting

Figure 7. F119XY013AR, Loamy Floodplain

State 1
Reference

The historical reference state for this ecological site was old growth bottomland forest. Natural flooding cycles were the primary processes affecting this ecologic site. Maximum tree age was likely 150 to 200 years. The understory was complex, with multiple layers of shade-tolerant species. A highly diverse ground flora was also present. Vines were common and went well into the canopy. Scattered open areas were common. A change to more frequent, higher-intensity floods on the modern landscape creates more frequent canopy gaps, and introduces or helps to maintain more flood-tolerant species such as sycamore, eastern cottonwood, green ash or hackberry.

Other references

NatureServe. 2015. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia.
Available http://explorer.natureserve.org. (Accessed: October 27, 2015).

Official Soil Survey, USDA-NRCS: https://soilseries.sc.egov.usda.gov/osdname.asp

Landfire: http://www.landfire.gov 2015 data

United States Department of Agriculture Handbook 296: Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin

NASIS database 2016 NASIS Client Version Number 6.4.1 and database model 7.2.5

Contributors

Kevin Godsey

Acknowledgments

Doug Wallace and Fred Young at Missouri NRCS State office, personal communication and sharing of state and transition models.

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:**