

# THE ECOREGIONS OF ARKANSAS

## A Brief Overview

Theo Witsell

Southeastern Grasslands Institute



**SOUTHEASTERN  
GRASSLANDS  
INSTITUTE**

**AP** **Austin Peay**  
State University  
CLARKSVILLE  TENNESSEE



The Department of  
**Arkansas  
Heritage**

**Natural divisions** are geographic regions of a larger area like a state, country, or continent. A division contains similar landscapes, climates, and substrate features like geology and soils that support similar vegetation and wildlife across the division's area. The geographic regions often cross political boundaries and contain smaller subdivisions.

An **ecoregion** is a "recurring pattern of ecosystems associated with characteristic combinations of soil and landform that characterize that region".

An **ecosystem** is a community of living organisms in conjunction with the nonliving components of their environment, interacting as a system. These biotic and abiotic components are linked together through nutrient cycles and energy flows.

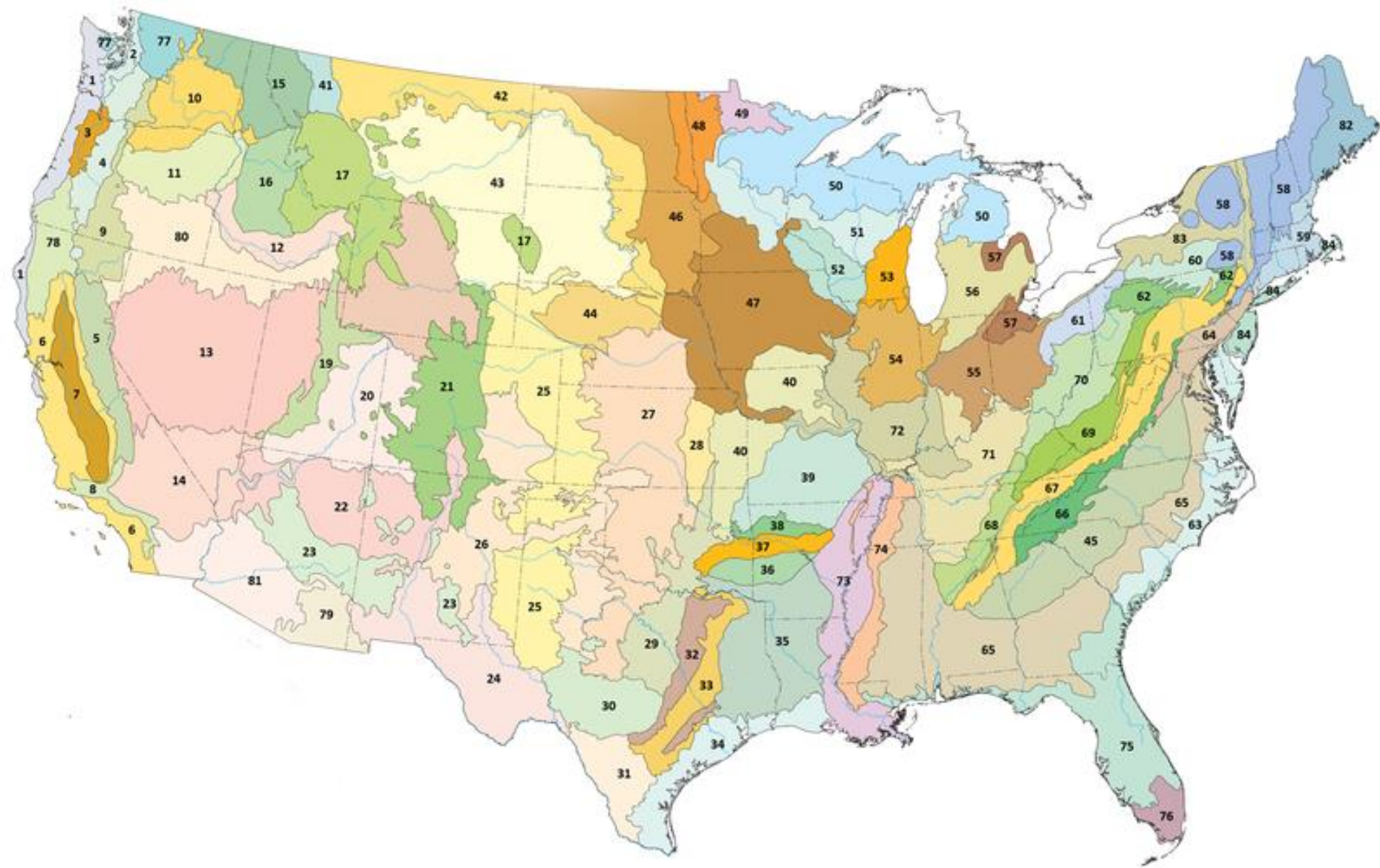


# Four levels: Level I divides North America into 15 ecological regions.



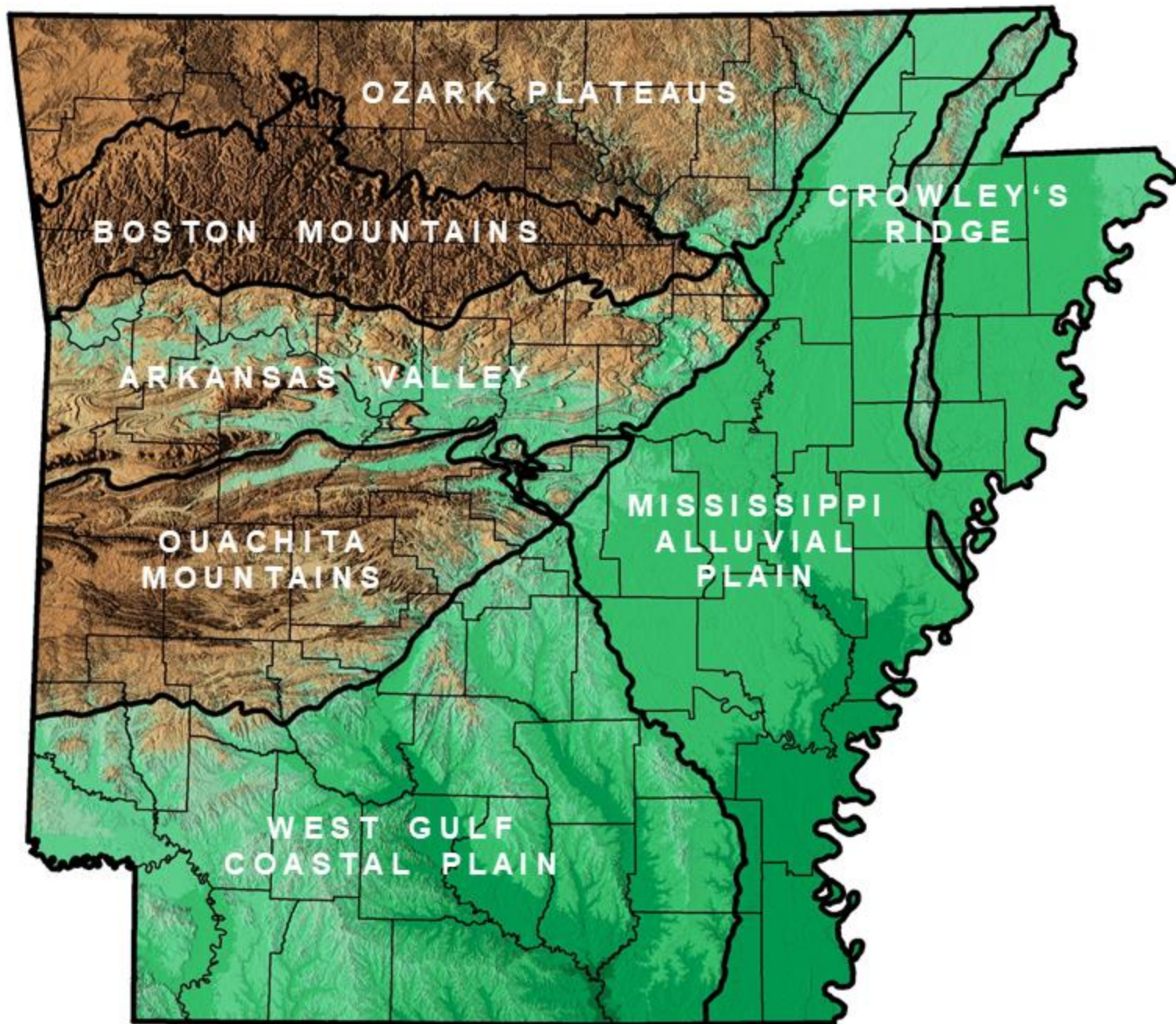




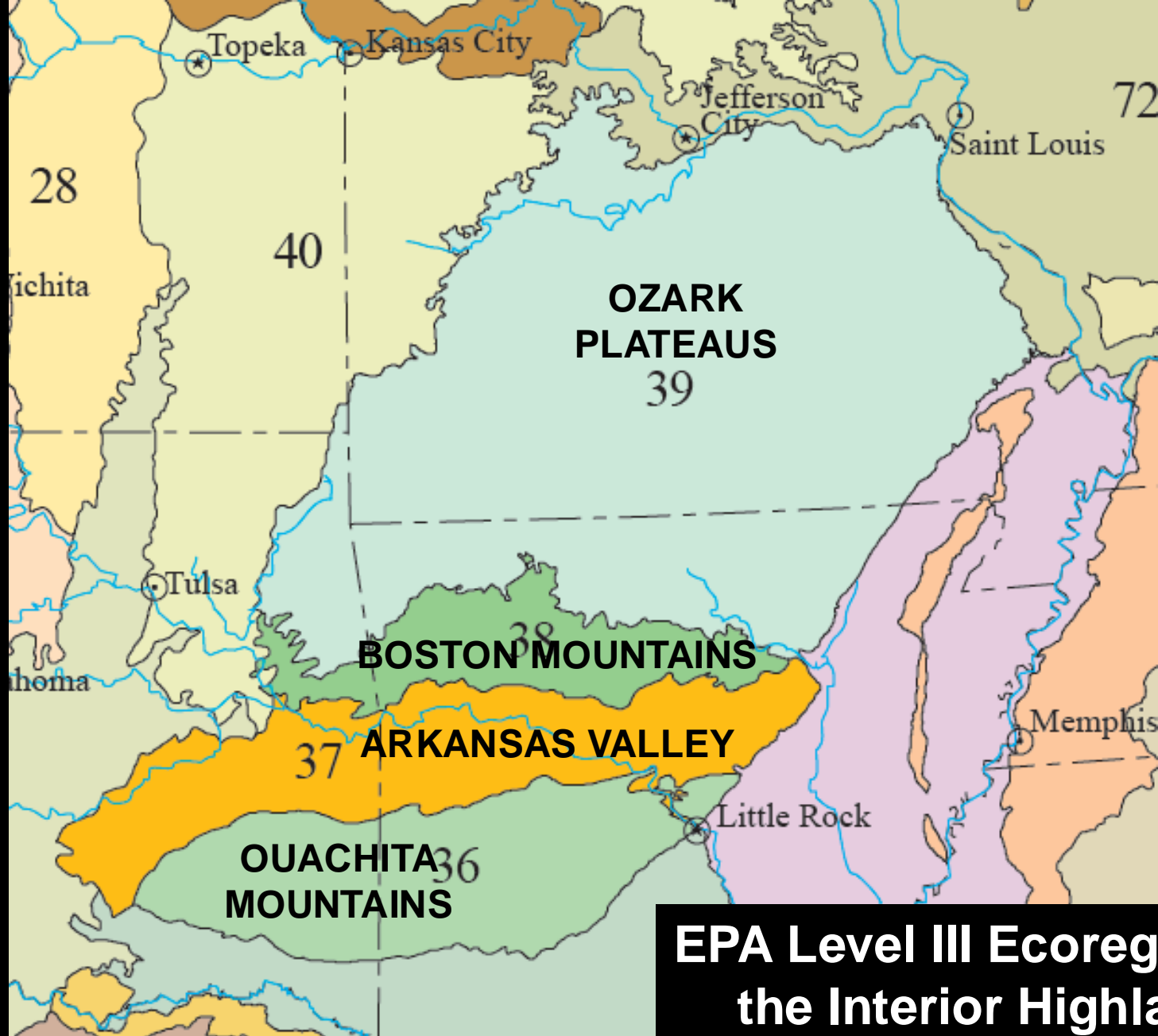


**EPA Level III Ecoregions of the United States**









## EPA Level III Ecoregions of the Interior Highlands

[http://www.epa.gov/wed/pages/ecoregions/ar\\_eco.htm](http://www.epa.gov/wed/pages/ecoregions/ar_eco.htm)

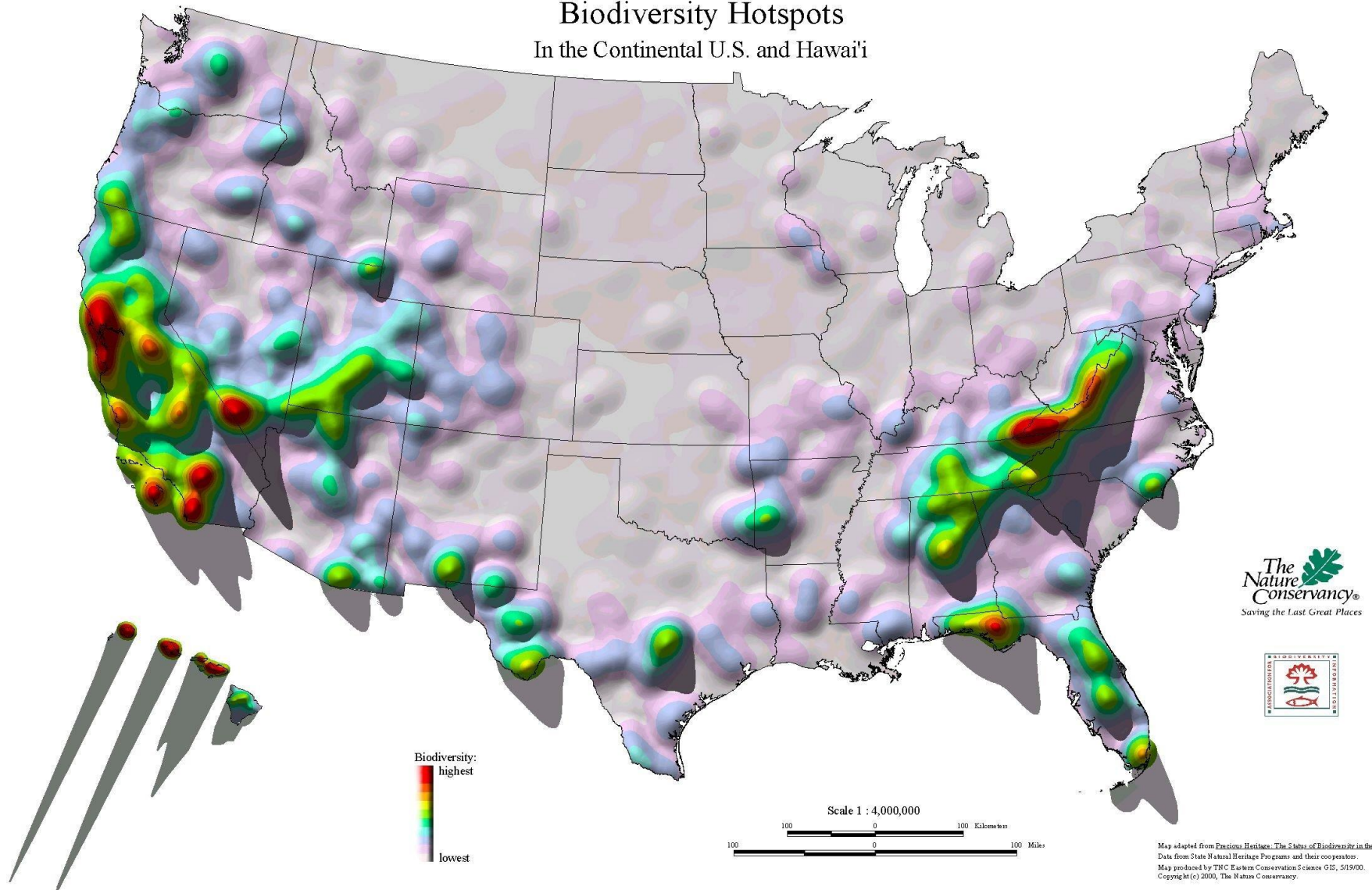


The Interior  
Highlands

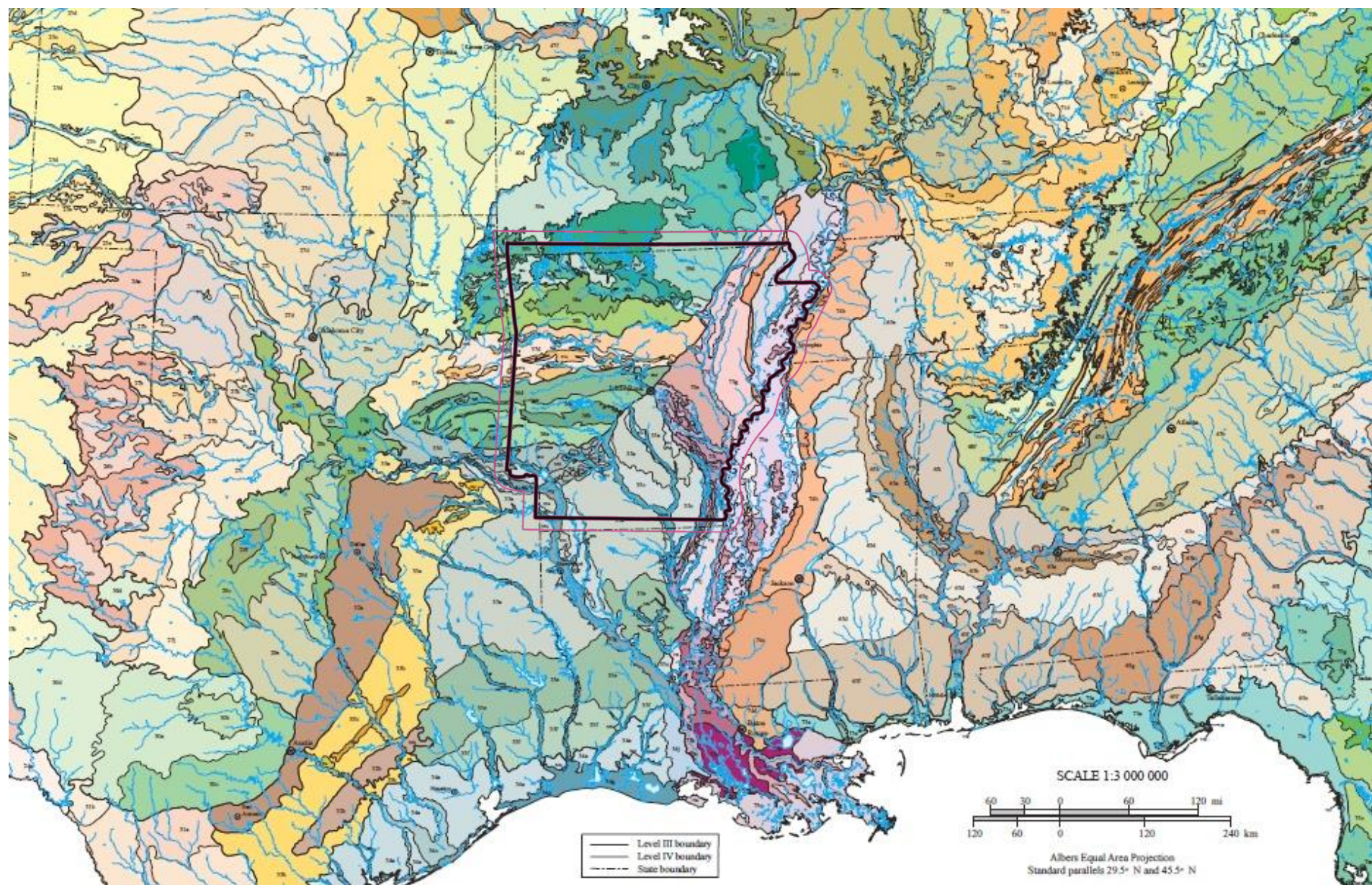


# Biodiversity Hotspots

In the Continental U.S. and Hawai'i





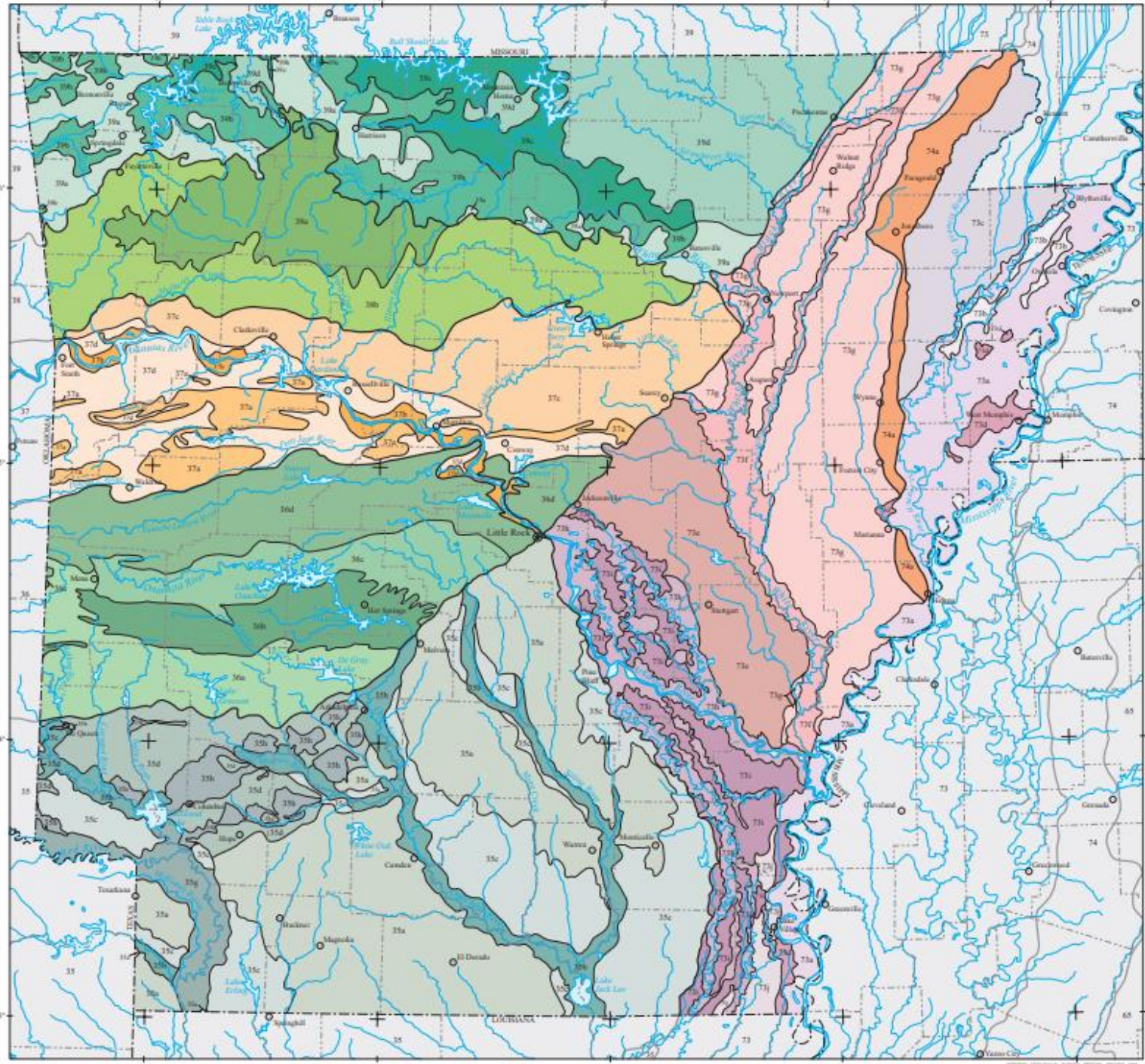


Level III - 7 ecoregions in Arkansas; Level IV - 32 ecoregions in Arkansas



This project was partially supported by funds from the USEPA Region 6, Bioactives Program and USEPA Office of Science and Technology through a contract with Dynamic Corporation. It was also supported by funds from the Arkansas Soil and Water Conservation Commission through grants provided by the USEPA Region 6 under the provisions of Section 104(b) (3) of the Clean Water Act (through the wetlands grant program).

Electronic versions of ecoregion maps and posters as well as other ecoregion resources are available at <http://www.epa.gov/wed/pages/ecoregions/ecoregions.htm>.

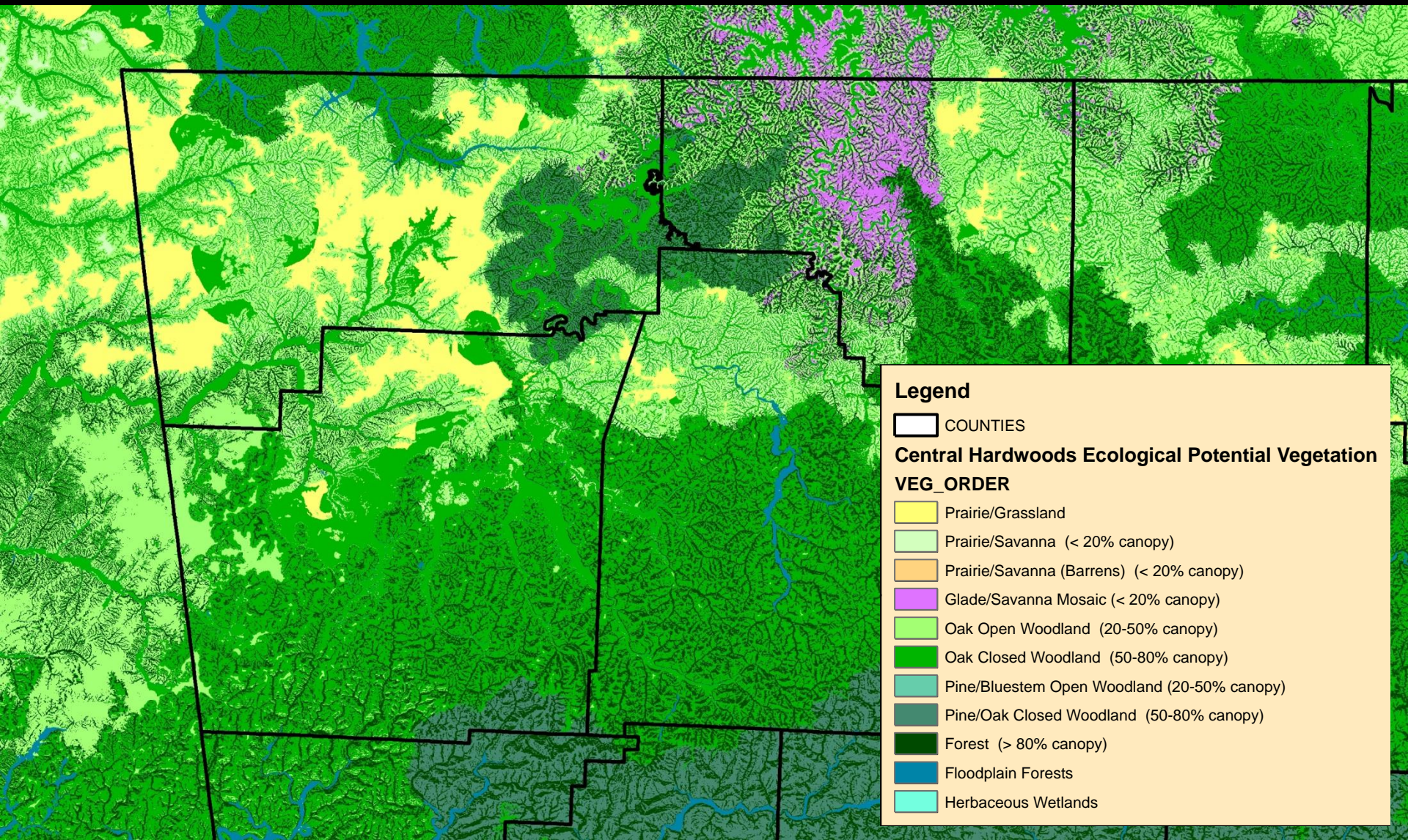


- 35 South Central Plains**
  - 35a Tertiary Uplands
  - 35b Floodplains and Low Terraces
  - 35c Pleistocene Fluvial Terraces
  - 35d Cretaceous Dissected Uplands
  - 35e Red River Bottomlands
  - 35f Blackland Prairie
- 36 Ouachita Mountains**
  - 36a Athens Plateau
  - 36b Central Mountain Ranges
  - 36c Central Hills, Ridges, and Valleys
  - 36d Fourche Mountains
  - 36e Western Ouachitas
- 37 Arkansas Valley**
  - 37a Scattered High Ridges and Mountains
  - 37b Arkansas River Floodplain
  - 37c Arkansas Valley Hills
  - 37d Arkansas Valley Plains
- 38 Boston Mountains**
  - 38a Upper Boston Mountains
  - 38b Lower Boston Mountains
- 39 Ozark Highlands**
  - 39a Springfield Plateau
  - 39b Dissected Springfield Plateau-Elk River Hills
  - 39c White River Hills
  - 39d Central Plateau
- 73 Mississippi Alluvial Plain**
  - 73a Northern Holocene Meander Belts
  - 73b Northern Pleistocene Valley Trains
  - 73c St. Francis Lowlands
  - 73d Northern Backswamps
  - 73e Grand Prairie
  - 73f Western Lowlands Holocene Meander Belts
  - 73g Western Lowlands Pleistocene Valley Trains
  - 73h Arkansas/Ouachita River Holocene Meander Belts
  - 73i Arkansas/Ouachita River Backswamps
  - 73j Macon Ridge
- 74 Mississippi Valley Loess Plains**
  - 74a Bluff Hills

— Level III ecoregion  
 — Level IV ecoregion  
 - - - County boundary  
 - - - State boundary

SCALE 1:1,000,000  
 15 10 5 0 15 20 30 40 50 60 mi  
 15 10 5 0 15 20 30 40 50 60 km  
 Albers Equal Area Projection  
 Standard parallels 33° 35' N and 35° 45' N





**Potential Natural Vegetation Map. Central Hardwoods Joint Venture.**



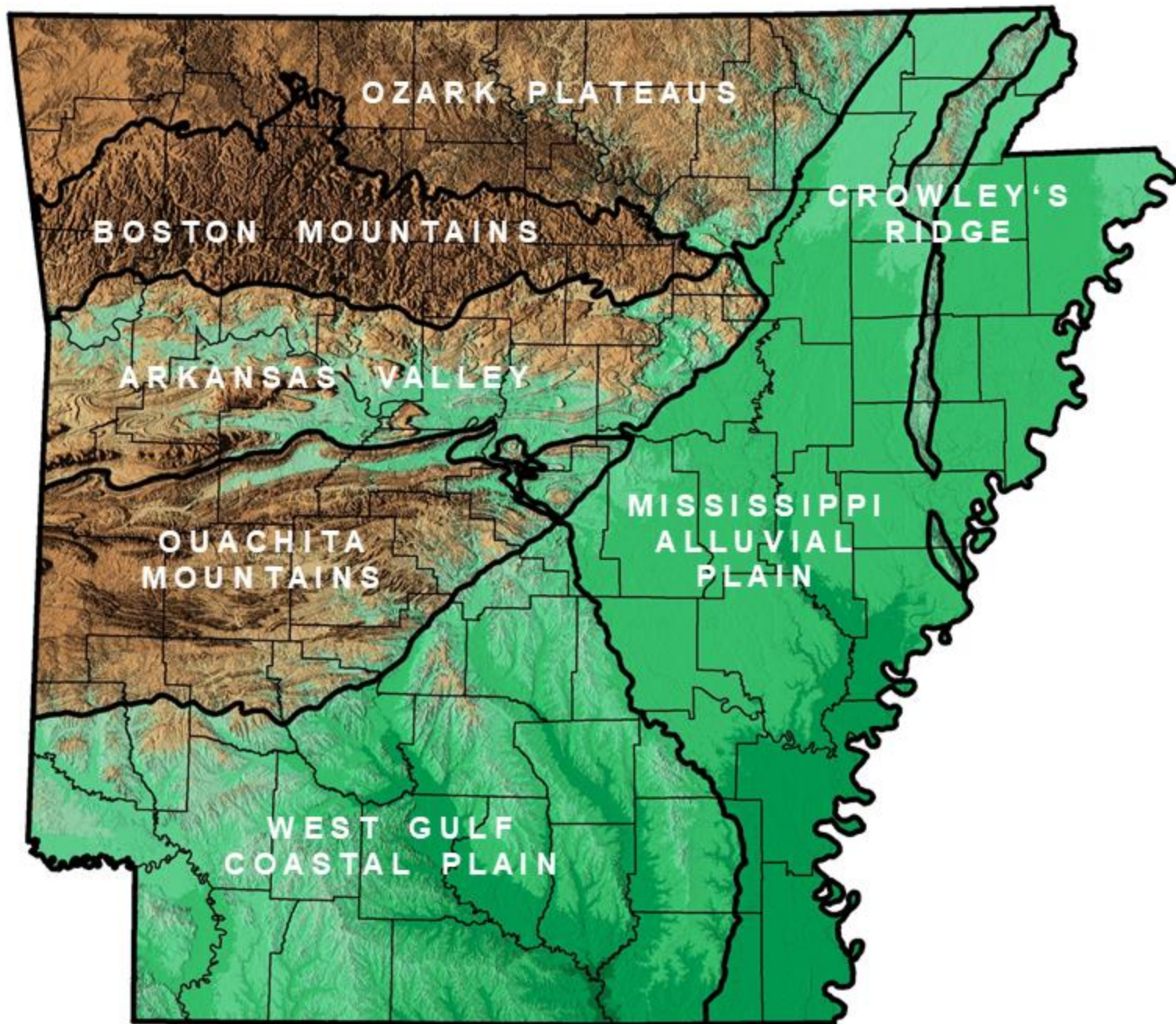
# **OZARK PLATEAUS and BOSTON MOUNTAINS**

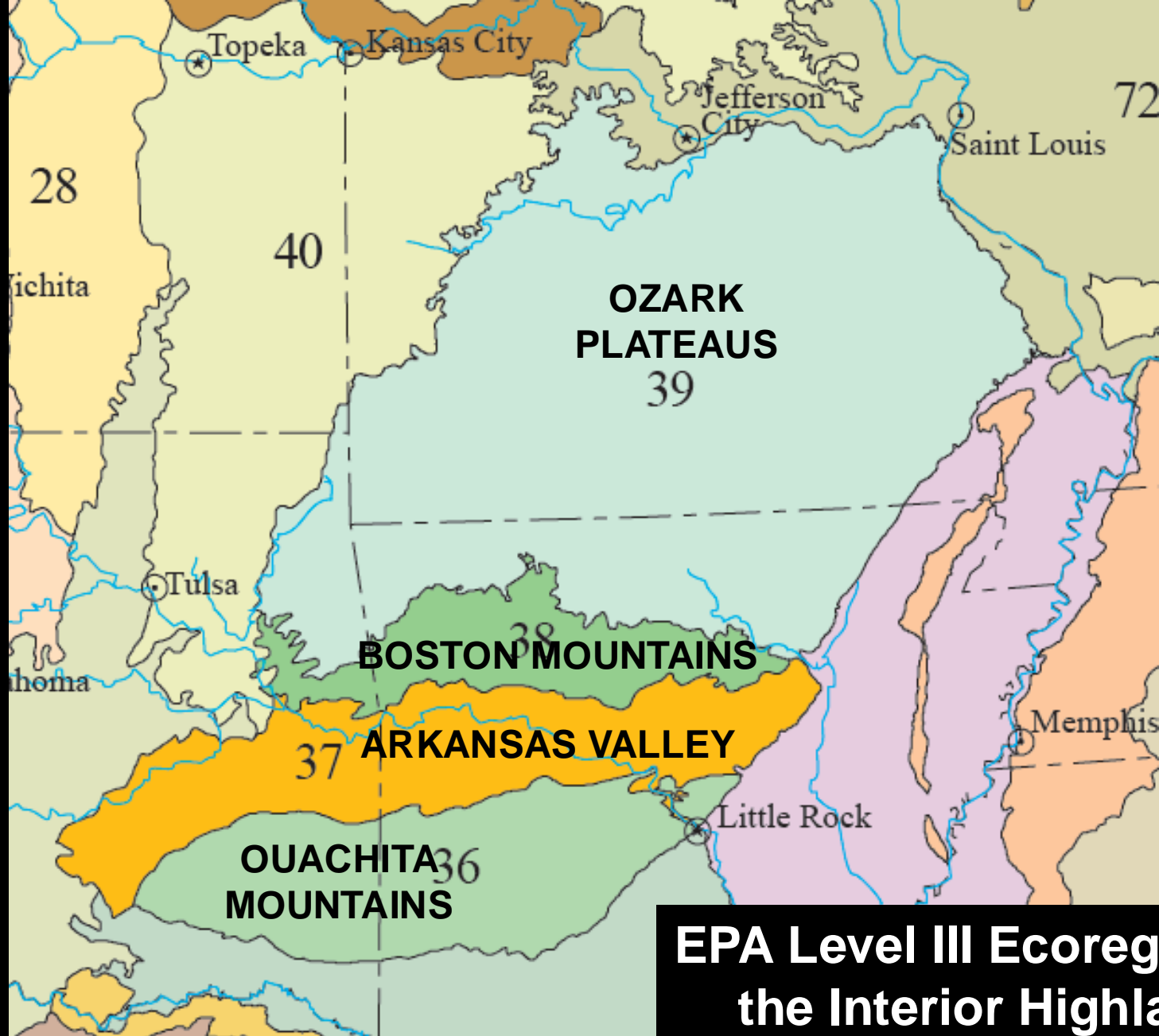








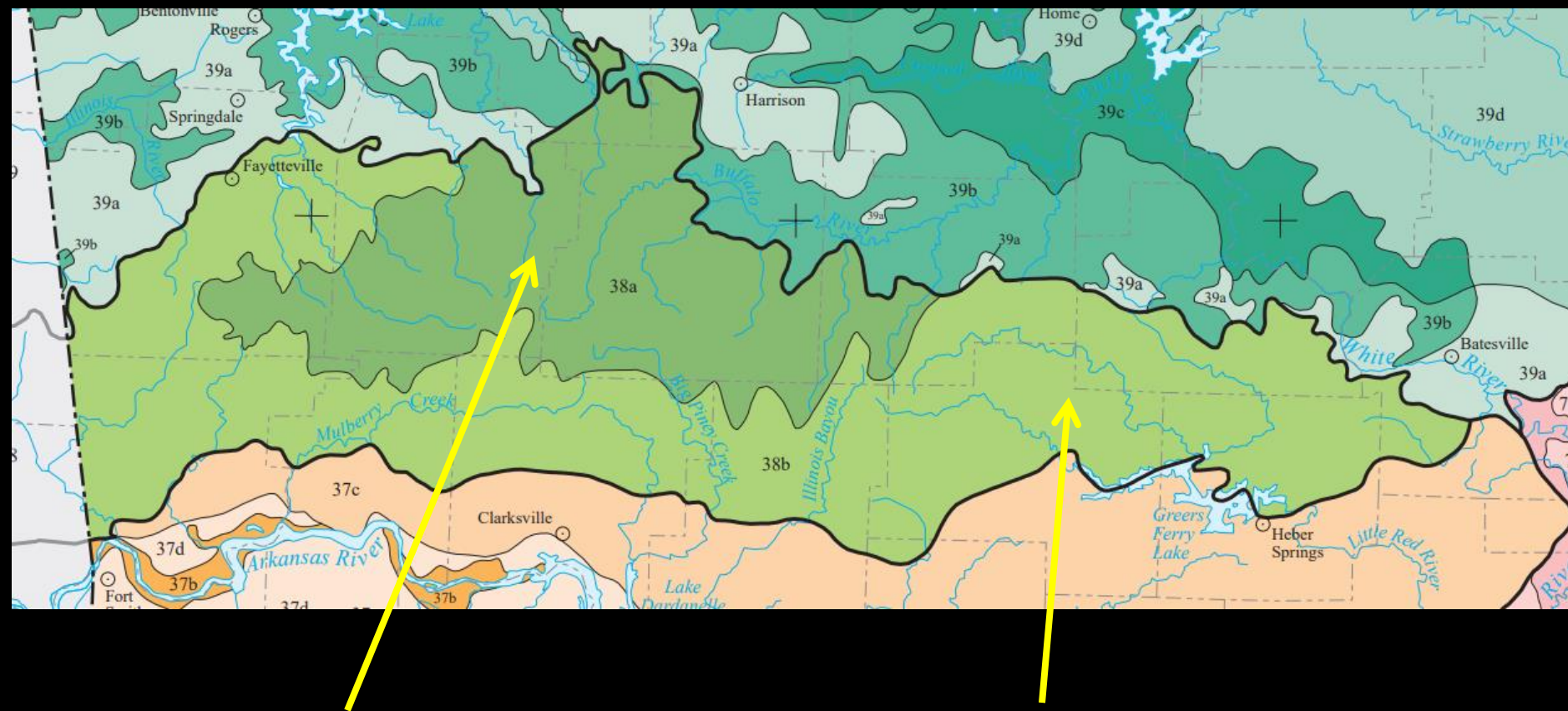




## EPA Level III Ecoregions of the Interior Highlands

[http://www.epa.gov/wed/pages/ecoregions/ar\\_eco.htm](http://www.epa.gov/wed/pages/ecoregions/ar_eco.htm)





**Upper Boston Mountains**

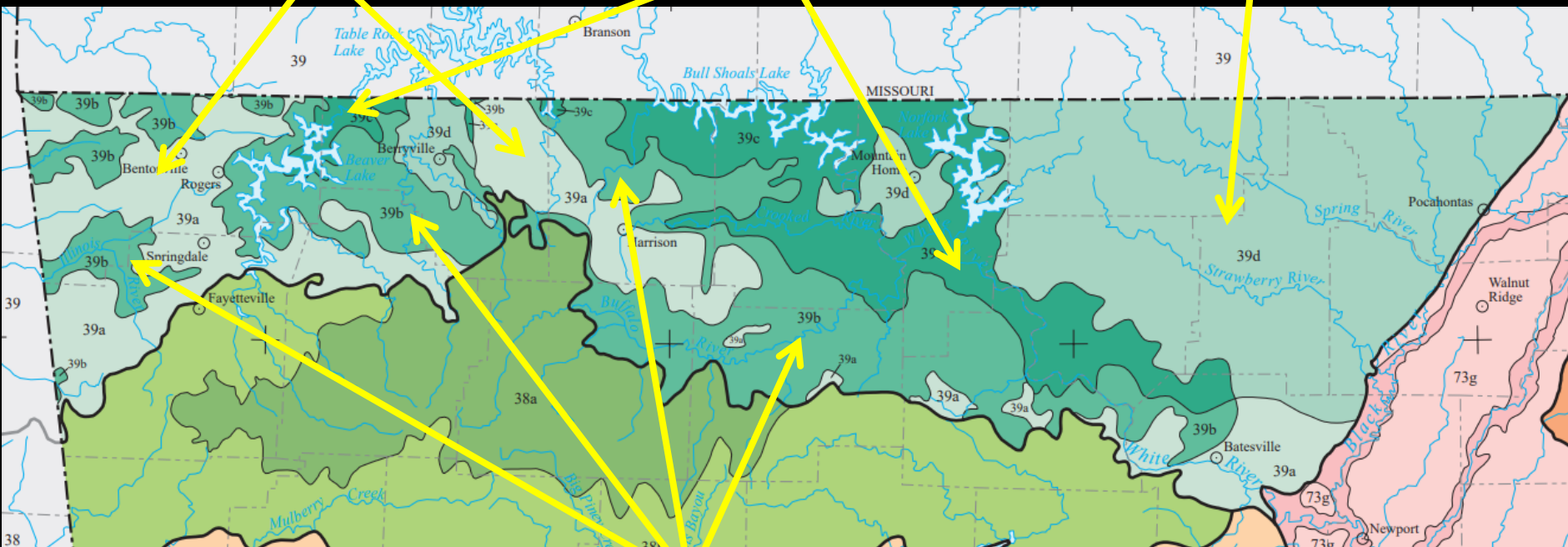
**Lower Boston Mountains**

## **EPA Level IV Ecoregions of the Boston Mountains**

**Springfield Plateau**

**White River Hills**

**Salem Plateau**

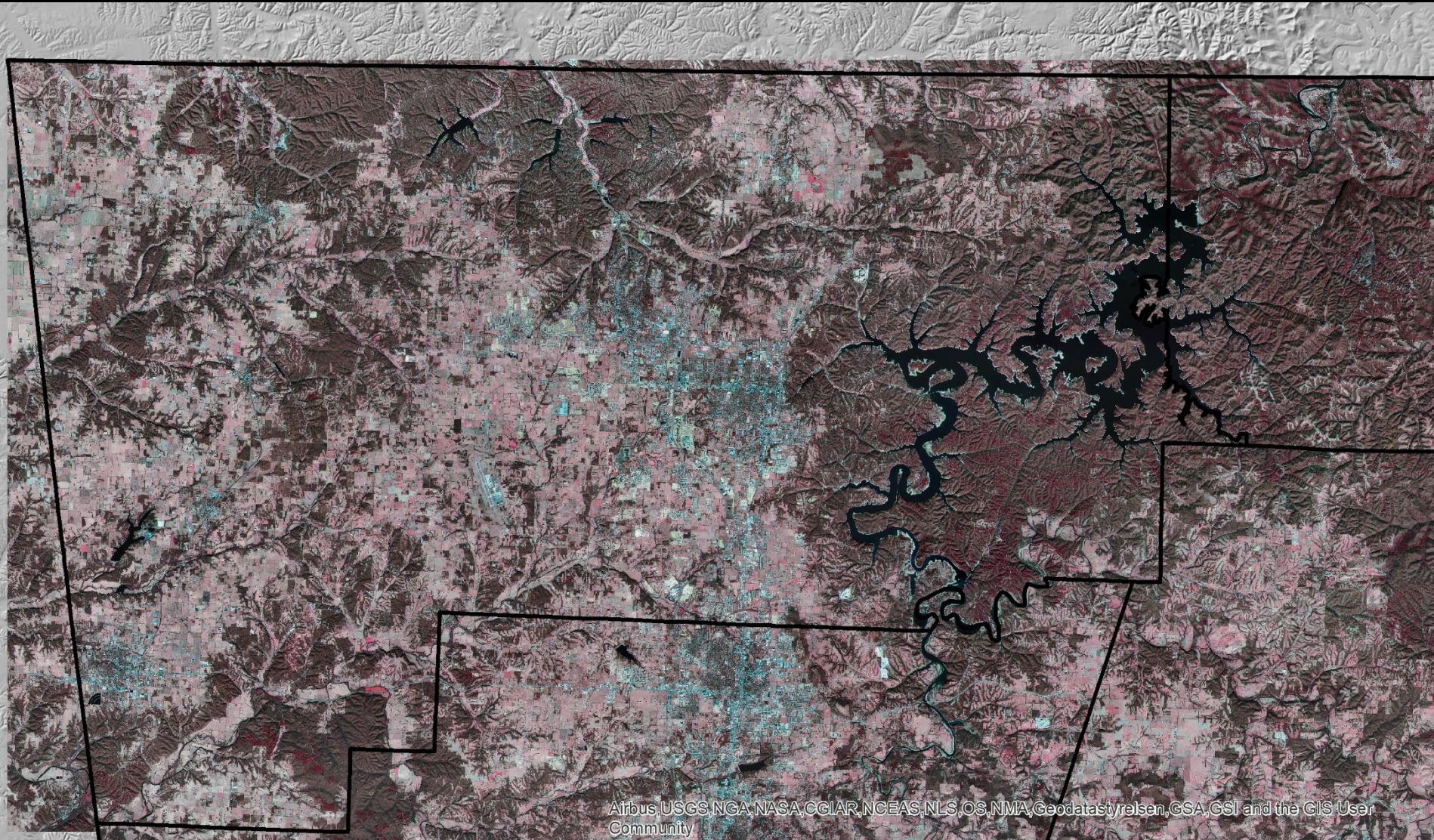


**Dissected Springfield Plateau**

**EPA Level IV Ecoregions of the Ozark Plateaus**



# Mosaic of Grassland, Woodland, and Forest





An aerial photograph showing a vast rural landscape. In the foreground, there are green fields, some with small ponds, and clusters of trees. A dirt road or path winds through the fields. In the middle ground, there are more fields, some with small ponds, and a few small buildings or structures. In the background, there are rolling hills and mountains under a clear blue sky with a few wispy clouds. The text "Boston Mountains" is overlaid in the upper right, "Dissected Springfield Plateau" is overlaid in the upper left, and "Springfield Plateau" is overlaid in the center right.

**Boston Mountains**

**Dissected Springfield Plateau**

**Springfield Plateau**

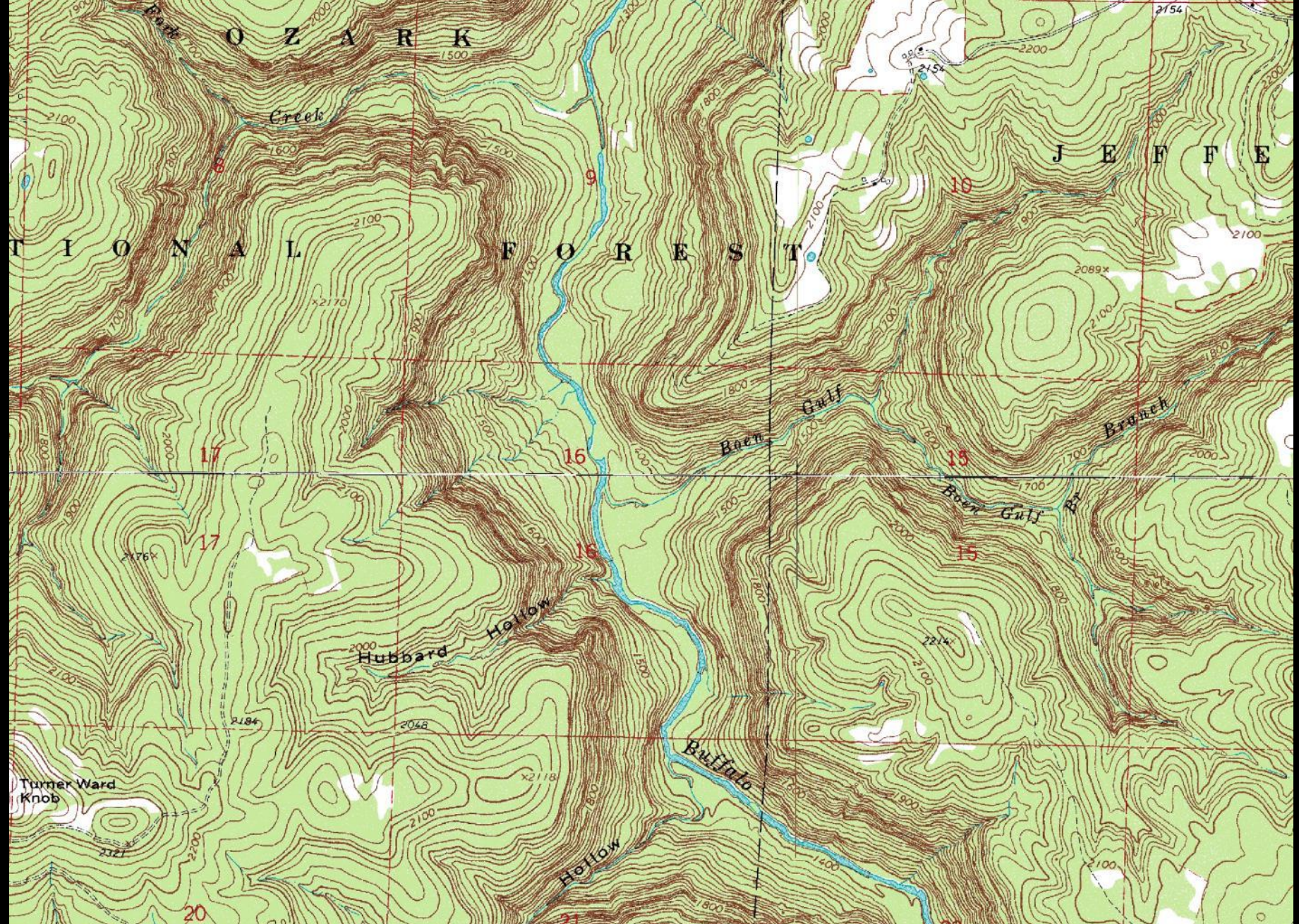


An aerial photograph showing a vast rural landscape. In the foreground, there are several large, irregularly shaped fields, some of which are green and others brown, separated by dark lines of trees. A winding road or path is visible on the right side. In the middle ground, there are more fields and a small cluster of buildings. The background consists of rolling hills and mountains, with the Boston Mountains specifically labeled on the left. The sky is blue with scattered white clouds.

**Boston Mountains**

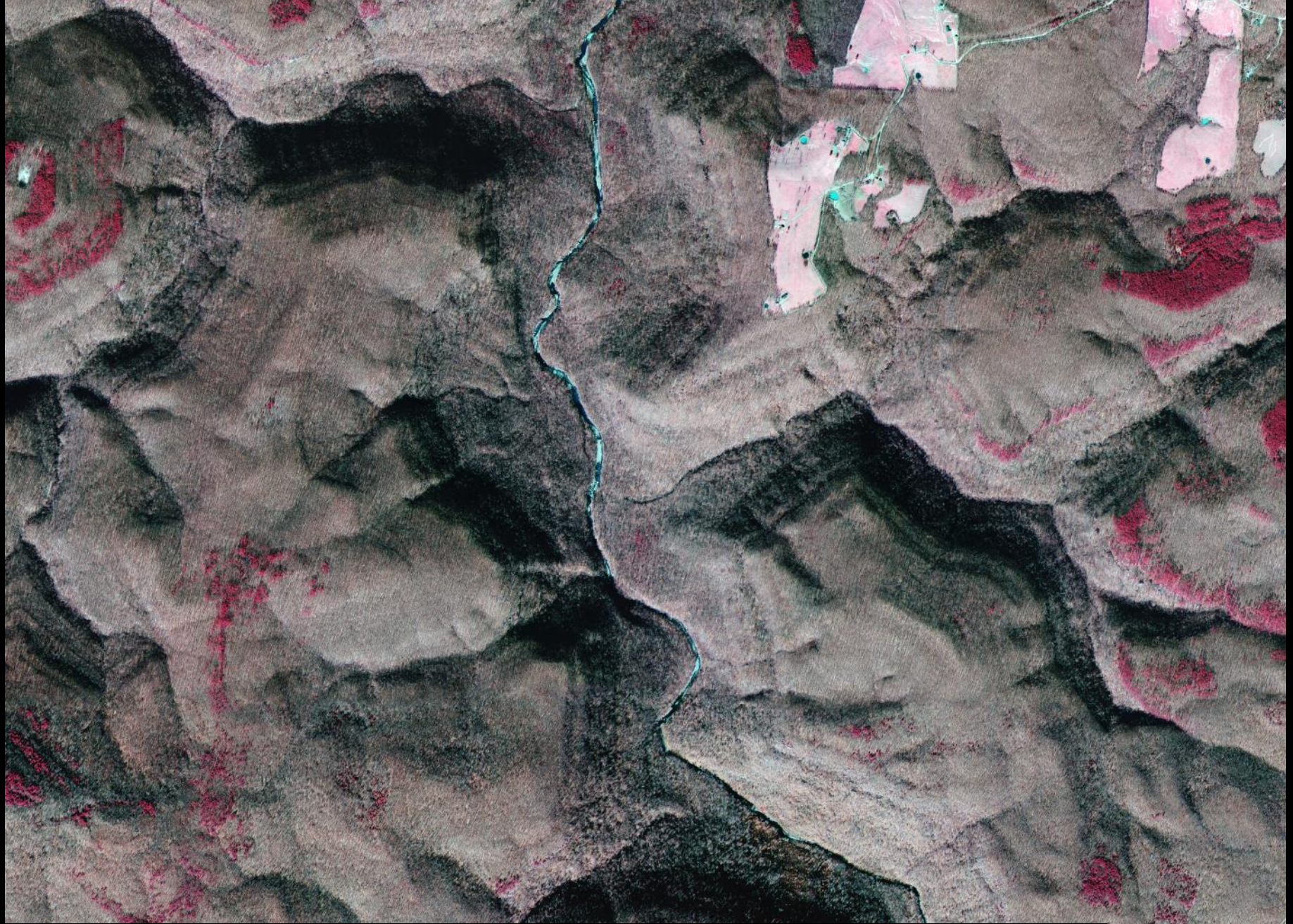
**Springfield Plateau**





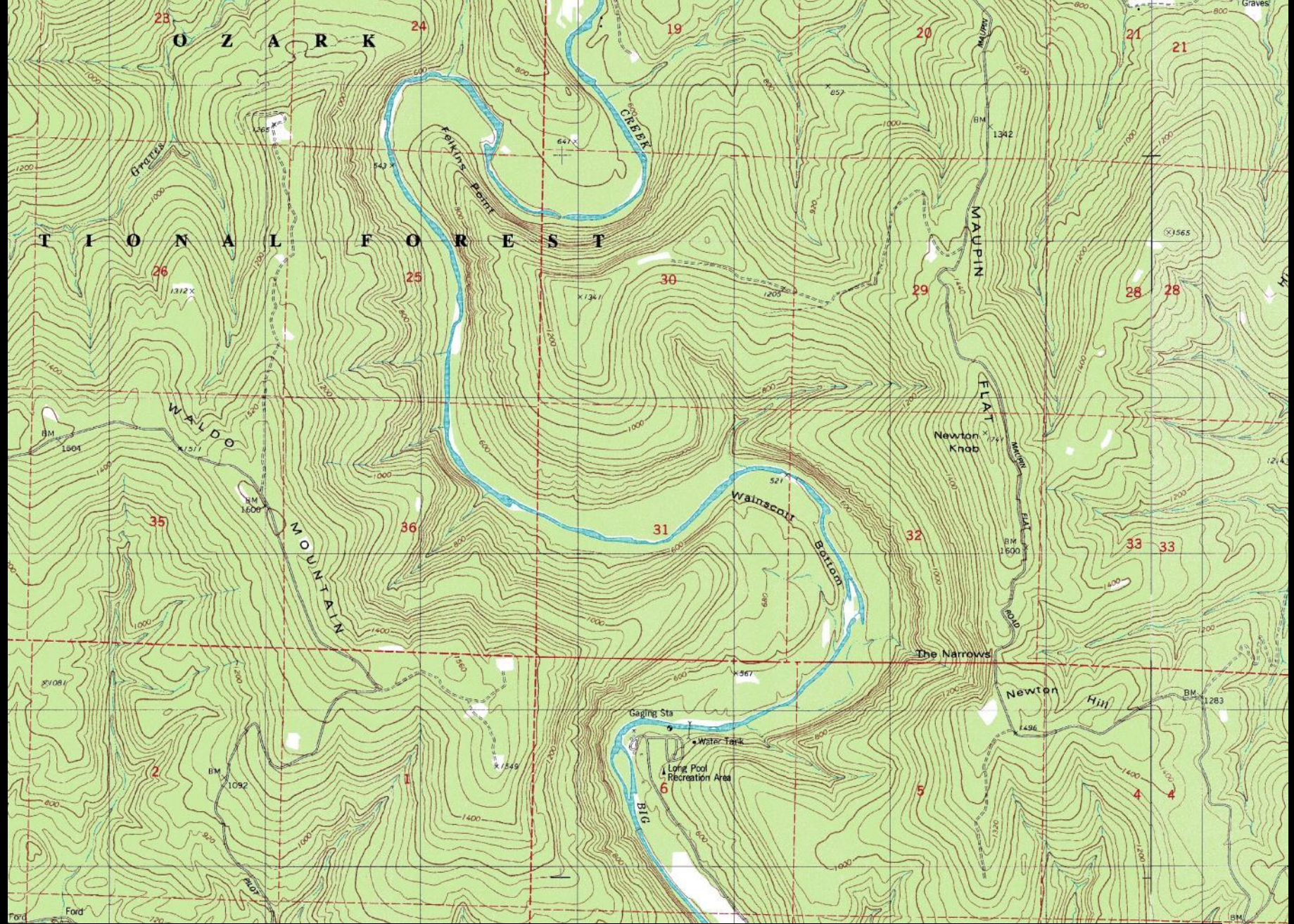
Upper Buffalo Wilderness Area. Ozark National Forest. Newton County





**Upper Buffalo Wilderness Area. Ozark National Forest. Newton County**





**Big Piney Creek at Long Pool Rec. Area. Ozark National Forest. Pope County**

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community





Long Pool Recreation Area

Image State of Arkansas

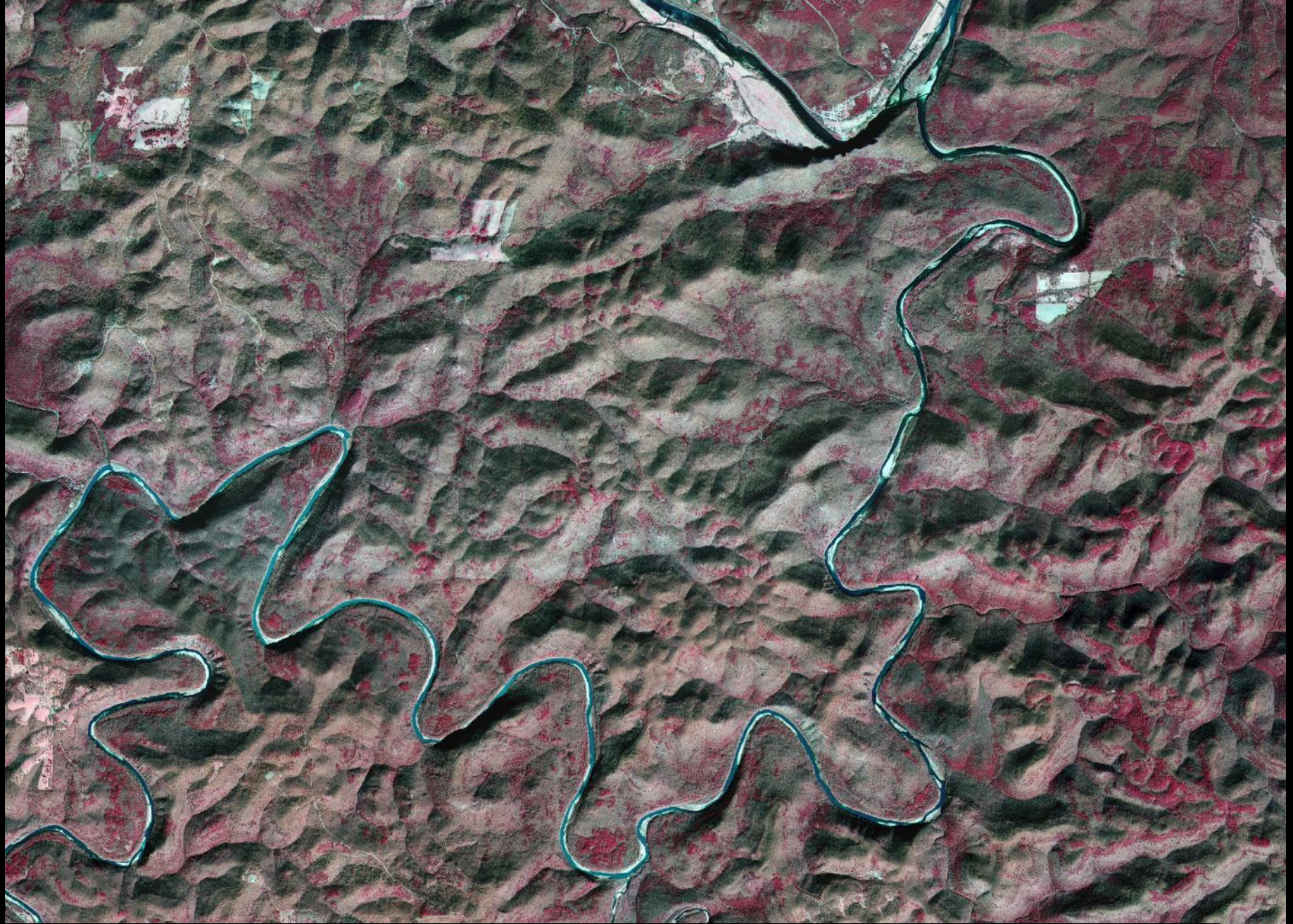
**Big Piney Creek at Long Pool Rec. Area. Ozark National Forest. Pope County**





**Clifty Canyons Special Interest Area. Ozark National Forest. Stone & Baxter Counties.**





**Lower Buffalo Wilderness. Buffalo National River. Marion County.**





# **The Grassland – Forest Continuum**



Foreword by Edward O. Wilson

# *Forgotten Grasslands of the South*

NATURAL HISTORY AND CONSERVATION



REED F. NOSS

**“A grassland is any community in which the grass layer, with its associated forbs is the dominant layer in terms of either total cover or biomass or both”.**

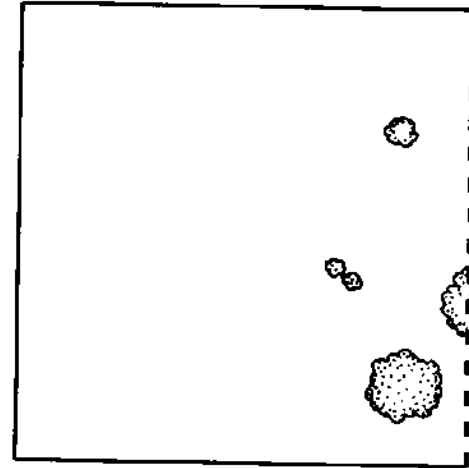
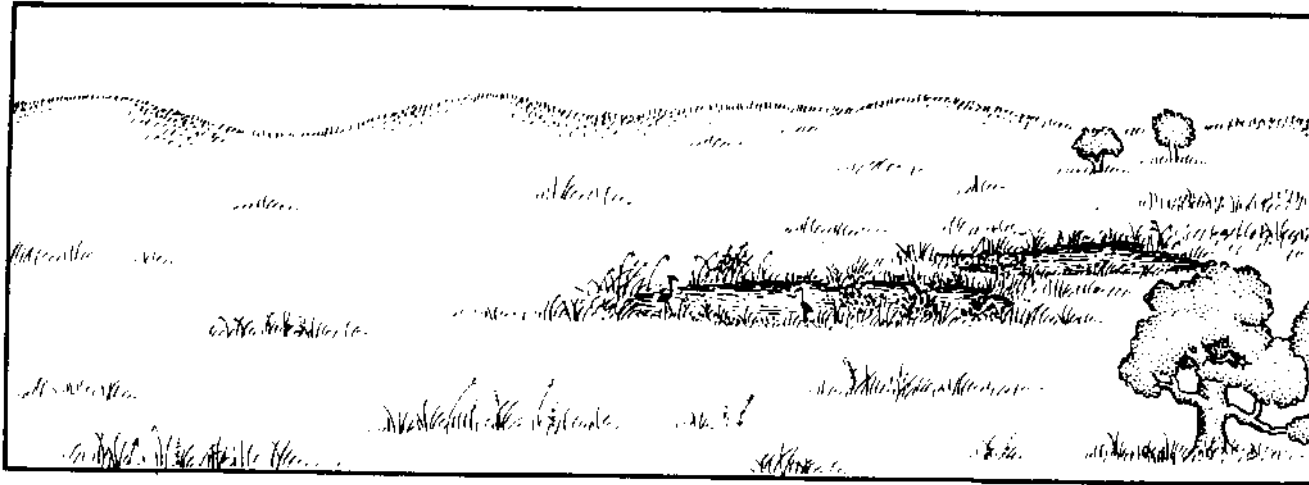
**-Frost, 2006**

**“In some instances shrubs or trees emerge above the canopy as scattered individuals to form savannas... An ecosystem may be designated a grassland when the canopy of grasses is continuous or nearly so”.**

**-Coupland, 1991**



# Prairies



A. Prairie: Grassland with few or no trees.





**Tallgrass Prairie (Baker Prairie Natural Area, Boone County)**





Bill Holimon/ANHC

**Tallgrass Prairie (Baker Prairie Natural Area, Boone County)**





Photo by Bill Holimon/ANHC

**Baker Prairie Natural Area – Boone County, Arkansas**





**Switchgrass (*Panicum virgatum*)**



**Indian Grass (*Sorghastrum nutans*)**



**Big Bluestem (*Andropogon gerardii*)**



**Little Bluestem (*Schizachyrium scoparium*)**



Prairie Gayfeather  
(*Liatris pycnostachya*)



Indian Paintbrush  
(*Castilleja coccinea*)



Sensitive Brier (*Mimosa quadrivalvis nuttallii*)



Pale Purple Coneflower  
(*Echinacea pallida*)



Butterfly Milkweed  
(*Asclepias tuberosa*)



Compass Plant  
(*Silphium laciniatum*)







Arkansas Beard-tongue  
(*Penstemon arkansanus*)



Large Coneflower (*Rudbeckia grandiflora*)

Warren Montague



Meadow Beauty  
(*Rhexia mariana*)



Green Milkweed  
(*Asclepias viridis*)



Cream False Indigo  
(*Baptisia bracteata*)



Narrow-leaf Sunflower  
(*Helianthus angustifolius*)

Photos by John Pelton



# **Major Grassland Types in the Ozarks**

- **dry prairie**
- **mesic prairie**
- **wet prairie/marsh**
- **fen**
- **acidic seepage prairie  
(historical)**
- **sand barrens**
- **limestone glade**
- **dolomite glade**
- **sandstone glade**
- **chert glade**
- **shale barrens**
- **riverscour barrens**





**Dry Prairie Remnant, Springfield Plateau**





Joan Reynolds

**Dry Prairie Remnant, Springfield Plateau**





Photos: Terry Stanfill

**Mesic Prairie Remnants, Benton County, Arkansas**





*Rhexia mariana*



*Calopogon  
oklahomensis*



*Platanthera  
lacera*

Photos: Joe Neal



**Ornate Box Turtle**  
(*Terrapene ornata*)



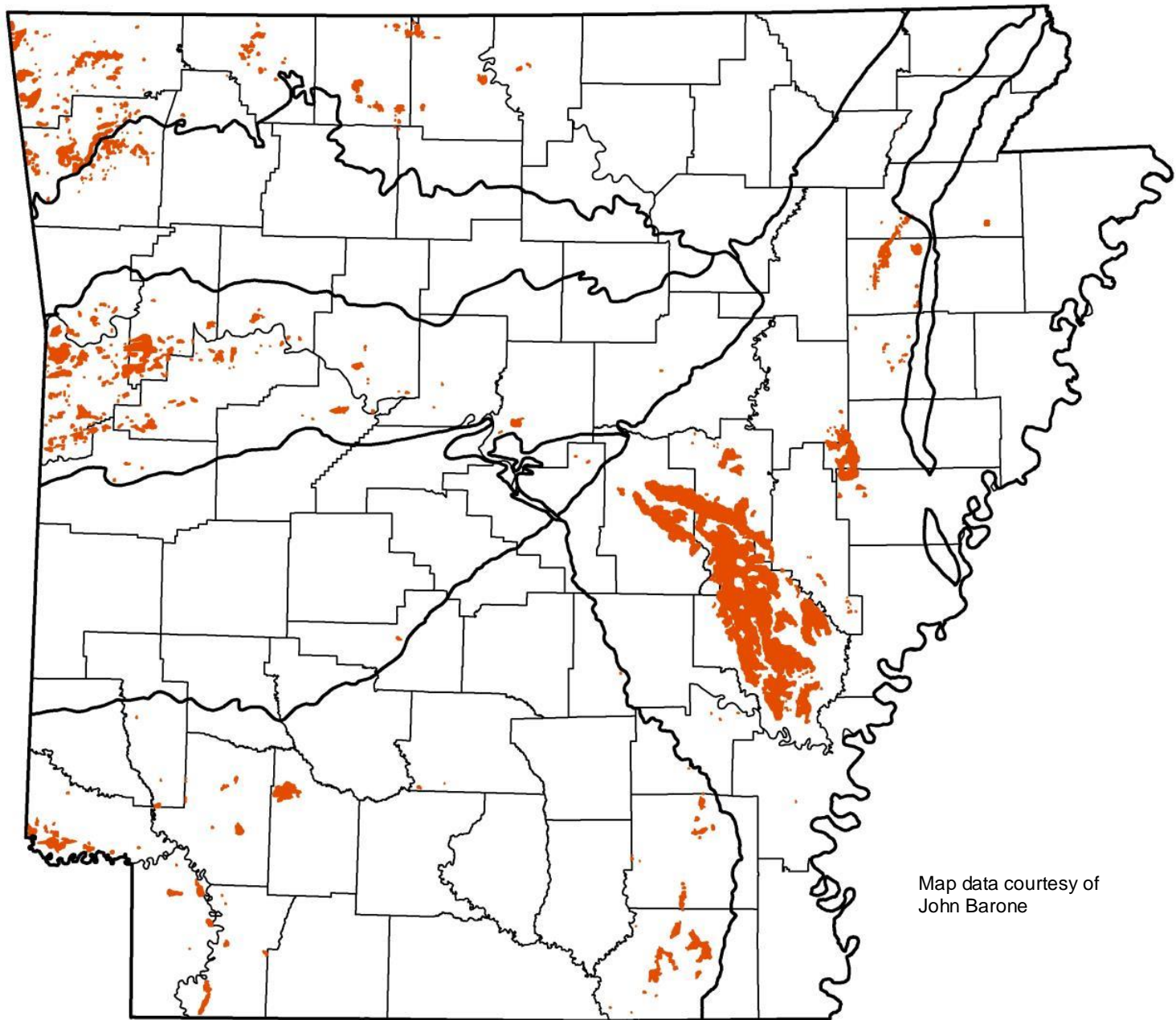
**Ozark Pocket Gopher (*Geomys bursarius ozarkensis*)**



**Black-tailed Jackrabbit**  
(*Lepus californicus*)







Map data courtesy of  
John Barone











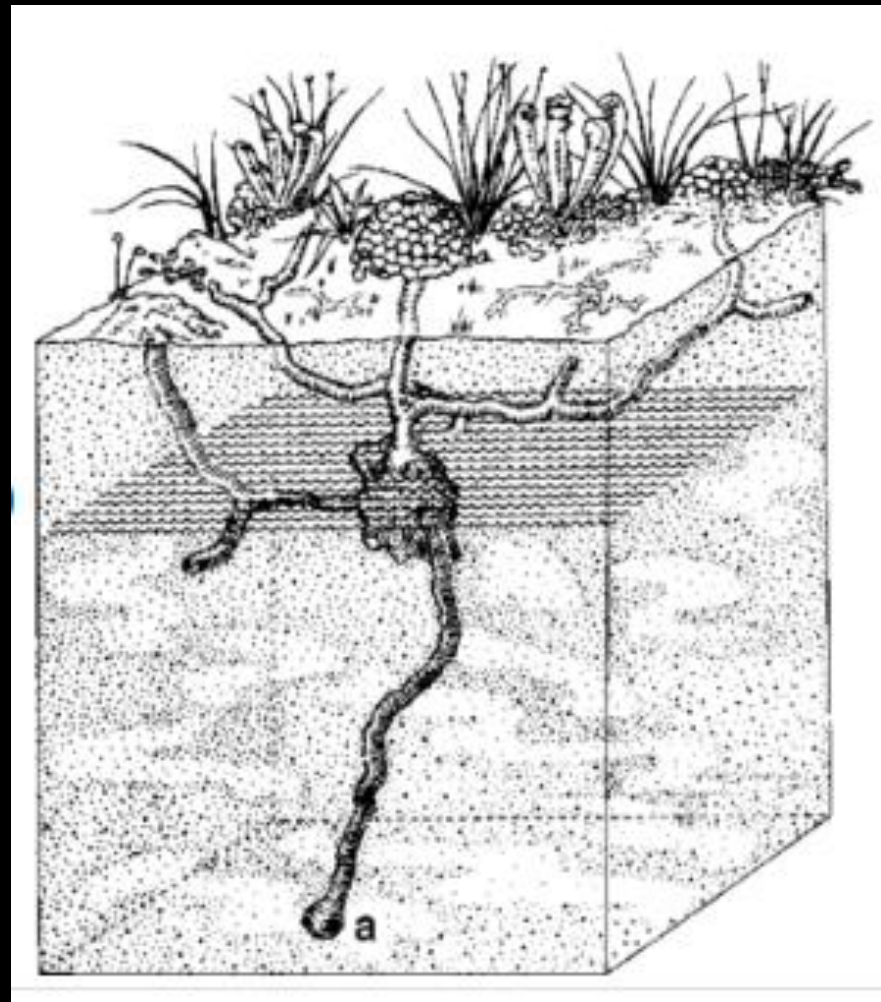




**Osage Burrowing Crayfish**  
**(*Procambarus liberorum*)**













**White-tailed Deer (*Odocoileus virginianus*)**



Casey Morris

**Bison (*Bison bison*)**



Larry Master/www.masterimages.org

**Elk (*Cervus elaphus*)**



Larry Master/www.masterimages.org

MasterImages





Graham's  
Crayfish  
Snake



Crawfish Frog



Monarch



Painted  
Bunting



Willow  
Flycatcher



Bobwhite  
Quail



Scissor-tailed Flycatcher

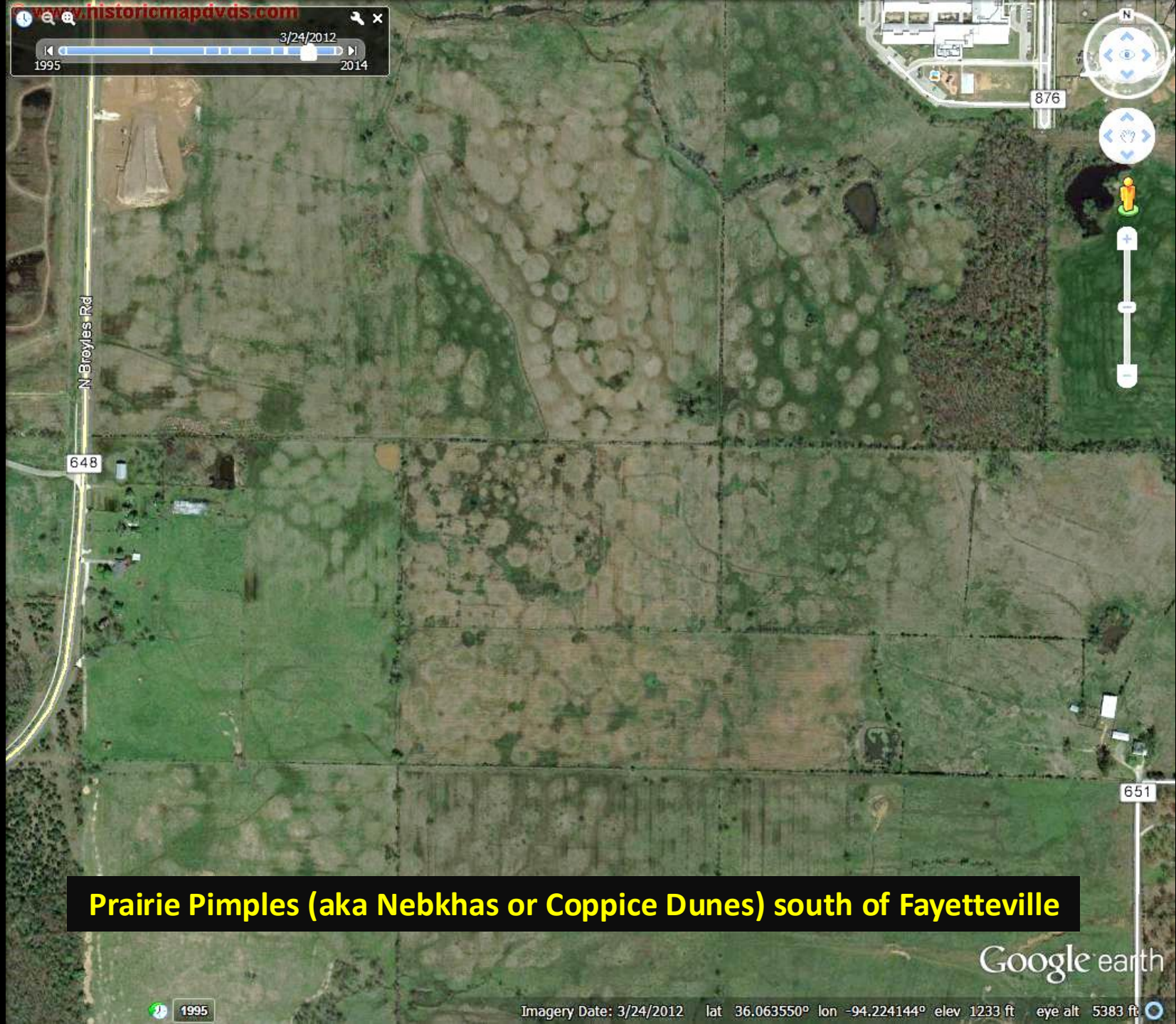




Photo by Jennifer Akin/ANHC

**Prairie Remnant with Pimple Mounds**



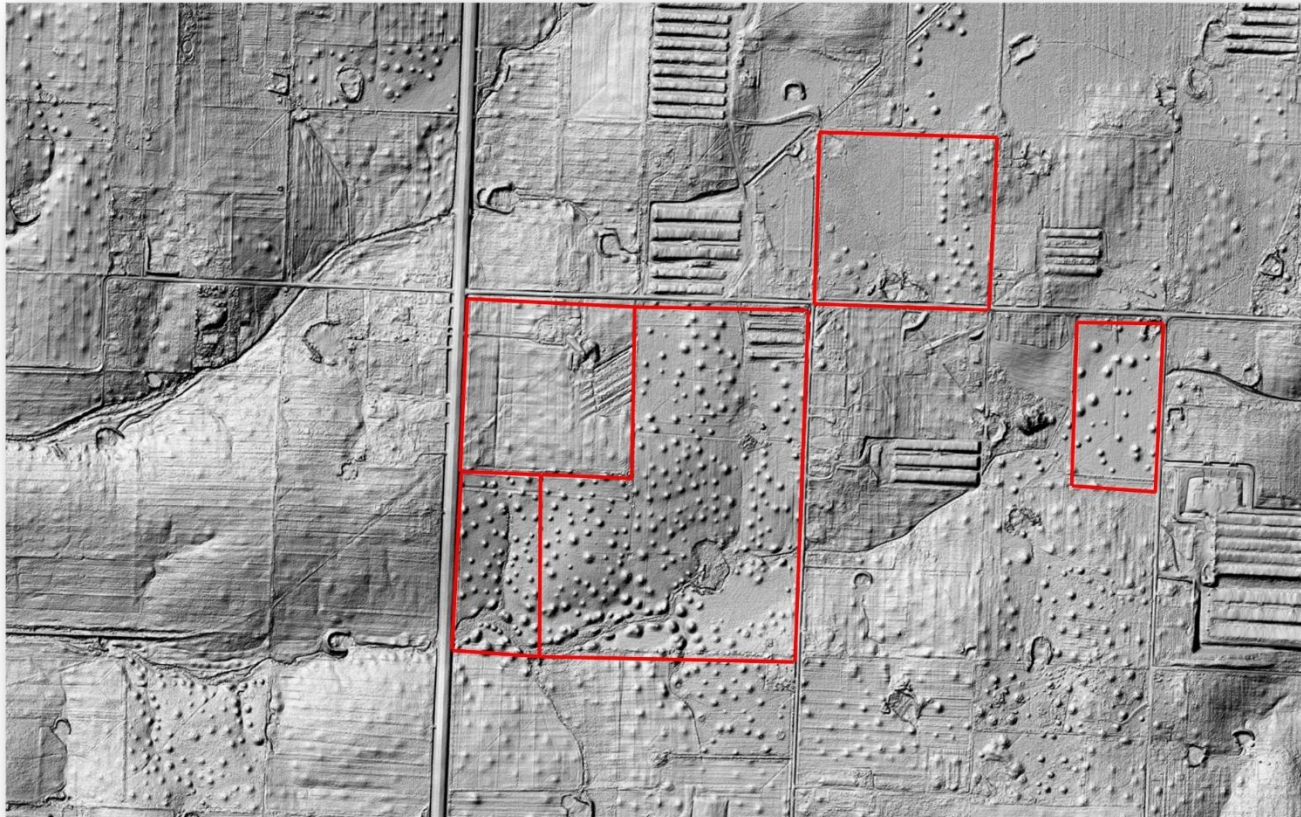


**Prairie Pimples (aka Nebkhas or Coppice Dunes) south of Fayetteville**

Google earth



**Proposed Lindsley's Prairie Natural Area, Sites 1-5 (from LiDAR)**



Source data:  
USGS



8/27/2019  
JA

**Prairie Pimples (aka Nebkhas or Coppice Dunes)**





Contents lists available at [ScienceDirect](#)

## Quaternary Research

journal homepage: [www.elsevier.com/locate/yqres](http://www.elsevier.com/locate/yqres)



# Relict nebkhas (pimple mounds) record prolonged late Holocene drought in the forested region of south-central United States

Christopher L. Seifert<sup>a</sup>, Randel Tom Cox<sup>a,\*</sup>, Steven L. Forman<sup>b</sup>, Tom L. Foti<sup>c</sup>,  
Thad A. Wasklewicz<sup>d</sup>, Andrew T. McColgan<sup>a</sup>

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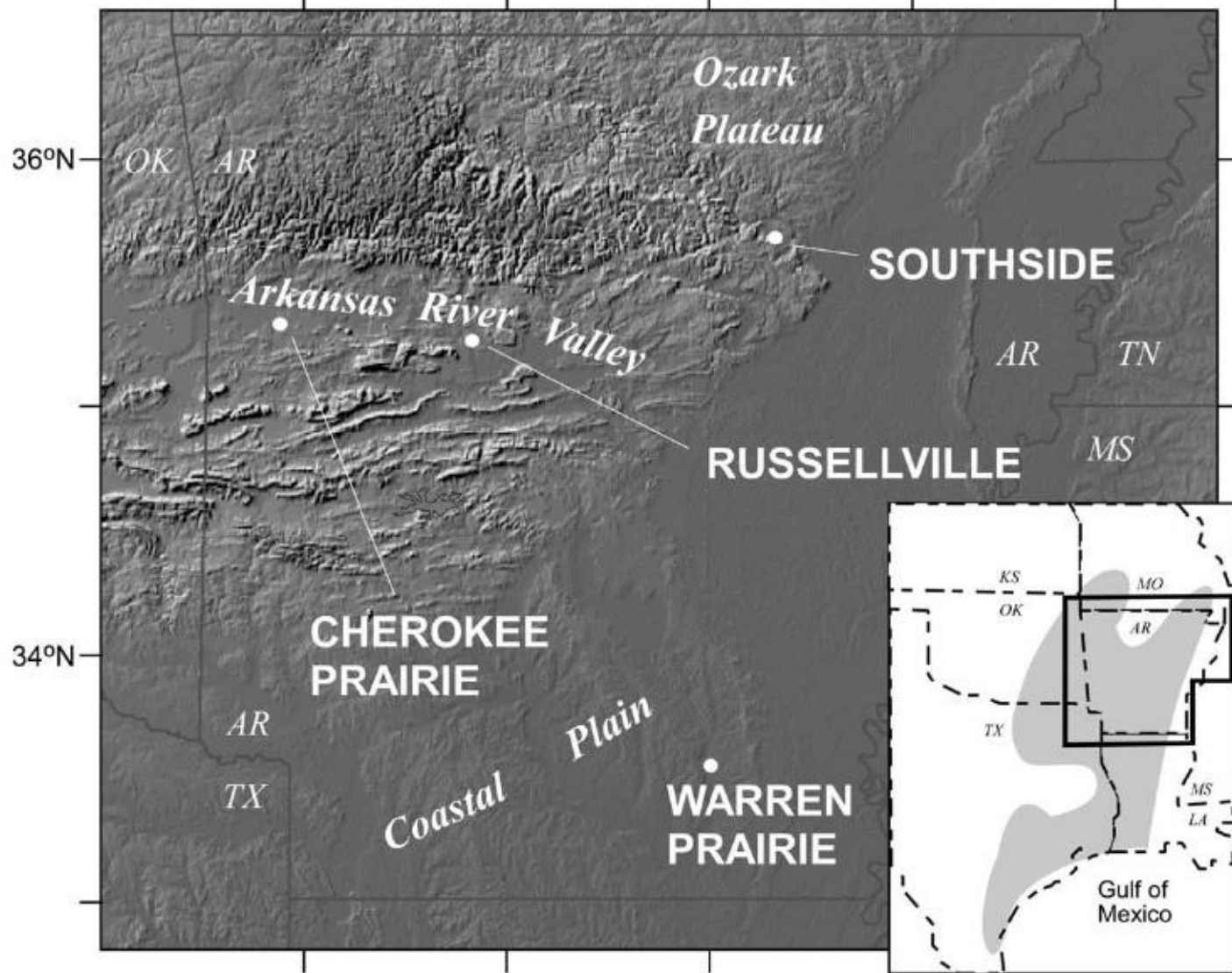
Eolian

### ABSTRACT

The origin and significance of pimple mounds (low, elliptical to circular dune-like features found across much of the south-central United States) have been debated for nearly two centuries. We cored pimple mounds at four sites spanning the Ozark Plateau, Arkansas River Valley, and Gulf of Mexico Coastal Plain and found that these mounds have a regionally consistent textural asymmetry such that there is a significant excess of coarse-grained sediment within their northwest flanks. We interpret this asymmetry as evidence of an eolian depositional origin of these mounds and conclude they are relict nebkhas (coppice dunes) deposited during protracted middle to late Holocene droughts. These four mounds yield optically stimulated luminescence

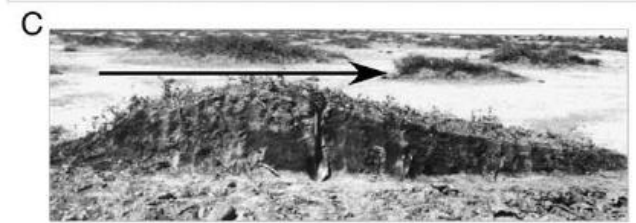
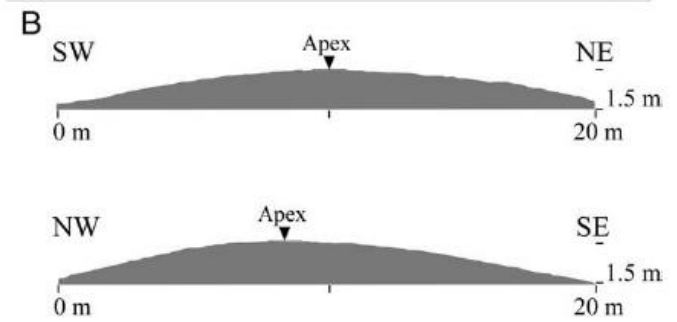
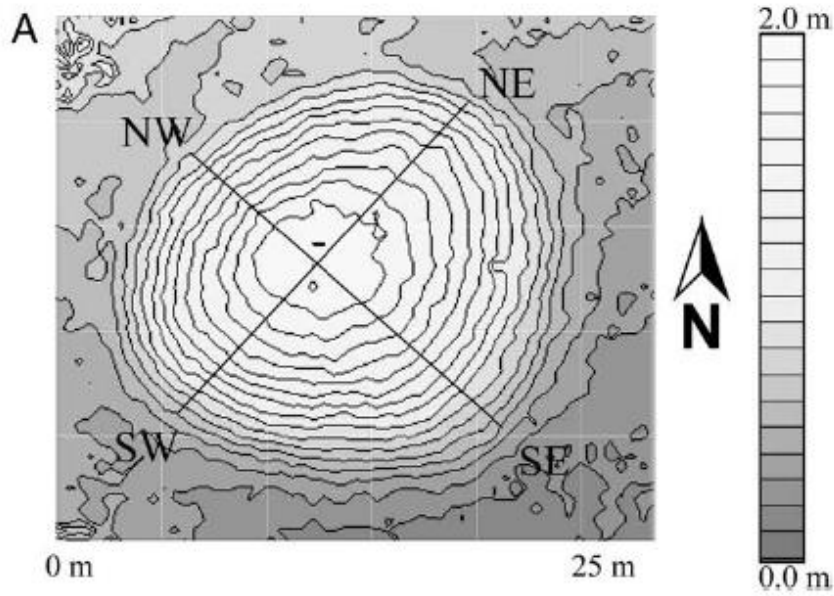
## Nebkhas (Coppice Dunes)



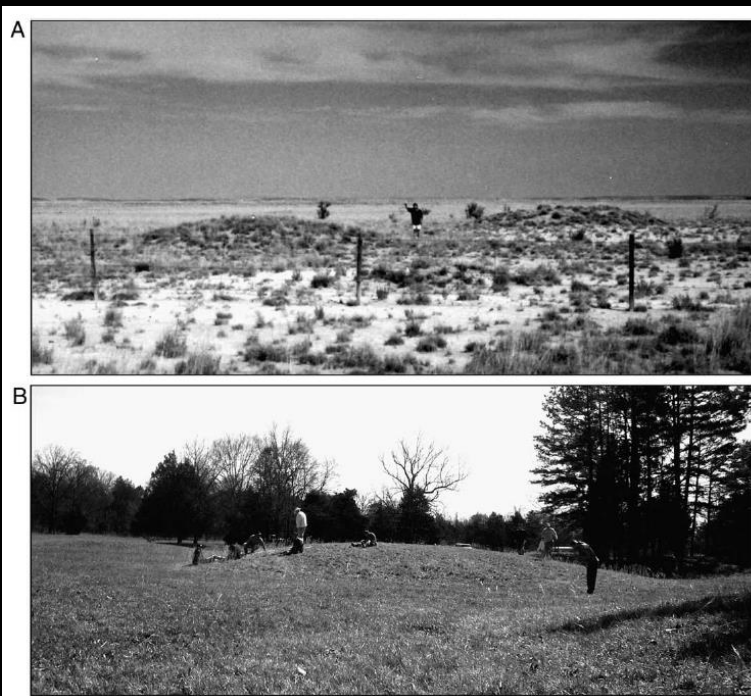


**Nebkhas (Coppice Dunes)**





Nebkha in Mali, West Africa



**Nebkhas (Coppice Dunes)**





*Corydalis crystallina*



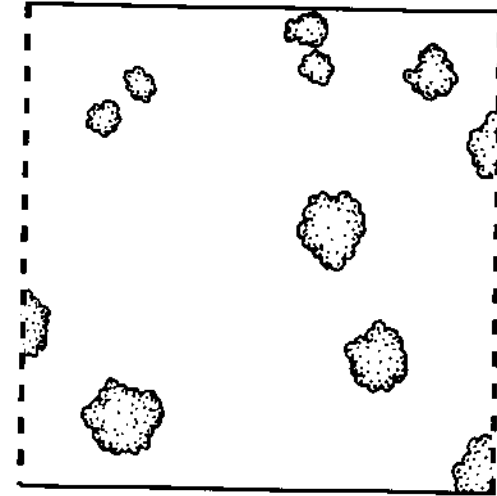
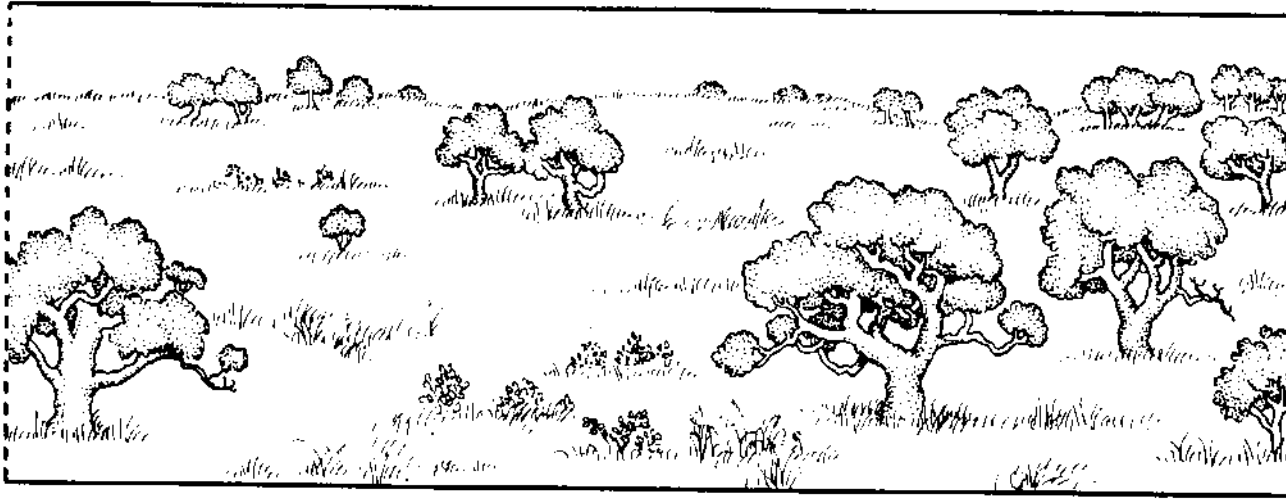




**Marsh, Washington County, Arkansas**



# Savannas



B. Savanna: Grassland with scattered trees. Trees may be oaks or pines, well-spaced or in clusters. May have extensive areas of shrubs and tree resprouts.





Photo by Mark Clark/TNC

**Blackland (Calcareous) Savanna (Terre Noire Natural Area, Clark County)**





Photo: Theo Witsell/ANHC

**Oak Savanna, Tallgrass Prairie, and Saline Barrens (Fort Chaffee, Franklin County)**





Beth Phillips

**Death Camas (*Toxicoscordion nuttallii*) - Fort Chaffee**







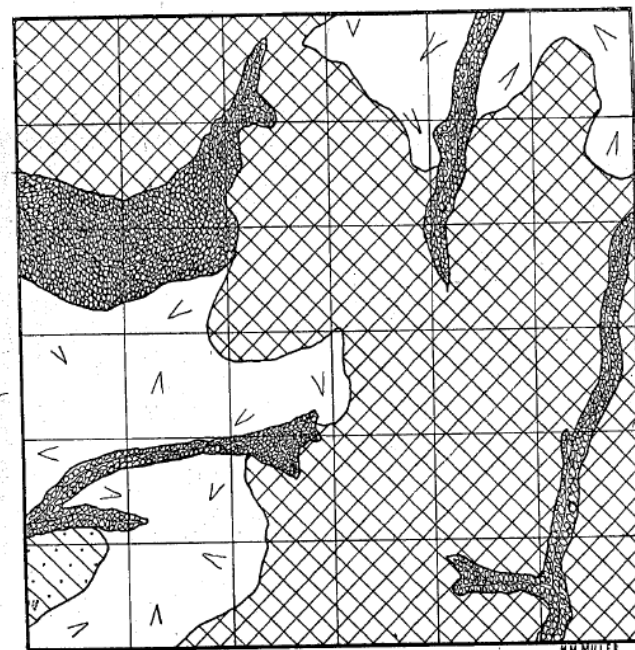




A Vegetal Reconstruction of Early  
Historic Northwest Arkansas

By  
Henry M. Miller

Department of Anthropology  
University of Arkansas  
1972



The Reconstructed Vegetation Zones of  
Township 14 North, Range 32 West

Scale  
1:63,360



Map based upon the original U.S.

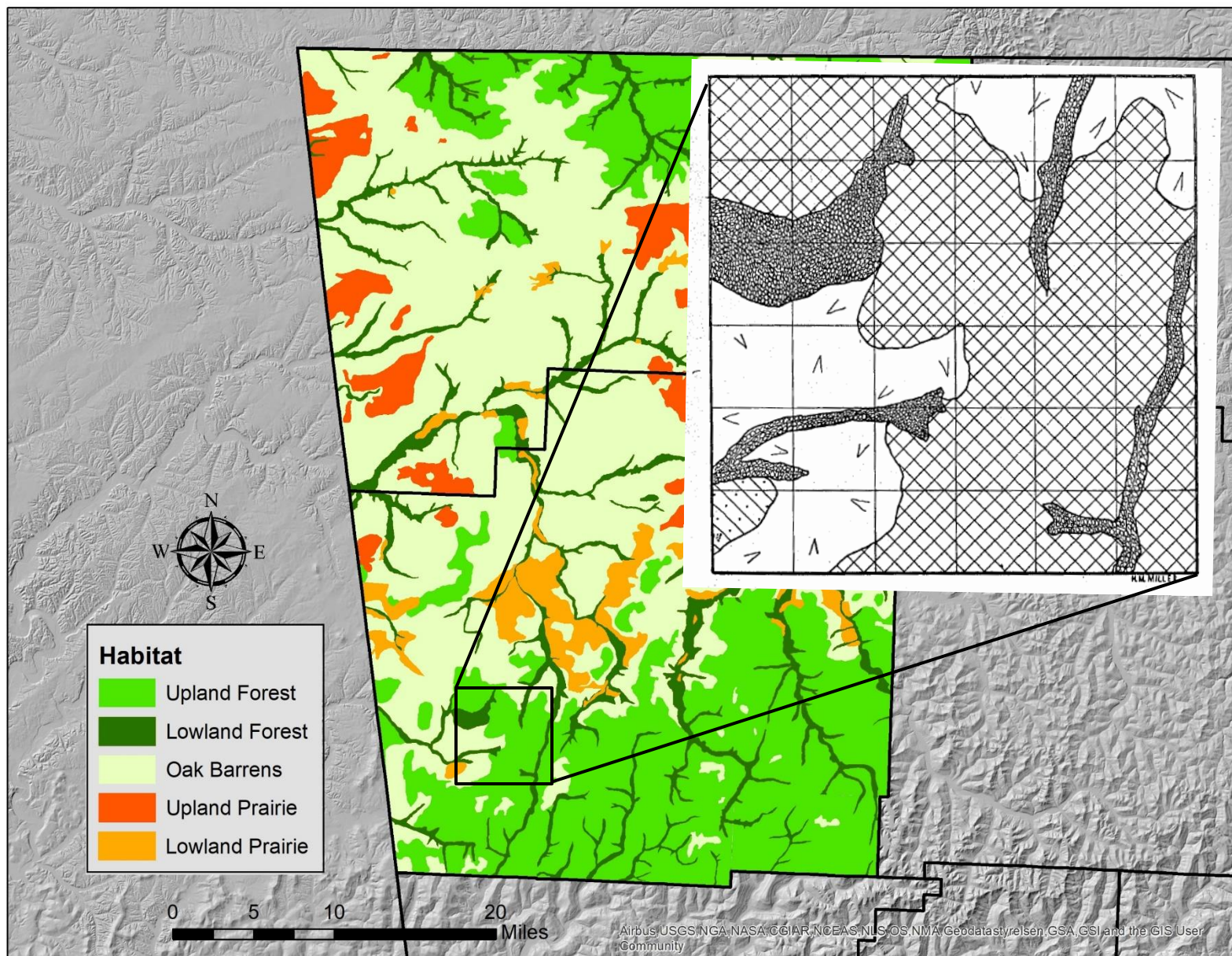
Government Land Survey Records

1831-1838

Legend

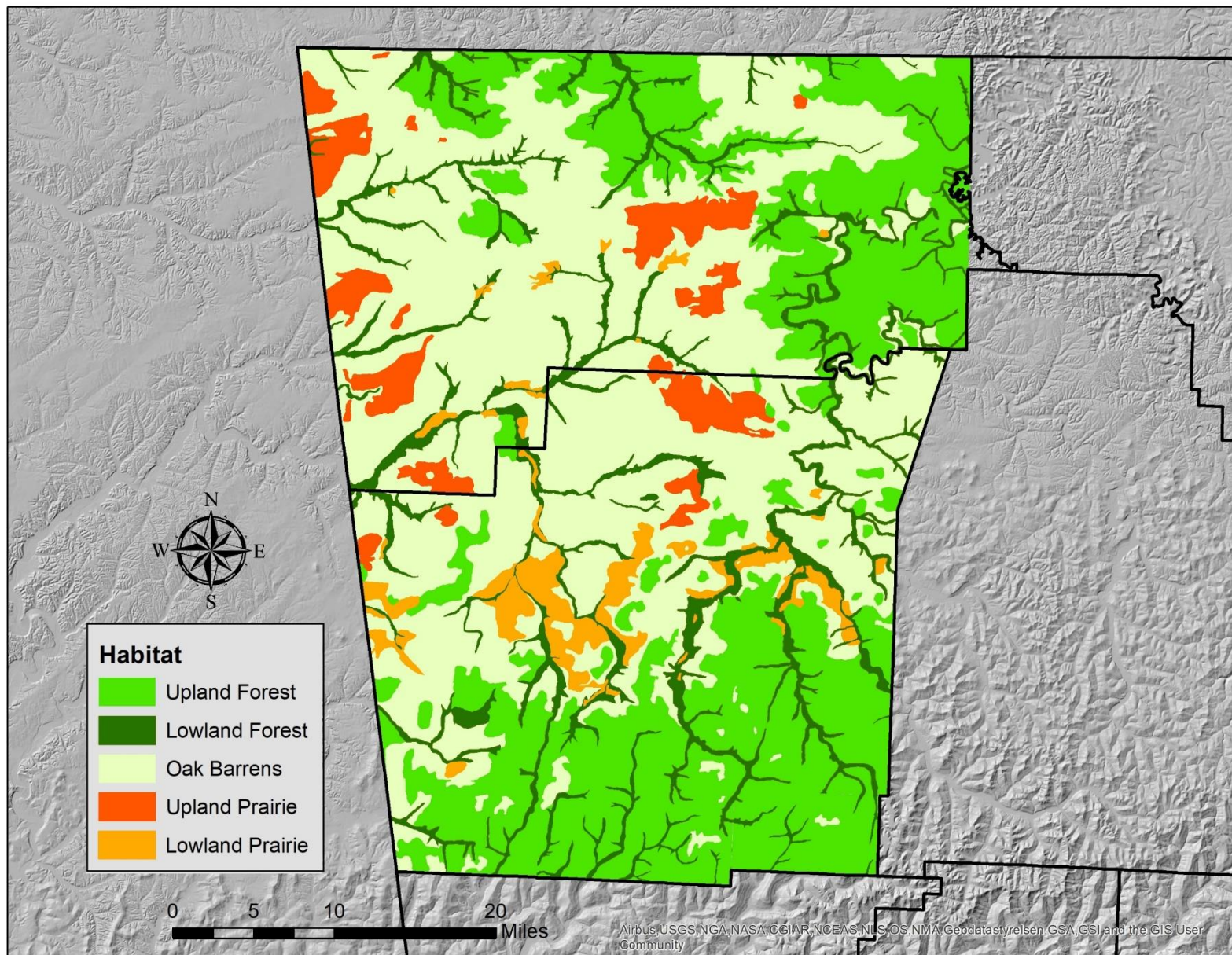
- |                 |  |
|-----------------|--|
| Oak Barrens     |  |
| Lowland Forest  |  |
| Lowland Prairie |  |
| Upland Forest   |  |
| Upland Prairie  |  |





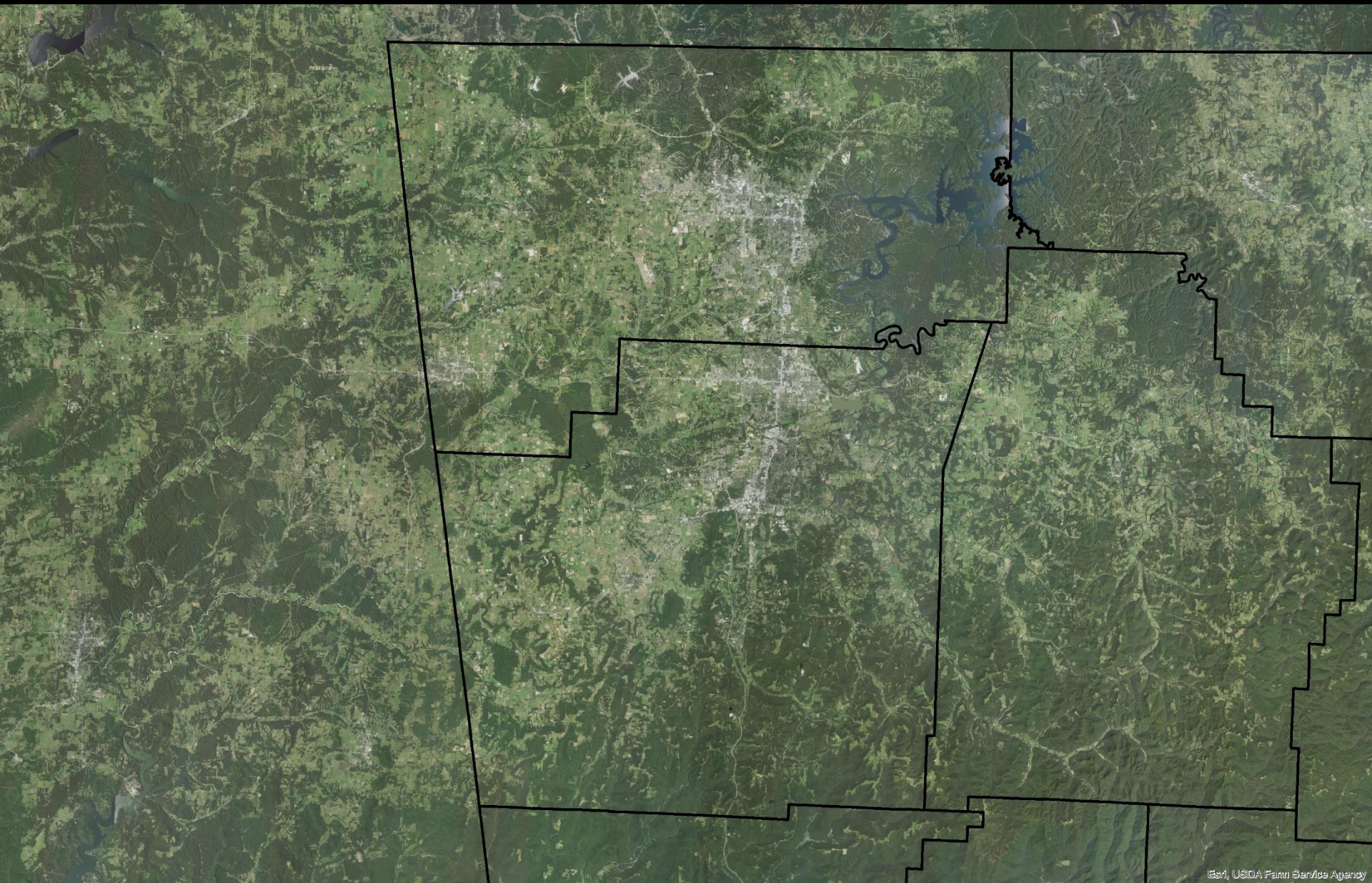
1830s Vegetation Map from *A Vegetal Reconstruction of Early Historic Northwest Arkansas* by Henry M. Miller





1830s Vegetation Map from *A Vegetal Reconstruction of Early Historic Northwest Arkansas* by Henry M. Miller

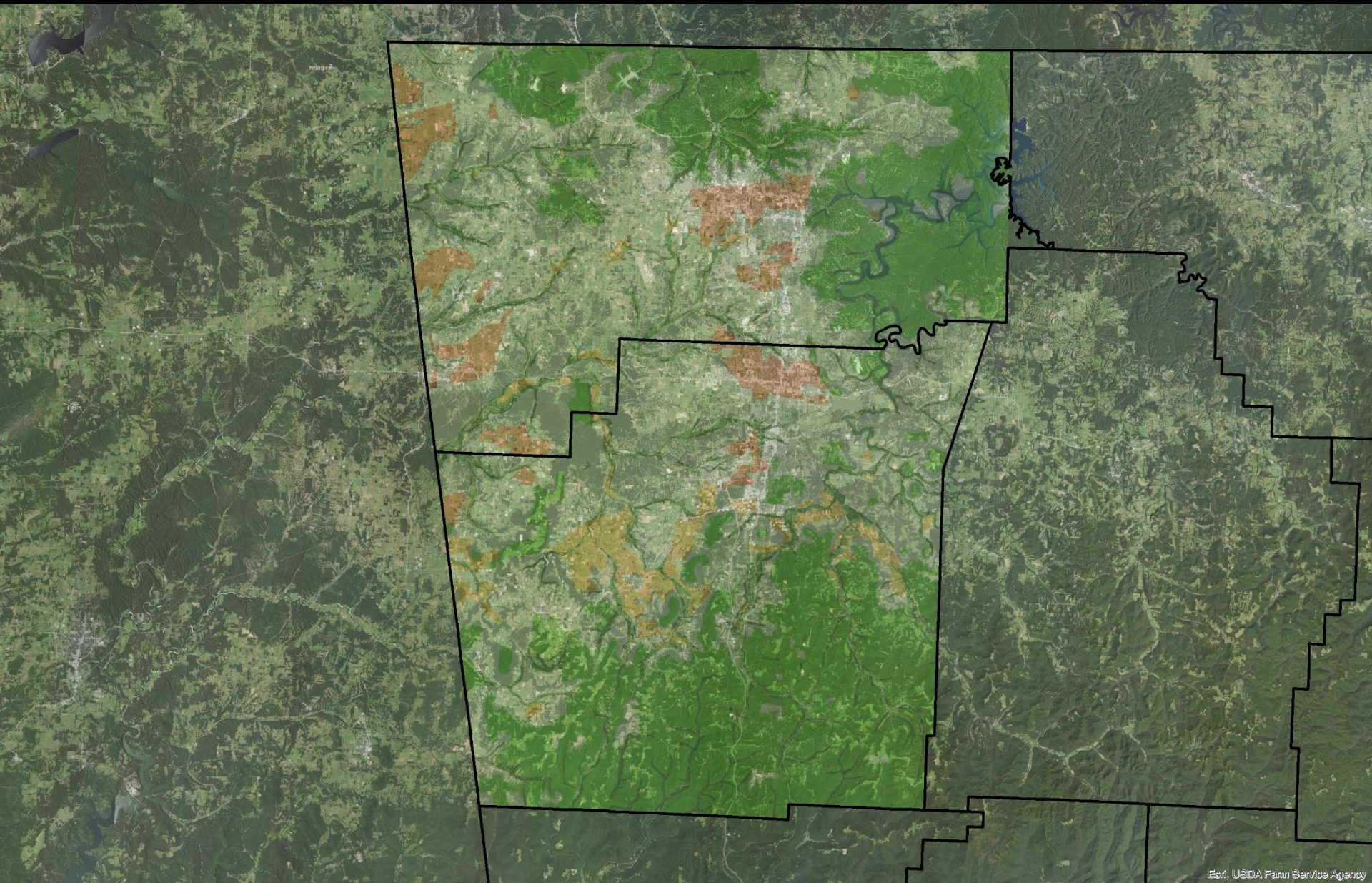




ESRI, USDA Forest Service Agency

**1830s Vegetation Map from *A Vegetal Reconstruction of Early Historic Northwest Arkansas* by Henry M. Miller**



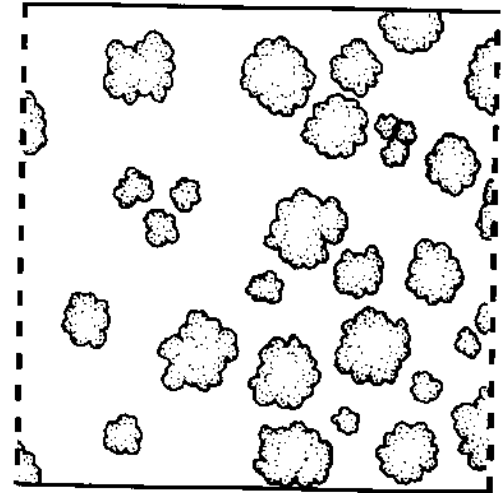
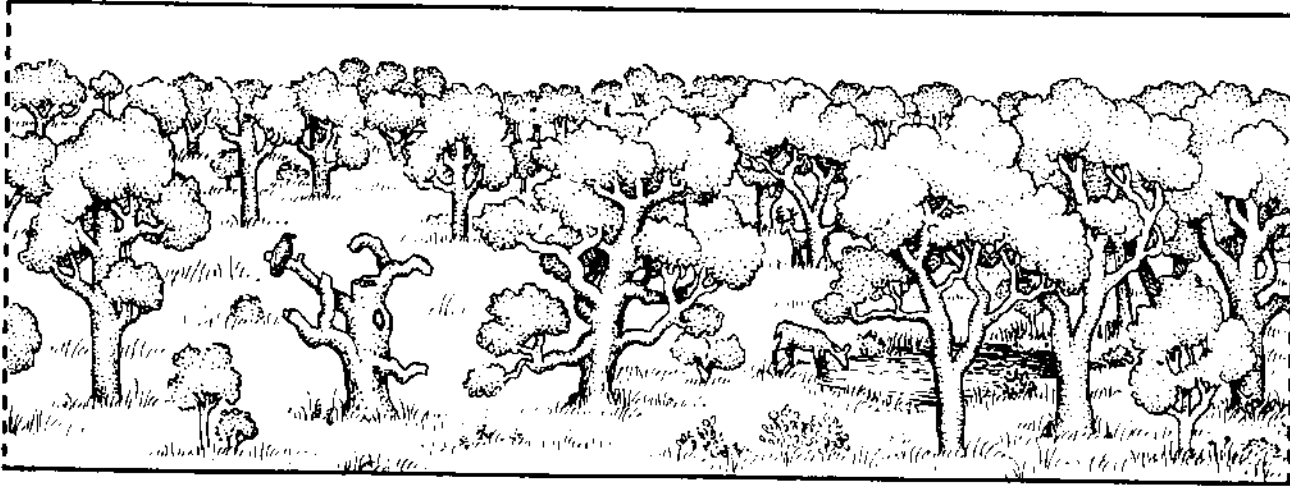


ESRI, USDA Farm Service Agency

1830s Vegetation Map from *A Vegetal Reconstruction of Early Historic Northwest Arkansas* by Henry M. Miller



# Woodlands



C. Woodland: An open forest with a vigorous turf of grasses and flowers throughout the growing seasons. Depends on frequent fire. Many trees have spreading lower limbs. Bright enough for oak or pine regeneration (i.e. less than 80% canopy cover).





Photo: McRee Anderson/TNC

**Post Oak Woodland (Fort Chaffee, Sebastian County)**





Photo: John Andre/USFS

**Post Oak Woodland (Ozark National Forest, Pope County)**





John Andre

**Post Oak Woodland (Ozark National Forest, Van Buren County)**



# WOODLAND/SAVANNA INDICATORS

- Typically low diversity of trees and shrubs, but those present well-adapted to drought and fire
- Mature trees *often* short, stunted, and gnarly
- Shortleaf pine *often* present on acidic sites
- Diversity of light-dependent, often drought-adapted understory plants
  - Spring ephemeral wildflowers
  - Species that require summer sun to thrive and reproduce in Not especially dry on average
- Landscape context exposes site to sun, wind, fire





**Post Oak**



**Post Oak**



**Blackjack Oak**



**Blackjack Oak**



**Chinquapin Oak**