



Threatened and Endangered Species Overview

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Arkansas Natural Heritage Commission




The Arkansas Natural Heritage Commission is one of seven agencies of the Department of Arkansas Heritage.



The Department of
Arkansas Heritage

These agencies work together to protect, preserve and interpret Arkansas's natural and cultural heritage.



Endangered Species Act (ESA) of 1973

The purpose of the ESA is to protect and recover imperiled species and ecosystems upon which they depend.

The ESA defines an “endangered species” as any species in danger of extinction throughout all or a significant portion of its range.” A “threatened” species is one likely to become endangered within the foreseeable future throughout all or a significant portion of its range.”

The ESA has become one of the most effective tools in the continuing effort to protect imperiled species and their habitats in the U.S.

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Before the ESA

1900: **The Lacey Act** became the first federal law protecting wildlife. Today it regulates the import of any species protected by international or domestic law and prevents the spread of invasive, or non-native, species.

1903: President Theodore Roosevelt establishes the first **National Wildlife Refuge** at Pelican Island, Florida, to protect wood storks, brown pelicans, and other dwindling water birds. (Today, national wildlife refuges support nearly 300 endangered and threatened plant and animal species.)

1914: The passenger pigeon, once the most abundant bird in North America, and perhaps the world, becomes **extinct**.

1916: The United States and Great Britain (on behalf of Canada) adopted a uniform system of protection for certain species of birds that migrate between the United States and Canada. On July 3, 1918, the United States passed the **Migratory Bird Treaty Act** to implement the treaty.

1944: The whooping crane population reaches its lowest population level, with only **21 birds** remaining.

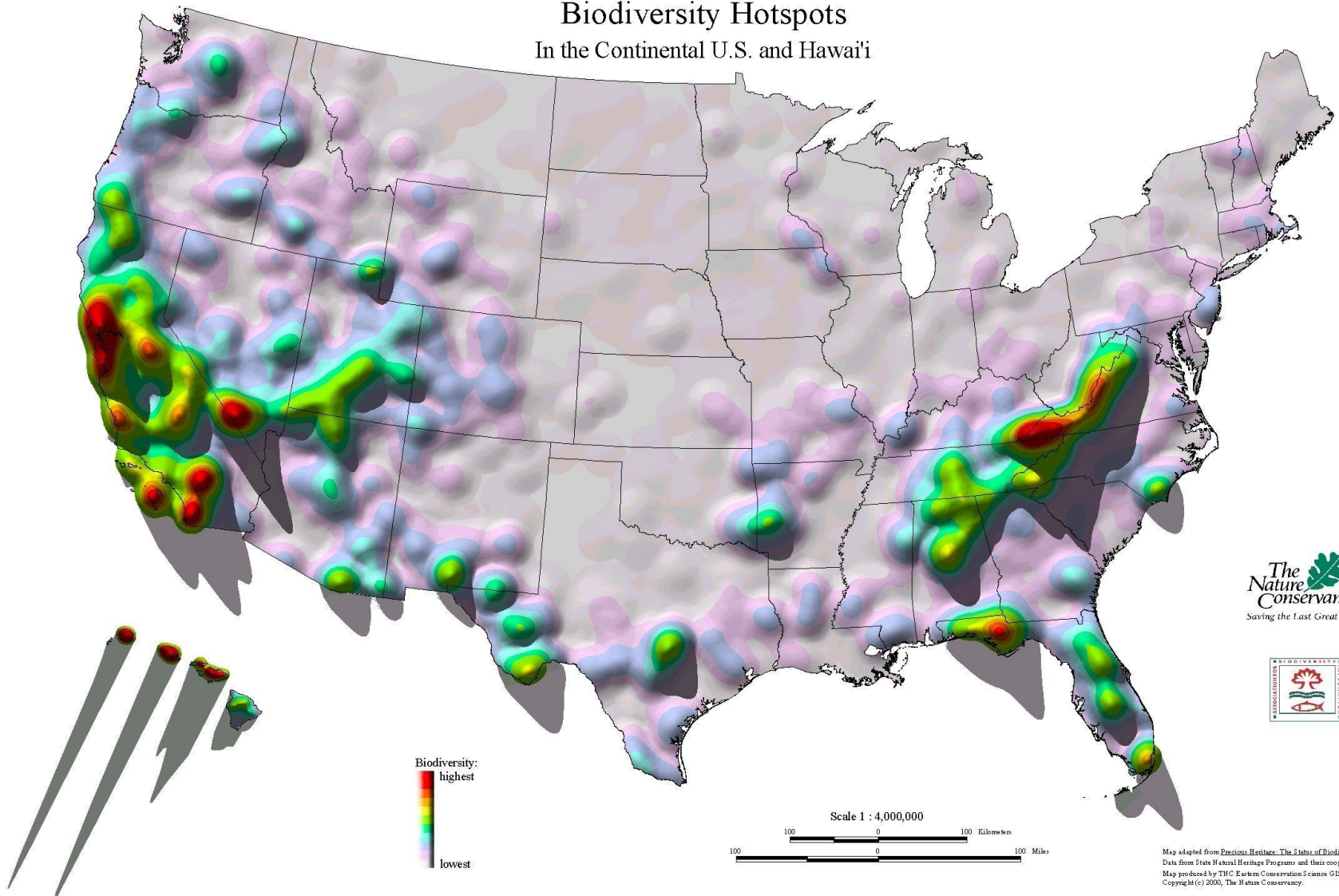
1966: **Endangered Species Preservation Act** of 1966 authorizes land acquisition to conserve “selected species of native fish and wildlife.”

1969: **Endangered Species Conservation Act** of 1969 expands on the 1966 act, authorizing the compilation of a **list of animals “threatened with worldwide extinction”** and prohibits their importation without a permit. Crustaceans and mollusks are included for protection, along with mammals, fish, birds, and amphibians.

1973: **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** - 80 nations sign this treaty to protect designated plant and animal species by regulating or **prohibiting international trade** in certain taxa except by permit.

Why do we (AR) have T&E Species???

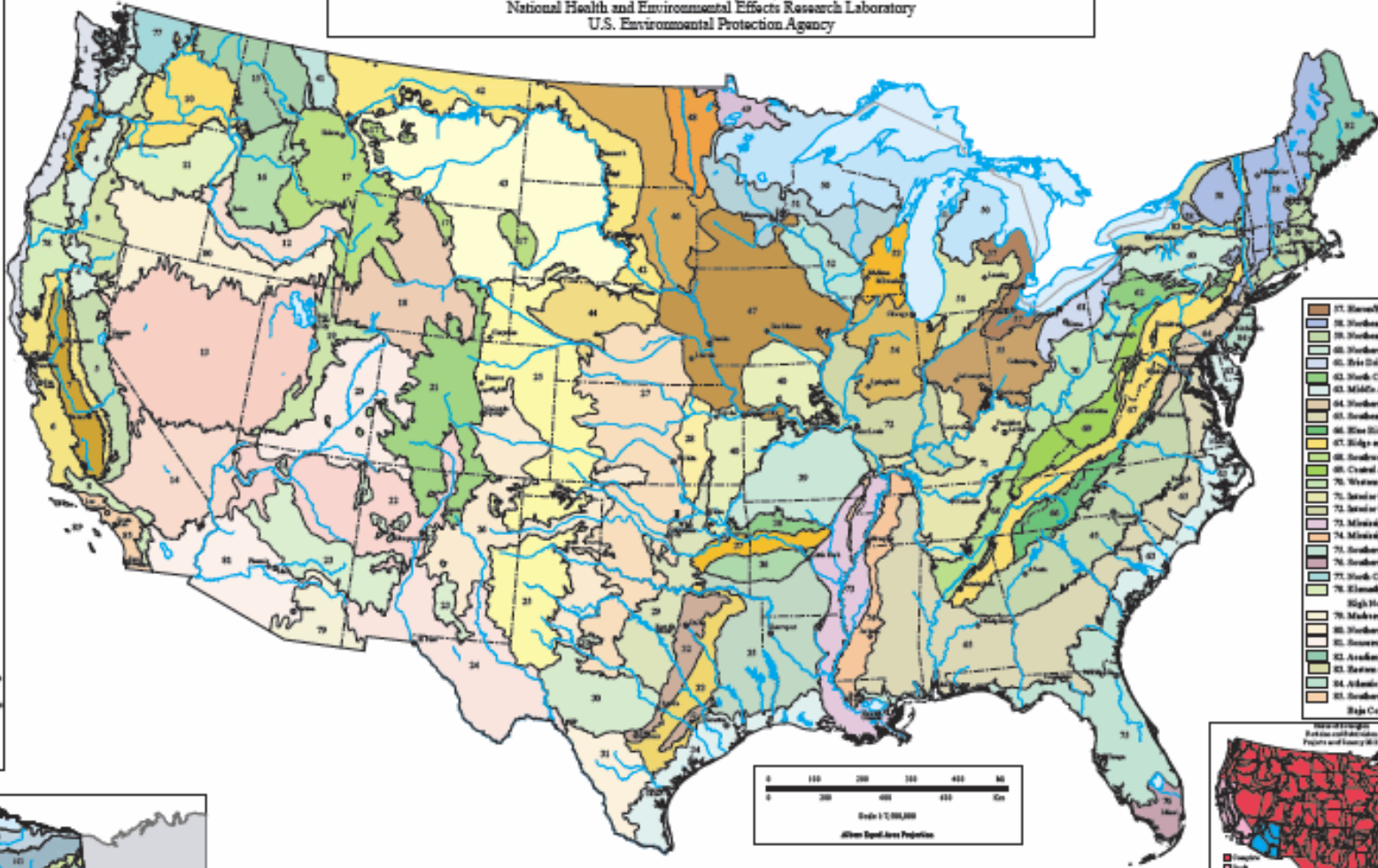
Biodiversity Hotspots
In the Continental U.S. and Hawai'i



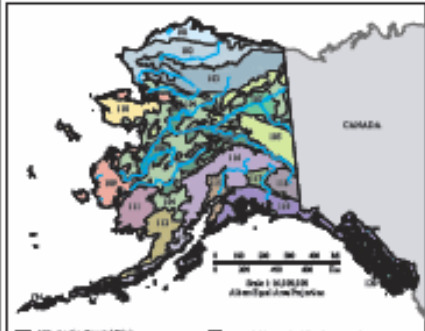
Level III Ecoregions of the Continental United States

(Revised January 2011)
National Health and Environmental Effects Research Laboratory
U.S. Environmental Protection Agency

- 1. Coast Range
- 2. Puget Lowland
- 3. Willamette Valley
- 4. Cascade
- 5. Klamath
- 6. Central California Piedmont and Coastal Mountains
- 7. Central California Valley
- 8. Southern California Mountains
- 9. Eastern Cascade Slopes and Piedmont
- 10. Columbia Basin
- 11. Blue Mountains
- 12. Snake River Plain
- 13. Coastal Basin and Range
- 14. Mojave Basin and Range
- 15. Northern Rockies
- 16. Idaho Batholith
- 17. M&M Basin
- 18. Wyoming Basin
- 19. Washita and Texas Mountains
- 20. Colorado Plateau
- 21. Southern Rockies
- 22. Arizona/New Mexico Plateau
- 23. Arizona/New Mexico Mountains
- 24. Chihuahuan Desert
- 25. High Plains
- 26. Southwestern Badlands
- 27. Central Great Plains
- 28. Pine Hills
- 29. Cross Timbers
- 30. Edwards Plateau
- 31. Southern Texas Plains
- 32. Texas Blackland Prairie
- 33. East Central Texas Plains
- 34. Western Gulf Coastal Plain
- 35. South Central Plains
- 36. Ozarkian Mountains
- 37. Arkansas Valley
- 38. Eastern Mountains
- 39. Ozark Highlands
- 40. Central Georgia Plains
- 41. Carolina Piedmont
- 42. Mountainous Piedmont Plateau
- 43. Piedmont Coastal Plain
- 44. Atlantic Coastal Hills
- 45. Piedmont
- 46. Northern Coastal Plains
- 47. Western Cross Belt Plains
- 48. Lake Apalachicola
- 49. Northern Mississippi Valleys
- 50. Northern Lakes and Forests
- 51. South Coastal Plain of the Carolinas
- 52. Delaware Area
- 53. Southeastern Virginia Piedmont
- 54. Central Cross Belt Plains
- 55. Eastern Cross Belt Plains
- 56. Southern Mid-Atlantic/Piedmont
- 57. Indiana Dells Plains



- 57. Erie/Ontario Lake Plains
- 58. Northeast Highlands
- 59. Northeast Coastal Zone
- 60. Western Allegheny Plateau
- 61. Erie O&B Plain
- 62. North Central Appalachians
- 63. Middle Atlantic Coastal Plain
- 64. Northern Piedmont
- 65. Southeastern Plains
- 66. New England
- 67. Ridge and Valley
- 68. Southwestern Appalachians
- 69. Central Appalachians
- 70. Western Allegheny Plateau
- 71. Sandhills
- 72. Sandhills and River Valleys and Hills
- 73. Mississippi Alluvial Plain
- 74. Mississippi Valley Lower Plains
- 75. Southern Coastal Plain
- 76. Southern Florida Coastal Plain
- 77. North Carolina
- 78. Elkhorn Mountains/Columbia High North Coast Range
- 79. Modern Appalachians
- 80. Western Basin and Range
- 81. Southern Basin and Range
- 82. Acadian Forest and Hills
- 83. Eastern Great Lakes Lowlands
- 84. Atlantic Coastal Plain Province
- 85. Southern California/South Baja Coast



- 100. Arctic Coastal Plains
- 101. Arctic Foothills
- 102. Denali Range
- 103. Interior Foothill Lowlands and Tundra
- 104. Interior Highlands
- 105. Interior Plateaus
- 106. Yukon Flats
- 107. Porcupine Mountains
- 108. Yukon Coastal Plains
- 109. Yukon Plateaus
- 110. Arctic Foothills
- 111. Arctic Coastal Lowlands
- 112. Arctic Coastal Lowlands
- 113. Arctic Coastal Lowlands
- 114. Arctic Coastal Lowlands
- 115. Arctic Coastal Lowlands
- 116. Arctic Coastal Lowlands
- 117. Arctic Coastal Lowlands
- 118. Arctic Coastal Lowlands
- 119. Arctic Coastal Lowlands
- 120. Arctic Coastal Lowlands

The ecoregions shown here have been derived from Cowardin (1977) and have refinements of Cowardin's boundaries that have been made for other projects. These changes are generally simplified polygons, modified in collaboration with the U.S. EPA regional offices, state resource management agencies, and with other federal agencies, primarily reflecting changes in land use, vegetation, and land cover. The ecoregions are not intended to be used as a basis for environmental assessment, resource management, or land-use planning. They are intended to be used as a general reference system for environmental assessment, resource management, and land-use planning. The ecoregions are not intended to be used as a basis for environmental assessment, resource management, or land-use planning. They are intended to be used as a general reference system for environmental assessment, resource management, and land-use planning.

Dryden, J.J., S.E. Shultz, J.M. Cowardin, H.L. Fausch, R.P. Hartigan, U.S. Hawks, L.M. Smith, and D.E. Chapman. 2004. Ecoregions of the United States (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Oliver, A.L., T.S. Whitton, D.P. Lauen, J.M. Cowardin, and S.M. Hughes. 1993. Reproduction as a tool for comparing riverine systems. *Environmental Biology of Fishes*, U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR. 179.

Oliver, A.L., T.S. Whitton, L.M. Cowardin, and M.B. Stealy. 1991. Ecoregions of Idaho. U.S. Geological Survey Professional Paper 1402. U.S. Environmental Printing Office, Washington, D.C. 17 p.

Oliver, A.L., S.L. Pyle, J.M. Cowardin, J.A. Corbett, A.C. Pyle, S. Rother, G.L. Roth, and D. Steiner. 1989. Ecoregions of Utah (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Oliver, A.L., S.L. Pyle, J.M. Cowardin, M.B. Stealy, W.S. Seidel, D.S. Lane, J.B. Gross, and V.B. Bellows. 2002. Ecoregions of North Carolina and South Carolina (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Nelson, C.L., A.J. White, J.M. Cowardin, S.A. Ryan, M. Edwards, J.A. Stone, J. Doolittle, S.C. Crowder, J.A. Cowardin, and M.B. Stealy. 2002. Ecoregions of Florida (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Cowardin, J.M. 1982. Ecoregions of the conterminous United States. *Water Resources Bulletin* 18(2):52-60.

Chapman, D.E. 1991. Ecoregions of the United States: an environmental assessment. In *National Atlas and Climate Data for the United States* (ed. by J. M. Cowardin, S. E. Shultz, and T. P. Lauen), pp. 10-15. Lewis Publishers, Chelsea, MI. 70 p.

Cowardin, J.M. 1984. Ecoregions of the United States: an environmental assessment. *Environmental Management* 10(2): 101-102.

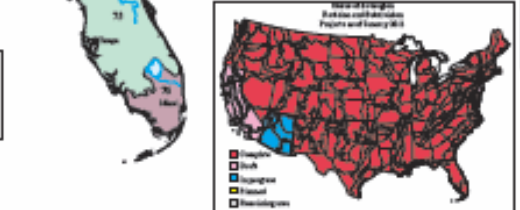
Cowardin, J.M., S.E. Shultz, S.A. Ryan, and B.T. Coster. 2004. Ecoregions of Wisconsin: Description of the Wisconsin Ecoregions of Wisconsin Areas and Maps. U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Thomson, T.O., J.A. Pyle, J.M. Cowardin, J.J. Walsh, J.M. Cowardin, J. Corbett, D.E. Shultz, and J.A. Cowardin. 2003. Ecoregions of Oregon (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

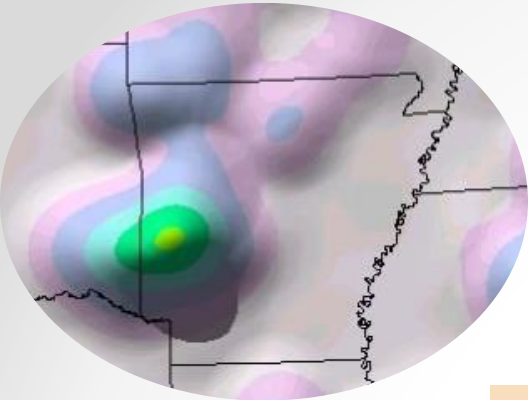
Waltz, E. 1984. Ecoregions of the Pacific Northwest: Canada. *Environmental Canada: Environmental Research Laboratory*, U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

Waltz, E., J.M. Cowardin, D.E. Shultz, and C.M. Edwards. 1990. Level III and IV ecoregions of the Pacific Northwest (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.

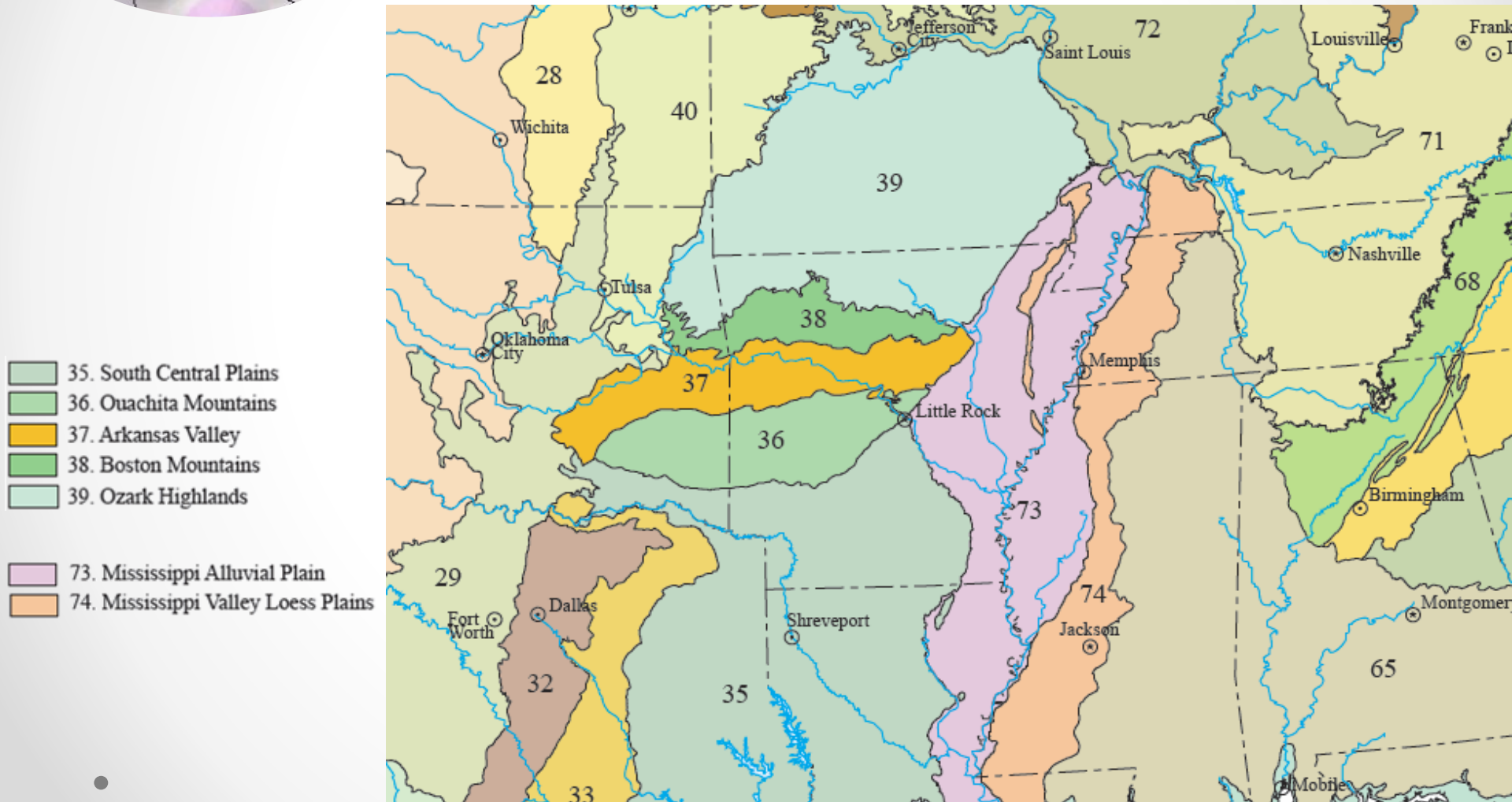
U.S. Environmental Protection Agency. National Health and Environmental Effects Research Laboratory, Corvallis, OR. 1990. Ecoregions of the United States (map series). U.S. Geological Survey, Reston, VA. Scale 1:1,000,000.



The ecoregion and sub-ecoregion boundaries shown here are based on Cowardin (1977) and have refinements of Cowardin's boundaries that have been made for other projects. These changes are generally simplified polygons, modified in collaboration with the U.S. EPA regional offices, state resource management agencies, and with other federal agencies, primarily reflecting changes in land use, vegetation, and land cover. The ecoregions are not intended to be used as a basis for environmental assessment, resource management, or land-use planning. They are intended to be used as a general reference system for environmental assessment, resource management, and land-use planning.



Level III Ecoregions



27 T&E Species in Arkansas

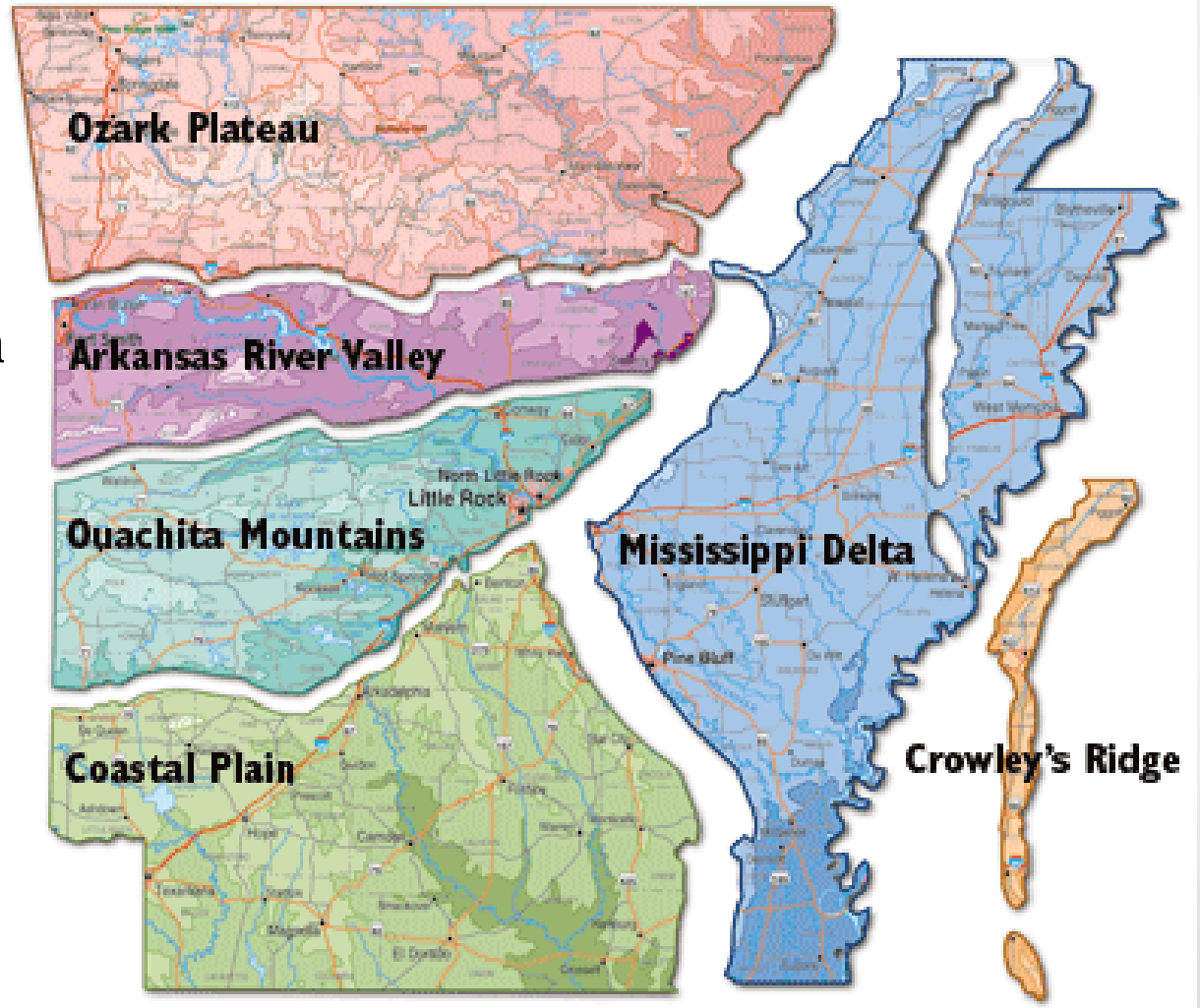
23 Animals

4 Plants

129 endemic species in
Arkansas

117 Animals

12 Plants



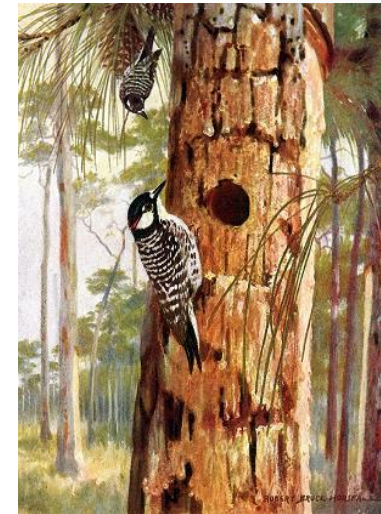
MAMMALS



Gray bat (*Myotis grisescens*)

Indiana bat (*Myotis sodalis*)

Ozark big-eared bat (*Corynorhinus townsendii ingens*)



BIRDS

Interior Least Tern (*Sterna antillarum*)

Red-cockaded Woodpecker (*Picoides borealis*)





FISH

- Ozark cavefish (*Amblyopsis rosae*)
- Leopard darter (*Percina pantherina*)
- Arkansas River Shiner (*Notropis girardi*)
- Pallid sturgeon (*Scaphirhynchus albus*)
- Yellowcheek darter (*Etheostoma moorei*)
- Arkansas darter (*Etheostoma cragini*)



AMPHIBIAN

- Ozark hellbender
(*Cryptobranchus alleganiensis bishopi*)

INVERTEBRATES



12 freshwater mussels
2 crayfish
1 insect



PLANTS (4)



Missouri bladderpod
(*Lesquerella filiformis*)



Harperella
(*Ptilimnium nodosum*)



Pondberry
(*Lindera melissifolia*)



Geocarpon
(*Geocarpon minimum*)

Information About Rare Species

USFWS

http://ecos.fws.gov/tess_public/pub/stateListingAndOccurrenceIndividual.jsp?state=AR

ANHC

<http://www.naturalheritage.com/research-data/rare-species-search.aspx>



Home

Research & Data

PRINT THIS PAGE

RARE SPECIES SEARCH ENGINE: FIND ARKANSAS ENDANGERED SPECIES

Become an ANHC Donor



Name	Status		Rank	
	Federal	State	Global	State
Animals - Invertebrates - Molluscs				
Arkansia wheeleri (Ouachita rock pocketbook)	LE	SE	G1	S1
Cumberlandia monodonta (spectaclecase)	LE	SE	G3	S1
Epioblasma florentina curtisi (Curtis pearlymussel)	LE	SE	G1T1	S1
Epioblasma triquetra (snuffbox)	LE	SE	G3	S1
Epioblasma turgidula (turgid blossom)	LE	SE	GX	SX
Lampsilis abrupta (pink mucket)	LE	SE	G2	S2
Lampsilis powellii (Arkansas fatmucket)	LT	SE	G2	S2
Lampsilis rafinesqueana (Neosho mucket)	LE	SE	G2	S1
Lampsilis streckeri (speckled pocketbook)	LE	SE	G1Q	S1
Leptodea leptodon (scaleshell)	LE	SE	G1G2	S1
Margaritifera hembeli (Louisiana pearlshell)	LT	SE	G1	SH
Potamilus capax (fat pocketbook)	LE	SE	G2	S1
Quadrula cylindrica cylindrica (rabbitsfoot)	LT	SE	G3G4T3	S2
Quadrula fragosa (winged mapleleaf)	LE	SE	G1	S1

Name	Status		Rank	
	Federal	State	Global	State
Animals - Invertebrates - Crustaceans				
Cambarus aculabrum (Benton County cave crayfish)	LE	SE	G1	S1
Cambarus zophonastes (Hell Creek Cave crayfish)	LE	SE	G1	S1

Name	Status		Rank	
	Federal	State	Global	State
Animals - Invertebrates - Insects				
Nicrophorus americanus (American burying beetle)	LE	SE	G2G3	S1

Name	Status		Rank	
	Federal	State	Global	State
Animals - Vertebrates - Fish				
Amblyopsis rosae (Ozark cavefish)	LT	SE	G3	S1
Etheostoma moorei (yellowcheek darter)	LE	SE	G1	S1
Notropis girardi (Arkansas River shiner)	LT	SE	G2	SX
Percina pantherina (leopard darter)	LT	SE	G2	S1
Scaphirhynchus albus (pallid sturgeon)	LE	SE	G2	S1

Name	Status		Rank	
	Federal	State	Global	State
Animals - Vertebrates - Amphibians				
Cryptobranchus alleganiensis bishopi (Ozark hellbender)	LE	SE	G3G4T2Q	S2

Name	Status		Rank	
	Federal	State	Global	State
Animals - Vertebrates - Birds				
<i>Campephilus principalis</i> (Ivory-billed Woodpecker)	LE	SE	G1	SU
<i>Charadrius melodus</i> (Piping Plover)	LT*	SE	G3	SNA
<i>Mycteria americana</i> (Wood Stork)	LE*	WAT	G4	SNA
<i>Picoides borealis</i> (Red-cockaded Woodpecker)	LE	SE	G3	S2
<i>Sternula antillarum athalassos</i> (Interior Least Tern)	LE	SE	G4T2Q	S2B

Name	Status		Rank	
	Federal	State	Global	State
Animals - Vertebrates - Mammals				
<i>Corynorhinus townsendii ingens</i> (Ozark big-eared bat)	LE	SE	G3G4T1	S1
<i>Myotis grisescens</i> (gray myotis)	LE	SE	G3	S2S3
<i>Myotis sodalis</i> (Indiana bat)	LE	SE	G2	S1

Name	Status		Rank	
	Federal	State	Global	State
Plants - Vascular - Dicots				
<i>Geocarpon minimum</i> (geocarpon)	LT	SE	G2	S2
<i>Lindera melissifolia</i> (pondberry)	LE	SE	G2G3	S2
<i>Physaria filiformis</i> (Missouri bladderpod)	LT	INV	G3	S1
<i>Ptilimnium nodosum</i> (harperella)	LE	INV	G2	S2
<i>Trifolium stoloniferum</i> (running buffalo clover)	LE	INV	G3	SH

Leopard Darter

Percina pantherina



Percina pantherina, Leopard darter.
Miller and Robison (1973)

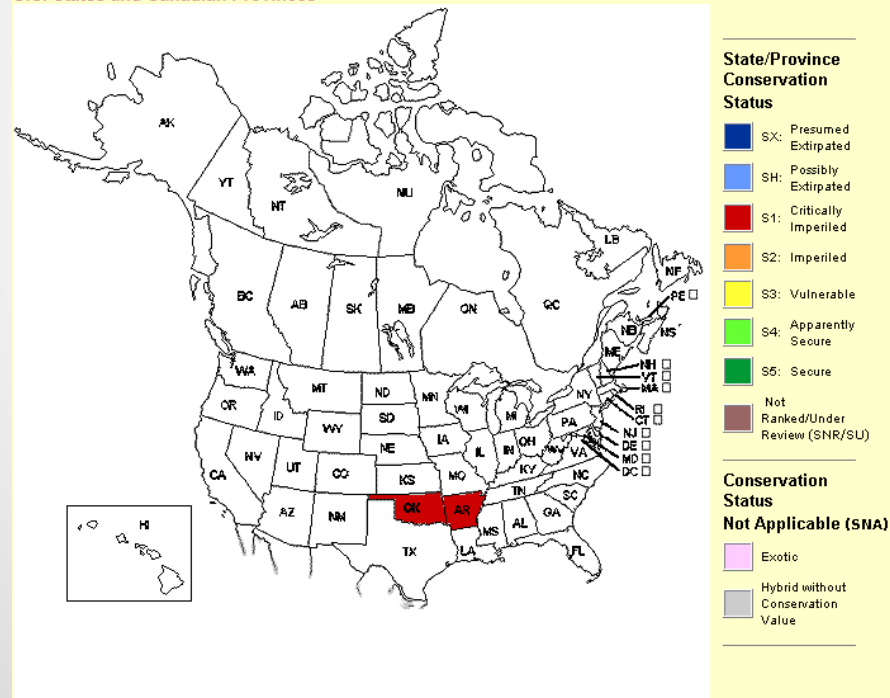


Distribution

[Collapse](#)

Global Range: (1000-20,000 square km (about 400-8000 square miles)) Range includes the Little River system (Red River drainage) of southeastern Oklahoma and southwestern Arkansas; upper Little River (above Pine Creek Reservoir), Glover River, Mountain Fork River (above Broken Bow Reservoir), Cossatot River (above Gillham Reservoir), and Robinson Fork of the Rolling Fork River (James and Maughan 1989, Williams et al. 1999).

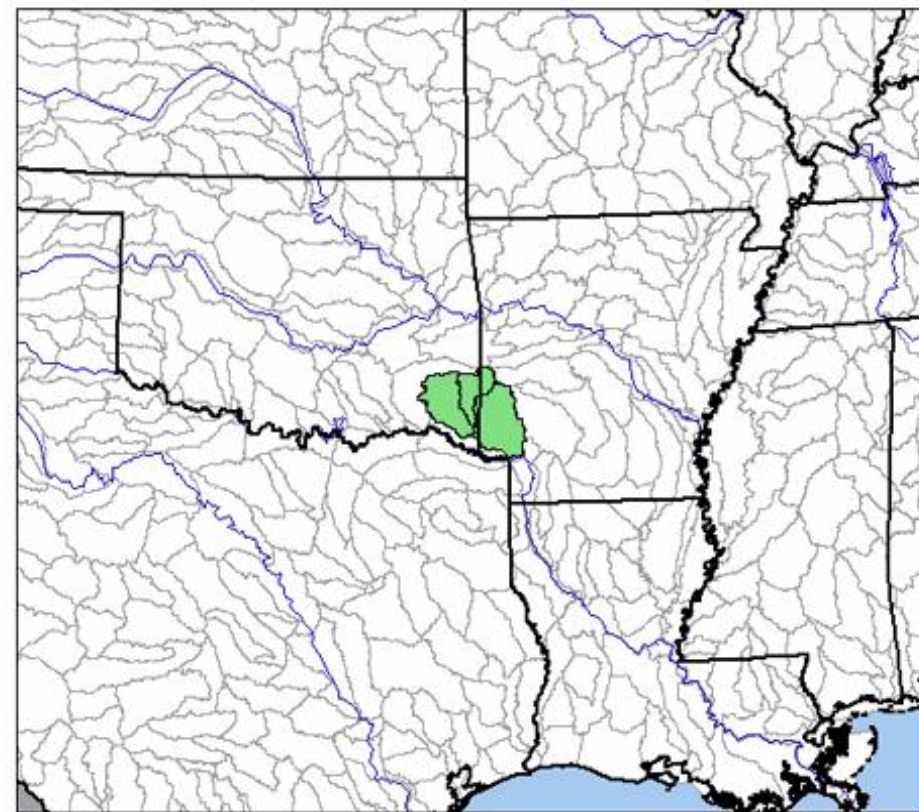
U.S. States and Canadian Provinces



Endemism: endemic to a single nation

U.S. & Canada State/Province Distribution	
United States	AR, OK

U.S. Distribution by Watershed (based on multiple information sources) ?

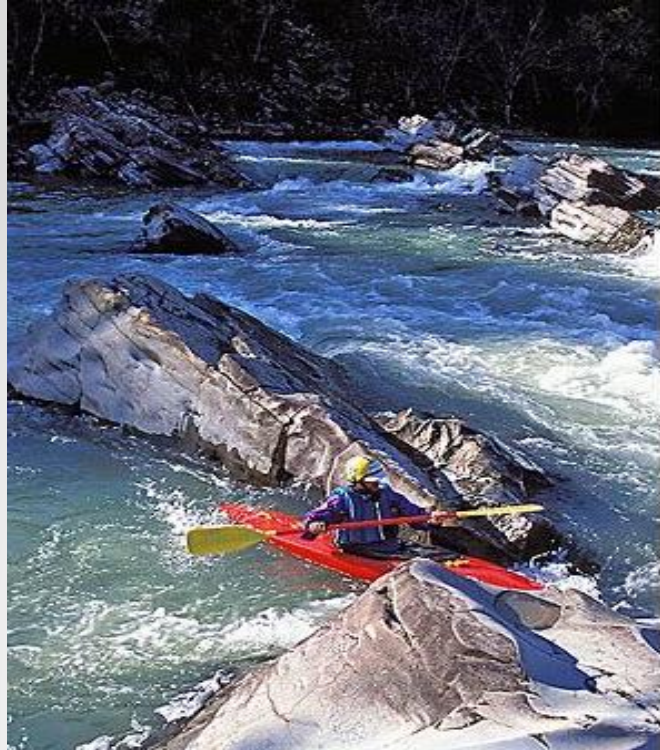


State Boundary
Major Rivers
USGS 8-digit HUC
Current Distribution
Historic Distribution
Out of Scope

200 0 200 Kilometers

Tendencies / Public Perception:

- **Increased focus on the T&E species**
- **Reduced focus on the place and other species that benefit**



The value of the variety of species and ecosystems

Why do we need biodiversity?

- **Medicines:** Despite great advances in drug design, most of our prescription drugs are derived from compounds from plants, animals, and microbes.



From the bark of the white willow tree (*Salix alba vulgaris*)

Vinblastine (Hodgkin's lymphoma) and vincristine (childhood leukemia) from the Madagascar periwinkle (*Catharanthus roseus*)



ACE inhibitors (high blood pressure, congestive heart failure) from the venom of a South American pit viper (*Bothrops jararaca*)

Taxol, from the bark of the Pacific yew tree (*Taxus brevifolia*) and is used in the treatment of breast, lung, and ovarian cancer, as well as Kaposi's sarcoma.



Our health is dependent on biodiversity

- **Rare species:** 1.9 million species have been identified and scientists estimate there are likely at least 10 million yet to be described. Don't we have species to spare?

We don't know which species will provide the medicines for current and future diseases and which hold the secrets to medical discoveries.



Gastric-brooding frogs (*Rheobatrachus vitellinus*, *R. silus*)

- Swallowed and hatched fertilized eggs in stomach
- Eggs and tadpoles secreted compounds that protected them from stomach acid
- Research was underway for peptic ulcer disease
- Both species disappeared and are assumed extinct



Cone snails (several species) – shoot poison-coated harpoon at prey and predators

- Studies underway for Ziconotide, 1,000 times more powerful than morphine and doesn't cause addiction or tolerance
- Clinical trials underway for protecting nerve cells from dying due to reduced blood flow
- Occur in endangered tropical coral reefs

Diversity of Pollinators: Food / Clothing



- Honeybees and wild bees are the most important pollinators of many of the fruits and vegetables we eat.
- Of 100 crop species that provide 90% of our global food supply, 71 are bee-pollinated.
- The value of pollination of food crops by bees in the U.S. alone is estimated at \$16 billion and insect pollinators in general contribute \$29 billion to U.S. farm income (CNN)

Hand-pollination in China



- **Recreation and jobs:** Big fun and big business.

In 2011 in the United States, there were

- 13.7 million hunters who spent \$34 billion
- 33.1 million anglers who spent \$41.8 billion
- 71.8 million birders who spent \$55 billion
- Collectively, anglers, birders, and hunters accounted for \$131 billion in revenue in 2011 in America alone compared to \$156 billion worldwide by Apple in its 2012 fiscal year.

Birding is second largest hobby in the U.S. behind gardening.

Nature photography, botanizing, etc.



- **Ecosystem Services**

- Clean water – wetlands purify water by soils acting as massive filters to bind toxic substances. Wetlands purify our water at such a vast scale that there is no economically feasible substitute.
- Clean air – take up and store carbon, give off oxygen
- Food, timber, other goods

- **Green spaces:**

- Quality of life / connectivity
- Greater productivity by workers
- Attracts industry
- Recreation



The Little Things Are Important!



**"This means something
but I can't remember what!"**

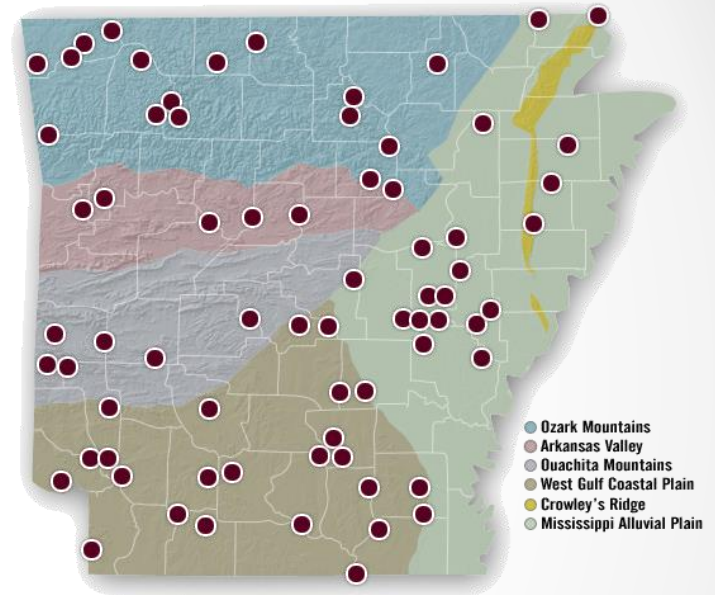
Bottom-line = What are we passing down to the next generation?

The Natural Heritage Commission protects and manages some of the most diverse areas in our state: System of Natural Areas

living museums...

aid in the recovery of rare species...

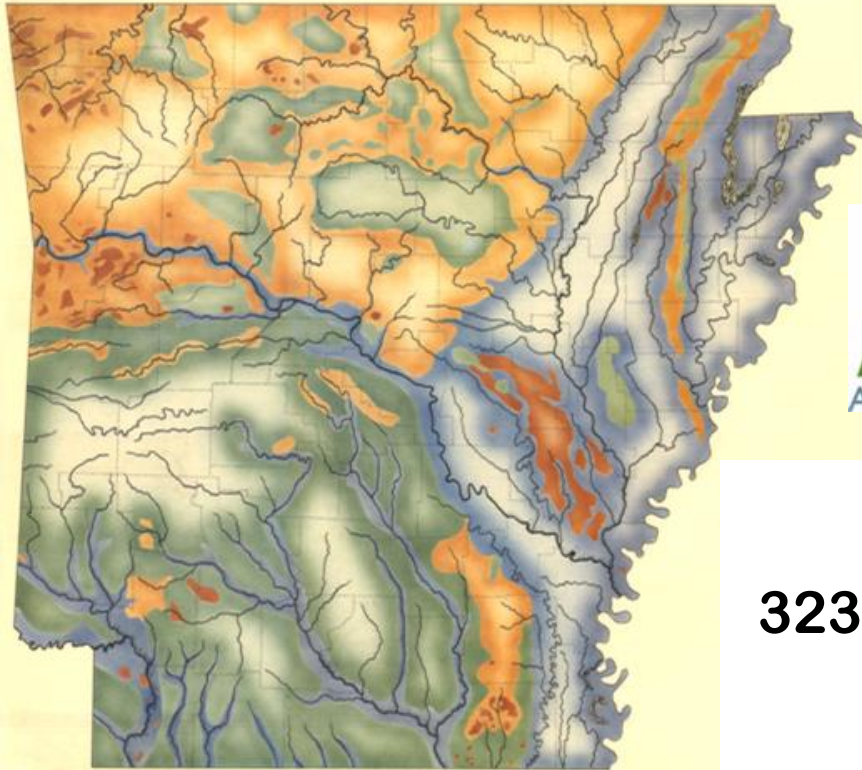
blue prints for restoration...



The System is currently made up of 71 Natural Areas (61,000 acres) around the state.

Arkansas Natural Heritage Commission

Preserving Arkansas's Natural Heritage



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