

Ecoregions of Arkansas

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions are structured to provide a framework for the management of the environment by its probable response to disturbance (Boyce, Omernik, and Larsen, 1999).

Ecoregions are general purpose regions that are critical for structuring and implementing ecosystem management strategies across federal agencies, state agencies, and nongovernment organizations that are responsible for different types of resources in the same geographical areas. Omernik and others, 2000, A Roman numeral hierarchical scheme has been adopted for different levels of ecological regions. Level I is the coarsest level, dividing North America into 15 ecological regions. Level II divides the continent into 52 regions (Commission for Environmental Cooperation Working Group, 1997). At level III, the continental United States contains 104 ecoregions and the conterminous United States has 84 ecoregions (U.S. Environmental Protection Agency (USEPA), 2000). Level IV ecoregions are further subdivisions of level III ecoregions. Methods used to define the USEPA's ecoregions are explained in Omernik (1995), Omernik and others (2000), and Gallant and others (1989).

The approach used to compile the ecoregion map of Arkansas is based on the premise that ecological regions can be identified through the analysis of the spatial patterns and the composition of biotic and abiotic characteristics that affect or reflect differences in ecosystem quality and integrity (Wiken, 1988; Omernik, 1987, 1995). These characteristics include geology, physiography, climate, soils, land use, wildlife, fish, hydrology, and vegetation (including "potential natural vegetation" defined by Küchler in 1962) as "vegetation that would exist today" if human influence ended and "the resulting plant succession" was "teleselected into a single monotype". The relative importance of each characteristic varies from one ecological region to another regardless of ecoregion hierarchical level.

In Arkansas, there are 7 level III ecoregions and 32 level IV ecoregions, all of which are based on these level IV ecoregions. These level III ecoregions and all adjacent states (Chapman and others, 2002, 2004, 2004b; Griffith, Omernik, and Azevedo, 1998). Arkansas' ecological diversity is strongly related to regional physiography, geology, soil, climate, and land use.

Elevated karst plateaus, floodplains, floodplains, agricultural valleys, forested uplands, and bottomland forests occur. Fire-miniminated prairie was once extensive in several parts of the state.

The ecoregion map on this poster was compiled at a scale of 1:250,000, and depicts regions and subdivisions of earlier level III ecoregions that were originally compiled at a smaller scale (U.S. Environmental Protection Agency, 2000; Omernik, 1987). It is part of a collaborative project primarily between USEPA Region 6, USEPA-National Health and Environmental Effects Research Laboratory (Corvallis, Oregon), and the Multi-Agency Wetland Planning Team (MAWPT), which comprises representatives of six Arkansas state agencies (Arkansas Natural Heritage Commission, Arkansas Soil and Water Conservation Commission, Arkansas Game and Fish Commission, Arkansas Department of Environmental Quality, Arkansas Forestry Commission, and University of Arkansas Cooperative Extension Service). Collaboration and consultation also occurred with the U.S. Army Corps of Engineers (USACE), U.S. Department of Agriculture-Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), U.S. Fish and Wildlife Service, USGS-Earth Resources Observers Systems Data Center, and University of Arkansas Center for Advanced Spatial Technologies.

This project is associated with an interagency effort to develop a common framework of ecological regions (McMahon and others, 2001). Reaching that goal requires recognition of the differences in the conceptual approaches and mapping methodologies applied to develop the most common ecoregion-type frameworks, including those developed by the U.S. Department of Agriculture-Forest Service (Bailey and others, 1994), the USEPA (Omernik 1987, 1995), and the U.S. Department of Agriculture-Soil Conservation Service (1981). As each of these frameworks is further refined, their differences are becoming less discernible. Each collaborative ecoregion project, such as this one (1:250,000), is a step toward attaining consensus and consistency in ecoregion frameworks for the entire nation.

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35. South Central Plains

Ecoregion 35 is composed of rolling plains that are broken by nearly flat fluvial terraces, bottomlands, sandy low lands, and low coasts; its terrain is unlike the more rugged Ouachita Mountains (36) or the flatter, less dissected Mississippi Alluvial Plain (73). Uplands are underlain by poorly consolidated Tertiary sandstone and shale, generally gray, and terraces are veneered with Quaternary alluvium or windblown silt deposits (loess). The lithologic mosaic is distinct from the Paleozoic rocks of Ecoregion 36 and the strictly Quaternary deposits of Ecoregion 35. Potential natural vegetation is oak-hickory-pine forest on uplands and southern floodplain forest on bottomlands. Today, more than 75% of Ecoregion 35 remains wooded. Extensive commercial loblolly pine-shorthorn pine plantations occur. Lumber and pulpwood production, livestock grazing, and cropland farming are major land uses. Cropland dominates the drained bottomlands of the Red River. Turbidity and total suspended solid concentrations are usually low except in the Red River. Summer and winter water quality is similar, but non-existent but enduring poor water quality. Fish communities typically have a limited proportion of sensitive species; sunfishes are dominant, and darters and minnows are common.

35a The rolling Tertiary **Uplands** are dominated by commercial pine plantations that have replaced the native oak-hickory-pine forest. Ecoregion 35a is underlain by poorly-consolidated Tertiary sandstone and shale, generally gray, and terraces are veneered with Quaternary alluvium or windblown silt deposits (loess). The lithologic mosaic is distinct from the Paleozoic rocks of Ecoregion 36 and the strictly Quaternary deposits of Ecoregion 35. Potential natural vegetation is oak-hickory-pine forest on uplands and southern floodplain forest on bottomlands. Today, more than 75% of Ecoregion 35 remains wooded. Extensive commercial loblolly pine-shorthorn pine plantations occur. Lumber and pulpwood production, livestock grazing, and cropland farming are major land uses. Cropland dominates the drained bottomlands of the Red River. Turbidity and total suspended solid concentrations are usually low except in the Red River. Summer and winter water quality is similar, but non-existent but enduring poor water quality. Fish communities typically have a limited proportion of sensitive species; sunfishes are dominant, and darters and minnows are common.

35b The **Floodplains and Low Terraces** ecoregion is nearly level, underlain by Holocene alluvium, and contains natural levees, swales, oxbow lakes, and meander scars. Longitudinal channel gradients are low and are less than in the Ouachita Mountains (36). Large parts of Ecoregion 35b are frequently flooded. Forested wetlands are characteristic, but postulated also occurs. Cropland is far less extensive than in the Red River Valley (37). Potential natural vegetation is oak-hickory-pine forest on uplands and southern floodplain forest on bottomlands. Today, more than 75% of Ecoregion 35 remains wooded. Extensive commercial loblolly pine-shorthorn pine plantations occur. Lumber and pulpwood production, livestock grazing, and cropland farming are major land uses. Cropland dominates the drained bottomlands of the Red River. Turbidity and total suspended solid concentrations are usually low except in the Red River. Summer and winter water quality is similar, but non-existent but enduring poor water quality. Fish communities typically have a limited proportion of sensitive species; sunfishes are dominant, and darters and minnows are common.

35c The **Pleistocene Fluvial Terraces** are nearly level, poorly-drained, periodically wet, underlain by Pleistocene unconsolidated terrace deposits, and covered by pine floodplains. Loblolly pine and oaks are common and are adapted to the prevailing hydrologic regime; pastureland and hayland are less extensive. A vertical sequence of terraces occurs. The lowest terrace is nearly flat, clayey, and has extensive hardwood wetlands. Higher terraces become progressively older and more dissected; they are dominated by pine floodplains, pine savanna, or prairie. Flooded wetlands are less extensive than on the lowest terrace. The mid-level terrace is veneered with windblown silt deposits (loess). Streams tend to be mildly acidic, and stained by organic matter. They have more suspended solids, greater turbidity, and higher hardness values than Ecoregion 35a.

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