Ecoregions of Arkansas

Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and Elevated karst plateaus, folded mountains, agricultural valleys, forested uplands, and bottomland Chapman, S.S., Griffith, G.E., Omernik, J.M., Comstock, J.A., Beiser, M.C., and Johnson, D., 2004a, quantity of environmental resources. They are designed to serve as a spatial framework for forests occur. Fire-maintained prairie was once extensive in several parts of the state. the research, assessment, management, and monitoring of ecosystems and ecosystem components. By recognizing the spatial differences in the capacities and potentials of ecosystems, ecoregions stratify the environment by its probable response to disturbance (Bryce, Omernik, and Larsen, 1999).

ecosystem management strategies across federal agencies, state agencies, and nongovernment (MAWPT), which comprises representatives of six Arkansas state agencies (Arkansas Natural organizations that are responsible for different types of resources in the same geographical Heritage Commission, Arkansas Soil and Water Conservation Commission, Arkansas Game and areas (Omernik and others, 2000). A Roman numeral hierarchical scheme has been adopted Fish Commission, Arkansas Forestry Gallant, A.L., Whittier, T.R., Larsen, D.P., Omernik, J.M., and Hughes, R.M., 1989, Regionalization as for different levels of ecological regions. Level I is the coarsest level, dividing North America Commission, and University of Arkansas Cooperative Extension Service). Collaboration and into 15 ecological regions. Level II divides the continent into 52 regions (Commission for consultation also occurred with the U.S. Army Corps of Engineers (USACE), U.S. Department of Environmental Cooperation Working Group, 1997). At level III, the continental United States Agriculture—Natural Resources Conservation Service (NRCS), U.S. Geological Survey (USGS), contains 104 ecoregions and the conterminous United States has 84 ecoregions (U.S. U.S. Fish and Wildlife Service, USGS-Earth Resources Observation Systems Data Center, and Environmental Protection Agency [USEPA], 2003). Level IV ecoregions are further University of Arkansas—Center for Advanced Spatial Technologies. subdivisions of level III ecoregions. Methods used to define the USEPA's ecoregions are

This project is associated with an interagency effort to develop a common framework of explained in Omernik (1995), Omernik and others (2000), and Gallant and others (1989).

would exist today" if human influence ended and "the resulting plant succession" was ecoregion frameworks for the entire nation. "telescoped into a single moment"). 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 but four of these level IV ecoregions are also found in ecologically similar parts of adjacent states (Chapman and others, 2002, 2004a, 2004b; Griffith, Omernik, and Azevedo, 1998). Arkansas' ecological Bryce, S.A., Omernik, J.M., and Larsen, D.P., 1999, Ecoregions – a geographic framework to guide risk diversity is strongly related to regional physiography, geology, soil, climate, and land use.

The ecoregion map on this poster was compiled at a scale of 1:250,000, and depicts revisions and subdivisions of earlier level III ecoregions that were originally compiled at a smaller scale (U.S. Environmental Protection Agency, 2003; Omernik, 1987). It is part of a collaborative project primarily between USEPA Region 6, USEPA-National Health and Environmental Effects Ecoregions are general purpose regions that are critical for structuring and implementing Research Laboratory (Corvallis, Oregon), and the Multi-Agency Wetland Planning Team

ecological regions (McMahon and others, 2001). Reaching that objective requires recognition of The approach used to compile the ecoregion map of Arkansas is based on the premise that the differences in the conceptual approaches and mapping methodologies applied to develop the ecological regions can be identified through the analysis of the spatial patterns and the most common ecoregion-type frameworks, including those developed by the U.S. Department of Omernik, J.M., 1987, Ecoregions of the conterminous United States (map supplement): Annals of the composition of biotic and abiotic characteristics that affect or reflect differences in ecosystem Agriculture–Forest Service (Bailey and others, 1994), the USEPA (Omernik 1987, 1995), and the quality and integrity (Wiken, 1986; Omernik, 1987, 1995). These characteristics include U.S. Department of Agriculture–Soil Conservation Service (1981). As each of these frameworks geology, physiography, climate, soils, land use, wildlife, fish, hydrology, and vegetation is further refined, their differences are becoming less discernible. Each collaborative ecoregion (including "potential natural vegetation" defined by Küchler (p. 2, 1964) as "vegetation that project, such as this one in Arkansas, is a step toward attaining consensus and consistency in Omernik, J.M., Chapman, S.S., Lillie, R.A., and Dumke, R.T., 2000, Ecoregions of Wisconsin:

> Bailey, R.G., Avers, P.E., King, T., and McNab, W.H., editors, 1994, Ecoregions and subregions of the United States (map): Washington, D.C., U.S. Department of Agriculture-Forest Service, map scale

characterization and ecosystem management: Environmental Practice, v. 1, no. 3, p. 141-155.

coregions of Mississippi (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey, map scale 1:1,000,000. Chapman, S.S., Kleiss, B.A., Omernik, J.M., Foti, T.L., and Murray, E.O., 2004b, Ecoregions of the Mississippi Alluvial Plain (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey, map scale 1:1,150,000. Chapman, S.S., Omernik, J.M., Griffith, G.E., Schroeder, W.A., Nigh, T.A., and Wilton, T.F., 2002,

Ecoregions of Iowa and Missouri (color poster with map, descriptive text, summary tables, and photographs): Reston, Virginia, U.S. Geological Survey, map scale 1:1,800,000. ommission for Environmental Cooperation Working Group, 1997, Ecological regions of North America – toward a common perspective: Montreal, Commission for Environmental Cooperation, 71 p. a tool for managing environmental resources: Corvallis, Oregon, U.S. Environmental Protection Agency, EPA/600/3-89/060, 152 p. riffith, G., Omernik, J., and Azevedo, S., 1998, Ecoregions of Tennessee (color poster with map, descriptive text, summary tables, and photographs): Reston, Virgnia, U.S. Geological Survey, scale Küchler, A.W., 1964, Potential natural vegetation of the conterminous United States (map and manual): American Geographical Society, Special Publication 36, map scale 1:3,168,000. McMahon, G., Gregonis, S.M., Waltman, S.W., Omernik, J.M., Thorson, T.D., Freeouf, J.A., Rorick, A.H., and Keys, J.E., 2001, Developing a spatial framework of common ecological regions for the onterminous United States: Environmental Management, v. 28, no. 3, p. 293-316. Association of American Geographers, v. 77, p. 118-125, map scale 1:7,500,000. ernik, J.M., 1995, Ecoregions – a framework for environmental management, in Davis, W.S., and Simon, T.P., editors, Biological assessment and criteria – tools for water resource planning and decision making: Boca Raton, Florida, Lewis Publishers, p. 49-62.

Fransactions of the Wisconsin Academy of Sciences, Arts, and Letters, v. 88, p. 77-103

Effects Research Laboratory, Western Ecology Division, Map M-1, various scales.

land resource areas of the United States: Agriculture Handbook 296, 156 p.

Classification Series no. 19, 26 p.

U.S. Department of Agriculture-Soil Conservation Service, 1981, Land resource regions and major

U.S. Environmental Protection Agency, 2003, Level III ecoregions of the continental United States

Wiken, E., 1986, Terrestrial ecozones of Canada: Ottawa, Environment Canada, Ecological Land

revision of Omernik, 1987): Corvallis, Oregon, USEPA-National Health and Environmental

ne rolling Tertiary Uplands (35a) are widely covered by trees and are underlain by both coasta mall streams to carve relatively wide bottomlands. Dorcheat Bayou, which flows through Falcon Bottoms Natural Area northeast of Buckner, is pictured here. Dorcheat Bayou is considered to b one of Arkansas' most intact and ecologically important streams in Ecoregion 35 west of the

Ouachita River. Pine flatwoods are found adjacent to bottoms. Better drained sites, including

knolls, support upland pine-hardwood forest. Photo: Thomas L. Foti, Arkansas Natural Heritage

Cretaceous, often calcareous rocks of Ecoregion 35d and the extensive Quaternary alluvium of Ecoregions 35b, 35g, and 73. is lithologically distinct from the Tertiary noncalcareous deposits of Ecoregion 35a, the Quaternary alluvium of Ecoregions 35b, Extensive forests dominated by loblolly and shortleaf pines grow on loamy, well-drained, thermic Ultisols; scattered, stunted, 35g, and 73, and the chalks and marls of Ecoregion 35h. Native vegetation is largely oak—hickory—pine forest. Today, woods sandhill woodlands also occur. Waters tend to be stained by organics, thus lowering water clarity and increasing total organic and pastureland are common. Water quality in forested watersheds tends to be good, and is better than in pastureland. Streams carbon and biochemical oxygen demand levels. Most streams have a sandy substrate and a forest canopy. Many do not flow generally have lower total dissolved solids values and much lower total organic carbon values than Ecoregions 35a and 35c, during the summer or early fall. However, in sandhills, spring-fed, perennial streams occur; here, total dissolved solids, and hardness values are slightly higher. Longitudinal stream gradients and Ouachita soils derived from chalk and marl. suspended solids, alkalinity, and hardness values are lower than elsewhere in Ecoregion 35. Water quality in forested basins is Mountain influences are greater than in Ecoregions 35a or 35c. better than in pastureland. Oil production has lowered stream quality in the south.

The Floodplains and Low Terraces ecoregion is nearly level, veneered by Holocene alluvium, and contains natural

The nearly flat Red River Bottomlands ecoregion is veneered with Holocene alluvium and has been widely cleared and drained for agriculture. It contains floodplains, low terraces, oxbow lakes, meander scars, backswamps, natural better than in pastureland. Oil production has lowered stream quality in the south.

levees, swales, oxbow lakes, and meander scars. Longitudinal channel gradients are low and are less than in the levees, and the meandering Red River. Potential natural vegetation is southern floodplain forest; it is unlike the oak-hickory-Ouachita Mountains (36). Large parts of Ecoregion 35b are frequently flooded. Forested wetlands are characteristic, but pine forest of higher, better drained, and lithologically distinct Ecoregions 35a and 35d. Western species, such as bur oak and pastureland also occurs. Cropland is far less common than in the Red River Bottomlands (35g). Potential natural vegetation is Durand oak, were native to Ecoregion 35g but were typically absent from the Mississippi Alluvial Plain (73). The natural forest southern floodplain forest as in the Mississippi Alluvial Plain (73); it is unlike the oak-hickory-pine forest of the higher, better of Ecoregion 35g has been largely replaced by agriculture. Today, cropland is more extensive than in other parts of Ecoregion drained, and lithologically distinct Tertiary Uplands (35a) and Cretaceous Dissected Uplands (35d). The Pleistocene Fluvial Terraces are nearly level, poorly-drained, periodically wet, underlain by Pleistocene in the Saline or Ouachita rivers of Ecoregion 35b due to land cover, land use, and upstream lithology differences.

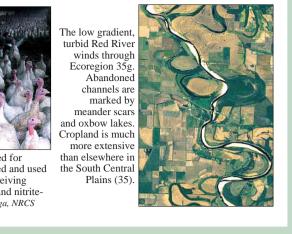
unconsolidated terrace deposits, and covered by pine flatwoods. Loblolly pine and oaks are common and are adapted to the prevailing hydroxeric regime; pastureland and hayland are less extensive. A vertical sequence of terraces occurs. The lowest terrace is nearly flat, clayey, and has extensive hardwood wetlands. Higher terraces become progressively older and more Holocene Epoch. By the late 18th century, Ecoregion 35h was a mosaic of woodland, savanna, and prairies, containing species dissected; they are dominated by pine flatwoods, pine savanna, or prairie; flatwood wetlands are less extensive than on the that were found nowhere else in Arkansas. Today, hayland and, especially, pastureland dominate; pastureland is more common lowest terrace. The mid-level terrace is veneered with windblown silt deposits (loess). Streams tend to be mildly acidic and than elsewhere in Arkansas' South Central Plains (35). Only a few prairie remnants still occur and are mostly limited to the thin, stained by organic matter. They have more suspended solids, greater turbidity, and higher hardness values than Ecoregion 35a. droughty soils of cuesta scarps.

non-existent but enduring pools may occur. Fish communities typically have a limited proportion of sensitive species; sunfishes are dominant, and darters and minnows are common. The rolling **Tertiary Uplands** are dominated by commercial pine plantations that have replaced the native oakhickory—pine forest. Ecoregion 35a is underlain by poorly-consolidated Tertiary sand, silt, and gravel; it lacks the

35 in Arkansas. The Red River is almost continuously turbid; suspended sediment concentrations are usually much higher than



rivers in Ecoregion 35b. They also occur in othe ndview Prairie Wildlife Management Area near parts of Arkansas but populations in Ecoregion Photo: Jim Leopold, U.S. Fish and Wildlife Service





pine-upland hardwood forest and underlain by Paleozoic sandstone, shale, and novaculite (chert).

36. Ouachita Mountains

35. South Central Plains

The Ouachitas are made up of ridges, hills, and valleys formed by the erosion of folded and faulted Paleozoic sandstone, shale, and chert, known locally as novaculite. They are a continuation of the Appalachians, formed during the late Paleozoic Era when an ocean closed and continents collided, causing marine sediments to be folded, faulted, and thrust northward. The Ouachitas are structurally different from the Boston Mountains (38), more folded and rugged than the lithologically distinct Ozark Highlands (39), and physiographically unlike the Arkansas Valley (37), South Central Plains (35), and Mississippi Alluvial Plain (73). Potential natural vegetation is oak—hickory—pine forest; it contrasts with the oak—hickory forest that dominates Ecoregion 39 and the northern part of Ecoregion 38. Today, loblolly pine and shortleaf pine grow in a distinctive mix of thermic Ultisols and Inceptisols. Logging and recreation are major land uses, and pastureland and hayland are found in broader valleys. Regional water quality is influenced by lithology, soil composition, and land use activities. In most reaches, water quality is exceptional; typically, total suspended solids, and biological oxygen demand values are lower whereas dissolved oxygen levels are higher than in Ecoregions 35, 37, and 73. Water hardness varies by level IV ecoregion; Ecoregions 36d and 36e tend to have the lowest hardness values while progressively higher values occur in Ecoregions 36a, 36b, and 36c. Stream substrates are made up of gravel, cobbles, boulders, or bedrock; they contrast with the fine-grained substrates of lower gradient streams in Ecoregions 35 and 73. The fish community is dominated by sensitive species; minnows and sunfish along with darters and bass are common.

The low ridges and hills of the **Athens Plateau** are widely underlain by shale in contrast to other parts of Ecoregion 36. Rocks are less resistant to erosion than in higher, more rugged Ecoregions 36b, 36d, and 36e but are more resistant than the unconsolidated rocks of the coastal plain in Ecoregion 35. Today, pine plantations are widespread; they are far more continuity is greater, the lithologic mosaic is different, and the topographic orientation is more consistent than in other parts of extensive than in the more rugged parts of Ecoregion 36 in Arkansas. Pastureland and hayland also occur. Cattle and broiler the Ouachita Mountains (36). Differences in moisture and temperature between north- and south-facing slopes significantly chickens are important farm products. Water quality values are distinct from Ecoregion 36c. influence native plant communities; they are products of the prevailing topographic trend. Forests on steep, north-facing slopes The Central Mountain Ranges are dominated by east-west trending ridges that are characteristically steep and rugged are more mesic than on southern aspects; grassy woodlands are found on steepest, south-facing slopes. Pastureland and hayland and underlain by resistant sandstone and novaculite (chert). Igneous intrusions occur along with associated hot springs. are restricted to a few broad valleys. Logging is not nearly as intensive as in the commercial pine plantations of the less rugged Rock outcrops, and shallow, stony soils are widespread. Novaculite glades occur. Potential natural vegetation is oak—hickory— Athens Plateau (36a). Nutrient, mineral, and biochemical water quality; nutrient, turbidity, effluent, and siltation from agriculture, road pine forest. Perennial springs and seeps are common and support diverse vegetation. Constricted valleys between ridges have

Ecoregion 36d but turbidity can be higher than in other mountainous parts of the Ouachitas.

Ecoregion 35 is composed of rolling plains that are broken by nearly flat fluvial terraces, bottomlands, sandy low hills, and low cuestas; its terrain is unlike the much more rugged Ouachita Mountains (36) or the flatter, less dissected Mississippi Alluvial Plain (73). Uplands are underlain by poorly-consolidated, Tertiary- through Cretaceous-age, coastal plain deposits and marginal marine sediments (laid down as the Gulf of Mexico opened and North America's southern continental margin subsided). Bottomlands 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 73. 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—shortleaf pine plantations occur. Lumber and pulpwood production, livestock grazing, and crawfish 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 flow in many small streams is limited or

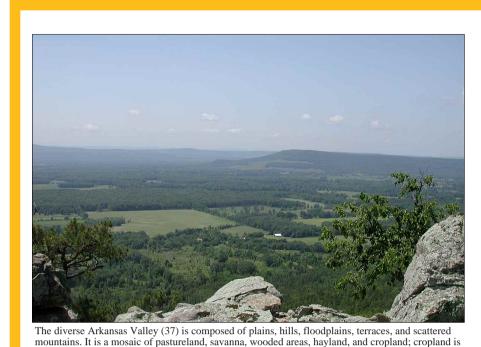
waterfalls and rapids. The surface waters of Ecoregion 36b have very low nutrient, mineral, and biochemical water quality parameter concentrations and turbidity. Logging is not nearly as common as in the less rugged Athens Plateau (36a).

The Western Ouachitas ecoregion is composed of mountains, hills, and narrow valleys. In Arkansas, Ecoregion 36e is confined to Round Mountain in western Polk County, where it is underlain by sandstone and shale; novaculite (chert) is The Central Hills, Ridges, and Valleys ecoregion is lower, less rugged, and more open than neighboring Ecoregions absent in contrast to the Central Mountain Ranges (36b). Ridge top elevations exceed 2,300 feet in Arkansas; both elevation and 36b and 36d. Ecoregion 36c is underlain by folded and faulted sandstone, shale, and novaculite (chert); the lithologic precipitation decrease westward into Oklahoma. Ecoregion 36e in Arkansas is higher and more rugged than the lithologically mosaic is distinct from the Athens Plateau (36a). Its forests are codominated by loblolly pine–shortleaf pine and upland distinct Athens Plateau (36a). Today, pine and upland oak–hickory–pine forest types codominate. Ecoregion 36e in Arkansas and Oklahoma contains, perhaps, the greatest concentration of critically-imperiled and imperiled species in mid-North America. oak-hickory-pine forest types. Pastureland is also common, much more so than in Ecoregions 36b and 36d.



its distribution. Today, in Arkansas, the leopard bottomed riffle reaches in Ecoregion 36a. In Oklahoma, it is found in Ecoregions 36a and 36





37. Arkansas Vallev

Ecoregion 37 is a synclinal and alluvial valley lying between the Ozark Highlands (39) and the Ouachita Mountains (36). The Arkansas Valley (37) is, characteristically, diverse and transitional. It generally coincides with the Arkoma Basin, an oil and gas province, that developed as sand and mud were deposited in a depression north of the rising Ouachita Mountains during the Mississippian and Pennsylvanian eras. The Arkansas Valley (37) contains plains, hills, floodplains, terraces, and scattered mountains. It is largely underlain by interbedded Pennsylvanian sandstone, shale, and siltstone. Prior to the 19th century, uplands were dominated by a mix of forest, woodland, savanna, and prairie whereas floodplains and lower terraces were covered by bottomland deciduous forest. Today, less rugged upland areas have been cleared for pastureland or hayland. Poultry and livestock farming are important land uses. Water quality is generally good and influenced more by land use activities than by soils or geology; average stream gradients and dissolved oxygen levels are lower in the Arkansas Valley (37) than in the Ouachita Mountains (36) or Ozark Highlands (39), whereas turbidity, total suspended solids, total organic carbon, total phosphorus, and biochemical oxygen demand values are typically higher. The Arkansas River is continuously turbid. Summer flow in smaller streams is typically limited or nonexistent. Fish communities characteristically contain a substantial proportion of sensitive species; a sunfish- and minnow-

Mesic sites also occur and may contain beech—maple forests.

dominated community exists along with substantial proportions of darters and catfishes (particularly madtoms).

meander scars, oxbow lakes, point bars, swales, and backswamps. It is lithologically and physiographically distinct Westward, Ecoregion 37d becomes flatter, drier, more open, and has fewer topographic fire barriers. Prior to the 19th century, m the surrounding uplands of the Arkansas Valley (37). Mollisols, Entisols, Alfisols, and Inceptisols are common; the soil frequently burned western areas had extensive prairie on droughty soils; scattered pine—oak savanna also occurred. Elsewhere, osaic sharply contrasts with nearby, higher elevation ecoregions where Ultisols developed under upland oaks, hickory, and potential natural vegetation is primarily oak-hickory forest or oak-hickory-pine forest. Today, pastureland and hayland are pine. Potential natural vegetation is southern floodplain forest. Bottomland oaks including bur oak, American sycamore, extensive but remnants of prairie, particularly the Cherokee Prairie near Fort Smith, and woodland occur. Poultry and livestock sweetgum, willows, eastern cottonwood, green ash, pecan, hackberry, and elm were once extensive. They have been widely farming are primary land uses. Cropland agriculture in the Arkansas Valley Plains (37d) is less important than in Ecoregion 37b, cleared for pastureland, hayland, and cropland. However, some forest remains in frequently flooded or poorly-drained areas are not as extensive as in more rugged Ecoregions 36, 37a, 37c, and 38. Stream turbidity generally remains

The Scattered High Ridges and Mountains ecoregion is more rugged and wooded than Ecoregions 37b, 37c, or 37d. Ecoregion 37a is characteristically covered by savannas, open woodlands, or forests dominated or codominated by

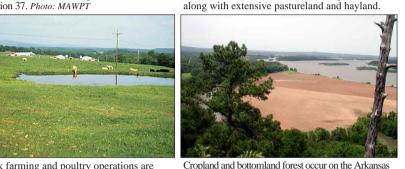
The Arkansas Valley Hills are underlain by Pennsylvanian sandstone and shale, and are lithologically distinct from Ecoregions 37b and 39. Ecoregion 37c is more hilly than the Arkansas Valley Plains (37d) and less rugged than upland oaks, hickory, and shortleaf pine; loblolly pine occurs but is not native. It is underlain by Pennsylvanian sandstone and Ecoregions 36, 37a, and 38. Ultisols are common and support a potential natural vegetation of oak—hickory forest or have altered habitat in and along the Arkansas River Plains (37d), remnant woodland and prairie occurs shale; calcareous rocks such as those that dominate the Ozark Highlands (39) are absent. Nutrient and mineral values (including oak-hickory-pine forest; both soils and natural vegetation contrast with those of Ecoregion 37b. Today, pastureland is turbidity and hardness) in streams are slightly higher than in other parts of the Arkansas Valley (37). Magazine Mountain, the extensive, but rugged areas are wooded; overall, trees are much less extensive than in neighboring Ecoregions 36d, 37a, and 38 nighest point in Arkansas at 2,753 feet, is distinguished by diverse habitats. Its flat top is covered with xeric, stunted woodlands. but more widespread than in Ecoregions 37b and 37d. Poultry operations, livestock farming, and logging are important land uses. The Arkansas River Floodplain is characteristically veneered with Holocene alluvium and includes natural levees,

The Arkansas River Floodplain is characteristically veneered with Holocene alluvium and includes natural levees,

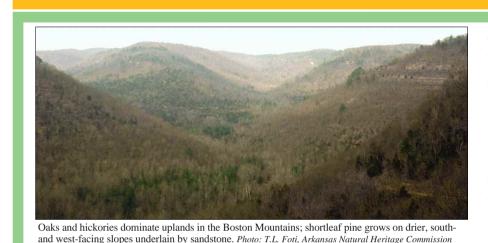
The Arkansas Valley Plains are in the rainshadow of the Fourche Mountains and were once covered by a distinctive mosaic of prairie, savanna, and woodland. Ecoregion 37d is mostly undulating but a few hills and ridges occur.





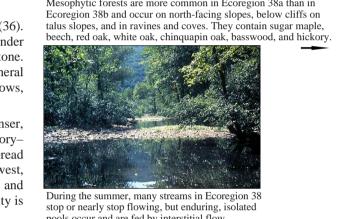


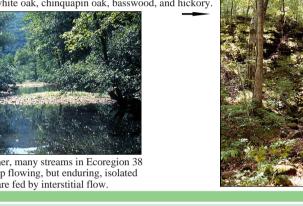
important land uses in the Arkansas Valley (37). River Floodplain (37b). Photo: MAWPT Iesophytic forests are more common in Ecoregion 38a than in

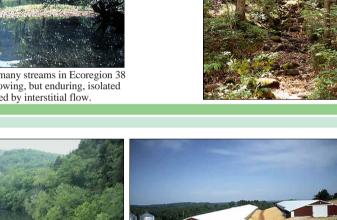


38. Boston Mountains

Ecoregion 38 is mountainous, forested, and underlain by Pennsylvanian sandstone, shale, and siltstone. It is one of the Ozark Plateaus; some folding and faulting has occurred but, in general, strata are much less deformed than in the Ouachita Mountains (36). Maximum elevations are higher, soils have a warmer temperture regime, and carbonate rocks are much less extensive than in the Ozark Highlands (39). Physiography is distinct from the Arkansas Valley (37). Upland soils are mostly Ultisols that developed under pak—hickory and oak—hickory—pine forests. Today, forests are still widespread; northern red oak, southern red oak, white oak, and hickories usually dominate the uplands, but shortleaf pine grows on drier, south- and west-facing slopes underlain by sandstone. Pastureland or hayland occur on nearly level ridgetops, benches, and valley floors. Population density is low; recreation, logging, and livestock farming are the primary land uses. Water quality in streams is generally exceptional; biochemical, nutrient, and mineral water quality parameter concentrations all tend to be very low. Fish communities are mostly composed of sensitive species; a diverse, often darter-dominated community occurs along with nearly equal proportions of minnows and sunfishes. During low flows, streams in both Ecoregions 38 and 36 usually run clear but, during high flow conditions, turbidity in Ecoregion 38 tends to be greater than in Ecoregion 36. Summer flow in many small streams is limited or non-existent but isolated, enduring pools may occur. The **Upper Boston Mountains** ecoregion is generally higher and moister than the Lower Boston Mountains (38b); elevations vary from 1,900 to 2,800 feet. Potential natural vegetation is oak–hickory forest. Characteristically, the forests of the Upper Boston Mountains (38a) are more closed and contain far less pine than those of the Lower Boston pine and oak—hickory forests; pine is much more common than in Ecoregions 38a or 39. Shortleaf pine is especially widespread Mountains (38b). North-facing slopes support mesic forests. Ecoregion 38a is underlain by Pennsylvanian sandstone, shale and on drier, south- and west-facing slopes underlain by sandstone. Both precipitation and forest density decrease toward the west, siltstone that contrasts with the limestone and dolomite that dominates Ozark Highlands (39). Water quality in streams reflects where oak-pine woodland or savanna become common. Ecoregion 38b is underlain by Pennsylvanian sandstone, shale, and geology, soils, and land use, and is typically exceptional; mineral, nutrient, and solid concentrations as well as turbidity all tend siltstone; it is lithologically distinct from the limestone- and dolomite-dominated Ozark Highlands (39). Overall, water quality is to be very low. During the summer, many streams do not flow. quite similar to Ecoregion 38a, which, although generally higher, has similar lithology and land uses.







he Springfield Plateau (39a) is undulating, slightly dissected, and underlain by Mississippian

dolomite and limestone of the Boone Formation; many karst features occur. Cleared areas are

39. Ozark Highlands

The Ozarks formed as the Ouachita Mountains weighted down the edge of the North American continent, flexing the crust of the Arkoma Basin upward; younger sedimentary layers then eroded away, exposing the older, Paleozoic rocks that dominate the area. Ecoregion 39 is composed of the Springfield and Salem plateaus and largely underlain by highly soluble and fractured limestone and dolomite. It is level to highly dissected, partly forested, and rich in karst features. Caves, sinkholes, and underground drainage occur, heavily influencing surficial water availability and water temperature. Clear, cold, perennial, spring-fed streams are common, and typically have gravelly substrates; in addition, many small dry valleys occur. Ecoregion 39 is not as mountainous as Ecoregions 36 or 38, but is higher and more rugged than Ecoregion 73. Habitat diversity and species richness is high. Soils are often cherty and have developed from carbonate rocks or interbedded chert, sandstone, and shale; mesic Ultisols, Alfisols, and Mollisols are common. Soil order mosaic, soil temperature regime, and lithology are all distinct from nearby Ecoregions 36, 37, 38, and 73. Potential natural vegetation is mostly oak—hickory forest. Open forest dominates rugged areas and pastureland and hayland are common on nearly level sites. Shortleaf pine grows on steep, cherty escarpments and on shallow soils derived from sandstone; it becomes more common in Ecoregions 35, 36, and the southern portion of Ecoregion 38. Glades dominated by grass and eastern redcedar are found on shallow, droughty soils especially over dolomite. Primary land uses are logging, housing, recreation, and, especially, poultry and livestock farming. Water quality in the Ozark Highlands (39) is different from the other ecoregions in Arkansas and is strongly influenced by lithology and land use practices. Alkalinity, total dissolved solids, and total hardness values are relatively high, reflecting the influence of Ecoregion 39's distinctive limestone and dolomite. Fecal coliform and nitrite-nitrate values are elevated downstream of improved pastureland that is intensively grazed by cattle and fields where animal wastes from confined poultry and hog operations have been applied. Parts of Ecoregion 39 are experiencing rapid population

Ecoregions 39c and 39d. Karst features, such as sinkholes and caves, are common. Cold, perennial, spring-fed streams occur. along the White River. Ecoregion 39c is lithologically unlike another highly dissected portion of the Ozarks, Ecoregion 39b, Upland potential natural vegetation is primarily oak-hickory-pine forests; savannas and tall grass prairies where Mississippian cherty limestone of the Boone Formation predominates. Clear, cold, perennial, spring-fed streams are also occurred and were maintained by fire. Today, most of the forest and almost all of the prairie have been replaced by common, but dry valleys occur. Potential natural vegetation is oak-hickory forest, oak-hickory-pine forest, and cedar glades. agriculture or expanding residential areas. Poultry, cattle, and hog farming are primary land uses; pastureland and hayland are Glades are more extensive than elsewhere in Arkansas, and occur on thin, droughty soils derived from carbonates. Pine is most common. Application of poultry litter to agricultural fields is a non-point source that can impair water quality. Total suspended common on steep, thin, cherty soils. Ecoregion 39c includes Table Rock, Bull Shoals, Norfork, and Beaver lakes. Turbidity and solids and turbidity values in streams are usually low, but total dissolved solids and hardness values are high. The **Dissected Springfield Plateau–Elk River Hills** are underlain by cherty limestone of the Mississippian Boone Formation and contain many karst features. Cold, perennial, spring-fed streams occur. Ecoregion 39b is more rugged

The **Central Plateau** is an undulating to hilly portion of the Salem Plateau that is dominated by agriculture. Ecoregion 39d is largely underlain by cherty Ordovician dolomite and limestone; it is lithologically distinct from another slightly

growth along with associated habitat alteration and water pollution. Fish communities characteristically have a preponderance of sensitive species and are usually dominated by a diverse minnow community along with sunfishes and darters. The nearly level to rolling **Springfield Plateau** is underlain by cherty limestone of the Mississippian Boone Formation; it is less rugged and wooded than Ecoregions 38, 39b, and 39c, and lacks the Ordovician dolomite and limestone of 39 than elsewhere in Arkansas.

The nearly level to rolling **Springfield Plateau** is underlain by cherty limestone of the Mississippian Boone Formation; and land use. Alkalinity, total dissolved solids, and total hardness values are often higher in Ecoregion 39 than elsewhere in Arkansas.

The forested **White River Hills** ecoregion is a highly dissected portion of the Salem Plateau that is underlain by cherty limestone of the Mississippian Boone Formation; and land use. Alkalinity, total dissolved solids, and solid hardness values are often higher in Ecoregion 39 than elsewhere in Arkansas.

The forested **White River Hills** ecoregion is a highly dissected portion of the Salem Plateau that is underlain by cherty limestone of the Mississippian Boone Formation; ordivation and limestone of the Mississippian Boone Formation; and land use. Alkalinity, total dissolved solids, and an inimal waste on fields increases feed elsewhere in Arkansas. total suspended solids are usually low in its streams and rivers, but total dissolved solids and hardness values are high.

and wooded than the lithologically similar Springfield Plateau (39a) and the lithologically dissimilar Central Plateau (39d). dissected part of the Ozarks, the Springfield Plateau (39a). Karst features occur. The Central Plateau (39d) is less rugged and Potential natural vegetation is oak—hickory and oak—hickory—pine forests. Shortleaf pine grows on the thin, cherty soils of steep wooded than Ecoregions 38, 39b, and 39c. Natural vegetation is oak—hickory forest, oak—hickory—pine forest (often on soils slopes, and is more common than in Ecoregion 39a, 39c, and 39d. Scattered limestone glades occur, but are less extensive than derived from sandstone), barrens (on thin soils), and scattered cedar glades (on shallow, rocky, droughty soils from dolomite or

Turbidity, total suspended solids, total dissolved solids, and hardness values are often higher than in Ecoregions 39a and 39c.





The Ozark cavefish is federally listed as threatened. Streams draining even small watersheds in the It occurs in Ecoregion 39's subsurface streams and dolomite- and limestone-dominated White Rive on the dolomites of the lithologically distinct Ecoregion 39c. Today, Ecoregion 39b remains dominated by forest and woodland. limestone). Today, pastureland, hayland, and housing are common, but remnant forests and savannas occur in steeper areas.



73. Mississippi Alluvial Plain

Logging, livestock farming, woodland grazing, recreation, quarrying, and housing are primary land uses.

The Mississippi Alluvial Plain (73) extends along the Mississippi River from the confluence of the Ohio and Mississippi rivers southward to the Gulf of Mexico; temperatures and annual average precipitation increase toward the south. Ecoregion 73 is a broad, nearly level, agriculturally-dominated alluvial plain. It is veneered by Quaternary alluvium, loess, glacial outwash, and lacustrine deposits. River terraces, swales, and levees provide limited relief, but overall, the Mississippi Alluvial Plain (73) is flatter than neighboring ecoregions in Arkansas, including the South Central Plains (35). Nearly flat, clayey, poorly-drained soils are widespread and characteristic. Streams and rivers have very low gradients and fine-grained substrates. Many reaches have ill-defined stream channels. Ecoregion 73 provides important habitat for fish and wildlife, and includes the largest continuous system of wetlands in North America. It is also a major bird migration corridor used in fall and spring migrations. Potential natural vegetation is argely southern floodplain forest and is unlike the oak-hickory-pine forests that dominate uplands to the west in Ecoregions 35, 36, 37, 38, and 39; loblolly pine, so common in the South Central Plains (35), is not native to most forests in the Arkansas portion of Ecoregion 73. The Mississippi Alluvial Plain (73) has been widely cleared and drained for cultivation; this widespread loss or degradation of forest and wetland habitat has impacted wildlife and reduced bird populations. Presently, most of he northern and central sections of Ecoregion 73, including Arkansas, are in cropland and receive heavy treatments of insecticides; soybeans, cotton, and rice are the major crops, and aquaculture is also important. Agricultural runoff containing fertilizers, herbicides, pesticides, and livestock waste have degraded surficial water quality. Concentrations of total suspended solids, total phosphorus, ammonia nitrogen, sulfates, turbidity, biological oxygen demand, chlorophyll a, and fecal coliform are high in the rivers, streams, and ditches of Ecoregion 73; they are often much greater than elsewhere in Arkansas, increase with increasing watershed size, and are greatest during the spring, high-flow season. Fish communities in least altered streams typically have an insignificant proportion of sensitive species; sunfishes are dominant followed by minnows. Man-made flood control levees typically flank the Mississippi River and, in effect, separate the river and its adjoining habitat from the remainder of its natural hydrologic system; in so doing, they interfere with sediment transfer within Ecoregion 73 and have reduced available habitat for many species. Between the levees that parallel the Mississippi River is a corridor known as the "batture ands". Batture lands are hydrologically linked to the Mississippi River, flood-prone, and contain remnant habitat for "big river" species (e.g., pallid sturgeon) as well as river-front plant communities; they are too narrow to map as a separate level IV ecoregion. Earthquakes in the early nineteenth century offset river courses in Ecoregion 73. Small to medium size earthquakes still occur frequently; their shocks are magnified by the alluvial plain's unconsolidated deposits, creating regional land management issues.

The Northern Holocene Meander Belts ecoregion is a flat to nearly flat floodplain containing the meander belts of the forest in the Mississippi Alluvial Plain (73). Cropland also occurs. Flood control levees are less developed and riverine present and past courses of the Mississippi River. Point bars, natural levees, swales, and abandoned channels marked by processes are more natural and dynamic than in Ecoregion 73a. Backwater flooding in the White River occurs well upstream of Louisiana. Ecoregion 73a is underlain by Holocene alluvium; it lacks the Pleistocene glacial outwash deposits of Ecoregion 73b. been designated as one of only nineteen "Wetlands of International Importance" in the United States by the Ramsar Convention The Mississippi River winds through nearly level, agriculturally-dominated terrain in the Northern Soils on natural levees are relatively coarse-textured, well-drained, and higher than those on levee back slopes and point bars; on Wetlands. Regulation of White River flow, in combination with the downcutting of the Mississippi River for navigation (and Holocene Meander Belts (73a) north of Memphis. Extremely low water has exposed a large sandbar they grade to very heavy, poorly-drained clays in abandoned channels and swales. Overall, soils are not as sandy as the related wing levees and cutoffs), have altered flood regimes on the lower White River, thereby increasing stream bank Northern Pleistocene Valley Trains (73b) and are finer and have more organic matter than the Arkansas/Ouachita River instability and bottomland forest mortality in Ecoregion 73f. Most streams and rivers in Ecoregion 73f are fed by the Ozark Holocene Meander Belts (73h). Natural vegetation varies with site characteristics. Younger sandy soils have fewer oaks and Highlands and Boston Mountains; sediment load is generally less than in the Mississippi River. more sugarberry, elm, ash, pecan, cottonwood, and sycamore than Ecoregion 73d. Widespread draining of wetlands and removal of bottomland forests for cropland has occurred. Soybeans, cotton, corn, sorghum, wheat, and rice are the main crops.

Catfish farms are increasingly common and contribute to the already large agricultural base. The Northern Pleistocene Valley Trains ecoregion is a flat to irregular alluvial plain composed of sandy to gravelly

Northern Pleistocene Valley Trains (73b) and St. Francis Lowlands (73c). Many interdunal depressions called "sandponds" Pleistocene outwash deposits of Ecoregion 73b are usually coarser and better drained than the alluvial deposits of Ecoregions Northern Holocene Meander Belts (73a) and Western Lowlands Holocene Meander Belts (73f); consequently, uplands are 73a, 73d, and 73f. They were transported to Arkansas by the Mississippi River and its tributaries and have been subsequently rarely if ever flooded. Native plant communities are different from more frequently inundated ecoregions; for example, post oak eroded, reduced in size, and fragmented by laterally migrating channels or buried by thick sediments. Ecoregion 73b has little and loblolly pine are native to Ecoregion 73g but are absent from lower, overflow areas. Sandpond forest communities are local relief or stream incision. Elevations tend to be slightly higher than adjacent parts of Ecoregions 73a and 73d. Cropland is generally dominated by overcup oak, water hickory, willow oak, and pin oak; understory in a few sandponds may include extensive and has largely replaced the original forests; soybeans are the main crop and cotton is also produced. The few pondberry (*Lindera melissifolia*), federally listed as endangered. Today, cropland is extensive and the main crops are soybeans remaining forests are dominated by species typical of higher bottomlands such as Nuttall oak, willow oak, swamp chestnut oak, and cotton. Commercial crawfish, baitfish, and catfish farms are common. The Western Lowlands Pleistocene Valley Trains

better than in the less channelized areas of Ecoregion 73g because of a lack of loess veneer in Ecoregion 73c.

sugarberry, and green ash. There are more lowland oaks in Ecoregion 73b than in Ecoregions 73a and 73d.

narrow belt of low hills is found in the east. Prior to the 19th century, flatter areas with slowly to very slowly permeable soils

Backswamps (73d). As a result, willow oak and water oak are native instead of species adapted to wetter overflow conditions. (often containing fragipans) supported Arkansas' largest prairie. They were generally bounded by open woodland or savanna. In Drainage canals and ditches are common. This artificial drainage, together with the sandy veneer of natural levee deposits, help all, about 400,000 acres of prairie grasses and forbs occurred in Ecoregion 73e, and were a sharp contrast to the bottomland explain why Ecoregion 73i is more easily and widely farmed than the Northern Backswamps (73d). Rice, cotton, and soybeans forests that once dominated other parts of the Mississippi Alluvial Plain (73). Low hills were covered by upland deciduous are important crops but forests and forested wetlands also occur.

fields provide habitat and forage for large numbers and many species of waterfowl; duck and goose hunting occurs.

neander scars and oxbow lakes are common and characteristic. Ecoregion 73a tends to be slightly lower in elevation than its confluence with the higher Mississippi River; as a result, riparian and natural levee communities are less common and oakjacent ecoregions. Its abandoned channel network is more extensive than in the Southern Holocene Meander Belts (73k) of dominated communities are more widespread than in Ecoregion 73a. Wetlands in the Cache-lower White River systems have

muted by windblown silt deposits (loess), sand sheets, or sand dunes; loess and sand sheets are more widespread than in the

Many streams in Ecoregion 73c have been glacial outwash overlain by alluvium; sand sheets, widespread in the St. Francis Lowlands (73c), are absent. The occur and are either in contact with the water table or have a perched aquifer. Elevations are higher than adjacent parts of the (73g) ecoregion is a wintering ground for water fowl. Duck hunting is widespread.

The St. Francis Lowlands ecoregion is flat to irregular and has many relict channels. Ecoregion 73c is mainly composed of late-Wisconsinan age glacial outwash deposits and, in contrast to Ecoregion 73b, is partly covered by undulating sand sheets. "Sand blows" and "sunk lands" occur and have been attributed to the New Madrid earthquakes of 1811- swales, and abandoned channels, marked by meander scars and oxbow lakes, are common and characteristic. Soils on natural 12 (~ magnitude 8). Loess, which veneers older outwash deposits in Ecoregion 73g, is absent. Topography, lithology, and levees are relatively coarse-textured, well-drained, and higher than those on levee back slopes and point bars; they grade to Water-intensive commercial rice production has Rice fields in Ecoregion 73e provide habitat and hydrology vary over short distances and natural vegetation varies with site characteristics. Cropland is extensive and has largely heavy, poorly-drained clays in abandoned channels and swales. Overall, soils have less organic matter than in the Northern significantly depleted Ecoregion 73e's aquifer. forage for waterfowl including mallards. Photo: replaced the original forests; soybeans, corn, and cotton are the most common crops but wheat, sorghum, and rice are also Holocene Meander Belts (73a). The modern, active Arkansas River meander belt comprises only a small portion of Ecoregion produced. Although the streams of the St. Francis Lowlands (73c) have been extensively channelized, water quality tends to be 73h. The rest of Ecoregion 73h contains small streams flowing in abandoned courses of the Arkansas River. These small streams are usually underfit relative to the older channels, higher than the adjacent Arkansas/Ouachita River Backswamps (73i), The Northern Backswamps ecoregion is made up of low-lying overflow areas on floodplains, and includes poorly-drained flats and swales. Water often collects in its marshes, swamps, oxbow lakes, ponds, and low gradient streams. Soils developed from clayey alluvium including overbank and slack-water deposits; they commonly have a high shrink-swell most species-rich streams in North America. The pink mucket and the fat pocketbook mussels, both federally listed as potential and are locally rich in organic material. Water levels are seasonally variable. Native vegetation in the wettest areas is endangered, have been collected from the Bayou. Within an abandoned course, bald cypress and water tupelo often grow in the generally dominated by bald cypress-water tupelo forest; slightly higher and better drained sites have overcup oak-water modern stream channel adjacent to a strip of wet bottomland hardwood forest dominated by overcup oak and water hickory. In hickory forest and the highest, best-drained areas support Nuttall oak forest. Today, bottomland forest, cropland, farmed the rest of Ecoregion 73h, cropland and pastureland are widespread; soybeans, rice, and wheat are the main crops.

wetlands, pastureland, and catfish farms occur. Backswamps are important areas for capturing excess nutrients from local The flats, swales, and natural levees of the Arkansas/Ouachita River Backswamps ecoregion include the slackwater areas along the Arkansas and Ouachita rivers, where water often collects into marshes, swamps, oxbow lakes, ponds, The Grand Prairie ecoregion is a broad, loess-covered terrace formerly dominated by tall grass prairie and now and sloughs. Ecoregion 73i, in contrast to the Northern Backswamps (73d), is widely veneered with natural levee deposits. Soils primarily used as cropland. It is typically almost level. However, incised perennial and intermittent streams occur and a derived from these natural levee deposits are coarser and are not as poorly drained as the clayey soils of the Northern have reduced forest habitat in Ecoregion 73f and Lowlands Pleistocene Valley Trains (73g). Photo:

forest containing white oak, black oak and southern red oak. Drier ridges were dominated by post oak. Narrow floodplains had bottomland hardwood forests. Cropland has now largely replaced the native vegetation. In the process, some prairie species the Mississippi River and deposited by braided streams. It is veneered by windblown silt deposits (i.e. loess) like have been extirpated from the ecoregion (e.g., greater prairie chicken); others have been sharply reduced in population and Ecoregions 73e, 73g, and 74a. Soils are influenced by loess and contrast with the alluvial soils of Ecoregions 73a and 73h. restricted to a few prairie remnants. Distinctively, rice is the main crop; soybeans, cotton, corn, and wheat are also grown. Rice Macon Ridge (73j) is a continuation of the Western Lowlands Pleistocene Valley Trains (73g) but is better drained, and supports drier plant communities. Its eastern edge is 20 to 30 feet above the adjacent, lithologically and physiographically The Western Lowlands Holocene Meander Belts ecoregion is a flat to nearly flat floodplain containing the meander distinct, Northern Holocene Meander Belts (73a). The western side of Macon Ridge (73j) is lower than the eastern side, and is belts of the present and past courses of the White, Black, and Cache rivers. Its meander belts are narrower than the about the same elevation as the lithologically and physiographically distinct Arkansas/Ouachita River Holocene Meander Belts orthern Holocene Meander Belts (73a), but point bars, natural levees, swales, and abandoned channels are common in both (73h). Native forest types range from those of better drained bottomlands dominated by willow oak, water oak, and swamp regions. Soils on natural levees are relatively coarse-textured, well-drained, and higher than those on levee back slopes and chestnut oak to upland hardwood forests dominated by white oak, southern red oak, and post oak. Prairies and loblolly pinepoint bars; they grade to heavy, poorly-drained clays in abandoned channels and swales. Natural vegetation varies with site dominated areas may also have occurred on Macon Ridge (73j). Today, Ecoregion 73j is a mosaic of pastureland, forest, and Photo: Barb Kleiss, USACE



The least tern once nested on sandbars in the Arkansas portion of Ecoregion 73a. Channel alterations and rising river levels have eliminated Mississippi Alluvial Plain (73). It is adapted to inaccessible sandbars that formed the core of its sandy soil. Photo: Missouri Department of nesting habitat. The least tern is now federally Con



areas of the Northern Backswamps (73d). Photo:

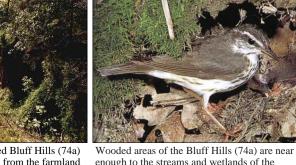








the crop from the boll weevil. *Photo: Gary Kramer*,













rich streams in North America, supporting 120 fish species. Photo: MAWPT

stureland, and orchards of the Bluff Hills (74a) contrast with the cropland of the lower, flatter

Mississippi Alluvial Plain (73) in the background. Photo: T.L. Foti, Arkansas Natural Heritage Commission

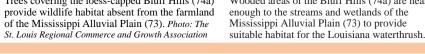
74. Mississippi Valley Loess Plains Ecoregion 74 stretches from the Ohio River in western Kentucky all the way to Louisiana. It is characteristically veneered with windblown silt deposits (loess) and underlain by erosion-prone, unconsolidated coastal plain sediments; loess is thicker than in the Southeastern Plains (65). Western areas, including Arkansas, have hills, ridges, and bluffs, but further east in Mississippi and Tennessee, the topography becomes flatter. Overall, irregular plains are common. Ecoregion 74 is lithologically and physiographically

distinct from the Ouachita Mountains (36), Boston Mountains (38), Ozark Highlands (39), Interior Plateau (71), and Interior River Valleys and Hills (72). Potential natural vegetation is primarily oak—hickory forest or oak—hickory—pine forest and is unlike the southern floodplain forests of the Mississippi Alluvial Plain (73). Streams tend to have gentler gradients and more silty substrates than in the Southeastern Plains (65). Crowley's Ridge, the only portion of the **Bluff Hills** ecoregion in Arkansas, is a disjunct series of loess-capped hills cropland is found in Ecoregion 74a. Post oak-blackjack oak forest, southern red oak-white oak forest, and beech-maple forest sufficient height to have trapped wind-blown silt during the Pleistocene Epoch. It was formed by the aggregation of loess and these mesophytic communities. The forests of the Bluff Hills (74a) are usually classified as oak-beech. They are related to the e subsequent erosion by streams. The loess is subject to vertical sloughing when wet. Spring-fed streams and seep areas occur beech-maple cove forests of the Appalachian Mountains; like the Appalachian cove forests, tulip poplar dominates early on the lower slopes and in basal areas where Tertiary sands and gravels, that were never removed by the Mississippi River, are successional communities, at least in the southern ridge. In Arkansas, tulip popular is native only to the Bluff Hills (74a). exposed. Soils are generally well-drained; they are generally more loamy than those found in the surrounding Northern Shortleaf pine grows on the sandier soils of the northern ridge.

Pleistocene Valley Trains (73b) and St. Francis Lowlands (73c). Wooded land and pastureland are common; only limited

characteristics. Today, Ecoregion 73f contains some of the most extensive remaining tracts of native bottomland hardwood cropland. Soybeans, cotton, and oats are major crops.

surrounded by the lower, flatter Mississippi Alluvial Plain (73). Crowley's Ridge, with elevations of up to 500 feet, is occur. Undisturbed ravine vegetation can be rich in mesophytes, such as beech and sugar maple. Oaks still dominate most of







35 South Central Plains

35b Floodplains and Low Terraces

35d Cretaceous Dissected Uplands

35c Pleistocene Fluvial Terraces

35g Red River Bottomlands

36 Ouachita Mountains

36b Central Mountain Ranges

36c Central Hills, Ridges, and Valleys

37a Scattered High Ridges and Mountains

Level III Ecoregions of the Conterminous United States

35a Tertiary Uplands

35h Blackland Prairie

36a Athens Plateau

36d Fourche Mountains

36e Western Ouachitas

37 Arkansas Valley

37b Arkansas River Floodplain

37c Arkansas Valley Hills

37d Arkansas Valley Plains







2 Puget Lowland

3 Willamette Valley

5 Sierra Nevada

6 Southern and Central California

8 Southern California Mountains

9 Eastern Cascades Slopes and

7 Central California Valley

Chaparral and Oak Woodlands 35 South Central Plains

4 Cascades

Foothills

10 Columbia Plateau

11 Blue Mountains

15 Northern Rockies

16 Idaho Batholith

17 Middle Rockies

18 Wyoming Basin

20 Colorado Plateaus

24 Chihuahuan Deserts

27 Central Great Plains

26 Southwestern Tablelands

21 Southern Rockies

25 High Plains

28 Flint Hills

2 Snake River Plair

13 Central Basin and Range

14 Mojave Basin and Range

19 Wasatch and Uinta Mountains

22 Arizona/New Mexico Plateau



23 Arizona/New Mexico Mountains 52 Driftless Area



38a Upper Boston Mountains

38b Lower Boston Mountains

39 Ozark Highlands

Albers Equal Area Projection

Standard parallels 33° 35' N and 35° 45' N

29 Cross Timbers

30 Edwards Plateau

36 Ouachita Mountains

39 Ozark Highlands

41 Canadian Rockies

40 Central Irregular Plains

44 Nebraska Sand Hills

46 Northern Glaciated Plains

47 Western Corn Belt Plains

51 North Central Hardwood

53 Southeastern Wisconsin Til

54 Central Corn Belt Plains

55 Eastern Corn Belt Plains

Indiana Drift Plains

48 Lake Agassiz Plain

37 Arkansas Vallev

38 Boston Mountain

45 Piedmont

31 Southern Texas Plains

32 Texas Blackland Prairies

33 East Central Texas Plains

34 Western Gulf Coastal Plain

39b Dissected Springfield Plateau–Elk River Hills

State boundary --—-—

57 Huron/Erie Lake Plains

58 Northeastern Highlands

and Uplands

64 Northern Piedmont

65 Southeastern Plains

67 Ridge and Valley

71 Interior Plateau

75 Southern Coastal Plain

■ 78 Klamath Mountains

79 Madrean Archipelago

80 Northern Basin and Range

81 Sonoran Basin and Range

83 Eastern Great Lakes and Hudson

82 Laurentian Plains and Hills

66 Blue Ridge

42 Northwestern Glaciated Plains 69 Central Appalachians

43 Northwestern Great Plains 70 Western Allegheny Plateau

49 Northern Minnesota Wetlands 76 Southern Florida Coastal Plain

56 Southern Michigan/Northern 84 Atlantic Coastal Pine Barrens

61 Erie Drift Plain

59 Northeastern Coastal Zone

62 North Central Appalachians

68 Southwestern Appalachians

72 Interior River Valleys and Hills

73 Mississippi Alluvial Plain

74 Mississippi Valley Loess Plains

60 Northern Appalachian Plateau

63 Middle Atlantic Coastal Plain

39a Springfield Plateau

39c White River Hills

39d Central Plateau







Reston, Virginia, U.S. Geological Survey (map scale 1:1,000,000).

the Clean Water Act (through the wetlands grant program).

Cooperative Extension Service).

Smith (Executive Director, Audubon Arkansas).



73 Mississippi Alluvial Plain

73c St. Francis Lowlands

73e Grand Prairie

73j Macon Ridge

74a Bluff Hills

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Corporation), and Michael Radford (Arkansas Soil and Water Conservation Commission).

73d Northern Backswamps

73f Western Lowlands Holocene

Meander Belts

Valley Trains

Meander Belts

73g Western Lowlands Pleistocene

73h Arkansas/Ouachita River Holocene

73i Arkansas/Ouachita River Backswamps

74 Mississippi Valley Loess Plains

73a Northern Holocene Meander Belts

73b Northern Pleistocene Valley Trains

