Ouachita Mountains Ecoregional Assessment

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Executive Summary

In 1996 The Nature Conservancy developed an ecoregional approach to conservation, outlined in *Conservation by Design: A Framework for Mission Success*, stating that biodiversity conservation requires working at larger scales and along ecological instead of geopolitical lines. Ecoregions, large units of land and water delineated by characteristic biotic and abiotic factors, provide a better geographic basis than state boundaries for organizing our conservation priorities and actions. Strategic planning on an ecoregional scale encourages review of many species and ecological communities at once, providing a structure for capturing genetic and ecological variability within species or communities.

The major products of an ecoregional assessment include: 1) identification of a portfolio of sites that, if protected, collectively conserve the biodiversity of the ecoregion, 2) an implementation strategy to protect the sites, including strategies and conservation partners, and 3) identification of data gaps to improve the quality of future conservation decision-making and ensure ecoregional assessment updates capture relevant and useful data. A critical element of the conservation areas is the data captured through the plan, which not only provides a science-based foundation for ecoregional assessments but also provides a starting point for site conservation planning in the implementation phase.

This plan serves as an update of sorts to the 1994 Ouachita Mountains Conservation Initiative plan, which included many of the analyses, information and strategies that are integral to the ecoregional assessments that are the basis for the Conservancy's conservation efforts today.

The Ouachita Mountain Ecoregion includes parts of Arkansas and Oklahoma, and comprises a landscape of approximately 11.48 million acres of rugged mountain ridges, broad valleys, and the headwaters of several large river systems. The complex geological formations and soils of this forested landscape have created a tremendous diversity of habitat reflected in a biodiversity of ancient lineage; the Ouachitas have been available for continuous occupation by terrestrial and aquatic life for 225 million years, and are a center for endemism in North America, particularly in the realm of aquatic species.

The Ouachita Ecoregion is home to 48 endemic species and 68 species with limited ranges. More than one-third of the endemic species are aquatic. There are fourteen federally listed species and 28 others that are recognized as potentially endangered by the United States Fish and Wildlife Service (USFWS) in the ecoregion. There are 79 terrestrial communities identified in the ecoregion, 9 of which are endemic. Most of the remaining communities are shared only with the Ozark Ecoregion within the area collectively referred to as the Interior Highlands.

This ecoregional assessment identified 40 portfolio conservation areas as integral to conservation of the Ouachita's biodiversity. In this iteration of the plan, the aquatic, landscape scale and small patch conservation areas cover a total of 6,068,258 acres, or 53% of the ecoregion. This number, however, can be misleading due to the fact that the watershed area of aquatic conservation areas was used in its calculation. Terrestrial sites alone total 2,494,920 acres or approximately 21% of the ecoregion. Currently, 2,280,231 acres or 38% of conservation areas include land managed under some type of public conservation ownership. This figure increases to 91% when only the area of terrestrial conservation areas is used in the calculation. Of all the conservation areas that are managed for

conservation, 2,120,340 acres or 35 % are federally owned; 159,890 acres or 3% are state or locally owned; and 4,028 acres or 0.07% are privately owned.

Terrestrial ecosystems in Ouachitas are stressed by habitat destruction/conversion, habitat fragmentation, and alteration of natural fire regimes. These stresses have incompatible forestry practices, development, conversion and agriculture, and fire suppression as their sources. Aquatic systems are stressed by incompatible land use practices leading to sedimentation and runoff, and other nonpoint source pollution. Conversion includes land uses associated with grazing and plantation forestry. Habitat alteration and incompatible land use include incompatible agricultural (grazing, confined animal feeding operations) and commercial timber use, as well as development.

The portfolio conservation areas depicted in this iteration of the Ouachita ecoregional assessment are intended as a prioritization management tool for conservation action and resources. This plan also contains the supporting data for each portfolio conservation area, as well as an ecoregional management strategy applicable to the portfolio management areas. Portfolio management action areas are prioritized by biodiversity, threats, complementarity, and potential leverage. Results and data from this ecoregional assessment process should be used to create working site conservation plans as part of the initial implementation phase of the plan.

Introduction

The mission of The Nature Conservancy is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive (TNC, 2001). The Nature Conservancy has worked to fulfill this mission for over 50 years through land acquisition and management, creating partnerships and involving stakeholders and communities in the conservation process. As the threats to biodiversity and their corresponding immediacy increase, TNC has been growing and changing to better fulfill its mission; one key change has been the movement from an opportunistic approach towards strategic conservation management. Strategic conservation is represented here in the ecoregional assessment. *Conservation by Design* (TNC, 1996) defined the framework on which this ecoregional assessment is based by planning for biodiversity at the landscape scale.

An ecoregion is generally defined as relatively large areas containing geographically distinct assemblages of natural communities, where communities share a large majority of their species, dynamics, and environmental conditions, and the communities also function together as a conservation unit at large scales (Ricketts, et al. 1999). TNC based initial ecoregion design on the efforts of the US forest Service (Bailey, 1995) and further refined to sub-ecoregions (Keys, et al., 1995).

Ecoregional assessments endeavor to set the groundwork for regional, state, local, and community based conservation through strategic, long-term priorities and strategies. An ecoregional assessment should:

- Prioritize TNC resources and management action,
- Provide a scientific basis for community based conservation action by delineating geographic areas that should be managed for conservation and biodiversity,
- Provide a general conservation strategy for those sites, and
- Clearly illustrate data gaps discovered during the planning and implementation process, and provide a roadmap for reconciling those gaps.

A complete ecoregional assessment contains not only the ecological sites, but tools for the conservation planners and practitioners:

- Data to support those sites and priorities,
- Strategy to implement the plan, and
- A mechanism to review, update and measure the success of a plan.

The portfolio conservation areas, supporting data, and the applicable management and conservation strategies are based on the best available science, and therefore provide a roadmap for the best use of TNC and partner resources. An ecoregional assessment is also useful as a data bank and data gap analysis. As such, it is a living document that requires review and updates as necessary.

Note that while the goal of an ecoregional assessment effort is to delineate the minimum or priority areas necessary to conserve an ecoregion's biodiversity, different conservation areas represent different goals and not all sites represent functional landscapes. Plan users should carefully review each site description and strategy to ensure plan success.

Within ecoregions, portfolio conservation areas are designed to conserve biodiversity by managing viable native community, zoology and botany targets identified during the planning process. Protection of high quality sites that conserve multiple, unprotected or nontarget occurrences are preferred conservation strategies. To best fulfill the conservation goals of the plan, practitioners need to restore and maintain ecosystem patterns and processes that species and communities need to survive (Turner, 2000).

While conservation area boundaries were conceptually drawn based on element occurrences and not the location of public lands, several of these conservation areas are located entirely within federal ownership based on necessity. For instance, the Ouachita Novaculite Glade ecological system is located entirely within the Ouachita National Forest acquisition boundaries. Therefore, there can be no private lands component to a site like this one except for privately owned inholdings to the Forest which are insignificant in size. This scenario repeated itself for several systems entirely or for large parts of them. As a result, the plan may appear to have a bias toward publicly owned land.

This document represents a 2002 update of sorts to the 1994 plan completed by Douglas Zollner, called the Ouachita Mountains Conservation Initiative, because many of the components of this earlier plan are the very parts required under the Conservancy's ecoregional assessment guidelines. The plan will provide a portfolio of conservation areas, including priority or action areas, the data compiled and created during this planning effort, methodology, the data gaps identified, and a strategies for plan implementation. It is hoped that conservation planners, site-based conservation staff, and TNC partners use this plan to effectively manage the biodiversity of the ecoregion. Successful use, however, will require a commitment of cooperation, resources and time, as well as the sharing of responsibility and effort.

Background

Ecoregional Boundary Delineation

The Ouachita Ecoregion is approximately 11.48 million acres or 17,937 square miles in size, and encompasses parts of Arkansas and Oklahoma. It is bordered by 4 other ecoregions. To the north, the boundary meets the Ozark Ecoregion with which the Ouachitas are often lumped together as the "Interior Highlands," despite their distinct differences in geology. The Ouachita Mountains share much of its diversity with the Ozark ecoregion. To the east, the ecoregion borders the Mississippi River Alluvial Plain, and the Crosstimbers and Southern Tallgrass Prairie Ecoregion to the west. Finally, the Ouachitas are bordered by the Upper West Gulf Coastal Plain to the south.

The northern part of the ecoregion includes an area north of the Arkansas River in Pulaski, Faulkner and White Counties, Arkansas, which is geologically related to the Ouachita Mountains and has the typical east-west ridge lines. However, the terrestrial communities of this area actually have a more Ozark ecoregion character than the rest of the Ouachitas. In this iteration of the plan the Arkansas River Valley is included in the Ouachita Mountains Ecoregion despite its landscape of isolated mountains and oak-hickory forest which is unlike those found in the Ouachitas. Bailey (1982) actually included this area with the Upper West Gulf Coastal Plain ecoregion despite the fact that the two are separated by at least 20 miles. The Arkansas River Valley should perhaps be more appropriately included within the Mississippi River Alluvial Plain ecoregion because of its alluvial geology and similarities in the associated bottomland plant communities.

To the west, the boundary follows the geology as the Ouachitas disappear under the western plains. Vegetationally, the western edge is dynamic; the pine-oak, tallgrass prairie, oak savanna (cross timbers) ecoregions meet along this edge. The boundaries of these floristic association intergrade, advance and retreat with historic changes in climate.

To the south, the boundary follows the divide between the Upper West Gulf Coastal Plain (UWGCP) and Ouachita Mountains. High levels of faunal diversity are found in the rivers that flow south out of the Ouachitas and into the Red River system. The upland forest ecosystem also extends south in this area to where it intergrades with the vegetation types found on the Coastal Plain.

A portion of the Coastal Plain was incorrectly included within the Conservancy's boundary of the Ouachita Mountains Ecoregion. The characteristics of this subsection include deep alluvial deposits (sand, silt, clay) of Pleistocene age which contrasts strongly with the geology of the Ouachitas. It is an irregular plain with low relief (100-300 feet elevation), historically vegetated by oak woodlands and flatwoods. This area will be assessed as part of an UWGCP ecoregional assessment update, and its removal from the Ouachita ecoregional boundary will be addressed in a future iteration of the Ouachita plan.

Geology

The Ouachita Mountains Physiographic Subprovince covers 11.48 million acres in central and western Arkansas and southeast Oklahoma, extending in a broad belt eastward from Atoka county, Oklahoma to the vicinity of Little Rock, Arkansas. The Ouachitas form the southern section of the Interior Highlands, which includes the Ozark Plateau. These geologic features were created 345 million years ago by the same geophysical action that formed the Appalachian Mountains and Central Plateau of Texas. To the east, structural and stratigraphic features are buried by Cretaceous and Tertiary rocks and deposits of the Mississippi Embayment and to the west the structural trend curves south and is buried by Cretaceous strata of the Central Plains (Bryan Tapp, pers. comm., 1992; Miser, 1929). This process has left the Ouachitas isolated from other mountain systems.

The landform of the Ouachita Mountains is an accretionary prism composed of intensely folded and deformed sandstone, shale and chert units that form one of the major fold-belt mountain ranges of the North American continent. Initial sedimentation occurred in deeply submerged ocean troughs. Silty oceanic ooze was metamorphosed into thin layers of shale and chert during Paleozoic times. Occasional units of sandstone occur in the succession, probably emplaced by ocean currents and as fans at the heads of submarine canyons. Strata of Ordovician, Silurian, Devonian and Mississippian ages are exposed in the Ouachitas and represent this early phase of sedimentation. During late Mississippian and early Pennsylvanian periods huge deposits of sand entered the ocean from rivers which had their deltas in the area of present day Poteau, Oklahoma. These rivers deposited great volumes of sand and mud in the basin with accumulations reaching thicknesses of 45,000 feet. These strata are represented by the Stanley, Jackfork, Johns Valley and Atoka formations (Bryan Tapp pers. comm., 1992; Miser, 1929).

The collision of Lanoria with the North American plate resulted in a mountain building process referred to as the Ouachita Orogeny. Metamorphosed oceanic oolithic and deltaic deposits were intensely deformed by compressive forces which were directed north toward the stable interior of the American continent. Twisted, warped and overturned folds and thrust faults reflect this violent collision (Bryan Tapp pers. comm., 1992; Miser, 1929). Deformed Paleozoic rocks were intruded during the Cretaceous by veins of

igneous rock. The hot springs of Hot Springs National Park and the diamond-bearing Kimberlite formation near Murfreesboro, Arkansas are results of this activity (Croneis, 1930).

Erosion has been the dominant geological force over the last 300 million years. Soft shales have been eroded away or deposited in valleys while resistant sandstones, cherts and novaculites have been formed into the dominant ridges we see today. This ridge and valley formation is characterized by long, hogback ridges with relief as great as 1600 feet above the valley floors and total elevations of between 600 and 2,750 feet above sea level. These ridges run east-west and generally have long north and south facing slopes. Because of the way the rock strata fractured north facing slopes tend to be steeper than south facing slopes. Surface rocks are sandstones, shales and cherts (Croneis, 1930).

The Ouachita Mountains can be divided into four geologically distinct subsections (Croneis, 1930; Bryan Tapp, per. comm., 1992):

1) Northern Hogback Frontal Belt (Fourche Mountains): Includes the rugged sandstone ridges of Fourche, Poteau, Winding Stair, Kiamichi, Rich, Black and Boktukola Mountains. These ridges are composed of massive formations of sandstone underlain in places by various shales.
2) Broken Bow-Benton Novaculite Uplift (Central Ouachita Mountains): The most rugged terrain in Arkansas with sharp narrow ridges piled close together, shallow soils and narrow stony valleys. The ridges are capped with fractured novaculite, a hard, resistant siliceous rock which has influenced the formation of glade communities. This area is noted for its numerous springs and seeps.
3) Athens Plateau (Piedmont): The novaculite formation gives way in the south to a gentler topography. Rivers turn south and drop over the fall line to the Gulf Coastal Plain. This is an area of low ridges 150-220 feet high. Uplifted toward the end of the Ouachita orogeny, this plateau was dissected by downcutting rivers.
4) Arkansas River Valley: Divides the geologically simple Ozarks from the geologically complex Ouachitas, with elements of each, was formed between 320 – 286 Ma during the Pennsylvanian era. The river valley is a typical alluvial plain characterized by rapid infilling of clastic sediments and development of growth faults along northern basin margin. As the basin shallowed, plant debris accumulated in nearshore swampy areas (AGC, 1997).

Soils

The Ouachita Mountains are very diverse in terms of aspect, slope and bedrock. The valleys between the ridges are underlain by shale and have a gentle relief. The ridges are composed of sandstone and chert and extremely steep slopes with numerous rock exposures. The ridge tops often have very shallow soils and rock glaciers have formed the steepest slopes.

Most soils of the Ouachita Mountains Natural Division are assigned to the Ultisol order, with a few Inceptisols and Alfisols. Ultisols are intensively weathered soils and characterized by low fertility. They are low in base saturation, and therefore acidic, due to long periods of weathering during the Pleistocene and Holocene epochs. Soils in this order form in humid climates under pine-hardwood forests. They are generally moist throughout the year. Westward, the soils are subject to an annual dry period during the hot season of the year. The soils are deep, strongly leached, generally of medium texture and moderate permeability (Steila, 1989).

This mixture of bedrock, slope, aspect and soils has created unique plant assemblages across rather small areas of mountain ridge. Together with the many small seeps and springs these small areas of

biodiversity form an important part of the total biodiversity of the Ouachita Mountains. The low soil fertility led to the failure of most homesteading efforts in the Ouachita Mountains. Crop farming rapidly diminishes the already low fertility of the soils and it was mostly abandoned early in this century. Cleared land would not easily support a farmer and his family let alone make a profitable excess (Smith, 1986). For this reason most of the landscape has remained or returned to forest. Farmers today raise small livestock (chickens/hogs) in intensive feeding operations or graze cattle on mostly improved pastures. Several large wood product corporations have established large plantations (tree farms) in areas with gentler relief.

In the Arkansas River Valley, soils are from the Quaternary Period, Holocene Epoch and include Steprock, Taft, Roxana, Eram, Spadra, Okay, and Stigler.. Alluvial deposits of present streams include gravels, sands, silts, clays, and mixtures of any and all of these clastic materials. The partition of this unit from other Holocene alluvial deposits was on the basis of geomorphic considerations rather than age or lithology. Fossils are rare and modern. The lower contact is unconformable and the thickness is variable (McFarland, 1998).

Climate

The Ouachita Mountains are located in the humid subtropical zone. Hot, sultry summers and moderately cool winters with some snow, but no accumulations, are normal. The climate is controlled by two different air masses. Warm, moist air from the Gulf of Mexico generally dominates especially in the spring and summer. Cooler, dryer air from the Central Plains enters the area in the winter. (Stroud and Hanson, 1981)

Precipitation is well distributed throughout the year. As one moves from east to west spring rainfall becomes more important with doughty conditions likely in the summer. Total precipitation ranges from 1100mm-1500mm decreasing from east to west. The taller mountains ranges receive additional rainfall due to orographic effects (Smith, 1989). Droughts occur most likely during late summer and fall (Stroud and Hanson, 1981). Moderate droughts occur at 15-20 year intervals with sever, multi-year droughts even less frequent. Tornadoes and floods may occur in any month but are most likely during the spring. Strong winter winds with sleet and freezing rains occur in late December, January and February.

Temperatures average from 4-10 degrees Celsius in January to 21-32 degrees Celsius in July. The peak high temperatures usually occur in August. Elevation can be an important factor influencing temperatures in the mountains.

Ecological Systems

TERRESTRIAL SYSTEMS

The Ouachita Highlands terrestrial community targets were updated from original lists kept by Doug Zollner and Milo Pyne. Descriptions for each community as it is represented in the ecoregion are attached as an appendix. System names have been generalized to conform to the Southern Resource Office's and Association for Biodiversity Information's database. Though system complex names may be used across ecoregions, the composition of each as it occurs in the ecoregion is unique and endemic to the ecoregion. Further, community associations as they are described for this ecoregion that belong to a terrestrial community complex are endemic to the Ouachitas; therefore even though some groups

are noted for not containing localized endemic or rare species, the associations themselves may be rare or endemic. The systems and the associated communities are:

Forest And Woodland Systems

Ozark-Ouachita Fen
This small patch fen community type is found in the Interior Highlands region of the United States. Stands occur on the sideslopes of hills in narrow valleys, bases of bluffs, rock ledges, and terraces of streams and rivers, where the soil or substrate is saturated by calcareous groundwater seepage. Soils are moist to wet, mucky peat or mineral, with pH above 6.5, and vary from shallow (0-40 cm) to moderately deep (40-100 cm), depending on natural disturbance and slope. The parent material is a mixture of gravel and dolomite with fragments of deeply weathered bedrock present, or colluvium over bedrock. The bedrock strata are exposed, especially in hanging fens where the slope is greater than 35 degrees. Hydrophytic plants dominate the fen, which varies from mixed grass or sedge fen with complex zonation to more tallgrass prairie species mixed with calciphiles. Fires are possible in some of the larger prairie fens.

Central Interior Highlands Dry Acidic Glade and Barrens
This small patch system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions. It occurs along moderate to steep slopes or valley walls of rivers along most aspects. Parent material includes chert, igneous and/or sandstone bedrock with well- to excessively well-drained, shallow soils interspersed with rock and boulders. These soils are typically dry during the summer and autumn, becoming saturated during the spring and winter. Grasses such as *Schizachyrium scoparium* and *Sorghastrum nutans* dominate this system with stunted oak species (*Quercus stellata, Quercus marilandica*) and shrub species such as *Vaccinium* spp. occurring on variable depth soils. This system is influenced by drought and infrequent to occasional fires. Prescribed fires help manage this system by maintaining an open glade structure.

Ouachita Montane Oak Forest
This large patch system represents hardwood forests of the highest elevations of the Ouachita Mountains, including Mount Magazine. Vegetation consists of either forests or open woodlands dominated by *Quercus alba* or *Quercus stellata*. Canopy trees are often stunted due to the effects of ice, wind and cold conditions, in combination with fog, shallow soils over rock, and periodic severe drought. Some stands form almost impenetrable thickets.

Ozark-Ouachita Dry Oak Woodland
This small patch system occurs in the Ozark and Ouachita Highlands and far western portions of the Interior Low Plateau regions along gentle to steep slopes and over bluff escarpments with southerly to westerly aspects. Parent material can range from calcareous to acidic with very shallow, well- to excessively well-drained soils, sometimes with a fragipan that causes "xero-hydric" moisture conditions. This system was historically woodland in structure, composition, and process but now includes areas of more closed canopy. Oak species such as *Quercus stellata, Quercus marilandica*, and *Quercus coccinea* dominate this system with an understory of grassland species such as *Schizachyrium scoparium* and shrub species such as *Vaccinium arboreum*. Drought stress is the major

dynamic influencing and maintaining this system. On flatwoods with fragipans, *Quercus stellata* is the major dominant.

Ozark-Ouachita Dry-Mesic Oak Forest
This matrix system is found throughout the Ozark and Ouachita Highlands ranging to the western edge of the Interior Low Plateau. It is the matrix system of this region and occurs on dry-mesic to mesic gentle to moderately steep slopes. Soils are typically moderately to well-drained and more fertile than those associated with oak woodlands. A closed canopy of oak species (*Quercus rubra* and *Quercus alba*) often associated with hickory species (*Carya* spp.) typify this system. *Acer saccharum* (or *Acer barbatum* to the south) may occur on more mesic examples of this system. Wind, drought, lightening, and occasional fires can influence this system.

Ozark-Ouachita Mesic Hardwood Forest
This small patch system is found on toeslopes and valley bottoms within the Ozark and Ouachita regions, as well as on north slopes. In the Ozarks, *Quercus rubra* increases in abundance compared to dry-mesic habitats, and *Acer saccharum* is sometimes a leading dominant. On more alkaline moist soils *Quercus muehlenbergii, Tilia americana*, and *Cercis canadensis* may be common. In the Boston Mountains, mesic forests may also be common on protected slopes and terraces next to streams. Here *Fagus grandifolia* may be the leading dominant, with codominants of *Acer saccharum, Liquidambar styraciflua, Tilia americana, Magnolia acuminata*, and others. Similar habitats occur in the western Ouachita Mountains.

Ozark-Ouachita Shortleaf Pine-Oak Forest and Woodland
This matrix system represents forests and woodlands of the Ouachita and Ozark mountains region of Arkansas, adjacent Oklahoma, and southern Missouri in which *Pinus echinata* is an important or dominant component. Although examples of this system occur throughout this region, there is local variation in the extent to which they were present. For example, this system was historically prominent only in the southeastern part of the Ozark Highlands where sandstone derived soils were common (USFS 1999); being limited from other areas by inadequate winter precipitation, and non-conducive soils. In contrast, pine was "virtually ubiquitous in the historical forests of the Ouachitas" (USFS 1999). In nearly all cases (at least in the Ouachitas), *Pinus echinata* occurs with a variable mixture of hardwood species. The exact composition of the hardwoods is much more closely related to aspect and topographic factors than is the pine component (Dale and Ware 1999). In some examples of this system, the aggregate importance of hardwoods may be greater than pine, especially on subxeric and mesic sites (Dale and Ware 1999).

Steppe ans Savanna Systems

Central Interior Highlands Calcareous Glade and Barrens
This small patch system is found primarily in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone and/or dolomite bedrock typify this system with shallow, moderately to well-drained soils interspersed with rocks. These soils often dry out during the summer and autumn, and then become saturated during the winter and spring. *Schizachyrium scoparium*

dominates this system and is commonly associated with *Andropogon gerardii, Bouteloua curtipendula*, and calcium-loving plant species. Stunted woodlands primarily dominated by *Quercus muehlenbergii* interspersed with *Juniperus virginiana* occur on variable-depth-to-bedrock soils. Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.

Ouachita Novaculite Glade and Woodland
This small patch system represents a mosaic of glades and woodlands found on novaculite geology in the central Ouachita Mountains of western Arkansas. Novaculite is a weakly metamorphosed rock of sedimentary origin that is primarily composed of microcrystalline quartz and chalcedony. Examples of this system generally occupy ridgetops at 450-640 m (1476-2100 feet) elevation. They are a mosaic of small woodlands scattered on ridges and upper slopes with outcrops and patches of talus scattered throughout. Some woodland or forest patches may appear as almost linear strips interspersed with grassy openings. Wooded patches have a variable, often patchy, structure with some areas of dense canopy interspersed with more open canopies and open grassy patches. In general, the grassy openings occur on shallow soils with exposed bedrock, while the woodlands occur on somewhat deeper soils. In all cases, these are fairly extreme growing conditions due to droughty, rocky soils.

Herbaceous Systems

Arkansas Valley Prairie and Woodland
This small patch system of prairies and associated woodlands is found in the Arkansas River Valley region of Arkansas and adjacent Oklahoma. This region is distinctly bounded by the Boston Mountains to the north and the Ouachita Mountains to the south, although it has been considered part of the Ouachita Ecoregion (TNC Ecoregion 39). The valley is characterized by broad, level to gently rolling uplands derived from shales and is much less rugged and more heavily impacted by Arkansas River erosional processes than the adjacent mountainous regions. In addition, the valley receives annual precipitation total of 2-6 inches less than the surrounding regions due to a rainshadow produced by a combination of prevailing western winds and mountain orographic effects. The shale-derived soils associated with the prairies are thin and droughty. The combined effect of droughty soils, reduced precipitation, and prevailing level topography create conditions highly conducive to the ignition and spread of fires. Stands are typically dominated by *Andropogon gerardii, Sorghastrum nutans, Panicum virgatum*, and *Schizachyrium scoparium*.

Southeastern Great Plains Tallgrass Prairie
This large patch system is found primarily within the Flint Hills of Kansas and the Osage Plains of Oklahoma; however, it can range into the Ozarks of Missouri, the Arbuckle Mountains of Oklahoma, and the Arkansas River Valley. It is distinguished from Central Tallgrass Prairie (CES205.683) by having more species with western geographic affinities and the presence of a thin soil layer over limestone beds ranging to more acidic substrates, although some areas of deeper soils are found within the region, especially on lower slopes. Because of the presence of the rocky substrate close to the surface and the rolling topography, this area is relatively unsuitable for agriculture. The Flint Hills contain one of the largest remaining, relatively intact pieces of tallgrass prairie. The vegetation in this system is typified by tallgrass species such as *Andropogon gerardii, Panicum virgatum, Schizachyrium scoparium*, and *Sorghastrum nutans* forming a dense cover. A moderate to high density of forb species

such as *Oligoneuron rigidum (= Solidago rigida), Liatris punctata, Symphyotrichum ericoides, Lespedeza capitata*, and *Viola pedatifida* also occur. Areas of deeper soil, especially lower slopes along draws, slopes and terraces, can include *Baptisia alba var. macrophylla, Liatris pycnostachya*, and *Vernonia missurica*. Shrub and tree species are relatively infrequent and, if present, constitute less than 10% cover in the area. Fire and grazing constitute the major dynamic processes for this region. Although many of the native common plant species still occur, grazing does impact this region. Poor grazing practices can lead to soil erosion and invasion by cool-season grasses such as *Bromus inermis*.

Wetland Systems

Central Interior Highlands and Appalachian Sinkhole and Depression Pond

This small patch system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions, as well as the adjacent Appalachian region. Stands occur in basins of sinkholes or other isolated depressions on uplands. Soils are very poorly drained, and surface water may be present for extended periods of time, rarely becoming dry. Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Some examples become dry in the summer. Soils may be deep (100 cm or more), consisting of peat or muck, with parent material of peat, muck or alluvium. Ponds vary from open water to herb-, shrub-, or tree-dominated systems. Tree-dominated examples typically contain *Quercus* species or *Nyssa* species, or a combination of these. In addition, *Liquidambar styraciflua* may be present in southern examples. *Cephalanthus occidentalis* is a typical shrub component.

Ouachita Mountain Forested Seep

This small patch system of forested seeps occurs in the Ouachita Mountains of central Arkansas. Examples may be found along the bottom slopes of smaller valleys where rock fractures allow water to seep out of the mountainsides and in the riparian zones of larger creeks, sometimes extending upslope along small ephemeral drainages. The soil remains saturated to very moist throughout the year. The vegetation is typically forested with highly variable canopy composition. *Acer rubrum var. trilobum, Nyssa sylvatica, Liquidambar styraciflua*, and *Quercus alba* are common and typical. Other canopy species may include *Fagus grandifolia* and *Magnolia tripetala*. Canopy coverage can be moderately dense to quite open. The subcanopy is often well-developed and characteristically includes *Ilex opaca var. opaca, Magnolia tripetala, Carpinus caroliniana*, and *Ostrya virginiana*.

Mixed Upland and Wetland Systems

Ozark-Ouachita Riparian

This linear system is found along streams and small rivers within the Ozark and Ouachita regions. In contrast to larger floodplain systems, this system has little to no floodplain development and often contains cobble bars and steep banks. It is traditionally higher gradient than larger floodplains and experiences periodic, strong flooding. It is often characterized by a cobble bar with forest right adjacent with little to no marsh development. Canopy cover can vary within examples of this system, but typical tree species include *Liquidambar styraciflua, Platanus occidentalis, Betula nigra*, maples

species (*Acer* spp.), and oaks (*Quercus* spp.). The richness of the herbaceous layer can vary significantly, ranging from species-rich to species-poor. Likewise, the shrub layer can vary considerably, but typical species may include *Lindera benzoin, Alnus serrulata*, and *Hamamelis vernalis*. Small seeps and fens can often be found within this system, especially at the headwaters and terraces of streams. These areas are typically dominated by primarily wetland obligate species of sedges (*Carex* spp.), ferns (*Osmunda* spp.), and other herbaceous species such as *Impatiens capensis*. Flooding and scouring strongly influence this system and prevent the floodplain development found on larger rivers.

South-Central Interior Large Floodplain
This linear floodplain system is found throughout the Interior low Plateau, Cumberlands, Southern Ridge and Valley, Western Allegheny Plateau, and lower elevations of the Southern Blue Ridge. Examples occur along large rivers where topography and alluvial processes have resulted in a well-developed floodplain. A single occurrence may extend from river's edge across the outermost extent of the floodplain or to where it meets a wet meadow or upland system. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands resulting, in part, from beaver activity. A variety of soil types may be found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates in combination with different flooding regimes that creates the mix of vegetation. Most areas, except for the montane alluvial forests, are inundated at some point each spring; microtopography determines how long the various habitats are inundated. Although vegetation is quite variable in this broadly defined system, examples may include *Acer saccharinum, Platanus occidentalis, Liquidambar styraciflua*, and *Quercus* spp. Understory species are mixed, but include shrubs, such as *Cephalanthus occidentalis* and *Arundinaria gigantea ssp. gigantea*, and sedges (*Carex* spp.). This system likely floods at least once annually and can be altered by occasional severe floods. Impoundments and conversion to agriculture can also impact this system.

Barren Systems

Central Interior Calcareous Cliff and Talus
This small patch system is found primarily in non-Appalachian portions of the Central Interior Division. It ranges from the Ouachitas east to the Cumberlands and north into the Western Allegheny Plateau and Lake states. Limestone and dolomite outcrops and talus distinguish this system. Examples range from moist to dry and from sparsely to moderately well-vegetated. Woodland species such as *Thuja occidentalis* can establish along the ridgetops. Understory species can range from grassland species such as *Andropogon gerardii* on drier slopes to more mesic species in areas with higher moisture and more soil development. Wind and water erosion along with fire are the primary natural dynamics influencing this system.

AQUATIC SYSTEMS

All watersheds within the Ouachita Ecoregion are located within the Mississippi River basin, although the rivers may not drain directly into the Mississippi itself. The ecoregion can be divided into three main drainages: the Arkansas, the Ouachita, and the Red River systems. Aside from the Arkansas River and the Red Rivers proper, all other stream systems originate within the ecoregion, flowing into either the Mississippi River Alluvial Plain or the Upper West Gulf Coastal Plain ecoregions. Aquatic

systems represented in the Ouachita Ecoregion include riverine systems as high-order/big rivers, and low-order/small headwater streams, sloughs and swamps, and seeps. Man-made lakes and impoundments are not included in this summary.

A total of 24 fish families are represented in the ecoregion, with most species located within the minnow (Cyprinidae), perch (Percidae), sucker (Catistomidae), sunfish (Centrarchidae), and catfish (Ictaluridae) families. The Ouachitas host a total of 8 ecoregionally endemic fish species, most of which are limited in geographic range within the ecoregion. The aquatic invertebrate diversity of the ecoregion is also quite impressive; twelve crayfish and three mussels are found nowhere else except the Ouachita Mountains. Collectively, the Interior Highlands are home to at least 190 native species of fish, 18 percent of all native freshwater fishes on the continent.. This diversity is due in large part to the complex drainage history of the region which started in the Pleistocene Age and involved multiple mixing, division, and isolation of fish faunas (Pell, Clingenpeel, et al., 1999). The result of these changes and continual occupation of aquatic species for 225 million years is a region that is a center of aquatic endemism for North America.

Low-order/small streams and rivers

Small streams originate in the ecoregion through surface and sheetflow-fed seeps and through sheetflow, groundflow, and surface flow drainage. Reaches of low-order streams and rivers originating in the Ouachitas are considered more typical upland cool low-order streams, and offer the most diverse fish communities in the ecoregion. Substrates can be composed of sand, gravel, cobble, or exposed bedrock. Pool/riffle/run systems are a common feature of these systems. Water is commonly clear and cool with medium to high gradients. These systems provide critical habitat for mussel communities and beds, many of which are species targets, and flow into higher-order/big rivers which have lower gradients. Fish target species found in low-order streams include catfish, shiners, and darters (Robison, 1988, Smith, 1992). Ecological processes in many small streams and rivers have been affected by dams.
In fact, all rivers within the Ouachitas have mainstem dams except for the Glover and Saline. The Middle Fork of the Saline River has many of its tributaries dammed with the remaining free-flowing stream targeted for future impoundment.

High-order/large rivers

Small streams feed into high-order larger rivers of the ecoregion, which in turn contribute to slough/swamp systems. However, most if not all of the slough/swamp habitat in the ecoregion is associated with the Arkansas River and its tributaries within the Arkansas River Valley. The largest of the rivers which originates in the ecoregion is the Ouachita River. Transitioning from low-order streams, gravel and cobble give way to more fine substrates, such as sand and silt. Ecological processes in many of the large-order rivers in the Ouachitas have been affected by locks, dams, or dredging.

As a result of serious alteration of the lower Arkansas River associated with dam construction, the Arkansas River is not a target within this river system; the Arkansas has a total of 6 navigation dams and a larger dam that impounds Lake Dardanelle, all which have had dramatic effects on habitat. Many important aquatic targets, such as the Arkansas shiner, *Notropis girardi*, have been extirpated

from the reach found within the boundaries of the ecoregion. These targets should be addressed more appropriately in adjacent ecoregions where habitat is not limiting or absent.

Socioeconomics

There exists a vast body of local knowledge and research into the socio-economic history and current conditions in the Ouachita Mountains. Only a small fraction of this data is presented here because of the variability between the two states and the many localized effects and conditions of economic development patterns. Generalities and averages present a distorted picture and are not useful in planning and implementing specific projects.

POPULATION

The population of the Ouachita Ecoregion in 1990 was 470,000 with 395,000 in Arkansas and 75,000 in Oklahoma. Most of this population is concentrated in Little Rock and its western suburbs (220,000 or 47%). Little Rock is located on the eastern edge of the Ouachitas downstream from the significant riverine ecosystems. Urbanization, suburban sprawl, and recreation pressures are the main impacts of Little Rock on the ecosystems of the Ouachitas. Hot Springs and its satellite retirement communities are home to another 75,000 people (16%) bringing urbanization and recreational pressures to the Saline River and Lake Ouachita. The rural and small town population of the Ouachitas in Arkansas stands at 100,000 and has decreased in every census since the 1920's. Most of these small towns are located on the periphery of the ecoregion where the mountains meet the Gulf Coastal Plain. In the Oklahoma third of the Ouachitas, the population (75,000) has decreased or remained stable in every census since the 1920's.

The Arkansas and Oklahoma populations are very different. The population of the Ouachitas in Arkansas have higher levels of education and income than the state average and the minority population is low. However, in the Oklahoma portion of the Ouachitas, education and income levels are well below state average and a large minority population resides in the area.

LAND OWNERSHIP PATTERNS

Of the 11.48 million acres in the Ecoregion 1.61 million (15%) is managed by the U.S. Forest Service. Approximately 2.6 million acres is owned by timber or resource extraction interests. Other state and federal agencies manage 10% of the ecoregion. A majority of the balance (~40%) is in small private holdings. The distribution of land ownership is very different between the two states and consequently will be discussed separately as this pattern affects the local political scene.

The majority of federal ownership is in Arkansas with 30% of the ecoregion managed by the federal or state government. Timber corporations, such as Weyerhaeuser and Green Bay Packaging, manage another 25%, with the balance (45%) in private, generally small ownership. In Oklahoma, the largest landowner is Weyerhaeuser Corporation with 775,000 acres (26%), 550,000 acres of which lies in McCurtain county alone. The Forest Service manages 150,000 acres (5%) of the ecoregion in Oklahoma. Another 5% is managed by other state and federal agencies with the balance (55%) in the hands of smaller private landowners.

ECONOMIC PATTERNS

The timber industry is the largest economic force in the Ouachita Ecoregion followed by tourism and small livestock production. It is expected that this pattern will continue as timber corporations transfer operations from the Pacific Northwest to the South, tourism increases and high density chicken farms saturate the area. The spread of chicken farms has done more to raise the incomes of the poorer, land based, rural population than any other economic trend. Mining of sand, gravel and stone as well as drilling for gas and oil are also locally important.

LOCAL ATTITUDES AND FUTURE TRENDS

In Arkansas, the impacts from timber practices, recreation and urbanization will increase and continually effect and modify Conservancy conservation plans and objectives. Generally, people of the Arkansas Ouachitas are familiar with conservation efforts by both environmental groups and governmental agencies. The Conservancy's efforts to work with the private timber industry will be vital to the success of this project.

In Oklahoma, impacts from timber practices are also key with increases in recreational use and urbanization expected but not yet evident. However, the resident population is generally more wary of government and "outside" efforts in environmental conservation.

Where the Conservancy proposes to work in specific locations within the Ouachitas, more detailed data on socio-economic conditions, history and attitudes will need to be researched. The Conservancy will move to enlist the support of organizations with the expertise and local knowledge base in providing and developing this essential information.

Human Use and Historical Impacts to Ecoregion

Humans have been a powerful force in the ecological dynamics of the Ouachita Mountains for thousands of years. Shortleaf pine spread throughout the Ouachita Mountains 1600 to 1000 years ago (Delcourt and Delcourt, 1990). This spread was accompanied by the extensive use of fire by aboriginal Americans. For more than 4000 years aboriginal Americans used fire to increase forage for game animals. They also cleared fertile areas in the major river valleys to raise crops and introduced new species of plants and animals to the Ouachitas. Their fishing and mussel harvesting impacted riverine ecosystems. These activities together with a complex geological and evolutionary history created the anthropogenic phenomenon that was the tessellated landscape present when the first European settlers penetrated the area.

Intrusions by Europeans began approximately 450 years ago with the first Spanish explorations. Newly introduced diseases caused native populations to crash and the human influence on the landscape lessened for a time. Bison spread eastward from the plains during this interval. Anthropogenic influence increased again when the Ouachitas were resettled in the 1850's by Europeans, when wagon trains five across could be driven through a fire-maintained landscape. By then, the herds of bison were gone, followed shortly by the woodland elk, ocelot, black bear, red wolves, Florida panther, and even white-tailed deer. Overharvesting and changes in ecosystem processes and community composition and structure also resulted in the extirpation as breeding species - two fish, nine birds and twelve plants. Some of these species are now extinct, some are recovering or have been reintroduced.

The forests of the Ouachita Mountains were completely cut over by the late 1920's and the second growth forest cut again in the 40's and 50's. Only scattered fragments remain in a "pre-settlement" condition within this completely reordered landscape. Even within these fragments, 70 years of fire suppression have taken a toll. The riparian ecosystem was completely disrupted by the building of railroads to extract timber and the cutting of hardwood cross-ties. Many riparian areas were then homesteaded and have not regenerated. Construction of large impoundments in the 1950's and 1960's exacerbated the destruction of riparian forests and devastated many riverine ecosystems.

An excellent opportunity exists for conservation of the remaining biodiversity and restoration of these ecosystems. The reintroduction of ecosystem processes, such as fire, and the full range of community structures, such as old growth, that maintained and defined the original ecosystems will go a long way toward restoring the entire range of ecosystem functional qualities and values.

The stresses on ecosystem integrity identified in the following section come from a variety of human activities which degrade existing ecosystem functions and communities or prevent recovery of these communities and systems. These stresses are diverse in origin and complex in their short-term and long-term consequences. Stresses on ecological systems are cumulative and interactive in their deleterious effects. In order to assess and prioritize these stresses, a stress assessment has been completed. This analysis provided a framework by which we rank both our evaluation of the degree of ecological stress and our understanding of its effects and consequences. Further research may cause priority reorganization. As our understanding of ecosystem processes deepens, the degree of perceived risk may increase or decrease.

Stresses and Sources of Stress to Ecological Systems

Upland Forest Ecosystems

Stresses: Habitat destruction/conversion, altered composition/structure, alteration of natural fire regimes, fragmentation
Source: conversion to silviculture

Over the last 20 years, two million acres of second growth forest have been converted to pine plantation. These plantations consist mostly of genetically "improved" loblolly pine not naturally found in the forested upland ecosystem. Although conversion has slowed due to the lack of economically viable areas to convert and decisions by the USFS to abandon this management practice, it is an ongoing stress to the forest ecosystem. The ecosystem stress is derived from the impact of having large areas in what amounts to a monoculture of early serial stage exotics. Furthermore, the stress is continuous through the second, third and fourth rotations ad infinitum.

Conversion to plantation removes native trees, involves intensive site preparation, such as bedding and fertilizing, and planting of genetically improved stock. The trees are harvested on a 28-32 year rotation. Many miles of dirt and gravel roads have been constructed for easy access to these trees, fragmenting the landscape and contributing to the sedimentation in rivers. Plantations use biocides and fertilizers heavily, and are often surrounded by plowed firebreaks. The result is the complete loss of ecosystem integrity through the destruction of community composition, structure and natural

processes. This process threatens further loss of rare species, unique communities, ecosystem structure, and composition and processes – essentially the integrity of the large forested landscape.

In comparison, conversion for uses other than forestry is relatively minor except in the flat Arkansas Valley. Row cropping was never sustainable on Ouachita Mountain soils (doesn't apply to the Arkansas Valley) and was abandoned long ago. Livestock farming is a common practice. The preparation of pasture by herbiciding and chaining the forest has been a widespread on private lands in Oklahoma. This is a serious stress on the forested ecosystem at the western end of the Ouachitas. Because all trees are not eliminated and pastures generally remain in native grasses, the long-term effect of conversion to livestock or pasture is not likely to be as severe as conversion to plantations. Still, these practices destroy natural communities and degrade ecosystem functions, and can increase erosion rates.

All factors of urbanization and sprawl disrupt ecosystem processes and landscape integrity. Urbanization and sprawl occurs around the city of Hot Springs and the western suburbs of Little Rock. Its effects on the total ecosystem are localized but serious in some areas. In addition to commercial and residential development, one practice that is having a particularly negative impact on ridgetop forest communities is the placement of communication towers on tall peaks in the range. The forest communities found on these peaks are unique because the stressful environmental conditions lead to many local adaptations, and tend to be old because ridgetop tree harvest was not economical. Increased urbanization also leads to the fragmentation of the forest with utility right-of-ways, roads and strips of development.

The conversion of large forested ecosystems to other uses such as impoundments, agricultural fields and urban conglomerations destroys the habitat that birds need to sustain their numbers. Such habitat changes favor generalist species over others, mostly migratory songbirds. Neo-tropical migrants generally require interior forest area, often with a specific community structure to reproduce successfully. Industrial forests tend to keep large areas in earlier serial stages, create edges that are often abrupt, and suppress other ecological processes (such as fire and insect outbreaks which are part of the functional qualities of the forest ecosystem).

Stresses: habitat destruction/conversion, Altered composition/structure, alteration of natural fire regimes, fragmentation
Source: Incompatible forestry Practices

The forest industry is the single largest economic force in the Ouachita Mountains. With at least six million acres of maturing forest, logging pressures will remain high. Traditional silvicultural practices have affected the forest ecosystem in a number of ways over the past 90 years. The emphasis has been on the harvesting and growing of pine, which has changed community composition and structure in different ways across the forested landscape.

Although traditional forestry practices conserve forested areas, until recently, little consideration has been given to the conservation of unique communities and essential ecosystem processes. Matrix forest structure in the Ouachitas has changed from an open, savanna-woodland community with large trees in the overstory and a grass dominated understory to a dense closed canopy forest with many small trees and a depauperate understory. The forested ecosystem has become a more uniform one

created by timber harvesting and the alteration of fire regimes, without the patterns created by natural ecosystem processes and diverse natural communities.

On Forest Service land the emphasis on management for pine timber has changed. It is still common on private lands to clear mesic north-slope hardwood forests and plant pine and attempts are made in other forest communities to control hardwoods with herbicides to increase the pine component. Trees in wooded seeps, springs and along cliff lines have been harvested, thus eliminating mesic conditions and the associated dependent species. Old growth conditions are virtually non-existent, the largest fragment being the 14,000-acre McCurtain County Wilderness Area. Old growth dependent species or species that need large forested areas as habitat may be eliminated from forest communities. The lack of research and extension in sustainable forestry alternatives results in a large data gap.

The forested upland ecosystem is fire dependent and many forest communities cease to exist without this essential ecosystem process. Seventy years of fire suppression in the Ouachita Mountains has drastically altered community composition and structure. Fire reduces tree density, favors some species and communities over others, changes community structure and adds diversity to the forested landscape. Glades, prairies, woodlands, savannas and pine-oak forests are examples of fire dependent communities.

Good progress has been made over the last 8 years toward restoring altered fire regimes in pine dominated ecosystems, and a partnership of interested agencies and others is working toward the same for the Oak dominated ecosystems of the Ouachitas at the necessary landscape scale. Within these restorations, fires must be allowed to burn at different intensities during different seasons of the year and across transitional boundaries to maintain ecotones. These efforts need to be continued and expanded to ensure conservation of the ecoregional fire dependent targets.

Incompatible forestry practices can also lead to increased erosion and fragmentation from harvesting and road building. The use of biocides and introduction of exotic species during wildlife "improvement" projects also decreases biodiversity and degrade ecosystem processes. Aquatic systems are also indirectly effected by these forestry practices

Traditional silvicultural practices alter the composition and structures of forest communities. These practices have virtually eliminated old growth conditions in the Ouachita Highlands. Some species are able to take advantage of these forestry operations while others cannot; the result is that forestry operations artificially favor some species over others. Those species that are dependent on old growth conditions, unfragmented or large blocks of mature forest or other ecosystem processes decline, while generalists species or those favoring young or small patches of forest increase.

Stresses: habitat destruction or conversion, fragmentation, erosion/sedimentation, toxins/contaminants
Source: Mining Practices

This activity is very localized but has the potential to threaten unique communities in the Ouachitas. Glades, seeps and cliff lines are particularly vulnerable to the exploitation of mineral resources.

The frontal belt in Oklahoma and the Poteau Mountains of Oklahoma and Arkansas adjoin the Arkoma Basin, which has experienced extensive development of fuel resources (oil, gas, and coal). Oil exploration has moved into the frontal belt with over 100 wells drilled between 1986-1990 alone.

Many of these wells have yielded gas or oil and exploratory activity is continuing. The right of ways (pipelines, roads) associated with this type of development are serious sources of forest fragmentation. Coal resources are not currently being developed although it has been considered. If developed, the geology would dictate strip mining methods similar to those found to the north.

Stresses: habitat disturbance, erosion/sedimentation, introduction of exotic species
Source: Recreational Uses

Recreational uses are often concentrated in special areas. The complete destruction of the natural communities found in the natural hot springs of the Ouachitas occurred historically before any research was completed. Glades and other more open areas in the forest make great campgrounds both official and casual. Mountain peaks with their viewscapes, cliff lines and waterfalls with their delicate natural communities are examples of areas heavily used by hikers.

Riparian Ecosystems

Stresses: alteration of habitat destruction, change in hydrologic regime, introduction of invasive species
Source: Dam Construction, water withdrawals

The construction of impoundments has drowned hundreds of miles of riparian forest and destroyed hundreds of miles of riverine aquatic habitat. The Ouachita valley suffered the loss of fully two-thirds of its riparian forests to impoundments along its lower end. The other major river valleys have lost between 20-30% of their riparian forests and riverine aquatic habitats to impoundments. Seventeen major dams have been built and there are plans for an additional six.

Aggravating this direct habitat loss is the associated change in hydroperiods, which reverse normal ecosystem processes. The timing, duration, depth and velocity of flooding has been altered or stopped due to impoundments. Floodwaters stored behind the dams are released slowly at a time when the rivers would normally be low. Floodwaters also move large volumes of silt and sediment which should be naturally deposited on the floodplains during flood events. Nutrient rich silts and sediments are now trapped behind the dams. The seasonal expansions of riverine water onto floodplains are critical to the lifecycle of many aquatic species. The scouring action of floodwaters and deposition of silts and sediments are essential ecosystem processes. Furthermore, the permanent retention of sediment in these impoundments results in an often severe alteration of the system's natural sediment budget which can cause geomorphological instability and associated severe streambank erosion downstream of the dam. This erosion can alter and even destroy large amounts of the riparian ecosystem. Overall, the interruption of this complex ecological process has far reaching impacts on the flora and fauna, some of which may take decades to become noticeable. The results are destruction of the riparian forest, or changes in forest composition, structure and growth rates and a concurrent change in fauna as riparian ecosystems adjust to new parameters.

Ecosystem processes in riparian zones are intact only above the high level mark of the impoundments. These areas also have the narrowest strips of riparian forest. The larger floodplains with their large bottomland hardwood forests have been most impacted.

Stresses: habitat alteration/destruction, habitat fragmentation, introduction of exotic species.
Sources: Conversion

Historically, riparian areas have been used as travel corridors, as a pathway to upland timber removal, and for homesteading. Riparian areas were cleared for railroads and the hardwoods used as crossties. These areas were then settled and farmed; seldom were they allowed to regrow. Beginning in the 1930's and continuing today, many homesteads were abandoned and riparian areas allowed to reforest through natural processes.

Recent trends in forestry toward large plantations has resulted in the conversion of riparian forest to softwoods. The replacement of riparian forests (mostly hardwoods) with plantations of loblloy pine leads to diminished biological diversity. This practice is most widespread where flooding has been controlled. The result is the destruction of ecological communities, reduction of riparian forests to narrow strips along river corridors, and the loss of ecosystem processes and functions. Some of the practices associated with traditional forestry can also degrade riparian areas. Inappropriate harvesting methods, road building and disturbances which allow the spread of exotic species will degrade riparian forests through fragmentation, changes in species composition and community structure, and a loss of biological diversity.

Conversion to agriculture is not as great a concern. Past agricultural clearing is reversing itself as agriculture becomes economically marginal. In the narrower upper watershed the riparian forests have mostly reestablished themselves. Those areas that have been converted to agriculture continue to degrade riparian ecosystems by fragmenting the forest. In many places there is no riparian buffer strip at all. Free ranging livestock (also feral hogs) have had deleterious impacts on understory vegetation and forest reproduction through heavy and uncontrolled access and use of riparian zones. This disturbance has also been a pathway for the introduction of exotic species.

Urbanization threatens riparian ecosystems throughout the Ouachita Mountains. Currently these developments are limited in extent and in most cases tied to the recreational opportunities and industries associated with the large impoundments. New roads and other developments are inevitably restricted to the relatively flat areas of floodplains found in riparian ecosystems. Southeast Oklahoma is the poorest area in the state, and consequently many development efforts are underway to encourage industrial and recreational uses, including new and improved corridors, assistance to industrial parks and promotion of recreational opportunities. Arkansas has similar, if less extensive, development assistance programs. Particularly worrisome is the proposed interstate highway connection which would run north-south along the Arkansas-Oklahoma border from Fort Smith to Texarkana. At present there are no quick and easy routes through the Ouachitas. A highway such as this opens up large areas of rather remote and hard to reach areas to development.

Urbanization increases the fragmentation of riparian forests and accelerates the spread of exotic species. Urban development also makes the restoration of ecosystem processes, such as functional hydroperiods, difficult or impossible.

As a whole, riparian forest conversion and clearing can also have dramatic effects on aquatic systems. Forested riparian corridors provide important shade which plays a role in keeping water temperatures low. These forests also play a key role in curbing streambank erosion, whether at natural or accelerated rates associated with stream or watershed alterations; sedimentation is a major threat to

aquatic targets of the ecoregion. In fact, soil is the largest pollutant by volume in the ecoregion. Furthermore, riparian forests provide fish and invertebrate habitat in the form of branches and even whole trees. Leaves and other inputs also play an important role in the carbon cycle, fueling the food chain of aquatic systems.

Stresses: habitat degradation, habitat fragmentation, introduction of exotic species
Source: Recreational Uses

Riparian zones are popular recreational sites. Most of the recreational opportunities are concentrated along the major impoundments where boating, fishing and camping use is heavy. All the larger streams receive heavy use in the summer from campers, canoeists and day users in both developed and undeveloped recreation sites. Where overuse occurs erosion, habitat destruction, forest fragmentation and the spread of exotic species are problems.

Riverine Ecosystems

Stresses: habitat destruction, habitat disturbance, loss of genetic diversity, alteration of hydrologic regimes, thermal alteration, resource depletion, sedimentation, salinity alteration
Source: Dam Construction, Water Diversions and Withdrawals, operation of dams/reservoirs

The ecological integrity of the rivers and streams of the Ouachita Mountains has been severely compromised by numerous dams. Only the Glover River and the mainstems of the upper forks of the Saline River have escaped impoundment. Seventeen major impoundments and uncountable small, private dams have been built. At least six additional major dams are planned and several have various levels of approval. These would impound the Glover and Saline (North Fork) Rivers and further impound the Little and Kiamichi Rivers.

Impoundments physically destroy large areas of riverine ecosystem, and therefore alter the hydrology of the downstream portion of the entire ecosystem; it is disrupted and often destroyed. Impoundments also block the normal movement and migration of species, allow the introduction of exotics, and create thermal pollution downstream. Mussel glochidia (young) are parasitic though harmless to their often species specific host fish. Various fish species serve as hosts to the glochidia depending on the species of mussel. By hosting mussel glochidia, migratory fish perform an important function of distributing mussels throughout a river system; impoundments make such repopulation impossible. This disruption may have doomed some species of mussel to extinction even though the senescent populations are still extant. Overtime reduced reproductive productivity caused by interrupted breeding migrations leads to general population decline for both fish and mussels.

Texas water authorities, specifically Dallas in partnership with State of Oklahoma are currently exploring interbasin transfer options, including diversion from the Kiamichi River.

The destruction of a natural riffle-pool environment dislocates fish communities as well as other aquatics species, including amphibians and mussels. With impoundments in place, many big river fish can no longer migrate upstream to breed.

Downstream ecological disruption occurs because impoundments generally reverse and regulate the hydropattern of the dammed rivers. Water is impounded during high flows and released slowly throughout the year. The water temperature, oxygen levels and natural sediment transfer process are drastically altered. The scouring action produced by large storm events is an essential ecosystem process which remakes riverine topography, opening up new habitat for disturbance dependent species and communities. Further, without the natural variation in flow, seasonal flooding of riverine water onto floodplains, critical to the lifecycle of many aquatic species, is lost. For example, many fish species use seasonally flooded areas for spawning. Similarly, the permanent retention of sediment in these impoundments results in an often severe alteration of the system's natural sediment budget which can lead to severe streambank erosion downstream of the dam. This often severe erosion can result in increases in sedimentation and habitat destruction.

River reaches upstream of impoundments can also be effected. Although these reaches are often targeted as conservation priorities, isolation from downstream reaches can result in shifts in community composition, local extirpation of species present prior to dam construction, and even reduction in species richness (Lienesch et. al 2000). Headwaters, stream reaches typically isolated by reservoirs, are more dramatically affected by abiotic factors that can temporarily render certain habitats inhospitable, making access to downstream refuge areas important. Isolation cuts off colonizers from downstream areas that play a key role in re-establishing the fish populations after these catastrophic events, such as flooding and severe drought.

Stresses: sedimentation/erosion, toxins/contaminants, habitat destruction, alteration of hydraulic regime
Source: Incompatible Forestry Practices

Forestry is the primary land use in every major watershed in the Ouachita Mountains. The USFS and large forest industries manage well over half the landscape. The thousands of smaller non-industrial landowners also manage much of their land for the economic benefits derived from timber production. As with any heavily timbered landscape, poor in agricultural resources (soil) and with over 2,000,000 acres in plantations, forestry is likely to remain the major economic use of the land.

Forestry operations which do not use best management practices cause many non-point source pollution problems. Erosion and sedimentation occurs during and after tree harvesting and as a result of unsound construction, placement, and maintenance of roads. Sediment deposited on the river substrate alters the habitat used by fish and mussels. It smothers breeding sites and eggs and reduces reproductive productivity. In suspension it reduces light penetration, alters the micro flora and fauna, increases water temperatures, reduces mussel feeding time and causes a general degradation of riverine ecosystems.

Intensive forestry operations (plantations) are heavy users of biocides and fertilizers. Poor application procedures result in degradation of riverine ecosystems through toxic poisoning and increased nutrient load. Extensive manipulation of vegetative cover results in changes in the infiltration and runoff of precipitation. Usually these changes increase short term runoff and decrease the amount of water available over the longer term.

Mussels are particularly sensitive to the toxins released by biocides, and the stress to micro flora and fauna causes degradation and local extirpation. These poisons have both acute and chronic effects to aquatic communities.

Stream crossing construction often occurs at riffles areas; unfortunately, riffles are primary habitat for many mussels and darters. The destruction of riffle habitat causes localized degradation and extirpations. It also destructively alters the hydrology of the streambed, leading to scour and increases chronic sedimentation problems. Biocides, sedimentation, and other runoff enter riverine systems at road crossings. Poorly placed and designed culverts and low water bridges alter stream hydrology and habitat and block the normal movement and migration of species.

Stresses: nutrient loading, toxins/contaminants, alteration of hydrologic regime, sedimentation, habitat destruction
Source: Agricultural Practices

The agricultural practices in the Ouachita Mountains consist of grazing livestock, hay mowing and confined animal feeding operations, mostly hogs and chickens. Historically the river valleys were settled and cleared for farming and have the best soils. Although the amount of land devoted to these practices is relatively small they are most often located in the river valleys along the streams where they can have the greatest, most direct impacts. These practices are the source of many non point source pollution problems. These stresses are the similar to those produced by forestry operations, including increased sedimentation from overgrazing, land clearing with biocides, and alterations in runoff and stream hydrology. Landowners have traditionally allowed livestock free access to riverine areas. This practice can result in streambank instability and decreased riparian understory which leads to increased sedimentation.

A particular problem in the Ouachita Mountains occurs with small livestock operations because of the large amount of animal waste produced and concentrated near streams. Runoff from these operations increases nutrient loading and degrades water quality. Nutrient enrichment causes changes in community composition and ecosystem processes, or their outright destruction.

Stresses: Sedimentation, habitat destruction
Source: roads, unpaved permanent and temporary

Sedimentation from the thousands of miles of unpaved road systems that run throughout the Ouachitas is a huge source of sediment. These roads, usually not designed and built with sediment retention in mind, provide a direct conduit for sediment to reach a stream – even the best streamside buffer cannot reduce this kind of runoff. The Natural Resources Conservation Service estimated that approximately ¼ of the sediment entering an Ozark stream comes from road runoff. Ouachita streams face the same threat. This number is likely similar for all Ouachita streams meaning that one quarter of sediment entering Ouachita streams has an easily identifiable source to target for action.

Sediment deposited on the river substrate alters the habitat used by fish and mussels. It smothers breeding sites and eggs and reduces reproductive productivity. In suspension it reduces light penetration, alters the micro flora and fauna, increases water temperatures, reduces mussel feeding time and causes a general degradation of riverine ecosystems.

Stresses: toxic poisoning, nutrient enrichment/loading
Source: Point source discharge, wastewater treatment, catastrophic contaminant spills

The Ouachita Mountains Physiographic Province contains one city (Hot Springs), various towns, and over 300 small villages, settlements, crossroads, state parks, forest campgrounds and recreation areas, one military base and the western suburbs of Little Rock. Each of these entities has one or more permitted point source discharges into the ecoregion's rivers. The majority of these discharges (including Little Rock) are from the settled area along the periphery of the Ouachita Mountains where the major roads follow the fall line. However, though individual point sources are permitted, no current federal or state policy or management takes the cumulative effect of these discharges into account.

Toxins and nutrient loadings from municipal sewage, wood processing mills and chicken factories have major negative impacts on sensitive species such as mussels and microorganisms. Repeated discharges and spills depauperate riverine ecosystems. Inorganic contaminants include mercury and arsenic.

Stresses: erosion/sedimentation, habitat destruction, toxins/contaminants, alteration of hydrologic regime
Source: Mining

There is very little mining activity in the Ouachita Mountains aquatic systems, but some stone and gravel mining does occur. During road and bridge construction stone and gravel are often mined from riverbeds. These operations, while generally localized and small, can cause havoc when they take place instream. Changes in hydrodynamic flow, very high rates of sedimentation, localized habitat destruction and long term changes in the physical parameters of the river bed can disrupt riverine ecosystems over the long term. These operations have acute localized and long term chronic effects on the aquatic ecosystem.

There is exploratory drilling for gas and oil in the northern part of the ecoregion. This activity is not currently impacting the riverine ecosystems of concern. Low-quality coal reserves, apparently occur in the area, but many of the historical mining sites, such as those for coal in the Arkansas River Valley and for Barite in the Caddo watershed, are being restored

Stress: extraordinary resource competition, habitat destruction/alteration, extraordinary predation/parasitism/disease
Sources: Introduction of Exotic Species

Exotic aquatic species have been documented in the riverine ecosystems of the Ouachita Mountains. Aquatic invasives—plants and animals—are both purposefully and accidentally introduced into riverine ecosystems. The Asian clam (*Corbicula fluminea*) is now a permanent resident throughout most of the continental U.S. Of particular concern is the rapid expansion of the zebra mussel (*Dreissenia polymorpha*); invasion has been documented in the Lower Mississippi and Arkansas Rivers, but not in the Red River system. No effective means have been developed to control zebra mussel spread, and with its large impoundments and heavy recreational marine traffic, invasion may be an eventuality in the Red River system. It is possible for populations of this mussel to disrupt the

entire aquatic community structure of a river by changing the food chain base. Further, by growing on the shells of native mussels, Zebra mussels will kill natives by smothering them outright.

The stocking of exotic game fish can also pose problems. Traditionally state game and fish organizations have introduced various species of sport fish, and as a result, exotic bait fish are also widespread. Game fish tend to be apex predators, which can decimate smaller native fish species and outcompete native apex predators. The introduction of the smaller species of fish used as bait disrupts native ecosystems due to competition for breeding and spawning sites.

The impact of predation by resident animals is not well documented and is probably significant only where populations have been severely impacted by other negative stresses. Muskrats, raccoons and turtles all eat mussels, as do some fish. Monitoring of endangered populations may show cause for concern. It is believed that heavy predation, in conjunction with habitat loss and reduction of other prey species, has in some cases prevented the recovery of endangered species of mussel with reduced populations (Neves, 1992).

Other rare species of fish and reptiles are preyed on as well by these and other species. Rare species could be forced into extinction, or may be unable to recover under high rates of "natural" predation. Human predation takes the form of collecting; mussels for their shells or food, fish for food, bait to catch fish, and amphibians and reptiles for bait or collecting.

Stresses: habitat destruction, nutrient enrichment, sedimentation, introduction of invasive species
Source: Recreational Uses

Water attracts recreation users. Canoeing is a particularly popular activity in Arkansas and is increasing in Oklahoma. Since the Dallas metropolitan area is only two hours away from the Kiamichi river there is the potential for great increases in the recreational use of this area. The rivers of Arkansas already receive a great deal of recreational use. Heavy recreational use can result in localized habitat destruction, increase in nutrient levels, and increased sedimentation.

Stresses: habitat destruction, habitat fragmentation, modification of water levels
Source: commercial/industrial development, development of roads and utilities, primary and secondary home development.

Hot Springs is a rapidly growing small city, with retirement homes in the area (Hot Springs Village). Second home development is becoming popular throughout the ecoregion, and is especially visible around Mena, Broken Bow and some of the reservoirs. Little Rock is likewise growing and losing urban population to its outlying suburban and rural areas. Census data shows sprawl is in effect as large and small urban areas lose populations to outlying suburban and rural areas (U.S. Census, 1999). Habitat destruction, increased municipal discharge, water diversions and conversion of habitat to other uses are the greatest threats to aquatic systems from urbanization. .

Stresses by Site: Landscape-Scale Terrestrial Sites:

Cherokee Prairies: Fragmentation, conversion (to rangeland and urbanization around Fort Smith), altered fire regime.

Magazine Mountain: Change in structure/composition: incompatible timber practices, altered fire regime, recreation, habitat destruction.

Pine-Bluestem Restoration Area: Change in structure/composition: incompatible timber practices, altered fire regime.

Novaculite Uplift: Change in structure/composition: incompatible timber practices, altered fire regime.

Beaver Bend Hills: Change in structure/composition : incompatible timber practices , altered fire regime;.

North Shore Glades: Change in structure/composition: incompatible timber practices , altered fire regime, fragmentation (timber practices); fragmentation, habitat destruction/conversion.

Rich Mountain: Change in structure/composition; altered fire regime.

Stresses by Site: Other Terrestrial Sites:

Pushmataha: Change in structure/composition; incompatible wildlife management, altered fire regime, incompatible timber.

Meadow-Rue Seeps: Change in structure/composition; alteration hydrologic regime: grazing, conversion; incompatible agriculture (pasture).

Sugarloaf Mountain: Change in structure/composition altered fire regime, incompatible timber practices, recreation (off-road vehicle use).

Least Terns sites: Alteration of hydrologic regime; barge, traffic, no flooding predation, change in structure/composition; habitat destruction.

Goose Pond: Changes in hydrologic regime, habitat destruction conversion incompatible forestry incompatible recreation (duck management), nutrification.

Cove Creek: Change in structure/composition—altered fire regime.

Little Rock Air Force Base: Incompatible land use, altered fire regime, data gaps.

Holland Bottoms: Incompatible timber, change in structure/composition, altered hydrology.

Flatside / Forked Mountain: Change in structure/composition—altered fire regime, , incompatible timber practices, recreation.

Brady Mountain: Change in structure/composition—altered fire regime.

Crayfish Complexes: Change in structure/composition habitat destruction: predation..

Stresses by Site: Aquatic sites

The stresses to aquatic systems in the Ouachita Ecoregion are varied, but most sites face a similar suite of stresses:

Name	Stress Rar	Site Stresses	Priority
Kiamichi River	High	Stresses: :Altered hydrologic regime, water withdrawals, operation of dams/reservoirs, dam construction. no. 1 priority.	1
Glover River	High	Stresses: Roads/sedimentation (logging), incompatible forestry/sedimentation sedimentation/runoff from land use, alteration of natural hydrologic regime, water withdrawals. no. 2priority	2
Upper Saline River	High	Stresses: toxins/pollution from CFOs, urbanization, dam construction/operation, extraction, incompatible forestry/sedimentation high 3-4 priority.	3
Upper Little River	High	Stresses: Roads/sedimentation (logging), incompatible forestry/sedimentation sedimentation/runoff from land use, alteration of natural hydrologic regime, water withdrawals, dam construction or maintenance. tied as no. 2 priority	4
Caddo River	Medium	Stresses: historic mining/extraction, recreational use, current gravel mining on mainstem, and nutrification from CFOs. 3-4 priority.	4
Ouachita Headwaters	High	Stresses: Point-source pollution, CFOs, incompatible forestry/sedimentation pasture/conversion	4
Mountain Fork	Medium	Stresses: Roads/sedimentation (logging), incompatible forestry/sedimentation sedimentation/runoff from land use, alteration of natural hydrologic regime, water withdrawals, dam construction or maintenance..--threats not as extreme as in Glover and Upper Little.	5
Cossatot River	Low	Stresses: Roads/sedimentation (logging), incompatible forestry/sedimentation, sedimentation/runoff from land use, alteration of natural hydrologic regime, water withdrawals, dam construction or maintenance..	5
Little Missouri River	Medium	Stresses: Road construction/maintenance, recreation, incompatible forestry/sedimentation	5
Fourche La Fave River	Medium	Stresses: nutrification	6

Plan Implementation: Addressing Stresses/Threats Through Multi-Site Strategies

Multi-Site Strategies - Background

Multi-site strategies were developed to enable implementation of the ecoregional assessment through clear, prioritized, cohesive measurable action. Participants in the multi-site strategy were asked to review literature and guidance pertaining to multi-site strategies, including relevant *Geography of*

Hope chapters, implementation sections from other ecoregional assessments, and the results of multi-site strategy meetings from other ecoregions. Initial activities were to review the major systems in the ecoregion, then review stresses and threats to determine multi-site stresses and their sources. The stresses/sources of stress assessment relied on the Geography of Hope definitions of a stress, source of stress, and threats[1]. For the purposes of this chapter and activity these definitions have been truncated: "stress" is defined as an ecological or biological element (e.g. sediments), "sources" are defined as anthropogenic in nature (e.g. roads or development), and "threats" can be any combination of sources or stresses.

Ecoregional assessments are translated to implementation through conservation action at individual sites and through implementation of multi-site strategies. Note that many multi-site strategies also address or link several threats. Major terrestrial and aquatic systems in the ecoregion were reviewed, then multi-site threats and top sources of stresses were developed and listed. The multi-site strategies below are simply outlines; a formal plan should be developed than includes specific goals, outcomes, and timelines.

The following are system threats identified in the experts meeting. Terminology was structured from the initial Geography of Hope based stresses/sources of stress analyses.

Terrestrial system threats:

- Conversion: Industrial forestry
- Agricultural conversion (present/historic) – pasture except for row cropping in the in the Arkansas River valley
- Incompatible forestry
- Altered Fire Regime
- Conversion/destruction from commercial and residential development
- Fragmentation

Aquatics system threats:

- Hydrologic alteration: dam/reservoir construction and operation, water withdrawals, dredging, channelization, instream structure and "training", thermal pollution/alteration
- Incompatible agriculture, (including CAFOs)
- Silviculture/incompatible forestry
- Roads and right-of-way construction
- Extraction/mining, (mineral as well as water extraction)
- Non-point source pollution
- Exotic species

The implementation team decided on the following as the top threats, in order of priority based on severity and pervasiveness of threat:

1. Dams/water withdrawal
2. Altered fire regime/forestry management

[1] *Stress*: something that impairs or degrades the size, condition, or landscape context of a conservation target, resulting in reduced viability; *Source*: a human or biological factor that infringes upon a conservation target that results in stress; *Threat*: the combined concept of stresses to a target and the sources of that stress to that target.

3. Nonpoint source pollution (including roads)
4. Conversion – industrial forestry
5. Conversion – agriculture
6. Development – residential/commercial
7. Exotic species

Multisite strategies are outlined below for the top threats in order of priority. See Table 1 for a list of sites included within each multi-site strategy.

The Multi-site Strategies

1. Altered Hydrology/Water Diversions

   Although variability in season flows exists for natural systems, alterations associated with dam construction and water diversions can alter these flows beyond the natural range of variability to which the aquatic species and communities have evolved or adapted. Similarly, the threat of dam construction also results in large-scale habitat destruction and alteration. These threats are of some level of concern for all aquatic sites in the ecoregion, although they are the "killer" threat for the aquatic systems in the southwestern Ouachitas, including the Kiamichi, Glover, and Upper Little Rivers where some of the rarest or most threatened species in the ecoregion are found. As a result, there exists a strong need for a multi-site strategy that addresses these threats. Specifically, this strategy will address the following linked threats:

   - Altered hydrologic regime
   - Habitat destruction/conversion
   - Habitat fragmentation/migration barrier
   - Thermal alteration
   - Geomorphic instability

To address these threats, the following goals should be incorporated into a formal Multi-Site Strategic Plan, the first step in implementing a multi-site strategy:

STRATEGY: Ensure protection or initiate restoration of natural flow regimes of target aquatic sites. The strategy will be accomplished through demonstration projects, external affairs work, and cultivation of a suite of partners.

Goals:

- Assessment of the specific source of these threats for each site (Conservation Area Plans)
- Development of capacity within existing staff to understand legal issues
- Formulation of ecosystem flow prescriptions or desired site conditions for each site
- Enlisting of partners necessary to implement strategy across suite of sites
- Utilization of existing/ongoing work at Kiamichi River as ecoregional "demonstration" site
- Development of agreements with regulatory agencies and their local counterparts responsible for dam management or water withdrawals in order to implement ecosystem flow prescriptions

- Development of a monitoring program for those parameters that fall outside the standard aquatic measures of success (e.g. physical parameter monitoring)

The completion of a multi-site strategic plan will likely include other goals not listed above, and should involve a diverse group of staff and partners to fully address this threat. Furthermore, the site conservation plans for effected sites should incorporate parts of the strategic plan where appropriate.

2. Altered Fire Regime/Forestry Management

The forested upland ecosystem of the ecoregion is fire dependent and many forest communities cease to exist without this essential ecosystem process. Seventy years of fire suppression in the Ouachita Mountains has drastically altered community composition and structure. Fire reduces tree density, favors some species and communities over others, changes community structure and adds diversity to the forested landscape. Glades, prairies, woodlands, savannas and pine-oak forests are examples of fire dependent communities. As a result, there is a strong need for a multi-site strategy that addresses this pervasive threat.

STRATEGY: Reestablish natural fire regime to the suite of forest communities and the systems within these matrix forests at a scale necessary to conserve viable populations of terrestrial targets across all ecoregional sites. The strategy will be accomplished through demonstration projects, external affairs work, and cultivation of a suite of partners.

Goals:

- Expand number and size of restoration projects on public lands, particularly those in the Ouachita National Forest and Ft. Chaffee, toward a defined, desired future outcome
- Participate in Ouachita National Forest plan revision process to incorporate appropriate use of fire and forest thinning toward desired future outcomes for suite of fire dependent systems as part of most appropriate management alternative to conserve target species and communities
- Incorporate large-scale restoration successes into Ouachita National Forest plan revision process
- Ensure that National Forest restoration success stories are utilized to educate the public, government officials, and agency staff

The completion of a multi-site strategic plan will likely include other goals not listed above, and should involve a diverse group of staff and partners to fully address this threat. Furthermore, the site conservation plans for effected sites should incorporate parts of the strategic plan where appropriate.

3. Nonpoint Source Pollution

Some type of nonpoint source pollution (NPS) is a threat to all aquatic sites in the Ouachita Ecoregion. The multi-site threat abatement project that will address this issue will have two components – a set of goals associated with sedimentation and a set of goals associated with nutrients. First, sedimentation is a key threat to the biodiversity targets of these systems; sources of this threat include unpaved roads (permanent and temporary), incompatible forestry practices, and to a much lesser extent, incompatible agricultural practices. To address this component of the

multi-site strategy, the following strategy and goals should be included, keeping in mind that some of these goals will be addressed by a similar strategy underway for the Ozark Ecoregion and need not be duplicated. In fact, it may be appropriate and more feasible to address this threat for the entire Interior Highlands.

STRATEGY 1: Develop and promote river-friendly road maintenance practices utilizing existing research data and/or new data for use throughout the Ouachitas. This strategy will be accomplished through a demonstration project and an associated focused educational program that uses specialized training and fact sheets for county officials and their road crews.

Goals:

- Compile reference materials on sedimentation associated with roads and any research into combating (Best Management Practices) this problem
- Enlist partners necessary to develop and implement a demonstration/research project that is based on the best available knowledge, including academia, government, and NGOs
- Identify a site most suitable for road sedimentation demo project (probably in conjunction with Forest Service) based on partners, funding, opportunity, and leverage, and then implement the demonstration project with partners, ensuring that it addresses the identified threat
- Based on reference materials and initial results of demonstration project, develop a workshop for key audience of county judges and road crews that work within target watersheds
- Develop a monitoring program that can be implemented outside of demonstration site to collect additional data to document changes in stream quality
- Play a key role in the research component of project to ensure that focus remains on answering TNC's questions

Second, nutrients associated confined animal feeding operations (CAFO) are threatening many ecoregional aquatic sites. This component of the multi-site strategy is also being addressed for the Ozark ecoregion, although the type of CAFO differs somewhat for the Ouachita Mountains. The following strategy and goals should be included in the multi-site plan:

STRATEGY 2: Develop and promote best management practices associated with confined animal feeding operations. This strategy will be accomplished via demonstration farms, innovative workshops, and direct landowner and corporate outreach and associated brochures and fact sheets. This strategy will also have a government relations program designed to funnel Farm Program dollars into programs toward best management practice cost-shares in the Ouachitas that make the most significant improvement in water quality.

Goals:

- Compile reference materials on sedimentation associated with agricultural operations (cattle and hog CAFO) and any research into combating (BMPs) this problem
- Enlist additional partners necessary to implement demonstration/research project that is based on the best available knowledge, including corporations, academia, government, and NGOs
- Utilize NRCS technical advisory committees in each stae to guide funding toward priority sites based on ecological significance

- Enlist partners necessary to develop and implement CAFO waste demonstration/research project that is based on the best available knowledge, including corporations, academia, government, and NGOs
- Identify a site most suitable for CAFO demo project based on partners, funding, opportunity, and leverage, and then implement the demonstration project with partners, ensuring that it addresses the identified threat
- Conduct compatible CAFO workshops for landowners within target watersheds

The completion of a multi-site strategic plan will likely include other goals not listed above, and should involve a diverse group of staff and partners to fully address this threat. Furthermore, the site conservation plans for effected sites should incorporate parts of the strategic plan where appropriate.

Table 1. *Sites to be included within each multi-site strategy described above.*

Altered Hydrology/Water Diversions	Altered Fire Regime/Forestry Management	Nonpoint Source Pollution
Kiamichi River Glover River Upper Saline River Upper Little River Mountain Fork Cossatot River	Cherokee Prairies Magazine Mountain Pine-Bluestem Restoration Area Novaculite Uplift Beaver Bend Hills North Shore Glades Rich Mountain Pushmataha Sugarloaf Mountain Cove Creek Little Rock Air Force Base Flatside / Forked Mountain Brady Mountain	Kiamichi River Glover River Upper Saline River Upper Little River Mountain Fork Caddo River Ouachita River Headwaters Cossatot River Little Missouri River Fourche La Fave

Multi-Site Strategies Reference and Comparison Table

Multi-Site Strategy	Strategy Statement	Threats Addressed	Sites Included
Altered Hydrology/ Water diversions	STRATEGY: Ensure protection or initiate restoration of natural flow regimes of target aquatic sites. The strategy will be accomplished through demonstration projects, external affairs work, and cultivation of a suite of partners.	• Altered hydrologic regime • Habitat destruction/conversion • Habitat fragmentation/migration barrier • Thermal alteration • Geomorphic instability	• Kiamichi River • Glover River • Upper Saline River • Upper Little River • Mountain Fork • Cossatot River
Altered Fire Regime/ Forest Management	STRATEGY: Reestablish natural fire regime to the suite of forest communities and the systems within these matrix forests at a scale necessary to conserve viable populations of terrestrial targets across all ecoregional sites. The strategy will be accomplished through demonstration projects, external affairs work, and cultivation of a suite of partners.	• Fire suppression • Change in structure/ composition	• Cherokee Prairies • Magazine Mountain • Pine-Bluestem Restoration Area • Novaculite Uplift • Beaver Bend Hills • North Shore Glades • Rich Mountain • Pushmataha • Sugarloaf Mountain • Cove Creek • Little Rock Air Force Base • Flatside/Forked Mountain • Brady Mountain

NonPoint Source Pollution	STRATEGY 1: Develop and promote river-friendly road maintenance practices utilizing existing research data and/or new data for use throughout the Ouachitas. This strategy will be accomplished through a demonstration project and an associated focused educational program that uses specialized training and fact sheets for county officials and their road crews. STRATEGY 2: Develop and promote best management practices associated with confined animal feeding operations. This strategy will be accomplished via demonstration farms, innovative workshops, and direct landowner outreach and associated brochures and fact sheets. This strategy will also have a government relations program designed to funnel Farm Program dollars into programs toward best management practice cost-shares in the Ozarks that make the most significant improvement in water quality.	• Sedimentation • Nutrification • Habitat destruction	• Kiamichi River • Glover River • Upper Saline River • Upper Little River • Mountain Fork • Caddo River • Ouachita River Headwaters • Cossatot River • Little Missouri River • Fourche La Fave

2002 Plan Update Rollout Data

Target Goals

Goals were set using defaults available through TNC ecoregional guidance including *Geography of Hope and Guidelines for Representing Ecological Communities in Ecoregional Plans*. All goals and targets underwent expert review. Default goals from Geography of Hope were used for most targets, although some target goals were adjusted according species rarity, known occurrences, and availability. Specifically, no target number for a G1 species could be more than the number of known population occurrences in the ecoregion and no G2 species could have a goal over 20 by Heritage definition. In addition, because of the complexities associated with using element occurrence records to identify aquatic species populations (i.e. how many element occurrences constitute a population?), particularly those of mussels, aquatic G3-G4 species are considered "captured" if occurrences are located in at least three aquatic conservation areas, which in this assessment are 8-digit watersheds.

Requested roll-out information was completed as per Geography of Hope (Groves, et al., 2000) and was approved by update team leader in June 2003.

Where is the data generated from ecoregional planning efforts stored, in what format, who is responsible for information management?
Data is stored on the latest version of the plan CD-ROM for the ecoregion. Data was collected in Microsoft Access 2000 using CPT versions 1.3 and 1.5 as the operating platform. Please see the Methodology and data management section for further data information. The Project Manager is responsible for information management.

A list of conservation targets by species, terrestrial/aquatic community, marine habitat, or ecological system
Please see the Rollout Report (Appendix B).

For each Conservation target provide: percentage of all targets that met their conservation goals; percent of targets that met their conservation goals by species, communities, and ecological system (aquatic/terrestrial); percent of G1 and G2 species that met their conservation goals; percent federally listed threatened and endangered species that met their conservation goals.
Please see the Rollout Report (Appendix B) for all lists. Percentages follow:

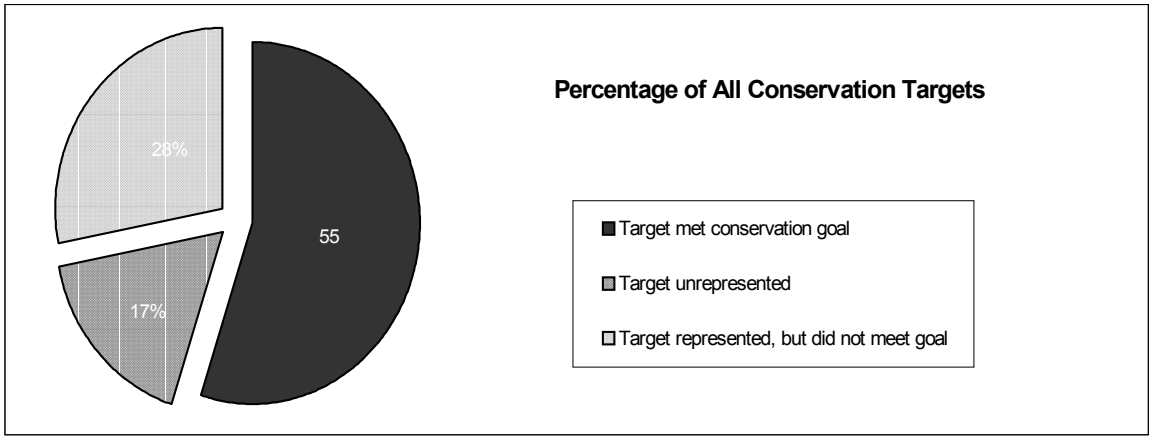
- Percent of all targets that met their conservation goals: 56% (139 of 246)
- Percent of targets that met their conservation goals by species, communities, and ecological system (aquatic/terrestrial): see below.
- Percent of G1 and G2 species that met their conservation goals: see below.
- Percent federally listed threatened and endangered species that met their conservation goals: see below.

Targets That Met Goals Matrix

Amphibians:	69% (9 of 13)	**Insects:**	63% (10 of 16)
Birds:	57% (11 of 19)	**Invertebrates:**	100% (7 of 7)
Communities:	60% (47 of 78)	**Mammals:**	50% (1 of 2)
Crustaceans:	71% (5 of 7)	**Mussels:**	100% (17 of 17)
Fish:	100% (19 of 19)	**Plants:**	31% (20 of 64)
		Reptiles:	50% (2 of 4)
All G1 Targets:	88% (22 of 25)	**All G2 Targets:**	71% (25 of 35)
OOHA PETs:	92% (26 of 28)	**All G1 – G3:**	70% (94 of 134)
Listed as Endangered:	83% (5 of 6)		
Other federal listing:	25% (3 of 12)		

Figure 1 illustrates the percentage of all conservation targets that met their goal, percentage of targets that did not meet their goal, and percentage of unrepresented (no element occurrences) targets in the portfolio.

Figure 1.



Representative populations: representative populations were used when inaccurate, outdated, inappropriate, or nonexistent point data was available for an occurrence, or if the number of individual occurrences present could be considered collectively to form a population or community. Representative populations comprise 47% of the occurrences considered viable. Of those, 78% were created from expert knowledge in the absence of contemporary ground-truthed data points (proto-EOs); 25% of the representative populations came from the OOHA data.

List up to five critical threats (sources of Stress) to targets that recur at many conservation areas across most or all of the ecoregion
Please refer to the "Threats, Sources of Threats, and Multi-Site Strategies" section.

The number of conservation areas in the ecoregion
There are 40 sites within the ecoregion. Ten of the sites are landscape-scale sites designed to conserve aquatic targets and communities; six are landscape-scale sites designed to conserve terrestrial targets and communities. There are 12 sites that are designed to be part of a network of small sites.

The number of conservation areas in the ecoregion that are considered protected
No site in the ecoregion is considered completely protected; the degree of protection determined by ownership or management plan/mission alignment with TNC has not been determined.

The number of sites that contain aquatic communities/systems and species targets
Ten sites contain aquatic communities, systems, or targets.

The number of action sites in the ecoregion
Action sites have not been determined.

The number of action sites that are landscape sites
Please see above.

An estimate of the area of all conservation areas, all action sites, all landscape-scale sites in the ecoregion.

- Acres Terrestrial Landscape-Scale Sites: 2,411,461 or 21% of ecoregion
- Acres Aquatic Landscape-Scale Sites (watershed): 3,573,338 or 31% of ecoregion
- Acres non-landscape scale terrestrial sites: 256,375 or 2% of ecoregion
- Acreage all terrestrial sites: 2,667,836 or 23% of ecoregion
- Acreage all sites: 6,068,258 or 53% of ecoregion

Management/ownership percentage of the conservation areas broken down by Federal, state, private, TNC

- Total Public Ownership: 2,113,139 acres; 79% of terrestrial conservation areas (34% if watersheds of aquatic conservation areas are included)
- Total State (AR + OK) Ownership: 112,872 acres; or 4% of terrestrial conservation areas
- Total Federal 2,000,267 Acres; or 75% of terrestrial conservation areas
- Total TNC: 8,287 acres or 0.07% of terrestrial conservation areas

Forty conservation areas were identified as part of this ecoregional assessment. In this iteration of the plan, the aquatic, landscape scale and small patch conservation areas cover a total of 6,068,258 acres, or 54% of the ecoregion. This number, however, can be misleading due to the fact that the watershed area of aquatic conservation areas was used in its calculation. Similarly, the fact that certain systems are located entirely within federal ownership may incorrectly suggest a strong federal ownership bias in conservation area selection. However, there exists nearly 2 million acres of Forest Service lands alone in the ecoregion. As a result , many conservation areas, like the geologically restricted novaculite uplift system, are found almost entirely within the Ouachita National Forest ownership. Therefore, capture of the entire site includes a predominance of federal ownership.

Terrestrial sites total 2,667,836 acres or approximately 23% of the ecoregion. Currently 2,113,139 acres or 79% of those terrestrial portfolio conservation areas are being

managed under some type of public conservation ownership. Of the conservation areas that are managed in some way for conservation, 2,000,267 acres or 17% are federally owned; 8,287 acres or 0.7% are state or locally owned; and 4,028 acres or 0.07% are owned by TNC. Table 1 provides acreage for each conservation area.

Table 1. Complete list of Portfolio Conservation Areas chosen for the Ouachita Ecoregion and the corresponding acreage for each.

Site Name	Acres	TYPE
North Shore Glades	217,739	Terrestrial
Beaver Bend Hills	272,735	Terrestrial
Holland Bottoms	9,568	Terrestrial
Cove Creek Natural Area	537	Terrestrial
Goose Pond	13,858	Terrestrial
Crayfish Complex 1	307	Terrestrial
Crayfish Complex 2	232	Terrestrial
Crayfish Complex 3	968	Terrestrial
Crayfish Complex 4	410	Terrestrial
Crayfish Complex 5	576	Terrestrial
Crayfish Complex 6	331	Terrestrial
Crayfish Complex 7	461	Terrestrial
Crayfish Complex 8	391	Terrestrial
Rich Mountain	528,196	Terrestrial
Sugarloaf Mountain	24,108	Terrestrial
Little Rock Air Force Base	7,370	Terrestrial
Bradey Mountain	10,611	Terrestrial
Meadow Rue Seep	1,234	Terrestrial
Meadow Rue Seep	1,075	Terrestrial
Pine Bluestem Restoration	317,630	Terrestrial
Flatside-Forked Mountain	81,762	Terrestrial
Crayfish Complex	799	Terrestrial
Crayfish Complex	799	Terrestrial
Novaculite Uplift	565,685	Terrestrial
Pushmataha Wildlife Management Area	32,568	Terrestrial
Least Terns Site 1	15,110	Terrestrial
Cherokee Prairies	122,922	Terrestrial
Magazine Mountain	173,153	Terrestrial
Least Terns Site 2	7,137	Terrestrial
Kiamichi River	1,165,716	Aquatic
Glover River	290,722	Aquatic
Upper Little River	235,708	Aquatic
Mountain Fork Creek	279,327	Aquatic
Cossatot River	139,485	Aquatic
Little Missouri River	79,142	Aquatic
Caddo River	193,373	Aquatic
Upper Saline River	431,671	Aquatic
Fourche La Fave River	393,510	Aquatic
Ouachita Headwaters	364,679	Aquatic

A total of 245 targets were selected; 168 species targets (46 aquatic and 122 terrestrial) and 78 community targets (8 matrix, 51 small patch, 18 large patch) were identified. A total of 148 targets or 60% met their goals.

Of the targets that met their goals, 33% were communities, 15% were plants, and 52% were animals. Of the 168 species targets, 100 or 59% met their goals. Of the 78 community targets, 47 or 60% met their goals. 39 targets or 27% of the targets that did not reach their goal (15% of all targets) did not do so due to data gaps, outdated data, or occurrences outside of portfolio conservation areas.

208 or 84% of the targets made some progress towards their goals, that is, some though not necessarily all occurrences necessary to complete a goal were recorded. Of the 1502 occurrences, 20% were heritage-recorded ranks of A, AB, B, BC or E, and 80% were representative, that is, population based, goal-derived, or expert-derived.

Of the species that met their conservation goals 23 or 15% were ranked as G1. Eight or 5% are listed endangered or threatened, and 20 or 15% are ranked as G2. Seventy percent or 94 of the 134 targets ranked G1 through G3 targets met their goals. Seventy-nine of 104 or 75% of the zoology targets, 22 of 64 or 34% of the plant targets, and 46 of 78 or 58% of the community targets met their goals. Table 2 provides a breakdown of conservation targets by global rank. Note that Combined ranks are rolled into the next highest full rank (e.g., G1G2s are counted with G2s, G2G3s are counted with G3s):

Table 2. The number of targets within each global ranking unit.

Target Type	G1	G2	G3	G4	G5	Total
Aquatic Animals	9	11	12	8	5	45
Terrestrial Animals	10	11	5	11	21	58
Plants	3	6	21	10	23	63
Terrestrial Communities	6	22	31	6	14	79
Total	28	50	69	35	63	245

Many, though not all conservation areas in the Ouachitas, contain areas that are already managed for conservation or protected by a state, federal, TNC, or other privately entity. However, rarely do these management areas encompass the entirety or even a majority of the individual conservation areas. There are approximately 2,113,139 acres or 34% of conservation areas already under some type of conservation or wildlife management (e.g., owned by state or federal government, or TNC) within the ecoregion. 14 of the 40 have this type of protection component.

Of the areas in the portfolio conservation areas that are already managed for biodiversity, 2,000,267 acres or 75% are under federal management; 112,872 acres or 4% are under

some form of state management; and 8,287 acres or 0.07% are under TNC or other private conservation management. Table 1 provides a breakdown of protected areas within the portfolio.

TERRESTRIAL COMMUNITIES

78 community targets were used for this plan; of those 9 were endemic, and 40 were limited in range. 47 of the 78 community targets, or 60% met their goals. Five of the community targets that made their goal are considered matrix size; 10 are considered large patch, and 32 are considered small patch communities. Table 3 illustrates the number of community targets that met assessment goals.

Table 3. Percent of each community target type that met assessment goals.

Spatial Pattern	Goals Met / Total Targets	Percent Targets Meeting Goals
Small Patch	32 / 52	62%
Large Patch	10 / 18	55%
Matrix	5 / 8	62%
Total	**47 / 78**	**60%**

ZOOLOGY AND BOTANY TARGETS

There were 64 plant targets; 6 of which are endemic, and 7 limited in range; 20 or 31% of the plant targets met their goals.

There were 104 zoological targets determined; 35 endemics, 32 endemic zoology targets or 91% met their goal. 16 limited range targets met their goal. Eighty-three of the 104 or 79% of the zoology targets met their goal.

APPENDIX A

Bibliography and References

Bibliography and References

I. Amphibian and Reptile Elements

____. Status Review of the Fourche Mountain Salamander. U.S.FWS; 1992.

Black, Jeffery Howard. Notes on *Plethodon ouachitae* in Oklahoma. In Proc: Okla. Acad. Sci., vol. 54; 1974.

Black, Jeffery H. and William L. Puckette. The Ouachita Salamander in Oklahoma Caves. Okla. Underground, vol. 6, no. 2, n.d.

Cobb, Vincent A. and Jeff A. Summerhill. A one-year Study of the Species Diversity and Relative Abundance of Snakes and Lizards in the Jack Mountain Region of Hot Spring County, Arkansas. Proc: Ark, Acad. Sci., Vol. 50; 1996.

Fletcher, Doug M., et al. Distribution of the Southern Red Backed Salamander, *Plethodon serratus* (Caudata: Plethodontidae), in the Ouachita Mountain Region of Arkansas. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Jones, Robert L. 1991 Status Review of the Fourche Mountain Salamander, *Plethodon fourchensis*. U.S.FWS; 1991.

Karlin, Alvan A., et al. Population Structure in the Ouachita Mountains Dusky Salamander, *Desmognathus brimleyorum* (Cudata: Plethodotidae). Southwest. Nat., vol. 38, no. 1; 1993.

LaClaire, Linda V. Status Review of Caddo Mountain Salamander (*Plethodon caddoensis*). U.S.FWS; 1994.

Lutterschmidt, William I. A Herpetofaunal Survey of the Cucumber Creek Watershed and Mountain Fork Drainage in LeFlore County, Oklahoma. A Final Report To: TNC; 1996.

Plummer, Michael V. The Status of the Caddo Mountain and Fourche Mountain Salamanders, *Plethodon caddoensis*, *P. fourchensis*, in Arkansas. Ark. Nat. Her. Comm.; 1982.

Robinette, John W. and Stanley E. Trauth. Reproduction in the Western Mud Snake, *Farancia abacura reinwardii* (Serpentes: Colubridae), in Arkansas. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Sievert, Gregory. An Investigation of the Distribution and Population of the Rich Mountain Salamander (*Plethodon ouachitae*) in Oklahoma. Okla. Dept. Wildl. Cons.; 1986.

Stout, I. Jack et al. Management of Amphibians, Reptiles and Small Mammals in Xeric Pinelands of Peninsular Florida. In Proc: Management of Amphibians, Reptiles, and Samll mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Taylor, Cindy L., Robert F. Wilfinson, jr., and Chris L. Peterson. Reproductive Patterns of Five Plethodontid Salamanaders of the Ouachita Mountains. Southwest. Nat., vol. 35, no. 1; 1990.

Trauth, Stanley E. Distributional Survey of the Bird Voiced Treefrog, *Hyla avivoca* (Anura: Hylidae), in Arkansas. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Trauth, Stanley E. et al. Distribution of the Mole Salamander, *Ambystoma talpodium* (Urodela: Ambystomatidea), in Arkansas with Notes on Paedomorphic Populations. In Proc: Ark. Acad. Sci., vol. 47; 1993.

II. Atlas/Maps

____. Geological Highway Map: Mid-continent Region. Amer. Ass. Petro. Geol; 1986.

____. General Soil Map of Arkansas. U.S.SCS.; 1982.

____. Hydrologic Atlas 1, 3 and 9. Okla. Geol. Sur.; 1969-83.
____. Oklahoma Recreation Map. Weyerhaeuser, 1990.

____. Oklahoma Water Atlas. Okla. Wat. Res. Brd.; 1990.

____. Ouachita National Forest: Arkansas and Oklahoma. U.S. For. Ser. (1985); rev. 1993.

____. Ouachita National Forest: Mapped Managed Areas; 1984; revised 1990.

____. Southwest Arkansas Recreation Map. Weyerhaeuser, 1982.

____. Surface Minerals Management Status (1:100,000): Mena Quadrangle. BLM; 1975.

Bailey, R.G., P.E. Avers, T. King, and W.H. McNab (editors), 1994. *Ecoregions and subregions of the United States.* Map and metadata (scale 1:7,500,000). U.S. Department of Agriculture, Forest Service.

Johnson, Kenneth S. Map of Aquifers and Recharge Areas in Oklahoma. Okla. Geol. Sur.; 1991

Johnson, Kenneth S. Geology and Mineral Resources of Oklahoma. Okla. Geol. Sur.; 1993.

Smith, Richard M. The Atlas of Arkansas. Univ. Ark. Press; 1989.

Stroud, Hubert B. and Gerald T. Hanson. Arkansas Geography: Physical landscape and the historical cultural setting. Rose Pub. Co.; 1981.

Winkle, Tom. Atlas of Oklahoma: Classroom edition. Okla. St. Univ.; 1991.

III. Biodiversity/Ecological Diversity.

____. Biological Diversity in Aquatic Management. Trans. 57th No. Amer. Wildl. Nat. Res. Conf.; 1992.

____. Biological Diversity on Federal Lands. Report of a Keystone Policy Dialogue; 1991.

____. Oklahoma Natural Areas. Okla. Nat. Hert. Inv.; 1977.

____. Ouachita National Forest's Wildlife and Fisheries Program: An assessment of performance 1988-1993. Wildl. Mgt. Inst.; 1993.

Pell, William F., Clingenpeel, Alan J., et al., 1999. Ozark Ouachita Highlands Assessment. Volumes 1 – 5.: Summary Report, Air Quality, Aquatic Conditions, Social and Economic Conditions, Terrestrial Vegetation and Wildlife. U.S. Forest Service Southern Research Station, Asheville, NC.

Crow, Tom, et al. Report of the Scientific Roundtable on Biological Diversity. U.S. For. Ser., TR-R9-CFN/NNF-93-1; 1993.

Fiedler, Peggy L., et al. The Contemporary Paradigm in Ecology and its Implications for Endangered Species Conservation. Endang. Spec. UPDATE, vol.19, nos. 3/4; 1993.

Gould, Stephen J. The Golden Rule: A proper scale for our environmental crisis. Nat. His.; 9/90.

Grove, Noel. The Species You Save May Be Your Own. Amer. For.; 12/92.

Grumbie, Edward. Protecting Biological Diversity Through the Greater Ecosystem Concept. Nat. Areas J., vol. 10, no. 3, pp. 114-120; 1990.

Huston, Michael. Biological Diversity, Soils, and Economics. Science, vol. 262, pp. 1676-1680; 12/93.

Lacy, Robert C. and Terry Kreeger. Vortex: A Stochastic Simulation of the Extinction Process (inc. disk). Captive Breeding Specialist Group; 1992.

Kaufman, Wallace. How Nature Really Works. Amer. For., pp. 17-19.; 4/93.

Magurran, Anne E. Ecological Diversity and Its Measurement. Princ. Univ. Press; 1988.

Masters, Ron E. Oklahoma's Endangered and Threatened Species. Oklahoma State University, Forestry Extension Report #6; 1993.
Noss, Reed F. Do We Really Want Diversity. Whole Earth Rev., pp. 126-133; 6/87.

Pell, Bill. The Natural Divisions of Arkansas: A revised classification and description. Nat. Areas J., vol. 3, no. 2.

Shepard, Bill. (ed). Arkansas's Natural Heritage. August House; 1984.

Robison, Henry W. and Kenneth L. Smith. The Endemic Flora and Fauna of Arkansas. In Proc: Ark. Acad. Sci., vol. 37, pp. 52-57; 1982.

Robison, Henry W. and Robert T. Allen. Only in Arkansas: A study of the endemic plants and animals of the state. Univ. Ark. Press; 1995.

Williams, Jack E. and Richard J. Neves. Introducing the Elements of Biological Diversity in the Aquatic Environment. In Trans: 57th No. Amer. Wildl. Nat. Res. Conf.; 1992.

IV. Communities

____. Ecological Land Classification: Applications to identify the productive potential of southern forests. Sym. Proc., SE For. Exp. Sta., GTR-SE-68; 1991.

Barbander, Jerry J., et al. Bottomland Hardwoods of Eastern Oklahoma. U.S.FWS; 1985.

Dale, Edwards E. Literature on the Vegetation of Arkansas. In Proc: Ark. Acad. Sci., vol. 17; 1963.

Eyre, F. H. Forest Cover Types of the United States and Canada. Soc. Amer. For.; 1980.

Johnson, Forrest L. Woody Vegetation of Southeastern LeFlore County, Oklahoma, in Relation to Topography. In Proc: Okla. Acad. Sci., vol. 66, pp. 1-6; 1986.

Monk, Carl D., et al. Oak Forests of Eastern North America. Castanea, vol. 55, no. 2, pp. 77-97; 1990.

Nelson, Paul W. The Terrestrial Natural Communities of Missouri. Mo. Nat. Areas Comm.; 1985.

Peck, James H. and W. Carl Taylor. Checklist and Distribution of Arkansas Pteridophytes. Proc: Ark. Acad. Sci. Vol. 49; 1995.

Pell, Bill. Natural Communities of Arkansas. unpublished.

Redfearn, Paul L. Bryophytes of Cedar Glades. --incomplete--

TNC. Southeastern United States Ecological Community Classification. TNC; 1990 Interim Report; additional updates and revisions 1996.

TNC. Community Characterization Abstracts: Sugarberry-Amer. Elm-Green Ash Bottomland For.; Sycamore-Sweetgum-Amer. Elm Riverfront For.; River Birch-Sycamore Riverfront For.; Willow Oak For.; Sweetgum-Mixed Bottomland Oak For.; Swamp Chestnut Oak-Cherrybark Oak Bottomland For.; Black Willow Riverfront For.; Eastern Cottonwood-Willow Riverfront For.; Montane Oak-Hickory For.; Interior Upland Dry-Mesic Oak-Hickory For.; Xeric Shortleaf Pine-Oak For.; Blue Ridge-Peidmont Low Elevation Acidic Rocky Summit; Natural Impoundment Pond; Floodplain Pool; Riverside Shoal and Stream Bar Complex. TNC; n.d.

TNC. Rare Plant Communities of the Conterminous United States: An initial survey. 1994.

TNC. Element Stewardship Abstracts: Eastern Okla. Bottomland Forest, TNC; n.d.

Warton, Charles H., et al. The Ecology of Bottomland Hardwood Swamps of the Southeast: A community profile. U.S.FWS, FWS/OBS-81/37; 1982.

Wilkinson, Dan L., et al. Synopsis of Wetland Functions and Values: Bottomland Hardwoods with Special Emphasis on Eastern Texas and Oklahoma. U.S.FWS, Biol. Rep. 87(12); 1987.

Anderson, Mark; Pat Comer; Dennis Grossman, Craig Groves; Karen Poiani; Marion Ried; Rick Schneider; Barbara Vickery; Alan Weakley. 1999. *Guidelines for Representing Ecological Communities in Ecoregional Plans.* The Nature Conservancy, Arlington, VA.

V. Compatible Human Uses/Forest Resources

____. Assessment of the Weyerhaeuser Company's Forestry Operations in Southwestern Arkansas and Southeastern Oklahoma. Rep. To: National Wildlife Federation Blue-Ribbon Panel on Wildlife and Forestry; 1982.

____. Oklahoma's Forestry Code. Okla. Dept. Ag.; n.d.

____. The South's Fifth Forest: Opportunities to increase the resource wealth of the South. USDA, Misc. pub. no. 1461; 1988.

Beltz, Roy C., et al. Forest Resources of Arkansas. So. For. Exp. Sta., Res. Bull. SO-169; 1992

Chlouber, Carla. Oklahoma's Forest Resources. Okla. Dept. Ag.-Forestry Services; July, 1992.

Faulkner, Judy and John White. Feasibility Study for an Ozark Man and the Biosphere Cooperative. Report to: Ozark MAB Steering Comm.; 1991.

Franco, Peter A. Forest Statistics for Southeast Oklahoma Counties. So. For. Exp. Sta. Res. Bul. SO-176; 1993.

Greene, John L. and Mark L. Duff. Utilization and Marketing Opportunities for Ozark Region Hardwoods. Winrock International Rur. Dev. Ser.; 1991.

Gunderson, Ralph O. and Enrique Ospin. Agricultural and Socioeconomic Perspectives of Arkansas. Winrock International; 1987.

Henderson, Douglas R. (ed). Mid-South Conference on Agroforestry Practices and Policies. Winrock International; 1991.

Henderson, Douglas, et al. Facing the Future: Critical Issues in the Management of Arkansas's Forest Resources. Winrock International; 1992

Lewis, David K. and Jeffery P. Goodier. The South's Fourth Forest: Oklahoma. Okla. St. Univ., Ag. Exp. Sta., MP-130; 1990.

Miller, Patrick E., et al. Forest Statistics for East Oklahoma Counties: Southern For. Exp. Sta. Res. Bull. SO-177; 1993.

Miller, Sandra E. A Flexible Results-Oriented Approach to Rural Development: A case study of the mountain association for community economic development. Winrock International Rur. Dev. Ser.; 1991.

Nelson, Lindie. Private Woodlands as Household Assets. Dissertation; Cornell Univ.; 1990.

Repetto, Robert. Accounting for Environmental Assets. Sci. Amer., June; 1992.

Roberts Roy W., et al, (eds). Arkansas' Natural Resources: Their conservation and use. Univ. of Ark. Press; 1942.

Sample, Alaric V. Defining Sustainable Forestry. EPA; 1993.

Siehl, George H. Natural Resource Concerns in Military Training. National Defense, March; 1993.

U.S. Census Bureau, 1999. *USA Counties 1998: Statistical Abstract Supplement*. (CD-ROM) U.S. Department of Commerce, Washington, DC.

Wear, David N. Private Forest Investment and Softwood Production in the U.S. South. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-237; 1993.

Williams, R.A. and R.A. Kluender. An Assessment of Timber Resource Values in Arkansas. In Proc: Ark. Acad. Sci., vol. 46, pp. 91-95; 1992

Williston, Hamlin L., et al. Managing the Family Forest in the South. USDA, Mgt. Bull. R8-MB 1; 1986.

VI. Ecosystems

____. A Synoptic Approach to Cumulative Assessment: A proposed methodology. EPA, EPA/600/R-92/167; 1992.

Arno, Stephen F., et al. Forest Structure and Landscape Patterns in the Subalpine Lodgepole Pine Type: A procedure for quantifying past and present conditions. GTR-INT-294; 1993.

Barnes, Burton V. The Landscape Ecosystem Approach and Conservation of Endangered Species. Endang. Spec. UPDATE, vol. 10, nos. 3/4; 1993.

Cairns, John Jr. Some Factors Affecting Management Strategies for Restoring the Earth. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

Constanza, Robert, et al. Modeling Complex Ecological Economic Systems: Toward an evolutionary, dynamic understanding of people and nature. BioSci., vol. 43, no. 8; 1993.

Decker, Daniel J., et al, (eds). Challenges in the Conservation of Biological Resources: A practitioner's guide. Westview Press; 1991.

Fahrig, Lenore A. Conservation of Fragmented Populations. Cons. Bio., vol. 8, no. 1; 1994.

Groves, Craig; Laura Valutis; Diane Vosick; Betsy Neely; Kimberly Wheaton; Jerry Touval; Bruce Runnels; 2000. *Geography of Hope: Second Edition*. The Nature Conservancy, Arlington, VA.

Joyce, Linda A. The Life Cycle of the Range Condition Concept. J. of Range Mgt., vol. 46, no. 2; 1993.

Kessler, Winfred B., et al. New Perspectives for Sustainable Natural Resource Management. Ecol. App., vol. 2, no. 3, pp. 221-25; 1992.

Mitchell, Richard S., et al. Ecosystem Management: Rare species and significant habitats. Proc. 15th Nat. Areas Conf.; 1990.

Povilitis, Tony. Applying the Biosphere Reserve Concept to a Greater Ecosystem: The San Juan Mountain area of Colorado and New Mexico. Nat. Areas J., vol. 13, no. 1, 1993.

Quigley, Thomas M. and Stephen E. McDonald. Ecosystem Management in the Forest Service: Linkage to endangered species management. Endang. Spec. UPDATE, vol. 10, nos. 3/4; 1993.

Sampson, Neil. Ecosystem Management: A leap ahead. Amer. For; 4/93.

Sesco, Jerry A. The Role of Research in Taking an Ecological Approach to Land and Resource Management. In Proc: National Workshop: Taking an ecological approach to management; 1992.

Schroeder, Richard L. and M. E. Keller. Setting Objectives: A prerequisite of ecosystem management. In: Ecosystem Management: Rare species and significant habitats. New York St. Mus. Bull. 471, pp. 1-4; 1990.

Short, Henry L. and Samuel C. Williamson. An Ecological Problem-solving Process for Managing Special-interest Species. In Proc: Managing Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Slocombe, D. Scott. Implementing Ecosystem-based Management: Development of theory, practice, and research for planning and managing a region. BioSci. vol. 43, no. 9; 1993.

Swanson, F. J. and J.F. Franklin. New Forestry Principles from Ecosystem Analysis of Pacific Northwest Forests. Ecol. App., vol. 2, no. 3, pp. 262-274; 1992.

Turner, Monica G., et al. Landscape Disturbance Models and the Long-term Dynamics of Natural Areas. Nat. Areas J., vol. 14, no. 1; 1994.

Worster, Donald. The Anti-management Revolt. Rest. Mgt. Notes, vol. 3, no. 1; 1985.

VII. Fish Elements

Collins, Ken. Leopard Darter (*Percina pantherina*) Surveys - 1992/3, Ouachita National Forest, Oklahoma and Arkansas. U.S.FWS; 1993.

Gagen, Charlie J. and Joseph N. Stoeckel. Dry Season Habitat Use and Reproductive Biology of the Ouachita Madtom. Final Rep: Ouachita National Forest; 1994.

James, Paul W. and Kenneth D. Collins. Leopard Darter *Percina pantherina*: Revised Recovery Plan. U.S. FWS; 1993.

James, Paul W. et al. Life History of the Leopard Darter (*Percina panterina*) in Glover River, Oklahoma. Amer. Mid. Nat., vol. 125, no. 2; 1991.

Jamers Paul W and O. Eugene Maughan. Spawning Behavior and Habitat of the Threatened Leopard Darter, (*Percina pantherina*). Southwest Nat. , vol. 34, no. 2; 1991.

Jones Ray N. et al. Abundance and Preferred Habitat of the Leopard Darter, *Percina panterina* in Glover Creek, Oklahoma. Copeia, no. 4; 1984.

Matthews, William. et al. Fishes of Oklahoma Springs. Southwest. Nat., vol. 30, no. 1; 1985.

Mulhern, Daniel W. Status Report on Arkansas Darter (*Etheostoma cragini*). U.S. FWS; 1989.

Pardew, Mitzi G. et al. Range Extension of the Paleback Darter. In Proc: Ark. Acad. Sci., vol. 47; 1993.

Robison, Henry W. and George L. Harp. A Study of Three Endemic Arkansas Threatened Fishes. (Ouachita Madtom, *Notorus lachneri*; Caddo Madtom, *Noturus taylori*; Paleback Darter, *Etheostoma pallididorsum*). Proj. E-1-3; 1982.

Robison, Henry W. *Notropis snelsoni*, a new Cyprinid from the Ouachita Mountains of Arkansas and Oklahoma. Copeia, no.1 pp.126-134; 1985.

Robison, Henry W., et al. Changes in the Nomenclature and Composition of the Arkansas Fish Fauna from 1988 to 1993. In Proc: Ark Acad. Sci., vol. 47; 1993.

Snelson, Franklin F. Jr. Systematics and Distribution of the Ribbon Shiner, *Notropis fumeus* (Cyprinidae), from the Central United States. Amer. Mid. Nat., vol. 89, no. 1; 1973.

Stewart, James. Status Review of Longnose Darter, *Percina nasuta*. U.S.FWS; 1993.

Taylor, Christopher M., et al. Zoogeographic Implications for the First Record of *Crystallaria asperella* (Percidae) from the Kiamichi River Drainage, and for the Occurrence of *Notropis boops* (Cypridae) and *Luxilus chrysocephalus* (Cyprinidae) in the Wichita Mountains, Oklahoma. Southwest. Nat., vol. 38, no. 3; 1993.

Taylor, Christopher M. Distribution and Abundance of *Lythrurus snelsoni* (Robison), An Endemic Species from the Ouachita Mountains Uplift. Final Rep: Ouachita National Forest; 1994.

Tumlison, Renn and Creed Tumlison. A Survey of the Fishes in Streams Draining the Jack Mountain Area, Hot Spring and Garland Counties, Arkansas, with Notes on The Ouachita Madtom (*Noturus Lachneri*). Proc: Ark. Acad. Sci., Vol. 50.; 1996

VIII. Geology

Arkansas Geological Commission. AGC web Page and adaptations of various information pamphlets, incl. AGC Bulletin 24: Mineral, Fossil-Fuel, and Water Resources of Arkansas, 1997 and Croneis, 1930. http://www.state.ar.us/agc/

____. Guide Book: Southeastern Arkansas Valley and the Ouachita and Frontal Ouachita Mountains, Arkansas. Ark. Geol. Comm; 1963.

____. The Geology of Magnet Cove. Ark. Geol. Comm.; 1988.

Croneis, Carey. Geology of the Arkansas Paleozoic Area. Ark. Geol. Comm. Bull. 3; 1930.
Halsey, Boyd R., et al. A Guidebook to the Second Geological Excursion on Lake Ouachita. Ark. Geol. Comm,; 1979.

Holbrook, Drew F. and Charles G. Stone. The Arkansas Novaculite: A silica resource. Ark. Geol. Comm., n.d.

Howard, J. Michael. Arkansas Quartz Crystals. Ark. Geol. Comm.; 1990.

Howard, J. Michael. Finding Diamonds in Arkansas. Ark. Geol. Comm.; 1989.

Knechital, Maxwell M. Pimpled Plains of Eastern Oklahoma. Bull. Geol. Soc. Amer., vol. 63, pp. 689-700; 1952.

Lookingbill, S. Marie, et al. Botanical Evidence for Holocene Movement of Rock Streams in Arkansas. In Proc: Ark. Acad. Sci., vol. 41; 1987.

McFarland III, John David, and William Bush. The Geologic Story of Pinnacle Mountain State Park. Ark. Geol Comm., n.d.

McFarland III, John David., Stratigraphic Summary of Arkansas. Arkansas Geological Commission, Little Rock, AR,1998.

Miser, Hugh D. Structure of the Ouachita Mountains of Oklahoma and Arkansas. Okla Geol. Sur. Bull., no. 50; 1929.

Stone, Charles G., et al. A Guidebook to the Geology of the Ouachita Mountains, Arkansas. Ark. Geol. Comm.; 1973.

Steila, Donald, Pond, Thomas E. Geography of Soils: Formation, Distribution, and Management. Rowan and Litchfield, 1989.

Suneson, Neil H., et al. Update on Ouachita Mountains Frontal Belt Exploration and Development. Okla. Geol. Sur., vol. 51, no. 3; 1991.

Tapp, Bryan. A Field Guide to the Ouachita Mountains w/ bibliography. Univ. Tulsa; 1993.

Vere, Victor K. A Preliminary Report on the Rock Streams of Mount Magazine, Arkansas. U.S. For. Ser.; 1983.

IX. Global Ecosystems/Climatic Change/Presettlement-History

Albert, Lois E. Five Thousand Years of Environmental Change in Southeastern Oklahoma. Okla. Arch. Sur., no. 7; 1981.

Albert, Lois E., and Don G. Wycoff. Oklahoma Environments: Past and Present. In: Prehistory of Oklahoma, Robert E. Bell (ed).

Beilmann, August P. and Louis G. Brenner. The Recent Intrusion of Forests in the Ozarks. Annals Mo. Bot. Gard., vol. 38; 1951.

Bolton, S. Charles. Territorial Ambition: Land and society in Arkansas 1800-1840. Univ. Ark. Press; 1993.

Bradbury, John. Travels in the Interior of America in the Years 1809, 1810, and 1811. Univ. Neb. Press; 1986.

Bartusiak, Marcia. Sun-Earth: Energizing the climate cycles. Mosaic, vol 19, no. 3/4; 1988.

Brecque, Mort La. Biogeochemical Cycles: A global chemical flux. Mosaic, vol. 19, no. 3/4; 1988.

Brooks, David J. U.S. Forests in a Global Context. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-228; 1993.

Burnett, Barbara A. and Katherine A. Murray. Death, Drought and de Soto: The bioarcheology of depopulation. In Proc: De Soto Sym. 1988 and 1990; 1993.

Coleman, Roger E. Birds of Passage--Subsistence Farming in The Ouachita Mountains. Ann. Mtg. Soc. Hist. Arch.; 1996.

Cowen, Ron. Global Ecosystem: Wheels within wheels. Mosaic, vol. 19, no. 3/4; 1988.

Cromie, William J. Air/Ocean: Grappling with coupled systems. Mosaic, vol. 19, no. 3/4; 1988.

Delcourt, Hazel R. and Paul A. Delcourt. Late Quaternary Vegetation History of the Interior Highlands of Missouri, Arkansas, and Oklahoma. In Proc: Restoration of Old Growth Forests of the Interior Highlands of Arkansas and Oklahoma. Winrock International; 1992.

Edelson, Edward. Overview: Laying the foundation. Mosaic, vol. 19, no. 3/4; 1988.

Fisher, Arthur. Global Model: One model to fit all. Mosaic, vol. 19 no. 3/4; 1988.

Foti, Thomas L. and Susan Glenn. The Ouachita Mountains Landscape at the Time of Settlement. In Proc: Restoration of Old Growth Forest in the Interior Highlands of Arkansas and Oklahoma. Winrock International; 1992.

Jansma, Jerome and Harriet H, Jansma. George Engelmann in Arkansas Territory. Ark. Hist. Quart., pp. 225-248.

Londer, Randi. Earth Archives: Learning the language of climatic change, Mosaic, vol. 19, no. 3/4; 1988.

MacCleery, Doug. Understanding the Role the Human Dimension Played in Shaping America's Forest and Grassland Landscapes: Is there a landscape archaeologist in the house? Eco-watch; 2/1994.

Mayden, Richard L. Biogeography of Ouachita Highland Fishes. Southwest. Nat., vol. 30, no. 2, 1985.

Palmer, Ernest J. The Forest Flora of the Ozark Region. J. Arnold Arbor., vol. 2; 1921.

Palmer, Ernest J. The Ligneous Flora of Rich Mountain, Arkansas and Oklahoma. J. Arnold Arbor., vol. 5; 1924.

Patrusky, Ben. Greenhouse Gases: Dirtying the infrared window. Mosaic, vol. 19, no. 3/4; 1988.

Perttula, Timothy K. The Long Term Consequences and Effects of the de Soto Entrada on Aboriginal Caddoan Populations. In Proc: De Soto Sym,1988 and 1990; 1993.

Pickett, S.T.A. Earthquakes, Fires and Communicating Ecology. Bull. Ecol. Soc. Amer. 71(3): 159-161; 1990.

Smith, Kenneth L. Sawmill: The story of cutting the last great virgin forest east of the rockies. Univ. Ark. Press; 1986.

Smith, Kimberly G. and Joseph C. Neal. Pre-settlement Birds and Mammals of the Interior Highlands. In Proc: Restoration of Old Growth Forests in the Interior Highlands of Arkansas and Oklahoma. Winrock International; 1992.

Young, Gloria A. and Michael P. Hoffman (eds). The Expedition of Hernando de Soto West of the Mississippi, 1541-1543. Proc: De Soto Sym. 1988 and 1990; 1993.

X. Inventory/Sampling

____. County Soil Surveys: Faulkner, 1979; Garland, 1989; Hempstead, 1979; Howard, 1975; Logan, 1980; Perry, 1982; Pulaski, 1975; Sebastian, 1975; also available are Hot Springs/Clark, Lonoke/Prairie, Saline, White, and Yell Counties Arkansas; and Atoka, Latimer, LeFlore, McCurtain, Pittsburg and Pushmataha Counties Oklahoma.

____. Mount Magazine State Park: Final environmental impact statement. US For. Ser.; 1993.

____. Research Natural Areas: Baseline monitoring and management. Sym. Proc.; 1984.

Bates, Vernon. Ouachita National Forest: Inventory of natural areas and sensitive species. Rep. To: U.S. For. Ser., TNC, and Ark. Nat. Hert. Comm. (3 vols.); 1991-1993.

Bates, Vernon and Albert B. Pittman. Cossatot River State Park and Natural Area: Sensitive plant species survey. Ark. Nat. Hert. Comm.; 1989.

Brown, David E., et al. A Digitized Systematic Classification for Ecosystems with an Illustrated Summary of the Natural Vegetation of North America. Roc. Mtn. For. Ran. Exp. Sta., GTR-RM-73; 1980.

Garton, Edward O. Cost-efficient Baseline Monitoring in Research Natural Areas. Sym. Proc: Research Natural Areas: Baseline monitoring and management. Int. For Rang. Exp. Sta., GTR-Int-173: 1984.

Glenn, Susan M. Summary of Field Survey of Cucumber Creek. TNC/ONHI; 1990

Halvorson, Curtis H. Long-term Monitoring of Small Vertebrates: A review with suggestions. Sym. Proc: Research Natural Areas: Baseline monitoring and management. Int. For. Rang. Exp. Sta., GTR-INT-173; 1984.

Keane, Robert E., et al. ECODATA and ECOPAC: Analytical Tolls for Integrated Resource Management. Compiler, vol. 8, no. 3; 1990.

Martin, Thomas E. and Geoffrey R. Geupel. Nest Monitoring Plots: Methods for locating nests and monitoring success. Field Ornith., vol. 64, no.4; 1993.

Memkins, George E. Jr. and Stanley H. Anderson. Sampling Problems in Estimating Small Mammal Population size. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988

Morrison, Michael L. The Design and Importance of Long-term Ecological Studies: Analysis of vertebrates in the Inyo-white Mountains, California. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America.

Orzell, Steve. Selected Acid Seeps in the Ouachita National Forest: Preliminary botanical assessment (inc. Meyers and Tea Creeks); updated 1986.

Orzell S. and E. Bridge. Ouachita Glade Sites including Flora of Novaculite and Shale Glades; Granite Mountain Glade Site; and Winding Stair Megasite; 1985.

Orzell Steve L. and Ken L. Smith. Meyers Creek Acid Seep Forest Site Report; 1986.

Owe, Wayne R. and Roger Rosentreter. Monitoring Rare Perennial Plants: Techniques for Demographic Studies. Nat. Areas. J., vol. 12, no. 1; 1992.

Ralph C. John. Field Methods for Monitoring Landbirds. USDA, For. Ser,;1992.

Ralph, C. John, et al. Managing and Monitoring Birds using Point Counts: Standards and Applications. Point Count Workshop; 1992.

Ralph, C. John, et al. Training Methods and Resources for Monitoring Landbirds.; 1993.

Tucker, Gary E. A Survey of the Botanical Feature of Magazine Mountain on the Slopes and Plateau Surface. Rep. To: Ozark Nat. For., TNC, and Ark. Nat. Hert. Comm; 1989.

Tucker, Roger N. III and Linda Watson. Ouachita National Forest: Sensitive Plant Survey, Eastern Range of Choctaw and Kiamichi Ranger Districts. U.S. For. Ser.; Vols. I and II; 1993.

Watson, Linda. Plant Candidate Inventory of McCurtain County Wilderness Area. U.S.FWS; 1992.

Watson, Linda E, and Susan M. Glenn. Ouachita National Forest: Sensitive plant survey 1990-91. U.S. For. Ser.; 1992.

Wiersma, G. B., et al. Integrated Monitoring in Mixed Forest Biosphere Reserves. Sym. Proc: Research Natural Areas: Baseline monitoring and management, Int. For. Rang. Exp. Sta., GTR-Int-173; 1984.

XI. Invertebrate Elements

Cadwell, Ronald S. Status of *Stenotrema pilsbryi* (Ferriss), Pilsbry's Narrow Apertured Land Snail, in Oklahoma. Rep. To Okla. Dept. Wildl. Con.; 1989.

Carlton, Chris. A survey of Substrate Arthropods in Deciduous Forests of the Ouachita National Forest. Report To Ouachita Nat. For.; 1992.

Harp, George L. and John D. Rickett. The Dragonflies (Anisoptera) of Arkansas. In Proc: Ark. Acad. Sci., vol. 31; 1977.

Harris, John L. and Mark E. Gordon. Distribution and Status of Rare and Endangered Mussels (Mollusca: Margaritiferidae, Unionidae) in Arkansas. In Proc: Ark. Acad. Sci., vol. 41; 1987.

Harris, John L. Microhabitat and Population Analysis of *Lampsilis powellii* (lea, 1852) in the South Fork Ouachita River, Montgomery County, Arkansas. Final Rep: Ouachita National Forest; 1994.

Hartfield, Paul. Status Review of the Rich Mountain Slitmouth Snail, *Stenotrema pilsbryi*. U.S. FWS; 1991.

Jenkinson, John J. Relocation of *Potamilus capax* from a 4-mile Reach of the St. Francis Floodway in Arkansas. Rep. To: Tenn. Val. Auth.; 1989.

Koch Leroy M. Status of Fat Pocketbook Mussels (*Potamilus Capax*) Three Years After Reintroduction to the Upper Mississippi River, Missouri. Mo. Dept. Cons.; 1993.

Lomolino, Mark V. et al. Ecology and Conservation of the Endangered Burying Beetle (*Nicrophorus americanus*). Cons. Bio., vol. 9, no. 3; 1995.

Pilsbry, H.A. Land Mollusca of North America (North of Mexico). Monog. Acad. Nat. Sci. Phila. no. 3; 1940.

Raithel, Christopher. American Burying Beetle, *Nicrophorus americanus*, Recovery Plan. U.S.FWS; 1991.

Stewart, James H. Arkansas Fatmucket Mussel (*Lampsilis powellii*) Recovery Plan. U.S.FWS; 1992.

Stewart, James H. Speckled Pocketbook Mussel (*Lampsilis streckeri*) Recovery Plan. U.S.FWS; 1992.

Vaughn, Caryn C. Survey for *Arkansia wheeleri* in the Little River: A progress report.

Vaughn, Caryn C., et al. Habitat Use and Reproductive Biology of *Arkansia wheeleri* (Mollusca: Unionidae) in the Kiamichi River, Oklahoma. Okla. Dept. Wildl. Cons.; 1993.

Vaughn, Caryn, et al. Habitat Use and Reproductive Biology on *Arkansia wheeleri* (Mollusca: Unionidae in the Kiamichi River, Oklahoma. Okla. Nat. Hart. Inv.; 1993.

Vaughn, Caryn C. Survey of Mussel Assemblages in the Glover River. Rep. To: TNC; 1996.

XII. Mammal Elements

Clark, Joseph D. Ecology of Two Black Bear (*Ursus americanus*) Populations in the Interior Highlands of Arkansas. Dissertation, Univ. Ark.; 1991.

Parker, Warren T., et al. Red Wolf Recovery Plan. U.S.FWS; 1990.

Saugey, David A. et al. Distribution and Status of the Brazilian Free-tailed Bat (*Tadarida basiliensis cynocephala*) in Arkansas. In Proc: Ark. Acad. Sci., vol. 42, pp. 79-80; 1988.

Saugy, David A., et al. Arkansas Range Extension of the Eastern Small-footed bat (*Myotis leibii*) and Northern Long-eared Bat (*Myotis septentrionalis*) and additional County Records for the Silver-haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*), and Rafinesue's Big-eared Bat (*Plecotus rafinesuii*). In Proc: Ark. Acad. Aci., vol. 47; 1993.

XIII. Neotropical Migratory Birds

____. Concern Scores for Breeding Neotropical Migrants, Temperate Migrants, and Residents for each Physiographic area within the Southeastern United States. PIF---SE Mgt. Wk. Grp.; rev. 1993.

____. Needs Assessment: Monitoring Neotropical Migratory Birds. PIF, Mon. Wk. Grp.; 1991.

____. North American Research Workshop on the Ecology and Management of Cowbirds. Proc. to come; 1993.

____. Songbird Initiative: Interstate Ecosystem Cooperative (Interior Low Plateau), Project Proposal; 1993.

____. Status and Management of Neotropical Migratory Birds. U.S. For. Ser. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-229; 1992.

Bollinger, Eric K. and Eric T. Linder. Reproductive Success of Neotropical Migrants in a Fragmented Landscape. Wil. Bull., vol. 106, no. 1; 1994.

Carter, William A. Ecology of the Nesting Birds of the McCurtain Game Preserve, Oklahoma. Wilson Bull, vol. 70, no. 3; 1967.

Freemark, Kathryn and Brian Collins. Landscape Ecology of Birds Breeding in Temperate Forest Fragments. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 443-454; 1989.

Green, R.E. and G.J.M. Hirons. The Relevance of Populations Studies to the Conservation of Threatened Birds (inc. Concluding remarks by Ian Newton). Bird Population Studies. Perrins C.M., et al. (eds.) Ox. Univ. Press, pp. 594-654; 1991.

Hagan, John M. and David W. Johnson (eds). Ecology and Conservation of Neotropical Migrant Landbirds. Smithso. Inst. Press; 1992.

Hamel, Paul B. The Land Manager's Guide to the Birds of the South. TNC; 1992.

Hands, Helen M., et al. Status of the Cerulean Warbler in the Northcentral United States. Rep. To: U.S.FWS.; 1989.

James, Douglas A. Measuring Shrubland Vegetational Structure Using Avian Habitats as an Example. In Proc: Ark. Acad. Sci., vol. 46, pp. 46-47; 1992

James, Douglas A. and Joseph C. Neal. Arkansas Birds: Their distribution and abundance. Univ. Ark. Press; 1986.

James, Frances C., et al. Trends in Breeding Populations of Warblers: Declines in the southern highlands and increases in the lowlands. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp.43-56; 1989.

Keller, Cherry M. E. Avian Communities in Riparian Forests of Different Widths in Maryland and Delaware. Wetlands., vol. 13, no. 2, pp. 137-144; 1993.

Koford, Rolf R., et al. A Glossary for Avian Conservation Biology. Wil. Bull., vol. 104, no. 1; 1994.

Litwin, Thomas S. and Charles R. Smith. Factors Influencing the Decline of Neotropical Migrants in a Northeastern Forest Fragment: Isolation, fragmentation or mosaic effects? In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 483-496; 1989.

Martin, Thomas E. Breeding Productivity Considerations: What are the appropriate habitat features for management. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 455-473; 1989.

Martin, Thomas E. Nest Predation and Nest Sites. BioSci., vol. 43, no.8, pp. 523-532; 1993.

Martin, Thomas E. Coexisting Species and Predation: The disadvantage of using similar microhabitats. In Review---Nature; n.d.

O' Connor, Raymond J. Population Variation in Relation to Migrancy Status in some North American Birds. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 64-74; 1989.

Peterjohn, Bruce G. and John Sauer. North American Breeding Bird Survey Annual Summary 1990-1991. Bird Populations, vol. 1; 1993.

Reed, J. Michael. A System for Ranking Conservation Priorities for Neotropical Migrant Birds Based on Relative Susceptibility to Extinction. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 524-536; 1989.

Robinson, Scott K. Population Dynamics of Breeding Neotropical Migrants in a Fragmented Illinois Landscape. In: Ecology and Conservation of Neotropical Landbirds. Hagan and Johnston (eds)., pp. 408-418; 1989.

Saur, John R. and Sam Droege. Geographic Patterns in Population Trends of Neotropical Migrants in North America. In: Ecology and Conservation of Neotropical Migrant Landbirds. Hagan and Johnston (eds)., pp. 26-42; 1989.

Smith, Kenneth Lee, et al. A Survey of the Interior Least Tern in the Arkansas River in Arkansas; 1987.

Smith, Winston Paul, (ed). Proc: 4th Meeting of the Southeast Management Working Group., GTR-SO-95; 1992.

Terborgh, John. Why American Songbirds are Vanishing. Sci. Amer., pp. 98-104; 5/1992.

Welsh, Christopher J. E. and William M. Healy. Effects of Even-aged Timber Management on Bird Species Diversity and Composition in Northern Hardwoods of New Hampshire. Wildl. Soc. Bull., vol. 21, no. 2, pp. 143-154; 1993.

Yaich, Karen L. Avian Species of Special Concern for Arkansas. Ark. Game Fish Comm; 1992.

XIV. Plant Elements

____. Guide to Rare Plants. Tennessee Division of Forestry District #3.

____. Status Report: *Streptanthus squamiformis*. U.S.FWS; n.d.

____. Status Report: *Carex latebracteata*. U.S.FWS; n.d.

Bartgis, Rodney L. The Distribution of the Endangered Plant Ptilimnium nodosum (Rose) Mathias (Apiaceae) in the Potomac Rvier Drainage. Cast., vol. 62, no. 1; 1997.

Bates, Vernon. An Endangered Species Status Report: *Ptilimnium nodosum* in Arkansas. Ark. Nat. Hert. Comm.; 1993.

Bates, Vernon and Albert B. Pittman. A Review of the Status of *Polymnia Cossatotensis* Pittman & Bates or the "Cossatot Leafcup".

Dietz, Donald R., et al. Maximilian Sunflower (*Helianthus maximiliani*) U.S. Cor. Eng., Wat. Exp. Sta., Tech Rep EL-92-16; 1992.

Gentry, Johnny L. Jr., et al. Status Report: *Hedyotis ouachitana*. U.S.FWS; 1978.

Kral, Robert and Vernon Bates. A New Species of Hydrophyllum from the Ouachita Mountains of Arkansas. Novon 1, pp.60-66; 1991.

Kress, W. John, et al. Genetic Variation and Protection Priorities in Ptilimnium nodosum (Apiacae), an Endangered Plant of the Eastern United States. Cons. Bio., vol. 8, no. 1; 1994.

Maddox, David. Harperella (*Ptilimnium nodosum*) Recovery Plan. U.S.FWS; 1991.

Pittman, Albert B., et al. A New Species of Polymnia (Compositae: Heliantheae) from the Ouachita Mountain Region of Arkansas. SIDA, vol. 13, no. 4, pp. 481-486; 1989.

Watson, Linda E., et al. Conservation Biology of a Rare Plant Species: *Eriocaulon kornickianum* (Eriocaulaceae). In Press J. Bot., vol. 81; 1994.

XV. Red-cockaded Woodpecker

____. Draft Environmental Impact Statement for the Management of Red-cockaded Woodpecker and its Habitat on National Forests in the Southern Region: Recovery through management. USDA, Forest Service; 1993.

____. Effects of Midstory Vegetation Removal and Fire on Breeding Birds and Plant Community Composition in Red-cockaded Woodpecker Clusters. ---incomplete---

____. Red-cockaded Woodpecker recovery Plan. U.S.FWS; n.d.

____. The Red-cockaded Woodpecker and Private Landowners. No. Car. Ext. Ser.; 1990.

Baker, W. Wilson. Decline and Extirpation of a Population of Red-cockaded Woodpeckers in Northwest Florida. RCWP Sym. II. pp. 44-45; 1983.

Barlow, Chuck D. The Proposed Management of the Red-cockaded Woodpecker in the Southern National Forests: Analysis and Suggestions. UALR Law Joun., vol. 17; 1995.

Cater, J.H., et al. Restrictors for Red-cockaded Woodpecker Cavities. Wildl. Soc., Bull. 17, pp. 68-72; 1989.

Conner, Richard N. and D. Craig Rudolph. Effects of Midstory Reduction and Thinning in Red-cockaded Woodpecker Cavity Tree Clusters. Wildl. Soc., Bull. 19, pp.63-66; 1991.

Conner, Richard N. and D. Craig Rudolph. Forest Habitat Loss, Fragmentation, and Red-cockaded Woodpecker Populations. Wils. Bill., vol. 103, no. 3, pp. 446-457; 1991.

Conner et. al. Red-cockaded Woodpecker Nesting Success, Forest Structure, and Southern Flying Squirrels in Texas. Wilson. Bul., vol. 108, no. 4; 1996.

Conner, Richard N and Kathleen A. O'Halloran. Cavity-tree Selection by Red-cockaded Woodpeckers as Related to Growth Dynamics of Southern Pines. Wil. Bull., vol. 99, no. 3, pp. 398-412; 1987.

Conner, Richard N., et al. Woodpecker Dependence on Trees Infected by Fungal Heart Rots. Wils. Bull., vol. 88, no. 4, pp. 575-580; 1976.

Conner, Richard N., et al. Red-cockaded Woodpecker Use of Seed-tree/Shelterwood Cuts in Eastern Texas. Wildl. Soc., Bull. 19, pp. 67-73; 1991.

Delotelle, Roy S. and J.R. Newman. Possible Factors Influencing Red-cockaded Woodpecker Colony Abandonment: A case study. In Proc: RCWP Sym. II, pp. 104-106; 1983.

Ferral, D. Pat. Long-distance Dispersal of Red-cockaded Woodpeckers. Wilson. Bul., vol. 109, no. 1; 1996.

Harlow, Richard F. Effects of Fidelity to Nest Cavities on the Reproductive Success of the Red-cockaded Woodpecker in South Carolina. In Proc: RCWP Sym. II; pp. 94-97; 1983.

Hooper, Robert G., et al. An Increase in a Population of Red-cockaded Woodpeckers. Wildl. Soc. Bull., vol. 19, pp. 277-286; 1991.

Hooper, Robert G., et al. The Red-cockaded Woodpecker: Notes on Life History and Management. US For. Ser., Gen. Rep. SA-GR 9; 1980.
Hooper, Robert G., et al. Heart Rot and Cavity Tree Selection by Red-cockaded Woodpeckers. J. Wildl. Mgt., vol. 55, no. 2, pp. 323-327; 1991.

Hooper, Robert G. Colony Formation by Red-cockaded Woodpeckers: Hypotheses and Management Implications. In Proc: RCWP Sym II, pp.72-77, 1983.

Jackson, Jerome A. Determination of the Status of Red-cockaded Woodpecker Colonies. J. Wildl. Mgt., vol. 41, no. 3, pp. 448-452; 1977.

Jackson, Jerome A. Competition for Cavities and Red-cockaded Woodpecker Management. In: Endangered Birds, Management Techniques for Preserving Threatened Species, S. A. Temple (ed), Univ. Wis. Press, pp. 103-112; 1978.

Jackson, Jerome A. Gray Rat Snakes Versus Red-cockaded Woodpeckers: Predator-Prey Adaptations. The Auk, vol. 91, no. 2, pp. 342-347; 1974.

Jackson, Jerome A. Use of Seed Tree Cuts as Colony Sits by Red-cockaded Woodpeckers. The Miss Kite., vol. 12, pp. 6-7; 1982.

Jackson, Jerome A., et al. Tree Age and Cavity Initiation by Red-Cockaded Woodpeckers. J. For., vol. 77, no. 2, pp. 102-103; 1979.

Jackson, Jerome A. Biopolitics, Management of Federal Lands, and the Conservation of the Red-cockaded Woodpecker. Amer. Birds, vol. 40, no. 5, pp. 1162-1167; 1986.

Jackson, Jerome A. The Red-cockaded Woodpecker. Aud. Wild. Rep., pp. 479-493; 1987.

Jackson, Jerome A. Red-cockaded Woodpeckers and Pine Red Heart Disease. The Auk, vol. 94, no. 1, pp. 160-163; 1977.

Jackson, Jerome A. Analysis of the Distribution and Population Status of the Red-cockaded Woodpecker. In Proc: Rare and Endangered Wildl. Sym., Ron R. Odum and Larry Landers (eds), pp. 101-111; 1978.

Jackson, Jerome A. et al. The Effects of Wilderness on the Endangered Red-cockaded Woodpecker. In: Wilderness and Natural Areas of the Eastern United States: A management challenge. Kulhavy, D.L. and R.N. Conner (eds) pp. 71-78; 1986.

Jackson, Jerome A. and Bette J. Schardien Jackson. Why Do Red-cockaded Woodpeckers Need Old Trees? Wildl. Soc. Bull. 14, pp. 318-322; 1986.

Jackson, Jerome A. Cavity Tree Killed by Red-cockaded Woodpeckers. The Chat, vol. 49, pp. 72-75; 1985.

James, Douglas A., et al. Study of the Red Cockaded Woodpecker in Arkansas. Ark. Game Fish Comm.; 1981.

Kalisz, Paul J. and Susan E. Boettcher. Active and Abandoned Red-cockaded Woodpecker Habitat in Kentucky. J. Wildl. Mgt., vol. 55, no. 1; 1991.

Kulhavy, David L., et al. Silviculture and the Red-cockaded Woodpecker: Where do we go from here? In Proc: 6th Southern Silvicultural Research Con., Sandra S. Colemen and Daniel G. Neary (eds)., pp. 786-794; 1990.

Lenartz, Michael R. and Richard F. Harlow. The Role of Parent and Helper Red-cockaded Woodpeckers at the Nest. Wils. Bull., vol. 91, no. 2, pp. 331-335; 1979.

Leob, Susan C. Use and Selection of Red-Cockaded Woodpecker Cavities by Southern Flying Squirrels. J. Wildl. Mgt., vol. 57, no. 2; 1993.

Ligon, J. David. Behavior and Breeding Biology of the Red-cockaded Woodpecker. The Auk, vol. 87, pp. 255-278; 1970.

Ligon, J. David, et al. Report of the American Ornithologists Union Committee for the Conservation of the Red-cockaded Woodpecker. The Auk, vol. 10, no. 3, pp. 848-855; 1986.

Locke, Brain A., et al. Factors Influencing Colony Site Selection by Red-cockaded woodpeckers. RCWP Sym. II, pp. 46-49; 1983.

Montague, Warren G., et al. Unhatched eggs in Nests of Red-cockaded Woodpeckers. In Proc: Ark. Acad. Sci., vol. 47; 1993.

Mengel, Robert M. and Jerome A. Jackson. Geographic Variation of the Red-cockaded Woodpecker. The Condor, vol. 79, no. 3, pp. 349-355; 1977.

Neal, Joseph C. Sequential Occupations of Cavities by Red-cockaded Woodpeckers and Red-bellied Woodpeckers in the National Forest. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Neal, Joseph C. and Warren G. Montague. Past and Present Distribution of The Red-cockaded Woodpecker *Picoides borealis* and its Habitat in the Ouachita Mountains, Arkansas. In Proc: Ark. Acad. Sci., vol. 45, 1991.

Reed, J. Michael, et al. Effective Population Size in Red-cockaded Woodpeckers. Population and model differences. Cons. Bio. vol. 7, no. 2; 1993.

Rudolph, D. Craig., et al. Experimental Reintroduction of Red-cockaded Woodpeckers. The Auk, vol. 109, no. 4; 1992.

Rudolph, D. Craig and Richard N. Conner. Cavity Tree Selection by Red-cockaded Woodpeckers in Relation to Tree Age. Wil. Bull., vol. 103, no. 3; 1991.

Stamps, Robert T., et al. Effects of Prescribed Burning on Red-cockaded Woodpecker Colonies During the Breeding Season in North Carolina. In Proc: RCWP Sym. II; 1983.

Walters, Jeffery R. Application of Ecological Principles to the Management of Endangered Species: The case of the red-cockaded woodpecker. Ann. Rev. Ecol. Syst. 22., pp. 505-523; 1991.

William, Ross G., et al. Physiology of Red-cockaded Woodpecker Cavity Trees: Implications for management. In Proc: The Southern Silvicultural Research Conf. Sandra Coleman and Daniel D. Neary (eds), pp. 558-566; 1990.

Wilson, Christopher W., et al . Breeding Bird Response to Pine-grassland Community Restoration for Red-cockaded Woodpecker. J. Wild. Manage., vol. 59, no. 1; 1995.

Wood. Don A. Foraging and Colony Habitat Characteristics of the Red-cockaded Woodpecker in Oklahoma. In Proc: RCWP Sym. II, pp. 51-58; n.d.

Wood, Don A. (ed). Proc. Red Cockaded Woodpecker Symposium II. Fla. Game and Fish Comm.; 1983.

Wood, Gene W., et al. Comparability of Even-aged Timber Management and Red-cockaded Woodpecker Conservation. Wildl. Soc. Bull. 13, pp. 5-17; 1985.

XVI. Riparian Forest Ecosystems

____. Region II Wetlands Regional Concept Plan. U.S. FWS; 1991.

Anderson, Steve and Ron Masters. Riparian Forest Buffers. Okla. St. Univ. Coop Ext. Sev., no. 5034; n.d.

Baird, Kathryn. High Quality Restoration of Riparian Ecosystems. Rest. Mgt. Notes, 7:2, pp. 60-64; 1989.

Dickson, James G. and J. Howard Williamson. Small Mammals in Streamside Management Zones in Pine Plantations. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Gregory, Stanley V., et al. An Ecosystem Perspective of Riparian Zones. BioSci. vol. 41, no. 8; pp. 540-550; 1991.

Grove, Sally T. Buffer Strip Research (extensive biblio.), TNC; 1991.
Hook, Donal D. and Russ Lea. The Forested Wetlands of the Southern United States. Sym. Proc.; 1989.

Johnson W. Carter. Dams and Riparian Forest: Case study for the Upper Missouri River. Rivers, vol. 3, no. 4, pp. 229-242; 1992.

Jones, K. Bruce. Comparison of Herpetofaunas of a Natural and Altered Riparian Ecosystem. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Kondolf, G. Mathias. Hydrology and Channel Stability Considerations in Stream Habitat Restoration. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

Miller, Edwin. Effects of Forest Practices on Relationships Between Riparian Areas and Aquatic Ecosystems. --in complete-- pp. 172-179.

Nilsson, Christer, et al. Long term Effects of River Regulation on River Margin Vegetation. J. App. Eco., vol. 28, pp. 963-987; 1991.

Nutter, Wade L. and Julia W. Gaskin. Role of Streamside Management Zones in Controlling Discharges to Wetlands. pp. 81-84 ---in complete---

Parker, Michael, et al. Erosional Downcutting in Lower Order Riparian Ecosystems: Have historical changes been caused by removal of beaver? In Proc: First No. Amer. Riparian Conf., pp. 35-38; 1985.

Rudolph, D. Craig, and James G. Dickson. Streamside Zone Width and Amphibian and Reptile Abundance. Southwest. Nat., vol. 35, no. 4; 1990.

Shankman, David. Channel Migration and Vegetation Patterns in the Southeastern Coastal Plain. Cons. Bio., vol. 7, no. 1, pp. 176-183; 1993.

Sowl, John H. Restoration of Riparian Wetlands Along a Channelized River: Oxbow lakes and the middle Missouri. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

Tappe, Phillip A. Streamside Management Zones: Their value for nongame wildlife. Rep. To: Weyerhaeuser Co. and Ark. Nongame Preserve. Comm.; 1991.

Walbridge, Mark R. Functions and Values of Forested Wetlands in the Southern United States. J. For., pp. 15-19; 5/93.

Williams, John G. and Graham Matthews. Willow Ecophysiology: Implications for riparian restoration. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

XVII. Riverine Ecosystems

____. A Guide for Monitoring and Evaluating Fish Communities in Bottomland Hardwood Wetlands. U.S. Cor. Eng., WRP Tech Note FW-EV-2.2; 1992.

____. *Dreissena polymorpha* : Information Review (most recent research issue) vol. 4, no. 3, 1993.

____. Environmental Effects of Dredging. U.S. Cor. Eng. EEDP-03-6; 1989.

____. 5 C.F.S.: Streams in Arkansas. Ark. St. High. Trans. Dept.; n.d.

____. Fish and Wildlife Aspects of the Lukfata Lake, McCurtain County, Oklahoma Project. U.S.FWS; 1976.

____. Fishes of Oklahoma. Okla. Dept. Wildl. Cons.; n.d.

____. Rapid Bioassessment Protocols for Use in Streams and Rivers. EPA/444/4-89-001; 1989.

____. Restoration of Aquatic Ecosystems: Science, technology, and public policy. Nat. Res. Coun.; 1992.

____. Silent Steams. Ark. Wild., pp. 2-7; 1992.

____. Stream Preservation In Arkansas. State Committee on Stream Preservation; 1971.

____. West Mountain Hydrologic Investigation, Hot Springs National Park. U.S Cor. Eng.; 1993.

Aldridge, David W., et al. The Effects of Intermittent Expose to Suspended Solids and Turbulence on Three Species of Freshwater Mussels. Envir. Poll., vol. 45, pp. 29-47; 1987.

Allen, J. David and Alexander S. Flecker. Biodiversity Conservation in Running Waters. BioSci., vol. 43, no. 1, pp. 32-43; 1993

Allen, Robert T. A Faunal and Seasonal Study of the Aquatic Insects in Two Water Ecosystems in South Arkansas: DeGray Reservoir and the Upper Caddo River. Ark. Wat. Res. Cen., Pub. no. 88, 1982.

Angermeier Paul L. and James R. Karr. Applying an Index of Biotic Integrity Based on Stream Fish Communities: Consideration in sampling and interpretation. No. Amer. J. Fish. Mgt., vol. 6, pp. 418-429; 1986.

Angermeier, Paul L. and Isaac J. Schlosser. Assessing Biotic Integrity of the Fish Community in a Small Illinois Stream. No. Amer. J. Fish. Mgt., vol. 7, pp. 331-338; 1987.

Bedinger, M.S. Forests and Flooding with Special Reference to the White River and Ouachita River Basins Arkansas. USGS; n.d.

Blinn, Dean W., et al, Effects of Rainbow Trout Predation on Little Colorado Spinedace. Amer. Fish. Soc., vol. 122, pp. 139-143; 1993.

Bramblett, Robert G. and Kurt D. Fausch. Variable Fish Communities and the Index of Biotic Integrity in a Western Great Plains River. Amer. Fish. Soc., vol. 120, pp. 752-769; 1991.

Branson, Branley Allan. The Mussels (Unionacea: Bivalvia) of Oklahoma - Part I - Ambleminae. In Proc: Okla. Acad. Sci., vol. 62, pp. 38-45; 1982.

Branson, Branley Allan. The Mussels (Unionacea: Bivalvia) of Oklahoma - Part II - Pleurobemini and Anodontini. In Proc: Okla. Acad. Sci., vol. 63, pp. 49-59; 1983.

Branson, Bramley Allan. The Mussels (Unionacea: Bivalvia) of Oklahoma - Part 3: Lampsilini. In Proc: Okla. Acad. Sci., vol. 64, pp. 20-36; 1984.

Brooks, Ronald J., et al. Developing Management Guidelines for Snapping Turtles. In Proc: Management of Amphibians, Reptiles, and Samll Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta.; 1988.

Brown, Thomas C. and Dan Brinkley. Effect of Management on Water Quality in North American Forests. Roc. Mtn. For. Rang. Exp. Sta., GTR-248; 1994.

Burch, J. B. Freshwater Unionacen Clams (Mollusca: Pelecypodia) of North America. EPA: Biota of Freshwater Ecosystems Identification Man. no. 11; 1973.

Carrol, John H., et al . Community Metabolism in a Southeastern Oklahoma Mountain Stream. Southwest. Nat., vol. 27, no. 3; 1982.

Clingenpeel, Alan J. Basin Area Stream Survey (BASS) Monitoring Plan: Status Report 1990. (plus other related materials) Ouachita Nat. For.; 1988-1993.

Cloutman, Donald G. and Larry L. Olmstead. A Survey of the Fishes of the Cossatot River in Southwestern Arkansas. Southwest. Nat., vol. 19, no. 3; 1974.
Cobb, D.G., et al. Effects of Discharge and Substrate Stability on Density and Species Composition of Stream Insects. Can. J. Fish. Aquat. Sci., vol. 49, pp. 1788-1795; 1992.

Courtenay, Walter R. Jr. and Peter B. Moyle. Crimes Against Biodiversity: The lasting legacy of fish introductions. In: Trans. 57th No. Amer. Wildl. Nat. Res. Conf.; 1992.

Cross, Frank B., et al. Fishes in the Western Mississippi Basin (Missouri, Arkansas and Red Rivers). In: The Zoogeography of North American Freshwater Fishes. Charles Hocutt and E. O. Wiley (eds), pp. 363-412; 1986.

Daniel, T.C., et al. Water Quality and Poultry Disposal Pits. Ark. Water Res. Cen. fact sheet no. 2, n.d.

Fausch, Kurt D., et al. Fish Communities as Indicators of Environmental Degradation. Amer. Fish. Soc. Sym. 8, pp. 123-144; 1990.

Fausch, Kurt D., et al. Regional Application of an Index of Biotic Integrity Based on Stream Fish Communities. Amer. Fish. Soc., vol. 113, pp. 39-55; 1984.

Fryxell, John M. Space Use by Beavers in Relation to Resource Abundance. Oikos vol. 64, pp. 474-478; 1992.

Gordon Mark E. Recent Mollusca of Arkansas with Annotations to Systematics and Zoogeography. In Proc: Ark. Acad. Sci., vol 34; 1980.

Gordon, M. E., et al. Unionacea of Arkansas: Historical review, checklist, and observations on distributional patterns. Bull Amer. Malacol. Unio., pp. 31-36.; 1979.

Harris, John L and Mark E. Gordon. Arkansas Mussels. Ark. Game Fish Comm. n.d.

Harris, John L. and Mark E. Gordon. Distribution and Status of Rare and Endangered Mussels (Mollusca: Margaritiferidae, Unionidae) in Arkansas. In Proc: Ark. Acad. Sci., vol. 41, 1987.

House, Kelly L, et al. Environmental Analysis of the Caddo River and its Tributaries: Comparison of water quality during 1992 with 1974-75. In Proc: Ark. Acad. Sci., vol. 74; 1993.

Hughs, Robert M., et al. A Regional Framework for Establishing Recovery Criteria. Env. Mgt., vol. 14, no. 5, pp. 673-683; 1990.

Jester, Douglas B., et al. The Fishes of Oklahoma, Their Gross Habitats, and Their Tolerance of Degradation in Water Quality and Habitat. In Proc: Okla. Acad. Sci., vol. 72; 1992.

Johnson, Richard I. Zoogeography of North American Unionacea (Mollusca: Bivalvia) North of the Maximum Pleistocene Glaciation. Bull. Mus. Comp. Zool., vol. 149, no. 2; 1980.

Kanehl, Paul and John Lyons. Impacts on Instream Sand and Gravel Mining on Stream Habitat and Fish Communities, Including a Survey of the Big Rib River, Marathon County, Wisconsin. Wis. Dept. Nat. Res., Res. Rep. 155; 1992.

Karr, James R. Measuring Biological Integrity: Lessons from streams. In: Ecological Integrity and the Management Of Ecosystems, pp. 83-104.

Karr, James R., et al. Spatial and Temporal Variability of the Index of Biotic Integrity in Three Midwestern Streams. Amer. Fish. Soc., vol. 116, pp. 1-11; 1987.

Kieth, William E. Distribution of Fishes in Reference Streams within Arkansas's Ecoregions. In Proc: Ark. Acad. Sci., vol. 41; 1987.

Kuehne, Robert A. and Roger W. Barbour. The American Darters. Univ. Ken. Press; 1983.
Ludyanskiy, Mickael L., et al. Impact of the Zebra Mussel, a Bivalve Invader. BioSci., vol. 43, no. 8, pp. 533-544, 1993.

Mattews, William J. and Henry W. Robison. The Distribution of Fishes in Arkansas: A multivariate analysis. Copea, vol. 2;1988.

Matthews, William J., et al. Similarities in Fish Distribution and Water Quality Patterns in Streams of Arkansas: Congruence of multivariate analysis. Copeia, vol. 2, pp. 926-305; 1992.

Mehlhop, Patricia and Caryn C. Vaughn. Threats to and Sustainability of Ecosystems for Freshwater Mollusks. Roc. Mtn. For. Ran. Exp. Sta., GTR-In Press.

Miller, E. L., et al. Forest Harvest and Site Preparation Effects on Storm Flow and Peakflow of Ephemeral Streams in the Ouachita Mountains. J. Envir. Qual., vol. 17, no. 2; 1988.

Naiman, Robert J., et al. Alterations of North American Steams by Beaver. BioSci., vol. 38, no. 11, pp. 753-762; 1988.

Oesch, Ronald D. Missouri Naiades: A guide to the mussels of Missouri. Mo. Dept. Cons.; 1984.

O'Neill, Charles R. Jr. The Zebra Mussel: Its origin and spread in North America. New York Sea Grant; 1993.

O'Neill, Charles R. Jr. The Zebra Mussel (*Dreissena polymorpha*): An unwelcome invader. Cornell Coop. Ext., Fact Sheet, 1991.

Orth, Donald J., et al. Species Composition and Relative Abundance of Benthic Macroinvertebrates in Glover Creek, Southeast Oklahoma. In Proc: Okla. Acad. Sci., vol. 62, pp. 18-21; 1982.

Orth, Donald J., et al. Population Characteristics of Smallmouth Bass in Glover Creek, Southeast Oklahoma. In Proc: Okla. Acad. Sci., vol. 63, pp. 37-41; 1983.

Page, Lawrence M. and Brooks M. Burr. A Field Guide to Freshwater Fishes. Houghton Miff. Co.; 1991.

Pigg, Jimmie and Loren G. Hill. Fishes of the Kiamichi River, Oklahoma. In Proc: Okla. Acad. Sci., vol. 54, vol. 121-130; 1974.

Pister, Edwin P. Species in a Bucket. Nat. Hist., pp. 14-19; 1/93.

Pledger, Mike. Fish: A Guide to the Fish of Arkansas. Ark. Game Fish Comm.; n.d.

Rickett, John D. Physiography and Hydrology of the Upper Saline River, Saline and Garland Counties, Arkansas. In Proc: Ark. Acad. Sci., vol. 41, pp. 73-78; 1987.

Robison, Henry W. A Faunal Analysis of the Springs of the Ouachita Mountains, Arkansas. Ark. Wat. Res. Cen., Pub. no. 83; 1981.

Robison, Henry W. and Thomas M. Buchanan. Fishes of Arkansas. Univ. Ark. Press; 1988.

Robinson, Henry W. Threatened Fishes of Arkansas. In Proc: Ark. Acad. Sci., vol. 28; 1974.

Rohm, Christina M., et al. Evaluation of an Aquatic Ecoregion Classification of Streams in Arkansas. J. Freshwater Ecol., vol. 4, no.1; 1987.

Rutherford, Allen D., et al. Changes in the Fauna of the Little River Drainage, Southeastern Oklahoma, 1948-1955 to 1981-1982: A test of the hypothesis of environmental degradation. Comm. Evol. Eco. No. Amer. Str. Fishes, pp. 178-183; 1983.

Schaefer, Joseph M. and Mark T. Brown. Designing and Protecting River Corridors for Wildlife. Rivers, vol. 3, no. 1, pp. 14-25; 1992.

Snyder, Fred L., et al. Zebra Mussels in the Great Lakes: The invasion and its implications. Ohio Sea Grant; 1992.

Steedman, Robert J. Modification and Assessment of an Index of Biotic Integrity to Quantify Stream Quality in Southern Ontario. Can. J. Fish. Aquat. Sci., vol. 45; 1988.

Stock, Jean D. and Isaac J. Shlosser. Short-term Effects of a Catastrophic Beaver Dam Collapse on a Stream Fish Community. Env. Bio. Fish., vol. 31, pp. 123-129; 1991.

Williams, James D., et al. Conservation Status of Freshwater Mussels of the United States and Canada. Fisheries, vol. 18, no. 9, pp. 6-22; 1993.

XVIII. Site Design

____. A Common Sense Guide to Rural Environmental Protection. EPA 904-B-92-002; 1992.

____. Arkansas Natural Areas Plan. Ark. Dept. Plan.; 1974.

____. Arkansas Natural Heritage Commission. Report; 1984.

____. Big Fork Natural Area; Polk County. Ark. Nat. Hert. Comm.; 1979.

____. Environmental Assessment of Proposed Actions on McCurtain County Wilderness Area. Okla. Dept. Wildl. Cons.; 1991.

____. Guidelines for Research Natural Area Evaluation and Establishment. US For. Ser. R8/SE/SO; Series 4000-Research w/ amendment; 1987-1990.

____. Iron Mountain Natural Area; Polk County. Ark. Nat. Hert. Comm; 1978/81.

____. Land and Resource Management Plan: Ouachita National Forest, vol. I-III w/amendment and attachments; 1989-1992.

____. Management Plan: Cossatot River State Park and Natural Area. Ark. St. Parks and Nat. Hert. Comm; 1990.

____. McCurtain County Wilderness: Implementation plan and guidelines. Okla. Dept. Wildl. Cons.; 1991.

____. McCurtain County Wilderness Area: Management Plan. Okla. Dept. Wildl. Cons.; 1991 (revised).

____. Proposed Establishment of Cossatot National Wildlife Refuge, Sevier County, Arkansas. U.S.FWS; 1992.

____. Proposed Protection of Little River Bottomland Hardwoods McCurtain County, Oklahoma. U.S.FWS; 1986.

____. Research Natural Areas: Baseline monitoring and management. Proc. Sym., U.S. For. Ser., GTR-INT-173; 1984.

____. Site Design Workshop. TNC (Seaton and Sutter) revisions 1996, 1994; 1993.

____. Unique Wildlife Ecosystems of Oklahoma: Concept Plans. U.S. FWS; 1979.

Bean, Michael J., et al. Reconciling Conflicts Under the Endangered Species Act: The habitat conservation planning experience. World Wildlife Fund; 1991.

Ford, Kittle E., et al. Watershed Planning and Restoration: Achieving holism through interjurisdictional Solutions. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

Groves, Craig; Laura Valutis; Diane Vosick; Betsy Neely; Kimberly Wheaton; Jerry Touval; Bruce Runnels; 2000. *Geography of Hope: Second Edition*. The Nature Conservancy, Arlington, VA.

Harris, Larry D. The Fragmented Forest. Univ. Chicago Press; 1984.

Hobbs, Richard J. The Role of Corridors in Conservation---solution or bandwagon? Trends in Ecology and Evolution, vol. 7, pp. 389-392; 1992.

Hornbeck, James W. and Wayne T. Swank. Watershed Ecosystem Analysis as a Basis for Multiple-use Management of Eastern Forests. Ecol. App., vol. 2, no. 3, 238-247; 1992.

Naiman, Robert J., et al. The Role of Riparian Corridors in Maintaining Regional Biodiversity. Preserv. Biodiv,; 1993.

Peacock, Lance. Ten Mile Creek, Garland County-Site Summary; 1983.

Peacock, Lance. Site Summaries for Paleback Darter in Montgomery County Including: Brunt Spring, Kenneth Willie Spring, Rough Creek Spring, Gap Creek and Caddo High School Ditch; 1983.

Romero, Richard. McGee Creek NSRA Interim Operating Plan. Okla. Dept. Tour.; 1992

Shepard, Bill (ed). Arkansas's Natural Heritage. August House, Little Rock,1984.

Shepard, Bill. Sugar Loaf Mountain (Quercus shumardii var. acerifolia) Site Report; 1991.

Simberloff, Daniel, et al. Movement Corridors: Conservation bargains or poor investments? Conser. Bio., vol. 6, pp. 493-504; 1992.

Simberloff, Daniel and Mary Tebo. Corridors for Conservation: Do habitat connecting corridors really help birds? Living Bird, vol 13, no. 1; 1994.

Stankey, George H., et al. The Limits of Acceptable Change System for Wilderness Planning. Intermtn. For. Ran. Exp. Sta., GTR-INT-176; 1985.

Studenmund, Richard G. Preparing a Land Management Plan. J. Land Trust Exchg., pp. 6-8; 3/1989.

TNC. Preserve Design and Selection Manual; 1987.

TNC. BioReserve Handbook; 1994.

TNC. Eller Seep Conservation Plan; 1994.

Van Herik, Russell. Financial and Legal Aspects of Land Management. J. Land Trust Ex., vol. 8, no. 4, pp. 4-13; 1989.

Wiersma, G. B. et al. Integrated Monitoring in Mixed Forest Biosphere Reserves. In Proc: Research Natural Areas: Baseline monitoring and Research; 1984.

Zachary, Doy L., et al. Potential National Natural Landmarks of the Interior Highlands Natural Region, Central United States. Univ. Ark.; 1979.

XIX. Upland Forest Ecosystems

____. Arkansas Mycological Society's Easy Guide to Mushroom Identification; n.d.

____. Baseline Vegetation and Air Pollution Effects Inventory. Ouachita Nat. For.; 1991.

____. Best Management Practices Guidelines for Silviculture. Ark. For. Comm.; n.d.

____. Healthy Forests for America's Future: A strategic plan. U.S. For. Ser., MP-1513; 1993.

____. Management of Amphibians, Reptiles, and Small Mammals in North America. Sym. Proc., Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

____. Mount Magazine State Park: Final Environmental Impact Statement. USDA, Ozark Nat. For.; 1993.

____. Oklahoma Mammals. Okla. Dept. Wildl. Cons., n.d.
____. Plant Taxa of Special Concern: A guide to resource persons. Amer. Soc. of Pla. Taxo.; 1988.

____. Silvics of North America, vol. 1, Conifers, Agric. Handb. 654; USDA; 1991.

____. Weeds of Arkansas: A guide to identification. Coop. Ext. Ser., MP-169; n.d.

____. Wildlife Habitat Relations: Ouachita Nat. For.; 1994.

____. Workshop on Implementation Monitoring of Forestry Best Management Practices. U.S. For. Ser.; 1990.

Alder, Gregory H. The Role of Habitat Structure in Organizing Small Mammal Populations and Communities. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Allen, Robert T. Additions to the Known Endemic Flora and Fauna of Arkansas. In Proc: Ark. Acad. Sci., vol. 42, 1988.

Arney, Ken. To Cut or Not to Cut. Tennessee's 10 Most Common Myths and Misconceptions about Forestry and Wildlife Management, pp. 13-17, n.d.

Baker, James B. Uneven-aged Stand Management on the Crossett Experimental forest. In Proc: Success in Silviculture, pp. 208-212; 1985.

Baston, Wade T. Genera of Eastern Plants. Pub. by Author; 1975.

Belanger, R.P. and R.L. Anderson. A Guide for Visually Assessing Crown Densities of Loblolly and Shortleaf Pines. SE For. Exp. Sta., Res. Note SE-352/revised; 1992.

Beasley, R. Scott, et al. Forest Road Erosion in the Ouachita Mountains. In Proc: Mountain Logging Symposium, W. Vir. Univ.; 1984.

Beiswenger, Ronald E. Integrating Anuran Amphibian Species into Environmental Assessment Programs. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Bierregaad, Richard O., et al. The Biological Dynamics of Tropical Rain Forest Fragments. BioSci., vol. 42, no. 11, pp. 859-866; 1992.

Black, Jeffery H. and Gregory Sievert. A Field Guide to Amphibians of Oklahoma. Okla. Dept. Wildl. Cons; 1989.

Bowler, Peter A. Shrublands: In defense of disturbed land. Rest. Mgt. Notes, vol. 10, no. 2; 1992.

Brooks, Robert T. and William M. Healy. Response of Small Mammal Communities to Silvicultural Treatments in Eastern Hardwood Forests of West Virginia and Massachusetts. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Brissette, John C. and James P Barnett (eds). In Proc: Shortleaf Pine Regeneration Workshop. So. For. Exp. Sta., GTR-SO-90; 1992.

Brisson, Jacques. The History and Tree Stratum of an Old Growth Forest of Haut Saint Laurent Region, Quebec. Nat. Areas J., vol. 12, no. 1; 1992.

Buck, Paul. Distribution and Identification of Woody Plants of Oklahoma in the Winter Condition. Univ. of Tulsa; 1983.

Burger, George V., et al. (eds). Proceedings of the Oak Woods Management Workshop. E. Ill. Univ.; 1991.

Campbell. J.J.N., et al. Floristic and Historical Evidence of Fire Maintained, Grassy Pine-oak Barrens before Settlement in Southeastern Kentucky. In Proc: Fire and the Environment: Ecological and Cultural Perspectives. SE. For. Exp. Sta., pp. 359-375; 1991.
Cartmill, Matt. The Bambi Syndrome. Nat. His. 6/93.

Clark, Donald R. Jr. Environmental Contaminants and the Management of Bat Populations in the United States. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Clark, G. Thomas. Winter Twigs of Arkansas: A field guide to deciduous woody plants. Rose Pub.;1981

Collins, James P., et al. Conserving Genetically Distinctive Populations: The case of the Hauchuca Tiger salamander (*Ambystoma tigrum stebbinsi* Lowe) In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GRT-RM-166; 1988.

Conany, Roger and Joseph T. Collins. Reptiles and Amphibians: Eastern and Central North America. Houghton Miff. Co.; 1991.

DuVall, Margaret S. and Paul F. Ramp. U.S. Forest Service Research Natural Areas and Protection of Old Growth in the South. Nat. Areas J., vol. 12, no. 2; 1992.

DuVall Margaret S. and Victor A, Rudis. Older Stands Characterized and Estimated from Sample Based Surveys. In Proc: Restoration of Old Growth Forests in the Interior Highlands of Arkansas and Oklahoma, Winrock International; 1992.

Duncan, Wilbur H. and Leonard E. Foote. Wildflowers of the Southeastern United States. Univ. Geor. Press; 1975.

Evans, James E. Japanese Honeysuckle (*Lonicera japonica*): A Literature Review of Management Practices. Nat. Areas J., vol. 4, no. 2, pp. 4-10; n.d.

Everett, Richard, et al. Eastside Forest Ecosystem Assessment. TNC/USFS. vol 1 complete, vol. II draft.; 1993.

Farrish, K.W., et al. Soil Conservation Practices on Clearcut Forestlands in Louisiana. J. Soil Wat. Cons., vol. 48, no. 2, pp. 136-139.

Fountain, Michael S. Tree and Non Tree Dimensions of an Old Growth Shortleaf Pine Stand: Lake Winona Research Natural Area. In Proc: Restoration of Old Growth Forests in the Interior Highlands of Arkansas and Oklahoma. Winrock International; 1992.

Fryar, Roger D. Old Growth Stands of the Ouachita National Forest. In Proc: Restoration of Old Growth Forest in the Interior Highlands of Arkansas and Oklahoma. Winrock International; 1992.

Garland, Diana A and Gary A. Heidt. Distribution and Status of Shrews in Arkansas. In Proc: Ark. Acad. Sci., vol. 43, pp.35-38; 1989.

Gosz, James R. Gradient Analysis of Ecological Change in Time and Space: Implications for Forest Management. Ecol. App., vol 2, no. 3, pp. 248-261; 1992.

Grelen, Harold E. and Ralph H. Hughes. Common Herbaceous Plants of Southern Forest Range. So. For. Exp. Sta., RP-SO-210.

Gulden, James M. Silvicultural Practices Applied to Old Growth Stand Management. In Proc: Restoration of Old Growth Forests in the Interior Highlands. Winrock International; 1991.

Harrington, H.D. and L.W. Durrell. How to Identify Plants. Swallow Press, 1957.

Harvey, Michael J. Arkansas Bats: A valuable resource. Ark. Game Fish Comm.; 1986.

Henderson, Douglas and L.D. Hedricks (eds). Restoration of Old Growth Forests in the Interior Highlands of Arkansas and Oklahoma. Conf. Proc., Winrock International; 1991.

Hill, John E. and James D. Smith. Bats: A natural history. Univ. Texas; 1984.
House, John H. Buffalo Bones Identified at Lincoln County Archeological Site. Arch. Sur., no. 248; 1992.

Hunter, Carl G. Trees, Shrubs and Vines of Arkansas. Ozark Soc. Found.; 1989.

Hunter, Carl G. Wildflowers of Arkansas (3rd. ed.). Ozark Soc. Found.; 1992

Hyatt, Philip E. Arkansas Carex: An annotated list; 1993.

Johnson, Forrest L. and Gary Schnell. Wildland Fire History and the Effects of Fire on Vegetative Communities at Buffalo National River, Arkansas. Rep. To: Nat. Park Ser.; 1985.

Johnson, Forrest L. and Gary D. Schnell. Effects of Prescribed Burning on Plant Communities at Buffalo National River, Arkansas. Rep. To: Nat. Park Ser.; 1988.

Johnson, Forest L. and Gary D. Schnell. Wildland Fire History and the Effects of Fire on Vegetative Communities at Hot Springs National Park, Arkansas. Rep. To: Nat. Park Ser.; 1985

Johnson, Tom R. The Amphibians and Reptiles of Missouri. Mo. Dept. Cons.; 1992.

Key, James S. Filed Guide to Missouri Ferns. Mo. Dept. Cons.; 1982.

Ladd, Douglas. Reexaminations of the Role of Fire in Missouri Oak Woodlands. In Proc: Oak Woods Management Workshop, pp. 67-80, 1991.

Lawson, Edwin R. *Pinus echinata* Shortleaf Pine --incomplete--

Little, Edward (revised by). Forest Trees of Oklahoma. Okla. For. Dept.; 1985.

Miller, Howard A. and Samuel H. Lamb. Oaks of North America. Naturegraph; 1985.

Martin, William H. Characteristics of Old Growth Mixed Mesophytic Forests. Nat. Areas J., vol. 12, no. 3; 1992

Masters, Ronald E., et al. Effects of Timber Harvest and Periodic Fire on Soil Chemical Properties in the Ouachita Mountains. So. J. App. For., vol. 17, no. 3, pp. 139-145; 8/93.

McCoy, Doyle. Oklahoma Wildflowers, Pub. by Author; 1987.

Mendelson, Jon, et al. Carving up the Woods: Savanna restoration in Northeastern Illinois. Res. Mgt. Notes, vol. 10, no. 2; 1992.

Miller, E. L., et al. Forest Road Sediments: Production and delivery to stream. So. For. Res. Cen.; n. d.

Miller, E. L., et al. Forest Harvest and Site Preparation Effects on Erosion and Sedimentation in the Ouachita Mountains. J. Envir. Qual., vol. 17, pp. 219-225; 1988.

Millers, Imants, et al. History of Hardwood Decline in the Eastern United States. NE. For. Exp. Sta., GTR-NE-126; 1989.

Moore, Dwight M. Trees of Arkansas. Ark. For. Comm.; 1991.

Musselman, Lytton J. and William F. Mann, Jr. Root Parasites of Southern Forests. So. For. Exp. Sta., GTR-SO-20; 1978.

Mutch, Robert W. Forest Health in the Blue Mountains: A management strategy for fire adapted ecosystems. U.S. For. Ser., PNW-GTR-310; 1993.

Nordyke, Kirk A. and Steven W. Buskirk. Evaluation of Small Mammals as Ecological Indicators of Old Growth Conditions. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM166; 1988.

Richard, J and Joan E. Heitzman. Butterflies and Moths of Missouri. Miss. Dept. Cons.; 1987.

Reinhard, Richard T. and Stewart Ware. Adaptation to Substrate in Rock Outcrop Plants: Interior highlands Talinum (Portulacaceae). Bot. Gaz., vol. 150, no. 4, pp. 449-453; 1989.

Rezendes, Paul. Tracking and the Art of Seeing: How to read animal tracks and sigh. Camden House Pub; 1992.

O' Hara, Kevin L., et al. Silviculture and our Changing Profession: Leadership for shifting paradigms. J. For., pp. 8-13; Jan./1993

Opler, Paul A. and Vichai Malikul. Eastern Butterflies. Houghten Miff. Co.; 1992.

Peck, James H. and Carol J, Peck. A Bibliographic Summary of Arkansas Field Botany. In Proc: Ark. Acad. Sci., vol. 42; 1988.

Petrides, George A. Eastern Trees. Houghton Miff. Co.; 1988.

Pohl, Richard W. How to Know Grasses. Iowa St. Univ.; 1978.

Rafferty, Milton D. and John C. Catau. The Ouachita Mountains: A guide for fisherman, hunters, and Travelers. Univ. of Okla. Press; 1991.

Roeder, Beverly J., et al. Rare Plants of the Ozark Plateau: A field identification guide. No. Cen. For. Exp. Sta.; 1978.

Saugey, David A., et al. The Bats of Hot Springs National Park, Arkansas. In Proc: Ark. Acad. Sci., vol. 42, pp. 81-83; 1988.

Saugey, David A., et al. The Bats of The Ouachita Mountains. In Proc: Ark. Acad. Sci., vol. 43, pp. 71-77; 1989.

Saugey, David A., et al. Utilization of Abandoned Mine Drifts and Fracture Caves by Bats and Salamanders: Unique subterranean habitat in the Ouachita Mountains. In Proc: Management of

Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Scott, James A. The Butterflies of North America: A natural history and field guide. Stanford Univ.; 1986.

Sealander, John A. and Gary A. Heidt. Arkansas Mammals: Their natural history, classification, and distribution. Univ. Ark. Press; 1990.

Sharitz, Rebecca R., et al. Integrating Ecological Concepts with Natural Resource Management of Southern Forests. Ecol. App., vol. 2, no. 3, pp. 226-237; 1992.

Sievert, Gregory and Lynnette Sievert. A Field Guide to Reptiles of Oklahoma. Okla. Dept. Wildl. Cons., 1993.

Smith, Edwin B. An Atlas and Annotated List of the Vascular Plants of Arkansas, Second Edition; 1999.

Smith, Edwin B. Keys to the Flora of Arkansas. Univ. Ark. Press; 1994.

Steward, T.W., et al. The Mammals of Southwestern Arkansas, Part II Rodents, Part III Carnivores. In Proc: Ark. Acad. Sci., vol.43, pp. 88-95; 1989.

Stout, I. Jack, et al. Management of Amphibians, Reptiles and Small Mammals in Xeric Pinelands of Peninsular Florida. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Summers, Bill. Missouri Orchids. Mo. Dept. Cons.; 1987.

Taylor, John R. and Constance E. S. Taylor. An Annotated List of the Ferns, Fern Allies, Gymnosperms and Flowering Plants of Oklahoma. SE. Okla. St. Univ. Herbarium; 1991.

Taylor, W. Carl. Arkansas Ferns and Fern Allies. Milwaukee Pub. Mus.; 1984.

Tumlison, Renn, et al. New Records of Vertebrates in Southwestern Arkansas. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Tucker, Gary. A Guide to the Woody Flora of Arkansas, Dissertation, Univ. Ark; n.d.

Turton, Donald, et al. Best Management Practices for Forest Road Construction and Harvesting Operations in Oklahoma. Coop. Ext. Ser., For. Ext. Rep., vol. 5; n.d.

Van Lear, David H. and Thomas A. Waldrop. History , Uses, and Effects of Fire in the Appalachians. So. For. Exp. Sta., GTR-SE-54; 1989.

Vora, Robin S. Integrating Old-growth Forest into Managed Landscapes: A northern Great Lakes perspective. Nat. Areas J., vol. 14, no. 2; 1994.

Vowell Jeffery L. Erosion Rates and Water Quality Impacts from a Recently Established Forest Road in Oklahoma's Ouachita Mountains. In Proc: Forestry and Water Quality, pp. 152-163; 1985.

Weber, Nancy Smith and Alexander H. Smith. A Field Guide to Southern Mushrooms. Univ. Mich. Press; 1985.

Weiss, Stuart B. and Dennis M. Murphy. Thermal Microenvironments and the Restoration of Rare Butterfly Habitats. In: Environmental Restoration. John J. Berger (ed). Island Press; 1990.

Welsh, Hartwell H. Jr. and Amy L. Lind. Old Growth Forests and the Distribution of the Terrestrial Herpetofauna. In Proc: Management of Amphibians, Reptiles, and Small Mammals in North America. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-166; 1988.

Wheeler, G. L. and J.K. Eichman. The Effects of Forest Management Practices on Soil Nutrient Status. Report to Ouachita Nat. For.; 1991.

Whitney, Gordon G. Some Reflections of the Value of Old Growth Forests, Scientific and Otherwise. Nat. Areas J., vol. 7, no. 3; 1987.

Wilhelm, Gerould and Douglas Ladd. Natural Area Assessment in the Chicago Region. In: Trans, 53rd N. A. Wildl. Nat. Res. Conf.; pp. 361-373; 1988.

XX. Water Quality/Watersheds

____. Alabama Water Watch (water quality, bioassessments, forms, directions, training, relevant articles). Supplied by Cahaba River Society.

____. American Management Systems. Environmental Monitoring and Assessment Program: 1992 project descriptions. EPA/600/R92/146; 1992.

____. Final Comprehensive State Ground Water Protection Program Guidance. EPA 100-R-93-001; 1992

____. Implementation Plan for the National Water-Quality Assessment Program. USGS, open-file re. 90-174, w/bibliography and Basin Study Area; 1990-1992.

____. Methods for Measuring Sedimentation Rates in Bottomland Hardwood Wetlands. U.S. Cor. Eng. WRP Tech Note SD-CP-4.1; 1993.

____. National Water Summary 1990-91: Hydrologic events and stream water Quality. USGS, pp. 179-186 and 445-453; 1993.

____. Oklahoma Water Resources Board: Rules and Water Quality Standards; 1992.

____. Physical, Chemical and Biological Characteristics of Least Disturbed Streams in Arkansas's Ecoregions; vol. I and II. Ark. Dept. Poll. Cont. Ecol; 1987.
____. Project WET Materials. Ark. Soil Wat. Comm.; 1992.

____. Protecting The Nation's Groundwater: EPA's Strategy for the 1990's. EPA. 21Z-1020; 1991.

____. Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas. Ark. Dept. Poll. Cont. Ecol.; 1988-1991.

____. The Watershed Protection Approach. EPA 840-S-93-001; 1993.

____. Watershed Protection: Catalog of federal programs. EPA-841-B-93-002; 1993.

Brinkley, Dan and Thomas C. Brown. Management Impacts on Water Quality of Forests and Rangelands. Roc. Mtn. For. Rang. Exp. Sta., GTR-RM-239; 1993.

Brown, Thomas C., et al. Laws and Programs for Controlling Nonpoint Source Pollution in Forest Areas. War. Res. Bull, vol. 29, pp.1-13; 1993.

Buchanan, Tom M. A Limnological Study of Ricks Pond and the Gulpha Creek Drainage in Garland County, Arkansas. Ark. Water Res. Cen. Pub. no. 62; 1978.

Clingenpeel, J. Alan and Betty G. Cochran. Using Physical, Chemical and Biological Indicators to Assess Water Quality on the Ouachita National Forest Utilizing Basin Area Stream Survey Methods. In Proc: Ark. Acad. Sci., vol. 46; 1992.

Hlass, Lisa J. Application of an Index of Biotic Integrity to Streams in the Lower Ouachita Mountains Ecoregion,. Arkansas. Oklahoma State Univ., Thesis; 1995.

Jackson, Jeanne L. and Dr. Leslie E. Mack. Arkansas Water: Why wait for the crisis? Rockfeller Foundation; 1982.

Karr, James R. and Daniel R. Dudley. Ecological Perspectives on Water Quality Goals. Env. Manage., vol. 5, no. 1; 1981.

Louthian, Bobbie L. and E. E. Gann. Current Water Resource Activities in Arkansas, 1986-87. USGS Open file Report 88-338; 1988.

Wagner, George H. and Kenneth F. Steele. Chemistry of the Spring Waters of the Ouachita Mountains Excluding Hot Springs, Arkansas. Ark. Water Res. Cen. Pub. no. 69; 1980.

Yanchosek, John J. and Marion S. Hines. Drainage Areas of Streams in Arkansas: Red River Basin. USGS Open file Rep. 28-555; 1978, Ouachita River Basin. USGS Open file Rep. 80-334; 1979.

APPENDIX B

Rollout Reports

Complete list of Portfolio Conservation Areas chosen for the Ouachita Ecoregion and the corresponding acreage for each.

Site Name	Acres	TYPE
North Shore Glades	217,739	Terrestrial
Beaver Bend Hills	272,735	Terrestrial
Holland Bottoms	9,568	Terrestrial
Cove Creek Natural Area	537	Terrestrial
Goose Pond	13,858	Terrestrial
Crayfish Complex 1	307	Terrestrial
Crayfish Complex 2	232	Terrestrial
Crayfish Complex 3	968	Terrestrial
Crayfish Complex 4	410	Terrestrial
Crayfish Complex 5	576	Terrestrial
Crayfish Complex 6	331	Terrestrial
Crayfish Complex 7	461	Terrestrial
Crayfish Complex 8	391	Terrestrial
Rich Mountain	528,196	Terrestrial
Sugarloaf Mountain	24,108	Terrestrial
Little Rock Air Force Base	7,370	Terrestrial
Bradey Mountain	10,611	Terrestrial
Meadow Rue Seep	1,234	Terrestrial
Meadow Rue Seep	1,075	Terrestrial
Pine Bluestem Restoration	317,630	Terrestrial
Flatside-Forked Mountain	81,762	Terrestrial
Crayfish Complex	799	Terrestrial
Crayfish Complex	799	Terrestrial
Novaculite Uplift	565,685	Terrestrial
Pushmataha Wildlife Management Area	32,568	Terrestrial
Least Terns Site 1	15,110	Terrestrial
Cherokee Prairies	122,922	Terrestrial
Magazine Mountain	173,153	Terrestrial
Least Terns Site 2	7,137	Terrestrial
Kiamichi River	1,165,716	Aquatic
Glover River	290,722	Aquatic
Upper Little River	235,708	Aquatic
Mountain Fork Creek	279,327	Aquatic
Cossatot River	139,485	Aquatic
Little Missouri River	79,142	Aquatic
Caddo River	193,373	Aquatic
Upper Saline River	431,671	Aquatic
Fourche La Fave River	393,510	Aquatic
Ouachita Headwaters	364,679	Aquatic

Species Targets

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
Amphibian						
	Ambystoma annulatum	ringed salamander	G4		Terrestrial	5
	Desmognathus brimleyorum	Ouachita dusky salamander	G4		Riparian	5
	Eurycea multiplicata multiplicata	many-ribbed salamander	G4T4		Aquatic	3
	Hemidactylium scutatum	Four-Toed salamander	G5		Riparian	5
	Plethodon caddoensis	Caddo Mountain salamander	G2		Terrestrial	10
	Plethodon fourchensis	Fourche Mountain salamander	G2		Terrestrial	10
	Plethodon albagula	western slimy salamander	G4		Terrestrial	5
	Plethodon ouachitae	Rich Mountain salamander	G2G3		Terrestrial	10
	Plethodon serratus	southern redback salamander	G5		Terrestrial	5
	Plethodon kiamichi	Kiamichi slimy salamander	G2Q		Terrestrial	1
	HYLA AVIVOCA	BIRD-VOICED TREEFROG	G5		Wetlands	1
	Rana areolata circulosa	northern crawfish frog	G4T4		Wetlands	5
	Plethodon sequoyah	Sequoyah slimy salamander	G2Q		Terrestrial	1
Bird						
	Accipiter cooperi	Cooper’s hawk	G4		Terrestrial	5
	STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	G4T2Q	(PS:LE)	Riparian	1
	Coccyzus americanus	yellow-billed cuckoo	G5		Terrestrial	5
	Caprimulgus carolinensis	chuck-will’s-widow	G5		Terrestrial	5
	Caprimulgus vociferus	whip-poor-will	G5		Terrestrial	5

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
	PICOIDES BOREALIS	RED-COCKADED WOODPECKER	G3	LE	Terrestrial	2
	Contopus virens	eastern wood –pewee	G5		Terrestrial	5
	THRYOMANES BEWICKII	BEWICK'S WREN	G5		Terrestrial	5
	Dendroica pensylvanica	chestnut-sided warbler	G5		Terrestrial	5
	Dendroica virens	black-throated green warbler	G5		Terrestrial	5
	Dendroica discolor	prairie warbler	G5		Terrestrial	5
	Dendroica cerulea	Cerulean warbler	G4		Terrestrial	5
	Helmitheros vermivorus	worm-eating warbler	G5		Terrestrial	5
	Limnothlypis swainsonii	Swainson’s warbler	G4		Terrestrial	5
	Oporornis formosus	Kentucky warbler	G5		Terrestrial	5
	Piranga rubra	summer tanager	G5		Terrestrial	5
	AIMOPHILA AESTIVALIS	BACHMANS SPARROW	G3		Terrestrial	8
	Ammodramus henslowii	Henslow’s sparrow	G3G4		Terrestrial	5
	Icterus spurius	orchard oriole	G5		Terrestrial	5
Crustacean						
	Orconectes menae	Orconectes menae	G3		Terrestrial	5
	PROCAMBARUS REIMERI	A CRAYFISH	G1	PET	Terrestrial	4
	PROCAMBARUS PARASIMULANS	A CRAYFISH	G4	PET	Terrestrial	5
	FALLICAMBARUS JEANAE	A CRAYFISH	G2	PET	Riparian	1
	FALLICAMBARUS STRAWNI	A CRAYFISH	G1G2	PET	Riparian	6
	FALLICAMBARUS HARPI	NCN - a crayfish	G1	PET	Terrestrial	3

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
	FAXONELLA BLAIRI	crayfish	G2	PET	Aquatic	1
Fish						
	Notropis greenei	wedgespot shiner	G5		Aquatic	2
	NOTROPIS ORTENBURGERI	KIAMICHI SHINER	G3	PET	Aquatic	3
	NOTROPIS PERPALLIDUS	PEPPERED SHINER	G3	PET	Aquatic	3
	Notropis suttkusi	Rocky Shiner	G3		Aquatic	3
	LYTHRURUS SNELSONI	OUACHITA SHINER	G3	PET	Aquatic	3
	NOTURUS ELEUTHERUS	Mountain madtom	G4	PET	Aquatic	3
	NOTURUS LACHNERI	OUACHITA MADTOM	G2	PET	Aquatic	3
	Noturus miurus	Brindled madtom	G5		Aquatic	3
	NOTURUS TAYLORI	CADDO MADTOM	G1	PET	Aquatic	3
	Fundulus blairae	Lowland topminnow	G4	PET	Aquatic	3
	CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	G3	PET	Aquatic	3
	ETHEOSTOMA COLLETTEI	Creole darter	G4		Aquatic	5
	ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	G2	PET	Aquatic	3
	ETHEOSTOMA PARVIPINNE	goldstripe darter	G4	PET	Aquatic	3
	EtHEOSTOMA RADIOSUM	Orangebelly darter	G4		Aquatic	3
	PERCINA NASUTA	LONGNOSE DARTER	G3	PET	Aquatic	3
	PERCINA PANTHERINA	LEOPARD DARTER	G1	LT	Aquatic	3
	PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	G5	PET	Aquatic	3
	PERCINA SP. NOV.	OUACHITA DARTER	G2	PET	Aquatic	1

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
Insect						
	STYGOBROMUS MONTANUS	mountain cave amphipod	G1	PET	Subterranean	1
	Arianops sandersoni	Magazine Mountain mold beetle	G1?		Terrestrial	1
	ARIANOPS COPELANDI	COPELAND'S MOLD BEETLE	G1		Terrestrial	1
	NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	G2G3	LE	Terrestrial	2
	OUACHITYCHUS PARVOCULUS	SMALL-EYED MOLD BEETLE	G1		Terrestrial	1
	PARALEPTOPHLEBIA CALCARICA	A MAYFLY	G1		Aquatic	1
	Speyeria diana	Diana fritillary	G3		Terrestrial	5
	Enodia creola	creole pearly-eye	G3G4		Terrestrial	5
	Papaipema eryngii	rattlesnake master borer moth	G1G2		Terrestrial	4
	Gryllotalpa major	prairie mole cricket	G3		Terrestrial	1
	Neoperla falayah	Neoperla falayah	G3		Aquatic	3
	Neoperla osage	stonefly	G3		Aquatic	3
	Isoperla ouachita	a stonefly	G3		Aquatic	3
	Isoperla szczytkoi	a stonefly	G1		Aquatic	1
	Helopicus nalatus	stonefly	G3		Aquatic	3
	Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	G1		Aquatic	3
Invertebrate						
	STYGOBROMUS ELATUS	ELEVATED SPRING AMPHIPOD	G1G2		Terrestrial	1
	PSEUDACTIUM MAGAZINENSIS	OUACHITA PSEUDACTIUM	G1		Terrestrial	2
	PENTACORA OUACHITA	OUACHITA SHORE BUG	G1		Aquatic	1

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
	PATERA CLENCHI	CALICO ROCK OVAL	G1		Terrestrial	1
	INFLECTARIUS MAGAZINENSIS	MAGAZINE MOUNTAIN SHAGREEN	G1	LT	Terrestrial	1
	STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	G2		Terrestrial	8
	STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	G1		Terrestrial	2
Mammal						
	Ursus americanus	black bear	G5		Terrestrial	1
	Spilogale putorius interrupta	plains spotted skunk	G5T3T4		Terrestrial	5
Mussel						
	Alasmidonta marginata	Elktoe	G4		Aquatic	3
	ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	G1	LE	Aquatic	3
	Cumberlandia Monodonta	spectaclecase pearlymussel	G2G3	(C.)	Aquatic	1
	CYPROGENIA ABERTI	WESTERN FANSHELL	G2	PET	Aquatic	3
	ELLIPTIO DILATATA	Spike	G5	PET	Aquatic	3
	FUSCONAIA EBENA	Ebonyshell	G4G5	PET	Aquatic	3
	LAMPSILIS ABRUPTA	PINK MUCKET	G2	LE	Aquatic	3
	LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	G5	PET	Aquatic	2
	LAMPSILIS POWELLII	ARKANSAS FATMUCKET	G1G2	LT	Aquatic	3
	LEPTODEA LEPTODON	SCALESHELL	G1	LE	Aquatic	3
	OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	G1G2	PET	Aquatic	3
	PLEUROBEMA CORDATUM	OHIO PIGTOE	G3	PET	Aquatic	1
	PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	G3	PET	Aquatic	3

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
	QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	G3T3	PET	Aquatic	3
	QUADRULA FRAGOSA	WINGED MAPLELEAF	G1	(LE,XN)	Aquatic	3
	Toxolasma lividus	purple lilliput	G2		Aquatic	3
	VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	G2	PET	Aquatic	3
Plant						
	Osmorhiza claytonii	hairy sweet-cicely	G5		Terrestrial	5
	AMSONIA HUBRICHTII	OUACHITA BLUE STAR	G3		Terrestrial	5
	Panax quinquefolium	American ginseng	G4		Terrestrial	5
	Asclepias incarnata	swamp milkweed	G5		Riparian	5
	ASCLEPIAS STENOPHYLLA	NARROW-LEAVED MILKWEED	G4G5		Terrestrial	5
	Matelea baldwyniana	Baldwin’s milkvine	G3		Terrestrial	6
	Cirsium muticum	swamp thistle	G5		Terrestrial	5
	HELIANTHUS OCCIDENTALIS SSP. PLANTAGINEUS	SHINNERS SUNFLOWER	G5T2T3Q		Terrestrial	5
	HIERACIUM SCABRUM	ROUGH HAWKWEED	G5		Terrestrial	5
	Liatris squarossa var compacta	Ouachita blazing star	G5T3?		Terrestrial	5
	Polymnia cossatotensis	heartleaf leafcup	G1		Terrestrial	3
	SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	G3		Terrestrial	6
	Verbesina walteri	rayless crown-beard	G3		Terrestrial	5
	Vernonia fasciculata	prairie ironweed	G5		Terrestrial	5
	Vernonia lettermanii	Letterman’s ironweed	G3		Terrestrial	6

Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
Caulophyllum thalictroides	blue cohosh	G4G5		Terrestrial	5
CARDAMINE DISSECTA	A TOOTHWORT	G4		Terrestrial	5
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	G3		Terrestrial	5
Erysimum capitatum	western wallflower	G5		Terrestrial	5
Streptanthus obtusifolius	a twistflower	G3		Terrestrial	6
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	G2		Terrestrial	8
Arenaria benthami	hilly sandwort	G4		Terrestrial	5
SILENE REGIA	ROYAL CATCHFLY	G3		Terrestrial	6
GEOCARPON MINIMUM	GEOCARPON	G2	LT	Terrestrial	1
Amorpha canescens	leadplant	G5		Terrestrial	5
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	G3Q		Terrestrial	5
QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	G1		Terrestrial	4
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	G1		Terrestrial	5
Monarda stipitatoglandulosa	Ouachita horsemint	G3		Terrestrial	6
CALLIRHOE BUSHII	BUSH'S POPPY-MALLOW	G3		Terrestrial	5
Delphinium newtonianum	Moore’s larkspur	G3		Terrestrial	5
Thalictrum arkansanum	Arkansas meadow-rue	G2		Terrestrial	4
NEVIUSIA ALABAMENSIS	ALABAMA SNOW WREATH	G2		terrestrial	2
ROSA FOLIOLOSA	WHITE PRAIRIE ROSE	G5		Terrestrial	5
Galium arkansanum var pubiflorum	Ouachita bedstraw	G5T2Q		Terrestrial	5

Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
Hedyotis ouachitana	Ouachita hedyotis	G3		Terrestrial	5
PARNASSIA GRANDIFOLIA	LARGE-FLOWERED GRASS-OF-PARNASSUS	G3		Terrestrial	6
VALERIANELLA OZARKANA	A CORN-SALAD	G3		Terrestrial	6
Valerianella palmeri	Palmer’s corn-salad	G3		Terrestrial	6
TRADESCANTIA LONGIPES	A SPIDERWORT	G4		Terrestrial	5
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	G2G3		Terrestrial	5
Carex bicknellii var opaca	a sedge	G5T2T3		Terrestrial	5
CAREX BROMOIDES	A SEDGE	G5		Terrestrial	5
CAREX LAEVIVAGINATA	SMOOTH-SHEATH SEDGE	G5		Terrestrial	5
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	G3		Terrestrial	6
CAREX STRICTA	UPRIGHT SEDGE	G5		Terrestrial	5
Carex swanii	Swan’s sedge	G5		Terrestrial	5
CAREX VIRESCENS	RIBBED SEDGE	G5		Terrestrial	5
CAREX WILLDENOWII	A SEDGE	G5		Terrestrial	5
Carex ouachitana	Ouachita sedge	G3		Terrestrial	6
SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	G5		Terrestrial	5
Veratrum woodii	wood’s false hellbore	G5		Terrestrial	6
TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	G3T3		Terrestrial	8
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	G3		Terrestrial	5
Liparis loeselii	yellow twayblade	G5		Terrestrial	5

	Scientific Name	Common Name	GRank	USESARank	Habitat	Goal
	Bromus nottawayanus	Nottaway brome-grass	G3G4		Terrestrial	5
	CALAMOVILFA ARCUATA	A SANDGRASS	G2		Terrestrial	8
	DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	G5		Terrestrial	5
	ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT	G4		Terrestrial	5
	DENNSTAEDTIA PUNCTILOBULA	EASTERN HAY-SCENTED FERN	G5		Terrestrial	5
	DRYOPTERIS CARTHUSIANA	SPINULOSE WOOD-FERN	G5		Terrestrial	5
	DRYOPTERIS CELSA	LOG FERN	G4		Terrestrial	5
	WOODSIA SCOPULINA VAR. APPALACHIANA	APPALACHIAN WOODSIA	G4T4		Terrestrial	5
	TRICHOMANES PETERSII	DWARF FILMY-FERN	G4G5		Terrestrial	5
Reptile						
	Terrapene ornata ornata	ornate box turtle	G5T5		Terrestrial	5
	Eumeces septentrionalis obtusirostris	southern prairie skink	G5T5		Terrestrial	1
	Eumeces obsoletus	Great Plains skink	G5		Terrestrial	1
	Regina septemvittata	queen snake	G5		Terrestrial	3

Community Targets

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL001197	G5	SALIX EXIGUA TEMPORARILY FLOODED SHRUBLAND	Coyote Willow Temporarily Flooded Shrubland Northern and Central Great Plains Wooded Riparian Vegetation/Montane Riparian Shrublands	Widespread	Small Patch	5
CEGL002024	G2G	ANDROPOGON GERARDII - PANICUM VIRGATUM - HELIANTHUS GROSSESERRATUS HERBACEOUS VEGETATION	Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous Vegetation Midwestern Deep Soil Tallgrass Prairies	Limited	Large Patch	2
CEGL002049	G2G	RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation Midwestern Sand and Gravel Strands	Widespread	Small Patch	5
CEGL002058	G3	Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest White Oak - Red Oak - Sugar Maple Mesic Forest	Limited	Small Patch	25
CEGL002060	G3	ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest Interior Highlands Small Stream Floodplain / Terrace Forests	Widespread	Small Patch	5
CEGL002067	G3	Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest Interior Highlands Dry-mesic Oak Forests and woodlands	Limited	Matrix	3
CEGL002070	G4G	Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest interior highlands circumneutral/basic dry-mesic hardwood forests	Widespread	Large Patch	3
CEGL002086	G5	BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Widespread	Small Patch	5
CEGL002087	G4	CARYA ILLINOINENSIS - CELTIS LAEVIGATA FOREST	Pecan - Sugarberry Forest South Central Bottomland Hardwood Forests	Widespread	Large Patch	4
CEGL002096	G3	POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest CEGL002096	Widespread	Large Patch	4

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL002101	G2G	QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest Interior Highlands Wet Hardwood Flatwoods	Limited	Small Patch	20
CEGL002102	G4G	QUERCUS PHELLOS - (QUERCUS LYRATA) / CAREX SPP. - LEERSIA SPP. FOREST	Willow Oak - (Overcup Oak) / Sedge species - Cutgrass species Forest Southeastern Coastal Plain Bottomland Hardwood Forests	Limited	Large Patch	4
CEGL002103	G4	SALIX NIGRA FOREST	Black Willow Forest Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Widespread	Small Patch	5
CEGL002150	G3	Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland Interior Highlands Dry-mesic Oak Forests and woodlands	Widespread	Large Patch	5
CEGL002191	G4	CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland Southeastern Coastal Plain Floodplain Shrublands/Southeastern Coastal Plain Upland Depression Shrub Ponds	Widespread	Small Patch	5
CEGL002212	G3	SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation Midwestern Thin Soil Tallgrass Prairies	Limited	Small Patch	25
CEGL002242	G3	SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation Interior Highlands Sandstone Glades and Barrens	Limited	Small Patch	18
CEGL002244	G1G	SCHIZACHYRIUM SCOPARIUM - SEDUM NUTTALLIANUM - SELAGINELLA RUPESTRIS - PORTULACA PILOSA / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Nuttalls Stonecrop - Rock Spikemoss - Kiss-Me-Quick / Lichens Wooded Herbaceous Vegetation Interior Highlands Sandstone Glades and Barrens ozark chert glade	Limited	Small Patch	3
CEGL002263	G2G	CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation Interior Highlands Acid Herbaceous Seeps	Limited	Small Patch	25
CEGL002309	G4G	SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation Interior Highlands Sandstone Talus / eastern acid talus	Limited	Small Patch	25
CEGL002314	G4G	RIVER MUD FLATS SPARSE VEGETATION	River Mud Flats Sparse Vegetation Midwestern Mudflats	Widespread	Small Patch	25

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL002391	G2G	: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation Post Oak Central Dry Barrens	Widespread	Matrix	18
CEGL002393	G2G	PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Matrix	10
CEGL002394	G3G	PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Matrix	10
CEGL002400	G3G	PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Large Patch	18
CEGL002401	G3	PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Matrix	10
CEGL002402	G2G	PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Small Patch	20
CEGL002421	G3G	TAXODIUM DISTICHUM - (NYSSA AQUATICA) / FORESTIERA ACUMINATA - PLANERA AQUATICA FOREST	Bald-cypress - (Water Tupelo) / Swamp-privet - Planertree Forest Southeastern Coastal Plain Backswamp/Slough Floodplain Forests	Widespread	Large Patch	4
CEGL002425	G3G	Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodlan	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland Interior highlands xeric oak forests and woodlands	Endemic	Large Patch	18
CEGL002426	G3	Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland Interior Highlands Carbonate Glades and Barrens	Limited	Small Patch	25
CEGL002427	G4G	FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest Southeastern Coastal Plain Bottomland Hardwood Forests	Widespread	Large Patch	4
CEGL002428	G2	QUERCUS MARILANDICA - (JUNIPERUS VIRGINIANA) / SCHIZACHYRIUM SCOPARIUM - DANTHONIA SPICATA WOODED HERBACEOUS VEGETATION	Blackjack Oak - (Eastern Red-cedar) / Little Bluestem - Poverty Oatgrass Wooded Herbaceous Vegetation Interior Highlands Shale Glades and Barrens -- central shale glade	Limited	Small Patch	2

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL002430	G4G	POLYGONUM SPP. - MIXED FORBS HERBACEOUS VEGETATION	Smartweed species - Mixed Forbs Herbaceous Vegetation Eastern Emergent Marshes	Widespread	Small Patch	5
CEGL002431	G3G	ACER SACCHARINUM - CELTIS LAEVIGATA - CARYA ILLINOINENSIS FOREST	Silver Maple - Sugarberry - Pecan Forest Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Widespread	Small Patch	5
CEGL002433	G1	QUERCUS ALBA / CAREX PENSYLVANICA - CAREX OUACHITANA DWARF FOREST	White Oak / Pennsylvania Sedge - Ouachita Sedge Dwarf Forest Ouachita Mountains Dwarf White Oak Forest	Endemic	Large Patch	2
CEGL003836	G2	ARUNDINARIA GIGANTEA SSP. GIGANTEA SHRUBLAND	Giant Cane Shrubland Interior Highlands Riverfront and Levee Forests and Shrubland/Southeastern Coastal Plain Floodplain Shrublands	Limited	Small Patch	10
CEGL003884	G2	QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland Post Oak Interior Highlands Scrub Woodland	Endemic	Small Patch	4
CEGL003889	G1	TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation Eastern Dry Acid Cliffs	Endemic	Small Patch	25
CEGL003898	G3	HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland Interior Highlands Riverscour Vegetation	Limited	Small Patch	25
CEGL003899	G5?	SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Widespread	Small Patch	5
CEGL003901	G4	SALIX NIGRA TEMPORARILY FLOODED SHRUBLAND	Black Willow Temporarily Flooded Shrubland Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Widespread	Small Patch	5
CEGL003911	G3	FORESTIERA ACUMINATA - (PLANERA AQUATICA, CEPHALANTHUS OCCIDENTALIS) SHRUBLAND	Swamp-privet - (Planertree, Buttonbush) Shrubland Southeastern Coastal Plain Floodplain Shrublands/Interior Highlands Large River Floodplain Forests and Shrublands	Widespread	Small Patch	5
CEGL003942	G2	JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland Interior Highlands Riverscour Vegetation	Limited	Small Patch	1

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL004140	G2	ZIZANIOPSIS MILIACEA ROCKY RIVERBED HERBACEOUS VEGETATION	Southern Wild Rice Rocky Riverbed Herbaceous Vegetation Interior Highlands Riverscour Vegetation	Endemic	Small Patch	2
CEGL004150	G5	TYPHA LATIFOLIA SOUTHERN HERBACEOUS VEGETATION	Broadleaf Cattail Southern Herbaceous Vegetation Eastern Emergent Marshes	Widespread	Small Patch	5
CEGL004286	G4G	JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation Rocky Riverbeds	Limited	Small Patch	25
CEGL004331	G5	PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation Appalachian Highlands Riverine Vegetation	Limited	Small Patch	25
CEGL004347	G2G	SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation Interior Highlands Shale Glades and Barrens	Limited	Small Patch	25
CEGL004444	G3	PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Large Patch	18
CEGL004528	G3	CERATOPHYLLUM DEMERSUM HERBACEOUS VEGETATION	Coontail Herbaceous Vegetation Interior Highlands Open Ponds and Marshes /Great Plains Open Ponds and Marshes	Widespread	Small Patch	5
CEGL004543	G3	QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest interior highlands dry-mesic oak forests and woodlands	Limited	Large Patch	18
CEGL004544	G3	QUERCUS MACROCARPA - QUERCUS SHUMARDII - CARYA CORDIFORMIS / CHASMANTHIUM LATIFOLIUM FOREST	Bur Oak - Shumard Oak - Bitternut Hickory / River-oats Forest South Central Bottomland Hardwood Forests	Widespread	Large Patch	2
CEGL004602	G2G	QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest interior highlands circumneutral/basic dry-mesic hardwood forests	Limited	Small Patch	25
CEGL004782	G2G	JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation Interior Highlands Wet Prairies and Meadows	Limited	Small Patch	20

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL004796	G3	QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest interior highlands dry-mesic oak forests and woodlands	Limited	Small Patch	13
CEGL004919	G3G	POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland Southern Great Plains Riverfront and Scour Woodlands	Widespread	Small Patch	5
CEGL005033	G4G	ACER NEGUNDO FOREST	Box-elder Forest Southeastern Coastal Plain Bottomland Hardwood Forests	Widespread	Small Patch	5
CEGL007377	G2	TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest Interior Highlands Riverfront and Levee Forests and Shrublands / Interior Highlands Riverscour Vegetation	Endemic	Small Patch	3
CEGL007444	G3	ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest Interior Highlands Forested Acid Seeps	Limited	Small Patch	25
CEGL007489	G3G	PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Fores Interior Highlands Shortleaf Pine - Oak Dry-mesic Forest	Limited	Matrix	10
CEGL007807	G3	ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland Interior Highlands Riverscour Vegetation	Limited	Small Patch	25
CEGL007811	G2	Acer (barbatum, saccharum) - Juglans nigra - Fraxinus americana / Hybanthus concolor Forest	(Southern Sugar Maple, Sugar Maple) - Black Walnut - White Ash / Green-violet Forest Mesic Mixed Mount Magazine Forest	Limited	Small Patch	1
CEGL007815	G1G	Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland Interior Highlands Shortleaf Pine Forests and Woodlands	Limited	Matrix	8
CEGL007818	G3	QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest Interior Highlands Dry-mesic Oak Forests and Woodlands (402-20; 2.5.3.7)	Limited	Large Patch	18
CEGL007820	G2	(RIBES CYNOSBATI) / DESCHAMPSIA FLEXUOSA - DRYOPTERIS MARGINALIS - DENNSTAEDTIA PUNCTILOBULA HERBACEOUS VEGETATION	(Eastern Prickly Gooseberry) / Wavy Hairgrass - Marginal Woodfern - Hay-scented Fern Herbaceous Vegetation Eastern Dry Acid Cliffs	Limited	Small Patch	1

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL007822	G2	ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest Interior Highlands Forested Acid Seeps	Limited	Small Patch	25
CEGL007823	G3G	FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest Ozark Rich Beech - Mixed Hardwood Forest : interoir highlands mesic hardwod forests	Limited	Small Patch	25
CEGL007824	G2	(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation Interior Highlands Carbonate Glades and Barrens	Limited	Small Patch	4
CEGL007825	G3	QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation Interior Highlands Felsic Igneous/Metamorphic Glades and Barrens	Endemic	Large Patch	18
CEGL007826	G3G	LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest Interior Highlands Small Stream Floodplain / Terrace Forests	Limited	Small Patch	13
CEGL007827	G2G	SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation Southeastern Coastal Plain Circumneutral Patch Prairies	Widespread	Matrix	2
CEGL007828	G3	QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland Interior Highlands Dry-mesic Oak Forests and Woodlands	Endemic	Large Patch	18
CEGL007837	G1	OSMUNDA CINNAMOMEA - RHYNCHOSPORA CAPITELLATA - HEUCHERA PARVIFLORA VAR. PUBERULA - XYRIS JUPICAI HERBACEOUS VEGETATION	Cinnamon Fern - Northern Beaksedge - Ozark Alumroot - Richards Yellow-eyed-grass Herbaceous Vegetation Eastern Moist Acid Cliffs	Limited	Small Patch	1
CEGL007838	G2	PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation Interior Highlands Riverscour Vegetation	Endemic	Small Patch	25
CEGL007915	G4G	QUERCUS PHELLOS - QUERCUS NIGRA MISSISSIPPI RIVER ALLUVIAL PLAIN FOREST	Willow Oak - Water Oak Mississippi River Alluvial Plain Forest Southeastern Coastal Plain Bottomland Hardwood Forests	Widespread	Large Patch	4

ELCode	GRank	Scientific Name	Common Name Other Names	Distribution	Spatial Pattern	Goal
CEGL007984	G4	QUERCUS NIGRA - LIQUIDAMBAR STYRACIFLUA - (PINUS TAEDA) / ILEX OPACA - VACCINIUM FUSCATUM / CAREX DEBILIS TEMPORARILY FLOODED FLOODPLAIN FOREST	Water Oak - Sweetgum - (Loblolly Pine) / American Holly - Black Highbush Blueberry / White-edge Sedge Temporarily Flooded Floodplain Forest Southeastern Coastal Plain Small Stream Acid Hardwood Forests / Southeastern Coastal Plain Bottomland Hardwood Forests	Widespread	Small Patch	25
CEGL007999	G3	PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest Southeastern Coastal Plain Riverfront and Levee Forests and Shrublands	Limited	Small Patch	13
CEGL008562	G4G	SALIX INTERIOR TEMPORARILY FLOODED SHRUBLAND	Sandbar Willow Temporarily Flooded Shrubland Northern and Central Great Plains Wooded Riparian Vegetation	Widespread	Small Patch	5

Conservation Areas and Occurences

Site Name **8040102 Caddo River** **78255 Hectares** ID No. 126

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690*OOHA*112	R	1/1/1988
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*023*AR	R	
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*OOHA*135	R	1/1/1988
NOTURUS LACHNERI	OUACHITA MADTOM	AFCKA02140*OOHA*137	R	1/1/1988
Noturus miurus	Brindled madtom	AFCKA02160*OOHA*146	R	1/1/1988
NOTURUS TAYLORI	CADDO MADTOM	AFCKA02230*015*AR	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*OOHA*59	R	1/1/1988
ETHEOSTOMA COLLETTEI	Creole darter	AFCQC02140*OOHA*67	R	1/1/1988
ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	AFCQC02560*001*AR	R	11/24/1998
ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*OOHA*88	R	1/1/1988
PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*OOHA*157	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*29	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*42	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*18	R	1/1/1988
Helopicus nalatus	stonefly	IIPLE2N020*OOHA*89	R	1/1/1988
Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	IITRI33030*OOHA*1	R	1/1/1988
Alasmidonta marginata	Elktoe	IMBIV02040*OOHA*197	R	1/1/1988
Cumberlandia Monodonta	spectaclecase pearlymussel	IMBIV08010*001*AR	R	1/29/2003
CYPROGENIA ABERTI	WESTERN FANSHELL	IMBIV10010*008*AR	E	5/19/1994
ELLIPTIO DILATATA	Spike	IMBIV14100*OOHA*221	R	1/1/1988
FUSCONAIA EBENA	Ebonyshell	IMBIV17060*PROTOEO*006	R	10/1/2002
LAMPSILIS ABRUPTA	PINK MUCKET	IMBIV21110*PROTOEO*050	R	10/1/2002
LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	IMBIV21120*PROTOEO*01	R	10/1/2002
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*015*AR	R	1/1/1985
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*OOHA*249	R	1/1/1988
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010*OOHA*262	R	1/1/1988
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*OOHA*265	R	1/1/1988
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*OOHA*274	R	1/1/1988
QUADRULA FRAGOSA	WINGED MAPLELEAF	IMBIV39050*OOHA*281	R	1/1/1988
Toxolasma lividus	purple lilliput	IMBIV43030*OOHA*286	R	1/1/1988

VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020*OOHA*290	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*005	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*015	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*001	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*002	R	10/4/2002
FALLICAMBARUS JEANAE	A CRAYFISH	ICMAL15020*OOHA*45	R	1/1/1988
FALLICAMBARUS STRAWNI	A CRAYFISH	ICMAL15040*OOHA*47	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
PROCAMBARUS REIMERI	A CRAYFISH	ICMAL14110*OOHA*48	R	1/1/1988

Site Name **Magazine Mountain** **70073 Hectares** ID No. 102

Scientific Name	Common Name	EO Code	Rank	Last Obs
Eurycea multiplicata multiplicata	many-ribbed salamander	AAAAD05062*PROTOEO*002	R	1/1/1999
Isoperla szczytkoi	a stonefly	IIPLE24560*PROTOEO*001	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Coccyzus americanus	yellow-billed cuckoo	ABNRB02020*PROTOEO*001	R	1/1/1999
Helmitheros vermivorus	worm-eating warbler	ABPBX08010*PROTOEO*001	R	1/1/1999
Oporornis formosus	Kentucky warbler	ABPBX11010*PROTOEO*001	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*018	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*019	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*020	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*021	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*022	R	1/1/1999
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*002	R	10/4/2002
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*006	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO*007	R	10/4/2002
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*001	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*002	R	1/1/1999

SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*003	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*004	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*005	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*006	R	1/1/1999
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*002	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*011	R	10/4/2002
QUERCUS MARILANDICA - (JUNIPERUS VIRGINIANA) / SCHIZACHYRIUM SCOPARIUM - DANTHONIA SPICATA WOODED HERBACEOUS VEGETATION	Blackjack Oak - (Eastern Red-cedar) / Little Bluestem - Poverty Oatgrass Wooded Herbaceous Vegetation	CEGL002428*PROTOEO*01	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*021	R	10/4/2002
(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	CEGL003889*PROTOEO*024	R	10/4/2002
QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest	CEGL004796*PROTOEO*003	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*007	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*008	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*009	R	10/4/2002
(RIBES CYNOSBATI) / DESCHAMPSIA FLEXUOSA - DRYOPTERIS MARGINALIS - DENNSTAEDTIA PUNCTILOBULA HERBACEOUS VEGETATION	(Eastern Prickly Gooseberry) / Wavy Hairgrass - Marginal Woodfern - Hay-scented Fern Herbaceous Vegetation	CEGL007820*PROTOEO*001	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*003	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*004	R	10/4/2002
OSMUNDA CINNAMOMEA - RHYNCHOSPORA CAPITELLATA - HEUCHERA PARVIFLORA VAR. PUBERULA - XYRIS JUPICAI HERBACEOUS VEGETATION	Cinnamon Fern - Northern Beaksedge - Ozark Alumroot - Richards Yellow-eyed-grass Herbaceous Vegetation	CEGL007837*PROTOEO*001	R	10/4/2002
STYGOBROMUS ELATUS	ELEVATED SPRING AMPHIPOD	ICMAL05260*PROTOEO*001*AR	R	5/4/1940
Arianops sandersoni	Magazine Mountain mold beetle	IICOL10010*003*AR	R	1/1/1989
OUACHITYCHUS PARVOCULUS	SMALL-EYED MOLD BEETLE	IICOLE1010*001*AR	R	5/27/1987

PSEUDACTIUM MAGAZINENSIS	OUACHITA PSEUDACTIUM	IICOLH6020*001*AR	E	5/21/1987
Speyeria diana	Diana fritillary	IILEPJ6010*004*AR	E	7/10/1998
Speyeria diana	Diana fritillary	IILEPJ6010*006*AR	E	6/25/1997
PATERA CLENCHI	CALICO ROCK OVAL	IMGAS95100*003*AR	E	9/29/1996
INFLECTARIUS MAGAZINENSIS	MAGAZINE MOUNTAIN SHAGREEN	IMGAS95210*001*AR	R	3/26/1986
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*001*AR	E	10/1/1991
Erysimum capitatum	western wallflower	PDBRA16050*001*AR	R	6/5/1980
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*PROTOEO1	R	1/1/2002
QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	PDFAG05350*PROTOEO*1	R	1/1/2002
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0*PROTOEO*1	R	1/1/2002
Veratrum woodii	wood's false hellbore	PMLIL1F030*003*AR	E	1/1/1989
Veratrum woodii	wood's false hellbore	PMLIL1F030*016*AR	R	1/1/1989
WOODSIA SCOPULINA VAR. APPALACHIANA	APPALACHIAN WOODSIA	PPDRY0U020*001*AR	E	10/5/1985

Site Name **Stallings Swamp** **1285 Hectares** ID No. 113

Scientific Name	Common Name	EO Code	Rank	Last Obs
ACER SACCHARINUM - CELTIS LAEVIGATA - CARYA ILLINOINENSIS FOREST	Silver Maple - Sugarberry - Pecan Forest		E	10/1/2002
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*001	R	10/4/2002
TAXODIUM DISTICHUM - (NYSSA AQUATICA) / FORESTIERA ACUMINATA - PLANERA AQUATICA FOREST	Bald-cypress - (Water Tupelo) / Swamp-privet - Planertree Forest	XXNCPS.S1-*005*AR	E	2/7/1982

Site Name **8040103 LITTLE MISSOURI** **32028 Hectares** ID No. 125

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690*PROTOEO*01	R	10/1/2002
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*PROTOEO*01	R	10/1/2002
Noturus miurus	Brindled madtom	AFCKA02160*protoEO*01	R	10/1/2002
NOTURUS TAYLORI	CADDO MADTOM	AFCKA02230*PROTOEO*050	R	10/1/2002
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*PROTOEO*01	R	10/1/2002
ETHEOSTOMA COLLETTEI	Creole darter	AFCQC02140*PROTOEO*02	R	10/1/2002
ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*protoeo*01	R	10/1/2002
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*protoeo*01	R	10/1/2002
PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*PROTOEO*01	R	10/1/2002
PENTACORA OUACHITA	OUACHITA SHORE BUG	IIHEM05020*001*AR	E	7/7/1992
Neoperla falayah	Neoperla falayah	IIPLE1X060*protoEO*01	R	10/1/2002
Neoperla osage	stonefly	IIPLE1X120*PROTOEO*01	R	10/1/2002

Isoperla ouachita	a stonefly	IIPLE24430*PROTOEO*053	R	10/1/2002
Helopicus nalatus	stonefly	IIPLE2N020*PROTOEO*054	R	10/1/2002
CYPROGENIA ABERTI	WESTERN FANSHELL	IMBIV10010*protoEO*01	R	10/1/2002
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*PROTOEO*01	R	10/1/2002
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*PROTOEO*60	R	10/1/2002
QUADRULA FRAGOSA	WINGED MAPLELEAF	IMBIV39050*PROTOEO*01	R	10/1/2002
Toxolasma lividus	purple lilliput	IMBIV43030*PROTOEO*01	R	10/1/2002
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020*protoeo*01	R	10/1/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*006	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*016	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*001	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*002	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*003	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*001	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*002	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*003	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*003	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*004	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*001	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*009	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*016	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*023	R	10/4/2002

Site Name **Least Terns Sites 01** **6115 Hectares** ID No. 11101

Scientific Name	Common Name	EO Code	Rank	Last Obs
STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	ABNNM08102*077*AR	R	1/1/1999

RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	CEGL002049*PROTOEO*001	R	10/4/2002
RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	CEGL002049*PROTOEO*003	R	10/4/2002
RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	CEGL002049*PROTOEO*004	R	10/4/2002
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*001	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest	CEGL002096*PROTOEO*001	R	10/4/2002

Site Name **Pushmataha WMA** **13180 Hectares** ID No. 108

Scientific Name	Common Name	EO Code	Rank	Last Obs
Helmitheros vermivorus	worm-eating warbler	ABPBX08010*PROTOEO*005	R	1/1/1999
AIMOPHILA AESTIVALIS	BACHMANS SPARROW	ABPBX91050015000	R	1/1/1998
AIMOPHILA AESTIVALIS	BACHMANS SPARROW	ABPBX91050023000	R	1/1/1998
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*002	R	10/4/2002
QUERCUS MACROCARPA - QUERCUS SHUMARDII - CARYA CORDIFORMIS / CHASMANTHIUM LATIFOLIUM FOREST	Bur Oak - Shumard Oak - Bitternut Hickory / River-oats Forest	CEGL004544*PROTOEO*001	R	10/4/2002
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*002	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*003	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*004	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*005	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*006	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*007	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*008	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*009	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*010	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*011	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*012	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*013	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*014	R	1/1/1999
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*005	R	10/4/2002
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010008000	B	10/10/1995
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010010000	B	10/10/1995

CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010023000	BC	10/13/1989

Site Name **Novaculite Uplift** **228925 Hectares** ID No. 104

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*001	R	1/1/1999
Hemidactylium scutatum	Four-Toed salamander	AAAAD08010*005*AR	E	2/23/1983
Hemidactylium scutatum	Four-Toed salamander	AAAAD08010*007*AR	E	10/15/1983
Hemidactylium scutatum	Four-Toed salamander	AAAAD08010*008*AR	E	9/20/1984
Hemidactylium scutatum	Four-Toed salamander	AAAAD08010*009*AR	E	7/21/1986
Hemidactylium scutatum	Four-Toed salamander	AAAAD08010*011*AR	E	5/3/1986

Scientific Name	Common Name	EO Code	Rank	Last Obs
Ambystoma annulatum	ringed salamander	AAAAA01010*031*AR	E	10/7/1982
Ambystoma annulatum	ringed salamander	AAAAA01010*035*AR	E	10/10/1987
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*001*AR	E	5/9/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*006*AR	E	4/3/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*007*AR	E	5/10/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*010*AR	E	4/4/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*011*AR	E	5/10/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*013*AR	E	5/9/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*014*AR	E	4/3/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*015*AR	E	5/9/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*016*AR	E	5/10/1982
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*017*AR	E	5/3/1984
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*018*AR	E	10/9/1986
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*019*AR	E	10/9/1986
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*020*AR	E	11/18/1991
Plethodon caddoensis	Caddo Mountain salamander	AAAAD12010*021*AR	E	11/18/1990
Plethodon albagula	western slimy salamander	AAAAD12070*PROTOEO*001	R	1/1/1999
Plethodon serratus	southern redback salamander	AAAAD12160*007*AR	E	4/1/1935
Plethodon serratus	southern redback salamander	AAAAD12160*ProtoEO*01	R	10/1/2002
Accipiter cooperi	Cooper’s hawk	ABNKC12040*PROTOEO*002	R	
Coccyzus americanus	yellow-billed cuckoo	ABNRB02020*PROTOEO*004	R	1/1/1999
Caprimulgus carolinensis	chuck-will’s-widow	ABNTA07010*PROTOEO*001	R	1/1/1999
Caprimulgus vociferus	whip-poor-will	ABNTA07070*PROTOEO*002	R	1/1/1999

Contopus virens	eastern wood –pewee	ABPAE32060*PROTOEO*002	R	1/1/1999
Dendroica discolor	prairie warbler	ABPBX03190*PROTOEO*001	R	1/1/1999
Dendroica cerulea	Cerulean warbler	ABPBX03240*001*AR	E	6/28/1994
Dendroica cerulea	Cerulean warbler	ABPBX03240*PROTOEO*001	R	1/1/1999
Helmitheros vermivorus	worm-eating warbler	ABPBX08010*PROTOEO*004	R	1/1/1999
Oporornis formosus	Kentucky warbler	ABPBX11010*PROTOEO*004	R	1/1/1999
Piranga rubra	summer tanager	ABPBX45030*PROTOEO*002	R	1/1/1999
Icterus spurius	orchard oriole	ABPBXB9070*PROTOEO*002	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*003	R	10/4/2002
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*013	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*014	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*016	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*017	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*027	R	1/1/1999
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*003	R	10/4/2002
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*004	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO*005	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO002*AR	R	10/4/2002
Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest	CEGL002070*PROTOEO*003	R	1/1/1999
BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	CEGL002086*PROTOEO*003	R	10/4/2002
BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	CEGL002086*PROTOEO*004	R	10/4/2002
BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	CEGL002086*PROTOEO*005	R	10/4/2002
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*007	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*016	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*017	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*018	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*019	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*020	R	10/4/2002

CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*021	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*022	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*023	R	10/4/2002
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	CEGL002393*PROTOEO*010	R	10/4/2002
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*008	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO001*AR	R	10/4/2002
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*001	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*004	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*007	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*010	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*013	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*016	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*019	R	1/1/1999
FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	CEGL002427*PROTOEO*03	R	10/4/2002
FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	CEGL002427*PROTOEO*04	R	10/4/2002
QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland	CEGL003884*PROTOEO*003	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*011	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*012	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*015	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*016	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*018	R	10/4/2002

TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*019	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*025	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*026	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*03	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*05	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*07	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*08	R	10/4/2002
SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	CEGL003899*PROTOEO*001	R	10/4/2002
QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest	CEGL004543*PROTOEO*002	R	10/4/2002
QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest	CEGL004796*PROTOEO*002	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*001	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*002	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*003	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*004	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*005	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*006	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*007	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*008	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*009	R	10/4/2002
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*005	R	10/4/2002

PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489PROTOEO003*AR	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*006	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*013	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*014	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*015	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*016	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*017	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*018	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*019	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*020	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*021	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*022	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*023	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*024	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*025	R	10/4/2002
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*006	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*006	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*007	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*008	R	1/1/1999

FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*009	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*010	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*011	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*013	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*014	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*015	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*016	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*017	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*018	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*019	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*020	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*021	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*022	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*023	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*024	R	1/1/1999

QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*01	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*02	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*03	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*04	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*05	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*06	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*07	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*08	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*09	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*005	R	10/4/2002

LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*006	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*001	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*002	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*003	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*004	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*005	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*006	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*007	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*008	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*009	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*010	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*011	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*012	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*013	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*014	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*015	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*016	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*017	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*018	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*019	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*020	R	10/4/2002

QUERCUS NIGRA - LIQUIDAMBAR STYRACIFLUA - (PINUS TAEDA) / ILEX OPACA - VACCINIUM FUSCATUM / CAREX DEBILIS TEMPORARILY FLOODED FLOODPLAIN FOREST	Water Oak - Sweetgum - (Loblolly Pine) / American Holly - Black Highbush Blueberry / White-edge Sedge Temporarily Flooded Floodplain Forest	CEGL007984*PROTOEO*002	R	10/4/2002
Orconectes menae	Orconectes menae	ICMAL11530*PROTOEO*003	R	1/1/1999
Orconectes menae	Orconectes menae	ICMAL11530*PROTOEO*004	R	1/1/1999
Orconectes menae	Orconectes menae	ICMAL11530*PROTOEO*005	R	1/1/1999
PROCAMBARUS PARASIMULANS	A CRAYFISH	ICMAL14810*PROTOEO*01	R	10/1/2002
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*005*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*006*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*007*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*008*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*011*AR	E	1/1/2000
PSEUDACTIUM MAGAZINENSIS	OUACHITA PSEUDACTIUM	IICOLH6020*003*AR	E	4/24/1992
STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	IMGAS98240*001*AR	E	5/20/1996
STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	IMGAS98240*003*AR	E	1/1/1996
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*060*AR	E	6/4/2001
Cirsium muticum	swamp thistle	PDAST2E1U0*001*AR	E	9/20/1984
Cirsium muticum	swamp thistle	PDAST2E1U0*003*AR	E	10/29/1988
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*001*AR	E	7/15/1988
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*017*AR	E	1/1/1989
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*018*AR	R	1/1/1989
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*019*AR	E	1/1/1989
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*029*AR	E	5/28/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*030*AR	E	5/28/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*038*AR	E	7/10/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*065*AR	R	7/11/1995
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*070*AR	E	6/13/2001
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*071*AR	R	8/1/2001
Polymnia cossatotensis	heartleaf leafcup	PDAST7G040*001*AR	E	6/15/2001
Polymnia cossatotensis	heartleaf leafcup	PDAST7G040*003*AR	E	5/1/1991
Polymnia cossatotensis	heartleaf leafcup	PDAST7G040*004*AR	E	8/25/1999
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*003*AR	E	
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*004*AR	R	10/2/1988

SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*007*AR	E	1/1/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*008*AR	E	1/1/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*009*AR	R	1/1/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*010*AR	E	10/4/1994
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*011*AR	E	9/28/1994
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*013*AR	E	1/1/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*014*AR	E	10/3/1994
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*015*AR	E	10/5/1994
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*016*AR	E	9/11/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*017*AR	E	
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0*019*AR	E	
Vernonia fasciculata	prairie ironweed	PDAST9S090*004*AR	E	8/1/1998
Vernonia lettermanii	Letterman’s ironweed	PDAST9S0E0*005*AR	E	10/1/1989
Vernonia lettermanii	Letterman’s ironweed	PDAST9S0E0*007*AR	E	1/1/1989
Vernonia lettermanii	Letterman’s ironweed	PDAST9S0E0*008*AR	E	1/1/1989
CARDAMINE DISSECTA	A TOOTHWORT	PDBRA0K1D0*001*AR	R	3/23/1985
CARDAMINE DISSECTA	A TOOTHWORT	PDBRA0K1D0*003*AR	E	3/20/1998
CARDAMINE DISSECTA	A TOOTHWORT	PDBRA0K1D0*004*AR	E	3/20/1998
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*001	R	1/1/1999
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*002	R	1/1/1999
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*003	R	1/1/1999
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*004	R	1/1/1999
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*005	R	1/1/1999
Streptanthus obtusifolius	a twistflower	PDBRA2G0Z*PROTOEO*006	R	1/1/1999
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*001*AR	E	4/21/1995
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*003*AR	E	1/1/1989
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*004*AR	E	5/15/1988
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*006*AR	E	5/11/1963
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*007*AR	E	5/23/1989
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*008*AR	E	6/28/1989
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*016*AR	R	5/28/1991
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*017*AR	E	6/1/1995
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*018*AR	R	5/15/2000

STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*019*AR	E	5/7/1998
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*020*AR	E	5/8/1998
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0*021*AR	E	6/28/1997
SILENE REGIA	ROYAL CATCHFLY	PDCAR0U1G0*020*AR	R	11/12/1998
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*019*AR	R	1/1/1989
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*026*AR	R	1/1/1989
QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	PDFAG05350*004*AR	E	6/11/1993
QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	PDFAG05350*005*AR	E	7/13/1991
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*003*AR	E	5/6/1988
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*004*AR	E	5/11/1999
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*006*AR	R	5/11/1999
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*007*AR	E	5/11/1999
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*009*AR	E	5/1/2000
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*010*AR	E	5/12/1999
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*013*AR	E	5/9/2001
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*014*AR	E	5/17/2001
HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	PDHYD08090*017*AR	E	5/2/2001
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*001	R	1/1/1999
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*002	R	1/1/1999
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*003	R	1/1/1999
Delphinium newtonianum	Moore’s larkspur	PDRAN0B140*015*AR	R	5/11/1995
Delphinium newtonianum	Moore’s larkspur	PDRAN0B140*021*AR	E	5/22/1989
Delphinium newtonianum	Moore’s larkspur	PDRAN0B140*026*AR	E	5/2/1997
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*006*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*007*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*008*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*009*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*010*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*011*AR	E	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*013*AR	R	1/1/1999
Galium arkansanum var pubiflorum	Ouachita bedstraw	PDRUB0N071*014*AR	E	1/1/1999
Hedyotis ouachitana	Ouachita hedyotis	PDRUB1T0G*PROTOEO*001	R	1/1/1999
Hedyotis ouachitana	Ouachita hedyotis	PDRUB1T0G*PROTOEO*002	R	1/1/1999

Hedyotis ouachitana	Ouachita hedyotis	PDRUB1T0G*PROTOEO*003	R	1/1/1999
PARNASSIA GRANDIFOLIA	LARGE-FLOWERED GRASS-OF-PARNASSUS	PDSAX0P060*001*AR	E	9/26/1988
Valerianella palmeri	Palmer’s corn-salad	PDVAL040A0*005*AR	E	1/1/1989
Valerianella palmeri	Palmer’s corn-salad	PDVAL040A0*006*AR	E	4/21/1995
CAREX BROMOIDES	A SEDGE	PMCYP03260*003*AR	E	5/3/1984
CAREX BROMOIDES	A SEDGE	PMCYP03260*004*AR	E	4/28/1985
CAREX BROMOIDES	A SEDGE	PMCYP03260*006*AR	E	5/12/1988
CAREX BROMOIDES	A SEDGE	PMCYP03260*008*AR	E	4/14/1998
CAREX LAEVIVAGINATA	SMOOTH-SHEATH SEDGE	PMCYP036Z0*001*AR	E	7/26/1984
CAREX LAEVIVAGINATA	SMOOTH-SHEATH SEDGE	PMCYP036Z0*003*AR	E	5/12/1988
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*007*AR	E	4/21/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*009*AR	R	5/21/1989
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*013*AR	E	10/24/1989
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*019*AR	R	6/28/1991
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*025*AR	R	6/1/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*029*AR	R	10/6/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*034*AR	R	10/6/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*036*AR	R	10/6/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*041*AR	R	6/29/1995
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*005*AR	E	4/20/1984
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*008*AR	R	4/27/1985
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*017*AR	E	5/24/1989
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*018*AR	E	3/22/1990
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*019*AR	E	3/22/1990
CAREX VIRESCENS	RIBBED SEDGE	PMCYP03EK0*003*AR	E	5/2/1984
SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	PMCYP0Q170*001*AR	E	7/7/1988
SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	PMCYP0Q170*003*AR	E	7/7/1988
SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	PMCYP0Q170*005*AR	E	8/23/1988
Veratrum woodii	wood’s false hellbore	PMLIL1F030*010*AR	E	6/14/2001
Veratrum woodii	wood’s false hellbore	PMLIL1F030*011*AR	E	5/13/1988
Veratrum woodii	wood’s false hellbore	PMLIL1F030*014*AR	E	5/24/1989
Veratrum woodii	wood’s false hellbore	PMLIL1F030*018*AR	E	4/17/1992
Veratrum woodii	wood’s false hellbore	PMLIL1F030*019*AR	E	6/17/1989

TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	PMLIL200Q1*008*AR	R	6/13/2001
TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	PMLIL200Q1*018*AR	R	4/20/1999
TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	PMLIL200Q1*026*AR	R	4/21/1999
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*008*AR	R	7/6/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*009*AR	E	4/27/1985
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*010*AR	R	8/25/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*013*AR	R	9/26/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*014*AR	R	4/13/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*015*AR	E	4/14/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*016*AR	E	4/14/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*023*AR	E	5/18/1982
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*026*AR	E	9/28/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*028*AR	R	5/6/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*031*AR	E	6/14/2001
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*034*AR	E	9/26/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*036*AR	R	5/9/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*038*AR	E	9/29/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*039*AR	E	7/12/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*043*AR	R	5/7/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*045*AR	E	10/1/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*047*AR	E	5/15/1988
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*055*AR	E	1/1/1989
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*056*AR	E	5/24/1989
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*059*AR	R	5/11/1995
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*060*AR	E	4/27/1995
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*063*AR	E	
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*065*AR	E	5/21/1995
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*067*AR	E	
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*068*AR	E	
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*069*AR	R	5/31/1990
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*080*AR	E	10/17/1998
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*081*AR	R	6/2/2001
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*085*AR	R	9/27/1988

Liparis loeselii	yellow twayblade	PMORC1M040*001*AR	E	5/15/1998
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010*001*AR	E	1/1/1989
DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	PMPOA22090*001*AR	E	1/1/1989
DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	PMPOA22090*003*AR	E	1/1/1989
DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	PMPOA22090*004*AR	E	11/1/1989
DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	PMPOA22090*005*AR	E	7/11/1995
ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT	PPASP02100*009*AR	E	6/1/1989
ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT	PPASP02100*015*AR	E	10/17/1998
DENNSTAEDTIA PUNCTILOBULA	EASTERN HAY-SCENTED FERN	PPDEN01050*003*AR	R	8/18/1999
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*001*AR	E	7/6/1988
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*003*AR	E	8/17/1988
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*004*AR	E	7/4/1999
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*005*AR	E	7/8/1988
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*006*AR	E	9/29/1988
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*007*AR	E	2/20/1990
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*008*AR	E	7/11/1992
DRYOPTERIS CELSA	LOG FERN	PPDRY0A050*011*AR	E	8/18/1995
TRICHOMANES PETERSII	DWARF FILMY-FERN	PPHYM020K0*003*AR	E	5/12/1988
TRICHOMANES PETERSII	DWARF FILMY-FERN	PPHYM020K0*004*AR	E	4/27/1995
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	XXNCTS.F2-*001*AR	E	9/14/1980
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	XXNCTS.F2-*004*AR	E	9/19/1979
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	XXNCTS.F6-*007*AR	E	8/20/1982
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	XXNCTS.W6-*001*AR	E	5/1/1982

Site Name **Flatside-Forked Mt** **33088 Hectares** ID No. 117

Scientific Name	Common Name	EO Code	Rank	Last Obs
Eurycea multiplicata multiplicata	many-ribbed salamander	AAAAD05062*PROTOEO*003	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*005	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*012	R	1/1/1999

SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*013	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*014	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*015	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*016	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*003	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*006	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*009	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*012	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*015	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*018	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*007	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*008	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*009	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*010	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*011	R	1/1/1999
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*021	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*022	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*023	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*024	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*025	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*026	R	10/4/2002

ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*027	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*028	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*029	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*030	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*033	R	10/4/2002
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*008	R	1/1/1999
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*009	R	1/1/1999
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*004	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*010	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*048	R	1/1/1999
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*049	R	1/1/1999
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*050	R	1/1/1999
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*029*AR	E	10/6/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*047*AR	R	8/10/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*048*AR	E	6/19/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*049*AR	R	6/19/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*050*AR	R	5/8/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*051*AR	E	5/12/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*033*AR	E	6/4/1995
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*046*AR	E	8/10/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*050*AR	E	5/8/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*051*AR	E	8/9/1992

Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*053*AR	E	8/10/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*055*AR	E	6/19/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*056*AR	E	5/12/1992
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*058*AR	E	10/6/1991
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*073*AR	E	5/14/1993
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*074*AR	E	5/8/1992

Site Name **8040101 OUACHITA HEADWATERS** **147581 Hectares** ID No. 129

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*003*AR	R	9/1/1981
NOTURUS LACHNERI	OUACHITA MADTOM	AFCKA02140*PROTOEO*02	R	10/1/2002
Noturus miurus	Brindled madtom	AFCKA02160	R	10/1/2002
NOTURUS TAYLORI	CADDO MADTOM	AFCKA02230*protoeo*02	R	10/1/2002
ETHEOSTOMA COLLETTEI	Creole darter	AFCQC02140*protoEO*01	R	10/1/2002
ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	AFCQC02560*031*AR	R	8/27/1992
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*protoEO*01	R	10/1/2002
PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*protoeo*01	R	10/1/2002
PERCINA SP. NOV.	OUACHITA DARTER	AFCQC04370*010*AR	R	6/4/1991
Neoperla falayah	Neoperla falayah	IIPLE1X060*protoeo*02	R	10/1/2002
Isoperla ouachita	a stonefly	IIPLE24430*protoEO*01	R	10/1/2002
Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	IITRI33030*protoEO*01	R	10/1/2002
Alasmidonta marginata	Elktoe	IMBIV02040*protoEO*01	R	10/1/2002
CYPROGENIA ABERTI	WESTERN FANSHELL	IMBIV10010*protoEO*02	R	10/1/2002
ELLIPTIO DILATATA	Spike	IMBIV14100*protoeo*01	R	10/2/2002
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*006*AR	R	7/9/1992
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*047*AR	R	7/11/1992
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*protoeo*01	R	10/1/2002
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*003*AR	R	6/25/1988
Toxolasma lividus	purple lilliput	IMBIV43030*protoeo*01	R	10/1/2002
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020*protoEO*02	R	10/1/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*007	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*017	R	10/4/2002

ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*005	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*006	R	10/4/2002

Site Name **Crayfish Complex 06** **134 Hectares** ID No. 11906

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS STRAWNI	A CRAYFISH	ICMAL15040*007*AR	E	4/13/1997

Site Name **11140109 Cossatot** **56448 Hectares** ID No. 124

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*OOHA*124	R	1/1/1988
Notropis suttkusi	Rocky Shiner	AFCJB28C80*OOHA*129	R	1/1/1988
LYTHRURUS SNELSONI	OUACHITA SHINER	AFCJB52070*001*AR	R	5/23/1995
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*OOHA*134	R	1/1/1988
Fundulus blairae	Lowland topminnow	AFCNB04270*OOHA*99	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*OOHA*58	R	1/1/1988
ETHEOSTOMA COLLETTEI	Creole darter	AFCQC02140*OOHA*69	R	1/1/1988
ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*OOHA*87	R	1/1/1988
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*169	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*34	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*23	R	1/1/1988
Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	IITRI33030*OOHA*32	R	1/1/1988
ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	IMBIV07010*OOHA*206	R	1/1/1988
ELLIPTIO DILATATA	Spike	IMBIV14100*OOHA*223	R	1/1/1988
FUSCONAIA EBENA	Ebonyshell	IMBIV17060*OOHA*229	R	1/1/1988
LAMPSILIS ABRUPTA	PINK MUCKET	IMBIV21110*OOHA*231	R	1/1/1988
LEPTODEA LEPTODON	SCALESHELL	IMBIV24020*OOHA*256	R	1/1/1988
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010*OOHA*261	R	1/1/1988
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*OOHA*270	R	1/1/1988
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*OOHA*278	R	1/1/1988
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020*OOHA*295	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*008	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*018	R	10/4/2002

HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*019	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*004	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*005	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*006	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*004	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*005	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*006	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*007	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*007	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*008	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*005	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*022	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*023	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*024	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*025	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*026	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*027	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*028	R	10/4/2002
FALLICAMBARUS STRAWNI	A CRAYFISH	ICMAL15040*OOHA*46	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*002	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*010	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*017	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*024	R	10/4/2002

Site Name **MeadowRue Seep 02** **435 Hectares** ID No. 10902

Scientific Name	Common Name	EO Code	Rank	Last Obs

Thalictrum arkansanum	Arkansas meadow-rue	PDRAN0M020006000	R	3/31/1978

Site Name **North Shore Glades** **88116 Hectares** ID No. 106

Scientific Name	Common Name	EO Code	Rank	Last Obs
Eurycea multiplicata multiplicata	many-ribbed salamander	AAAAD05062*PROTOEO*004	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*002	R	1/1/1999
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*002	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*004	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*023	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*024	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*025	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Ambystoma annulatum	ringed salamander	AAAAA01010*033*AR	R	10/7/1982
Plethodon albagula	western slimy salamander	AAAAD12070*PROTOEO*002	R	1/1/1999
Accipiter cooperi	Cooper’s hawk	ABNKC12040*PROTOEO*003	R	
Caprimulgus carolinensis	chuck-will’s-widow	ABNTA07010*PROTOEO*002	R	1/1/1999
Caprimulgus vociferus	whip-poor-will	ABNTA07070*PROTOEO*004	R	1/1/1999
Contopus virens	eastern wood –pewee	ABPAE32060*PROTOEO*003	R	1/1/1999
Dendroica discolor	prairie warbler	ABPBX03190*PROTOEO*003	R	1/1/1999
Piranga rubra	summer tanager	ABPBX45030*PROTOEO*003	R	1/1/1999
Icterus spurius	orchard oriole	ABPBXB9070*PROTOEO*003	R	1/1/1999
Spilogale putorius interrupta	plains spotted skunk	AMAJF05011*PROTOEO*004	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*006	R	10/4/2002
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*005	R	10/4/2002
CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	CEGL002191*PROTOEO*01	R	10/4/2002
CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	CEGL002191*PROTOEO*05	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*021	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*022	R	1/1/1999

SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*023	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*024	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*026	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*010	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO002*AR	R	10/4/2002
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*012	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*013	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*014	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*015	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*016	R	1/1/1999
(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	CEGL003889*PROTOEO*01	R	10/4/2002
SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	CEGL003899*PROTOEO*004	R	10/4/2002
SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	CEGL003899*PROTOEO*005	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*010	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*02	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*021	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*025	R	10/4/2002

SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*08	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*09	R	10/4/2002
QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest	CEGL004543*PROTOEO*003	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*011	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*007	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*008	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*009	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*010	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*011	R	1/1/1999
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*003*AR	E	5/11/1988
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*013*AR	E	9/14/1990
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*014*AR	E	9/1/1990
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*015*AR	E	5/15/1990
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*016*AR	E	5/25/1990
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*034*AR	E	5/16/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*054*AR	R	9/14/1994
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*056*AR	E	9/8/1992
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*059*AR	R	6/5/2001
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*011*AR	R	5/15/1990
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*037*AR	E	6/9/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*040*AR	E	11/21/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*041*AR	E	11/21/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*047*AR	E	9/30/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*057*AR	E	3/5/1992
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*064*AR	R	5/16/1995
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060*009*AR	R	6/7/2001
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060*013*AR	E	4/17/1992
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060*014*AR	E	3/27/1992

AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*005*AR	E	7/8/1988
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*016*AR	E	6/10/1990
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*024*AR	R	5/16/1995
Valerianella palmeri	Palmer's corn-salad	PDVAL040A0*007*AR	E	5/16/1995
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*004*AR	E	4/30/1996
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*005*AR	E	6/9/1992
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*007*AR	E	3/27/1992
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*008*AR	E	4/17/1992
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*009*AR	E	3/27/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*017*AR	R	5/27/1989
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*039*AR	E	6/9/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*046*AR	E	3/24/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*047*AR	R	6/4/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*048*AR	E	3/27/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*050*AR	E	3/27/1992
CAREX STRICTA	UPRIGHT SEDGE	PMCYP03D30*014*AR	E	5/15/1990
CAREX WILLDENOWII	A SEDGE	PMCYP03ET0*001*AR	E	5/18/1993
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*075*AR	E	8/6/1992

Site Name **Crayfish Complex 10** **324 Hectares** ID No. 11910

Scientific Name	Common Name	EO Code	Rank	Last Obs
PROCAMBARUS PARASIMULANS	A CRAYFISH	ICMAL14810*001*AR	R	2/28/1981

Site Name **Crayfish Complex 08** **158 Hectares** ID No. 11908

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS STRAWNI	A CRAYFISH	ICMAL15040*002*AR	R	5/17/1997

Site Name **Sugarloaf Mt** **9756 Hectares** ID No. 110

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*003	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*007	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401PROTOEO003*AR	R	10/4/2002
QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	PDFAG05350*006*AR	R	10/12/1991

Site Name **11140105 KIAMICHI** **471749 Hectares** ID No. 120

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690*OOHA*113	R	1/1/1988
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720011000	R	6/14/1984
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*PROTOEO*01	R	10/4/2002
ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*PROTOEO*001	R	10/4/2002
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*OOHA*90	R	1/1/1988
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*166	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*30	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*19	R	1/1/1988
ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	IMBIV07010*OOHA*203	R	1/1/1988
ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	IMBIV07010009000	R	8/22/1990
LEPTODEA LEPTODON	SCALESHELL	IMBIV24020003000	R	9/7/1984
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010*OOHA*257	R	1/1/1988
PLEUROBEMA CORDATUM	OHIO PIGTOE	IMBIV35090001000	R	7/11/1989
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*PROTOEO*001	R	10/4/2002
QUADRULA FRAGOSA	WINGED MAPLELEAF	IMBIV39050*OOHA*280	R	1/1/1988
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020008000	R	8/2/1987

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*009	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*020	R	10/4/2002
JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland	CEGL003942*PROTOEO*001	R	10/4/2002
JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland	CEGL003942*PROTOEO*002	R	10/4/2002
JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland	CEGL003942*PROTOEO*003	R	10/4/2002
ZIZANIOPSIS MILIACEA ROCKY RIVERBED HERBACEOUS VEGETATION	Southern Wild Rice Rocky Riverbed Herbaceous Vegetation	CEGL004140*PROTOEO*002	R	10/4/2002
ZIZANIOPSIS MILIACEA ROCKY RIVERBED HERBACEOUS VEGETATION	Southern Wild Rice Rocky Riverbed Herbaceous Vegetation	CEGL004140*PROTOEO*003	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*007	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*008	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*009	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*010	R	10/4/2002

PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*011	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*012	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*009	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*010	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*006	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*007	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*008	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*009	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*010	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*011	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*012	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*003	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*011	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*018	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*025	R	10/4/2002

Site Name **11140108 MOUNTAIN FORK** **113040 Hectares** ID No. 123

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690*OOHA*109	R	1/1/1988
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*ProtoEO*01	R	10/1/2002
Notropis suttkusi	Rocky Shiner	AFCJB28C80*PROTOEO*01	R	10/1/2002
LYTHRURUS SNELSONI	OUACHITA SHINER	AFCJB52070*005*AR	R	9/10/1996
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*OOHA*132	R	1/1/1988
Noturus miurus	Brindled madtom	AFCKA02160*OOHA*142	R	1/1/1988
Fundulus blairae	Lowland topminnow	AFCNB04270*OOHA*96	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*OOHA*55	R	1/1/1988
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*OOHA*92	R	1/1/1988

PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*OOHA*155	R	1/1/1988
PERCINA PANTHERINA	LEOPARD DARTER	AFCQC04210*PROTOEO*003	R	1/1/1999
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*168	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*27	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*36	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*14	R	1/1/1988
Helopicus nalatus	stonefly	IIPLE2N020*OOHA*66	R	1/1/1988
ELLIPTIO DILATATA	Spike	IMBIV14100*OOHA*219	R	1/1/1988
FUSCONAIA EBENA	Ebonyshell	IMBIV17060*OOHA*228	R	1/1/1988
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010006000	R	5/4/1982
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*OOHA*263	R	1/1/1988
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*OOHA*277	R	1/1/1988
Toxolasma lividus	purple lilliput	IMBIV43030*OOHA*283	R	1/1/1988
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020006000	R	10/9/1983

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*010	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*021	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*010	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*011	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*012	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*013	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*014	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*011	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*012	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*004	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*012	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*019	R	10/4/2002

PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*026	R	10/4/2002

Site Name **Cherokee Prairies** **49745 Hectares** ID No. 101

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*004	R	1/1/1999
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*002	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Ammodramus henslowii	Henslow's sparrow	ABPBXA0030*PROTOEO*001	R	1/1/1999
Terrapene ornata ornata	ornate box turtle	ARAAD08022*003*AR	R	4/22/1987
Terrapene ornata ornata	ornate box turtle	ARAAD08022*008*AR	R	5/1/1988
Terrapene ornata ornata	ornate box turtle	ARAAD08022*009*AR	R	1/1/1992
Eumeces septentrionalis obtusirostris	southern prairie skink	ARACH01101*PROTOEO*001	R	1/1/1999
Eumeces obsoletus	Great Plains skink	ARACH01130*PROTOEO*001	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*001	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*002	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*003	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*004	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*005	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*006	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*007	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*008	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*009	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*010	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*011	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*012	R	1/1/1999

QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*013	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*014	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*015	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*016	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*017	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*018	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*019	R	1/1/1999
QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	CEGL002101*PROTOEO*020	R	1/1/1999
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*002	R	10/4/2002
CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	CEGL002191*PROTOEO*02	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation	CEGL002212*PROTOEO*001	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation	CEGL002212*PROTOEO*002	R	10/4/2002
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*001	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*002	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*003	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*004	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*005	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*006	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*007	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*008	R	1/1/1999

: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*009	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*010	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*011	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*012	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*013	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*014	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*015	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*016	R	1/1/1999
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	CEGL002391*PROTOEO*017	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*009	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401PROTOEO004*AR	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*001	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*002	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*003	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*004	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*005	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*006	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*007	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*008	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*009	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*010	R	10/4/2002
(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	CEGL003889*PROTOEO*04	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*015	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*016	R	10/4/2002

SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*017	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*018	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*019	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*023	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*04	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*002	R	10/4/2002
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	CEGL004782*PROTOEO*001	R	1/1/1999
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	CEGL004782*PROTOEO*002	R	1/1/1999
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	CEGL004782*PROTOEO*003	R	1/1/1999
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	CEGL004782*PROTOEO*004	R	1/1/1999
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	CEGL004782*PROTOEO*005	R	1/1/1999
NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	IICOL42010*PROTOEO*0001	R	1/1/1999
Papaipema eryngii	rattlesnake master borer moth	IILEYC0310*PROTOEO*001	R	1/1/1999
Gryllotalpa major	prairie mole cricket	IIORT17010*001*AR	E	5/9/1987
Gryllotalpa major	prairie mole cricket	IIORT17010*003*AR	R	5/9/1987
Gryllotalpa major	prairie mole cricket	IIORT17010*007*AR	R	5/14/1990
Gryllotalpa major	prairie mole cricket	IIORT17010*009*AR	R	5/14/1990
QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland	XXNCTS.F9-*003*AR	E	8/13/2000
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*008B*AR	E	6/25/1989
SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation	XXNCTS.P4-*008C*AR	R	6/25/1989
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*009B*AR	E	4/27/1987

SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation	XXNCTS.P4-*009C*AR	R	4/27/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*010B*AR	E	4/22/1987
ANDROPOGON GERARDII - PANICUM VIRGATUM - HELIANTHUS GROSSESERRATUS HERBACEOUS VEGETATION	Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous Vegetation	XXNCTS.P4-*013A*AR	R	4/22/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*013B*AR	E	4/22/1987
ANDROPOGON GERARDII - PANICUM VIRGATUM - HELIANTHUS GROSSESERRATUS HERBACEOUS VEGETATION	Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous Vegetation	XXNCTS.P4-*014A*AR	R	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*014B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*015B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*016B*AR	E	4/22/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*017B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*018B*AR	E	4/22/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*019B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*020B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*021B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*023B*AR	E	4/23/1987
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*035B*AR	E	8/5/2000
SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation	XXNCTS.P4-*035C*AR	E	8/5/2000

SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation	XXNCTS.P4-*035D*AR	E	8/5/2000
JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	XXNCTS.P4-*036B*AR	R	7/23/1996

Site Name **Holland Bottoms** **3872 Hectares** ID No. 116

Scientific Name	Common Name	EO Code	Rank	Last Obs
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*003	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Limnothlypis swainsonii	Swainson's warbler	ABPBX09010*017*AR	E	7/3/1984
POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest	CEGL002096*PROTOEO*002	R	10/4/2002
QUERCUS PHELLOS - QUERCUS NIGRA MISSISSIPPI RIVER ALLUVIAL PLAIN FOREST	Willow Oak - Water Oak Mississippi River Alluvial Plain Forest	CEGL007915*PROTOEO*001	R	10/4/2002
QUERCUS PHELLOS - (QUERCUS LYRATA) / CAREX SPP. - LEERSIA SPP. FOREST	Willow Oak - (Overcup Oak) / Sedge species - Cutgrass species Forest	XXNCTS.F14*007*AR	E	5/24/1984

Site Name **Rich Mountain** **213754 Hectares** ID No. 107

Scientific Name	Common Name	EO Code	Rank	Last Obs
Eurycea multiplicata multiplicata	many-ribbed salamander	AAAAD05062*PROTOEO*001	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*005	R	1/1/1999
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*001	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*003	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*021	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*022	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
STYGOBROMUS MONTANUS	mountain cave amphipod	ICMAL05270*001*AR	R	4/22/1981

Scientific Name	Common Name	EO Code	Rank	Last Obs
Plethodon fourchensis	Fourche Mountain salamander	AAAAD12060*005*AR	R	1/1/1998
Plethodon fourchensis	Fourche Mountain salamander	AAAAD12060*006*AR	R	4/10/1982
Plethodon albagula	western slimy salamander	AAAAD12070*PROTOEO*003	R	1/1/1999
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130*013*AR	R	5/27/1998
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130*015*AR	R	4/20/1984
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130*022*AR	R	10/8/1998
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130002000	AB	4/22/1988

Plethodon ouachitae	Rich Mountain salamander	AAAAD12130003000	A	12/10/1993
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130006000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130007000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130008000	E	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130012000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130015000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130016000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130017000	R	10/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130018000	R	5/1/1985
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130022000	R	10/28/1990
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130023000	E	4/3/1994
Plethodon ouachitae	Rich Mountain salamander	AAAAD12130024000	R	7/3/1993
Plethodon kiamichi	Kiamichi slimy salamander	AAAAD12330001000	R	3/26/1995
Accipiter cooperi	Cooper’s hawk	ABNKC12040*PROTOEO*004	R	
Coccyzus americanus	yellow-billed cuckoo	ABNRB02020*PROTOEO*002	R	1/1/1999
Caprimulgus carolinensis	chuck-will’s-widow	ABNTA07010*PROTOEO*003	R	1/1/1999
Caprimulgus vociferus	whip-poor-will	ABNTA07070*PROTOEO*003	R	1/1/1999
Contopus virens	eastern wood –pewee	ABPAE32060*PROTOEO*004	R	1/1/1999
Dendroica discolor	prairie warbler	ABPBX03190*PROTOEO*004	R	1/1/1999
Helmitheros vermivorus	worm-eating warbler	ABPBX08010*PROTOEO*002	R	1/1/1999
Oporornis formosus	Kentucky warbler	ABPBX11010*PROTOEO*002	R	1/1/1999
Piranga rubra	summer tanager	ABPBX45030*PROTOEO*004	R	1/1/1999
Icterus spurius	orchard oriole	ABPBXB9070*PROTOEO*004	R	1/1/1999
Ursus americanus	black bear	AMAJB01010*PROTOEO*001	R	1/1/1999
Spilogale putorius interrupta	plains spotted skunk	AMAJF05011*PROTOEO*005	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*008	R	10/4/2002
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*023	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*024	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*025	R	1/1/1999
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*001	R	10/4/2002
ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	CEGL002060*PROTOEO*005	R	10/4/2002

Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO*006	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO003*AR	R	10/4/2002
Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest	CEGL002070*PROTOEO*002	R	1/1/1999
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*003	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*017	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*018	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*019	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*020	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*021	R	1/1/1999
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*011	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*012	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*013	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*014	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*015	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*024	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*001	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*003	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*004	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*005	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*006	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*007	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*008	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*009	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*010	R	10/4/2002

SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*011	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*012	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*013	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*014	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*015	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*016	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*017	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*018	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*019	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*020	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*021	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*022	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*023	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*024	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*025	R	10/4/2002
SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	CEGL002309*PROTOEO*026	R	10/4/2002
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	CEGL002393*PROTOEO*011	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*005	R	1/1/1999
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*006	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401PROTOEO005*AR	R	10/4/2002
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*017	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*018	R	1/1/1999
(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	CEGL003889*PROTOEO*02	R	10/4/2002
SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	CEGL003899*PROTOEO*002	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*001	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*020	R	10/4/2002

SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*024	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*05	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*06	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*07	R	10/4/2002
QUERCUS MACROCARPA - QUERCUS SHUMARDII - CARYA CORDIFORMIS / CHASMANTHIUM LATIFOLIUM FOREST	Bur Oak - Shumard Oak - Bitternut Hickory / River-oats Forest	CEGL004544*PROTOEO*002	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*010	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*011	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*012	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*013	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*014	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*015	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*016	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*017	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*018	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*019	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	CEGL007444*PROTOEO*020	R	10/4/2002
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*006	R	10/4/2002

PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489PROTOEO001*AR	R	10/4/2002
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489PROTOEO002*AR	R	10/4/2002
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	CEGL007815*PROTOEO*008	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*001	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*002	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*003	R	10/4/2002
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*001	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*002	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*003	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*004	R	1/1/1999
FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	CEGL007823*PROTOEO*005	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*001	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*002	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*021	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*022	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*023	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*024	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*025	R	10/4/2002

Orconectes menae	Orconectes menae	ICMAL11530*PROTOEO*001	R	1/1/1999
Orconectes menae	Orconectes menae	ICMAL11530*PROTOEO*002	R	1/1/1999
PROCAMBARUS REIMERI	A CRAYFISH	ICMAL14110*001*AR	R	4/12/1997
PROCAMBARUS REIMERI	A CRAYFISH	ICMAL14110*006*AR	R	4/12/1997
PROCAMBARUS REIMERI	A CRAYFISH	ICMAL14110*007*AR	E	4/12/1997
PROCAMBARUS REIMERI	A CRAYFISH	ICMAL14110*008*AR	R	4/12/1997
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	IIA2A00008004000	A	9/15/1991
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	IIA2A00008005000	A	5/31/1991
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190*002*AR	R	5/28/1996
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190*004*AR	R	5/28/1996
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190*007*AR	R	5/1/1989
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190001000	B	5/1/1988
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190002000	R	5/26/1989
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190004000	R	10/26/1998
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190006000	R	5/1/1988
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190008000	B	5/1/1988
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190009000	B	5/1/1988
STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	IMGAS98190010000	C	10/25/1998
STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	IMGAS98240*005*AR	R	7/23/1996
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*003*AR	R	4/20/1990
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*007*AR	E	4/20/1990
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*008*AR	E	8/9/1989
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*039*AR	E	7/10/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0002000	R	9/6/1989
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0010000	R	9/29/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0011000	C	10/2/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0012000	B	10/2/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0013000	B	9/28/1992
SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	PDAST8P2L0014000	AB	4/6/1995
Verbesina walteri	rayless crown-beard	PDAST9R0H0*003*AR	R	8/20/1998
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0*011*AR	E	4/23/1989
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0010000	AB	4/28/1992

TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0015000	B	5/22/1994
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730006000	A	5/25/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730038000	B	6/20/1991
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730049000	R	5/25/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730051000	R	5/25/1995
Veratrum woodii	wood’s false hellbore	PMLIL1F030*001*AR	E	5/10/1989
Veratrum woodii	wood’s false hellbore	PMLIL1F030*007*AR	R	8/10/1982
Veratrum woodii	wood’s false hellbore	PMLIL1F030*008*AR	R	4/20/1984
Veratrum woodii	wood’s false hellbore	PMLIL1F030*013*AR	R	5/12/1989
Veratrum woodii	wood’s false hellbore	PMLIL1F030*020*AR	E	5/2/1995
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0*054*AR	R	5/10/1989
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0004000	B	8/11/1996
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0011000	R	4/1/1995
CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	PMORC0Q0F0012000	R	5/14/1996
QUERCUS ALBA / CAREX PENSYLVANICA - CAREX OUACHITANA DWARF FOREST	White Oak / Pennsylvania Sedge - Ouachita Sedge Dwarf Forest	XXNCTS.W4-*001*AR	R	1/1/1979
QUERCUS ALBA / CAREX PENSYLVANICA - CAREX OUACHITANA DWARF FOREST	White Oak / Pennsylvania Sedge - Ouachita Sedge Dwarf Forest	XXNCTS.W4-*002*AR	E	7/9/1997

Site Name **11140107 UPPER LITTLE** **117651 Hectares** ID No. 121

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690064000	R	4/1/1993
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*PROTOEO*02	R	10/4/2002
LYTHRURUS SNELSONI	OUACHITA SHINER	AFCJB52070004005	R	4/3/1993
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*PROTOEO*02	R	10/1/2002
Fundulus blairae	Lowland topminnow	AFCNB04270*OOHA*97	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*protoEO*02	R	10/1/2002
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*OOHA*89	R	1/1/1988
PERCINA PANTHERINA	LEOPARD DARTER	AFCQC04210*PROTOEO*002	R	1/1/1999
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*165	R	1/1/1988
FAXONELLA BLAIRI	crayfish	ICMAL51020*protoEO*01	R	10/1/2002
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*31	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*12	R	1/1/1988
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010008000	R	5/19/1983
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020018003	R	7/1/1994

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*011	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*022	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*013	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*014	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*015	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*015	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*016	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*017	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*018	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*013	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*014	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*005	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*013	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*020	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*027	R	10/4/2002

Site Name **Goose Pond** **5608 Hectares** ID No. 112

Scientific Name	Common Name	EO Code	Rank	Last Obs
HYLA AVIVOCA	BIRD-VOICED TREEFROG	AAABC02030*021*AR	R	7/4/1991

Site Name **11140107 GLOVER** **95388 Hectares** ID No. 122

Scientific Name	Common Name	EO Code	Rank	Last Obs
NOTROPIS PERPALLIDUS	PEPPERED SHINER	AFCJB28720*PROTOEO*002	R	10/4/2002
Notropis suttkusi	Rocky Shiner	AFCJB28C80*OOHA*127	R	1/1/1988
LYTHRURUS SNELSONI	OUACHITA SHINER	AFCJB52070*protoEO*001	R	10/4/2002
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*OOHA*131	R	1/1/1988

Fundulus blairae	Lowland topminnow	AFCNB04270*OOHA*98	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*OOHA*56	R	1/1/1988
ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*OOHA*84	R	1/1/1988
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*OOHA*91	R	1/1/1988
PERCINA PANTHERINA	LEOPARD DARTER	AFCQC04210*PROTOEO*001	R	1/1/1999
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*167	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*32	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*40	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*20	R	1/1/1988
Helopicus nalatus	stonefly	IIPLE2N020*OOHA*78	R	1/1/1988
ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	IMBIV07010*OOHA*204	R	1/1/1988
FUSCONAIA EBENA	Ebonyshell	IMBIV17060*OOHA*227	R	1/1/1988
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010*PROTOEO*004	R	10/4/2002
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010020000	R	10/9/1983
PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	IMBIV38040*OOHA*267	R	1/1/1988
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*OOHA*275	R	1/1/1988
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020007001	R	7/10/1996

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*012	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*024	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*016	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*017	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*018	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*019	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*020	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*021	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*015	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*016	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*004	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*013	R	10/4/2002

PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*014	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*015	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*016	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*017	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*018	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*019	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*020	R	10/4/2002
PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	CEGL007838*PROTOEO*021	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*006	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*014	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*021	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*028	R	10/4/2002

Site Name **Bells slough/Camp Robinson** **18626 Hectares** ID No. 0

Scientific Name	Common Name	EO Code	Rank	Last Obs
Speyeria diana	Diana fritillary	IILEPJ6010*003*AR	E	7/7/1997

Site Name **11110206 FOURCHE LA FAVE** **159248 Hectares** ID No. 128

Scientific Name	Common Name	EO Code	Rank	Last Obs
Notropis greenei	wedgespot shiner	AFCJB28500*OOHA*105	R	1/1/1988
NOTROPIS ORTENBURGERI	KIAMICHI SHINER	AFCJB28690*OOHA*110	R	1/1/1988
Noturus miurus	Brindled madtom	AFCKA02160*OOHA*139	R	1/1/1988
PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*OOHA*153	R	1/1/1988
PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	AFCQC04230*OOHA*163	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*28	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*38	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*15	R	1/1/1988
Helopicus nalatus	stonefly	IIPLE2N020*OOHA*056	R	1/1/1988
Alasmidonta marginata	Elktoe	IMBIV02040*OOHA*195	R	1/1/1988

FUSCONAIA EBENA	Ebonyshell	IMBIV17060*OOHA*226	R	1/1/1988
LEPTODEA LEPTODON	SCALESHELL	IMBIV24020*OOHA*253	R	1/1/1988
Toxolasma lividus	purple lilliput	IMBIV43030*OOHA*284	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*013	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*025	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*019	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*020	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*021	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*022	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*023	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*024	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*017	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*018	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest	CEGL007377*PROTOEO*003	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*007	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*015	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*022	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*029	R	10/4/2002

Site Name **Pine Bluestem Restoration** **128540 Hectares** ID No. 103

Scientific Name	Common Name	EO Code	Rank	Last Obs
Eurycea multiplicata multiplicata	many-ribbed salamander	AAAAD05062*PROTOEO*005	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*006	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs

Plethodon albagula	western slimy salamander	AAAAD12070*PROTOEO*004	R	1/1/1999
Accipiter cooperi	Cooper's hawk	ABNKC12040*PROTOEO*001	r	
Coccyzus americanus	yellow-billed cuckoo	ABNRB02020*PROTOEO*005	R	1/1/1999
Caprimulgus carolinensis	chuck-will's-widow	ABNTA07010*PROTOEO*005	R	1/1/1999
Caprimulgus vociferus	whip-poor-will	ABNTA07070*PROTOEO*001	R	1/1/1999
PICOIDES BOREALIS	RED-COCKADED WOODPECKER	ABNYF07060*PROTOEO*001	R	1/1/1999
Contopus virens	eastern wood –pewee	ABPAE32060*PROTOEO*001	R	1/1/1999
Dendroica discolor	prairie warbler	ABPBX03190*PROTOEO*002	R	1/1/1999
Oporornis formosus	Kentucky warbler	ABPBX11010*PROTOEO*005	R	1/1/1999
Piranga rubra	summer tanager	ABPBX45030*PROTOEO*001	R	1/1/1999
Icterus spurius	orchard oriole	ABPBXB9070*PROTOEO*001	R	1/1/1999
Spilogale putorius interrupta	plains spotted skunk	AMAJF05011*PROTOEO*002	R	1/1/1999
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*004	R	10/4/2002
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*007	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*008	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*009	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*010	R	1/1/1999
SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	CEGL002242*PROTOEO*011	R	1/1/1999
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*004	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*007	R	1/1/1999
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*008	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999

PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*012	R	10/4/2002
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*001	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*002	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*003	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*004	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*005	R	1/1/1999
Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	CEGL002425*PROTOEO*006	R	1/1/1999
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*008	R	10/4/2002
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	CEGL007815*PROTOEO*007	R	10/4/2002
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	CEGL007815*PROTOEO003*AR	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*012	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*012	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*013	R	1/1/1999
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*014	R	1/1/1999
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*017*AR	E	7/20/1990
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*021*AR	R	6/15/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*024*AR	E	8/28/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*025*AR	E	10/2/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*030*AR	R	10/3/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*033*AR	R	6/12/1991
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080*035*AR	E	7/20/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*021*AR	R	9/28/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*023*AR	R	4/21/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*024*AR	R	3/28/1991
Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*027*AR	E	4/10/1991

Liatris squarossa var compacta	Ouachita blazing star	PDAST5X0U2*035*AR	R	7/2/1995
Vernonia fasciculata	prairie ironweed	PDAST9S090*003*AR	R	
Vernonia lettermanii	Letterman's ironweed	PDAST9S0E0*011*AR	R	4/3/1992
AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	PDFAB080B0*017*AR	E	7/20/1990
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*027*AR	E	7/3/1995
Veratrum woodii	wood's false hellbore	PMLIL1F030*017*AR	E	4/16/1991

Site Name **Least Terns Sites 02** **2888 Hectares** ID No. 11102

Scientific Name	Common Name	EO Code	Rank	Last Obs
RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	CEGL002049*PROTOEO*002	R	10/4/2002
RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	CEGL002049*PROTOEO*005	R	10/4/2002
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*004	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest	CEGL002096*PROTOEO*003	R	10/4/2002

Site Name **Crayfish Complex 03** **391 Hectares** ID No. 11903

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*003*AR	R	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*004*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*009*AR	E	1/1/2000
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*010*AR	E	1/1/2000

Site Name **Crayfish Complex 04** **167 Hectares** ID No. 11904

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS STRAWNI	A CRAYFISH	ICMAL15040*006*AR	R	5/17/1997

Site Name **MeadowRue Seep 01** **499 Hectares** ID No. 10901

Scientific Name	Common Name	EO Code	Rank	Last Obs
Thalictrum arkansanum	Arkansas meadow-rue	PDRAN0M020010000	R	1/1/1997

Site Name **Cove Creek NA** **218 Hectares** ID No. 114

Scientific Name	Common Name	EO Code	Rank	Last Obs
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*005	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*009	R	10/4/2002
QUERCUS MARILANDICA - (JUNIPERUS VIRGINIANA) / SCHIZACHYRIUM SCOPARIUM - DANTHONIA SPICATA WOODED HERBACEOUS VEGETATION	Blackjack Oak - (Eastern Red-cedar) / Little Bluestem - Poverty Oatgrass Wooded Herbaceous Vegetation	XXNCTS.W2-*004*AR	E	4/1/1983

Site Name **Little Rock AFB** **2983 Hectares** ID No. 115

Scientific Name	Common Name	EO Code	Rank	Last Obs
POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	CEGL004919*PROTOEO*006	R	10/4/2002

Scientific Name	Common Name	EO Code	Rank	Last Obs
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*010	R	10/4/2002
: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	XXNCTS.W2-*017*AR	R	1/1/1999

Site Name **Crayfish Complex 01** **124 Hectares** ID No. 11901

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS JEANAE	A CRAYFISH	ICMAL15020*001*AR	R	4/21/1973

Site Name **Bradey Mt** **4294 Hectares** ID No. 118

Scientific Name	Common Name	EO Code	Rank	Last Obs
Dendroica pensylvanica	chestnut-sided warbler	ABPBX03020*PROTOE*001	R	1/1/1999
Dendroica virens	black-throated green warbler	ABPBX03100*PROTOEO*001	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*011	R	10/4/2002
LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	CEGL007826*PROTOEO*015	R	1/1/1999
TRADESCANTIA LONGIPES	A SPIDERWORT	PMCOM0B0D0*006*AR	E	4/20/1989
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730*038*AR	R	4/20/1989

Site Name **Crayfish Complex 02** **94 Hectares** ID No. 11902

Scientific Name	Common Name	EO Code	Rank	Last Obs
FALLICAMBARUS JEANAE	A CRAYFISH	ICMAL15020*003*AR	R	4/21/1973

Scientific Name	Common Name	EO Code	Rank	Last Obs
PROCAMBARUS PARASIMULANS	A CRAYFISH	ICMAL14810*003*AR	R	4/21/1973

Site Name **8040203 UPPER SALINE** **174691 Hectares** ID No. 127

Scientific Name	Common Name	EO Code	Rank	Last Obs
Notropis greenei	wedgespot shiner	AFCJB28500*OOHA*104	R	1/1/1988
NOTURUS ELEUTHERUS	Mountain madtom	AFCKA02040*OOHA*130	R	1/1/1988
NOTURUS LACHNERI	OUACHITA MADTOM	AFCKA02140*001*AR	R	5/27/1992
Noturus miurus	Brindled madtom	AFCKA02160*OOHA*138	R	1/1/1988
CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	AFCQC01010*OOHA*57	R	1/1/1988
ETHEOSTOMA COLLETTEI	Creole darter	AFCQC02140*OOHA*66	R	1/1/1988
ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	AFCQC02560*OOHA*81	R	1/1/1988

ETHEOSTOMA PARVIPINNE	goldstripe darter	AFCQC02570*OOHA*86	R	1/1/1988
EtHEOSTOMA RADIOSUM	Orangebelly darter	AFCQC02620*OOHA*93	R	1/1/1988
PERCINA NASUTA	LONGNOSE DARTER	AFCQC04150*OOHA*152	R	1/1/1988
Neoperla falayah	Neoperla falayah	IIPLE1X060*OOHA*26	R	1/1/1988
Neoperla osage	stonefly	IIPLE1X120*OOHA*41	R	1/1/1988
Isoperla ouachita	a stonefly	IIPLE24430*OOHA*13	R	1/1/1988
Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	IITRI33030*OOHA*23	R	1/1/1988
Alasmidonta marginata	Elktoe	IMBIV02040*OOHA*194	R	1/1/1988
ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	IMBIV07010*OOHA*205	R	1/1/1988
CYPROGENIA ABERTI	WESTERN FANSHELL	IMBIV10010*056*AR	R	8/29/1987
ELLIPTIO DILATATA	Spike	IMBIV14100*OOHA*218	R	1/1/1988
FUSCONAIA EBENA	Ebonyshell	IMBIV17060*OOHA*225	R	1/1/1988
LAMPSILIS ABRUPTA	PINK MUCKET	IMBIV21110*OOHA*230	R	1/1/1988
LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	IMBIV21120*001*AR	R	
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*001*AR	R	8/29/1987
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*023*AR	R	10/28/1989
LAMPSILIS POWELLII	ARKANSAS FATMUCKET	IMBIV21150*061*AR	R	7/23/1992
OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	IMBIV31010*OOHA*260	R	1/1/1988
QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	IMBIV39041*OOHA*272	R	1/1/1988
Toxolasma lividus	purple lilliput	IMBIV43030*OOHA*285	R	1/1/1988
VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	IMBIV47020*OOHA*289	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*014	R	10/4/2002
HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	CEGL003898*PROTOEO*023	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*022	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*023	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*024	R	10/4/2002
JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	CEGL004286*PROTOEO*025	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*025	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*026	R	10/4/2002
PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	CEGL004331*PROTOEO*026	R	10/4/2002

ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*019	R	10/4/2002
ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	CEGL007807*PROTOEO*020	R	10/4/2002
FALLICAMBARUS JEANAE	A CRAYFISH	ICMAL15020*OOHA*44	R	1/1/1988

Scientific Name	Common Name	EO Code	Rank	Last Obs
TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest	CEGL007377*PROTOEO*001	R	10/4/2002
TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest	CEGL007377*PROTOEO*002	R	10/4/2002
PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	CEGL007999*PROTOEO*008	R	10/4/2002
FALLICAMBARUS HARPI	NCN - a crayfish	ICMAL15060*OOHA*43	R	1/1/1988

Site Name **Beaver Bend Hills** **110372 Hectares** ID No. 105

Scientific Name	Common Name	EO Code	Rank	Last Obs
Desmognathus brimleyorum	Ouachita dusky salamander	AAAAD03030*PROTOEO*007	R	1/1/1999

Scientific Name	Common Name	EO Code	Rank	Last Obs
Plethodon albagula	western slimy salamander	AAAAD12070*PROTOEO*005	R	1/1/1999
Plethodon sequoyah	Sequoyah slimy salamander	AAAD12070b*PROTOEO*001	R	1/1/1999
Accipiter cooperi	Cooper's hawk	ABNKC12040*PROTOEO*005	R	
Coccyzus americanus	yellow-billed cuckoo	ABNRB02020*PROTOEO*003	R	1/1/1999
Caprimulgus carolinensis	chuck-will's-widow	ABNTA07010*PROTOEO*004	R	1/1/1999
Caprimulgus vociferus	whip-poor-will	ABNTA07070*PROTOEO*005	R	1/1/1999
Contopus virens	eastern wood –pewee	ABPAE32060*PROTOEO*005	R	1/1/1999
Dendroica discolor	prairie warbler	ABPBX03190*PROTOEO*005	R	1/1/1999
Helmitheros vermivorus	worm-eating warbler	ABPBX08010*PROTOEO*003	R	1/1/1999
Oporornis formosus	Kentucky warbler	ABPBX11010*PROTOEO*003	R	1/1/1999
Piranga rubra	summer tanager	ABPBX45030*PROTOEO*005	R	1/1/1999
Icterus spurius	orchard oriole	ABPBXB9070*PROTOEO*005	R	1/1/1999
Spilogale putorius interrupta	plains spotted skunk	AMAJF05011*PROTOEO*001	R	1/1/1999
Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	CEGL002058*PROTOEO*012	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO*004	R	10/4/2002
Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	CEGL002067*PROTOEO001*AR	R	10/4/2002
Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest	CEGL002070*PROTOEO*001	R	1/1/1999

BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	CEGL002086*PROTOEO*001	R	10/4/2002
BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	CEGL002086*PROTOEO*002	R	10/4/2002
Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	CEGL002150*PROTOEO*006	R	10/4/2002
CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	CEGL002191*PROTOEO*03	R	10/4/2002
CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	CEGL002191*PROTOEO*04	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*001	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*002	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*003	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*004	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*005	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*006	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*007	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*008	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*009	R	10/4/2002
CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	CEGL002263*PROTOEO*010	R	10/4/2002
PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	CEGL002393*PROTOEO*010	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*002*AR	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*003	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*009	R	1/1/1999
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO*010	R	1/1/1999
PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	CEGL002394*PROTOEO001*AR	R	10/4/2002
PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	CEGL002400*PROTOEO*0	R	1/1/1999
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401*PROTOEO*007	R	10/4/2002
PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	CEGL002401PROTOEO006*AR	R	10/4/2002
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*002	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*005	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*008	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*011	R	1/1/1999

PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*014	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*017	R	1/1/1999
PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	CEGL002402*PROTOEO*020	R	1/1/1999
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*001	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*002	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*003	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*004	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*005	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*006	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*007	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*008	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*009	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*010	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*011	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*012	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*013	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*014	R	10/4/2002
Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	CEGL002426*PROTOEO*015	R	10/4/2002
FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	CEGL002427*PROTOEO*01	R	10/4/2002
FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	CEGL002427*PROTOEO*02	R	10/4/2002
QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland	CEGL003884*PROTOEO*004	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*010	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*013	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*014	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*017	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*020	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*022	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*023	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*027	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*050	R	10/4/2002

TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*051	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*06	R	10/4/2002
TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	CEGL003889*PROTOEO*09	R	10/4/2002
SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	CEGL003899*PROTOEO*003	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*011	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*012	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*013	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*014	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*022	R	10/4/2002
SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	CEGL004347*PROTOEO*03	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*001	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*003	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*004	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*005	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*006	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*007	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*008	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*009	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*010	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*011	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*012	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*013	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*014	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*015	R	10/4/2002
PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	CEGL004444*PROTOEO*016	R	10/4/2002
QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest	CEGL004543*PROTOEO*001	R	10/4/2002
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*015	R	1/1/1999

QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*016	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*017	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*018	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*019	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*020	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*021	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*022	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*023	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*024	R	1/1/1999
QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	CEGL004602*PROTOEO*025	R	1/1/1999
QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest	CEGL004796*PROTOEO*001	R	10/4/2002
PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	CEGL007489*PROTOEO*007	R	10/4/2002
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	CEGL007815*PROTOEO001*AR	R	10/4/2002
Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	CEGL007815*PROTOEO002*AR	R	10/4/2002
QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	CEGL007818*PROTOEO*013	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*001	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*002	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*003	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*004	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*005	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*006	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*007	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*008	R	10/4/2002

ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*009	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*010	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*011	R	10/4/2002
ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	CEGL007822*PROTOEO*012	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*010	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*011	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*012	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*013	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*014	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*015	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*016	R	10/4/2002
QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*017	R	10/4/2002

QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	CEGL007825*PROTOEO*018	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*026	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*027	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*028	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*029	R	10/4/2002
QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	CEGL007828*PROTOEO*030	R	10/4/2002
QUERCUS NIGRA - LIQUIDAMBAR STYRACIFLUA - (PINUS TAEDA) / ILEX OPACA - VACCINIUM FUSCATUM / CAREX DEBILIS TEMPORARILY FLOODED FLOODPLAIN FOREST	Water Oak - Sweetgum - (Loblolly Pine) / American Holly - Black Highbush Blueberry / White-edge Sedge Temporarily Flooded Floodplain Forest	CEGL007984*PROTOEO*001	R	10/4/2002
AMSONIA HUBRICHTII	OUACHITA BLUE STAR	PDAPO03080009000	B	8/24/1996
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060004000	R	5/30/1984
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060009000	C	5/8/1991
DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	PDBRA11060010000	C	5/8/1991
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0001000	C	5/11/1994
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0013000	B	5/14/1995
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0014000	B	4/8/1992
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0015000	R	5/9/1992
STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	PDBRA2G0Z0018000	B	5/11/1992
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*004	R	1/1/1999
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*005	R	1/1/1999
Monarda stipitatoglandulosa	Ouachita horsemint	PDLAM170BG*PROTOEO*006	R	1/1/1999
Thalictrum arkansanum	Arkansas meadow-rue	PDRAN0M020008000	AB	4/5/1995
Hedyotis ouachitana	Ouachita hedyotis	PDRUB1T0G*PROTOEO*004	R	1/1/1999
Hedyotis ouachitana	Ouachita hedyotis	PDRUB1T0G*PROTOEO*005	R	1/1/1999
Valerianella palmeri	Palmer’s corn-salad	PDVAL040A0001000	A	4/27/1989
Valerianella palmeri	Palmer’s corn-salad	PDVAL040A0002000	BC	4/4/1995
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0013000	A	5/12/1994
TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0016000	C	5/13/1992

TRADESCANTIA OZARKANA	OZARK SPIDERWORT	PMCOM0B0H0018000	C	5/12/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730002000	A	5/13/1994
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730010000	A	5/13/1994
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730023000	R	5/13/1994
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730027000	A	4/27/1989
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730031000	B	5/14/1994
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730036000	A	5/3/1996
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730039000	B	4/8/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730041000	B	5/25/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730043000	B	5/10/1992
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730052000	A	4/4/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730053000	A	4/4/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730054000	A	4/4/1995
CAREX LATEBRACTEATA	WATERFALL'S SEDGE	PMCYP03730056000	R	1/1/1997
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010016000	AB	9/26/1993
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010017000	B	9/26/1993
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010019000	R	10/11/1995
CALAMOVILFA ARCUATA	A SANDGRASS	PMPOA18010024000	B	10/11/1995

Ouachita Highlands -- All Targets, Goals, and Counts

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA
Community							
	CEGL002024	ANDROPOGON GERARDII - PANICUM VIRGATUM - HELIANTHUS GROSSESERRATUS HERBACEOUS VEGETATION	Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous Vegetation	2	2	G2G3	Terrestrial
	CEGL002049	RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	5	5	G2G3	Riparian
	CEGL002058	Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	25	24	G3	Terrestrial
	CEGL002060	ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	5	6	G3	Terrestrial
	CEGL002067	Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	3	7	G3	Terrestrial
	CEGL002070	Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest	3	3	G4G5	Terrestrial
	CEGL002086	BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	5	5	G5	Terrestrial
	CEGL002096	POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest	4	3	G3	Terrestrial
	CEGL002101	QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	20	20	G2G3	Terrestrial
	CEGL002102	QUERCUS PHELLOS - (QUERCUS LYRATA) / CAREX SPP. - LEERSIA SPP. FOREST	Willow Oak - (Overcup Oak) / Sedge species - Cutgrass species Forest	4	1	G4G5	Terrestrial
	CEGL002150	Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	5	7	G3	Terrestrial
	CEGL002191	CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	5	5	G4	Terrestrial
	CEGL002212	SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation	25	3	G3	Terrestrial
	CEGL002242	SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	18	25	G3	Terrestrial
	CEGL002263	CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	25	24	G2G3	Terrestrial
	CEGL002309	SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	25	26	G4G5	Terrestrial
	CEGL002391	: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	18	18	G2G3	Terrestrial

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA
CEGL002393		PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	10	6	G2G3	Terrestrial
CEGL002394		PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	10	10	G3G4	Terrestrial
CEGL002400		PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	18	20	G3G4	Terrestrial
CEGL002401		PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	10	12	G3	Terrestrial
CEGL002402		PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	20	20	G2G3	Terrestrial
CEGL002421		TAXODIUM DISTICHUM - (NYSSA AQUATICA) / FORESTIERA ACUMINATA - PLANERA AQUATICA FOREST	Bald-cypress - (Water Tupelo) / Swamp-privet - Planertree Forest	4	1	G3G5	Terrestrial
CEGL002425		Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	18	18	G3G4	Terrestrial
CEGL002426		Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	25	25	G3	Terrestrial
CEGL002427		FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	4	4	G4G5	Terrestrial
CEGL002428		QUERCUS MARILANDICA - (JUNIPERUS VIRGINIANA) / SCHIZACHYRIUM SCOPARIUM - DANTHONIA SPICATA WOODED HERBACEOUS VEGETATION	Blackjack Oak - (Eastern Red-cedar) / Little Bluestem - Poverty Oatgrass Wooded Herbaceous Vegetation	2	2	G2	Terrestrial
CEGL002431		ACER SACCHARINUM - CELTIS LAEVIGATA - CARYA ILLINOINENSIS FOREST	Silver Maple - Sugarberry - Pecan Forest	5	1	G3G4	Terrestrial
CEGL002433		QUERCUS ALBA / CAREX PENSYLVANICA - CAREX OUACHITANA DWARF FOREST	White Oak / Pennsylvania Sedge - Ouachita Sedge Dwarf Forest	2	2	G1	Terrestrial
CEGL003884		QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland	4	3	G2	Terrestrial
CEGL003889		TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	25	25	G1	Terrestrial
CEGL003898		HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	25	25	G3	Riparian
CEGL003899		SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	5	5	G5?	Terrestrial
CEGL003942		JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland	1	3	G2	Riparian
CEGL004140		ZIZANIOPSIS MILIACEA ROCKY RIVERBED HERBACEOUS VEGETATION	Southern Wild Rice Rocky Riverbed Herbaceous Vegetation	2	2	G2	Riparian
CEGL004286		JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	25	25	G4G5	Riparian
CEGL004331		PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	25	25	G5	Riparian

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA
CEGL004347		SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	25	25	G2G3	Terrestrial
CEGL004444		PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	18	17	G3	Terrestrial
CEGL004543		QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest	18	3	G3	Terrestrial
CEGL004544		QUERCUS MACROCARPA - QUERCUS SHUMARDII - CARYA CORDIFORMIS / CHASMANTHIUM LATIFOLIUM FOREST	Bur Oak - Shumard Oak - Bitternut Hickory / River-oats Forest	2	2	G3	Terrestrial
CEGL004602		QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	25	25	G2G4	Terrestrial
CEGL004782		JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	20	20	G2G3	Terrestrial
CEGL004796		QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest	13	3	G3	Terrestrial
CEGL004919		POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	5	6	G3G4	Riparian
CEGL007377		TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest	3	3	G2	Terrestrial
CEGL007444		ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	25	31	G3	Terrestrial
CEGL007489		PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	10	9	G3G4	Terrestrial
CEGL007807		ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	25	25	G3	Riparian
CEGL007815		Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	8	6	G1G2	Terrestrial
CEGL007818		QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	18	16	G3	Terrestrial
CEGL007820		(RIBES CYNOSBATI) / DESCHAMPSIA FLEXUOSA - DRYOPTERIS MARGINALIS - DENNSTAEDTIA PUNCTILOBULA HERBACEOUS VEGETATION	(Eastern Prickly Gooseberry) / Wavy Hairgrass - Marginal Woodfern - Hay-scented Fern Herbaceous Vegetation	1	1	G2	Terrestrial
CEGL007822		ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	25	25	G2	Terrestrial
CEGL007823		FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	25	25	G3G4	Terrestrial

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CEGL007824		(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	4	4	G2	Terrestrial
CEGL007825		QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	18	18	G3	Terrestrial
CEGL007826		LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	13	15	G3G4	Terrestrial
CEGL007827		SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation	2	3	G2G3	Terrestrial
CEGL007828		QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	18	30	G3	Terrestrial
CEGL007837		OSMUNDA CINNAMOMEA - RHYNCHOSPORA CAPITELLATA - HEUCHERA PARVIFLORA VAR. PUBERULA - XYRIS JUPICAI HERBACEOUS VEGETATION	Cinnamon Fern - Northern Beaksedge - Ozark Alumroot - Richards Yellow-eyed-grass Herbaceous Vegetation	1	1	G1	Terrestrial
CEGL007838		PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	25	25	G2	Riparian
CEGL007915		QUERCUS PHELLOS - QUERCUS NIGRA MISSISSIPPI RIVER ALLUVIAL PLAIN FOREST	Willow Oak - Water Oak Mississippi River Alluvial Plain Forest	4	1	G4G5	Terrestrial
CEGL007984		QUERCUS NIGRA - LIQUIDAMBAR STYRACIFLUA - (PINUS TAEDA) / ILEX OPACA - VACCINIUM FUSCATUM / CAREX DEBILIS TEMPORARILY FLOODED FLOODPLAIN FOREST	Water Oak - Sweetgum - (Loblolly Pine) / American Holly - Black Highbush Blueberry / White-edge Sedge Temporarily Flooded Floodplain Forest	25	2	G4	Terrestrial
CEGL007999		PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	13	29	G3	Terrestrial
Species	Amphibian						
AAAAA01010		Ambystoma annulatum	ringed salamander	5	3	G4	Terrestrial
AAAAD03030		Desmognathus brimleyorum	Ouachita dusky salamander	5	7	G4	Riparian
AAAAD05062		Eurycea multiplicata multiplicata	many-ribbed salamander	3	5	G4T4	Aquatic
AAAAD08010		Hemidactylium scutatum	Four-Toed salamander	5	5	G5	Riparian

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AAAAD12010		Plethodon caddoensis	Caddo Mountain salamander	10	14	G2		Terrestrial
AAAAD12060		Plethodon fourchensis	Fourche Mountain salamander	10	2	G2		Terrestrial
AAAAD12070		Plethodon albagula	western slimy salamander	5	5	G4		Terrestrial
AAAAD12130		Plethodon ouachitae	Rich Mountain salamander	10	16	G2G3		Terrestrial
AAAAD12160		Plethodon serratus	southern redback salamander	5	3	G5		Terrestrial
AAAAD12330		Plethodon kiamichi	Kiamichi slimy salamander	1	1	G2Q		Terrestrial
AAABC02030		HYLA AVIVOCA	BIRD-VOICED TREEFROG	1	1	G5		Wetlands
AAAD12070b		Plethodon sequoyah	Sequoyah slimy salamander	1	1	G2Q		Terrestrial
Species	Bird							
ABNKC12040		Accipiter cooperi	Cooper’s hawk	5	5	G4		Terrestrial
ABNNM08102		STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	1	3	G4T2Q	(PS: LE)	Riparian
ABNRB02020		Coccyzus americanus	yellow-billed cuckoo	5	5	G5		Terrestrial
ABNTA07010		Caprimulgus carolinensis	chuck-will’s-widow	5	5	G5		Terrestrial
ABNTA07070		Caprimulgus vociferus	whip-poor-will	5	5	G5		Terrestrial
ABNYF07060		PICOIDES BOREALIS	RED-COCKADED WOODPECKER	2	1	G3	LE	Terrestrial
ABPAE32060		Contopus virens	eastern wood –pewee	5	5	G5		Terrestrial
ABPBX03020		Dendroica pensylvanica	chestnut-sided warbler	5	1	G5		Terrestrial
ABPBX03100		Dendroica virens	black-throated green warbler	5	1	G5		Terrestrial
ABPBX03190		Dendroica discolor	prairie warbler	5	5	G5		Terrestrial
ABPBX03240		Dendroica cerulea	Cerulean warbler	5	2	G4		Terrestrial
ABPBX08010		Helmitheros vermivorus	worm-eating warbler	5	5	G5		Terrestrial
ABPBX09010		Limnothlypis swainsonii	Swainson’s warbler	5	1	G4		Terrestrial
ABPBX11010		Oporornis formosus	Kentucky warbler	5	5	G5		Terrestrial

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ABPBX45030		Piranga rubra	summer tanager	5	5	G5		Terrestrial
ABPBX91050		AIMOPHILA AESTIVALIS	BACHMANS SPARROW	8	3	G3		Terrestrial
ABPBXA0030		Ammodramus henslowii	Henslow's sparrow	5	1	G3G4		Terrestrial
ABPBXB9070		Icterus spurius	orchard oriole	5	5	G5		Terrestrial
Species	Crustacean							
ICMAL11530		Orconectes menae	Orconectes menae	5	5	G3		Terrestrial
ICMAL14110		PROCAMBARUS REIMERI	A CRAYFISH	4	5	G1	PET	Terrestrial
ICMAL14810		PROCAMBARUS PARASIMULANS	A CRAYFISH	5	3	G4	PET	Terrestrial
ICMAL15020		FALLICAMBARUS JEANAE	A CRAYFISH	1	4	G2	PET	Riparian
ICMAL15040		FALLICAMBARUS STRAWNI	A CRAYFISH	6	5	G1G2	PET	Riparian
ICMAL15060		FALLICAMBARUS HARPI	NCN - a crayfish	3	10	G1	PET	Terrestrial
ICMAL51020		FAXONELLA BLAIRI	crayfish	1	1	G2	PET	Aquatic
Species	Fish							
AFCJB28500		Notropis greenei	wedgespot shiner	2	2	G5		Aquatic
AFCJB28690		NOTROPIS ORTENBURGERI	KIAMICHI SHINER	3	6	G3	PET	Aquatic
AFCJB28720		NOTROPIS PERPALLIDUS	PEPPERED SHINER	3	7	G3	PET	Aquatic
AFCJB28C80		Notropis suttkusi	Rocky Shiner	3	3	G3		Aquatic
AFCJB52070		LYTHRURUS SNELSONI	OUACHITA SHINER	3	6	G3	PET	Aquatic
AFCKA02040		NOTURUS ELEUTHERUS	Mountain madtom	3	7	G4	PET	Aquatic
AFCKA02140		NOTURUS LACHNERI	OUACHITA MADTOM	3	3	G2	PET	Aquatic
AFCKA02160		Noturus miurus	Brindled madtom	3	6	G5		Aquatic
AFCKA02230		NOTURUS TAYLORI	CADDO MADTOM	3	4	G1	PET	Aquatic
AFCNB04270		Fundulus blairae	Lowland topminnow	3	4	G4	PET	Aquatic

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA	
AFCQC01010		CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	3	8	G3	PET	Aquatic
AFCQC02140		ETHEOSTOMA COLLETTEI	Creole darter	5	5	G4		Aquatic
AFCQC02560		ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	3	4	G2	PET	Aquatic
AFCQC02570		ETHEOSTOMA PARVIPINNE	goldstripe darter	3	6	G4	PET	Aquatic
AFCQC02620		EtHEOSTOMA RADIOSUM	Orangebelly darter	3	7	G4		Aquatic
AFCQC04150		PERCINA NASUTA	LONGNOSE DARTER	3	6	G3	PET	Aquatic
AFCQC04210		PERCINA PANTHERINA	LEOPARD DARTER	3	3	G1	LT	Aquatic
AFCQC04230		PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	3	6	G5	PET	Aquatic
AFCQC04370		PERCINA SP. NOV.	OUACHITA DARTER	1	1	G2	PET	Aquatic
Species	Insect							
ICMAL05270		STYGOBROMUS MONTANUS	mountain cave amphipod	1	1	G1	PET	Subterranean
IICOL10010		Arianops sandersoni	Magazine Mountain mold beetle	1	1	G1?		Terrestrial
IICOL42010		NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	2	1	G2G3	LE	Terrestrial
IICOLE1010		OUACHITYCHUS PARVOCULUS	SMALL-EYED MOLD BEETLE	1	1	G1		Terrestrial
IILEPJ6010		Speyeria diana	Diana fritillary	5	4	G3		Terrestrial
IILEYC0310		Papaipema eryngii	rattlesnake master borer moth	4	1	G1G2		Terrestrial
IIORT17010		Gryllotalpa major	prairie mole cricket	1	4	G3		Terrestrial
IIPLE1X060		Neoperla falayah	Neoperla falayah	3	10	G3		Aquatic
IIPLE1X120		Neoperla osage	stonefly	3	7	G3		Aquatic
IIPLE24430		Isoperla ouachita	a stonefly	3	10	G3		Aquatic
IIPLE24560		Isoperla szczytkoi	a stonefly	1	1	G1		Aquatic
IIPLE2N020		Helopicus nalatus	stonefly	3	5	G3		Aquatic
IITRI33030		Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	3	4	G1		Aquatic

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA	
Species	Invertebrate							
	ICMAL05260	STYGOBROMUS ELATUS	ELEVATED SPRING AMPHIPOD	1	1	G1G2		Terrestrial
	IICOLH6020	PSEUDACTIUM MAGAZINENSIS	OUACHITA PSEUDACTIUM	2	2	G1		Terrestrial
	IIHEM05020	PENTACORA OUACHITA	OUACHITA SHORE BUG	1	1	G1		Aquatic
	IMGAS95100	PATERA CLENCHI	CALICO ROCK OVAL	1	1	G1		Terrestrial
	IMGAS95210	INFLECTARIUS MAGAZINENSIS	MAGAZINE MOUNTAIN SHAGREEN	1	1	G1	LT	Terrestrial
	IMGAS98190	STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	8	9	G2		Terrestrial
	IMGAS98240	STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	2	3	G1		Terrestrial
Species	Mammal							
	AMAJB01010	Ursus americanus	black bear	1	1	G5		Terrestrial
	AMAJF05011	Spilogale putorius interrupta	plains spotted skunk	5	4	G5T3T4		Terrestrial
Species	Mussel							
	IMBIV02040	Alasmidonta marginata	Elktoe	3	4	G4		Aquatic
	IMBIV07010	ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	3	6	G1	LE	Aquatic
	IMBIV08010	Cumberlandia Monodonta	spectaclecase pearlymussel	1	1	G2G3	(C.)	Aquatic
	IMBIV10010	CYPROGENIA ABERTI	WESTERN FANSHELL	3	4	G2	PET	Aquatic
	IMBIV14100	ELLIPTIO DILATATA	Spike	3	5	G5	PET	Aquatic
	IMBIV17060	FUSCONAIA EBENA	Ebonyshell	3	6	G4G5	PET	Aquatic
	IMBIV21110	LAMPSILIS ABRUPTA	PINK MUCKET	3	3	G2	LE	Aquatic
	IMBIV21120	LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	2	2	G5	PET	Aquatic
	IMBIV21150	LAMPSILIS POWELLII	ARKANSAS FATMUCKET	3	8	G1G2	LT	Aquatic
	IMBIV24020	LEPTODEA LEPTODON	SCALESHELL	3	3	G1	LE	Aquatic

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IMBIV31010		OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	3	8	G1G2	PET	Aquatic
IMBIV35090		PLEUROBEMA CORDATUM	OHIO PIGTOE	1	1	G3	PET	Aquatic
IMBIV38040		PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	3	7	G3	PET	Aquatic
IMBIV39041		QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	3	6	G3T3	PET	Aquatic
IMBIV39050		QUADRULA FRAGOSA	WINGED MAPLELEAF	3	3	G1	(LE, XN)	Aquatic
IMBIV43030		Toxolasma lividus	purple lilliput	3	6	G2		Aquatic
IMBIV47020		VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	3	9	G2	PET	Aquatic
Species	Plant							
PDAPO03080		AMSONIA HUBRICHTII	OUACHITA BLUE STAR	5	28	G3		Terrestrial
PDAST2E1U0		Cirsium muticum	swamp thistle	5	2	G5		Terrestrial
PDAST5X0U2		Liatris squarossa var compacta	Ouachita blazing star	5	34	G5T3?		Terrestrial
PDAST7G040		Polymnia cossatotensis	heartleaf leafcup	3	3	G1		Terrestrial
PDAST8P2L0		SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	6	19	G3		Terrestrial
PDAST9R0H0		Verbesina walteri	rayless crown-beard	5	1	G3		Terrestrial
PDAST9S090		Vernonia fasciculata	prairie ironweed	5	2	G5		Terrestrial
PDAST9S0E0		Vernonia lettermanii	Letterman’s ironweed	6	5	G3		Terrestrial
PDBRA0K1D0		CARDAMINE DISSECTA	A TOOTHWORT	5	3	G4		Terrestrial
PDBRA11060		DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	5	4	G3		Terrestrial
PDBRA16050		Erysimum capitatum	western wallflower	5	1	G5		Terrestrial
PDBRA2G0Z		Streptanthus obtusifolius	a twistflower	6	6	G3		Terrestrial
PDBRA2G0Z0		STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	8	16	G2		Terrestrial
PDCAR0U1G0		SILENE REGIA	ROYAL CATCHFLY	6	1	G3		Terrestrial
PDFAB080B0		AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	5	8	G3Q		Terrestrial

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA
PDFAG05350		QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	4	4	G1	Terrestrial
PDHYD08090		HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	5	9	G1	Terrestrial
PDLAM170BG		Monarda stipitatoglandulosa	Ouachita horsemint	6	6	G3	Terrestrial
PDRAN0B140		Delphinium newtonianum	Moore’s larkspur	5	3	G3	Terrestrial
PDRAN0M020		Thalictrum arkansanum	Arkansas meadow-rue	4	3	G2	Terrestrial
PDRUB0N071		Galium arkansanum var pubiflorum	Ouachita bedstraw	5	8	G5T2Q	Terrestrial
PDRUB1T0G		Hedyotis ouachitana	Ouachita hedyotis	5	5	G3	Terrestrial
PDSAX0P060		PARNASSIA GRANDIFOLIA	LARGE-FLOWERED GRASS-OF-PARNASSUS	6	1	G3	Terrestrial
PDVAL04090		VALERIANELLA OZARKANA	A CORN-SALAD	6	1	G3	Terrestrial
PDVAL040A0		Valerianella palmeri	Palmer’s corn-salad	6	5	G3	Terrestrial
PMCOM0B0D0		TRADESCANTIA LONGIPES	A SPIDERWORT	5	6	G4	Terrestrial
PMCOM0B0H0		TRADESCANTIA OZARKANA	OZARK SPIDERWORT	5	5	G2G3	Terrestrial
PMCYP03260		CAREX BROMOIDES	A SEDGE	5	4	G5	Terrestrial
PMCYP036Z0		CAREX LAEVIVAGINATA	SMOOTH-SHEATH SEDGE	5	2	G5	Terrestrial
PMCYP03730		CAREX LATEBRACTEATA	WATERFALL'S SEDGE	6	36	G3	Terrestrial
PMCYP03D30		CAREX STRICTA	UPRIGHT SEDGE	5	7	G5	Terrestrial
PMCYP03EK0		CAREX VIRESCENS	RIBBED SEDGE	5	1	G5	Terrestrial
PMCYP03ET0		CAREX WILLDENOWII	A SEDGE	5	1	G5	Terrestrial
PMCYP0Q170		SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	5	3	G5	Terrestrial
PMLIL1F030		Veratrum woodii	wood’s false hellbore	6	13	G5	Terrestrial
PMLIL200Q1		TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	8	3	G3T3	Terrestrial
PMORC0Q0F0		CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	5	43	G3	Terrestrial
PMORC1M040		Liparis loeselii	yellow twayblade	5	1	G5	Terrestrial

Taxa	ELCODE	Scientific Name	Common Name	Goal	Count	GRank	USESA
PMPOA18010		CALAMOVILFA ARCUATA	A SANDGRASS	8	12	G2	Terrestrial
PMPOA22090		DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	5	4	G5	Terrestrial
PPASP02100		ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT	5	2	G4	Terrestrial
PPDEN01050		DENNSTAEDTIA PUNCTILOBULA	EASTERN HAY-SCENTED FERN	5	1	G5	Terrestrial
PPDRY0A050		DRYOPTERIS CELSA	LOG FERN	5	8	G4	Terrestrial
PPDRY0U020		WOODSIA SCOPULINA VAR. APPALACHIANA	APPALACHIAN WOODSIA	5	1	G4T4	Terrestrial
PPHYM020K0		TRICHOMANES PETERSII	DWARF FILMY-FERN	5	2	G4G5	Terrestrial
Species	Reptile						
ARAAD08022		Terrapene ornata ornata	ornate box turtle	5	3	G5T5	Terrestrial
ARACH01101		Eumeces septentrionalis obtusirostris	southern prairie skink	1	1	G5T5	Terrestrial
ARACH01130		Eumeces obsoletus	Great Plains skink	1	1	G5	Terrestrial

Targets that met goals

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
Community							
CEGL003899	SALIX CAROLINIANA TEMPORARILY FLOODED SHRUBLAND	Carolina Willow Temporarily Flooded Shrubland	G5?	Small Patch	Widespread	5	5
CEGL007377	TAXODIUM DISTICHUM - PLATANUS OCCIDENTALIS OUACHITA FOOTHILLS FOREST	Bald-cypress - Sycamore Ouachita Foothills Forest	G2	Small Patch	Endemic	3	3
CEGL003942	JUNIPERUS VIRGINIANA VAR. VIRGINIANA - LEPTOPUS PHYLLANTHOIDES - (QUERCUS NIGRA, ILEX VOMITORIA) SHRUBLAND	Eastern Red-cedar - Maidenbush - (Water Oak, Yaupon) Shrubland	G2	Small Patch	Limited	1	3
CEGL007826	LIQUIDAMBAR STYRACIFLUA - (QUERCUS ALBA, ACER SACCHARUM) / CARPINUS CAROLINIANA / LINDERA BENZOIN FOREST	Sweetgum - (White Oak, Sugar Maple) / Ironwood / Northern Spicebush Forest	G3G4	Small Patch	Limited	13	15
CEGL007820	(RIBES CYNOSBATI) / DESCHAMPSIA FLEXUOSA - DRYOPTERIS MARGINALIS - DENNSTAEDTIA PUNCTILOBULA HERBACEOUS VEGETATION	(Eastern Prickly Gooseberry) / Wavy Hairgrass - Marginal Woodfern - Hay-scented Fern Herbaceous Vegetation	G2	Small Patch	Limited	1	1
CEGL004347	SEDUM PULCHELLUM - TALINUM CALYCINUM - OENOTHERA LINIFOLIA SHALE HERBACEOUS VEGETATION	Widows-cross - Rockpink Fameflower - Narrowleaf Evening-primrose Shale Herbaceous Vegetation	G2G3	Small Patch	Limited	25	25
CEGL002402	PINUS ECHINATA / ROCK OUTCROP INTERIOR HIGHLAND WOODLAND	Shortleaf Pine / Rock Outcrop Interior Highland Woodland	G2G3	Small Patch	Limited	20	20
CEGL007838	PANICUM VIRGATUM - CALAMOVILFA ARCUATA HERBACEOUS VEGETATION	Switchgrass - Rivergrass Herbaceous Vegetation	G2	Small Patch	Endemic	25	25
CEGL002242	SCHIZACHYRIUM SCOPARIUM - ARISTIDA DICHOTOMA - CROTON WILLDENOWII / LICHENS WOODED HERBACEOUS VEGETATION	Little Bluestem - Forktip Three-awn - Broadleaf Rushfoil / Lichens Wooded Herbaceous Vegetation	G3	Small Patch	Limited	18	25
CEGL004919	POPULUS DELTOIDES - SALIX NIGRA WOODLAND	Eastern Cottonwood / Black Willow Woodland	G3G4	Small Patch	Widespread	5	6
CEGL007444	ACER RUBRUM VAR. TRILOBUM - LIQUIDAMBAR STYRACIFLUA - MAGNOLIA TRIPETALA / OSMUNDA REGALIS - (CYPRIPEDIUM KENTUCKIENSE) FOREST	Carolina Red Maple - Sweetgum - Umbrella Magnolia / Royal Fern - (Southern Yellow Ladys-slipper) Forest	G3	Small Patch	Limited	25	31

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
CEGL007828	QUERCUS RUBRA / OSTRYA VIRGINIANA / PTELEA TRIFOLIATA - RIBES CURVATUM / HELIANTHUS DIVARICATUS WOODLAND	Northern Red Oak - Eastern Hop-hornbeam / Hop-tree - Granite Gooseberry / Spreading Sunflower Woodland	G3	Large Patch	Endemic	18	30
CEGL002150	Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland	White Oak - Post Oak - Black Oak / Little Bluestem Woodland	G3	Large Patch	Widespread	5	7
CEGL002425	Quercus marilandica / Vaccinium arboreum / Danthonia spicata scrub woodland	Blackjack Oak / Farkleberry / Poverty Oatgrass Scrub Woodland	G3G4	Large Patch	Endemic	18	18
CEGL004544	QUERCUS MACROCARPA - QUERCUS SHUMARDII - CARYA CORDIFORMIS / CHASMANTHIUM LATIFOLIUM FOREST	Bur Oak - Shumard Oak - Bitternut Hickory / River-oats Forest	G3	Large Patch	Widespread	2	2
CEGL002400	PINUS ECHINATA / VACCINIUM (ARBOREUM, PALLIDUM, STAMINEUM) FOREST	Shortleaf Pine / (Farkleberry, Hillside Blueberry, Deerberry) Forest	G3G4	Large Patch	Limited	18	20
CEGL002426	Juniperus virginiana Alkaline Bluff Woodland	Eastern Red-cedar Alkaline Bluff Woodland	G3	Small Patch	Limited	25	25
CEGL004602	QUERCUS MUEHLENBERGII - QUERCUS SHUMARDII FOREST	Chinquapin Oak - Shumard Oak Forest	G2G4	Small Patch	Limited	25	25
CEGL002060	ACER (SACCHARUM, BARBATUM) - QUERCUS RUBRA - CARYA CORDIFORMIS / ASIMINA TRILOBA FOREST	(Sugar Maple, Southern Sugar Maple) - Northern Red Oak - Bitternut Hickory / Common Pawpaw Forest	G3	Small Patch	Widespread	5	6
CEGL007827	SCHIZACHYRIUM SCOPARIUM - DICHANTHELIUM SPP. - BUCHNERA AMERICANA - ECHINACEA PALLIDA HERBACEOUS VEGETATION	Little Bluestem - Witchgrass species - Bluehearts - Pale Purple Coneflower Herbaceous Vegetation	G2G3	Matrix	Widespread	2	3
CEGL007999	PLATANUS OCCIDENTALIS - BETULA NIGRA - CELTIS LAEVIGATA - FRAXINUS PENNSYLVANICA / ARUNDINARIA GIGANTEA TEMPORARILY FLOODED FOREST	Sycamore - River Birch - Sugarberry - Green Ash / Giant Cane Temporarily Flooded Forest	G3	Small Patch	Limited	13	29
CEGL002191	CEPHALANTHUS OCCIDENTALIS / CAREX SPP. - LEMNA SPP. SOUTHERN SHRUBLAND	Buttonbush / Sedge species - Duckweed species Southern Shrubland	G4	Small Patch	Widespread	5	5
CEGL002067	Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest	White Oak - Northern Red Oak - (Mockernut Hickory, Shagbark Hickory) / Flowering Dogwood Acid Forest	G3	Matrix	Limited	3	7
CEGL002401	PINUS ECHINATA - QUERCUS VELUTINA - QUERCUS STELLATA / VACCINIUM SPP. FOREST	Shortleaf Pine - Black Oak - Post Oak / Blueberry species Forest	G3	Matrix	Limited	10	12
CEGL002391	: Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation	Post Oak - Blackjack Oak / Little Bluestem Wooded Herbaceous Vegetation	G2G3	Matrix	Widespread	18	18
CEGL003898	HAMAMELIS VERNALIS - CORNUS OBLIQUA - HYPERICUM PROLIFICUM SHRUBLAND	Spring Witch-hazel - Pale Dogwood - Shrubby St. Johns-wort Shrubland	G3	Small Patch	Limited	25	25

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
CEGL002024	ANDROPOGON GERARDII - PANICUM VIRGATUM - HELIANTHUS GROSSESERRATUS HERBACEOUS VEGETATION	Big Bluestem - Switchgrass - Sawtooth Sunflower Herbaceous Vegetation	G2G3	Large Patch	Limited	2	2
CEGL002101	QUERCUS PALUSTRIS - (QUERCUS STELLATA) - QUERCUS PAGODA / ISOETES SPP. FOREST	Pin Oak - (Post Oak) - Cherrybark Oak / Quillwort species Forest	G2G3	Small Patch	Limited	20	20
CEGL003889	TOXICODENDRON RADICANS / (POLYMNIA COSSATOTENSIS) SPARSE VEGETATION	Poison-ivy / (Cossatot Leafcup) Sparse Vegetation	G1	Small Patch	Endemic	25	25
CEGL007825	QUERCUS MARILANDICA VAR. ASHEI / SCHIZACHYRIUM SCOPARIUM - ANDROPOGON GERARDII - MONARDA FISTULOSA VAR. STIPITATOGLANDULOSA - STREPTANTHUS MACULATUS / LICHENS NOVACULITE GLADE WOODED HERBACEOUS VEGETATION	Ashes Blackjack Oak / Little Bluestem - Big Bluestem - Ouachita Beebalm - Clasping Jewelflower / Lichens Novaculite Glade Wooded Herbaceous Vegetation	G3	Large Patch	Endemic	18	18
CEGL007822	ACER RUBRUM VAR. TRILOBUM - NYSSA SYLVATICA / RHEXIA MARIANA VAR. INTERIOR FOREST	Carolina Red Maple - Blackgum / Midwestern Meadow-beauty Forest	G2	Small Patch	Limited	25	25
CEGL007824	(QUERCUS STELLATA, ULMUS ALATA) / SCHIZACHYRIUM SCOPARIUM - SYMPHYOTRICHUM PATENS VAR. PATENTISSIMUM WOODED HERBACEOUS VEGETATION	(Post Oak, Winged Elm) / Little Bluestem - Western Clasping Aster Wooded Herbaceous Vegetation	G2	Small Patch	Limited	4	4
CEGL002427	FRAXINUS PENNSYLVANICA - ULMUS AMERICANA - CELTIS LAEVIGATA / ILEX DECIDUA FOREST	Green Ash - American Elm - Sugarberry / Possum-haw Forest	G4G5	Large Patch	Widespread	4	4
CEGL002049	RIVERINE SAND FLATS - BARS SPARSE VEGETATION	Riverine Sand Flats - Bars Sparse Vegetation	G2G3	Small Patch	Widespread	5	5
CEGL004331	PODOSTEMUM CERATOPHYLLUM HERBACEOUS VEGETATION	Riverweed Herbaceous Vegetation	G5	Small Patch	Limited	25	25
CEGL004782	JUNCUS (ACUMINATUS, BRACHYCARPUS) - PANICUM VIRGATUM - BIDENS ARISTOSA - HIBISCUS MOSCHEUTOS SSP. LASIOCARPOS HERBACEOUS VEGETATION	(Sharp-fruit Rush, Short-fruit Rush) - Switchgrass - Bearded Beggarticks - Interior Rose-mallow Herbaceous Vegetation	G2G3	Small Patch	Limited	20	20
CEGL007837	OSMUNDA CINNAMOMEA - RHYNCHOSPORA CAPITELLATA - HEUCHERA PARVIFLORA VAR. PUBERULA - XYRIS JUPICAI HERBACEOUS VEGETATION	Cinnamon Fern - Northern Beaksedge - Ozark Alumroot - Richards Yellow-eyed-grass Herbaceous Vegetation	G1	Small Patch	Limited	1	1

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
CEGL002428	QUERCUS MARILANDICA - (JUNIPERUS VIRGINIANA) / SCHIZACHYRIUM SCOPARIUM - DANTHONIA SPICATA WOODED HERBACEOUS VEGETATION	Blackjack Oak - (Eastern Red-cedar) / Little Bluestem - Poverty Oatgrass Wooded Herbaceous Vegetation	G2	Small Patch	Limited	2	2
CEGL007823	FAGUS GRANDIFOLIA - QUERCUS RUBRA - TILIA AMERICANA VAR. CAROLINIANA / MAGNOLIA TRIPETALA / PODOPHYLLUM PELTATUM FOREST	American Beech - Northern Red Oak - Southern Basswood / Umbrella Magnolia / May-apple Forest	G3G4	Small Patch	Limited	25	25
CEGL002309	SANDSTONE INTERIOR HIGHLANDS TALUS SPARSE VEGETATION	Sandstone Interior Highlands Talus Sparse Vegetation	G4G5	Small Patch	Limited	25	26
CEGL004286	JUSTICIA AMERICANA HERBACEOUS VEGETATION	Common Water-willow Herbaceous Vegetation	G4G5	Small Patch	Limited	25	25
CEGL002433	QUERCUS ALBA / CAREX PENSYLVANICA - CAREX OUACHITANA DWARF FOREST	White Oak / Pennsylvania Sedge - Ouachita Sedge Dwarf Forest	G1	Large Patch	Endemic	2	2
CEGL002394	PINUS ECHINATA - QUERCUS ALBA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - White Oak / Little Bluestem Woodland	G3G4	Matrix	Limited	10	10
CEGL002070	Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest	White Oak - Northern Red Oak - Chinquapin Oak / Redbud Forest	G4G5	Large Patch	Widespread	3	3
CEGL004140	ZIZANIOPSIS MILIACEA ROCKY RIVERBED HERBACEOUS VEGETATION	Southern Wild Rice Rocky Riverbed Herbaceous Vegetation	G2	Small Patch	Endemic	2	2
CEGL002086	BETULA NIGRA - PLATANUS OCCIDENTALIS FOREST	River Birch - Sycamore Forest	G5	Small Patch	Widespread	5	5
CEGL007807	ALNUS SERRULATA - AMORPHA FRUTICOSA SHRUBLAND	Smooth Alder - Tall Indigobush Shrubland	G3	Small Patch	Limited	25	25
Species							
Amphibian							
AAAAD03030	Desmognathus brimleyorum	Ouachita dusky salamander	G4		Endemic	5	7
AAABC02030	HYLA AVIVOCA	BIRD-VOICED TREEFROG	G5			1	1
AAAAD08010	Hemidactylium scutatum	Four-Toed salamander	G5			5	5
AAAAD12130	Plethodon ouachitae	Rich Mountain salamander	G2G3		Endemic	10	16
AAAAD05062	Eurycea multiplicata multiplicata	many-ribbed salamander	G4T4		Endemic	3	5
AAAD12070b	Plethodon sequoyah	Sequoyah slimy salamander	G2Q		Limited	1	1
AAAAD12010	Plethodon caddoensis	Caddo Mountain salamander	G2		Endemic	10	14
AAAAD12330	Plethodon kiamichi	Kiamichi slimy salamander	G2Q		Endemic	1	1
AAAAD12070	Plethodon albagula	western slimy salamander	G4		Limited	5	5
Bird							
ABPBX08010	Helmitheros vermivorus	worm-eating warbler	G5			5	5

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
ABPAE32060	Contopus virens	eastern wood –pewee	G5			5	5
ABPBX11010	Oporornis formosus	Kentucky warbler	G5			5	5
ABNRB02020	Coccyzus americanus	yellow-billed cuckoo	G5			5	5
ABPBXB9070	Icterus spurius	orchard oriole	G5			5	5
ABPBX03190	Dendroica discolor	prairie warbler	G5			5	5
ABNNM08102	STERNA ANTILLARUM ATHALASSOS	INTERIOR LEAST TERN	G4T2Q			1	3
ABNTA07070	Caprimulgus vociferus	whip-poor-will	G5			5	5
ABNKC12040	Accipiter cooperi	Cooper's hawk	G4			5	5
ABPBX45030	Piranga rubra	summer tanager	G5			5	5
ABNTA07010	Caprimulgus carolinensis	chuck-will's-widow	G5			5	5
Crustacean							
ICMAL14110	PROCAMBARUS REIMERI	A CRAYFISH	G1			4	5
ICMAL15060	FALLICAMBARUS HARPI	NCN - a crayfish	G1		Endemic	3	10
ICMAL51020	FAXONELLA BLAIRI	crayfish	G2		Endemic	1	1
ICMAL15020	FALLICAMBARUS JEANAE	A CRAYFISH	G2		Endemic	1	4
ICMAL11530	Orconectes menae	Orconectes menae	G3		Endemic	5	5
Fish							
AFCQC02140	ETHEOSTOMA COLLETTEI	Creole darter	G4		Limited	5	5
AFCJB28720	NOTROPIS PERPALLIDUS	PEPPERED SHINER	G3		Limited	3	7
AFCNB04270	Fundulus blairae	Lowland topminnow	G4			3	4
AFCKA02160	Noturus miurus	Brindled madtom	G5			3	6
AFCQC04150	PERCINA NASUTA	LONGNOSE DARTER	G3		Limited	3	6
AFCQC04370	PERCINA SP. NOV.	OUACHITA DARTER	G2		Endemic	1	1
AFCKA02230	NOTURUS TAYLORI	CADDO MADTOM	G1		Endemic	3	4
AFCQC02620	EtHEOSTOMA RADIOSUM	Orangebelly darter	G4		Limited	3	7
AFCJB28500	Notropis greenei	wedgespot shiner	G5		Limited	2	2
AFCQC02570	ETHEOSTOMA PARVIPINNE	goldstripe darter	G4		Widespread	3	6
AFCQC01010	CRYSTALLARIA ASPRELLA	CRYSTAL DARTER	G3		Limited	3	8
AFCJB28690	NOTROPIS ORTENBURGERI	KIAMICHI SHINER	G3		Endemic	3	6
AFCJB52070	LYTHRURUS SNELSONI	OUACHITA SHINER	G3			3	6
AFCQC02560	ETHEOSTOMA PALLIDIDORSUM	PALEBACK DARTER	G2			3	4
AFCKA02140	NOTURUS LACHNERI	OUACHITA MADTOM	G2		Endemic	3	3
AFCKA02040	NOTURUS ELEUTHERUS	Mountain madtom	G4		Limited	3	7

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
AFCJB28C80	Notropis suttkusi	Rocky Shiner	G3		Limited	3	3
AFCQC04210	PERCINA PANTHERINA	LEOPARD DARTER	G1		Endemic	3	3
AFCQC04230	PERCINA PHOXOCEPHALA	SLENDERHEAD DARTER	G5			3	6
Insect							
IIPLE24430	Isoperla ouachita	a stonefly	G3		Endemic	3	10
IIPLE24560	Isoperla szczytkoi	a stonefly	G1		Endemic	1	1
IIPLE1X060	Neoperla falayah	Neoperla falayah	G3			3	10
IIPLE1X120	Neoperla osage	stonefly	G3		Endemic	3	7
IICOL10010	Arianops sandersoni	Magazine Mountain mold beetle	G1?		Endemic	1	1
IITRI33030	Agapetus medicus	ARKANSAS AGAPETUS CADDISFLY	G1		Endemic	3	4
IICOLE1010	OUACHITYCHUS PARVOCULUS	SMALL-EYED MOLD BEETLE	G1		Endemic	1	1
ICMAL05270	STYGOBROMUS MONTANUS	mountain cave amphipod	G1		Endemic	1	1
IIPLE2N020	Helopicus nalatus	stonefly	G3		Endemic	3	5
IIORT17010	Gryllotalpa major	prairie mole cricket	G3			1	4
Invertebrat							
IIHEM05020	PENTACORA OUACHITA	OUACHITA SHORE BUG	G1		Endemic	1	1
IMGAS98240	STENOTREMA UNCIFERUM	OUACHITA SLITMOUTH	G1		Endemic	2	3
ICMAL05260	STYGOBROMUS ELATUS	ELEVATED SPRING AMPHIPOD	G1G2		Endemic	1	1
IMGAS95100	PATERA CLENCHI	CALICO ROCK OVAL	G1		Endemic	1	1
IICOLH6020	PSEUDACTIUM MAGAZINENSIS	OUACHITA PSEUDACTIUM	G1		Endemic	2	2
IMGAS95210	INFLECTARIUS MAGAZINENSIS	MAGAZINE MOUNTAIN SHAGREEN	G1			1	1
IMGAS98190	STENOTREMA PILSBRYI	RICH MOUNTAIN SLITMOUTH	G2		Endemic	8	9
Mammal							
AMAJB01010	Ursus americanus	black bear	G5		Widespread	1	1
Mussel							
IMBIV39041	QUADRULA CYLINDRICA CYLINDRICA	RABBITSFOOT	G3T3			3	6
IMBIV14100	ELLIPTIO DILATATA	Spike	G5		Limited	3	5
IMBIV07010	ARKANSIA WHEELERI	OUACHITA ROCK POCKETBOOK	G1		Endemic	3	6
IMBIV08010	Cumberlandia Monodonta	spectaclecase pearlymussel	G2G3		Limited	1	1
IMBIV24020	LEPTODEA LEPTODON	SCALESHELL	G1			3	3
IMBIV17060	FUSCONAIA EBENA	Ebonyshell	G4G5			3	6
IMBIV10010	CYPROGENIA ABERTI	WESTERN FANSHELL	G2		Limited	3	4

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
IMBIV47020	VILLOSA ARKANSASENSIS	OUACHITA CREEKSHELL	G2		Endemic	3	9
IMBIV21150	LAMPSILIS POWELLII	ARKANSAS FATMUCKET	G1G2		Endemic	3	8
IMBIV21120	LAMPSILIS ORNATA	SOUTHERN POCKETBOOK	G5			2	2
IMBIV21110	LAMPSILIS ABRUPTA	PINK MUCKET	G2			3	3
IMBIV43030	Toxolasma lividus	purple lilliput	G2			3	6
IMBIV39050	QUADRULA FRAGOSA	WINGED MAPLELEAF	G1			3	3
IMBIV02040	Alasmidonta marginata	Elktoe	G4		Limited	3	4
IMBIV38040	PTYCHOBRANCHUS OCCIDENTALIS	Ouachita kidneyshell	G3		Limited	3	7
IMBIV31010	OBOVARIA JACKSONIANA	SOUTHERN HICKORYNUT	G1G2			3	8
IMBIV35090	PLEUROBEMA CORDATUM	OHIO PIGTOE	G3			1	1
Plant							
PDAST5X0U2	Liatris squarossa var compacta	Ouachita blazing star	G5T3?		Endemic	5	34
PDAPO03080	AMSONIA HUBRICHTII	OUACHITA BLUE STAR	G3		Endemic	5	28
PDAST7G040	Polymnia cossatotensis	heartleaf leafcup	G1			3	3
PMLIL1F030	Veratrum woodii	wood’s false hellbore	G5		Widespread	6	13
PDRUB1T0G	Hedyotis ouachitana	Ouachita hedyotis	G3		Endemic	5	5
PDFAG05350	QUERCUS ACERIFOLIA	MAPLE-LEAVED OAK	G1			4	4
PMCYP03730	CAREX LATEBRACTEATA	WATERFALL'S SEDGE	G3			6	36
PDBRA2G0Z	Streptanthus obtusifolius	a twistflower	G3		Limited	6	6
PMCYP03D30	CAREX STRICTA	UPRIGHT SEDGE	G5			5	7
PDBRA2G0Z0	STREPTANTHUS SQUAMIFORMIS	A TWISTFLOWER	G2		endemic	8	16
PDRUB0N071	Galium arkansanum var pubiflorum	Ouachita bedstraw	G5T2Q			5	8
PDAST8P2L0	SOLIDAGO OUACHITENSIS	OUACHITA MOUNTAIN GOLDENROD	G3		Endemic	6	19
PDFAB080B0	AMORPHA OUACHITENSIS	OUACHITA LEADPLANT	G3Q		Endemic	5	8
PMORC0Q0F0	CYPRIPEDIUM KENTUCKIENSE	SOUTHERN LADY'S-SLIPPER	G3			5	43
PDLAM170BG	Monarda stipitatoglandulosa	Ouachita horsemint	G3			6	6
PMCOM0B0D0	TRADESCANTIA LONGIPES	A SPIDERWORT	G4		Widespread	5	6
PPDRY0A050	DRYOPTERIS CELSA	LOG FERN	G4			5	8
PDHYD08090	HYDROPHYLLUM BROWNEI	BROWNE'S WATERLEAF	G1			5	9
PMPOA18010	CALAMOVILFA ARCUATA	A SANDGRASS	G2			8	12
PMCOM0B0H0	TRADESCANTIA OZARKANA	OZARK SPIDERWORT	G2G3		Limited	5	5
Reptile							
ARACH01130	Eumeces obsoletus	Great Plains skink	G5			1	1

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
ARACH01101	Eumeces septentrionalis obtusirostris	southern prairie skink	G5T5		Limited	1	1

Targets that did NOT meet goals

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
Community							
CEGL007489	PINUS ECHINATA - QUERCUS (ALBA, RUBRA) / VACCINIUM (ARBOREUM, PALLIDUM) / SCHIZACHYRIUM SCOPARIUM - CHASMANTHIUM SESSILIFLORUM - SOLIDAGO ULMIFOLIA FOREST	Shortleaf Pine - (White Oak, Northern Red Oak) / (Farkleberry, Hillside Blueberry) / Little Bluestem - Longleaf Spikegrass - Elmleaf Goldenrod Forest	G3G4	Matrix	Limited	10	9
CEGL004444	PINUS ECHINATA - QUERCUS ALBA - QUERCUS FALCATA FOREST	Shortleaf Pine - White Oak - Southern Red Oak Forest	G3	Large Patch	Limited	18	17
CEGL002263	CAREX CRINITA - OSMUNDA SPP. / SPHAGNUM SPP. HERBACEOUS VEGETATION	Fringed Sedge - Royal Fern species / Peatmoss species Herbaceous Vegetation	G2G3	Small Patch	Limited	25	24
CEGL004796	QUERCUS RUBRA - QUERCUS SHUMARDII FOREST	Northern Red Oak - Shumard Oak Forest	G3	Small Patch	Limited	13	3
CEGL002431	ACER SACCHARINUM - CELTIS LAEVIGATA - CARYA ILLINOINENSIS FOREST	Silver Maple - Sugarberry - Pecan Forest	G3G4	Small Patch	Widespread	5	1
CEGL007984	QUERCUS NIGRA - LIQUIDAMBAR STYRACIFLUA - (PINUS TAEDA) / ILEX OPACA - VACCINIUM FUSCATUM / CAREX DEBILIS TEMPORARILY FLOODED FLOODPLAIN FOREST	Water Oak - Sweetgum - (Loblolly Pine) / American Holly - Black Highbush Blueberry / White-edge Sedge Temporarily Flooded Floodplain Forest	G4	Small Patch	Widespread	25	2
CEGL002096	POPULUS DELTOIDES - ULMUS AMERICANA - CELTIS LAEVIGATA FOREST	Eastern Cottonwood - American Elm - Sugarberry Forest	G3	Large Patch	Widespread	4	3
CEGL003884	QUERCUS STELLATA - QUERCUS MARILANDICA VAR. ASHEI INTERIOR HIGHLANDS SCRUB WOODLAND	Post Oak - Ashes Blackjack Oak Interior Highlands Scrub Woodland	G2	Small Patch	Endemic	4	3
CEGL002212	SCHIZACHYRIUM SCOPARIUM - SORGHASTRUM NUTANS - ANDROPOGON TERNARIUS - COREOPSIS GRANDIFLORA SANDSTONE - SHALE HERBACEOUS VEGETATION	Little Bluestem - Yellow Indiangrass - Splitbeard Bluestem - Bigflower Coreopsis Sandstone - Shale Herbaceous Vegetation	G3	Small Patch	Limited	25	3
CEGL002393	PINUS ECHINATA - QUERCUS STELLATA - QUERCUS MARILANDICA / SCHIZACHYRIUM SCOPARIUM WOODLAND	Shortleaf Pine - Post Oak - Blackjack Oak / Little Bluestem Woodland	G2G3	Matrix	Limited	10	6
CEGL002058	Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest	White Oak - Northern Red Oak - Sugar Maple - Bitternut Hickory / Northern Spicebush Forest	G3	Small Patch	Limited	25	24

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
CEGL004543	QUERCUS FALCATA - CARYA ALBA - CARYA OVATA FOREST	Southern Red Oak - Mockernut Hickory - Shagbark Hickory Forest	G3	Large Patch	Limited	18	3
CEGL007818	QUERCUS ALBA - CARYA ALBA / OSTRYA VIRGINIANA / CAREX PENSYLVANICA - SCHIZACHYRIUM SCOPARIUM FOREST	White Oak - Mockernut Hickory / Eastern Hop-hornbeam / Pennsylvania Sedge - Little Bluestem Forest	G3	Large Patch	Limited	18	16
CEGL002102	QUERCUS PHELLOS - (QUERCUS LYRATA) / CAREX SPP. - LEERSIA SPP. FOREST	Willow Oak - (Overcup Oak) / Sedge species - Cutgrass species Forest	G4G5	Large Patch	Limited	4	1
CEGL002421	TAXODIUM DISTICHUM - (NYSSA AQUATICA) / FORESTIERA ACUMINATA - PLANERA AQUATICA FOREST	Bald-cypress - (Water Tupelo) / Swamp-privet - Planertree Forest	G3G5	Large Patch	Widespread	4	1
CEGL007915	QUERCUS PHELLOS - QUERCUS NIGRA MISSISSIPPI RIVER ALLUVIAL PLAIN FOREST	Willow Oak - Water Oak Mississippi River Alluvial Plain Forest	G4G5	Large Patch	Widespread	4	1
CEGL007815	Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland	Shortleaf Pine / Little Bluestem - Elmleaf Goldenrod - Red-purple Beebalm - Pale Purple Coneflower Woodland	G1G2	Matrix	Limited	8	6
Species							
Amphibian							
AAAAD12160	Plethodon serratus	southern redback salamander	G5		Limited	5	3
AAAAD12060	Plethodon fourchensis	Fourche Mountain salamander	G2		Endemic	10	2
AAAAA01010	Ambystoma annulatum	ringed salamander	G4			5	3
Bird							
ABPBX03240	Dendroica cerulea	Cerulean warbler	G4			5	2
ABPBX91050	AIMOPHILA AESTIVALIS	BACHMANS SPARROW	G3			8	3
ABPBX03020	Dendroica pensylvanica	chestnut-sided warbler	G5			5	1
ABPBXA0030	Ammodramus henslowii	Henslow’s sparrow	G3G4			5	1
ABPBX09010	Limnothlypis swainsonii	Swainson’s warbler	G4			5	1
ABNYF07060	PICOIDES BOREALIS	RED-COCKADED WOODPECKER	G3		Widespread	2	1
ABPBX03100	Dendroica virens	black-throated green warbler	G5			5	1
Crustacean							

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
ICMAL15040	FALLICAMBARUS STRAWNI	A CRAYFISH	G1G2		Endemic	6	5
ICMAL14810	PROCAMBARUS PARASIMULANS	A CRAYFISH	G4			5	3
Insect							
IILEPJ6010	Speyeria diana	Diana fritillary	G3			5	4
IILEYC0310	Papaipema eryngii	rattlesnake master borer moth	G1G2			4	1
IICOL42010	NICROPHORUS AMERICANUS	AMERICAN BURYING BEETLE	G2G3			2	1
Mammal							
AMAJF05011	Spilogale putorius interrupta	plains spotted skunk	G5T3T4			5	4
Plant							
PMORC1M040	Liparis loeselii	yellow twayblade	G5			5	1
PMCYP036Z0	CAREX LAEVIVAGINATA	SMOOTH-SHEATH SEDGE	G5			5	2
PDBRA16050	Erysimum capitatum	western wallflower	G5			5	1
PPDRY0U020	WOODSIA SCOPULINA VAR. APPALACHIANA	APPALACHIAN WOODSIA	G4T4			5	1
PDRAN0B140	Delphinium newtonianum	Moore’s larkspur	G3			5	3
PDRAN0M020	Thalictrum arkansanum	Arkansas meadow-rue	G2		Limited	4	3
PDAST9S090	Vernonia fasciculata	prairie ironweed	G5		Widespread	5	2
PDSAX0P060	PARNASSIA GRANDIFOLIA	LARGE-FLOWERED GRASS-OF-PARNASSUS	G3			6	1
PPHYM020K0	TRICHOMANES PETERSII	DWARF FILMY-FERN	G4G5		Widespread	5	2
PMPOA22090	DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	G5			5	4
PMCYP03ET0	CAREX WILLDENOWII	A SEDGE	G5			5	1
PDCAR0U1G0	SILENE REGIA	ROYAL CATCHFLY	G3			6	1
PDAST9S0E0	Vernonia lettermanii	Letterman’s ironweed	G3		Limited	6	5
PDBRA11060	DRABA APRICA	OPEN-GROUND WHITLOW-GRASS	G3			5	4

ElCode	Scientific Name	Common Name	GRank	Spatial Pattern	Distribution	Goal	Count
PDVAL040A0	Valerianella palmeri	Palmer’s corn-salad	G3		Widespread	6	5
PMCYP03EK0	CAREX VIRESCENS	RIBBED SEDGE	G5			5	1
PDAST9R0H0	Verbesina walteri	rayless crown-beard	G3			5	1
PDAST2E1U0	Cirsium muticum	swamp thistle	G5			5	2
PMLIL200Q1	TRILLIUM PUSILLUM VAR. OZARKANUM	OZARK LEAST TRILLIUM	G3T3		Limited	8	3
PPASP02100	ASPLENIUM PINNATIFIDUM	LOBED SPLEENWORT	G4			5	2
PMCYP0Q170	SCIRPUS POLYPHYLLUS	LEAFY BULRUSH	G5			5	3
PDVAL04090	VALERIANELLA OZARKANA	A CORN-SALAD	G3		Widesrpead	6	1
PMCYP03260	CAREX BROMOIDES	A SEDGE	G5			5	4
PPDEN01050	DENNSTAEDTIA PUNCTILOBULA	EASTERN HAY-SCENTED FERN	G5			5	1
PDBRA0K1D0	CARDAMINE DISSECTA	A TOOTHWORT	G4			5	3
Reptile							
ARAAD08022	Terrapene ornata ornata	ornate box turtle	G5T5		Limited	5	3

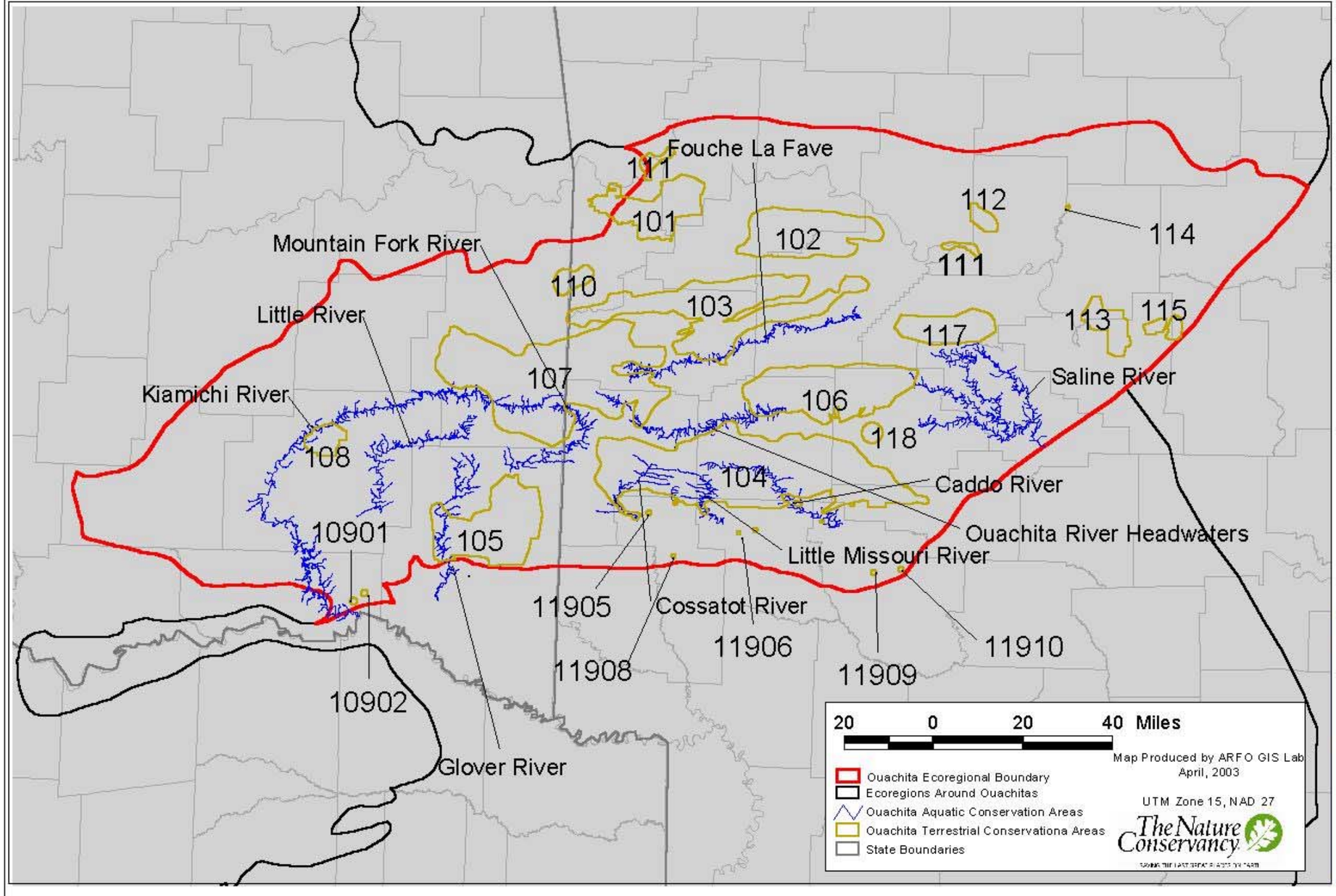
APPENDIX C

Maps

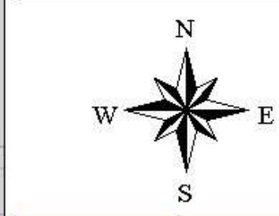
Appendix C Table of Contents

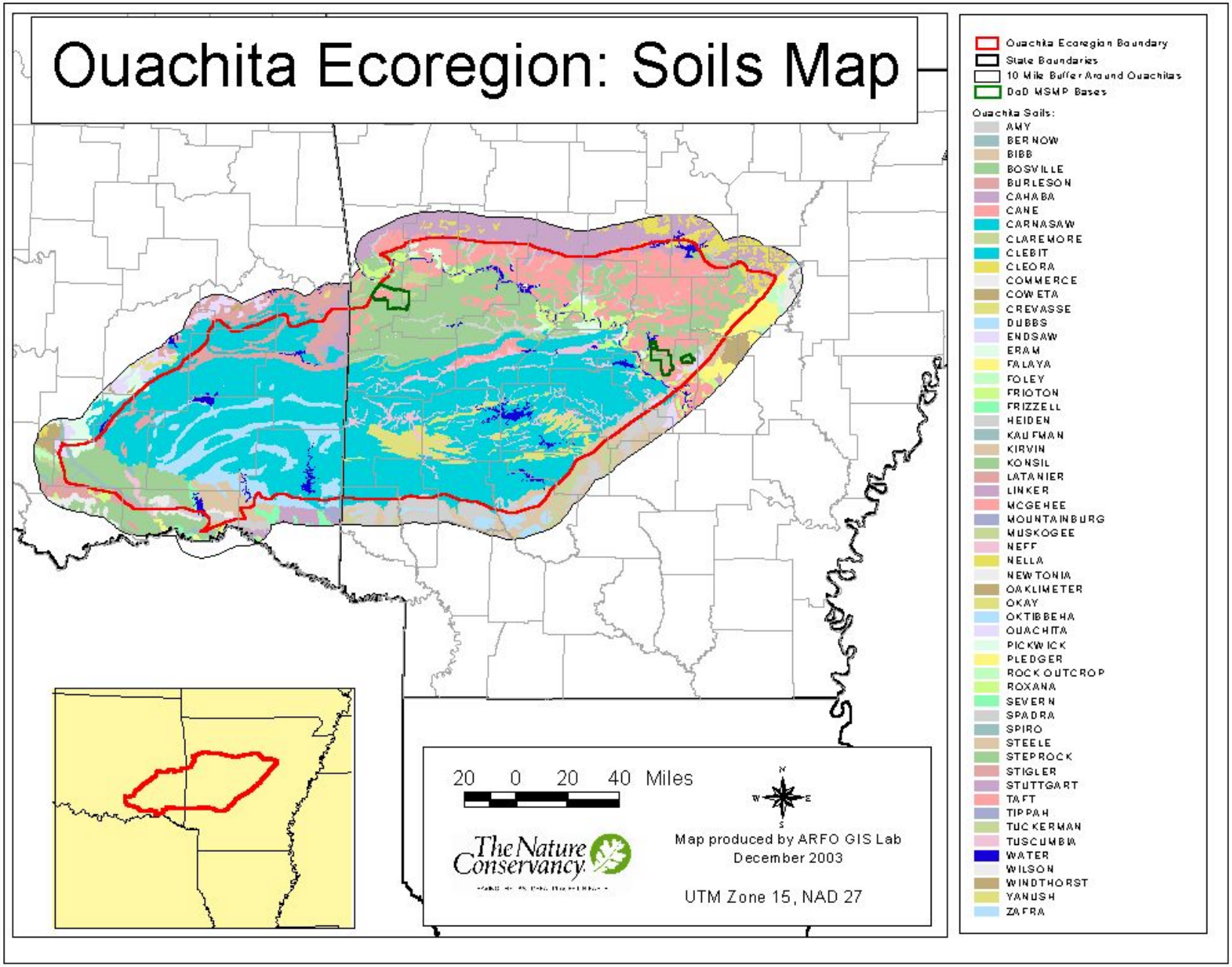
Maps

Ouachita Ecoregion: Portfolio of Conservation Areas

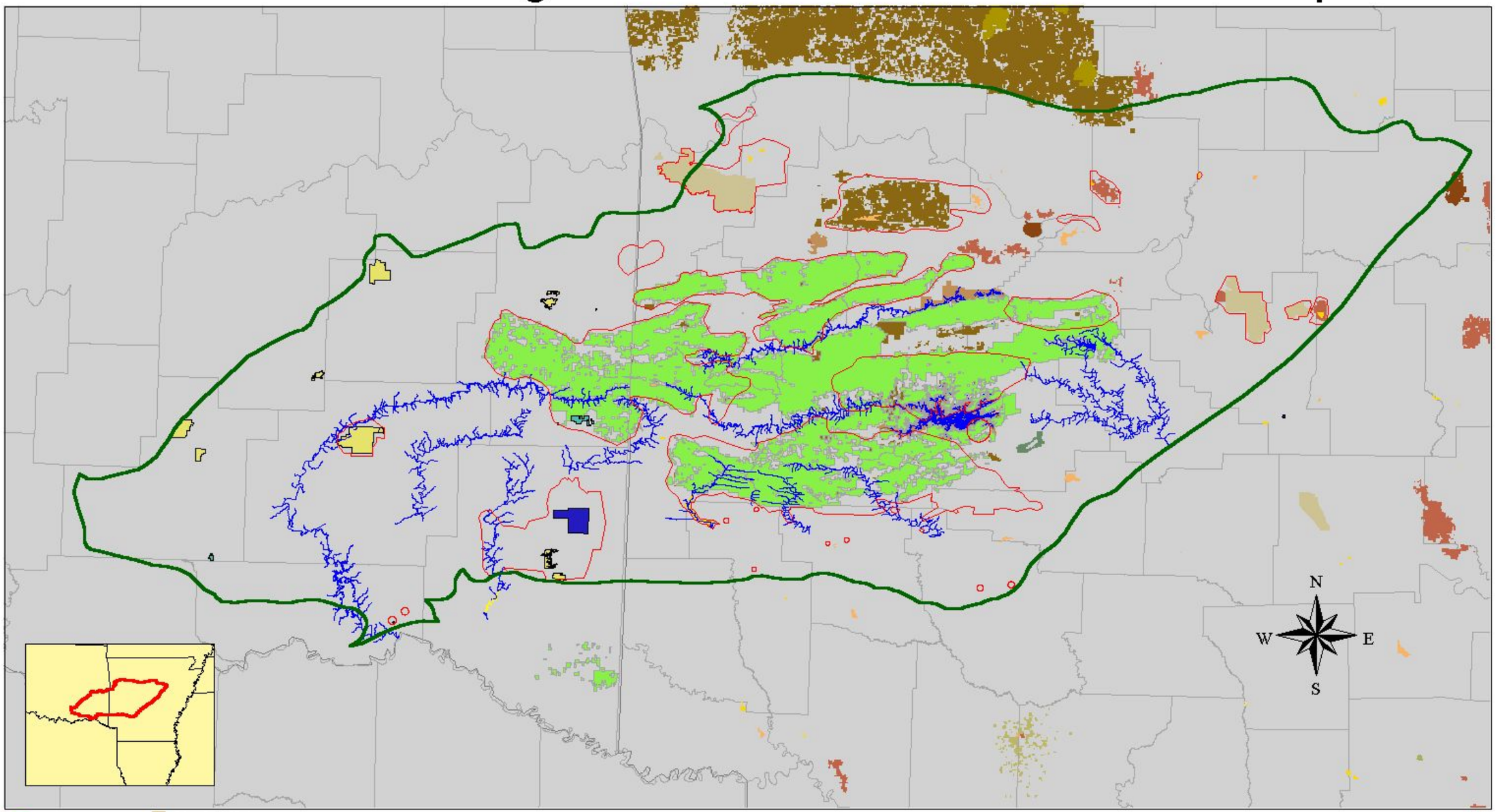


Site #	Site Name
106	North Shore Glades
116	Holland Bottoms
114	Cove Creek
112	Goose Pond
11901	Crayfish Complex 01
11902	Crayfish Complex 02
11903	Crayfish Complex 03
11904	Crayfish Complex 04
11905	Crayfish Complex 05
11906	Crayfish Complex 06
119	Crayfish Complex 07
11908	Crayfish Complex 08
107	Rich Mountain
110	Sugarloaf Mountain
115	Little Rock Air Force Base
118	Bradley Mountain
10901	Meadowrue Seep 01
10902	Meadowrue Seep 02
103	Pine Bluestem Restoration
117	Flatside-Forked Mountain
113	Bell's Slough / Camp Robinson
11909	Crayfish Complex 09
11910	Crayfish Complex 10
104	Novaculite Uplift
108	Pushmataha
111	Least Terns Site 01
101	Cherokee Prairies
102	Magazine Mountian
111	Least Terns Site 02
105	Beaver Bend Hills




Ouachita Ecoregion: Soils Map
Ouachita Ecoregion Boundary
State Boundaries
10 Mile Buffer Around Ouachitas
DoD MSMP Bases
Ouachita Soils:
AMY
BERNOW
BIBB
BOSVILLE
BURLESON
CAHABA
CANE
CARNASAW
CLAREMORE
CLEBIT
CLEORA
COMMERCE
COWETA
CREVASSE
DUBBS
ENDSAW
ERAM
FALAYA
FOLEY
FRIOTON
FRIZZELL
HEIDEN
KAUFMAN
KIRVIN
KONSIL
LATANIER
LINKER
MCGEHEE
MOUNTAINBURG
MUSKOGEE
NEFF
NELLA
NEWTONIA
OAKLIMETER
OKAY
OKTIBBEHA
OUACHITA
PICKWICK
PLEDGER
ROCK OUTCROP
ROXANA
SEVERN
SPADRA
SPIRO
STEELE
STEPROCK
STIGLER
STUTTGART
TAFT
TIPPAH
TUCKERMAN
TUSCUMBIA
WATER
WILSON
WINDTHORST
YANUSH
ZAFRA
20 0 20 40 Miles
N
W
E
S
The Nature Conservancy
Map produced by ARFO GIS Lab
December 2003
UTM Zone 15, NAD 27

Ouachita Ecoregion: Federal and State Ownership



Ouachita Ecoregional Boundary
Terrestial Conservation Areas
Aquatic Conservation Areas
Indian Reservation
Ouachita National Forest
Ozark National Forest
OK State Ownership
AR Game and Fish Commission
AR Natural Heritage Commission
AR Forestry Commission
AR State Parks
Dept. of Defense
US Army Corps of Engineers
US Fish and Wildlife Service
US Forest Service Wilderness Areas
University Lands
The Nature Conservancy (AR)
The Nature Conservancy (OK)

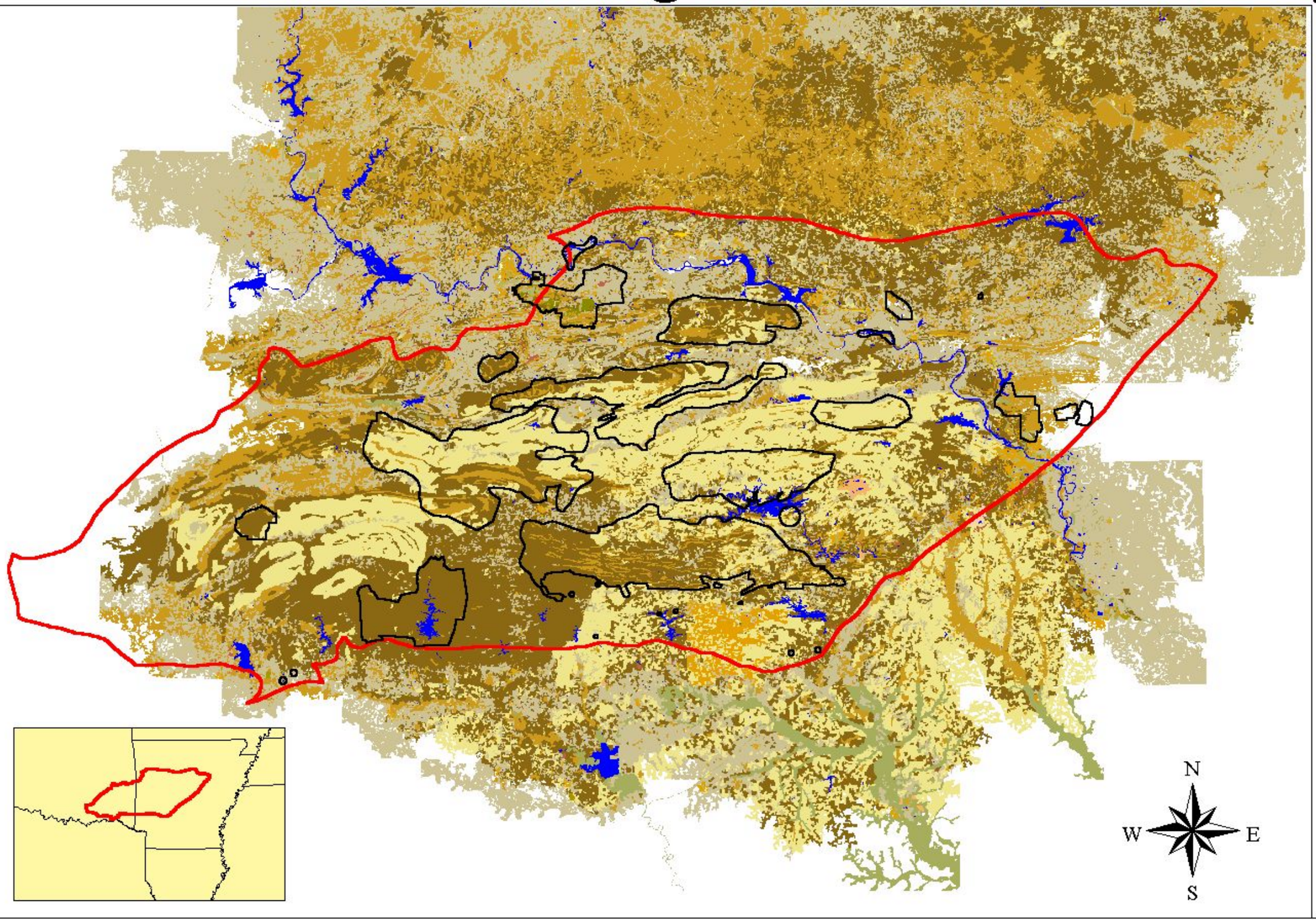
25 0 25 50 75 Miles

Map produced by the ARFO GIS Lab
April 2003

UTM Zone 15, NAD 27

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

Ouachita Ecoregion: Landcover Types



N
W E
S

Ouachita Conservation Areas
Ouachita Ecoregion
BARE EXPOSED ROCK
COMMERCIAL AND SERVICES
CONFINED FEEDING OPS
CROPLAND AND PASTURE
DECIDUOUS FOREST
EVERGREEN FOREST
FORESTED WETLAND
HERBACEOUS RANGELAND
INDUST & COMMERCIAL
INDUSTRIAL
LAKES
MIXED FOREST
MIXED RANGELAND
MIXED URBAN
NONFORESTED WETLAND
ORC
ORCH,GROV,VNYRD,NURS,ORN
OTHER AGRICULTURAL LAND
OTHER URBAN OR BUILT-UP
RESERVOIRS
RESIDENTIAL
SANDY AREA
SHRUB & BRUSH RANGELAND
STRIP MINES
TRANSITIONAL
TRANSITIONAL/UTILITY
TRANSITIONAL AREAS

10 0 10 20 Miles

Map Produced by ARFO
GIS Lab, December 2003

UTM Zone 15
NAD 27

The Nature Conservancy
SAVING THE LAST GREAT PLACES ON EARTH

APPENDIX D

Terrestrial Community Descriptions for Ouachita Ecoregion

CES202.052 OZARK-OUACHITA FEN

Division 202,

Spatial Scale & Pattern: Small Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Wetland
Concept Summary: This fen community type is found in the Ozarks region of the United States. Stands occur on the sideslopes of hills in narrow valleys, bases of bluffs, rock ledges, and terraces of streams and rivers, where the soil or substrate is saturated by calcareous groundwater seepage. Soils are moist to wet, mucky peat or mineral, with pH above 6.5, and vary from shallow (0-40 cm) to moderately deep (40-100 cm), depending on natural disturbance and slope. The parent material is a mixture of gravel and dolomite with fragments of deeply weathered bedrock present, or colluvium over bedrock. The bedrock strata are exposed, especially in hanging fens where the slope is greater than 35 degrees. Hydrophytic plants dominate the fen, which varies from mixed grass or sedge fen with complex zonation to more tallgrass prairie species mixed with calciphiles. Fires are possible in some of the larger prairie fens.

Comments: Some fens are typically associated with riparian vegetation. Seeps in the Ozarks are typically acidic to circumneutral and differ substantially in floristics and groundwater chemistry from these alkaline fens.

DISTRIBUTION

Range: This fen community type is found in the Ozarks region of the United States.
Ecological Divisions:

CONCEPT SOURCES

Last updated: 19 May 2003 **Stakeholders:**
Concept Author: D. Faber-Langendoen **LeadResp:** MCS

CES202.692 CENTRAL INTERIOR HIGHLANDS DRY ACIDIC GLADE AND BARRENS

Division 202, Forest and Woodland

Spatial Scale & Pattern: Small Patch **Classification Confidence:** high
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Woody-Herbaceous, Sedimentary Rock, Igneous Rock, Acidic Soil

Concept Summary: This system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions. It occurs along moderate to steep slopes or valley walls of rivers along most aspects. Parent material includes chert, igneous and/or sandstone bedrock with well- to excessively well-drained, shallow soils interspersed with rock and boulders. These soils are typically dry during the summer and autumn, becoming saturated during the spring and winter. Grasses such as *Schizachyrium scoparium* and *Sorghastrum nutans* dominate this system with stunted oak species (*Quercus stellata, Quercus marilandica*) and shrub species such as *Vaccinium* spp. occurring on variable depth soils. This system also includes dry *Quercus stellata*-dominated barrens on Cretaceous-aged gravel substrates on the northern fringes of the Upper East Gulf Coastal Plain Ecoregion in southern Illinois and western Kentucky. This system is influenced by drought and infrequent to occasional fires. Prescribed fires help manage this system by maintaining an open glade structure.

DISTRIBUTION

Range: This system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions.
Ecological Divisions: 202, 203
TNC Ecoregions: 36:P, 38:C, 39:C, 43:C, 44:C
Subnations/Nations: AR:c, IL:c, IN:c, KY:c, MO:c, OK:c, TN:?

CONCEPT

Associations:

- (Quercus stellata, Ulmus alata) / Schizachyrium scoparium - Symphyotrichum patens var. patentissimum Wooded Herbaceous Vegetation (G2?, Ouachita Basic Shale/Sandstone Glade, CEGL007824)
- Asplenium montanum - Heuchera parviflora var. parviflora - Silene rotundifolia Sparse Vegetation (G3G4, Cumberland Plateau Sandstone Cliff (Dry Type), CEGL004392)
- Pinus virginiana - Pinus (rigida, echinata) - (Quercus prinus) / Vaccinium pallidum Forest (G4?, Appalachian Low-Elevation Mixed Pine / Hillside Blueberry Forest, CEGL007119)
- Quercus marilandica - Juniperus virginiana var. virginiana / Schizachyrium scoparium - Hypericum gentianoides Wooded Herbaceous Vegetation (G3?, Shawnee Sandstone Glade, CEGL004062)

- Quercus marilandica / Vaccinium arboreum / Danthonia spicata Scrub Woodland (G3G4, Blackjack Oak Xeric Scrub, CEGL002425)
- Quercus prinus / Cornus florida - Amelanchier arborea / Pityopsis graminifolia var. latifolia Woodland (G2?, CEGL003706)
- Quercus prinus / Danthonia spicata - Silene caroliniana Woodland (G2?, Kentucky Knobs Shale Barren, CEGL004439)
- Quercus stellata - (Pinus echinata) / Vaccinium arboreum / Andropogon gerardii - Symphyotrichum patens var. patentissimum Wooded Herbaceous Vegetation (G2?, Ozark Basic Sandstone Glade, CEGL007814)
- Quercus stellata - Quercus marilandica - Quercus velutina - Carya texana / Schizachyrium scoparium Woodland (G2G3, Ozark - Ouachita Post Oak - Blackjack Oak / Little Bluestem Woodland, CEGL002149)
- Quercus stellata - Quercus marilandica / Schizachyrium scoparium - Silphium terebinthinaceum Wooded Herbaceous Vegetation (G1, Post Oak Chert Barrens, CEGL005134)
- Schizachyrium scoparium - Aristida dichotoma - Croton willdenowii / Lichens Wooded Herbaceous Vegetation (G3, Ozark Sandstone Glade, CEGL002242)
- Schizachyrium scoparium - Sedum nuttallianum - Selaginella rupestris - Portulaca pilosa / Lichens Wooded Herbaceous Vegetation (G1G2, Ozark Chert Glade, CEGL002244)
- Schizachyrium scoparium - Sorghastrum nutans - Andropogon ternarius - Coreopsis grandiflora Sandstone - Shale Herbaceous Vegetation (G3, Midwest Sandstone / Shale Prairie, CEGL002212)
- Schizachyrium scoparium - Sorghastrum nutans - Coreopsis lanceolata - Croton willdenowii Wooded Herbaceous Vegetation (G4?, Ozark Igneous Glade, CEGL002243)
- Schizachyrium scoparium - Sorghastrum nutans - Danthonia spicata - Silene regia Chert Herbaceous Vegetation (G3, Midwest Chert Prairie, CEGL002211)

SOURCES

References: Nelson 1985
Last updated: 07 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard and T. Nigh **LeadResp:** MCS

CES202.696 NORTH-CENTRAL INTERIOR MAPLE-BASSWOOD FOREST

Division 202, Forest and Woodland

Spatial Scale & Pattern: Large Patch **Classification Confidence:** high
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Side Slope, Toeslope/Valley Bottom, Mesotrophic Soil, Deep Soil, Loam Soil Texture

Concept Summary: This system is primarily found in the prairie forest border region of Minnesota, Wisconsin and Iowa, but can range north into northern Minnesota and Wisconsin and south to southern Illinois and eastern Kansas. This forest system is distinguished by underlying mesic soils and the predominance of mesic deciduous species forming a moderately dense to dense canopy. Examples of this system occur on valley slopes and bottoms often with northern or eastern aspects. Soils are moderately well-drained, fertile, and moderate to deep loams that have developed from glacial till or loess parent material. *Acer saccharum* typifies this system with *Tilia americana, Quercus rubra*, and *Ostrya virginiana* often occurring as common associates. The dense canopy allows for a rich mixture of shrub and herbaceous species in the understory. Examples of common herbaceous species include *Anemone quinquefolia, Adiantum pedatum, Arisaema triphyllum*, and *Sanicula* spp. Dynamic processes such as wind and fire can impact this system over long return cycles, however, the most immediate threats to remaining examples of this system are grazing and conversion to agriculture.

DISTRIBUTION

Range: This system ranges from Minnesota and Wisconsin south to eastern Kansas and Nebraska and southeast to Illinois and possibly western Indiana.
Ecological Divisions: 202, 205
TNC Ecoregions: 36:C, 37:?, 38:?, 45:C, 46:C, 47:C, 48:C
Subnations/Nations: IA:c, IL:c, IN:p, KS:c, MI:p, MN:c, MO:c, NE:c, WI:c

CONCEPT

Associations:
- Acer saccharum - Acer nigrum - Tilia americana - Quercus rubra / Ostrya virginiana Forest (G3G4, Central Maple - Basswood Forest, CEGL002061)
- Acer saccharum - Tilia americana / Ostrya virginiana - Carpinus caroliniana Forest (G3G4, North-central Maple - Basswood Forest, CEGL002062)
- Quercus rubra - (Acer saccharum, Quercus alba) Forest (G?Q, Red Oak - Sugar Maple - Elm Forest, CEGL005017)
- Quercus rubra - Acer saccharum Forest (G4G5, Northern Red Oak - Sugar Maple Forest, CEGL002461)

Environment: This system is found primarily on mesic soils that are moderately well-drained and fertile. These are mostly moderate to deep loams that have developed from glacial till or loess. This system occurs primarily on valley slopes and bottoms often with northern or eastern aspects.

Vegetation: Mesic deciduous trees form a moderately dense to dense canopy in examples of this system. *Acer saccharum* is the most common tree species forming the majority of the canopy and sapling layers. Common associates include *Tilia americana, Quercus rubra*, and *Ostrya virginiana*. The understory contains a rich mixture of shrub and herbaceous species such as *Anemone quinquefolia, Adiantum pedatum, Arisaema triphyllum*, and *Sanicula* spp.

Dynamics: Wind and fire can impact this system over long return intervals. Small gap development and replacement due to tree death is more frequent than more catastrophic fire or wind. The greatest impacts on this system are due to conversion to agriculture, logging and grazing.

SOURCES

References: Barbour and Billings 1988
Last updated: 07 Mar 2003 **Stakeholders:** MCS
Concept Author: S. Menard and K. Kindscher **LeadResp:** MCS

CES202.306 OUACHITA MONTANE OAK FOREST

Division 202, Forest and Woodland

Spatial Scale & Pattern: Large Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Diagnostic Classifiers: Montane, Forest and Woodland (Treed), Broad-Leaved Tree

Concept Summary: This system represents hardwood forests of the highest elevations of the Ouachita Mountains, including Mount Magazine. Vegetation consists of either forests or open woodlands dominated by *Quercus alba* or *Quercus stellata*. Canopy trees are often stunted due to the effects of ice, wind and cold conditions, in combination with fog, shallow soils over rock, and periodic severe drought. Some stands form almost impenetrable thickets.

DISTRIBUTION

Ecological Divisions: 202
TNC Ecoregions: 39:C
Subnations/Nations: AR:c

CONCEPT

Associations:

- Quercus alba / Carex pensylvanica - Carex ouachitana Dwarf Forest (H, G1, Ouachita Mountains Dwarf White Oak Forest, CEGL002433)
- Quercus stellata - Quercus marilandica var. ashei Interior Highlands Scrub Woodland (H, G2, Post Oak Interior Highlands Scrub Woodland, CEGL003884)

SOURCES

Last updated: 04 Dec 2002 **Stakeholders:** SCS
Concept Author: T. Foti and R. Evans **LeadResp:** SCS

CES202.707 OZARK-OUACHITA DRY OAK WOODLAND

Division 202, Forest and Woodland

Spatial Scale & Pattern: Small Patch **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Woody-Herbaceous

Concept Summary: This system occurs in the Ozark and Ouachita Highlands and far western portions of the Interior Low Plateau regions along gentle to steep slopes and over bluff escarpments with southerly to westerly aspects. Parent material can range from calcareous to acidic with very shallow, well- to excessively well-drained soils, sometimes with a fragipan that causes "xero-hydric" moisture conditions. This system was historically woodland in structure, composition, and process but now includes areas of more closed canopy. Oak species such as *Quercus stellata, Quercus marilandica*, and *Quercus coccinea* dominate this system with an understory of grassland species such as *Schizachyrium scoparium* and shrub species such as *Vaccinium arboreum*. Drought stress is the major dynamic influencing and maintaining this system. On flatwoods with fragipans, *Quercus stellata* is the major dominant.

Comments: Dry-mesic to mesic oaks were separated from dry oak per the suggestion of Missouri [see Ozark-Ouachita Dry-Mesic Oak Forest (CES202.708)]. This separation may need to be further reviewed.

DISTRIBUTION

Range: This system occurs in the Western Interior Highlands of the Ozark, Ouachita, and western Interior Low Plateau regions.
Ecological Divisions: 202
TNC Ecoregions: 38:C, 39:C, 44:C
Subnations/Nations: AR:c, IL:c, MO:c, OK:p

CONCEPT

Associations:
- Quercus alba - Quercus stellata - Quercus velutina / Schizachyrium scoparium Woodland (G2G3, White Oak - Post Oak / Bluestem Ozark Woodland, CEGL002150)
- Quercus falcata - Quercus alba - Quercus stellata - Quercus velutina Forest (G3G5, Southern Red Oak - Mixed Oak Forest, CEGL005018)
- Quercus marilandica / Vaccinium arboreum / Danthonia spicata Scrub Woodland (G3G4, Blackjack Oak Xeric Scrub, CEGL002425)
- Quercus stellata - Quercus marilandica - Carya (glabra, texana) / Vaccinium arboreum Forest (G4, Midwest Post Oak - Blackjack Oak Forest, CEGL002075)
- Quercus stellata - Quercus marilandica - Quercus velutina - Carya texana / Schizachyrium scoparium Woodland (G2G3, Ozark - Ouachita Post Oak - Blackjack Oak / Little Bluestem Woodland, CEGL002149)
- Quercus stellata / Cinna arundinacea Flatwoods Forest (G2G3, Post Oak Flatwoods, CEGL002405)
- Quercus velutina - Carya (alba, glabra) / Vaccinium arboreum Forest (G2G3Q, Highland Rim Sandy Terrace Black Oak - Sparkleberry Forest, CEGL004987)
- Quercus velutina - Quercus coccinea - Carya texana Ozark Forest (G?, Ozark Black Oak - Scarlet Oak Forest, CEGL002399)

SOURCES

References: Nelson 1985
Last updated: 31 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard and T. Nigh **LeadResp:** MCS

CES202.708 OZARK-OUACHITA DRY-MESIC OAK FOREST

Division 202, Forest and Woodland

Spatial Scale & Pattern: Matrix **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Quercus - Carya

Concept Summary: This system is found throughout the Ozark and Ouachita Highlands ranging to the western edge of the Interior Low Plateau. It is the matrix system of this region and occurs on dry-mesic to mesic gentle to moderately steep slopes. Soils are typically moderately to well-drained and more fertile than those associated with oak woodlands. A closed canopy of oak species (*Quercus rubra* and *Quercus alba*) often associated with hickory species (*Carya* spp.) typify this system. *Acer saccharum* (or *Acer barbatum* to the south) may occur on more mesic examples of this system. Wind, drought, lightening, and occasional fires can influence this system.

Comments: Dry-mesic to mesic oaks were separated from dry oak (Ozark-Ouachita Dry Oak Woodland (CES202.707)) per the suggestion of Missouri. This separation may need to be further reviewed. Likewise, the distribution of this system versus the one farther north needs to be reviewed. Currently the glacial line separates the two systems.

DISTRIBUTION

Range: This system is found throughout the Ozark and Ouachita Highlands, reaching to the western Interior Low Plateau.
Ecological Divisions: 202
TNC Ecoregions: 37:P, 38:C, 39:C, 44:C, 49:P
Subnations/Nations: AR:c, IL:c, IN:c, KS:?, MO:c, OK:c

CONCEPT

Associations:
- Acer (barbatum, saccharum) - Juglans nigra - Fraxinus americana / Hybanthus concolor Forest (G2, Mesic Mixed Mount Magazine Forest, CEGL007811)

- Quercus alba - Carya alba / Ostrya virginiana / Carex pensylvanica - Schizachyrium scoparium Forest (G3Q, Magazine Mountain White Oak Forest, CEGL007818)
- Quercus alba - Fagus grandifolia Western Allegheny Plateau Forest (G?, Western Allegheny Oak - Beech Forest, CEGL006144)
- Quercus alba - Quercus rubra - Acer saccharum - Carya cordiformis / Lindera benzoin Forest (G3?, White Oak - Red Oak - Sugar Maple Mesic Forest, CEGL002058)
- Quercus alba - Quercus rubra - Carya (alba, ovata) / Cornus florida Acid Forest (G3, White Oak - Red Oak Dry-Mesic Acid Forest, CEGL002067)
- Quercus alba - Quercus rubra - Quercus muehlenbergii / Cercis canadensis Forest (G4G5, White Oak - Mixed Oak Dry-Mesic Alkaline Forest, CEGL002070)
- Quercus alba / Cornus florida Unglaciated Forest (G?, White Oak / Dogwood Dry-Mesic Forest, CEGL002066)
- Quercus falcata - Carya alba - Carya ovata Forest (G3Q, Eastern Oklahoma Dry-Mesic Oak - Hickory Forest, CEGL004543)
- Quercus prinus / Smilax spp. Forest (G3G5, Chestnut Oak Forest, CEGL005022)
- Quercus rubra - Acer saccharum - Liriodendron tulipifera Forest (G?, High Allegheny Rich Red Oak - Sugar Maple Forest, CEGL006125)
- Quercus rubra - Quercus shumardii Forest (G3?, Oklahoma Mesic Oak Forest, CEGL004796)
- Quercus rubra - Tsuga canadensis - Liriodendron tulipifera / Hamamelis virginiana Forest (G?, Hemlock / White Pine - Red Oak - Mixed Hardwood Forest, CEGL006566)
- Quercus velutina - Quercus alba - Carya (glabra, ovata) Forest (G4?, Black Oak - White Oak - Hickory Forest, CEGL002076)

SOURCES

References: Nelson 1985
Last updated: 31 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard **LeadResp:** MCS

CES202.043 OZARK-OUACHITA MESIC HARDWOOD FOREST

Division 202, Forest and Woodland

Spatial Scale & Pattern: Small Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Diagnostic Classifiers: Forest and Woodland (Treed)

Non-Diagnostic Classifiers: Lowland [Foothill], Lowland [Lowland], Toeslope/Valley Bottom

Concept Summary: This system is found on toeslopes and valley bottoms within the Ozark and Ouachita regions, as well as on north slopes. In the Ozarks, *Quercus rubra* increases in abundance compared to dry-mesic habitats, and *Acer saccharum* is sometimes a leading dominant. On more alkaline moist soils *Quercus muehlenbergii, Tilia americana*, and *Cercis canadensis* may be common. In the Boston Mountains, mesic forests may also be common on protected slopes and terraces next to streams. Here *Fagus grandifolia* may be the leading dominant, with codominants of *Acer saccharum, Liquidambar styraciflua, Tilia americana, Magnolia acuminata*, and others. Similar habitats occur in the western Ouachita Mountains.

DISTRIBUTION

Range: This system is found within the Ozarks and Ouachita Mountains of Missouri, Arkansas, and possibly Oklahoma.
Ecological Divisions: 202
TNC Ecoregions: 38:C, 39:C
Subnations/Nations: AR:c, MO:c, OK:?

CONCEPT

Associations:
- Acer (saccharum, barbatum) - Quercus rubra - Carya cordiformis / Asimina triloba Forest (G3, Sugar Maple - Oak - Bitternut Hickory Mesic Bottomland Forest, CEGL002060)
- Fagus grandifolia - Acer saccharum - Liriodendron tulipifera Unglaciated Forest (G4?, Beech - Maple Unglaciated Forest, CEGL002411)
- Fagus grandifolia - Quercus rubra - Tilia americana var. caroliniana / Magnolia tripetala / Podophyllum peltatum Forest (G3G4, Ozark Rich Beech - Mixed Hardwood Forest, CEGL007823)
- Quercus muehlenbergii - Acer saccharum Forest (G2G4, CEGL004662)

SOURCES

References: Barnes 1991, Nelson 1985
Last updated: 31 Mar 2003 **Stakeholders:** SCS, MCS
Concept Author: R. Evans, D. Faber-Langendoen **LeadResp:** SCS

CES202.313 OZARK-OUACHITA SHORTLEAF PINE-OAK FOREST AND WOODLAND

Division 202, Forest and Woodland

Spatial Scale & Pattern: Matrix
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Diagnostic Classifiers: Forest and Woodland (Treed), Short Disturbance Interval, Needle-Leaved Tree

Concept Summary: This system represents forests and woodlands of the Ouachita and Ozark mountains region of Arkansas, adjacent Oklahoma, and southern Missouri in which *Pinus echinata* is an important or dominant component. Although examples of this system occur throughout this region, there is local variation in the extent to which they were present. For example, this system was historically prominent only in the southeastern part of the Ozark Highlands where sandstone derived soils were common (USFS 1999); being limited from other areas by inadequate winter precipitation, and non-conducive soils. In contrast, pine was "virtually ubiquitous in the historical forests of the Ouachitas" (USFS 1999). In nearly all cases (at least in the Ouachitas), *Pinus echinata* occurs with a variable mixture of hardwood species. The exact composition of the hardwoods is much more closely related to aspect and topographic factors than is the pine component (Dale and Ware 1999). In some examples of this system, the aggregate importance of hardwoods may be greater than pine, especially on subxeric and mesic sites (Dale and Ware 1999).

DISTRIBUTION

Range: This system occurs in the Ouachita and Ozark mountains region of Arkansas, adjacent Oklahoma, and southern Missouri.
Ecological Divisions: 202
TNC Ecoregions: 38:C, 39:C
Subnations/Nations: AR:c, MO:c, OK:c

CONCEPT

Associations:

- Pinus echinata - Quercus (alba, rubra) / Vaccinium (arboreum, pallidum) / Schizachyrium scoparium - Chasmanthium sessiliflorum - Solidago ulmifolia Forest (G3G4, Interior Highlands Shortleaf Pine - Oak Dry-Mesic Forest, CEGL007489)
- Pinus echinata - Quercus alba - Quercus falcata Forest (G3?Q, Ouachita Shortleaf Pine - Oak Forest, CEGL004444)
- Pinus echinata - Quercus alba / Schizachyrium scoparium Woodland (G3G4, Shortleaf Pine - Oak Dry-Mesic Woodland, CEGL002394)
- Pinus echinata - Quercus stellata - Quercus marilandica / Schizachyrium scoparium Woodland (G2G3, Ozark/Ouachita Shortleaf Pine - Oak Dry Woodland, CEGL002393)
- Pinus echinata - Quercus velutina - Quercus stellata / Vaccinium spp. Forest (G3, Interior Highlands Shortleaf Pine - Black Oak Forest, CEGL002401)
- Pinus echinata / Rock Outcrop Interior Highland Woodland (G2G3, Shortleaf Pine / Little Bluestem Woodland, CEGL002402)
- Pinus echinata / Schizachyrium scoparium - Solidago ulmifolia - Monarda russeliana - Echinacea pallida Woodland (G1G2, Ouachita Shortleaf Pine Savannah, CEGL007815)
- Pinus echinata / Vaccinium (arboreum, pallidum, stamineum) Forest (G3G4, Shortleaf Pine / Blueberry Forest, CEGL002400)
- Pinus echinata Crowley's Ridge Forest [Provisional] (G3G4, CEGL007919)

SOURCES

References: Dale and Ware 1999, USFS 1999
Last updated: 12 Dec 2002 **Stakeholders:** SCS
Concept Author: T. Foti and R. Evans **LeadResp:** SCS

CES202.691 CENTRAL INTERIOR HIGHLANDS CALCAREOUS GLADE AND BARRENS

Division 202, Steppe/Savanna

Spatial Scale & Pattern: Small Patch **Classification Confidence:** high
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland

Diagnostic Classifiers: Woody-Herbaceous, Rock Outcrops/Barrens/Glades, Alkaline Soil

Non-Diagnostic Classifiers: Forest and Woodland (Treed), Sedimentary Rock, F-Patch/Medium Intensity

Concept Summary: This system is found primarily in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions along moderate to steep slopes and steep valleys on primarily southerly to westerly facing slopes. Limestone and/or dolomite bedrock typify this system with shallow, moderately to well-drained soils interspersed with rocks. These soils often dry out during the summer and autumn, and then become saturated during the winter and spring. *Schizachyrium scoparium* dominates this system and is commonly associated with *Andropogon gerardii, Bouteloua curtipendula*, and calcium-loving plant species. Stunted woodlands primarily dominated by *Quercus muehlenbergii* interspersed with *Juniperus virginiana* occur on variable-depth-to-bedrock soils. Fire is the primary natural dynamic, and prescribed fires help manage this system by restricting woody growth and maintaining the more open glade structure.

DISTRIBUTION

Range: This system is found primarily in the Interior Highlands of the Ozark, Ouachita, and the Interior Low Plateau regions ranging east to southern Ohio and including the Knobs region of Kentucky and the Moulton Valley of northern Alabama.
Ecological Divisions: 202, 203
TNC Ecoregions: 36:P, 38:C, 39:C, 43:C, 44:C, 50:C
Subnations/Nations: AL:c, AR:c, IL:c, IN:c, KY:c, MO:c, OH:c, OK:c, TN:c

CONCEPT

Associations:
- (Quercus stellata, Ulmus alata) / Schizachyrium scoparium - Symphyotrichum patens var. patentissimum Wooded Herbaceous Vegetation (G2?, Ouachita Basic Shale/Sandstone Glade, CEGL007824)
- Acer saccharum - Quercus muehlenbergii / Cercis canadensis Forest (G4?, Appalachian Sugar Maple - Chinquapin Oak Limestone Forest, CEGL006017)
- Eleocharis compressa - Nothoscordum bivalve Herbaceous Vegetation (G?, Kentucky Glade Seep, CEGL004669)
- Fraxinus quadrangulata - Juniperus virginiana var. virginiana / Schizachyrium scoparium - Lithospermum canescens Woodland (G2, Eastern Knobs Ledge/Cliff Glade Woodland, CEGL007994)
- Hydrangea arborescens / Heuchera (americana var. hirsuticaulis, villosa var. arkansana) - Aquilegia canadensis Herbaceous Vegetation (G3?, Moist Ozarkian Limestone Bluff, CEGL007819)
- Juniperus ashei / Cotinus obovatus / Carex eburnea - Rudbeckia missouriensis Woodland (G2?, Ozark Ashe's Juniper Glade Woodland, CEGL007833)
- Juniperus ashei Dry Chalk Outcrop Woodland (G1, Upper West Gulf Coastal Plain Dry Chalk Outcrop Woodland, CEGL007967)
- Juniperus ashei Ozark Clifftop Woodland (G2?, Ozark Ashe's Juniper Clifftop Woodland, CEGL004672)
- Juniperus virginiana / Schizachyrium scoparium - (Andropogon gerardii, Sorghastrum nutans) - Silphium (trifoliatum, terebinthinaceum) Wooded Herbaceous Vegetation (G2, Moulton and Tennessee Valley Limestone Hill Barrens, CEGL004738)
- Juniperus virginiana / Schizachyrium scoparium - Silphium terebinthinaceum var. luciae-brauniae - Carex juniperorum - Castilleja coccinea Wooded Herbaceous Vegetation (G1Q, Bluegrass Cat Prairie, CEGL004464)
- Juniperus virginiana Alkaline Bluff Woodland (G?, Red Cedar Alkaline Bluff Woodland, CEGL002426)
- Juniperus virginiana var. virginiana - Fraxinus quadrangulata / Symphyotrichum oblongifolium - Panicum flexile - Sedum pulchellum Woodland (G2, Bluegrass Ledge/Cliff Glade Woodland, CEGL004271)
- Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation (G4G5, Midwest Dry Limestone - Dolostone Cliff, CEGL002291)
- Limestone - Dolostone Midwest Moist Cliff Sparse Vegetation (G4G5, Midwest Moist Limestone - Dolostone Cliff, CEGL002292)
- Limestone - Dolostone Talus Sparse Vegetation (G4G5, Midwest Limestone - Dolostone Talus, CEGL002308)
- Quercus marilandica - (Juniperus virginiana) / Schizachyrium scoparium - Danthonia spicata Wooded Herbaceous Vegetation (G2, Central Shale Glade, CEGL002428)
- Quercus muehlenbergii - Fraxinus (quadrangulata, americana) / Schizachyrium scoparium Woodland (G3G4, Chinquapin Oak - Ash / Little Bluestem Woodland, CEGL002143)
- Quercus muehlenbergii - Juniperus virginiana - Acer saccharum / Frangula caroliniana Forest (G3G4, Chinquapin Oak - Red Cedar Dry Alkaline Forest, CEGL002108)
- Quercus muehlenbergii - Juniperus virginiana / Schizachyrium scoparium - Manfreda virginica Wooded Herbaceous Vegetation (G2G3, Central Limestone Glade, CEGL005131)
- Quercus muehlenbergii - Quercus shumardii Forest (G2G4, Chinquapin Oak - Shumard Oak Ozark Forest, CEGL004602)

- Quercus muehlenbergii / Schizachyrium scoparium - Bouteloua curtipendula Wooded Herbaceous Vegetation (G2G3, Chinquapin Oak Limestone - Dolomite Savanna, CEGL005284)
- Quercus stellata - Quercus alba - (Quercus falcata) / Schizachyrium scoparium Woodland (G1, Post Oak - White Oak Dry-Mesic Barrens, CEGL004217)
- Quercus stellata - Quercus marilandica / Schizachyrium scoparium Wooded Herbaceous Vegetation (G2G3, Post Oak Central Dry Barrens, CEGL002391)
- Rhus aromatica - Celtis tenuifolia / Carex eburnea Shrubland (G?, Limestone Cliff Fragrant Sumac Shrubland, CEGL004393)
- Schizachyrium scoparium - Bouteloua curtipendula - Rudbeckia missouriensis - Mentzelia oligosperma Wooded Herbaceous Vegetation (G2, Ozark Limestone Glade, CEGL002251)
- Schizachyrium scoparium - Sorghastrum nutans - Bouteloua curtipendula - Rudbeckia missouriensis - Hedyotis nigricans Wooded Herbaceous Vegetation (G3G4, Ozark Dolomite Glade, CEGL002398)
- Schizachyrium scoparium - Sorghastrum nutans - Tradescantia bracteata Alkaline Bedrock Herbaceous Vegetation (G1G2, Central Dry-Mesic Limestone - Dolomite Prairie, CEGL005280)
- Schizachyrium scoparium - Sporobolus compositus var. compositus - Rudbeckia fulgida var. fulgida Wooded Herbaceous Vegetation (G2, Limestone Cliff Barrens, CEGL004078)
- Sedum pulchellum - Talinum calycinum - Oenothera linifolia Shale Herbaceous Vegetation (G2G3, Interior Highlands Shale Glade, CEGL004347)
- Sporobolus (neglectus, vaginiflorus) - Leavenworthia exigua var. laciniata - Viola egglestonii Herbaceous Vegetation (G1Q, Outer Bluegrass Dolomite Glade, CEGL007772)
- Sporobolus vaginiflorus var. ozarkanus Ozark Herbaceous Vegetation (G3?, Ozark Annual Grass Glades, CEGL008563)

Vegetation: *Schizachyrium scoparium* dominates this system and is commonly associated with *Andropogon gerardii, Bouteloua curtipendula*, and calcium-loving plant species. Stunted woodlands primarily dominated by *Quercus muehlenbergii* interspersed with *Juniperus virginiana* occur on variable depth to bedrock soils. Other woody plants associated with this system (within their ranges) include *Quercus shumardii, Cercis canadensis, Ulmus alata, Fraxinus quadrangulata, Juniperus ashei, Acer saccharum*, and *Frangula caroliniana*. Other herbaceous taxa include *Silphium trifoliatum, Silphium terebinthinaceum, Liatris* spp., *Symphyotrichum oblongifolium, Castilleja coccinea, Hedyotis nigricans, Talinum* spp., *Sedum* spp., and *Panicum flexile*. Small-scale stands of annual *Sporobolus* spp. may be prominent in some examples. In some examples, small-scale seepage areas may contain *Eleocharis compressa, Nothoscordum bivalve, Isoetes butleri*, and *Hypoxis hirsuta*.

Other Comments: In Alabama, this system is found in the Moulton Valley, which is technically part of TNC Ecoregion 50, but ambiguously placed there. This region is included in the Interior Plateau of USEPA (2002).

SOURCES

References: DeSelm and Murdock 1993, DeSelm and Webb 1997, Nelson 1985, USFWS 1974, Webb et al. 1997
Last updated: 07 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard, T. Nigh, M. Pyne **LeadResp:** MCS

CES202.314 OUACHITA NOVACULITE GLADE AND WOODLAND

Division 202, Steppe/Savanna

Spatial Scale & Pattern: Small Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Diagnostic Classifiers: Woody-Herbaceous, Rock Outcrops/Barrens/Glades

Concept Summary: This system represents a mosaic of glades and woodlands found on novaculite geology in the central Ouachita Mountains of western Arkansas. Novaculite is a weakly metamorphosed rock of sedimentary origin that is primarily composed of microcrystalline quartz and chalcedony. Examples of this system generally occupy ridgetops at 450-640 m (1476-2100 feet) elevation. They are a mosaic of small woodlands scattered on ridges and upper slopes with outcrops and patches of talus scattered throughout. Some woodland or forest patches may appear as almost linear strips interspersed with grassy openings. Wooded patches have a variable, often patchy, structure with some areas of dense canopy interspersed with more open canopies and open grassy patches. In general, the grassy openings occur on shallow soils with exposed bedrock, while the woodlands occur on somewhat deeper soils. In all cases, these are fairly extreme growing conditions due to droughty, rocky soils.

DISTRIBUTION

Range: Endemic to the central Ouachita Mountains in Arkansas, possible extending into adjacent Oklahoma.
Ecological Divisions: 202
TNC Ecoregions: 39:C

Subnations/Nations: AR:c, OK:?

CONCEPT

Associations:

- Quercus marilandica var. ashei / Schizachyrium scoparium - Andropogon gerardii - Monarda fistulosa var. stipitatoglandulosa - Streptanthus maculatus / Lichens Novaculite Glade Wooded Herbaceous Vegetation (G3, Ouachita Novaculite Glade, CEGL007825)
- Quercus rubra / Ostrya virginiana / Ptelea trifoliata - Ribes curvatum / Helianthus divaricatus Woodland (G3, Red Oak Ridgetop Novaculite Woodland, CEGL007828)
- Quercus stellata - Ulmus alata - (Juniperus virginiana var. virginiana) / Sporobolus clandestinus - Monarda fistulosa var. stipitatoglandulosa Woodland (G2, Post Oak Novaculite Woodland, CEGL003756)
- Toxicodendron radicans / (Polymnia cossatotensis) Sparse Vegetation (M, G1, Ouachita Mountains Novaculite Talus Slope, CEGL003889)--actually a talus slope

Environment: The novaculite formation is of Devonian and Mississippian age and consists of novaculite interbedded with some shale, ranging in thickness from about 250 to 900 feet (Arkansas Geological Commission 2001, Babcock et al. 2001).

Vegetation: Several distinct communities may be recognized at a local scale within this system. Open habitats may be characterized by sparse tree cover of dwarfed (1-3 m) *Quercus marilandica var. ashei*, which can sometimes occur in clumps. Herbaceous cover is 100% except where bare rock is exposed or on talus. Lichens cover 40-70% of the exposed rock surface. Open community components of this system grade into more densely wooded types, with a variable structure, dominated by *Quercus stellata, Ulmus alata, Quercus marilandica, Juniperus virginiana var. virginiana, Pinus echinata*, and *Carya texana*. More submesic areas have *Quercus rubra*-dominated woodlands with *Carya texana* that may approach a forest physiognomy.

Dynamics: The structure of this system is thought to be controlled by a combination of periodic fire and severe drought. Many existing overstory trees have multiple stems indicating past die-back due to severe drought of decades-long intervals. Summer leaf loss is common and snags extant. Minor droughts cause extensive die-backs in smaller stems and appear to maintain shrubby conditions in places. Historically fire is thought to have played a more important role than today in maintaining the open canopy. The effects of fire suppression are unknown but have probably allowed these woodlands to increase in density.

SOURCES

References: Arkansas Geological Commission 2001, Babcock et al. 2001

Last updated: 12 Dec 2002 **Stakeholders:** SCS

Concept Author: T. Foti and R. Evans **LeadResp:** SCS

CES202.312 ARKANSAS VALLEY PRAIRIE AND WOODLAND

Division 202, Herbaceous

Spatial Scale & Pattern: Small Patch

Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland

Diagnostic Classifiers: Herbaceous, Graminoid

Non-Diagnostic Classifiers: Lowland

Concept Summary: This system of prairies and associated woodlands is found in the Arkansas River Valley region of Arkansas and adjacent Oklahoma. This region is distinctly bounded by the Boston Mountains to the north and the Ouachita Mountains to the south, although it has been considered part of the Ouachita Ecoregion (TNC Ecoregion 39). The valley is characterized by broad, level to gently rolling uplands derived from shales and is much less rugged and more heavily impacted by Arkansas River erosional processes than the adjacent mountainous regions. In addition, the valley receives annual precipitation total of 2-6 inches less than the surrounding regions due to a rainshadow produced by a combination of prevailing western winds and mountain orographic effects. The shale-derived soils associated with the prairies are thin and droughty. The combined effect of droughty soils, reduced precipitation, and prevailing level topography create conditions highly conducive to the ignition and spread of fires. Stands are typically dominated by *Andropogon gerardii, Sorghastrum nutans, Panicum virgatum*, and *Schizachyrium scoparium*. Some extant examples of this system remain, but most are small and isolated. They were common on the western edge of the region bordering or possibly included in the Crosstimbers (TNC Ecoregion 32) where precipitation and agriculture conversion were lowest.

Comments: There is little floristic and environmental overlap with the Grand Prairie and calcareous prairies of southern Arkansas. There may be stronger overlap with Southeastern Great Plains Tallgrass Prairie (CES205.685), and further review is needed to verify the distinction between these two systems.

DISTRIBUTION

Ecological Divisions: 202, 205
TNC Ecoregions: 32:C, 39:C
Subnations/Nations: AR:c

CONCEPT

Associations:

- Andropogon gerardii - Panicum virgatum - Helianthus grosseserratus Herbaceous Vegetation (G2G3, Central Wet-Mesic Tallgrass Prairie, CEGL002024)
- Andropogon gerardii - Sorghastrum nutans Unglaciated Herbaceous Vegetation (G3, Unglaciated Mesic Tallgrass Prairie, CEGL002204)
- Juncus (acuminatus, brachycarpus) - Panicum virgatum - Bidens aristosa - Hibiscus moscheutos ssp. lasiocarpos Herbaceous Vegetation (G2G3, Arkansas Valley Wet Prairie, CEGL004782)
- Schizachyrium scoparium - Bothriochloa laguroides ssp. torreyana - Croton willdenowii Herbaceous Vegetation (G1?, Arkansas Cherokee Prairie, Xeric Phase, CEGL008564)
- Schizachyrium scoparium - Dichanthelium spp. - Buchnera americana - Echinacea pallida Herbaceous Vegetation (G2G3, Arkansas Cherokee Prairie, Dry Phase, CEGL007827)

Environment: This region is distinctly bounded by the Boston Mountains to the north and the Ouachita Mountains to the south, although it has been considered part of the Ouachita Ecoregion (TNC Ecoregion 39). The valley is characterized by broad, level to gently rolling uplands derived from shales and is much less rugged and more heavily impacted by Arkansas River erosional processes than the adjacent mountainous regions. In addition, the valley receives annual precipitation total of 2-6 inches less than the surrounding regions due to a rainshadow produced by a combination of prevailing western winds and mountain orographic effects (T. Foti pers. comm. 2003). The shale-derived soils associated with the prairies are thin and droughty. The combined effect of droughty soils, reduced precipitation, and prevailing level topography create conditions highly conducive to the ignition and spread of fires. Some extant examples of this system remain, but most are small and isolated. They were common on the western edge of the region bordering or possibly included in the Crosstimbers (TNC Ecoregion 32) were precipitation and agriculture conversion were lowest.

SOURCES

References: Foti pers. comm.
Last updated: 12 Dec 2002 **Stakeholders:** SCS, MCS
Concept Author: T. Foti and R. Evans **LeadResp:** SCS

CES202.018 CENTRAL INTERIOR HIGHLANDS AND APPALACHIAN SINKHOLE AND DEPRESSION POND

Division 202, Woody Wetland

Spatial Scale & Pattern: Small Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Wetland
Diagnostic Classifiers: Lowland [Lowland], Muck , Mineral: W/ A Horizon >10 cm, Depressional [Pond], Depressional [Sinkhole]

Non-Diagnostic Classifiers: Forest and Woodland (Treed), Alkaline Water, Circumneutral Water

Concept Summary: This system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions, as well as the adjacent Appalachian region. Stands occur in basins of sinkholes or other isolated depressions on uplands. Soils are very poorly drained, and surface water may be present for extended periods of time, rarely becoming dry. Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Some examples become dry in the summer. Soils may be deep (100 cm or more), consisting of peat or muck, with parent material of peat, muck or alluvium. Ponds vary from open water to herb-, shrub-, or tree-dominated systems. Tree-dominated examples typically contain *Quercus* species or *Nyssa* species, or a combination of these. In addition, *Liquidambar styraciflua* may be present in southern examples. *Cephalanthus occidentalis* is a typical shrub component.

Comments: Many of these ponds have their geologic origin as a more-or-less complete karst collapse feature. Some of them may display this geologic origin in a more explicit manner, with definite walls and exposed limestone or dolomite at the surface ("sinkholes"). Others are more subtle, and exist as more gentle depressions, with no exposed surface geology ("depression ponds").

DISTRIBUTION

Range: This system is found in the Interior Highlands of the Ozark, Ouachita, and Interior Low Plateau regions, as well as the adjacent Appalachian region.
Ecological Divisions: 202

TNC Ecoregions: 38:C, 39:C, 44:C, 50:C
Subnations/Nations: AL:c, AR:c, IL:c, IN:c, KY:c, MO:c, TN:c

CONCEPT

Associations:

- Carex aquatilis - Dulichium arundinaceum Herbaceous Vegetation (G1?, Montane Herbaceous Pond (Water Sedge - Threeway Sedge Type), CEGL008542)
- Carex barrattii Herbaceous Vegetation (G1, Maple Flats Barratt's Sedge Marsh, CEGL007857)
- Carex comosa - Carex decomposita - Dulichium arundinaceum - Lycopus rubellus Herbaceous Vegetation (G3G4, Sinkhole Pond Marsh, CEGL002413)
- Cephalanthus occidentalis - (Salix nigra, Quercus lyrata) Karst Depression Shrubland (G1Q, CEGL008439)
- Cephalanthus occidentalis / Dulichium arundinaceum Shrubland (G1, Montane Buttonbush Pond, CEGL007854)
- Cephalanthus occidentalis / Hibiscus moscheutos ssp. moscheutos Depression Pond Shrubland (G3?, Buttonbush Sinkhole Pond Swamp, CEGL004742)
- Cephalanthus occidentalis / Torreyochloa pallida Shrubland (G1?, CEGL007855)
- Liquidambar styraciflua - Acer rubrum / Carex spp. - Sphagnum spp. Forest (G2Q, Upland Sweetgum - Red Maple Pond, CEGL007388)
- Nyssa aquatica / Cephalanthus occidentalis Pond Forest (G1?, Water Tupelo Sinkhole Pond Swamp, CEGL004712)
- Orontium aquaticum - Schoenoplectus subterminalis - Eriocaulon aquaticum Herbaceous Vegetation (G1, CEGL007859)
- Pontederia cordata - Sagittaria graminea - Sagittaria latifolia Semipermanently Flooded Herbaceous Vegetation (G1G2Q, Highland Rim Pond (Pickerelweed - Arrowhead Type), CEGL004986)
- Quercus alba - Nyssa sylvatica Sandstone Ridgetop Depression Forest (G2Q, White Oak Sandstone Ridgetop Depression Forest, CEGL008440)
- Quercus alba - Nyssa sylvatica Seasonally Flooded Forest [Provisional] (G?, White Oak - Blackgum Seasonally Flooded Forest, CEGL008473)
- Quercus bicolor - Fraxinus pennsylvanica / Carex spp. Forest (G1G2, Bluegrass Basin Swamp White Oak Forest, CEGL004422)
- Quercus lyrata - Quercus (palustris, phellos) - Liquidambar styraciflua - (Populus heterophylla) Forest (G2G3, Interior Oak - Swamp Cottonwood Pond Forest, CEGL004421)
- Quercus lyrata / Betula nigra / Pleopeltis polypodioides ssp. michauxiana Forest (G1, Sinking Pond Overcup Oak Swamp, CEGL004975)
- Quercus lyrata Pond Forest (G1G3, Overcup Oak Pond Forest, CEGL004642)
- Quercus palustris - (Quercus bicolor) / Carex crinita / Sphagnum spp. Forest (G3?, Pin Oak - Swamp White Oak Sinkhole Flatwoods, CEGL002406)
- Quercus palustris / Panicum rigidulum var. rigidulum - Panicum verrucosum - Eleocharis acicularis Herbaceous Vegetation (G1, CEGL007858)
- Quercus palustris Pond Forest (G2, Ozark Pin Oak Pond Forest, CEGL007809)
- Quercus phellos - Liquidambar styraciflua / Chasmanthium laxum Cumberland Plateau Forest (G3, Cumberland Plateau Willow Oak Pond, CEGL008441)
- Quercus phellos Seasonally Flooded Ozark Pond Forest [Provisional] (G?, CEGL007402)
- Scirpus cyperinus - Dulichium arundinaceum / Sphagnum spp. Herbaceous Vegetation (G1Q, Southern Appalachian Montane Upland Pool, CEGL004134)
- Sparganium americanum - Epilobium leptophyllum Herbaceous Vegetation (G2G3, Piedmont/Mountain Semipermanent Impoundment (Montane Boggy Type), CEGL004510)
- Vaccinium macrocarpon / Pogonia ophioglossoides Dwarf-shrubland (G1Q, CEGL007856)

Vegetation: Ponds vary from open water to herb, shrub, or tree-dominated systems. Tree-dominated examples typically contain *Quercus* species or *Nyssa* species, or a combination of these. In addition, *Liquidambar styraciflua* may be present in southern examples. *Cephalanthus occidentalis* is a typical shrub component.

Dynamics: Water depth may vary greatly on a seasonal basis, and may be a meter deep or more in the winter. Some examples become dry in the summer.

SOURCES

Last updated: 24 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: M. Pyne, S. Menard, D. Faber-Langendoen **LeadResp:** MCS

CES202.321 OUACHITA MOUNTAIN FORESTED SEEP

Division 202, Woody Wetland

Spatial Scale & Pattern: Small Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Wetland
Diagnostic Classifiers: Forest and Woodland (Treed), Seepage-Fed Sloping

Non-Diagnostic Classifiers: Broad-Leaved Deciduous Tree

Concept Summary: This system of forested seeps occurs in the Ouachita Mountains of central Arkansas. Examples may be found along the bottom slopes of smaller valleys where rock fractures allow water to seep out of the mountainsides and in the riparian zones of larger creeks, sometimes extending upslope along small ephemeral drainages. The soil remains saturated to very moist throughout the year. The vegetation is typically forested with highly variable canopy composition. *Acer rubrum var. trilobum, Nyssa sylvatica, Liquidambar styraciflua*, and *Quercus alba* are common and typical. Other canopy species may include *Fagus grandifolia* and *Magnolia tripetala*. Canopy coverage can be moderately dense to quite open. The subcanopy is often well-developed and characteristically includes *Ilex opaca var. opaca, Magnolia tripetala, Carpinus caroliniana*, and *Ostrya virginiana*.

Comments: There are physiognomically and compositionally similar forested seep systems in the Appalachian Plateau that lack abundant, evergreen ericads and are apparently less sphagnous. Examples from the Ozarks (on sandstone) are apparently less species-rich and may be associated with more acidic substrates.

DISTRIBUTION

Range: Endemic to the Ouachita Mountains of central Arkansas, possibly extending into adjacent Oklahoma.
Ecological Divisions: 202
TNC Ecoregions: 39:C
Subnations/Nations: AR:c, OK:?

CONCEPT

Associations:
- Acer rubrum - Fraxinus pennsylvanica / Carex spp. / Climacium americanum Forest (GU, Red Maple Forested Seep, CEGL002407)
- Acer rubrum var. trilobum - Liquidambar styraciflua - Magnolia tripetala / Osmunda regalis - (Cypripedium kentuckiense) Forest (G3?, Ouachita Mountains Acid Forested Seep, CEGL007444)
- Acer rubrum var. trilobum - Nyssa sylvatica / Rhexia mariana var. interior Forest (G2?, Sandstone Seepage Forest/Woodland, CEGL007822)

SPATIAL CHARACTERISTICS

Spatial Summary: Many are less than one hectare in area, but riparian seeps are often much larger.

SOURCES

Last updated: 12 Dec 2002
Concept Author: T. Foti and R. Evans
Stakeholders: SCS
LeadResp: SCS

CES202.703 OZARK-OUACHITA RIPARIAN

Division 202, Mixed Upland and Wetland

Spatial Scale & Pattern: Linear
Classification Confidence: high
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland, Wetland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Stream terrace (undifferentiated)

Concept Summary: This system is found along streams and small rivers within the Ozark and Ouachita regions. In contrast to larger floodplain systems, this system has little to no floodplain development and often contains cobble bars and steep banks. It is traditionally higher gradient than larger floodplains and experiences periodic, strong flooding. It is often characterized by a cobble bar with forest right adjacent with little to no marsh development. Canopy cover can vary within examples of this system, but typical tree species include *Liquidambar styraciflua, Platanus occidentalis, Betula nigra*, maples species (*Acer* spp.), and oaks (*Quercus* spp.). The richness of the herbaceous layer can vary significantly, ranging from species-rich to species-poor. Likewise, the shrub layer can vary considerably, but typical species may include *Lindera benzoin, Alnus serrulata*, and *Hamamelis vernalis*. Small seeps and fens can often be found within this system, especially at the headwaters and terraces of streams. These areas are typically dominated by primarily wetland obligate species of sedges (*Carex* spp.), ferns (*Osmunda* spp.), and other herbaceous species such as *Impatiens capensis*. Flooding and scouring strongly influence this system and prevent the floodplain development found on larger rivers.

Comments: A separate Ozark-Ouachita fen/seep system may be needed.

DISTRIBUTION

Range: This system is found within the Ozarks and the Ouachita Mountains of Missouri, Arkansas and Oklahoma.
Ecological Divisions: 202
TNC Ecoregions: 38:C, 39:C
Subnations/Nations: AR:c, MO:c, OK:c

CONCEPT

Associations:
- (Carex interior, Carex lurida) - Carex leptalea - Parnassia grandifolia - Rhynchospora capillacea Herbaceous Vegetation (G2G3, Ozark Fen, CEGL002404)
- Acer (saccharum, barbatum) - Quercus rubra - Carya cordiformis / Asimina triloba Forest (G3, Sugar Maple - Oak - Bitternut Hickory Mesic Bottomland Forest, CEGL002060)
- Alnus serrulata - Amorpha fruticosa Shrubland (G3?, Ouachita Riparian Alder Shrubland, CEGL007807)
- Betula nigra - Platanus occidentalis Forest (G5, River Birch - Sycamore Forest, CEGL002086)
- Carex crinita - Osmunda spp. / Physocarpus opulifolius Seep Herbaceous Vegetation (G2, Midwest Sand Seep, CEGL002392)
- Carex crinita - Osmunda spp. / Sphagnum spp. Herbaceous Vegetation (G2G3, Midwest Acid Seep, CEGL002263)
- Carex interior - Carex lurida - Andropogon gerardii - Parnassia grandifolia Herbaceous Vegetation (G1G2, Ozark Prairie Fen, CEGL002416)
- Hamamelis vernalis - Cornus obliqua - Hypericum prolificum Shrubland (G3, Witch-hazel - Dogwood Gravel Wash, CEGL003898)
- Juniperus virginiana var. virginiana - Leptopus phyllanthoides - (Quercus nigra, Ilex vomitoria) Shrubland (G2Q, CEGL003942)
- Liquidambar styraciflua - (Quercus alba, Acer saccharum) / Carpinus caroliniana / Lindera benzoin Forest (G3G4, Ouachita-Ozark Small Stream Hardwood Forest, CEGL007826)
- Panicum virgatum - Calamovilfa arcuata Herbaceous Vegetation (G2?, Bedrock River Scour, CEGL007838)
- Podostemum ceratophyllum Herbaceous Vegetation (G3G5, Rocky Bar and Shore (Riverweed Type), CEGL004331)
- Taxodium distichum - Platanus occidentalis Ouachita Foothills Forest (G2Q, CEGL007377)
- Zizaniopsis miliacea Rocky Riverbed Herbaceous Vegetation (G2?, CEGL004140)

SOURCES

References: Nelson 1985
Last updated: 10 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard **LeadResp:** MCS

CES202.705 SOUTH-CENTRAL INTERIOR LARGE FLOODPLAIN

Division 202, Mixed Upland and Wetland

Spatial Scale & Pattern: Linear **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland, Wetland
Non-Diagnostic Classifiers: Forest and Woodland (Treed), Herbaceous, Floodplain

Concept Summary: This floodplain system is found throughout the Interior low Plateau, Cumberlands, Southern Ridge and Valley, Western Allegheny Plateau, and lower elevations of the Southern Blue Ridge. Examples occur along large rivers where topography and alluvial processes have resulted in a well-developed floodplain. A single occurrence may extend from river's edge across the outermost extent of the floodplain or to where it meets a wet meadow or upland system. Many examples of this system will contain well-drained levees, terraces and stabilized bars, and some will include herbaceous sloughs and shrub wetlands resulting, in part, from beaver activity. A variety of soil types may be found within the floodplain from very well-drained sandy substrates to very dense clays. It is this variety of substrates in combination with different flooding regimes that creates the mix of vegetation. Most areas, except for the montane alluvial forests, are inundated at some point each spring; microtopography determines how long the various habitats are inundated. Although vegetation is quite variable in this broadly defined system, examples may include *Acer saccharinum, Platanus occidentalis, Liquidambar styraciflua*, and *Quercus* spp. Understory species are mixed, but include shrubs, such as *Cephalanthus occidentalis* and *Arundinaria gigantea ssp. gigantea*, and sedges (*Carex* spp.). This system likely floods at least once annually and can be altered by occasional severe floods. Impoundments and conversion to agriculture can also impact this system.

Comments: Montane alluvial forests may be difficult to place within this system. They share traits between this system and Southern and Central Appalachian Cove Forest (CES202.373), at least in the southern Appalachians. This split from Central

Appalachian Floodplain (CES202.608) seems somewhat arbitrary but is based on our knowledge of the Freshwater Systems classification.

DISTRIBUTION

Range: This system ranges from the Interior Low Plateau to the Southern Blue Ridge and north into the Western Allegheny Plateau.
Ecological Divisions: 202
TNC Ecoregions: 32:C, 37:C, 38:P, 39:C, 44:C, 49:C, 50:C, 51:C
Subnations/Nations: AL:c, GA:c, IL:c, IN:c, KY:c, MO:c, NC:c, OH:c, PA:c, SC:?, TN:c, VA:c, WV:c

CONCEPT

Associations:
- (Diospyros virginiana, Platanus occidentalis) / Eupatorium serotinum - Diodia virginiana Herbaceous Vegetation (GW, Artificial Lake Drawdown Zone, CEGL003910)
- Acer negundo Forest (G4G5, Box-elder Floodplain Forest, CEGL005033)
- Acer rubrum var. trilobum - Fraxinus pennsylvanica / Carex crinita - Peltandra virginica Forest (G1, Montane Floodplain Slough Forest, CEGL004420)
- Acer saccharinum - Betula nigra / Cephalanthus occidentalis Forest (G3Q, Silver Maple - River Birch / Buttonbush Forest, CEGL007810)
- Acer saccharinum - Celtis laevigata - Carya illinoinensis Forest (G3G4, Silver Maple - Sugarberry - Pecan Floodplain Forest, CEGL002431)
- Acer saccharinum - Ulmus americana - (Populus deltoides) Forest (G4?, Silver Maple - Elm - (Cottonwood) Forest, CEGL002586)
- Acer saccharum - Carya cordiformis / Asimina triloba Floodplain Forest (G2, Maple - Hickory Mesic Floodplain Forest, CEGL005035)
- Arundinaria gigantea ssp. gigantea Shrubland (G2?, Floodplain Canebrake, CEGL003836)
- Carex torta Herbaceous Vegetation (G3G4, Rocky Bar and Shore (Twisted Sedge Type), CEGL004103)
- Cephalanthus occidentalis / Carex spp. - Lemna spp. Southern Shrubland (G4, Southern Buttonbush Pond, CEGL002191)
- Fagus grandifolia - Quercus spp. - Acer rubrum - Juglans nigra Forest (G2G3, Beech - Mixed Hardwood Floodplain Forest, CEGL005014)
- Fraxinus pennsylvanica - Ulmus americana - Celtis laevigata / Ilex decidua Forest (G4G5, Southern Green Ash - Elm - Sugarberry Forest, CEGL002427)
- Juglans nigra / Verbesina alternifolia Forest (GD, Successional Black Walnut Forest, CEGL007879)
- Liquidambar styraciflua - Liriodendron tulipifera - (Platanus occidentalis) / Carpinus caroliniana - Halesia tetraptera / Amphicarpaea bracteata Forest (G?, Montane Sweetgum Alluvial Flat, CEGL007880)
- Liquidambar styraciflua - Quercus michauxii - Carya laciniosa / Fagus grandifolia - (Aesculus flava) Forest (G2G3Q, Eastern Highland Rim Rich Floodplain Terrace Forest, CEGL007702)
- Platanus occidentalis - Acer saccharinum - Juglans nigra - Ulmus rubra Forest (G4, Sycamore - Silver Maple Calcareous Floodplain Forest, CEGL007334)
- Platanus occidentalis - Betula nigra - Celtis laevigata - Fraxinus pennsylvanica / Arundinaria gigantea Temporarily Flooded Forest (G3?, Ozark Elm - Ash - Sugarberry Forest, CEGL007999)
- Platanus occidentalis - Fraxinus pennsylvanica - Quercus imbricaria Forest (G2Q, Montane Alluvial Forest (Cades Cove/Oconaluftee), CEGL007339)
- Platanus occidentalis - Liriodendron tulipifera - Betula (alleghaniensis, lenta) / Alnus serrulata - Leucothoe fontanesiana Forest (G2?, Appalachian Montane Alluvial Forest, CEGL004691)
- Quercus michauxii - Quercus shumardii - Liquidambar styraciflua / Arundinaria gigantea Forest (G3G4, Swamp Chestnut Oak - Sweetgum Mesic Floodplain Forest, CEGL002099)
- Quercus nigra - Quercus (alba, phellos) Forest (G3?, Eastern Highland Rim Water Oak Floodplain Forest, CEGL004979)
- Quercus palustris - (Fraxinus nigra) / Lindera benzoin / Carex bromoides Forest (G?, Meadow River Floodplain Pin Oak Forest, CEGL007399)
- Quercus palustris - (Quercus stellata) - Quercus pagoda / Isoetes spp. Forest (G2G3, Pin Oak - Post Oak Lowland Flatwoods, CEGL002101)
- Quercus phellos - (Quercus lyrata) / Carex spp. - Leersia spp. Forest (G3G4Q, Willow Oak Bottomland Flatwoods Forest, CEGL002102)
- Quercus stellata - Quercus marilandica - Quercus falcata / Schizachyrium scoparium Sand Woodland (G2, Post Oak - Blackjack Oak / Bluestem Sand Woodland, CEGL002417)
- Quercus stellata / (Danthonia spicata, Croton willdenowii) Woodland (G1, Post Oak Clay Barrens, CEGL005057)
- Salix nigra Forest (G4, Black Willow Riparian Forest, CEGL002103)

Environment: This system inhabits broad floodplains along large creeks and rivers that are usually inundated for at least part of each year.

Vegetation: Vegetation varies quite widely, encompassing shrubby and herbaceous communities as well as forested communities with a wide array of canopy types.

Dynamics: Flooding is an important component of this system.

SPATIAL CHARACTERISTICS

Size: Can range from very small (<1 acre) to hundreds of acres in larger floodplain areas.

SOURCES

Last updated: 10 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard, M. Pyne, R. Evans, R. White **LeadResp:** MCS

CES202.689 CENTRAL INTERIOR ACIDIC CLIFF AND TALUS

Division 202, Barren

Spatial Scale & Pattern: Small Patch **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Non-vegetated (<10% vasc.), Upland
Non-Diagnostic Classifiers: Cliff (Landform), Talus (Landform), Acidic Soil

Concept Summary: This system is found primarily in the Interior Highlands including the Ozark, Ouachita, and Interior Low Plateau ecoregions. Sandstone outcrops and talus ranging from moist to dry typify this system. It is typically sparsely vegetated, however, on moister sites with more soil development several fern species and sedges (*Carex* spp.) can establish. Wind and water erosion are the major dynamics influencing this system.

DISTRIBUTION

Range: This system is found primarily in the Interior Highlands including the Ozark, Ouachita, and Interior Low Plateau ecoregions.
Ecological Divisions: 202
TNC Ecoregions: 38:C, 39:C, 44:C
Subnations/Nations: AR:c, IL:c, IN:c, KY:c, MO:c, TN:c

CONCEPT

Associations:

- (Carex interior, Carex lurida) - Carex leptalea - Parnassia grandifolia - Rhynchospora capillacea Herbaceous Vegetation (L, G2G3, Ozark Fen, CEGL002404)
- (Ribes cynosbati) / Deschampsia flexuosa - Dryopteris marginalis - Dennstaedtia punctilobula Herbaceous Vegetation (G2?, CEGL007820)
- Chert Ozark Dry Cliff Sparse Vegetation (G3?, Ozark Dry Chert Cliff, CEGL002285)
- Chert Ozark Moist Cliff Sparse Vegetation (G2G3, Ozark Moist Chert Cliff, CEGL002288)
- Igneous Ozark Dry Cliff Sparse Vegetation (G4, Ozark Dry Igneous Cliff, CEGL002286)
- Igneous Ozark Moist Cliff Sparse Vegetation (G4Q, Ozark Moist Igneous Cliff, CEGL002289)
- Igneous Ozark Talus Sparse Vegetation (G4, Ozark Igneous Talus, CEGL005203)
- Osmunda cinnamomea - Rhynchospora capitellata - Heuchera parviflora var. puberula - Xyris jupicai Herbaceous Vegetation (G1Q, Ozark Sandstone Vertical Seep, CEGL007837)
- Sandstone Dry Cliff Sparse Vegetation (G4G5, Midwest Dry Sandstone Cliff, CEGL002045)
- Sandstone Interior Highlands Talus Sparse Vegetation (G4G5, Interior Highlands Sandstone Talus, CEGL002309)
- Sandstone Midwest Moist Cliff Sparse Vegetation (G4G5, Midwest Moist Sandstone Cliff, CEGL002287)

SOURCES

Last updated: 07 Mar 2003 **Stakeholders:** MCS, ECS, SCS
Concept Author: S. Menard, T. Foti, R. Evans **LeadResp:** MCS

CES202.690 CENTRAL INTERIOR CALCAREOUS CLIFF AND TALUS

Division 202, Barren

Spatial Scale & Pattern: Small Patch **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Non-vegetated (<10% vasc.), Upland

Concept Summary: This system is found primarily in non-Appalachian portions of the Central Interior Division. It ranges from the Ouachitas east to the Cumberlands and north into the Western Allegheny Plateau and Lake states. Limestone and dolomite outcrops and talus distinguish this system. Examples range from moist to dry and from sparsely to moderately well-vegetated. Woodland species such as *Thuja occidentalis* can establish along the ridgetops. Understory species can range from grassland species such as *Andropogon gerardii* on drier slopes to more mesic species in areas with higher moisture and more soil development. Wind and water erosion along with fire are the primary natural dynamics influencing this system.

Comments: Similar examples in the driftless region of Minnesota, Wisconsin, Iowa and Illinois should be considered part of Paleozoic Plateau Bluff and Talus (CES202.704).

DISTRIBUTION

Range: This system is found primarily in non-Appalachian portions of the Central Interior Division.
Ecological Divisions: 201?, 202, 205
TNC Ecoregions: 36:P, 38:C, 39:C, 44:C, 45:C, 46:C, 47:?, 48:C, 49:C
Subnations/Nations: AR:c, IA:c, IL:c, IN:c, KY:?, MI:c, MN:c, MO:c, NY:c, OH:c, OK:c, PA:c, TN:c, WI:c, WV:c

CONCEPT

Associations:
- Acer saccharum - Tilia americana - Fraxinus americana / Ostrya virginiana / Geranium robertianum Woodland (G3G5, Rich Northern Hardwood Woodland, CEGL005058)
- Adiantum capillus-veneris - Boehmeria cylindrica - Lobelia siphilitica Herbaceous Vegetation (G2G3, Cumberland River Limestone Seep Cliff, CEGL004728)
- Andropogon gerardii - Chasmanthium latifolium - Amsonia tabernaemontana var. salicifolia Herbaceous Vegetation (G2G3, Duck River Scour Prairie, CEGL004739)
- Cystopteris bulbifera - Asplenium rhizophyllum Ozark Sparse Vegetation [Provisional] (G?, Ozarkian Sparse Dry Limestone Cliff, CEGL008486)
- Impatiens pallida - Cystopteris bulbifera - Adoxa moschatellina - (Chrysosplenium iowense, Aconitum noveboracense) Herbaceous Vegetation (L, G2, Algific Talus Slope, CEGL002387)
- Limestone - Dolostone Midwest Dry Cliff Sparse Vegetation (G4G5, Midwest Dry Limestone - Dolostone Cliff, CEGL002291)
- Limestone - Dolostone Midwest Moist Cliff Sparse Vegetation (G4G5, Midwest Moist Limestone - Dolostone Cliff, CEGL002292)
- Limestone - Dolostone Talus Sparse Vegetation (G4G5, Midwest Limestone - Dolostone Talus, CEGL002308)
- Rhus aromatica - Celtis tenuifolia / Carex eburnea Shrubland (G?, Limestone Cliff Fragrant Sumac Shrubland, CEGL004393)
- Schizachyrium scoparium - Sporobolus compositus var. compositus - Rudbeckia fulgida var. fulgida Wooded Herbaceous Vegetation (G2, Limestone Cliff Barrens, CEGL004078)
- Small Eroding Bluffs Midwestern Sparse Vegetation (G?, Midwestern Small Eroding Bluffs, CEGL002315)
- Thuja occidentalis / Carex eburnea - Pellaea atropurpurea Woodland (G2G3, Appalachian Cliff White-cedar Woodland, CEGL002596)
- Thuja occidentalis Cliff Woodland (G3, White-cedar Cliff Woodland, CEGL002451)
- Toxicodendron radicans / Heuchera americana - (Dichanthelium depauperatum, Woodsia obtusa) Herbaceous Vegetation (G?, Appalachian Mafic Cliff (Low-Elevation Type), CEGL004395)

SOURCES

Last updated: 07 Mar 2003 **Stakeholders:** MCS, ECS, SCS
Concept Author: S. Menard **LeadResp:** MCS

CES203.531 LOWER MISSISSIPPI RIVER DUNE WOODLAND AND FOREST

Division 203, Forest and Woodland

Spatial Scale & Pattern: Large Patch
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Diagnostic Classifiers: Forest and Woodland (Treed), Dune (Substrate), Sand Soil Texture

Concept Summary: This system represents the vegetation of sand dunes and related eolian features of the lower Mississippi River Alluvial Valley in Missouri and Arkansas. These Pleistocene dunes were overlooked or unrecognized until the late 1970s (Saucier 1978). This fact coupled with long periods of weathering and human disturbance, as well as proximity to a terrace mapped as "prairie" in General Land Office records, has led to considerable confusion regarding this type (T. Foti pers. comm.). These dunes are near Crowley's Ridge and the Black and White rivers, above the normal flood level of the Mississippi. Examples in Missouri occur amidst a series of low-lying, anastamosing channels that have helped to protect

them from extensive alteration more typical in Arkansas where the uplands have been largely cleared. The uppermost portions of the dunes support a xeric community similar to sandhills of the West Gulf Coastal Plain (WGCP), but are outside the natural range of *Quercus incana*, a diagnostic species typical of the WGCP examples. Instead the dunes support very open *Quercus stellata* woodlands with *Schizachyrium scoparium* and abundant lichen cover (presumably *Cladonia* spp.), along with *Opuntia* sp. Less edaphically extreme slopes support more closed-canopied forests in which *Quercus stellata* is still important, along with *Quercus falcata* and possibly other species. In many instances, distinctive wetlands are also present. Called "sand ponds" in Arkansas, these depressions have silty bottoms and perched water tables. The margin of these ponds are rimmed by *Quercus phellos* and have *Quercus lyrata*.

DISTRIBUTION

Ecological Divisions: 202?, 203?
TNC Ecoregions: 38:?, 42:C
Subnations/Nations: AR:, MO:

CONCEPT

Associations:

- Quercus lyrata - Quercus palustris / Acer rubrum var. drummondii / Itea virginica - Cornus foemina - (Lindera melissifolia) Forest (G2?, Mixed Oak - Hardwood Sand Pond Forest, CEGL004778)
- Quercus stellata - Quercus marilandica - Quercus falcata / Schizachyrium scoparium Sand Woodland (G2, Post Oak - Blackjack Oak / Bluestem Sand Woodland, CEGL002417)
- Quercus stellata - Quercus velutina - Quercus alba - (Quercus falcata) / Croton michauxii Sand Woodland (G2, Post Oak - Mixed Oak Sand Woodland, CEGL002396)
- Schizachyrium scoparium - Sorghastrum nutans - Aristida lanosa - Polypremum procumbens Herbaceous Vegetation (G1Q, Mississippi Embayment Sand Prairie, CEGL002397)

SOURCES

References: Saucier 1978
Last updated: 06 Feb 2003 **Stakeholders:** SCS, MCS
Concept Author: T. Foti and R. Evans **LeadResp:** SCS

CES205.685 SOUTHEASTERN GREAT PLAINS TALLGRASS PRAIRIE

Division 205, Herbaceous

Spatial Scale & Pattern: Large Patch **Classification Confidence:** medium
Required Classifiers: Natural/Semi-natural, Vegetated (>10% vasc.), Upland
Non-Diagnostic Classifiers: Herbaceous, Unglaciated, Shallow Soil, F-Landscape/Medium Intensity, G-Landscape/Medium Intensity

Concept Summary: This system is found primarily within the Flint Hills of Kansas and the Osage Plains of Oklahoma; however, it can range into the Ozarks of Missouri, the Arbuckle Mountains of Oklahoma, and the Arkansas River Valley. It is distinguished from Central Tallgrass Prairie (CES205.683) by having more species with western geographic affinities and the presence of a thin soil layer over limestone beds ranging to more acidic substrates, although some areas of deeper soils are found within the region, especially on lower slopes. Because of the presence of the rocky substrate close to the surface and the rolling topography, this area is relatively unsuitable for agriculture. The Flint Hills contain one of the largest remaining, relatively intact pieces of tallgrass prairie. The vegetation in this system is typified by tallgrass species such as *Andropogon gerardii, Panicum virgatum, Schizachyrium scoparium*, and *Sorghastrum nutans* forming a dense cover. A moderate to high density of forb species such as *Oligoneuron rigidum (= Solidago rigida), Liatris punctata, Symphyotrichum ericoides, Lespedeza capitata*, and *Viola pedatifida* also occur. Areas of deeper soil, especially lower slopes along draws, slopes and terraces, can include *Baptisia alba var. macrophylla, Liatris pycnostachya*, and *Vernonia missurica*. Shrub and tree species are relatively infrequent and, if present, constitute less than 10% cover in the area. Fire and grazing constitute the major dynamic processes for this region. Although many of the native common plant species still occur, grazing does impact this region. Poor grazing practices can lead to soil erosion and invasion by cool-season grasses such as *Bromus inermis*.

Comments: This includes the Flint Hills plus prairies in Oklahoma and Missouri south of the glacial line. There may need to be further review concerning the prairies in Missouri and Oklahoma. In Arkansas, this system of prairies and associated woodlands is found in the Arkansas River Valley region of Arkansas and adjacent Oklahoma. The valley is characterized by broad, level to gently rolling uplands derived from shales and is much less rugged and more heavily impacted by Arkansas River erosional processes than the adjacent mountainous regions. The shale-derived soils associated with the prairies are thin and droughty. The combined effect of droughty soils, reduced precipitation (compared to surrounding mountainous regions), and prevailing level topography create conditions highly conducive to the ignition and spread of fires. Some extant examples

of this system in Arkansas remain, but most are small and isolated, in the western edge of the region towards the Crosstimbers where precipitation and agriculture conversion were lowest (T. Foti pers. comm. 2003).

DISTRIBUTION

Range: This system is found primarily within the Flint Hills and Osage Plains, but small patches can be found in the Ozarks of Missouri, the Arbuckle Mountains of Oklahoma, and the Arkansas River Valley.
Ecological Divisions: 205
TNC Ecoregions: 32:P, 37:C, 38:P, 39:P
Subnations/Nations: AR:c, KS:c, MO:c, OK:c

CONCEPT

Associations:

- Andropogon gerardii - Schizachyrium scoparium Northern Plains Herbaceous Vegetation (G3G5, Northern Plains Big Bluestem Prairie, CEGL002205)
- Andropogon gerardii - Sorghastrum nutans - Schizachyrium scoparium Flint Hills Herbaceous Vegetation (G4?, Flint Hills Tallgrass Prairie, CEGL002201)
- Andropogon gerardii - Sorghastrum nutans Unglaciated Herbaceous Vegetation (G3, Unglaciated Mesic Tallgrass Prairie, CEGL002204)
- Bouteloua curtipendula - Bouteloua (eriopoda, gracilis) Herbaceous Vegetation (G4, Grama Mixedgrass Prairie, CEGL002250)
- Juniperus ashei / Bouteloua (curtipendula, hirsuta) Woodland (G2G3, CEGL002125)
- Muhlenbergia reverchonii - Croton monanthogynus Herbaceous Vegetation (G2G3, Seep Muhly Meadow, CEGL004785)
- Schizachyrium scoparium - Aristida dichotoma - Croton willdenowii / Lichens Wooded Herbaceous Vegetation (G3, Ozark Sandstone Glade, CEGL002242)
- Schizachyrium scoparium - Bouteloua curtipendula - Rudbeckia missouriensis - Mentzelia oligosperma Wooded Herbaceous Vegetation (G2, Ozark Limestone Glade, CEGL002251)
- Schizachyrium scoparium - Sorghastrum nutans - Andropogon ternarius - Coreopsis grandiflora Sandstone - Shale Herbaceous Vegetation (G3, Midwest Sandstone / Shale Prairie, CEGL002212)
- Schizachyrium scoparium - Sorghastrum nutans - Danthonia spicata - Silene regia Chert Herbaceous Vegetation (G3, Midwest Chert Prairie, CEGL002211)
- Schizachyrium scoparium - Sorghastrum nutans - Tradescantia bracteata Alkaline Bedrock Herbaceous Vegetation (G1G2, Central Dry-Mesic Limestone - Dolomite Prairie, CEGL005280)

Environment: This system is typified by the thin soil layer over limestone beds or acidic substrates such as chert or granite, although areas of deeper soils are possible along lower slopes, draws, and terraces. The topography is rolling and mostly unsuitable for agriculture.

Vegetation: Tallgrass species such as *Andropogon gerardii, Panicum virgatum, Schizachyrium scoparium*, and *Sorghastrum nutans* predominate this system and often form a dense cover. Forb species such as *Oligoneuron rigidum (= Solidago rigida), Liatris punctata, Symphyotrichum ericoides, Lespedeza capitata*, and *Viola pedatifida* can also occur. In those areas of deeper soils, *Baptisia alba var. macrophylla, Liatris pycnostachya*, and *Vernonia missurica* can also occur. Tree and shrub species are relatively infrequent and constitute less than 10% cover.

Dynamics: Fire and grazing are the prevalent dynamic processes in examples of this system. Overgrazing can lead to soil erosion and invasion of cool-season grasses. Fire suppression can lead to increased cover of woody species.

SOURCES

References: Barbour and Billings 1988, Lauver et al. 1999, Ricketts et al. 1999
Last updated: 05 Mar 2003 **Stakeholders:** MCS, SCS
Concept Author: S. Menard and K. Kindscher **LeadResp:** MCS

APPENDIX E

Methodology and Data Management Plan

Methodology and Data Management Plan

This plan was developed as per Conservancy protocols found in *Geography of Hope*, and is based loosely on the 1994 Ouachita Mountains Conservation Initiative plan. The National Forest Service's Ozark-Ouachita Highlands Assessment (OOHA; Pell, Clingenpeel, et al., 1999), which involved experts from several states and agencies, including the Conservancy, was also used because of similar protocols, goals, and consulted experts, and because it prevented a heavy duplication of effort on the part of Conservancy and partner staff. The OOHA assessment covered both Ouachita Mountains and Ozark ecoregions, and was designed to serve as a data assessment and opportunity identification tool for the U.S. National Forest Service public lands within the ecoregions. The following are the data sources and methodology sections from the OOHA assessment.

Some base data for this ecoregional assessment came from the Ozark-Ouachita Highlands Assessment (Clingenpeel, Pell, 1999). Target lists, occurrences, and land cover, were reviewed and updated with Arkansas and Oklahoma Natural Heritage Commission lists. All Ozarks targets were removed from the data set for this assessment.

Aquatic site updates were performed with data based on 8-digit Hydrologic Unit Codes (HUCs). Target data was refined with 2 modifiers: native landscape is greater than 50%; dams or impoundments create a nonviable zone 20 miles downstream.

Core Planning Team Members (Name, Role, Phone Number, Email):

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2003 Data Management and Methodology

The body of data methodology for this plan resides in its database platform, Conservation Planning Tool (CPT) version 1.5. Please refer to that software for additional information. One element of note: representative element occurrences are noted with an "R" in the EO viability column; any EOs that could be subsumed by the representative population are noted with a "Y"

in that column. Elements were consolidated to a representative population if they existed with in a certain proximity of each other. Representative ("R") EOs may also indicate a proto-EO named by a technical expert, and as such, does not have an exact on-the-ground location. This information was added because this data had not yet been incorporated in the Heritage database or was deemed credible by the core team.

The following is extracted from the data management and methodology sections of the CPT v1.5 data management tool. Data/text field names from CPT are shown in **bold**.

Wide Ranging Species: not specifically addressed.

Crosswalk with Adjacent Ecoregions: UWGCP; Crosstimbers; Ozarks. In 1/03 internal review Mike Fuhr asked that crosswalking with adjacent ecoregions be performed

Goals setting: Goals were set using defaults available through TNC ecoregional guidance including *Geography of Hope and Guidelines for Representing Ecological Communities in Ecoregional Plans*. All goals and targets underwent expert review. Default goals from Geography of Hope were used for most targets, although some target goals were adjusted according species rarity, known occurrences, and availability. Specifically, no target number for a G1 species could be more than the number of known population occurrences in the ecoregion and no G2 species could have a goal over 20 by Heritage definition. In addition, because of the complexities associated with using element occurrence records to identify aquatic species populations (i.e. how many element occurrences constitute a population?), particularly those of mussels, aquatic G3-G4 species are considered "captured" if occurrences are located in at least three aquatic conservation areas, which in this assessment are 8-digit watersheds.

Sites or other Automated selection program: not used

Threats and sources of threats: The Core Team provided compiled a list of all threats and strategies at October 2002 accounting meeting based on the 1994 plan.

Action site selection: Action sites not selected.

Conservation Area Determination and Methodology: Since no conservation areas were specified in the 1994 plan or in the OOHA assessment, the selection of conservation areas was based on a compilation of expert knowledge and EO occurrences reviewed and completed at the October 2002 meeting.

When reviewing EO points against portfolio sites towards accounting, terrestrial EOs ONLY WITHIN TERRESTRIAL sites were counted toward goals. Though terrestrial EOs in aquatic conservation areas appeared, those areas do not have a terrestrial focus and should not be counted. After the October 2002 meeting, EOs within conservation areas were reviewed. Aquatic EOs were crosswalked with existing EOs -- if an OOHA-sourced EO existed then it was used and labled as the proto-EO for the population. If not a proto-EO was not created. Existing EOs were reviewed with respect to date and proximity; those closer than 1/2 mile were combined

and noted. Remaining EOs were labeled with "R" for overall viability as "representative." See below for details:

- R = Representative population; could be a protoEO (created for the purpose of representing the population or could be a converted existing Heritage EO record. Specifications are noted in each record.
- Y = EO records that were subsumed into a representative population e.g., if 25 viable (current, A, B, AB, etc.) EO records for Red-cockaded woodpecker occurred within ¼ mile of each other, they were subsumed into 1 viable representative population. Individual records were retained in the database, however.
- H = Any record over 20 years old was determined to be historic.
- E = extant (existing, viability may not have been determined) records or populations.

For selecting landscape scale conservation areas, 100,000 acres was used as a minimum, including a minimum of 1 matrix community at 10,000 acres.

APPENDIX F

OOHA 1998 Data Sources and Methods of Analysis

OOHA 1998 Data Sources and Methods of Analysis

Since the 2003 Ouachita Ecoregional Assessment utilizes a great deal of data compiled in the 1999 Ozark-Ouachita Highlands Assessment (OOHA; Pell, Clingenpeel, et al., 1999), each relevant "Data Sources and Methods of Analysis" section was scanned from the original texts of reports 3 and 5, *Aquatic Conditions* and *Terrestrial Vegetation and Wildlife* respectively. While the following selections provide data sources and methods of analysis, ecoregional plan users are encouraged to review the entire OOHA texts for reference and implementation.

Data Sources

To facilitate agency ecosystem management efforts, the USDA Forest Service developed a new regionalization framework for the Eastern United States (Keys and others 1995, henceforth referred to as "Keys and others" or the "Keys map") based on a national map of ecoregions of the United States by Bailey and others (1994).

The new framework is hierarchical (like older efforts) but is based on a more holistic consideration of landscape properties than some earlier maps, with climate and soil playing prominent roles along with physiography. The new framework is also designed to rationally subdivide landscapes in ways meaningful to ecosystem management. The older and newer maps coincide most closely at the level of section (Keys and others), province (Fenneman 1938), and natural division (Foti 1974). Although differences occur at this level they are usually in the form of one unit in one system equating to two units in another system. The new framework is often more detailed at lower levels in the hierarchy than older maps.

The Terrestrial Team examined the Keys and others (1995) framework to determine whether the ecological units and their boundaries were adequate for Assessment purposes. Important considerations were that the sections and subsections and their boundaries be ecologically meaningful and consistent across State lines.

Examination of the Keys map and comparison with other regional maps and geological and topographical base maps revealed that sections and subsections and their boundaries were not consistently meaningful and accurate across the Assessment area. The Missouri units and their boundaries have been settled for years; therefore, the Keys map simply adopted those boundaries, and changes needed for the Assessment were very minor. In contrast, the Arkansas units and boundaries needed considerable revision because: (1) the Keys and others (1995) approach departs substantially and without convincing rationale from long-standing delineations (Croneis 1930, Foti 1974) and (2) locally created maps were not available. The Keys map is also problematic in Oklahoma, because in that State only general regions have been defined (OK BTF 1996), boundaries are not detailed, and subdivisions are not mapped. Furthermore, the Keys map appears to be derived from low-detail base maps, and its boundaries were judged to be too general for this Assessment. The Keys map and supporting materials do not explicitly define the

source or rationale for boundaries; therefore, revision of the map sometimes required a determination of the defining physical feature and use of an appropriate base map.

Although production of the new map involved many changes to the Keys and others (1995) map, few changes were made in the list of sections and subsections. (A map illustrating the changes the team made to subsection boundaries is available on the Web site for the Assessment, http://www.fs.fed.us.oonf) The emphasis was on employing clearly-stated boundary definitions that in most cases were first articulated by Croneis (1930), and then using appropriate digital base maps to create an accurate final product. Many changes were made to the Croneis (1930) and Foti (1974) maps, however, primarily by adding detail to the older maps. (See, for examples, the White River Hills and Central Plateau subsections [which are nested within the Salem Plateau of Croneis 1930], the Upper and Lower Boston Mountains subsections [nested within the Boston Mountain subdivision of Foti 1974], or the three new subsections within the Arkansas Valley.) Croneis (1930) and Foti (1974) presented rationales for many regional boundaries in Arkansas and Oklahoma, most of which were adopted for this revision.

All boundaries are based on either geology or topography, although soils maps were used for comparison in some cases. The geologic base map was the 1 :2,500,000-scale geology of the conterminous United States (Schruben and others 1994). The topographic base map was created for this project from 30-meter (m) USGS digital elevation model files by the Spatial Analysis Laboratory of the School of Forest Resources, University of Arkansas at Monticello.

Ecological Units

The following discussion describes the ecological units used in the Ozark-Ouachita Highlands area and the factors on which the boundaries were based along with changes from the Keys map. Alphanumeric codes used here are the same as those used in the Keys map. The modified map of sections and subsections of the Highlands of Arkansas and Oklahoma is the first such delineation for Oklahoma and provides four significant advancements over earlier maps for Arkansas by Croneis (1930) and Foti (1974): .Boundaries are defined and mapped consistently across the three States sharing the Highlands; .Boundaries based on topography are much more accurate than previous maps due to the use of 30-m digital elevation models; .Changes in section and subsection definitions that have occurred since production of the earlier maps are incorporated; and .The map produced by this team is in digital form and freely available on the Assessment Web site.

Arkansas Valley Section (231G) 23 I Ga-The Eastern Arkansas Valley (1,490,182 ac) lies entirely in Arkansas, where it consists of plains with hills 300 to 500 ft in elevation. Underlain by Pennsylvanian sandstone and shale with sandy residuum, this subsection is covered with pine-oak and pine woodlands and forests. Northern and eastern boundaries were modified in detail to better match topographic and geologic boundaries, respectively. The southern boundary was redefined to match the traditional physiographic boundary, Cadron Ridge (Croneis 1930, Foti 1974). The southwestern boundary was redefined to place all Arkansas River bottomlands within the Western Arkansas Valley subsection; topographic and geologic boundaries also contributed to the modified subsection boundary. The Keys map name was changed to eliminate "and

Ridges" since the redefined southern boundary eliminated the most prominent structural ridges from the subsection (one of the reasons for redefining that boundary).

231 Gb-The Western Arkansas Valley Mountains occurs in Oklahoma (494,643 ac) and Arkansas (433,498 ac). It consists of low mountains and ridges and some wide valleys as well. Ranging from 750 to 2,800 ft in elevation, the Western Arkansas Valley Mountains are underlain by Pennsylvanian sandstone and shale with sandy residuum and covered with pine-oak and oak woodlands and forests and prairies. The eastern, northern, and western boundaries as delineated on the Keys map were modified somewhat to better include the mountains and exclude the plains that were continuations of those in the Western Arkansas Valley. The southern boundary was changed to follow the northern boundary of the physiographic Ouachita Mountains (Croneis 1930, Foti 1974). The Keys map name (Mount Magazine) was changed to reflect the importance of other mountains within this subsection.

231 Gc- The Western Arkansas Valley subsection includes portions of Oklahoma (829,099 ac) and Arkansas (1,354,977 ac) and consists of plains, low hills, and ridges 300 to 1,000 ft in elevation underlain by Pennsylvanian sandstone and shale with sandy and clayey residuum along with Holocene sandy alluvium. This subsection is covered with pine-oak and oak woodlands and forests, substantial bottomland forests, and prairies. One major low mountain, Petit Jean Mountain, was included within this section because it was disjunct from the Western Arkansas Valley Mountains, in which it would otherwise have been included. The northern, eastern, and southern boundaries of the Keys map were refined based on topography and geology to place all of the Arkansas River alluvial plains, the most extensive alluvial plains of its major tributaries, and almost all of the Pennsylvanian eroded plains within this subsection. A substantial area that extended up the Canadian River at the western end of this subsection on the Keys map was eliminated on the basis of geology, topography, and the definition of the Arkansas Valley as lying between the Ouachita Mountains and the uplifted plateaus of the Ozark Mountains (Croneis 1930).

Ouachita Mountains Section (M231A) M231Aa- The Fourche Mountains occur in Oklahoma (743,093 ac) and Arkansas (2,148,080 ac) where they form open, low to relatively high mountain ridges, often with wide valleys. Elevations range from 750 to over 2,600 ft, among the highest in the Assessment area. Ridges are underlain by Pennsylvanian and Mississippian sandstone and shale valleys by sandy residuum. Slopes and ridges are covered with pine-oak and oak woodlands and forests. The northern boundary was modified from Keys to coincide with the physiographic boundary based on topography (Croneis 1930, Foti 1974). The southern boundary was modified to match the boundary with Mississippian Arkansas Novaculite and toward the west to follow the long narrow ridges and include the Pennsylvanian Jackfork Sandstone. M231Ab- The Western Ouachita Mountains subsection occurs in Oklahoma (1,623,109 ac) and Arkansas (109,249 ac) and consists of open high hills and low mountains, often with wide valleys, with elevations ranging from 750 to 2,500 ft. The subsection is underlain by Mississippian sandstone and shale with clayey colluvium, covered with pine-oak and oak woodlands and forests, along with prairies. The Keys map boundaries were modified using geology (Arkansas Novaculite) to eliminate portions of the Central Ouachita Mountains from this subsection. The word "Central" was eliminated from the Keys map name (West Central

Ouachita Mountains) because a substantial part of the subsection lies along the southern boundary of the Ouachita Mountains section.

M231Ac- The Central Ouachita Mountains occur in Oklahoma (244,015 ac) and Arkansas (1,401,574 ac). They consist of open high hills and low mountains, often with wide valleys, and they range from 750 to 2,500 ft in elevation. The Central Ouachita Mountains are underlain by Mississippian sandstone and shale with clayey colluvium and covered with pine-oak and oak woodlands and forests. The Keys map boundaries were modified using geology (Arkansas Novaculite); a large disjunct area with consistent characteristics is newly delineated in southeastern Oklahoma. The Keys map name was changed by dropping "East" as it was no longer needed (because of the name change to Western Ouachita Mountains).

M231Ad- The Athens Piedmont Plateau occurs in Oklahoma (56,546 ac) and Arkansas (837,602 ac). It consists of open high hills underlain by Mississippian (with small amounts of Pennsylvanian) sandstone and shale with sandy and clay-loam colluvium covered with pine-oak and pine woodlands and forests. The Keys map boundary was refined using geology (Arkansas Novaculite) for north and west boundaries and Tertiary and Cretaceous deposits on the south and east.

Plant and Animal Diversity

Biologists give each species two ranks—a global (G) rank reflecting its rarity throughout the world and a State (S) rank reflecting its rarity in the State. Following are definitions and criteria for each global rank. State ranks parallel the global ranks closely but are based on the range of each species within a State, not the complete range of the species.

- G l-Critically imperiled globally because of extreme rarity (five or fewer occurrences or very few remaining individuals or acres) or because of some factor of its biology making it especially vulnerable to extinction.
- G2-Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of other factors demonstrably making it very vulnerable to extinction throughout its range.
- G3-Either very rare and local throughout its range or found locally in a restricted area ("endemic"); from 21 to 100 occurrences.
- G4-Apparently secure globally, although it may be quite rare in parts of its range, especially at the periphery.
- G5-Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery. GH-Historically known, with the expectation that it may be rediscovered.
- GX-Believed to be extinct.
- GU-Not yet ranked
- G?- There is a question about the assigned rank.
- GQ- There are taxonomic questions concerning the species or sub specific taxon.
- GT -Associated with global rank, indicating a global rarity for a particular sub specific taxon.

- (S) rank reflecting its rarity in the State. Following are definitions and criteria for each global rank. State ranks parallel the global ranks closely but are based on the range of each species within a State, not the complete range of the species.

The data bases of State Natural Heritage agencies in Arkansas, Missouri, and Oklahoma were the primary sources of the spatial and quantitative data for this analysis. Members of the Terrestrial Team also contributed personal observations. The Team developed the tables included in this chapter and in the Appendix at the end of this chapter. Patterns and Trends At least 333 terrestrial species of plants and animals occurring in the Ozark-Ouachita Highlands are at risk because of habitat loss or other threats and thus appear on State and global lists of species with viability concerns.

Nearly three-fourths of these species inhabit geologically or hydrologically isolated and/or unusual sites, including riparian wetlands, seeps, fens, prairies, rock outcrops, glades, talus, and cliffs, or communities dependent upon type. Many of these communities are highly vulnerable to disruption and, therefore, their dependent species are vulnerable to habitat loss. Two-thirds of the viability concern species occur on public lands, with 187 (56 percent) occurring on Federal lands.

Almost all such species occurring on Federal lands in the Assessment area are found on one or more of the Highland's three national forests. Private lands are the only known sites in the Assessment area for 108 of these species. Many viability concern species occur in more than one ecological subsection (see fig. I.I in Chapter I for map of sections and subsections), and the number of such species per ecological subsection ranges from 4 to 86. The highest concentrations of viability concern species are in the White River Hills of Arkansas and Missouri, the Central Ouachita Mountains, the Fourche Mountains, and the Springfield Plateau. Thirty-five of the terrestrial or amphibious species with viability concerns are globally imperiled ("G2," i.e., with 20 or fewer known populations) or critically imperiled globally ("G I ," i.e., with 5 or fewer known populations). About half of these species inhabit the kinds of restricted plant communities noted previously.

The 12 nonaquatic animals biologists rate as having global viability concerns are either amphibians or invertebrates. Fourteen of the 35 imperiled species are known to occur only on public lands, and II are known to Occur only on private lands. Ten (29 percent) of these species are known to occur on both public and private lands. The Team analyzed the conservation status and conservation trends of the 35 critically imperiled and imperiled taxa, assigning each a conservation status of satisfactory, unsatisfactory, critical, or unknown based on the following criteria: satisfactory = 5 or more conserved populations; unsatisfactory = 1 to 4 conserved populations; critical = no conserved populations; unknown = number of populations unknown. A conserved population is one the landowner or manager (I) is aware of and (2) on a site being managed in a way likely to sustain viable habitat for the population. The 35 species were also assigned a "conservation trend" rating of stable, increasing, decreasing, or unknown. Both kinds of rankings are subjective, but the Team felt these were reasonable estimates of the conservation status and trend of vulnerable species. Federally listed threatened and endangered species were not included here, but were treated in a separate section (see subsequent discussion). The conservation status of the 35 critically imperiled and imperiled taxa, where known, is relatively good, with 37 percent satisfactory and none critical. However, the conservation status of 49 percent of the species is unknown. The pattern for conservation trend is similar. Those species

that have been studied show stable or increasing populations while, for 60% of the species the conservation trend is unknown.

Neotropical Migratory and Resident Birds

Birds in the Ozark-Ouachita Highlands are a large and diverse group of vertebrates. The Terrestrial Team studied the status of 157 species that breed or are likely to breed in the Assessment area. Some species are the subjects of international conservation efforts. In particular, neotropical migratory birds are the focus of one of the largest international conservation efforts for nongame wildlife that are not yet endangered (Terborgh 1989, Hagan and Johnston 1992, Finch and Stangel 1993, Martin and Finch 1995).

The Team analyzed data from several databases to compile three lists: species identified as conservation priorities for the Ozark-Ouachita Highlands by the Partner's in Flight Program (PIP); declining birds in the Ozark-Ouachita Highlands; and species that occur in the Ozark-Ouachita Highlands considered national conservation priorities. Partners in Flight is a collection of Government agencies and nongovernment organizations working to conserve birds (Rogers and others 1993). The list of priority species and declining species was developed for the Ozark-Ouachita Plateau, a region that corresponds closely to the Ozark-Ouachita Highlands Assessment area.

The PIP Priority Species were developed for physiographic regions across the United States and are based on the PIP database, which includes information on breeding landbirds within physiographic regions or States. This information includes global abundance of each species, breeding distribution, winter distribution, threats on breeding grounds, threats on wintering grounds, importance of the region or State to the individual species, and population trends (Hunter and others 1993, Carter and Barker 1993). The Team reported species that are considered conservation priorities, based on the information in the database, for the Ozark-Ouachita Plateau (Colorado Bird Observatory 1998). Species were classified as priorities by PIP if they met one or more of the following criteria: .a species total score in the database is 23 or greater; .a species total score is 19 to 22, with the sum of Area Importance and Population Trend equal to or greater than 8; .it is an Audubon Watchlist species and the Area Importance score is 3 or greater; .its Area Importance score and Population Trend scores add up to 10 (regardless of total score); .the percentage of the population breeding in the planning unit is greater than 5 percent in planning units smaller than 2,000 square kilometers or 10 percent in areas greater than 2,000 square kilometers; .a species is federally listed as threatened or endangered; or .the species is of local concern as identified by PIP Technical, State or Regional Working Groups.

The Team also listed the scores for each element in the database and the total scores for species in the Ozark-Ouachita Plateau. The Team identified declining species from the North American Breeding Bird Survey, which the U.S.G.S. Patuxet Wildlife Research Center coordinates (Robbins and others 1986, Sauer and others 1997). This large-scale roadside survey does not provide good information on species that are rare or not sampled well from roads but does provide the most extensive longterm abundance information for nongame wildlife.

The Team analyzed data for the Ozark-Ouachita Plateau physiographic region from this survey to create a list of species with significant population declines during the period 1966 to 1996. The Terrestrial Team also identified species on the National Audubon Society's Watchlist that may breed within the Assessment area. This list identifies birds that are at risk but do not qualify for Federal listing as threatened or endangered. The National Audubon Society compiles the list in collaboration with scientists and PIP. The Watchlist is based on the PIF Landbird Database but provides a national perspective. Thus, the Watchlist is useful for identifying opportunities in the Ozark-Ouachita Highlands to contribute to national conservation priorities.

The Team also classified species according to the following general habitats: aquatic, developed, agriculture, grassland, savanna/glade, shrub/sapling, and forest (Probst and Thompson 1996, Dickson and others 1995, HamelI992). "Developed habitats" include suburban, urban, and commercial areas. "Agriculture" refers to cropland, pasture, fencerows, and farmyards. "Grassland" includes prairie and rangeland; "savanna/glade" includes semi-forested grassland habitats; "shrub/ sapling" includes old fields and young regenerating forest; and "forest" includes upland, lowland, coniferous, and deciduous forest. In addition to identifying birds breeding in the region and species that pose a management concern, the Team reviewed recent research and recommendations on the effects of habitat fragmentation and forest management practices on birds. These topics have been the subject of significant debate and investigation, particularly regarding neotropical migratory birds in the Eastern United States (Finch 1991, Hagan and Johnston 1992, Martin and Finch 1995, Thompson 1995).

Diversity of Fishes

To examine the distribution of fish species, each of the 10 major basins within the Assessment area was subdivided into hydrologic units (watersheds) according to standard eight-digit hydrologic unit codes (HUC's). The Aquatic Team further subdivided 32 of these 50 watersheds to form 2 or 3 "ecological-hydrologic units" by digitally overlaying ecological sections (slightly modified from Keys and others 1995). From north to south on figure 2.17, the four ecological sections in the Assessment area are the Ozark Highlands (OZ), Boston Mountains (BM), Arkansas Valley (AV), and Ouachita Mountains (OM).

Some watersheds within the aquatic study area lie partially in sections outside the Highlands (those italicized in the following tabulation). The following tabulation shows how the ecological sections used in this analysis and in the remainder of this chapter are roughly equivalent to all or portions of the various physiographic units used earlier in this chapter and elsewhere in this report: Ecological section Physiographic unit Ozark Highlands Ozark Plateaus Province minus Boston Mountains Boston Mountains Boston Mountains section of Ozark Plateaus Province Arkansas Valley Arkansas Valley section of Ouachita Province Ouachita Mountains Ouachita Province minus Arkansas Valley section Mississippi Alluvial Basin Mississippi Alluvial Plain section of Coastal Plains Province Middle Coastal Plains, West Gulf Coastal Plain section Western of Coastal Plains Province Cross Timbers and Prairie Small part of Osage Plains section of Central Lowland Province Osage Plains Portion of Osage Plains section of Central Lowland Province The distribution of fishes within a particular ecological hydrologic unit was determined primarily from maps in Pflieger (1971, 1975), Miller and Robison (1973), and Robison and Buchanan (1988).

The determination of a species' occurrence within a unit depended on the temporal (time) coverage, quality, and scale of source distribution maps. Distributions in both Pflieger (1975) and Robison and Buchanan (1988) were presented as drainage maps for each species with dots indicating the occurrence of a fish species at that point within the drainage. The drainage maps allowed the team to make relatively unambiguous interpretations of fish distributions. Miller and Robison (1973) also used drainage maps for each species, but distributions were shaded rather than indicated by discrete points of occurrence.

Nevertheless, the quality and scale of these maps along with textual descriptions of distributions permitted an accurate delineation of a species' occurrence within an ecological hydrologic unit. Pflieger (1975) reported known collections of fishes in Missouri from about 1905 to 1969. Miller and Robison (1973) are current through the early 1970's for Oklahoma. Robison and Buchanan (1988) covered all known and verified collections of fishes in Arkansas before 1987. Information from these primary sources was augmented with fish distributional information presented in Lee and others (1980), Cross and others (1986), and Page and Burr (1991). Scientific and common names of fishes generally follow that of Mayden and others (1992). Distributions of species described subsequent to the previously cited works were obtained from Harris (1986, Ozark chub); Mayden (1988a, cardinal shiner); and Humphries and Cashner (1994, rocky shiner).

The undescribed darter, Percina species, documented by Robison and Buchanan (1988) from the Ouachita River drainage, is included here under the longnose darter. During late stages of preparation of this chapter, Ceas and Page (1997) described one new species (brook darter) and elevated two subspecies to species status (strawberry and current darters). These last three species are included here under the orangethroat darter.

Fish species were noted as present or absent within each ecological-hydrologic unit and classified as native, endemic, or introduced. Fishes occurring in peripheral (outside the Highlands) ecological-hydrologic units also were noted. The status of a fish species reflects its known historical presence within a unit but does not necessarily indicate its continued present-day occurrence in a unit. Information to account for changes to the fauna is inadequately synthesized for area-wide analysis. Fishes were considered native if the Assessment area is within their known historical range and no evidence of their having been artificially introduced is available. Scientists define endemic fishes as those species that have a restricted range within one locale. Introduced fishes are defined as those that have been intentionally or accidentally released in a locale.

Some species can be described as native, endemic, and introduced. For example, Ozark bass initially were found only in the Upper White River Basin drainage where they are native and endemic. Ozark bass have also been introduced to the Illinois watershed. Therefore, Ozark bass occur in all three categories. Diversity was analyzed using native fish species richness, native fish species density, and number of endemic species.

Native fish species richness is the number of native fish species within each ecological hydrologic unit. Ecological-hydrologic units vary in areal extent, and fish species richness often

increases with increases in stream size or area drained. To examine the effect of areal additivity (increases in area may be accompanied by an increase in species), native species richness was divided by the number of square miles (multiplied by 100) to produce native fish species density values for each unit. In addition, the log of native fish species richness was regressed on the log area of ecological-hydrologic units to examine the relationship between species richness and unit size.

Native fish species richness, native fish species densities, and regional endemicity were plotted on separate ecological hydrologic unit maps. Three levels of relative richness, density, and endemicity were recognized among ecological-hydrologic units: primary, secondary, and tertiary. Primary levels were assigned to the 15 to 17 units (depending on tied scores) with the highest values; secondary levels were assigned to the next highest 15 to 21 units; and tertiary levels, to the remaining units. Hence, primary levels approximate values in the fourth quartile or top 25 percent; secondary levels approximate values in the third quartile or second 25 percent; and tertiary levels approximate values in the first and second quartiles or bottom 50 percent.

Fish faunal composition among drainages of the region was taken from existing works for Arkansas (Mat thews and Robison 1988, Mat thews and others 1992) and Missouri (Pf1ieger 1971). Although methods of analysis varied among these authors, each relied on comparing distributions of native fish species and classifying the resulting similarity patterns into fish faunal regions. The fish faunal regions recognized by these authors are highly compatible and generally congruent even along the shared Missouri-Arkansas border. For Assessment purposes, the Aquatic Team assumed that sections of drainages not included in these previous works (e.g., units wholly in eastern Oklahoma) are classified in the same fish faunal regions as adjacent drainages in Arkansas.

Diversity of Mussels

As in the preceding section-"Diversity of Fishes" the Aquatic Team subdivided each of the major drainages within the Assessment area using the watersheds indicated in Chapter 1. The team further subdivided 32 of the 50 hydrologic units within the Assessment area by overlaying ecological unit boundaries of the Ozark Highlands, Boston Mountains, Arkansas Valley, and Ouachita Mountains. Sixty-one ecological-hydrologic units were recognized within the four ecological sections. The team categorized an additional 25 hydrologic units or watersheds that extended outside the borders of the Assessment area as "peripheral," making a total of 86 ecological-hydrologic units within the aquatic study area.

The team noted freshwater mussels as present or absent within each ecological-hydrologic unit and, using the conservation rank for individual species given by Williams and others (1993), rated them as (I) currently stable, (2) of special concern, (3) threatened, or (4) endangered. Finally, the team combined the ecological hydrologic units into their respective hydrologic units with associated presence or absence and conservation rank data. They omitted the introduced Asian clam and zebra mussel from these analyses. Only data for existing freshwater mussels (i.e., records of live individuals or fresh dead shells taken within the past 30 years) were used in this analysis.

Nomenclature and species concepts generally follow Turgeon and others (1988), as modified by Williams and others (1993). The team analyzed diversity of freshwater mussels using species richness, conservation-rank species richness, species density, and conservation-rank species density. Unionacean bivalve richness is defined as the total number of freshwater mussel species within an ecological-hydrologic unit or hydrologic unit. Ecological hydrologic and hydrologic units vary in areal extent, and freshwater mussel richness may increase as stream size, stream length, or drainage area increases. To examine the effect of drainage area size, the Aquatic Team divided freshwater mussel richness by drainage area size to produce freshwater mussel density values (expressed as density per 100 mi1 for each unit.

The team totaled species conservation ranks for both ecological-hydrologic and hydrologic units to arrive at the conservation-rank species richness. For example, if an ecological-hydrologic unit contained one stable species (rank = I), one species of special concern (rank = 2), and one threatened or endangered species (rank = 3), then the conservation-rank species richness for that unit would be 6 (1 + 2 + 3 = 6). The team then divided conservation-rank species richness by drainage unit area to determine conservation-rank species density.

Forty-five hydrologic units and 47 ecological hydrologic units had sufficient data to use for analysis of freshwater mussel spatial patterns (species distribution), species richness, and density. Three levels of relative richness and density were recognized among ecological-hydrologic and hydrologic units: primary, secondary, and tertiary. Ecological-hydrologic and hydrologic unit values for richness, density, conservation-rank richness, and conservation-rank density were sorted and ranked, and levels were assigned based on breaks in sequence.

The Aquatic Team assigned primary levels to grouped ecological-hydrologic and hydrologic units with the highest parameter values (e.g., for richness and density), secondary levels to the next highest natural group of units, and tertiary levels to the remaining units. Hence, primary levels approximate values in the fourth quartile (top 25 percent); secondary levels, values in the third quartile (second 25 percent); and tertiary levels, values in the first and second quartiles (bottom 50 percent). The team plotted species richness, species density, and conservation-rank species richness on both ecological-hydrologic and hydrologic maps of the Assessment area to show patterns of distribution, richness, and density.

Individual rank orders of hydrologic units for species richness, species density, conservation-rank species richness, and conservation-rank species density were added together to provide a value of the relative importance of hydrologic units as a freshwater mussel habitat in the Assessment area. The Aquatic Team determined distributions of freshwater mussels within ecological-hydrologic units from an array of data sources. Johnson (1980) presented mussel presence or absence data for drainages encompassing much of the Assessment area.

For drainages in Missouri, dot distribution maps provided by Oesch (1984) were the primary data source. The team used Buchanan (1980) extensively to determine mussel distributions within the Meramec River Basin. Gordon (1980) and Clarke and Obermeyer (1996) provided data about mussel distribution in the Spring and Elk Rivers (Neosho-Illinois Basin) in Missouri. Warren (1991) discussed the mussels of the upper Eleven Point River (Upper Black River Basin). Gordon and others (1980) summarized the distributional data for Arkansas mussels, and

Gordon (1980) discussed the systematics and zoogeography (geographic distribution of animals) of the Mollusca in Arkansas.

Several studies of mussels have taken place in the large Upper White and Upper Black River drainages of Arkansas. Freshwater mussel distributions for the Spring and Black Rivers were reported by the Arkansas Highway and Transportation Department (AR HTD 1984), Gordon and others (1984), Miller and Nelson (1984), Miller and Hartfield (1986), Rust (1993), and Davidson and others (1997). Rust (1993) also surveyed mussel distributions and population structures in portions of the Strawberry and Current Rivers. Buchanan (1993) and Sietman and Sadler (1994) surveyed selected sites in northeast Arkansas and southwest Missouri to monitor the declining status of the Curtis pearlymussel. Meek and Clark (1912) first studied the distribution of freshwater mussels in the Buffalo River, and Harris (1996) resurveyed the same Buffalo River reaches to determine if population densities and distributions had remained stable.

Miller and Harris (1987), Harris (1987, 1994b, 1995), and Christian (1995) studied mussel distributions in the main stem of the White River downstream of its confluence with the Black River. Gordon (1980) surveyed the mussels of the White River upstream from Beaver Reservoir, and Gordon (1982) summarized the available data for the main stem of the White River in Arkansas and Missouri.

Freshwater mussel distributions within the Little Red River (Upper White River Basin) were documented by Clarke (1987) and Harris (1992a, 1993). Little published data are available for mussel distributions in rivers and streams draining the Arkansas Valley. Relatively large Arkansas River tributaries such as the Illinois Bayou, Fourche La Fave River, Petit Jean River, Point Remove Creek, Cadron Creek, Maumelle River, and Little Maumelle River have not been surveyed to determine mussel species composition and distribution. Limited data about mussel distribution are available for the Neosho River of Oklahoma, e.g., Branson (1973,1982,1983,1984), White (1977), Shepard and Covich (1982), Mather (1990), and Vaughn (1996a).

Gordon (1979) and Harris (1991c, 1997b) surveyed mussel distributions within the Illinois River (Neosho-Illinois Basin) in Arkansas, and Vaughn (1995) provided distributional data for the Oklahoma portion of the Illinois River. Gordon (1980,1985) surveyed the mussels of Frog Bayou, and Stoeckel and others (1996) investigated the mussel fauna of the ~ Mulberry River (Frog-Mulberry watershed). Davidson (1997) surveyed the Ozark and Dardanelle reservoirs of the Arkansas River (also known as the Kerr-McClellan Navigation System) for mussels, and Harris (1991a) surveyed a portion of Dardanelle Reservoir. Harris (1992b, 1994c, respectively) also surveyed the mussel populations in a short reach of the South Fourche La Fave River and tributaries (Arkansas River Basin) and the freshwater mussel distribution in the Arkansas reach of the Poteau River.

Freshwater mussel distributions in the Kiamichi-Little River drainage of Oklahoma were taken from Branson (1982, 1983,1984), Clarke (1987), Mehlhop and Miller (1989), Vaughn and others (1993,1994,1996), Vaughn and Pyron (1995), and Vaughn (1996a, 1996b, 1997). Gordon and Harris (1983) and Clarke (1987) studied the mussels of the Red River and tributaries in southwestem Arkansas. Mussels of the Ouachita River drainage were first reported by Wheeler

(1918); Gordon and Harris (1983) summarized the results of surveys in several Ouachita River tributaries. Harris and Gordon (1988) provided the most comprehensive data set regarding mussels of the upper Ouachita River system during their status survey of the Arkansas fatmucket. Additional studies (Harris 1989a, 1991b, 1994a; Bums and McDonnel11992a, 1992b) to elucidate the status of the Arkansas fatmucket provided data about the distribution of mussel species associates.

The mussels of portions of the Little Missouri and Ouachita River main stems were surveyed by Davidson (1997) and Posey (1997). Distributional data for mussels in the Upper St. Francis River came primarily from Oesch (1984) and Ecological Consultants, Inc. (1984). Additional distributions in the St. Francis River Basin were obtained from Ahlstedt and Jenkinson (1987) and Jenkinson and Ahlstedt (1987 [synthesized in Ahlstedt and Jenkinson (1991)]).

Diversity of Crayfishes

Data Sources and Methods of Analysis To account for the distributions of crayfishes, the Aquatic Team subdivided each of 10 major drainages within the Assessment area according to hydrologic units or watersheds. River basins and watersheds are shown in figure 1.2. Fifty hydrologic units or watersheds were recognized within the aquatic study area. Half of these watersheds extend beyond the Assessment area and contain portions of other ecological sections (e.g., the Mississippi Alluvial Basin).

Within a particular hydrologic unit, the team determined the presence or absence of a crayfish species or subspecies primarily from maps, distributional tables, and descriptions in Williams (1954), Reimer (1969), Bouchard and Robison (1980), Hobbs and Brown (1987), Hobbs and Robison (1985,1988,1989), Hobbs (1989), Pflieger (1996), Robison and Leeds (1996), and Taylor and others (1996). The team also used these sources for species regarded as endemic to the aquatic study area.

With the exception of Missouri (Pflieger 1996), no recent distributional monographs for crayfishes are available for much of the study region; in particular, there are no current maps of crayfish distributions for Arkansas and Oklahoma. The status of a crayfish species reflects its known historical presence within a hydrologic unit but does not indicate its continued or present-day occurrence there. Available maps (e.g., Pflieger 1996) depicted distributions by discrete points of occurrence, allowing relatively unambiguous interpretation of crayfish distributions. In cases where the Aquatic Team could not interpret the location of data points or maps were not available, the team attempted to identify referenced site locations. In a limited number of cases, reference data were unavailable or not interpretable; the presence of a species in those hydrologic units was not included in the final data set.

Because of the lack of detailed information on distribution, assignment to hydrologic units may have resulted in an underestimation of the range of some crayfish species, particularly those within Arkansas or Oklahoma. Likewise, some crayfish that occur predominantly in portions of hydrologic units extending outside the Assessment area were included in estimates of the species richness of those units. Scientific names are generally consistent with Taylor and others (1996); less than one-quarter of crayfish taxa have common names (Williams and others 1989a). Because

of uncertainty regarding the distribution of subspecies, we treat Orconectes palmeri palmeri and Orconectes palmeri longimanus under the species name Orconectes palmeri (Penn 1957, Pflieger 1996). The Aquatic Team analyzed diversity of crayfishes using species richness, species density, and numbers of endemic species. Species richness is the total number of crayfishes within each hydrologic unit.

Hydrologic units vary in size, and richness often increases with an increase in stream size or area drained (areal additivity). To examine the effect of areal additivity, the team divided species richness by the number of square miles to produce species density values (times 100) for each unit. Species richness, species density, and number of endemic species were plotted on separate hydrologic unit maps. Three levels of relative species richness, density, and endemicity were recognized among hydrologic units: primary, secondary, and tertiary. Primary levels were assigned to the 12 to 17 units (depending on tied scores) with highest values, secondary levels to the next highest II to 12 units, and tertiary values to the remaining units. Hence, primary levels approximate values in the fourth quartile; secondary levels, values in the third quartile; and tertiary levels, values in the first and second quartile.

Diversity of Aquatic Insects

To analyze distributions of stoneflies and caddis flies, the Aquatic Team subdivided each of 10 major drainages within the Assessment area according to hydrologic units or watersheds. River basins and watersheds are shown in figure 1.2. Fifty hydrologic units or watersheds were recognized within the aquatic study area. Half of these watersheds extend beyond the Assessment area and contain portions of other ecological sections (e.g., the Mississippi Alluvial Basin).

Within a particular hydrologic unit, the team determined the presence or absence of a stonefly or caddis fly species as well as endemicity. This was done primarily from maps and distributional tables in Poulton and Stewart (1991) and Moulton and Stewart (1996), respectively. Poulton and Stewart (1991) and Moulton and Stewart (1996) independently undertook analyses of faunal composition of stoneflies and caddis flies. Both studies used smaller drainage units and more finely divided ecological regions than were used in this Assessment report. Each study also included several variables to classify or predict the presence of stonefly or caddis fly species (e.g., stream size, flow permanence, and vegetational types for stoneflies; and latitude, longitude, physiography, geology, springs, and vegetational type for caddis flies).

A summary and synthesis of the primary results of the two studies are presented here; for details, the reader is referred to the original studies. Poulton and Stewart (1991) collected specimens from more than 1,200 sites. These researchers included monthly collections of stoneflies from 693 stream sites across 123 watersheds between November 1983 and May 1988. They found stoneflies at 523 sites and subsequently made repeat collections at 191 of these. For caddis flies, Moulton and Stewart (1996) collected from over 500 different locations between March 1990 and March 1994. Limited collecting occurred after November 1992. These researchers augmented their field collection records by examining and including museum material. In both of these substantial and unprecedented studies, most collection localities were within the Assessment area.

The Aquatic Team used species richness, species density, and number of regionally endemic species to analyze diversity of stoneflies and caddis flies. Species richness is the number of stoneflies and caddis flies within each hydrologic unit. Hydrologic units vary in size, and aquatic species richness often increases with an increase in stream size or area drained (areal additivity). To examine the effect of areal additivity, the Aquatic Team divided species richness by the number of square miles to produce species density values (expressed as density per 100 mi1 for each unit. In addition, the team examined the regression of the log of stonefly and caddis fly species richness with the log of square miles in hydrologic units.

The Aquatic Team plotted species richness, species density, and regional endemicity on separate hydrologic unit maps of the Assessment area. The team recognized three levels of relative species richness, density, and endemicity among hydrologic units: primary, secondary, and tertiary. Primary levels were assigned to the 15 to 17 units, depending on tied scores, with highest values; secondary levels to the next highest 15 to 21 units; and tertiary values to the remaining units. Hence, primary levels approximate values in the fourth quartile (or top 25 percent); secondary levels, values in the third quartile (or second 25 percent); and tertiary levels, values in the first and second quartiles (or bottom 50 percent).

Endangered, Threatened and Other Aquatic Species of Special Concern

The Aquatic Team synthesized information on endangered, threatened, and other aquatic organisms of special concern, including aquatic insects, mollusks, crayfishes, totally aquatic herptiles, and fishes. To analyze and display the distribution of these aquatic species, each of 10 major drainages within the aquatic study area was subdivided, yielding 50 hydrologic units or watersheds. The team noted each endangered, threatened, and other species of special concern that was present or absent within each hydrologic unit. Some species with occurrences in portions of hydrologic units extending outside the Assessment area were included in the analysis.

The team included species with Federal status (i.e., endangered. proposed endangered, threatened, and proposed threatened under the ESA); those ranked globally as G 1, G2, or G3 by The Nature Conservancy; and those ranked as S 1, S2, or S3 by the State heritage programs. The team referred to these three conservation rankings as "Federal status," "global ranks," and "State ranks," respectively. The team presented separately the conservation status rankings of the American Fisheries Society (see the "Management Indicator Species" section later in this chapter). The team determined distributions of endangered, threatened, and other aquatic species of special concern within a particular hydrologic unit from Element occurrence Records (EOR's) received from heritage programs in Arkansas, Oklahoma, and Missouri (USDA FS 1997a, b).

The EOR data sets were based on information updated by the States in 1997. The team used the temporal coverage, spatial coverage, and quality of information on State EOR 's to determine the occurrence of each species within hydrologic units. The presence of an endangered, threatened, or other aquatic species of special concern reflects known historical presence within a unit but does not necessarily indicate the continued occurrence of a species in that watershed. Recent verification of the continued presence of species documented in historical EOR's (i.e., those 10

or 20 years old) may be limited by constraints on funding, personnel, and expertise in State heritage programs. Further, the collection of EOR data tends to be weighted toward surveys or environmental assessments associated with State or Federally regulated projects or lands.

The team compared lists of species compiled from EOR data with lists of endangered, threatened, proposed endangered, and proposed threatened species of the USDI Fish and Wildlife Service (1997a, b), and corrected inconsistencies. They also augmented and corrected information from the States by using information for fishes from Pflieger (1975) and Robison and Buchanan (1988) and for crayfishes from Pflieger (1996).

The Aquatic Team analyzed endangered, threatened, and other aquatic organisms of special concern by major groups of organisms (insects, mollusks, crustaceans, fishes, and herptiles) and by geographic distribution. The number of endangered and threatened species accounted for by EOR's was tallied for each hydrologic unit, and the results were mapped across hydrologic units in four categories: no Federal status species or insufficient data; one to two Federal status species; three Federal status species; and four Federal status species.

The Aquatic Team added the number of other species of special concern (i.e., those with global and State ranks) to the Federal status tally for each hydrologic unit and mapped the results to show total imperilment for each unit. Three levels of total imperilment were recognized among hydrologic units: primary, secondary, and tertiary. Primary levels were assigned to the 13 units with highest values, secondary levels to the next highest 14 units, and tertiary values to the remaining units. Hence, primary levels approximate values in the fourth quartile (top 25 percent), secondary levels (second 25 percent), values in the third quartile, and tertiary levels, values in the first and second quartiles (bottom 50 percent).

Aquatic Habitats

The Aquatic Team calculated stream type diversity by summing the combinations of stream orders and ecological sections for each hydrologic unit within the Assessment area, following Warren and others (1997). The team recognized 50 hydrologic units (watersheds) as occurring partly or wholly within the Assessment area. As reported in the "Diversity of Fishes" subsection of this chapter, the team further subdivided 32 of these watersheds by digitally overlaying ecological sections (Keys and others 1995) onto each hydrologic unit to form two or more ecological-hydrologic units.

Twenty-five hydrologic units include lands and waters outside the Assessment area. For these units, stream type diversity includes stream types not necessarily within the Highlands. The team used the EPA's River File version 3 (RF3), to determine stream size. The Aquatic Team recognized stream sizes as ranging from first order (smallest streams) to seventh order (largest streams), where order was determined following Strahler (1964).

The team then delineated three levels of stream type diversity among hydrologic units: primary, secondary, and tertiary. Primary levels were assigned to the 13 units with highest values; secondary levels were assigned to the next highest 13 units; and tertiary levels, to the remaining 24 units. Hence, primary levels approximate values in the fourth quartile (top 25 percent);

secondary levels (second 25 percent), values in the third quartile; and tertiary levels, values in the first and second quartiles (bottom 50 percent).

The Aquatic Team used two approaches to examine the association of stream type diversity with elements of the aquatic fauna. First, using data synthesized for this report, the team examined stream type diversity for association with richness of native fish species and richness of endemic fish species in hydrologic units. Second, the team summarized the work of Matthews and Robison (1988) and Matthews and others (1992) on largescale physical habitat attributes and distribution of fishes.

Fish species richness is the total number of native fishes recorded as present in a hydrologic unit; richness of endemic fish species is the number of fishes that are endemic to the Assessment area and occur exclusively in a particular hydrologic unit (see "Diversity of Fishes" in this chapter). The Aquatic Team used a rank correlation procedure (known in statistics as Kendall's tau beta coefficient) to test the association between stream type diversity, richness of native fish species, and richness of endemic species among hydrologic units. In this report, stream type diversity accounts only for flowing surface waters and the presence of a unique combination of ecological section and stream size within a hydrologic unit. Some hydrologic units certainly contain other unique habitat types such as springs, caves, wetlands, or natural lakes that are not accounted for by stream type diversity. Hydrologic units also may have impoundments (e.g., reservoirs) that have altered the habitats available to aquatic organisms.

The gains or losses of habitat diversity in these inundated areas are not reflected in this report as contributing to or lessening the number of stream types within a hydrologic unit. Likewise, the measure of stream type diversity in this report does not account for the spatial extent of a particular stream type within a hydrologic unit. The Aquatic Team accounted only for the presence of certain stream types within a unit.