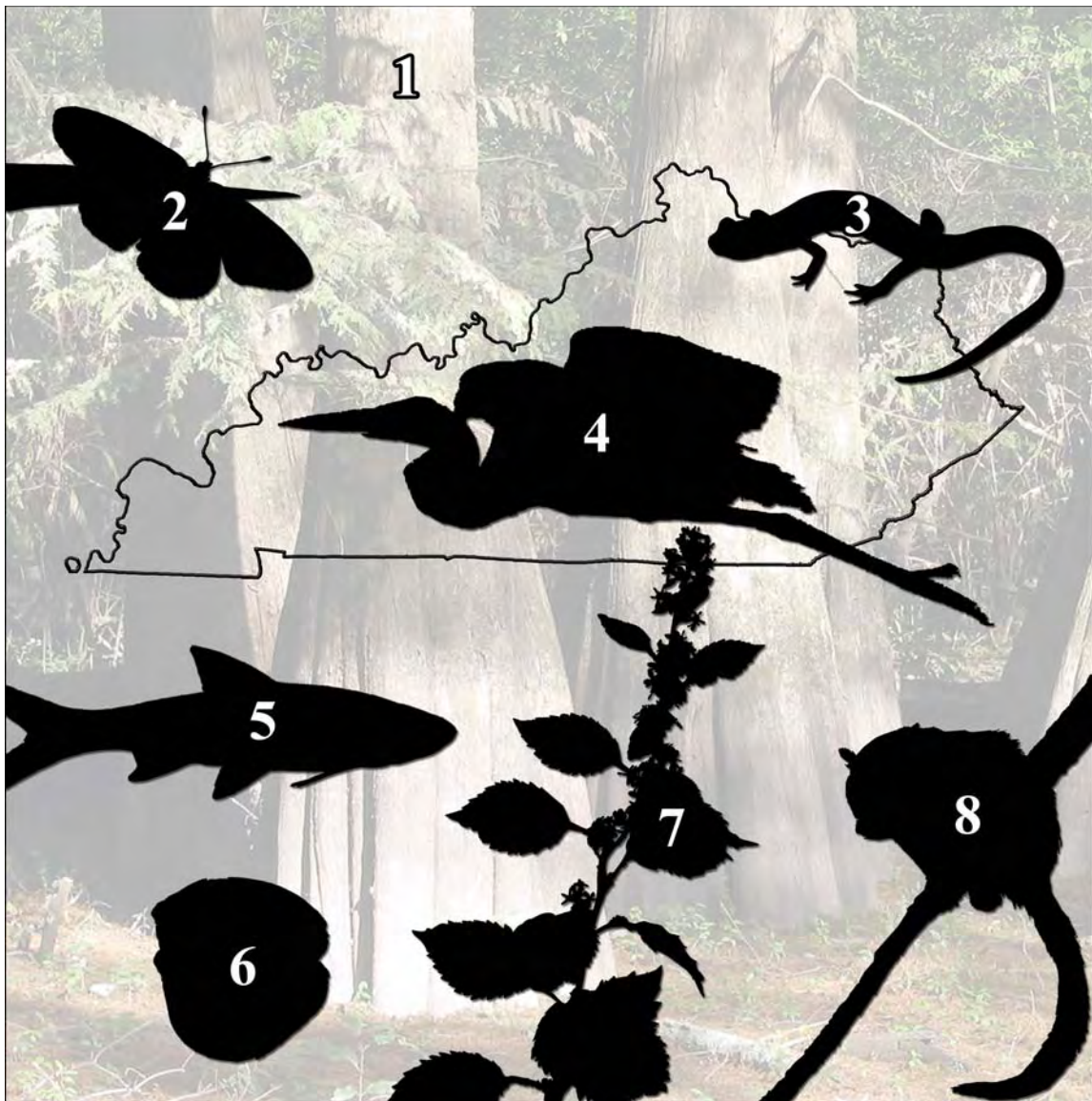


KENTUCKY STATE NATURE PRESERVES COMMISSION

BIENNIAL REPORT

January 2005





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- 1 – Coastal Plain Slough at Three Ponds State Nature Preserve (Heather Housman, KSNPC)
- 2 – Baltimore Checkerspot - *Euphydryas phaeton* (Ellis Laudermilk, KSNPC)
- 3 – Three-lined Salamander - *Eurycea guttolineata* (James D. Kiser)
- 4 – Great Blue Heron - *Ardea herodias* (Lana Hays)
- 5 – Cypress Minnow – *Hybognathus hayi* (Ronald R. Cicerello, KSNPC)
- 6 – Pyramid Pigtoe – *Pleurobema rubrum* (Ronald R. Cicerello, KSNPC)
- 7 – White-haired Goldenrod – *Solidago albopilosa* (Nicholas Drozda, KSNPC)
- 8 – Southern Flying Squirrel - *Glaucomys volans* (John MacGregor, KDFWR)

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Biennial Report of the Kentucky State Nature Preserves Commission January 2005

INTRODUCTION

This is the 15th biennial report submitted to the Governor and the General Assembly as required by KRS 146.410 et seq., the Kentucky State Nature Preserves Act, or simply the “Act.” The Kentucky State Nature Preserves Commission was created in 1976.

It is the mission of the Kentucky State Nature Preserves Commission to protect Kentucky’s natural heritage by:

1. Identifying, acquiring, and managing natural areas that represent the best known natural occurrences of rare native species, natural communities, and significant natural features in a statewide nature preserves system.
2. Working with others to protect biological diversity.
3. Educating Kentuckians as to the value and purpose of nature preserves and biodiversity preservation.

The Commission is composed of five citizen members selected by the Governor, two at-large members and one member appointed from each of three groups: the Kentucky Farm Bureau Association, the State Association of Soil Conservation Districts and the National Farmers Organization. The current commissioners are: Mrs. Clara Wheatley, Chairperson (National Farmers Organization), Mr. David Wright (at-large), Mr. O. D. Hawkins (Kentucky Farm Bureau Association), Mrs. Gayle Horn (State Association of Soil Conservation Districts), and Dr. Eunice Johnson, M.D. (at-large). The executive director is Donald S. Dott, Jr. The Commission staff consists of 22 full-time positions and one permanent part-time position. Interim positions are used when funding is available to perform seasonal support work such as biological inventory and nature preserve maintenance or stewardship.

The Commission has adopted a vision statement for our long-term future:

“The people of Kentucky recognize, appreciate, endorse, and actively support biodiversity conservation, including the acquisition and maintenance of a state nature preserve system that represents the best possible examples of native biological diversity and significant natural features within the Commonwealth.”

WHY PROTECT BIODIVERSITY?

Protecting biodiversity is our statutory mission, but a fuller explanation may be beneficial. Biodiversity is an abbreviated version of the phrase “biological diversity.”

Biodiversity has been aptly explained by the Kentucky Biodiversity Task Force:

“Kentuckians are privileged to live in one of America’s most beautiful states with a rich tapestry of lands and waters, all teeming with life. This life is found in an abundance of plants, animals, and other organisms that interact with each other and the environments they occupy.

These living things and their relationships with each other and with their surroundings form a mosaic of biological communities and ecosystems that represent the complex and valuable diversity that makes Kentucky unique. This diversity of life, long a central theme of biological studies, is much more than a scientific discipline. It is a fundamental aspect of life on our planet. The interdependency among living things is an essential feature that makes life unique and our existence possible.

Biological diversity – or biodiversity, to use a shorthand term – is the focus of increasing interest and concern today, not only in Kentucky but across the country and around the world. The governments of several nations, recognizing that biodiversity knows no political boundaries, have launched conservation efforts. Biodiversity is emerging as a concept that unifies scientists, conservationists, economists, politicians, and philosophers in their attempts to address the problems resulting from the earth’s ever-increasing human population.” (Excerpted from the Executive Summary of Kentucky Alive! Report of the Kentucky Biodiversity Task Force.)

There are numerous reasons to protect the native biodiversity of Kentucky – both pragmatic and ethical. A few reasons include:

1. Commercial benefits – Biological resources are the basis of critical commercial uses, such as plants for food and fiber and wood for fuel and housing. The Kentucky Division of Forestry reports that forest industries employ over 30,000 people and more than \$2 billion of revenue is generated annually from the primary and secondary wood industries.
2. Medicines – Almost one-fourth of all medical prescriptions throughout the world are derived from plants and microorganisms or synthesized versions of their chemical compounds. For example, willow is the basis for common aspirin. Alternative medicine and health care is also largely reliant on natural remedies which are plant-based; i.e., ginseng, echinacea (coneflowers), goldenseal, as well as many others yet to be found.

3. Recreation – Our diverse natural areas and ecosystems draw millions of visitors each year to Kentucky’s state parks, and to other natural areas such as Kentucky State Nature Preserves, Kentucky Department of Fish and Wildlife Resources’ Wildlife Management Areas, Daniel Boone National Forest, Mammoth Cave National Park, Land Between the Lakes National Recreation Area and many others. Kentucky’s state nature preserves are open and available for public visitation and education. According to the Kentucky Commerce Cabinet, the tourism industry provided Kentucky’s third-largest revenue producing industry, contributing \$9.1 billion to the state economy in 2002. Wildlife watching, hunting and fishing in Kentucky generated an estimated \$1.92 billion in expenditures according to the 2001 estimates of the U. S. Fish and Wildlife Service.
4. Ecological functions – Biological diversity provides the basis for a stable environment. Forests provide oxygen to the atmosphere, help cool the climate and absorb man-made air pollution. Wetlands function with their unique diversity of species to purify water runoff from uplands and are sometimes referred to as “nature’s kidneys.” Wetlands are being used as alternative treatment methods for acid drainage from mines. Wetlands also act as reservoirs to retain and slowly release floodwaters. Songbirds help reduce crop damage and forest injury by feeding on insects. Other insects provide pollination for both native flora and agricultural crops. These multiple biological elements are complexly interwoven in nature’s scheme of biological diversity that is the key to a healthy, stable environment.
5. Man as steward – Many people believe we have a social, spiritual or moral responsibility to ourselves *and our children* to preserve and share our natural resources – both the non-living and the biological.

Whatever reason may be most compelling for protecting our biological diversity, the 1976 Kentucky General Assembly made it our mission. KRS 146.410(1) states:

“All areas within the borders of the Commonwealth, except those which are expressly dedicated by law for preservation and protection in their natural condition, are subject to alteration by human activity. As part of the continuing growth of the population and the economic development of the Commonwealth, it is necessary and desirable that the overall impact on the natural ecology be considered when major alterations are proposed affecting same, and that certain areas of unusual natural significance be set aside and

preserved for the benefit of present and future generations. Such unique areas are valuable as laboratories for scientific research, as reservoirs of natural materials not all of the uses of which are now known, as habitats for plant and animal species and biotic communities, as living museums of the native landscape where people may observe nature's web of life and our natural heritage, as places of historic and natural interest and scenic beauty, and as reminders of the vital human dependence upon fresh air, clean water, and unspoiled natural areas."

THREATS TO KENTUCKY'S BIODIVERSITY

Land conversion ranks as the primary threat to our natural areas and the native biological diversity they support. Natural areas support a great diversity of species, which we humans replace with only a few preferred species in our managed landscapes. When forests are logged the most desirable species are removed, reducing tree diversity. Farmlands are largely fescue pastures or monocultures of row crops. Suburban lawns are planted in fescue and a relatively few ornamental plants and favored tree species that thrive in urban conditions. Certainly these types of managed landscapes are both desirable and necessary for lodging, food, timber and fiber production, but part of their overall cost is a loss of biodiversity. As the conversion of land to such uses increases, it becomes more critical to protect the rare undisturbed natural areas that serve as reservoirs of Kentucky's bountiful biological diversity, before they are reduced to such a small scale that they cannot sustain themselves, or are lost entirely.

The rapid rate of land development in Kentucky, noted as being second in the nation in 2001, led to the appointment of the Smart Growth Task Force that same year. The task force noted in its draft report that, "Habitat loss/alteration/fragmentation is the largest contributor to species imperilment." Kentucky currently has 52 species listed as threatened or endangered by the U. S. Fish and Wildlife Service, 15 of which are considered extinct or extirpated. There are 19 potential additions or "candidate" species, but 2 of these are now believed extinct or extirpated. The Commission lists and monitors 704 plants and animals as rare in Kentucky. Four plants and 49 animal species are listed as extinct or extirpated from Kentucky.

The current Forest Inventory Analysis of our state's forests, compiled by the Kentucky Division of Forestry and the U.S. Forest Service, reports a 3 percent net decline, or a loss of 769,000 acres of forested land from 1988 to 2003. A 3 percent loss does not sound like much, but 769,000 acres does. That's an area larger than Jefferson, Shelby, Franklin and Woodford Counties combined – or larger than the Daniel Boone National Forest, which is over 700,000

acres. It is encouraging to learn from the report that nearly half of Kentucky remains forested, but the trend in loss of forest acreage warrants close monitoring.

While land development is the primary cause of the loss of biodiversity, the invasion of and competition from exotic (non-native) species, like kudzu, garlic mustard, multi-flora rose and zebra mussels is the second most serious threat to our native species. Invasive exotic species spread rapidly, unchecked by the natural controls that exist in their place of origin. In a report warning of the dangers that invasive species pose to the environment and the economy, the U. S. Government Accounting Office stated that enormous costs have been incurred seeking to control zebra mussels in the U.S. In Kentucky, two of the best-known invasive species that farmers and natural areas managers must fight to control are musk thistle and Johnson grass. Kudzu is another and one of the best-recognized invasive exotic plants, while Bush honeysuckle is rapidly changing the composition of forested habitat in the Bluegrass Region. Unfortunately, additional invasive species continue to arrive in the United States due in large measure to our global economy.

Exotic species that have no natural predators or disease to keep them in check can proliferate rapidly and crowd out native species. Historically, American chestnut blight and Dutch elm disease took a devastating toll on these two tree species, fundamentally changing the composition of our native forests. More current forest threats include sudden oak death, dogwood anthracnose, hemlock wooly adelgid and butternut (or white walnut) canker.

Additionally, virtual elimination of wildfire as a normal event in the natural environment, to protect human habitation and timber value, has led to “non-natural” changes in ecosystems that evolved with wildfire as a normal component. For example, woody species and trees invade open grasslands or other prairie-like areas that historically were kept open by wildfires and large herds of grazing animals, like bison. Such areas need controlled burns carried out by trained professionals or these special communities of plants and their associated fauna will cease to exist as part of our landscape. Lack of fire is also a factor in the decline of the oak reproduction, reducing mast available for wildlife.

Nature preserves are often thought of by the public as areas in an undisturbed natural state, best left to “Mother Nature.” Unfortunately, there are too many threats to the remaining natural areas (as witnessed by their scarcity) for a hands-off approach. These threats not only come in the form of trespassing, unauthorized use of ATVs, timber theft, habitat destruction,

arson, etc., but natural areas also suffer from other threats, like exotic species.

HOW WE ACCOMPLISH OUR MISSION

NATURAL HERITAGE PROGRAM

The Commission uses a methodology known as the natural heritage program to inventory and catalog information on rare plant and animal species and natural communities. This information is crucial to science-based decisions to prioritize the protection of our natural areas and rare species. The natural heritage program methodology is used in all 50 states, several Canadian provinces and more than a dozen Central and South American nations. The Commission is part of the largest international biological data network in the world that is used for land and species protection. The Commission's natural heritage program houses the most complete and accurate rare species and natural areas database in the state.

The Commission has a staff of dedicated expert biologists to search or survey the state for rare species, including federally listed endangered and threatened species. Our field staff includes: two botanists for rare plants (there are nine federally listed and 383 state-listed rare plants in Kentucky); an aquatic zoologist who specializes in native fish and mussels (the most at-risk group of animals in the United States); a terrestrial zoologist who surveys birds, mammals, reptiles and amphibians; and an invertebrate zoologist assigned to taxonomic groups such as insects, gastropods and others, some of which are cave organisms unique to Kentucky. These biologists gather information from all sources, confirm its integrity and record it in a comprehensive database on biodiversity, the Kentucky Natural Heritage database.

The Natural Heritage data management staff maintains the informational databases and provides all aspects of technical support. With assistance from the biologists, the data management staff analyzes the Heritage data to identify conservation targets. The data staff also provides computer system, Web site and Geographic Information Systems (GIS) support to all members of the Commission staff. In addition, the staff provides environmental review and GIS services by responding to information requests from the public and under various agreements with other agencies. The implementation of new programs and services such as delivering real-time data to other agencies, delivering searchable data to the public via the Web site, and developing GIS products and services has created many opportunities for the staff of this section to play key roles in fulfilling our mission.

The Commission employs ecologists to find and classify plant communities; i.e., various types of forest, wetlands, prairies, barrens, etc. The ecologists utilize a process called Natural Areas Inventory (NAI) to systematically find and evaluate the natural areas of Kentucky and guide the acquisition of outstanding natural areas for our nature preserves system. The ecologists use aerial photography, aerial surveys, topographic maps and other tools to locate potential natural areas prior to making ground visits to assess these areas. The best natural communities are targeted for inclusion in the nature preserves system.

Our NAI process has not yet completed an assessment of the natural areas of Kentucky, due to our limited resources and staff. The NAI section reached three full-time and one part-time staff in 1999 but fell to one full-time position under recent budget cuts. A second position was just restored in December 2004. The NAI process has been completed in only 37 counties and partly completed in another 44 counties, leaving 39 counties completely unassessed. We estimate that only *one-half of one percent* (.5%) of Kentucky remains in a natural condition comparable to what existed when the pioneers arrived. The current high rate of land conversion threatens even these scarce remaining areas.

Another tool used to locate and evaluate natural areas is the Large Forest Block project - a GIS-created map that delineates contiguous blocks of forest larger than 1,000 acres in the Commonwealth (or a minimum of 5,000 acres in heavily forested eastern Kentucky). This is very important information, as there are numerous species (including some of our songbirds and large mammals such as black bears) that require large unbroken forests for their survival. Prior to development of this map there was no assembled information as to the number, size and location of the remaining forest blocks in Kentucky. The Commission has shared this data with other agencies.

The Commission uses a Web site to distribute information to the public. In 2003 the Web site was redesigned, the Kentucky Rare Plant Database was launched and a series of species "Fact Sheets" was added. Data staff collaborated to create a number of information posters, kiosk panels and graphics that illustrate and highlight conservation issues throughout the Commonwealth.

NATURE PRESERVES AND LAND PROTECTION

The Nature Preserves and Natural Areas Branch staff members protect and preserve our diverse system of nature preserves and provide opportunities for environmental education and

outreach to the public. This involves expertise in land management techniques such as prescribed burning and exotic plant control, including a myriad of tasks ranging from trail maintenance to research on the viability of rare species populations. We are working to create additional interpretive materials and trail maps to better enable visitors to enjoy the preserves. Currently, our preserve system consists of 21,010 acres and is growing. However, we have a staff of *only six* to oversee our 51 preserves. These outstanding natural sites are scattered across the Commonwealth from the wetlands of the Mississippi River to the dense forests of Pine Mountain on the state's eastern border.

The source of funding for the Commission to purchase land for nature preserves is the Kentucky Heritage Land Conservation Fund (KHLCF). Since January 2003, the Commission has received \$1,213,129 in funding and has expended \$1,104,162 in our efforts to acquire and protect additional ecologically significant property. The HLCF receives its funding from three sources: the unmined minerals tax, environmental fines and sales of the "Nature's Finest" license plates.

The Commission has sought out additional sources of funding to assist in our land acquisition efforts. For example, we applied for and were awarded a Transportation Enhancement grant from the Federal Highway Administration that was used in 2003 to purchase a 23-acre conservation easement protecting a high quality limestone glade in Bullitt County. In addition, during 2004 we acquired conservation easements *donated* by private landowners in Franklin and Allen Counties to protect species listed as endangered by the U.S. Fish and Wildlife Service. The Commission has also been awarded two U.S. Fish and Wildlife Service Recovery Land Acquisition grants for work to protect mussels and rare plants in the Licking and Kentucky river watersheds.

ACCOMPLISHMENTS DURING THE LAST BIENNIUM

Thanks to the General Assembly's creation of the Kentucky Heritage Land Conservation Fund Board (KRS 146.550-146.570), the Commission has been able to purchase high-quality natural areas from willing sellers. Since the 2003 biennial report, the Commission, working with county and state government partners, or alone, has enlarged several existing preserves and established seven new ones using funds from the Kentucky Heritage Land Conservation Fund (KHLCF) Board. These are (with new preserves in bold text):

Bad Branch	Letcher County	76 acres
Blanton Forest	Harlan County	490 acres
Bissell Bluff	Livingston County	563 acres
Bouteloua Barrens	Lincoln County	261 acres
Crooked Creek	Lewis County	48 acres
Hi Lewis Pine Barrens	Harlan County	138 acres
James E. Bickford	Harlan County	348 acres
Natural Bridge	Powell County	194 acres
Newman's Bluff	Livingston County	168 acres
Short's Goldenrod	Fleming County	129 acres
Springhouse Barrens	Hardin County	55 acres
Stone Mountain	Harlan County	1,025 acres
Terrapin Creek	Graves County	1 acre
Tom Dorman	Garrard County	5 acres
Thompson Creek Glades	Larue County	91 acres
TOTAL		3,592 acres

As natural areas continue to be fragmented and impacted by land use, habitat rehabilitation becomes more critical to the success of conservation projects. However, purchasing land will never be a complete solution. For instance, 75 percent of Kentucky's rare plant populations occur on private lands. To begin to address the need for conservation on private lands, the Commission entered into a partnership with the Kentucky Department of Fish and Wildlife Resources (the lead agency) to develop a Landowner Incentive Program. The U.S. Fish and Wildlife Service awarded over \$800,000 to establish this program. One new position at the Commission has been funded for three years through this award. In cooperation with 29 private landowners, this new program has already resulted in recovery management work for 15 rare plant species, providing cost share funding to private landowners.

The Commission continues to expand its series of scientific publications for both public use and the scientific community. Our aquatic zoologist, Ronald Cicerello, in collaboration with Dr. Guenter Schuster of Eastern Kentucky University, completed a seventh publication for the series: A Guide to the Freshwater Mussels of Kentucky. This guide identifies our native mussels, the most endangered group of animals in the United States. Kentucky is a global center for freshwater mussel diversity, and is ranked third in the United States behind Alabama and

Tennessee for the greatest number of species. The guide is available at the reasonable price of \$6, as the publishing costs were primarily covered by grants.

The Commission's scientists continue to contribute information on the state's flora, fauna and natural communities, improving our ability to make science-based decisions on conservation issues. One study being completed is a status survey for the United States Fish and Wildlife Service of the Kentucky creekshell, a freshwater mussel endemic to the Upper Green River basin. A study of the distribution and status of five USFWS fish species of concern in the Green River system has also been completed. The surveyed fish are the Shawnee darter, the Crystal darter, the Eastern sand darter, the Longhead darter and the Spotted darter.

To guide and promote the conservation of imperiled aquatic species, our aquatic zoologist and GIS specialist created a "Hotspots & Priority Watersheds Analysis." Kentucky's native freshwater fish and mussel faunas are among the richest in North America, the center of worldwide freshwater mussel and temperate freshwater fish biodiversity. During the last century, habitat destruction and degradation (e.g., dams, pollution, introduced non-indigenous mussels) caused the extirpation or extinction of 21 percent of mussels and 4 percent of Kentucky's fish species. Of the extant groups of species, *41 percent of mussels* and *25 percent of fishes* are imperiled because of significant declines in diversity, numbers and distribution.

Efforts to conserve Kentucky's imperiled mussels and fishes are under way, but priority areas for the conservation have not been assessed. "Hot spot" watersheds were determined by totaling the number of imperiled mussel and fish species by watershed. Priority watersheds to conserve imperiled fishes and mussels were identified by calculating a rarity-weighted richness index for all groups of species in each watershed. Conservation of the top 10 hot spot watersheds would protect populations of 88 percent of the imperiled mussel species and 58 percent of imperiled fish species. Eight of the top 10 priority watersheds are found in three drainages (Mayfield and Obion Creeks and Bayou de Chien, the Upper Green River, and the Upper Cumberland River below the Falls). This preliminary assessment focused on imperiled mussels and fishes. A future assessment will use data for all native mussel and fish species to determine priorities for biodiversity conservation of these groups of species.

Invertebrate surveys during the biennium continued to yield species previously unknown from Kentucky. One damselfly and three moth species were discovered in 2003. These species are currently being evaluated for addition to our list of monitored species. Our invertebrate

biologist, Ellis Lauder milk, co-authored a scientific paper describing a new dragonfly species in North America whose range includes Kentucky. We also received a grant from the U.S. Fish and Wildlife Service to look for cave beetle species that are candidates for listing as threatened or endangered by the Service, and that study is ongoing.

In culmination of seven years of monitoring and study of the white-haired goldenrod, which the federal government lists as an endangered species, the Commission's botanists have documented that 75 percent of its populations have been degraded in some way by recreational use. Our surveys also confirmed the very restricted range of this Kentucky endemic found only in the Red River Gorge. Efforts to protect the fragile rockshelter habitat where it occurs have been initiated by the U. S. Forest Service. Another monitoring study focused on Running buffalo clover, a federally endangered species of the Bluegrass region. This work led to improved conservation management and public education at two historical sites, the Henry Clay Ashland Estate and Dinsmore Woods, where this plant persists. We are working with the University of Kentucky and Bernheim Arboretum and Research Forest to develop a seed source for recovery efforts on this species.

The Commission has continued its participation in a \$1.3 million project funded by NASA and administered through the Commonwealth Office of Technology, entitled the Kentucky Landscape Snapshot. The purpose of this project is to produce a map of the state depicting existing land cover (farm, forest, urban, etc.) using the latest available satellite imagery. The Commission's role in the project includes aerial vegetation sampling to provide verification of the satellite data. This digital map will enable the state to track changes in land use and development, providing a critical planning tool.

Kentucky Educational Television featured the state nature preserves and other natural areas cited in Tom Barnes' book, Kentucky's Last Great Places, during its 2004 Spring Telethon. Commission staff assisted in planning the program, aided the film crew on our preserves and participated on camera with the program's host. This telethon was the most successful KET had ever conducted.

The Commission was a co-sponsor for the 5th Annual Symposium of the Southeast Regional Pest Plant Council held in Lexington in May 2003 and hosted by the Kentucky Exotic Pest Plant Council. Over 100 participants from the southeastern United States and as distant as Wyoming and Pennsylvania met to hear presentations on invasive plant control methods and

research on invasive plants that threaten the nation's biodiversity.

The Commission has entered into a new partnership with the Kentucky Department of Fish and Wildlife Resources (KDFWR) to manage land. Stone Mountain Wildlife Management Area and State Natural Area in Harlan County marks both agencies' first joint effort. Protecting Kentucky's biodiversity requires great outlays of staff time and resources. Combining agency expertise and resources will enable both agencies to ensure the long-term protection of a high quality area of 1,005 acres supporting at least 10 rare species. The Commission has also joined with the KDFWR and the Livingston County Fiscal Court to manage two properties the county purchased with Kentucky Heritage Land Conservation Funds. These two sites were dedicated in December 2004 and will be jointly managed for the protection of rare species (federally threatened Price's potato bean) and to provide for hiking and hunting opportunities in Livingston County.

The specialized expertise of the Commission's biologists is also utilized in the review of development proposals. These proposals involve projects where federal funding requires a review for potential impacts to endangered and threatened species or high quality wildlife habitat. Commission staff regularly reviews proposals from state and federal agencies, such as the U.S. Forest Service (Daniel Boone National Forest and Land Between the Lakes National Recreation Area), Kentucky Division of Water, Department of Highways, the Division of Abandoned Mine Lands and the Division of Waste Management.

Grants and contract work are needed to supplement the agency's budget. During 2003 and 2004, KSNPC received commitments of over \$200,000 each year for grant and contract work. This work is in addition to the regular demands of maintaining and developing information to address our mandate as a natural heritage program, although we attempted to accept contracts that serve both purposes. As a point of reference, during 1997 and 1998, the Commission received \$567,030 via grants and contracts. The primary source of these funds was the former Department for Surface Mining Reclamation and Enforcement (DSMRE) and several federal agencies. The DSMRE (now reorganized into the Department for Natural Resources of the EPPC) provided via a memorandum of agreement \$33,000 per year in 2003-2004 to the Commission for environmental review, data and assistance. However, this is substantially less than received historically and it has reduced our ability to hire seasonal field assistants, and the contract work diverts our biologists from their most pressing work.

The following tables contain information on projects undertaken and accomplished by the Commission for 2003 and 2004 and include the agencies from which the grants/contacts were awarded.

Contracts by Agency and Project 2003	Amount
U.S. Fish and Wildlife Service Endangered Species Act	\$ 27,144
Landowner Incentive Program	\$ 80,000
Division of Water Survey of Martin's Fork	\$ 24,600
Ky. Dept. for Natural Resources (formerly DSMRE)	\$ 33,000
Clark County MOA-Study of Lower Howard's Creek	\$10,000
Ky. Dept of Fish and Wildlife – Adair WMA	\$ 5,000
Ky. Dept of Fish and Wildlife – State Wildlife Grant – data exch.	\$80,000
Commonwealth Office of Technology Ky. Landscape Snapshot	\$33,300
Grants/Contracts total for 2003	\$293,044

Contracts by Agency and Project 2004	Amount
U.S. Fish and Wildlife Service Endangered Species Act	\$ 34,419
Landowner Incentive Program	\$ 50,000
Ky. Dept. for Natural Resources (formally DSMRE)	\$ 33,000
U.S. Fish and Wildlife Service – Green River Survey	\$ 8,000
Division of Water – Martin's Fork	\$ 31,000
Harlan County Survey of Stone Mountain	\$ 14,000
Commonwealth Office of Technology –Ky. Landscape Snapshot	\$25,000
Division of Water – Little South Fork	\$ 5,000
Ky. Dept of Fish and Wildlife – Letourneau Woods	\$ 5,000
Licking River RC&D Council	\$ 1,900
Grants/Contracts total for 2004	207,319

NATURAL HERITAGE PROGRAM DATA SERVICES

The Natural Heritage Data Program of information on rare species, natural communities, sites and managed areas is the result of 28 years of field research by the Commission biologists, as well as the compilation of herbarium and natural history museum records and field records from other biologists. The Commission is committed to providing timely and accurate data in a professional and cooperative manner through data request services and by agreement with other state and federal agencies and conservation organizations. The database and geographic information is recognized as invaluable as we provide government and private requesters with current, reliable data for environmental impact statements, biological analyses, research, and long-term planning.

The following table summarizes the source and number of data requests received during fiscal years 2003 and 2004.

Data Requests Summary
Fiscal Years 2003 and 2004

Requester	Requests FY 2003	Requests FY 2004
Private Consultants	96	78
State Government	51	32
The Nature Conservancy	2	1
Researchers	3	1
Individuals	1	0
Local Government	3	2
Federal Government	12	4
Utilities	41	57
Conservation Groups	4	4
Others	1	2
TOTAL	214	181

The implementation of Geographic Information Systems (GIS) over the last few years has provided the Commission with new tools that aid us with everything from species tracking and monitoring to preserve design and management. GIS is a system of computer software, hardware, database files and trained personnel that allows for data creation, modification and

analysis. Data are stored in real world coordinates that enable us to integrate data from other agencies and organizations. The modeling and mapping capabilities of GIS provides insights into species and ecological communities and allows for assessment of threats to their continued existence.

The Commission recently migrated the Kentucky Natural Heritage Program (KYNHP) Database to the Biodiversity Tracking and Conservation System (BIOTICS); a custom ArcView/Oracle application developed by NatureServe specifically for use in natural heritage programs. The transfer to the new BIOTICS system began in 2002 with the conversion of points and hand-drawn areas from paper maps into GIS shape files and was completed in 2003 with the conversion of the 20-year old DOS-based system into the new Oracle database in BIOTICS. Implementation of the BIOTICS system required a significant commitment by all Heritage Branch staff members. As part of the migration, our GIS specialists converted and updated the statewide-managed areas and the conservation sites shape files. The resulting data have been shared with federal and state agencies. The KYNHP database currently contains 11,000 species and ecological community records, 508 site records and 502 managed area records.

BIOTICS provides enhanced functionality and flexibility, enabling greater utilization of our database. The Commission's implementation and utilization of BIOTICS enables our data to be more readily compiled with data from other members of the Natural Heritage Network throughout North America, thus allowing for aggregation of data across political boundaries.

In 2003, the Commission entered into an agreement with the Kentucky Department of Fish and Wildlife Resources (KDFWR) to share animal data records and improve the KYNHP database under the State Wildlife Grant, a federally funded statewide planning grant. Biologists and data staff spent a significant amount of time improving the species data requested by KDFWR. The grant also enabled the Commission to acquire and setup BIOTICS, including a new data server, additional computers and advanced training by NatureServe.

The Commission has used GIS to improve our in-house environmental review process. GIS has provided new tools and modeling approaches for conducting reviews and generating associated reports and shape files. The enhanced process for environmental reviews enables us to provide meaningful data and comments in a timely manner and provides accurate information in many different formats for data requests. The Commission staff also developed a custom GIS application for the Department for Natural Resources Division of Permits for the surface

coalmine permit review process. The application provides a suite of new tools and reports to streamline the permit review process saving staff time.

The Commission has also been involved in conservation planning with a variety of conservation-based organizations. The Commission worked with Bernheim Forest to generate maps of adjacent lands of conservation interest and potential corridors between Bernheim Forest and Fort Knox. We collaborated with the Kentucky Natural Lands Trust to generate a map of all managed areas and a threat assessment of the 120-mile-long Pine Mountain in eastern Kentucky. Additionally staff worked with a number of land trusts in the state to generate a map depicting the primary focus areas of these groups.

The Commission has also used GIS to great effect, generating public educational posters and cartographic products, such as the ones below.

- *Kentucky Then & Now* – A poster depicting the land cover change in Kentucky since settlement. This map was used in a conservation tabloid produced by The Courier-Journal and has been displayed at various conferences and meetings.
- *Running Buffalo Clover at Ashland, The Henry Clay Estate* – An information panel provides background information on Running Buffalo Clover, a federally listed plant found at the Ashland estate.
- *KSNPC Overview Poster*– A poster highlighting the various functions of the agency. The original version of this poster won the Poster Contest at the 2003 Kentucky GIS Conference.
- *Managed Areas Map* – A map showing the distribution of publicly owned areas statewide that retain natural values. This map has been shared with various federal and state agencies.
- *State Nature Preserve Trail Maps and Kiosk Panels*– Numerous hiking trail maps and information panels have been generated for use in preserve brochures and kiosks.
- *2004 Kentucky GIS Conference* – KSNPC design was selected to be used as the official conference logo.
- *Aquatic Hotspots & Priority Watersheds Analysis* - A guide to conserving our most important aquatic resources depicted by poster.

Desktop GIS applications, along with the quality and quantity of spatial data available for Kentucky, have made GIS a tool that nearly all staff utilizes. The migration to GIS and the

creation of a spatial natural heritage database have provided us with a means of developing predictive models that help identify potential species habitat and target field surveys, improved environmental review and data request procedures, enhanced preserve designs, improved preserve management and enabled us to create higher quality cartographic products.

NATURE AND WILDLIFE FUND

The Nature and Wildlife Fund allows Kentucky taxpayers to donate to the Commission and the Kentucky Department of Fish and Wildlife Resources (KDFWR) on their state income tax returns using the tax check-off boxes. Contributions are evenly divided with KDFWR.

A table containing the total check-off receipts recorded by tax year follows. The Revenue Cabinet may further adjust figures beyond tax year 2004.

Nature and Wildlife Fund Income by Tax Year

Tax Year	Total Receipts
1994	\$99,682
1995	\$99,842
1996	\$98,624
1997	\$109,792
1998	\$90,946
1999	\$76,732
2000	\$45,088
2001	\$38,624
2002	\$34,256
2003	\$37,676
2004	\$38,113

Appeals to the public are made through all possible media that offer free advertising. Articles and news releases have been offered to the media during each tax season. KDFWR produced a video promotional advertisement that was test-marketed on Louisville area cable

television. If this test proves successful in generating higher contributions, it will be expanded to additional areas of the state. As specified in KRS 141.470, all funds from the Nature and Wildlife Fund are used by the Commission solely for land acquisition or the protection, maintenance and use of nature preserves.

NATURE PRESERVES AND STEWARDSHIP

The Commission's Nature Preserves and Natural Areas Branch manages 51 preserves containing 21,010 acres that comprise the Kentucky State Nature Preserves System. The majority of the preserves are owned by the Commission, but three preserves are owned by The Nature Conservancy, five are owned by county governments, one is owned by a local private organization, one is owned by Berea College, three are privately owned, and eight are within Kentucky state parks.

The Commission has also begun holding conservation easements on private properties with significant populations of rare species. Currently, 51 acres have been protected by the Commission in this way. The landowners wished to retain ownership of these areas, but agreed to sell or donate conservation easements to the Commission. One conservation easement in Franklin County protects a population of the federally listed endangered plant Brauns' rockcress (*Arabis perstellata*). A site in Allen County protects a maternity cave for the federally endangered Gray bat (*Myotis grisescens*). One in Bullitt County protects the state endangered glade cress (*Leavenworthia exigua* var. *laciniata*). Altogether, land and conservation easements currently owned and/or dedicated by the Commission total 21,061 acres. Conservation easements are a less costly method to protect a natural area than a full fee simple purchase.

Stewardship activities have increased steadily with the establishment of management objectives for each nature preserve. All preserves require routine maintenance such as boundary posting and inspections. Projects involving habitat manipulation, exotic species control, trail construction or species monitoring are developed according to the purpose and management needs of each preserve. The Commission's recent acquisitions include several areas that will require intensive management to restore the integrity of natural communities and ensure the survival of rare species.

Blanton Forest State Nature Preserve in Harlan County will continue to require a significant amount of staff time. The overall Blanton Forest preserve design encompasses 6,700

acres on Pine Mountain. During this biennium, the Commission worked with the Kentucky Natural Lands Trust to hire an employee dedicated to assisting with preserve management. Acquiring and managing this much land requires a long-term effort and more preserve management staff. We continue to have encroachment problems and illegal trespass on our five remotely located Pine Mountain preserves.

To offset the increasing responsibilities of preserve management, the Commission has entered into partnerships to help ensure that preserves are properly maintained. Custodial care of four preserves has been assigned to other organizations in accordance with statutory authority. We use memoranda of agreement (MOAs) with other public agencies and private organizations to assume partial responsibility for the costs of preserve maintenance and operation, when we can find willing partners. MOAs are presently in effect with the Louisville Nature Center, the Jefferson County Board of Education, the Blackacre Foundation, Berea College and Eastern Kentucky University.

The Commission has continued to recruit volunteers as management responsibilities have increased. Volunteers include scout troops, school groups, members of organizations such as the Sierra Club and the Kentucky Native Plant Society as well as local citizens. Volunteers patrol trails and boundaries and add to our knowledge of the flora and fauna of selected preserves. Future plans for volunteers include training interested persons as field trip leaders and recruiting preserve monitors for each preserve.

Major stewardship activities since the January 2003 biennial report:

- Results indicate a positive response from rare species being managed (increase in stem counts for the federally endangered Short's goldenrod, state endangered royal catchfly, ear-leaved false foxglove and prairie gentian).
- Acreage managed by prescribed fire has increased each year. Barrens communities at Crooked Creek, Raymond Athey Barrens and Eastview Barrens (SNPs) are becoming more open as woody stem densities decrease. Long-term goals are coming to fruition on these preserves with restoration of periodic burns.
- Exotic plant control demands an increasing amount of time on state nature preserves. Fescue control at Crooked Creek and Raymond Athey Barrens SNPs has been very successful, with a significant increase in native grasses at both sites.

- The preserves branch manager continues her leadership role in communicating the threat of exotic species in natural areas to the public and to other agencies by participating in both state and regional exotic species organizations.
- Research projects on preserves funded by KHLCF money have discovered a number of insects and plants that are considered rare or were previously unknown for Kentucky.
- Use of Geographic Information Systems resources and high quality global positioning equipment has enhanced the quality of map products and improved preserve management planning and interpretive materials for public use.

The following table lists all the dedicated state nature preserves, state park nature preserves and state natural areas by county:

Kentucky State Nature Preserves System

Managed Acreage by County and Preserve

January, 2005

County	Preserve	Acres
Allen	Goodrum Cave SNP	51
Ballard	Axe Lake Swamp SNP	458
Barren	Brigadoon SNP	181
Bell	Pine Mountain SPNP	868
Boone	Boone Co. Cliffs SNP	74
Boone	Dinsmore Woods SNP	106
Carter	Bat Cave SPNP	128
Carter	Cascade Caverns SPNP	18
Clark	Lower Howard's Creek Heritage Park & SNP	244
Fayette	Floracliff SNP	287
Fleming	Short's Goldenrod SNP	129
Franklin	Julian Savanna SNP	42
Franklin	River Cliffs SNP	112

County	Preserve	Acres
Graves	Terrapin Creek SNP	230
Greenup	Jesse Stuart SNP	714
Hardin	Eastview Barrens SNP	120
Hardin	Jim Scudder SNP	58
Hardin	Springhouse Barrens SNP	55
Hardin	Vernon-Douglas SNP	730
Harlan	Blanton Forest SNP	3,066
Harlan	Hi Lewis Pine Barrens SNP	302
Harlan	James E. Bickford SNP	348
Harlan	Stone Mountain SNA	1,025
Harrison	Quiet Trails SNP	165
Henderson	John James Audubon SPNP	325
Hickman	Obion Creek SNA	1,402
Hickman	Three Ponds SNP	216
Jefferson	Beargrass Creek SNP	41
Jefferson	Blackacre SNP	170
Jefferson	Six Mile Island SNP	81
Jessamine	Tom Dorman SNP	818
Larue	Thompson Creek Glades SNP	155
Letcher	Bad Branch SNP	2,453
Letcher	Kingdom Come SPNP	225
Lewis	Crooked Creek Barrens SNP	399
Lincoln	Bouteloua Barrens SNP	261
Livingston	Bissell Bluff SNA	563
Livingston	Newman's Bluff SNA	168
Logan	Logan Co. Glade SNP	41
Logan	Raymond Athey Barrens SNP	216
McCracken	Metropolis Lake SNP	123
McCreary	Cumberland Falls SPNP	1,294

County	Preserve	Acres
Muhlenberg	Cypress Creek SNP	97
Powell	Pilot Knob SNP	648
Powell	Natural Bridge SPNP	1,188
Pulaski	Frances J. Palk SNP	150
Robertson	Blue Licks SPNP	53
Rockcastle	John B. Stephenson Memorial Forest SNP	124
Simpson	Flat Rock Glade SNP	99
Warren	Chaney Lake SNP	169
Warren	Woodburn Glade SNP	20
Total		21,010

Included with this report is our directory of the Kentucky State Nature Preserves with a description of each.

REGISTERED NATURAL AREAS

The Kentucky Natural Areas Registry is a non-regulatory program that recognizes landowners who agree to exercise good stewardship of ecologically significant property. The registry simply encourages the preservation of important habitat on private and public lands that are not available or quite suitable for dedication as a state nature preserve. Private individuals, government agencies and local governments, as well as businesses and other corporate entities, may register property they own. Those who have enrolled their land in the Natural Areas Registry have earned the appreciation of all citizens of the Commonwealth for their preservation of our state's most unique remaining habitat - something that state government cannot wholly achieve on its own.

Currently 49 landowners are enrolled in the Natural Areas Registry program. These registry agreements encompass approximately 4,407 acres in 34 counties and are listed below by county:

**KENTUCKY STATE NATURE PRESERVES COMMISSION
REGISTERED NATURAL AREAS**

COUNTY	NAME	ACRES	OWNERSHIP	SIGNIFICANCE
Adair	Rossin Mayne Woods	230	Private	mature woods
Ballard	Axe Lake	385	Private	wetland community
Boyle	Central Kentucky Wildlife Refuge	500	Private	forest
Bullitt	Jefferson County Sportsmen Club	12	Private	rare plant
Bullitt	Rocky Run Glade	25	Private	glades, rare plants
Calloway	Panther Creek Swamp	128	TVA	wetland, rare plants
Carlisle	Back Slough/Laketon	43	Private	wetland community
Casey	Bradley Lewis Weddle	73	Private	rare plant
Clinton	Seventy-Six Falls	1	USACE	rare plant
Crittenden	Goodman/Clouser – Sandstone Glade	15	Private	glades
Edmonson	White's Cave	5	NPS	rare insects
Fayette	Ashland	15	Private	rare plant
Fayette	Boone Creek	260	Private	undisturbed woods & rare plants
Fayette	Raven Run	274	Municipal	Kentucky River palisades
Fleming, Nicholas, Robertson	Blue Licks Highway	2	KTC	rare plant
Franklin	Camp Pleasant Woods	118	Private	rare plant
Franklin	Leeland Valley	26	Private	rare plant
Franklin	Rockcress Woods (Bryan)	10	Private	rare plant
Franklin	Rockcress Woods (Greene/Adams)	15	Private	rare plant

COUNTY	NAME	ACRES	OWNERSHIP	SIGNIFICANCE
Franklin	Strohmeiers Hill	53	Private	rare plant
Grayson	Big Clifty Prairie	2	KTC	prairie remnant
Hardin	Dowell	20	Private	glade, rare plants
Hardin	Hardin Cedar Glade	20	Private	glade, rare plants
Hardin	Knights Barrens	400	Private	barrens community
Hart	Big Woods	307	NPS	old-growth woods
Hart	Riders Mill Cave	260	Private	rare animal
Jefferson	Shippingport Island Rookery	10	USACE	heron rookery
Jefferson	Surrey Hills Woods	35	Private	mature forest
Larue	Jackson Pond	8	Private	geologically significant pond
Letcher	Bad Branch (Crawford)	245	Private	rare plants & animals
Letcher	Bad Branch (Gatton)	215	Private	rare plants & animals
Logan	Katie White Barrens (Webb)	15	Private	glades/barrens communities
Logan	Katie White Barrens (Lockett)	15	Private	glades/barrens communities
Logan	Log House Prairie	10	Private	prairie remnant
Lyon	Cannon Springs Woods	220	USACE	recovering woods
Marshall	Bear Creek Rookery	10	TVA	heron rookery
McCracken	Bayou Creek Ridge	150	TVA/KDFWR	old-growth woods
McCracken	Metropolis Lake	2	TVA	natural lake, rare fish
McLean	Floyd Woods	25	Private	old-growth woods
Nicholas	Abnee Goldenrod	1	Private	rare plant
Nicholas	Kingsolver Goldenrod	5	Private	rare plant
Owsley	Morris Kentucky Ladyslipper	5	Private	rare plant
Perry	Stillhouse Branch	105	USACE	mature forest

COUNTY	NAME	ACRES	OWNERSHIP	SIGNIFICANCE
Pulaski	Blowing Cave	5	Private	rare plants & animals
Taylor	Blue Knob	30	Private	glades, barrens
Todd	North Elk Fork Woods	41	Private	old growth woods
Todd	South Elk Fork Woods	37	Private	old-growth woods
Trigg	Lake Barkley Rookery	10	USACE	heron rookery
Warren	Watt Cave	1	Private	rare animal
Whitley	Grove Powerline	8	Utility	rare plants
TOTAL		4,407		

Abbreviations: Kentucky Dept. of Fish & Wildlife Resources (KDFWR), Kentucky Transportation Cabinet (KTC), National Park Service (NPS), Tennessee Valley Authority (TVA), U.S. Army Corps of Engineers (USACE)

CONCLUSION

The Kentucky State Nature Preserves Commission, despite being a small agency, has made great strides since its beginning nearly 29 years ago. The Commission has created an impressive system of nature preserves, safeguarding some of the most unique habitats in Kentucky. The Commission's Natural Heritage database of information on rare species and natural areas is the best such source in the state and is relied upon by other federal and state agencies, private consultants and Kentucky's scientific community. Our field biologists, ecologists and preserve management staff are committed experts and are well-known and respected among their peers.

Though much has been accomplished in the Commission's 29 years, much work remains to be done. The fact that 21,010 acres have been forever protected as dedicated preserves is impressive. But, if you consider that Kentucky has about 25 million acres, it is evident that we need a greatly expanded nature preserve system to protect at least one viable example of each of Kentucky's many unique habitats. The Commonwealth is blessed with a diversity of natural areas – from the lushly forested mountains of eastern Kentucky to the bald cypress swamps of western Kentucky, and the myriad transitional areas in between of tall-grass prairies, rocky glades, blue holes and caves of the karst region, free-flowing streams, bluegrass savannas and

more. There are, of course, other managed natural areas under public ownership, such as state parks and federal lands, but the Commission's nature preserve system is truly the best-protected repository for Kentucky's biological diversity.

A very pressing need is stewardship of the expanding nature preserves system. Very simply, more acres require more staff for management, and more funds for infrastructure such as trail building and visitor parking. The Commission is woefully understaffed. The current geographic distribution of managers provides the bare minimum coverage to prevent serious damage to the preserves. Personnel have not increased since 1998, yet total acreage and the management responsibilities of the nature preserve system are increasing.

To date, there are only *six* full-time permanent employees to care for a preserve system of over 21,010 acres. Stewardship personnel include a branch manager supervising three regional preserve managers, and two stewardship assistants. Two of the regional preserve managers are stationed in satellite offices in Bowling Green and in Whitesburg. The stewardship assistants develop management plans for each preserve and interpretive materials for visitor use and assist with the administrative and field management duties of a statewide operation. We need at least 4 interims to keep up with management needs. No interim (seasonal) positions were filled from mid-2003 until October 2004 due to lack of funds. Additional staff is critical to the future successful management of Kentucky's nature preserves, in which so much has been invested. We are losing ground in our ability to care for our nature preserve system.

The Kentucky Heritage Land Conservation Fund (KHLCF) wisely provides 10 percent of acquisition costs for the initial management expenses in the first 2.5 years. However there is no similar fund source for the ongoing management expenses after that is exhausted. Preserves acquired prior to the establishment of the fund do not have a dedicated funding source to tap for basic infrastructural needs such as parking lot and road maintenance. We are particularly in need of an additional preserve manager for far western Kentucky. We need additional permanent staff and funding to hire more interim workers to keep up with the increased work that comes with the annual growing season. Without sufficient staff the quality of preserves will decline and visitor experience will suffer.

To forge ahead with our task of surveying the remaining *half* of Kentucky that has yet to be inventoried for high quality natural areas, we need to employ more ecologists before the escalating rate of land conversion and the loss of natural areas destroys our remaining gems. The

Commission currently employs two full-time ecologists and one part-time ecologist. We cannot take another 20 years to complete the natural areas inventory if we are to be successful. An additional ecologist is needed for this task.

The biologists' contract surveys workload is increasing, which means they cannot adequately revisit known rare species sites, so the age of the database records is increasing. For the Natural Heritage database to remain a viable tool, the records for all sites and species must be regularly updated. This provides the information needed to monitor the status and trends in Kentucky's biodiversity. We are not able to perform this function without additional scientific staff. It will also adversely impact the other agencies, which rely on the Commission for this data. We have converted to a more complex GIS-based data management system, leading to expanded uses and demands on this system and staff. We need to restore a data specialist position lost in the last biennium due to budget cuts.

Currently we employ a single zoologist to survey aquatic species statewide, a single zoologist to survey birds/mammals/reptiles/amphibians statewide, a single zoologist to survey invertebrates statewide and two botanists to survey plants statewide. Historically the Commission has utilized at least six additional seasonal biologists in the summer to assist the fieldwork, positions that are no longer available to us. Another invertebrate zoologist is needed, particularly considering the thousands of groups/species this category includes and because the Commission is the only agency working on these groups of species.

Additionally, most of the botanists' time is used for contract work primarily from federal programs focused on federally listed plants, and other surveys needed by various agencies. The Kentucky Rare Plant Recognition Act, enacted in 2002, added the responsibility to the Commission to maintain a defensible list of those plants which are rare, based on their status in Kentucky alone. There were no specific funds or staff provided for this additional work. An additional botanist is greatly needed to focus on our state listed plants.

We acutely need an additional position to assist the aquatic zoologist. Presently, he trades times with other agencies to get assistance to perform basic aquatic inventories needed to monitor the status of mussels and fish, the most endangered group of organisms in the nation. Kentucky is critical to the protection of these animals. It is ranked third after only Alabama and Tennessee for the number of species of freshwater mussels found in a single state. Considering Kentucky's importance to these highly endangered aquatic animals, we must provide an

enhanced level of conservation effort.

The rare species, both plant and animal, and the unique natural areas that make Kentucky the ecologically diverse state it is, are perhaps the most precious endowment we can leave to our children and their children. It is the task of the Kentucky State Nature Preserves Commission to protect this heritage.

Appendix 1



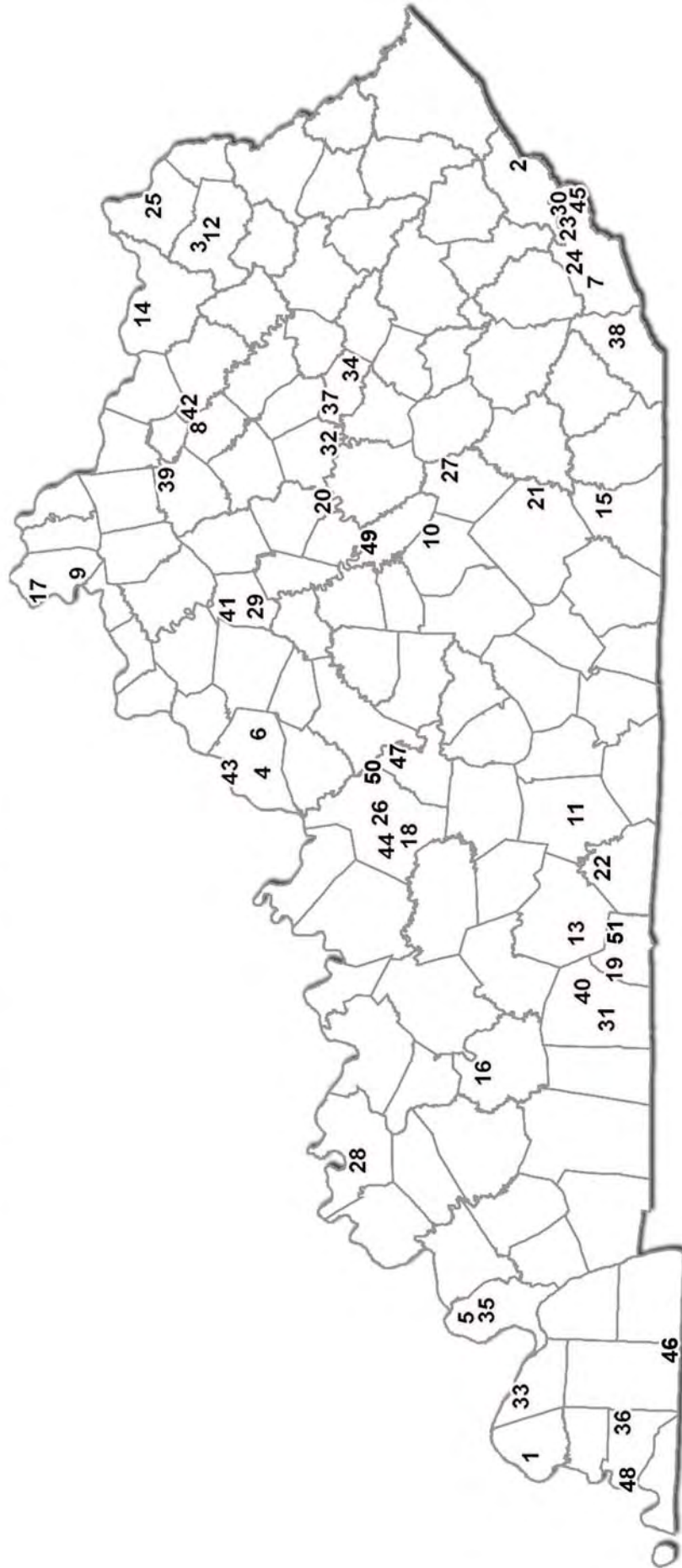
Directory of Kentucky State Nature Preserves and State Natural Areas

January, 2005

KENTUCKY STATE NATURE PRESERVES COMMISSION

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Frankfort, KY 40601
Tel: (502) 573-2886 Fax: (502) 573-2355
E-mail: naturepreserves@ky.gov
www.naturepreserves.ky.gov

Kentucky State Nature Preserves



PRESERVE	DATE DEDICATED	(number on map)	PAGE
Axe Lake Swamp SNP	February 20, 1991	(1)	4
Bad Branch SNP	September 26, 1985	(2)	4
Bat Cave SPNP	December 16, 1981	(3)	5
Beargrass Creek SNP	February 17, 1982	(4)	5
Bissell Bluff SNA	December 8, 2004	(5)	14
Blackacre SNP	March 19, 1979	(6)	6
Blanton Forest SNP	September 15, 1995	(7)	6
Blue Licks SPNP	December 16, 1981	(8)	7
Boone Co. Cliffs SNP	November 5, 1987	(9)	7
Bouteloua Barrens SNP	September 8, 2004	(10)	7
Brigadoon SNP	March 14, 1985	(11)	8
Cascade Caverns SPNP	December 16, 1981	(12)	5
Chaney Lake SNP	May 9, 1991	(13)	8
Crooked Creek Barrens SNP	June 15, 1999	(14)	8
Cumberland Falls SPNP	September 26, 1983	(15)	9
Cypress Creek SNP	December 5, 1986	(16)	9
Dinsmore Woods SNP	May 16, 1990	(17)	9
Eastview Barrens SNP	September 17, 1997	(18)	10
Flat Rock Glade SNP	October 24, 1990	(19)	10
Floracliff SNP	March 15, 1996	(20)	10
Frances J. Palk SNP	July 9, 2002	(21)	11
Goodrum Cave SNP	August 12, 1992	(22)	11
Hi Lewis Pine Barrens SNP	June 4, 1997	(23)	11
James E. Bickford SNP	June 30, 2003	(24)	12
Jesse Stuart SNP	December 7, 1979	(25)	12
Jim Scudder SNP	September 2, 1987	(26)	12
John B. Stephenson Memorial Forest SNP	December 10, 1996	(27)	13
John James Audubon SPNP	September 19, 1979	(28)	13
Julian Savanna SNP	October 22, 2002	(29)	14
Kingdom Come SPNP	March 4, 1992	(30)	14
Logan Co. Glade SNP	October 24, 1990	(31)	15
Lower Howard's Creek Heritage Park & SNP	January 22, 2001	(32)	15
Metropolis Lake SNP	July 16, 1984	(33)	16
Natural Bridge SPNP	December 16, 1981	(34)	16
Newman's Bluff SNA	December 8, 2004	(35)	15
Obion Creek SNP	June 1992	(36)	16
Pilot Knob SNP	September 26, 1985	(37)	17
Pine Mountain SPNP	September 26, 1983	(38)	17
Quiet Trails SNP	1992	(39)	18
Raymond Athey Barrens SNP	October 24, 1990	(40)	18
River Cliffs SNP	October 22, 2002	(41)	18
Short's Goldenrod SNP	December 8, 2004	(42)	19
Six Mile Island SNP	June 24, 1979	(43)	19
Springhouse Barrens	September 8, 2004	(44)	19
Stone Mountain SNA	December 8, 2004	(45)	20
Terrapin Creek SNP	June 3, 1992	(46)	20
Thompson Creek Glades SNP	March 4, 1992	(47)	20
Three Ponds SNP	June 12, 2001	(48)	21
Tom Dorman SNP	December 20, 1996	(49)	21
Vernon-Douglas SNP	August 12, 1992	(50)	22
Woodburn Glade SNP	March 15, 1996	(51)	22

SNP = state nature preserve. SPNP = state park nature preserve. SNA = state natural area.

1. AXE LAKE SWAMP STATE NATURE PRESERVE

Dedicated February 20, 1991, 146 acres of Axe Lake Swamp in Ballard County, KY established the Axe Lake Swamp State Nature Preserve. An additional tract of 312 acres was bought and dedicated on December 11th, 2001 increasing the size of the preserve to 458 acres. This preserve was acquired with the assistance of The Nature Conservancy and represents the first step for the Commission in assisting with the long term protection of the entire 3,000 acre Axe Lake Swamp wetlands complex which supports at least eight rare plant and animal species. Axe Lake Swamp State Nature Preserve is a portion of Kentucky's best-known example of a large, intact bald cypress-tupelo swamp. The 3,000-acre wetland contains a large great blue heron (*Ardea herodias*) rookery and is the only known nesting site for the great egret (*Casmerodius albus*) in Kentucky. Thousands of waterfowl, particularly wood ducks (*Aix sponsa*), roost here during the winter, and the site has been recognized as a priority wetland in the North American Waterfowl Management Plan. Access is by written permission only.

2. BAD BRANCH STATE NATURE PRESERVE

Initially, 435 acres of land in Letcher County were dedicated on September 26, 1985, forming Bad Branch State Nature Preserve. An additional 1,088 acres, owned by The Nature Conservancy, were dedicated March 4, 1992 and 820 acres, owned by the Commission, were dedicated September 17, 1997. The preserve contains Bad Branch Gorge, a forested gorge on the south face of Pine Mountain. The 853-acre addition provides protection to the majority of Presley House Branch Watershed and the rare species associated with this drainage. This is one of the most significant and beautiful natural areas in the state. This 2,452-acre preserve protects the scenic beauty of the gorge and one of the largest concentrations of rare and uncommon species known in the state. The preserve also protects Kentucky's only known nesting pair of common ravens (*Corvus corax*). Bad Branch has been designated a Kentucky Wild River.

<i>Features</i>	-	hemlock gorge, waterfall, high quality stream, numerous rare species, trail along mountain crest
<i>Access</i>	-	foot trail and bridges, 7.4 miles of trail over uneven terrain, strenuous
<i>Facilities</i>	-	none
<i>Parking</i>	-	10 cars; 1 bus
<i>Hazards</i>	-	steep cliffs, venomous snakes (rare)
<i>Activities</i>	-	hiking, birdwatching, nature photography, research, etc.
<i>Directions</i>	-	Letcher County. From the junction of KY 15 and US 119 in Whitesburg, follow US 119 south 8.0 miles. Turn left at junction with KY 932 and travel east for 2.0 miles to gravel parking area on left side of KY 932.

3. BAT CAVE (ROGER W. BARBOUR) &

11. CASCADE CAVERNS STATE NATURE PRESERVES

Dedicated on December 16, 1981, Bat Cave/Cascade Caverns State Nature Preserves consist of two tracts totaling 146 acres located in Carter County within Carter Caves State Resort Park. Bat Cave was dedicated into the nature preserves system for the protection of the Indiana bat (*Myotis sodalis*). This federally endangered species' wintering numbers in Bat Cave are estimated at 28,000. The Cascade Caverns portion of the preserve was dedicated into the nature preserves system to protect two rare plant species, the mountain maple (*Acer spicatum*) and the Canadian yew (*Taxus canadensis*). To prevent disturbance of the bats in hibernation, the caves are closed to public visitation from October through May. However, hiking trails on the portion of the preserve that is above ground are open year-round.

<i>Features</i>	-	2 cave systems, rare bat winter roost, rare plants
<i>Access</i>	-	cave tours (Bat Cave closed in between months of October and April), 1 mile of trails on surface
<i>Facilities</i>	-	state resort park
<i>Parking</i>	-	abundant
<i>Hazards</i>	-	steep banks above Tygarts Creek at Cascade Caverns
<i>Activities</i>	-	hiking, geological study, birdwatching, etc.
<i>Directions</i>	-	Carter County. From the junction of I-64 and U.S. 60 N.E. of Olive Hill, follow U.S. 60 east 1.5 miles. Turn left at the junction with KY 182 and drive east for 2.5 miles to Carter Caves State Resort Park entrance. Inquire about the preserve at the lodge.

4. BEARGRASS CREEK STATE NATURE PRESERVE

Dedicated on February 17, 1982, Beargrass Creek State Nature Preserve is a 41-acre second growth forest located in close proximity to Joe Creason Park and the Louisville Zoological Gardens in Jefferson County. This urban green space is a popular birding area and offers passive recreation and nature education within the city limits of Louisville. The preserve is co-managed with The Louisville Nature Center and is also a Watchable Wildlife Site.

<i>Features</i>	-	wooded tract in urban Louisville, diversity of migrant birds
<i>Access</i>	-	1.0 mile of trails on ridgetop and bottomland, easy
<i>Facilities</i>	-	Louisville Nature Center and adjacent Joe Creason Park
<i>Parking</i>	-	abundant
<i>Activities</i>	-	birdwatching, hiking, nature study, etc.
<i>Directions</i>	-	Jefferson County. From the junction of I-264 (Watterson Expressway) and Newburg Road, follow Newburg Road north for 1.0 mile. Turn left onto Trevilian Way for 0.5 mile. Turn right into Joe Creason Park.

5. BLACKACRE STATE NATURE PRESERVE

Dedicated on March 19, 1979, Blackacre State Nature Preserve is a tract of approximately 170 acres located in Jefferson County near Jeffersontown that is used as an environmental education center by the Jefferson County Public School System and the University of Louisville. Since it is located adjacent to a large metropolitan area, it offers a unique outdoor laboratory for environmental education to a large number of children who otherwise might not have the opportunity for this experience. Through an agreement with the Commission, the Jefferson County Public School System and the Blackacre Foundation, Inc. are currently managing this area. Visits are scheduled by contacting the director at Blackacre or the Jefferson County Public School System.

6. BLANTON FOREST STATE NATURE PRESERVE

A 1,075-acre tract in Harlan County, dedicated on September 15, 1995, protects half of the largest old-growth forest in Kentucky. As the preserve has grown, an additional 326 acres were transferred from Kentucky Division of Forestry in 1996, an additional eight-acre tract was dedicated on June 15, 1999, and 1,167 acres were dedicated on September 25, 2001, yielding 2,576 acres of preserve property. Another 479 acres were dedicated on March 3, 2003; 3,055 acres are now protected in total. As one of thirteen large old-growth tracts in the eastern United States, Blanton Forest is a diverse ecological treasure. Many of the trees are three to four feet in diameter, towering 100 feet above the forest floor. Blanton Forest contains several forest communities, including mixed-mesophytic deciduous forest with many kinds of canopy trees, such as sugar maple, tulip poplar, various oaks, hemlocks, beech and several magnolia trees. The preserve is open to the public.

<i>Features</i>	-	largest old growth forest in Kentucky
<i>Access</i>	-	loop foot trail (4 miles) up the south face of Pine Mt, foot trail (0.5miles) along Watts Creek.
<i>Facilities</i>	-	none
<i>Parking</i>	-	lot adjacent to Camp Blanton
<i>Hazards</i>	-	steep slopes, snakes, and hazard trees
<i>Activities</i>	-	hiking, bird watching, nature study etc...
<i>Directions</i>	-	Blanton Forest State Nature Preserve is located in extreme

southeastern Kentucky near the community of Keith in Harlan County. The preserve is on Pine Mountain, north of U.S. Highway 119 and west of the city of Harlan. From Interstate 75, exit onto U.S. Highway 25 East at Corbin. Continue on U.S. Hwy 25E through Barbourville to Pineville. In Pineville, turn left off of U.S. Hwy 25E onto U.S. Hwy 119, crossing the Cumberland River at the Exxon Station/Happy Mart. Continue traveling east on U.S. Hwy 119 for 23 ½ miles, then turn left (north) on KY 840. There will be a sign for KY 840 and Camp Blanton at this point. Follow KY 840 (Watts Creek Rd.) for approximately 2 miles until encountering the parking area for the preserve adjacent to Camp Blanton.

7. BLUE LICKS BATTLEFIELD STATE PARK NATURE PRESERVE

Blue Licks Battlefield State Park Nature Preserve is located in Robertson County within Blue Licks State Park. The original 15-acre tract was dedicated on December 16, 1981. An additional 15 and 23 acres were dedicated on June 16, 1998 and March 7, 2000, respectively. This area was dedicated into the nature preserves system for the protection of Short's goldenrod (*Solidago shortii*), an extremely rare species of plant known to exist in only two locations in the world and protected under the Federal Endangered Species Act.

<i>Features</i>	-	globally rare plant, relict bison trail, glade
<i>Access</i>	-	0.25-mile foot path along buffalo trace, easy
<i>Facilities</i>	-	state park
<i>Parking</i>	-	abundant
<i>Activities</i>	-	hiking, birdwatching, nature study, etc.
<i>Directions</i>	-	Robertson County. From Maysville, take US 68 25 miles south to park entrance. From Carlisle, take US 68 10 miles north to Blue Licks State Park entrance.

8. BOONE COUNTY CLIFFS STATE NATURE PRESERVE

Dedicated on November 5, 1987, the preserve is owned by the Kentucky Chapter of The Nature Conservancy and protects unique glacial features and four forest community types. Forty-six acres were initially dedicated. Twenty-eight additional acres were dedicated on May 16, 1990. The preserve protects a tributary to Middle Creek, and is named for the 20- to 40-foot conglomerate cliffs along the valley walls. The conglomerate is composed of gravel that was deposited as glacial outwash 700,000 years ago.

<i>Features</i>	-	glacial outwash cliffs, spring wildflower display
<i>Access</i>	-	2.4 mile trail over uneven terrain, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	5 cars; 1 bus
<i>Hazards</i>	-	steep cliffs
<i>Activities</i>	-	hiking, nature study, geological study, birdwatching, etc.
<i>Directions</i>	-	Boone County. From the junction of I-75 and KY 18 near Florence, follow KY 18 west for 10.8 miles, then left on Middle Creek Road for 1.5 miles to gravel parking area on left side of road.

9. BOUTELOUA BARRENS STATE NATURE PRESERVE

Bouteloua Barrens in Lincoln County is named for the beautiful side-oats grama grass (*Bouteloua curtipendula*) that grows there. Dedicated on September 8, 2004 this 261- acre preserve protects a native grassland that is the largest known in the Bluegrass Region and one of the largest in the entire state. The barrens communities consist of a patchwork of grassy cedar barrens and open glades with exposed gravel. Other rare species known from the site include state endangered hairy false gromwell (*Onosmodium hispidissimum*), and two special concern species: Eggleston's violet (*Viola septemloba* var. *egglestonii*), and Craue's sedge (*Carex crawei*). The preserve is not open to the public except by Commission-sponsored hikes. Research may be conducted by written permission.

10. BRIGADOON STATE NATURE PRESERVE

Brigadoon State Nature Preserve is located in Barren County adjacent to the Barren River Reservoir. With assistance from The Nature Conservancy 92 acres of mostly mature forest was dedicated into the preserve system on March 14, 1985. Another 88 acres were dedicated on June 12, 2001. Including another one-acre tract, a total of 181 acres are protected. The rich woodlands contain an impressive array of spring wildflowers including several species that are considered rare or uncommon. The preserve also provides habitat for many resident and migratory birds.

<i>Features</i>	-	mature beech, maple, tulip poplar forest
<i>Access</i>	-	one-mile foot trail through ridgetops, mature forest and scenic ravines, moderately strenuous
<i>Facilities</i>	-	none
<i>Parking</i>	-	10 cars
<i>Hazards</i>	-	steep cliffs, venomous snakes
<i>Activities</i>	-	hiking, birdwatching, nature photography, research, etc.
<i>Directions</i>	-	Barren County - From Exit 43 on I-65, travel east on the

Cumberland Parkway to its junction with US 31E in Glasgow. Follow US 31E south for 6.5 miles. Turn left onto Dover Church-Browning School Road and travel approximately 1.5 miles. Turn left onto Mutter Road. The parking area is approximately one-half mile on the left.

12. CHANEY LAKE STATE NATURE PRESERVE

Dedicated May 9, 1991, Chaney Lake State Nature Preserve consists of 169 acres of intermittently flooded low-lying fields and woodlands. The area was acquired with the assistance of The Nature Conservancy. Chaney Lake, located near Woodburn in Warren County, is one of two “transient” lakes in the area. The lake forms when heavy rains cause groundwater levels to rise and overflow onto the surface through several sinkholes located in the low-lying depression. The area is well known to birdwatchers for the abundance of migrant waterfowl and shorebirds that pass through the area in the spring. Access is by written permission only.

13. CROOKED CREEK BARRENS STATE NATURE PRESERVE

Crooked Creek Barrens State Nature Preserve, was established when the original 60-acre tract was dedicated on June 15, 1999. Today a total of 399 acres makes up this unique preserve in Lewis County. The preserve features a unique oak barrens community and adjacent oak-hickory forest. Prairie species such as big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), and prairie dock (*Silphium terebinthinaceum* var. *luciae-brauniae*) occur in the barrens areas. This site also protects five rare plant species: starry false Solomon’s seal (*Maianthemum stellatum*), white rattlesnake root (*Prenanthes alba*), slender blazing-star (*Liatris cylindracea*), earleaf foxglove (*Agalinis auriculata*), and scarlet Indian paintbrush (*Castilleja coccinea*). Access to this preserve is by written permission only.

14. CUMBERLAND FALLS STATE PARK NATURE PRESERVE

Dedicated on September 26, 1983, Cumberland Falls State Park Nature Preserve encompasses approximately 1,294 acres in Cumberland Falls State Resort Park in McCreary and Whitley Counties. This preserve protects several species of rare plants and animals. In addition, a number of waterfalls are located within the preserve including Cumberland Falls, which plummets 67 feet into a rocky gorge and is the highest waterfall in the eastern United States south of Niagara Falls. The Cumberland River, designated as a Kentucky Wild River, flows through the preserve.

<i>Features</i>	-	waterfalls, rare plant and animal species, scenic views
<i>Access</i>	-	4.5 miles of trail over uneven terrain, moderate
<i>Facilities</i>	-	state resort park
<i>Parking</i>	-	limited at trailheads; parking areas within short walk
<i>Hazards</i>	-	steep cliffs, waterfalls, venomous snakes (rare)
<i>Activities</i>	-	hiking, nature study, geological study, birdwatching, etc.
<i>Directions</i>	-	Whitley and McCreary Counties. From the junction of I-75 and

U.S. 25W southwest of Corbin, follow 25W for 14.5 miles. Turn right onto KY 90 for 8.8 miles to reach the Cumberland Falls State Resort Park Lodge area. Inquire at the lodge for information about the preserve.

15. CYPRESS CREEK STATE NATURE PRESERVE

Dedicated on December 5, 1986, Cypress Creek State Nature Preserve consists of a 97-acre portion of bottomlands lying adjacent to Cypress Creek in Muhlenberg County. The preserve and adjacent areas contain a mosaic of natural communities including bald cypress (*Taxodium distichum*) swamp and bottomland hardwood forest complex, that support numerous rare species typically associated with wetlands. Access is by written permission only.

16. DINSMORE WOODS STATE NATURE PRESERVE

Dedicated May 16, 1990, Dinsmore Woods State Nature Preserve is a 106-acre area owned by the Kentucky Chapter of The Nature Conservancy. The preserve protects a relatively undisturbed maple-oak-ash forest in Boone County. Prior to the Conservancy's ownership, the woods had been in the possession of one family dating back to the 1830's. The maturity and species composition of this woodland are attributed in part to the fact that it has never been commercially logged. The preserve is adjacent to the early 19th century Dinsmore Homestead, an historical landmark. Populations of the federally endangered running buffalo clover (*Trifolium stoloniferum*) are also adjacent to preserve property.

<i>Features</i>	-	mature forest
<i>Access</i>	-	1.7-mile trail, moderately strenuous
<i>Facilities</i>	-	none
<i>Parking</i>	-	limited
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Boone County. From the junction of I-75 and KY 18 near

Florence, follow KY 18 west for 11.3 miles, turn left into gravel parking lot for the county horsemen's area. Trailhead is across KY 18

17. EASTVIEW BARRENS STATE NATURE PRESERVE

Dedicated Sept. 17, 1997, Eastview Barrens State Nature Preserve is 120 acres of grassland and open woodland co-owned by The Nature Conservancy and the Commission. The presence of globally rare species at Eastview Barrens makes protection a critical priority. Numerous rare species, including prairie gentian (*Gentiana puberulenta*), barrens silky aster (*Aster pratensis*), frostweed (*Helianthemum bicknellii*), long-haired hawkweed (*Hieracium longipilum*), and spikemoss (*Selaginella apoda*) continue to survive on the fire-maintained grasslands. Due to the sensitivity of the preserve, Eastview Barrens State Nature Preserve is only accessible through guided tours with the Commission or The Nature Conservancy.

18. FLAT ROCK GLADE STATE NATURE PRESERVE

Dedicated Oct. 24, 1990, Flat Rock Glade State Nature Preserve was originally a 65-acre natural area in Simpson County. An additional four acres were acquired as buffer acreage and were dedicated on March 11, 1994. The area was acquired with the assistance of The Nature Conservancy. On December 5, 2000, the Commission dedicated another 30 acres adjacent to the existing preserve. The preserve's name describes the large expanses of limestone bedrock that outcrop at the surface and form openings in the oak-hickory woods. The glades support seven rare plant species including limestone fameflower (*Talinum calcaricum*), which is only known from two sites in Kentucky. Access is by written permission only.

19. FLORACLIFF STATE NATURE PRESERVE

The late Dr. Mary Wharton, former Botany Professor and Biology Department Head at Georgetown College, established Floracliff as a nature sanctuary. Dr. Wharton began acquiring the Floracliff property in 1958. The property is located on the Kentucky River in Fayette County. The Floracliff Board of Directors owns the preserve and jointly manages it with the Kentucky State Nature Preserves Commission. This area was dedicated on March 15, 1996. Floracliff consists of 287 acres of old field upland and second growth forest dominated by maple, oak and hickory. In addition to having a rich and diverse wildflower display, Floracliff also harbors a significant geologic feature. Below Elk Lick Falls is a tufa formation, which resembles a frozen waterfall. It is considered one of the best tufa formations in the eastern United States. Similar to stalagmites in caves, tufa forms when minerals within dripping water are deposited on a surface. Travertine is the primary mineral composing this tufa. The formation is 61 feet high and 8-12 feet in diameter. The rich flora, ravines, cliffs and waterfalls of Floracliff make it one of the more scenic areas in central Kentucky. Visitation to the preserve is by appointment only and is restricted to small groups led by approved leaders.

20. FRANCES JOHNSON PALK STATE NATURE PRESERVE

Frances Johnson Palk State Nature Preserve was dedicated on July 9, 2002 and is located in Pulaski County. Discovered in 1998 by KSNPC biologists, this 150-acre preserve contains a series of acid seep communities that can rarely be seen in Kentucky. These small wetlands are formed by seeps found at the heads of several small streams. Although much of the preserve is dominated by upland forest, over 70 species of plants occur within the bogs, several of which are considered rare. This preserve was acquired with a generous contribution from East Kentucky Power Cooperative, Inc. and the assistance of The Nature Conservancy. Access is by written permission only.

21. GOODRUM CAVE STATE NATURE PRESERVE

Dedicated Aug. 12, 1992, this preserve is a 51-acre area in Allen County containing one of the six most important maternity caves known in Kentucky. The site protects a maternity colony of approximately 13,000 gray myotis (*Myotis grisescens*) bats, one of three federally endangered bats found in Kentucky. The preserve includes a section of the wooded stream corridor and uplands surrounding the cave, which has been surveyed and mapped for a distance of approximately 6,200 feet. The acquisition of Goodrum Cave represents the Commission's first purchase of a cave for the protection of an endangered bat species. Access is by written permission only.

22. HI LEWIS PINE BARRENS STATE NATURE PRESERVE

Hi Lewis Pine Barrens State Nature Preserve protects an outstanding example of an open pine-oak woodland, dominated by pitch pine (*Pinus rigida*) and chestnut oak (*Quercus montana*), on the steep, mid to upper south-facing slope of Pine Mountain in Harlan County. One hundred sixty-four acres were acquired with the assistance of The Nature Conservancy and dedicated into the State Nature Preserves System on June 4, 1997. Named for the branch that drains the area, this part of the mountain supports an extremely rare pine barrens community as well as a number of rare plants that are found in association with it. The open areas feature an unusual mix of plants typically thought of as prairie plants, such as little bluestem (*Schizachyrium scoparium*) and Indian grass (*Sorghastrum nutans*) and drought tolerant plants such as low-bush blueberries (*Vaccinium sp.*). Rare plants found at the site include diminutive screwstem (*Bartonia virginica*), frostweed (*Helianthemum canadense*), and the largest known Kentucky population of yellow wild indigo (*Baptisia tinctoria*). Spanning 1000 feet in elevation from the base of the mountain to the ridge crest, the preserve also protects flowering and fruiting American chestnut trees (*Castanea dentata*), hemlock-mixed mesophytic forest, and massive sandstone outcrops and cliffs. Access is by written permission only.

23. JAMES E. BICKFORD STATE NATURE PRESERVE

Dedicated on 30 June 2003, James E. Bickford State Nature Preserve encompasses 348 acres on the north face of Pine Mountain in Harlan County. The preserve is named in honor of the former Natural Resources and Environmental Protection Cabinet Secretary James E. Bickford. The preserve is located on the grounds of the historic Pine Mountain Settlement School, a highly regarded community education facility founded in 1913. The preserve protects a relatively high quality mixed mesophytic forest, the typical natural community found on the north face of Pine Mountain. The preserve also protects Sawmill Hollow Cave, a small cave that developed in the limestone layer that is exposed on the north face of Pine Mountain. Additionally, the preserve supports a diverse invertebrate fauna including two rare beetles and two species new to science. Six rare plant species, including fetterbush and golden saxifrage, are known to occur on the preserve. For access to the preserve, please contact the Pine Mountain Settlement School.

24. JESSE STUART STATE NATURE PRESERVE

Dedicated on December 7, 1979, Jesse Stuart State Nature Preserve encompasses 714 acres located in Greenup County that was acquired through a gift-purchase arrangement with the internationally known author, Jesse Stuart. The area is used for passive recreation and environmental education. The preserve is also a Watchable Wildlife Site.

<i>Features</i>	-	hills and hollows made famous in Stuart's writings
<i>Access</i>	-	3.0 miles of trail over uneven terrain, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	6 cars; 1 bus
<i>Activities</i>	-	hiking, birdwatching, literature study, etc.
<i>Directions</i>	-	Greenup County. From the junction of I-64 and KY 1 north of Grayson, follow KY 1 north for 20 miles. Turn left onto W-Hollow Road. Drive 1.5 miles to parking area on right side of road.

25. JIM SCUDDER STATE NATURE PRESERVE

Dedicated on September 2, 1987, Jim Scudder State Nature Preserve is a 58-acre glade and prairie complex located in Hardin County. The dry, rocky glade openings provide habitat for several rare plant species including the silky aster (*Aster sericeus*). The preserve, owned by Hardin County, is managed by the Commission to protect one of the best remaining examples of a limestone glade in Kentucky. Access is by written permission only.

26. JOHN B. STEPHENSON MEMORIAL FOREST STATE NATURE PRESERVE

Dedicated December 10, 1996, John B. Stephenson Memorial Forest State Nature Preserve in Rockcastle County protects a 124-acre wooded gorge with two waterfalls and a rich spring floral display. The preserve honors John B. Stephenson, the former President of Berea College who enjoyed the area's beauty and solitude and worked hard to preserve the forest surrounding Anglin Falls. Long open to the public, the preserve will remain a significant source for education, interpretation, and inspiration for the people of Kentucky and the students and faculty of Berea College.

<i>Features</i>	-	Anglin Falls (75 feet), Venable Falls (150 feet) spring wildflower display, Anglin Creek, forested gorge.
<i>Access</i>	-	1-mile foot trail over uneven terrain, moderate to strenuous
<i>Facilities</i>	-	none
<i>Hazards</i>	-	cliffs at waterfalls, slippery rocks.
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Rockcastle County. From Exit 76 on I-75, go east 3.5 miles on KY

21 through Berea, at the Boone Tavern bear right (staying on KY 21) and travel another 5 miles. Turn right (south) on to US 421 and travel 2.6 miles. Turn right on Burnt Ridge Road and travel .2 miles, then left on Himanns Fork Road and travel 3.4 miles. Look for a red brick house on the right (box 530); approximately one-tenth of a mile past the house make a sharp left turn down a steep hill on to Anglin Falls Road. Travel .9 miles on Anglin Falls Road to a sign that says "Anglin Falls" next to a mailbox marked "542 R2". Turn left and travel .2 miles to the parking area/trail head.

27. JOHN JAMES AUDUBON STATE PARK NATURE PRESERVE

Dedicated on September 19, 1979, John James Audubon State Park Nature Preserve consists of approximately 325 acres and is located in Henderson County within John James Audubon State Park. This area is composed of a rich, mixed hardwood forest which was originally set aside as a bird sanctuary and memorial to the distinguished naturalist, John James Audubon. The preserve protects an excellent example of the forested loess bluffs along the Ohio River.

<i>Features</i>	-	old growth trees, lake, spring wildflowers
<i>Access</i>	-	5.5 miles of trail over uneven terrain, moderate
<i>Facilities</i>	-	state park
<i>Parking</i>	-	abundant
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Henderson County. From the junction of US 60 and US 41 in

Henderson, follow U.S. 41 north for 1.7 miles to the John James Audubon State Park entrance.

28. JULIAN SAVANNA STATE NATURE PRESERVE

Located in Franklin County, Julian Savanna protects 42 acres of remnant bluegrass savanna woodland. A globally imperiled community type unique to the bluegrass region of Kentucky, the Commission plans to conduct research on methods to restore and enhance the woodland. Several other remnant sites in the region will benefit from the research results. Dedicated on October 22, 2002, this property is also privately owned and is accessible by written permission only. This preserve was made possible with the generous donation of a conservation easement by the owner.

29. KINGDOM COME STATE PARK NATURE PRESERVE

Dedicated March 4, 1992, Kingdom Come State Park Nature Preserve consists of 225 acres on the north face of Pine Mountain in Letcher County within the Kingdom Come State Park. This preserve protects Kentucky's third largest colony of the federally endangered Indiana bat (*Myotis sodalis*). Line Fork Cave, located in the preserve, is the winter roost for over 3,000 bats. Historically, 10,000 Indiana bats inhabited Line Fork Cave. This serious decline in bat population is due to human disturbance and vandalism to the cave. Consequently, cave visitation has been restricted to the days between May 1 and August 31 and can be arranged through the Kingdom Come State Park office.

<i>Features</i>	-	cave system, rare bat winter roost
<i>Access</i>	-	at your own risk, due to rugged terrain and absence of trail
<i>Facilities</i>	-	state park
<i>Parking</i>	-	limited
<i>Hazards</i>	-	steep cliffs, venomous snakes
<i>Activities</i>	-	caving, hiking, birdwatching, etc.
<i>Directions</i>	-	Harlan and Letcher Counties. From junction of KY 160 and U.S.

119 in Cumberland, take U.S. 119 1.0 mile to the east. Turn left at entrance to Kingdom Come State Park and follow signs to the park office.

30. LIVINGSTON COUNTY WILDLIFE MANAGEMENT AREA AND STATE NATURAL AREA - BISSELL BLUFF

Dedicated into the preserve system on December 8th 2004, management of this site is shared between the Livingston County Fiscal Court, the Kentucky Department of Fish and Wildlife Resources (KDFWR), and the Commission. The Livingston County Fiscal Court owns the property and agreed to dedicate the 563 acres they purchased along the Cumberland River in central Livingston County. It contains at least seven natural communities, including steep forested bluffs on both limestone and sandstone, mesic ravine forest, bottomland hardwood forest, bald cypress slough, and riparian forest. Although most of the forested areas are second growth, a small area of very mature mesic forest occurs in one of the ravines within the site and a portion of the bottomland hardwood forest is also quite mature. A great blue heron (*Ardea herodias*) rookery is located within the bottomlands along Bissell Creek, which is a slow, meandering tributary of the lower Cumberland River. Once facilities are completed, the area will be open for hiking, nature study, and wildlife-related recreation, including hunting and fishing in accordance with regulations established by KDFWR.

31. LIVINGSTON COUNTY WILDLIFE MANAGEMENT AREA AND STATE NATURAL AREA – NEWMAN’S BLUFF

Dedicated into the preserve system on December 8th 2004, management of this site is shared between the Livingston County Fiscal Court, the Kentucky Department of Fish and Wildlife Resources (KDFWR), and the Commission. The Livingston County Fiscal Court agreed to dedicate the 168-acre property that is part of a larger tract they own along Sugarcamp Creek and Newman’s Bluff. The tract protects Price’s potato bean (*Apios priceana*), a federally threatened species, as well as habitat along the forested slope of Newman’s Bluff and the creek. Once facilities are completed, the area will be open for hiking, nature study, and wildlife-related recreation, including hunting and fishing in accordance with regulations established by KDFWR.

32. LOGAN COUNTY GLADE STATE NATURE PRESERVE

Dedicated October 24, 1990, Logan County Glade State Nature Preserve is the result of a cooperative effort between the Logan County fiscal court and the Commission to protect 41 acres of limestone glades in Russellville. The glades occupy the southwest facing midslope of an 810 foot high knob located within the city limits. The steep rocky slope is dominated by prairie grasses such as little bluestem (*Schizachyrium scoparium*) and side-oats grama (*Bouteloua curtipendula*). Rare plants include Carolina larkspur (*Delphinium carolinianum*), glade violet (*Viola egglestonii*), and limestone fameflower (*Talinum calcaricum*). The county and the Commission manage this preserve jointly.

<i>Features</i>	-	high quality limestone glades
<i>Access</i>	-	0.5 mile trail over uneven terrain, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	parking lot adjacent to preserve, space for 15 cars
<i>Hazards</i>	-	steep slopes, loose rock, venomous snakes (rare)
<i>Activities</i>	-	birdwatching, hiking, nature study, etc.
<i>Directions</i>	-	Logan County. From the junction of the Green River Parkway and U.S. 68/KY 80 at Bowling Green, follow U.S. 68/KY 80 west for 24.4 miles to Russellville. Turn right into parking area between Health Department and old hospital.

33. LOWER HOWARD’S CREEK HERITAGE PARK AND STATE NATURE PRESERVE

Clark County fiscal court agreed to dedicate and protect 244 acres surrounding Lower Howard Creek that they own in southwestern Clark County, and the Commission made it official on January 22, 2001. A tributary to the Kentucky River, Lower Howard Creek flows through a deep, twisting gorge. Second growth forests cover the slopes and cliff tops, and a showy array of spring wildflowers grace the valley bottoms. The steep topography has left refuge for two rare plants, the federally endangered running buffalo clover (*Trifolium stoloniferum*) and state threatened water stitchwort (*Stellaria fontinalis*). Located downstream from Boonesborough, Lower Howard Creek valley was an industrial center for water powered stone milling in the 18th and 19th centuries. Five of the stone buildings that remain are on the National Register of Historic Places, and one can still find the rock fences and hike the historic wagon road winding down into the steep, forested gorge. Presently, access is by guided hike only.

34. METROPOLIS LAKE STATE NATURE PRESERVE

Dedicated on July 16, 1984, Metropolis Lake State Nature Preserve is a 123-acre tract in McCracken County, which contains 50-acre Metropolis Lake, one of only a few remaining natural lakes in the Ohio River floodplain. The area was acquired with the assistance of The Nature Conservancy. The lake is ringed with bald cypress (*Taxodium distichum*) and swamp tupelo (*Nyssa aquatica*) and provides habitat for five species of fish that are rare or uncommon in Kentucky. The preserve is also a Watchable Wildlife Site.

<i>Features</i>	-	natural floodplain lake, rare species
<i>Access</i>	-	0.75 mile interpretive trail over uneven terrain, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	20 cars; 2-3 buses
<i>Activities</i>	-	birdwatching, hiking, nature study, etc.
<i>Directions</i>	-	McCracken County. From the Junction of I-24 and US 60 in Paducah, follow US 60 west for 7.0 miles, then turn right on KY 996 for 5.5 miles. Turn right onto Stafford Road, drive past gate to lake parking area.

35. NATURAL BRIDGE STATE PARK NATURE PRESERVE

Dedicated on December 16, 1981, Natural Bridge State Park Nature Preserve consists of approximately 994 acres and is located in Powell County within Natural Bridge State Resort Park. This area was dedicated into the nature preserves system to protect a significant geological system and rare species habitat. The rare Virginia big-eared bat (*Corynorhinus townsendii virginianus*), a federally endangered species, has been recorded from the preserve.

<i>Features</i>	-	Natural Bridge, rare species, scenic views
<i>Access</i>	-	13.7 miles of trail over uneven terrain, moderate to strenuous
<i>Facilities</i>	-	state resort park
<i>Parking</i>	-	abundant
<i>Hazards</i>	-	cliffs, venomous snakes (rare)
<i>Activities</i>	-	hiking, nature study, geological study, etc.
<i>Directions</i>	-	Powell County. From the junction of the Mountain Parkway and KY 11 at Slade, follow KY 11 south for 2.0 miles to the Natural Bridge State Resort Park entrance.

36. OBION CREEK STATE NATURE PRESERVE

Purchased in June 1992 this 1,402-acre tract in Hickman County is a mosaic of wetland communities and upland slopes. The area was acquired with the assistance of The Nature Conservancy. The property includes shrub swamp, marsh, and bottomland hardwood forest and is part of one of the largest remaining tracts of wetland in Kentucky. The entire Obion Creek watershed is a haven for numerous rare plants and animals. Access is by written permission only.

37. PILOT KNOB STATE NATURE PRESERVE

Pilot Knob State Nature Preserve is a 648-acre area in Powell County. The original 308-acres were acquired with the assistance of The Nature Conservancy and dedicated on September 26, 1985. The 340 acres purchased in 1998 more than doubled the size of this preserve. This new section was dedicated on March 16, 1999. A sandstone outcrop at the southeast end of the 730-foot high knob, considered to be the prominence upon which Daniel Boone first stood and looked out over the Bluegrass Region of Kentucky, is known as “Boone’s Overlook.” This preserve is managed with Eastern Kentucky University through an agreement with the Commission.

<i>Features</i>	-	cultural history, scenic views, historic millstone quarry
<i>Access</i>	-	1.75 mile trail to top of knob, strenuous hike; 0.5 mile trail along creek, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	7-8 cars; 1-2 buses
<i>Hazards</i>	-	cliffs, venomous snakes (rare)
<i>Activities</i>	-	hiking, nature study, birdwatching, geological study, etc.
<i>Directions</i>	-	Powell County. From the junction of the Mountain Parkway and KY 15 at Clay City, follow KY 15 north for 2.7 miles. Turn right on Brush Creek Road for 1.5 miles to gravel parking area.

38. PINE MOUNTAIN STATE PARK NATURE PRESERVE

Dedicated on September 26, 1983, Pine Mountain State Park Nature Preserve consists of two tracts of approximately 868 total acres within Pine Mountain State Resort Park in Bell County. This area contains an old growth forest of hemlock (*Tsuga canadensis*), tulip poplar (*Liriodendron tulipifera*), and white oak (*Quercus alba*), many of which are 200-300 years old, as well as a significant archaeological site—a large sandstone shelter that was inhabited by Native Americans, now known as a Rock Hotel. Pine Mountain fault block is also one of the most prominent geological structures in the eastern United States.

<i>Features</i>	-	old growth hemlocks, fault-block mountain, scenic views, rare species
<i>Access</i>	-	3.0 miles of trail over uneven terrain, strenuous
<i>Facilities</i>	-	state resort park
<i>Parking</i>	-	abundant
<i>Hazards</i>	-	cliffs, venomous snakes (rare)
<i>Activities</i>	-	hiking, nature study, birdwatching, geological study, etc.
<i>Directions</i>	-	Bell County. From Pineville follow U.S. 25E south for 1.5 miles. Turn right onto KY 190 for 1.5 miles. Then turn right on 1491 for 1.5 miles to the Pine Mountain State Resort Park Lodge parking lot.

39. QUIET TRAILS STATE NATURE PRESERVE

Quiet Trails consists of 165 acres of ridges and ravines bordering the Licking River in Harrison County. Mr. and Mrs. W. G. Wigglesworth, Jr. donated the original 110 acres to the Commonwealth of Kentucky in 1992. For years the property was set aside as a private nature sanctuary and was utilized by local scout troops, schools and private organizations for nature study and as a place for quiet reflection. The diversity of birds, trees and wildflowers represent the richness of the Bluegrass fauna and flora. An additional 55 acres were purchased and dedicated in 1997. The Kentucky State Nature Preserves Commission manages this area primarily for environmental education and passive recreation. The preserve is also a Watchable Wildlife Site.

<i>Features</i>	-	great diversity of birds, trees, wildflowers and mussels
<i>Access</i>	-	3.1 miles of trail, moderate
<i>Facilities</i>	-	none
<i>Parking</i>	-	4 cars
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Harrison County. From Cynthiana, take US 27 north

approximately 10 miles. Turn right onto KY 1284, which leads to Sunrise. Continue on Pugh's Ferry Road after crossing the four-way intersection. The preserve is located on the right, 1.8 miles from the intersection.

40. RAYMOND ATHEY BARRENS STATE NATURE PRESERVE

This preserve was named in honor of the man who discovered the site's significance as a natural area. Raymond Athey, a self-taught botanist, freely gave of his extensive knowledge to help in the protection of Kentucky's unique natural areas. Initially, 63 acres of land in Logan County were acquired with the assistance of The Nature Conservancy and dedicated on Oct. 24, 1990. Additional tracts of three and 90 acres were purchased in 1991 and 1994 and dedicated on Feb. 20, 1991 and March 11, 1994, respectively. The 156-acre preserve supports several plant communities with a high diversity of associated species. The barrens are typified by the open-grown post (*Quercus stellata*) and black jack (*Quercus marilandica*) oaks that dominate the woodland canopy. Glades occur as small openings within the woods. The soils are characteristically thin with bedrock at or near the surface. Several rare species are known from this preserve, including the prairie gentian (*Gentiana puberulenta*), a wildflower with vibrant deep blue petals. Access is by written permission only.

41. RIVER CLIFFS STATE NATURE PRESERVE

River Cliffs State Nature Preserve, located in Franklin County, was dedicated on October 22, 2002. Situated along the Kentucky River palisades northwest of Frankfort, River Cliffs protects Lucy Braun's rockcress (*Arabis perstellata*), a federally endangered species. This 112-acre preserve is one of the Commission's first privately owned preserves. This preserve was made possible by the generous donation of a conservation easement by the owner. Access is by written permission only.

42. SHORT'S GOLDENROD STATE NATURE PRESERVE

Dedicated December 8, 2004, the 129-acre natural area in Fleming County protects the northernmost known occurrence of the federally endangered Short's goldenrod (*Solidago shortii*). Other than a recently discovered population near the Blue River in southern Indiana, all documented occurrences of this endemic species are from a two square mile area around Blue Licks Battlefield State Resort Park covering portions of three counties (Fleming, Nicholas and Robertson) in Kentucky. The preserve will be managed to enhance habitat for the goldenrod. Access is by written permission only.

43. SIX MILE ISLAND STATE NATURE PRESERVE

Dedicated on June 24, 1979, Six Mile Island State Nature Preserve is an 81-acre island located in the Ohio River in Jefferson County near Louisville that is noted for its variety of water birds. This island was protected so that it would be allowed to return to its original natural state. With time, this island will allow researchers and citizens the unique opportunity to study the ecology of riverine island systems.

<i>Features</i>	-	undeveloped riverine island
<i>Access</i>	-	by boat
<i>Facilities</i>	-	none
<i>Hazards</i>	-	barge and motorboat traffic
<i>Activities</i>	-	nature study, birdwatching, etc.
<i>Directions</i>	-	Jefferson County. From the junction of I-71 and Zorn Avenue, turn right onto Zorn Avenue for 0.2 mile. Then turn right on River Road for 0.5 mile to the Cox Park boat ramp. Island is 1.5 miles upstream from landing.

44. SPRINGHOUSE BARRENS STATE NATURE PRESERVE

Springhouse Barrens is located roughly a half-mile north of the Eastview Barrens State Nature Preserve in western Hardin County. Dedicated September 8, 2004 the 56-acre preserve contains a highly significant limestone barrens and glade community and supports a wide variety of grassland species including the state-endangered Prairie gentian (*Gentiana puberulenta*). Additionally, there's an A-ranked occurrence of the federally threatened Eggert's sunflower (*Helianthus eggertii*). This site is privately owned and is not open to the public except during a Commission-sponsored event. Research may be conducted by written permission.

45. STONE MOUNTAIN WILDLIFE MANAGEMENT AREA AND STATE NATURAL AREA

This 1,025-acre property located in Harlan County, was dedicated on December 8, 2004 and is jointly managed by the Kentucky Department of Fish and Wildlife Resources (KDFWR) and the Commission to protect rare species and high quality examples of the natural communities occurring on Stone Mountain's north face. Public ownership also provides opportunities for wildlife and nature-related recreation and education. Dedication and management of this area helps to protect at least nine rare plant species that have been documented there, including *Carex appalachica*, Appalachian sedge; *Corydalis sempervirens*, rock harlequin; *Cymophyllus fraserianus*, Fraser's sedge; *Deschampsia caespitosa*, tufted hairgrass; *Gentiana decora*, showy gentian; *Hexastylis heterophylla*, variable-leaved heartleaf; *Juncus articulatus*, jointed rush; *Lycopodiella appressa*, southern bog clubmoss; and *Solidago caesia* L. var. *curtisii*, mountain decumbent goldenrod. Once facilities are completed, the area will be open for hiking, nature study, and wildlife-related recreation, including hunting and fishing in accordance with regulations established by KDFWR.

46. TERRAPIN CREEK STATE NATURE PRESERVE

The Terrapin Creek drainage in Graves and Calloway counties is a highly significant aquatic system that supports an unusual diversity of fishes including several species found nowhere else in Kentucky. The area is characterized by extensive wetlands, springs, and spring runs unlike any other in Kentucky that are home to a broad array of plants and animals. The Commission's goal is to protect this important system from future modifications that could result in the loss of a unique Kentucky resource. With the assistance of The Nature Conservancy, 22 acres of land in Graves County were acquired and dedicated on June 3, 1992, forming Terrapin Creek State Nature Preserve. An additional 39 acres were dedicated on March 11, 1994, another 79 acres on March 15, 1996, another 61 acres on June 15, 1999, and another 28 acres on December 9, 1999. Acquisition of this 229-acre preserve is the first step for the Commission in the long-term protection of the Terrapin Creek wetlands complex. Access is by written permission only.

47. THOMPSON CREEK GLADES STATE NATURE PRESERVE

Thompson Creek Glades State Nature Preserve is a high quality limestone glade complex located in Larue County. Several hill glades occur on thin-bedded Salem limestone outcroppings on south- and west-facing slopes above Thompson Creek. These areas are characterized by shallow, rocky soils and a number of showy prairie/glade plant species that are able to survive the harsh, dry conditions. This preserve will be managed to maintain the glade openings from encroaching woody vegetation. The original 64 acres were acquired with the assistance of The Nature Conservancy and dedicated March 4, 1992. An addition of 90 acres was dedicated at the March 18, 2003 Commission meeting. Access is by written permission only.

48. THREE PONDS STATE NATURE PRESERVE

Dedicated on June 12, 2001, Three Ponds State Nature Preserve protects 216 acres of loess bluff, bottomland hardwood forest, and coastal plain slough communities on the Mississippi River floodplain. Bald cypress (*Taxodium distichum*) and buttonbush (*Cephalanthus occidentalis*) surround a series of three small ponds, which have a surface area of about 20 acres, and which drain into Obion Creek. The preserve currently encompasses the upper two ponds. Sugarberry (*Celtis laevigata*), green ash (*Fraxinus pennsylvanica*) and sweetgum (*Liquidambar styraciflua*) dominate the bottomland hardwood forest, while sugar maple (*Acer saccharum*) dominates the bluff. Access is by written permission only.

49. TOM DORMAN STATE NATURE PRESERVE

Dedicated as the Kentucky River Authority Palisades State Nature Preserve on December 20, 1996, this 356-acre preserve was renamed in 1999 to honor Thomas Dorman for his service as former director and Commission chairman of the Kentucky River Authority, and his efforts to acquire this site. Another 200 acres were dedicated on September 25, 2001, including spectacular 220-foot palisades along the Kentucky River in Garrard and Jessamine counties. With the dedication of 247 acres on October 22, 2002 and an additional nine acres owned by TNC, the preserve protects a total of 812 acres. Several rare plants are located in the thin soils on the limestone cliffs including starry cleft phlox (*Phlox bifida* ssp. *stellaria*) and Eggleston's violet (*Viola septemloba* var. *egglestonii*). Due to hazardous cliffs, fragile habitat and limited access on the Jessamine County tract, the preserve is open to the public on the Garrard County side of the Kentucky River only.

<i>Features</i>	-	220-foot limestone palisade walls, rare plants, Kentucky River .
<i>Access</i>	-	Foot trail through the forest and to the river, 2-mile loop.
<i>Facilities</i>	-	None
<i>Parking</i>	-	8 cars
<i>Hazards</i>	-	Extremely high cliffs.
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Garrard County. From Nicholasville, follow Rt. 27 south for approximately 9 miles. After crossing the Kentucky River into Garrard County, continue for an additional 1-1/4 miles. Turn right on Rt. 1845 and follow it for 1 mile. At the road next to Lambert's Chapel turn right. Follow this road for approximately 3/4 mile (go straight, do not take the fork to the left). Park in the gravel parking lot at the end of this road.

50. VERNON-DOUGLAS STATE NATURE PRESERVE

Dedicated August 12, 1992, Vernon-Douglas State Nature Preserve is located within a rugged, steep forested section of Hardin County. This 730-acre preserve protects one of the most mature second growth forests in the Knobs Physiographic Region. Hall Hollow, a north-facing valley in the preserve, supports a rich array of spring wildflowers. A trail system passes through the valley bottom to the dry ridges above Hall Hollow. A spur trail takes hikers onto a narrow point locally known as “the pinnacle”, which provides a bird’s-eye view of the Younger Creek valley.

<i>Features</i>	-	stands of sugar maple, beech and tulip poplar, spring wildflower display
<i>Access</i>	-	4.5 miles of trail over uneven terrain, moderate to strenuous
<i>Facilities</i>	-	none
<i>Hazards</i>	-	venomous snakes (rare), steep slopes
<i>Activities</i>	-	hiking, nature study, birdwatching, etc.
<i>Directions</i>	-	Hardin County. From Elizabethtown, take the Bluegrass Parkway east 9.0 miles to KY 583. Exit right and turn right at the stop sign. Immediately turn right again onto Audubon Trace Road. Drive 0.5 mile to the preserve and park in parking lot on left.

51. WOODBURN GLADE STATE NATURE PRESERVE

Acquired with the assistance of The Nature Conservancy and dedicated March 15, 1996, this 20-acre tract in Warren County consists of several rocky glade openings. Six rare plants occur in these openings: Carolina larkspur (*Delphinium carolinianum*), upland privet (*Forestiera ligustrina*), Butler’s quillwort (*Isoetes butleri*), necklace glade cress (*Leavenworthia torulosa*), Gattinger’s lobelia (*Lobelia appendiculata* var. *gattingeri*), and eastern eulophus (*Perideridia americana*). This is the only known population of Gattinger’s lobelia in Kentucky. Access is by written permission only.

The Environmental and Public Protection Cabinet does not discriminate on the basis of race, color, national origin, sex, age, religion, or disability and on request will provide accommodations and services, including auxiliary aids, necessary to afford an individual with a disability an equal opportunity to participate in all services, programs, and activities.

Appendix 2

Kentucky's Federally Listed Endangered and Threatened Species

Key to Status:
E - Endangered
T - Threatened

This list includes only species that are not extinct or extirpated from the state.

SCIENTIFIC NAME	COMMON NAME	STATUS
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Vascular Plants

<i>Apios priceana</i>	Price's Potato-bean	T
<i>Arabis perstellata</i>	Braun's Rockcress	E
<i>Conradina verticillata</i>	Cumberland Rosemary	T
<i>Helianthus eggertii</i>	Eggert's Sunflower	T
<i>Minuartia cumberlandensis</i>	Cumberland Sandwort	E
<i>Schwalbea americana</i>	Chaffseed	E
<i>Solidago albopilosa</i>	White-haired Goldenrod	T
<i>Solidago shortii</i>	Short's Goldenrod	E
<i>Spiraea virginiana</i>	Virginia Spiraea	T
<i>Trifolium stoloniferum</i>	Running Buffalo Clover	E

Freshwater Mussels

<i>Alasmidonta atropurpurea</i>	Cumberland Elktoe	E
<i>Cyprogenia stegaria</i>	Fanshell	E
<i>Epioblasma brevidens</i>	Cumberlandian Combshell	E
<i>Epioblasma capsaeformis</i>	Oyster Mussel	E
<i>Epioblasma florentina walkeri</i>	Tan Riffleshell	E
<i>Epioblasma obliquata obliquata</i>	Catspaw	E
<i>Epioblasma torulosa rangiana</i>	Northern Riffleshell	E
<i>Lampsilis abrupta</i>	Pink Mucket	E
<i>Obovaria retusa</i>	Ring Pink	E
<i>Pegias fabula</i>	Littlewing Pearlymussel	E
<i>Plethobasus cooperianus</i>	Orangefoot Pimpleback	E
<i>Pleurobema clava</i>	Clubshell	E
<i>Pleurobema plenum</i>	Rough Pigtoe	E
<i>Potamilus capax</i>	Fat Pocketbook	E
<i>Villosa trabalis</i>	Cumberland Bean	E

Crustaceans

<i>Palaemonias ganteri</i>	Mammoth Cave Shrimp	E
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Insects

<i>Nicrophorus americanus</i>	American Burying Beetle	E
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Fishes

<i>Etheostoma chienense</i>	Relict Darter	E
<i>Etheostoma percnurum</i>	Duskytail Darter	E
<i>Notropis albizonatus</i>	Palezone Shiner	E
<i>Phoxinus cumberlandensis</i>	Blackside Dace	T
<i>Scaphirhynchus albus</i>	Pallid Sturgeon	E

Breeding Birds

<i>Haliaeetus leucocephalus</i>	Bald Eagle	T
<i>Sterna antillarum athalassos</i>	Interior Least Tern	E

Mammals

<i>Corynorhinus townsendii virginianus</i>	Virginia Big-eared Bat	E
<i>Myotis grisescens</i>	Gray Myotis	E
<i>Myotis sodalis</i>	Indiana Bat	E

Source: Kentucky State Nature Preserves Commission, 2004.

References:

United States Fish and Wildlife Service. 2000. Endangered and threatened wildlife and plants. Department of the Interior, Washington, DC.

United States Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants; review of species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; notice of review; proposed rule. Federal Register 69:24876-24904.

Appendix 3

Plants and animals presumed extinct or extirpated from Kentucky, November 2004

US Status ¹		US Status ¹	
PLANTS		<i>Hemistena lata</i>	LE
Vascular Plants		Cracking Pearlymussel	
<i>Caltha palustris</i> var. <i>palustris</i>	--	<i>Lasmigona subviridis</i>	--
Marsh Marigold		Green Floater	
<i>Orbexilum stipulatum</i>	--	<i>Leptodea leptodon</i>	LE
Stipuled Scurf-pea		Scaleshell	
<i>Physostegia intermedia</i>	--	<i>Lexingtonia dolabelloides</i>	C
Slender Dragon-head		Slabside Pearlymussel	
<i>Polytaenia nuttallii</i>	--	<i>Plethobasus cicatricosus</i>	LE
Prairie Parsley		White Wartyback	
		<i>Quadrula fragosa</i>	LE
		Winged Mapleleaf	
		<i>Quadrula tuberosa</i>	--
		Rough Rockshell	
		<i>Villosa fabalis</i>	C
		Rayed Bean	
ANIMALS			
Freshwater Mussels		Insects	
<i>Dromus dromas</i>	LE	<i>Pentagenia robusta</i>	--
Dromedary Pearlymussel		Robust Pentagenian Burrowing Mayfly	
<i>Epioblasma arcaeformis</i>	--		
Sugarspoon			
<i>Epioblasma biemarginata</i>	--	Fishes	
Angled Riffleshell		<i>Ammocrypta vivax</i>	--
<i>Epioblasma flexuosa</i>	--	Scaly Sand Darter	
Leafshell		<i>Crystallaria asprella</i>	--
<i>Epioblasma florentina florentina</i>	LE	Crystal Darter	
Yellow Blossom		<i>Erimystax x-punctatus</i>	--
<i>Epioblasma haysiana</i>	--	Gravel Chub	
Acornshell		<i>Etheostoma microperca</i>	--
<i>Epioblasma lewisii</i>	--	Least Darter	
Forkshell		<i>Hemitremia flammea</i>	--
<i>Epioblasma obliquata perobliqua</i>	LE	Flame Chub	
White Catspaw		<i>Hybopsis amnis</i>	--
<i>Epioblasma personata</i>	--	Pallid Shiner	
Round Combsell		<i>Ichthyomyzon gagei</i>	--
<i>Epioblasma phillipsii</i>	--	Southern Brook Lamprey	
Cincinnati riffleshell		<i>Moxostoma lacerum</i>	--
<i>Epioblasma propinqua</i>	--	Harelip Sucker	
Tennessee Riffleshell		<i>Moxostoma valenciennesi</i>	--
<i>Epioblasma sampsonii</i>	--	Greater Redhorse	
Wabash Riffleshell		<i>Percina burtoni</i>	--
<i>Epioblasma stewardsonii</i>	--	Blotchside Logperch	
Cumberland Leafshell			
<i>Epioblasma torulosa torulosa</i>	LE		
Tubercled Blossom			

Plants and animals presumed extinct or extirpated from Kentucky, November 2004

US Status ¹

Reptiles

Masticophis flagellum flagellum --
Coachwhip

Breeding Birds

Anhinga anhinga --
Anhinga
Campephilus principalis LE
Ivory-billed Woodpecker
Chlidonias niger --
Black Tern
Conuropsis carolinensis --
Carolina Parakeet
Ectopistes migratorius --
Passenger Pigeon
Elanoides forficatus --
Swallow-tailed Kite
Picoides borealis LE
Red-cockaded Woodpecker
Tympanuchus cupido --
Greater Prairie-chicken
Vermivora bachmanii LE
Bachman's Warbler

Non-Breeding Birds

Cygnus buccinator --
Trumpeter Swan
Grus americana LE
Whooping Crane

Mammals

Bos bison --
American Bison
Canis lupus LE
Gray Wolf
Canis rufus LE
Red Wolf
Felis concolor cougar LE
Eastern Cougar

¹ The US Status provided here refers to the current status of the taxon under the U.S. Endangered Species Act (USES) as interpreted for its range within the state of Kentucky.

KEY TO STATUS CATEGORIES

(KSNPC) Kentucky State Nature Preserves Commission

- E: Endangered. A taxon in danger of extirpation and/or extinction throughout all or a significant part of its range in Kentucky.
- T: Threatened. A taxon likely to become endangered within the foreseeable future throughout all or a significant part of its range in Kentucky.
- S: Special Concern. A taxon that should be monitored because (1) it exists in a limited geographic area in Kentucky, (2) it may become threatened or endangered due to modification or destruction of habitat, (3) certain characteristics or requirements make it especially vulnerable to specific pressures, (4) experienced researchers have identified other factors that may jeopardize it, or (5) it is thought to be rare or declining in Kentucky but insufficient information exists for assignment to the threatened or endangered status categories.
- H: Historic. A taxon documented from Kentucky, but not observed reliably since 1984 and not considered extinct or extirpated.

(US) Endangered Species Act of 1973

- E: Endangered. "... any species ... in danger of extinction throughout all or a significant portion of its range ... " (USFWS 1992).
- T: Threatened. "... any species ... likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range" (USFWS 1992).
- C: Candidate. Species for which the USFWS has "... on file sufficient information on biological vulnerability and threats to support proposals to list them as endangered or threatened" (USFWS 2004).

Extinct/Extirpated. A taxon for which habitat loss has been pervasive and/or concerted efforts by knowledgeable biologists to collect

or observe specimens within appropriate habitat have failed.

Extinct: A taxon that no longer exists.

Extirpated: A taxon that no longer exists in the wild in Kentucky, but exists elsewhere in the wild.

For status category definitions see:

United States Fish and Wildlife Service. 1992. Endangered Species Act of 1973 as amended through the 100th Congress. United States Government Printing Office, Washington, District of Columbia.

United States Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants; review of species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; notice of review; proposed rule. Federal Register 69:24876-24904.

US statutes were taken from:

United States Fish and Wildlife Service. 2000. Endangered and threatened wildlife and plants. Department of the Interior, Washington, DC.

United States Fish and Wildlife Service. 2004. Endangered and threatened wildlife and plants; review of species that are candidates or proposed for listing as endangered or threatened; annual notice of findings on resubmitted petitions; annual description of progress on listing actions; notice of review; proposed rule. Federal Register 69:24876-24904.

Appendix 4

Kentucky State Nature Preserves Commission, 2004 State Listing Status of the Major Groups of Organisms in Kentucky

Number of Kentucky Species or Taxa ¹	Lichens	Mosses	Vascular Plants	Gastropods	Freshwater Mussels	Crustaceans	Insects	Fishes	Amphibians	Reptiles	Breeding Birds	Mammals
Native	Unknown	326	2030	ca. 278	104	Unknown	Unknown	241	51	52	170	70
Exotic	Unknown	0	570	ca. 13	0	Unknown	Unknown	22	0	1	4	5
KSNPC Endangered	1	11	146	4	27	8	14	31	2	2	18	4
KSNPC Threatened	0	5	121	8	5	6	24	12	1	8	14	3
KSNPC Special Concern	0	0	68	14	2	7	19	17	8	7	16	7
KSNPC Historical	0	0	62	0	0	0	19	0	0	0	2	0
Presumed Extinct or Extirpated	0	0	4	0	22	0	1	10	0	1	11	4
Federal Listing Candidate	0	0	2	0	5	0	8	4	0	0	0	0

Key to Status Categories

Endangered:

A taxon in danger of extirpation and/or extinction throughout all or a significant part of its range in Kentucky.

Threatened:

A taxon likely to become endangered within the foreseeable future throughout all or a significant part of its range in Kentucky.

Special Concern:

A taxon that should be monitored because (a) it exists in a limited geographic area, (b) it may become threatened or endangered due to modification or destruction of habitat, (c) certain characteristics or requirements make it especially vulnerable or declining but insufficient information exists for assignment to the threatened or endangered status categories.

Historical:

A taxon documented from Kentucky but not observed reliably since 1984.

Extirpated:

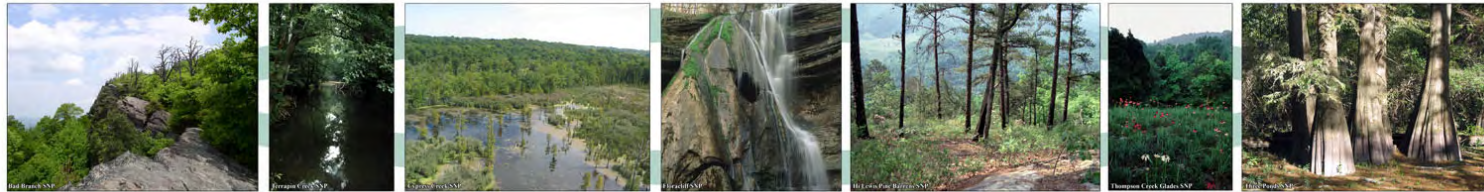
A taxon that no longer exists in the wild in Kentucky, but exists elsewhere in the wild.

Extinct:

A taxon that no longer exists.

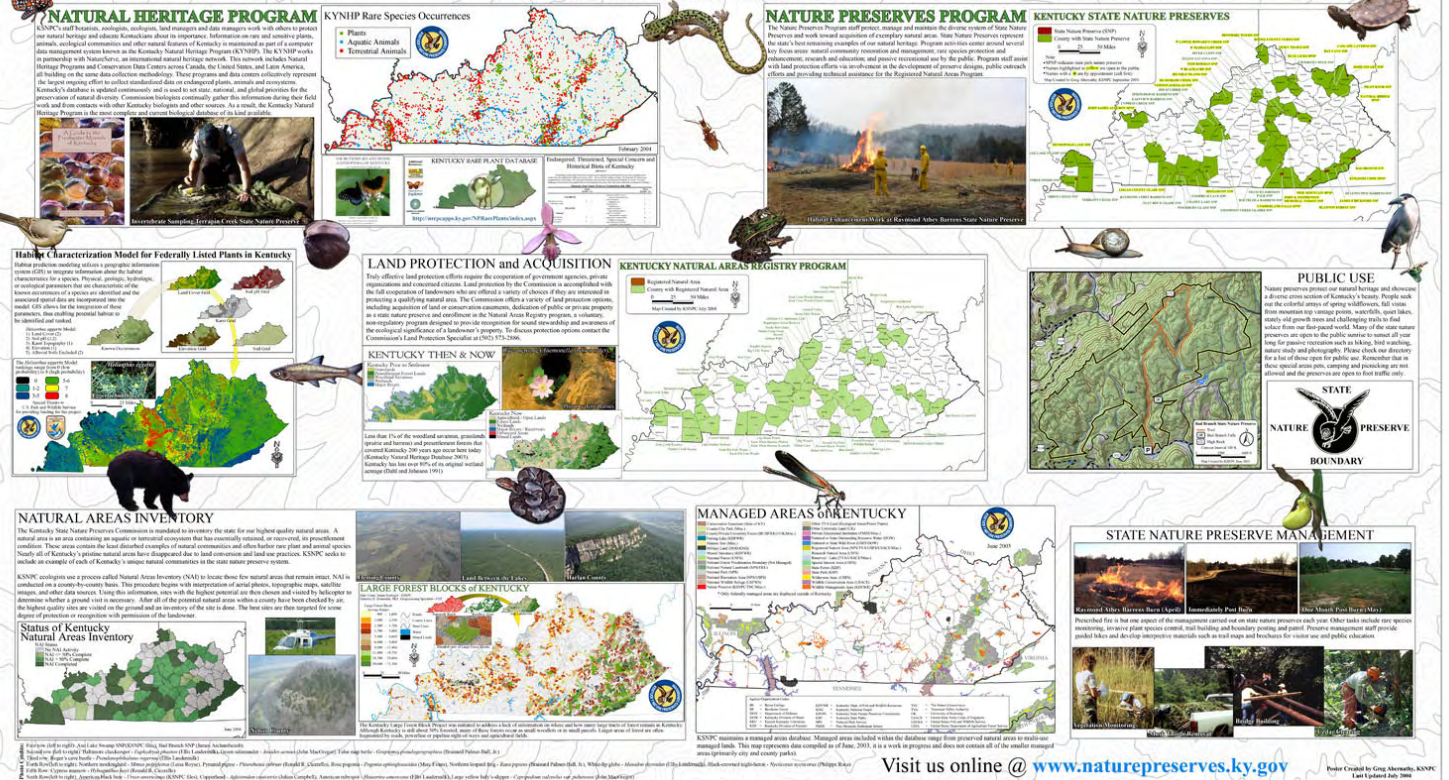
¹ Totals include some distinctive subspecies and varieties for gastropods, freshwater mussels, and fishes but only species for lichens, mosses, vascular plants, amphibians, reptiles, breeding birds, and mammals. Totals do not include species recorded from Kentucky based on fossil specimens. Sources for totals of native taxa/species: mosses (Risk 1999; Snider et al. 1988); vascular plants (Jones 2004); gastropods, freshwater mussels, fishes, amphibians, reptiles, breeding birds, and mammals (KSNPC 2004).

Appendix 5



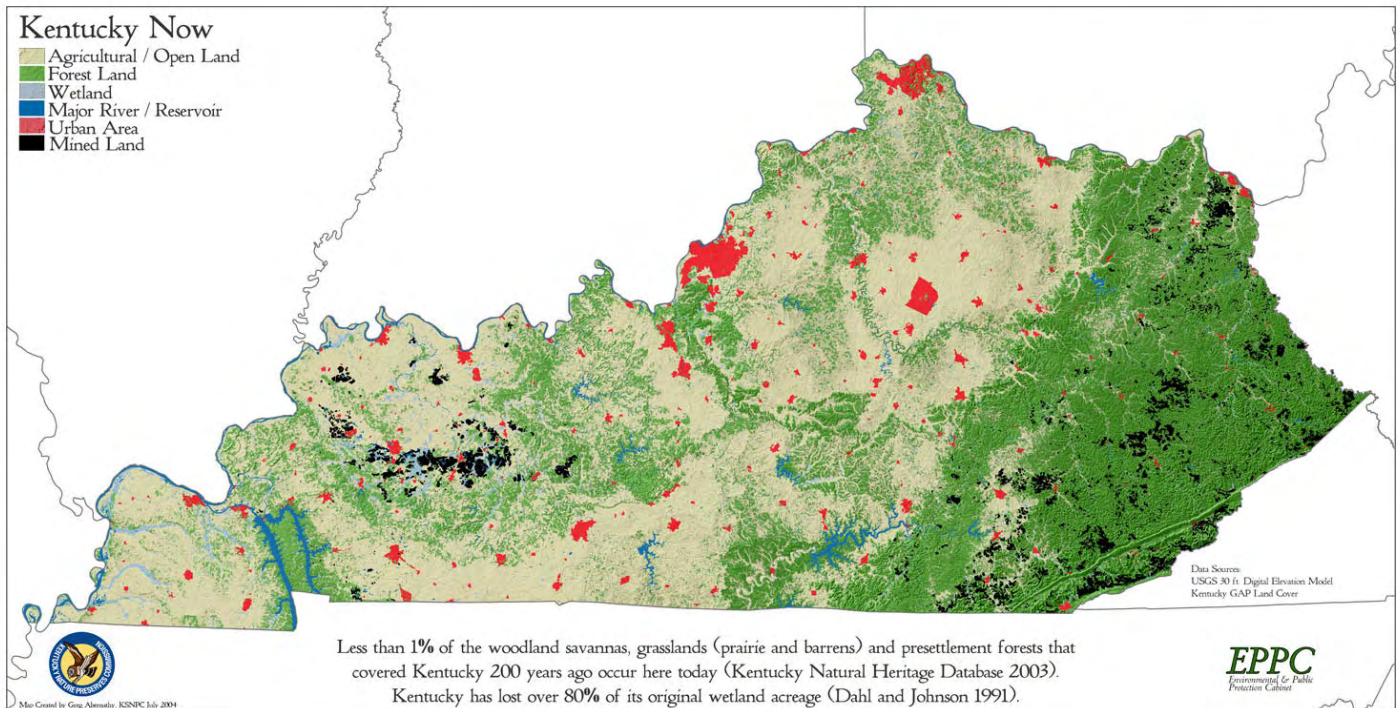
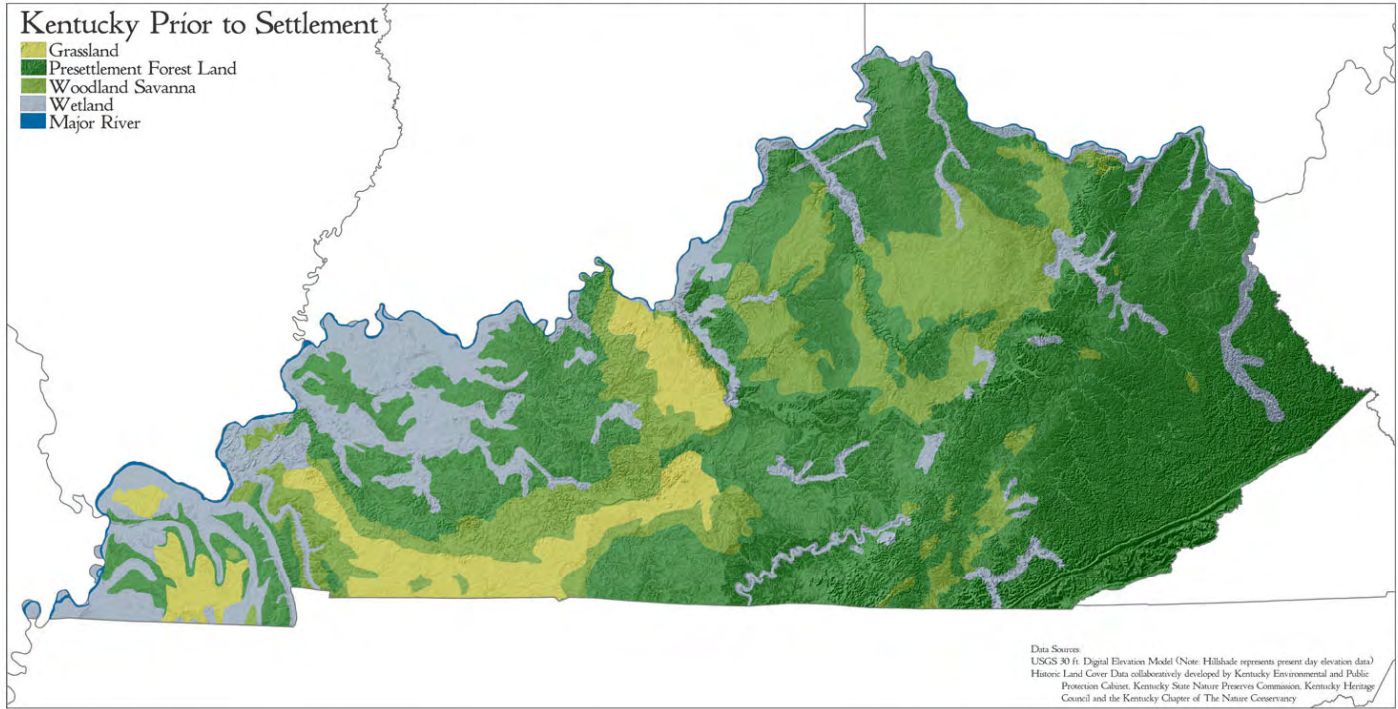
KENTUCKY STATE NATURE PRESERVES COMMISSION

KSNPC protects Kentucky's natural heritage by (1) identifying, acquiring, and managing natural areas that represent the best known occurrences of rare native species, natural communities, and significant natural features in a statewide nature preserve system; (2) working with others to protect biological diversity; and (3) educating Kentuckians as to the value and purpose of nature preserves and biodiversity conservation.

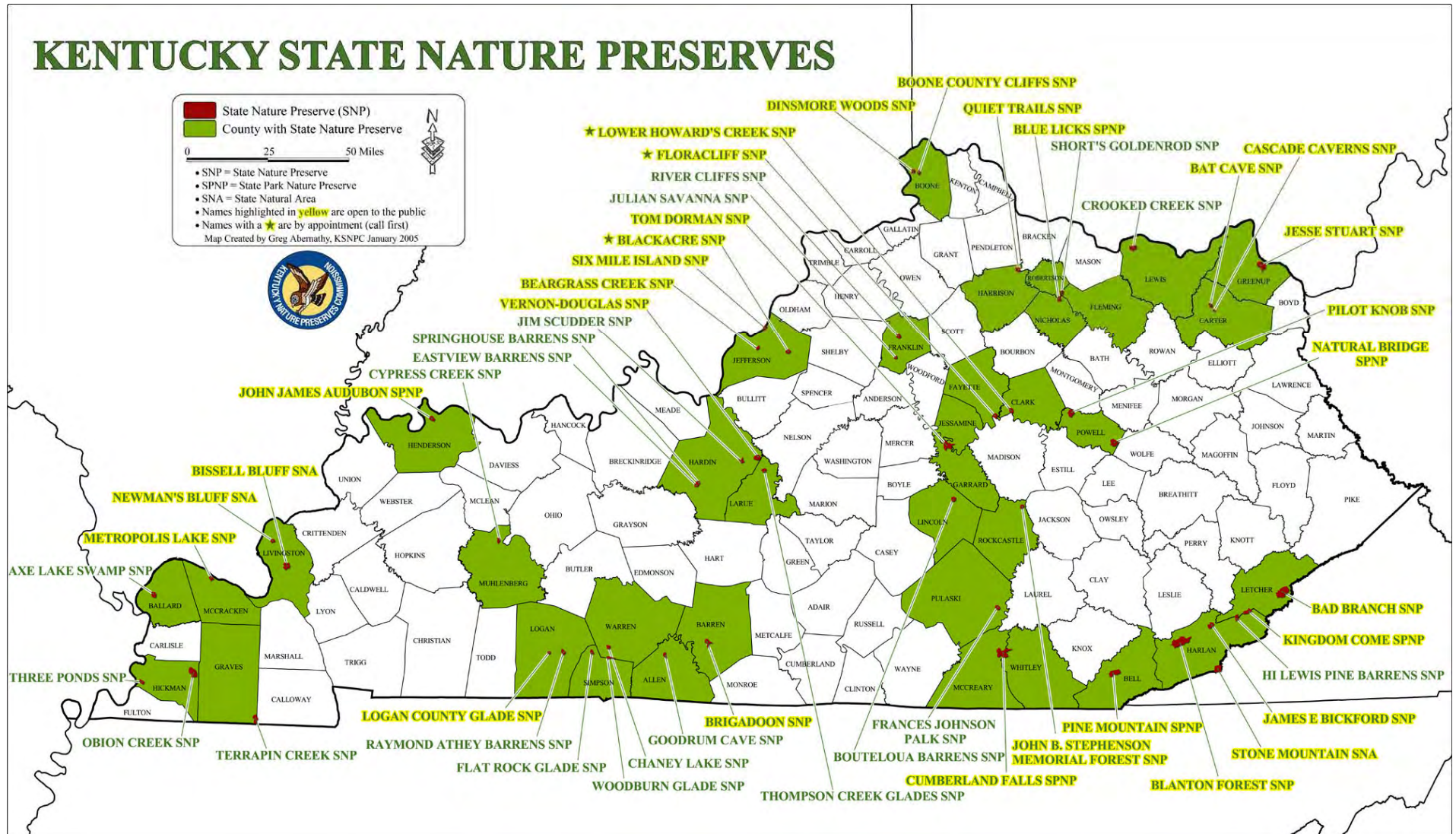


Appendix 6

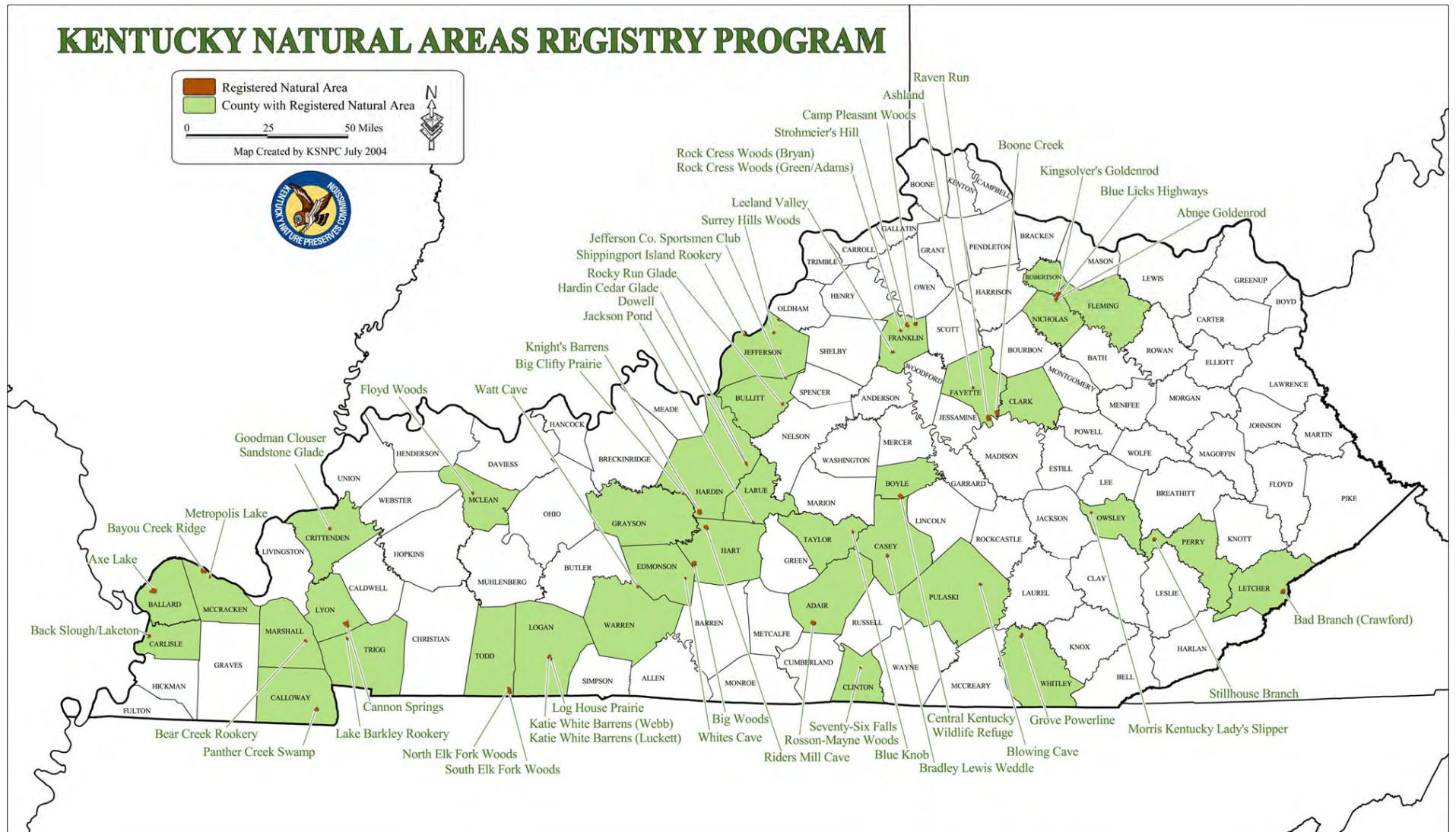
KENTUCKY THEN & NOW



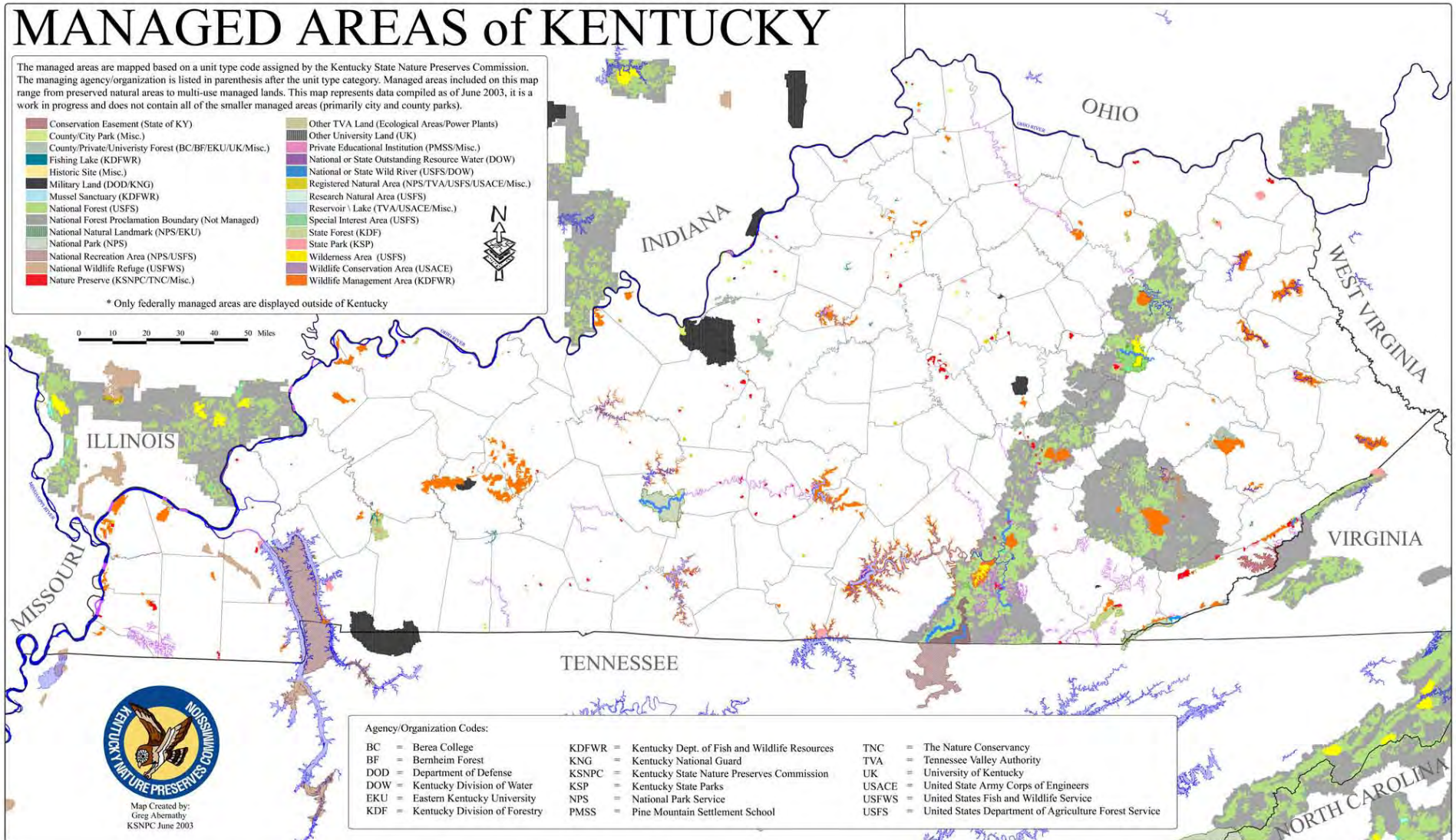
Appendix 7



Appendix 8



Appendix 9



RUNNING BUFFALO CLOVER

Trifolium stoloniferum

HISTORICAL ACCOUNTS

There is evidence that running buffalo clover occurred here as a native species at the time of settlement and could even have been a common species. The references to clover and buffalo trails indicate a white clover was abundant in the Bluegrass at this time. The earliest specimens of running buffalo clover are from 1834 by R. Peter and labeled "meadows about Lexington".

"The rich soil, thanks to generations of animals that had haunted the lick, was open, firm, and almost free from undergrowth, and except about the trampled lick and in the broad buffalo path, was adorned early as it was, with great patches of fine white clover ..." referring to a lick area near Boonesborough (Ranck 1775).

Edna Kenton (ancestor of Simon Kenton) describing the Bluegrass Region in the 1770's: "It was carpeted with wild rye, with prairie and buffalo clover, with deep bluegrass and with rich weed".

"You frequently find beds of clover to the horse's knees" (Anonymous 1791).

"We now sometimes see a specimen of 'buffalo clover'. This has a large white blossom, is intermediate between the common white and red clover, and is only to be in very shaded places" (Perrin 1882).

"So rich a soil we had never seen before; covered with clover in full bloom..." (Walker 1824).

NATURAL HABITATS

Running buffalo clover is associated with disturbance, perhaps historically from migrating herds, but more recently with any type of animal trail or scour along streams. It may have occurred in bluegrass savannas, natural communities with widely spaced trees making up the canopy and with a low ground cover. Today, it is most commonly found on forested stream terraces but has also turned up in the lawns of old homesteads such as here at Ashland. Could these old homes have been placed in bluegrass savannas and the clover persisted under a new disturbance regime - mowing?

LIFE HISTORY

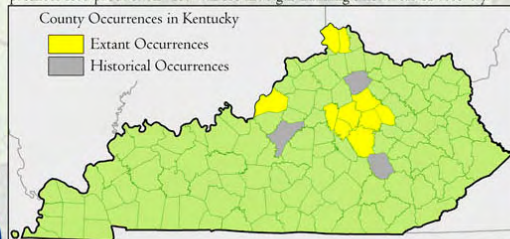
Running buffalo clover is different from the introduced European white clover in having leaves on the flowering stem and in being a generally coarser larger plant. It also lacks the watermark or chevron that often appears on white clover leaves. If you take the time to look at it out on the Ashland lawn, you will see that the leaves are typically bigger and rounder (nearly as wide as long). A robust white flower head appears in the spring and the seeds drop in summer.

It is called "running" buffalo clover because it produces stolons that root along its length and eventually may separate from the original or mother plant.

It was listed as "endangered" under the U.S. Endangered Species Act in 1987. While new populations have been found over the last 15 years throughout its range, many populations have continued to decline and disappear.

RUNNING BUFFALO CLOVER at ASHLAND

Running Buffalo Clover was found at Ashland in 1989 as part of a Kentucky State Nature Preserves Commission (KSNPC) effort to survey lawns of historical homes to locate more populations of this plant. The map to the right provides an account of its distribution on the property over the years. Disturbance plays some role in maintaining the habitat for this species, whether it is grazing, stream scour, or deer trampling. The Ashland staff have worked with biologists to use mowing as a tool to maintain the lawn to simulate natural disturbance and benefit the growth of Running Buffalo Clover. KSNPC continues to work with Ashland staff to reduce weed competition and promote seed production. You will see the signs marking these areas of recovery.



For more information visit KSNPC's Rare Plant Database online @ www.naturepreserves.ky.gov
Poster Design by Greg Altenbach, KSNPC September 2004



Appendix 11

