

KENTUCKY STATE NATURE PRESERVES COMMISSION

30 YEARS OF PROTECTING KENTUCKY'S NATURAL HERITAGE



SMALL WHITE LADY'S-SLIPPER



BIENNIAL REPORT
JANUARY 2007

Cover photo by Thomas G. Barnes: Small White Lady's-slipper (*Cypripedium candidum*) – state listed endangered

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Dedicated to the Memory of

Commissioner O.D. Hawkins of Owenton, KY who passed away on October 9, 2006 at the age of 92 while fulfilling his appointed duties. Beginning in 1982, Commissioner Hawkins served KSNPC for a total of 21 years as a representative of the Farm Bureau Association. During that time, he steadfastly supported our mission and was instrumental in moving the Commission forward. His public service and dedication are greatly appreciated.

KENTUCKY STATE NATURE PRESERVES COMMISSION MEMBERS

Mrs. Clara Wheatley, Chair

Howardstown, KY

Representing the National Farmers Organization

Mrs. Gayle Horn, Secretary

Harrodsburg, KY

Representing the Kentucky Association of Soil Conservation Districts

Ms. Ellen Joy Hawkes

Louisville, KY

Representing citizens at-large

Mrs. Nancy H. Grayson

Walton, KY

Representing citizens at-large

Mr. Patrick Henderson

Irvington, KY

Representing the Farm Bureau Association

Donald S. Dott, Jr.

Executive Director

Kentucky State Nature Preserves Commission
801 Schenkel Lane, Frankfort KY 40601-1403
Telephone: 502-573-2886 - Fax: 502-573-2355

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Biennial Report of the Kentucky State Nature Preserves Commission January 2007

INTRODUCTION

This is the biennial report to be 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), Mrs. Nancy Grayson (at-large), Mrs. Gayle Horn (State Association of Soil Conservation Districts) and Ms. Ellen Joy Hawkes (at-large) and Mr. Patrick Henderson (Kentucky Farm Bureau Association). Mr. O. D. Hawkins served as representative of the Kentucky Farm Bureau Association during the term of this report, until his passing on October 9, 2006. The executive director is Donald S. Dott, Jr. The Commission staff consists of 23 full-time positions. 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 WE SHOULD PROTECT BIOLOGICAL DIVERSITY.

Protecting biodiversity is our statutory mission, but this doesn't answer "Why?"

Biodiversity is an abbreviation 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..." (Excerpted from the Executive Summary of Kentucky Alive! Report of the Kentucky Biodiversity Task Force.)

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

1. Commercial benefits – Biological resources are the basis of countless commercial products, such as plants for food and fiber and wood for fuel and housing. The Kentucky Division of Forestry reports that more than 3500 forest industries employ over 30,000 people and generate more than \$4.5 billion of revenue annually from the primary and secondary wood industries alone.
2. Medicines – Almost one-fourth of all medical prescriptions throughout the world are derived from plants and microorganisms or are synthesized versions of their chemical compounds.
3. Recreation – Our diverse natural areas and ecosystems draw millions of visitors each year to Kentucky's state parks and other natural areas such as Kentucky State Nature Preserves, Wildlife Management Areas, Daniel Boone National Forest, Mammoth Cave National Park, Land Between the Lakes and many others. According to the Kentucky Commerce Cabinet, the tourism industry provided Kentucky's third-largest revenue producing industry, contributing more than \$9 billion to the state economy annually and employing 174,000 people. About half of this tourism is nature based.

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 purify water runoff from uplands and are sometimes referred to as “nature’s kidneys.” Songbirds help reduce crop damage by feeding on harmful insects. Other insects pollinate both wildflowers 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 biological and the inanimate.

Whatever reason you may find to be the most compelling for protecting our biological diversity, the 1976 Kentucky General Assembly said it best. 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, or habitat loss, continues to be the number one threat to our natural areas and biological diversity. Natural areas support a great diversity of species, which we humans supplant with only a few preferred species in our managed landscapes. When forests are logged typically 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 plant and tree species that thrive in urban conditions. Certainly these types of managed landscapes are both desirable and necessary, 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 current Forest Inventory Analysis, compiled by the Kentucky Division of Forestry and the U.S.D.A. Forest Service, reports a 3 percent net decline of forested land from 1988 to 2003. A 3 percent loss does not sound like much, but its 769,000 acres, 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.

Another statistic compiled by the USDA Natural Resources Conservation Service reveals that Kentucky is losing 130 acres *per day* of forest and farmlands to development. This is an irreversible loss of prime farmland, wildlife habitat and natural areas. It equates to 1 square mile of land being developed *every week*, which is one of the highest rates in the country. When compared to the seven surrounding states, Kentucky has protected the smallest percentage of its land. State owned lands are approximately .9% of the state. When federal lands are added, including military bases, this figure increases to only 7.5%. To be competitive with other states Kentucky must support a land stewardship and conservation initiative. Existing programs are already in place to facilitate the purchase of land and conservation agreements from willing sellers. The need is for an increased and sustainable funding mechanism. Based on the current availability of large blocks of land and reasonable prices - there will never be a better time to act to preserve scarce natural lands.

While land development is the primary harm to biodiversity, the invasion and competition from invasive exotic (non-native) species is the second most serious threat to our native species. Invasive exotic species like kudzu, musk thistle, multi-flora rose and zebra mussels spread rapidly, unchecked by the natural controls that exist in their place of origin and choke out native species. The U. S. Government Accounting Office has long recognized the enormous costs ranging in billions of dollars in damages to natural areas, agriculture, businesses and consumers caused by invasive species. 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 one of the most easily recognized invasive exotic plants, while bush honeysuckle is rapidly changing the composition of forested habitat in the Bluegrass area. Chinese yam and Asian bittersweet are invading much of southeastern Kentucky and moving into the rest of the state from there.

Unfortunately, new invasive species continue to arrive in the United States due in large measure to our global economy.

Invasive 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 the gypsy moth, dogwood anthracnose and butternut (or white walnut) canker. Damaging pests in bordering states that have yet to be found within Kentucky are the emerald ash borer and sudden oak death.

The hemlock wooly adelgid has now been documented on three state nature preserves in southeastern Kentucky; two in Harlan County and one in Bell, including Blanton Forest, the state's largest old growth forest. This insect attacks and slowly kills hemlock trees which make up a significant portion of the forest canopy in the southeastern region of the state. Kill rates in other Appalachian states have been about 80%. Issues associated with hemlock die-off include water quality concerns, changes in forest structure and composition, increased forest fire danger, safety concerns for structures near dead or dying trees and for hikers on trails located in a dying stand. Landscape aesthetics will also be harmed as the trees lose their needles and die over a course of five to ten years. The only known treatments are not economically feasible except for select individual specimen trees. The loss of hemlocks will be tragic in eastern areas of the state.

Loss of diversity is also caused by the virtual elimination of wildfire as a normal event in the natural environment. While fire suppression is necessary to protect human habitation, it 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 and glade-like areas that historically were kept open by wildfires and large herds of grazing animals, like bison. Such areas need the restoration of 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.

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 making science-based decisions to protect our natural areas and rare species and set conservation priorities. The natural heritage program methodology is used in all 50 states, most Canadian provinces and 12 Central and South American countries. The Commission is part of the largest international biological data network in the world. 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 survey the state for rare species, including federally listed endangered and threatened species. Our field staff includes: two botanists for rare plants, mosses and lichens (there are 276 plants listed as rare by regulation and an additional 57 are considered special concern); 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 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 the Kentucky Natural Heritage database. One additional biologist was funded through the Landowner Incentive Program in 2003, a federal program focusing on endangered species habitat on private lands. It enables us to provide advice and cost share funding to willing landowners who want to improve rare species habitat on their lands. KSNPC is in partnership with KDFWR, the U.S Fish and Wildlife Service and the Kentucky Chapter of The Nature Conservancy to implement this program statewide.

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 these rare natural areas of Kentucky and guide the acquisition of outstanding natural areas for our nature preserves system. Our NAI process has not yet completed an assessment of Kentucky, due to our limited resources and staff. The Ecology section was reduced by one ecologist due to budget cuts; there are two remaining. We estimate that only *one-half of one percent* (0.5%) of Kentucky remains in a natural condition comparable to what existed when the pioneers arrived.

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.

NATURE PRESERVES AND LAND PROTECTION

The Nature Preserves and Natural Areas Branch protects and manages our diverse system of nature preserves and provides opportunities for environmental education and outreach to the public. Administering the nature preserve system requires highly trained staff with expertise in land management techniques such as prescribed burning and exotic plant control and includes tasks ranging from research on the viability of rare species populations to trail maintenance. Nature preserves are often thought of 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 come in the form of unauthorized use of ATVs, timber theft, habitat destruction, arson, etc., in addition to the threat of invasive exotic species.

Our staff uses GIS to create map products outlining prescribed burn units, invasive plant distributions and other information included in management plans that must be written for each property. We are developing additional interpretive materials and trail maps that are downloadable from the Commission’s website to better enable visitors to enjoy the preserves.

A hidden threat to the nature preserve system comes from our growing inability to maintain a sufficient level of stewardship or management. We are fortunate to have a funding source for land acquisition, which earmarks 10% of the acquisition cost for management activities. While these funds defray some of the stewardship expenses, they are not sufficient to enable the Commission to hire much needed additional staff.

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. These outstanding preserves are scattered across the Commonwealth from the wetlands of the Mississippi River to the dense forests of Pine Mountain on the Virginia border.

The nature preserve system continues to grow, but due to past state personnel reductions and budget cuts, we have been prevented from adding staff to manage our nature preserves since 1998. It is inefficient, at best, to remove invasive plants one year and be unable to return the next, allowing them to retake areas that had been recovered. The Commission currently has 23,269 acres in the nature preserve system, but a total of *only 6 permanent full-time staff* to oversee and manage them. Without a sufficient level of stewardship these scarce high quality natural areas and the rare species they shelter are put at risk and the quality of the visitor experience will decline. To address our immediate needs, an additional preserve manager is needed to divide the oversized eastern region and an additional manager is needed for western Kentucky (the Jackson Purchase area). Two additional full time stewardship assistants to replace seasonal workers are also needed to rotate among preserves, as demands require.

The primary source of funding for the Commission to purchase land for nature preserves is the Kentucky Heritage Land Conservation Fund (KHLCF). Since January 2005, the Commission has received \$761,846 in funding and has expended \$325,855 in our efforts to acquire and protect additional ecologically significant property. Although not expended, remaining funds received are currently obligated to ongoing land acquisition efforts. The HLCF receives its funding from three sources: the unmined minerals tax, environmental fines and sales of the very popular “Nature’s Finest” license plates (a cardinal, bobcat and butterfly).

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 Recovery Land Acquisition grant in the amount of \$550,000 in late 2005 from the U.S. Fish and Wildlife Service to acquire land in Fleming County. In addition, we were a co-sponsor, along with the Department of Parks, of a Federal Highway Administration Transportation Enhancement (TEA-21) grant that will be used to acquire a 768 parcel as an addition to the Pine Mountain Trail State Park and the state nature preserves system.

ACCOMPLISHMENTS DURING THE LAST BIENNIUM

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, as 93% of the state is privately owned. We estimate that 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 and the Kentucky Chapter of The Nature Conservancy known as the Landowner Incentive Program, funded by the U.S. Fish and Wildlife Service. One position at the Commission has been funded for three years through this award. In cooperation with 36 private landowners, this new program has already resulted in recovery management work for 18 rare plant species, providing cost share funding and technical guidance to private landowners. Unfortunately, due to reduced federal funding, fewer dollars will be available for cost share in 2007 and potentially none in 2008.

The Commission's Director was elected to the U.S. Section Council of NatureServe in 2006. This is one of nine regional representatives nationally. NatureServe is the parent organization for our natural heritage database of rare species and natural areas. The Director is one of two southeast representatives to liaison between the heritage programs and the national office. This gives Kentucky a stronger voice in this non-profit, international conservation organization.

To guide and promote the conservation of imperiled aquatic species the Commission developed a "Hotspots & Priority Watersheds Analysis." Kentucky's native freshwater fish and mussel faunas are among the richest in North America and the southeastern United States is the center worldwide of freshwater mussels and temperate freshwater fish diversity. 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 numbers and distribution.

The analysis the Commission conducted to prioritize conservation work relied on 20 years of species observation data. "Hot spot" watersheds were determined by assessing the number and rarity of imperiled mussel and fish species by watershed. Conservation of the top 10 hot spot watersheds would protect populations of 88% of the imperiled mussel species and 58% of imperiled fish species. Eight of the top 10 priority watersheds are found in three drainages

(Mayfield and Obion Creek and Bayou de Chien, the Upper Green River and the Upper Cumberland River below the falls). The Commission provided the analysis results for consideration during the Southeast Aquatic Biodiversity Workshop Assessment which was conducted during the Spring of 2006. Additionally, in December 2005 the Commission convened a meeting of state and federal agencies to discuss the state of aquatic conservation efforts. The analysis results have also been presented at professional and nonprofit meetings and were used to illustrate conservation GIS practices to school groups.

Our invertebrate biologist, Ellis Lauder milk, co-organized the annual meeting of The Dragonfly Society of the Americas with Mr. Carl Cook of Center, Kentucky. The meeting was held in June 2006 in Cave City, Kentucky and approximately 60 participants from 25 states and Canada attended the three day Kentucky portion of the meeting. He also worked on two major projects for KET's *Kentucky Life* program: an introduction to Kentucky's dragonflies and damselflies; and rare or uncommon butterflies of Kentucky. The dragonfly program is scheduled to air in late January 2007. A status survey funded by the U.S. Fish and Wildlife Service (USFWS) of eight subterranean obligate cave beetles that were candidates for listing by the USFWS was also completed. Two of the species endemic to one Kentucky cave have subsequently been removed from the candidate list as a result of conservation measures taken at the cave. This "preventative" work, in partnership with several entities including the U.S. Fish and Wildlife Service, a private landowner and a non-profit land trust, avoided the need to list these 2 species as threatened or endangered under the federal Endangered Species Act. Finally, state ranks were assigned to all of Kentucky's globally rare invertebrates, especially the subterranean obligate species, for possible addition to KSNPC's list of rare biota and in preparation for the Biodiversity of Kentucky Atlas that KSNPC is developing.

In culmination of seven years of monitoring and study of 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 found in the Bluegrass region. This work led to improved conservation management and public education at two historical sites where this plant persists, the Henry Clay Ashland Estate and Dinsmore Woods. We are working with the University of

Kentucky and Bernheim Arboretum and Research Forest to develop a seed source for recovery of this species.

Data gained by our botanists was used by the U.S. Fish and Wildlife service in a review that resulted in the de-listing of Eggert's sunflower. Federally listed as threatened, additional surveys revealed this plant was not as rare as previously believed, enabling its removal from the federal ESA list. This plant is found only in Kentucky, Tennessee and Alabama.

The 2005 winter survey of Indiana bat hibernation caves showed an overall increase in population for this federal and state listed endangered mammal. This was the first gain recorded in about 20 years. The Great blue heron was removed from the state special concern list due to an increase in its population statewide.

Kentucky Educational Television (KET) continues to feature the state nature preserves and other natural areas the Commission protects on its Kentucky Life program. Commission staff guide site visits and are often featured on camera with the program's host. This program remains the Commission's best public outreach venue and has been used for public education about the need to restore fire in some natural areas.

The Commission supported the Kentucky Exotic Pest Plant Council (KY EPPC) in the creation of a field guide on Kentucky's most threatening invasive plants. The informative booklet provides descriptive text and color pictures for identification as well as suggested methods of treatment for control of each species. The booklet was distributed to Division of Forestry personnel during invasive plant training workshops conducted by the Nature Preserves Branch and the KY EPPC in spring 2005. The booklets are distributed to volunteers at invasive species removal workdays and other public events.

The Commission convened a statewide Natural Lands Protection planning meeting in December 2005. The theme of this biennial meeting was land acquisition to further protect aquatic resources. Aquatic species, particularly freshwater mussels, are some of our most at-risk organisms. Habitat alteration (impoundments) and degraded water quality are the two biggest causes of their decline. Over 30 participants attended including representatives of the Division of Water, U.S. Fish and Wildlife Service, KY. Dept. of Fish and Wildlife Resources, the Corps of Engineers, The Nature Conservancy and others.

Small grants funded through the Sherri Evans Memorial fund were provided to graduate students and professors at UK, Bradley University and ECU in 2006. The reports resulting from this work will assist the Commission's preserve managers in making critical decisions for

preserve management. Additional studies supported by the Commission include projects to inventory insects on fire-maintained communities, to determine the effects of various herbicide treatments on targeted invasive plants and establishing sampling plots to track changes to forests infected with the hemlock wooly adelgid.

The Commission has expanded its partnership to manage land with the Kentucky Department of Fish and Wildlife Resources (KDFWR) and the EPPC, Division of Water. Martin's Fork Wildlife Management Area and State Natural Area in Harlan County marks another 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 1,061 acres supporting at least 9 rare species found in a state-designated wild river watershed.

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 review 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, the Division of Waste Management and the U.S Army Corps of Engineers.

Grants and contract work are needed to supplement the agency's budget. During 2005 and 2006 KSNPC received commitments of approximately \$147,000 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 find 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. This is substantially less than received historically and it has reduced our ability to hire seasonal field assistants. The contract work also diverts our biologists from their most pressing needs with rare species.

The following tables contain information on projects undertaken and accomplished by the Commission for 2005 and 2006 and include the agencies from which the grants/contracts were awarded.

Contracts by Agency and Project 2005	Amount
U.S. Fish and Wildlife Service Endangered Species Act	\$ 29,162
KDFWR - Landowner Incentive Program	\$ 50,000
Ky. Dept. for Natural Resources (formerly DSMRE)	\$ 33,000
Division of Abandoned Mine Lands	\$ 5,000
Licking River RC&D	\$ 1,900
NatureServe	\$ 2,400
Ky Dept of Fish and Wildlife - Letourneau Woods	\$ 2,500
Commonwealth Office of Technology –Ky. Landscape Snapshot	\$ 22,775
Grants/Contracts total for 2005	\$ 146,737

Contracts by Agency and Project 2006	Amount
U.S. Fish and Wildlife Service Endangered Species Act	\$ 28,641
Landowner Incentive Program	\$ 50,000
Ky. Dept. for Natural Resources (formally DSMRE)	\$ 33,000
Division of Abandoned Mine Lands	\$ 5,000
NatureServe	\$ 10,625
Dept. of Military Affairs, Div. of Facilities Mgmt	\$ 15,000
Ky Dept. of Fish and Wildlife Res. Breeding Bird Survey	\$ 5,000
Grants/Contracts total for 2006	\$ 147,266

NATURAL HERITAGE PROGRAM DATA SERVICES

The Natural Heritage Program maintains a database of information on rare species, natural communities, conservation sites and managed areas. The Natural Heritage Program database is the result of 30 years of field research by 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 is recognized as the best available on rare species and natural communities. It is invaluable for providing 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 2005 and 2006.

Data Requests Summary
Fiscal Years 2005 and 2006

Requester	Requests FY 2005	Requests FY 2006
Private Consultants	68	93
State Government	7	5
The Nature Conservancy	2	0
Researchers/Individuals	2	2
Local Government	2	3
Federal Government	9	3
Utilities	13	10
Others	1	2
TOTAL	104	118

Geographic Information Systems (GIS) provide the Commission with 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 natural heritage data for Kentucky is maintained in the Biodiversity Tracking and Conservation System (BIOTICS); a custom Oracle database application with an integrated ArcView GIS component developed by NatureServe specifically for use in natural heritage programs. Migration to this system was enabled in 2003 by the use of state wildlife grant funds made available through Kentucky Department for Fish and Wildlife Resources. The KYNHP database currently contains an impressive 11,333 species and ecological community records, 522 site records and 539 managed area records.

BIOTICS provides enhanced functionality and flexibility, enabling greater utilization of our data. It allows our data to be more readily compiled with data from other members of the Natural Heritage Network throughout North America and portions of South America, thus allowing for aggregation of data across political boundaries. This data is shared with state and federal agencies for many purposes. Some of these include environmental review projects for I-66 alternate routes and providing quarter quad level species data for the Southern Forestland Assessment.

In 2006, the Commission entered into a 3 year agreement with the Kentucky Department of Fish and Wildlife Resources to improve the knowledge about distribution and status of wildlife species of greatest conservation need under the state wildlife action plan (WAP), a federally funded statewide grant program. This project builds upon the previous data sharing agreement and expands it to include data management objectives from Kentucky's WAP.

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 shapefiles. 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 continues to support and enhance custom GIS applications created for the Department for Natural Resources Division of Permits for surface coal mine permit reviews and for the Division of Abandoned Mine Lands for project review. The applications provide a suite of tools to streamline the review process saving critical staff time and providing documentation in the form of custom reports.

The Commission has also been involved in planning with a variety of conservation-based organizations in the last biennium. The Commission worked with Bernheim Forest to develop conservation planning and preserve design maps. We provided data to facilitate an assessment of aquatic biodiversity in Kentucky as a part of a U.S. Geological Survey sponsored workshop to identify priority watersheds in the southeast for species restoration. We collaborated with the U.S.

Fish and Wildlife Service and U.K. Forestry Extension to develop blackside dace maps to help protect this federally listed threatened fish during logging operations. Additionally, Commission data was used to support a diverse array of projects such as biological assessments for numerous infrastructure and development projects statewide, land preservation efforts in Jefferson County, identifying significant areas for wildlife species of greatest concern for the State Wildlife Grants, best management practices on private forestland and conservation efforts in the Green River and Obion Creek Watersheds.

The Commission has also used GIS to generate public educational posters and cartographic products, such as the ones below:

- *Running Buffalo Clover at Ashland, Dinsmore Woods and Big Bone Lick State Park* – Information panels that provide background information on Running buffalo clover, a federally listed plant found on all three properties.
- *Managed Areas Map* – A map showing the distribution of federal, state and privately managed areas. The map was displayed at the 2006 Kentucky GIS Conference and has been used to create dialogue with other agencies aimed at establishing a comprehensive statewide data layer that is annually updated.
- *State Nature Preserve Trail Maps* – Numerous hiking trail maps and information panels have been created and are being used in preserve brochures, kiosks and on the web.
- *Large Forest Blocks of Kentucky* – A map illustrating the analysis conducted to identify large contiguous tracts of forest throughout the commonwealth. The map was included in volume 20 of ESRI's Map Book, a publication distributed at the annual international conference.

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 2006.

Nature and Wildlife Fund Income by Tax Year

Tax Year	Total Receipts
1996	\$109,792
1997	\$90,946
1998	\$76,732
1999	\$48,084
2000	\$38,188
2001	\$34,256
2002	\$37,676
2003	\$38,114
2004	\$35,837
2005	\$34,182
2006*	\$33,756.
*receipts received thru October 2006	

Unfortunately, the trend has seen a decline, in part due to the addition of other tax check-off donation boxes. 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. 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. The decline in funds from this source creates a need for additional general funds to keep pace with preserve management needs. Although these funds can be used for land purchase, we have instead limited their use to preserve stewardship needs.

NATURE PRESERVES AND STEWARDSHIP

The Commission's Nature Preserves and Natural Areas Branch manages 57 preserves and easements containing 23,269 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, six are owned by county governments, one is owned by the Division of Water, one is owned by Berea College, one is owned by Murray State University, eight are within Kentucky state parks, three are privately owned and three are owned by non-profit foundations.

The Commission has also begun holding conservation easements on private properties with significant populations of rare species. Currently, 107 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 gladeceess (*Leavenworthia exigua* var. *laciniata*). Conservation easements are a less costly method to protect a natural area than a full fee simple purchase.

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 2005 biennial report, the Commission, working with county and state government partners, or alone, has accepted another conservation easement, enlarged several existing preserves and established two new ones using funds from the Kentucky Heritage Land Conservation Fund (KHLCF) Board and a variety of other funding sources. These areas are (with new properties in bold text):

State Nature Preserve Additions

Bad Branch SNP	Letcher County	187 acres
Blanton Forest SNP	Harlan County	24 acres
Bob Overton Cave CE	Christian County	55 acres
Jim Scudder SNP	Hardin County	109 acres
John James Audubon SPNP	Henderson County	13 acres
Martins Fork SNA	Harlan County	1,601 acres
Mutters Cave	Barren County	110 acres
Obion Creek SNP	Hickman County	175 acres
Pilot Knob SNP	Powell County	93 acres
Thompson Creek Glades SNP	Larue County	15 acres
TOTAL		2,382 acres

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.

The preserves in southeastern Kentucky will continue to require a significant amount of staff time due to their size, remoteness and the lack of sufficient staff to patrol them effectively on a regular basis. We continue to have encroachment problems and illegal trespass on our six Pine Mountain preserves and now those on Stone and Cumberland and Brush Mountains as well.

Damage from illegal off-road vehicle use is increasing as local communities seek to promote tourism opportunities for ATV enthusiasts. Areas set aside specifically for all-terrain vehicles are being developed, but more will be needed to keep pace with the interest. Cooperation and coordination from local law enforcement will be necessary to direct off road vehicle users to areas appropriate for such heavy usage.

Acquiring and managing this much land requires a long-term effort and more preserve management staff. 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 two 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 and the Blackacre Foundation. The Commission has continued to recruit volunteers as management responsibilities have increased. Volunteers include scout troops, school groups and members of organizations such as the Sierra Club and the Kentucky Native Plant Society as well as local citizens and preserve neighbors. 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 spotters for the hemlock wooly adelgid, as field trip leaders and recruiting preserve monitors for each preserve.

Major stewardship activities since the January 2005 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 ear-leaved false foxglove and prairie gentian).
- Acreage managed by prescribed fire has increased each year. Barrens communities at Crooked Creek, Jim Scudder, 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.
- The Commission and the Kentucky Department of Parks planned and co-hosted a successful festival to heighten awareness of the federally endangered Short's goldenrod at Blue Licks State Park.
- Exotic plant control demands an increasing amount of time on state nature preserves. Asian bittersweet control at James Bickford SNP and Pine Mountain SPNP has been very successful, with significant decreases at both sites.
- Trail design and construction at Bissell Bluffs SNA in Livingston County opens the preserve for visitor use.
- A joint project with the Kentucky Department of Parks and the US Forest Service resulted in a road closure and stabilization of a highly eroded area of Natural Bridge State Park Nature Preserve.
- 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.
- Dedicated Murphy's Pond in partnership with Murray State University. Nature preserve status brings added protection and recognition to Kentucky's highest quality cypress swamp. It is also well known for having the highest concentration of cottonmouth snakes in the state.

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

Acreage Managed by KSNPC

SNP denotes dedicated State Nature Preserve; SNA denotes dedicated State Natural Area;

CE denotes Conservation Easement; SPNP denotes dedicated portion of a State Park

January 2007

County	Preserve	Acres
Allen	Carpenter Cave CE	14
Allen	Goodrum Cave SNP	51
Ballard	Axe Lake Swamp SNP	458
Barren	Brigadoon SNP	181
Barren	Mutter's Cave	110
Bell	Pine Mountain SPNP	868
Boone	Boone Co. Cliffs SNP	74
Boone	Dinsmore Woods SNP	106
Bullitt	Apple Valley Glades CE	23
Carter	Bat Cave SPNP	128
Carter	Cascade Caverns SPNP	18
Christian	Bob Overton Cave CE	55
Clark	Lower Howard's Creek Heritage Park & SNP	244
Fayette	Floracliff SNP	287

County	Preserve	Acres
Fleming	Short's Goldenrod SNP	129
Franklin	Feindel CE	15
Franklin	Julian Savanna SNP	42
Franklin	River Cliffs SNP	112
Graves	Terrapin Creek SNP	230
Greenup	Jesse Stuart SNP	714
Hardin	Eastview Barrens SNP	120
Hardin	Jim Scudder SNP	167
Hardin	Springhouse Barrens SNP	55
Hardin	Vernon-Douglas SNP	730
Harlan	Blanton Forest SNP	3,088
Harlan	Hi Lewis Pine Barrens SNP	302
Harlan	James E. Bickford SNP	348
Harlan	Martin's Fork SNA	1,601
Harlan	Stone Mountain SNA	1,025
Harrison	Quiet Trails SNP	165
Henderson	John James Audubon SPNP	325
Hickman	Obion Creek SNA	1,577
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	170
Letcher	Bad Branch SNP	2,639
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

County	Preserve	Acres
McCreary	Cumberland Falls SPNP	1,294
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		23,269

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

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 48 landowners with interests in 59 different sites are enrolled in the Natural Areas Registry program. These registry agreements encompass approximately 4783.5 acres in 39 counties and are listed below by county:

KENTUCKY STATE NATURE PRESERVES COMMISSION
REGISTERED NATURAL AREAS

County	Name	Acres	Ownership	Significance
Adair	Rosson-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	UASCE	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
Franklin	Camp Pleasant Woods	131	Private	rare plant
Franklin	Far Side Farm*	27	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
Franklin	Strohmeiers Hill	53	Private	rare plant
Franklin	Tucker Creek*	30	Private	rare plant

County	Name	Acres	Ownership	Significance
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
Livingston	Corley Farm*	100	Private	rare plant
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
Madison	Jean's Glade*	6	Private	rare plant
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

County	Name	Acres	Ownership	Significance
Nicholas, Robertson, Fleming	Blue Licks Highway	2	KTC	rare plant
Owsley	Morris Kentucky Ladyslipper	5	Private	rare plant
Perry	Stillhouse Branch	105	USACE	mature forest
Pulaski	Blowing Cave	5	Private	rare plants & animals
Russell	Sundew Meadow*	12	Private	rare plant
Russell, Pulaski, Wayne	Lake Cumberland* (7 discrete sites)	188	USACE	rare plants
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	Greenhill Woods*	0.5	Private	rare plant
Warren	Watt Cave	1	Private	rare animal
Whitley	Grove Powerline	8	Utility	rare plants
	TOTAL	4,783.5		

* Added since January 2005

Abbreviations: Kentucky Department 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 30 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 30 years, much work remains to be done. The fact that 23,269 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 natural communities. 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 has *doubled* and the management responsibilities of the nature preserve system are increasing at an ever-faster rate.

To date, there are *only six* full-time permanent employees to care for a preserve system of over 23,000 acres. We need at least 4 interims (or two additional permanent full-time staff) to keep up with management needs, but can only fund two interims per year. 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 preserves system and provide for the safety and education of visitors.

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 the ten percent 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 the Jackson Purchase area of western Kentucky and for another to divide the 23 preserves now handled by one person in the central region of the state. We need additional permanent staff and funding to hire more interim workers to keep up with the increased work that comes with the need to conduct prescribed burns and to address the invasive plants that increase their hold each 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 the scarce remaining gems. The Commission currently employs two full-time ecologists. A part-time ecologist had to be reassigned to other work to utilize available grant funds. 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' workload of contract surveys to generate agency receipts is increasing, which means they cannot adequately revisit known rare species sites, so the age of the records in the database 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 a past 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.

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 rare plants.

We acutely need an additional position to assist the aquatic zoologist. Presently, he trades work time 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 and fourth respectively after only Alabama and Tennessee for the number of species of freshwater fish and 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.

In 1976 the General Assembly declared that, "As a 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 to the vital human dependence upon fresh air, clean water and unspoiled natural areas."

It is the task of the Kentucky State Nature Preserves Commission to protect this heritage, but we are in critical need of greater resources to be successful.

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STATE NATURE PRESERVES & STATE NATURAL AREAS DIRECTORY



KENTUCKY STATE NATURE PRESERVES COMMISSION

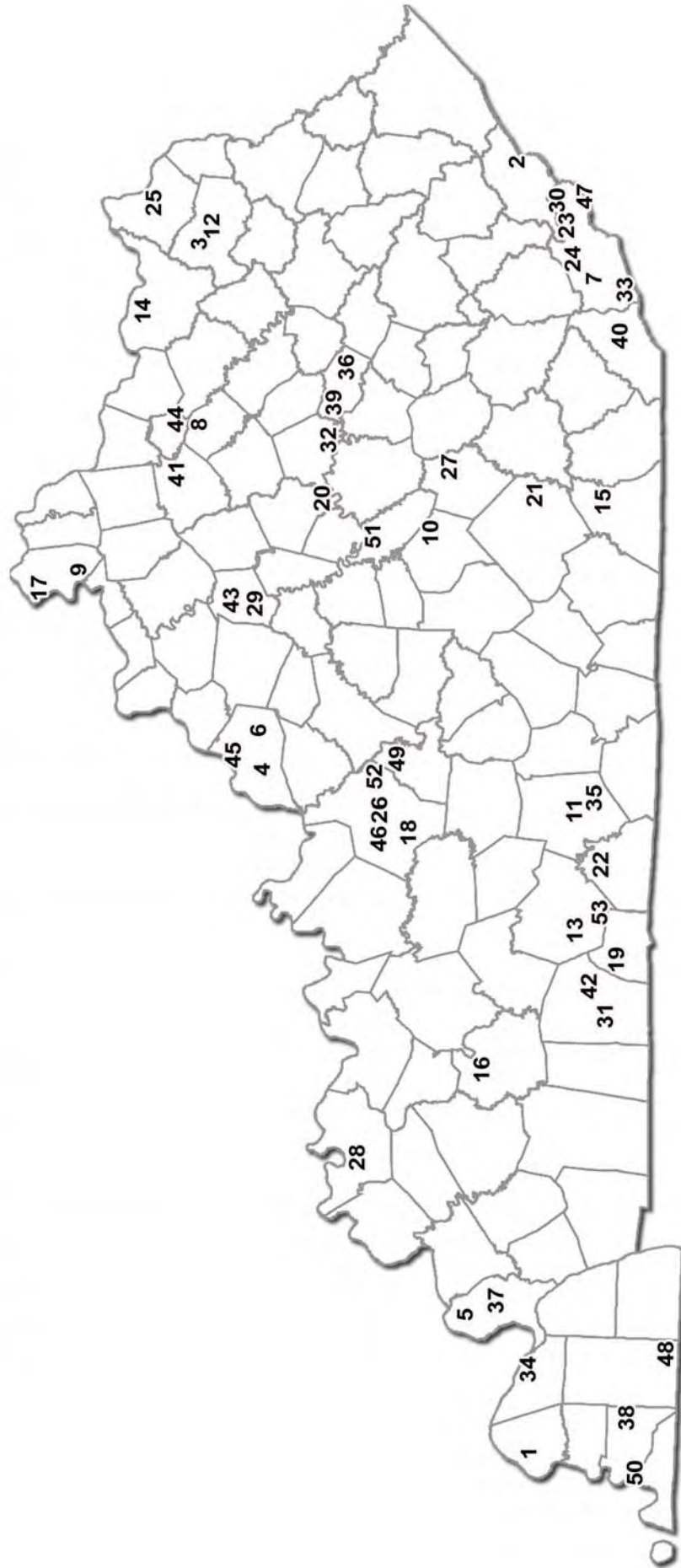
801 Schenkel Lane
Frankfort, KY 40601
Tel: (502) 573-2886 Fax: (502) 573-2355
E-mail: naturepreserves@ky.gov
www.naturepreserves.ky.gov

December 2006



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.

State Nature Preserves and State Natural Areas



NUMBER ON MAP	STATE NATURE PRESERVES AND STATE NATURAL AREAS	DATE DEDICATED	PAGE IN DIRECTORY
1	Axe Lake Swamp SNP	February 20, 1991	(6)
2	Bad Branch SNP	September 26, 1985	(6)
3	Bat Cave SNP	December 16, 1981	(7)
4	Beargrass Creek SNP	February 17, 1982	(7)
5	Bissell Bluff SNA	December 8, 2004	(15)
6	Blackacre SNP	March 19, 1979	(7)
7	Blanton Forest SNP	September 15, 1995	(8)
8	Blue Licks SPNP	December 16, 1981	(8)
9	Boone Co. Cliffs SNP	November 5, 1987	(9)
10	Bouteloua Barrens SNP	September 8, 2004	(9)
11	Brigadoon SNP	March 14, 1985	(9)
12	Cascade Caverns SNP	December 16, 1981	(7)
13	Chaney Lake SNP	May 9, 1991	(10)
14	Crooked Creek Barrens SNP	June 15, 1999	(10)
15	Cumberland Falls SPNP	September 26, 1983	(10)
16	Cypress Creek SNP	December 5, 1986	(10)
17	Dinsmore Woods SNP	May 16, 1990	(11)
18	Eastview Barrens SNP	September 17, 1997	(11)
19	Flat Rock Glade SNP	October 24, 1990	(11)
20	Floracliff SNP	March 15, 1996	(12)
21	Frances J. Palk SNP	July 9, 2002	(12)
22	Goodrum Cave SNP	August 12, 1992	(12)
23	Hi Lewis Pine Barrens SNP	June 4, 1997	(12)
24	James E. Bickford SNP	June 30, 2003	(13)
25	Jesse Stuart SNP	December 7, 1979	(13)
26	Jim Scudder SNP	September 2, 1987	(13)
27	John B. Stephenson Memorial Forest SNP	December 10, 1996	(14)
28	John James Audubon SPNP	September 19, 1979	(14)
29	Julian Savanna SNP	October 22, 2002	(14)
30	Kingdom Come SPNP	March 4, 1992	(15)
31	Logan Co. Glade SNP	October 24, 1990	(16)
32	Lower Howard's Creek SNP	January 22, 2001	(16)
33	Martin's Fork SNA	March 8, 2006	(16)
34	Metropolis Lake SNP	July 16, 1984	(17)
35	Mutter's Cave	---	(17)
36	Natural Bridge SPNP	December 16, 1981	(17)
37	Newman's Bluff SNA	December 8, 2004	(15)
38	Obion Creek SNP	July 14, 1992	(18)
39	Pilot Knob SNP	September 26, 1985	(18)
40	Pine Mountain SPNP	September 26, 1983	(18)
41	Quiet Trails SNP	March 4, 1992	(19)
42	Raymond Athey Barrens SNP	October 24, 1990	(19)
43	River Cliffs SNP	October 22, 2002	(19)
44	Short's Goldenrod SNP	December 8, 2004	(19)
45	Six Mile Island SNP	June 24, 1979	(20)
46	Springhouse Barrens SNP	September 8, 2004	(20)
47	Stone Mountain SNA	December 8, 2004	(20)
48	Terrapin Creek SNP	June 3, 1992	(20)
49	Thompson Creek Glades SNP	March 4, 1992	(21)
50	Three Ponds SNP	June 12, 2001	(21)
51	Tom Dorman SNP	December 20, 1996	(21)
52	Vernon-Douglas SNP	August 12, 1992	(22)
53	Woodburn Glade SNP	March 15, 1996	(22)

SNP = STATE NATURE PRESERVE. SPNP = STATE PARK NATURE PRESERVE. SNA = STATE NATURAL AREA.

OUR MISSION

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 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; and (3) educating Kentuckians as to the value and purpose of nature preserves and biodiversity conservation.

OUR VISION

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

THE STATE NATURE PRESERVES SYSTEM

The Kentucky State Nature Preserves Commission has preserved in perpetuity **23,379** acres of ecological communities and natural habitat for rare species throughout the state. With the assistance of other state and county government agencies, private organizations, foundations, and individuals, the Commission is able to acquire land, dedicate it, and manage it as state nature preserves. A State Nature Preserve (SNP) is a legally dedicated area which is recognized by the state for its natural significance, established to protect rare native species and ecological communities, managed to enhance and perpetuate these elements of biodiversity, and protected by the highest form of land protection by statute. An area may also be dedicated for the purpose of environmental education. A State Natural Area (SNA) is a site jointly managed as a Wildlife Management Area (WMA) with the Kentucky Department of Fish and Wildlife Resources (KDFWR). These areas are also dedicated to permanently protect them. They are protected for the same purposes as State Nature Preserves, but a rule allowing hunting differentiates them from State Nature Preserves. The Commission manages 40 dedicated SNP's, eight dedicated preserves on Kentucky state parks, four dedicated SNA's and four privately-owned conservation easements. Negotiations for acquisition of additional acres, often on land adjoining dedicated preserves, are ongoing.

PUBLIC ENJOYMENT

The majority of the preserves are open to the public (unless otherwise noted) throughout the year, sunrise to sunset, for non-consumptive recreation such as hiking, birding, photography, and nature study. Four State Natural Areas are open to wildlife-related recreation, including hunting and fishing in accordance with regulations established by Kentucky Department of Fish and Wildlife Resources (KDFWR). For the protection of sensitive species, visitation to the other preserves is restricted but guided tours are given periodically. Please contact the Commission for more information.

RULES FOR STATE NATURE PRESERVES AND STATE NATURAL AREAS

By observing these rules you will be helping to protect Kentucky's natural heritage.

- Preserves are open sunrise to sunset.
- Trails are open to foot traffic only. The established trail system is the safest and best way to travel through the preserve. Visitors must not re-route or shortcut the existing trail system.
- Horses, bicycles, climbing and rappelling are not permitted on State Nature Preserves/ State Natural Areas because of their destructive impacts to the trails and natural features.
- Motorized vehicles are not permitted.
- Possession of drugs or alcohol is prohibited. Possession of firearms is illegal on dedicated State Nature Preserves.
- Collecting plants, animals, rocks, artifacts, or wood reduces those things that are needed to maintain nature's delicate balance. Therefore, collecting, hunting and trapping are prohibited on dedicated State Nature Preserves.
- Fishing is allowed **ONLY** at Metropolis Lake SNP and Six Mile Island SNP.
- Hunting is allowed **ONLY** at Stone Mountain State Natural Area (SNA), Martin's Fork SNA, Bissell Bluff SNA and Newman's Bluff SNA, in accordance with regulations established by KDFWR under KRS 150 and 300 KAR chapters 1 – 3.
- To ensure the natural beauty of each preserve and to promote visitor safety and enjoyment, camping, picnicking, building fires, audio equipment and pets are not permitted.
- Remember to carry out your trash.

Rules for State Nature Preserves are established by 400 KAR 2:090. Any person in violation of this regulation may be liable for a civil penalty of \$1,000 per day and possible criminal prosecution as provided for in KRS 224.

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 dedicated December 11, 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.

BAD BRANCH STATE NATURE PRESERVE

Initially 435 acres of land in Letcher County were dedicated September 26, 1985, establishing Bad Branch State Nature Preserve. Additional acreage owned by The Nature Conservancy was dedicated March 4, 1992. To date, 2,639 have been protected. The preserve contains Bad Branch Gorge and the majority of the Presley House Branch watershed. The preserve protects the scenic beauty of the gorge and one of the largest concentrations of rare and uncommon species known in the state. Kentucky's only known nesting pair of common ravens (*Corvus corax*) makes Bad Branch its home. Along the 7.5-mile trail system visitors may experience Bad Branch Falls, a 60-foot waterfall plunging down the south face of Pine Mountain, and unparalleled views from High Rock. The Pine Mountain Trail runs along the crest of the mountain and joins the preserve trail system before crossing into the Jefferson National Forest. Kentucky Division of Water has designated Bad Branch as a Kentucky Wild River.

- Features* - hemlock gorge, waterfall, high quality stream, numerous rare species, trail along mountain crest
- Access* - foot trail and bridges, 7.5 miles of trail over uneven terrain, very strenuous
- Facilities* - none
- Parking* - 10 cars, 1 bus. No overnight parking is allowed.
- Hazards* - steep cliffs, falling ice in winter, venomous snakes (rare)
- Activities* - hiking, birding, nature photography, research, etc.
- Directions* - Letcher County. From the junction of KY 15 and US 119 in Whitesburg, follow US 119 south 8.0 miles. Turn left at the junction with KY 932 and travel east for 2.0 miles to the gravel parking area on the left side of KY 932.

BAT CAVE (ROGER W. BARBOUR) & CASCADE CAVERNS STATE NATURE PRESERVES

Dedicated 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 park 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.

- Features* - 2 cave systems, rare bat winter roost, rare plants
- Access* - cave tours (Bat Cave closed in between months of October and April), 1 mile of trails on surface
- Facilities* - state resort park
- Parking* - abundant
- Hazards* - steep banks above Tygarts Creek at Cascade Caverns
- Activities* - hiking, geological study, birding, etc.
- Directions* - 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.

BEARGRASS CREEK STATE NATURE PRESERVE

Dedicated 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.

- Features* - wooded tract in urban Louisville, diversity of migrant birds
- Access* - 1.0 mile of trails on ridgetop and bottomland, easy
- Facilities* - Louisville Nature Center and adjacent Joe Creason Park
- Parking* - abundant
- Activities* - birding, hiking, nature study, etc.
- Directions* - Jefferson County. From the Watterson Expressway (I-264), take Exit 14 to Poplar Level Road North. Take Poplar Level Road to Trevilian Way (1.0 mile). Turn Right on to Trevilian Way and go 0.2 mile to Illinois Avenue. Turn Left on to Illinois Avenue. Take Illinois Avenue to the Louisville Nature Center parking lot on your right (0.2 mile)

BLACKACRE STATE NATURE PRESERVE

Dedicated 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.

BLANTON FOREST STATE NATURE PRESERVE

On September 15, 1995, 1,075 acres of the south face of Pine Mountain in Harlan County were dedicated, protecting half of the largest old-growth forest in Kentucky. As the preserve has grown with additions in 1996, 1999, 2001, 2003, 2004 and 2005, Blanton Forest State Nature Preserve now protects 3,090 acres 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. Many kinds of trees, such as sugar maple, tulip poplar, various oaks, hemlocks, beech and several magnolias make up the forest canopy. The preserve is open to the public.

- Features* - largest old growth forest in Kentucky
- Access* - loop foot trail (4 miles) up the south face of Pine Mt, foot trail (0.5miles) along Watts Creek.
- Facilities* - none
- Parking* - lot adjacent to Camp Blanton
- Hazards* - steep slopes, venomous snakes, and hazard trees
- Activities* - hiking, birding, nature study etc...
- Directions* - Harlan County, approximately five miles west of the city of Harlan. From Interstate 75, take exit 29 onto U.S. Hwy 25E at Corbin. Travel south on U.S. 25E to Pineville. Turn left on U.S. Hwy 119 (crossing the Cumberland River) and travel north for 23.5 miles. Turn left on KY 840 at a sign for Camp Blanton. Follow KY 840 for approximately 2 miles; the parking area for the preserve is adjacent to Camp Blanton.

BLUE LICKS STATE PARK NATURE PRESERVE

Blue Licks State Park Nature Preserve is located in Robertson County within Blue Licks Battlefield State Resort Park. The original 15-acre tract was dedicated on December 16, 1981. Additional tracts of 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.

- Features* - globally rare plant, relict bison trail, glade
- Access* - 0.25-mile foot path along buffalo trace, easy
- Facilities* - state park
- Parking* - abundant
- Activities* - hiking, birding, nature study, etc.
- Directions* - 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.

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.

- Features* - glacial outwash cliffs, spring wildflower display
- Access* - 2.4 mile trail over uneven terrain, moderate
- Facilities* - none
- Parking* - 5 cars; 1 bus
- Hazards* - steep cliffs
- Activities* - hiking, nature study, geological study, birding, etc.
- Directions* - 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.

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 species of special concern: Eggleston's violet (*Viola septemloba* var. *egglestonii*), and Craze's sedge (*Carex crazei*). The preserve is not open to the public except by Commission-sponsored hikes. Research may be conducted by written permission.

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 were 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.

- Features* - mature beech, maple, tulip poplar forest
- Access* - one-mile foot trail through ridgetops, mature forest and scenic ravines, moderately strenuous
- Facilities* - none
- Parking* - 10 cars
- Hazards* - steep cliffs, venomous snakes
- Activities* - hiking, birding, nature photography, research, etc.
- Directions* - 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.

CHANNEY 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.

CROOKED CREEK BARRENS STATE NATURE PRESERVE

Crooked Creek Barrens State Nature Preserve was established when the original 60-acre tract was dedicated 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.

CUMBERLAND FALLS STATE PARK NATURE PRESERVE

Dedicated 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. Additionally, 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.

- Features* - waterfalls, rare plant and animal species, scenic views
- Access* - 4.5 miles of trail over uneven terrain, moderate
- Facilities* - state resort park
- Parking* - limited at trailheads; parking areas within short walk
- Hazards* - steep cliffs, waterfalls, venomous snakes (rare)
- Activities* - hiking, nature study, geological study, birding, etc.
- Directions* - 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.

CYPRESS CREEK STATE NATURE PRESERVE

Dedicated 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.

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.

- Features* - mature forest
- Access* - 1.7-mile trail, moderately strenuous
- Facilities* - none
- Parking* - limited
- Activities* - hiking, nature study, birding, etc.
- Directions* - 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

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.

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 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.

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 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.

FRANCES JOHNSON PALK STATE NATURE PRESERVE

Frances Johnson Palk State Nature Preserve was dedicated 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.

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 was the Commission's first purchase of a cave for the protection of an endangered bat species. Access is by written permission only.

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. 164 acres were acquired with the assistance of The Nature Conservancy and dedicated into the State Nature Preserves System June 4, 1997. An addition of 138 acres was dedicated June 9, 2004. 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.

JAMES E. BICKFORD STATE NATURE PRESERVE

Dedicated June 30, 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 (*Leucothoe recurva*) and golden saxifrage (*Chrysosplenium americanum*), are known to occur on the preserve. For access to the preserve, please contact the Pine Mountain Settlement School.

JESSE STUART STATE NATURE PRESERVE

Dedicated December 7, 1979, Jesse Stuart State Nature Preserve encompasses 714 acres located in Greenup County. The preserve 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.

- Features* - hills and hollows made famous in Stuart's writings
- Access* - 3.0 miles of trail over uneven terrain, moderate
- Facilities* - none
- Parking* - 6 cars; 1 bus
- Activities* - hiking, birding, literature study, etc.
- Directions* - 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.

JIM SCUDDER STATE NATURE PRESERVE

The Hardin County Fiscal Court dedicated 58 acres of county property September 2, 1987, initiating the Commission's first land protection partnership with local government. The Commission purchased 109 acres of additional glades and surrounding second growth forest which were dedicated March 2, 2005. The preserve protects one of the best remaining examples of limestone glades in Kentucky. These glades are dry, rocky openings on otherwise forested south-facing slopes. They provide habitat for several rare plant species, including the Barrens Silky Aster (*Symphyotrichum pratense*). Public access is by guided hike only.

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.

- Features* - Anglin Falls (75 feet), Venable Falls (150 feet) spring wildflower display, Anglin Creek, forested gorge.
- Access* - 1-mile foot trail over uneven terrain, moderate to strenuous
- Facilities* - none
- Hazards* - cliffs at waterfalls, slippery rocks.
- Activities* - hiking, nature study, birding, etc.
- Directions* - Rockcastle County. From Exit 76 on I-75, go east 3.5 miles on KY 21 to the center of Berea. Turn right at the light (staying on KY 21), past the Boone Tavern 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 mile, 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 mile on Anglin Falls Road to a sign that says "Anglin Falls" next to a mailbox marked "542 R2". Turn left and travel .2 mile to the parking area/trail head.

JOHN JAMES AUDUBON STATE PARK NATURE PRESERVE

Located within John James Audubon State Park in Henderson County, the John James Audubon State Park Nature Preserve protects a mature mixed hardwood forest. More than 300 acres of the park was originally set aside as a bird sanctuary and memorial to the distinguished naturalist, John James Audubon. This area was dedicated September 19, 1979. Today a total of 338 acres have been protected in perpetuity. Rich displays of spring wildflowers and loess bluffs overlooking the Ohio River are some of the features to explore.

- Features* - old growth trees, lake, spring wildflowers
- Access* - 5.5 miles of trail over uneven terrain, moderate
- Facilities* - state park
- Parking* - abundant
- Activities* - hiking, nature study, birding, etc.
- Directions* - 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.

JULIAN SAVANNA STATE NATURE PRESERVE

Located in Franklin County, Julian Savanna protects 42 acres of remnant bluegrass savanna woodland. This globally imperiled community type is unique to the bluegrass region of Kentucky. The Commission will 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.

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.

- Features* - cave system, rare bat winter roost
- Access* - at your own risk, due to rugged terrain and absence of trail
- Facilities* - state park
- Parking* - limited
- Hazards* - steep cliffs, venomous snakes
- Activities* - caving, hiking, birding, etc.
- Directions* - 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.

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

Dedicated into the preserve system in December 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.

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

Dedicated into the preserve system in December 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 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.

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.

- Features* - high quality limestone glades
- Access* - 0.5 mile trail over uneven terrain, moderate
- Facilities* - none
- Parking* - parking lot adjacent to preserve, space for 15 cars
- Hazards* - steep slopes, loose rock, venomous snakes (rare)
- Activities* - birding, hiking, nature study, etc.
- Directions* - 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.

LOWER HOWARDS CREEK HERITAGE PARK AND STATE NATURE PRESERVE

244 acres surrounding Lower Howards Creek in southwestern Clark County that is owned by the Clark County Fiscal Court was dedicated into the Nature Preserves System January 22, 2001. A tributary to the Kentucky River, Lower Howards 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 Howards 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.

MARTIN'S FORK WILDLIFE MANAGEMENT AREA AND STATE NATURAL AREA

Martin's Fork of the Cumberland River is a scenic, high quality mountain stream that originates in the higher elevations of Cumberland Gap National Historical Park in Bell County, Kentucky. Dedicated into the preserve system on March 8, 2006, this 1,601-acre site is located on Cumberland and Brush mountains in Harlan County. Management of this site is shared between the Kentucky Division of Water Wild Rivers Program, the Kentucky Department of Fish and Wildlife Resources (KDFWR), and the Commission. Martin's Fork and its watershed constitute a significant natural resource for Kentucky. Nine plants and three animals listed by the Commission as Endangered, Threatened, or Special Concern are known from the property. The property protects six natural community types and one new state record insect. Once facilities are completed, the area will be open for hiking, nature study, and wildlife-related recreation, including hunting in accordance with regulations established by KDFWR.

METROPOLIS LAKE STATE NATURE PRESERVE

Dedicated 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.

- Features* - natural floodplain lake, rare species
- Access* - 0.75 mile interpretive trail over uneven terrain, moderate
- Facilities* - none
- Parking* - 20 cars; 2-3 buses
- Activities* - birding, hiking, nature study, etc.
- Directions* - 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.

MUTTER'S CAVE

Mutter's Cave is located in Barren County, Kentucky. The cave is a high-priority maternity cave for the federally listed gray bat (*Myotis grisescens*). The 110-acre property protects the cave entrance, the land overlying the primary cave passage, and important travel corridors to foraging areas for the gray bats inhabiting the cave. Management efforts are focused on limiting unauthorized access to the cave, controlling exotic plant species and restoration and reforestation of the riparian corridor and associated uplands. Due to the extreme sensitivity of the federally listed species present, access is strictly limited to researchers and management personnel.

NATURAL BRIDGE STATE PARK NATURE PRESERVE

Dedicated December 16, 1981, Natural Bridge State Park Nature Preserve consists of approximately 1,188 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.

- Features* - Natural Bridge, rare species, scenic views
- Access* - 13.7 miles of trail over uneven terrain, moderate to strenuous
- Facilities* - state resort park
- Parking* - abundant
- Hazards* - cliffs, venomous snakes (rare)
- Activities* - hiking, nature study, geological study, etc.
- Directions* - 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.

OBION CREEK STATE NATURE PRESERVE

This preserve in Hickman County protects a mosaic of wetland communities and upland slopes. 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. The original 1,402-acre tract was acquired with the assistance of The Nature Conservancy in 1992. Murphy's Pond, a 175-acre tract owned by Murray State University, was dedicated into the State Nature Preserves system in October 2005. Access to the original tract is for scientific research only and requires written permission from KSNPC. Written permission from Murray State University is required for access to Murphy's Pond.

PILOT KNOB STATE NATURE PRESERVE

Pilot Knob State Nature Preserve protects 741 acres of natural area in Powell County. The original 308 acres were acquired with the assistance of The Nature Conservancy and dedicated September 26, 1985. The 340 acres dedicated March 16, 1999 more than doubled the size of the preserve. An addition of 93 acres owned by the Powell County Fiscal Court was dedicated June 1, 2005. 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." The Pilot Knob trail is approximately 1.25 miles one-way to the top of the knob. Due to elevation gain it is considered very strenuous. The Sage Point Loop trail is approximately 2 miles and connects to the Pilot Knob Trail near the pinnacle. The Millstone Quarry trail is 1 mile round trip from the parking area.

- Features* - cultural history, scenic views, historic millstone quarry
- Access* - Pilot Knob trail to overlook, very strenuous; Sage Point Loop trail, strenuous; Millstone Quarry trail, moderate
- Facilities* - none
- Parking* - 7-8 cars; 1-2 buses
- Hazards* - cliffs, poison ivy, venomous snakes (rare)
- Activities* - hiking, nature study, birding, geological study, etc.
- Directions* - 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.

PINE MOUNTAIN STATE PARK NATURE PRESERVE

Dedicated 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. Within the preserve is a significant archaeological site now known as 'Rock Hotel', a large sandstone shelter that was inhabited by Native Americans. The Pine Mountain fault block is also one of the most prominent geological structures in the eastern United States.

- Features* - old growth hemlocks, fault-block mountain, scenic views, rare species
- Access* - 3.0 miles of trail over uneven terrain, strenuous
- Facilities* - state resort park
- Parking* - abundant
- Hazards* - cliffs, venomous snakes (rare)
- Activities* - hiking, nature study, birding, geological study, etc.
- Directions* - 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.

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.

- Features* - great diversity of birds, trees, wildflowers and mussels
- Access* - 3.1 miles of trail, moderate
- Facilities* - none
- Parking* - 4 cars
- Activities* - hiking, nature study, birding, etc.
- Directions* - 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.

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 October 24, 1990. Additional tracts were dedicated February 20, 1991 and March 11, 1994. Today the 216-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.

RIVER CLIFFS STATE NATURE PRESERVE

River Cliffs State Nature Preserve, located in Franklin County, was dedicated 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.

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 is managed to enhance habitat for the goldenrod. Access is by written permission only.

SIX MILE ISLAND STATE NATURE PRESERVE

Dedicated 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.

- Features* - undeveloped riverine island
- Access* - by boat
- Facilities* - none
- Hazards* - barge and motorboat traffic
- Activities* - nature study, birding, etc.
- Directions* - 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.

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 55-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*). An occurrence of the federally threatened Eggert's sunflower (*Helianthus eggertii*) is present on the preserve. 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.

STONE MOUNTAIN WILDLIFE MANAGEMENT AREA AND STATE NATURAL AREA

This 1,025-acre property located in Harlan County was dedicated 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 Appalachian sedge (*Carex appalachica*), rock harlequin (*Corydalis sempervirens*), Fraser's sedge (*Cymophyllus fraserianus*), tufted hairgrass (*Deschampsia caespitosa*), showy gentian (*Gentiana decora*), variable-leaved heartleaf (*Hexastylis heterophylla*), jointed rush (*Juncus articulatus*), southern bog clubmoss (*Lycopodiella appressa*), and mountain decumbent goldenrod (*Solidago caesia* L. var. *curtisii*). 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.

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 dedicated June 3, 1992 establishing Terrapin Creek State Nature Preserve. Additions were dedicated March 11, 1994, March 15, 1996, June 15, 1999, and December 9, 1999. Acquisition of this 230-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.

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 is 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. Today the preserve protects a total of 170 acres. Access is by written permission only.

THREE PONDS STATE NATURE PRESERVE

Dedicated 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.

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. With additional acreage dedicated September 25, 2001, October 22, 2002 and December 2, 2003 the preserve now protects a total of 818 acres, including spectacular 220-foot palisades along the Kentucky River in Garrard and Jessamine counties. 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.

- Features* - 220-foot limestone palisade walls, rare plants, Kentucky River
- Access* - Foot trail through the forest and to the river, 2-mile loop.
- Facilities* - None
- Parking* - 8 cars
- Hazards* - Extremely high cliffs
- Activities* - hiking, nature study, birding, etc.
- Directions* - 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.

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.

- Features* - stands of sugar maple, beech and tulip poplar, spring wildflower display
- Access* - 4.5 miles of trail over uneven terrain, moderate to strenuous
- Facilities* - none
- Hazards* - venomous snakes (rare), steep slopes
- Activities* - hiking, nature study, birding, etc.
- Directions* - Hardin County. Nine miles east of Elizabethtown on the Bluegrass Parkway. Westbound: Take Exit 8 (KY 583), turn right on KY 583 and take an immediate right on Audubon Trace Road. Eastbound: Take Exit 10 (KY 52), turn right on to KY 52, turn left on US 62, turn left on KY 583, cross over the Parkway and turn right on Audubon Trace Road. The parking lot for the preserve is approximately 0.5 mile on the left.

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.

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>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, 2006.

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 2006

US Status ¹		US Status ¹	
PLANTS		<i>Epioblasma stewardsonii</i>	--
Vascular Plants		Cumberland Leafshell	
<i>Anemone canadensis</i>	--	<i>Epioblasma torulosa torulosa</i>	E
Canada Anemone		Tuberclad Blossom	
<i>Caltha palustris</i> var. <i>palustris</i>	--	<i>Hemistena lata</i>	E
Marsh Marigold		Cracking Pearlymussel	
<i>Lysimachia fraseri</i>	SOMC	<i>Lasmigona subviridis</i>	SOMC
Fraser's Loosestrife		Green Floater	
<i>Orbexilum stipulatum</i>	--	<i>Leptodea leptodon</i>	E
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>	E
Prairie Parsley		White Wartyback	
		<i>Quadrula fragosa</i>	E
		Winged Mapleleaf	
		<i>Quadrula tuberosa</i>	--
		Rough Rockshell	
		<i>Villosa fabalis</i>	C
		Rayed Bean	
ANIMALS			
Freshwater Mussels		Insects	
<i>Dromus dromas</i>	E	<i>Pentagenia robusta</i>	--
Dromedary Pearlymussel		Robust Pentagenian Burrowing Mayfly	
<i>Epioblasma arcaeformis</i>	--		
Sugarspoon		Fishes	
<i>Epioblasma biemarginata</i>	--	<i>Ammocrypta vivax</i>	--
Angled Riffleshell		Scaly Sand Darter	
<i>Epioblasma flexuosa</i>	--	<i>Crystallaria asprella</i>	SOMC
Leafshell		Crystal Darter	
<i>Epioblasma florentina florentina</i>	E	<i>Erimystax x-punctatus</i>	--
Yellow Blossom		Gravel Chub	
<i>Epioblasma haysiana</i>	--	<i>Etheostoma microperca</i>	--
Acornshell		Least Darter	
<i>Epioblasma lewisii</i>	--	<i>Hemitremia flammea</i>	--
Forkshell		Flame Chub	
<i>Epioblasma obliquata perobliqua</i>	E	<i>Ichthyomyzon gagei</i>	--
White Catpaw		Southern Brook Lamprey	
<i>Epioblasma personata</i>	--	<i>Moxostoma lacerum</i>	--
Round Combshell		Harelip Sucker	
<i>Epioblasma phillipsii</i>	--	<i>Moxostoma valenciennesi</i>	SOMC
Cincinnati riffleshell		Greater Redhorse	
<i>Epioblasma propinqua</i>	--	<i>Percina burtoni</i>	SOMC
Tennessee Riffleshell		Blotchside Logperch	
<i>Epioblasma sampsonii</i>	--		
Wabash Riffleshell			

Plants and animals presumed extinct or extirpated from Kentucky, November 2006

	US Status ¹	US Status ¹
Reptiles		
<i>Masticophis flagellum flagellum</i>	--	
Coachwhip		
Breeding Birds		
<i>Anhinga anhinga</i>	--	
Anhinga		
<i>Campephilus principalis</i>	E	
Ivory-billed Woodpecker		
<i>Chlidonias niger</i>	--	
Black Tern		
<i>Conuropsis carolinensis</i>	--	
Carolina Parakeet		
<i>Ectopistes migratorius</i>	--	
Passenger Pigeon		
<i>Elanoides forficatus</i>	--	
Swallow-tailed Kite		
<i>Picoides borealis</i>	E	
Red-cockaded Woodpecker		
<i>Tympanuchus cupido</i>	--	
Greater Prairie-chicken		
<i>Vermivora bachmanii</i>	E	
Bachman's Warbler		
Non-Breeding Birds		
<i>Cygnus buccinator</i>	--	
Trumpeter Swan		
<i>Grus americana</i>	E	
Whooping Crane		
Mammals		
<i>Bos bison</i>	--	
American Bison		
<i>Canis lupus</i>	--	
Gray Wolf		
<i>Canis rufus</i>	E	
Red Wolf		
<i>Felis concolor couguar</i>	E	
Eastern Cougar		

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

Appendix 4

Key to Status Categories

(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).

SOMC: Species Of Management Concern: Species the USFWS believes are in need of conservation management.

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 statuses 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 5

Kentucky State Nature Preserves Commission, 2006 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. 281	123	Unknown	Unknown	241	59	65	351	77
Exotic	Unknown	0	570	ca. 13	4	Unknown	Unknown	24	0	1	6	4
KSNPC Endangered	1	11	149	4	27	9	16	32	2	2	18	4
KSNPC Threatened	0	5	110	8	5	7	36	11	1	8	13	3
KSNPC Special Concern	0	0	57	14	2	8	12	17	8	7	15	7
KSNPC Historical	0	0	62	0	0	0	15	0	0	0	2	0
Presumed Extinct or Extirpated	0	0	6	0	22	0	1	9	0	1	11	4
Federal Listing Candidate	0	0	2	0	5	0	7	1	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:

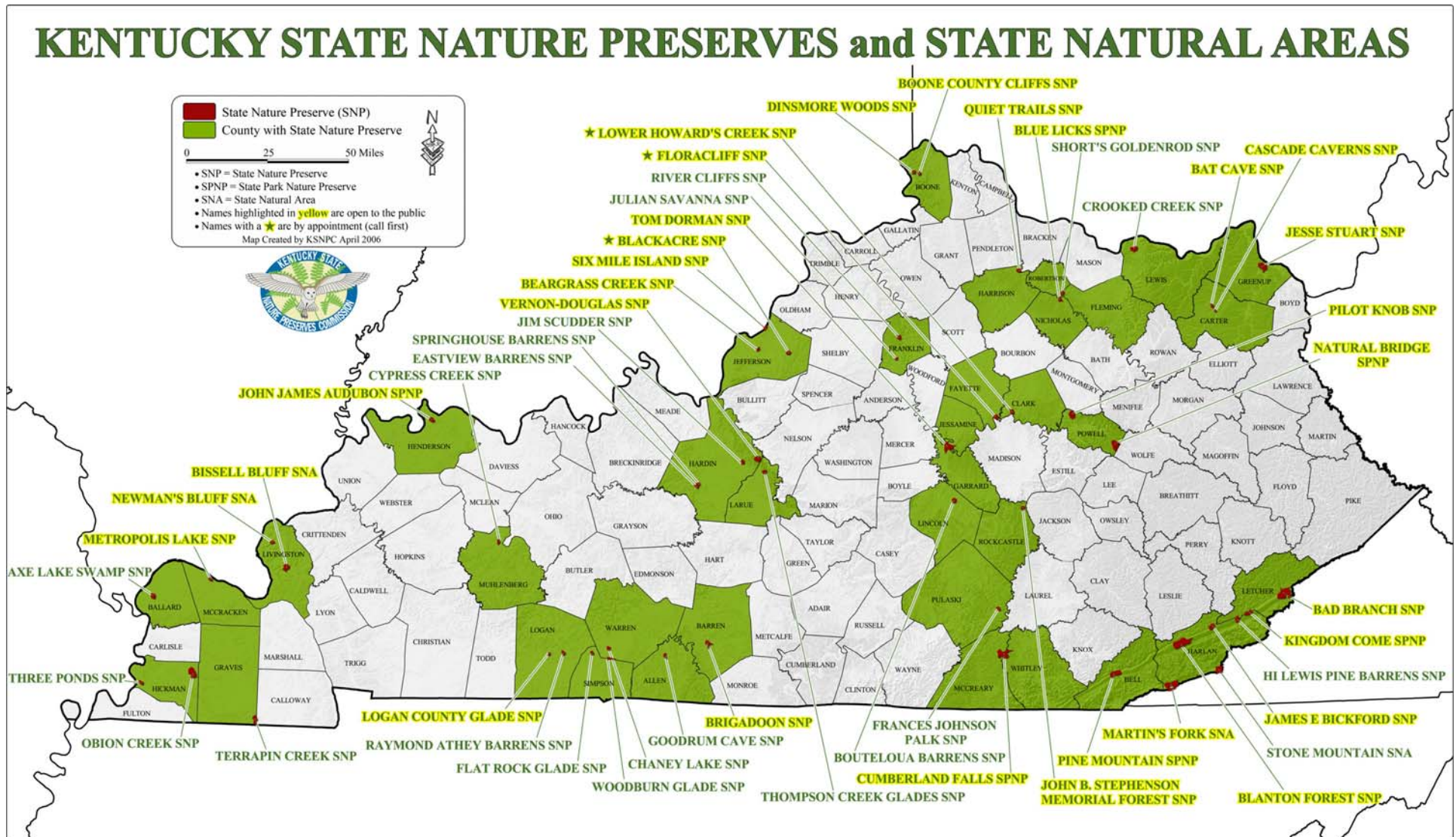
A taxon that no longer exists in the wild in Kentucky, but exists elsewhere in the wild.

Extinct:

A taxon that no longer exists.

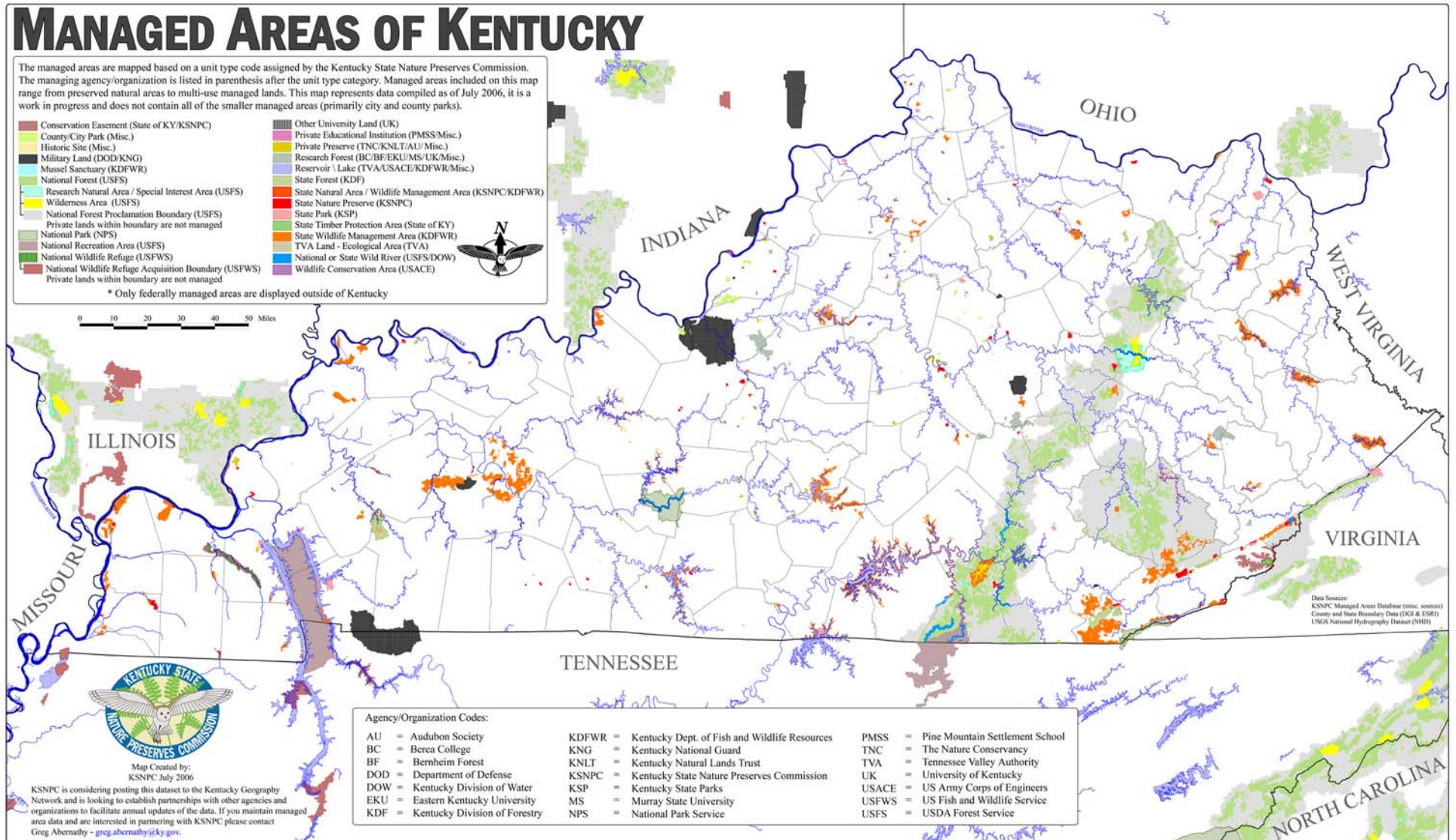
¹ Totals include some distinctive subspecies and varieties for gastropods, freshwater mussels, and fishes but only species for lichens, mosses, vascular plants, amphibians, reptiles, breeding birds, and mammals. Totals do not include species recorded from Kentucky based on fossil specimens. Sources for 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 2006).

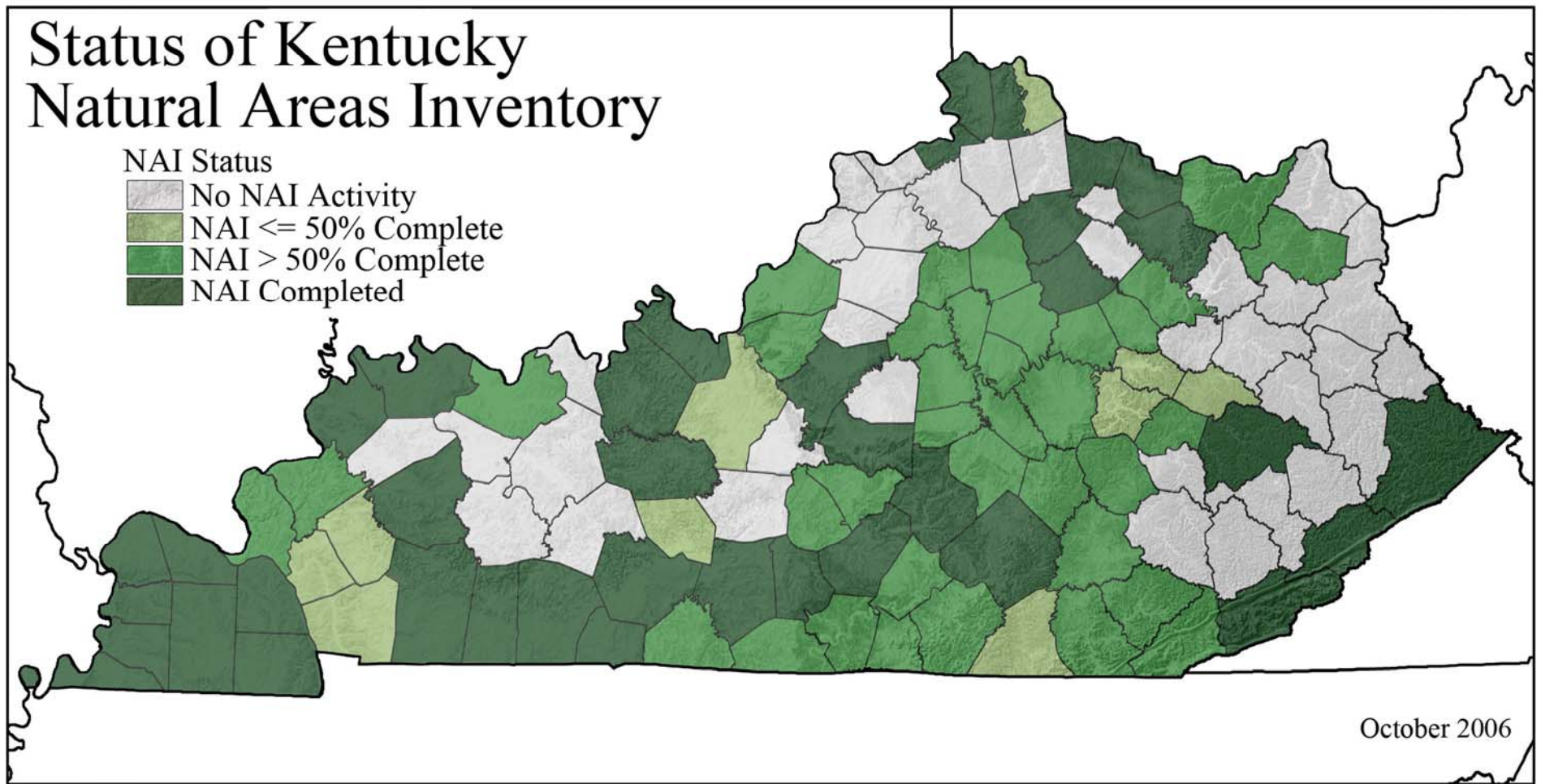
Appendix 6



Note: Mutter's Cave (Barren County) has not yet been dedicated and is not shown on this map.

Appendix 7





RUNNING BUFFALO CLOVER *Trifolium stoloniferum*

AT BIG BONE LICK



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. References to clover and buffalo trails by early explorers and settlers 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 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 animal trails, scour along streams or even mowing. 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, lawns of old homesteads and in trails.

LIFE HISTORY

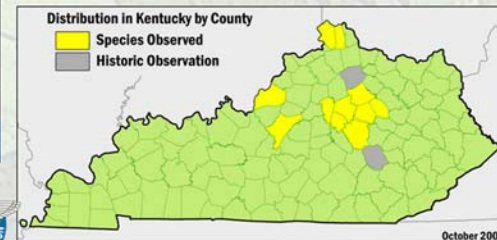
Running buffalo clover is different from the introduced European white clover in having leaves on the flowering stem and in being a generally coarser larger plant. It also lacks the watermark or chevron that often appears on white clover leaves. If you take the time to look at it out on the Park trails, 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 throughout its range since initially being listed, many populations have continued to decline and disappear.

RUNNING BUFFALO CLOVER at BIG BONE LICK

Running buffalo clover was found at Big Bone Lick State Park in 1997. It occurs in association with trails in the park, which is typical for this species. Disturbance typically plays some role in maintaining the habitat where clover is found either through stream scour, trampling or periodic grazing. The Park and Commission staff have worked to maintain this endangered plant to make sure that the habitat is not overly shaded by competing vegetation or overly trampled. You will see the signs marking the areas where habitat management is focused on the recovery of running buffalo clover.



For more information visit KSNPC's Rare Plant Database online at www.naturepreserves.ky.gov
Poster Design by KSNPC October 2006

Data Sources:
FSA NAIP Digital Ortho Photo (NRCS/USDA APFO)
Observation Data (KSNPC)

0 500 1000 Feet
October 2006

