

Office of Kentucky Nature Preserves

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# Biennial Report

2024

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*Conserving Kentucky's Natural  
Heritage since 1976*





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## Office of Kentucky Nature Preserves

300 Sower Blvd  
Frankfort, KY 40601  
(502)-573-2886

### Website

[eec.ky.gov/Nature-Preserves/](http://eec.ky.gov/Nature-Preserves/)

### Email

[naturepreserves@ky.gov](mailto:naturepreserves@ky.gov)

This report is submitted to the Governor and the General Assembly as directed by KRS 146 and 418 KAR relating to the Office of Kentucky Nature Preserves, the Kentucky Heritage Land Conservation Fund, and the Rare Plant Recognition Act.

# TEAM KENTUCKY®

ENERGY AND ENVIRONMENT CABINET  
OFFICE OF KENTUCKY NATURE PRESERVES

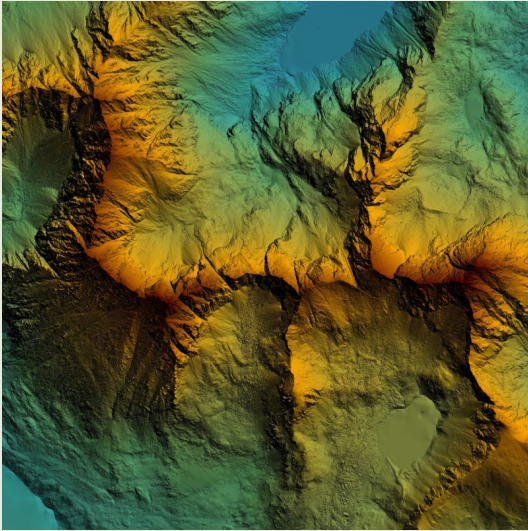
The Kentucky Heritage Land Conservation Fund



Preserving Kentucky's Natural Treasures



# Director's Office





# Director's Office:

## Director's Message



Zack Couch, Office of Kentucky Nature Preserves  
Executive Director

The Office of Kentucky Nature Preserves has, at its core, the charge to manage and conserve Kentucky's most-rare species and most-pristine areas. It's an obligation that has been enthusiastically adopted by every staff member. That enthusiasm is what fuels the accounts that follow.

Our goals with this report are twofold, to communicate our accomplishments and to encourage us all as we embark upon the work that lies ahead.

As you read the accounts of the projects we've undertaken, pay special attention to the public agencies, nonprofit organizations, and citizens that are mentioned. It's a rarity for us to conduct any project without the collaboration and support of our longstanding partners. Whether it's surveying for rare plants along state highways (thanks to The Kentucky Transportation Cabinet), training the next generation of natural area manager (thanks to Eastern Kentucky University), documenting species of pollinators never reported from the state (thanks to Kentucky Natural Lands Trust, the United States Fish and Wildlife Service, and The Louisville Zoo), or increasing bat habitat on public lands (thanks to the Kentucky Department of Fish and Wildlife Resources), our work is only as successful as the partnerships we maintain.

It's difficult to slow down and take time to reflect on the work that's been done. It is our intent that this report describes, not only the accomplishments we've had, but the trajectory we're on as we continue to conserve Kentucky's native species and habitats. We look forward to what's in store for 2025. In the meantime, take the time to enjoy the creation all around you and reflect on what you can do to help conserve it.



With gratitude,

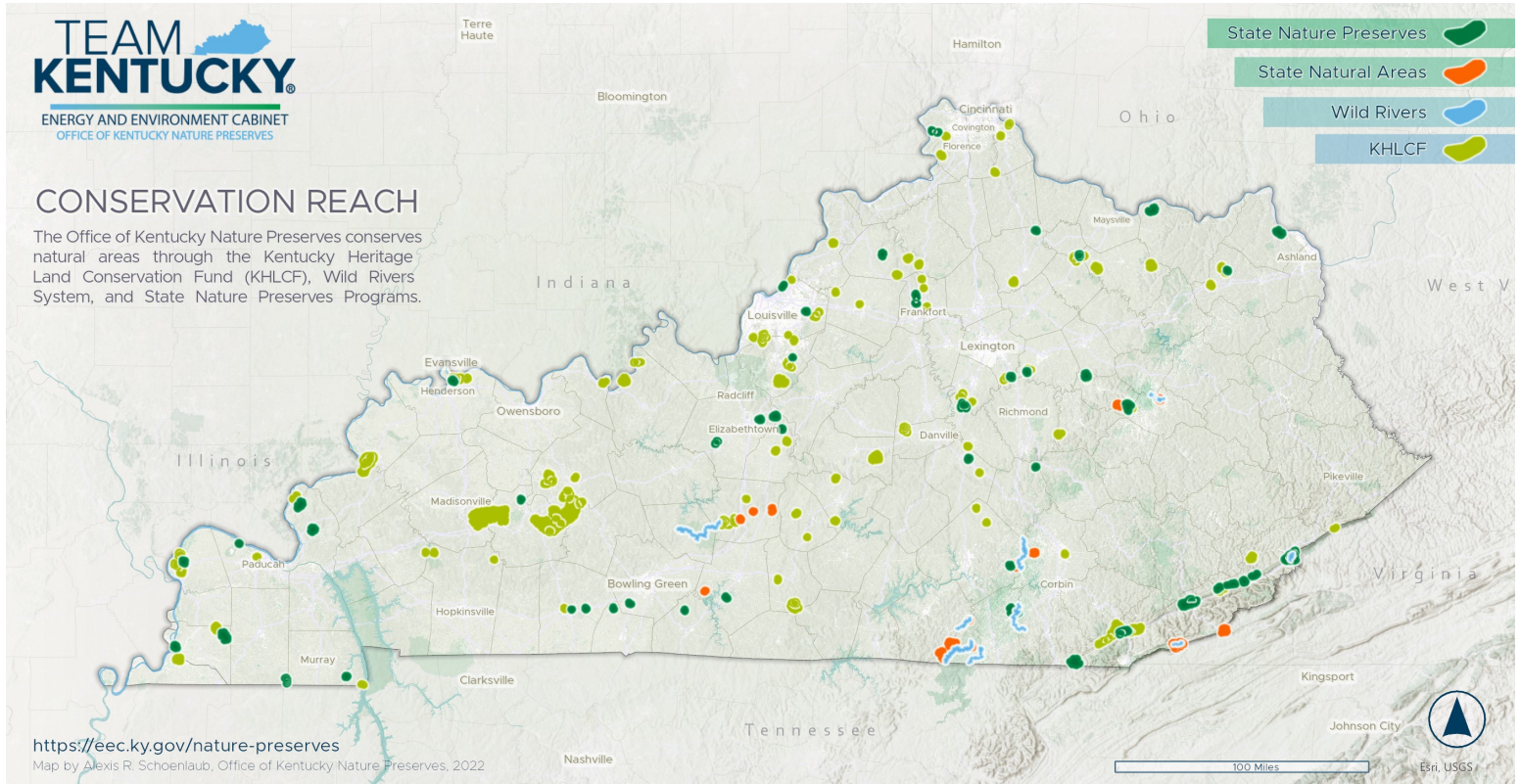
Zack Couch

Executive Director

Office of Kentucky Nature Preserves

# Director's Office:

## OKNP Natural Areas Map



OKNP manages four distinct programs to conserve Kentucky's natural areas. While these programs all share common goals—rare species habitat, environmental education opportunities, and conserving natural areas through a combination of land acquisition, conservation easements, and public-private partnerships— they have some differences.

- **The Kentucky Heritage Land Conservation Fund**  
Assists with funding conservation at the local and state level.
- **The State Nature Preserve System**  
Prioritizes rare species habitat conservation and quiet enjoyment of natural areas.
- **The Natural Areas Registry**  
Recognizes private landowners and others who own land with outstanding ecological attributes.
- **The Wild Rivers Program**  
Focuses on riparian forest conservation and paddling opportunities on pristine rivers and streams.

### As of July 1, 2024, Office of Kentucky Nature Preserves programs include:

- **32,419.82** acres owned or dedicated by OKNP on **70** State Nature Preserves and State Natural Areas
- **79,190.46** acres on **135** properties purchased via the Kentucky Heritage Land Conservation Fund
- **9,215.37** acres owned by private landowners and other agencies on **77** Registered Natural Areas
- **24,034.12** acres on **9** rivers that are state-designated Wild Rivers monitored by OKNP



# Director's Office:

## OKNP Managed Natural Areas and State Nature Preserves

Natural Areas and State Nature Preserves managed by OKNP				
OKNP Property Name	Acres (Approx.)	County	State Senate District	State House District
Apple Valley Glades State Nature Preserve	60	Bullitt	38	49
Archer-Benge State Nature Preserve	2230	Whitley	25	82
Axe Lake Swamp State Nature Preserve	458	Ballard	2	1
Bad Branch State Nature Preserve	2830	Letcher	29	94
Beargrass Creek State Nature Preserve	41	Jefferson	19	41
Blackacre State Nature Preserve	181	Jefferson	36	36
Blanton Forest State Nature Preserve	3504	Harlan	29	94
Blood River Seeps State Nature Preserve	192	Calloway	1	5
Blue Licks State Park State Nature Preserve	54	Nicholas, Robertson	27	70, 72
Bouteloua Barrens State Nature Preserve	260	Lincoln	21	80
Brigadoon State Nature Preserve	187	Barren	9	23
Chaney Lake State Nature Preserve	169	Warren	32	17
Crooked Creek State Nature Preserve	729	Lewis	18	96
Cumberland Falls State Resort Park	1974	McCreary, Whitley	25	52, 82
Cypress Creek State Nature Preserve	97	Muhlenberg	3	15
Dr. William H. Martin State Natural Area	459	Pulaski	15	85
Drennon Creek State Nature Preserve	329	Henry	7	47
E. Lucy Braun State Park State Nature Preserve	609	Harlan	29	94

# Director's Office:

## OKNP Managed Natural Areas and State Nature Preserves

### Natural Areas and State Nature Preserves managed by OKNP (cont.)

OKNP Property Name	Acres (Approx.)	County	State Senate District	State House District
Eastview Barrens State Nature Preserve	119	Hardin	10	18
Embry Lay Glade State Nature Preserve	19	Hardin	10	25
Flat Rock Glade State Nature Preserve	99	Simpson	32	22
Frances Johnson Palk State Nature Preserve	250	Pulaski	15	85
Goodrum Cave State Nature Preserve	51	Allen	16	22
Green River State Natural Area (Boiling Springs)	121	Hart	9	24
Green River State Natural Area (Davis Bend)	166	Hart	9	24
Green River State Natural Area (Rush Island Bottoms)	139	Hart	9	24
Hi Lewis Pine Barrens State Nature Preserve	426	Harlan, Letcher	29	94
Jesse Stuart State Nature Preserve	710	Greenup	18	98
Jim Scudder State Nature Preserve	231	Hardin	10	25
Little South Fork State Natural Area (Burnett Branch SNA)	1068	McCreary, Wayne	15, 25	52
Little South Fork State Natural Area (Steele Hollow SNA)	2231	McCreary, Wayne	15, 25	52
Little South Fork State Natural Area (Tucker SNA)	23	McCreary	25	52
Lone Oak Barrens State Nature Preserve	34	Grayson	5	18
Martin's Fork State Natural Area	1601	Harlan	29	87
Metropolis Lake State Nature Preserve	123	McCracken	2	1
Mutters Cave State Natural Area	108	Barren	9	23
Obion Creek State Nature Preserve	1599	Hickman	1	1



# Director's Office:

## OKNP Managed Natural Areas and State Nature Preserves

### Natural Areas and State Nature Preserves managed by OKNP (cont.)

OKNP Property Name	Acres (Approx.)	County	State Senate District	State House District
Perryville Battlefield State Historic Site	1184	Boyle	12	54
Pilot Knob State Nature Preserve	742	Powell	30	91
Quiet Trails State Nature Preserve	177	Harrison	27	70
Raymond Athey Barrens State Nature Preserve	156	Logan	32	16
Red River State Natural Area	754	Powell, Wolfe	30	89, 91
River Cliffs State Nature Preserve	210	Franklin	20	57
Rock Creek State Natural Area	90	McCreary	25	52
Rockcross Hills State Nature Preserve	84	Franklin	20	57
Shorts Goldenrod State Nature Preserve	228	Fleming, Robertson	27	72
Sinking Creek State Natural Area	301	Laurel	21	71, 85
Six Mile Island State Nature Preserve	86	Jefferson	26	48
Stone Mountain Wildlife Management Area and State Natural Area	1017	Harlan	29	87
Terrapin Creek State Nature Preserve	269	Graves	1	2
Thompson Creek Glades State Nature Preserve	169	Larue	14	24
Three Ponds State Nature Preserve	528	Hickman	1	1
Tom Dorman State Nature Preserve	911	Garrard, Jessamine	22	55, 80
Vernon-Douglas State Nature Preserve	729	Hardin	10	25
Woodburn Glade State Nature Preserve	20	Warren	32	17

# Director's Office:

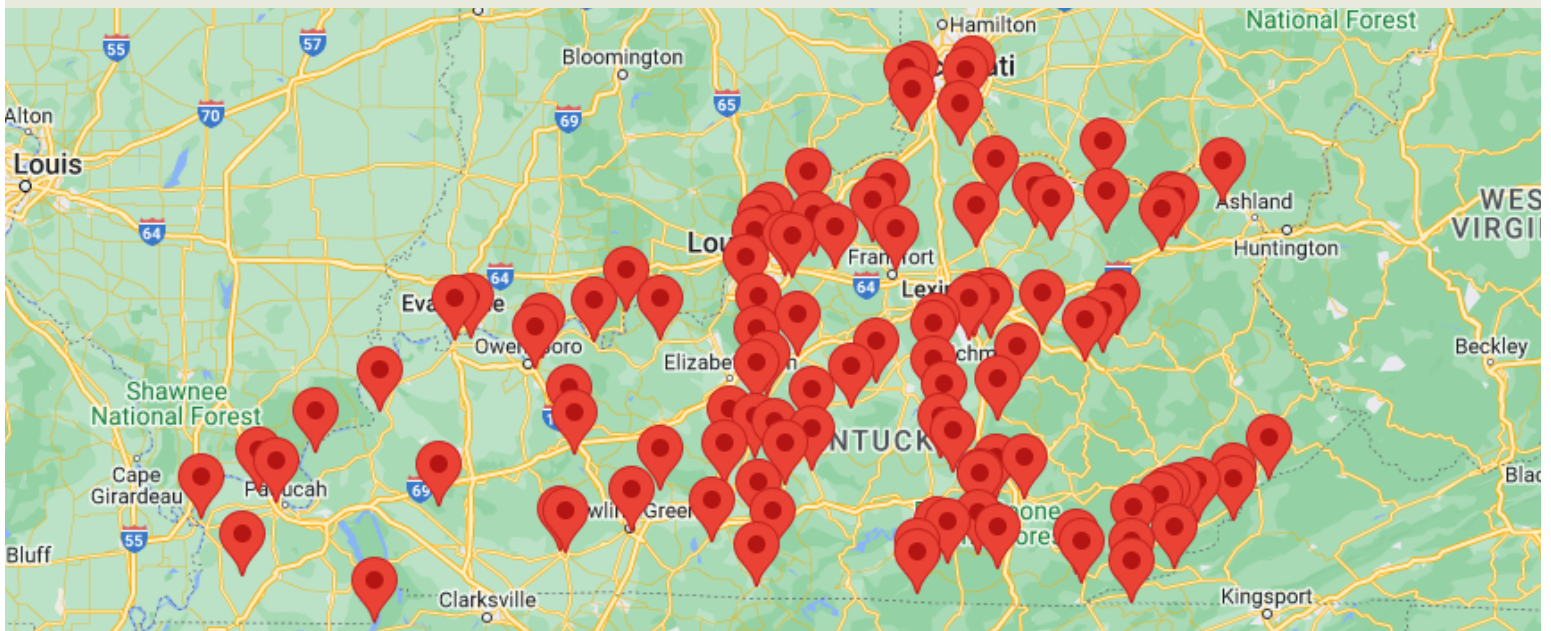
## *Outdoor Recreation and Hiking Opportunities*

### **OKNP trails traverse many of Kentucky's highest quality natural communities**

In addition to conserving habitat for rare species, OKNP strives to provide passive outdoor recreation opportunities to the citizens of Kentucky and tourists alike. OKNP State Nature Preserves, KHLFC sites, and natural areas provide an opportunity for individuals, families, and groups to see, hear, explore, and connect with nature in its purest state possible and to experience what Kentucky may have looked like centuries ago. For the hiker, nature photographer, bird watcher, and those seeking solitude in pockets of wild Kentucky, State Nature Preserves, Wild Rivers, and Heritage Lands truly are some of the most cherished places in the state.

Another notable update is our website, which includes an online tool making it easier to find information on our public sites. Our trails manager makes regular visits to each site we manage and has made numerous updates to bridges, boardwalks, and steps that assist visitors in traversing our trails. We have updated signage and are now using a new trail blaze to help guide visitors on their trek.

**Find your new favorite hiking spot now at  
<https://eec.ky.gov/Nature-Preserves/Locations/>**



# Director's Office:

## Data and GIS Innovations

### OKNP's data specialists drive conservation efforts through innovative digital frameworks, ensuring the preservation of Kentucky's natural heritage

The Data and GIS Branch, operating under the Director's Office, plays a vital role in managing geospatial data and information. At the heart of their operations is the Kentucky Natural Heritage Database, a database that adheres to NatureServe Data standards and utilizes the Biotics 5 framework. OKNP's GIS specialists produce detailed cartographic representations of State Nature Preserves and develop innovative GIS solutions, workflows, and applications to support the Biological Assessment and Plant Conservation Branch and Natural Areas and Recovery Branch. The Natural Areas and Recovery Branch relies on tools such as the KHLCF Inspection Dashboard, Prescribed Fire Workflow, and the Trails Database. The Biological Assessment and Plant Conservation Branch utilizes Intensive Plant Surveys, Kentucky Roadside Pollinator Survey, and Citizen Science Projects using ESRI's Survey123 and utilizes mobile maps to collect crucial data on the Commonwealth's cherished natural areas and communities.

Collaboration is key, and the GIS support specialist partners with the Natural Resources Conservation Service (NRCS) to maintain and update the Endangered Species Act matrices. Additionally, the Data and GIS team supports multiple data agreements with various organizations, including Tennessee Valley Authority, Kentucky Department of Fish and Wildlife Resources, Office of Energy Policy, U.S. Fish and Wildlife Service, Kentucky Department of Transportation, The Nature Conservancy, and many more, to further support the OKNP's mission. Recognizing the importance of information sharing with geographically-led data in the conservation community. The team ensures a sustainable future for citizens while preserving Kentucky's beautiful natural heritage.

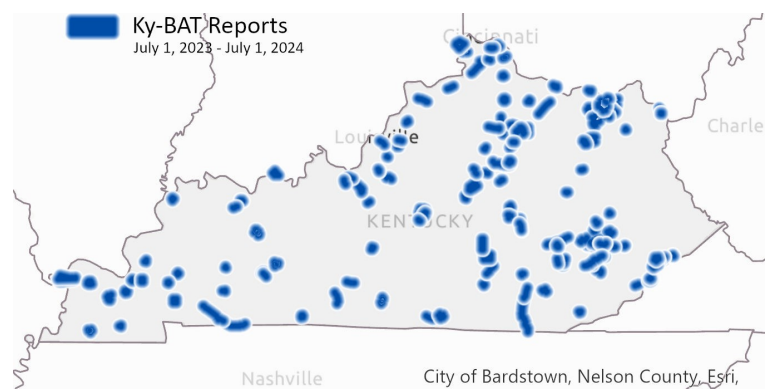
### Over 200 Kentucky Biological Assessment Tool (KY-BAT) reports serve conservation interests of the public

The Kentucky Biological Assessment Tool (KY-BAT) provides information to help projects avoid and minimize impacts to sensitive plants, animals and natural communities. Receive a biological assessment report and map within minutes at

<https://kynaturepreserves.org/>

Last year, the Office of Kentucky Nature Preserves (OKNP) developed the newest version of the Kentucky Biological Assessment Tool (KY-BAT), an environmental review tool accessible at (<https://kynaturepreserves.org/>). The KY-BAT tool continues to serve the public by allowing clients to submit projects and receive reports with information on rare species and communities, conservation lands, and other natural resources within the project area within minutes.

Since the launch of the newest version on July 1, 2023, 220 reports have been generated through KY-BAT. The majority of these reports were run for transportation, solar energy storage, and general developmental projects. Internal partners include the Kentucky Division of Abandoned Mine Lands, Division of Water, and Kentucky Transportation Cabinet.



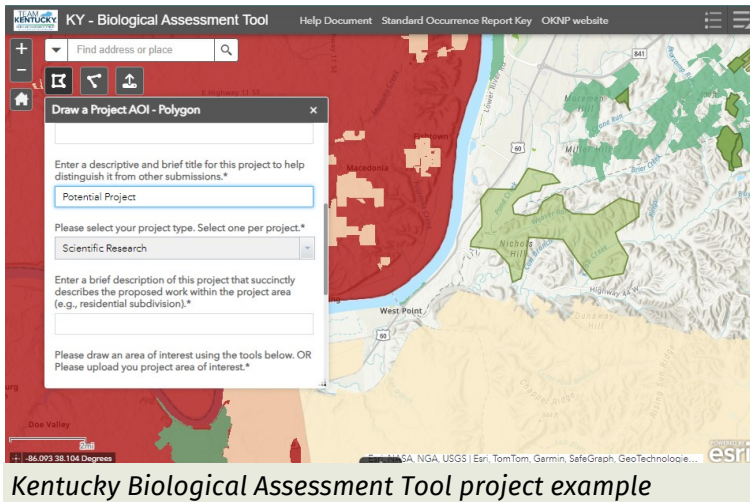
Kentucky Biological Assessment Tool Reports generated in this fiscal year



# Director's Office:

## Data and GIS Innovations

### KY-BAT (cont.)



Kentucky Biological Assessment Tool project example

The Office of Kentucky Nature Preserves continues to collaborate with other stakeholders and conservation partners to offer insightful and relevant references and recommendations in the reports received. This functionality allows us to inform the public not only about important ecological resources present or on dedicated conservation properties but also to make informed decisions backed by reputable data and resources, thereby playing a role in preventing impact to those properties. Currently, the office has incorporated data from the U.S. Fish and Wildlife Service as well as Kentucky Department of Fish and Wildlife Resources, with plans to expand to include other sectors of infrastructure such as water and energy resources.

OKNP is a leader in the biological and environmental data field. OKNP biologists are recognized for their field experience and commitment to complete, accurate data. Data analysts respond to numerous large-scale and site-specific information requests, guiding land-use planning, development, conservation efforts, and research. KY-BAT allows the public to query the state's natural heritage database of rare species, natural habitats, and conservation lands in Kentucky, which is updated regularly. The Natural Heritage Database is the result of 40 years of research and on-the-ground inventories by OKNP biologists, plus a compilation of herbarium records, museum records, and data from other agencies and organizations. OKNP is committed to providing timely, creative, high-quality solutions to a wide variety of environmental and

developmental planning needs. Data systems are linked with powerful mapping tools, accessible online 24/7 through KY-BAT.

### OKNP land conservation enhanced through Innovative Land Management Workflow

OKNP's Data and GIS team utilize ArcGIS products to develop more efficient and effective workflows for preserve managers.

In 2024, the Office of Kentucky Nature Preserves (OKNP) has made significant advancements by developing a new Land Management Workflow. This innovative workflow is designed to collect spatial information on activities completed by our land managers, offering a comprehensive and efficient

[Management Log](#)

**Selected record count:** 44

**Total record count:** 44

[Recent 3 records in a table:](#)

Action	Submitted by	Submitted time
Mid Story Removal	NaturePreserves@ky.gov	July 3, 2024 6:33 PM
Pesticide Application	NaturePreserves@ky.gov	July 3, 2024 6:33 PM
Mid Story Removal	NaturePreserves@ky.gov	July 2, 2024 5:47 PM

[Recent 3 records on a map:](#)

Kentucky Division of Geographic Information (DGI) Powered by Esri

Land Management Workflow report example

# Director's Office:

## Data and GIS Innovations

### Innovative Land Management Workflow (cont.)

approach to documenting and analyzing land management efforts.

The new workflow replaces traditional handwritten notes and qualitative methods with a robust digital system that allows for the accurate recording of all management activities over time. This system houses chemical licenses, ensuring compliance and easy access to essential documentation, allows land managers to record their work in real-time, enhancing accuracy and reliability, enables the creation of detailed reports on work completed on both OKNP and partner sites, facilitating better management and accountability, and supports querying of completed work for grant reporting purposes, such as generating reports on the number of trees and the diameter at breast height (DBH) of those treated for Hemlock Woolly Adelgid.



*OKNP preserve manager treats eastern hemlock tree for the invasive Hemlock Woolly Adelgid, an action now tracked and managed through the new Land Management Workflow*

The implementation of this workflow offers numerous benefits. Collecting quantitative data allows OKNP to understand and document the specifics of management activities over the next 20 years or more. This capability not only meets current needs, such as grant reporting, pesticide purchase tracking, and logging travel hours but also ensures that we can

explain the precise actions taken on the ground as years go by. This is vital for measuring the impacts of our efforts on the rare plants and animals we strive to protect.

OKNP is excited about the potential of the Land Management Workflow to enhance our ability to manage and conserve Kentucky's natural resources. By embracing this innovative approach, we are better equipped to meet both current and future needs, ensuring that our conservation efforts are effective and sustainable for years to come.



*Mobile version of Land Management Workflow*



# Director's Office:

## Outreach and Environmental Education

### OKNP is excited to announce a new partnership with the Louisville Zoo and their Kentucky Trails project!

Kentucky Trails will be an extensive, interactive, naturalistic experience, providing up-close encounters with species such as bison, elk, black bear, bobcat, and other iconic native animals and their natural plant communities. OKNP will continue to collaborate with the Louisville Zoo to develop educational materials and events centered around the incredible interactions between native animals and their natural habitats.

The Louisville Zoo's investment in the Kentucky Trails Project will be a tremendous addition to the conservation and promotion of the Commonwealth's natural heritage.

Stay tuned to learn more about this educational partnership.



### OKNP connects with thousands of Kentuckians through iNaturalist

*Kentuckians using the community science platform iNaturalist have the unique opportunity to contribute biologically significant data to OKNP.*

OKNP's rare plant database is comprised of data from a variety of sources, including OKNP field surveys, information shared by conservation partners, and herbarium specimens. This data is used to assess species' conservation statuses, create distribution maps and models, and to assist agencies, researchers, and private organizations in conservation planning and land management. In 2019, OKNP also began to use observational data collected by Kentuckians via iNaturalist, a community science platform that helps users identify the plants, animals, and fungi they encounter in the wild. Observations from iNaturalist users have provided OKNP with important data such as confirmation of rare plant populations, relocation of historic plant records, and range extensions.

The platform has also been invaluable in sharing skills and knowledge with nature enthusiasts, connecting with other biologists and conservation professionals, and forging rela-

tionships with conservation-minded landowners. Engaging with the public through iNaturalist has not only benefited OKNP's rare plant database, it has been a powerful outreach tool to nurture the naturalist community in Kentucky.



*iNaturalist user @pat298 discovered a new population of state endangered rose vervain (*Glandularia canadensis*).*



*State endangered water-purslane (*Didiplis diandra*) was photographed in Trigg County by @sbrockway, a new county record.*

# Director's Office:

## Outreach and Environmental Education

### OKNP greatly increases outreach, environmental education, and social media presence to better engage with the public

OKNP's biologists, land managers and data scientists work to educate and professionally train a variety of public and private groups about Kentucky's natural heritage and the most effective ways to restore and conserve it.

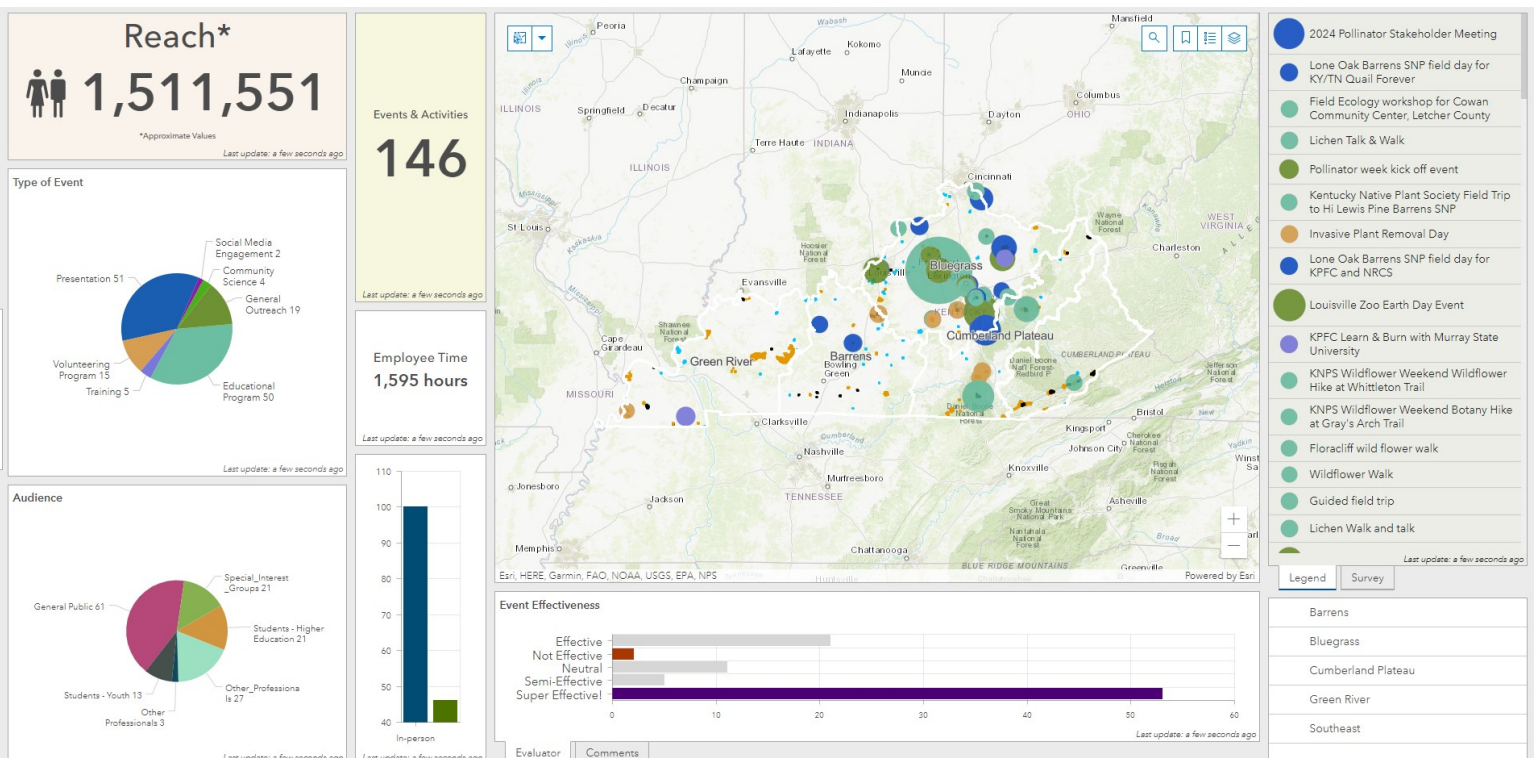
In the last two years, OKNP has greatly expanded our in-person outreach, virtual outreach and social media presence on Facebook and Instagram. Staff have lead over 65 events across the Commonwealth, reaching an estimated 1.5 million Kentuckians through presentations, educational programs, community science programs, volunteer events, outreach events, and more. Our biologists and land managers have been able to bring the splendor of Kentucky biodiversity and the importance of its conservation to not only the public, but to further the education of K-12 students, higher education students, special interest groups and professionals.

Additionally, OKNP has increased our Facebook following by

3,500+ followers and expanded Facebook reach to over 1.4 million and increased our Instagram following by 970+ followers and expanding Instagram reach to over 7,300. OKNP is committed to the ongoing education of the public about Kentucky's natural heritage and is working to continue to expand our reach to a wider audience through marketing, events, partnerships, and more. Check out OKNP on our website, Facebook, Instagram and YouTube for updates and upcoming events.

**Don't miss out on the latest on Kentucky Natural Heritage!**

**Follow Office of Kentucky Nature Preserves**



OKNP tracks outreach and environmental education activities on the Outreach Dashboard



# Director's Office:

## Outreach and Environmental Education



### Volunteers play vital role in Terrestrial Mollusk Biodiversity Inventory Project (TMBIP)

The TMBIP, organized by OKNP, has concluded a statewide snail survey with the aid of 110 volunteers from state and federal agencies, museums, universities, private biological consulting firms, and the general public. These efforts resulted in 1,730 new county records, 13 new state records and 12 species potentially new to science.

*Photo: Snail workshop hosted by Terrestrial Mollusk Biodiversity Inventory Project*



### Kentucky Native Bee Working Group hosts state's first native bee identification workshop

In March 2024, OKNP's Kentucky Native Bee Working Group hosted the state's first native bee identification and ecology course in Frankfort, Kentucky. The Kentucky Bee Working Group's main objective is to further focus on bee inventory, as we expect to discover at least 250 new bees in Kentucky over the next 5 years.

*Photo: Kentucky Native Bee Working Group participants that attended the Kentucky Native Bee Identification Workshop*



### OKNP engages public in Monarch Butterfly tagging and native pollinator habitat education

The Monarch Butterfly (*Danaus plexippus*) is one of the most beloved species in the world, but unfortunately populations have declined drastically the last 20 years. To help conserve the Monarch Butterfly, OKNP has participated in the Kentucky Monarch Conservation Plan through public education on native pollinator habitat conservation and restoration, and volunteer monarch tagging events on state parks and state nature preserves.

*Photo: The Monarch Butterfly ([Danaus plexippus](#)) on one of its host plants, the Milkweed (*Asclepias* sp.)*



### Entomologists document under-studied moth pollinators with the help of the public

OKNP entomologists hosted and assisted with volunteer Moth Bioblitzes and Mothing nights at state parks, state nature preserves, local parks, and private lands. Volunteer centered events such as these allow Kentucky residents to gather data that is vital to understanding more about this under appreciated and under-studied group of pollinators.

*Photo: OKNP participated in Moth Week with a mothing event at the LFUCG Arboretum*



# Biological Assessment and Plant Conservation



# Biological Assessment and Plant Conservation: Endangered Species Act

## **OKNP has been the official USFWS partner for monitoring and managing Kentucky's federally listed plant species for almost four decades**

One important action towards OKNP's goal to prevent species extinctions is recovering globally rare species populations. We accomplish this through targeted surveys, population monitoring, species and community level management, land acquisition, education, research, seed banking, propagation and restoration.

Since 1985, OKNP has had a cooperative agreement with the United States Fish and Wildlife Service (USFWS) to serve as the official partner for monitoring and managing federally listed and at risk plants in Kentucky under Section 6 of the Endangered Species Act. Currently, we work on over 30 federally listed, at risk plants and globally rare plants through this agreement.



**OFFICE OF KENTUCKY  
NATURE PRESERVES  
TEAM  
KENTUCKY**  
ENERGY AND ENVIRONMENT CABINET

We work closely with USFWS and partners to meet recovery goals and implement conservation action that truly protects those species as well as assess possible additions to the federal list. Often times targeted conservation work on globally rare plants that are not yet federally listed can prevent the need for additional federal listings.

## **Multi-agency effort yields effective solutions in habitat management for Price's Potato Bean (*Apios priceana*)**

OKNP, U.S. Forest Service and the Land Between the Lakes National Recreation Area are working together to recover Price's Potato Bean through monitoring, seed translocations, and targeted management.

Price's Potato Bean (*Apios priceana*) is a federally threatened species endemic to the southeastern U.S., where it grows on open, rocky, forested slopes near creeks and rivers. This rare bean is native to only six counties in western Kentucky, and less than 60% of historically documented populations still exist in today. Over-shading from forest succession is the greatest threat to the species in Kentucky, and OKNP collaborates with partners to conduct periodic thinning of shrubs and trees to maintain the ideal habitat that leads to more vigorous plants, increased flowering, increased seed production, and overall population growth. Additionally, OKNP and partners conduct seed collection and translocation activities to ensure the long term survival of Price's Potato Bean.



Federally threatened Price's Potato Bean (*Apios priceana*)



OKNP Staff monitoring Price's Potato Bean

OKNP partners with the U.S. Forest Service at Land Between the Lakes National Recreation Area on monitoring and management of Price's Potato Bean on more than half of populations in Kentucky, representing at least 20% of the populations needed for recovery of the species. Identification of suitable habitat on public lands in the range of the species is being emphasized for future seed introduction projects to increase the number of self-sustaining populations on protected land in Kentucky. These actions all help progress towards the primary goals of OKNP working towards recovery and delisting of Price's Potato Bean.



# Biological Assessment and Plant Conservation: Endangered Species Act

## Braun's Rockcress (*Borodinia perstellata*) populations respond positively to annual invasive species removal

OKNP partners with local government and private land owners surrounding Frankfort, KY to manage lands for the recovery of the federally endangered Braun's Rockcress.



Federally endangered Braun's Rockcress (*Borodinia perstellata*)

OKNP botanists and land managers collaborated with local government and private land owners to continue long term monitoring and management of sites vital to the recovery of the federally endangered Braun's Rockcress (*Borodinia perstellata*). Braun's Rockcress is a very rare native mustard endemic to Kentucky and Tennessee, known globally from only six counties. It inhabits rich, rocky forests along the Kentucky River around Frankfort and adjacent counties. The most prominent threat to the species is non-native, invasive plants that can outcompete and displace native biodiversity.

OKNP staff removed non-native, invasive species that threaten Braun's Rockcress populations at five protected sites, including two State Nature Preserves, two Conservation Easements, and one Registered Natural Area. This work maintains the pristine ecosystems and provides routine management that maintains high quality resources for some of the largest Braun's Rockcress populations in Kentucky. This helps to meet recovery goals by maintaining five healthy populations on protected land over a span of years, which is roughly half the required populations for Braun's Rockcress to be considered for downlisting to threatened status. Invasive species control will continue into the future to preserve quality of these protected areas and recover the species.

## Historic populations rediscovered and new populations introduced of Kentucky Gladecress (*Leavenworthia exigua* var. *laciniata*)

OKNP partners with Louisville Metro Parks, U.S. Fish and Wildlife Service, RES Consulting, and Kentucky Heritage Land Conservation Fund to recover the federally threatened Kentucky Gladecress.

Kentucky Gladecress (*Leavenworthia exigua* var. *laciniata*) is a federally threatened mustard that only occurs in two counties in the world, Jefferson and Bullitt, in Kentucky. This small, limestone loving plant is most threatened by habitat loss and modification and lack



Federally threatened Kentucky Gladecress (*Leavenworthia exigua* var. *laciniata*)

of access and conservation management on private lands. Monitoring of the Kentucky Gladecress has recently focused on collaborating with private land owners to survey populations that have not been surveyed in the last 20 years. Many of these populations were previously classified as low quality or possibly eliminated, but OKNP survey efforts were able to determine over half of the Kentucky Gladecress populations visited were stable or increasing. In addition to visiting known populations, there were two new populations found on private land in 2024 and one new population at a KHLFC site.

To further ensure the recovery and sustainability of this rare plant, OKNP worked on reintroduction and augmentation of Kentucky Gladecress populations. Seeds were collected with the help of Louisville Metro Parks, U.S. Fish and Wildlife Service, and RES Consulting, from three high-risk populations along roadsides and in a planned housing development. These seeds were used to augment the population at McNeely Lake Park and introduce the species to an KHLFC restoration site. Kentucky Gladecress monitoring will continue to focus on historic populations, high quality private property sites, and augmenting protected populations to ensure steps towards species downlisting and recovery take place.



# Biological Assessment and Plant Conservation:

## *Endangered Species Act*

### Globe Bladderpod (*Physaria globosa*) introduction at KHLCF site to be used as successful model for introductions in the Bluegrass Region

OKNP partnered with the City of Frankfort Parks and Recreation Department to restore and recover the federally endangered Globe Bladderpod through introductions on protected lands.

The federally endangered Globe Bladderpod (*Physaria globosa*) is endemic to Kentucky, Indiana, and Tennessee where it grows on open, dry, limestone woodlands above streams, creeks, and rivers. In Kentucky, the Globe Bladderpod populations are centered around the Kentucky River Palisades and the rocky hills throughout Frankfort. Unfortunately, this species has experienced significant historical declines across its range, including Kentucky, where only 22% of historically known populations still exist today.



Federally endangered Globe Bladderpod (*Physaria globosa*)



To ensure collection of the tiny seeds of Globe Bladderpod, botanists use mesh bags around pollinated plants

Excessive shading due to forest succession and competition from non-native invasive plant species are two of the main threats to the Globe Bladderpod in Kentucky and have contributed significantly to the population loss.

To establish new populations of this species, OKNP partners with the City of Frankfort Parks and Recreation Department on introduction and restoration projects for Globe Bladderpod. Seed translocations are paired with thinning the mid-story and removing invasive shrubs to restore open, sunny habitat this rare plant prefers. Currently, this partnership has yielded the successful introduction of one population and will be used as a model for several planned future introductions on protected lands in the Palisades.

These ongoing efforts of enhancing currently protected populations, introducing new populations onto additional protected lands, and seeking further solutions on private lands all hope to achieve downlisting in the coming decades.



# Biological Assessment and Plant Conservation: Endangered Species Act

## Recovery, monitoring and research of the federally threatened White Fringeless Orchid (*Platanthera integrilabia*) in Kentucky

OKNP partners with the Daniel Boone National Forest, U.S. Fish and Wildlife Service, University of Kentucky, Green Forest Works, Atlanta Botanical Garden, North American Orchid Conservation Center, and Illinois College on recovering the federally threatened White Fringeless Orchid.

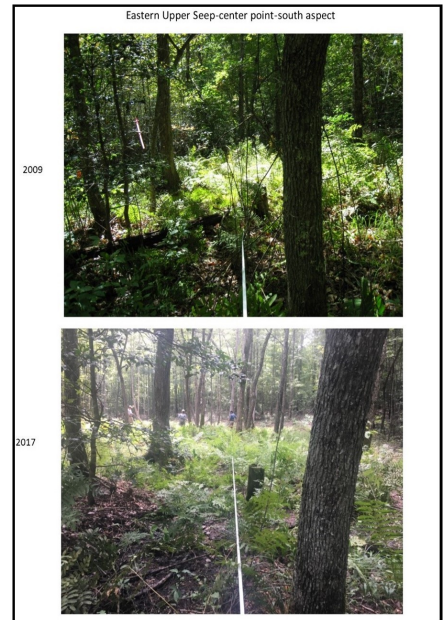


Federally threatened White Fringeless Orchid (*Platanthera integrilabia*)

White Fringeless Orchid (*Platanthera integrilabia*) is a federally threatened plant in Kentucky that serves as a flagship species for wetland and pine barren restoration, as well as rare plant recovery efforts in Kentucky. OKNP has been working on monitoring, management, research, and recovery of this rare orchid since the 1990s. OKNP conducts annual monitoring of populations on private and public lands, survey for new populations, work with partners on seed banking and mycorrhizal research, work with researchers on hydrological restoration of habitat, monitor and manage populations on state and federal lands, and work to protect privately owned populations through land acquisition and conservation actions.

For the past year, we have continued with managing sites for canopy reduction and invasive species, installing debris dams, creating best management practices, and collecting data on monitoring plots on all state and federally owned populations.

OKNP has also coordinated and conducted research on pollinators, insect ecology, genetics, and mycorrhizal symbionts. Through this collaborative work, OKNP has demonstrated that by reducing canopy, creating debris dams within the wetlands, and managing for invasive species, the orchid populations increase. OKNP has also discovered a new pollinator of the white fringeless orchid, the white lined sphinx moth (*Hyles lineata*) and documented a new undescribed aphid pest, representing the yin and yang of orchid insect ecology. Management and monitoring efforts have been used as a model to recover populations across the entire range in the southeastern United States, with a collective goal of delisting this beautiful orchid from the endangered species list.



OKNP works to create the ideal open habitat for the White Fringeless Orchid



White Lined Sphinx Moth, a newly discovered White Fringeless Orchid pollinator



White Fringeless Orchid in the open habitat of a utility corridor

### Conservation Collaboration



# Biological Assessment and Plant Conservation:

## Endangered Species Act

### Citizen Scientists monitor the White-haired Goldenrod (*Solidago albopilosa*) in the Red River Gorge after successful delisting

OKNP partners with the U.S. Fish and Wildlife Service, U.S. Forest Service, FIND Outdoors, and citizen scientists on continued monitoring of the federally delisted White-haired Goldenrod.



Previously federally threatened White-haired Goldenrod (*Solidago albopilosa*)



Sandstone rockhouses of the Red River Gorge are habitat for White-haired Goldenrod

White-haired Goldenrod (*Solidago albopilosa*, WHG) is a narrowly endemic, globally rare species that can be found only in Kentucky, within a 30 mile radius of the Red River Gorge (RRG) area of Powell, Menifee and Wolfe counties in the Daniel Boone National Forest. In 1988, the U.S. Fish and Wildlife Service (USFWS) listed this rare goldenrod as federally threatened due to its extremely narrow range and the many threats it faced from recreational activities in the RRG. The heavy use of rock-shelters by hikers, campers, and rock climbers had resulted in potentially irreparable damage to WHG populations from trampling, campfires, garbage dumping, and the spread of invasive species.

The USFWS published a Recovery Plan for the species in 1993, and OKNP partnered with the U.S. Forest Service (USFS) to implement the major points outlined in the plan, including diverting trails away from populations, constructing protective fencing with educational signage around populations where trails could not be diverted, and designating forest habitat near populations as protected from logging. OKNP and USFS also worked together to monitor known WHG populations and locate new ones, and by 2016 these efforts had improved WHG populations enough that USFWS was able to delist the species.

Following the delisting, OKNP was tasked with conducting post-delisting monitoring for a 5 year period to ensure that the recovery of WHG remained secure. Because some threats were likely to persist for a subset of populations with high recreational impact, OKNP again collaborated with the USFS to design a pilot program of volunteer-based population monitoring. Community scientists were trained by OKNP botanists in the monitoring protocols that would provide ongoing data to assess the health of WHG populations that are considered most at-risk. This program design, along with the feedback provided by the pilot program's enthusiastic volunteers, could be used in future monitoring of this globally rare wildflower, which can be found nowhere else in the world but Kentucky.

### Short's Goldenrod (*Solidago shortii*) populations respond positively to prescribed fire and invasive removal

OKNP partners with the U.S. Fish and Wildlife Service, Kentucky State Parks, Kentucky Heritage Land Conservation Fund, and Kentucky Department of Transportation on continued monitoring of the federally endangered Short's Goldenrod.



Federally endangered Short's Goldenrod



Prescribed fire to maintain Short's Goldenrod habitat

Short's goldenrod (*Solidago shortii*) is a globally rare and federally endangered species that historically occurred on rocky, open habitats along the buffalo trace that spanned across the Bluegrass region, but now is only found in the Blue Licks Battlefield State Resort Park area. Kentucky Heritage Land Conservation Fund (KHLCF) sites play a significant role in the protection of Kentucky's Short's goldenrod, with approximately half of our known populations occurring on KHLCF lands.



# Biological Assessment and Plant Conservation:

## Endangered Species Act

### Short's Goldenrod (cont.)

The major ongoing threats to Short's Goldenrod include competition with non-native invasive species and habitat degradation; therefore management strategies for these populations include invasive species eradication and prescribed fire to maintain open conditions. OKNP conducts yearly surveys on long term monitoring plots to ensure that the populations are healthy and responding positively to these management strategies.

Additionally, the roadsides in the Blue Licks area and beyond were surveyed for new or existing populations as a part of the Roadside Pollinator Habitat Project with Kentucky Transportation Cabinet. No new populations were discovered, but several natural and introduced populations surveyed were found to be stable or increasing, indicating that the species is on track for recovery.

Future Short's Goldenrod work includes surveys of private land to locate new populations, continued surveying of long-term monitoring plots, and increased management to greatly expand and improve habitat across OKNP, Kentucky State Parks, and KHLCF owned properties.

### Multi-agency efforts successfully complete post-delisting monitoring of the Running Buffalo Clover (*Trifolium stoloniferum*)

*OKNP partners with the U.S. Fish and Wildlife Service, Kentucky Department of Fish and Wildlife Resources, Natural Resources Conservation Science, and the University of Kentucky on post delisting monitoring of the federally delisted Running Buffalo Clover.*

Running Buffalo Clover (*Trifolium stoloniferum*) is a previously federally endangered species that has been successfully delisted due to goals of its recovery plan being met. The rare clover is endemic to the southeast and Midwest, and generally occurs around the Lexington, Louisville and northern Kentucky areas in the Commonwealth. Even though the plant is delisted, OKNP continues to ensure its recovery by monitoring it during the 5 year post-delisting monitoring period. The 2024 field surveys marked the final year of post-



*Previously federally endangered Running Buffalo Clover (*Trifolium stoloniferum*)*



*Monitoring Running Buffalo Clover in its preferred open, lawn-like habitat using flagging*

delisting monitoring of the Running Buffalo Clover. Monitoring efforts focused on ten of the largest populations in Kentucky, most of which appeared to be stable, though non-native invasive encroachment poses a threat to continued success of these populations.

In addition to population monitoring, increased land management to maintain prime Running Buffalo Clover habitat is an objective of the post-delisting monitoring period. Many of the Running Buffalo Clover populations occur on public Wildlife Management Areas that are owned and maintained by the Kentucky Department of Fish and Wildlife Resources. In partnership with Clay WMA, OKNP hosted a workshop for WMA land managers, KDFWR private lands biologists, and NRCS private lands biologists on appropriate management techniques in areas where the Running Buffalo Clover is present.

To further ensure success in Running Buffalo Clover recovery, a reintroduction project began between OKNP, the Henry Clay Ashland Estate, and the LFUCG Arboretum: State Botanical Garden of Kentucky. Seeds were collected from the Henry Clay Ashland Estate in Lexington to be grown and reintroduced to the LFUCG Arboretum.

While post-delisting monitoring is finished, OKNP will continue to work with partners to manage existing Running Buffalo Clover populations and reintroduce the clover to areas where it may have historically been present.

# Biological Assessment and Plant Conservation:

## Botanical Collaborations

### **The Importance of Collaboration in the Plant Conservation Community**

The Office of Kentucky Nature Preserves collaborates with many conservation agencies, non-profits, native plant propagators, universities, and local, state and federal government to achieve our goal of conserving Kentucky's natural heritage. These partnerships and collaborations are vital to the continued growth and success of the state's plant conservation community, and have yielded great successes for the botanical status of the Commonwealth.

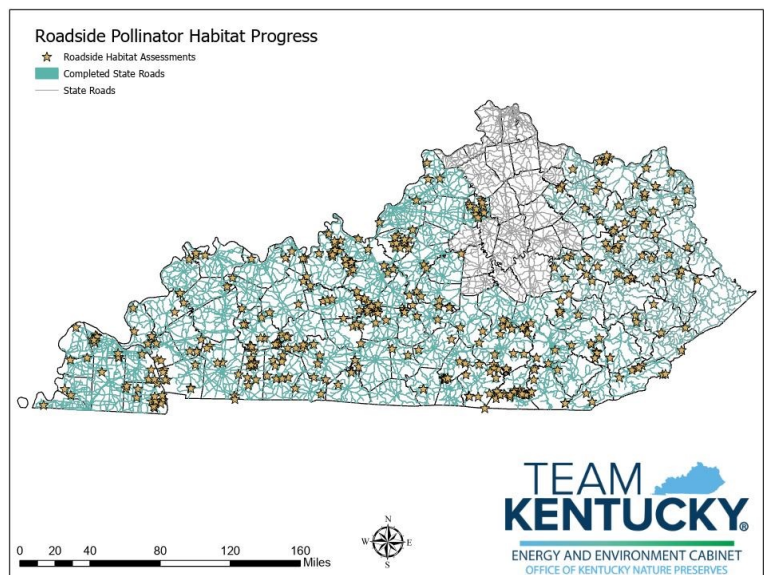
### **Hundreds of roadside sites identified as outstanding pollinator resources in the Roadside Pollinator Habitat Program**

OKNP collaborates with the Kentucky Transportation Cabinet to conduct pollinator habitat surveys of the state-maintained roadside rights-of-way.

Roadside rights-of-way are increasingly recognized for their potential conservation value. Remnant native plant communities along roadsides can provide vital habitat for imperiled pollinating insects like the monarch butterfly and the federally endangered rusty patched bumble bee (*Bombus affinis*). They also support many different rare plant species including several that are federally listed as threatened or endangered under the ESA such as Short's Goldenrod, Kentucky Gladecress, and Globe Bladderpod.

In 2020, OKNP partnered with the Kentucky Transportation Cabinet to conduct a habitat inventory of the state-maintained roadside rights-of-way. The project will be completed in 2024. To date, OKNP has surveyed over 26,000 miles of roads across the Commonwealth and identified over 200 sites with significant conservation value. These sites provide outstanding pollinator resources and habitat for rare plant species.

Identified habitats have been designated as Roadside Conservation Areas with special management guidelines, such as reduced mowing frequency or restrictions on herbicide applications. These management guidelines help ensure the protection of these natural resources, safeguard habitat for several federally listed species, and can potentially reduce the need for listing of our at-risk species like the monarch butterfly.



State-wide progress of the Roadside Pollinator Habitat Program



Roadside Conservation Area signs mark significant pollinator habitat throughout Kentucky



Roadside population of federally endangered Short's Goldenrod (*Solidago shortii*)



Monarch butterflies rely on many roadside habitats as they migrate south



Federally endangered Rusty Patched Bumble Bee (*Bombus affinis*)



# Biological Assessment and Plant Conservation:

## Botanical Collaborations

### OKNP evaluates health of 4000+ acres of Kentucky forests in National Forest Inventory Projects

*In collaboration with the U.S. Forest Service, OKNP has conducted several years of forest quality assessments in the Daniel Boone National Forest.*

In partnership with the U.S. Forest Service (USFS), OKNP botanists regularly conduct forest quality assessments, botanical inventories, and rare plant surveys throughout the Daniel Boone National Forest (DBNF). Over the past three years, our botany team intensively surveyed over 4,000 acres of forests in the Jellico Mountains area of the Stearns District of the DBNF. We documented over 400 plant species, including new populations of 6 species on the state rare plant list, and provided USFS with detailed mapping of non-native invasive species that threaten forest health and productivity in this region of DBNF. The information gathered from these surveys supports USFS planning processes for conservation enhancement, recreation development, and other management activities on DBNF.

In addition to our work in the Jellico Mountains, OKNP has conducted targeted rare plant surveys and monitoring throughout all districts of DBNF to identify important habitats for conservation and restoration management, status surveys to monitor the health of populations of federally threatened or endangered plants that occur on DBNF, and to gather supporting data for the evaluation of at-risk species that have been petitioned for listing under the ESA.



*Daniel Boone National Forest; Jellico Mountains*

### Kentucky Forest Biodiversity Assessment Program completes state-wide Wild Ginseng (*Panax quinquefolius*) monitoring

*OKNP partners with the Kentucky Department of Agriculture to monitor wild ginseng populations to ensure sustainable harvest for multi-million-dollar industry.*



*American Ginseng in its mature 4-prong stage*

American Ginseng (*Panax quinquefolius*) harvest in Kentucky is a long-standing part of the state's heritage and economy, going back to the days of the early pioneers. Kentucky is the leading exporter of wild ginseng, with the trade generating \$4 to \$8 million annually for the Commonwealth. Unfortunately, over harvest of wild ginseng and destruction of its forested habitats continue to threaten this economically important plant.

To ensure legal harvest is sustainable for future generations, the Kentucky Department of Agriculture works with OKNP on the Kentucky Forest Biodiversity Assessment Program (KFBAP), which monitors over 200 wild ginseng populations and associated forested communities. The results of this program directly effect the future limitations and/or expansions of Kentucky ginseng harvest at a county level. Additionally, this long-term monitoring program assesses the biodiversity of Kentucky's forested landscapes, resulting in the documentation and mapping of high-quality natural communities, discovery of new populations of state listed plants, and a better understanding of the effects of natural and human disturbance on Kentucky's forests.



# Biological Assessment and Plant Conservation:

## Botanical Collaborations

### Rare Plant Conservation Through Propagation, Seed Banking, and Reintroductions

OKNP works closely with several conservation partners on *ex situ* conservation strategies that provide further insurance to protect some of the rarest members of Kentucky's botanical heritage. Collaborative activities include seed banking, genetic research, rare plant propagation, translocation, and reintroduction of rare plant populations. Staff are working on the propagation of over 30 species with various partners, including Missouri Botanical Garden, Cincinnati Zoo, Atlanta Botanical Garden, Dropseed Nursery, Ironweed Nursery, University of Kentucky, and the Kentucky Plant Conservation Alliance.

### Wood Lily

After five years of site preparation, seed collection, and propagation, OKNP and volunteers from the Kentucky Plant Conservation Alliance transplanted Wood Lily (*Lilium philadelphicum*) bulbs into new several sites in the Cumberland Plateau that are being managed and restored to the pine barrens woodland community. This highly charismatic, state endangered species has been on the brink of extinction in Kentucky. OKNP's continued management at these transplant sites is critical to preserving its beauty for future generations.



Wood Lily, State Endangered

### Canby's Mountain Lover

Recent efforts by OKNP, Kentucky Plant Conservation Alliance, LFUCG Arboretum, and the Atlanta Botanical Garden, along with partners at the Daniel Boone National Forest, Berea College Forest, and several private landowners, have resulted in successful propagation and reintroduction of Canby's Mountain Lover (*Paxistima canbyi*). Transplants of this globally rare species were placed at a KHLFC site in the Pali-sades region that provided high-quality suitable habitat. Monitoring of these new populations has demonstrated successful results.



Canby Mountain's Lover transplant site.

### Small White Lady's Slipper

In collaboration with The Kentucky Plant Conservation Alliance and The Nature Conservancy, OKNP is assisting with conservation, research, and propagation efforts of the Small White Lady's Slipper (*Cypripedium candidum*). Fruits collected by OKNP were sent to Longwood Gardens for propagation, while seeds and leaf tissue samples of the state endangered orchid were sent to the Atlanta Botanical Garden for storage and genetic study. In the future, multiple KHLFC sites will serve as reintroduction sites for the resulting propagated orchids, playing a vital role in the conservation of this dainty state endangered orchid.



Small White Lady's Slipper, State Endangered.

### Kentucky Clover

The globally rare Kentucky Clover (*Trifolium kentuckiense*) was first discovered in 2010, and was only known from two privately owned limestone sites in central Kentucky. Despite annual monitoring and management by OKNP and



OKNP staff with Kentucky Clover transplants.

KDFWR, Kentucky Clover vanished from these sites not long after it was described. Fortunately, seed collection and propagation efforts were successful due to collaborative efforts with the Cincinnati Zoo CREWs plant program and other partners. Two batches of propagated Kentucky Clovers were transplanted in high quality limestone woodlands, one on KHLFC lands. Through ongoing management, propagation, and transplantation, OKNP is ensuring that this small Kentucky endemic will never be lost again.

# Biological Assessment and Plant Conservation:

## Terrestrial Zoology Conservation

### **OKNP's growing terrestrial zoology program conducts ground-breaking research on Kentucky's native invertebrates and pollinators**

OKNP invertebrate biologists work with botanists and ecologists to inventory and assess terrestrial invertebrate species across Kentucky. The heritage program forms the basis of OKNP's invertebrate role, as so many plants, insects, animals, and natural communities are uniquely tied together. OKNP's growing terrestrial invertebrate conservation programs focuses on pollinator conservation, rare insect conservation, insect-plant/animal interactions, and insect ecology.

OKNP conducts cutting edge field work and research that seeks to document the diversity, distribution, and conservation status of Kentucky's understudied and underappreciated terrestrial invertebrate animals. OKNP documents native bees, butterflies, moths, bee flies, hover flies, dragonflies, terrestrial snails, cave beetles, tiger beetles, fireflies, ants and more- all serving many critical ecosystem functions such as pollination, decomposition and critical food web roles in our natural and human world.



The Bear-like Bigger Bee (*Anthophora ursina*)  
(Photo credit: USGS Bee Inventory and Monitoring Lab)



Concave Cuckoo Bee (*Triepeolus concavus*)  
(Photo credit: USGS Bee Inventory and Monitoring Lab)

### **Native Bee Inventory and Monitoring Program documenting new pollinators across Kentucky**

Native bees have life history strategies and morphological features that make them the most important group of pollinators. Bees are some of the only pollinators that actively forage for pollen and individuals can visit hundreds of flowers per day.

There is a substantial gap in the knowledge of Kentucky's native bee species diversity, distributions, population trends, and behavioral ecology, which in turn hinders conservation efforts to monitor and manage effectively for their persistence.

OKNP recently established a Native Bee Inventory and Monitoring program and began inventories of native bees across state nature preserves and partner lands. This program seeks to expand inventory efforts across the state and establish long-term monitoring protocols and plots. Approximately 4,000 species of bee are found in the United States, while the preliminary state list for Kentucky includes only 180 species.

In the spring of 2023, OKNP invertebrate biologists added 3 additional state records to this list, during two sampling events including a species in the previously undocumented genus *Melitta*. Eastern Cranberry Bee (*Melitta americana*), Broad-faced Masked Bee (*Hylaeus sparsus*), and Bear-like Digger Bee (*Anthophora ursina*) were all collected and added to the list in May 2023. In previous years, OKNP biologists have added several other state record species, including Cuckoo Bee (*Epeolus lectoides*), Concave Cuckoo Bee (*Triepeolus concavus*), Plated Miner Bee (*Andrena platyparia*), and others. Future OKNP inventories are could potentially yield 200+ more new native bee species for Kentucky.



# Biological Assessment and Plant Conservation:

## Terrestrial Zoology Conservation

### OKNP hosts southeastern salamander bioblitz to search for rare Yellow Spotted Salamander (*Plethodon pauleyi*)

OKNP hosted a significant salamander bioblitz with the collaboration of Kentucky Natural Lands Trust, Kentucky Department of Fish and Wildlife Resources, U.S. Fish and Wildlife Service and volunteers.



© Kevin Hutcheson

Yellow spotted salamander (*Plethodon pauleyi*). Photo by Kevin Hutcheson

Last fall OKNP partnered with Kentucky Natural Lands Trust, Kentucky Department of Fish and Wildlife Resources, U.S. Fish and Wildlife Service and many volunteer experts from throughout the region for a salamander blitz in southeastern Kentucky.

This was the best coordinated and most intense salamander survey effort in the state. The goal of this effort was to locate additional populations of the rare yellow spotted salamander, *Plethodon pauleyi*. The species is only known from the Central Appalachians. It has been petitioned for listing as threatened or endangered by the US Fish and Wildlife Service under the Endangered Species Act. Data collected from the blitz will help inform the USFW's review of the species status. The yellow spotted salamander lives on cliffs and rock outcrops hiding in crevasses during daytime and only hunts at night.

Twenty survey participants, equipped with headlamps, scoured areas of potential habitat, including cliffines and



Volunteers searching for salamanders

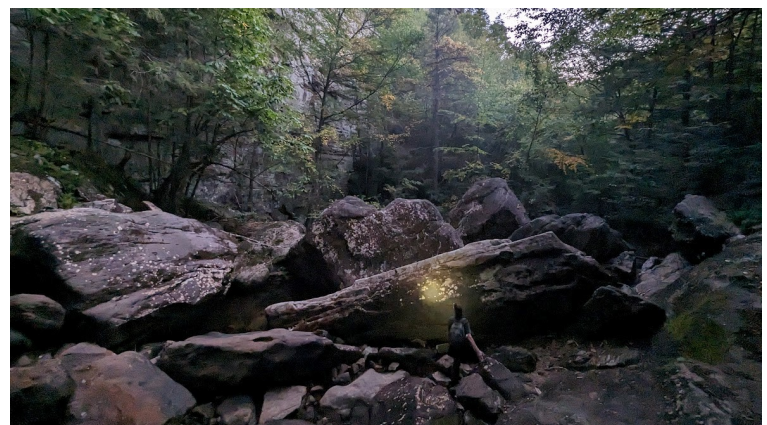


Yellow spotted salamander potential habitat

rock outcrops of sandstone and shale. During three nights, they found over 400 salamanders of twelve species, including several Species of Greatest Conservation Need as designated in the Kentucky Wildlife Action Plan, were found despite uncharacteristically dry conditions. No observations of the yellow spotted woodland salamander were reported.

Based on the results of the blitz, it is still unclear if populations of yellow spotted woodland salamander are in decline throughout the species Kentucky range. Some sites have experienced habitat loss while two new sites were recently reported.

As the yellow spotted woodland salamander is notoriously cryptic, additional surveys are needed to better assess the species status in Kentucky. The Office of Kentucky Nature Preserves is partnering with The Nature Conservancy and Kentucky Department of Fish and Wildlife Resources to conduct another salamander blitz in the spring of 2025 focused on locating the species in Southeastern Kentucky.



OKNP staff searching for salamanders at Bad Branch State Nature Preserve



# Biological Assessment and Plant Conservation:

## Aquatic Zoology Conservation

### Kentucky Crayfish Collaborative hosts 2nd annual Crayfish Blitz to gather data on the Commonwealth's rare Crayfish

*The Kentucky Crayfish Collaborative is possible due to a vital conservation partnership between OKNP and Kentucky Department of Fish and Wildlife Resources.*

The Office of Kentucky Nature Preserves has partnered with the Kentucky Department of Fish and Wildlife Resources to form the Kentucky Crayfish Collaborative (KCC). Kentucky has 70 species of crayfish, but unfortunately 67% of the fauna is lacking basic information regarding their life history, ecology, and conservation status.

Therefore, the principal objective of the KCC is to enhance the knowledge of crayfish ecology and conservation across the Commonwealth by bringing together aquatic biologists



*2nd Annual Crayfish Blitz participants and volunteers*

from state and federal agencies, academia, and non-governmental groups across the Southeast and Midwest.

This year the KCC hosted the 2nd annual Kentucky Crayfish Collaborative Crayfish Blitz at Pine Mountain State Park (May 19-23, 2024). A total of 44 crayfish biologists from seven different states attended the event, led by OKNP aquatic biologist Mike Compton and Dr. Zac Loughman of West Liberty University. The group was able to attend a Crayfish 101 workshop, conduct crayfish surveys in streams and wetlands across eastern Kentucky, and discuss crayfish biology, ecology, and conservation with experts across the region.

One of the specific goals of the event was to obtain more data for the Spiny Scale Crayfish (*Cambarus jezerinaci*). The species was petitioned for Federal listing under the Endangered Species Act, but data on its distribution and status were needed before a review could be conducted. The data obtained will assist USFWS with the review and Species Status Assessment. Fortunately, over 130 surveys were conducted during the event and data on the Spiny Scale Crayfish and dozens of other species were obtained, with numerous range extensions and several new records of rare crayfishes documented. The KCC plans to host another successful event in western Kentucky in 2025.



*Spiny Scale Crayfish (*Cambarus jezerinaci*), currently under review*



*Upland Burrowing Crayfish (*Cambarus dubius*)*



*The Kentucky Crayfish Collaborative hosted a Crayfish 101 workshop*



*Crayfish Blitz participant shows off crayfish pulled from a crayfish burrow*



# Biological Assessment and Plant Conservation:

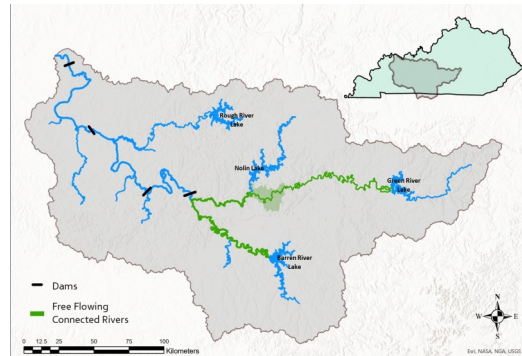
## Aquatic Zoology Conservation

### OKNP monitors the significant changes in biodiversity of the Green River Drainage during lock and dam removal process

*OKNP aquatic biologists and botanists have tracked the ecological changes and restoration efforts that have occurred within the Green River watershed as the lock and dam system has been removed.*

The Green River is one of the most biologically diverse rivers in the temperate zone of the world and harbors the last remaining individuals of some of the most imperiled aquatic species. It is an extremely important river not only for Kentucky but also for the Southeast United States. Unfortunately, a series of lock and dams were installed in the river as part of the United States Army Corps of Engineers 'flatwater' project during the 19th Century, which drastically altered and degraded the river, and restricted the recovery of the ecosystem and its species. The removal of the obsolete and dilapidated dams was discussed for decades but no measurable actions were taken until 2016. However, lock and dam #6 near Mammoth Cave National Park breached during November 2016, which caused a serious emergency safety hazard and immediate action was needed. A multiagency collaborative among state and federal agencies worked with local and state officials to secure the removal of lock and dam #5 and #6 on the Green River and lock and dam #1 on the Barren River. Lock and dam #5 is last remaining dam of the three and is expected to be removed by September 2024.

Collectively, the removal of the three infrastructures would represent the largest and most significant river restoration



Green River Drainage

project east of the Mississippi River. The removals not only eliminate the safety hazards, but also restores approximately 35 miles of impounded river to free flowing con-

ditions and connects over 300 miles of free flowing river in the Green River drainage. The Office of Kentucky Nature Preserves was tasked with the monitoring of the river ecosystem to determine the baseline conditions of the river prior to the dam removals. OKNP conducted fish, mussel, vegetation, and habitat surveys along the river between 2017-2023. A report of the findings will be available in 2024. The work indicated fish and mussel species were limited based on the hydrological conditions and influence of the dams. Mussels were especially limited, with only 37 species of the 61 known species encountered, and many of the imperiled species absent.

However, following the removal of lock and dam #6 the river structure has started to change and exhibit a more complex and diverse river. Island formation was evident upstream of Boardcut Island, which will provide new habitat for many of the fish, mussel, and other aquatic species. It is perceived the river will continue to change and recover, and ultimately benefit the ecosystem. The restoration project will not only benefit the immediate river segments but a large portion of the drainage too.



Green River, impounded segment above LD5



Green River, LD5 removal work



Green River, free flowing segment formerly impounded

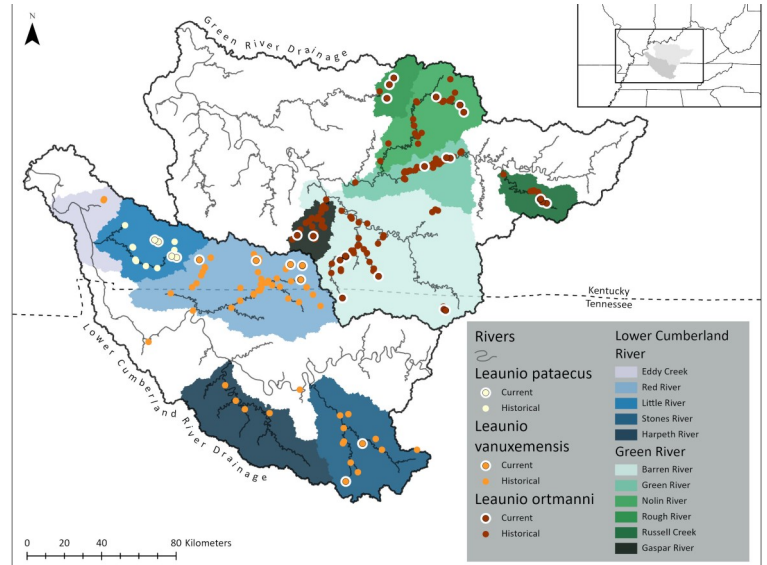
# Biological Assessment and Plant Conservation:

## Aquatic Zoology Conservation

### The Kentucky Creekshell Project conducts Kentucky Creekshell (*Leaunio ortmanni*) Distribution, Status, and Genetic Assessment Study to gather data for potential federal listing

OKNP partners with U.S. Fish and Wildlife Service, Kentucky Department of Fish and Wildlife Resources, and Virginia Tech University to assess the imperiled Kentucky Creekshell in the Kentucky Creekshell Project.

The Kentucky Creekshell project is a collaboration with the USFWS, KDFWR, and Virginia Tech University. The Kentucky Creekshell (*Leaunio ortmanni*) is an imperiled freshwater mussel considered to be endemic to the Green River drainage and restricted solely within Kentucky. A recent preliminary study suggested the species was part of a species complex with the Mountain Creekshell (*L. vanuxemensis*) and Dwarf Rainbow (*L. pataecus*), and more widespread than previously known, which prompted a need to fully assess the species in Kentucky. The goals of the project were to delineate the distribution of the three closely related species, assess the genetic structure of the various populations, determine the status for each species, and to augment populations with juvenile mussels reared from females obtained in the wild. The data obtained from the work will provide USFWS with the information needed to determine if the species warrants federal protection under the Endangered Species Act. The Kentucky Creekshell is current under review by USFWS, and an expected determination will be proposed during Fall 2024.



Creekshell map of the Lower Cumberland and Green River Drainage areas

Over 100 surveys were conducted, and a genetic assessment of the populations was made. It was determined that the Kentucky Creekshell is endemic to the Green River and occurs in Kentucky and Tennessee, the Dwarf Rainbow is a valid species and occurs only in the Little River system of the Cumberland River in Christian County, Kentucky, and the Mountain Creekshell occurs in the Stones River system (Tennessee) downstream to Eddy Creek (Kentucky) of the Cumberland River, except absent from the Little River system. However, data indicated each species was highly imperiled and declined over the decades. Fortunately, propagation, augmentation, and reintroductions of populations into suitable streams is a possible tool in the recovery of the species. To date, over 5,000 individuals have been released to augment the populations of the Green River, Nolin River, Rough River, Russel Creek, and Red River systems.



Kentucky Creekshell (*Leaunio ortmanni*)



Dwarf Rainbow (*Leaunio pataecus*)



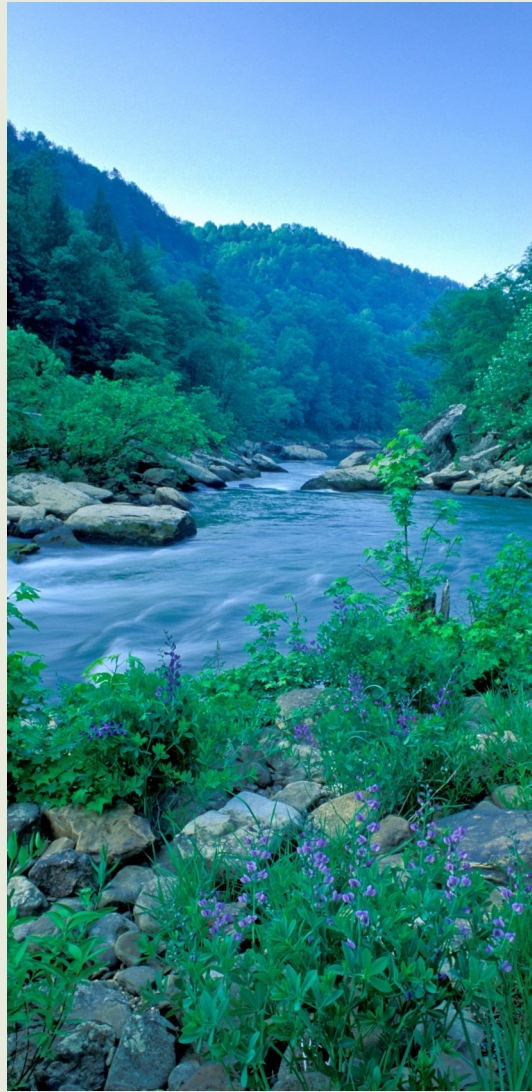
Mountain Creekshell (*Leaunio vanuxemensis*)



Volunteer in mussel survey



# Natural Areas and Recovery



# Natural Areas and Recovery: Land Management Regions

## OKNP land managers maintain and restore over 85 of the highest quality natural areas in Kentucky

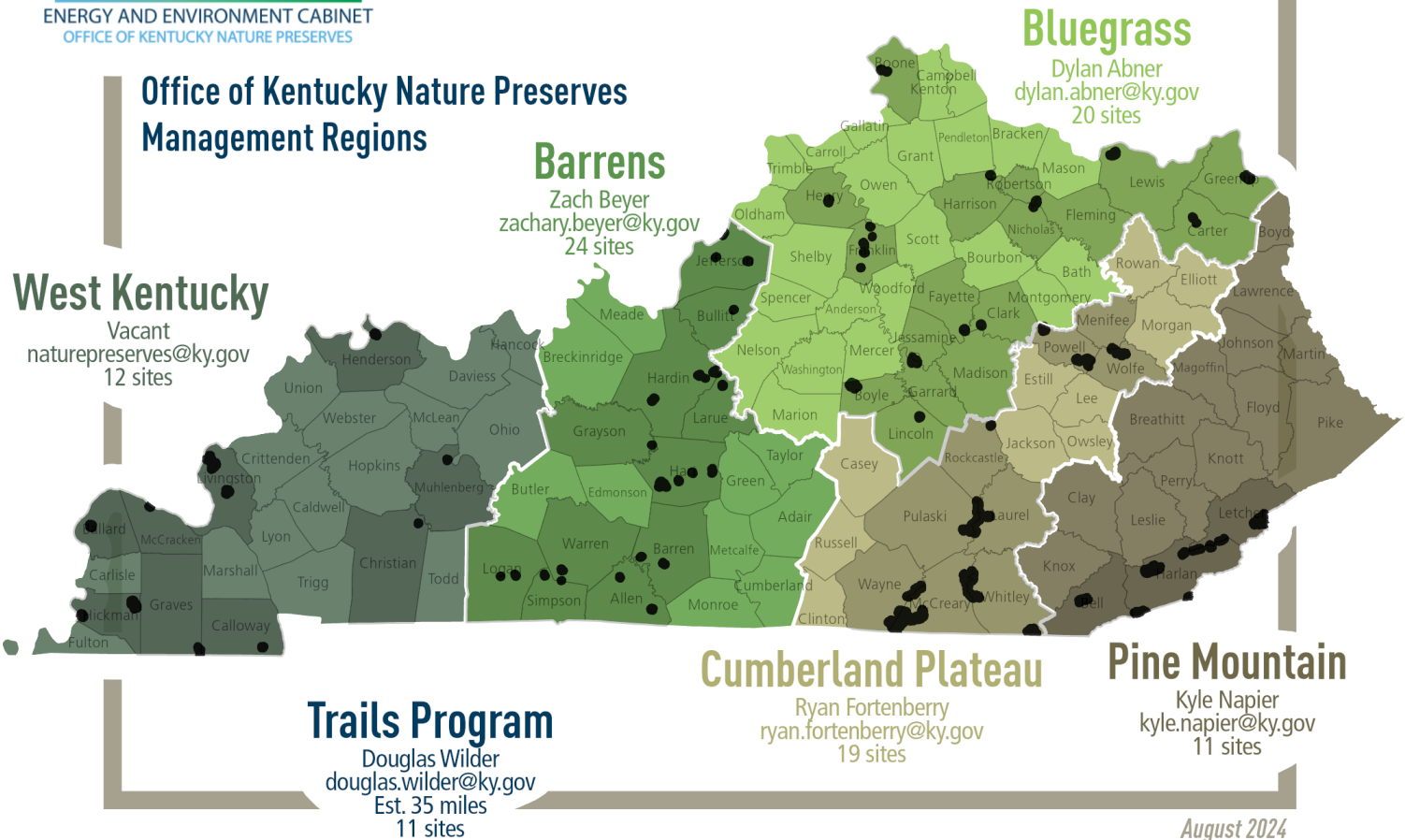
OKNP land managers work to protect, maintain, and restore some of the state's most high-quality natural areas that are dedicated in the State Nature Preserves system, protected within the Kentucky Wild Rivers Program, or were purchased with the Kentucky Heritage Lands Conservation Fund.

State Nature Preserves, Wild Rivers and KHLCF lands contain the best remaining examples of rare species populations or natural communities known in the state, are particularly suited for environmental education, or preserve the Commonwealth's most spectacular nature scenery. Conserving these high quality areas often reduces the risk that species will become federally endangered, helps the recovery of already listed species, or moves species closer towards their delisting.

OKNP lands with less sensitive habitats are open to the public for hiking, wildlife viewing, and passive recreation on a system of hiking trails. Over 35 miles of trail are available across almost a dozen high quality natural areas in the Commonwealth.



### Office of Kentucky Nature Preserves Management Regions



August 2024

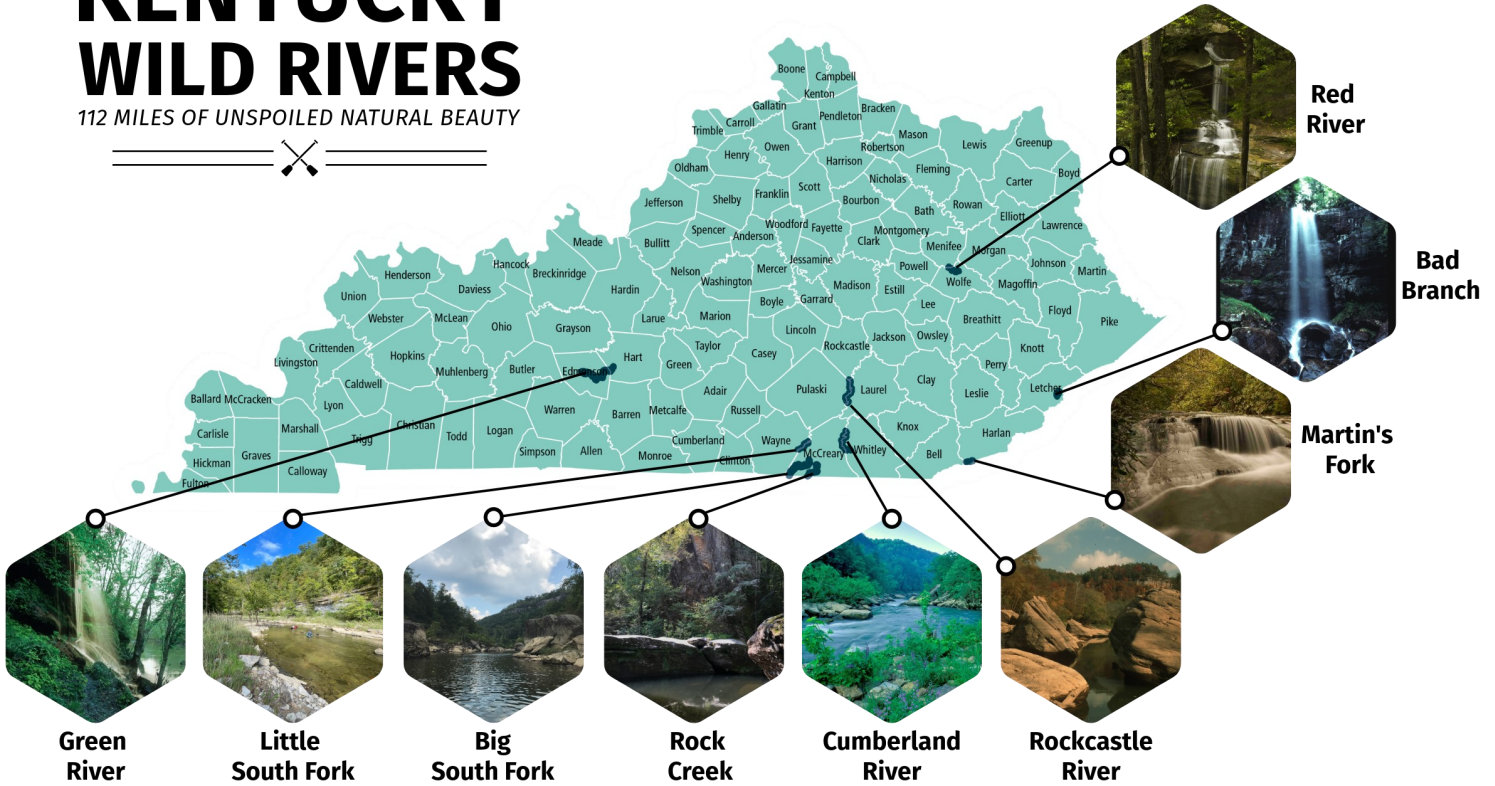


# Natural Areas and Recovery:

## Wild Rivers Program

# KENTUCKY WILD RIVERS

112 MILES OF UNSPOILED NATURAL BEAUTY



## Kentucky Wild Rivers Program conserving the state's most pristine rivers for over 50 years

To preserve the unique scenic, fish and wildlife, botanical, geological, cultural and recreational values of its most pristine rivers, the Kentucky Wild Rivers Act of 1972 established nine wild rivers corridors, including specific sections of exceptional quality and aesthetic character:

- **The Cumberland River**
- **The Red River**
- **The Green River**
- **The Rockcastle River**
- **The Big South Fork of the Cumberland River**
- **The Little South Fork of the Cumberland River**
- **Rock Creek**
- **Bad Branch**
- **Martin's Fork**

Each Wild River is actually a linear corridor encompassing all visible land on each side of the river up to a distance of 2,000 feet.

While much of the land surrounding the wild river corridors is privately owned, public land includes:

- Mammoth Cave National Park
- The Red River National Geological Area
- The Big South Fork National Recreation Area
- The Daniel Boone National Forest
- Bad Branch State Nature Preserve
- Martin's Fork State Nature Preserve
- Little South Fork State Natural Area
- Cumberland Falls State Park

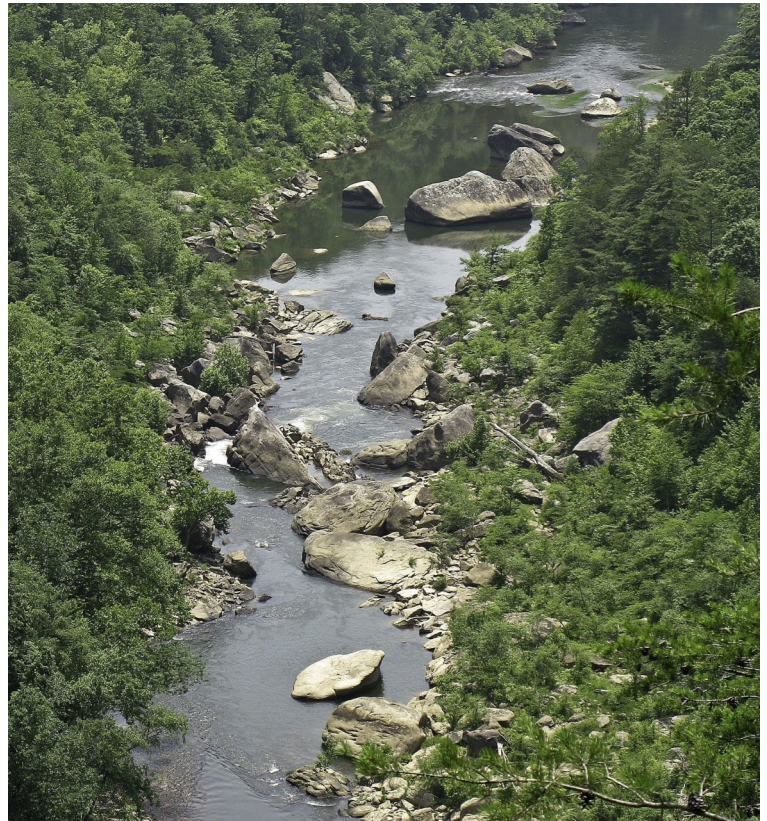
Not only do these free-flowing waters provide important habitat for native species, but wilderness recreation and paddling set Kentucky's Wild Rivers apart. These scenic settings are havens for people seeking solitude and tranquility in nature. Their waters provide healthy sport fisheries, cool pools for swimming, serene floats, and in some cases, white-water rapids for more adventurous paddlers.

# Natural Areas and Recovery: *Wild Rivers Program*

## Kentucky Wild Rivers (cont.)

The Office of Kentucky Nature Preserves is responsible for monitoring and managing Kentucky’s designated Wild River corridors to ensure that they remain in pristine condition. Understanding that what happens upstream can have a positive or negative impact downstream, OKNP has utilized a watershed level approach to managing each designated Wild River. This effort would not be successful without our partnerships with multiple agencies and groups including The Nature Conservancy, Western Kentucky University, Mammoth Cave National Park, Daniel Boone National Forest, Big South Fork National River and Recreational Area, Cumberland Gap National Park, Kentucky Natural Lands Trust, Kentucky Department of Fish and Wildlife Resources, Kentucky Division of Water, Kentucky State Parks, and the United States Fish and Wildlife Service among many others.

The Wild Rivers Program continues to serve as the lynchpin for promoting outdoor recreation and local tourism while conserving Kentucky’s most important aquatic resources for generations to come.



*Kentucky Wild Rivers are high quality examples of Kentucky’s primitive past, hosting miles of unspoiled beauty.*



*Blackside Dace (Chrosomus cumberlandensis); federally threatened fish protected by Wild Rivers Corridors*



*Spiny Scale Crayfish (Cambarus jezerinaci); crayfish currently under review for federal listing protected by Wild Rivers Corridors*



*Kentucky Creekshell (Leaunio ortmanni); imperiled mussel protected by Wild rivers Corridors*



*Rockcastle Aster (Eurybia saxicastellii); state imperiled river scour plant protected by Wild Rivers Corridors*





# Natural Areas and Recovery:

## Prescribed Fire Program

### Historical Role of Fire on Kentucky's Landscape

Historically, fire played a crucial role in the distribution of natural communities, plants, animals, and insects across the Kentucky landscape. Due to decades of active fire suppression and fragmentation of the landscape, Kentucky's fire-dependent natural communities, along with the organisms that inhabit them, are at risk of disappearing. Prescribed fire provides the necessary disturbance in grasslands and other natural communities to keep them from disappearing by reducing woody encroachment, controlling some invasive species, and stimulating the growth of native plants.

### OKNP Prescribed Fire Program growing to restore the state's high quality natural communities



OKNP Burn Crew conducting a prescribed fire in a grassland habitat

Fire is a necessary ecological process that is utilized to maintain natural communities. As the OKNP prescribed fire program continues to grow, more work is being accomplished. Ultimately, the larger the program, the more land can be burned annually to protect rare species. Over the past fiscal year, OKNP's fire crew led or assisted on 13 prescribed burns to burn a total of 515 acres. Burn objectives included maintaining open habitat for rare species conservation within glades, prairies, or barrens complexes, reducing fuels, stimulating native species, as well as teaching younger generations how to properly implement prescribed fire.

### OKNP provides prescribed fire training to professionals and higher education students throughout the Commonwealth

Partners in our efforts include KDFWR, KDF, ECU, LFCUG Arboretum, Murray State, and the Kentucky Prescribed Fire Council. OKNP staff participated on three teaching burns to give students hands-on experience implementing burns and to get mentored by professional fire practitioners. OKNP led burns for two partners, ECU and LFCUG Arboretum, while allowing the partners to apprentice burn boss to get one step further to qualifying as certified Kentucky Burn Bosses and increasing the capacity for prescribed fire in the state.



OKNP teaching ECU students how to conduct prescribed fire at Taylor Fork Ecological Area.

### Conservation Collaboration





# Natural Areas and Recovery:

## Land Management and Restoration

### OKNP provides hands on experience to next generation of natural areas land managers at Eastern Kentucky University

OKNP partners with Eastern Kentucky University and the Kentucky Natural Lands Trust to train EKU students in natural areas management through funding provided by the National Fish & Wildlife Foundation.



OKNP teaching EKU students how to conduct prescribed fire at Taylor Fork Ecological Area.

The National Fish & Wildlife Foundation's Cumberland Plateau Stewardship Fund has been a vital source of funding for projects on the Cumberland Plateau and Pine Mountain. This grant has enabled the Office of Kentucky Nature Preserves to restore upland barrens systems, implement prescribed fire, and combat invasive species across the region. In the most recent grant cycle, OKNP, along with the Kentucky Natural Lands Trust (KNLT), partnered with Eastern Kentucky University (EKU) to provide students with valuable field experience. EKU's natural areas crews participated in activities such as installing firebreaks, implementing prescribed fire, treating invasive species, and restoring upland areas through midstory management.

This partnership between OKNP and EKU extends beyond immediate project goals, significantly contributing to workforce development within the conservation community. By involving EKU students in practical, hands-on fieldwork, this collaboration equips them with essential skills and experience in real-world conservation practices. Upon graduating, these students enter the workforce as a highly skilled labor force, well-prepared to tackle complex challenges in habitat restoration and management. This experience fosters a cul-

ture of environmental stewardship and professional development, ensuring that the next generation of conservation professionals is knowledgeable, capable, and ready to address pressing ecological issues with confidence.



EKU student learns to girdle a tree with a chainsaw



EKU student learns to use herbicide



EKU student on the prescribed fire crew



OKNP Chainsaw Workshop for EKU students



Eastern Kentucky University students at OKNP natural areas training



# Natural Areas and Recovery:

## Land Management and Restoration

### Pine Barrens restoration across the Cumberland Plateau of Kentucky continues to expand

*Through funding provided by the National Fish & Wildlife Foundation, OKNP continued and expanded pine barrens restoration throughout southeast Kentucky.*

For the last five years, OKNP has worked on a large-scale project to restore pine barren communities at nature preserves and natural areas in the Cumberland Plateau. Historically, pine barrens were an open canopy plant community maintained by wildfire and supported a diverse herbaceous layer with grasses and forbs more adapted to prairie-like conditions. These pine barren communities host over 20 rare plant and animal species that are tracked by OKNP. Unfortunately, pine barrens have become increasingly rare due to fire suppression, invasive species, woody species encroachment and modern logging practices, and are now designated as a globally rare plant community.

Work conducted to restore the pine barrens includes removal of the forest midstory to increase sunlight to the forest floor, removal of invasive species, reestablishment of native pines, and reintroduction of fire onto the landscape. OKNP has successfully implemented these land management techniques to restore and maintain high quality restoration on several pine barrens communities in Pulaski, Wolfe, and Harlan counties.

Recently, pine barren restoration efforts were extended to the Sinking Creek State Natural Area in Laurel County. The OKNP Prescribed Fire Program Burn Crew assisted the Kentucky Division of Forestry in a 26-acre prescribed burn on the natural area to rejuvenate the ecosystem through reducing



*Comparison of pre-management (left of dirt road) and post-management (right of dirt road) pine barrens units*

woody encroachment. To help restore the natural open structure of this pine barrens community, OKNP also conducted 9.5 acres of midstory thinning and removal of undesirable but native species (such as red maple, tulip poplar, sassafras, and sourwood). Invasive species management has been crucial to restoration efforts at Sinking Creek, with techniques such as foliar spray and cut stump treatments being effectively utilized to reduce and eradicate several species of encroaching and competing invasive species. Additionally, similar invasive species management techniques were utilized to treat aggressive encroaching invasive species at a continuing pine barrens restoration at Frances Johnson Palk State Nature Preserve.

This restoration work has continued to expand on several sites thanks to grants awarded by the National Fish & Wildlife Foundation. Moving forward, efforts will continue to expand the current management units in OKNP's effort to restore this globally rare plant community, and all the plant and animal species it supports.



*Prescribed fire used to manage pine barren habitat*



*Pine seedling in post-management pine barrens*



*Pine barrens habitat, post-management conditions*



# Natural Areas and Recovery: Land Management and Restoration

## Barrens Region restoration and land management education provided to professionals and private land owners in Kentucky and Tennessee

*In the Barrens Region of Kentucky, OKNP partners with University of Kentucky, Quail Forever, and Natural Resources Conservation Service to restore natural communities and provide professional land management education*

OKNP continues to play a pivotal role in conserving the unique remnant ecosystems of the Barrens Region. This region, once dominated by vast grasslands and woodlands critical for numerous state and federally listed species, now holds only scattered remnants of its original ecosystems. To maintain these ecosystems, OKNP employs a range of management strategies tailored to the natural adaptations and needs of each site, ensuring proper preservation of these rare communities for future generations.

Historically, the Barrens were sustained through periodic fires, which were either naturally occurring or set by indige-



*Swallowtail butterflies visit the blazing stars in the grassland glade complexes of Lone Oak State Nature Preserve*



*Quail Forever and NRCS attending a Barrens Region land management field day hosted by OKNP*

nous people. Today, OKNP uses prescribed fire as a vital tool to control woody encroachment, combat non-native plant invasions, and promote fire-adapted native species. In cases where fire is not feasible, chemical and mechanical methods are employed to remove invasive species and manage the landscape effectively.

Partnerships have been invaluable, not only in conducting management on OKNP properties, but expanding our efforts to address greater conservation need. This year, OKNP collaborated with the LFUCG Arboretum and the Logan County Conservation District to translocate state endangered prairie gentian (*Gentiana puberulenta*) plugs, which were propagated by LFUCG Arboretum staff. Additionally, OKNP hosted two field days to showcase its management practices in the Barrens. These events provided training opportunities for professionals from the Natural Resources Conservation Service (NRCS) and Quail Forever private lands biologists.

By sharing knowledge and strategies, OKNP aims to empower others to adopt effective conservation practices, thereby extending the impact of our work beyond public lands.



*State endangered prairie gentian (*Gentiana puberulenta*)*



*Prescribed fire is used to replicate natural historical fire events in the Barrens*



*Aerial view of limestone glades in the Barrens Region of Kentucky*



*Flat Rock Glade State Nature Preserve in Simpson County, Kentucky*



# Natural Areas and Recovery:

## Land Management and Restoration

### Volunteers help treat thousands of Eastern Hemlock trees against the invasive Hemlock Woolly Adelgid

Through funding provided by the National Fish & Wildlife Foundation, OKNP partners with Kentucky Division of Forestry, Kentucky Natural Lands Trust, Kentucky State Parks, and U.S. Forest Service to organize volunteer Hemlock Woolly Adelgid treatment days.



Volunteer injecting Hemlock Woolly Adelgid treatment into eastern hemlock roots



Hemlock Woolly Adelgid, a non-native invasive species treated by volunteers

With funding from U.S. Fish and Wildlife Service (National Fish & Wildlife Foundation grant), OKNP has partnered with the Kentucky Division of Forestry and Kentucky Natural Lands Trust to chemically treat thousands of eastern hemlock trees throughout the Cumberland mountains and Cumberland plateau to protect them from the devastating non-native invasive insect pest hemlock woolly adelgid (HWA).

The protection of these trees is of the highest importance because eastern hemlocks are ecologically significant, they play a crucial role in regulating stream flow and maintaining water quality. Their dense foliage and shallow root system help minimize soil erosion, filter pollutants, and reduce the risk of flooding. They provide shelter, food, nesting sites, and protection for over 120 species of vertebrates. Losing hemlocks can lead to a loss of hemlock-dependent wildlife, especially several songbirds. Hemlocks shade streams, thus making them more oxygenated, preventing nutrient runoff and sedimentation. This also helps to keep water temperatures moderate and suitable for aquatic species that are dependent on cold-water. When hemlocks are removed, streams can become warmer in the summer and cooler in the winter, making it harder for these species to survive.

Economically, the loss of hemlocks degrades the scenery and could cause lower income from visitors to natural areas. Dead hemlock trees can also create dangers for hikers and campers, create wildfire hazards, fall across roads and structures all of which can be costly to remove.

**OKNP and partners treated over 6,400 eastern hemlocks for the Hemlock Woolly Adelgid in Kentucky!**

Most recently OKNP and its partners have hosted volunteer events to treat hemlocks infested with HWA. At these events, volunteers are taught how to identify HWA infestations, the importance of hemlock trees in our ecosystems, and the methods utilized to treat HWA. Volunteers assist with measuring, recording, and marking trees while OKNP and KDF staff apply the treatment. The most recent volunteer event took place at Cumberland Falls State Resort Park, but additional events have been held at Bee Rock Campground in Laurel County, William H. Martin State Nature Preserve in Pulaski County, and on both private land and an adjoining Daniel Boone National Forest Hemlock Conservation area along the Rockcastle River in Pulaski County.



Volunteer measuring the diameter (DBH) of an eastern hemlock tree before treating it for Hemlock Woolly Adelgid



# Natural Areas and Recovery: Land Management and Restoration

## Volunteers instrumental in non-native invasive species treatment and removal in Kentucky's natural areas

*OKNP partners with Kentucky State Parks, Kentucky Division of Forestry, University of Kentucky, Kentucky State University, Kentucky Master Naturalists, and local Scout troops to organize volunteer land management days on high quality natural areas.*

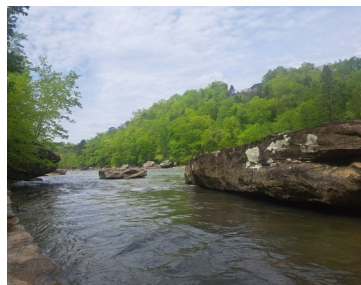
In 2024, OKNP organized volunteer invasive species removal and treatment days at Tom Dorman State Nature Preserve, Sinking Creek State Natural Area, and Cumberland Falls State Park Nature Preserve. Supported by partnerships with the Kentucky Division of Forestry, University of Kentucky, Kentucky State University, Kentucky Master Naturalists, and local Scout troops, these efforts have been instrumental in treating hemlock woolly adelgid infestations, eradicating non-native invasive plant species, and protecting critical habitats. For example, 21 volunteers treated approximately 400 trees at Cumberland Falls, safeguarding 15 acres of riparian habitat and supporting local economies dependent on tourism and outdoor recreation.

The value of these partnerships and public support is immense. Collaborating with academic institutions and community groups has provided essential manpower and resources, greatly enhancing OKNP's conservation efforts. Volunteer involvement not only aids in practical tasks like invasive species removal but also fosters a shared sense of responsibility and stewardship for Kentucky's natural resources. Public engagement initiatives, such as the invasive plant removal day at Tom Dorman State Nature Preserve, have been highly effective in educating participants about invasive species identification and management. These events offer hands-on experiences that empower individuals to apply their newfound knowledge to their properties and communities.

Ongoing support from the public and partners is crucial for the long-term health and resilience of the state's ecosystems. Through these collaborative efforts, OKNP remains committed to preserving Kentucky's unique biodiversity and natural heritage for future generations.



*Group of volunteers take a well deserved break during Hemlock Woolly Adelgid treatments*



*Hemlock Woolly Adelgid treatment area in the Cumberland Plateau*



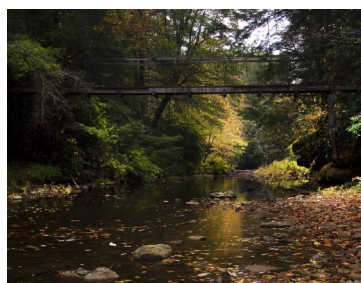
*Hemlock Woolly Adelgid, a non-native invasive species treated by volunteers*



*Tom Dorman State Nature Preserve in Garrard County, Kentucky*



*Volunteers treat invasive species at Tom Dorman State Nature Preserve*



*Sinking Creek State Natural Area in Laurel County, Kentucky*



*Hemlock Woolly Adelgid treatment at Sinking Creek State Natural Area*



# Natural Areas and Recovery:

## Land Management and Restoration

### OKNP hosts Trail Workshop and repairs flood damaged infrastructure at Buckhorn Lake State Resort Park

*OKNP collaborated with Kentucky State Parks, Kentucky Natural Lands Trust, and Perry County Trail Association to host a Trail Workshop at Buckhorn Lake State Resort Park*

In the fall of 2023, the Office of Kentucky Nature Preserves, in collaboration with Kentucky State Parks, Kentucky Natural Lands Trust (KNLT), Perry County Trail Association, and local volunteers, organized a successful trail workshop at Buckhorn Lake State Resort Park. The three-day workshop, attended by 36 participants, focused on essential trail maintenance skills, including building bridges, adding steps to steep grades, rerouting trails, controlling erosion, and laying out new trails. This effort was particularly significant following the devastating 2022 flood, which damaged existing infrastructure and caused a major mudslide.

The workshop's accomplishments included constructing a new 32-foot bridge, rerouting the trail around the mudslide, and creating a new 2-mile Autumn Loop Trail. These improvements are vital for enhancing local tourism, ensuring accessibility, and providing sustainable outdoor recreation opportunities. By bringing together skilled professionals and dedi-

cated volunteers, OKNP demonstrated its commitment to preserving and improving Kentucky's treasured natural areas, exemplifying the power of teamwork and collaboration.



*Participants of Trail Workshop help install steps on a steeply graded trail at Buckhorn Lake State Resort Park*



*New 32 foot bridge built by participants of the OKNP Trail Workshop at Buckhorn Lake State Resort Park*



# Office of Kentucky Nature Preserves Staff

## Director's Office



**Zack Couch**  
Executive Director



**Stephanie Ellis**  
Purchasing Specialist



**Judy Cunningham**  
Budget Specialist



**Alexis Sheehan**  
Database Analyst



**Ted Brancheau**  
NRCS Data Steward



**Zeb Weese**  
Consultant





# Office of Kentucky Nature Preserves Staff

## Biological Assessment and Plant Conservation



**Tara Littlefield**  
Branch Manager,  
Botanist, Ecologist



**Martina Hines**  
Botanist, Ecologist



**Mike Compton**  
Aquatic Biologist



**Devin Rodgers**  
Botanist, Ecologist



**Kendall McDonald**  
Botanist, Lichenologist,  
Outreach Coordinator



**Tony Romano**  
Botanist, Conservation  
Coordinator



**Rachel Cook**  
Botanist



**Vanessa Voelker**  
Botanist



**Sarah Kosieniak**  
Botany Technician



**Katie Glauber**  
Botany Technician



**Jon Eisenhour**  
Aquatics Technician



**Kevli Sheth**  
Botany Intern



# Office of Kentucky Nature Preserves Staff

## Natural Areas and Recovery



**Jason Nally**  
Branch Manager



**Kyle Napier**  
Southeast Region  
Preserve Manager



**Heidi Braunreiter**  
Prescribed Fire Program  
Coordinator



**Gregg Janos**  
KHLCF, Wild Rivers  
Coordinator



**Ryan Fortenberry**  
Cumberland Plateau  
Preserve Manager



**Doug Wilder**  
Trails Manager



**Zach Beyer**  
Barrens Preserve  
Manager



**Dylan Abner**  
Bluegrass Preserve  
Manager



**Rod Botkins**  
Natural Areas  
Technician



**Sandra Elliott**  
Natural Areas  
Technician



**Molly Uphoff**  
Graphic Design Intern

**Not Pictured:**  
Kenneth Mills (Natural  
Areas Technician), Boyd  
Hopkins (Natural Areas  
Technician), Garret  
Gallion (Natural Areas  
Technician)



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# Conservation Collaborations Acknowledgement

Office of Kentucky Nature Preserves would like to thank all of our conservation partners mentioned in this report. Without these collaborations, OKNP could not continue to expand and improve upon its mission to conserve Kentucky's natural heritage.

