

KEEPING IT

Wild!



SUSTAINING KENTUCKY'S NATIVE WILDLIFE.

2023 Conservation Writing and Jim Claypool Art Contest

Sponsors: Kentucky Farm Bureau Federation // Kentucky Association of Conservation Districts // Kentucky Division of Conservation

CONSERVATION DISTRICTS

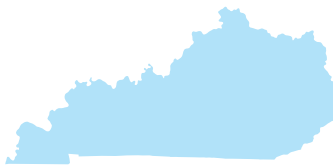
Do you know what is located in every county in the state? Conservation Districts! For more than 60 years, Kentucky's 121 Conservation Districts (there are two districts in Logan County) have been made up of locally elected boards that develop plans to help communities grow while still protecting our soil and water for the fish and wildlife of the state.

These boards assist farmers with conservation plans that reduce soil erosion and control silt and other contaminants from entering ponds, lakes and streams. Certain practices such as grass waterways, strip cropping, adding fences or adding trees attract wildlife provide their basic needs such as shelter, nesting and food.

Another practice that supports wildlife is crop rotation. During the winter, farmers will leave the crop residue left over from harvesting. In doing that, wildlife can feed off of the estimated 2 to 3 bushels of grain that is left over.

Many farm ponds have been constructed all over the state. The small lakes built in Kentucky's small watershed program prevent floods, control silt in the streams below and can be used for fishing.

The biggest job that the conservation districts have is educating the public about the importance of soil and water conservation. They work with schools, civic groups and various other organizations to get the conservation district message out.



KENTUCKY CREATURE FUN FACTS!

The Grey Squirrel is listed as Kentucky's State Animal.



The largest animal in Kentucky is the Elk.

Wild Pigs are listed as an invasive wildlife species due to rapid reproduction & destructive nature.



DO YOU WANT TO BE MORE INVOLVED? FORM AN **ENVIROTHON** TEAM!

Interested in learning more about the environment? A great way to get more involved is to form an Envirothon Team at your school! The Kentucky Envirothon is a natural resource competition made up of high school teams across the state.

Students compete in hands-on outdoor competition in the areas of Wildlife, Soils, Water, Forestry, and current topics to test their knowledge on how much they know. Each team has five students. These teams are tested on their knowledge of Kentucky's natural resources at five "in the field" test stations. Each station covers a separate topic addressing soils, forestry, wildlife, aquatics, and a current environmental issue. Through experiments, analysis and use of critical thinking skills, the teams answer a set of questions at each station.

There are two regional competitions held in April in both the Eastern and Western part of our state. The top scoring regional winners advance to the state competition, and the state winners advancing to the international North American Envirothon. Registration begins in December.

It is a great way to learn more, compete with other schools and meet folks who all share the same passion for our natural resources.



TO LEARN MORE CONTACT:

- **Your local conservation district:**
eec.ky.gov/NaturalResources/Conservation/Pages/Conservation-Districts.aspx
- **Division of Conservation Envirothon Page:**
eec.ky.gov/NaturalResources/Conservation/Pages/Envirothon.aspx
- **Johnna McHugh: 502-782-6703 or johnna.mchugh@ky.gov**



White-Tailed Deer and Forest Management

White-tailed deer are wonderful wildlife to view in their native habitat and provide a valuable natural resource in Kentucky. They are considered the most sought-after big game species in North America. When deer populations are too high, they can cause damage to crops, gardens, orchards, and forest management issues for woodland owners. White-tailed deer can damage or destroy seedlings and saplings in a woodland affecting the forest regeneration of the next stand of trees. It is important to manage for both the long-term health of the deer population and forest management on the woodland owner's property.



Photo provided by Dr. Matthew T. Springer, University of Kentucky, Department of Forestry and Natural Resources

KENTUCKY CREATURE FUN FACTS!



The largest bear captured in our state was a 480lb. black bear.

The most venomous snakes in Kentucky are the Copperhead and Timber Rattlesnake.



The Kentucky "bobcat" can run in speeds excess of 34 miles per hour but are rarely seen.



FIRESCAPING

Reviving grasslands the Native American way

Reprinted from *Kentucky Afield*, Fall 2022

A quarter century ago, seven Kansas elk were released into the mountains of eastern Kentucky. It marked the start of an effort to restore the elusive wapiti to its ancestral home in southern Appalachia. The release echoed a foregone past, when elk roamed the vast woodlands and grassy balds of southeast Kentucky, long before Daniel Boone dropped down through the Cumberland Gap in 1775.

The landscape Daniel Boone set eyes upon while blazing the Wilderness Trail around present-day Middlesboro was, by that time, very much an altered landscape from what the megafauna of the distant past had adapted to through time. When biologists consider restoring a species or system, they consider an important question: To what point in time should they aim for on the geologic clock? Should they attempt to put all the pieces back together from 250 years ago? Or 25,000 years ago? These may seem like minor questions, but the fate of many restoration attempts have failed without its careful consideration.

Biologists considered this next step in restoration when they created the Eastern Kentucky Habitat Initiative. This is an effort to maintain open grazing lands in the mountains by using fire to reduce concentrations of trees and shrubs in the landscape. Because it is not enough to simply release animals into the wild. The landscape must continue to support the herd. This is why Kentucky Fish and Wildlife is using techniques once employed by Native Americans to help sustain open habitat.

Elk released in eastern Kentucky came from vast grasslands in the west; they need open lands for grazing. If elk were to persist in their new Kentucky home, it is imperative to create a landscape that looks more like it did when elk – known as “wapiti” by native peoples - last prospered in the state’s mountain region. The success of Kentucky’s elk restoration can be at least partially owed to the fact that the correct point in time was

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sought as a restoration target: approximately 500 to 3,000 years ago. This is sometime after the mammoth but, while Native Americans still shaped this part of the world.

Plant and animal species appear and disappear through time. However, some may have gone prematurely due to interruptions in their natural system. Some of these interruptions can be mitigated by restoration, such as planting native plants in an open field or moving animals back into an area that had them historically. Biologically speaking, the last time eastern Kentucky had a relatively stable ecosystem was long before Europeans felled the first American chestnut.

This concept leads to the question: What did southeast Kentucky look like before Daniel Boone set foot in what he saw as an endless forest? Well, researchers have a few places to look for answers. One is a tiny, wooded place in Jackson County called Cliff Palace Pond. Beneath the unassuming water's surface, the mud reveals clues on the recent and distant past of the southeast Kentucky landscape. By taking deep cores of mud, scientists determined what plants grew around the pond. The mud also revealed the presence of ash from fire.

Core samples showed two important things: 1) pollen from herbaceous plants, such as squash and sunflowers, become more abundant starting around 3,000 years ago and 2) ash deposits from fire become more abundant 3,000 years ago. So, what was going on 3,000 years ago? The answer is Native Americans. Native peoples at this time began settling down. They began utilizing fire to shape their surroundings. If you were a native Shawnee or Cherokee in present day McCreary County - and you needed a way to clear a large tract of land to encourage food plants like mast-producing hickories and oaks along with some seed-producing weeds - setting fire to the landscape at the right time was the way to do it.

Native peoples through eons of practice learned precisely how to use low intensity fire for everything from seed bed preparation to driving game to maybe sending a nasty message to another tribe. It was around 3,000 years ago that Native Americans really started using fire a lot. Over thousands of years, they

changed the landscape from heavy forest into more open, savannah-like forests. Instead of a closed canopy overhead, the landscape become open grasslands with a tree scattered every 45 yards or so.

This method of burning created open land utilized by large grazing animals. Native peoples knew this well. They took advantage of the habitat they created for hunting large herbivores. The Shawnee people referred to southeastern Kentucky as "Ouasioto," which roughly translates to "deer pass."

There are more clues. The Wilderness Trail that Boone blazed into Kentucky was actually an old buffalo trail linking grazing lands in Virginia to grazing lands in southeast and central Kentucky. Buffalo and elk once grazed in Appalachia's open grasslands - a landscape created by Native Americans setting fire to it. Another clue? The word "Kentucky" derives from a Native American word that translates to "meadow" or "prairie."

Boone described the landscape along his path through southeast Kentucky in 1775 as largely forested, but he also mentions plains as he gets farther west into the outer Bluegrass. Given this, plus the fact southeast Kentucky is largely forested today, raises the question: Why does the pollen record and older sources hint at grasslands in eastern Kentucky where there are fewer today?

Part of the answer may lie with the devastation of Native American populations in North America following the introduction of settlers and their diseases. Some researchers believe the Little Ice Age, a period of global cooling in the 1600s, may have been triggered by the sheer amount trees that grew in North America following what the native peoples called the "Great Death." One theory holds that the massive reforestation sequestered so much carbon that it actually cooled the planet.

By the time Boone reached his self-proclaimed heaven of "Kaintuck," the native peoples that had shaped the land with fire for eons had largely left or succumbed to European diseases. By the late 1700s, much of the open land from Native American agriculture and burning had become reforested. Without fire or disturbance, most of the land area of Kentucky became covered with trees.

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This leads back to the original question of what time to aim for when considering restoration. If large tracts of grasslands existed in eastern Kentucky - but there are less today - then why restore a species that depends on grasslands? The decision to move forward with elk restoration in Kentucky hinged on the largest source of open land in this part of the Commonwealth: reclaimed coal mines.

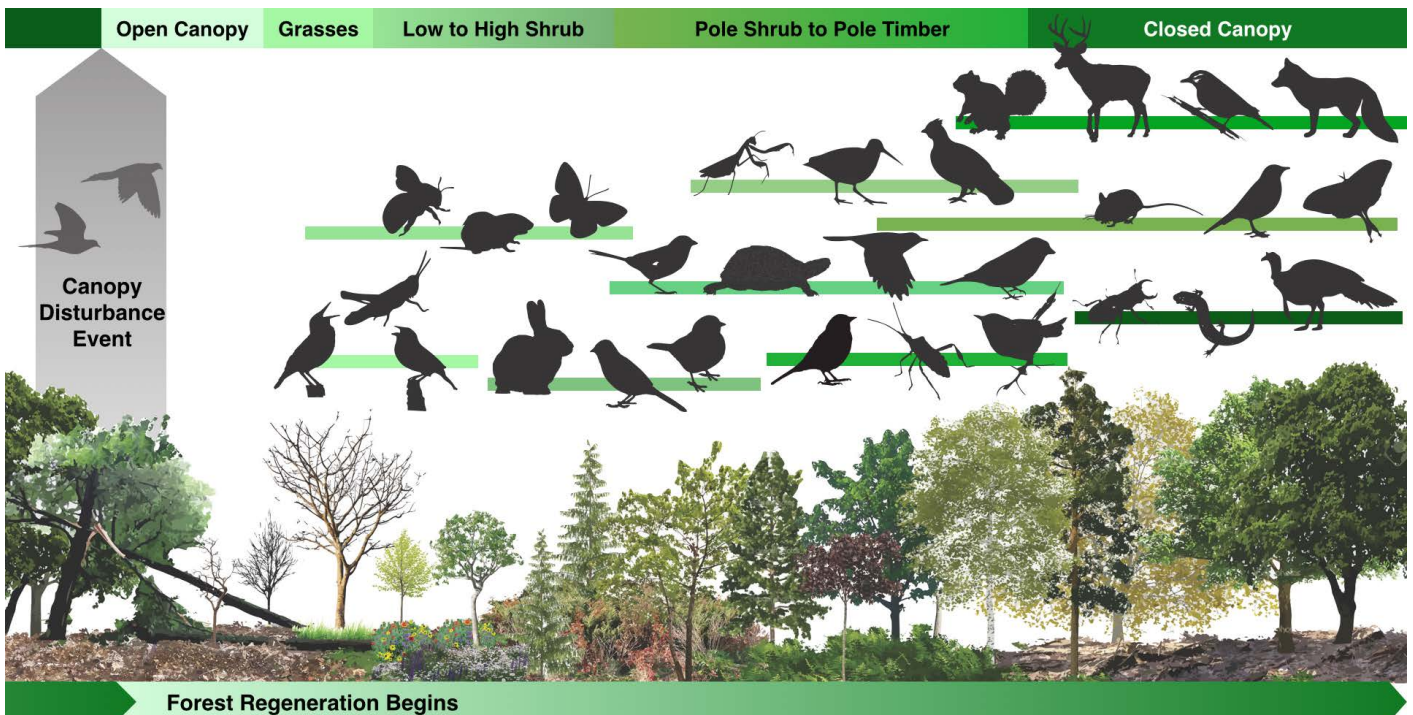
Coal companies must restore the contours of the landscape once they finish mining an area. In eastern Kentucky, which is often steep and rocky, the best reclamation methods include establishing plants that grow quickly and secure the soil from erosion. This process creates more open lands in areas that had reforested after extensive clear-cutting of trees in the 1900s.

The plight of grasslands does not end in eastern Kentucky. Grasslands are Kentucky's most imperiled large-scale landscape: the state has fewer savannahs, balds, prairies, shrublands and other native open lands than in the past. The coal mine reclamation process, however, only creates temporary grasslands. Natural succession will eventually turn them into forests if left undisturbed.

Twenty-five years ago, when elk were first released in the mountains, southeastern Kentucky included reclaimed open lands of varying ages. It was the perfect landscape for elk to graze. As time moves on and demand for coal lessens, however, fewer areas are being mined and reclaimed. New open areas are not being created at the pace of decades past. Compounding the issue: older reclaimed areas are now starting to form ground-shading canopies of shrubs and trees, which hampers the growth of forbs.

Enter the Eastern Kentucky Habitat Initiative - because restoration success may depend upon shaping the landscape to meet the needs of the focal plant or animal. In southeast Kentucky, biologists knew elk would need a consistent source of open lands for forage, as well as timber for cover. With an abundance of upland hardwoods scattered throughout the elk zone, it became imperative to recreate the ancient grasslands of eastern Kentucky. Researchers thought, why not use the oldest and most natural tool in the anthropogenic toolbox: fire.

Fire burns away woody cover, such as trees and shrubs. This is why Native Americans used fire to create vast grasslands in Kentucky. Beginning last year, Kentucky Fish and Wildlife, along with its partner, the Kentucky



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Division of Forestry, began efforts to set back succession with carefully managed fire on open areas in the elk zone. The goal is to fire 2,000 acres of open lands a year to promote grassland habitat. This will not only benefit elk, but a multitude of grassland species that are becoming less common.

Recent studies conducted by Kentucky Fish and Wildlife and the University of Kentucky show replenished grasslands touched by fire can help retain elk in the area. By tracking their movement with radio and GPS collars (think Apple AirTags for animals), studies show freshly burned areas concentrate elk. This is especially true during calving season, when elk cows need high quality nutrition. Regenerating vegetation offers this.

Other animals benefit from the regrowth of burned areas as well. The lush growth that springs up following fire creates brood rearing habitat and strut zones for turkey. Quail utilize burned areas, too. Dr. Howard Whiteman of Murray State University describes Kentucky elk as an Appalachian phoenix rising from the ashes. Elk are a potential revenue generator for communities in which coal was once the main economic driver.

The phoenix cannot restore itself without flame. Likewise, it will take flame, in the form of burning fields as Native Americans practiced 3,000 years ago, to rejuvenate the grasslands of southeastern Kentucky.

FISH HANGOUTS

Where do fish live? If you say “in water,” you’re only partly correct. That would be the same as saying birds and mammals live “in the air.”

Just as land animals require a certain kind of habitat to meet their basic needs, fish seek out specific spots in a lake, stream or pond – spots that provide them with the habitat they need.

Some fish, such as largemouth bass, spend most of their time near “structure” — objects or unusual features on the shoreline or the bottom in deeper waters. Examples of structure are tree stumps, aquatic weeds and underwater humps, trenches and rock piles. Other fish, such as white bass, are found in open water, sometimes near the middle of the lake.

Fish have many options for finding comfortable hangouts in the water. Since water temperatures drop in deeper water, fish such as rainbow trout, which prefer cool water, can drop down to the temperature they like. But bluegill, which are a warm water fish, will often be found in shallower, warmer water, where they don’t mind



temperatures in the 80s.

Just as rabbits often hide in brush piles or briar patches, most fish will seek out some kind of shelter, or cover. Cover, such as the top of a tree that has fallen into the water, provides needed shade and also food and protection from predators.

Algae grow on the brush, attracting small algae-eating fish. This in turn draws larger fish-eating species such as bass or crappie. So in a brush pile or other shelter, a fish can find food, shade and protection – just about everything it needs.

Eastern Hellbender

Kentucky's secretive oversized salamander

Reprinted from *Kentucky Afield*, Winter 2018

The Eastern hellbender, *Cryptobranchus alleganiensis*, is the largest salamander in North America and the third largest salamander in the world. This curious animal spends its entire life in streams and rivers. Surrounded by lore, a number of colorful nicknames accompany the Eastern hellbender: Snot otter, lasagna lizard, mud-devil and Allegheny alligator are just a few.

Although the hellbender appears to be widespread in many streams or rivers in Kentucky, they are difficult to monitor. Because hellbenders are susceptible to low oxygen and pollutants in the water, their survival depends on healthy waters throughout Kentucky.

The Eastern hellbender has a flat body and head, but a keeled or vertically flattened tail for propulsion in the water. Each of its short legs have four toes on the front and five toes on the back. When looking at the sides of the hellbender, large folds of skin extend along the side of the body, which help the animal absorb oxygen. Its blotchy brown-gray color and lighter underbelly provide excellent camouflage in Kentucky's streams.

Hellbenders prefer shallow streams with fast moving water and an abundance of large rocks. Having poor eyesight, hellbenders have light sensing cells all over their body, but are more concentrated in their tail. The hellbender finds safety throughout the day by hiding underneath a large rock, with its light sensing tail near the excavated entrance to its den. When night falls, it hunts for crayfish or a small fish for its evening meal.

Adult hellbenders range from 12 inches to 29 inches long. They can weigh 3-5 pounds or more. It takes five



Adult hellbenders range from 12 inches to 29 inches long. They can weigh 3-5 pounds or more.

years for young to reach sexual maturity. Although these animals may live up to 30 years, their survival depends on recruitment of young animals into the population. With predators such as fish,

snakes and turtles lurking, for a hellbender to survive from an egg to a mature adult is quite a miracle.

A single male hellbender tends to eggs deposited by multiple females under its den rock for up to 2-2 1/2 months while the eggs develop. After approximately 1 1/2 years, the immature hellbenders go through metamorphosis and lose the external gills present during their larval stage. Immature hellbenders are often confused with mudpuppies, which maintain external gills throughout their life.

GARDENING FOR MONARCHS



Reprinted from *Kentucky Afield*, Winter 2018

Millions of Monarch butterflies spend the winter tightly clustered in the oyamel fir trees atop the Sierra Madre Mountains of central Mexico. These butterflies have risked predators, vehicle collisions, disease, parasitoids, hazardous weather, starvation, and a slew of other dangers to reach this destination.

In many cases, individual butterflies have traveled thousands of miles to reach their winter home. Perhaps most remarkably, not one of the millions of butterflies making this epic journey has previously been to this Mexican forest.

Their challenge does not end once they reach the cloud forests of Mexico. Monarch butterflies now face perhaps their biggest challenges of all: habitat loss and fragmentation, widespread use of pesticides, and climate change.

Monarch populations have been in decline for the last 20 years, with estimates of up to 90 percent loss from a population high just two decades ago. Luckily, organizations and agencies across the nation have joined the effort to restore and protect monarch butterfly habitat. You can help conserve this iconic species and its remarkable migration by providing what these and future generations of butterflies need for a successful journey.

Danaus plexippus plexippus is the subspecies that encompasses the entire North American monarch population. Eastern and western monarchs are separated by the Rocky Mountains, a significant geographical barrier. Though there have been instances of interchange between the two populations eastern monarchs are considered the sole population to make the journey to the forests of Mexico.

Kentuckians will see the first migrants of spring around Derby Day in early May. Finding nectar for food is a top priority for these butterflies along the journey.

For female monarchs, finding milkweed to lay their eggs on is equally as important. Monarchs lay their eggs in the southernmost states shortly after departing from their overwintering grounds. These eggs will become the butterflies that continue the journey north, the first generation of monarchs that Kentuckians will see during the year.

Milkweed (*Asclepias spp.*) is the host plant of monarch caterpillars. Female monarchs will lay their eggs directly onto the milkweed plant. Once the caterpillars hatch, this food source is readily available for them to consume in copious amounts. By providing food sources for adult butterflies and growing caterpillars, your backyard can play an important role in the monarch's journey.

BACKYARD GARDENING FOR MONARCHS

Creating a Monarch Waystation is a great way to achieve this goal. Kansas-based Monarch Watch launched a nationwide waystation initiative to encourage people to plant more milkweed and nectar resources in their yards, schools, businesses, local parks, and community centers.

Waystations are pollinator gardens that provide all the resources a monarch needs at each life state, from egg to adult. As they make their way north in the spring and south in the fall, monarchs will likely make a pit stop at these waystations for the rest and nourishment they need to continue their journey.

The best thing about the waystation program is that you don't need acres of land to set aside for butterflies. Research conducted by the University of Kentucky has shown that monarchs make use of small patches of habitat during the breeding season. Simply adding a few milkweed plants to a small flower garden can help make a difference for monarchs.

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Monarch Watch recommends maintaining a garden of at least 100 square feet - 10 feet by 10 feet - but this can be split into several areas throughout your garden. If you already have flowers planted in your yard, then you're on your way to creating a waystation!

NECTAR PLANTS, NATURALLY

Start your waystation by selecting a good site for your garden. It will need to get at least six hours of sunlight a day to attract butterflies - and encourage sun-loving plants. Be sure to include nectar plants that bloom during different periods of the growing season. This ensures a food supply for the earliest monarch arrivals in spring and supports breeding summer monarchs as well as fall migrants.

Check the lists included with this article to get a better idea of what to plant.

These are by no means exhaustive lists and availability of plants may vary depending on your location. Check in with your local nursery to see if they stock Kentucky native plants. Your Monarch Waystation also serves as a pollinator garden, and local plants will attract other Kentucky butterflies and provide resources that feed native bee species.

Nursery representatives will have recommendations based on their stock. Your county extension office is also a great resource for specific information on native pollinator plants and can connect you with garden clubs, which often offer plant swap and seed share programs.

MILKWEED SUCCESS

Monarch Watch recommends having at least 10 milkweed plants in your garden, as female monarchs prefer to disperse their eggs. This may not be possible for all spaces, so you might want to start with a few plants initially and expand from there. You'll also want to provide shelter and plant milkweeds in close proximity to each other but, not so close that they are overcrowded.

Common milkweed (*Asclepias syriaca*), butterfly milkweed (*Asclepias tuberosa*), and swamp milkweed (*Asclepias incarnata*) are the most commonly available



MEET THE MILKWEEDS

The Garden Club of Kentucky and the Lexington Chapter of the Wild Ones provided this list of plant characteristics and growing requirements for some of the state's native milkweeds.

- 1. COMMON MILKWEED** (*Asclepias syriaca*) Height 3-6 feet. An important and preferred host plant of the monarch. It prefers good drainage but thrives best in moist locations.
- 2. BUTTERFLY MILKWEED** (*Asclepias tuberosa*) Height 2-3 feet. Prefers dry, well-drained sunny locations; will thrive near paved surfaces. With its orange and yellow bloom, it attracts many pollinators besides butterflies. Easiest milkweed to find at nurseries.
- 3. SWAMP MILKWEED** (*Asclepias incarnata*) Height 4-6 feet, pink or purple blooms. Grows naturally in wet conditions and can tolerate well-watered gardens.
- 4. WHORLED MILKWEED** (*Asclepias verticillata*) Height 1-2 feet, white bloom with narrow leaves. Grows best in well-drained, sunny locations. Prolific spreader; adds an airy appearance to the garden.
- 5. PURPLE MILKWEED** (*Asclepias purpurascens*) Height 3-4 feet, tolerates light shade and moisture. Compact plant with a wonderful purple bloom. Difficult to find in nurseries.

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milkweed plants. It is easiest to start with milkweed plugs in the spring, as seeds can prove difficult to get started. If you do plant seed, you'll want to plant in late fall or early spring to allow the seeds to go through the cold stratification period they require to germinate. This can also be done by placing the seeds in a moist paper towel in your refrigerator for 30 days.

It is important to note that milkweeds can be prolific spreaders once established in a garden. If you are concerned with keeping your milkweed contained in one location, pick the seed pods when ripe. You can tell a pod is ripe when it browns and begins to split at the seam. You can save seeds for another season by putting them in a paper bag then storing them in a dry area.

If you have a waystation or decide to create one, please consider registering it online with Monarch Watch. This allows the organization to keep track of how many gardens have been created in Kentucky and adds your waystation to the national registry. Kentucky currently has just over a thousand waystations are currently recorded in Kentucky, which has exceeded the goal of 1,000 as part of the Kentucky Monarch Conservation Plan.



AND NOW, WE WAIT

So, you have your waystation planted - now what?

If you're looking for other ways to help monarchs, consider becoming a member of Kentucky Wild. This program provides funding to projects which enhance wildlife diversity like the monarch conservation initiative. You'll find an online link to the program at fw.ky.gov/kywild.

Also, once spring arrives, report your monarch sightings to Journey North. This organization tracks sightings throughout the migration cycle. Look online at JourneyNorth.org to add your observations to the monarch map.

Your data allows the organization to create maps that allow people to view the migration in real time.

Don't forget to take time to appreciate the beautiful garden you have created. By taking this action, you are providing much needed resources for the monarch butterfly to carry out its beautiful life cycle and incredible migration. You are truly making a difference!

IT TAKES A VILLAGE OF PLANTS

Suggestions for monarch waystation plants from Linda Porter of The Garden Club of Kentucky and the Lexington Chapter of Wild Ones:

1. Anise Hyssop (*Agastache foeniculum*) Blooms all summer and provide late season nectar.
2. Milkweed (*Asclepias species*) All milkweed plants are a wonderful source of nectar for monarchs and other pollinators.
3. Purple Coneflower (*Echinacea purpurea*) Blooms in summer, attracts monarchs and other butterflies.
4. Pale Purple Coneflower (*Echinacea pallida*) Blooms in late spring (sooner than purple coneflower) to provide support for early arriving monarchs.
5. Mistflower (*Eupatorium coelestinum*) Blooms in fall for migrating monarchs.
6. Joe-Pye Weed (*Eutrochium purpureum*) Large plant that blooms from late spring into fall. Attractive to butterflies.
7. Dense Blazing Star or Gayfeather (*Liatris spicata*) Summer blooms. Easiest blazing star to acquire in nurseries. All blazing star species are wonderful monarch attractors.
8. Sweet Susan (*Rudbeckia subtomentosa*) Blooms summer into fall.
9. Rough Goldenrod (*Solidago rugosa*) Shorter goldenrod and easiest to manage than other species. Blooms later summer into early fall.
10. Aromatic Aster (*Symphotrichum oblongifolium*) Blooms during fall migration. Shorter and less aggressive than some other asters.

THE LAST HOPE

RESTORING RARE MUSSELS TO THE BIG SOUTH FORK

Troublesome Creek is aptly named.

On a hot June day this summer, one of three all-terrain vehicles carrying some of the world's rarest mussels floundered in the greasy blue-green mud of a Troublesome Creek bog. Researchers hooked the stuck ATV's winch cable to the lead vehicle, and amid much splattering mud, it finally came free.

Reprinted from *Kentucky Afield*, Fall 2008

These were modern-day trailblazers: using chainsaws to clear large trees from their path, slashing through brush, dodging rocks that could puncture an oil pan and teetering on the edges of high cliffs. They labored through the thick McCreary County woods on ATVs, with a mission of restoring several rare species to the Big South Fork of the Cumberland River. Pulling a species back from the brink of extinction sometimes requires a considerable amount of sweat equity. Monte McGregor, who heads mussel restoration efforts for the Kentucky Department of Fish and Wildlife Resources, believes it is a worthwhile cause.

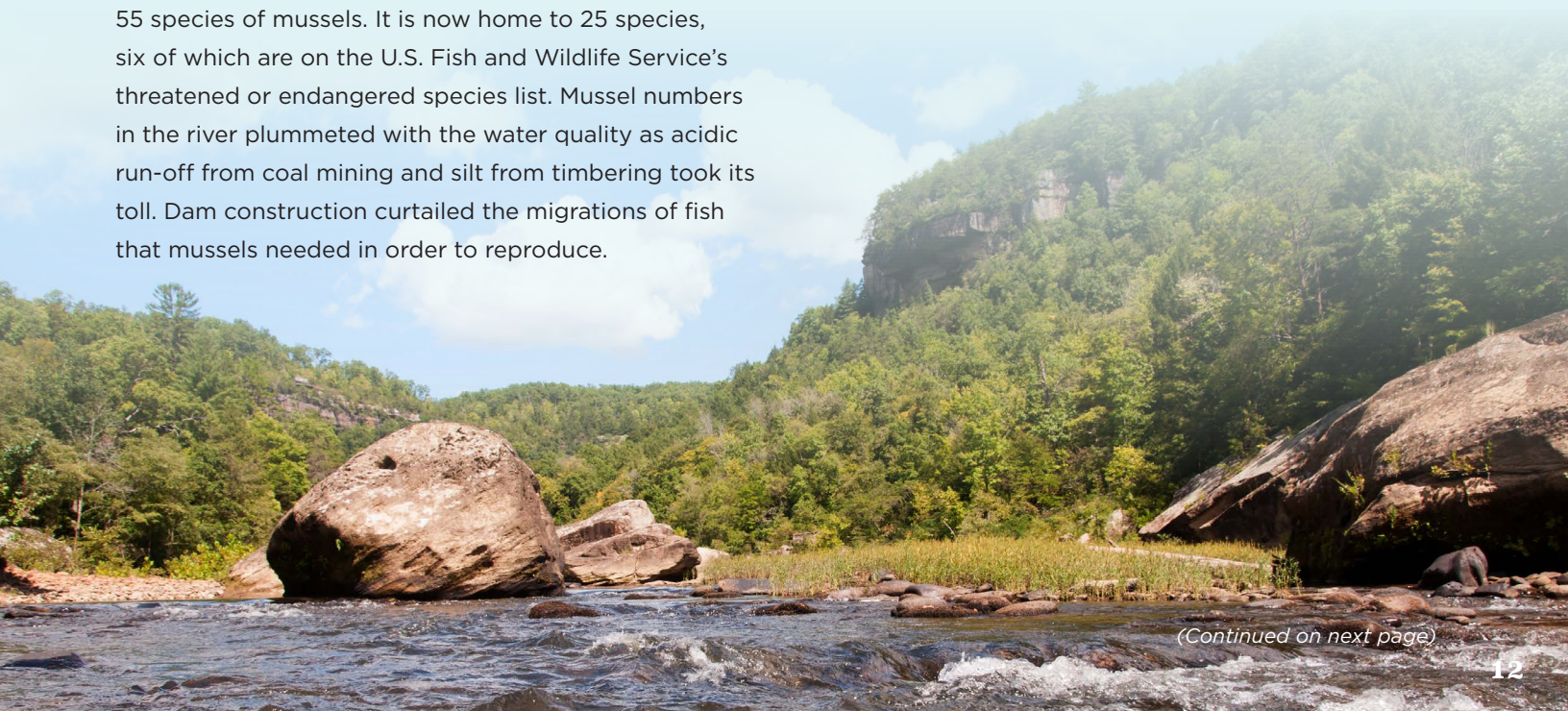
"In a couple of years, we should have nine to 12 federally endangered species (in the Big South Fork)," he said. "We'll have one of the richest sites of rare mussel species in the world."

The Big South Fork of Cumberland River once held 55 species of mussels. It is now home to 25 species, six of which are on the U.S. Fish and Wildlife Service's threatened or endangered species list. Mussel numbers in the river plummeted with the water quality as acidic run-off from coal mining and silt from timbering took its toll. Dam construction curtailed the migrations of fish that mussels needed in order to reproduce.

Kentucky Fish and Wildlife founded the Center for Mollusk Conservation – a mussel hatchery - in an effort to reverse the decline of mussels in the state. Researchers hope improved water quality will allow new populations of rare mussels to take hold. Recent efforts to restore mussels have included experimental stockings in the Green River and the main stem of the Elkhorn Creek in Franklin County.

On this June day, scientists carried the effort to a remote section of river near the Kentucky-Tennessee state line.

The lead ATV carried 48-quart coolers containing 142 fluted kidneyshell mussels, 19 dromedary pearlymussels, 43 spectaclecase mussels and 97 oyster mussels obtained from the Clinch River in Tennessee. Aerators and bottles of frozen river water kept the mussels healthy for the initial two-hour, 2 1/2-mile trip to the stocking site.



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Consultant Steve Ahlstedt, a retired mussel biologist with the Tennessee Valley Authority and the U.S. Geological Survey, joined researchers for the arduous trip. “This is historic,” he noted. “These mussels haven’t been seen down here in nearly 100 years.”

The Big South Fork’s mussels once provided sustenance to the people who lived along its banks. Families scoured the bottom of shallow shoals and collected pearls that grew in mussels such as the pink heelsplitter, said National Park Service biologist Steve Bakaletz.

“The country people would come down to the river on Sunday after church and look for pearls,” Bakaletz explained. “They would see if the Lord was looking out for them. It was like the lottery to them. It was the cash crop down here before tobacco.”

In 1904, a pearl from the river garnered \$4,000 at market in Clinton, Tennessee. “Clinton was the pearl buying center for the eastern United States,” Bakaletz explained.

Researchers chose an old mussel hunting ground for their modern-day mussel restocking. Their destination? A shoal located where Troublesome Creek pours into the Big South Fork, just upstream of a house-sized boulder known to local residents as Shiprock. Ahlstedt noted that rivers in this part of the country are prone to flash flooding because of the sandstone that underlies this area. Water rises and runs off quickly, producing tremendous scour on the bottom.

The Troublesome Creek confluence provided an ideal location for the stocking, however. “There are very

few places on this river like this with gravel, sand and pebbles,” Ahlstedt explained, “This is good habitat for mussels. Few shoals on the Big South Fork of the Cumberland are good for mussels.”

Researchers first measured the width of the shoal and planned where to look for mussels already living in the river. They found the Cumberlandian combshell mussel and the littlewing pearlymussel. Both of these species are on the U.S. Fish and Wildlife Service’s endangered species list. They also found several common mussels such as the pimpleback and the pink heelsplitter.

After the initial survey, the group carried the new mussels in mesh bags to the river; they arranged the species in the same pattern as they would be found naturally in the river. McGregor checked the health of the new mussels on a return trip several weeks later. They appeared alive and doing well despite the rugged trip to their new home.

McGregor wants to safeguard rare mussel species found only in the Cumberland River system by establishing them in other Kentucky rivers. “One environmental spill coming down river and it could wipe them out,” McGregor explained. “The littlewing pearlymussel is in severe decline throughout its range. They’ve dropped out at every place they are found.”

Mussels perform a valuable service by filtering the water of sediments and are an indicator species of the health of the stream. With hope, there will be more of the rarest ones on Earth cleaning the water of the Big South Fork of the Cumberland River.



GETTING WILD IN THE BACK YARD

It’s fun to find ways to bring wildlife into your back yard, especially with development crowding them out of their homes. They especially need our help during the winter months. Here’s how to get started:

1. PLAN

Decide what animals you’d like to attract. Plan to take the good aspects (they’re cute!) with the bad (they might eat your garden).

2. FOOD

Research and plant the foliage these animals eat. Native plants work best.

3. WATER

That can be as easy as putting out a birdbath or building a pond.

4. SHELTER

Animals need places to feel safe and to raise their young. It can be shrubbery, a nesting box or a brush pile on the edge of the yard.

The National Wildlife Federation Web site has tons of information about attracting backyard wildlife.

Go to: nwf.org/home/garden-for-wildlife

KEEPING IT *Wild!*

SUSTAINING KENTUCKY'S NATIVE WILDLIFE

Western Kentucky Hardwood Bottomland:

Four river systems meet in Western Kentucky. These systems and the wetland and bottomland forests around them provide habitat for many animals. The cypress swamps here are found nowhere else in the state. The wetland areas are also important for a healthy environment since they store floodwaters, trap sediment (soil in the water), and clean water by naturally filtering it. The Bald cypress is where wild things are in Western Kentucky!



National Wildlife Federation

Bald cypress is a very important tree in the swampland ecosystem. It is valuable for wildlife food and cover. Canadian geese migrating to the south feed on the seeds from this tree as they pass through our state. Swamp rabbits and several species of birds, such as cranes and ducks, also feed on Bald cypress. White-tailed deer escape to the cover of Bald cypress swamps during hunting season. Many animals find shelter in and around the base of large old-growth trees.

Central Kentucky Forest Edge:

Central Kentucky's forests and fields show that they were once prairie and savanna habitats. You can still see what is left of the ash-oak savannas, cedar glades, and prairie lands when traveling down roads that started out as bison trails. Most wildlife here is adapted to living in an open land or "edge" habitat. Edge habitat describes the area where grassland and forestland meet. You'll find lots of wild things in and near Bur Oaks!



Arborilogical

Bur Oaks grow well in the clay soil and open grassy areas of Central Kentucky; it is often planted in prairie grasslands because it doesn't mind dry habitats. This tree provides cover for many birds and small mammals, even in winter, since its leaves often stay on. Animals also use Bur Oak leaves and twigs as nest materials. Bur Oak acorns are also a tasty treat to many animals, including the Eastern Cottontail, White-footed Mouse, Eastern Gray Squirrel, Blue Jay, Northern Bobwhite, Wild Turkey, Mallard, Common Crow, Eastern Chipmunk, Raccoon, and White-tailed Deer.

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Eastern Kentucky Mountain Ridge:

The forests in the mountains of this area of Kentucky are a mix of hardwood and evergreen trees. The soils are not too wet or dry and the weather is not too cold or hot. The soils here are made up of a lot of rotted leaves and wood that soak up rainwater so the soils stay moist. The hills in this forested area serve as important watersheds where many rivers and creeks start. An important tree to the wild things in Eastern Kentucky is the American Beech.

American Beech fruit, called Beechnuts, are an important food source for many animals including: red foxes, raccoons, Virginia opossums, squirrels, eastern chipmunks, beavers, ducks, and many others. American Beech provides cover for many of these animals as well and is a favorite nesting site for Chickadees!



National Park Service

Vernal Pool:

Vernal pools can be found in any sunken place where water can collect without draining away. These pools are usually not deep and don't hold water all year long. Fish don't live in them since they eventually dry up, which is good news for amphibians like frogs and salamanders because without fish to eat their eggs and babies, these pools become nurseries for amphibians to raise their young. Many times, vernal pools occur where trees have fallen leaving a hole where the roots used to be. Sugar Maples are a favorite tree for wild things living near vernal pools in Kentucky!



Purdue Fort Wayne

Sugar Maples like cool, moist climates. Near a vernal pool is a likely place to find this tree. Young Sugar Maples are one of the favorite foods of White-tailed Deer. Seeds are eaten by squirrels and birds. Bees and butterflies, such as the Tiger Swallowtail and Mourning Cloaks visit Sugar Maple flowers. Sugar Maples also engage in hydraulic lift, drawing water from lower soil layers and exuding that water into upper, drier soil layers. This not only benefits the tree itself, but it is also good for all the plants growing around it.

KENTUCKY CREATURE FUN FACTS!

There are 47 threatened and endangered species in Kentucky



The Eastern Hellbender is one of the largest salamanders in America and has been in existence for over 150 million years.



ESTABLISHING WILDLIFE HABITAT IN YOUR WOODLAND



woodland. Most forest and wildlife objectives need to be narrowed down to get management practices implemented on-the-ground. Most wildlife species basically need food, cover, and water to survive.

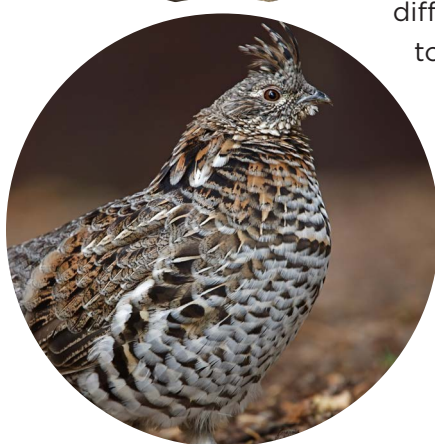


Woodlands provide different varieties of food for wildlife species. Tree and shrub species can produce berries, fruits, nuts and acorns. These foods are referred to as soft mast and hard mast within the tree canopy and understory of the woodland. Both the forester and wildlife biologist will recommend options where forest and wildlife management go hand in hand. For example, the management objective is hard mast production, the tree canopy will need to be dominated by mature white oak, red oak and hickory species to assure acorn production. Managing for wildlife habitat could be thinning young stands to move them from the sapling stage into pole timber or creating a small forest opening by removing over mature trees from the canopy. Wildlife species depend on tree species being in different age classes. So, it gets back to the woodland owner's objectives and what wildlife species they want to manage within their forest management plan.



Kentucky woodlands provide wildlife habitat to white tailed deer, turkeys, raccoons, birds, bats, snakes and other amphibians. Woodlands can be managed to create and enhance habitat to attract more wildlife species.

Woodland owners will work with a professional forester and wildlife biologist to develop a forest management plan for their property. A forest management plan will have wildlife and forest management objectives that are specific to the landowner's management goals for their



Wildlife species need different types of cover and habitat structure. Cover could be temporary in nature, open fields or

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permanent wildlife habitat required by each particular wildlife species. Woodlands can be regenerated to create successional habitat or range in age and maturity of tree species in a closed canopy situation. Dead snags can serve as an important source of cover for wildlife species also.

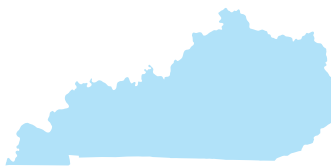
The third important factor for wildlife species is a vital source of water on the woodland owners property. A pond or lake can attract all kinds of wildlife species. Building ponds or lakes is not always financially feasible for a woodland owner. Vernal ponds can be created for a water source within a woodland and



will hold water at certain times of the year. Some woodlands have rivers, streams, wetlands, and natural springs that can provide additional sources of water for wildlife species. A woodland owner can protect and manage water resources identified in their forest management plan that attracts wildlife species they are managing.



- 1) Photos provided by Dr. Matthew T. Springer, University of Kentucky, Department of Forestry and Natural Resources
- 2) Frog photo is from Kentucky Department of Fish and Wildlife Resources



KENTUCKY CREATURE FUN FACTS!

Male Cardinals take a break from singing in the cold winter months.



The barking tree frog resembles a tennis ball and sounds like a dog.

The Kentucky Cave Shrimp is found nowhere else on the earth but Mammoth Cave.

SO MUCH WILDLIFE TO SEE



There are not many places you can see a bear, bass, bobcat, rattlesnake, snapping turtle, bison, elk and eagle all in the same day, but the Salato Wildlife Education Center in Frankfort is close to home! Take a hike through the woods, walk behind a waterfall or grab a net and work a fishing shocking boat.

There's plenty to do at the center. Learn more about the Salato Center and find out about special events online at fw.ky.gov/Education/Pages/Salato-Wildlife-Education-Center.aspx.



MAKING A COMEBACK

Twenty years ago, you couldn't find any elk or bears in the wilds of Kentucky. Now you can see both species roaming the southeastern part of the state. These are examples of wildlife coming back on its own, or with a little help from people. Either way, animals need the right habitat - such as grasslands or forests - to thrive.

Bears and elk were hunted out of existence in Kentucky by the 1850s. Intense logging of the mountains began

soon afterward. Without this forest habitat, a bear had no place to stay.

The forests eventually grew back. About 15 years ago, bears from Virginia, Tennessee and West Virginia started wandering into Kentucky to live.

Few wild elk existed in the Eastern United States, however. So in 1997, Kentucky captured more than 1,500 elk from six western states and released them in the mountains. The grasslands created at reclaimed coal mines and the surrounding forest provided the right habitat for elk to thrive. Now more than 10,000 elk roam the state.

These restorations worked because the right habitat existed. Kentucky's next big restoration project is quail. Just releasing birds doesn't work because quail need overgrown fields to hide and thrive. So what will it take to restore quail? Restoring the habitat first.



2023/Keeping It WILD!

Sustaining Kentucky's Native Wildlife.

Conservation Writing and Jim Claypool Art Contest | RULES

STATE WINNERS:

First: \$250; Second: \$150; Third: \$50

REGIONAL WINNERS: \$50

COUNTY LEVEL WINNERS: \$25

* State/Regional winners will receive a personalized certificate. County winners that win regional or state awards will only receive one check for the top prize.

RULES

1. Kentucky students grades 6-12 are eligible to compete in the writing contest. Students up to grade 5 may compete in the art contest.
2. A student may not enter both the art contest and the writing contest during the same contest.
3. An entry must be created by one and only one student. Any entry submitted by more than one student will be disqualified.
4. All entries become the property of the contest sponsors. The decisions of the judges at all levels of competition are final.
5. Top three writing entries and/or artworks from your school must be submitted to your local county conservation district by Dec. 1, 2023.
6. **ARTWORK:** Student entries shall be 8 1/2" X 11". Entries may be digital or submitted on any color or thickness of art board (poster board, mat board, etc.) or may be on art paper, which is firmly affixed to art board. All artwork must be two-dimensional (2-D). Three-dimensional (3-D) artwork will not be accepted. Artwork may be rendered in any medium: pencil, ink, charcoal, pastel, crayon, paint, photography, etc. Mixed media and collage work is acceptable as long as all pieces are securely glued to the surface of the work. All entries must convey at a glance an accurate understanding of the information provided in the tabloid, the theme of the competition, and persuade the viewers of the need for good wildlife conservation practices. All entries must be the original work of the student.
7. **WRITING:** Entry may not exceed 1,000 words and must be written in ink or typed on one side of paper only. No photographs or artwork may be included with the written work. The written entry should demonstrate an accurate understanding of the information provided in the tabloid and inform the reader about wildlife conservation. Students should write from the perspective of an informed writer to a less informed reader and may be in the form of a letter, article, editorial or speech. The work should be from the student author and avoid plagiarism from this source or other sources. ALL sources should be reputable and cited appropriately.
8. The entry form to the right must be completed and attached to your entry.

HELPFUL HINTS

- Keep entry simple and sincere.
- Be creative and original. Avoid plagiarism by using original words and ideas. Plagiarism is defined as the act of stealing and passing off the words of another as your own without crediting the source.
- Consider an area of wildlife conservation that is important to you, your family and your community.
- Draw from your personal interests or experiences.
- Writing entry should take the form of informational.
- Think about wildlife issues in your community, farm, subdivision or city.
- DO NOT use this tabloid as your only source.
- Interview people in your community about changes in wildlife issues
Find ways to improve wildlife issues in your community. TAKE ACTION!

POINT SYSTEM FOR ART

- **50 points** - Purpose/Audience. (Appropriate communication style to reach audience, establishes and maintains a purpose; and holds to subject in community. Theme clearly conveyed at a glance.)
- **30 points** - Composition/creativity/craftsmanship. (Layout, originality, and quality of work, such as neatness.)
- **20 points** - Language/correctness. (Word choice, usage, spelling, punctuation, capitalization.)

POINT SYSTEM FOR WRITING

- **30 points:** Purpose/Audience (establishes and maintains a purpose, communicates with audience, employs a suitable tone)
- **20 points:** Organization (logical order, coherence, transition organizational signals)
- **20 points:** Idea Development/Support and Evidence of Research (student's original work shows sources of research)
- **30 points:** Correctness (spelling, punctuation, capitalization), Language (word choice, usage), Sentences (varied in structure and length, constructed effectively, complete and correct)

ENTRY FORM

Conservation Writing and Jim Claypool Art Contest

Name (Miss, Mr) _____

Parent's Name _____

Home Address _____

City _____ Zip _____

Home Phone () _____

Age _____ Grade _____ Teacher _____

County _____

School _____

School Phone () _____

I hereby certify that I have read the rules and helpful hints and this entry is the original work of:

Student Signature

Parent/Guardian Signature (required)

Teacher or Principal Signature (required)