

LaBarque Creek

Land Stewardship Initiative



Ozark Highlands



Bleeding Shiner



Mottled Sculpin



Sandstone Bluff

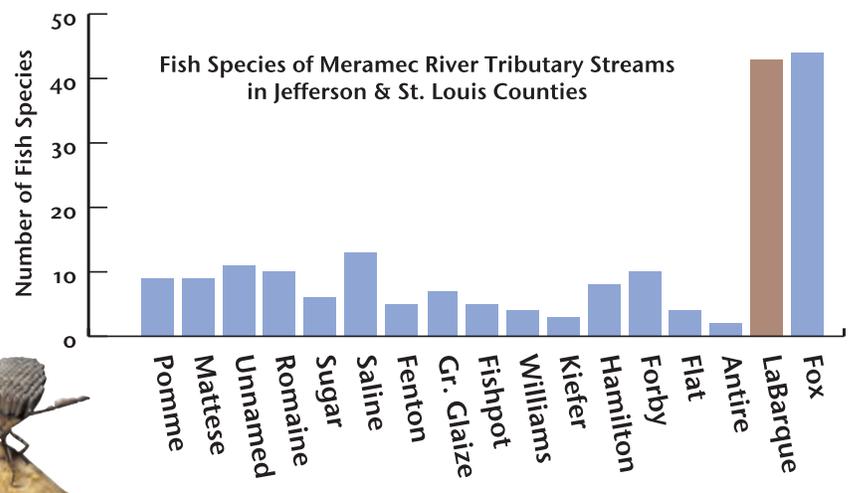
LaBarque Creek provides over six miles of high quality Ozark stream in northwest Jefferson County. Although extremely close to the St. Louis metropolis, LaBarque Creek supports 42 species of fish, one of the highest levels of aquatic diversity in the region (see table).

Current land development practices pose a major threat to urban stream health through increased stormwater runoff and erosion. Additional sediment in creeks and streams results in less oxygen and habitat available for fish and other aquatic organisms.

LaBarque Creek currently retains much of its natural character, but the rapid rate of development in the St. Louis area could impact stream quality. Working with private landowners to use land conservation tools will ensure that LaBarque Creek and its watershed remains a natural treasure.

Land Conservation Tools:

- Donated conservation easements
- Purchased conservation easements
- Community land trusts
- Land donations
- Deed restrictions
- Conservation buyer program

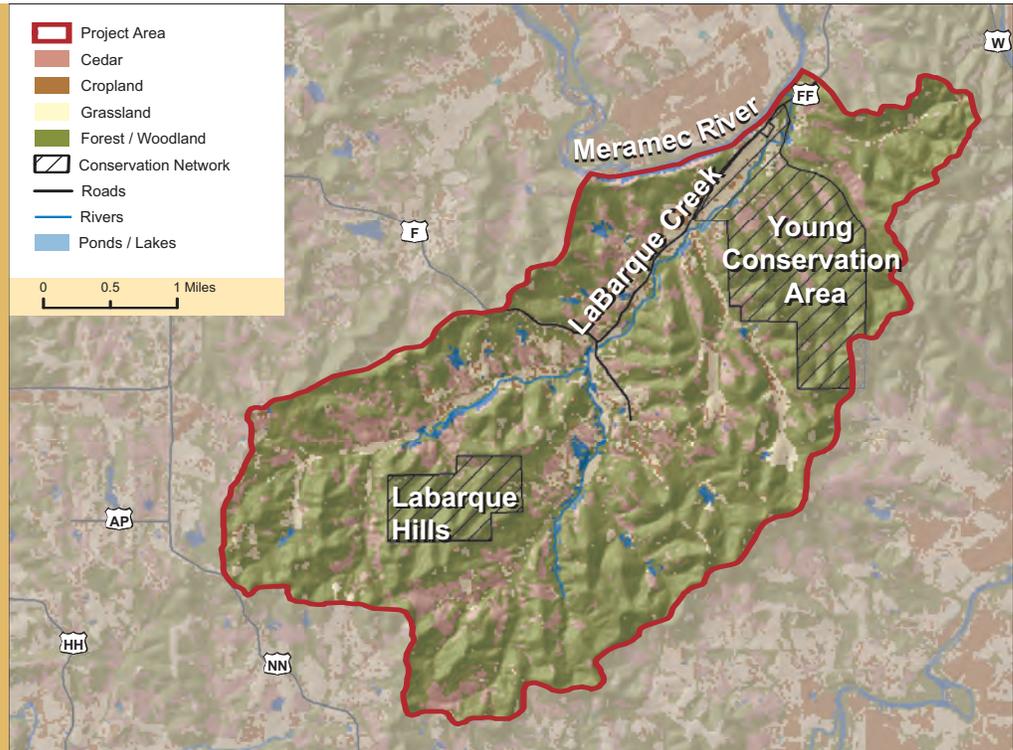


Landscape	Community	Species
LaBarque Creek Watershed	Ozark Headwaters Stream	Bleeding Shiner, Bigeye Shiner, Bluntnose Minnow, Silverjaw Minnow, Fantail Darter, Greenside Darter, Hornyhead Chub, Mottled Sculpin, Orangethroat darter, Ozark Minnow, Rainbow Darter, Slender Madtom

Missouri Department photos: Bleeding Shiner, Cliff White; Mottled Sculpin, Jim Rathert; Sandstone Bluff, Tracy Boaz

Strategic Conservation Goal:

Protect and conserve the natural integrity of LaBarque Creek and its 8,400-acre watershed by implementing a land conservation program.



Desired Change	Proposed Monitoring
↓ Unaltered natural stream channel	Verify channel condition using ground or aerial surveys every five years
↑ Maintained or improved wooded riparian corridors to protect stream habitat	Verify riparian corridor condition using aerial and ground surveys every five years
↑ Maintained healthy aquatic community integrity	Survey fish and aquatic animals every five years
↓ Unaltered floodplain	Assess land cover using satellite imagery or aerial photography every five years
↑ Sustained or improved water quantity and quality	Monitor stream flow, suspended solids and related water chemistry



To learn more about the LaBarque Creek Land Stewardship Initiative, please contact:



Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180

Greater Prairie-Chicken

Recovery Initiative



Grasslands Coalition
Focus Areas



Greater Prairie-chicken



Prairie-chicken Lek



Native Prairie

As a result of continuing population declines throughout the state, the Missouri Department of Conservation (MDC) added the greater prairie-chicken to Missouri’s endangered species list in 1999.

Greater prairie-chickens once thrived on the vast tracts of open grassland that blanketed a third of the state. Now just a fraction of a percent of native prairie remains. The greater prairie-chicken is just one of many prairie species imperiled by the loss of tallgrass prairie habitats.

The key to conserving prairie-chickens and other tallgrass prairie species is cooperative land management across prairie landscapes. Conservation at the scale needed will necessarily involve many partners, including the residents of Missouri communities that share a common geography with remnant tallgrass prairie habitats and the remaining prairie-chicken populations.

The Grasslands Coalition, a public/private partnership committed to the conservation of Missouri’s native grasslands, is refocusing conservation attention on recovering this symbol of healthy tallgrass prairie ecosystems.

Working together, we can recover the prairie-chicken in Missouri. The Grasslands Coalition invites your input and participation in this conservation project.

Recovery Goal: Remove greater prairie-chickens from the state’s endangered species list.

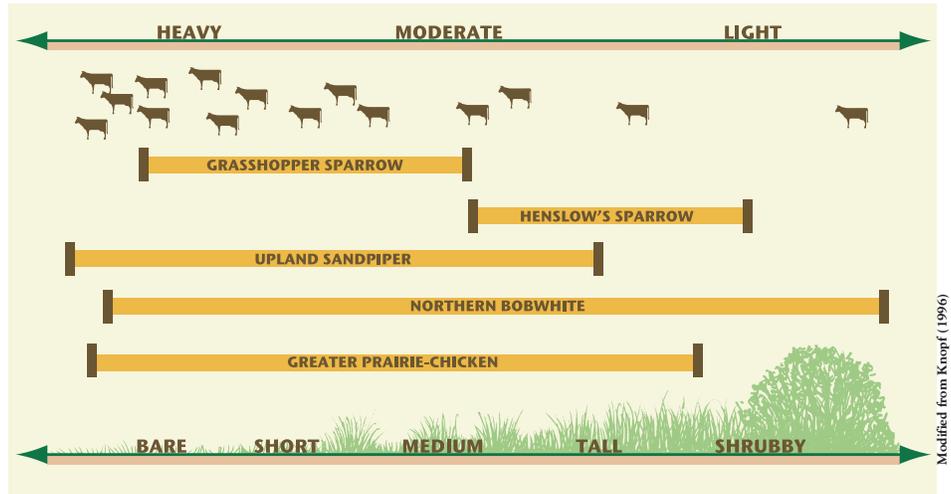
- Recovery will be considered accomplished when Missouri has a statewide population of at least 3,000 birds throughout the Grasslands Coalition Focus Areas for 10 years.

Grassland Habitat Goal: Each prairie-chicken population will require a minimum of 4,000 acres of grassland habitat within a 10,000 acre landscape.

- The 4,000 acres of managed grassland bird habitat should include a protected 2,000 acre core centered on prairie chicken leks and scattered tracts making up the remaining 2,000 acres. At least half of these scattered tracts should be greater than 100 acres.

Targeted Landscape	Targeted Species
Native prairie/wildlife friendly grassland complexes	Greater Prairie-chicken, Grasshopper Sparrow, Henslow’s Sparrow, Upland Sandpiper
Other Species that will Benefit	
Eastern Prairie Fringed Orchid, Western Prairie Fringed Orchid, Oklahoma Sedge, <i>Carex bicknellii</i> , <i>Carex missouriensis</i> , <i>Carex opaca</i> , Wolf’s Spike Rush, Mead’s Milkweed, American Burying Beetle, Prairie Mole Cricket, Regal Fritillary, Grassland Crayfish, Northern Crawfish Frog, Slender Glass Lizard, Bullsnake, Ornate Box Turtle, Topeka Shiner, Bobolink, Bell’s Vireo, Scissor-tailed Flycatcher, Dickcissel, Eastern Meadowlark, Northern Harrier, Sedge Wren, Loggerhead Shrike, Swainson’s Hawk, Hispid Cotton Rat, Prairie Vole, Black-tailed Jack Rabbit	

Grassland birds require a wide variety of plant heights and densities ranging from bare ground to tall grasses. One method used to produce this structural diversity in grasslands is called patch burn grazing. Patch burn grazing mimics the historical interaction of two ecological processes that shaped native prairies—fire and grazing. Each year a third of the pasture is burned. The lush regrowth focuses grazing within the burned area. The burned unit shifts from year to year, providing varied structure throughout the managed area.



Modified from Knopf (1996)

Desired Change	Proposed Monitoring
↑ Increasing numbers of prairie-chickens	Population survey of prairie-chickens annually
↓ Decreased fragmentation in prairie landscapes	Periodic assessment of land cover using satellite imagery or aerial photography
↑ Increased acres of prescribed fire management, rest-rotation and patch-burn grazing	Acres benefited as reported by MDC Private Lands program monitoring
↓ Decreased acres of grassland dominated by fescue	Periodic assessment of land cover using satellite imagery or aerial photography/ground truthing
↑ Increased acres of cropland restored to native grasses and prairie forbs or wildlife friendly grasses	Periodic assessment of land cover using satellite imagery or aerial photography
↓ Declining amount of sericea lespedeza due to active control methods	Field visits and regular site evaluations
↑ Improved native plant community composition on remnant prairies	Vegetation sampling to detect changes in conservative prairie plants at 3-year intervals
↑ Increased community awareness and involvement in prairie conservation	Human dimensions survey and workshops

This initiative represents just one aspect of tallgrass prairie conservation. The Grasslands Coalition seeks long-term protection of prairie landscapes including the full array of native natural communities and species.

To learn more, please contact:



Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180

Roaring River

Conservation Opportunity Area

Glade and Woodland Restoration Initiative



Ozark Highlands



Eastern Collared Lizard



Low Prickly Pear



Chuck-Will's Widow

Frequent, low-intensity fires shaped Roaring River's grassy glades and open woodlands. Fires likely occurred every three years prior to European settlement, but recent fire exclusion has led to dense second-growth forests and cedar thickets on former glades. Less than 5% of previous glade habitat remains open in the Roaring River landscape. Glade-associated wildlife including collared lizards, roadrunners, Bachman's sparrows and tarantulas have severely declined or disappeared. Removing cedar trees and reestablishing the grass and wildflower dominated hilltops is the only way to restore these animals to healthy populations. Approximately 12,000 acres of glade and woodland restoration potential exists within the project area (7,000 acres within the existing conservation network; 5,000 acres on privately owned land).

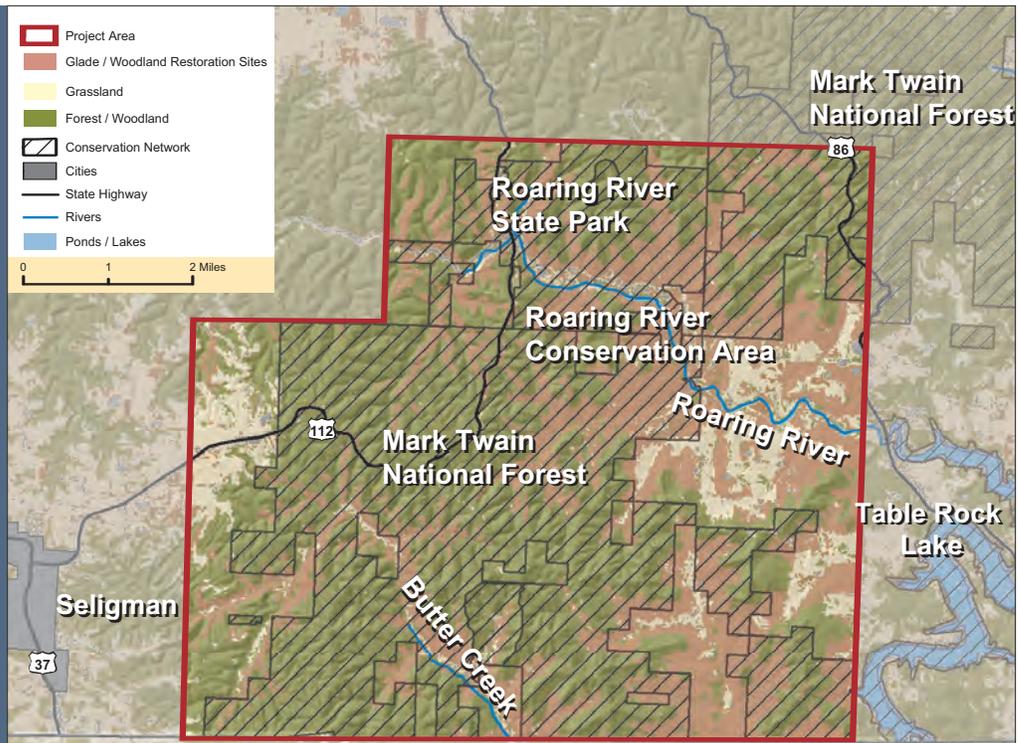
Glade. A natural, grassy opening in a woodland or forest; in Missouri, glades are usually located on hillsides and are a result of rock or soil conditions.

Woodland. A plant community with trees spaced to form an open canopy with a dense ground cover of sun-loving plants, including grasses.

Landscape	Community	Species
 <p>Glade and woodland complexes</p>	<p>Dry chert woodlands, Dry limestone/dolomite woodlands, Dry-mesic chert woodlands</p>	<p>Three-toed Box Turtle, Smooth Earth Snake, Northern Fence Lizard, Whip-poor-will, Chuck-will's widow, Orchard Oriole, Great Crested Flycatcher, Summer Tanager</p>
	<p>Dolomite Glades</p>	<p>Pale Gerardia, Bush's Poppy Mallow, Marine Vine, Fremont's Leather Flower, Umbrella Plant, Stemless Evening Primrose, Low Prickly Pear, Stenosiphon, Ozark Spiderwort, Venus' Looking Glass, Ozark Corn Salad, Arkansas Yucca, Eastern Collared Lizard, Flat-headed Snake, Greater Roadrunner, Painted Bunting, Bachman's Sparrow</p>

Strategic Conservation Goal:

Use prescribed burning and cedar tree removal as tools to improve 2,500 acres of glades and woodlands within the Roaring River Glades and Woodlands project area.



Desired Change	Proposed Monitoring
↓ Decreased number of acres dominated by Eastern Red Cedar	Periodic assessment of land cover using satellite imagery or aerial photography
↑ Increased populations of target animals	Population trend of eastern collared lizards at 3-year intervals
↑ Improved plant community composition in dolomite glades and woodlands	Vegetation sampling to detect changes in conservative glade plants at 3-year intervals
↑ Improved canopy structure of oaks and woodland hardwoods to 30-50%	Periodic assessment of land cover using satellite imagery or aerial photography
↑ Changed landscape character (more open areas with fewer trees; more grasses and sun-loving plants)	Land based photographs at 3-year intervals
↑ Increased natural community management on private land	Number of participating landowners; number of acres treated annually

To learn more about the Roaring River Glade and Woodland Restoration Initiative, please contact:



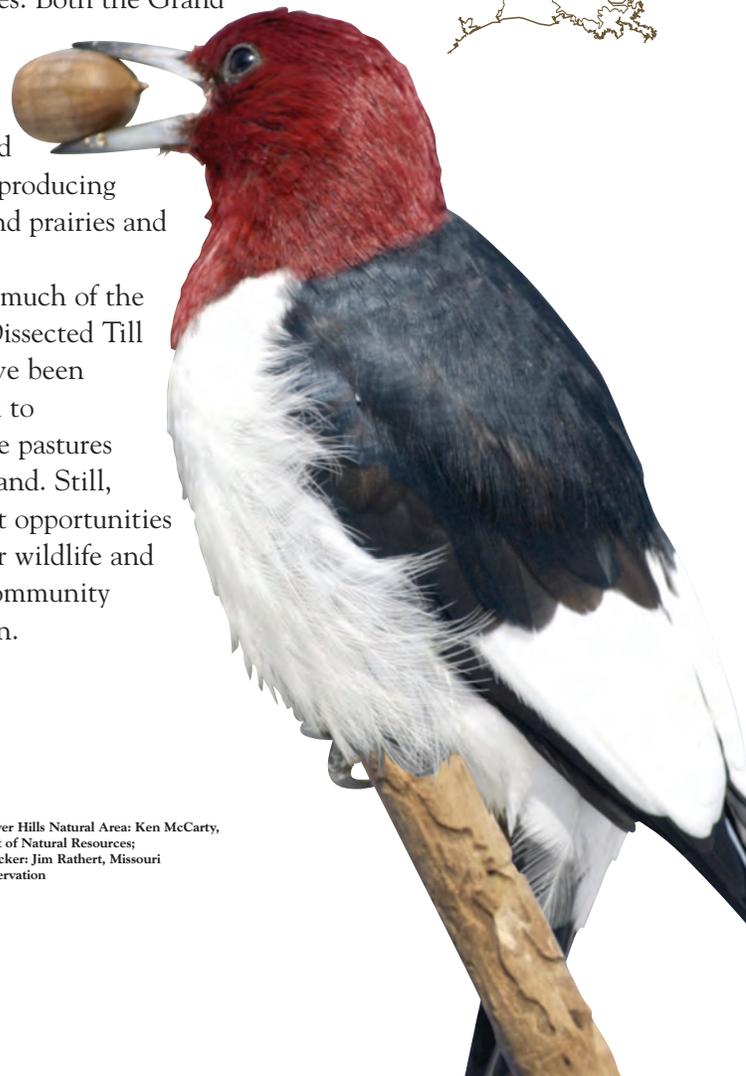
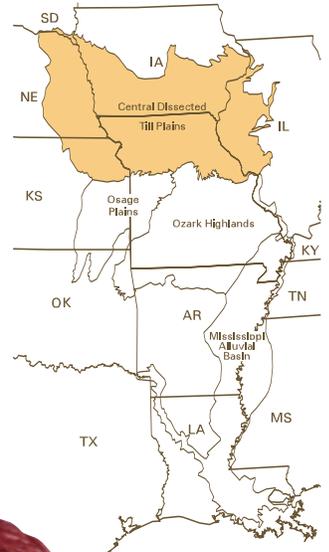
Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180

Central Dissected Till Plains

High prairie landscapes with savanna and woodland valleys characterize the Central Dissected Till Plains. These “till plains” are the result of deep soil deposited by glaciers more than 400,000 years ago. Winds blowing across the Great Plains lifted soil out of the glacial floodplains and onto adjoining hillsides, blanketing the land in a mantle of rich, silty loam. In some places this wind-blown soil, called loess, can be 25 to 100 feet thick.

On the Till Plains, wide floodplains of the Missouri River and Mississippi River developed complexes of sandbars, marshes and wet prairies. Both the Grand River and Chariton River functioned similarly, producing bottomland prairies and wetlands.

Today, much of the Central Dissected Till Plains have been converted to productive pastures and cropland. Still, significant opportunities remain for wildlife and natural community restoration.



Photos: Chariton River Hills Natural Area: Ken McCarty, Missouri Department of Natural Resources; Red-headed Woodpecker: Jim Rathert, Missouri Department of Conservation

Central Dissected Till Plains

Animal Targets of the Central Dissected Till Plains

Forest

Ringed Salamander • Four-toed Salamander • Wood Frog • Yellow-billed Cuckoo • Cerulean Warbler • Prothonotary Warbler

Woodland

Timber Rattlesnake • Red-headed Woodpecker • Eastern Phoebe • Great Crested Flycatcher • Eastern Wood-pewee • Baltimore Oriole • Orchard Oriole

Savanna

Eastern Tiger Salamander • Northern Bobwhite • Eastern Kingbird • Brown Thrasher • American Tree Sparrow • Field Sparrow • Harris's Sparrow • Indiana Bat

Prairie

Regal Fritillary • Great Plains Toad • Great Plains Narrow-mouthed Toad • Plains Spadefoot • Northern Crawfish Frog • Western Fox Snake • Northern Prairie Skink • Great Plains Skink • Illinois Mud Turtle • Northern Harrier • Greater Prairie Chicken • Upland Sandpiper • Short-eared Owl • Loggerhead Shrike • Bell's Vireo • Henslow's Sparrow • Grasshopper Sparrow • Dickcissel • Bobolink • Franklin's Ground Squirrel

Wetland

Northern Leopard Frog • Blanding's Turtle • Eastern Massasauga • Pied-billed Grebe • Little Blue Heron • Black-crowned Night Heron • Great Egret • American Bittern • Least Bittern • Common Moorhen • King Rail • Virginia Rail • Black Tern • Marsh Wren

River and Stream

Ebonysnail • Hickorynut • Rock Pocketbook • Wartyback • Elusive Clubtail • Blacknose Shiner • Blue Sucker • Brassy Minnow • Central Mudminnow • Flathead Chub • Ghost Shiner • Mooneye • Pallid Sturgeon • Plains Killifish • Plains Minnow • River Darter • Sturgeon Chub • Topeka Shiner • Trout-perch • Western Sand Darter



Eastern Tiger Salamander



Franklin's Ground Squirrel



Northern Bobwhite

Cuivre River Hills Conservation Strategies:

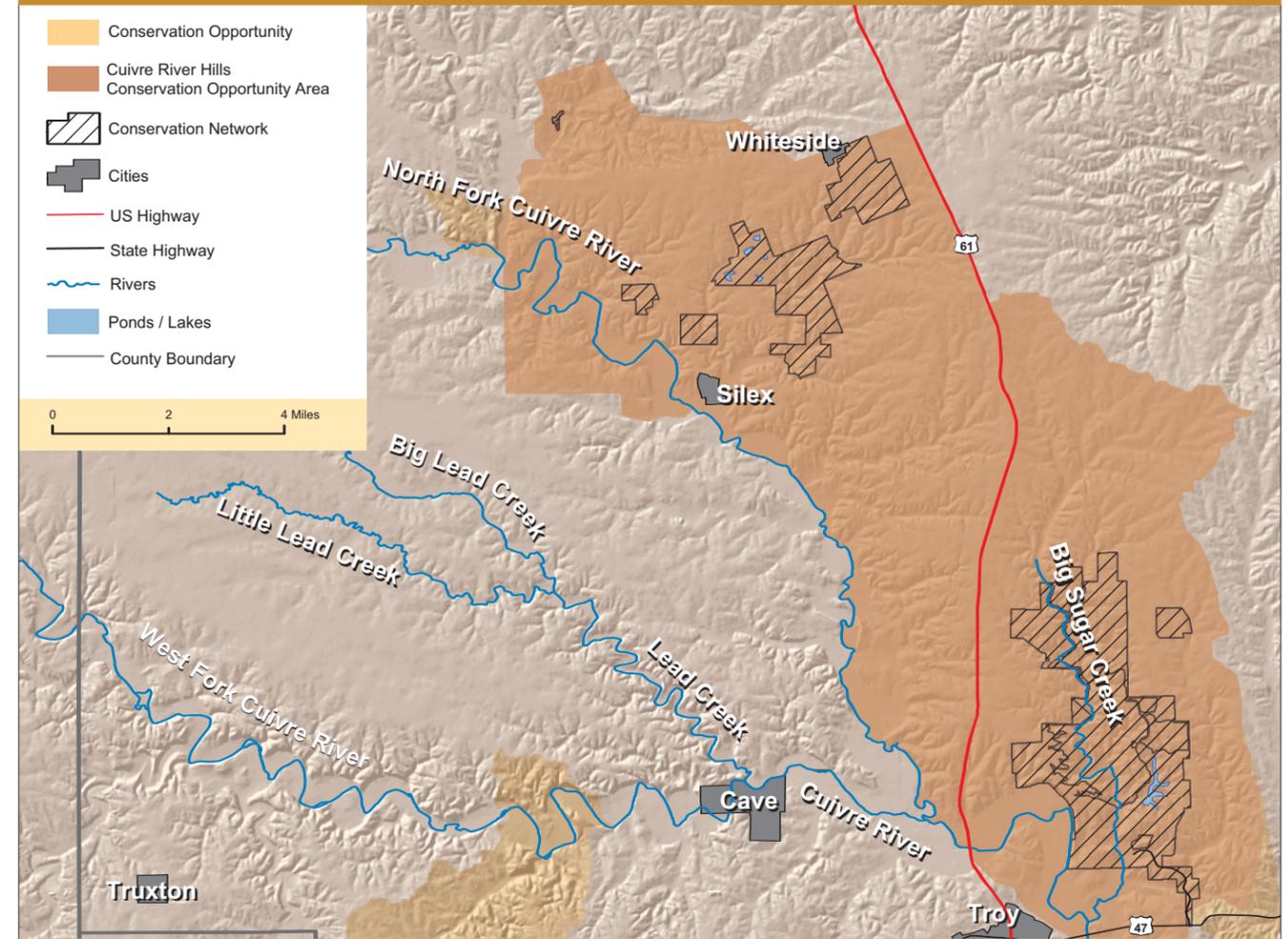
- Restore woodland, savanna, prairie, glade and forest natural communities and karst features.
- Work with willing private landowners to deliver conservation services. Encourage county and municipal officials to use watershed planning and “smart-growth” principles.
- Restore riparian corridors in the Big Sugar Creek watershed.
- Establish control programs for invasive exotic species (e.g. bush honeysuckle, garlic mustard, European buckthorn).
- Educate landowners and local citizens on the importance and value of conservation practices.
- Establish a Stream Team to monitor stream health and conduct projects on local creeks.



Lincoln Hills Natural Area includes a quarter-acre sinkhole pond within Cuivre River State Park. The pond contains aquatic plants, including pickerel weed and American lotus, and provides breeding habitat for several amphibians rarely encountered north of the Missouri River.

Bruce Schuette, Missouri Department of Natural Resources

Cuivre River Hills Conservation Opportunity Area



Priority Research and Inventory Needs

- Conduct a natural features inventory of Logan Conservation Area.
- Survey for Indiana bats.
- Continue surveys of plants and animals, especially invertebrates.
- Inventory the presence and extent of invasive exotic species.

Conservation Partners

Existing: Missouri Prairie Foundation (MPF); Girl Scout Council of Greater St. Louis; Natural Resources Conservation Service (NRCS); Lincoln County Soil and Water Conservation District (SWCD); Missouri Department of Natural Resources (DNR); Missouri Department of Conservation (MDC)

Potential: The Nature Conservancy; National Wild Turkey Federation (NWTf); Missouri Native Plant Society – St. Louis Chapter; Webster Groves Nature Study Society; St. Louis Audubon Society; Missouri Stream Teams; Missouri Conservation Heritage Foundation (MCHF); U.S. Fish and Wildlife Service (USFWS)

Funding Sources

Existing: DNR annual budget; MDC annual budget; Lincoln County SWCD State Cost Share Funds; NRCS Wildlife Habitat Incentive Program; NRCS Environmental Quality Incentives Program; Farm Service Agency Conservation Reserve Program

Promising Future Sources: MDC Wildlife Diversity Funds; MDC State Wildlife Grants; MCHF grants; USFWS Partners for Fish and Wildlife Program; NWTf Wild Turkey Super Fund; Quail Unlimited Quail Habitat Incentive Funds

Existing Conservation Network

Cuivre River State Park (Lincoln Hills Natural Area, George A. Hamilton Forest Natural Area, Big Sugar Creek Natural Area); Logan Conservation Area; White Conservation Area; Vonaventure Conservation Area; Kessler Conservation Area; Sandy Creek Natural Tunnel and Glade Natural Area; Girl Scout Camp Tuckaho



Bruce Schuette, Missouri Department of Natural Resources

Ringed salamanders are endemic to the Ozarks – they are found nowhere else in the world. The forested Ozark-like conditions of the Cuivre River Hills allow it to support the northernmost population of ringed salamanders.

Prairie Restoration



Prairie and savanna openings once occurred on flatter hilltops of the Cuivre River Hills, but today are extremely rare. Prairie restorations at Cuivre River State Park have been some of the most successful in the St. Louis area, now providing a local seed source for other prairie restoration projects.

Bruce Schuette, Missouri Department of Natural Resources

Cuivre River

Conservation Opportunity Area



Central Dissected
Till Plains



Cuivre River Hills Conservation Opportunity Area offers a glimpse of the Ozarks in north Missouri.

Bruce Schuette, Missouri Department of Natural Resources

Conservation Challenges

Several large blocks of woods are still found in rugged areas of the Cuivre River Hills Conservation Opportunity Area. Most prairies, savannas, open woodlands and glades, however, have been converted

to pasture and cropland. Potential obstacles to conservation success include urbanization and the rapid pace of development, invasive exotic species and limited budgets and staff time.

To learn more about the Cuivre River Hills Conservation Opportunity Area, please contact:



Missouri Department of Conservation
Wildlife Division
P.O. Box 180
Jefferson City, MO 65102-0180

Cuivre River Hills Conservation Opportunity Area (COA) contains many natural features (caves, sinkholes, glades, springs and rocky creeks) found more often in southern Missouri. Prairies and oak savannas formerly occupied scattered hilltops and graded into oak woodlands and forests. Today, most prairies and bottomlands have been transformed into pasture and croplands. A few large blocks of second-growth timber remain in areas with rugged terrain.

The Cuivre River Hills provide habitat for over 20 species of conservation concern. Many Ozark plants and animals are found at their northern limits here, including ringed salamanders, marbled salamanders and spotted salamanders that breed in sinkhole ponds;

adder's tongue fern, slender heliotrope and Missouri orange coneflower in limestone glades; banded sculpin and northern studfish in streams; and widow's cross on rock outcrops. Large patches of natural habitat support 40 species of nesting neotropical migrant birds. Many other birds use the Cuivre River Hills as an important stopover place on their migration routes.

Big Sugar Creek runs through Cuivre River State Park. This Ozark-like stream is ranked as one of the best protected streams in northeast Missouri. Several decidedly Ozark fish, including banded sculpins and northern studfish, occur here at the northern edge of their range.

Grand River Grasslands Conservation Strategies:

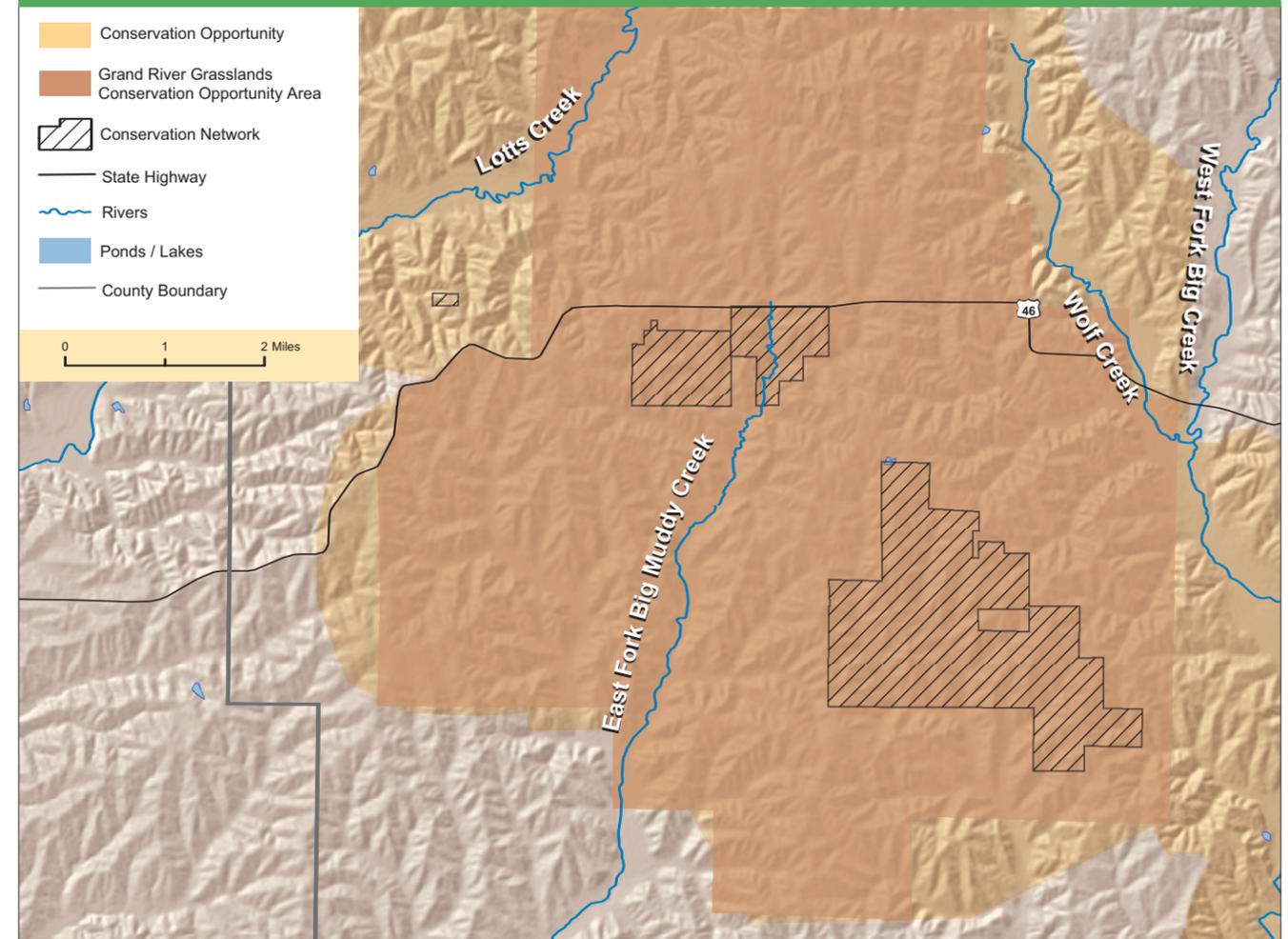
- Restore prairies and improve grasslands on private lands.
- Reduce woody plant invasion.
- Increase structural habitat diversity by promoting grazing management and increasing prescribed burns.
- Control populations of problem exotic plants (e.g., Canada thistle, sericea lespedeza).
- Continue to expand and improve native seed nurseries.
- Establish a self-sustaining population of Topeka shiners in ponds.



Jim Rathert, Missouri Department of Conservation

The Nature Conservancy and the Missouri Department of Conservation are partnering along with private landowners to build a 25,000-acre Grassland Coalition Focus Area in Harrison County.

Grand River Grasslands Conservation Opportunity Area



Priority Research and Inventory Needs

- Inventory remnant prairies and prairie indicator species.
- Determine the effectiveness of patch-burn grazing systems.
- Evaluate Topeka shiner introductions, consistent with Topeka shiner state action plan.
- Inventory amphibians, reptiles and insects.

Conservation Partners

Existing: The Nature Conservancy – Missouri Chapter (TNC); Grasslands Coalition; Missouri Conservation Heritage Foundation (MCHF); U.S. Fish & Wildlife Service (USFWS); Natural Resources Conservation Service; Iowa Department of Natural Resources; Missouri Department of Conservation (MDC)

Potential: Audubon Missouri; National Wild Turkey Federation; Missouri Prairie Foundation; Quail Unlimited

Funding Sources

Existing: MDC annual budget; TNC annual budget; National Fish and Wildlife Foundation Grant; USFWS Partners for Fish and Wildlife Program; MCHF Grant

Promising Future Sources: MDC State Wildlife Grants; MDC Wildlife Diversity Fund; MDC Landowner Incentive Program

Existing Conservation Network

Dunn Ranch Preserve; Pawnee Prairie Conservation Area (Pawnee Prairie Natural Area)

The northern harrier is one of the few hawks that nest on the ground. With the destruction of native prairies, these birds nest only infrequently in Missouri.



Jim Rathert, Missouri Department of Conservation

Native Seed Nursery



In June 1999, volunteers from The Nature Conservancy and Missouri Department of Conservation planted thousands of native prairie plant seedlings at Pawnee Prairie to have a reliable source of seeds for future restoration projects. Since then, the native seed nursery has been expanded to include 35 species of native prairie plants.

Missouri Department of Conservation

Conservation Challenges

The Grand River Grasslands Conservation Opportunity Area represents a bi-state effort to conserve native tallgrass prairie at a landscape scale. Conservation partners on both sides of the Missouri-Iowa border are working to restore a functional tallgrass prairie landscape. Potential challenges to conservation success include lack of

baseline information on prairie remnants, lack of reliable land cover data, changing ownership patterns, limited staff time and the challenge of finding willing and interested private landowners to conduct fire management, convert fescue to native grasses and control exotic species.

To learn more about the Grand River Grasslands Conservation Opportunity Area, please contact:



Missouri Department of Conservation
Wildlife Division
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Grand River Grasslands

Conservation Opportunity Area



Central Dissected
Till Plains



Pawnee Prairie Conservation Area provides a landscape view of the once-vast sea of grass mantling the northern Missouri glaciated plains.

Tom Nagel, Missouri Department of Conservation

Grand River Grasslands is a native grassland and prairie restoration area in the Central Tallgrass Prairie Ecoregion. The diversity of grassland wildlife, including a small population of greater prairie-chickens, confirms that this is one of the best places in Missouri to restore a functioning tallgrass prairie ecosystem.

Land survey maps from the 1840s indicate that approximately 95% of this landscape existed historically as open, rolling prairie. The rest consisted of “timber” or “scattering timber” – savannas largely confined to area drainages.

Today, the land cover is roughly 84% grassland (mostly non-native brome and fescue pastures), 10% cropland and 4% forest and tree lines. Approximately half of the grasslands contain significant prairie vegetation that is restorable.

The West Fork of Big Creek flows through this landscape and is considered a high priority for prairie stream wildlife. Characteristic prairie fish include trout perch, black bullhead, orange-spotted sunfish and red shiner. The federally listed Topeka shiner occurred here historically; this fish is being considered for reintroduction into the watershed.

The Grand River Grasslands Conservation Opportunity Area (COA) supports several species of conservation concern, including northern prairie skinks, regal fritillary butterflies and prairie mound ants. Many important grassland birds (Henslow’s sparrows, dickcissels, boblinks, northern harriers) breed within this landscape, benefiting from prairie restoration projects at Dunn Ranch and Pawnee Prairie.