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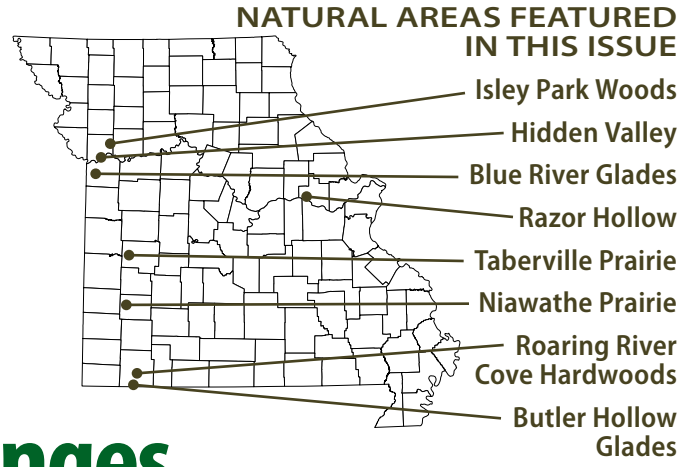
"…identifying, designating, managing and restoring the best remaining examples of natural communities and geological sites encompassing the full spectrum of Missouri's natural heritage"



Conservation Partnerships— A Way to Deal with Complex Environmental Challenges for Missouri's Natural Communities

by Kelly Srigley Werner, Missouri Private Lands Coordinator, U.S. Fish and Wildlife Service and former Chair of Missouri Bird Conservation Initiative

Read any newspaper or go online and you're sure to find articles about our imperiled natural environment. Even preparing this article, a simple Google search resulted in 1.9 million "hits" with headlines like: "Rising energy, food prices major threats to wetlands as farmers eye new areas for crops" (ScienceDaily, 2008), "Volunteers are sought for war against invasive honeysuckle…" (St. Louis Post-Dispatch, 2005), and "Change the forecast for wildlife – Global warming and Missouri" (National Wildlife Federation, 2008.) We are under what some may deem a dark cloud of uncertainty for our ecological future; and, unfortunately, Missouri is no more immune to changes in our ecological integrity than any other place on the globe. The looming question is who's responsible for dealing with complex issues facing our environment.

Let's look at our history. We can't go forward without looking at where we've been. Even back in the mid 1800s, species were disappearing from Missouri. Notable were wolf, bear and elk. Wetlands were drained for cultivation and prairies were converted to crop fields, forest or cultivated grass to help feed livestock. In 1826, pioneer Timothy Flint was convinced that "the climate will grow salubrious with…population and improvements" of the country. House sparrows (20 pairs) were brought from Germany and released in St. Louis in 1870, nearly expanding their range statewide by 1889. German carp released in 1879 and thought to be an easily cultivated species, proved problematic to other native fish and were actively being eliminated just 50 years later.

Between the mid 1800s and early 1900s, both state and federal governments worked to pass the first game laws to protect migratory birds, deer, prairie chickens, ruffed grouse and quail, setting bag limits and imposing season limits to keep wildlife plentiful and promoting breeding and restocking programs.[1]

Now, nearly 150 years later, we're faced with new, yet very similar conservation challenges affecting our natural communities: population declines, invasive species and habitat degradation. The difference between then and now is

that since 1860 the human population in Missouri has grown from 1.1 to 5.6 million and we've advanced in scientific knowledge and experience in managing wildlife and natural communities. We've learned much more about how we, as humans, fit into the context of our natural environment, but we're living in a highly populated fast-paced human environment less connected to our natural world. Our landscape changes every minute of every day and state and federal governments can no longer address problems through regulation alone.

So, who is responsible for dealing with all these complex ecological issues? *We all are*. By working together, in partnership, to achieve conservation success for our natural communities, we can collectively make a difference for Missouri's native habitats more efficiently and effectively. I've seen it happen. I know it works. This issue of *Missouri Natural Areas Newsletter* is dedicated to the success of partnerships that conserve, restore and manage Missouri's natural communities and the species that depend on them. There is a win-win approach for anyone interested in beginning their own partnership for similar purposes and I encourage you to read this issue for real examples of successful partnerships that benefit ruffed grouse, greater prairie chicken, myriads of migratory birds, northern bobwhite quail, and countless mammals, reptiles, amphibians, plants and insects.

Aldo Leopold once said "We abuse the land because we regard it as a commodity belonging to us. When we see land as a community to which we belong, we may begin to use it with love and respect." [2] Fortunately, the Missouri Department of Conservation's (MDC) Comprehensive Wildlife Conservation Strategy gives each Missourian a foundation from which to start improving and conserving Missouri's biodiversity together, in partnership, with other non-government organizations, government agencies and private landowners. There are numerous Conservation Opportunity Areas (COAs), 36 of which have been described to help guide collaborative conservation efforts.[3]

To start a partnership, consider the six "I"s:

1) **Identify** potential partners.
2) **Inform** them of your project.
3) Determine if there's a shared common **Interest**.
4) **Invite** them to participate.
5) Ask them to **Invest** their money, time or services.
6) **Integrate** your thoughts and ideas as a group. (Think in terms of "we" not "me.")

This simple recipe can brew up a grassroots commitment with a shared purpose that increases resources, shares efficiencies, invites innovative solutions, improves communication, increases public support (i.e., from local government and legislative/regulatory arenas) and helps organizations increase morale. In other words, don't ask "What if…" ask "Why not…" [4]

This approach is the foundation of the U.S. Fish and Wildlife Service's (USFWS) Partners for Fish and Wildlife Program (PFW Program). In the 1980s, waterfowl populations were falling precipitously. We needed to provide nesting habitat in areas beyond public lands. USFWS staff worked with other state and local organizations to increase wetland habitat on private land. Thanks to cooperating landowners, 2,063 acres were restored in one short year. In Missouri, the PFW Program has helped restore nearly 25,000 acres of native habitat since 1990. In this issue, you'll read about four partnerships that the USFWS' Missouri Private Lands Office is involved in through the PFW Program.[4]

One such partnership was formed out of each partner belonging to the Missouri Bird Conservation Initiative, a group of nearly 50 organizations interested in the conservation of Missouri's wild birds. The partnership works to help landowners around the new Razor Hollow Natural Area, located within the Missouri River Hills COA and important for interior forest and woodland-dwelling songbirds and ruffed grouse. The USFWS **interest** was improving habitat for songbirds. The Ruffed Grouse Society and the MDC **informed** us about the project's goal, and we collaborated on practices and worked out details of how the PFW Program could assist. We were **invited** to help and **invested** funds and technical services to improve habitat for forest dwelling song birds through the partnership. Other partners are now **integrated**, taking on tasks to monitor and catalog species of interest and help protect lands in the area. None of this would have happened without help from local landowners.

Another effort in the confluence of Missouri's two great rivers resulted from two parallel events: the designation of the Missouri/Mississippi River Confluence COA and a grassroots effort to address urban expansion on the floodplain of the two largest rivers in North America. A partnership of more than 30 conservation entities was **identified** with help from Ducks Unlimited, Inc., to **inform** one another about their conservation interests. They were **invited** to participate and **invest** resources to help restore and protect needed wetland habitat. These groups have since **integrated** into a strong partnership and are using conservation programs to work with landowners interested in conserving this important historically significant, culturally rich, agricultural and ecological treasure in Missouri.

Shaping partnerships and finding financial partners isn't easy. It takes *real* team work to make a partnership gel, but it's worth it. Dunn Ranch in extreme northern Missouri is where we worked with The Nature Conservancy in the 1990s to restore prairie for grassland-dependent migratory birds and the greater prairie chicken through the PFW Program. Activities didn't really gear up until other partners were **identified** and **information** was shared with Iowa's oak savanna restoration team. Common **interests** resulted in new **investments** through the USFWS Private Stewardship Grant for restoration on private lands. Later, the Grand River Grasslands COA was identified and a larger **integrated** partnership developed with more partners including the MDC

and the Missouri Prairie Foundation to help declining birds in prairie systems.

Finally, a partnership involving over 50 organizations and individuals resulted from efforts generated by Kansas City WildLands. There are multitudes of urban natural community restoration projects under way in this urban center. One that the PFW Program is assisting with is along the Blue River Parkway. Efforts are under way to eradicate non-native invasive species that are destroying a highly diverse riparian corridor important for migratory birds and other wildlife. The pride and commitment from the communities involved with this effort is evident and recognized by local leaders.

If history holds true, we always will be challenged by complex conservation issues. Climate change is the most recent issue we must face. Partnerships work to conserve Missouri's biodiversity. It takes just one voice, joining in conversation with another, to challenge each other to make a difference. Start the conversation, think about the six "I"s to partnership success, and begin. Abraham Lincoln once said "Things come to those who wait, but only the things left by those who hustle." As the present stewards of Missouri's natural communities that are part of the fabric of our human communities, we need to be smart, efficient and effective. For conservation success, we need partnerships to help generate grassroots appreciation for our flora and fauna. I am optimistic that through this approach, we will all realize that land is a community to which we belong and collectively we will respect it, as Leopold did, so future generations have the opportunity and honor to care for it. ▲

[1] *Missouri Conservationist, July 1976, 61p.*

[2] *Udall, Stuart L. 1963, The Quiet Crisis. Avon Books, 224p.*

[3] *For more information about the Missouri Conservation Opportunity Areas, visit www.mdc.mo.gov/nathis/cws/coa.*

[4] *Management Institute for Environment and Business. 1993. Conservation Partnerships: A field guide to public-private partnering for natural resources conservation. Washington, D.C.; National Fish and Wildlife Foundation. 35p*

"Cumulative Effects" in the Confluence Conservation Opportunity Area

By George Seek, Lands Specialist, Ducks Unlimited

For most of us in conservation, the phrase "cumulative effects" typically conjures up negative visions relating to the long-term impacts human activity has had on our environment, i.e. global warming and hypoxia. However "cumulative effects" can provide the solution for sustaining, restoring and protecting our natural resources if channeled in an environmentally sensitive way. Within the Missouri/Mississippi River Confluence Conservation Opportunity Area (Confluence COA), landowners, stakeholders and conservation partners are working together to demonstrate this premise.

Steeped in waterfowl hunting tradition and containing more than 36,000 acres of managed duck clubs, the Confluence COA is one of the largest and most important privately owned conservation complexes in the nation. The Confluence COA carries waters from over half of the United States, serves vital ecological functions such as storage and purification of floodwaters, and provides critically important migration habitat to over 250 species of waterfowl, wading birds and migrant songbirds.

Today the ability of the Confluence COA to serve these vital ecological functions is at risk. Approximately 90 percent of the region's natural wetland communities have been lost to man's activities. Locks and dams, dredging, ditching

Bob Trinity, president of the Wilkie Land Co., (which is the same as the Marais Temps Clair Duck Club) is shown at Ducks Unlimited's first conservation easement in the Confluence Conservation Opportunity Area.
George Seek

and levee construction have altered the hydrology; modern agriculture has taken advantage of the naturally fertile floodplain while a locally sprawling urban population views the floodplain as an expansion zone for factories, homes, airports and shopping malls.

Essential to successful conservation initiatives is the will of local stakeholders to take action and play an active role in leadership. In 1999, a group of floodplain landowners became extremely concerned about the construction of a 500-year levee to protect a commercial development project in the backyard of some of the most important privately owned wetland habitat in the Confluence. Garnering support from other conservation interests, the group officially formed the Great Rivers Habitat Alliance (GRHA) in 2000. This alliance, now with support from more than 20 state, federal and not-for-profit organizations, works to protect the 100-year floodplain from commercial development. The GRHA and partners have testified at numerous public hearings and submitted written opposition to planned developments, zoning changes and annexation proposals. More importantly, the GRHA has raised public awareness about the importance of the floodplain for wetlands, flood storage, clean water and productive farmland.

One of GRHA's most important victories came in August 2007 with the passage of Missouri Senate Bill 225. The bill changed Missouri's current floodplain development laws to better protect the 100-year floodplain from exploitation by prohibiting the use of tax incentive financing (TIF) for floodplain development while also ensuring Missourians will retain the right to discharge firearms within the 100-year floodplain, a vital component in preserving Missouri's hunting heritage. The "cumulative effect" ball was formed through the will and efforts of the GRHA, but it would take the collective efforts of partners and stakeholders to really make it roll.

In 2005, through the leadership of the Missouri Department of Conservation (MDC) and numerous conservation partners, *Missouri's Comprehensive Wildlife Strategy* was born and the "cumulative effects" platform was pushed into high gear. The strategy provided the framework from which conservation partners could engage, collaborate and take action to conserve all wildlife and the natural systems on which they depend. Confluence partners, led by the U.S. Fish and Wildlife Service (USFWS), recognized that development, agriculture, conservation and political interests create a very challenging environment for developing positive change. Out of this challenge emerged five broad areas of effort that would require specific, yet integrated strategies: private land protection, private land management, public land acquisition, floodplain policy, and outreach and education. Partners also acknowledged that to be successful, two important elements would be required: a comprehensive plan and a full-time coordinator. In 2005, Confluence partners, including Ducks Unlimited (DU), MDC, GRHA, USFWS, Pheasants Forever and most recently The Nature Conservancy, combined resources to hire Mark Howell, a USFWS-sponsored biologist/coordinator for the Confluence COA. Since 2005, Howell has been meeting stakeholders, attending meetings, developing programs and drafting the "Confluence Conservation Action Plan." When finished, the plan will be extensively reviewed by partners and stakeholders, and will serve to focus collaborative efforts toward positive "cumulative effects."

Acknowledging the region as a vital spring and fall bird migration corridor, DU established the area as a "Priority Conservation Region" and initiated a land protection program promoting the use of donated conservation easements. Conservation easements are an opportunity for landowners to protect valuable natural resources in perpetuity by legally specifying development rights and restrictions on their property. Ducks Unlimited helps the landowner tailor the agreement to meet his/her interests while maintaining the natural integrity of the land. Conservation easements do not prevent landowners from using their property for farming, ranching, timber harvest, hunting or other recreational purposes. Once an easement is established, DU biologists or other partner biologists monitor the property annually to ensure terms of the easement are maintained. A "cumulative effect" benefit of this relationship is that partner biologists can work collectively with the landowner to combine resources, address habitat management issues, or restore and improve wetland diversity through a multitude of partner programs.

Mallard Point, a 560-acre duck club in the Confluence COA, successfully combined program resources from the Natural Resources Conservation Service (NRCS) Wetland Emphasis Team with the Farm Services Agency, USFWS' Partners for Fish and Wildlife Program, MDC, Quail Forever and DU. This partnership resulted in one of the finest wetland restoration projects I've witnessed in my 35-year career. Talk about "cumulative effects"! Mallard Point also serves as a demonstration site that has resulted in interest from other duck clubs to restore and improve the wetland diversity on their properties.

Another important "cumulative effect" of donated conservation easements is that DU, as the holder of the easement, can use the conservation value of the easement as non-federal match for grants to acquire and restore wetland habitat. In 2007, DU in collaboration with MDC, USFWS, the Missouri Department of Natural Resources, and a host of other partners known as the Lewis and Clark Floodplain Heritage Partnership, was awarded a North American Wetland Conservation Act (NAWCA) grant through the USFWS for restoration of the Marais Temp Clair Marsh. The ownership of this 1,500-acre wetland oxbow of the Missouri River is divided between public and private interests. The west half is owned by MDC and the east half by the Wilke Land Co. (DU's first conservation easement in the Confluence). The value of the donated easements in the area was used as match to help support

the grant in addition to cash contribution from various partners including restoration assistance from NRCS through its Wetland Reserve Program—**"cumulative effects" on steroids!**

Ducks Unlimited now holds donated conservation easements on 4,672 acres in the Confluence COA with a conservation value of more than $23 million. Confluence partners have recently submitted the next NAWCA proposal to restore and enhance wetland habitat on the Clarence Cannon National Wildlife Refuge and B.K. Leach Memorial Conservation Area using donated conservation easement value as match.

A wise man once said, "Conservation without money is just conversation." Finding money to affect positive environmental change is always challenging. Just ask any not-for-profit these days. The Doris Duke Charitable Foundation is committed to assisting state agencies and conservation partners in implementing wildlife action plans. Through a partnership with DU, the foundation provided a $1 million grant to assist Confluence landowners with costs related to donating conservation easements. The foundation also provided funds for marketing and outreach efforts. Confluence partners are currently working on materials to launch a "Conserve the Confluence" marketing campaign that was scheduled for September 2008 with a goal of protecting and enhancing wetland diversity on 35,000 acres over the next 10 years. The best "cumulative effect" strategy seems to be the testimonials of landowners in the Confluence COA who have committed to land protection and benefited from the assistance of partner programs.

To be successful in conserving the Confluence, all stakeholders and conservation partners must continue to work together to develop trust, demonstrate commitment and leverage resources to promote and establish positive "cumulative effects." It is imperative that the remaining duck clubs demonstrate commitment by placing their property under some form of land protection. At the same time, it will be imperative to work with our agriculture stakeholders to find ways to keep agriculture a primary component of the Confluence COA to further demonstrate the compatibility of wetlands and agriculture. We must all work together to help the people of greater St. Louis understand and appreciate the conservation values of the Confluence. Finally, it will be important to work and participate with other Confluence partners to help shape and strengthen floodplain protection through local, state and federal policy initiatives.

The foundation for "cumulative effects" has been poured. It will take long-term commitment and passion from current and future generations to keep it from crumbling. ▲

Encroaching development continues to be a challenge. This development adjoins the Whistling Winds Duck Club.
Glen Chambers for Ducks Unlimited

Kansas City WildLands—Partnership for Urban Natural Community Restoration

By Larry Rizzo, Natural History Biologist, Missouri Department of Conservation and Linda Lehrbaum, Program Coordinator, Kansas City WildLands

Prescribed burns are now a part of the management of Rocky Point Glades in Swope Park.
Dylan Lehrbaum

Thanks in large part to steep hills, rocks and the foresight of a man known as Col. Thomas Swope, the Kansas City area is fortunate to have tucked away on public lands little known remnants of prairies, limestone glades, woodland and forest natural communities. These fragments of land, though small in acreage, are big in biological diversity, serenity and beauty. Eight years ago, they were in trouble.

Land managers, strapped for resources, for the most part left management of these lands "to nature." Invasive plant species, both native and prolific exotics, slowly and dangerously encroached on the remnants and threatened to finally take over. That's where the miracles that happen with partnerships began. In 2001, Kansas City WildLands (KCWL) was officially formed.

Kansas City WildLands is a coalition of 31 partners comprised of land managers, universities, conservation organizations, corporations and citizens. Its mission is two-fold and straightforward: to conserve, protect and restore the remnant natural communities of the Kansas City area by involving people in the stewardship of the land. This approach encourages volunteer stewardship of the remnants, while also promoting appreciation of these natural wonders by the urban public. Now, nearly eight years later, the mission, the partnerships and the health of the lands are getting better and better.

Since joining a local environmental organization, Bridging The Gap, in 2002, KCWL has conducted about 180 workdays, four BioBlitzes, five Cedar Christmas Tree Events, and umpteen educational presentations. These workdays and events are led by members of the partnership who also spend many hours creating management plans, raising funds and awareness, writing articles and staying connected to political and biological issues involving the lands. Each partner organization brings a strength, or several, to the mix—and the results are impressive.

Kansas City WildLands workdays have flourished thanks to the efforts of more than 2,600 corporate, academic and citizen volunteers putting in over 18,000 volunteer hours since April 2002. Even volunteers from across the United States have been drawn to Kansas City's urban wild places – students from the Universities of North Dakota and Wisconsin, and national conferences of Skills USA and Campfire Boys and Girls have participated in workdays. Corporations have become involved in hands-on work: Sprint-Nextel, Home Depot, Kansas City Power and Light, Inc. and local branches of HSBC (an international financial corporation) are frequently on the land. One local marketing corporation, VML, even closed its doors for a day to put 300 of its employees to work at Hidden Valley Natural Area.

Of the dozen or more sites KCWL works on in the metro area, four are designated Missouri natural areas. Below is a sampling of some KCWL areas with descriptions of the restoration challenges they face and examples of some—but not all—of the partners that have contributed to their stewardship.

• Isley Park Woods Natural Area (Clay County, City of Excelsior Springs): This 15-acre designated natural area is a north-facing slope of rich, mesic forest. The area contains a diverse array of tree species and some of the most dramatic and showy spring ephemeral wildflower displays you will find. The area is threatened by a number of exotics with garlic mustard, wintercreeper and shrub honeysuckle being the

most serious problems. Restoration activities include hand-pulling garlic mustard, foliar spraying of wintercreeper and cutting and stump-treating honeysuckle. Public workday volunteers, William Jewell College students, Missouri Master Naturalist volunteers and other partners have contributed to the stewardship of this area through the years.

• Hidden Valley Natural Area (Clay County, Kansas City Parks & Recreation): This 82-acre designated natural area contains mesic forest on deep loess soils in the Missouri River hills. Its deeply dissected ravines offer moist, shady environments for many species of ferns including the state-listed Goldie's fern. For years, Hidden Valley Natural Area suffered from illegal off-road vehicle (ORV) use. Deep ruts were worn in the fragile loess soil, severe erosion occurred and the natural area was severely degraded. Additionally, shrub honeysuckle is a major problem at Hidden Valley along with localized infestations of wintercreeper, garlic mustard and tree-of-heaven. Shortly after its inception, KCWL solicited the Thomas Hart Benton Group of the Sierra Club to "adopt" this area. The group organized regular workdays to eradicate honeysuckle and other exotics and remove trash, and also provided valuable eyes and ears to police the area and its boundaries. Coordinating with Kansas City Parks, the Thomas Hart Benton group initiated outreach to local neighbors and contacts with the Kansas City Police Department. Boundaries and regulations were posted, interpretive signage was created and barriers to ORV traffic installed. Kansas City WildLands, the Thomas Hart Benton group and KC Parks then worked together on a master plan for the natural area and received city funds to hire a consulting firm to prepare a comprehensive trail plan. The plan outlined a sustainable loop trail through the area. Much trail work is still to be done and funding needed to complete it, but ORV traffic has all but been eliminated and the future for this once-neglected urban jewel is much brighter.

• Rocky Point Glade/Woodland in Swope Park (Jackson County, Kansas City Parks & Recreation): Just north of Jackson County Park's Blue River Glades Natural Area (another KCWL work site), is a complex of small limestone glades and woodland. The site sits atop a thick outcropping of Bethany Falls limestone. At the time of KCWL's inception, old spreading chinquapin and post oaks presided over thickets of invaders both foreign and domestic (rough-leaved dogwood, redbud, shrub honeysuckle, red cedar and more). In small canopy gaps or where exposed rock prohibited woody plants, there were small floral teasers suggesting the area's potential—clumps of bluestem and sun-loving forbs like scurf-pea, coneflower, prairie larkspur and leadplant. Kansas City WildLands completed a management plan for the site that outlined a strategy for woody clearing, exotic species control and an aggressive schedule of prescribed burning. Though the site comprises less than 20 acres, the scale of woody clearing was an enormous task. Due to the terrain and access, work would have to be accomplished by chainsaws and hand tools. With the help of numerous KCWL citizen volunteers, organized groups including University of Missouri-Kansas City and Rockhurst University, Shawnee Mission East National Honors Society, and corporate groups like General Electric, we began to chip away at the invasive shrubs and trees and link up the scattered glade openings and canopy gaps. The long-suppressed flora took several growing seasons and multiple burns to respond, but today tall prairie grasses and forbs fill in the sunny openings while woodland sunflower, purple milkweed, bottlebrush grass and river oats flourish in the sun-dappled woodland areas. Aside from citizen volunteers, Rocky Point also serves as a nice example of cooperation between Kansas City and Jackson County Park departments. Staffs from both departments take part in prescribed burns at Rocky Point and Blue River Glades Natural Area and volunteer-collected seed is also shared between the sites.

• Blue River Parkway (Jackson County, Jackson County Parks & Recreation): The Blue River Parkway is a linear park of well over 2,000 acres. It connects Swope Park on the north to the Kansas state line on the south. While the parkway has lands developed for athletic fields and other maintained areas, most of it is in a "wild" condition and is a mix of closed canopy riparian forest and old fields in various stages of succession. The parkway and its adjacent public lands represent a rare opportunity in an urban area where lands with significant wildlife and natural community value are connected and not fragmented into small disjunct parcels. The parkway comprises the anchor feature of the recently developed Upper Blue River Conservation Opportunity Area (COA) and is the only COA in an urban setting. Several years ago, KCWL began to receive money from the Missouri Bird Conservation Initiative and the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program to hire a contractor to basal spray shrub honeysuckle. Kansas City WildLands in turn organizes public workdays and organized groups to further reduce surviving honeysuckle in the sprayed areas and tackle other locations. Honeysuckle eradication is a daunting task in the parkway lands, but will be a major focus of COA work for some time. Creating a network of recreational trails is also a high priority in the COA, and the Earth Riders Trails Association is an active partner. Dense stands of honeysuckle encroach on trails and spoil aesthetics, so the marriage of recreational interests and ecological restoration go hand-in-hand. Good trails also allow for better access for volunteers to reach and kill more honeysuckle!

As you can see, Kansas City WildLands is not only an organization composed of partners, but is completely reliant on partners and relationships to accomplish its mission. Thanks to Kansas City WildLands partnerships and committed, passionate volunteers, the wild places of Kansas City are thriving again, not only biologically, but in the hearts of people who now know and care about them. ▲

Razor Hollow Natural Area—A Showcase for the Missouri River Hills Conservation Opportunity Area and the Value of Partnerships

by Gus Raeker, Resource Forester, Missouri Department of Conservation

Ruffed grouse is a keystone bird species of the Razor Hollow Natural Area.
Jim Rathert, Missouri Department of Conservation

Tucked into the rolling Missouri River hills of southwestern Warren County is one of Missouri's newest natural areas—Razor Hollow. This natural area and the surrounding Missouri River Hills Conservation Opportunity Area (COA) are great examples of what can happen when you put the right people and places together in partnership.

Razor Hollow Natural Area is a relatively unknown gem located within the Missouri Department of Conservation's (MDC) Daniel Boone Conservation Area. The natural area consists of an impressive mix of high-quality woodlands, forests and glades resulting from an interesting mix of soils, topography and historic fire regimes. This is where glaciers once converged into the Ozarks. A soils map reveals a mosaic of glacial and Ozark (unglaciated) soils resembling a network of interlocking fingers. These soils are laid out across the natural area's 923 acres of truly dramatic topography. Combine this geology with thousands of years of historic fire disturbances and you get a highly diverse and attractive landscape. The area is botanically rich, with 313 native vascular plant species documented from the natural area. Just recently the St. Louis Chapter of the Missouri Native Plant Society documented the occurrence of two state-listed species previously unknown from the natural area.

Although Razor Hollow Natural Area is a showcase and certainly impressive in its own right, what makes it more remarkable is the surrounding landscape. Razor Hollow Natural Area resides fully within the Missouri River Hills COA and its associated River Hills Forest Habitat Project Focus Area. This COA is located in southern Warren, Montgomery and Callaway counties and consists of Missouri's largest block of contiguous forestland north of the Missouri River.

This broader geography is significant for a couple of reasons. First, the high quality and integrity of the surrounding landscape help to make Razor Hollow Natural Area a great place to find a diversity of sensitive and unusual birds and other wildlife. Ruffed grouse is perhaps the keystone bird species of this area. In the spring if you are lucky, you can hear a male grouse perched on a log "drumming" his wings to attract females. A ruffed grouse is about four times as large as a bobwhite quail and when flushed, they are so explosive that they sound like an entire covey of quail. In recent years, Missouri's ruffed grouse population has faced a serious downtown, much like the prairie chicken. The Missouri River Hills COA, including Razor Hollow Natural Area, is one of the best places in Missouri where ruffed grouse can still be found. To remain viable, ruffed grouse need large landscapes of high-quality forest and woodland habitat. These same conditions are also needed for numerous sensitive neotropical migrant songbirds such as wood thrush, worm-eating warbler and the scarlet tanager, which can be found during the breeding season in Razor Hollow Natural Area. Year-round resident birds like pileated and red-headed woodpeckers also need these conditions. This landscape also allows herptiles to flourish. Razor Hollow Natural Area alone supports populations of at least 17 herptiles, including the rare ringed salamander, four-toed salamander and wood frog.

As part of this larger focus area, Razor Hollow Natural Area has benefited from increased funding and MDC staff time for natural community restoration efforts within the natural area, and has been the beneficiary of considerable investment that has been devoted throughout the COA. You might wonder why this area would need such investment if it is in good enough shape to become a designated natural area.

Although Razor Hollow and the Missouri River Hills COA contain numerous high-quality natural communities, this is in large part due to ongoing restoration efforts. Historically, this landscape was subject to considerable wildland fires. It has just been in the last 50-100 years that this disturbance has been removed. In the absence of this important influence, many natural communities in this area have declined in health. Forests and woodlands have grown overcrowded with trees; tree species composition has started to shift from fire-tolerant species such as oaks and hickories to fire-intolerant species such as sugar maple; and much of the diverse ground layer vegetation important to many wildlife species has been shaded out. In light of this phenomenon, a few different initiatives have been spearheaded to reverse this trend.

In 2002, several conservation groups collectively had noticed a significant decline in the population of ruffed grouse and the use of this geography by many neotropical migrant songbirds. Although there were other factors involved, the habitat changes mentioned above were the primary suspect. In response, the River Hills Forest Habitat Project/ Partnership was formed including MDC, the Ruffed Grouse Society, Audubon Society of Missouri, and National Wild Turkey Federation. The goal of this group was to reverse the decline in local populations of these sensitive bird species by improving the habitat on which they depend. The partnership determined that MDC could sufficiently manage public land without much assistance. However, private land was another story. It was determined that many landowners were interested in improving the health and quality of natural communities on their properties, but lacked the funds to hire someone or the ability to do this work on their own. The partnership worked aggressively to obtain grant funds from a variety of sources, such as the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program, to provide cost share to private landowners for practices that would replicate the disturbances once created by wildland fire. Since 2002, the partnership has grown considerably in members and accomplishments. To date, about 7,500 acres of privately owned forest and woodland have been restored. Although this work was not done directly on the natural area, the efforts have had direct benefits to wildlife populations using the natural area.

In addition to this private land work, MDC really stepped up its efforts to improve habitat and natural communities on public land in the focus area such as Daniel Boone and Little Lost Creek conservation areas, including the area now known as Razor Hollow Natural Area. These public holdings were to serve as habitat cores for the River Hills Forest Habitat Project and create source populations for these sensitive wildlife species. Although much of this restoration work was done by MDC staff, a considerable amount was completed through the use of State Wildlife Grant funds (Wildlife Diversity Funds). Grant proposals submitted for these areas were highly competitive in large part because of the "matching funds" that the River Hills

Several St. Peter Sandstone waterfalls can be found in Razor Hollow Natural Area.
Gus Raeker

Forest Habitat Partnership had obtained and spent on neighboring private lands. On Razor Hollow Natural Area alone, use of grants and work by MDC staff have been used to restore hundreds of acres of natural communities. The majority of this work has been in the form of non-commercial thinning (deadening undesirable trees that have little or no commercial value) and prescribed fire. A smaller area is being restored in part with light selective harvesting of undesirable but merchantable trees. The natural communities resulting from these practices will be maintained into the future mostly with the use of prescribed fire.

In 2007, the River Hills Forest Habitat Project Focus Area was officially recognized as the Missouri River Hills COA and was included in Missouri's Comprehensive Wildlife Strategy. In the process, supporters have been able to incorporate some new groups into the already existing partnership. These groups are bringing in new energy for some additional and much needed efforts in the COA.

Stay tuned! Exciting things are yet to come. If you are in the area, be sure to stop by Razor Hollow Natural Area for a visit. To get to the area from Hermann, at the intersection of highways 94 and 19, go east on Highway 94 for 2 miles; turn left on Tower Road; go about 2 miles and enter Daniel Boone Conservation Area; keep driving for 1 mile and park at Service Road 1213 (on your left). This is the best access to the natural area. From Jonesburg (Interstate 70, exit 183), go south on Highway Y for 6 miles; turn left on Tower Road; keep going for about 3 miles and park at Service Road 1213 (on your left). ▲

Cooperative Efforts Benefit Charismatic Species in the Grasslands

by Elizabeth Nivens, The Nature Conservancy

The Nature Conservancy's Dennis Perkins, preserve assistant, harvests native seed at Grand River Grasslands.
The Nature Conservancy

The Grand River Grasslands is a 70,000-acre grassland landscape that straddles the Missouri-Iowa border. This area is a global priority to The Nature Conservancy since the Grand River Grasslands are the only known large expanse of unplowed, deep-loam prairie soils in the Central Tallgrass ecoregion, which spans portions of six Midwestern states. This provides an unparalleled opportunity in a landscape of working ranches to restore and conserve a functional tallgrass prairie system with its associated grassland wildlife.

Globally, temperate grasslands are the most converted to other land uses and the least conserved terrestrial habitat on Earth, with less than 2 percent protected. Therefore, success in the Grand River Grasslands will provide answers to other grassland restoration and conservation efforts within the Great Plains as well as grassland systems in faraway places like Mongolia and Patagonia.

Partnerships in this large landscape are vital to restoring functional tallgrass prairie habitats. Functional means that the biological integrity of the area is conserved and that the natural biological processes are sustainable. Experience tells us that to achieve these lofty goals, we must mimic on a large scale the natural processes and disturbances, like fire and grazing, that shaped the prairie for thousands of years prior to European settlement.

Size and scale, when we talk about prairie restoration, matters.

Large-scale restoration for the greater prairie chicken might mean the difference between a small population continuing to dwindle and a resurgence of this colorful indicator species.

"We work for chickens," said Randy Arndt, Grand River Grassland project manager for the Conservancy. "The greater prairie chicken is an indicator species of a functional grassland. In other words, their population benefits if we can offer them the habitat that they need. They have pretty high standards with their number one requirement being open space with no trees. Keep in mind, prairie chickens, other prairie wildlife and prairie plants are interdependent. What benefits the prairie chicken generally benefits all native prairies."

Prairie chickens present a sense of urgency as well. With only 500 of these birds left in Missouri, Missouri Department of Conservation (MDC) and the Conservancy are working on a reintroduction effort in the Osage Plains ecoregion of southwestern Missouri and a monitoring study in the Grand River Grassland, which contains the best know prairie chicken population in the state.

Each spring, the Conservancy and MDC offer scheduled visits to the prairie chicken viewing blind at Dunn Ranch, the Conservancy's preserve in the heart of the Grand River Grasslands. This is the best place in Missouri for visitors to hear the prairie chickens make their "booming" sounds on the lek and view the annual spring dance held by the males to find a female in prairie chicken society.

The Conservancy's Dunn Ranch is a 4,000-acre site with more than 1,000 acres of original unplowed native prairie. Pawnee Prairie, including Pawnee Prairie Natural Area, just to the north, contains more than 900 acres with about half owned by the Conservancy and half owned by MDC. Just north into Iowa, the 2,000-acre Ringgold Game Area and the 1,000-acre Kellerton Bird Conservation Area are owned and managed by the Iowa Department of Natural Resources. These sites are linked by private ranchlands that offer critical wildlife corridors for prairie chickens and other grassland birds that start on the Missouri side of this grassland landscape.

"Without our partners and area landowners, we could never achieve the scale with which prairie restoration needs to be done," said Arndt. "We have conservation

partners who share our priorities and their resources—it's an incredible spirit that makes the most out of limited conservation dollars. It's efficient and effective for all of us."

Tom Nagel, natural history biologist for MDC, echoed Arndt's comments and said, "The whole is greater than the sum of the parts. Together, we have worked on prescribed burns, seed harvest and plantings and tree removals as well as prairie inventories and working with private landowners."

Arndt explained one cooperative effort. "While harvesting seed last year, everyone had a hand in it. We borrowed a special 20-foot stripper head from the Fish and Wildlife Service and harvested nearly 9,000 pounds of bulk seed, with much of it coming from Pawnee Prairie. We share the seed for planting depending on which area needs it and what the priorities are for the project area. Again, scale is everything."

Private landowners also play a significant role in the scale of these projects. The Conservancy, MDC and U.S. Fish and Wildlife Service engage area landowners through grants and available resources to promote compatible and best land management practices. This helps expand the scale and increase the viability of the landscape, while meeting human and economic needs.

"We have been working with landowners to convert fescue to native prairie plantings. This means we serve as advisors, provide technical expertise and a management plan to the rancher, while in turn learning from the experience of the producers. It is an investment by conservation agencies and the landowner. In turn, the landowner receives the long-term benefit and contributes to the biological diversity of the prairie," said Nagel.

"It's a win-win for the rancher but it can be slow to demonstrate success. Again, if we can demonstrate success on our preserve and build trust with the area landowners, this supports the agencies working on landowner outreach and education, which is so vital to the scale of this project," said Arndt.

Just as the prairie chicken depends on high-quality grasslands, the Topeka shiner, a rare minnow-sized fish, depends on intact prairie headwater stream systems. Not only is scale important, in this case the entire watershed, but the grasslands that surround these meandering streams are vital to the watershed and its water quality.

Jerry Wiechman, MDC fisheries biologist, explained that Dunn Ranch and Pawnee Prairie were on the list as two of the seven watersheds where the federally listed Topeka shiner may be reintroduced in Missouri. "The water quality in the stream is dependent on good land use of the surrounding land. This means that the soil stays in place and nutrients, like nitrogen, aren't flowing into the streams."

"The Dunn Ranch site gives us an excellent opportunity to observe the Topeka shiner in a natural and protected watershed, especially since there is a box culvert on Little Creek, that will prevent downstream predator fishes from making it upstream into the watershed," said Wiechman. Thus Topeka shiners are another species that will reap the benefits of cooperative efforts in the Grand River Grasslands.

The Grand River Grasslands will only achieve restoration when the scale of the project can sustain all the natural biological processes. For species such as the greater prairie chicken, bigger is better. For the Topeka shiner, large portions of watersheds need good land stewardship. For landowners to cooperate and contribute to the conservation goals, they must be able to meet their own economic goals with any ecological plan.

By working together, The Nature Conservancy, Missouri Department of Conservation, Iowa Department of Natural Resources, U.S. Fish and Wildlife Service, Natural Resources Conservation Service and other conservation organizations are moving forward with giant steps to restore and conserve this unique prairie system and its plants and animals. Cooperatively, they are devising plans that interested ranchers and farmers can implement. They are providing the resources, both financial and educational, to motivate participation. They are working together on management plans like prescribed fire, harvesting and planting native seeds and removing trees. As a team with a common mission, to bring back biological diversity and sustainability within the 70,000 acre project area, the success of this enormous project depends on the cooperation and passion of individuals and agencies alike.

The chickens are counting on it. ▲

Prairie chickens boom at dawn on the lek at Dunn Ranch.
The Nature Conservancy

Conservation Opportunity Area Partners Accomplish Restoration Goals in the Roaring River Hills Glade and Woodland Landscape of Southwest Missouri

by Allison Vaughn, Natural Resource Steward, Missouri Department of Natural Resources

Following years of cedar-clearing projects and prescribed burning, Chute Ridge now harbors thriving populations of pale purple coneflower and other glade species.
Allison Vaughn, Missouri Department of Natural Resources

The organizational structure of Conservation Opportunity Areas (COA) offers stakeholders opportunities to accomplish resource management goals through cooperative efforts between agencies. Several years ago, Roaring River State Park, located in the White River Hills in Barry County, employed external efforts to assist in a glade restoration project, setting the framework for the establishment of the Roaring River Hills Conservation Opportunity Area. The working partnerships and subsequent organization of the COA highlighted the need for glade and woodland restoration in southwest Missouri. The Missouri Department of Natural Resources (DNR), recognizing the significance of the White River Hills glade complexes within the park, embarked on a glade restoration project that has exemplified the need for partnerships in achieving success. The Roaring River Hills COA encompasses vast tracts of glade and open woodland complexes and two Missouri natural areas, Roaring River Cove Hardwoods Natural Area, (120 acres) within Roaring River State Park and Butler Hollow Glade Natural Area (385 acres), in the Mark Twain National Forest.

In the mid-1980s, The Nature Conservancy (TNC), encouraged by the vegetative response to management efforts at nearby Butler Hollow Glades Natural Area, bought Chute Ridge, an area near Roaring River State Park that included dolomite glades and woodlands. TNC donated the property to DNR with the intention that DNR would manage Chute Ridge in a manner consistent with Butler Hollow Glades NA to encourage a similar vegetative response. By 1987, DNR published an Ecological Management Plan to guide the restoration of 58 acres on Chute Ridge; for seven years, contractors removed cedars from the glades within the restoration unit. Chute Ridge continues to be the most frequently burned unit for the park and an exemplary restoration site in the COA.

In early 1995, DNR assessed the restoration potential of the dolomite glades in the rest of Roaring River State Park. Butler Hollow Glades NA once again served as a benchmark for high-quality glades within the White River Hills subsection, with TNC providing a floristic assessment of the surrounding area to help identify high-quality glades throughout the park. The preliminary assessment of the park's glades revealed populations of Trelease's larkspur (*Delphinium treleasei*), Crawe's sedge (*Carex crawei*), and Gattinger's goldenrod (*Solidago gattingeri*), all of which are conservative species (i.e. species with a narrow range of habitat conditions and/or high fidelity to intact natural communities) within their range. Cedar-removal projects expanded to include these glades with

Americorps crews accomplishing most of the work. Thus, the best glade complex in the southern part of the park was cleared and burned.

A large part of the restoration project lay within Roaring River Hills Wild Area, a state designated wild area. Agency resource specialists and wilderness advocates agreed to a process that allowed glade restoration to improve natural qualities without denying the area's wildness. From this project description, 180 acres of glades are currently under restoration to the point that fire will be able to maintain the natural features of the wild area. The restoration project in the wild area must be completed within a certain timeframe as set forth by a wild area management plan.

To accomplish the wild area's restoration goals within the allotted time, DNR and the Missouri Department of Conservation (MDC) forged a partnership that originated in the Roaring River Hills COA. DNR received $20,000 of matched grant funding from MDC through the Wildlife Diversity Fund that covered the cost of Americorps crews for the express purpose of clearing cedars from designated restoration units. With this grant, Americorps cleared 20 acres of glades. Following the cedar-clearing exercise, Springfield Audubon Society volunteers began conducting quarterly surveys of the restoration units in 2006. In fall 2007, the National Wild Turkey Federation awarded DNR $5,000 to continue the clearing project. With this funding, Americorps crews removed cedars from roughly 5 acres of glades in preparation for a prescribed burn planned for 2008-09.

Roaring River State Park borders the Mark Twain National Forest on the east and MDC property on the south end. Following years of contracted cedar clearing on Chute Ridge, located in the southeast quadrant of the park next to the Mark Twain National Forest, DNR partnered with the U.S. Forest Service (USFS) to conduct a prescribed burn. It encompassed 50 acres of open woodland-glade complexes of DNR property and 244 acres of equal landscape type on USFS land. The 1997 cooperative burn resulted in a positive vegetative response that was surveyed the following growing season. Future plans for the continued maintenance of Chute Ridge and the glades within the Roaring River Hills Wild Area include multiagency prescribed fire regimes as coordinated through the Roaring River Hills COA.

In the 1980s, the Natural Features Inventory identified roughly 400 acres of quality glades in the White River Hills. The cedar removal projects are an example of the many restoration projects currently underway on properties owned by DNR, MDC and the USFS that provide promise that several thousand acres of White River Hills glades can be restored. Vast stretches of glade belts and open woodlands remain undeveloped in southwest Missouri, offering an opportunity for natural area designation to a large landscape-scale tract of land that could span agency boundaries. The two existing natural areas in the Roaring River Hills COA represent small scale themes, tracts of land that do not fully encompass the White River Hills landscape. The continued efforts of the COA members will allow the future visitor to southwest Missouri a glimpse into a historical landscape, one that early settlers encountered when they entered the wildlands of Missouri. ▲

Fire and Grazing: Professionals Interacting to Understand Natural Interactions

by Norman Murray, Missouri Department of Conservation, Grassland Field Station

The day was blisteringly hot, and most vegetation was crispy brown due to the severe drought that had descended upon the region. Family groups of bison raised small columns of dust as they foraged in patches of short vegetation that were surprisingly green. Plants outside these green patches had gone dormant, even though the hard frost was still a couple of months away. Then a new cloud appeared on the horizon but with a gray hue and greater height. Whether originating from a lightning bolt or Native American, the result was the same—the prairie was burning. The fire did not uniformly spread across the horizon but contained large gaps and narrow places as it followed a curious pattern devouring fine fuels and toasting already stressed woody plants. The fire waned and swelled, responding to fuels it found on which to feed. Some patches burned fiercely, leaving only black ash on the ground while others burned in little fingers that soon went out. Green patches of tightly grazed vegetation failed to burn at all. As the smoke rose, the bison lifted their heads to observe and soon began making their way toward the origin of the white plumes where they knew they would soon find fresh, nutritious plant growth on which to feed.

This erratic fire behavior resulted from the recent (two-three years) history of fire and grazing. Bison (and many other herbivores) preferentially graze burned patches of prairie (regardless of season of burn) because of the fresh

Staff from the Missouri Department of Conservation, Natural Resource Conservation Service and the University of Missouri-Columbia discuss patch-burn grazing at Niawathe Prairie Natural Area and its applicability to private landowners.
Brent Jamison, Missouri Department of Conservation

plant growth (Coppedge and Shaw 1998). Grazing keeps the grasses short and regrowth palatable. The result is a self-sustaining "grazing lawn" that exists until a fresh burn produces more attractive forage, causing grazers to move. Grazing lawns cannot build up fine fuels needed for a fire until grazing pressure is shifted away from them.

Because bison used unburned areas much less, fine fuels, in the form of grasses, built up and burned intensively during the next fire. Areas that were last grazed were used moderately and had not yet built high fuel loads and would burn in a spotty manner. Thus, the interaction between fire and grazing created a variety of fuel loads that perpetuated a mosaic of habitat conditions that moved about the landscape (Fuhlendorf and Engle 2001).

The above description is the scenario that ecologists have long recognized as having shaped the tallgrass prairie and produced the wealth of plant and wildlife species grassland managers are trying to conserve today. However, most management regimes today manage fire and grazing separately or burn entire pastures, causing grazers (usually cattle) to graze uniformly and thus habitats become simplified. Grassland managers from a number of states became interested in attempting to mimic the fire-grazing interaction to allow these natural forces to once again shape the prairie tracts that remain and began implementing a grazing system termed patch-burn grazing.

It was another day, but the air was blisteringly hot and most vegetation was crispy brown due to the severe drought that had descended upon the region. Small groups of stocker cattle on Taberville Prairie Natural Area in St. Clair County peered curiously as a group of people composed of scientists, students, professors, landowners and managers walked through the prairie. They were discussing how the resources were responding to the effort to mimic the fire-grazing interaction that once was a vital natural process fostering the immense diversity of the tallgrass prairie. This group of people represents a small piece of the larger body of collaborators that are assisting land managers in our exploration of restoring

natural processes to allow grasslands to function more naturally.

Included in the group are representatives from The Nature Conservancy (chapters from Missouri, Kansas, Oklahoma and Nebraska), Missouri Department of Natural Resources, Natural Resources Conservation Service, multiple divisions of Missouri Department of Conservation (MDC), Iowa State University, University of Missouri-Columbia, Kansas State University, Oklahoma State University, U.S. Fish and Wildlife Service and private landowners. These varied professionals and grassland enthusiasts came together to share experience with patch-burn grazing and grassland ecology, discuss questions and concerns that need answers, provide ideas on implementation and studies, and ensure that efforts to study patch-burn grazing effects are complementary rather than redundant.

Tasked in 2004 with assessing the impacts of patch-burn grazing on Missouri's prairies, MDC's Grassland Systems Field Station immediately began drawing together managers and others with expertise in grassland management to ensure that the assessment would address applicable questions. A newly formed Patch-Burn Grazing Working Group consisted of representatives from universities, state and federal agencies, non-profit organizations and private landowners throughout the Great Plains region. They met to discuss management outcomes for patch-burn grazing in Missouri. These outcomes were identified as:

1) enhanced grassland bird diversity through more diverse vegetation structure throughout the growing season;
2) improved habitat for greater prairie chickens by providing a more complex mix of sparse and thick vegetation;
3) maintained or enhanced long-term vegetative diversity; and
4) providing reasonable economic return for producers.

The most critical management questions were:

1) Will grazing pressure rotate with burns?
2) Will cattle weight gains be profitable to landowners?
3) Will the desired habitat diversity be produced?
4) Will the grazing harm floristic diversity?

The task of monitoring these resources on five study sites (including Niawathe and Taberville Prairie natural areas) filled the field station's capacity. By collaborating with an MDC employee seeking to earn a master's degree at the University of Missouri-Columbia, information on the response of grassland passerines was added to the body of information gained from the evaluation. A Ph.D. student at Oklahoma State University learned about Missouri's abundance of regal fritillaries through the Patch-Burn Grazing Working Group and incorporated four of the Missouri study sites into his research to provide us with information on how this management affects Lepidopterans.

Rather than handing off the project to the field station to conduct, managers and collaborators remained involved with the project throughout its duration. Managers worked closely with scientists to ensure that the grazing and control units were managed according to the study design and assisted with weighing cattle. Local producers provided prescribed stock densities of cattle and stocked them according to the put on and take off dates prescribed. Scientists led monitoring efforts and assisted managers with prescribed burns and other duties. The Nature Conservancy provided study sites in both Missouri and Nebraska for the evaluation. They also provided housing to sampling crews throughout the duration of the sampling periods. Staff from MDC's Wildlife and Private Land Services divisions assisted in conducting annual workshops for the public and agencies to demonstrate use of patch-burn grazing to blend conservation and livestock production goals. Due to the successful collaboration and good scientific design, the Natural Resources Conservation Service provided partial funding for the project through a Conservation Innovation Grant.

Getting people with various backgrounds and expertise to collaborate to assess patch-burn grazing has benefited this effort and transcends a single project. Expertise in plants, birds, prairie chickens, butterflies, management, livestock production, aquatic communities, research, etc. has provided a depth of experience, interest and perspective allowing a holistic evaluation of how native prairies respond to this effort to mimic natural function. Management goals were well defined to allow the current project to evaluate variables that would assess success. Involving others interested in the topic allowed evaluation of other aspects beyond the capacity of the field station and provided additional funding. A subsequent project to assess the response of prairie chickens to patch-burn grazing has begun and is building on the original collaboration.

The teamwork continues as yet another group of collaborators (some the same and some new) look at the ecology of intermittent prairie streams and will design a study to assess how patch-burn grazing influences these streams and their fauna and to test the effectiveness of fenced buffers where grazing is prevented.

All resulting information and understanding of how prairie communities function enables managers to better simulate natural processes and conserve the species and functions that rely on them. For more information on the study or other work conducted by the Missouri Department of Conservation, Grassland Field Station, call 660-885-6981 or write to P.O. Box 368, Clinton, MO 64735. ▲

Coppedge, B. R. and J. H. Shaw. 1998. Bison grazing patterns on seasonally burned tallgrass prairie. Journal of Range Management 51:258-264.

Fuhlendorf, S. D. and D. M. Engle. 2001. Restoring heterogeneity on rangelands: ecosystem management based on evolutionary grazing patterns. BioScience 51:625-632.

Passing the Torch

By Paul Nelson, Forest Ecologist, Mark Twain National Forest

With 29 years as a member of Missouri Natural Areas Committee (MONAC), I've witnessed major changes throughout the evolution of the Missouri Natural Areas Program. So to speak, I've carried the proverbial flaming torch for ideals to defend the most effective possible advances for restoring and protecting Missouri biodiversity, and against many odds. That torch of ideals has represented many strategies for institutionalizing values to preserve biodiversity. Beginning with the Missouri state park system, those strategies included developing strong resource management policies; classifying distinctive characteristic natural communities; creating a scientific research program; establishing a dedicated natural resource stewardship budget; defending the need to fill critical natural history gaps with the purchase of new state parks; ensuring that visitor centers focus on strong landscape/ecosystem restoration themes; and balancing natural resource management standards with park operations areas.

The Missouri Department of Natural Resources (DNR) created a new natural areas coordinator position in 1978 within the new Natural History Program, and I was hired to fill that position. My first assignment was to inventory state parks for candidate natural areas. I was young and energetic; the thought of traipsing the hills, valleys, rivers and swamps of Missouri state parks left me sleepless. In addition to potential natural areas, I added natural communities, critical habitats and rare and endangered species locations. The report identified 93 significant natural resource areas within 35 state parks. Inspired by the great diversity of state park and national park landscapes, I also wrote my share of natural area nominations including Prairie Hollow Gorge (National Park Service), Mudlick Mountain (Sam A. Baker State Park) and Johnson's Shut-Ins (Johnson's Shut-Ins State Park).

The above accomplishments paled in comparison to two enormous challenges to come: the writing of the Terrestrial Natural Communities of Missouri and institutionalizing prescribed burning to restore fire-adapted natural communities.

Burning woodlands was extremely controversial in the early 1980s. Opponents to woodland and forest burning had less an issue with using fire on glades and prairies because the trees that were not supposed to burn did not occur on them in great numbers. Uncontrolled arson, Smokey Bear fire-suppression tactics, air-quality concerns, smoke on highways, human-health issues and the lack of understanding of the ecological role of emulating historical fires—all these compounded the resistance to initiating burning to restore fire-adapted ecosystems. The matter of prescribed burning woodlands created tension among varied interest groups.

Ha Ha Tonka State Park became the testing ground for burning woodland natural communities. Despite people slamming their fists, a protest on the day of the burn, and area television coverage, the first true woodland burn happened. It would have been easy to quit, but within the span of 25 years, this resistance transitioned into one of the most important management tools used by conservation organizations and agencies in restoring woodland ecosystems and their associated biodiversity. We passed the test. Today, nearly 1,000 acres of the park are designated as a state-designated natural area exemplifying restoration of stellar fire-adapted natural communities. More importantly, state, federal and private agencies now burn in excess of 60,000 acres annually across Missouri.

Advocacy is of vital importance before anything can be accomplished in the field of resource management. I continue to fight to educate those in the natural resource field about the dynamic nature of Missouri's distinctive natural communities. Learning about Missouri's diverse ecosystems and their management challenges should be prerequisite to any specialized natural resource management career. And only with the support of MONAC partners did we publish The Terrestrial Natural Communities of Missouri after nearly nine years of working committee effort. Our natural area friends, managers and researchers demonstrated strong support for understanding ecosystem classification and management by purchasing 3,000 copies of the book within two years. The University of Missouri and Southeast Missouri State University have used The Terrestrial Natural Communities of Missouri as a textbook. On behalf of MONAC, I accepted the 2006 Wildlife Conservationist of the Year Award presented by the Conservation Federation of Missouri for this book.

As we celebrate more than 30 years of administering the Missouri Natural Areas Program, controversy and tension remain. Agencies and programs are reorganized; government services outsourced; budgets streamlined; air emission standards stiffened, and the very fabric of the people making up our work force has changed to meet the demands of the new millennium.

The future of the Missouri Natural Areas Program and the natural resource stewardship program in all agencies depends on strong leadership abilities of a few special people. We have a strong cadre of impassioned wildlife and fisheries biologists, ecologists, soil scientists, geologists, botanists, resource stewards and naturalists. However, a few of these people must part from their field endeavors to ensure that the 30 years of progress made toward restoring and managing Missouri ecosystems survives. Passion, love and inspiration connected

to the natural world are key qualities of the few individuals qualified to lead natural resource management programs. All the policies, procedures, books and natural areas themselves will not endure if there's no one to effectively deliver the torch of ideals for protecting Missouri's biodiversity.

I intend to remain with the Mark Twain National Forest to help field staff accomplish the ecosystem restoration objectives outlined in the 2005 Forest Plan. With a career so rewarding and still more to do, I find it extremely difficult, even after 30 years in the field, to separate work and recreation in the natural world. I remain steadfastly inspired by Missouri's exquisite natural history. ▲

New and Expanded Natural Areas

By Mike Leahy, Natural Areas Coordinator, Missouri Department of Conservation, and Mike Currier, Natural Areas Coordinator, Missouri Department of Natural Resources

Two new natural areas, a small addition to a natural area, and a substantial consolidation and expansion of four previously designated natural areas into one large landscape-scale natural area brings the count of designated Missouri natural areas to 179 totaling 68,062 acres. These areas were recommended for inclusion in the Missouri Natural Areas System by the Missouri Natural Areas Committee, Missouri Department of Natural Resources and Missouri Department of Conservation agency directors, and the Missouri Conservation Commission:

Regal Tallgrass Prairie Natural Area (addition), is a 3,646-acre natural area in Barton County within Prairie State Park that incorporates four smaller, previously designated natural areas (Regal Prairie, Hunkah Prairie, Tzi-Sho Prairie and East Drywood Creek natural areas) into one large landscape-scale prairie natural area. Owned and managed by the Missouri Department of Natural Resources' Division of State Parks, Regal Tallgrass Prairie Natural Area reflects more than 30 years of prairie restoration and management at Prairie State Park.

Regal Tallgrass Prairie Natural Area features the largest contiguous piece of publicly owned remnant prairie in Missouri. The area contains large, high-quality examples of dry-mesic sandstone/shale prairie, hardpan prairie, prairie swale, wet-mesic bottomland prairie, and prairie headwater creek natural communities. The natural area supports 19 species of conservation concern, including Mead's milkweed, prairie mole cricket, regal fritillary, and the greater prairie chicken. East Drywood Creek, which flows through the center of the area, has been recognized as an Outstanding State Resource Water by the Missouri Clean Water Commission.

Regal Tallgrass Prairie is a keystone tract within the Western Cherokee Grasslands Conservation Opportunity Area (COA). Management of the prairies includes prescribedfire, tree removal, brush-hogging, exotic species control (especially of sericea lespedeza), and patch-burn grazing using bison and elk. A total of 385 native plants have been documented from the area and the full suite of grassland birds.

Niangua River Hills Natural Area (new), is a 588-acre natural area in Dallas County within the Lead Mine Conservation Area. This area features three units (353, 191 and 44 acres) that contain a variety of high-quality natural communities and four species of conservation concern within the Niangua Basin COA. State-significant dolomite glade and dry chert woodlands occur with the opportunity to restore some of the best chert woodlands in the state. Two rare orchids occur, including the small white lady-slipper orchid (found at only two other locations in Missouri).Juxtaposed against the glades and woodlands are a prairie fen, headwater creeks and undisturbed springs. The area supports nearly 300 native vascular plant species.

Brickey Hills Natural Area (new), is a 221-acre natural area in Ste. Genevieve County within the Magnolia Hollow Conservation Area. This area features two units (51 and 170 acres) that contain state-significant examples of old-growth dry-mesic and mesic limestone forest. The area contains more than 30 native tree species and more than 150 other native vascular plant species. Old-growth trees here have reached large sizes for their species, including a 36-inch diameter northern red oak, and a 22-inch diameter Ohio buckeye. Old-growth forests on rich soils are rare throughout Missouri. The site is within the Brickey Hills COA.

Overcup Fen Natural Area (addition), a 21.5-acre addition to the 130-acre original natural area designated in 2001. This small addition is the result of a recent Conservation Department land acquisition that allows for the protection of an entire Ozark fen that supports the federally endangered Hine's emerald dragonfly. The 151.5-acre natural area occurs on the Little Black Conservation Area in Ripley County. ▲

Natural Area Management Guidelines

By Mike Currier, Natural Areas Coordinator, Missouri Department of Natural Resources

The Missouri Natural Areas Program, administered through the Missouri Natural Areas Committee (MONAC), has a track record of more than 30 years of interagency cooperation and public support. The designation and stewardship of these special areas is based on scientific surveys and a rigorous nomination process. As the natural areas movement has evolved, we have learned that establishing buffer land around significant core areas provides better protection. Resource managers also have learned that the natural integrity of these buffers can be restored and the land can even attain "natural area" quality. In high-quality core areas, the least invasive management alternative is used—with humility and caution. Our commitment is scientifically directed toward promoting long-term viability. We employ silvicultural techniques or other innovative practices within an adaptive framework to affect landscape restoration in buffer areas. These are tested first and then applied. As the committee responsible for assuring these areas maintain the values for which they are recognized, MONAC is developing Natural Area Management Guidelines. These will help all landowners that manage natural areas or other lands to promote and sustain natural integrity.

These guidelines will address existing threats and suggest ways to alleviate them. For example, deer overpopulations are one such threat due to degradation of natural vegetation associated with overbrowsing. It follows that there is a need to assess deer population density and associated impacts and manage accordingly. Also, some forms of recreation are not encouraged within natural areas because studies and experience have shown they have degrading effects that are not easily controlled. The limits of acceptable change are narrow because natural areas have special designations that merit protection. The Natural Area Management Guidelines, which will be available in spring 2009, will provide general management recommendations to ensure that natural areas will be protected into the future. ▲

Editor's Note

I consider myself fortunate to have been associated with this issue of the *Missouri Natural Areas Newsletter* because its theme is partnerships. Although I have worked for the Missouri state park system for more than 20 years, it is always good to be reminded of why we do this job. Regardless of what agency we work for, we all have similar missions to protect the natural communities of Missouri. This issue illustrates that by working together, we can accomplish so much more than working individually. Many of the articles have a theme of Conservation Opportunity Areas and how agencies and individuals working together have achieved a common goal.

I was asked to edit this issue of the newsletter following the retirement of Wayne Porath, who did a very good job of organizing this newsletter and keeping it on schedule. A subcommittee from the Missouri Department of Conservation and the Missouri Department of Natural Resources is currently assessing the future of the newsletter. The bottom line is deciding whether the newsletter is meeting the information needs of the readers, while doing so in the most efficient and cost-effective method possible. Issues being considered include whether the newsletter is providing more strength and breadth to the base of natural area supporters and whether it is effectively communicating the issues involved in natural area protection and management.

You can help this process by letting them know your thoughts. Do you have ideas about what the newsletter should be in the future? Your input is encouraged. Please contact Mike Currier of the Department of Natural Resources (Mike.Currier@dnr.mo.gov) or Michael Leahy of the Department of Conservation (Michael.Leahy@mdc.mo.gov) with your ideas.

Sue Holst, Editor
Missouri Department of Natural Resources

MISSOURI Natural Areas NEWSLETTER
Fall 2008

Calendar of Events

Feb. 4-6, 2009
MISSOURI NATURAL RESOURCES CONFERENCE
Tan-Tar-A Resort and Golf Club, Lake of the Ozarks, Missouri
www.mnrc.org/
Theme: "Global Trends, Missouri Impacts: Adapting to Climate Change"

Feb. 8-12, 2009
62ND ANNUAL MEETING SOCIETY FOR RANGE MANAGEMENT
Albuquerque, New Mexico
www.srmmeetings.org
Theme: Merging Trails: Culture, Science and Innovation

March 16-20, 2009
THE 74TH ANNUAL NORTH AMERICAN WILDLIFE AND NATURAL RESOURCES CONFERENCE
Crystal Gateway Marriott, Arlington, Virginia
www.fishwildlife.org/nawnre.html
Theme: Refining the Relevance of Resource Management

June 22-26, 2009
SOCIETY FOR WETLAND SCIENTISTS CONFERENCE
Madison, Wisconsin
www.sws.org/2009_meeting/

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MISSOURI Natural Areas NEWSLETTER

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Thanks to MDC's Kevin Lanahan for web updates and the print shop staff for publishing this issue. The newsletter can be found at **www.mdc.mo.gov/n1694** or linked through any of the MoNAC partner-agency websites.

The *Missouri Natural Areas Directory* is in the process of revision and will be a new web-based document. In the meantime the 1996 *Missouri Natural Areas Directory* is available to see online at **www.mdc.mo.gov/areas/natareas**. For a free copy of the revised brochure, *The Missouri Natural Areas Program*, information on a specific natural area, or comments about the *Missouri Natural Areas Newsletter,* please contact either **mike.currier@dnr.mo.gov** or **michael.leahy@mdc.mo.gov**.

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