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Fire on the Forty

A CAMPAIGN TO RESTORE FIRE-ADAPTED ECOSYSTEMS IN MISSISSIPPI

By Scott L. Edwards, John Gruchy, and Jeffrey M. Lee

Many Mississippi landowners fondly remember the days of their youth when they ran or rode on horseback through the open, piney woods. They remember the lush vegetation underfoot, the flush of a quail covey, and the diversity of forest wildlife. Over time, as land use changed, some of this diversity faded. But today, many landowners are re-connecting with their land and working to restore their forests and fields to habitats that again provide resources for wildlife to flourish.

One of the best means to restore forests is prescribed fire. “My longleaf stand is beautiful,” says Mississippi landowner Jack Wellborn, now a strong proponent of using fire to manage his longleaf pines. “The growth form of longleaf allows more light to the forest floor, supporting high-quality forage for wildlife, and prescribed fire maintains this quality habitat.”

Wellborn is right. Frequent use of prescribed fire is the key to creating quality, early-successional habitat for wildlife, especially in fire-adapted ecosystems such as native pine forests of the southeastern United States. But many landowners are skeptical of using prescribed fire for a variety of legitimate reasons—including fear about smoke and liability, should a fire get out of control. To address this concern, the Mississippi Department of Wildlife, Fisheries, and Parks (MDWFP) and our partners launched a new landowner incentive program in 2011 called **Fire on the Forty** to increase the use of prescribed fire on private lands (i.e., the “Back Forty”). This program is making positive impacts, but it has taken a lot of effort from many cooperators to bring about such change.

The Ebb and Flow of Fire

Wildlife biologists have long understood that fire is a natural process that has played a vital role in shaping



Credit: MDWFP

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Flames of a prescribed burn torch the floor of a loblolly pine stand in Mississippi. Just a few weeks after this March burn, the charred ground will begin to grow into a lush understory that will provide summertime habitat for many wildlife species.

Credit: J.R. Phillips Photography

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Credit: J.R. Phillips Photography

Lee Woodall, a wildlife biologist with MidSouth Resource Management, LLC, uses an ATV-mounted drip torch to ignite a prescribed burn on a restored grassland in the Blackland Prairie Region of Mississippi. Fire helps combat invasive plant species and restore native grasses to this rare and critical wildlife habitat.

many ecosystems in the U.S. Much of Mississippi is pyric-adapted, and many woodland and grassland habitats—along with their associated wildlife populations—depend on frequent fire disturbance to maintain habitat quality. We also know that fire historically occurred on the landscape naturally (e.g., lightning strikes) and artificially (e.g., human-ignited). Yet in recent history, many private landowners have utilized small-scale fires only for brush control. Over time, the occurrence of fire on these pyric habitats has declined and the ecosystems themselves have suffered great losses from increased non-desirable hardwood tree encroachment, increased fuel loads, and a decrease in early-successional habitats that are critical for many wildlife species.

Since the early 1900s, fire frequency across Mississippi and most of the southeastern U.S., especially in the longleaf pine-grassland ecosystem, has declined for a variety of reasons (Van Lear et al. 2005). Reasons for the decline in the application of prescribed fire include a general lack of fire knowledge, a growing disconnect between society and land management, increasing costs of implementing burns, and liability concerns.

Notably, Mississippi has had a Prescribed Burning Act since 1992 that identifies prescribed fire as a landowner's property right and touts its benefits to society, the environment, and Mississippi's economy (Sun and Londo 2008). For example, the Act recognizes prescribed fire for its benefits in reducing forest fuel loads (which in turn curbs catastrophic wildfire risk), increasing biological diversity, removing undesirable vegetation within forests and fields, promoting nutrient cycling, and controlling and/or eliminating some forest pathogens.

So why are so many landowners reluctant to use fire? The overarching problem is ultimately one of public apathy toward land management. Many private landowners have lost a connection that their ancestors once had with the land, and implementing practices because they are ecologically appropriate may not drive management decisions today as much as in the past. Aldo Leopold recognized this important connection and stated that "conservation can accomplish its objectives only when it springs from an impelling conviction on the part of private landowners" (1947).

Fighting apathy may be one of our greatest resource challenges in the 21st century. To take on the challenge, MDWFP's [strategic plan](#) includes goals to help private landowners advance conservation and address limiting factors to effective land management. Prescribed burning as described in the Fire on the Forty campaign helps do this by targeting challenges such as landowner knowledge levels about burning, liability concerns, and costs of burning. When developing the campaign, however, we also recognized that this effort could only be successful if it was a conservation partnership of all vested natural resource parties within Mississippi.

The Mississippi Partners for Fish and Wildlife program (hereafter [Partners](#)) was the perfect vehicle to create and launch such a program. Administered by the U.S. Fish and Wildlife Service (FWS), Partners is a federal, technical, and cost-share assistance program designed to help private landowners with habitat restoration to benefit federal trust species such as migratory birds, threatened and endangered species, and other declining species.

In Mississippi, Partners is comprised of 21 cooperators from various state and federal agencies, universities, and non-governmental organizations working to address resource needs. Key cooperators include FWS; MDWFP; Foundation for Mississippi Wildlife, Fisheries, and Parks; Wildlife Mississippi; Mississippi Forestry Commission; Mississippi State University; Mississippi Wildlife Federation; National Wild Turkey Federation; and Mississippi Prescribed Fire Council. All are linked by a commitment to restore fire-maintained habitats in Mississippi.

Starting the Fire

The Fire on the Forty steering committee decided that the best way to entice landowners to begin implementing prescribed fire was to provide a combination of financial incentives and education to teach both landowners and the general public about the benefits of prescribed fire in managing wildlife habitat. In the

end, we wanted a grassroots effort that would spread from property to property as one landowner shared success with others. We hoped participation would grow and progress toward a critical mass of habitat being established through increased fire frequency.

To achieve these goals, the Partners utilized the [Mississippi Comprehensive Wildlife Conservation Strategy](#), which identifies key habitats for conservation actions that will directly benefit wildlife species of greatest conservation need. Due to fire exclusion primarily by changing land uses over time, we specifically concentrated our efforts on two imperiled habitats that benefit fire-dependent wildlife species:

Blackland Prairie Region. Characterized by dark, fertile soils, this region extends for more than 300 miles from southeastern Tennessee through east-central Mississippi to southeastern Alabama. Less than 1 percent of the historic 350,000 acres of these native prairies still exist, yet they provide critical habitat for numerous wildlife and plant species. Conversion to agriculture and non-native grasses, excessive grazing, and fire exclusion were major causes of the decline of this ecosystem.

Because of the rarity of remnant prairie habitats, many private landowners today are restoring and maintaining them on their lands, and even converting agricultural land uses back to native prairies. Within the Blackland Prairie region, prescribed fire is a critical disturbance practice used to maintain a plant dominance of native grasses, forbs, legumes, and wild flowers. Fire reduces dead plant material at ground level, increases seed germination through scarifying seed coats, stimulates herbaceous growth, and reduces non-desirable woody plant density. Habitat restoration and reintroduction of prescribed fire in the Blackland Prairie region will benefit many rare grassland bird species including Henslow's sparrows (*Ammodramus henslowii*), grasshopper sparrows (*Ammodramus savannarum*), Le Conte's sparrows (*Ammodramus leconteii*), and Northern bobwhite (*Colinus virginianus*) ([Jones et al. 2007](#)).

Longleaf Pine Region. Today, less than 255,000 acres of longleaf pine forest remain, though it once covered more than 11 million acres in 36 southern Mississippi counties. Many species of wildlife, such as the gopher tortoise (*Gopherus polyphemus*), black pinesnake (*Pituophis melanoleucus lodingi*), and Northern bobwhite have suffered serious declines as a result of this habitat loss. Numerous factors contributed to the loss of longleaf forests, including land clearing for agriculture and development, re-

placement of harvested longleaf pine stands with densely stocked loblolly pine stands, feral hogs causing regeneration failures, and lack of fire as a management tool.

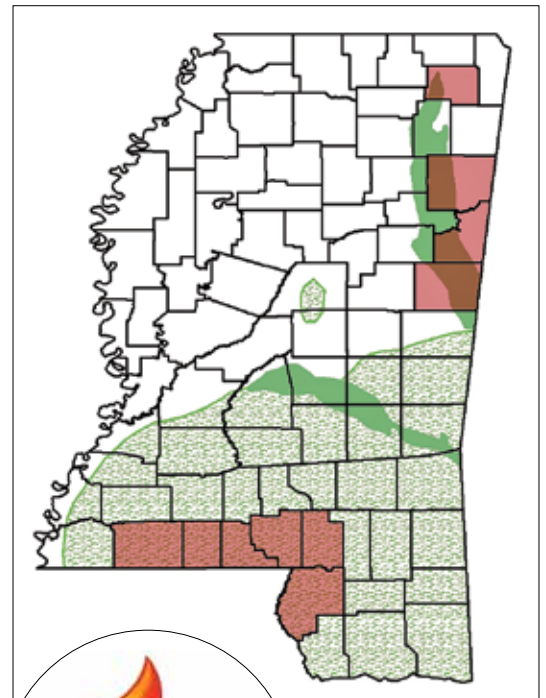
Longleaf pine is a fire-dependent species with thick bark and long needle clusters that protect terminal buds from all but the most intensive fires. The unique grass stage of longleaf seedling development is very intolerant to overtopping vegetation, so fire is essential to reducing competition and promoting successful stand establishment ([Browning et al. 2009](#)).

Within these two habitat types, we selected 10 counties to receive funding through the Fire on the Forty program (see map). Targeted delivery of fire to focal areas in these counties would allow us to create and maintain desirable early successional habitat on multiple properties in close proximity to one another. In turn, this would allow less mobile wildlife (such as Northern bobwhite and gopher tortoise) to travel between managed patches. Identifying focal areas also helped biologists use resources more efficiently and increased the likelihood that neighboring landowners would become interested in prescribed burning.

Coupled with habitat-population models, expected landowner interest, and biologist delivery capacity, these focal areas were ideal locations to concentrate conservation efforts. Additional habitat patches in these areas—created through other programs such as the [Black Belt Restoration Initiative](#), [Longleaf Pine Initiative](#), [Environmental Quality Incentives Program](#), [Forest Stewardship](#), and [Farm Bill](#) programs such as [Conservation Reserve Program](#)—would further help reach a critical mass of managed, landscape-level habitat improvements.

Grassroots Education Efforts

We wanted Fire on the Forty to be a grassroots effort, so we marketed it locally in each selected county, using four key approaches:



Credit: MDWFP GIS Lab



The fire on the Forty Program (logo at left) occurs within 10 Mississippi focal counties (shown in red). These counties contain parts of the remnant Blackland Prairie Region (solid green) and Longleaf Pine Region (historic range shown in light green). Prescribed burns in these counties enrich wildlife habitat.



- Landowner workshops.** We worked with the Mississippi State University Extension Service, the [Mississippi Prescribed Fire Council](#), county forestry associations, and other conservation organizations to plan and host six landowner workshops during 2013 and 2014. These hands-on workshops covered the safe and effective use of prescribed fire, relationships between fire ecology and wildlife habitat, and legal issues related to prescribed burning. Landowners could participate in a prescribed burn demonstration, working on a fire line with professional burn managers. We also encouraged landowners to become certified as prescribed burn managers by completing the [Prescribed Burning Short Course](#) offered by the Mississippi Forestry Commission. In all, more than 180 landowners and natural resource professionals with the ability

at key locations such as county farm-supply stores and USDA offices.

- Website.** We developed a website (www.mdwfp.com/fireontheforty) to provide general information, program goals, descriptions of the focal counties, and landowner applications.

These approaches resulted in the essential “branding” of our Fire on the Forty message and image. Our simple logo evokes the piney woods and a Northern bobwhite, an iconic game bird that was once part of rural southern culture and is closely tied to fire use. Ultimately, we wanted to communicate a message about the relationship between people, land, and conservation.

Choosing the Fire Sites

Assuming we would have more property applications than funding, we developed ranking criteria to competitively review each application. An ideal project site would have to be located within a focal county and would have the following characteristics:

- a longleaf pine stand or other species of pine if grown at a low stocking density such as less than 60 square feet per acre basal area;
- a field with less than 20 percent non-native grass composition;
- immediate adjacency to a regularly burned property;
- the presence of threatened and/or endangered species;
- a demonstrated history of completing conservation practices;
- ability to provide quality, early-successional habitat following one prescribed burn.



Credit: Melissa Moore

Landowners participating in a Prescribed Fire Workshop—part of Mississippi’s Fire on the Forty program—learn about fire weather, fire behavior, firing techniques, and other topics from certified prescribed burn managers.

to manage more than 250,000 acres attended the workshops where, thanks to favorable weather, they practiced burn techniques with fire professionals.

- Meetings.** Within each focal county, we hosted town-hall-style meetings where biologists gave presentations on fire history, habitat management, why prescribed fire is necessary, and legal issues pertaining to prescribed fire. These meetings allowed interested landowners to ask questions and learn more about prescribed burning and the Fire on the Forty program.
- Promotional materials.** We developed fliers, brochures, and other promotional materials, which we distributed through newspapers, e-mail lists, social media outlets, and through physical postings

Landowners submit applications and then receive a site visit from a Partners cooperator who inspects the proposed burn area. The cooperator develops a proposal if they deem the project to be competitive. If a site is rejected—for example, if a pine stand has a stocking density that is too high—the cooperator will still provide technical guidance to the landowner on how to improve habitat quality, perhaps through timber thinning, before pursuing prescribed fire activities. The Fire on the Forty steering committee meets annually to review, rank, and award projects.

The final step is determining the cost-share rate for burning. In Mississippi, burning costs vary across the state and even locally by contractor. Some landowners conduct the burns themselves, but most hire a certified private contractor. The average cost in

Mississippi for conducting a prescribed burn is \$25 per acre, with additional costs for installing fire lanes (typically bare-ground buffers of six to 10 feet wide installed to help keep fire contained in a burn unit). We provide a 50 percent cost-share reimbursement to the landowner (up to \$12.50 per acre) for the cost of prescribed burning.

The response to Fire on the Forty has been outstanding. Since 2011, we have contacted more than 2,000 landowners directly through more than 50 public presentations. Cooperating biologists have visited more than 500 properties and generated 452 applications for cost-share funding of 55,239 acres. To date, the program has funded 310 projects, cost-sharing the prescribed burning expense on 35,970 acres within our 10 focal counties.

To encourage as many landowners as possible to start a burning rotation on their properties, we have placed an acreage cap on project awards, and this cap fluctuates annually based on funding availability. Thus, funded projects have averaged 126 acres and cost \$1,575 to burn. The overall average cost per acre has been \$24.49, and Fire on the Forty has paid \$1.00 for every \$1.15 spent by landowners. This effective match ratio has been very successful at making our programmatic funds spread farther to more properties.

While cost-share is critical for landowners who do not have the resources to burn their own property, the long-term sustainability of prescribed fire on the landscape in the amount that is needed to impact wildlife populations will never be attainable through cost-sharing alone. Ultimately, the conservation movement needs private landowners who are willing and able to burn their own land in order to recreate the fire culture that sustained these habitats in the past.

Fanning the Flames

There have been many keys to success for Fire on the Forty in Mississippi. First, this endeavor would not have been so effective without the efforts of our cooperators uniting for a common purpose, collaborating to make a positive impact on natural resources in the focal areas. Second, the program is flexible with regards to the needs of private landowners. Landowners can hire their desired contractor to conduct burns; that is, Fire on the Forty cooperating personnel do not conduct any of the burns. The cooperators also work closely with local forestry consultants and state and federal agencies to make the application and delivery process as simple as possible. Landowners don't have to file extensive paperwork, and are



Credit: Melissa Moore

not restricted on the timing of their burning (i.e., each contract has an 18-month duration to allow for bad-burning-weather delays).

Another positive aspect of working within focal counties is that we have seen a slight increase in private forestry consultants and contractors providing burning services. Our goal was to bolster the private sector's role in delivering prescribed fire. As demand has increased, so has the supply of contractors in many of these focal areas, and more landowners are willing to burn where there is an increased supply of contractors.

Given the high demand from landowners, Fire on the Forty continues to seek and obtain new sources of funding to support its cost-share and educational programs. We have received some funds from State Wildlife Grants, the Mississippi Chapter of the National Wild Turkey Federation, and the U.S. Forest Service in cooperation with the Mississippi Forestry Commission. Based on current funding trends, the Fire on the Forty will likely be expanded to include more counties in the Piney Woods Region of south Mississippi.

At its core, this program has become a prime example of multi-stakeholder collaboration in conservation and habitat management. Partners' biologists often continue to work with landowners to provide technical guidance for developing and maintaining wildlife habitat, even after individual burning projects are completed. In many cases, multiple prescribed burns may be needed to properly restore and maintain habitat for wildlife. Ultimately, to realize the goal of restoring Mississippi's fire-adapted habitats, prescribed burning must become more than a one-time practice: it has to become a way of life. ■

A certified prescribed burn manager inspects the fire line during a demonstration burn as part of a Prescribed Fire Workshop for landowners. This longleaf pine stand in South Mississippi provides early-successional habitat that benefits game species (such as Northern bobwhite and Eastern wild turkey) and non-game species (such as the threatened gopher tortoise).



For more information about the Fire on the Forty initiative, visit www.mdwfp.com/fireontheforty.