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Forest management plan for agriculture stations

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COLT — Forest researchers will be working to regenerate a declining ecosystem in Arkansas – bottomland oak forests – to help restore healthy and productive red and white oak ecosystems to provide timber and improved habitat for deer, quail, ducks, turkeys and other species.

The regeneration is part of a forest management plan developed by Kyle Cunningham, extension and research forester; and Mike McGowan, Arkansas Agricultural Experiment Station forester, both of the University of Arkansas System Division of Agriculture. The plan covers all forest land managed by the Division of Agriculture on its research stations.

Flooded timberland

Flooded timberland in St. Francis County. Foresters discuss their management plan to help rebuild declining habitat. (U of A System Division of Agriculture image by Kyle Cunningham)

Cunningham and McGowan presented the plan to a local citizens committee in St. Francis County in December.

The initial project will involve 100 acres at the Pine Tree Research Station in St. Francis County. The station's 12,000 acres are home to both forest and row crop research conducted by the Arkansas Agricultural Experiment Station, part of the University of Arkansas System Division of Agriculture. The management plan has been peer-reviewed by the Arkansas Game and Fish Commission, the U.S. Forest Service and the Forestry Division of the Arkansas Department of Agriculture.

"Every longterm forest management plan must have in it the actions needed to regenerate the next forest," said Arkansas State Forester Joe Fox. "The Pine Tree Research Station's plan to thin out older, over-mature trees in order to release and regenerate young vigorous trees is sound forest science and necessary to keep to a diverse forest structure with multiple age trees to ensure the health of the forest. This is the best action to conserve wildlife habitat and therefore diversity."

Cunningham said the work will focus on a block with mature oak forests and a very dense canopy. The station is home to a variety of oaks. Floodplain areas have willow, water, cherrybark, Nuttal and overcup oaks. On areas elevated 4-5 feet above the floodplain, some upland species mix in, including southern red oaks, white oaks and post oaks.

"These areas open the door for a variety of management methods to be employed," Cunningham said.

"Where you have that mature overstory and midstory, less than 5 percent of the sunlight hitting the upper canopy reaches the ground," Cunningham said. "Not much happens at the ground level. The midstory is composed of trees that are shade-tolerant such as elm, maple and hickory. They really build up."

On that dark forest floor, no browse for deer grows. Vegetation that would shelter quail and other small wildlife is missing. Acorns trying to find a foothold don't have enough light to grow into the next generation of mighty oaks.

Using what's called the shelterwood management method, Cunningham said forest managers have to strike a balance in available sunlight while the stands go through regeneration to a new oak forest. They need to open the canopy to let just enough light in to allow that vegetation to grow, but not too much. A long time ago these hardwood forests would regenerate through disturbances such as fire, flood events or storms.

"If we clear cut, everything under the sun will grow in there. Grasses, vines and the seedling oaks can't keep up with all the fast-growing vegetation that comes in," he said. "Through this

shelterwood process, we control the light environment and allow those oak seedlings time to become more competitive.

“It allows the oak seedlings a few years to get some size and to get to 3-4 feet tall over a three- to five-year period, and if we’re comfortable with the abundance of seedlings in the stand, we’ll remove the overstory, giving the young trees a chance to compete,” Cunningham said.

Over time, this technique creates an environment for a healthier, more productive forest.

“The prescription is that you thin the forest and leave the large oaks so they drop seed with the most valuable genetics to reforest what you’re cutting,” said Mike McGowan, forester for the Division of Agriculture.

Preparation for this fall’s thinning began back in 2014 and the current work is expected to take about five months, McGowan said. The forestry crew’s window to complete the work runs through October, or even November, if they’re lucky.

“It all depends on how much rain we get,” he said.

Forest management is done on a scale of decades instead of months or years. The 100 acres is part of a decades-long, sustainable management plan developed by division forestry experts for the station’s forests. Thinning and other management techniques are rotated among the station’s 8,000 forested acres. It will be nearly a century before the rotation would return to the block being started this fall.

Opening a way for wildlife

Bringing the light back will also help bring back wildlife.

“Opening a stand and putting light on the floor creates an understory rich in herbaceous cover that slowly turns into woody cover and vines. It makes good habitat for turkeys to nest and deer to bed down in safety,” said Douglas Osborne, associate professor at the University of Arkansas at Monticello, with expertise in wetland ecology and management. Osborne is part of the Division of Agriculture’s Arkansas Forest Resource Center and the director of the Five Oaks Agriculture Research and Education Center. Once structural diversity is restored, wildlife “have more cover that can translate to improved reproduction and juvenile recruitment.”

Ducks can also benefit practically when red oaks acorn production is high. Timber thinning can help acorn production by allowing more space in the canopy for mature oaks to expand, and by releasing red oaks that are suppressed in the midstory.

“Red oak acorns are often as big as the end of a pinky. White oak acorns are big, like the end of your thumb,” Osborne said. “Ducks don’t eat the white oak acorns, but the red oak acorns are an important component in their diet during winter.

“Red oak acorns provide high amounts of amino acids and micronutrients they can’t get from other food sources,” he said. “Ducks can’t just eat rice. They have to have a variety for different stages of life.”

While in their wintering grounds, ducks begin to molt into their breeding plumage. “During molt they need those amino acids and a variety of micronutrients to replace feathers.”

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