



United States
Department of
Agriculture



Forest
Service

Kaskaskia Experimental Forest

**NORTHERN RESEARCH STATION
EXPERIMENTAL FOREST NETWORK**

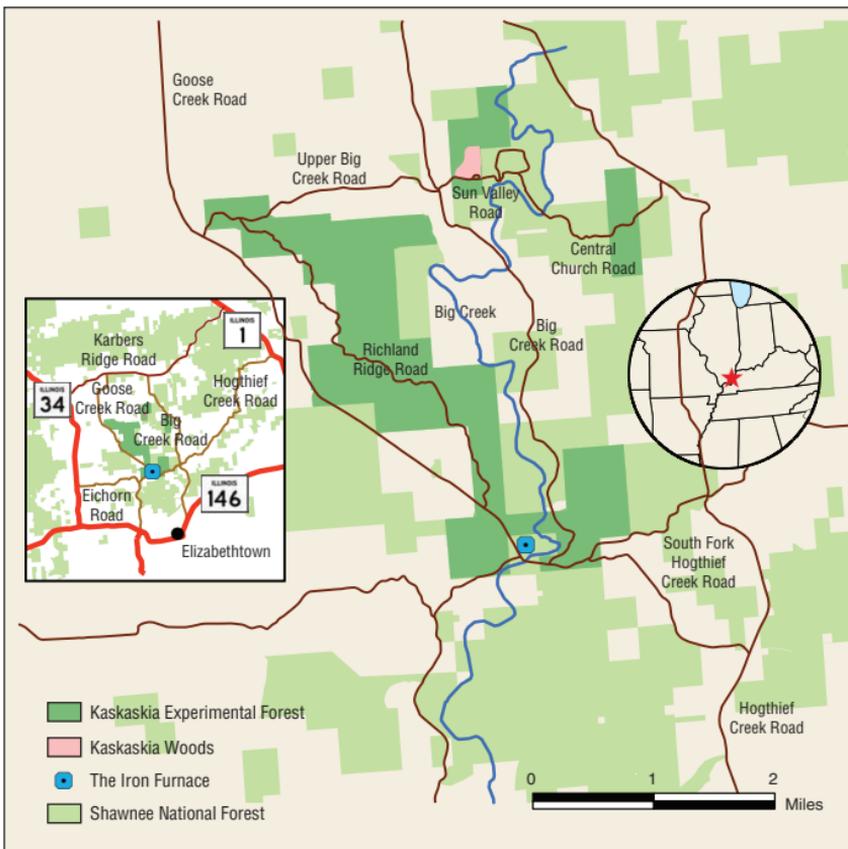
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Kaskaskia Experimental Forest

The Kaskaskia Experiment Forest (KEF), located 5 miles northwest of Elizabethtown, IL, was established in 1942 within the Shawnee National Forest. It was named after the Native American tribe that once roamed throughout most of southern Illinois.

The KEF presently comprises 2,169 acres. It originally included 5,811 acres and initially was managed by the Central States Forest Experiment Station headquartered in Columbus, OH, until 1946 when administration was transferred to the newly created research center in Carbondale, IL. In 1972, when the research mission turned to hardwood plantation culture, some of the land was returned to the Shawnee National Forest and boundaries were redrawn. Following the closure of the Carbondale research center in 1997, administration was transferred to Columbia, MO.

Map by U.S. Forest Service.



Features

Mixed-hardwood forests occur in coves, stream bottoms, and on north- and east-facing slopes dominated by yellow-poplar, maples, some hickory, elm, beech, blackgum, and northern red, white, and black oaks. Oak-hickory forests occur along south- and west-facing slopes and ridge tops dominated by black, white, post, scarlet, southern red, blackjack oaks and a mix of hickories. The forest is representative of more than 4 million acres of upland forest land in southern Illinois, western Kentucky, southwest Indiana, and southeastern Missouri.

The Kaskaskia is located on an extensive anticline known as Hicks Dome, which was formed during an explosive phase of igneous activity during Permian times. The exposed Mississippian and Devonian limestones are indicative of the Ozark uplift that occurred about 200 million years ago. Subsequently, wind and water from glaciers north of the area cut into the exposed rock, producing areas of deep glacial till through this area of gently to steeply sloping hills. A narrow belt of fine sandy loam runs along Big Creek and other streams.

- **The soils on the Kaskaskia primarily are Grantsburg silt loam, Alford silt loam, Baxter gravelly silt loam, and Clarksville gravelly silt loam.**
- **The average length of the growing season (frost-free period) is 190 days. The average date of the last killing frost of spring is April 16; the average first killing frost of autumn occurs around September 24.**
- **Annual average temperature is 13 °C (55 °F). In winter, the average minimum temperature is 4 °C (39 °F), and the average maximum temperature is 7 °C (44 °F). In summer, the average minimum temperature, 18 °C (64 °F) and the maximum average temperature is 30 °C (86 °F).**
- **The average annual rainfall is 1,000 mm (39 inches) distributed equally throughout the year; prolonged dry periods during the growing seasons are not unusual. Average annual snowfall is 25 cm (10 inches).**

Research

More than 30 research studies have been conducted within the KEF including systematic comparison of harvesting and regeneration methods for central hardwood forests. Studies were developed to examine the influence of leaf-litter mulch on the establishment and early growth of trees, the effects of site preparation on planted black locust, shortleaf pine, and pitch pine, logging damage, and the source of defects in upland hardwoods.

The largest study established on the KEF was initiated in 1948 and consisted of thirty-six 15- to 40-acre compartments designed to study the impacts of commercial-type forest management practices under uneven-aged silviculture. Experimental design included various combinations of selection harvesting type, cutting cycle length, maximum residual tree size retained, and management intensity.

Only two studies are still active—one documenting silvicultural changes since 1935 in a 20 acre old-growth natural area (Kaskaskia Woods); another documenting forest regeneration in group openings of different sizes. Kaskaskia Woods is one of the oldest permanent plots studies in the eastern U.S.

Science Delivery

Research conducted KEF has been used to develop prescriptions for regenerating oaks in oak-hickory and mixed-hardwood forests of the central hardwood region. The research has added to the knowledge of how oak regeneration dynamics vary by ecoregion and was recently incorporated into a landmark synthesis on oak forest ecosystems, “The Ecology and Silviculture of Oaks” by P.A. Johnson, S.R. Shifley, and R. Rogers. The early history of the KEF is described in “A Forestry Sciences Laboratory and how it grew”, published in 1976 by the North Central Forest Experiment Station and available on the Kaskaskia Experimental Forest Website..



Tagging a tree in the Kaskaskia Woods on the Kaskaskia Experimental Forest. Photo by Brad Graham, Purdue University, used with permission.

Outcomes

The principal outcome of the research on the KEF can be summed up in three words: Sustainably managed forests. Since 1942, the KEF has provided state-of-the-science information that has served as the foundation for sustainably managing oak-hickory and mixed-hardwood ecosystems and for understanding the character and dynamics of old growth forests.

Partners

Collaborators included the Shawnee National Forest, Southern Illinois University, University of Arkansas-Fayetteville, and Auburn University.

Facilities

There are no facilities at the KEF.

U.S. Forest Service Experimental Forest and Range Network

Forest Service Research and Development (R&D) works at the forefront of science to improve the health and use of our nation's forests and grasslands. Research has been part of the Forest Service mission since the agency's inception. Today, Forest Service researchers work in a range of biological, physical, and social science fields; their research covers all 50 states, U.S. territories, and commonwealths. The Northern Research Station is one of six in R&D, and includes 20 states in the north-central and northeastern U.S., comprising both the most densely populated and most heavily forested portions of the country.

The Experimental Forest and Range (EFR) network contributes importantly to R&D's research infrastructure and is increasingly viewed as one of its most valued assets. There are currently 22 official experimental forests in the Northern Research Station, and 80 EFRs nationwide. Taken together, these sites provide a record of forests and forest change that dates back more than 100 years. Though initially focused on local and regional topics, EFRs are becoming increasingly networked to address issues of national and international concern such as climate change, carbon sequestration, air and water quality, and invasive plants and animals.

For more information about the Kaskaskia Experimental Forest

Websites

<http://nrs.fs.fed.us/ef/locations/il/kaskaskia/>

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On the cover: A canopy gap in the forest of Kaskaskia Experimental Forest. Photo by Leon Minckler, U.S. Forest Service.