# An Old-Growth Forest
## on the Oak Ridge Reservation

Old-growth forests are increasingly rare around the globe. One occurs in the Oak Ridge National Environmental Research Park on the Department of Energy's Oak Ridge Reservation (ORR). This mixed mesophytic plant community is one of the few such old-growth forests remaining in the Ridge and Valley Province of Tennessee.

### East Fork Ridge Mesic Forest

The central part of this Research Park natural area exhibits characteristics typical of old-growth mixed mesophytic forests:

- The forest occurs on a steep northeast-facing slope, giving it minimal exposure to midday and afternoon sun and hence a moist microclimate.
- The forest has numerous large, tall trees of a number of species that prefer moist environments, and no species is dominant.
- Almost no non-native invasive plants grow in the herb layer on the forest floor.
- No major evidence of logging, farming, or other disturbance by European settlers is visible.

*This ancient beech tree looms over the forest. (Photo by Mike Ryon)*

This unique plant community contains very large specimens of several climax tree species, one indicator of a mixed-mesophytic forest. This mix of tree species includes basswood *(Tilia americana)*, tulip tree *(Liriodendron tulipifera)*, yellow buckeye *(Aesculus octandra)*, cucumber magnolia *(Magnolia acuminata)*, black walnut *(Juglans nigra)*, shagbark hickory *(Carya ovata)*, northern red oak *(Quercus rubra)*, American beech *(Fagus grandifolia)*, and sugar maple *(Acer saccharum)*. A shagbark hickory tree that was uprooted by high winds is estimated to be about 230 years old. This is evidence that the forest already existed in 1775, before Europeans settled this area of Tennessee. Younger forests surround the old-growth areas, and although these are not completely undisturbed, they make excellent buffer zones for it.

*The native wildflower makeup of the mesic forest may be as unique as its tree composition. Some spring wildflowers found here include, from left to right, yellow trillium* (Trillium luteum), *Canadian white violet* (Viola canadensis), *and sweet wakerobin* (Trillium vaseyi). *(Photos © R. K. McConathy)*

## Value of Old-Growth Forests

Old-growth mixed mesophytic forests are valuable for their aesthetic qualities, scientific and recreational potential, and contribution to our national natural heritage. They build rich soil, act as natural filtration systems for water and air, and store carbon that would otherwise contribute to global warming. They are globally significant centers of biodiversity, being home to a vast number of plant and animal species.

Standing and fallen dead trees and leaf litter provide shelter, nest and den sites, and foraging opportunities for mammals; salamanders; myriad insects, spiders, and other arthropods; and birds such as hawks, owls, woodpeckers, and songbirds. Much biodiversity is also apparent in the fungi, lichens, and woody and herbaceous plants.

*Spring vegetation is thick in this woods, both overhead and on the sloping forest floor. (Photo © R. K. McConathy)*

The old trees provide reliable records of climate, rainfall, and atmospheric conditions over their life spans. Ancient trees help us to monitor natural processes through time, serving as yardsticks for us to compare past conditions with today's human-dominated ecosystems.

## Future Research and Action

This unique forest has a high potential for both recreation and research. Hikers walking through it experience forests as they existed in this region prior to European settlement.

*Even in the winter with no leaves on the trees, this old-growth forest is awe-inspiring. (Photo by Pat Parr)*

Opportunities for research on old-growth forests in the Ridge and Valley Province in Tennessee are nearly nonexistent. This woody area is particularly valuable because data about it from the 1970s can be compared with current forest vegetation. Ecological researchers could collect additional data (e.g., tree ring counts) to better establish the age of the forest, map and measure trees within the mesic area, and determine the extent of buffer zone necessary to maintain the integrity of the old-growth portion of the forest. To learn more about the rich history of this old-growth forest, deed searches might reveal details of previous ownership of the land that might explain the lack of human disturbance. Continued protection of the old-growth forest and its surrounding buffer forest will acknowledge its irreplaceable significance.

For more information on the natural resources of the Oak Ridge National Environmental Research Park, contact Pat Parr, the Oak Ridge National Laboratory Natural Resources Manager, at 865-576-8123 or parrpd@ornl.gov.

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