Mammoth Cave International Center for Science and Learning

Mammoth Cave National Park
Western Kentucky University

Population and Health of Butternuts at Mammoth Cave National Park

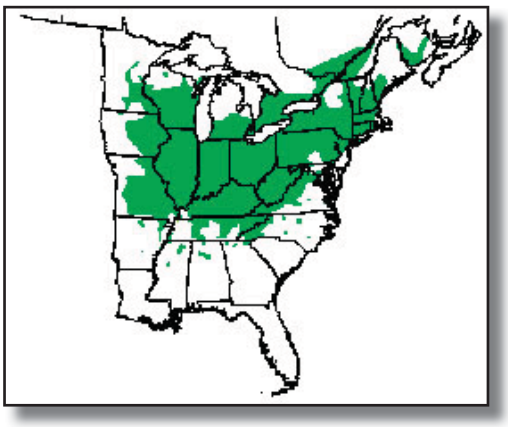
Research Project Summary August 2008

Background:

The butternut (*Juglans cinerea*) is a relative of the black walnut (*Juglans nigra*). Other names for it include white walnuts, oilnuts, or demon walnuts. Butternuts are canopy trees that produce nuts similar to black walnuts. The nuts are an important food source for wildlife and the wood is valued for building furniture.

In 1967, a strange canker was discovered on butternuts in Wisconsin. Infected butternuts became weak and eventually died. The canker was caused by a fungus, *Sirococcus clavigignenti-juglandacearum*. No one is sure where the fungus came from, but scientists believe that it is exotic to North America. The fungus reproduces by spores which are spread by rain, wind, and possibly birds / other animals. The spores may also remain viable on nut hulls causing young sprouts to become infected as soon as they emerge from the hull. The fungus soon spread across the butternut's range.

Scientists across the U.S. are studying butternuts and the fungus that causes butternut canker. Their research may one day find a way to combat the fungus and prevent butternuts from disappearing from our forests.



Native range of butternuts. Image provided by the US Forest Service.

The Questions:

- How many butternuts are growing in the park and where are they located?
- How much of an impact is butternut canker having on Mammoth Cave National Park's butternuts?

Butternuts collected from Mammoth Cave National Park. The nuts will be used for propagation and restoration efforts.

The Project:

Searches are being conducted to locate butternuts within Mammoth Cave National Park. Park staff are also working with interested neighbors who want to know if they have butternuts on their land. For each butternut that is located, its GPS coordinates and health are recorded. If the tree is producing nuts and appears to be resistant, then its nuts are collected for use in future propagation and restoration efforts.

Preliminary Findings:

Over 100 butternuts, most of which are on park property, have been identified. In general, butternuts in the Mammoth Cave area tend to be found in sinks and drainages. Researchers have used information gathered on the abiotic factors associated with these butternut

locations to produce predictive models. The models help predict the most likely places where additional butternuts may be found. They will also be used to determine the best places to plant butternuts during future restoration efforts.

The majority of the butternuts that have been identified in or around Mammoth Cave National Park are infected by butternut canker. However, some of the trees show signs of healing. That may indicate some level of resistance to the disease, although it is too early to know for sure. There are also some very healthy butternuts located within the park. Scientists are trying to determine whether those trees are resistant to the canker or if they just haven't been exposed yet.

This is an ongoing project. Surveys for additional butternuts continue to be conducted and the health of any newly discovered butternuts is recorded. Known butternuts are also monitored to determine any changes in their health. In addition, nuts from trees that appear to have some level of canker resistance are being collected. These nuts are sent to a grow out nursery where they are propagated and will later be transplanted back to the park as part of future restoration efforts.

Park staff examine a butternut found at Mammoth Cave National Park.

The Mammoth Cave International Center for Science and Learning is a partnership between Mammoth Cave National Park and Western Kentucky University. We are a member of a national network of research learning centers based within the National Parks.

Research Learning Centers

- Facilitate the use of parks for scientific inquiry.
- Support science-informed decision making.
- Communicate the relevance of and provide access to research knowledge.
- Promote resource stewardship through partnerships.

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