Country: United States of America
Region/State: Kentucky
Date Founded: 1990
Size (hectares): 367979
Distinguishing Features:
- Temperate broadleaf forest
- Cave systems
- Karst topography
Main Industries (in terms of employment):
- Tourism and recreation
- Agriculture
- Manufacturing

Mammoth Cave Biosphere Region

Located in South Central Kentucky, Mammoth Cave Biosphere Region was established in 1990 and substantially expanded in 1996 to add a second buffer zone and an outer transition zone. The main goal of the biosphere region is to achieve sustainable development in the area around Mammoth Cave National Park to improve the economic and cultural well-being of local people in ways that are compatible with the internationally renowned karst landscape, particularly with respect to preventing groundwater pollution. The biosphere region functions under an agreement between Mammoth Cave National Park, the Barren River Area Development District, and Western Kentucky University and is directed by the 25-member Mammoth Cave Biosphere Region Advisory Council that meets formally three times each year. The Advisory Council consists of members from key stakeholders in federal, state, and local governments and private sector organizations. Additionally, the Mammoth Cave Biosphere Region and its constituent agencies have ties or cooperative agreements with other international groups and biosphere reserves in the Philippines, China, and Slovenia.

Within the biosphere region are some of the most extensive caves and the finest examples of karst topography in the world, with surface and underground streams, diverse above-ground landscapes, an abundance of vegetation and animal life, and artifacts illustrating the lives and cultures of ancient peoples. Since pre-historic times, explorers have been discovering, surveying, and mapping cave passages. The core area of the biosphere region, Mammoth Cave National Park, contains a majority of the world’s longest known linear cave system, formed in limestone beneath sandstone and shale cap rock. As of May 2020, 412 miles of
interconnected passages have been mapped underlying the Flint, Mammoth Cave, Joppa, and Toohey Ridges including approximately 150 miles of passages extending beneath land outside the Park’s boundary. Most of the cave passages are dry, while the deepest passages are flooded by streams and lakes. More extensive than the miles of mapped cave passages below ground is the greater hydrologic basin and karst topography that led to the formation of Mammoth Cave. The biosphere reserve contains a total of five physiographic divisions of the central Kentucky karst: the Mammoth Cave Plateau, Green River Valley, Hilly Country, Dripping Spring Escarpment, and the Sinkhole Plain.

The biosphere region’s mosaic of habitats and diversity of forests types, grasslands, riparian areas, and caves supports 70 threatened, endangered, or state-listed species. Mammoth Cave is recognized as having one of the most diverse and well-studied karst biota in the world, including more than 40 species that spend their entire life in the cave. Mammoth Cave National Park’s range of topography and location at the juncture of the Shawnee Hills, Western Kentucky Coal Fields, and Mississippian Plateau regions, dissected by the Green and Nolin rivers, creates an interrelationship of the surface and subsurface ecosystems with exceptional diversity of landforms, habitats, species, and functions.

Abundant flora, fauna, and karst features provide opportunities for valuable scientific research which draws many universities and students to this living laboratory. As the university closest to the biosphere region’s core area, Western Kentucky University (WKU) conducts research in many disciplines throughout the Mammoth Cave Biosphere Region. In particular, the Crawford Hydrology Lab at WKU carries out important hydrology research such as dye tracing and water quality monitoring which are essential to the biosphere region’s goal of preventing groundwater pollution. Additionally, Mammoth Cave National Park is part of the Cumberland Piedmont vital signs monitoring network which is responsible for collecting data and monitoring trends in natural resources such as plant and animal diversity and air and water quality. Mammoth Cave has been studied by groups from many different universities across the United States and researchers from the international community.

Employment in the Mammoth Cave Biosphere Region, as part of the broader Barren River Area Development District region, is concentrated in the services and manufacturing sectors. Additionally, there is ongoing extraction of natural resources, including oil and gas, asphalt, and timber harvesting. Mammoth Cave National Park is one of many large tourist attractions in the state, which together with other “show caves” contribute to the biosphere reserve’s popularity for exploring spectacular cave systems. The picturesque Green River, designated an Outstanding State Resource Water and a Kentucky Wild River by the Kentucky Energy and Environment Cabinet, offers opportunities for kayaking and canoeing,
and state-designated Trail Towns offer gateways to hiking and camping opportunities in and around the biosphere region. Regarding agriculture, the varying terrains throughout the 10-county Barren River Area Development District region support a wide variety of crops and livestock, which have preserved the sustainability of the region’s agricultural economy.
Historic Entrance to Mammoth Cave  Photo Credit: National Park Service
Green River  Photo Credit: National Park Service