

Kentucky Geological Survey

The Study of Fossils: The “Glossary of Geology”¹ defines a fossil as “any remains, trace, or imprint of a plant or animal that has been preserved in the earth’s crust since some past geologic or prehistoric time.” The study of fossils is called paleontology and is closely associated with geology. Paleontologists use fossils to reconstruct what the earth was like in the distant past, to show how life has changed through time, and to correlate rock strata from one area to another to aid in searching for fossil fuels (oil, natural gas, and coal) and minerals.

Fossil-Bearing Rocks: Fossils are most commonly found in sedimentary rocks. Almost all of Kentucky’s rocks at the surface are sedimentary, so Kentucky is an excellent place to collect fossils. The types of fossils found across Kentucky vary with the age of the sedimentary rocks in which they are found and in the way the rocks were formed. The chart shows the ages of the surface rocks in Kentucky, and where they occur in the state. The oldest exposed rocks in Kentucky, from the Ordovician Period, are twice as old as the dinosaurs, which flourished during the Triassic and Jurassic Periods. Permian, Triassic, and Jurassic strata (from 285 to 144 million years ago) are largely missing from Kentucky; that’s why dinosaur fossils have not been found in Kentucky.

Types of Fossils: Most Ordovician through Mississippian rocks of Kentucky were deposited as sediments in shallow tropical seas. Consequently, fossils of seashells and other ancient marine life are common. The State Fossil of Kentucky is the brachiopod (shown below), a type of seashell. Fossil corals from an ancient reef are the highlight at the Falls of the Ohio River at Louisville. Fossil fish (even shark) bones, scales, and teeth have also been found in Kentucky rocks.

During the Pennsylvanian, land began to build out into the ancient seaways for longer periods of time, so that rocks from this period contain fossils from both the land and the sea. Because all Kentucky coal beds are essentially fossil peat swamps, fossil plant impressions and casts of tree trunks are common above coal beds. A fossil trackway found in Pennsylvanian rocks from McCreary County is one of the oldest evidences of reptiles anywhere in the world.

Cretaceous and Tertiary rocks and sediments were also deposited in shallow marine and terrestrial settings, and in some places contain plant fossils. Cretaceous rocks were deposited during the end of the age of dinosaurs. Fossils of extinct mammoths, mastodons, and giant ground sloths have been found in Quaternary rocks in Kentucky. Big Bone Lick State Park near Cincinnati is one of the most famous Ice Age mammal sites in the eastern United States. Some of these



fossils were originally studied by Thomas Jefferson and Benjamin Franklin.

Collecting in Kentucky: The laws governing fossil collecting in Kentucky are the same as in most states: you need permission from the landowner before you can enter and collect. Native American artifacts are protected by the Kentucky Antiquities Law. Although the Kentucky Geological Survey (KGS) does not publish lists of fossil collecting localities, clubs and organizations can help you get started (try the Kentucky Paleontological Society in care of Dan Phelps, 606-277-3148). You can find your own collection sites, using geologic quadrangle maps (GQ’s). These maps are available at KGS and illustrate the age and types of rocks at the surface in 7.5-minute areas (approximately 7 x 9 miles). GQ’s often mention fossils found in layers of rock that were used for correlating rock units.

Fossil Studies at KGS: Scientists at KGS have published several studies on the fossils of Kentucky. Two publications of particular interest to teachers, students, and fossil collectors are “Guide to ‘Progression of Life,’” by Stephen F. Greb, and “Fossil Beds of the Falls of the Ohio,” by Stephen F. Greb and others. They contain pictures of common fossils and illustrations of what the original animals looked like when they were alive. These and other paleontological publications are listed in the Survey’s “List of Publications.”

¹Bates, R.L., and Jackson, J.A., eds., 1980, Glossary of geology [2d ed.]: Falls Church, Va., American Geological Institute, 751 p.

Period	Age (Million Years Ago)	Occurrence
Ordovician	505–438	central Kentucky
Silurian	438–408	central Kentucky
Devonian	408–360	central Kentucky
Mississippian	360–320	eastern, south-central, and western Kentucky
Pennsylvanian	320–285	Eastern and Western Kentucky Coal Fields
Permian		
Triassic	285–144	largely missing in Kentucky
Jurassic		
Cretaceous	144–65	
Tertiary	65–1.6	Jackson Purchase

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www.uky.edu/KGS