

Sinkholes & Karst

Inlets for the Underground Water System

Sinkholes, along with caves, springs, and losing streams, are prominent features of karst terrain. Karst landscapes occur in areas with limestone or dolomite, like most of the Ozarks region. Karst landscapes form because rainwater becomes slightly acidic by absorbing carbon dioxide as it percolates through the soil. The weakly acidic water slowly dissolves the limestone and dolomite that underlies the soil. Over thousands of years, water slowly enlarges the cracks and joints in the bedrock to form a complex underground drainage network. Given enough time and the right conditions, other familiar features of karst landscapes can form—springs, caves and “losing streams” that lose some or all of their flow directly into the groundwater system.

Sinkholes form when water moves through the soil into a joint, carrying a little bit of soil with it and leaving a void space behind. Sinkholes come in various shapes and sizes, but they share this common feature: they serve as inlets for the underground drainage system, which makes them very important in protecting the water that many people drink.

ALL AROUND US

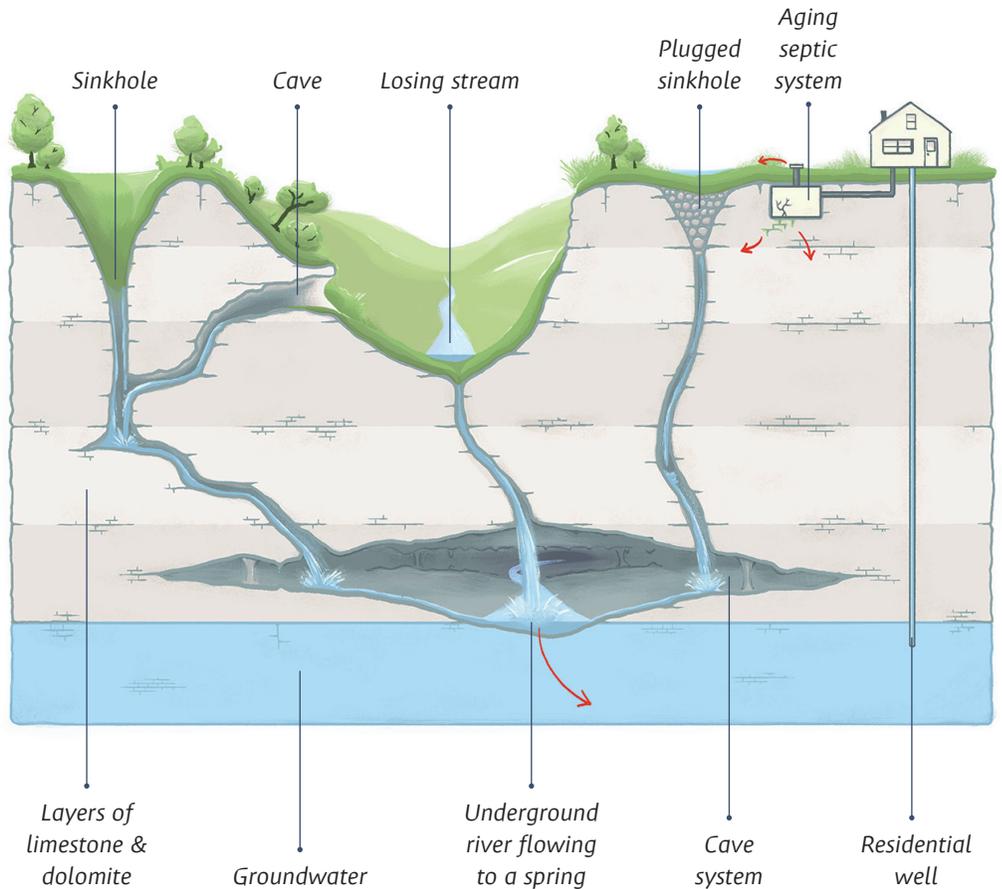
There are thousands of sinkholes in the Ozarks. In the eastern Ozarks, some large sinkholes have wetlands developed on their floors, with distinct and unique species of plants. In southwest Missouri, there are some very large, deep sinkholes.

In some ways, sinkholes are like a kitchen sink or a bathtub with a covered drain — they are basins that will hold water, but usually for only a short time. The water finds its way to the drain (conduit), then flows through the underground drainage system, often to a spring, but some of this water may also seep into the deeper groundwater called an aquifer.

Do you have a sinkhole on your property? Because sinkholes vary so greatly in size and

OZARKS KARST TOPOGRAPHY OVERVIEW

Karst geology provides highly connected bedrock passages that recharge groundwater. Because of these connections, it is important to remember that anything on the surface of the ground can make its way into our groundwater. Possible sources of contamination can include trash dumped into a sinkhole, old or improperly cased wells, and failing septic systems.



shape, it is sometimes difficult to recognize them. Some sinkholes are acres in size; others are as small as a few feet across. Some are shallow, saucer-shaped depressions; others are funnel-shaped, with very steep sides. There may or may not be a well-developed swallow hole, or eye, in the bottom of a sinkhole, indicating the actual opening into the conduit system. Often sinkholes in our area can be spotted by the presence of a circular grove of trees growing in the middle of a pasture. In the Ozarks, any depression in the ground should be treated as if it were a sinkhole.

GROUNDWATER CONNECTIONS

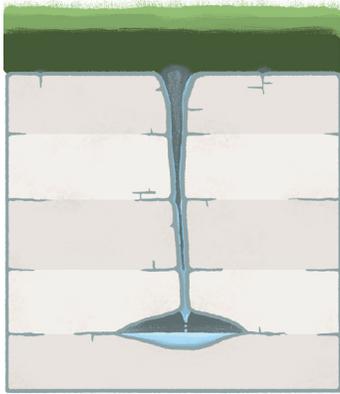
Because sinkholes drain rapidly, and because they have a direct connection with

our groundwater, we need to be careful what goes into them. Most people in southwest Missouri get their drinking water from wells which can be easily polluted when sinkholes become polluted. Trash should never be dumped into a sinkholes. Waste oil or other chemicals could be introduced directly into the groundwater, where they could easily pollute a spring or someone’s drinking water well. Sinkholes are bad places to build sewage lagoons or to install septic tanks. In fact, the best thing to do with sinkholes is to leave them alone.

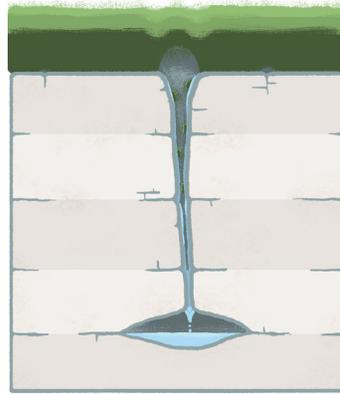
If you must build a home or other building in an area that drains to a sinkhole, leave a vegetated buffer area around the sinkhole to filter out sediment and pollutants that might

FORMATION OF A SINKHOLE

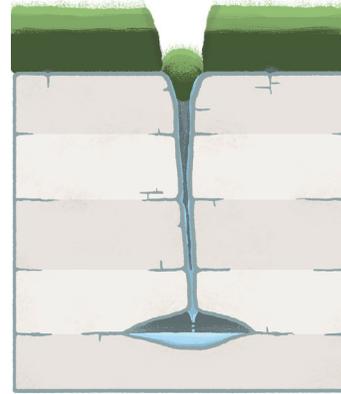
Much of the bedrock in the Ozarks is made of limestone and dolomite, which is dissolved by carbonic acid. As rainfall moves through the soil, it reacts with carbon dioxide in the air to form weak carbonic acid which slowly dissolves the bedrock to form karst features like sinkholes. Over time, sinkholes can begin to form anywhere a crack in the bedrock has been enlarged just enough to allow sediment to be carried along with the water.



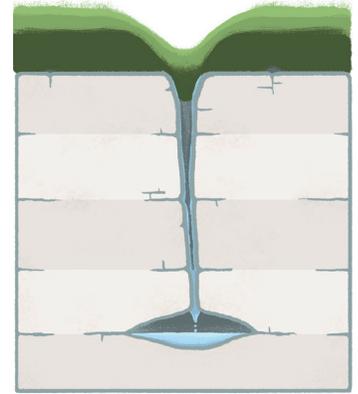
As water moves through the soil and into a small joint in the rock it carries away a little bit of soil with it. The soil that's washed away leaves an empty space, or void, under the ground near the rock surface.



Over time, the void space expands and grows toward the surface as the water carries more soil away through the joint in the limestone.



As the void grows toward the surface, the roof of soil over top of the void becomes thinner and thinner until it finally can no longer support its own weight and collapses into the void space below.



The eroded material is deposited in the bottom of the sinkhole and can block the original flow path, leaving a bowl-shaped depression in ground.

wash off of lawns, driveways or parking lots. Be very careful about applying fertilizers or pesticides in yards that might be flushed into a sinkhole with the next rain.

Sinkholes are natural drainage points for our groundwater systems and should not be filled. If a sinkhole is plugged, water will not drain properly and will run off into adjacent property, possibly causing flooding. Water that has been replenishing our groundwater supplies will now be diverted away as surface runoff. There are appropriate ways that collapsed sinkholes, if they present hazardous conditions, can be filled so that

the natural drainage abilities are maintained.

For more information on sinkholes, contact Greene County Resource Management at (417) 868-4147.

POLLUTION PREVENTION

Sinkholes are natural and interesting features of our karst landscape. They are also an essential part of our groundwater system. To keep Ozark springs and groundwater clean, sinkholes must be protected from pollution. Springs sustain the flow of Ozark rivers especially in dry times, so polluted spring water can affect fishing and swimming

in our streams and lakes.

Pollution in sinkholes can even threaten our health by showing up in our drinking water. For all of these reasons, we need to keep a watchful eye on our local sinkholes and make sure that the runoff flowing into them is as clean as possible. What goes into a sinkhole may come out in our taps.

By recognizing sinkholes for what they are, and respecting them for what they do, we have an opportunity to see that our groundwater, streams, springs and lakes will be clean enough for future generations to use and enjoy.



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