



Figure 1. Karst Areas in Indiana

WHY SINKHOLES FORM

Karst topography in Indiana is a landscape shaped by the dissolution of layers of limestone bedrock. The limestone is gradually dissolved by the flow of water, either rainfall, groundwater, or flows allowed to fluctuate by differing drainage conditions. Sinkholes can develop slowly as surface openings enlarge, but often progressive erosion is unseen and the roof of an underground cavern suddenly collapses.

Sinkholes are a natural formation in karst topography. Changing the flow of water, by increasing or decreasing surface or groundwater flows may increase the rate of formation. The soil over some sinkholes is supported by the pressure of the existing groundwater. When the area is drained, a sinkhole can open. Other sinkholes may enlarge more quickly as more water is allowed to drain into them. Figure 1 indicates areas in Indiana where sinkholes are most likely to occur.

WHY TREAT SINKHOLES?

Sinkholes are difficult to farm around and may be hazardous for both people and animals.

Water Quality in streams/ivers, lakes/ponds, and groundwater/wells has a greater likelihood of being a concern in karst areas. This is because the natural filtering effects of soil may be by-passed and nutrients, pesticides, septic effluent, and other chemicals may have direct access to the receiving body of water. Filtering (through soil or vegetation) as much water as possible before it enters a sinkhole, and being mindful of materials applied near sinkholes will help minimize water quality concerns.

WHAT TO DO

A qualified geologist can help to determine the nature of the sinkhole, and determine where underground caves exist that are in danger of opening to the surface (see <http://igs.indiana.edu/Licensing/findGeologist.cfm>)

Basic recommendations for treating a sinkhole include, as applicable:

- Remove any trash or debris from the sinkhole.
- Establish and maintain a vegetative buffer (grasses &/or trees) at least 25 feet wide around the sinkhole. Nutrients, herbicides, pesticides and animal waste should not be applied in the buffer area. Use only mechanical treatment for weed control.
- Develop and follow a nutrient and pest management plan for the drainage area of the sinkhole.
- Fence around the sinkhole and buffer area to keep people and animals out.
- Implement a Prescribed Grazing plan to retain minimum grazing heights to reduce runoff, filter nutrients and stabilize the soil.
- Keep water flows into and through the area as it was prior to disturbance. Flow areas can be stabilized and grassed, but changing the flows is not recommended, as it could affect the balance of the groundwater and increase the sinkhole size.
- Maintain or establish woody vegetation.
- Open sinkholes that pose a safety hazard may be filled with a rock filter or gabion as directed by a professional engineer.
- Never fill a sinkhole that opens into a cave. A gated opening may be installed for safety reasons.
- If the sinkhole has contaminated water entering it, make every effort to treat or redirect the contaminated water before it enters the sinkhole.