W.Va.’s only natural lake drying up

Opening of lakebed sinkhole believed behind situation

Edinburg, Va. “It’s been draining pretty fast. There’s not much left of it.”

The Lee Ranger District includes several thousand acres of eastern Hardy County.

Trout Pond’s water levels have dropped during past dry spells, “But it’s never dropped to the level it is now since I’ve been here,” Small said.

He said officials are working on a proposal for a geo-tech firm to study the problem and possibly help U.S. Forest Service officials determine if and how the lake should be refilled and stabilized.

The lake is believed to have been formed by the long-ago filling in of a sinkhole. It has since supported a thriving trout population and is surrounded by a hiking trail.

“Trout Pond is not Lake Superior, but it’s an extremely popular place,” Smalls said. But for now, outdoor enthusiasts are being kept away from the nearby dry lake.

“People can — and have — got stuck in the mud when they tried to walk down to the new shoreline,”

The Trout Pond Recreational Area is located in Hardy County, West Virginia. The Recreational Area lies within the boundaries of the George Washington National Forest. Trout Pond is (or was) West Virginia’s only natural lake. The Pond sits within a roughly circular depression marking the site of a sinkhole. Shown on the next page is the geologic map of the area compiled in 1997 by geologists from the West Virginia Geological and Economic Survey.
Modified from Lessing, Kulander, and Dean, 1997
As you examine the geologic map, notice the location of other sinkholes (in red). Determine if the sinkholes appear to form in any particular bedrock formation or formations. If so, which formation(s)?

This type of land surface, marked by numerous sinkholes, is typical of "karst" regions. Research the term "karst" and answer the following questions. Where is the "type" area for karst (in other words, where does the term "karst" come from)? Give two examples of geographic locations outside of West Virginia that have karst topography.

Finally, you may or may not have heard of news accounts of houses collapsing into "sinkholes" in western Pennsylvania. However, the majority of these "sinkholes" are actually examples of collapse into old and abandoned coal mine works. Suppose that you are a consulting engineering geologist and someone comes to you with the following request - "I see a number of "sinkholes" near my property. Do I have to worry about my house being swallowed up by a big hole in the ground?" Describe the steps you would go through to answer this question.

At its fullest, Trout Pond was approximately 3 acres in area and 35 feet deep. Because of the nature of sinkholes, the Pond itself has the form of an inverted cone (see the picture below). Calculate the approximate volume of water contained in the pond in gallons and in cubic metres. The formula for the volume of a cone is 1/3(area of the base)(height). Note: you will need to convert Acre·Feet to gallons and cubic metres - use the conversion tables in your textbook.
This is Trout Pond as it appeared on the afternoon of August 15, 2002. The view is to the east as in the photograph above. Notice the small hole (marked "Outlet" on the photo), approximately 0.5 feet in diameter, on the east side of the lake bed. On August 15, the remaining water in the Pond was draining into this hole. There is a possibility that more than one of these "outlets" may have formed when the bottom of the sinkhole moved. The currently active outlet does not seem large enough to have drained the entire Pond in the one to two day timeframe described by Park personnel (water levels began to fall drastically on August 6). The most recent collapse features (exposed slip scar and debris) on the east side of the Pond are also marked with an arrow. Note the high water mark for the Pond.
A closeup of the east side of the lakebed showing the collapse and active outlet. Examination of the soil in the collapse zone shows an orange or light reddish brown colouration at a uniform level. This horizon probably represents an old level of the water table that remained at this elevation long enough for limonite to precipitate in the soil.

A small stream feeds into Trout Pond from the north. Because of the extremely low water levels, even this minor flow of water has entrenched into the the lake bed in several places to depths greater than one foot. The white material along the margins of the stream is not sand. It is finely ground limestone placed in Trout Pond to raise the pH of the water to make it more habitable for trout.
One of several indications that recurrent movement in the bottom of Trout Pond has effected more than the lake bed. Photograph shows a boulder embedded in the soil just above the high water mark for the Pond. The arrow points to a gap that has formed next to the boulder as bank material rotated in towards the center of the sinkhole. A series of wooden fence posts marking the hiking path around the Pond were all rotated $10^\circ$ to $15^\circ$ towards the center of the sinkhole. A foot bridge spans the small stream feeding Trout Pond. Movement towards the center of the sinkhole caused the western foundation stones (cemented with concrete) to break away from the bank leaving a 1/2 inch wide gap.

Suppose that you are the geologist responsible for assessing the situation at Trout Pond. Give your evaluation discussing: 1) the likelihood of additional collapse underneath the Pond, 2) the likelihood that Trout Pond will refill with water, 3) the likelihood that people venturing near the Pond are in danger, and 4) your recommendation on either closing the Pond to the public or leaving it open. What do you think?