Richland Creek Road Landslide

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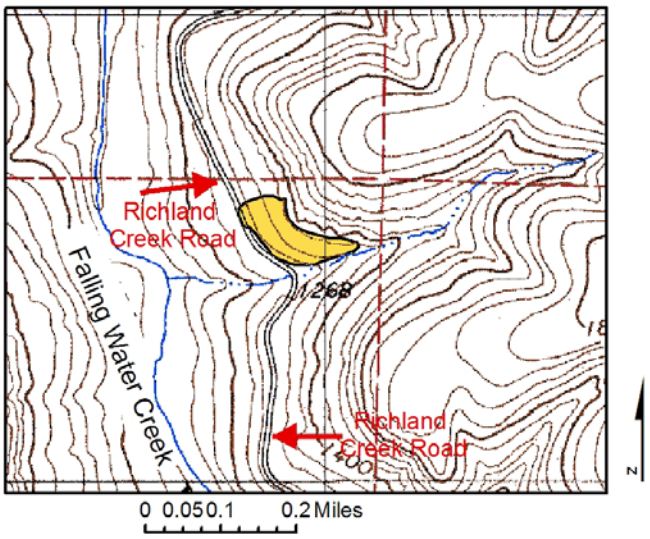
A landslide occurred along Richland Creek Road bordering Falling Water Creek in the Richland Creek Wilderness Area in response to a heavy rain event during the week of March 17, 2008. The landslide blocked the road (picture below) 2 miles north of the bridge over Falling Water Creek on the Moore 7.5-minute quadrangle. A short section of the Ozark Highlands Trail (between milepost 142 and 143) was displaced due to the slide as well.

View (north side) of landslide covering road. Notice water flowing from slide onto road.

The landslide started approximately 100 feet above the road in the Cane Hill Member of the Hale Formation. The Cane Hill Member is approximately 320 feet thick in the area and consists of clay to silty shale in the lower portion with thin bedded siltstones and sandstones forming a 30-40 ft. bluff above the shale. The lower shale portion of the unit is susceptible to sliding and several old landslide deposits are present in the area of Richland Creek as mapped by Braden and Smith in 2004. The Cane Hill Member contains natural fractures called joints that are prevalent in the slide area. Joints allow water to move throughout the formation and travel along bedding planes. This along with a steep slope and super saturation causes the shale to be vulnerable to sliding.



This picture illustrates the slide area (in yellow) on the Moore quadrangle (topographic base). The small Cane Hill bluff is present at the 1400 index contour above the slide.

This landslide is likely the result of a combination of super saturation of the formation and excessive runoff. The small bluff above the head of the slide probably contained a number of waterfalls directed along joints into an area that previous moved (slid) away from the bluff line (see pictures below).

Cane Hill bluff over which several waterfalls probably poured over onto shaly interval. Red line shows head of old slide scarp.

This photo shows well developed joints in the small Cane Hill bluff above the slide. A small waterfall is pouring over the bluff via the joint.

Much of the water probably went into the rock formation traveling along joints and bedding planes thus saturating the shale on the slope below the bluff. Eventually the amount of water became so great that a small stream developed near the base of the bluff and flowed southward becoming the southern boundary of the slide area.

The rock formation continues to de water as can be seen by the pooling of water in portions of the slide and drainage from the toe of the slide onto Richland Creek Road.

This photo shows where runoff developed into a small stream (red line) at the base of the bluff then flowed downhill creating the southern extent of the slide. Ripple marks and small sand bars are present in this area below the bluff line.

This photo displays the southern edge of the slide with the red line illustrating the path water flowed from below small bluff line.

Water pooling in the slide area.

Cane Hill shale virtually in place within the slide.

Several meters south of the landslide obstruction, a minor soil creep was developing and had advanced approximately 0.5-1 meter /2-3 feet onto Richland Creek Road between the debris obstruction and the drainage. Significant amounts of water were present, and water was pooling around the toe of the material, see picture below. South of the small drainage, more ground failure had occurred, and the likelihood for future ground failures in this area is probable.

This picture was taken approximately 30 feet from the major road obstruction.