

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, September 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas on Federal lands to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This map presents the results of a geologic survey of the Troublesome Roadless Area in the Daniel Boone National Forest, McCreary County, Ky. The area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

INTRODUCTION

The Troublesome Roadless Area is composed of six tracts of land and contains 2,943 acres (fig. 1). The largest tract of the study area, located 13 mi southwest of Stearns, Ky., is accessible from that town via State Route 92 to Hill Top, and then southwestward along country roads. Unimproved Forest Service roads, abandoned logging roads, and primitive trails provide access by foot or horseback into the interior of each tract of the study area.

Physiographically, the Troublesome Roadless Area is in the Cumberland Plateau section of the Appalachian Plateaus Province and is near the western edge of the Appalachian coal region. The topography is typical of the Cumberland Plateau section, characterized by irregular, narrow-crested ridges, deep narrow canyons, and a dendritic drainage pattern. Troublesome Creek, a small tributary of the South Fork of the Cumberland River, is the source of the area name (fig. 2). Altitudes range from about 1,600 ft on Laurel Ridge in the largest tract to approximately 800 ft along the South Fork of the Cumberland River.

Field investigations by personnel of the U.S. Geological Survey consisted of reconnaissance geologic studies and data collecting, including the measurement of stratigraphic sections and the mapping of poorly exposed coal beds and resistant sandstone units. Additional subsurface information was obtained by studying and interpreting the logs of several coreholes drilled near the study area.

GEOLOGIC SETTING

About 800 ft of sedimentary rocks of Late Mississippian to Middle Pennsylvanian age crop out in and adjacent to the study area (figs. 2 and 3), and as much as 8,000 ft of older Paleozoic rocks may be present in the subsurface. The basal part of the exposed section, assigned to the Newman Limestone of Late Mississippian age, crops out along the South Fork of the Cumberland River and its major tributaries east of the area. Overlying rocks of the Lee and Breathitt Formations of Early and Middle Pennsylvanian age are mostly continental and coal bearing, but the sequence may also contain marine deposits. The rocks of these formations crop out in the study area and underlie the highlands. Unmapped deposits of colluvium mantle many valley slopes, and deposits of alluvium, consisting of sand, coarse gravel, and large boulders, are present along the valley floors.

The basal 50+ ft of the exposed section is assigned to the upper member of the Newman Limestone. It consists predominantly of greenish-gray or grayish-red shale and thin beds of yellowish-brown-weathering sandstone and limestone. The sandstone units are fine grained, slightly calcareous, and locally crossbedded, and one or more of the thin limestone beds contains finely divided, bioclastic debris. Deposition of this sequence probably took place in tidal-flat and (or) delta-front environments.

The Newman Limestone is disconformably overlain by an undivided sequence of sedimentary rocks that is assigned to the Lee and Breathitt Formations. Quartz-pebble conglomerate locally fills irregularities in the unconformable surface.

The Lee and Breathitt Formations have a combined thickness of about 750 ft and include beds of conglomeratic, cliff-forming sandstone interbedded with nonresistant sandstone, siltstone, shale, coal, and underclay. Topographically, the most prominent unit in this sequence is the Rockcastle Sandstone Member of the Lee Formation, a massive sandstone and conglomerate that forms cliffs as much as 125 ft high. This unit, together with the overlying middle sandstone member of the Lee Formation, underlies the broad uplands of the Troublesome area. The Corbin(?) Sandstone Member of the Lee Formation is relatively thin and crops out as isolated remnants that cap the higher ridge tops. Deposition of sediments assigned to these formations took place in a coastal or near-coastal environment dominated by barrier-bar, lagoonal, and deltaic processes.

The principal coal beds in the Troublesome Roadless Area are in the Lee and Breathitt Formations. Usage of the names "Stearns No. 1 1/2(?) coal bed," "Barren Fork(?) coal bed," and "Corbin(?) Sandstone Member of the Lee Formation" follows that of previous investigations (Pomerene, 1964; Smith, 1978). Because of the local nature of the study of the Troublesome Area, queries were added to these names to indicate that correlations with the type areas are not confirmed.

Quaternary deposits consist primarily of sandstone and conglomeratic sandstone debris, locally as house-sized, rectangular blocks, that occur as colluvium in unmapped slope deposits and as alluvium on the valley floors.

STRUCTURE

Structure contour lines (fig. 4) drawn on the base of the Rockcastle Sandstone Member indicate an east-southeast dip, generally less than 1 degree. No evidence of faulting was observed in the area.

REFERENCES CITED

Pomerene, J. B., 1964, Geology of the Barthell quadrangle and part of the Oneida North quadrangle, Kentucky: U.S. Geological Survey Geologic Quadrangle Map GQ-314, scale 1:24,000.
Smith, J. H., 1978, Geologic map of the Bell Farm quadrangle and part of the Barthell SW quadrangle, McCreary and Wayne Counties, Kentucky: U.S. Geological Survey Geologic Quadrangle Map GQ-1496, scale 1:24,000.

DESCRIPTION OF MAP UNITS

BREATHITT AND LEE FORMATIONS (MIDDLE AND LOWER PENNSYLVANIAN)—Sandstone, siltstone, shale, coal, and underclay. Sandstone, light-gray, weathers light-brown or pink; mostly medium- to coarse-grained; massive; thick- to thin-bedded; some beds argillaceous; 50-95 percent quartz, smaller amounts of feldspar and other accessory minerals. Corbin(?) Sandstone Member (Plo) of Lee Formation, mostly medium- to coarse-grained, massive, and quartzose to thin-bedded and argillaceous; Rockcastle Sandstone Member (Plr) of Lee Formation, commonly conglomeratic containing well-rounded quartz pebbles throughout or in densely packed lenses; massive; crossbedded in large-scale trough or planar sets. Forms steep slopes and vertical or overhanging cliffs as high as 125 ft. Shale and siltstone (Pbu, Pbl, and Pls), light- to dark-gray, weathers brown; thin-bedded, often interbedded with thin sandstone beds; plant fossils locally present. Coal, mostly thin to thick vitrain bands in bright attritus matrix; occurs in at least 13 beds including the mapped Stearns No. 1 1/2(?) (s) and Barren Fork(?) (bf) coal beds. Underclay, medium-gray, clayey to silty; contains fossil rootlets and few plant fragments

NEWMAN LIMESTONE (UPPER MISSISSIPPIAN)—Limestone, shale, and sandstone. Upper member, mostly shale, greenish-gray and a few medium-gray and grayish-red beds, evenly bedded, partly calcareous; contains thin beds of very fine- to fine-grained, ripple-bedded sandstone and light-olive-gray limestone and argillaceous limestone. Marine invertebrates common

IPlc
IPbu
IPlm
IPbl
bf
Plr
Pls
s

Mnu

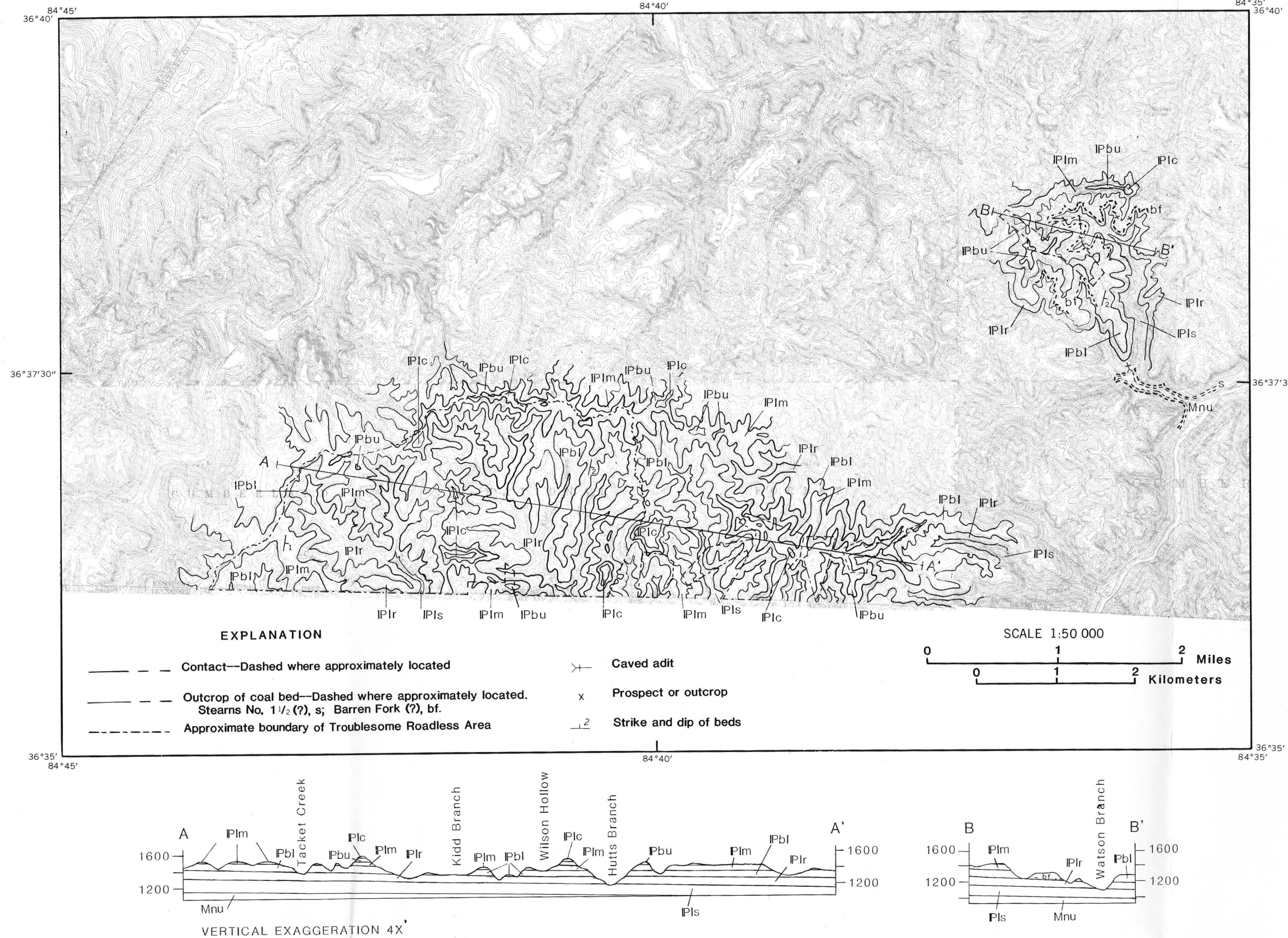


Figure 2.--Geologic map and cross section of the Troublesome Roadless Area.

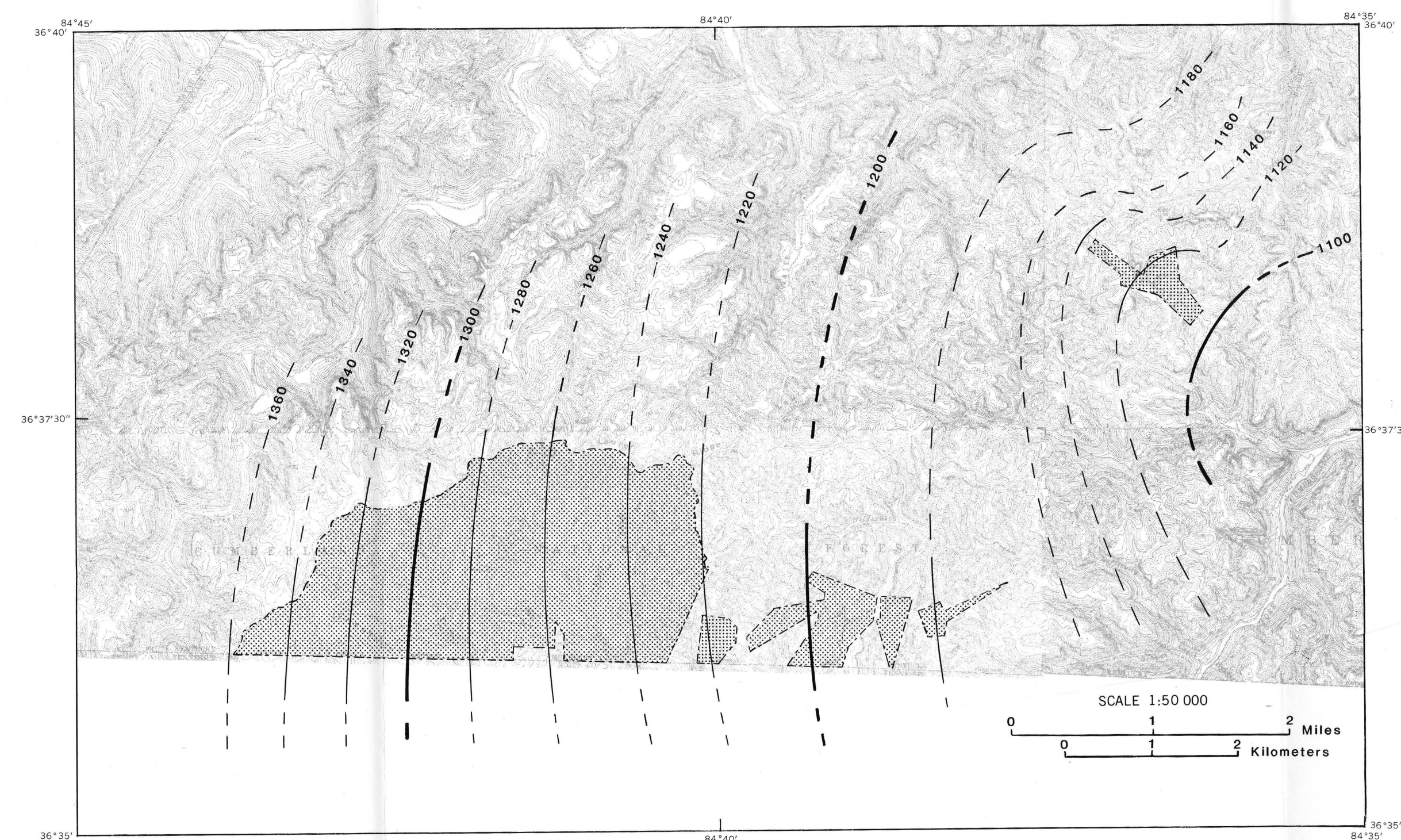


Figure 4.--Structure contour map of the Troublesome Roadless Area (shaded). Contours are drawn on the base of the Rockcastle Sandstone Member of the Lee Formation. Contours are in feet above sea level.

GEOLOGIC MAP OF THE TROUBLESOME ROADLESS AREA, MC CREARY COUNTY, KENTUCKY

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SYSTEM	SERIES	FORMATION, MEMBER, AND BED	LITHOLOGY	THICKNESS OF COAL BED IN INCHES	THICKNESS IN FEET
QUATERNARY	HOLOCENE	Alluvium			0-20
		Colluvium			0-30
PENNSYLVANIAN	LOWER AND MIDDLE PENNSYLVANIAN	Corbin (?) Sandstone Member of Lee Formation			40 +
		Upper tongue of Breathitt Formation			30-60
		Middle sandstone member of Lee Formation			60-80
		Lower tongue of Breathitt Formation			30-60
		Barren Fork (?) coal bed		0-22	0-20
		Rockcastle Sandstone Member of Lee Formation			100-125
				0-6	700-750
				0-2	125-160
				0-8	0-17
				0-3	0-6
MISSISSIPPIAN	UPPER MISSISSIPPIAN			0-4	0-10
		Stearns No. 1 1/2 (?) coal bed		15-50	0-17
				0-6	20-130
NEWMAN LIMESTONE					40+
		Upper member			

Figure 3.--Generalized stratigraphic section of the exposed rock formations in the Troublesome Roadless Area.