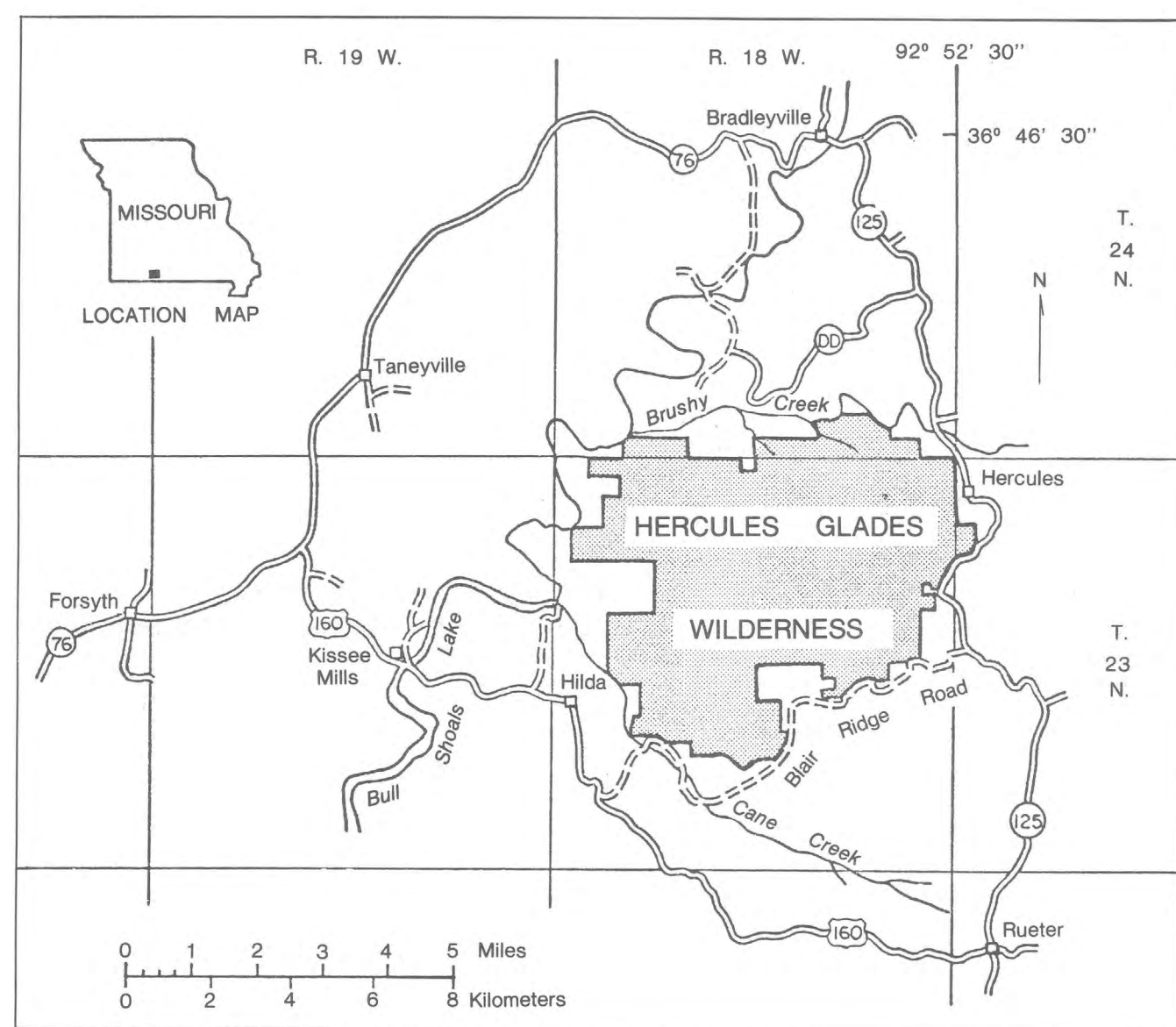
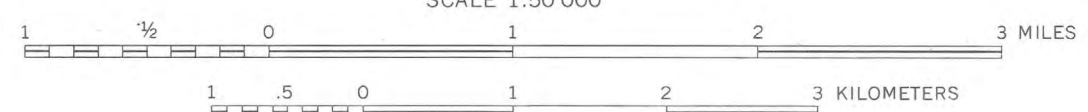


Base from U.S. Geological Survey
1:24,000. Hilda, 1967; Protom NE, 1968

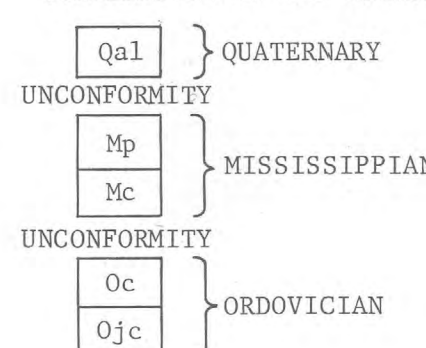
SCALE 1:50,000

Geology from Miller and others (1981)



INDEX MAP SHOWING LOCATION OF THE HERCULES GLADES WILDERNESS, MISSOURI

CORRELATION OF MAP UNITS



EXPLANATION OF MAP UNITS

- Qal ALLUVIUM (QUATERNARY)
- Mp PIERSON LIMESTONE OF WELLER (1901) (LOWER MISSISSIPPIAN)
- Mc COMPTON LIMESTONE (LOWER MISSISSIPPIAN)
- Oc COTTER DOLOMITE (LOWER ORDOVICIAN)
- Ojc JEFFERSON CITY DOLOMITE (LOWER ORDOVICIAN)

- CONTACT---Dashed where approximately located
- APPROXIMATE BOUNDARY OF HERCULES GLADES WILDERNESS

STUDIES RELATED TO WILDERNESS

The Wilderness Act (Public Law 88-577, Sept. 3, 1964) and related acts require the U.S. Geological Survey and the U.S. Bureau of Mines to survey certain areas of 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 report presents the results of a mineral survey of the Hercules Glades Wilderness in the Mark Twain National Forest, Taney County, Missouri.

SUMMARY

There is no record of mineral production, development, or prospecting within the study area. Rock units that underlie the Hercules Glades Wilderness at depth are known to be hosts of important lead-zinc-silver deposits of southeast Missouri and minor outcrops of rocks that host the zinc and lead deposits of the Tri-State district occur within the area. No drill-hole data are available within the wilderness, and geochemical surveys did not reveal any significant mineralization at the surface. Based on our present knowledge, the mineral resource potential of the study area is considered low.

INTRODUCTION

The Hercules Glades Wilderness, outlined on the geologic map (Miller and others, 1981) comprises about 20 sq miles (52 km²) of the Mark Twain National Forest in east-central Taney County, Mo., approximately 40 mi (64 km) southeast of Springfield, Mo.

The principal access to the study area is from Missouri State Highway 125, which passes along the eastern side of the study area. U.S. Highway 160 and Blair Ridge Road provide access from the south. The western and northern boundaries abut privately owned lands.

GEOLOGY

Surface Geology

The lowermost formation cropping out in the Hercules Glades Wilderness is the Jefferson City Dolomite of Early Ordovician age. The upper 10-25 ft (3-7.5 m) of this formation are exposed along parts of Beaver and Cane Creeks in the northwestern and western parts of the area.

A chert breccia unit makes up the upper part of the Jefferson City Dolomite, and the contact between the Jefferson City and the Cotter Dolomite is placed at the top of this breccia unit. In this area, the major part of the Jefferson City is a light- to dark-gray, fine-grained, and massively bedded dolomite that is more than 150 ft (45 m) thick.

Conformably overlying the Jefferson City Dolomite is the Cotter Dolomite, which makes up the major portion of exposed beds in the Hercules Glades Wilderness. The Cotter is a fine-grained, light-brown to gray, medium- to thick-bedded dolomite that weathers to a light or dark gray. This unit contains minor chert and some sandstone lenses. Outcrops are common on the hillsides. The upper part of the Cotter does not support the dense vegetation common on the lower part; hence, the name Glades refers to that area where the upper part of the Cotter is present, supporting only sparse juniper trees.

Rocks of Devonian age crop out in McDonald and Barry Counties, west of Taney County, but none are known to occur in this area.

Overlying the Cotter Dolomite is the Compton Limestone of Early Mississippian age. This formation is made up of light-gray to light-brown, fine- to medium-crystalline limestone in thin to medium beds. The limestone has green shale partings, is about 20 ft (6 m) thick, and weathers to a wavy surface. Fairly good exposures of the Compton Limestone occur along Missouri Highway 125 east of the Hercules Glades Wilderness and in sec. 25, T. 23 N., R. 18 W. along Blair Ridge Road near the southern boundary of the study area.

The uppermost lithified unit that crops out in the Hercules Glades Wilderness is the Lower Mississippian Pierson Limestone of Weller (1901). In this area the Pierson is approximately 80 ft (25 m) thick, and consists of fine- to medium-grained, crystalline, gray to light-brown limestone in thin to medium beds.

Sand and gravel in the bottoms of creeks and along the stream banks, together with soils developed in these areas, are mapped as Quaternary alluvium. The sands and gravels are made up principally of fragments of chert, limestone, and quartz grains rounded by stream action and fairly well sorted.

Subsurface Geology

No drill-hole data are available from within the study area, but one hole, for which information is available, was drilled into the Precambrian basement rocks by St. Joe Minerals Corp. in the SW 1/4 NE 1/4 sec. 24, T. 25 N., R. 20 W., about 6 mi (9.5 km) northwest of the area (Kurtz and others, 1975).

The Lower Ordovician Roubidoux Formation lies below the Jefferson City Dolomite, but it does not crop out in the study area. The Roubidoux consists of sandstone, dolomitic sandstone, and cherty dolomite, and ranges in thickness from 100 to 200 ft (30 to 60 m).

Beneath the Roubidoux is the Lower Ordovician Gasconade Dolomite, which is predominantly a light-brownish-gray cherty dolomite. In Taney County the Gasconade is approximately 200-300 ft (60-90 m) thick.

The contact between the Gasconade and Upper Cambrian Eminence represents an erosional unconformity. The Eminence Dolomite, medium to massively bedded, is a light-gray, medium- to coarse-grained dolomite. The thickness of the Eminence is approximately 200-250 ft (60-75 m); drill-hole data suggest that the Eminence may reach 325-350 ft (99-107 m) in thickness in Taney County. These beds conformably overlie the Upper Cambrian Potosi Dolomite, which is a massive, thickly bedded, medium- to fine-grained dolomite that contains quartz druse associated with chert. The Potosi is brownish gray and weathers to light gray. In Taney County, the Potosi Dolomite is approximately 80 ft (25 m) thick (Kurtz and others, 1975). The Potosi Dolomite conformably overlies the Upper Cambrian Derby-Doe Run Dolomite (of Missouri Geological Survey usage), which is made up of thin- to medium-bedded dolomite beds and thin-bedded siltstone and shales. In this area the Derby-Doe Run Dolomite is about 90 ft (27 m) thick.

Conformably below the Derby-Doe Run Dolomite is the Upper Cambrian Davis Formation, which is made up of shale, siltstone, sandstone, dolomite, and limestone conglomerate. Here the Davis is about 145 ft (44 m) thick, and conformably overlies the Upper Cambrian Bonneterre Dolomite. The Bonneterre is light-gray, medium- to fine-grained, medium-bedded dolomite. In Taney County it is about 225 ft (67 m) thick, and appears to contain considerable siltstone, sandstone, and some shale (Kurtz and others, 1975). The Bonneterre Dolomite conformably overlies the Upper Cambrian Lamotte Sandstone, which is predominantly a quartzose sandstone. In the area of Hercules Glades Wilderness the Lamotte Sandstone is about 200 ft (61 m) thick.

Drill-hole data indicate that the Precambrian rocks underlying the Hercules Glades Wilderness are granitic (Kisvarsanyi, 1975, p. 16).

GEOCHEMISTRY

Thirty-two dry stream-sediment (from 16 sites) and two rock samples were collected within or near Hercules Glades Wilderness. Sample sites are shown on the map. At each site, a grab sample and a composite sample across the stream bed were collected. All stream-sediment samples were sieved, and the minus-50-mesh fraction was split and analyzed for 31 elements by the six-step semiquantitative spectrographic method (Grimes and Marranzino, 1968). E. L. Mosier was the analyst. The bedrock areas from which samples were derived are dolomites and limestones.

Spectrographic analyses of stream-sediment and rock samples from the Hercules Glades Wilderness do not show anomalous amounts of metal in the formations exposed. The metals detected probably are concentrated in pyrite-marcasite or iron oxides as indicated by Erickson and others (1978, 1979) for areas farther east in Missouri.

In conclusion, geochemical data indicate that there are no major areas of surface mineralization within the study area. More complete information about the geochemistry of the area is contained in U.S. Geological Survey MF-1377-B (Miller and Chesson, 1982).

GEOPHYSICS

No detailed gravimetric survey has been made of the study area. Regional geophysical maps of Missouri (Missouri Geological Survey, 1943a, 1943b) show no anomalies in the study area. In July 1981, the U.S. Geological Survey made an aeromagnetic survey of Hercules Glades Wilderness and adjacent areas. A preliminary study of these data do not show any significant magnetic anomalies (Ronny Martin, oral commun., 1982).

MINING DISTRICTS AND MINERALIZED AREAS

Hercules Glades Wilderness contains no formal mining district, and no mining claims have been filed here. Lead and zinc have been produced from small operations south and east of Hercules Glades Wilderness. Gravel, sand, and stone are produced in the county, but outside the study area. All mineral production has been from occurrences 6 mi (10 km) or more outside the study area. One prospect pit in section 18, T. 23 N., R. 18 W., is said to have been opened in search of brown iron ore.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Several formations known to occur in the subsurface in the Hercules Glades Wilderness contain mineral deposits in other parts of Missouri. The most important of these are Upper Cambrian carbonates that

have lead, zinc, silver, and copper mineralization in southeast Missouri. Major deposits in the Viburnum Trend and the Southeast Missouri districts are in the Bonneterre Dolomite, and deposits are known to occur in the Lamotte, Potosi, Eminence, Gasconade, and Jefferson City formations. In the Tri-State district, Missouri, Kansas, and Oklahoma, the most productive zinc and lead deposits occur in Mississippian carbonates; minor deposits are in carbonates of Ordovician age (Killsgaard and others, 1967, p. 60). Most carbonates in this region could be host rocks for lead and zinc, but mineralization is not known to occur in these rocks. All carbonate-hosted deposits in southeast Missouri occur: (1) in dolomite near the limestone-dolomite interface; (2) in "brown rock" near the interface with white rock; (3) near areas of faults and fractures; and (4) near or within algal reefs. Some of the best ore occurs in solution-collapse breccia, and most deposits in the Bonneterre Dolomite occur where it is 200-400 ft (61-122 m) thick and where its insoluble residue is more than 50 percent shale (Pratt, 1981, p. 10-22). Most deposits in the Tri-State district occur in dolomite, but information about other criteria is not available.

Although galena has been observed in minor fractures in Taney County, no lead production has been recorded within or near the study area. Small lead and zinc operations have existed 6-12 mi (10-19 km) to the south and east.

Generally sand and gravel are restricted to drainage areas. Deposits of these resources nearer markets exist outside the study area.

No unique features of the limestone and dolomites in the study area would make them more valuable than similar materials found in abundant amounts throughout southwestern Missouri.

Coal, gas, and oil are produced from Pennsylvanian formations in western Missouri (Anderson and Wells, 1967; Searight, 1967); however, no Pennsylvanian rocks occur in the Hercules Glades Wilderness. Deposits of barite, iron, lead, and zinc are mined several places elsewhere in the state from geological formations that occur in the study area (Killsgaard and others, 1967); however, no occurrences of economic significance are known within the study area.

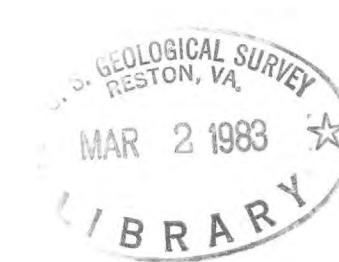
The mineral resource potential of the area is considered to be very low.

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MINERAL RESOURCE POTENTIAL MAP OF HERCULES GLADES WILDERNESS, TANAY COUNTY, MISSOURI

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and
George S. Ryan, U.S. Bureau of Mines
1982



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