DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

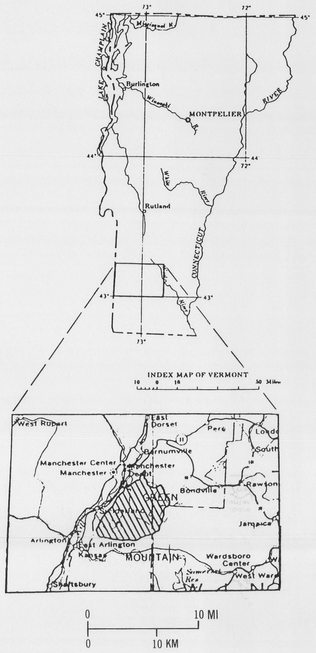


Figure 1.—Index map of Vermont showing location of the Lye Brook Wilderness.

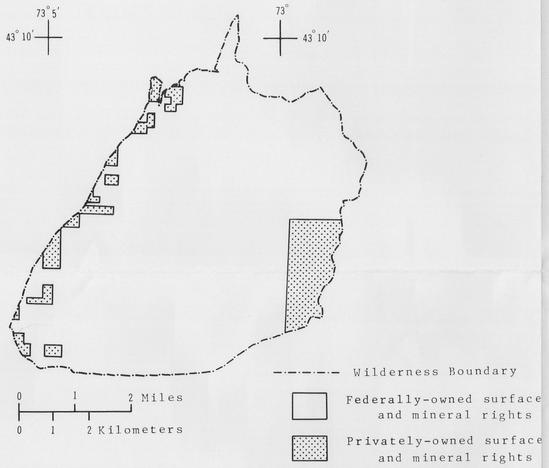
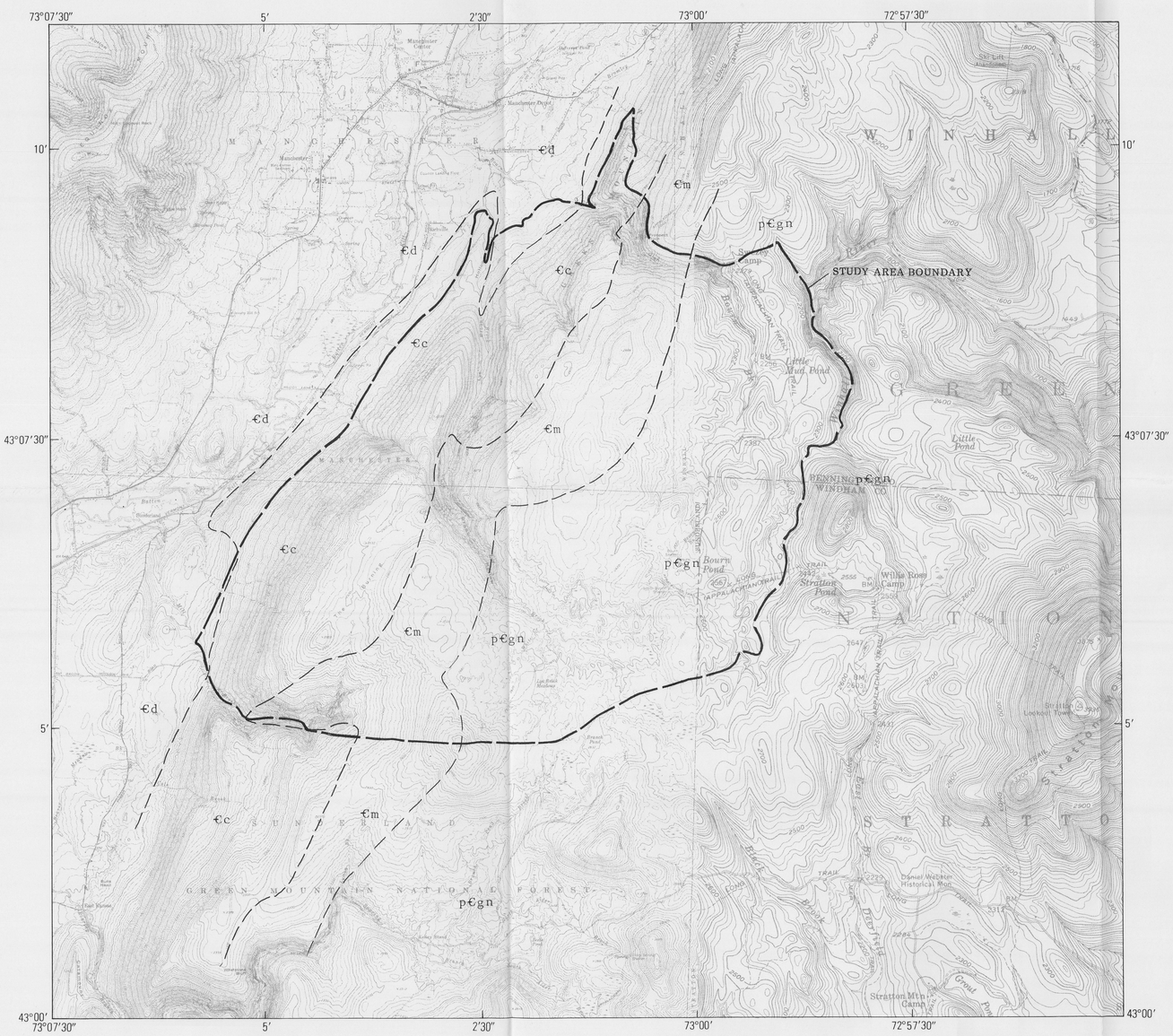


Figure 2.—Surface- and mineral-rights ownership.



Base from U.S. Geological Survey 1:24,000
Sunderland, Manchester, 1968; Londonderry, 1957

Geology mapped by P. C. Hewitt, 1961 and by R. A. Ayuso and G. R. Robinson, assisted by J. A. Goss, Allan Kolker, and W. B. Ward, 1981-1982

SCALE 1:48 000
1 .5 0 1 2 3 4 5 6 KILOMETRES
1 ½ 0 1 2 3 MILES

EXPLANATION

€d — Dunham Dolomite (Clark, 1934) (Early Cambrian)—Cream-colored, medium-bedded dolomite

€c — Cheshire Quartzite (Early Cambrian)—Massively bedded, grey to white, recrystallized sandstone. Rock unit may be approximately as much as 800 ft thick. No quarries are known in the area. Chemical analyses show that the quartzite has too many impurities for use as high-grade silica sand. Potential uses are for dimension stone or crushed stone

€m — Mendon Formation (Early Cambrian)—Conglomeritic quartz schist, gritty quartz-muscovite schist, and graphitic quartz-muscovite phyllite

p€gn — Mount Holly Complex (Precambrian)—Gneisses, quartzites, schists, and amphibolites

Contact—Long dashed where approximately located; short dashed where indefinite or inferred

Figure 3.—Geology and outcrop area of Cheshire Quartzite.

MISCELLANEOUS FIELD STUDIES MAP MF–1609–C

PAMPHLET ACCOMPANIES MAP

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 report presents the results of a mineral resource potential survey of the Lye Brook Wilderness, Green Mountains National Forest, Bennington and Windham Counties, Vt., which was established as a wilderness by Public Law 93-622, January 3, 1975.

SUMMARY

The most important potential mineral resource of the Lye Brook Wilderness (fig. 1) is the Cheshire Quartzite as a source of low-grade silica sand, dimension stone or crushed stone. Although about a third of the area is underlain by this quartzite, it has never been mined in the area; the abundance of the Cheshire elsewhere in the vicinity, its massive style of bedding, and its high grade of induration make its potential use in the wilderness uneconomical as a source of silica sand.

Precambrian rocks comprise approximately the easternmost third of the wilderness and represent the rock types potentially containing the highest contents of many base metals, but none of these metals occur in significant quantities to suggest the presence of a metallic-mineral deposit. Anomalously high radioactivity in the northern part of the area underlain by the rocks of the Mount Holly Complex of Precambrian age was reported by Popenoe (1964). The geochemical survey made by the U.S. Geological Survey (Ayuso and Day, in press), however, did not discover significant concentrations of uranium mineralization. The spotty distribution of outcrops and the low values for uranium argue against major uranium mineralization occurring in the area.

The Federal government owns all surface rights in the wilderness, except for about 10 percent of the area concentrated mainly along the western and southeastern boundaries (fig. 2).

INTRODUCTION

The Lye Brook Wilderness is located in the Green Mountains National Forest, Vt. It is southeast of the village of Manchester Center and is bounded by the Winhall River on the west and by U.S. Route 7 on the east (fig. 1). Mill Brook is the southern boundary together with an approximate line passing north of Branch Pond. The Appalachian and Long Trails are the northern boundaries of the wilderness. The area contains about 14,500 acres of extremely steep slopes along the deeply cut banks of Lye Brook, Bourn Brook, and Mill Brook. Marshy and flatter portions within the wilderness are in the southwestern part.

GEOLOGY

The most important geological features in the wilderness are summarized in the geological report for the Lye Brook Wilderness by Ayuso and Robinson (in press). Metamorphosed rocks belonging to the Mendon Formation, Dunham Dolomite (Clark, 1934), and Cheshire Quartzite unconformably overlie the Precambrian Mount Holly Complex (Hewitt, 1961). Except for the Mount Holly Complex, all other units are thought to be Early Cambrian based on stratigraphic correlations with fossiliferous rocks. The Mount Holly Complex is lithologically diverse and includes quartzofeldspathic gneisses, schists, amphibolites, and quartzites. Although some of these units may be thick and regular enough for accurate mapping in other areas, they outcrop very scantily in the wilderness. The most common Precambrian rock type is a strongly foliated quartz-biotite-feldspar gneiss cut by many migmatite and pegmatite veins.

The Mendon Formation overlies the Precambrian rocks above an unconformity where a conglomeratic unit composed of blue quartz pebbles is a most distinctive layer. Other than the conglomeratic quartzites, the most typical rock units of the Mendon Formation are phyllitic conglomeratic quartzites, phyllitic quartzites, and quartz-mica-schists.

The Cheshire Quartzite is gradational with the Mendon Formation. Typically, rocks within the formation are massively bedded and strongly recrystallized. The lower part of the Cheshire contains feldspar grains and white mica and chloritic layers occur as partings. Above the Cheshire Quartzite is the Dunham Dolomite. The transition between the two rock units is gradational, characterized by interlayering of quartzitic dolomites and dolomites. The Dunham Dolomite is not well exposed in the wilderness; it only crops out near the northwestern boundary.

GEOCHEMICAL SURVEY

The U.S. Geological Survey (USGS), made a reconnaissance geochemical survey (Ayuso and Day, in press) of the Lye Brook Wilderness in order to explore for unrecognized and(or) unexposed mineral deposits that might be identified by their geochemical halos. The geochemical studies show no evidence for the occurrence of metallic-mineral deposits in the area. Interpretation of the results of the geochemical survey are given in Ayuso and Day (in press). Results from stream sediment, soil, and rock samples suggest no indication of obviously anomalous elemental abundances that might indicate presence of mineralized areas.

MINES AND PROSPECTS

The U.S. Bureau of Mines (USBM) studied the Lye Brook Wilderness area for evidence of old mines and prospects (Harrison, 1981). Although iron ore was thought to have been mined from old workings within the wilderness, their exact location and quantity of production are unknown. The isolated occurrences within the wilderness are small and widely distrubuted. The wilderness has no other history of mining.

MINERAL RESOURCE POTENTIAL

The Cheshire Quartzite is a potential source of low-grade silica sand, and dimension or crushed stone. Although the Cheshire Quartzite represents a large resource of silica in the wilderness, its general availability outside of the wilderness argue against its potential use. No other significant mineral resource exists within the area.

REFERENCES

Ayuso, R. A., and Day, G. W., in press, Geochemical survey of the Lye Brook Wilderness, Bennington, and Windham Counties, Vermont: U.S. Geological Survey Miscellaneous Field Studies Map MF-1609-B.

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Clark, T. H., 1934, Structure and stratigraphy of southern Quebec: Geological Society of American Bulletin, v. 45, no. 1, p. 1-20.

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Hewitt, P. C., 1961, The geology of the Equinox quadrangle and vicinity, Vermont: Vermont Geological Survey Bulletin., 18, 83 p.

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MINERAL RESOURCE POTENTIAL MAP OF THE LYE BROOK WILDERNESS, BENNINGTON AND WINDHAM COUNTIES, VERMONT

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1983

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