

Figure 3.—Geologic map of the Bristol Cliffs Wilderness.

- DESCRIPTION OF MAP UNITS
- Cheshire Quartzite (Early Cambrian) — Massive to thin-bedded, fine- to coarse-grained quartzite, micaceous quartzite, and feldspathic quartzite. Parts of this unit have low potential for the production of high-silica sand (see pamphlet for full discussion)
 - Fairfield Pond Member (Dennis, 1964) of the Underhill Formation (Early Cambrian and (or) Late Proterozoic) — Thin-bedded quartzose schist and schistose quartzite, commonly with abundant muscovite and biotite. Base marked locally by thin unit of dolomitic quartzite
 - Pinnacle Formation (Early Cambrian and (or) Late Proterozoic) — Thin-bedded mica-quartz-chlorite phyllite and schist, typically with abundant biotite and plagioclase
 - Contact, dashed where approximate
 - Axial trace of anticline
 - Axial trace of syncline
 - Strike and dip of inclined bedding
 - Strike and dip of inclined foliation

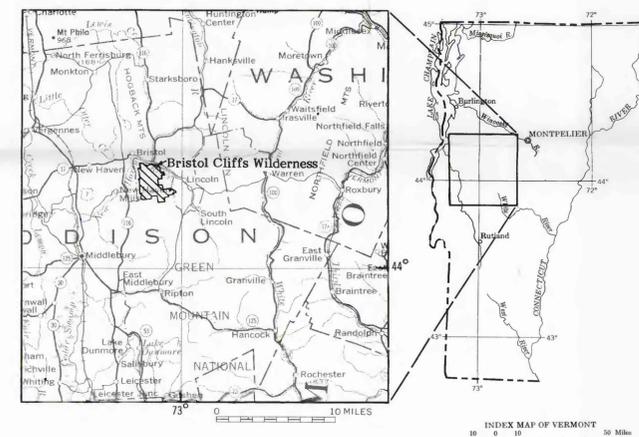


Figure 1.—Index map showing the location of the Bristol Cliffs Wilderness.

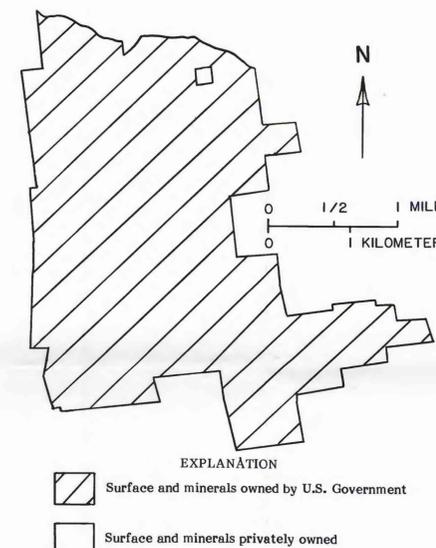


Figure 2.—Surface- and mineral-rights ownership.

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 area 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 Bristol Cliffs Wilderness in the Green Mountain National Forest, Addison County, Vermont. Bristol Cliffs Wilderness was established by Public Law 93-622, January 3, 1975, and modified by Public Law 43-268, April 16, 1976.

SUMMARY

The Bristol Cliffs Wilderness has no identified mineral resources, except for certain non-metallic commodities. These include small deposits of sand and gravel, minor peat, and abundant rock suitable for construction purposes; a potential also may exist for oil or natural gas at depth. The deposits of sand and gravel occur along the New Haven River on the northern edge of the wilderness, but large reserves in more accessible deposits are available outside the area. A small peat bog on the east side of North Pond was found to have about 2 ft of water-saturated sphagnum moss, but its size, inaccessibility, and contained debris limit its usefulness. In the western part of the wilderness there is a low potential for silica-sand resources for glass or chemical products.

INTRODUCTION

A mineral resource survey of the Bristol Cliffs Wilderness was made by the U.S. Bureau of Mines (USBM) in 1977 and the U.S. Geological Survey (USGS) in 1981. The study area covers 3,775 acres of mountainous terrain in the Green Mountain National Forest of Addison County, west-central Vermont. The wilderness is situated along the topographic front of the Green Mountains, approximately 1 mi southeast of Bristol and 8 mi northeast of Middlebury (fig. 1). The terrain varies from gentle within the interior to precipitous along the western boundary of the Bristol Cliffs, from which the wilderness obtains its name. Total relief in the study area is 1,805 ft, from lower elevations of about 520 ft along the New Haven River near Bristol to a high point of 2,325 ft on the crest of South Mountain. Access is provided by U.S. Route 7 at Middlebury and by State Highways 17 and 116, as well as by County and Forest Service roads. There is no record of past mineral production, development, or prospecting within the study area. With the exception of a 12 acre parcel of land in the northeast corner, surface and mineral rights of the wilderness are entirely under the jurisdiction of the U.S. Government (fig. 2).

GEOLOGY

The Bristol Cliffs Wilderness is underlain by metasedimentary rocks of Proterozoic and early Paleozoic age, mantled locally by glacial deposits. Bedrock units consist of the Pinnacle and Underhill Formations, and the younger Cheshire Quartzite (fig. 3). These formations belong to a thick cover sequence of metasedimentary and metavolcanic rocks overlying a basement terrane of Grenville-age (1 b.y. old) Mount Holly Complex to the east (Doll and others, 1961). The Cheshire Quartzite consists of massive to thin-bedded, fine- to coarse-grained quartzite, micaceous quartzite, and minor feldspathic quartzite. Rocks of the Underhill and Pinnacle Formations are more impure clastic metasediments including quartz-mica-feldspar-chlorite schists and phyllites. All of these rocks have been regionally metamorphosed to lower-green schist (chlorite-biotite) grade. The Underhill and Pinnacle Formations show steep westward dips off the flank of the basement to the east. The structure of the Cheshire Quartzite appears to consist of a series of broad, open folds. These folds are part of a group of north-trending anticlines and synclines common to the western front of the Green Mountain anticlinorium (Doll and others, 1961).

GEOCHEMISTRY

Geochemical analysis of 54 samples of rock, stream sediment, and panned concentrate collected from throughout the study area failed to show any significant concentrations of metals (Slack and others, in press). Slightly anomalous concentrations of copper, chromium, lead, nickel, tin, and zinc were detected in a few samples of stream-sediment and panned concentrate, but these readings are not high enough to be suggestive of buried mineral deposits. The only apparent resources in the wilderness are non-metallic commodities not examined by geochemical survey methods.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

The Bristol Cliffs Wilderness has no identified mineral resources, except for certain non-metallic commodities. No mines or prospects are known within the wilderness and no prospecting permits have been issued by the U.S. Bureau of Land Management. The mining of kaolin, iron, and manganese elsewhere in Addison County is related to rock units that are not present in the wilderness. The study area is geologically favorable for containing strata-bound lead deposits, but no evidence of lead mineralization was observed. Locally anomalous concentrations of zinc and copper are not indicative of a potential for the occurrence of resources of these metals. With the exception of silica sand, the non-metallic resources are only of little interest.

REFERENCES CITED

- Doll, C. G., Cady, W. M., Thomas, J. B., Jr., and Billings, M. P., 1961, Centennial geologic map of Vermont: Vermont Geological Survey, scale 1:250,000.
- Slack, J. F., Atelsek, P. J., and Grosz, A. E., in press, Geology and geochemistry of the Bristol Cliffs Wilderness, Addison County, Vermont: U.S. Geological Survey Miscellaneous Field Studies Map MF-1593-A.

MINERAL RESOURCE POTENTIAL MAP OF THE BRISTOL CLIFFS WILDERNESS, ADDISON COUNTY, VERMONT

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