MISCELLANEOUS FIELD STUDIES
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PAMPHLET

MINERAL RESOURCE POTENTIAL OF THE ADAMS GAP AND SHINBONE CREEK ROADLESS AREAS, CLAY COUNTY, ALABAMA

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Studies Related To Wilderness

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and related acts, the U.S. Geological Survey and U.S. Bureau of Mines have been conducting mineral surveys of wilderness and primitive areas. Areas officially designated as "wilderness," "wild," or "canoe" when the act was passed were incorporated into the National Wilderness Preservation System, and some of them are presently being studied. The act provided that areas under consideration for wilderness designation should be studied for incorporation into the Wilderness System. The mineral surveys constitute one aspect of the suitability studies. The act directs that the results of such surveys are to be made available to the public and be submitted to the President and the Congress. This report discusses the results of a mineral resource survey of the Adams Gap (08-215) and Shinbone Creek (08-067) Roadless Areas in the Talladega National Forest, Clay County, Alabama. The Adams Gap and Shinbone Creek Roadless Areas were classified as further planning areas during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

On January 3, 1983, the President signed a bill creating a 6,800-acre wilderness in the Talledega National Forest (Public Law 97-411). This area, named the Cheaha Wilderness, includes parts of the Adams Gap and Shinbone Creek Roadless Areas as shown in figure 2.

MINERAL RESOURCE POTENTIAL SUMMARY STATEMENT

The Adams Gap and Shinbone Creek Roadless Areas, which are in the Talladega Mountains of Clay County, Ala., are underlain by folded and faulted low-grade metamorphic rocks. Outside the study area this sequence of rocks contains a few small, abandoned, subeconomic prospects for manganese and iron. Quartzite, suitable for crushed rock and refractory silica-brick, is the only identified resource in the study area; a quarry for aggregate to make silica brick was once operated within the study area. Manganese, graphite, iron, pyrite, copper, zinc, and gold have been prospected or mined nearby, but they do not occur in the study area. The surface rocks in the study area are bounded by thrust faults at depth and a possibility exists for the presence of oil and gas resources beneath these thrust faults.

Eighty-nine percent of the surface rights and 93 percent of the mineral rights in the study area are owned by the Federal Government.

INTRODUCTION

The Adams Gap and Shinbone Creek Roadless Areas cover 9,480 acres, including about 8,408 acres of the Talladega National Forest in Clay County, Ala., (fig.1). The areas, which are contiguous, were examined together and are referred to in this report as the study area. They are bounded on the north by the Cheaha State Park and the Horse Creek drainage, on the west by Forest Service Route 600 (The Skyway Motorway), on the south by County Road 46, and on the east by County Road 31 and State Road 33. The study area includes Cedar Mountain, Robinson Mountain, and Talladega Mountain from Adams Gap to near McDill Point.

The hillsides are steep and wooded. Vegetation is dominated by second-growth forests consisting of both hardwoods and softwoods. Altitudes range from a low of 1,000 ft where Horse Creek leaves the study area in the northeast to 2,342 ft at Odum Point.

Access to the study area is provided by several forest service and county roads. Two blazed hiking trails, Chinnabee and Odum, provide access to the interior. Unmarked foot and jeep trails provide limited interior access. The woods are generally open for easy hiking, except in a few areas of dense second-growth timber in upland areas.

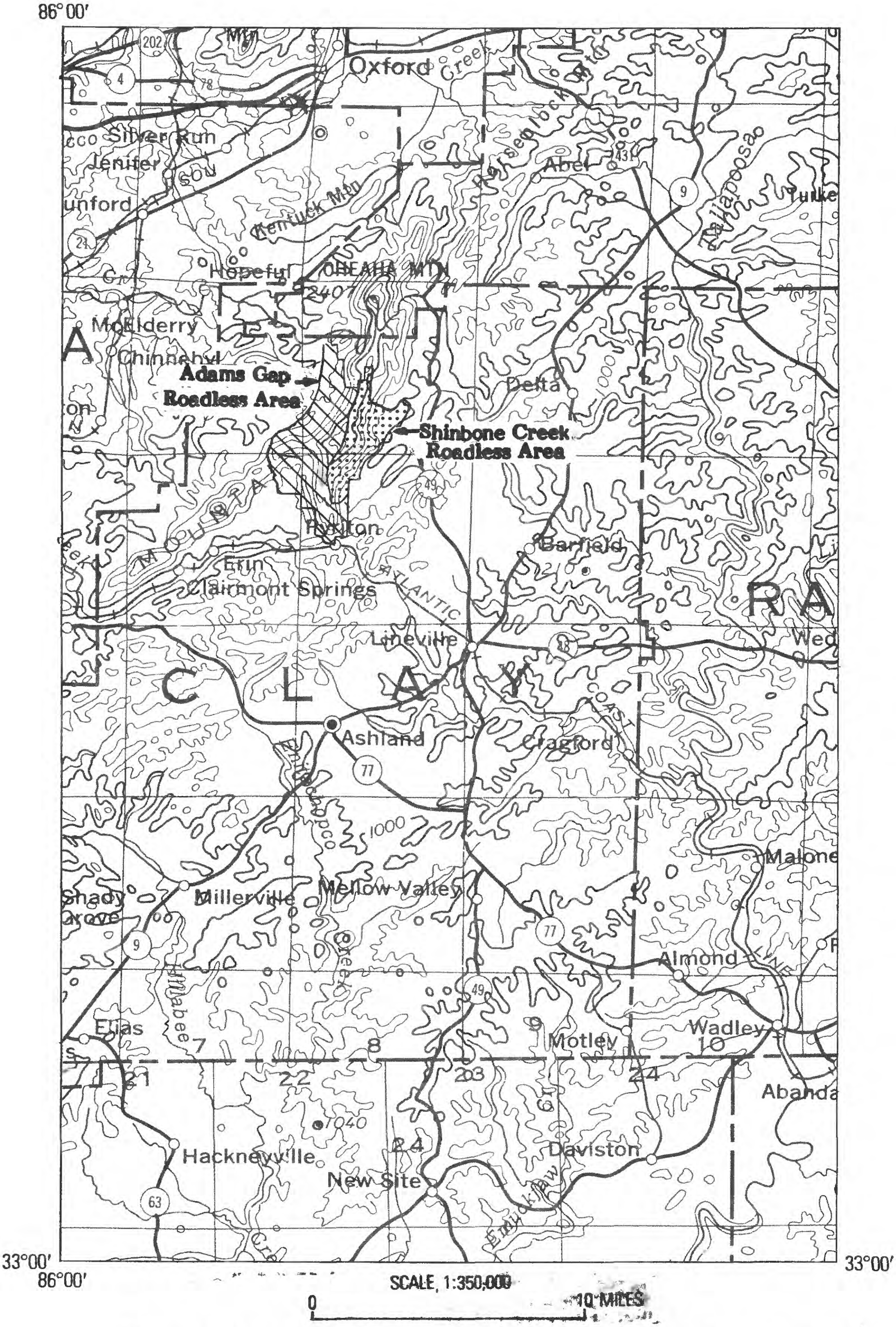

Figure 1.—Index map showing location of the Adams Gap and Shinbone Creek Roadless Areas.

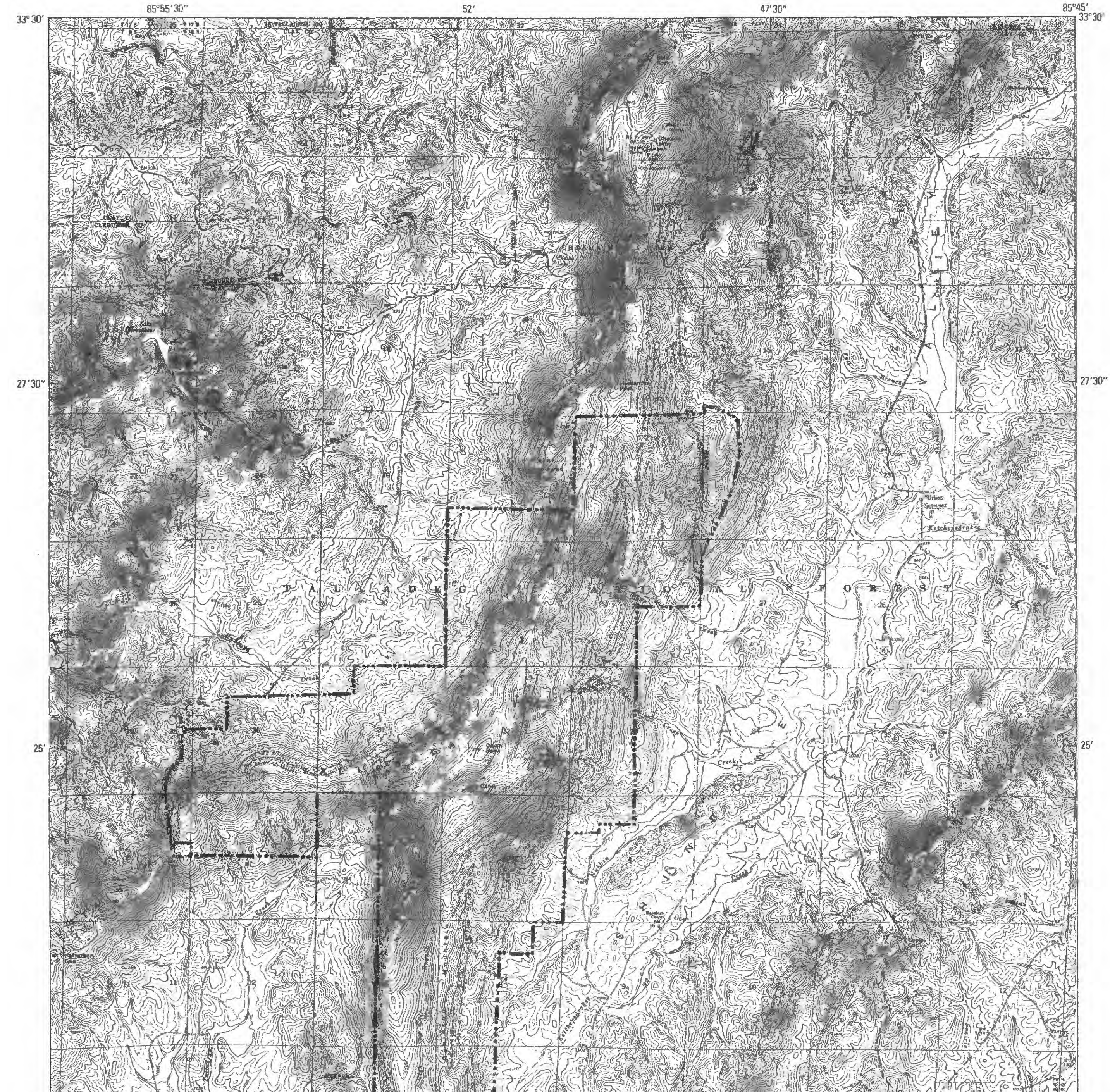

Figure 2.--Approximate boundary of the Cheaha Wilderness, established by Public Law 97-411, January 3, 1983.

Previous Work

A geologic map of Clay County, Ala., and an accompanying report on the geology and mineral resources of the county was published by Prouty (1922, 1923). The regional geology was recently discussed by Carrington (1973) and Tull and Stow (1979) as part of a series of guidebooks published by the Alabama Geological Society. A summary of previous work has been published by Neathery (1973) and Tull and others (1979). Recent mapping covering the Hillabee Chlorite Schist in the Pyriton area was published by Stow and Tull (1982). Reports covering the mineral resources of Clay County and vicinity include Brewer (1896) and Adams (1930) on gold, Prouty (1923) on graphite, and Heinrich and Olson (1953) on mica. The mineral resources of the Talladega National Forest were evaluated by Gilbert and Smith (1973).

A map and summary of the geology of the study area and vicinity is given in Robinson, Klein, and Lesure (in press). Previous to this work, William W. Carter, Jr., mapped part of the study area (Carter, written commun.) His work is currently under preparation as a masters thesis at Florida State University, Tallahassee, Fla.

Present Work

Robinson, Klein, and Lesure, with the assistance of J. A. Goss, J. T. Hanley, and W. D. Rowe, Jr., conducted field investigations for the U.S. Geological Survey (USGS) in early April 1982. During this time, bedrock and surficial geology were mapped and rock samples, soil samples, stream sediments, and panned concentrates were collected for analyses.

A U.S. Bureau of Mines (USBM) field-reconnaissance was conducted in the spring of 1979. Forty-seven rock samples were collected from within or near the study area (Harrison and Armstrong, 1982).

Acknowledgments

The USGS and USBM are grateful for the cooperation of U.S. Forest Service personnel in the Talladega and Shoal Creek Ranger Districts. Appreciation is also extended to James F. Tull, Department of Geology, Florida State University, and T. L. Neathery, Alabama Geological Survey, who supplied much useful information.

SURFACE- AND MINERAL-RIGHTS OWNERSHIP

Eighty-nine percent of the surface rights are owned by the Federal Government (fig. 3) and eleven percent of the surface rights are privately owned. Ninety-three percent of the mineral rights are owned by the Federal Government and the remaining seven percent of the mineral rights are privately owned and held in perpetuity.

GEOLOGY

The study area contains low-grade, regionally metamorphosed sedimentary rocks of the Talladega Group as used by Neathery (1973). The Talladega extends from the coastal-plain overlap in east-central Alabama to Cartersville, Ga., where it has been overthrust by rocks of the Blue Ridge Province. The Talladega forms the frontal crystalline thrust sheet of the southern Appalachians in Alabama (Thomas and other, 1980) and structurally overlies the easternmost fold and thrust belt of sedimentary rocks in the Valley and Ridge Province. The Talladega is composed of interlayered sandstones, micaceous siltstones, silty phyllites, slates, and lenses of granule conglomerate Robinson, Klein, and Lesure (in press). These units contain thin quartz and quartz-calcite veins which appear to fill tension gashes.

Outcrops of the Hillabee Chlorite Schist and rocks of the Poe Bridge Mountain Formation of Neathery (1975) occur nearby to the south and east of the study area, but are separated from the Talladega Group within the study area by thrust faults.

GEOCHEMICAL SURVEY

The USGS made a reconnaissance geochemical survey of the Adams Gap and Shinbone Creek Roadless Areas (Robinson, Klein, Lesure, and Hanley, in press) to test for unidentified, indistinct, or unexposed mineral deposits that might be recognized by their geochemical halos. Similar geochemical surveys based on trace-elements analyses have been credited with the discovery of many types of ore deposits (Rose and others, 1979).

The rock, soil, and bulk stream-sediment samples collected by the USGS were analyzed by semi-quantitative emission spectrographic methods for 31 elements and chemically for zinc in the USGS laboratories, Denver, Colo. (Erickson and others 1983). The concentrations of the elements tested for in the study area compare closely with normal background values for these elements in shales, siltstones, and quartzites. No unusual concentrations of metallic elements were found in the samples analyzed. No metallic deposits are reported to be in the study area, and none were found during the reconnaissance geologic mapping (Robinson, Klein, and Lesure, in press; Robinson, Klein, Lesure, and Hanley, in press).

RADIOMETRIC SURVEY

In addition to the geochemical survey, a radiometric survey was made at intervals along Forest Service Road 600 bordering the western margin of the study area using a four-channel gamma-ray spectrometer. The spectrometer traverse crosses the strike of the geologic contacts and characterizes lithologic types as a function of their spectral response. No unusual radioelement concentrations were found in the area traversed.

MINERAL RESOURCE POTENTIAL

Aggregate suitable for construction or refractory-brick use is the only mineral resource having known potential in the rocks of the Talladega Group as used by Neathery (1973) in the study area (fig. 4). A possibility exists for natural gas or petroleum at great depth beneath thrust faults bounding the rocks of the Talladega Group.

Construction Materials

No sand and gravel deposits of proven resource potential occur within the study area. The alluvial deposits along the small streams in the study area are

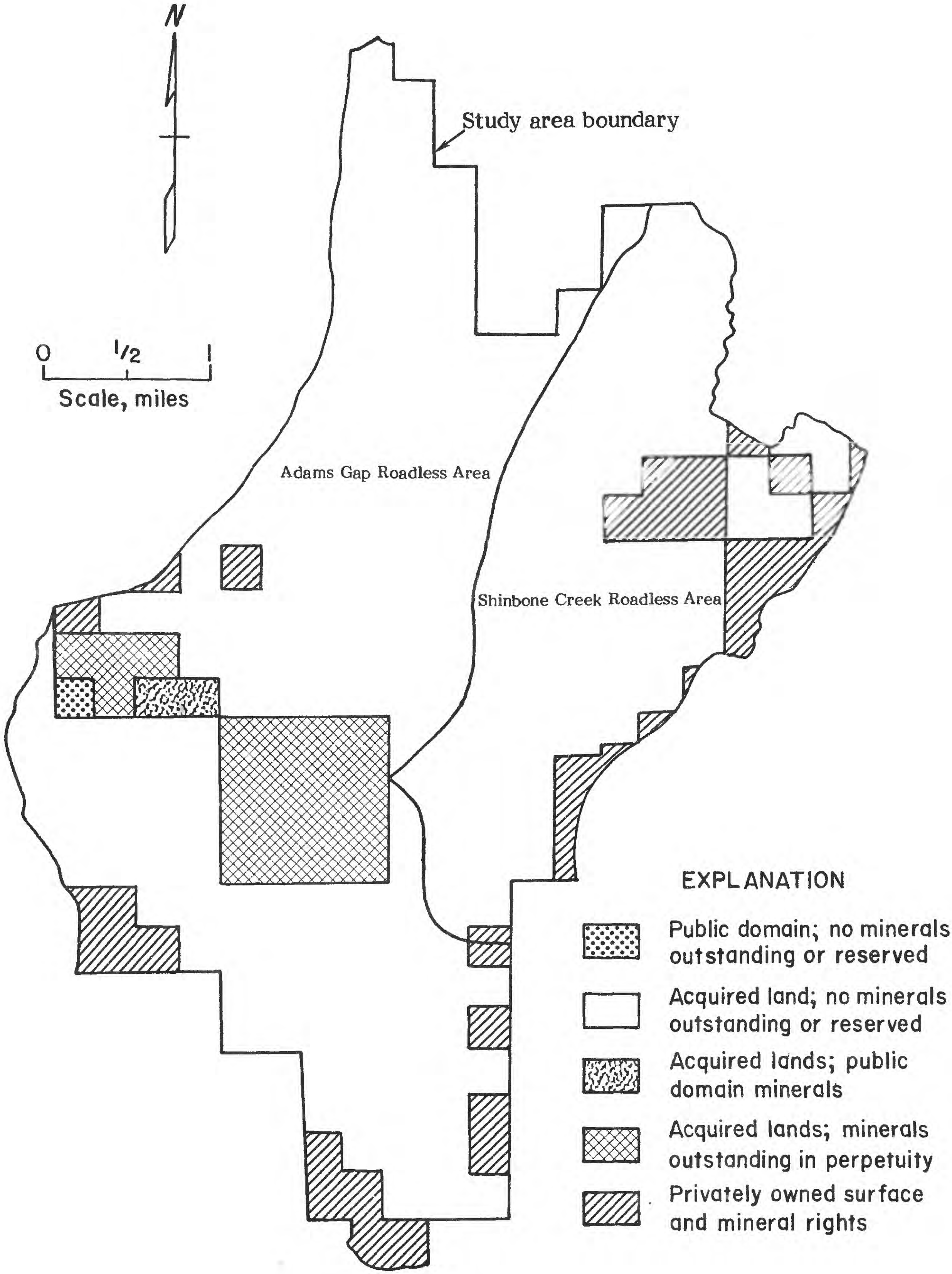

Figure 3.--Surface- and mineral-rights ownership.

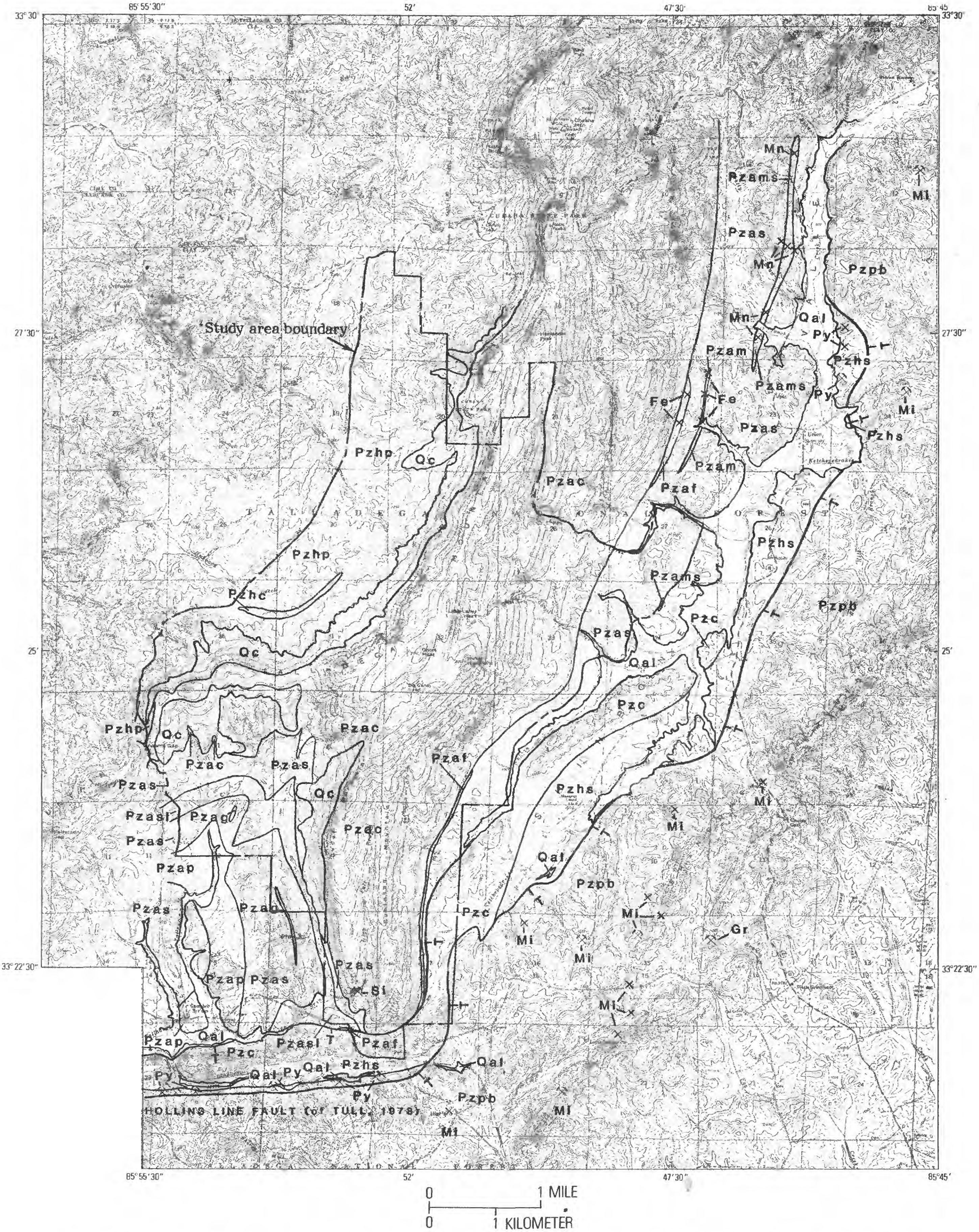

Figure 4.--Map showing geology and abandoned mine and prospect localities.

EXPLANATION

Qal | Pzac | Pzasl

Units containing construction materials

Sand and gravel resources in unconsolidated clay, silt, sand, and gravel in alluvial deposits (Qal). Crushed-rock resources in quartzite and conglomerate in the Cheaha quartzite beds (Pzac) of strata equivalent to part of the Able Gap formation of Bearce (1973). Slate resources (Pzasl) in the Able Gap formation of Bearce (1973).

Comments: Sand and gravel resources in the study area are limited in extent and suitable only for local fill. Sand and gravel, crushed rock, and slate resources of similar quality exist nearby outside of the study area.

Pzac

Unit containing refractory materials

Quartzite in the Cheaha quartzite beds (Pzac) of strata equivalent to part of the Able Gap formation of Bearce (1973). Some of the quartzite is of sufficient purity to produce refractory silica-brick.

Comments: Abundant resources of similar quality exist outside of the study area.

Pzams

Unit containing manganese

Siltstone beds (Pzams) cemented with manganese and iron oxides occurring in the Able Gap formation of Bearce (1973).

Comments: Abandoned prospects for manganese occur in this unit northeast of the study area. Insignificant resource potential in study area.

Pzaf | Pzam

Units containing limonite

Low-grade iron resources in sandstone bed (Pzaf) cemented with iron hydroxides and oxides in the Able Gap formation of Bearce (1973). Iron cement may occur only in the zone of weathered rock.

Limonite in surficial iron-rich deposits found in the zone of weathering developed over a marble bed (Pzam) in the Able Gap formation of Bearce (1973).

Comments: There is no production of iron ore from the district at the present time, and the deposits are of insufficient quality and grade to warrant development in the foreseeable future.

Pzam

Unit containing limestone

Resources in limestone bed (Pzam) (20 ft thick) in the Able Gap formation of Bearce (1973).

Comments: This limestone was once quarried for agricultural lime in an abandoned pit northeast of the study area. Surface exposures of the limestone bed have not been found in the study area.

Pzhs

Unit containing pyrite, copper, and zinc in pyrite-rich intervals in the Hillabee Chlorite Schist (Pzhs)

Comments: The pyrite-rich intervals were once prospected and mined for pyrite to provide sulfur and byproduct recovery of copper and zinc. No active production in the district. The Hillabee does not occur in the study area.

Pzpb | Pzhs

Units containing gold

Gold-bearing veins in quartzite layers in the Poe Bridge Mountain Formation (Pzpb) of Neathery (1975). Low-grade gold-bearing saprolite in surficial deposits of saprolite developed in the zone of weathering over pyrite-rich horizons in the Hillabee Chlorite Schist (Pzhs).

Comments: There is currently no production of gold from either district. No exposures of the Hillabee or quartzite layers in the Poe Bridge Mountain Formation occur within the study area and the geology of the region indicates that these units do not occur at depth under the study area.

Pzpb

Unit containing graphite

Graphitic schists of the Poe Bridge Mountain Formation (Pzpb) of Neathery (1975).

Comments: There is no active production of graphite in the area. No exposures of graphitic schist are known in the study area.

Qal | Pzc | Qc | Pzas | Pzag | Pzap | Pzhp | Pzhc

No Identified resource potential

Colluvium (Qc). Chulfinnee schist (Pzc) of Bearce (1973). phyllite and siltstone beds (Pzap), granule conglomerated beds (Pzag), and an unnamed siltstone and phyllite member (Pzas) of the Able Gap formation of Bearce (1973). Heflin phyllite (Pzhp) of Bearce (1973). Granule conglomerate bed (Pzhc) in the Heflin phyllite of Bearce (1973).

All map units are described in detail in Robinson, Klein, and Lesure (in press).

———	Contact — approximately located.
——T——	Thrust fault. T on upper plate.
×mi	Abandoned prospect, showing commodity.
⚒py	Inactive mine, showing commodity
	Commodity
Fe	Iron
Gr	Graphite
Mi	Mica
Mn	Manganese
Py	Pyrite, with associated byproduct recovery of copper and zinc
Si	Silica refractory
—— — ——	Approxmiate boundary of study area

limited in extent, and would be useful only as local sources of fill material rather than as deposits to support aggregate-production plants.

Quartzite from the Cheaha beds of strata equivalent to the Able Gap formation in the study area is suitable for crushed stone, riprap, or common building stone; Metcalf (1940, p. 4) suggsted that quartzite from Clay County might be a source for grinding pebbles and ballmill liners. Other suitable quartzite deposits occur elsewhere in the region, such as the Weisner Formation in eastern and northeastern Alabama.

Local areas of slate occur in an unnamed siltstone and phyllite member of the Able Gap formation in the study area. Slate has little present-day demand for use as a roofing material, and the slate deposits in the study area have low resource potential

Limestone

A small body of limestone in an unnamed siltstone and phyllite member of the Able Gap formation, located just northeast of the study area, was once quarried and calcined for agricultural lime (Prouty, 1923). No surface exposures of this limestone are known to exist in the study area.

Refractory Materials

Quartzite from the Cheaha beds was quarried for silica refractory brick in the study area within the 1/4, sec. 18, T. 19 S. R. 8 E. The quarry was operated for eight months in 1953 by Harbison and Walker Refractories Division of Dresser Industries, Inc., Birmingham, Ala. (Harrison and Armstrong, 1982, p. 14). Operations were discontinued because of excessive iron content, but two samples of quartzite collected several miles north of the quarry meet standards for refractory brick (Harrison and Armstrong, 1982, p. 14). Impurities in much of the rock and prohibitive quarrying and crushing costs make the Cheaha quartzite in the study area unattractive for both silica-refractory or silica-sand use. Suitable quartzite deposits occur elsewhere in the region, such as the Weisner Formation in eastern and northeastern Alabama, which has been quarried for refractory material in the past (Weigel, 1927).

Manganese and Limonite

Undeveloped manganese and limonite prospects in the Talladega Group as used by Neathery (1973) northeast of the study area occur along a trend that projects into the eastern edge of the study area (fig. 4, units Pzams and Pzaf). Resources at these prospects and from the manganese- and iron-bearing units in the study area were considered uneconomical due to their limited size, low grade, high phosphorous content, and beneficiation difficulties (Gilbert and Smith, 1973, p. 25).

Pyrite, Copper, and Zinc

Mineralization associated with the Hillabee Chlorite Schist includes pyrite, copper, and zinc. Sulfur was the principal product of pyrite mining near Pyriton just south of the study area. Copper and zinc were recovered as byproducts. The sulfides occur in lenticular pods or zones in the Hillabee. Mining activity began around 1900 but ceased around 1919 because of the availability of lower-cost sulfur from the gulf coast (Gilbert and Smith, 1973). Outcrops of the Hillabee lie outside of the study area, and its structural relations indicate that it does not underlie the rocks in the study area.

Gold

Gold is associated with quartzite members in the Poe Bridge Mountain Formation of Neatherly (1975). There is currently no production in the district. The Poe Bridge Mountain Group occurs in a small southern part of the study area, and structural relations indicate it does not underlie the rocks in the rest of the study area. Because the quartzites associated with the gold mineralization are not present, these rocks have no potential as a gold resource in the study area.

Saprolite developed over the pyrite-rich horizons in the Hillabee Chlorite Schist may have potential as a low-grade gold resource. However, areas of saprolite developed over the Hillabee lie outside of the study area.

Mica and Graphite

Sheet, punch, and scrap mica have been mined from small tabular or lens-shaped pegmatites in the Poe Bridge Mountain Formation of Neatherly (1975). Mica production peaked during World Wars I and II and ceased shortly after 1944. Graphite is associated with graphitic schists in the formation. There is currently no mica or graphite production from the district because of beneficiation costs and the availability of low-cost synthetic graphite.

Oil and Gas

The rocks of the Talladega Group in the study area have been thrust over younger unmetamorphosed sedimentary rocks (Thomas and others, 1980.). These younger sedimentary rocks have an unknown potential for oil and gas resources, but the low degree of metamorphism implies that both oil or natural gas could be present in rocks beneath the thrust fault. It is estimated that this thrust fault occurs at a depth greater than 7,000 ft under the study area. Because of the thrust fault contact separating the Talladega from underlying rocks, surface structures in the Talladega cannot be used to determine subsurface structures and thus the possible hydrocarbon traps in the sequence of rocks underlying the thrust. Until detailed seismic studies and deep drilling tests are performed, no estimate of hydrocarbon potential can be made.

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