

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

**Mineral investigation of the Fishooks Wilderness
Study Area, Graham County, Arizona**

U.S. Bureau of Mines Mineral Land Assessment
MLA 17-85
1985

By
Ryan, G.S.,

This open file report summarizes the results of a Bureau of Mines wilderness study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the U.S. Bureau of Mines editorial standards. Work on this study was conducted by personnel from Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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STUDIES RELATED TO WILDERNESS

Bureau of Land Management Wilderness Study Area

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral values, if any, that may be present. 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 Fishhooks Wilderness Study Area (AZ-040-014), Graham County, Arizona.

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By George S. Ryan, Bureau of Mines

SUMMARY

Located in the northwest-trending Gila Mountains, the Fishhooks Wilderness Study Area consists of late Tertiary volcanics overlying Paleozoic sediments. The large porphyry copper deposits discovered in the Gila Mountains near Safford, 24 mi southeast, are in the same Paleozoic sediments; but there the sediments have been mineralized by Laramide age intrusives. Although no Paleozoic sediments crop out in the study area, exposures of the sediments are found in drainages in the adjoining Day Mine area 3 mi south of the southern boundary. No mines, prospects, or mining claims are located within the Fishhooks Wilderness Study Area.

Thermal gradients established in drill holes in the Day Mine area have been used to define a zone classified as containing low-temperature geothermal waters. Because no deep holes have been drilled it is not known if the geothermal zone continues into the study area.

INTRODUCTION

In 1983, the Bureau of Mines, in conjunction with the U.S. Geological Survey conducted a mineral investigation of the Fishhooks Wilderness Study Area (WSA), Graham County, Arizona on land administered by the Bureau of Land Management (BLM). The Bureau of Mines surveys and studies mines, prospects, and mineral occurrences to evaluate identified resources. The Survey also investigates subeconomic resources and assesses the undiscovered mineral resources based on geological, geochemical, and geophysical evidence. This report presents the results of the Bureau of Mines study.

The Bureau's investigation included a review of available published material relating to the geology in the vicinity of the Fishhooks WSA. Claim data were checked using BLM claim recordation files.

A field examination of the WSA was conducted in November 1983, and included fixed-wing aircraft and helicopter reconnaissance followed by several trail-bike and foot traverses. No mines, prospects, alteration, or mineralized zones were located. No samples were taken.

Geographic setting

The Fishhooks WSA (fig. 1) encompasses 10,681 acres mainly on the northeast side of the northwest-trending Gila Mountains approximately 24 mi northwest of Safford, Arizona.

A barbed-wire fence, carefully maintained by the San Carlos Reservation Indians, inhibits access to the WSA from 3 directions. The only access to the study area is from the south by way of the bridge over the Gila River at Geronimo, and a maintained dirt road to the Diamond Bar Ranch (fig. 1). From the ranch, primitive roads and trails provide access to animal troughs, water tanks, and the private inholding within the WSA. A primitive loop road provides limited access to the extreme southeast tip of the WSA from the Day Mine area.

Elevations within the WSA range from 3,950 ft at a canyon bottom about 1 1/4 mi northwest of the Diamond Bar Ranch to 6,629 ft at Gila Peak on the southeastern boundary. The area is characterized by steep-walled canyons that dissect the WSA. Pinon pine and desert shrub is moderately dense along northern slopes and in drainages.

The WSA surface consists entirely of Tertiary volcanics, mainly andesite (Wilson and Moore, 1958). The volcanic rocks thin southward from the WSA to the Gila River as Quaternary gravels and sands increase in thickness. The

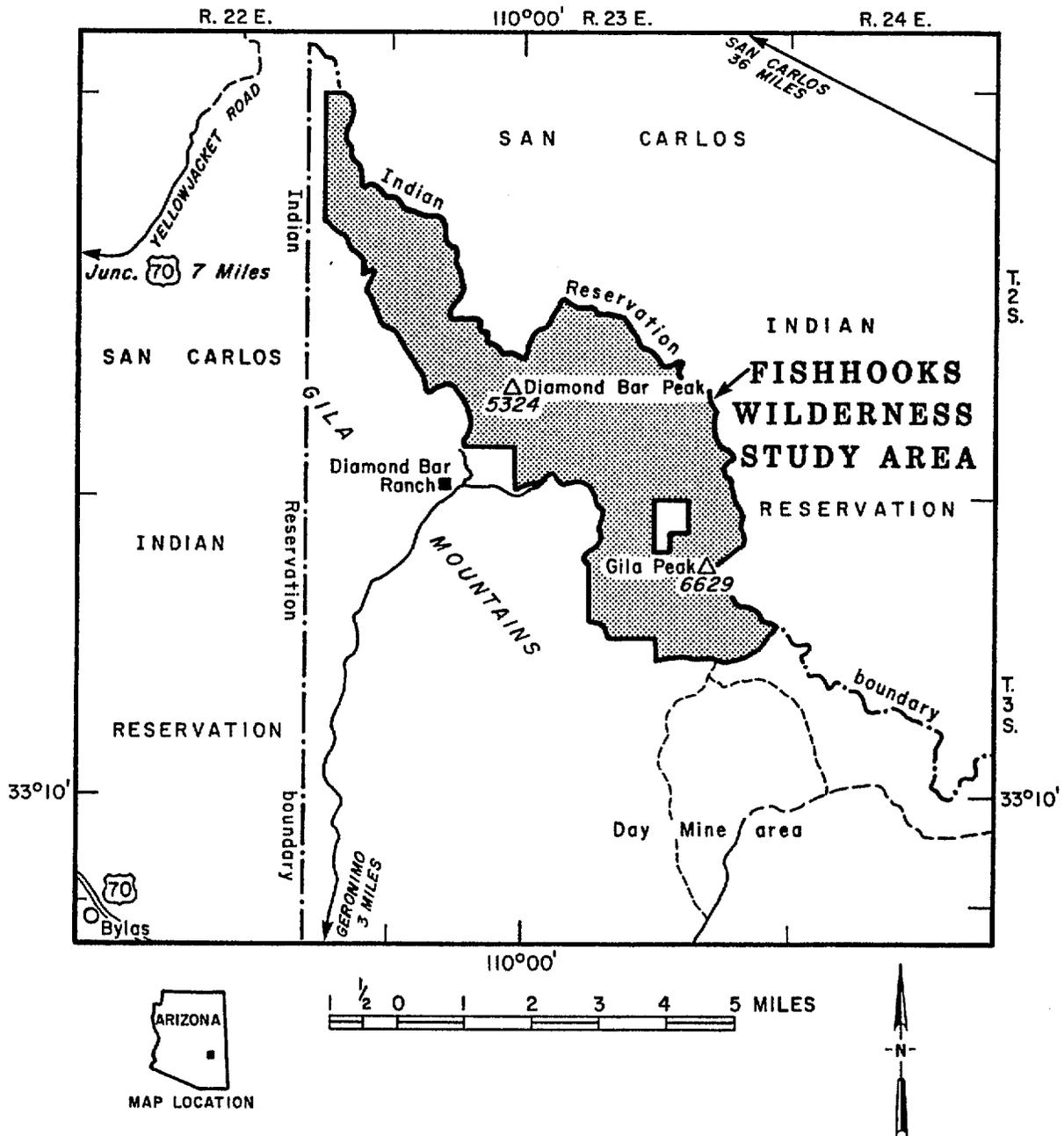


Figure 1. Index map of the Fishhooks Wilderness Study Area and vicinity, Graham County, Arizona.

southern flank of the Gila Mountains is dissected and the rounded ridges paralleling the drainages have a veneer of Quaternary gravels and sands. The incised drainages have some exposures of brecciated Paleozoic sediments and Tertiary intrusives. The groundmass of some of the exposed sediments, located south of the WSA, is permeated with malachite.

Mining activity

No mines or prospects were found by air reconnaissance or surface traverses. The owner of the Diamond Bar Ranch, near the western boundary (fig. 1), stated that he did not know of any claims having been staked in the WSA in the past 60 years. As of January 1985, BLM records indicated that although many claims were located in the Day Mine area, 3 mi south, none were staked in the WSA.

Large disseminated copper ore deposits discovered in the 1950's in the Safford area lie on a northwest belt of mineral occurrences that extends from the Santa Rita-Lordsburg zone in New Mexico to the Mineral Peak area near Kingman, Arizona. The belt includes the Bagdad Mine area, the Inspiration-Miami-Globe complex, and the Clifton-Morenci mines. Figure 2 shows the relationship of the WSA to the southeastern Arizona portion of the mineral belt. Line AB on the map represents a suggested northern limit for the occurrence of significant mineralization (Hibpshman and Peterson, 1981, p. 47). Before the discovery of the Safford deposits, Bromfield and Shride (1955, p. 631), in a report of the mineral resources of the San Carlos Indian Reservation, suggested that, "----base-metal deposits were possibly present under the cover of lavas and alluvial deposits in the extreme southeastern part of the reservation; but that the discovery of such deposits would depend on methods of prospecting that had not yet been developed and perfected." Subsequently the geophysical system, Induced Polarization (IP), was perfected and its use was instrumental in the discovery of the Safford deposits.

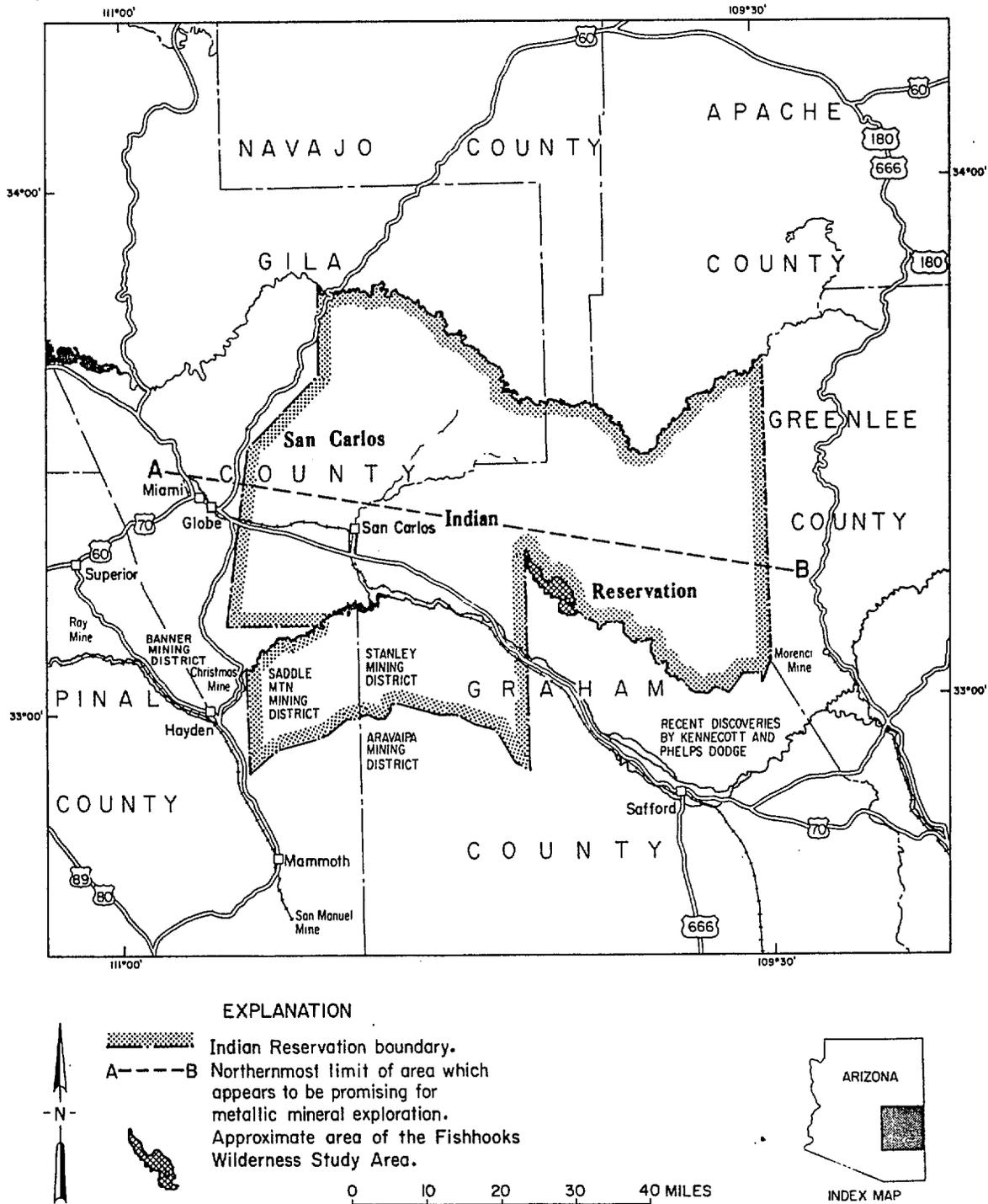


Figure 2. Map showing the relationship of the Fishhooks WSA to known mines and mining districts. (after Hibpsman and Peterson, 1981)

Extensive IP surveys were conducted northwest of Safford by several of the major mining companies over the pediment north and south of the Gila River. Follow-up drilling of IP anomalies encountered pyrite and minor copper mineralization but no minable deposits. Several of the geophysical anomalies and exploration drill holes were located in the southern part of the Day Mine area near the Gila River.

MINING DISTRICTS AND MINERALIZED AREAS

There are no mining districts in or near the WSA. The Day Mine area, commencing about 3 mi south of the WSA, extends 8 mi to the Gila River as a volcanic and alluvium covered pediment. Limited bedrock exposures containing malachite occur in some of the deep drainages on the pediment.

Water holes drilled in the Fishhooks WSA have not been deep enough to determine if a thermal gradient exists within the WSA. However, the Day Mine area adjoining the WSA is within a zone classified on the Arizona Geothermal Resources map (Witcher, and others, 1982) as containing "Low-Temperature Geothermal Waters", which is described as, "Favorable for discovery and development of low temperature (lower than 100°C) geothermal resources."

Lack of favorable Carboniferous and Cretaceous strata precludes oil and gas formation and concentration in the WSA. Deep drilling for hydrocarbons in southeast Arizona within the last 5 years was unsuccessful. There are no oil or gas leases extant in the WSA and surrounding area.

CONCLUSIONS

Paleozoic sediments and Laramide intrusives, a combination that has resulted in many world-class orebodies in southern Arizona, occur within a few miles of the WSA. The WSA is blanketed with late Tertiary volcanics which may cover intrusives. No deep holes have been drilled and it is not known if blind ore deposits are present at depth

A known low-temperature geothermal pool is located 3 mi south of the WSA in the Day Mine area. However, no deep holes from which a thermal gradient could be established have been drilled within the WSA. The geothermal reservoir could extend into the study area but additional data would be required to confirm this.

No oil or gas leases are in the WSA or immediate vicinity. The rocks in the area are not favorable for hydrocarbon formation and accumulation. No hydrocarbon production has occurred in southeast Arizona.

REFERENCES

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