MINERAL RESOURCE POTENTIAL OF THE CYPRESS ROADLESS AREA, SOUTHERN SIERRA NEVADA, CALIFORNIA

SUMMARY REPORT

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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 the 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 suitability 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 survey of the Cypress Roadless Area (A5213), Sequoia National Forest, Kern County, California. The area was classified as a further planning area during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

SUMMARY

A mineral resource appraisal of Cypress Roadless Area, Kern County, California was conducted by the U.S. Geological Survey and the U.S. Bureau of Mines in 1980-1982. Studies included field checking of a previously published geologic map and a reconnaissance geochemical survey by the Geological Survey and a search of mining records and examination of mines, prospects, and mineralized areas by the Bureau of Mines.

These studies indicate that Cypress Roadless Area has: (1) low to moderate potential for possible gold and associated silver resources; and (2) low potential for possible tungsten resources in tactite. There are no indications for the occurrence of coal, oil, gas, or geothermal energy in the roadless area.

INTRODUCTION

Cypress Roadless Area is small and comprises approximately 3 sq mi (1,949 acres) of Sequoia National Forest, Kern County, California. The area is at the southern end of the Sierra Nevada, approximately 30 mi east-northeast of Bakersfield, and 2.5 mi and 3.5 mi south-southeast of the communities of Bodfish and Lake Isabella, respectively (fig. 1). Cypress Roadless Area is bounded on the north by the Sequoia National Forest boundary, on the west and south by Piute Mountain Road (shown as Saddle Spring Road on map sheet), and on the east by Bodfish Creek and patented land of the Glen Olive mine. Access to the roadless area is from Piute Mountain Road and by unimproved dirt roads in Myers and Bodfish Canyons.

Major drainages in the area flow northwestward and are controlled by the regional trend of the metamorphic roof pendants. The western two-thirds of the roadless area is drained by Myers Canyon, and the eastern one-third by Bodfish Creek and its tributaries. The terrain is rugged and steep; elevations range from about 3,900 ft in Myers Canyon at the northern edge of the roadless area to 6,437 ft on the southern ridge crest along Piute Mountain Road.

Vegetation in the roadless area consists of manzanita and sage at lower elevations, deciduous vegetation in damp areas near springs and seasonally flowing streams, and conifers at higher elevations and in cooler north-facing areas. The largest of only nine known groves of Plute cypress, Cupressus nevadensis Abrams, occurs in Cypress Roadless Area and contiguous areas to the north and west.

GEOLOGY

The geology of Cypress Roadless Area is typical of the southern Sierra Nevada. Intensely deformed Paleozoic(?) to pre-Middle Jurassic metamorphic rocks of sedimentary and volcanic origin occur as roof pendants scattered throughout an intrusive country rock of predominantly Upper Cretaceous granitic rocks of the Sierra Nevada batholith. Scattered gabbroic intrusions of probable Triassic or Jurassic age are also present in the region.

Published geologic studies of the region are few and none of the studies has dealt specifically with the roadless area. Several early studies dealt with mineral resources and production from local mines (see references in Brown (1915, 1916), Tucker and Sampson (1940), and Troxel and Morton (1962)), and other studies dealt with possible dam sites on the Kern River in the Isabella Lake area. Miller (1931) presented a geologic section of the southern Sierra Nevada north of the Kern River and named several units in the area, including the Kernville Series and the Isabella Granodiorite. Miller and Webb (1940) described the geology of the old (1908) 30-minute Kernville quadrangle, which includes the roadless area, and named additional units, including the Summit Gabbro. The geology of the southern Sierra Nevada has been summarized in the geologic maps by Troxel and Morton (1962, pl. 2) and Smith (1965). The latter map included previously unpublished mapping that extended the known distribution of metamorphic rocks of the Kernville Series into an area on the east side of Bodfish Canyon, northeast of the roadless area.

The oldest rocks in the region are metamorphic rocks of the Kernville Series of Miller (1931). The Kernville Series includes a variety of metasedimentary and metavolcanic
The presence of anomalous concentrations of certain elements in rocks or stream sediments may be indicative of possible mineralization in an area. For rock samples, the presence of arsenic, gold, or silver is of particular interest because of their relationship to the types of mineralization that may occur in the roadless area. In a similar manner, gold, lead, molybdenum, or silver are possible indicators of mineralization when found in anomalous concentrations in stream sediments, and 11 elements (Ag, As, Au, Bi, Cu, Mo, Pb, Sn, and W) are possible indicators when found in anomalous concentrations in heavy-mineral concentrates.

Stream-sediment and concentrate samples

Anomalous concentrations of elements possibly related to mineralization are present in both stream-sediment and nonmagnetic heavy-mineral-concentrate samples from throughout the study area. Anomalies in stream sediments, which are probably related to gold and (or) silver mineralization, are highest in samples collected in upper Bodfish Canyon. These anomalies probably indicate contamination from mining and milling at the Glen Olive mine (fig. 2) and from workings at other prospects, but they also may be indications of additional mineralized areas. Slightly anomalous concentrations of gold and silver are also present in samples collected in Myers Canyon. These anomalies are thought to be related to the system of quartzfeldspathic dikes and veins that is exposed on the east side of Myers Canyon.

Two suites of elements are present in anomalous concentrations in heavy-mineral-concentrate samples. Restricted anomalies for one or more of the elements antimony, arsenic, copper, gold, or silver are present in samples collected from drainages on the west side of Bodfish Canyon and on the east side of Myers Canyon. The most significant of these anomalies may be the result of contamination from mining and milling activity in the Glen Olive mine area. Geologically these anomalies appear to be related to mineralized quartz-feldspathic dikes and veins that predominantly occur in the Isabella Granodiorite.

Elements that are characteristic of metasomatic contact-type tungsten mineralization (B, Bi, Mo, Pb, Sn, W) were found throughout the area in many of the nonmagnetic heavy-mineral-concentrate samples. However, because several of these elements, notably tungsten, also occur in mineralized quartz-vein type deposits in surrounding areas (Troxel and Morton, 1962, p. 34), the more intense of the anomalies, in drainages near the Glen Olive mine, may be the result of contamination from mining and milling activity there. Similar, although weaker, anomalies for the same elements occur within the roadless area in samples from Myers Canyon and outside the roadless area in samples from the east side of Bodfish Canyon, in the small unnamed canyons directly south of Bodfish, and in an unnamed canyon that drains westward from the vicinity of Bald Eagle Peak. These anomalies may indicate either (1) contact-type mineralization, although limestones are generally rare in the area, or (2) quartz-vein mineralization that may be more widespread than the areas. The sources of these minor anomalies have not been identified.

Mines and mining districts

Mines and prospects in the vicinity of the roadless area are encompassed by the poorly defined Pioneer mining district, an area also loosely referred to as the northwestern part of the Plute Mountains mining district (Troxel and Morton, 1962, p. 24, 31). Clark (1970, p. 46) assigned the roadless area to the Erskine Creek mining district, although this district is often restricted to a narrow region on either side of Erskine Creek, 2 to 3 mi to the east (Troxel and Morton, 1965, p. 31). The Clear Creek mining district, located...
west of the roadless area, is centered on lower Clear Creek and is coincident with part of the Kern River uranium area of MacKevett (1960).

Gold

Production from Sierran gold mines is dominantly from quartz and (or) quartz-feldsparic dikes and veins in granitic host rocks. Lode gold was first mined in the Kern River basin in 1852 and by the middle 1860's substantial amounts were being produced from four local mining districts, none very far from the roadless area. The total production of gold and associated silver from these districts has been estimated at between four and eight million dollars (250,000 to 400,000 oz gold), although no production records are available for the period prior to 1880 (Troxel and Morton, 1962, p. 92; Capstick, 1983).

Lode gold has been produced from several mines along the ridge of Isabella Granodiorite that extends through, and southeast of, the roadless area. At the Glen Olive mine, just outside of the area, free-milling gold was produced from two quartz veins that strike northwest and dip to the northeast (Troxel and Morton, 1962, p. 151). The mine was located about 1888 and yielded an estimated $500,000 (about 25,000 oz) in gold by 1914; considerably less has been produced since, although it was operated almost continuously until its closing in 1942. Work was underway on the Glen Olive mill in 1982 in anticipation of renewed production.

Numerous prospect pits and adits are present on the west-facing slope of Sierras Canyon and a few appear to have had limited, although mainly unrecorded, production; none is currently being worked, although 15 claims are still actively held (Capstick, 1983). The prospects here are probably all gold workings, as gold was found in most of the properties sampled. The Polar Bear mine (fig. 2), thought to be in the northernmost group of workings, is reported to have had pre-1916 production. The Pickwick mine (fig. 2), known to comprise some of the central workings, produced until about 1935. Combined production from these two is estimated to be at least 861 oz of gold (Capstick, 1983). Other workings (table 1) along or near this trend of prospects include the Rockey Hill, Devils Hole North and South, and Opportunity Subsection No. 4 prospects. Limited production is suggested also by the extent of workings at what may be the Fairview mine (fig. 2), near the northeastern corner of the roadless area (Capstick, 1983).

Tungsten

Tungsten ore was first mined in Kern County in 1905. Production was limited, however, until greater demand and higher prices were spurred by World War I. Production ceased after the war, but continued intermittently with minor production between 1929 and 1950. When the importation of tungsten from China ended in 1950, additional sources were sought and encouraged by price supports from the U.S. Government. Most of the mines and prospects in Kern County were discovered in the period 1951-1956. Production declined dramatically again in 1957, when price supports were withdrawn (Troxel and Morton, 1962, p. 294-295).

Scheelite, a tungsten mineral, has been produced from quartz veins and from tactite deposits in the Kernville Series in roof pendants that are located immediately east and west of the roadless area. The Tripolli prospect, the only tungsten prospect in Cypress Roadless Area, is on the west side of the area at the contact between the Kernville Series and the Summit Gabbro. Workings consist of one hand-dug trench and several bulldozer cuts in a tactite zone. No production has been recorded from the Tripolli prospect and none is suspected (Troxel and Morton, 1962; Capstick, 1983).

Antimony

Stibnite and, locally, native antimony have been mined from quartz veins in shear zones that cut granitic rocks or metamorphosed sedimentary rocks east, west, and south of the roadless area, in the Ereske Creek, Clear Creek, and Plute Mountains mining districts, respectively (Troxel and Morton, 1962). The only antimony ore produced from the roadless area was a 2-ton deposit associated with a gold occurrence at the Opportunity Subsection No. 4 prospect (fig. 2). The ore was valued at $540 per ton, but the deposit has been depleted and no further resources remain (Capstick, 1983).

Uranium

Uranium was first discovered in 1954 in the Kern River uranium area (MacKevett, 1960) near Miracle Hot Springs, 3 mi west-northwest of Cypress Roadless Area (fig. 1). The uranium minerals are secondary and occur in small deposits that are erratically distributed along faults and fracture systems in the Isabella Granodiorite. Total production from several mines in the area was limited to 189 tons of ore (MacKevett, 1960; Troxel and Morton, 1962).

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Mineral resource potential of Cypress Roadless Area has been determined on the basis of several criteria: (1) magnitude and location of geochemical anomalies in rocks, stream sediments, and heavy-mineral concentrates; (2) geologic favorability for the occurrence of mineral deposits; (3) similarity of geologic setting to those of nearby areas with known resources; and (4) history of mining and examination of known mines and prospects (table 1).

Cypress Roadless Area lies in an areally extensive geologic terrain that over the past 100 years has yielded locally small amounts of tungsten, base-metal, and uranium minerals along with substantial amounts of gold and associated silver. However, on the basis of the geologic reconnaissance, a geochemical survey of rock and stream-sediment samples (Sutley and others, 1983; Chaffee and others, 1984), and examination of mines and prospects (Capstick, 1983), the area has a low to moderate potential for possible deposits of lode gold with associated silver and a low potential for possible tungsten deposits associated with tactite.

Gold

Lode gold has been produced from the Glen Olive mine and other mines along the ridge of Isabella Granodiorite that extends through, and southeast of, the roadless area (table 1). The gold-bearing quartz veins at the Glen Olive mine may be genetically related to the shallowly eastward-dipping system of quartzo-feldspathic to milky-quartz dikes and veins that crops out in the Isabella Granodiorite below Bodfish Peak and Sierras Canyon. These gold-bearing late differentiates were emplaced in a north-northwest trending fault system that runs through the center of the roadless area. At least 30 adits have been driven in this system within the roadless area; a few have had limited production. One, the Polar Bear mine, is reported to have pre-1916 production. Another, the Pickwick mine, produced until about 1935. Combined production from these two is estimated to be at least 861 oz of gold. Analyses of samples from these workings suggest sporadic distribution of the gold, a characteristic apparently shared by similar prospects and mines in the region.

Within the area that is geologically favorable for the occurrence of gold-bearing quartz veins, four areas are identified that might have mineral resource potential (fig. 2). Of these areas, one has moderate potential and three have low potential for gold resources with accessory silver. On the basis of past production and assay values of collected samples, the area in and around the workings that comprise the Devils Hole North and Devils Hole South prospects have a low resource potential. Resource potential at the Glen Olive mine, however, is high (Capstick, 1983).
due to the steep terrain precludes even a low potential for roadless area. However, the extensive bedrock exposures and concomitant lack of gravel accumulations in Myers Canyon due to the steep terrain precludes even a low potential for heavy-metal placer resources in the roadless area.

Tungsten

Metamorphic rocks of the Kernville Series in roof pendants east and west of the roadless area have yielded small amounts of tungsten ore. Scheelite, a tungsten mineral, occurs in small amounts in association with limited tactite at the Tripoli prospect in the northwestern part of the roadless area. The occurrence is in the contact zone between the Kernville Series and the Summit Gabbro. Samples from this prospect assayed 0.03, 0.26, and 0.5 percent tungsten trioxide (WO₃), but the occurrence contains no identified resources. No production has been recorded from the Tripoli prospect and none is suspected (Troxel and Morton, 1962, p. 324; Capstick, 1983).

No tactite was observed in the mixed zone of metamorphic and granitic rocks in Myers Canyon, and outcrops of metamorphosed limestone are rare and of limited extent. Stream-sediment and heavy-mineral-concentrate samples from throughout the area contain slightly anomalous concentrations of elements related to tungsten-type mineralization, but none of these anomalies appears to be highly significant. On the basis of this evidence, Cypress Roadless Area has only a low potential for possible tungsten resources.

Antimony

Stibnite and, locally, native antimony have been produced from mining districts that are immediately east, west, and south of the roadless area. Two tons of antimony ore were mined in the roadless area in Myers Canyon at the Opportunity Subsection No. 4, a gold prospect. The deposit has been depleted and no further resources remain (Capstick, 1983).

Uranium

The Isabella Granodiorite locally contains abnormal amounts of uranium in the Kern River uranium area (MacKevett, 1960) about 3 mi west-northwest of the roadless area. No anomalous uranium was detected in the rock or stream-sediment samples that were analyzed for this study, and there is no indication of uranium resources in the roadless area.

Geothermal energy

Hot springs are locally present in the southern Sierra Nevada, and are usually associated with faults. The closest hot springs are about 3 mi west-northwest of the roadless area at Miracle Hot Springs (fig. 1). The absence of hot spring activity in Cypress Roadless Area suggests that no potential exists here for geothermal energy.

Other commodities

Marble is present in the Kernville Series in roof pendants both east and west of the roadless area. Because it comprises a very small part of the metamorphic rock in Cypress Roadless Area, marble is not a potential resource.

REFERENCES CITED


Table 1—Mines and Prospects in and adjacent to the Cypress Roadless Area

| No. | Name | Survey of the Cuyamaca mining district. Free milling gold is found within quartz-rich zones, originally reported to be “quartz veins” (Troxel and Norton, 1962, p. 151), in granodiorite country rock. The property is patented (480 acres) and is adjacent to the roadside area’s southeast boundary.

1 Outside roadless area

2 Partly in roadless area

3 Smaller prospect

4 Larger prospect

5 Larger prospect

6 Larger prospect

7 Larger prospect

8 Larger prospect

9 Larger prospect

10 Larger prospect

11 Larger prospect

Two samples: A chip sample from the quartz-feldspar dike contained 0.08 oz gold per ton; a grab sample from a stockpile contained 0.12 oz gold per ton. The prospect has low potential for gold resources.

Seven samples: A sample of vein quartz from the shaft dump contained 0.19 oz gold per ton.

Sixty-four samples: six chip samples contained gold. Three had 0.005 oz gold per ton; two had 0.028, and 0.042 oz gold per ton. The prospect has low potential for gold resources.

Forty-eight samples: 42 were from the dikes, 28 of these contained gold; the remainder were from dumps and probable stockpiles. Five of the dike samples contained from 0.23 to 0.49 oz gold per ton. Of the 4 samples from probable stockpiles, 3 contained greater than 0.1 oz gold per ton, and ranged from 0.24 to 0.38 oz gold per ton. Three adits exploring gold-bearing occurrences contain about 350 tons averaging 0.03 oz gold per ton, 750 tons averaging 0.22 oz gold per ton, and 370 tons averaging 0.136 oz gold per ton. This property has considerable potential for gold resources.

Ten samples: three contained 0.018, 0.028, and 0.03 oz gold per ton. Reported antimony has been depleted.

Six samples taken underground; three contained gold ranging from 0.01 to 0.04 oz per ton. One sample taken in the cut yielded no significant values. Low potential for gold resources.

High potential for gold resources on basis of past production record and reported activity during 1982.
Figure 1 — Index map showing location of Cypress Roadless Area, Kern County, California.
Figure 2.—Mineral resource potential map of Cypress Roadless Area.