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MINERAL RESOURCE POTENTIAL OF THE MARBLE MOUNTAIN WILDERNESS, SISKIYOU COUNTY, CALIFORNIA

SUMMARY REPORT

By

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STUDIES RELATED TO WILDERNESS

Under the provisions of the Wilderness Act (Public Law 88-577, September 3, 1964) and the Joint Conference Report on Senate Bill 4, 88th Congress, 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 President and the Congress. This report discusses the results of a mineral survey of the Marble Mountain Wilderness, Klamath National Forest, Siskiyou County, California. The area was established as a Primitive Area in 1931, reclassified as a Wilderness Area in 1953, and incorporated into the Wilderness Preservation System in 1964.

SUMMARY

The Marble Mountain Wilderness has a low potential for placer gold, chromite, and marble. Specific areas of mineral resource potential are: Gold placer terrace deposits along the North Fork Salmon River, chromite deposits in the Shackleford Creek mining district, and marble deposits in the Marble Mountain mining district.

INTRODUCTION

From 1979 to 1981, the U.S. Geological Survey and the U.S. Bureau of Mines carried out field investigations to evaluate the mineral resource potential of the Marble Mountain Wilderness. These investigations included geologic mapping, geochemical sampling, geophysical surveys, and a survey of known mines, prospects, and mineralized areas.

Location and geographic setting

The Marble Mountain Wilderness is in the north-central Klamath Mountains of northern California (fig. 1). The wilderness encompasses an area of about 214,000 acres of steep rugged terrain between the Scott, Salmon, and Klamath Rivers, at elevations ranging from 1,450 to 8,300 ft above sea level. The area is densely vegetated by Douglas-fir and mixed conifer forests at lower elevations, and by true firs at elevations above 5,000 ft. Trailheads in the northern and western parts of the study area are accessible via unpaved U.S. Forest Service roads leading to the south and east from State Highway 96 (Klamath River Highway) near the towns of Happy Camp and Somes Bar. The northeastern trailheads are reached by unpaved roads leading from the Scott River road via the town of Fort Jones and State Highway 3. The southern trailheads are reached via paved and gravel roads leading from the towns of Etna and Sawyers Bar.

Geologic setting

The Marble Mountain Wilderness is underlain by metamorphic and plutonic rocks of the western Paleozoic and Triassic belt of the Klamath Mountains geologic province (Irwin, 1966). The metamorphic rocks of the study area may be grouped into two units. The first unit is a structurally lower amphibolite-facies unit, interpreted as a metamorphosed tectonic melange (Donato and others, 1982). The second unit, which structurally overlies the first, is composed of greenschist-facies metasedimentary and metavolcaniclastic rocks and is part of the Hayfork terrane (Donato and others, 1981). These two units are juxtaposed along a south-dipping thrust fault that postdates the main metamorphic event. Both units are, in turn, crosscut by the Late Jurassic Wooley Creek batholith, which underlies much of the western part of the wilderness.

Unconsolidated materials include landslide deposits, which commonly occur in areas underlain by ultramafic rocks, and Quaternary alluvial deposits in streambeds and terraces.

Mining activity

Placer gold was produced during the 1930's from Pleistocene terrace deposits in the Liberty mining district on the North Fork Salmon River. Mining claims were located for marble (1920's) and gold (1930's) in the Marble Mountain mining district, and for chromite (1940's-1950's) and gold (1800's) in the Shackleford Creek mining district, but no mineral production came from these districts within the wilderness.

A total of 56 mining claims were identified from courthouse records; 5 claims were for lode gold, 6 for placer gold, 20 for chromite, and 25 for marble. No patented mining claims, mineral leases, or currently active mining operations are known in the wilderness.

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GEOLOGY, GEOPHYSICS, AND GEOCHEMISTRY PERTAINING TO MINERAL RESOURCE POTENTIAL

Geology

The geology of the Marble Mountain Wilderness was mapped by the U.S. Geological Survey (Donato and others, 1982). Detailed studies of specific areas within the wilderness boundary had been conducted previously (Pratt, 1964; Seyfert, 1964; Bero, 1980; Allen, 1981; Welsh, 1982).

The study area comprises two metamorphic-rock units, separated by a generally east-west-trending south-dipping thrust fault. The structurally lower amphibolite-facies unit, described as a metamorphosed tectonic melange, is exposed in the northern part of the wilderness; the unit contains a wide variety of rock types, including chert, marble, amphibolite, ultramafic rocks, and schist of mainly sedimentary origin. Of these rock types, only the ultramafic rocks and marble are significant in terms of mineral resource potential. The structurally higher greenschist-facies unit (Hayfork terrane), exposed in the southern part of the area, consists of volcanic and metasedimentary rocks, including an olistostromal breccia that contains small (as much as a few yards long) blocks of limestone and serpentinized peridotite in an argillite matrix. Although these blocks are the possible source of geophysical anomalies, they are insignificant in terms of mineral resource potential owing to their small size. No chromite was observed in these serpentinite blocks.

Elsewhere in the Klamath Mountains, greenschist-facies rocks of the Hayfork terrane characteristically host lode and placer gold deposits (Albers, 1981). In and near the Marble Mountain Wilderness, sampling by the U.S. Bureau of Mines yielded placer gold in alluvial deposits in the Hayfork terrane. In addition, chalcopyrite and bornite were identified on shear surfaces in intermittent quartz veins at one locality within the Hayfork terrane (Hale and Cwick, 1982). Neither geochemical sampling nor geophysical surveys, however, indicated the presence of sulfide deposits in the Hayfork terrane within the study area.

Within the amphibolite-facies unit, the ultramafic rocks are concordant mainly tabular or lenticular bodies, as inferred from geologic mapping and their geophysical signature. They range in size from a few feet to more than a mile on a side. The ultramafic rocks in the study area are known to have been formed, at least in part, by metamorphism of previously existing serpentinite (Donato and others, 1982; Welsh, 1982). Recrystallization of the serpentinite under amphibolite-facies conditions has resulted in the formation of olivine-antigorite-talc-tremolite schist which differs from typical alpine-type ultramafic rocks in texture and, to some degree, mineralogy (Trommsdorff and Evans, 1974).

Because most of these ultramafic rocks have undergone a previous serpentinization event, before metamorphism, we were unable to identify whether the protolith was dunite or harzburgite in most places. In localized zones within the larger ultramafic bodies, however, unserpentinized coarse-grained, foliated dunite with primary textural and mineralogic features was observed. These small discontinuous dunite bodies presumably represent areas unaffected by the premetamorphic serpentinization event. Although the total extent of such relict primary zones is not known, we estimate it to be small on the basis of examination of the rock sample network. No "primary" harzburgite was identified. Most, but not all, of the chromite in the study area is found in the dunite. Magnetite or ferrit-chromite (chromium-rich magnetite) is the common spinel phase in the metaserpentinite.

Chromite occurs as podiform bodies, disseminated stringers, schlieren, or discontinuous layers, as much as 100 ft long but averaging less than 65 ft in length, and as much as 6 ft wide, some as small as 4 in. wide. The largest podiform chromite body found was about 75 ft long by 6 ft wide. Undiscovered chromite bodies in the subsurface would be difficult to detect with current exploration techniques, but they may exist, particularly in the larger peridotite bodies. Any undiscovered chromite bodies, however, would probably be relatively small and discontinuous, on the basis of known surface occurrences.

Chrysotile asbestos is present only in rare local veins or sheared zones, and no veins wider than 1 to 2 in. were observed. Metamorphic antigorite, which is by far the predominant serpentine mineral in the peridotite, occurs as a product of both prograde and retrograde metamorphism, mainly as felted crystals intergrown on a microscopic scale.

Marble Mountain (fig. 2), the largest exposure of marble in the area, consists of a tabular lens exposed over 2 to 3 mi^2 and several hundred feet in maximum thickness. The rock is composed of coarsely recrystallized white, gray, or tan calcitic, siliceous, and dolomitic marble. Much of the rock is pure calcite marble containing less than 1 weight percent magnesium oxide and such minor impurities as pyrite, graphite, and tourmaline. Rare thin sedimentary interbeds (and possible tectonically emplaced fault slivers) of micaceous and siliceous schist and small dikes of mafic intrusive rock also occur within the marble. Because the marble occurs as a tectonic block in the metamorphosed melange rather than as a laterally continuous sedimentary layer, its projection into the subsurface is difficult to predict. Furthermore, the marble's inaccessibility and the availability of other sources closer to population and transportation centers lower its resource potential.

Aeromagnetic survey

Conspicuous aeromagnetic anomalies within the wilderness are associated with ultramafic bodies (R. C. Jachens and others, unpub. data, 1982), some of which contain small amounts of chromite. Four strong northeast-southwest-trending anomalies occur over the amphibolite-facies unit in the northern part of the wilderness, three of which are associated with large exposures of ultramafic rocks. The anomaly over ultramafic body 1 (fig. 2) suggests that the areal extent of this body in the subsurface is comparable to that seen at the surface. Ultramafic body 2 (fig. 2) dips southeast and extends into the subsurface a few thousand feet southwestward of its mapped south contact. Ultramafic body 3 (fig. 2) is probably very thin, on the basis of the very weak magnetic anomaly associated with it. A large magnetic high centered near ultramafic body 4 (fig. 2) probably reflects the position of a buried ultramafic body, about 2 by 3 mi in areal extent, although only small exposures of ultramafic rocks occur beneath this anomaly. Computer modeling of the magnetic data over the largest ultramafic body (5 in fig. 2) suggests that this body is tabular, dips gently southeast, and extends approximately 5 mi or more southeastward of its southernmost exposure.

Only two magnetic anomalies are associated with exposures of ultramafic rocks in the greenschist-facies unit. The magnetic data reflect the presence of a small body of ultramafic rocks south of Marble Mountain (6, fig. 2) that is probably a fault-bounded sliver derived from the underlying high-grade terrane. These magnetic data suggest that this body continues in the subsurface, is elongate northwest-southeastward, and is approximately 0.6 by 1.3 mi in areal extent. A second ultramafic body (not shown in fig. 2) is west of the Wooley Creek batholith, outside the wilderness boundary (see accompanying generalized geologic map); its magnetic signature suggests that it is a tabular body that dips steeply east and extends to a depth of approximately 1.3 mi. Ultramafic bodies in the greenschist-facies unit are typically composed of antigorite and are not likely hosts for chromite. The generally featureless magnetic field over other parts of the greenschist-facies unit within the wilderness indicates that no other large magnetic ultramafic bodies are concealed at shallow depth in this unit.

The results of the gravity survey have been summarized and interpreted by R. C. Jachens and others (unpub. data, 1982). Because these data provide no direct information pertaining to mineral resource potential, they are not discussed in this report.

Geochemical survey

A geochemical survey of the study area was undertaken to aid in the evaluation of its resource potential. A total of 55 stream-sediment and 131 panned-concentrate samples were taken from throughout the area; in addition, whole-rock grab samples were taken to obtain general background geochemical values. Analysis of the heavy, nonmagnetic fraction of panned concentrates from stream sediment proved to be the most useful method for evaluating the resource potential of the study area because all the more common rock-forming minerals (quartz and feldspar) that tend to dilute the anomalies have been removed. The samples were processed and analyzed for 31 elements using the semiquantitative emission spectrographic method of Grimes and Marranzino (1968). Details of the results of this study are reported by Adrian and others (1983).

The geochemical sampling delineated an area in the northeast quadrant of the wilderness that showed anomalous concentrations of chromium and nickel. The anomalous area is underlain primarily by metasedimentary, metavolcanic, and ultramafic rocks (fig. 2). The high chromium and nickel values derive from ultramafic rocks exposed in the drainage basins of individual sediment samples, as confirmed by several analyses of whole-rock samples of ultramafic rocks in the area.

MINING DISTRICTS AND MINERALIZATION

Four mining districts are located within the Marble Mountain Wilderness area: the Happy Camp, Liberty, Marble Mountain, and Shackleford Creek. Figure 3 shows the prospects and mineral occurrences in the study area, and table 1 lists the data for these localities.

Happy Camp mining district (Klamath River drainage system)

The Happy Camp mining district extends into the northwestern part of the study area in the Klamath River drainage system on Elk and Ukonom Creeks (fig. 3). One lode-mining claim, the Lost Indian No. 1, was located in 1971 within the wilderness. No potential mineral deposits were visible at this prospect. Assays of samples from greenstone, granitic intrusive rocks, and quartz veins did not indicate mineral potential.

Liberty mining district (Salmon River drainage system)

The Liberty mining district extends into the southeastern part of the wilderness and includes the North Fork Salmon River and its Right Hand Fork. One lode claim and seven placer claims were located within the wilderness. Mineral production came from gold placers on the North Fork Salmon River and on the Right Hand Fork. The last mining activity was during the 1930's, when gravel was processed by rocker and sluicebox. No underground mine workings were observed in this part of the wilderness.

Gold-bearing gravel deposits occur as discontinuous alluvial terraces and as river-level gravel bars at the mouths of tributaries. In this study, gold was detected in panned-concentrate samples from the North Fork Salmon River and from two tributaries, Boulder Creek and the Right Hand Fork.

Marble Mountain mining district (Klamath and Scott River drainage systems)

The Marble Mountain mine Nos. 1-24 mining claims were located on marble outcrops in T. 44 N., R. 12 W., and covered an area of about 4 mi^2. No development or production is recorded for these claims.

Marble.—Marble Mountain itself is composed of interlayered calcite marble and siliceous and dolomitic schist. The marble is exposed on a dip slope 0.5 to 2 mi wide for about 2.5 mi along strike. Grain size, mineral composition, and purity vary considerably. Much of the marble contains impurities in seams ranging from less than 1/8 in. to several inches in thickness throughout the beds.

Gold.—Dense networks of quartz veins are present locally, particularly near contacts with adjacent schist. No gold was produced from lode claims in the metasedimentary rocks near Marble Gap. Assays of quartz veins in mica and chlorite schist at Marble Gap were too low to infer a resource.

Shackleford Creek mining district (Scott River drainage system)

Chromite occurs in areas of ultramafic rocks covering about 15 mi^2 in the Shackleford and Canyon Creek drainages (fig. 3). A total of 20 lode claims for chromite were located in this district. Most of the locations were made in the late 1930's and early 1940's; several claims were located in 1954. No production has been recorded.

Chromite occurrences in the study area are characteristically discontinuous, as discussed in the preceding sections. Disseminated chromite stringers and podiform deposits of chromite occur in ultramafic rocks at Calf Lake, Deep Lake, and Gem Lake (figs. 3, 4). At Calf Lake, indicated disseminated chromite resources total 145 tons averaging 8.2 percent chromic oxide. At Gem Lake, indicated disseminated chromite resources total 4,170 tons averaging 2.4 percent chromic oxide. There are about 1,800 tons of inferred resources. The Deep Lake chromite occurrences do not have sufficient continuity of structure to determine chromite resources, although surface indications are small.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Geologic, geochemical, and geophysical evidence indicates that the Marble Mountain Wilderness has a low resource potential for placer gold and chromite; marble resources with low potential are also present. Table 1 summarizes the data on mines, prospects, and mineralized areas and indicates those properties with resources. Figure 4 shows areas in the wilderness with lode and placer mineral resource potential.

Gold

The Liberty mining district contains gold-bearing gravel deposits. Within the study area, 33 acres of terrace and stream gravels was identified. Approximately 16 acres of terrace and river-level gravels contains gold. Gold-bearing gravel in the study area is estimated to total about 149,000 yd^3 averaging 0.002 troy oz gold/yd^3, of which quantity only 4,000 yd^3 would average over 0.01 troy oz gold/yd^3. Gold-bearing terrace deposits are too low in grade, too small, and too isolated to mine by conventional methods. At present (March 1983) gold prices, the river-level bars on the Right Hand Fork and the North Fork Salmon River contain sufficient gold-bearing gravel to support two-man suction-dredging operations.

Chromite

Chromite potential exists in the Shackleford Creek mining district. Estimated chromite resources from disseminated deposits near Calf and Gem Lakes total 4,700 tons averaging 2.6 percent chromic oxide. In addition, a podiform deposit at Gem Lake contains an estimated 1,400 tons of inferred chromite resource; an accessible sample of this pod assayed 39.42 percent chromic oxide.

The chromite resources are small, low in grade, and presently of little interest. However, because the study area contains several large ultramafic bodies, the potential for chromite exists. Chromite deposits could be present (though not presently detectable) in the subsurface. If and when better subsurface-detection methods become available, presently unknown deposits may come to light.

Marble

Indicated marble resources in the Marble Mountain mining district total more than 2 billion tons, but distant markets and insufficient access to the deposits preclude their current use.

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Table 1.--Mines, prospects, and mineralized areas in the Marble Mountain Wilderness
[*, prospect with resources. See figure 3 for locations.]

Map No.	Name, commodity	Summary geology	Production, workings	Sample data-resource estimate
1	Lost Indian No. 1, gold	Massive quartz vein and granitic dike intruding greenstone. Quartz vein, 1 to 7 ft wide, oriented S. 85° E., dipping 65° SW., traced on the surface for 125 ft.	No production, 50-ft-long trench and several small trenches	Six lode samples. Four quartz-vein samples contained a trace of gold, and less than 0.2 troy oz silver per ton. Greenstone and granite contained a trace of gold and less than 0.1 troy oz silver per ton.
*2	Marble Mountain mine Nos. 1-24, marble	Massive outcrop of thin-bedded, granular marble is 1.5 mi wide, 2 mi long, and averages 250 ft in thickness. The marble is part of a metamorphic-rock unit, oriented N. 30° E., dipping 20° SE., consisting of thin-bedded chlorite schist, quartzite, and marble. Smaller outcrop, 0.25 mi wide and same thickness, crops out discontinuously for 3 mi.	None	Twenty-one lode samples. Massive outcrop--indicated limited marble resources: 1.7 billion tons averaging 45.6 percent CaO, 1.7 percent MgO, 0.2 percent Al_2O_3, and 0.1 percent Fe_2O_3. Smaller outcrop--inferred resource: 0.4 billion tons. Silicified marble-schist contact assayed a trace of gold, 0.2 troy oz silver per ton, and less than 0.01 percent WO_3.
3	Marble Gap, gold	Quartz veins 4 in. wide crop out for 250 ft; oriented N. 35° E., dipping 70° SE. in chlorite schist. Limonite staining, but no metallic minerals evident.	None	Four lode samples. One sample contained 0.1 troy oz silver per ton. Assays showed no gold and less than 0.2 weight percent WO_3.
4	Deep Lake, chromite	Disseminated chromite in dunite.	None	Four lode samples. Analysis ranged from 0.18 to 3.36 percent Cr_2O_3. Insufficient structural control to calculate a resource.
*5	Calf Lake, chromite	Chromite veins and schlieren in dunite and serpentinite in three zones: Zone A: A 4-in.-wide 50-ft-long chromite vein oriented EW., dipping 80° SW. found in 4-ft-wide dunite band. Zone B: Disseminated stringers of chromite, 1 ft wide crop out over a length of 25 ft. Zone C: Disseminated stringers of chromite 1 ft wide oriented, N. 40° E. crop out over a 35-ft length in serpentinite.	None	Pods and stringers of chromite estimated to contain less than 2 tons (Wells and Cate, 1950). A total of 75 lode samples contained chromite, but only 12 assayed more than 1 percent Cr_2O_3, and only 2 chip samples contained as much as 10 percent Cr_2O_3. Zone A, B, C: Indicated resources, 145 tons averaging 8.2 percent Cr_2O_3.

Table 1 cont.--

6	Mica Ledge, gold	Network of quartz veins ranging from 2 ft to 6 ft in width, oriented N. 80° E., dipping 80° NW., in metasedimentary rocks cropping out over a vertical distance of 570 ft. No metallic minerals found.	None	Seven samples. Assays showed no gold or silver.
*7	Gem Lake, chromite	Chromite pod and disseminated veins and stringers in dunite and in serpentinized dunite in four zones: Zone A: A podiform chromite deposit 6 ft wide, 75 ft long oriented N. 35° E., dipping 75° SE., in dunite. Zone B: Disseminated chromite vein oriented N. 10° E., averaging 3.8 ft in width and more than 35 ft in length. Zone C: Disseminated chromite stringers oriented N. 25° W., averaging 7.4 ft in width and more than 100 ft in length. Zone D: Disseminated chromite stringers, oriented N. 30° E., averaging 6 ft in width and more than 50 ft in length, extend 40 ft to zone B.	None	Twenty-four lode samples contained chromite, but only 15 contained more than 1 percent Cr_2O_3, and only 4 more than 10 percent Cr_2O_3. Zone A: Inferred resource, 1,400 tons. One sample contained 39.42 percent Cr_2O_3. Moderate potential. The pod is classified as large in comparison with other California chromite deposits (Allen, 1941). Zone B, C, D: Indicated resource 4170 tons averaging 2.4 percent Cr_2O_3. Inferred resource, 400 tons.
8	Golden Wonder, gold	Quartz vein, 1 ft wide, oriented N. 10° E., dipping 55° SE., crops out for 200 ft in metasedimentary rocks. No visible metallic minerals.	None	One lode sample across quartz vein contained a trace of gold, no silver, and less than 0.01 percent WO_3.
9	Shotgun Gulch (Clagstone claim), gold	Quartz vein, 2 ft wide, oriented N. 70° W., dipping 55° NE. crops out for 60 ft along schist and granitic intrusive rocks contact.	None	Four lode samples. Quartz vein contained a trace of gold, no silver, from 60 to 150 ppm copper, and from 690 to 870 ppm manganese.
10	Pointers Gulch (Clagstone claim), gold	Quartz veins containing chalcopyrite and bornite on shear surfaces on 18-ft-wide by 50-ft-long zone in metasedimentary rocks, oriented N. 30° W., dipping 68° NE.	None	One lode sample across outcrop contained a trace of gold, 0.1 troy oz silver per ton, and 85 ppm copper.
11	Flower Gulch, (Clagstone claim), gold	Outcrop of silicified rocks 3 ft wide, oriented N. 60° E., dipping 68° NW., traced 260 ft on surface.	Trench, 20 by 40 ft	Silicified rock contained a trace of gold and silver, 0.08 percent copper, 1 percent zinc, and 2 percent barite.
*12	Right Hand Fork at North Fork Salmon River, gold	Gravel terrace (4 acres) on contact between Triassic metavolcanic and metasedimentary rocks.	2 acres of gravel terrace mined	Seven pan-concentrate samples. Gold-bearing gravel on about 1 acre totals 1,400 yd^3 averaging 0.01 troy oz gold/yd^3.

Table 1 cont. --

*13	North Fork Salmon River at Right Hand Fork, gold	Gravel terrace (9 acres) on Triassic metavolcanic bedrock.	Small placer working at contact between bedrock and terrace gravel	Two channel samples, totaling 19 ft^3 from two trenches in alluvium, were analyzed. Gold-bearing gravel on 8 acres totals 77,000 yd^3 averaging 0.003 troy oz gold/yd^3. Large particles of gold in two placer samples indicated a nearby source of gold, possibly from metavolcanic rocks or from contact between metavolcanic and metasedimentary rocks.
*14	Deer Pen Creek, gold	Gravel terrace (4 acres) on Triassic metasedimentary bedrock.	1 acre of stream gravel mined	One trench was dug. 14 ft^3 of alluvium was removed from one channel sample for analysis. Gold-bearing gravel on 4 acres totals 39,000 yd^3 averaging 0.0003 troy oz gold/yd^3
*14	Wild Gulch, gold	Gravel terrace (4 acres) on Triassic schist bedrock.	None	One trench was dug. 9 ft^3 of alluvium was removed from one channel sample for analysis. Gold-bearing gravel on 2 acres totals 29,000 yd^3 averaging 0.0002 troy oz gold/yd^3.
*15	Keys Abbott Ranch terrace extension, gold	Gravel terrace (4 acres) on Triassic metasedimentary rocks.	None	One trench was dug. 7 ft^3 of alluvium was removed from one channel sample for analysis. Gold-bearing gravel on 1 acre totals 2,600 yd^3 averaging 0.03 troy oz gold/yd^3.
*16	Keys Abbott Ranch terrace, gold (outside wilderness)	Gravel terrace (16 acres) on Triassic metasedimentary rocks.	2 acres of stream gravel mined near Mule Bridge	Two trenches were dug. 23 ft^3 of alluvium was removed from two channel samples for analysis. Gold-bearing gravel on 6 acres totals 106,000 yd^3 averaging 0.002 troy oz gold/yd^3.
*17	Big Creek, gold (outside wilderness)	Gravel terrace (15 acres) on schist bedrock.	4 acres of stream gravel mined	Two trenches were dug. 19 ft^3 of alluvium was removed from two channel samples for analysis. Gold-bearing gravel on 12 acres totals 155,000 yd^3 averaging 0.002 troy oz gold/yd^3.

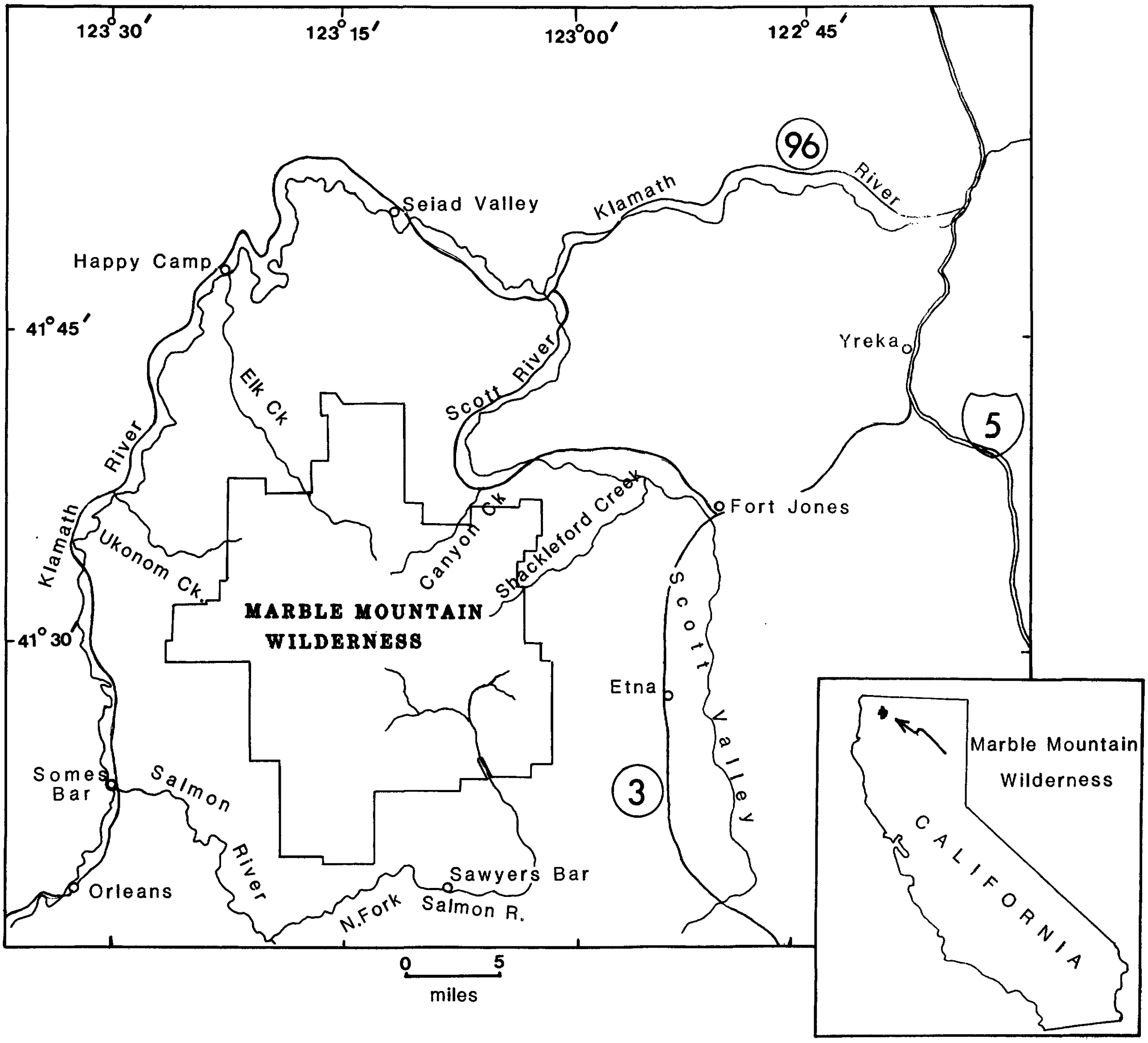

Figure 1.—Location of the Marble Mountain Wilderness, Siskiyou County, Calif.

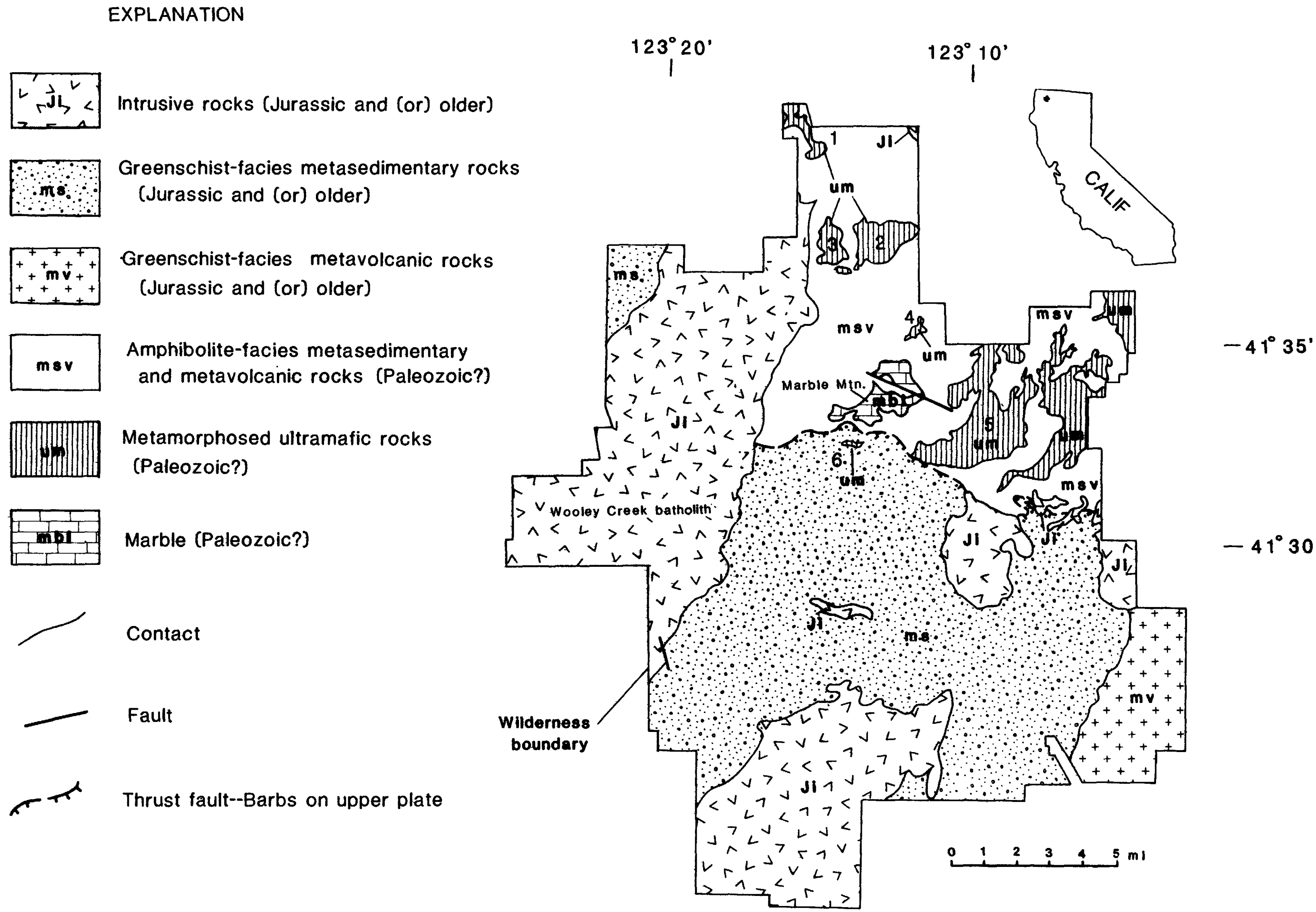

Figure 2.—Generalized geologic map of the Marble Mountain Wilderness. Numbers on ultramafic bodies refer to discussion in Aeromagnetic Survey section of text.

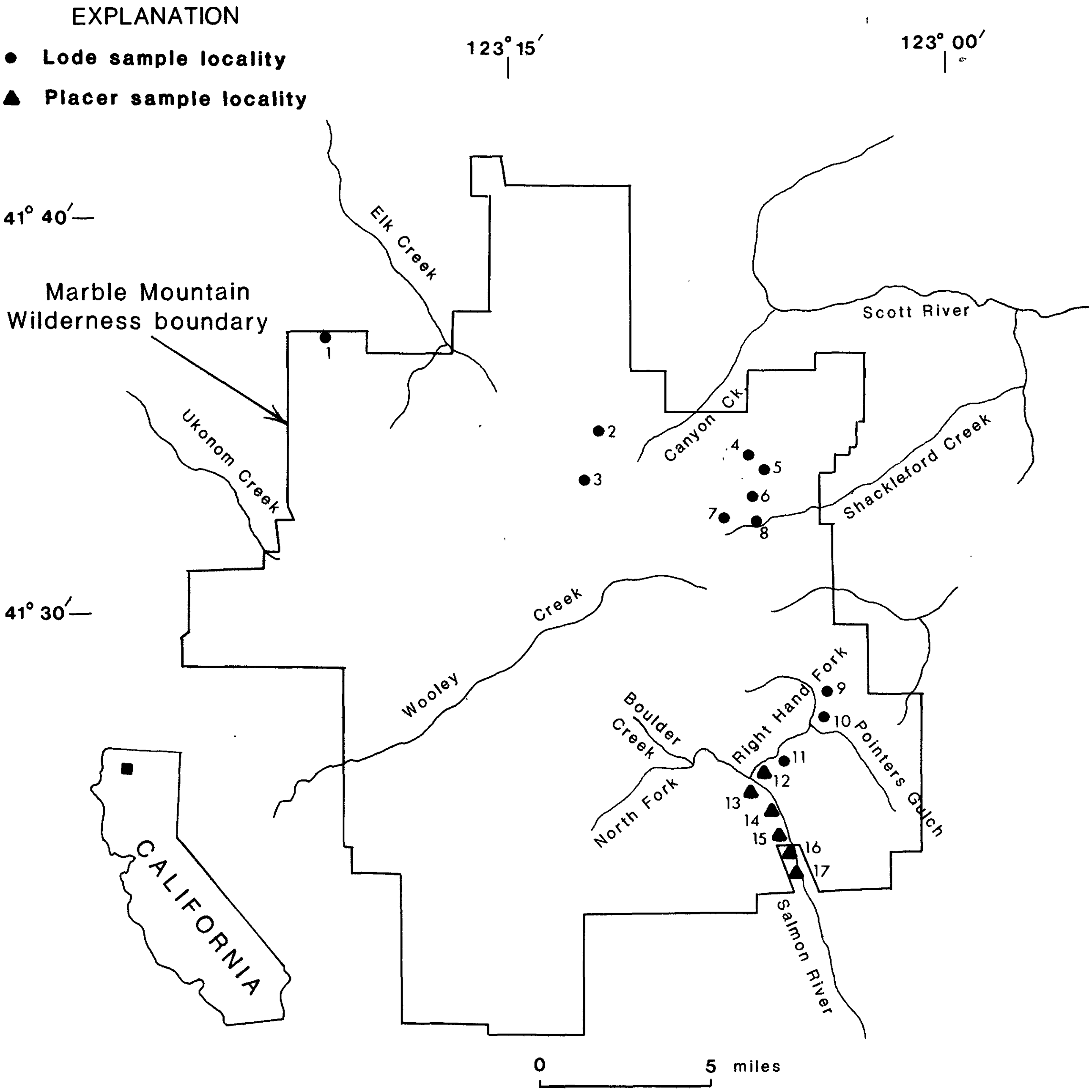

Figure 3.—Prospects and mineral occurrences in the Marble Mountain Wilderness (see table 1).

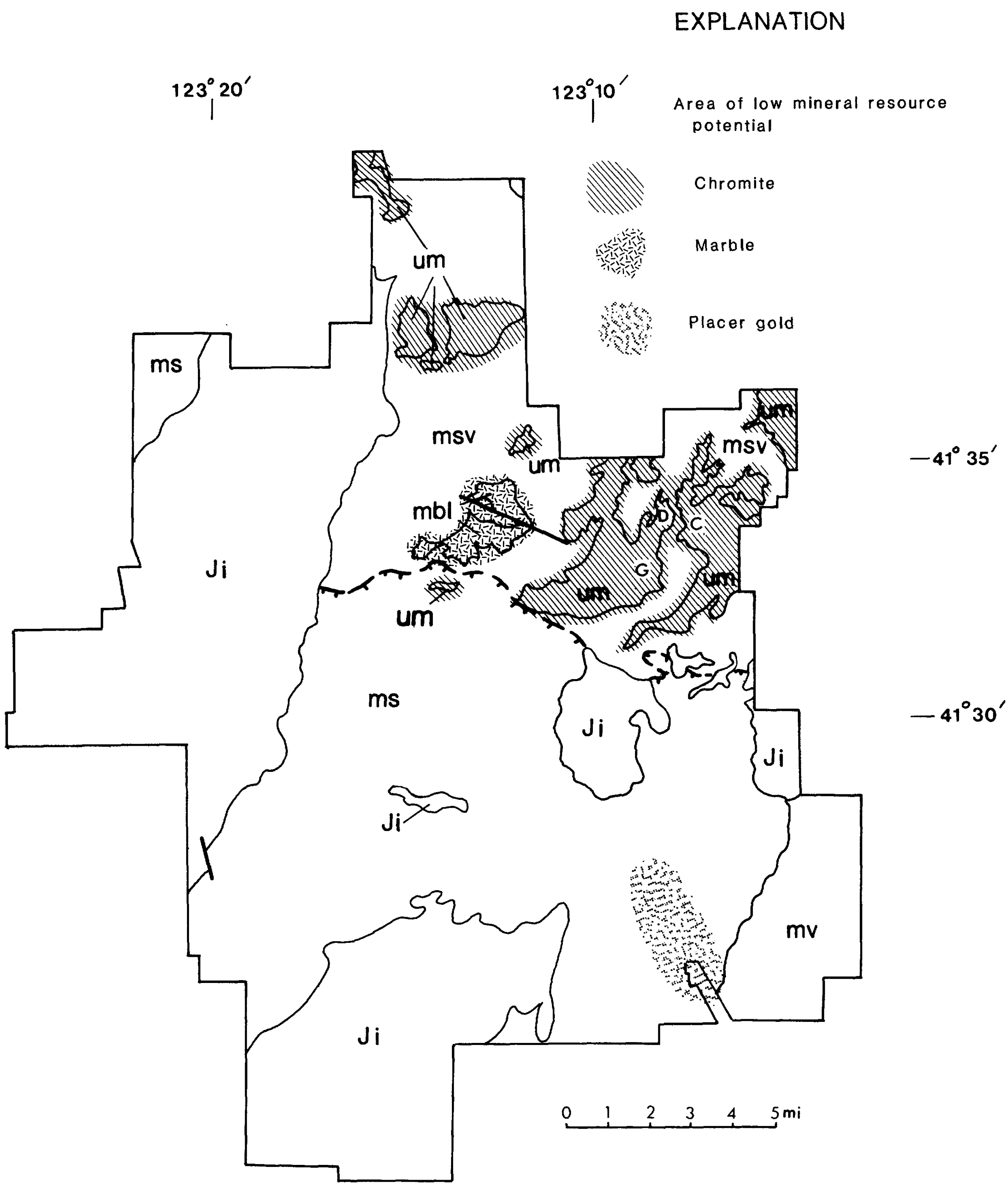

Figure 4.—Areas of mineral resource potential in Marble Mountain Wilderness. See figure 2 for explanation of lithologic symbols. Chromite occurrences: C, Calf Lake; D, Deep Lake; G, Gem Lake.