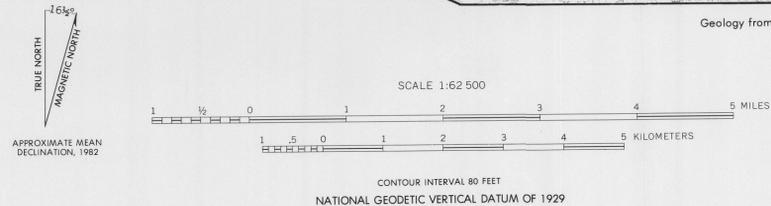


Base from U. S. Geological Survey  
Granite Chief, 1953, Donner Pass,  
Tahoe, Truckee, 1955

Geology from Harwood (1981)



**MINERAL RESOURCE POTENTIAL MAP  
OF THE GRANITE CHIEF WILDERNESS STUDY AREA,  
PLACER COUNTY, CALIFORNIA**

By  
**David S. Harwood**  
U. S. Geological Survey  
and  
**Francis E. Federspiel, Eric E. Cather, and Douglas F. Scott**  
U. S. Bureau of Mines  
1982

**EXPLANATION**

- SAMPLE LOCALITY-Number refers to table 1**
- x 11 Prospect pit
  - 2 Outcrop
  - BOUNDARY OF WILDERNESS STUDY AREA
- CORRELATION OF MAP UNITS**
- Qga QUATERNARY
  - Tv TERTIARY
  - KJg CRETACEOUS AND JURASSIC
  - MzPzr MESOZOIC AND (OR) PALEOZOIC
- DESCRIPTION OF MAP UNITS**
- Qga GLACIAL AND ALLUVIAL DEPOSITS (QUATERNARY)
  - Tv VOLCANIC ROCKS (TERTIARY)
  - KJg GRANODIORITE AND RELATED IGNEOUS ROCKS (CRETACEOUS AND JURASSIC)
  - MzPzr QUARTZITE, SLATE, CALC-SILICATE ROCK, METAMORPHOSED CHERT, AND MINOR MARBLE (MESOZOIC AND PALEOZOIC)
- CONTACT  
..... FAULT--Dotted where concealed

**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 areas 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 Granite Chief Wilderness Study Area in the Tahoe National Forest, Placer County, California. Granite Chief Wilderness Study Area was classified as a further planning area (A5-261) during the Second Roadless Area Review and Evaluation (RARE II) by the U.S. Forest Service, January 1979.

**SUMMARY**

A search of mining records coupled with geologic and geochemical field investigations indicate that the study area has not produced any significant amounts of economic minerals in the past and that it has a low mineral resource potential. No anomalies indicating minable quantities of precious or base metals were found in samples taken from the few prospect pits in and near the area or from grab samples taken from stained outcrops within the area. Panned concentrates of stream-sediment samples show scattered traces of gold in some of the major drainages in the area, but no anomalous target areas were identified in the geochemical survey. Substantial deposits of sand, gravel, and glacial till suitable for construction material occur in the area, but their inaccessibility and remoteness from major markets preclude their being classified as a resource. No potential for oil, gas, coal, or geothermal resources was identified.

**GEOLOGY**

The Granite Chief area is located in the northern part of the Sierra Nevada, a faulted and westward-tilted range that extends nearly the length of eastern California. The east boundary of the study area approximately follows the crest of the Sierra Nevada over steep mountainous terrain that is deeply glaciated and sparsely vegetated. A north-northwest-trending, steeply east-dipping range-front fault system lies immediately east of the study area and controls the precipitous east slope of the range along the adjacent Lake Tahoe basin. Elevations range from about 4,800 ft (1,460 m) in the headwater drainages of the North Fork and Middle Fork of the American River to more than 9,000 ft (2,758 m) along the Sierran crest.

A wide variety of Paleozoic and Mesozoic metamorphic rocks are exposed in and adjacent to the study area. These metamorphic rocks are intruded by large expanses of granodiorite and related granitic rocks of the Sierra Nevada batholith. Both the metamorphic rocks and the granitic rocks of the batholith are unconformably capped by Tertiary volcanic rocks that include basal rhyolitic flows, a thick intermediate section of andesitic lahar deposits, and overlying remnants of andesitic and basaltic flows. Unconsolidated Pleistocene glacial deposits and modern alluvium occur in or on the flanks of most drainages in the area. A detailed geologic map of the rocks in the area is given by Harwood (1981).

The study area lies about 20 mi (32 km) east of significant lode and placer mining areas (see Harwood and others, 1982) that are part of the Mother Lode district and about 30 mi (48 km) west of the Comstock mining district. Despite the proximity to these mining districts and a general comparability of rock types, no record of mining claims or mineral production was found in the Granite Chief Wilderness Study Area.

**GEOCHEMISTRY**

The results of a geochemical study of panned concentrates from stream-sediment samples taken within the study area are given by Harwood (1982a). Trace amounts of gold were located in some stream-sediment samples, but detailed subsequent sampling in those areas failed to find any traces of gold. It is concluded that gold occurs in trace amounts in the metamorphic rocks of the Shoo Fly Formation, but that gold does not occur in economic concentrations within the study area.

**PROSPECTS AND MINERALIZED AREAS**

No mining activity is currently being conducted in the study area and no records of mining claims or mineral production could be found. A few small prospect pits are the only evidence of exploration activity.

An inactive tungsten prospect lies 1 mi (1.6 km) southwest of the study area along the contact between metamorphosed calcareous rocks of the Shoo Fly Formation and the granodiorite. No record of production could be found from that area and samples from the pit contained less than 0.01 percent tungsten-oxide (WO<sub>3</sub>) and only trace amounts of gold and silver.

About 3 to 5 mi (5 to 8 km) from the study area, small amounts of gold have been produced from quartz veins in metamorphosed calcareous rocks and altered andesite. Samples from quartz veins in the study area contained less than 0.01 oz/ton (0.34 g/t) of gold.

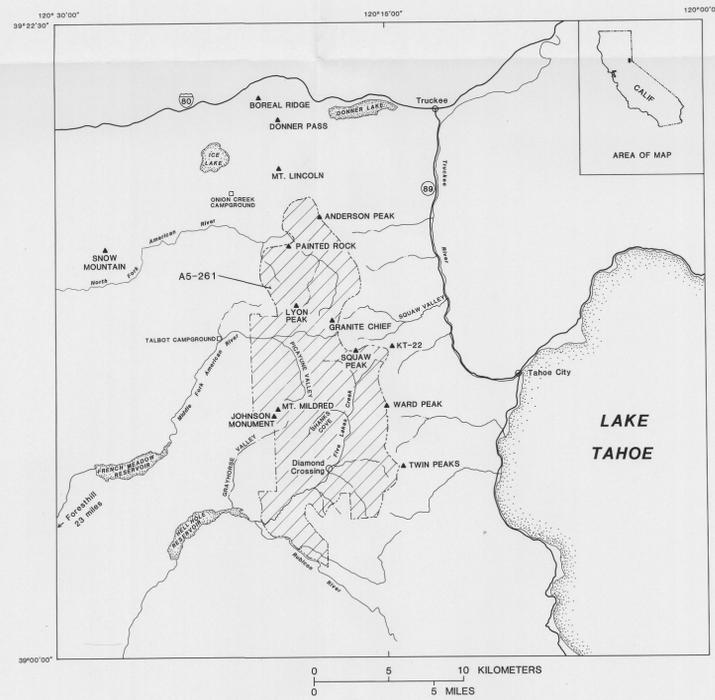
<sup>1/</sup>This unit has been renamed (redefined as) the Shoo Fly Complex by Harwood (1982b). The age of the unit is now considered to be Ordovician(?) to Devonian(?).

**REFERENCES CITED**

- Harwood, D. S., 1981, Geologic map of the Granite Chief Wilderness Study Area and adjacent part of the Sierra Nevada, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1273-A, scale 1:62,500.  
 --- 1982a, Geochemical maps of the Granite Chief Wilderness Study Area, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1273-B, scale 1:95,000.  
 --- 1982b, Stratigraphy of upper Paleozoic volcanic rocks and regional unconformities in part of the northern Sierra Nevada, California: Geological Society of America Bulletin, in press.  
 Harwood, D. S., Griscom, Andrew, Federspiel, F. E., Leszykowski, A. M., and Spicker, F. A., 1982, Mineral resource potential map of the North Fork of the American River Wilderness Study Area (RARE II no. 5-262), Placer County, California: U.S. Geological Survey Miscellaneous Field Studies Map MF-1177-C, scale 1:62,500.

Table 1.--Sample data from miscellaneous prospects and localities in the Granite Chief area

Locality number on map	Site	Summary	Development and production	Sample data
1	North Fork American River	Grayish-black quartzite that is limonite stained; no mineralized structure is exposed. Probable gold prospect.	One prospect pit 8 ft (2.4 m) long, 3 ft (0.9 m) wide, and 1 ft (0.3 m) deep. No production.	One grab sample assays trace gold and silver.
2	North Fork American River	Four quartz veins 1-2 in. (2.5-5.0 cm) thick in a zone about 1 ft (0.3 m) thick, strike N. 20°-30° W., dip 50°-70° NE, in sericitized diorite.	None	One chip sample across the veins; no significant metallic-mineral content.
3	North Fork American River	Grayish-black and light-green quartzite that strikes N. 20° W. and dips 80° NE. Quartzite contains 3-5 percent limonite and is near a diorite contact.	None	One chip sample contains a minor amount of silver.
4	Middle Fork American River	Quartz vein 6 in. (15.2 cm) thick in limonite-stained metasedimentary rocks; these rocks contain 1- to 2-in. (2.5- to 5.0-cm) thick quartz stringers. Vein and country rock strike N. 25° W. and dip 60° NE.	None	One chip sample of the vein and country rock contains trace gold.
5	Lower Pioyune Valley	Limonite-stained aphanitic metasedimentary rock contains colorless to white quartz stringers.	None	One 10-ft (3.0-m) chip sample across the vein contains trace gold.
6	Lower Pioyune Valley	Sinuuous, northeast- and northwest-trending quartz veins along a contact between metamorphosed calcareous rocks, sedimentary and granitic rocks. Veins are locally vuggy and limonite stained.	None	One chip sample of the veins contains trace gold and silver.
7	Lower Pioyune Valley	Pegmatite dikes and sills in micaceous schist; dikes are lightly coated by limonite.	None	One chip sample of the pegmatite contains trace gold and silver.
8	Grouse Canyon	Light-gray dolomitic limestone striking N. 50° W. and dipping 70°-80° SW. Limestone cross out about 1,000 ft (300 m) along strike and is 300 ft (90 m) wide.	None	Two chip samples across the limestone contain less than 50 percent CaO and as much as 10 percent MgO.
9	Bear Pan Creek	Quartz stringers, less than 1 in. (2.5 cm) thick, in dark-gray quartzite that strikes N. 30° W. and dips 70° SW. Stringers have about 1 percent disseminated sulfides.	None	One chip sample of quartz stringers contains no anomalous concentrations of metallic minerals.
10	Powderhorn Creek	A 2-ft (0.6-m)-thick massive quartz vein trending northeast in metasedimentary rocks. The vein contains 3-5 percent limonite and is locally vuggy.	None	One chip sample across the vein contains 0.01 oz/ton (0.34 g/t) gold.
11	Lower Five Lakes Creek	Interbedded hornfels and quartzite that strike N. 25° W. and dip 95° NE. Rocks are coated by limonite but contain no sulfides. Probable gold prospect.	One sloughed pit 7 ft (2.1 m) long, 3 ft (0.9 m) wide, 2 ft (0.6 m) deep. No production.	One grab sample contains no significant concentrations of metallic minerals.
12	Rubicon River west of study area	Garnetiferous calc-silicate rock in a marble-granodiorite contact zone traceable approximately 300 ft (90 m). Tungsten property.	One caved shaft; production unknown.	Six samples taken. Four chip samples contain as much as 0.01 percent WO <sub>3</sub> , 0.01 oz/ton (0.3 g/t) gold, and trace silver. One grab sample from the dump contains 0.1 percent WO <sub>3</sub> ; one select grab from the dump contains 1.0 percent WO <sub>3</sub> .



INDEX MAP SHOWING LOCATION OF GRANITE CHIEF WILDERNESS STUDY AREA (A5-261), CALIFORNIA

Explanatory pamphlet accompanies map