

**MINERAL RESOURCE POTENTIAL OF THE WILD ROGUE WILDERNESS (NF105),
COOS AND CURRY COUNTIES, OREGON**

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 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 public and be submitted to the President and the Congress. This report discusses the results of a mineral survey of the Wild Rogue Wilderness (NF105), Siskiyou National Forest and adjacent U.S. Bureau of Land Management public domain, Coos and Curry Counties, Oregon. The area was established as a wilderness by Public Law 95-237, February 28, 1978.

SUMMARY

Geologic, geophysical, and geochemical investigations and a survey of mines, prospects, and quarries have been conducted to evaluate the mineral resource potential of the Wild Rogue Wilderness, Coos and Curry Counties, southwestern Oregon (fig. 1). The wilderness lies within the western edge of the Klamath Mountains province of Oregon, just beyond the western border of the western Jurassic belt as defined by Irwin (1966). The area is underlain largely by faulted pre-Tertiary volcanic and plutonic rocks that, on the west side, are either overlain by Tertiary sedimentary rocks of the Coast Ranges or are in thrust contact with the Jurassic and Cretaceous Riddle Formation. To the east the pre-Tertiary volcanic and plutonic complex is faulted against the Dothan Formation of Jurassic and Cretaceous age. Approximately 800 mining claims, a third of which are for placer gold, have been recorded historically in or adjacent to the Wild Rogue Wilderness.

Areas with different degrees of mineral resource potential were designated on the basis of the presence of some combination of the following criteria: (1) known mineral occurrences, (2) favorable host rocks, (3) drainage basins with groups of geochemically anomalous stream-sediment and rock samples, and (4) aeromagnetic anomalies. The geologic environment of the Wild Rogue Wilderness suggests the possible existence of deposits of the following commodities: gold, silver, copper, lead, zinc, and coal. The wilderness is estimated to contain 11,477.9 oz of gold and 1,960 oz of silver and the potential for copper is high. The mineral resource potential for zinc, lead, and coal is not considered to be economically significant.

INTRODUCTION

The Wild Rogue Wilderness is located in Coos and Curry Counties, southwestern Oregon and is covered by parts of the Bone Mountain, Marial, and Agness 15-minute quadrangles. The area is approximately 19 mi long and as much as 5 mi wide and covers approximately 35,818 acres, extending from near the town of Agness in the southwest, to Mount Bolivar in the northeast (fig. 1). The Bureau of Land Management has transferred at least some of its authority in the wilderness to the Forest Service. The wilderness area can be accessed in the southwest via U.S. Forest Service road networks from the town of Agness and Powers, Oregon, which are about 20 mi to the northwest. To reach the area in the northeast, Forest Service roads stemming from Grants Pass can be used. The area, although having nearly continuous rock exposure in the steeply etched canyon of the Rogue River, is densely populated by manzanita, golden chinkapin, tan oak, and madrone as well as Douglas fir, sugar pine, Port Orford cedar, and others. The area is characterized by several diverse geologic terranes described in detail by Gray and others (1982).

Previous geologic studies in nearby areas were done by Wells and Walker (1953) and Baldwin (1969). Later studies

that include the geology within parts of the wilderness are by Wells (1955), Wells and Peck (1961), Baldwin and Rudd (1972), Kent (1972), Purdom (1977), and Ramp and others (1977).

Geologic mapping, geochemical sampling, and prospect examination for this study were done in 1979 and 1980. An aeromagnetic survey of the area was flown and compiled in 1978 as part of a larger survey of the Medford 1° by 2° sheet (U.S. Geological Survey, 1979). Detailed discussions on the geology, geochemistry, geophysics and mining history are given in Gray and others (1982), Ramp and Gray (1980), Gray and McKee (1981), Gray and Peterson (1982), Peterson and Gray (1983), Blakely and Senior (1983), and Miller and Gaps (1982).

Mining activity in the Wild Rogue Wilderness began about 1853 with the discovery of placer gold deposits on the Rogue River. The source of the placer deposits was subsequently traced to several lode deposits upstream, the largest being in the Mule Creek area (Purdom, 1977). Mining activity on the Rogue River and its tributaries has continued, although at a declining rate, to the present day.

GEOLOGY, GEOCHEMISTRY, AND GEOPHYSICS PERTAINING TO MINERAL RESOURCE ASSESSMENT

The Wild Rogue Wilderness is located along the western edge of the Klamath Mountains province of Oregon. The wilderness is underlain largely by faulted pre-Tertiary volcanic and plutonic rocks that are unconformably overlain by Tertiary sedimentary rocks and the Jurassic and Cretaceous Riddle Formation on the west and are fault bounded by the Dothan Formation of Jurassic and Cretaceous age on the east (fig. 2).

Pre-Tertiary igneous rocks underlie about 26 mi² of the Wild Rogue Wilderness. The igneous rocks of the wilderness area were collectively called the Rogue Formation by Baldwin (1969), a term originally applied by Wells and Walker (1953) to a sequence of metavolcanic rocks that lie east of the Dothan Formation and some 12 mi east of the wilderness. With the exception of small slivers of serpentinite dragged along fault planes, Jurassic gabbro is the oldest rock in the wilderness. The gabbro includes both foliated and massive varieties and is everywhere metamorphosed to a low-grade greenschist facies. Foliated, locally gneissic gabbro occurs as screens within a sheeted sequence of diabasic dikes. Massive gabbro, on the other hand, structurally underlies andesitic to dacitic volcanic rocks along a northeast-trending contact from Mule Mountain to Mount Bolivar. The massive gabbro hosts irregular andesitic to dacitic dike swarms that are best exposed on the ridges southwest of Mount Bolivar. The separate associations of foliated gabbro within sheeted diabasic dikes and of the massive gabbro with silicic volcanic rocks indicate different transitional crustal stratigraphic levels that have been juxtaposed by faulting. The zone separating these two structural and stratigraphic regimes is locally intruded by altered dioritic to granitic rocks and marked by mylonitized rocks, phyllite, and quartz veins, and it may represent an area of crustal suturing. A similar metamorphic character of lower greenschist facies assemblages pervades most of the rocks exposed in the massive gabbro horizon of the igneous terrane.

The sheeted dike sequence, best exposed along the Rogue River at Inspiration Point (Ramp and Gray, 1980), consists largely of dikes, but screens of gabbroic country rock constitute as much as 50 percent of some exposures. Detached lenticular fragments, 0.5–1.5 ft by 3–6 ft in size, of foliated gabbro in the dikes display a consistent foliation orientation and are interpreted as fractured, unrotated pieces of country rock. Locally, large proportions of gabbro fragments in dikes (for example, near Stair Creek) may indicate proximity to the main gabbroic body, which is not exposed.

The diabase dikes appear to be spatially associated with a small fault slice of sedimentary and amygdaloidal basaltic rocks that are exposed near Devils Backbone and the mouth of East Creek. The basalt unit consists of greenschist-facies basalt flows with lenses of shale and minor amounts of chert. The sequence of sheeted dikes, basalt (greenstone), and minor amounts of chert and shale, are characteristic of the upper part of an ophiolite suite formed at a spreading oceanic ridge (Coleman, 1977). Subsequent faulting and intrusive activity have truncated the base of the ophiolite suite. Both the basalt and the sheeted dikes are intruded by diorite which has yielded a potassium-argon age of 155 m.y., similar to ages of a number of widespread intrusive bodies in the Klamath Mountains (Hotz, 1971; Gray and McKee, 1981).

With no observed diorite intrusives cutting andesitic to dacitic rocks exposed northwest of the massive gabbro unit, these volcanic rocks represent a different exhalative sequence than those rocks included in the Rogue Formation. Preliminary potassium-argon ages of 133 and 122 m.y. were obtained from an andesite and a dacite, respectively (Gray and McKee, 1981). Therefore, these volcanic rocks are believed to be Early Cretaceous, and possibly Jurassic, in age and are not part of the Rogue Formation as originally defined by Wells and Walker (1953) for a predominantly fragmental metavolcanic sequence exposed 25 mi east of the wilderness. These younger volcanic rocks found within the wilderness consist of vesicular andesite flows, minor shallow

andesitic-intrusive rocks, agglomerate, tuff, hornblende dacite, quartz dacite, and rhyolitic rocks, and they probably represent an island-arc environment. This sequence may be as much as 9,000 ft thick between the Dothan Formation, to the southeast, and the Riddle Formation to the west, where it forms a thrust sheet overriding the Riddle Formation. The leading edge of the thrust, composed of island-arc volcanic rocks, gabbroic massifs, and sheeted dikes, overlies Jurassic sedimentary rocks and forms the western boundary of the pre-Tertiary igneous complex of the Wild Rogue Wilderness.

During or after the latest stages of magmatism, the Dothan and Riddle Formations were deposited contemporaneously in separate sedimentary basins. Petrologic characteristics indicate that the two units were derived from different sources. Thrust faulting juxtaposed rocks of the two basins, then tightly folded and locally overturned them; a less pervasive compressional tectonic regime followed and produced broad folds and vertical faults.

Three marine transgressive cycles during the Eocene are represented by the Lookingglass and Flournoy Formations of Baldwin (1974) and the Tye Formation. Angular unconformities that bound all three formations indicate the tectonic activity continued throughout the Eocene. After the Tye Formation was deposited, the region was uplifted and eroded. Dissection of the highlands by the ancestral Rogue River began by late Tertiary or early Pleistocene time, leaving terraces along the canyon walls.

Mass wasting in the form of massive rock flows has occurred in recent geologic time. These flows apparently originated from the failure of cliffs composed of the Tye Formation in the vicinity of Panther Ridge and Hanging Rock. Debris from these rock falls mixed with tangled vegetation, soil, and water during periods of rapid runoff and was channeled along steep-gradient creeks such as Blossom Bar, Paradise, and Clay Hill Creeks. The rock flow along Blossom Bar Creek probably occurred within the past 100 years. It deposited large quantities of debris, including blocks 150 ft in diameter, that form the treacherous Blossom Bar rapids in the Rogue River.

GEOCHEMISTRY

A geochemical survey of the Wild Rogue Wilderness was undertaken by the U.S. Geological Survey in 1979 and 1980. Forty stream-sediment samples and 256 whole-rock samples were collected from the wilderness and adjacent areas. Descriptions of sampling methods, analytical techniques, sample locations, and analytical data are presented by Gray and Peterson (1982). Geochemical anomaly maps, anomaly interpretations, and data-reduction procedures are discussed by Peterson and Gray (1983).

Data for the Wild Rogue Wilderness indicate that a number of the geochemically anomalous areas are associated with intermediate to silicic island-arc volcanic rocks, quartz veins in gabbro and diorite, or Tertiary sedimentary materials deposited along the Rogue River. Several elements, including lead, molybdenum, copper, silver, zinc, and gold, occur in anomalously high concentrations as shown on histograms and cumulative frequency charts (Peterson and Gray, 1983).

Both rock and stream-sediment data reveal anomalous amounts of copper, lead, silver, and zinc in a number of localities associated with shears, gossan, and altered rocks in the island-arc volcanic materials. Anomalous concentrations near the Old Red, Underslide, and Tina H-Dinawadja mines (fig. 3, Nos. 24, 16, and 34) are associated with vein and gossan material that carry gold, lead, zinc, silver and copper. Anomalous amounts of silver, lead, copper, molybdenum, and nickel occur in the Mount Bolivar area, associated with altered leached rocks as well as vein and gossan zones. In each area where anomalous values were obtained from stream-sediment samples, correlative bedrock-sample anomalies were also detected.

Geochemically anomalous amounts of silver, copper, and molybdenum occur south of Half Moon Bar in younger andesitic and dacitic dikes, thought to be feeders for, or intrusive masses contemporaneous with, island-arc volcanism. These small scattered dikes occur throughout the older ophiolite terrane. Dike clusters along or near the

Rogue River may be the source of anomalies in the stream-sediment samples of this region.

Geochemically anomalous values are associated with veins in gabbroic and dioritic intrusive rocks in the Mule Mountain ridge area north of Marial; anomalous gold, silver, zinc, and copper are present in rock samples, and anomalous copper and zinc values occur in stream-sediment samples. The mineralization here is associated with quartz veins and shears. The concentrations of most elements in samples from the mafic intrusive terrane, however, fall within the range of normal crustal abundances for mafic rocks (Turekian and Wedepohl, 1961).

Stream-sediment samples derived from Tertiary sedimentary rocks downstream from Clay Hill Creek are anomalous in copper, silver, zinc, molybdenum, and lead and are geochemically similar to those obtained from the younger-volcanic terrane. These anomalies may represent enrichment from source terranes other than those presently found in the wilderness, or perhaps they represent seepage from an underlying source rock similar to the younger volcanic terrane. It is also possible that human activity along this part of the Rogue River and its tributaries has caused contamination of the streams. Geochemical data for the Tertiary bedrock materials (graywacke, shale, and minor conglomerate and argillite) in this area do not show corresponding anomalous values of the same elements. The rock analyses match average chemical abundances except for cobalt, chromium, and nickel. High values of these elements are from widely scattered samples and probably represent detrital material eroded from mafic source rocks to the north and east. Chemical, isotopic, and mineralogic data from the graywacke of the Flourney Formation indicate a mafic source (Peterman and others, 1981).

GEOPHYSICS

A total-field aeromagnetic survey was flown and compiled in 1978 by a private contractor as part of a larger survey of the Medford 1° by 2° (scale 1:250,000) quadrangle (U.S. Geological Survey, 1979). Flight lines were flown at a constant barometric elevation of 4,500 ft above sea level, directed east-west, and spaced 1 mi apart. One north-south line was flown over the map area to aid in data compilation. Data were interpolated to a rectangular grid with 0.3-mi spacing and machine contoured at 20-gamma intervals (Blakely and Senior, 1983).

Several of the magnetic anomalies indicated by the survey correspond to known geologic features and are consistent with magnetic properties and patterns of geologic structures and rock types exposed at the surface. One anomaly, for example, consists of a linear north-south gradient that separates the subdued magnetic values of the Dothan Formation to the east from high-amplitude, short-wavelength anomalies to the west. This anomaly coincides with the trend of the steeply dipping fault near the eastern boundary of the wilderness that separates graywacke and shale from the tectonic wedge of volcanic and intrusive rocks to the west.

Most of the magnetic anomalies, however, appear to be due to source rocks beneath those exposed at the surface. The postulated source of the major anomalies of the Wild Rogue Wilderness is a relatively thin shallow sheet, possibly composed of ultramafic or gabbroic material, that terminates abruptly near the eastern edge of the volcanic wedge. The top of the source is less than 1,300 ft below the surface and may be relatively thin (less than 1.2 mi thick). The extension of these anomalies to the west suggests that the thrust fault along the western boundary of the volcanic wedge and the numerous normal faults within the wedge are strictly near-surface structures. Magnetic modeling (Blakely and Senior, 1983) shows that any deposit associated with surface rocks may have a maximum depth of approximately 1,300 ft; it also implies, however, that rocks of the volcanic-intrusive wedge (and associated mineral deposits) may extend farther west beneath the thrust fault exposed at the surface.

A fairly steep-sided circular anomaly over dacite around Saddle Peaks appears to be the only substantial anomaly within the wilderness that is caused by rocks that

crop out at the surface. Although the dacite produces a substantial anomaly in this area, it appears to be only weakly magnetic elsewhere. Mount Bolivar, for example, is a larger topographic feature than the Saddle Peaks and is composed of the same dacitic unit, but produces only a subdued magnetic anomaly. The northern edge of the Saddle Peaks anomaly is over a mineralized zone identified by a geochemically anomalous area (Peterson and Gray, 1983) and the magnetic anomaly may reflect a southward extension by perhaps 0.6 mi of the mineralized zone. The area may also be a remnant volcanic center since it is associated with a large volume of agglomerate, fragmental tuffs, and fine-grained air-fall tuffs.

We conclude from the magnetic data that only the Saddle Peaks region of the Wild Rogue Wilderness has surface rocks that are sufficiently magnetic to produce an aeromagnetic anomaly (Blakely and Senior, 1983). Elsewhere (for example, Mount Bolivar), the dacite is much less magnetic, so it is possible that the Saddle Peaks anomaly reflects an extension of a mineralized zone. Except for this one region, the major anomalies in the wilderness are not caused by the volcanic and intrusive rocks exposed at the surface; modeling experiments indicate that the source may be less than 1,300 ft below the topographic surface.

MINING DISTRICTS AND MINERALIZATION

Prospecting and mining in the Wild Rogue Wilderness postdate the 1850's, but most mining occurred prior to 1940. In the study area, small-scale lode and placer mining and prospecting were stimulated by high gold prices in 1979. The Mule Mountain, Tina H-Dinawadja, and Mammoth mines (fig. 3, Nos. 47, 34, 37) were worked in 1980 and 1981. This work employed eight or more people at least part time in 1981.

The Agness, Mule Creek, Powers, and Galice mining districts include or are near the Wild Rogue Wilderness (fig. 3). Gold and silver production from these districts is summarized in table 1; production figures are probably low because not all production was reported to the U.S. Bureau of Mines. Approximately 341,000 lbs of copper has also been produced from these districts.

More than 800 claims have been staked in or adjacent to the Wild Rogue Wilderness through the years. Approximately one-third of the claims are placer locations. Homestead or mineral patents have been granted at Paradise Bar, Half Moon Bar, Slide Creek Bar, Clay Hill Creek, and Walker Bar (Nos. 57, 59, 81, 72, and 46). Walker Bar has since been reconveyed to the U.S. government. Known mineral properties and mineralized areas in the Wild Rogue Wilderness are shown on figure 3 and described in table 2.

The most significant lode deposits in the wilderness occur along a northeast-trending zone, area B, approximately 0.5 mi wide and 6 mi long. Diorite and abundant quartz-rich dikes and veins permeate gabbroic and hypabyssal volcanic rocks (sheeted dikes). Mineralization is associated with late-stage quartz veins. Quartz veins and quartz-vein systems in this terrane are as thick as 12 ft as long as 2,600 ft long. Most quartz veins are lenticular, sheared, cross faulted, and contorted by folding. Some quartz veins and associated shear zones contain gold. Gold content, especially if high, is generally unevenly distributed. Overall minable gold content in mineralized quartz veins is probably 0.01 to 1 oz per ton.

Andesitic to dacitic volcanic rocks, tuff, and coarse agglomeritic flows form a sequence 0.5-2 mi thick, with accompanying mineralization. West and north-northeast of the West Fork of Mule Creek the rocks have been thrust over the Jurassic and Cretaceous Riddle Formation sediments or unconformably underlie Tertiary sedimentary rocks. Stringer mineralization in hydrothermally altered fracture zones that contain little or no quartz are the principal sites of mining activity in the upper Mule Creek area. These zones are as much as several hundred yards thick and several miles long. Pyrite is widely distributed in zones, but chalcopyrite, galena, sphalerite, and magnetite are localized. Laumontite (a zeolite) occurs along some zones as a filling in vesicles. Copper may have been enriched locally as a result of weathering. Brecciated volcanic rocks (stockwork) also contain some mineralization, mainly disseminated pyrite and chalcopyrite, and are typical of the area west-southwest of

the West Fork of Mule Creek.

The silicic (upper?) part of the volcanic sequence, which exhibits a volumetric increase in pyroclastic rocks and dacite with minor rhyolite dikes, contains several altered mineralized zones. These zones are all interpreted as partly remobilized massive-sulfide pods containing disseminated pyrite, chalcocopyrite, bornite, pyrrhotite with copper oxides, and carbonate minerals in weathered argillitic limonitic rock.

Most placer gold deposits are in the Mule Creek mining district and adjacent Agness mining district. The placer gold was probably derived from lodes upstream along the Rogue River and from quartz veins at Mule Mountain, Saddle Peaks, Mule Creek, and Pinnacle Point. Placer gold is present in gravel along both Mule Creek and the Rogue River, as well as on stranded river-bench deposits as high as hundreds of yards above creek or river level. Most gravel contains 0.00001 - 0.005 oz of gold per cubic yard. Some richer gravel, especially along Mule Creek and at Blossom and Gleason Bars (No. 52), may contain 0.001 to 0.05 oz/yd³ of gold. Average fineness of the gold is about 940; range of fineness for 24 samples is 876 to 989.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

On the basis of a joint investigation by the U.S. Bureau of Mines and U.S. Geological Survey, areas within and immediately adjacent to the Wild Rogue Wilderness have been classified according to their mineral resource potential. Properties with mineral potential and estimated resources of gold and silver are summarized in table 3 and located on figure 3. Figure 4 delineates general areas in the Wild Rogue Wilderness in which there is a potential for various types of mineral deposits.

Based on geologic, geochemical, and geophysical investigations and surveys of mines and prospects in the study area, the potential for the occurrence of lead, zinc, and coal resources are considered low. Mineral deposits that have identifiable resource potential in the Wild Rogue Wilderness include volcanogenic massive sulfides, lode gold, and placer gold. The geologic criteria and mining history favorable for the occurrence of each of these deposits are evaluated below. The wilderness is estimated to contain 3,000 oz of lode gold, 2,000 oz of lode silver and 8500 of placer gold.

The potential for copper, lead, and zinc resources exists in volcanogenic deposits in the form of leached, remobilized massive sulfide deposits in felsic to intermediate volcanic rocks. These small low-grade occurrences are believed to occur at Mt. Bolivar and in an area just north of Saddle Peaks (area A₁).

Gold and silver potential, considered high in the wilderness area, exists as vein gold and silver in quartz veins that are found at the Mammoth, Tina H-Dinawadja, and Mule Mountain mines (fig. 3, Nos. 37, 34, 48; fig. 4, area B). Mule Creek and the Rogue River (area C) contain placer gold.

Low coal potential exists in the Wild Rogue Wilderness Area. Thin seams of shaly coal crop out in the middle Eocene Tyee Formation, which is exposed as an unconformable cap along the northwestern boundary of the wilderness (area D). The major part of the Tyee depositional basin, just north of the wilderness, contains one of the principal coal fields in Oregon and has an estimated resource of 50 million tons of subbituminous and lignitic ranked coal (Brownfield, 1981). Outcrops of significant coal beds, however, do not extend into the wilderness.

Massive Sulfide

Conditions necessary for the occurrence and mining of mineral resources for copper, zinc, lead, silver and gold in volcanogenic deposits of the Wild Rogue Wilderness (fig. 4, areas A, A₁, and A₂) are tabulated and evaluated below (see expanded discussion of geology in Gray and others, 1982).

	Conditions	Conditions met in Wild Rogue Wilderness?
1.	Presence of compositionally intermediate to felsic calc-alkaline volcanic rocks indicative of late-stage volcanic activity in a sub-aqueous island-arc environment for example, pyroclastic rocks interbedded with immature volcanoclastic sedimentary rocks and silicic volcanic rocks).	Yes
2.	Geochemically anomalous amounts of Cu, Zn, Pb, and Mn in stream sediments.	Yes
3.	Occurrence of stratabound lenses of pyritic base-metal sulfide in clusters with intragroup spacings of one to several miles.	Partially
4.	Low-grade dissemination of vein mineralization, and hydrothermal alteration typically stratigraphically lower than stratabound lenses.	Yes
5.	Abundance of pyroclastic and rhyolitic rocks in the volcanic sequence, usually restricted to the late stages of volcanism in the area.	Yes
6.	Adequate tonnage and grade.	No
7.	Simple geology with limited faulting.	No
8.	Easy access and transportation.	Partially
9.	Ease of underground mining.	Partially
10.	Ease of milling and concentration. Flotation would probably work well for concentration.	Yes

Lode Gold

Conditions favorable for the occurrence and mining of mineral resources for lode gold deposits (fig. 4, area B) are evaluated below.

	Conditions	Conditions met in Wild Rogue Wilderness?
1.	Occurrence of gold in quartz veins.	Yes
2.	Presence of favorable host rocks, including metavolcanic and gabbroic rocks.	Yes
3.	Presence of rocks broken up by faults along which gold-bearing quartz veins may occur.	Yes
4.	Presence of quartz veins on the surface with hydrothermal circulation patterns superimposed on host rocks.	Yes
5.	Copper, silver, gold, and zinc geochemical anomalies associated with fractured rocks.	Yes

6. Grades in the range of 2 or more ounces gold per ton for small deposits, 1 or more oz per ton for deposits of 1,000 tons, and 0.5 or more oz per ton for deposits of 50,000 tons. 50,000 tons with 0.5 oz gold per ton probably is near the smallest tonnage and lowest grade feasible for a 15- to 20-person mine, when mined at 50 tons per day (1982 conditions). Partially
7. Ease of underground mining. Partially
8. Concentration techniques available for this type of deposit. Yes

Placer Gold

Conditions favorable for the occurrence and estimation of mineral resource potential for placer gold deposits are evaluated below (area C).

Conditions	Conditions met in Wild Rogue Wilderness?
1. Presence of known resources of placer gold.	Yes
2. Occurrence of alluvial and river-terrace deposits.	Yes
3. Presence of a bedrock source for gold in the headwaters of the stream drainages with alluvial deposits.	Yes
4. Grades in the range of at least 0.05 ounce per cubic yard (when mined at 5 yd ³ per day), or at least 0.005 ounce gold per cubic yard (when mined at 2,000 yd ³ per day). 2,000 yd ³ per day at 0.005 ounce gold per yd ³ would be near the minimum viable range for a 15- to 20-person mine (1982 conditions).	Partially
5. Availability of water. Water to work the bench gravel deposits probably would have to be pumped from the Rogue River. Most river-terrace gravel deposits are at least 50 ft above the present river level.	Yes

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Table 1.--Gold and silver production from mining districts that are in or near the the Wild Rogue Wilderness, Oregon

[Data are from the U.S. Bureau of Mines historical-production files and represent voluntary submittals from the mining industry. These data are not comparable to data developed during this study]

	Agness	Mule Creek	Powers	Galice
Gold (troy ounces)				
Lode	65	143	170	29,486
Placer	421	975	785	15,425
Silver (troy ounces)				
Lode	14	22	361	51,664
Placer	301	64	88	1,648

Table 3.--Estimates of indicated mineral resources in or near the Wild Rogue Wilderness, Oregon

[W, withheld; --, unknown or unestimated. Totals include estimates for withheld data]

Map No.	Name	Commodity	Type of deposit or occurrence	Description	Placer gold			Lode gold			Silver	
					Cubic yds	Troy oz/yd ³	Troy oz	Short tons	Troy oz/t	Troy oz	Troy oz/t	Troy oz
52	Blossom and Gleason Bars,	Gold	Placer	Bench gravel	260,000	0.0016	416	--	--	--	--	--
2	Bolivar (Fuller).	Copper	Lode	Sheared veins and weathered secondary deposits. An inferred 30,000 short tons contain about 5 percent copper.	--	--	--	--	--	--	--	--
65	Brushy Bar.	Gold	Placer	Bench gravel	1,200,000	.0005	600	--	--	--	--	--
73	Clay Hill Bar.	Gold	Placer	Bench gravel	W	--	--	--	--	--	--	--
59	Half Moon Bar.	Gold	Placer	Bench gravel	W	--	--	--	--	--	--	--
79	Hicks Creek Bar.	Gold	Placer	Bench gravel	800,000	.0003	240	--	--	--	--	--
37	Mammoth (Gloria).	Gold	Lode	Quartz veins and sheared zones.	--	--	--	1,000	0.76	760	0.2	200
38	Mule Creek Placers.	Gold	Placer	Modern-day and bench placer deposit.	W	--	--	--	--	--	--	--
48	Mule Mountain.	Gold	Lode	Quartz veins and sheared zones.	--	--	--	20,000	0.1	2,000	0.07	1,400
67	North Solitude Bar.	Gold	Placer	Bench gravel	240,000	.001	240	--	--	--	--	--
57	Paradise Bar.	Gold	Placer	Bench gravel	W	--	--	--	--	--	--	--
62	Recent Rogue River.	Gold	Placer	Recent gravel	3,000,000	.0005	1,500	--	--	--	--	--
81	Slide Creek Bar.	Gold	Placer	Bench gravel	W	--	--	--	--	--	--	--
74	South Clay Hill Point.	Gold	Placer	Bench gravel	30,000	.00003	0.9	--	--	--	--	--
66	South Solitude Bar.	Gold	Placer	Bench gravel	1,800,000	.0002	360	--	--	--	--	--
71	Tacoma Rapids Bar.	Gold	Placer	Bench gravel	90,000	.002	180	--	--	--	--	--
70	Tate Creek Bar.	Gold	Placer	Bench gravel	480,000	.0002	96	--	--	--	--	--
34	Tina H-Dinawadja (Old Serpentine).	Gold	Lode	Quartz veins and sheared zones.	--	--	--	600	.349	200	0.6	360
46	Walker Bar.	Gold	Placer	Bench gravel	650,000	.0007	455	--	--	--	--	--
TOTAL					13,000,000	--	8,517.9	21,600	--	2,960	--	1,960

Table 2.--Known mineral properties of the Wild Rogue Wilderness, Oregon

[L, lode; P, placer; W, withheld for owner confidentiality]

Map number	Property name	Workings	Resource data
1	West Fork Cow Creek (P)	Pits and trenches	Recent and bench gravel. Probably some gold resources because of past production. Two panned samples contained no detectable gold.
2	Bolivar mine (L) (outside study area)	Caved adits, pits, and trenches	Copper sulfides, oxides, and carbonate minerals in sheared lenticular veins and joints. At least 26,000 lbs of copper produced, and estimated resources of 30,000 short tons containing 5 percent copper
3	Bolivar Creek (P)	None	Recent and bench gravel. Four panned samples contained no detectable gold.
4	Unknown (L)	Bulldozer trenches and roads	Limonitic weathered metavolcanic and sedimentary rocks. Six samples contained as much as 0.01 oz gold/ton, 0.2 percent copper, and 0.0125 percent zinc.
5	Unknown (L)	One pit (?)	Overburden, probably metavolcanic rocks. Two samples contained as much as trace gold, 0.2 oz silver/ton, and 0.012 percent copper.
6	Unknown (L)	Adit about 145 ft long and small pit	Porphyritic metavolcanic rocks irregularly veined by white zeolite minerals. Seven samples contained as much as trace gold, 0.2 oz silver/ton, and 0.087 percent copper.
7	Unknown (L)	Small quarry	Contact of greenstone and sedimentary rocks, intensely fractured and sheared. Greenstone contains some pyrite and copper sulfides. A sample contained trace gold, 0.1 oz silver/ton, and 0.011 percent copper.
8	Foggy Creek (P)	None	Recent and bench gravel. Probably some gold resources, although five placer samples contained no detectable gold.
9	Unknown (L)	Three small pits	Limonitic weathered porphyritic greenstone irregularly veined by zeolite minerals. Two samples contained as much as trace gold and 0.007 percent copper.
10	Unknown (L)	One small pit	Weathered veined coarse basaltic metavolcanic rocks. A sample contained trace gold and silver and 0.012 percent copper.
11	Unknown (L)	None	Contact of greenstone and black shale. Three samples contained as much as 0.1 oz gold/ton, 0.1 oz silver, and 0.018 percent copper.
12	Unknown (L)	Two small pits	Limonitic weathered porphyritic metavolcanic rocks, some vein quartz. Two samples contained as much as trace gold, 0.1 oz silver/ton, and 0.011 percent copper.
13	Golden Goose-Mary-Naomi (L)	None	Altered sheared slightly quartzose pyritic greenstone. Three samples contained a maximum of 0.4 oz silver/ton.
14	Yankee Boys 1, 2 (L)	A short inclined shaft	Altered pyritic greenstone. Eight samples contained a maximum of trace gold and 0.4 oz silver/ton.
15	Red Blanket (L)	None	Limonitic weathered sheared pyritic zones in greenstone; minor chalcopyrite. Seven samples contained a maximum of trace gold and 0.04 oz silver/ton.
16	Underslide (L)	Small pits	Altered sheared zone in greenstone. Three samples contained less than 0.005 oz gold per ton and less than 0.2 oz silver/ton.

Table 2.--Known mineral properties of the Wild Rogue Wilderness, Oregon--Continued

Map number	Property name	Workings	Resource data
17	Paradise mine (L)	Two adits are 166 ft and 258.5 ft long	A quartzose sheared zone in greenstone. Sixteen samples contained a maximum of 0.01 oz gold/ton and a maximum of 0.2 oz silver/ton.
18	Camp Hope (L)	Small trenches, pits	Shaly metasedimentary rocks. Two samples contained traces of gold and silver.
19	North Hope (L)	Trench about 25 ft long	Contact of greenstone and metasedimentary rocks. Five samples contained as much as 0.01 oz gold/ton and 0.13 oz silver/ton.
20	West Hope (L)	Pits, trenches, and three short adits that total 77 ft.	Fractured altered limonitic greenstone. Sixteen samples contained trace gold, and as much as 0.2 oz silver/ton.
21	Wild Hog (L)	Caved 30-ft long trench	Greenstone talus, some conglomerate. Two samples contained trace gold and as much as 0.2 oz silver/ton.
22	Hanging Rock (L)	Bulldozer road and trench	Altered greenstone, mostly covered by talus. A sample contained 0.1 oz silver/ton.
23	South Ridge (L)	Small trench	Altered greenstone; some mafic dikes; some sheared fractured rocks. Two samples contained as much as 0.002 oz of gold/ton and 0.002 oz of silver/ton.
24	Old Red mine (L)	Bulldozer roads, trenches, pits, a short inclined shaft	Sheared siliceous zones in greenstone. One of 21 samples contained 0.51 oz gold/ton. Another contained 0.4 oz gold/ton. The rest contained up to 0.11 oz gold/ton. One sample contained 6.3, and one 2.5 oz silver/ton and the rest averaged 0.275 oz silver/ton. Average copper content was 0.089 percent; average lead content was 0.36 percent, and average zinc content was 0.52 percent.
25	Alpine (L)	Small pits, trenches, and two short adits	Metavolcanic rocks with altered sheared zones and joints. Laumontite along some discontinuities. Six samples contained a maximum of 0.06 oz gold/ton, 0.4 oz silver/ton, 0.84 percent lead and 0.017 percent copper.
26	Unknown (L)	Small pits and trenches	Limonitic altered metavolcanic rock. Of eight samples, two contained 0.52 and 0.18 oz gold/ton but the rest contained trace or less gold. Average silver content was 0.36 oz per ton.
27	Golden Fraction or Sabbath Day (L)	Caved adit	Greenstone with weathered sulfides. A grab sample from the dump contained 0.21 oz gold/ton and 0.2 oz silver/ton.
28	Unknown (L)	None	Intensely fractured, weathered greenstone. A sample contained trace gold, 0.2 oz silver/ton, and 0.011 percent copper.
29	Golden Cabin (L)	Adit less than 15 ft long and 3 trenches trenches 10 to 15 ft long	Greenstone, some brecciated; less than 5 percent quartz and pyrite. Four samples contained as much as trace gold, trace silver, and 0.01 percent copper.
30	Unknown (L)	Small pit	Amygdaloidal slightly silicified metavolcanic rocks. A sample contained trace gold and 0.018 percent copper.
31	Unknown (L)	Two small pits	Weathered metavolcanic rocks with quartz veins and other white vein minerals; some sulfides. Two samples contained trace gold and as much as 0.022 percent copper.
32	Unknown (L)	Seven small pits along 270 ft of the zone	Altered sheared quartzose zone in greenstone. Six samples contained as much as trace gold, 0.1 oz silver/ton and 0.22 percent copper. Average copper content was 0.08 percent.

Table 2.--Known mineral properties of the Wild Rogue Wilderness, Oregon--Continued

Map number	Property name	Workings	Resource data
33	Donahue (L)	A few small pits and trenches	Greenstone with thin quartz veins. Two samples contained a maximum of trace gold and 0.2 oz silver/ton.
34	Tina H-Dinawadja mines (L)	Five adits which total about 700 ft, one caved adit, and one inaccessible adit in a cliff face	Altered sheared greenstone and quartz veins. At least \$48,000 of gold produced. Estimated resources of 600 tons containing 0.349 oz gold/ton and 0.6 oz silver/ton.
35	Unknown (L)	Small pit	Fractured weathered metavolcanic rocks. A sample contained trace gold, 0.221 percent copper, 0.15 percent zinc, and 0.009 percent lead.
36	Borden (L)	Small caved pits	Greenstone. Two samples contained a maximum of trace gold and 0.2 oz silver/ton.
37	Mammoth mine (L)	Two adits which total 355 ft long, and 3 pits	Quartz veins in greenstone. Estimated resources of 1,000 tons containing 0.76 oz gold/ton and 0.2 oz silver/ton.
38	Mule Creek (P)	Small trenches, pits, ditches, and hydraulically overturned workings	At least 4.28 oz gold produced from the West Fork. Less than 100,000 yd ³ contains less than 0.02 oz gold/yd ³ .
39	Unknown (L)	Small pit (?)	Limonic greenstone. A sample contained 0.01 oz gold/ton and 0.01 oz silver/ton.
40	Blue Bird (L)	Several small pits and short adits, some caved	Altered sheared quartzose volcanic rocks. Eight samples contained as much as 0.28 percent copper, 0.053 oz silver/ton, and 0.006 oz gold/ton.
41	Anderson Ranch Bar (P)	Small trenches and pits possibly hydraulic workings	Bench gravel at mouth of Mule Creek. Thirteen placer samples contained an average of 0.00007 oz gold/yd ³ .
42	Victor 1 and 2 (L)	Two subsurface workings 41.5 ft and 78.5 ft long, and small pits	Sheared altered zone in greenstone; minor quartz. Of 11 samples, greatest silver content was 0.2 oz/ton. Trace gold and as much as 0.016 percent copper were contained in the samples.
43	Rocky Bar Creek (P)	None	Recent creek gravels and small bench gravel deposits. A placer sample contained 0.00014 oz gold/yd ³ .
44	North Mule Mountain (L)	Small pit	Alaskitic pegmatite in greenstone. One sample contained a trace of gold.
45	Marjal Bar (P)	Large hydraulic working	Bench gravel mostly mined out. Five placer samples contained an average of 0.0002 oz gold/yd ³ .
46	Walker Bar (P)	Trenches and hydraulic workings	Bench gravel production of at least 41.31 ₃ oz gold. Estimated resource of 650,000 yd ³ containing 0.0007 oz gold/yd ³ .
47	Mule Mountain mine (L)	At least 800 ft of underground workings	Quartz veins in greenstone. At least 94.75 oz of gold and 8 oz of silver produced. Resources of 20,000 tons are estimated to contain 0.1 oz gold/ton and 0.07 oz silver/ton.
48	Burns Creek (L)	Small pits	Metavolcanic rocks, some altered. Three samples each contained less than 0.005 oz gold/ton and less than 0.2 oz silver/ton.
49	Quo Vadis mine (L)	Adit about 614 ft long	A sheared quartz vein in greenstone. Fifteen samples contained an average of 0.1 oz gold/ton and an average of 0.09 oz silver/ton.
50	Milner No. 1 (L)	126.5-ft adit and drift; small pit	Quartzose sheared zone in greenstone. Twelve samples contained as much as 0.01 oz gold/ton, 0.3 oz silver/ton, and 0.17 percent copper.

Table 2.--Known mineral properties of the Wild Rogue Wilderness, Oregon--Continued

Map number	Property name	Workings	Resource data
51	Keystone mine (L)	Three adits which total 179 ft, and several small surface excavations	Quartz vein system in greenstone. Quartz veins as much as 3 ft thick along a zone about 700 ft long. Seven samples contained an average of 0.6 oz gold/ton and 0.15 oz silver/ton.
52	Blossom and Gleason Bars (P)	Hydraulic pits and trenches	Estimated 40,000 yd ³ gravel mined. Resources estimated at 210,000 yd ³ with 0.002 oz gold/yd ³ , 3,500 yd ³ with 0.004 oz gold yd ³ , and 45,000 yd ³ with 0.0001 oz gold/yd ³ .
53	Blossom and Gleason Bars (L)	Four short adits, one flooded	Shear zones in greenstone are at least 10 ft thick, and at least 100 ft long, and contain pyrite. An argillitized shear zone extends up Burns Creek. Of 30 samples taken, 25 contained up to 0.01 oz gold/ton. One sample contained 0.068 oz gold/ton and maximum silver content was 0.6 oz/ton. Maximum copper content was 0.184 percent.
54	Burns Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks, sheared altered rocks, and greenstone. One panned sample contained one very fine gold flake another contained no detectable gold.
55	Blossom Bar Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks, some sheared altered rocks, and some greenstone. No detectable gold was found in three panned samples.
56	Paradise Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks and minor greenstone. A panned sample contained no detectable gold.
57	Paradise Bar (P)	W	W
58	Jackson Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. A panned sample from near the water intake to Paradise Bar Lodge contained no detectable gold. Three panned samples from near the bridge over Jackson Creek contained 0.0000047 - 0.000019 oz gold/yd ³ .
59	Half Moon Bar (P)	W	W
60	Devils Backbone (L)	Small pits	Pyrite and chalcopryrite in greenstone and hornfels(?). Of five samples, one contained 0.05 oz gold/ton. Two contained 0.11 and 0.59 percent copper.
61	Sly Fox (L)	Small pits and a very short adit	Limonitic weathered siliceous zone in greenstone. Two samples contained 0.04 and 0.07 oz gold/ton, and 1.4 oz silver/ton.
62	Recent Rogue River (P)	Probable workings along river	Estimated resources of 3,000,000 yd ³ containing 0.0005 oz gold/yd ³ .
63	East Creek (P)	None	Modern-day gravel and small bench gravel deposits. Two placer samples contained no detectable gold.
64	Brushy Bar Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. A panned sample contained no detectable gold.
65	Brushy Bar (P)	Ditches, trenches, and pits	Estimated 45,000 yd ³ gravel mined. Resources of at least 1,200,000 yd ³ estimated. Gravel estimated to contain 0.0005 oz gold/yd ³ .
66	South Solitude Bar (P)	Pits, trenches, and hydraulic workings	Estimated 140,000 yd ³ gravel mined and resources of 1,800,000 yd ³ containing 0.0002 oz gold/yd ³ .

Table 2.--Known mineral properties of the Wild Rogue Wilderness, Oregon--Continued

Map number	Property name	Workings	Resource data
67	North Solitude Bar (P)	Pits, trenches, ditches, and hydraulicked workings	Bench placer. Estimated production of about 70,000 yd ³ containing 0.0003 oz gold/yd ³ and 20,000 yd ³ containing 0.0001 oz gold/yd ³ . Estimated resources are 240,000 yd ³ containing 0.001 oz gold/yd ³ .
68	North Solitude Bar (L)	Two small pits	Sheared pyritic lenses in greenstone are a few feet thick and at least 100 ft long. Four samples contained, at most, a trace of silver.
69	Tate Creek (P)	None	Modern-day and bench gravel derived from sedimentary rocks. A panned sample contained 0.0000079 oz gold/yd ³ .
70	Tate Creek Bar (P)	Pits, trenches, and ditches	Bench gravel. Estimated production of 15,000 yd ³ and resources of 480,000 yd ³ containing 0.0002 oz gold/yd ³ .
71	Tacoma Rapids Bar (P)	Ditches or gulches 15 to 30 ft wide	Bench gravel. 10.01 oz gold in 1912 and 2.59 oz gold in 1935 produced from this area. Estimated resource of 90,000 yd ³ containing 0.002 oz gold/yd ³ .
72	Clay Hill Creek (P)	W	W
73	Clay Hill Bar (P)	W	W
74	South Clay Hill Point (P)	Pits, trenches, ditches, and hydraulic workings	Bench gravel. Estimated production of 30,000 yd ³ mined and resources of 30,000 yd ³ . Gravel estimated to contain 0.00003 oz gold/yd ³ .
75	Unnamed Bench (P)	None	Bench gravel, landslide, and slopewash deposits. About 3,000,000 yd ³ . One placer sample contained no gold, but another contained 0.00041 oz/yd ³ .
76	Fall Creek (P)	None	Modern-day creek and small bench gravel deposits. A placer sample contained 0.000011 oz gold/yd ³ .
77	Flora Dell Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. A panned sample contained 0.000089 oz gold/yd ³ .
78	Flea Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. A panned sample contained 0.00001 oz gold/yd ³ .
79	Hicks Creek Bar (P)	Trenches, pits, and ditches	Estimated 30,000 yd ³ gravel mined. Estimated resources of 800,000 yd ³ . Gravel estimated to contain 0.0003 oz gold/yd ³ .
	Hicks Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. A panned sample contained no detectable gold.
81	Slide Creek Bar (P)	W	W
82	Slide Creek (P)	W	W
83	Dans Creek Bar (P)	Small trenches and ditches	Bench and modern-day gravel, affected by landsliding and slopewash. Five placer samples from benches at or near the mouth of Dans Creek contained an average of 0.000013 oz gold/yd ³ .
84	Dans Creek (P)	None	Modern-day and bench gravel from an area of sedimentary rocks. Some landsliding has affected the area. A panned sample contained 0.000499 oz gold/yd ³ .
85	Watson Creek (P)	None	Modern-day creek and small bench gravel deposits. A placer sample contained 0.00068 oz gold/yd ³ .

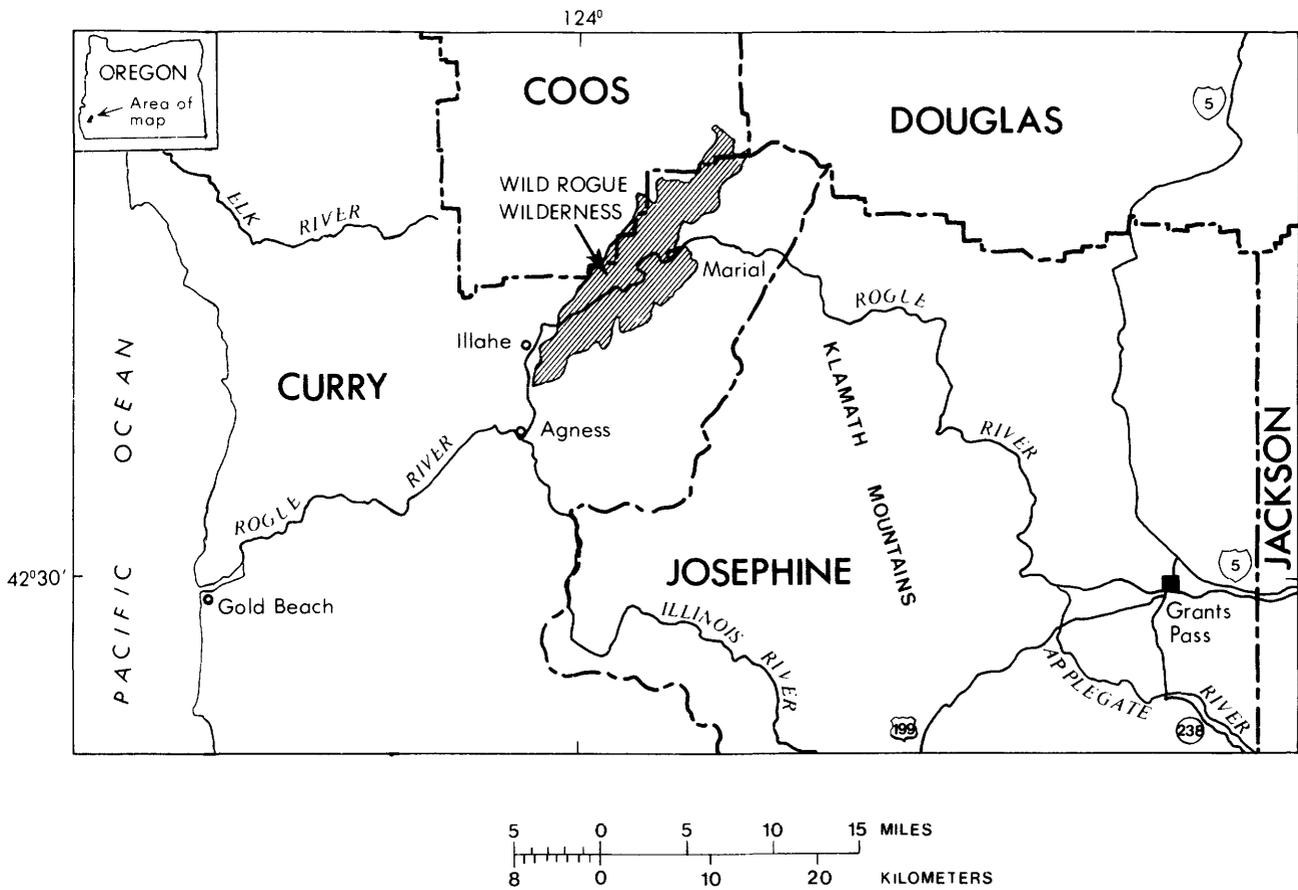


Figure 1.--Location of Wild Rogue Wilderness (NF105), southern Oregon.

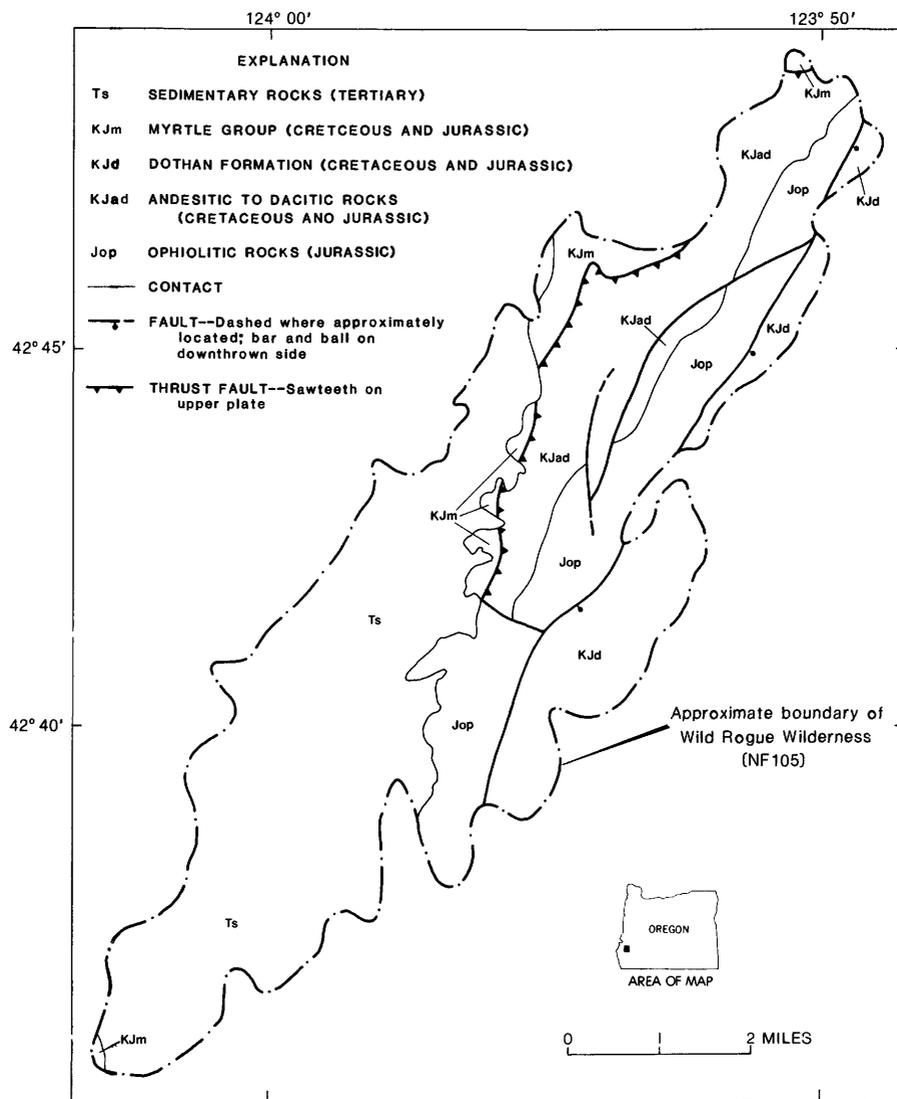


Figure 2.--Simplified geologic map for Wild Rogue Wilderness (modified from Gray and others, 1982).

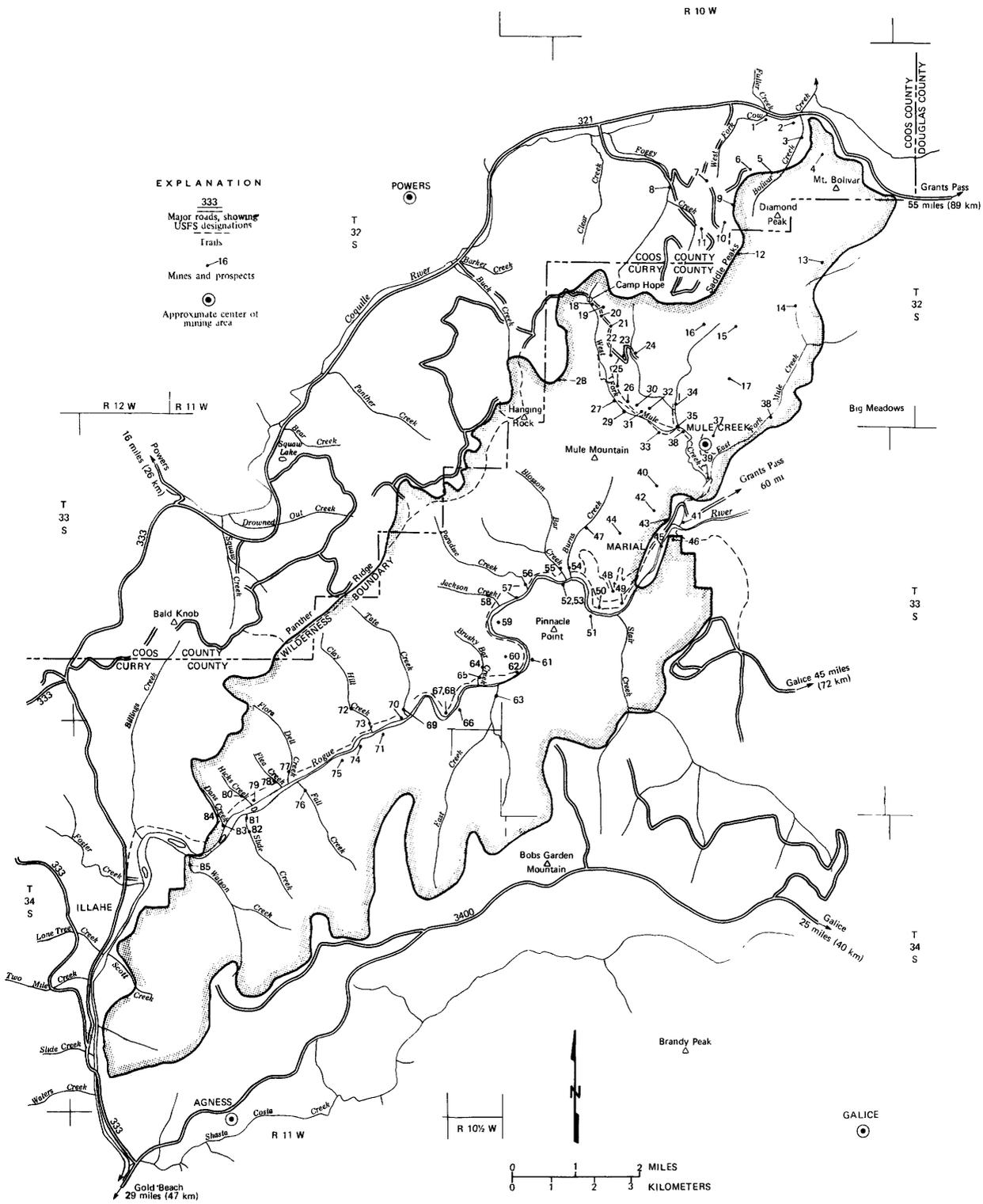


Figure 3.--Mines and prospects in and near the Wild Rogue Wilderness, Oregon. Names and descriptions are in table 2.

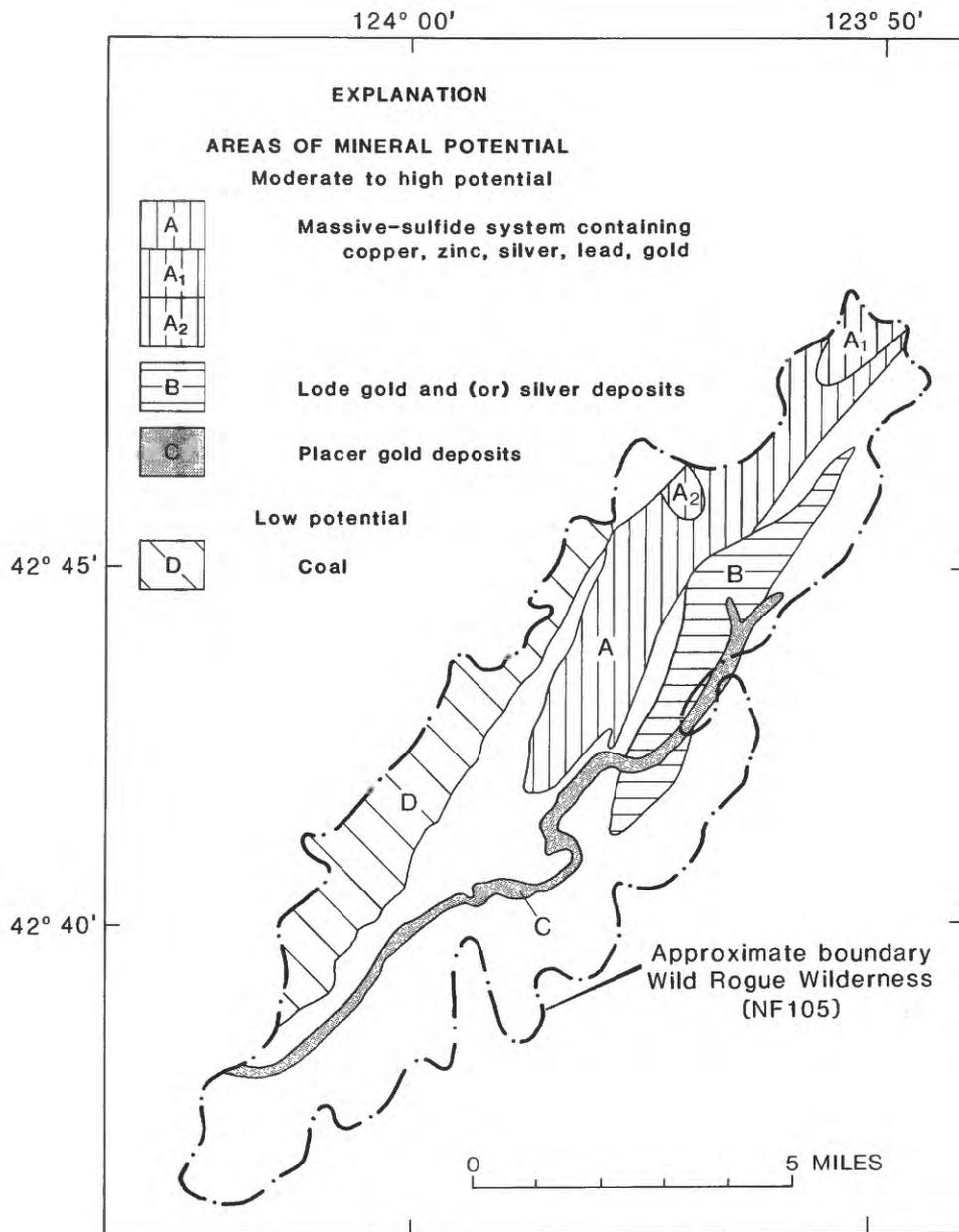


Figure 4.—Sketch map showing areas of mineral resource potential in the Wild Rogue Wilderness, Oregon.

