MINERAL RESOURCE POTENTIAL OF THE UPPER PRIEST ROADLESS AREA BONNER COUNTY, IDAHO

SUMMARY REPORT

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STUDIES RELATED TO WILDERNESS

Under the provision 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 Upper Priest Roadless Area (A1-123) in the Kaniksu National Forest, Bonner County, Idaho. The Upper Priest Roadless Area (A1-123) 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, but was later changed to nonwilderness by the administration.

SUMMARY

The Upper Priest Roadless Area has a low mineral resource potential. No geologic conditions favorable for mineral resource potential were found for metals, nonmetals, or fuels. Marginally anomalous amounts of zinc, lead, silver, tin, and tungsten were detected in stream- sediment sample concentrates, but they probably originate from widely scattered sparsely mineralized quartz veins common to the region. No other source for these slightly anomalous stream-sediment concentrations has been found.

INTRODUCTION

The Upper Priest Roadless Area is north of Priest Lake in northern Idaho, (fig. 1) about 75 mi (120 km) northeast of Spokane, Wash. The area coincides with the Upper Priest Lake Scenic Area, established May 25, 1967. It covers most of Plowboy Mountain on the west side of Upper Priest Lake and has two small noncontiguous areas on the east side of Upper Priest Lake. Upper Priest Lake, which is about 2 mi (3.2 km) north of Priest Lake, is reached by trail or boat on the navigable part of the Priest River that connects the two lakes. Trailhead and boat-launching facilities at Priest Lake are accessible by a paved side road from State Highway 57. The roadless area emcompasses 3,903 acres (15.8 km^2), ranging in elevation from 2,438 ft (743 m) to 5,130 ft (1564 m), all heavily timbered. The geology and geochemistry of the area is more comprehensively described by Miller (1983).

GEOLOGY AND GEOCHEMISTRY PERTAINING TO MINERAL RESOURCE ASSESSMENT

Geology

The Upper Priest Roadless Area (fig. 2) is underlain chiefly by the Prichard Formation of the Proterozoic Y Belt Supergroup and several diabase sills of Proterozoic Y age that intrude the Prichard. A small area of the Burke(?) Formation, also part of the Belt Supergroup, lies about 1 mi (1.6 km) northwest of the area. Two Cretaceous granitic plutons, the monzogranite of Tango Creek and the monzogranite of Granite Pass, intrude the Belt formations; another pluton of Cretaceous and (or) Tertiary age, the granodiorite of Trapper Creek, is faulted against the Prichard Formation.

The Prichard Formation is composed of interbedded argillite, siltite, and quartzite in about equal proportions. Its thickness is uncertain owing to folding, but it is estimated at about 5,000 ft (1,515 m). The diabase sills are dated at 1,430 m.y. on zircon, using the uranium-lead method (Elston and Bressler, 1980). About 1,300 ft (396 m) of medium-bedded siltite and quartzite and minor argillite that crops out just northwest of the study area is probably part of the Burke Formation.

The monzogranite of Tango Creek intrudes the Prichard Formation in the southern part of the area. The monzogranite is a medium-grained highly porphyritic muscovite-biotite monzogranite, has a color index of 7, and is essentially structureless. The leucocratic muscovite monzogranite of Granite Pass also intrudes the Prichard Formation about 1 mi (1.6 km) west of the area. This rock contains some biotite but mostly contains only muscovite. It is chiefly medium-grained and structureless, and has a background uranium content higher than that of most plutons of the region. The granodiorite of Trapper Creek, east of the Newport fault, is a muscovite-biotite granodiorite. This medium-grained but seriate pluton intrudes and is associated with regionally metamorphosed sillimanite-grade rocks just east of the map area.

Glacial till and outwash mantle the bedrock at lower elevations. Small thin exposures occur on some higher slopes but were not mapped. Modern alluvium, much of it derived from glacial deposits, is restricted to flood plains and channels of streams.

The Upper Priest Roadless Area straddles two fundamentally different terranes that are separated by the Newport fault. These two terranes represent highly contrasting structural levels. East of the fault are two-mica granitic and high-grade metamorphic rocks, and west of the fault are relatively unmetamorphosed rocks of the Belt Supergroup and relatively high level plutons. Most of the study area lies west of the fault and consists structurally of open north-northeast-trending folds in the Prichard Formation, cut by two high-angle faults.

The Newport fault, which underlies Upper Priest Lake, is locally exposed at the north end of the lake. Although the extent of movement on this fault is unknown, the relative motion is down on the west side. The fault is of regional extent and has been traced for about 125 mi (200 km). Forceful intrusion of the Tango Creek pluton may be the cause of the open folds in the Prichard Formation. The Granite Pass pluton appears to have been passively emplaced, at least along its east edge.

Geochemistry

In the study area, only Deadman Creek and the stream in Togo Gulch have sufficient flow, and drain a reasonably large bedrock area, to be utilized for stream-sediment sampling. Analyses of both panned concentrates and bulk samples from these two streams indicate that most elements fall within the expected range for sediment derived from rocks found in the respective drainages. Zinc, lead, and trace amounts of tin, tungsten, and silver were detected in slightly anomalous amounts in stream-sediment and (or) panned-concentrate samples. Except for trace amounts of silver and lead mineralization in widely scattered quartz veins in the Prichard Formation, no significant concentrations of any metals were observed. The mineral resource potential for these metals is considered to be low.

Greater than average amounts of cobalt, chromium, copper, nickel, and vanadium, measured in the panned concentrates but not in the stream-sediment samples, reflect the contribution of heavier mafic minerals derived from the diabase sills. Detection of lanthanum in anomalous amounts in panned concentrates is probably due to the presence of abundant allanite from granitic clasts in glacial till.

MINING DISTRICTS AND MINERALIZATION

In October 1979, the U.S. Bureau of Mines searched county, State, Federal, and private records and reports, and examined all mines, prospects, and claims in the study area. Where warranted, samples were taken for analysis (fig. 2). Table 1 lists the results of these examinations. Information from previous field studies by Courtis (1906), Lancaster (1910), and Ridenour (1974) were reviewed, and the metallic-mineral occurrences noted by Heikes (1906), Kirkham and Ellis (1926), Ross (1941), and Savage (1967) were field checked.

No production figures are recorded from the study area, which is in the Priest Lake mining district. Porthill, Metaline, and Pend Oreille mining districts are nearby. The Porthill district's Idaho-Continental mine, 8.5 mi (13.7 km) north of the area, was the district's top producer until closure in 1943. The only available production figures (Kirkham and Ellis, 1926) list about 500,000 tons (450,000 t) of silver, lead, zinc, and copper ore valued at $5.4 million to have been produced from the mine up to that time.

Mining activity around Upper Priest Lake began in August 1886, when Jonathan Truesdale's group located the Mountain Chief claims on a lead-silver deposit in the study area. By 1908, 30 prospects were located on the shores and hills near Upper Priest Lake, including the Idaho Copper Co. and Gem Copper Mining Cos. claims. U.S. Forest Service officials reported that a shipment of ore from the Mountain Chief mine was milled in Metaline Falls, Wash., in 1958. With the creation of the Upper Priest Lake Scenic Area on May 25, 1967, the entire study area was withdrawn from mineral location. Bonner County mining-claim records indicate that 105 lode claims were located in the study area between 1886 and 1967. Under present economic conditions, however, no minable deposits are known in the Upper Priest Roadless Area. The potential for occurrence and favorable recovery of silver and lead in the Prichard Formation in the vicinity of the Mountain Chief mine (see map) is considered to be insignificant to low.

ASSESSMENT OF MINERAL RESOURCE POTENTIAL

Geologic mapping, geochemical sampling, and examination of individual mines, prospects, and claims indicate that the Upper Priest Roadless Area has a low mineral resource potential. No geologic conditions favorable for mineral resource potential were found for metals, nonmetals, or fuels. Marginally anomalous amounts of zinc, lead, silver, tin, and tungsten were detected in stream-sediment sample concentrates, but probably originate from widely scattered, sparsely mineralized quartz veins common to the region. No other source for these slightly anomalous stream-sediment concentrations has been found. Most of the mines, prospects, and claims in the area are located on or adjacent to these quartz veins. None of the veins, however, have sufficient mineralization associated with these to constitute even a marginal mineral resource. The rocks in the region are not the type with which fossil fuels are associated.

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Table 1.--Mines, prospects, and mineralized areas in the Upper Priest Roadless Area

Map No.	Name	Summary	Number and type of workings	Sample data
1-5	Mountain Chief mine (Bluebell)	Quartz veins from near 0 to 1 ft (30 cm) wide strike N. 7° E. and dip 71° SE. in fractured light- to dark-gray siltite and argillite; quartz veins contain argentiferous galena and pyrite.	Two caved adits, one 700 ft (213 m) long (Lancaster, 1910), and an open cut.	One select sample from stockpile: trace of gold, 3.0 troy oz silver per ton, and 23.2 weight percent lead. Two chip samples from across a quartz vein: 0 and a trace of gold, 0 and 0.2 troy oz silver per ton, and 0 and 1.08 weight percent lead. Two chip samples from across siltite and argillite: 0 and a trace of gold, 0 and 1.2 troy oz silver per ton, and 0 and 3.00 weight percent lead.
6	Navigation mine	Dark-green to black schistose meta-diabase with quartz veins as much as 1 in. (2.5 cm) wide containing small amounts of disseminated galena and pyrite.	One water-filled 60-ft (18 m) 60° inclined shaft with a crosscut at the bottom (Lancaster, 1910), and a prospect pit.	One grab sample from shaft dump: trace of gold and 0.1 troy oz silver per ton.
7-9	Kootenai	Quartz fissure fillings in argillite and diorite; as much as 5 percent combined pyrite, limonite, galena, chalcopyrite, and malachite in the quartz.	One 18-ft (6 m) adit and four pits.	Three samples: no gold, 0 to 0.1 troy oz silver per ton, 0 to 0.33 weight percent copper, and 0.016 weight percent zinc.
10	Denver group	Quartz diorite porphyry and medium-grained hornblende quartz diorite outcrop, 120 ft (37 m) long; no metallic minerals observed.	None	One chip sample: no gold, 0.1 troy oz silver per ton.
11	Silver Top	Pyrite-bearing quartz veins as much as 1 in. (2.5 cm) thick, in limonite-stained quartzite strike N. 29° E. and dip 44° NW.	Test pit	One chip sample: no gold or silver.
12-13	Wrangler	Quartz veins, as much as 6 in. (15 cm) wide, in fine-grained limonite-stained quartzite and argillite; veins contain pyrite and lesser amounts of galena, strike N-S., and dip 58° E. Pyrite crystals as much as 0.5 in. (1.25 cm) across, are disseminated in quartzite and shale.	None	Two chip samples: no gold or silver.
14	Deadman Creek	Fractured gray fine-grained quartzite strikes N. 25° W., dips 64° SW., and contains disseminated 0.25-in. (0.6 cm) stringers of pyrite and marcasite.	None	One chip sample: trace of gold, no silver.
15	Mammoth	White coarsely crystalline quartz vein, 3.8 ft. (1.2 m) wide, exposed 22 ft (6.7 m) in fine-grained quartzite, strikes N-S. and dips 88° E.	Test pit	One chip sample from across fractured altered white coarsely crystalline quartz: no gold or silver.
16	Plowboy mine (Iron Horse group)	Light- to dark-gray fine-grained limonite-stained quartzite, with disseminated pyrite and pyrrhotite.	One caved adit, about 90 ft (27 m) long.	One grab sample from dump: trace of gold and 0.1 troy oz silver per ton.
17	Lone Ranger	Dark-green metaconglomerate with a limonite-stained quartzite matrix.	None	One chip sample: trace gold and 0.2 troy oz silver per ton.
18-19	Plowboy Mountain prospect	Shear zone with quartz, gouge, and brecciated country rock in argillite and siltite; structures are limonite stained but contain no visible sulfides.	One inclined shaft, a trench, and two pits.	Two samples: no gold, and 0 and 0.2 troy oz silver per ton.

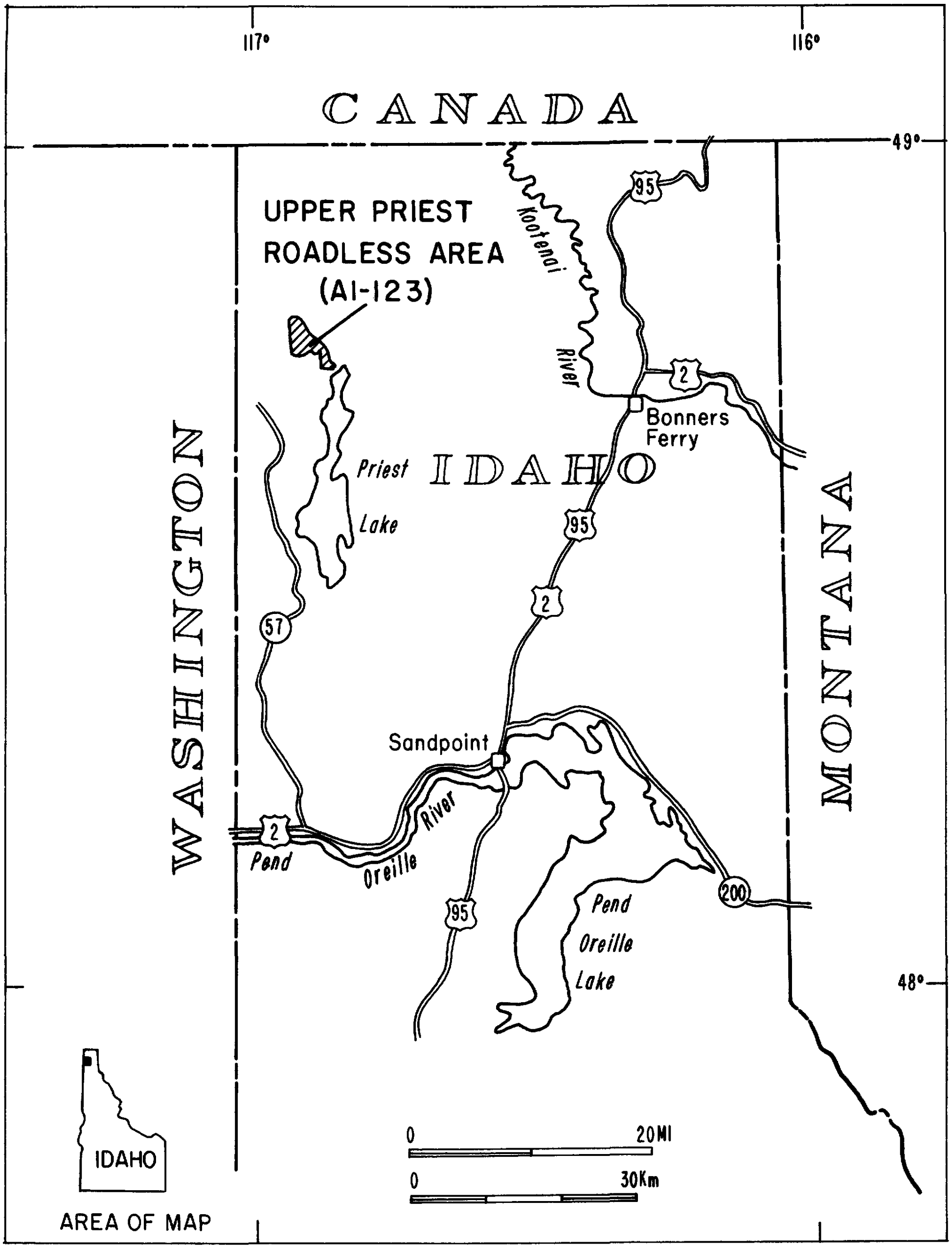

Figure 1. Index map showing location of Upper Priest Roadless Area (A1-123).

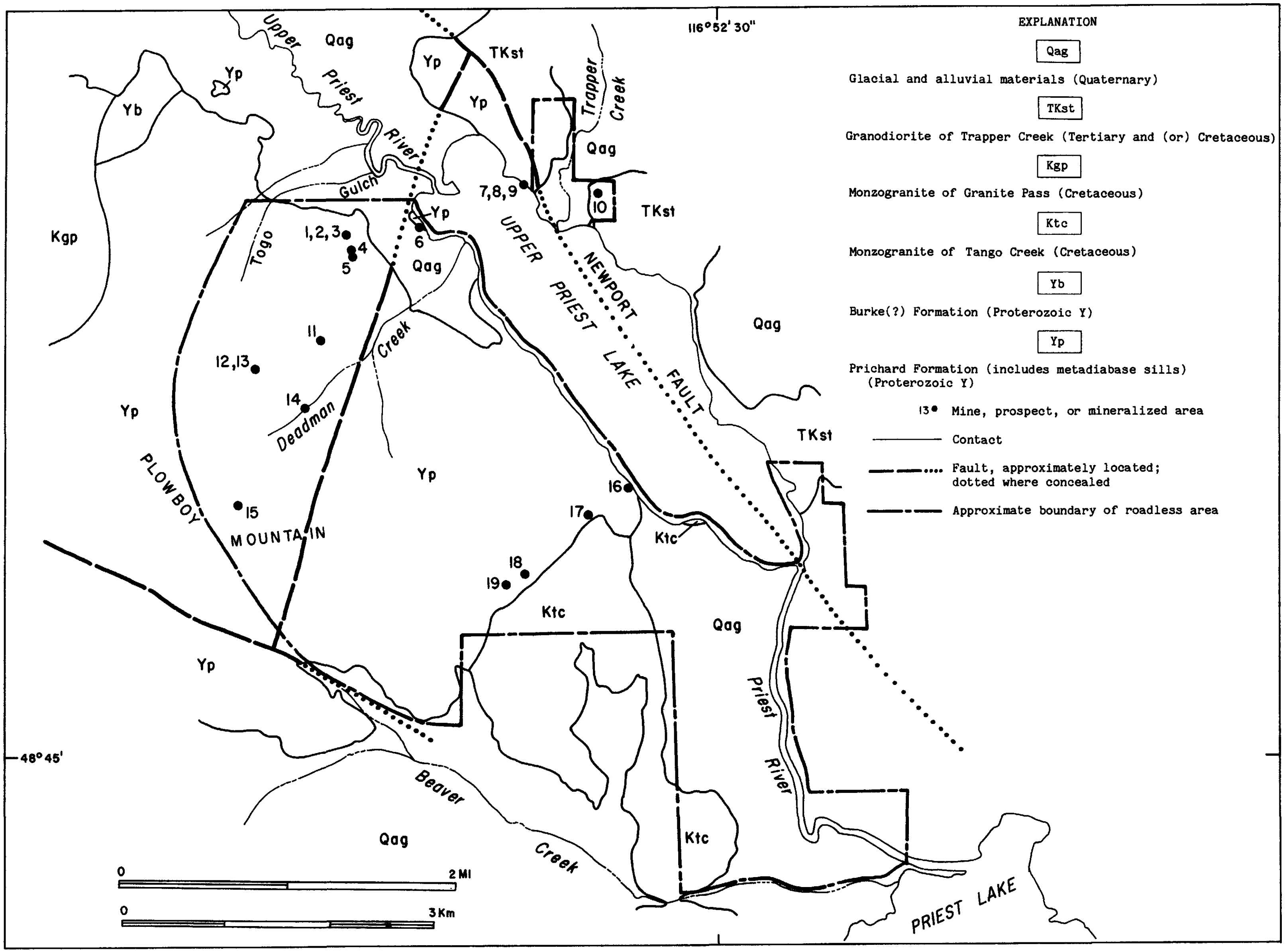

Figure 2. Mineral resource potential map showing location of mines, prospects, and mineralized areas. Numbers refer to properties listed in table 1.