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SCOPING OF MINERAL POTENTIAL: PROPOSED ROGUE WILDERNESS AREA ADDITIONS JOSEPHINE, CURRY, DOUGLAS, AND COOS COUNTIES, OREGON

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NOTICE

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SUMMARY OF THE ROGUE WILDERNESS AREA EXPANSION ACT OF 2011

The Rogue Wilderness Area Expansion Act of 2011 (the Act) would add specified federal land managed by the Bureau of Land Management (BLM) to the Wild Rogue Wilderness as a component of the National Wilderness Preservation System (NWPS). It amends the Wild and Scenic Rivers Act to add specified segments of creeks to the designation of the Rogue River in Oregon as a component of the National Wild and Scenic Rivers System. The Act also prohibits (1) the Federal Energy Regulatory Commission (FERC) from licensing the construction of any dam, conduit, reservoir, powerhouse, transmission line, or other project works affecting specified stream segments; and (2) any federal department or agency from assisting in the construction of any water resources project affecting any such segment, except for maintaining or repairing existing projects. In effect, all 143 miles of originally proposed Wild and Scenic Rivers and adjoining lands within the proposed Wild Rogue Wilderness would be withdrawn from mineral entry (Figure 1).

INTRODUCTION

The Oregon Department of Geology and Mineral Industries (DOGAMI) has prepared this mineral scoping report to summarize the mineral resources of the proposed Rogue Wilderness Area Additions (RWAA) in Josephine, Curry, Douglas, and Coos Counties, southwestern Oregon. This land is managed by the BLM.

This report describes the proposed RWAA in terms of identified mineral occurrences, mineral resource potential, mining activity, and mineral setting (if applicable). Understand that this type of scoping report is tenuous and based solely on literature searches. It does not include field studies for data collection and, at best, provides only a low-level of detail for mineral assessments as prescribed in BLM Manual 3031. No attempt is made in this report to assess the development potential of any identified mineral resource, nor recommendations on the management of the mineral resources.

For the convenience of the reader, this document is divided into the following four sections:

- Part I describes the RWAA's location and geologic setting.
- Part II describes the outcome of the desktop assessment.
- Part III is this study's reference list.
- Part IV (Appendix) briefly describes the methodology and limitations of the study and provides definitions for Levels of Resource Potential and Levels of Certainty.

PART I. LOCATION

The proposed Rogue Wilderness Area Additions (RWAA) is approximately 30 miles by road northwest of Grants Pass and is bisected by the Rogue River. The area's dimensions are about 18 miles long from northwest to southeast, and as much as 12 miles at its widest. The area extends from the eastern edge of the Wild Rogue Wilderness in the northwest, to near the town of Galice to the southeast (Figure 1). The proposed RWAA occupies an area of about 91 square miles — 58,100 acres of O&C lands (acronym for Oregon and California Revested Grantlands) covered by parts of the Dutchman Butte, Kelsey Peak, Bunker Creek, Mount Reuben, Hobson Horn, Mount Peavine, and Galice 7.5-minute quadrangles. The areas of the proposed RWAA, along with one-quarter mile on each side of 141.1 nautical miles of Rogue River tributaries, would be permanently withdrawn from mineral entry if the Act is adopted.

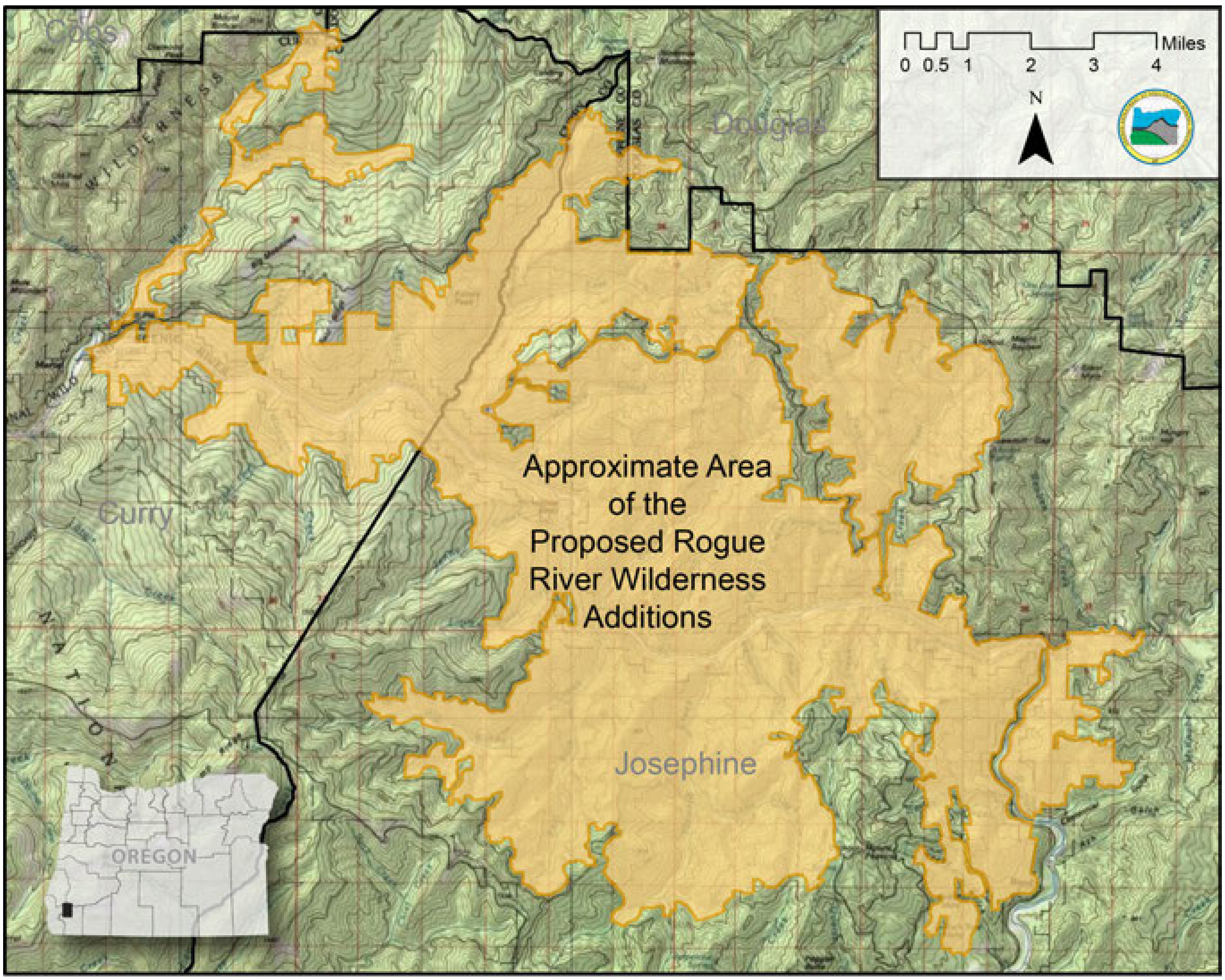

Figure 1. Location of the approximate area of the proposed Wild Rogue Wilderness Area Additions (orange; note: not an official map of the proposed RWAA) in southwestern Oregon. This area includes the proposed Scenic River Additions (not delineated).

Geology Pertaining to Mineral Resource Assessment

Previous geologic studies in area of the proposed RWAA were done by Wells and Walker (1953) and later by Ramp and others (1977), Smith and others (1982), Ramp and Peterson (1979), Gray and others (1982a,b), and Ramp and Moring (1986). The resolution of this geologic mapping is 1:48,000 scale to 1:125:000 scale. Understand that geologic maps at these small scales provide only a crude characterization of the mineral setting/geology; consequently, for mineral scoping purposes the geologic mapping available is not ideal.

The proposed RWAA lies within the Western Klamath Mountains geologic province of southwestern Oregon (Figure 2). This geologic province is an assemblage of accreted terranes (and individual subterranes) separated by faults that mark ancient subduction zones or shear boundaries. According to Yule and others (2000), the geologic history here reveals a period of Late Triassic and Jurassic ophiolite and oceanic-arc formation followed by Middle Jurassic terrane accretion, tectonic mélange formation, and continued oceanic arc magmatism.

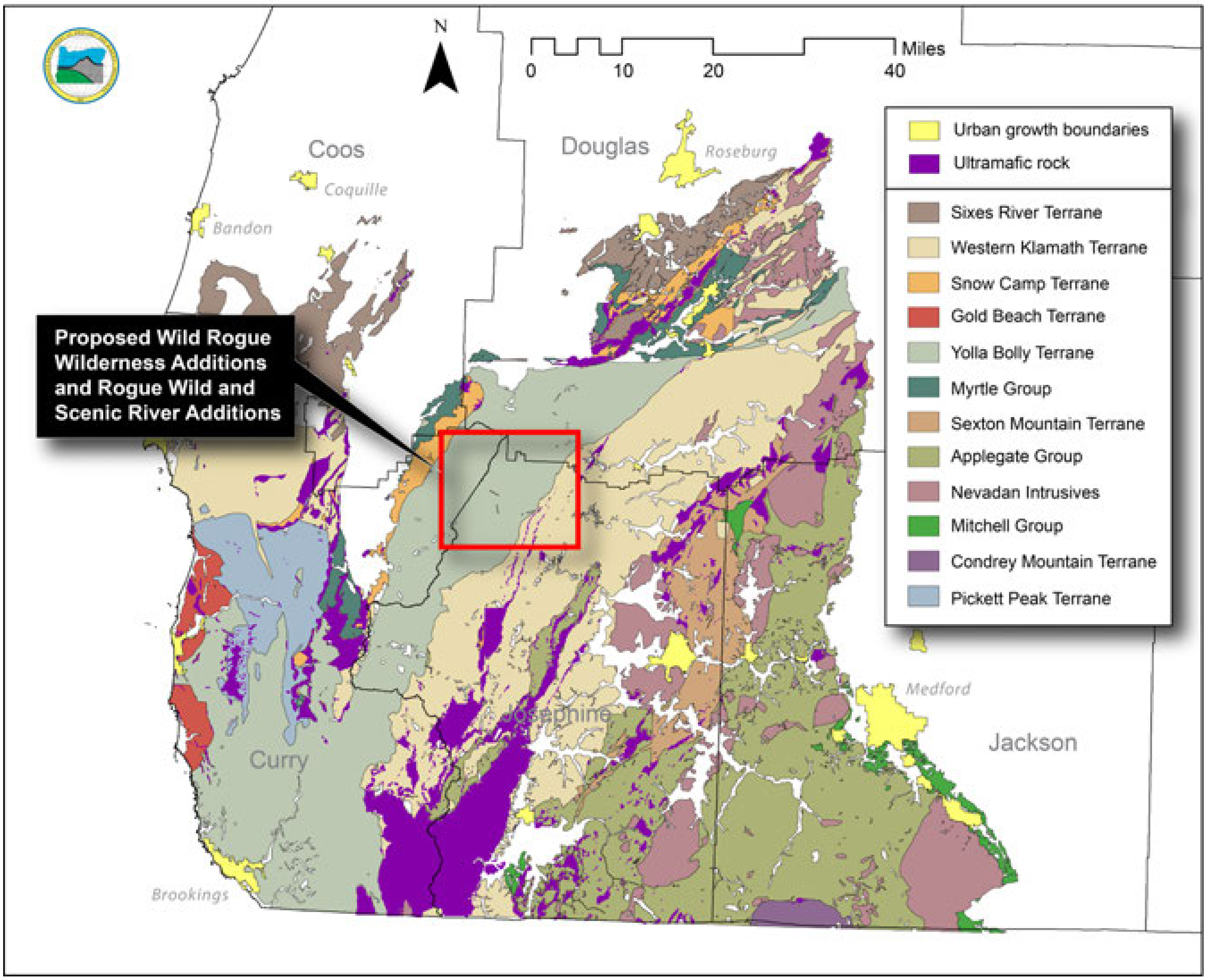

Figure 2. Location of the proposed Rogue Wilderness Area Additions in the Western Klamath Mountains geologic province of southwestern Oregon (modified after Ma and others, 2009).

As can be seen in Figure 3, rocks of the Western Klamath Terrane cover about a quarter of the proposed RWAA. Western Klamath Terrane is a term applied by Ma and others (2009) to the sequence of fragmental metavolcanic rocks and volcaniclastic metasedimentary rocks (Rogue and Galice Formations, respectively) that lie east of the sedimentary rocks of the Jurassic and Cretaceous age Dothan Formation of the Yolla Bolly Terrane.

Thrust faulting juxtaposed the boundary between these terranes. In the RWAA, thrust faults and faulting occupies an area bounded generally by Whisky Creek and a line running southwesterly across the Rogue River and into Howard Creek.

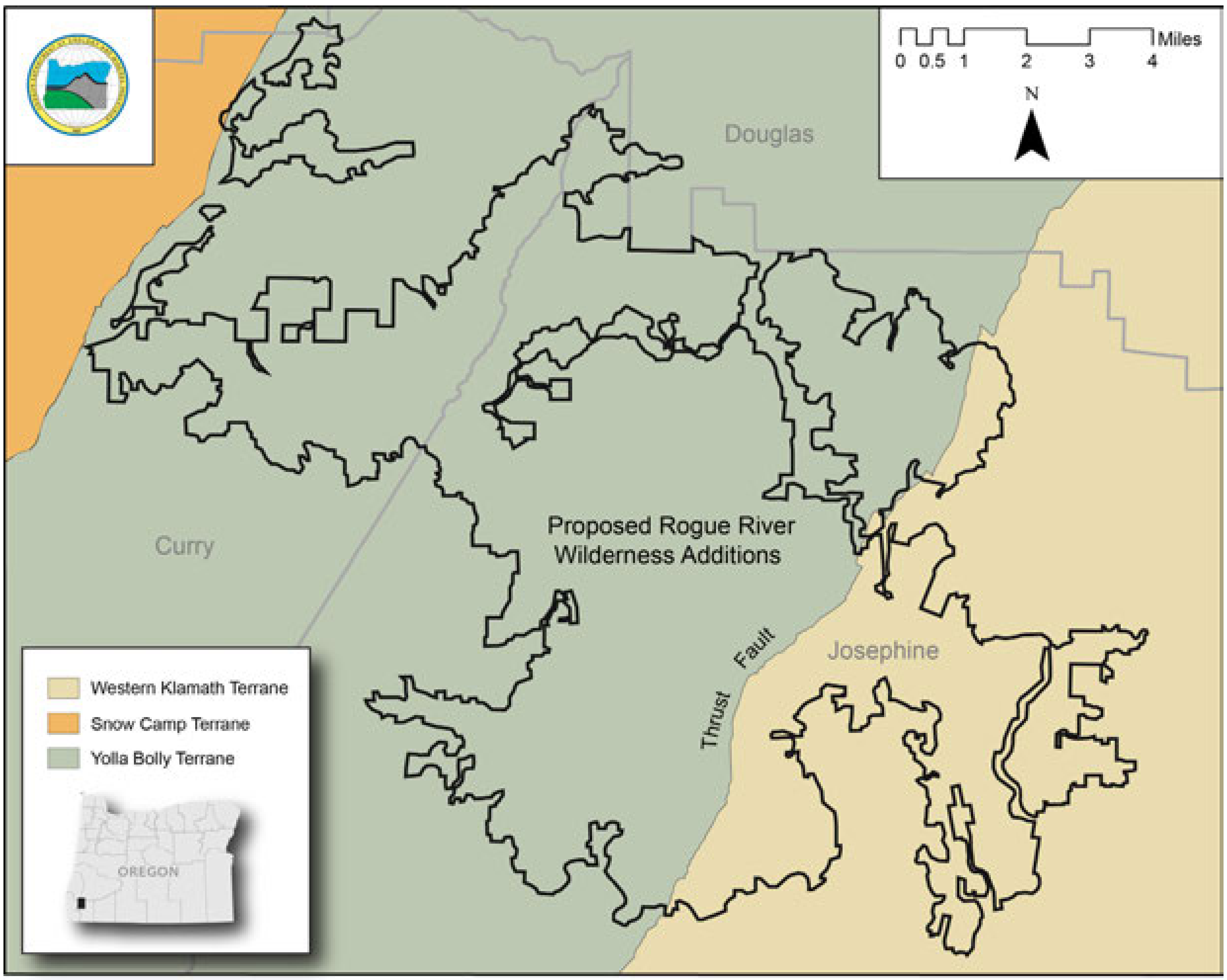

Figure 3. Simplified geologic terrane map (Ma and others, 2009) of the proposed Rogue Wilderness Area Additions (outlined in black).

Rocks in the Western Klamath Terrane consist of serpentine (notably along major shear zones), hornblende gabbro, diorite, quartz diorite, amphibolite, and related rocks, together with greenstones (metavolcanic rocks) that include meta-andesites, altered basic lava, and andesitic tuff (Figure 4). Some schists are found associated with the metavolcanic rocks. The Dothan Formation consists of massive and thin-bedded sandstones, siltstone, and shales, together with a few chert lenses, lenticular beds of conglomerate, and a few lava flows. A lower greenschist facies assemblage pervades most of the rocks exposed in the proposed RWAA. However, areas of high-grade metamorphism (e.g. amphibolite gneiss) are in fault contact with the less altered rocks (Figure 4).

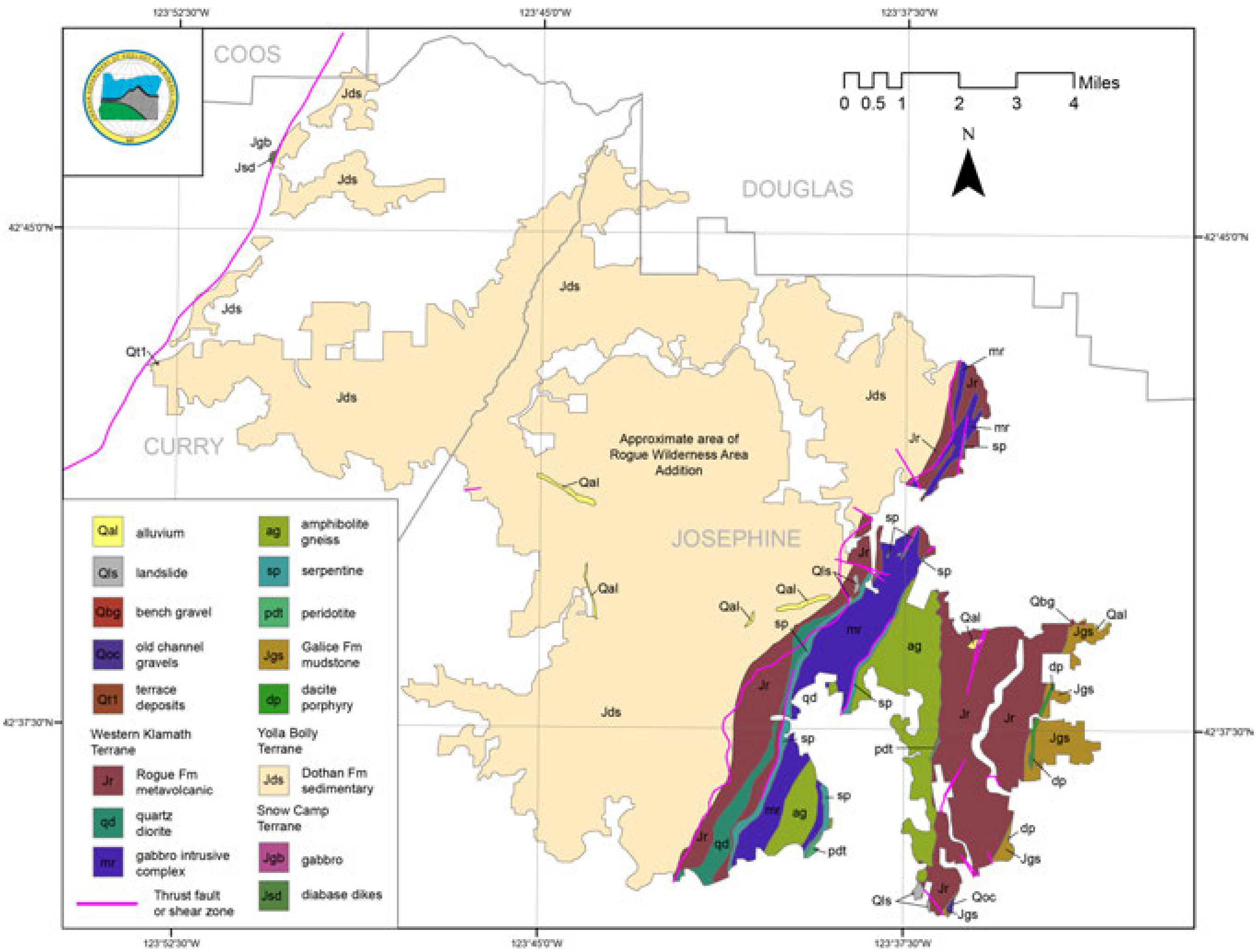

Figure 4. Generalized geologic map of the proposed Rogue Wilderness Area Additions (geology modified after Ma and others, 2009).

PART II. DESKTOP ASSESSMENT

A review of geologic investigations and a survey of mines, prospects, and quarries has been conducted to evaluate the mineral resources potential of the RWAA. Note that this review did not include a field examination for this study. The geologic environment of the proposed RWAA suggests the possible existence of deposits of the following commodities: gold, silver, copper, lead, and zinc.

Where this review indicates that a potential mineral resource might exist, it is important to understand what a "potential mineral resource" is and means. According to BLM Manual 3031, it means the potential for the occurrence (presence) of a concentration of mineral resources and does not refer or imply there is potential for development or extraction of valuable mineral resources (BLM, 1985).

Mining Timeline

A general timeline of mining processes and other events provides a basic context for understanding the history of mining included or adjacent to the proposed RWAA.

- The gold rush that started at Sutter's Mill in California in 1848 spread to southern Oregon by 1851-1852 (Kramer, 1999). Mining activity in the proposed RWAA almost certainly began in 1854 with the discovery of placer gold deposits on the Rogue River (Brooks and Ramp, 1968).
- The richest of the placer deposits along the Rogue River and those tributaries that dissected gold-bearing ground were worked out systematically, and by the 1860s this placer mining activity had decreased significantly (Brooks and Ramp, 1968).
- In the 1870s, Chinese miners had placered nearly all of the remaining smaller deposits (Kramer, 1999).
- By the late 1880s and early 1890s, lode ("hard rock," or "quartz") mining in the proposed RWAA outside of the creek beds and placer mining areas was well established (Kramer, 1999).
- From the 1880s to 1930s, sixty or more gold and silver mines or prospects were being worked from Whisky Creek in the Mount Reuben area to Galice Creek (Ramp and Peterson, 1979).
- The period of greatest mining activity at the Almeda Mine was from 1905 to 1915 (Shenon, 1933).
- From 1935 to 1942, Whisky Creek was placered again from its junction with the Rogue River to Huckleberry Flat on the East Fork of Whisky Creek, a distance of 4 miles (Youngberg, 1947).
- The years of the Great Depression saw the Benton Mine, though discovered in the late 1880s, gain prominence as the largest underground operation in southwestern Oregon (Youngberg, 1947).
- With the onset of World War II, the War Production Board issued Limitation Order L-208 in October of 1942, effectively closing the mines mentioned above along with the rest of Oregon's gold mines all together.
- In 1945, Order L-208 was rescinded.
- During 1959-1960 an attempt was made at placering in the Rogue River. The Rocky Gulch placer near Galice was worked (Ramp, 1960).
- In the mid-1960s, there was renewed activity, though limited, at the Benton Mine (Kramer, 1999).
- Mining activity since the 1960s included in or adjacent to the proposed RWAA, with the exception of the activity at the Benton Mine, has been limited to small placer operations and pocket hunters searching for surface pockets of gold left behind after vein material weathered away.
- As a result of higher gold prices in 1979, exploration activities and prospecting took place within the proposed RWAA.
- Mineral entry on the Rogue River itself, which transverses the proposed RWAA in a general east-to-west direction, is no longer possible due to the river's designation as wild and scenic.
- From 1994 to 1996, Dutch Mining, LLC worked to explore and develop the Benton Mine.
- In 2005, Dutch Mining, LLC reopened the Benton Mine, and performed a full rehabilitation of the mine. The company built a new gold ore mill near Merlin, Oregon, to process 330 tons of ore per day; processing could be increased to 450 tons per day as needed (David Brown & Associates, 2007).
- In 2006 it was reported that the Benton Mine was the only operating underground mine in Oregon (see http://www.infomine.com/index/properties/BENTON_MINE.html).
- In 2007, Dutch Gold Resources, Inc. was acquired by Dutch Mining, LLC in a reverse merger transaction. It was announced that a discovery was made of new ore bodies at the mine. As part of its U.S. Securities and Exchange Commission fair disclosure (FD), Dutch Gold Resources, Inc. referred to a

N.I. 43-101 compliant reserves report (http://www.wnd.com/markets/action/getedgarwindow?accesscode=114036110012515), which estimates the gold reserves at the Benton Mine.

- In 2008, "test" production from the Benton Mine was halted.
- Today, according to Dutch Gold Resources, Inc., the mine and milling facility are now in a care-and-maintenance program (http://www.dutchgold.com/projects/benton-mine; http://ir.stockpr.com/dutchgold/sec-filings?page=3#document-6923-0001144204-11-050307). Dutch Gold Resource, Inc. owns the Gold Bug Mine property in fee-simple title but has no plans to develop this property in the near future.

Mining Districts and Mineralization

The Galice area (Brooks and Ramp, 1968), as used here, is included in or adjacent to the proposed RWAA and embraces the Mount Reuben and Galice mining districts. For its size, the Galice area was one of the richest producers in southwestern Oregon and has a high concentration of mines. According to a query of the BLM LR2000 database of mining claims (http://www.blm.gov/lr2000/), 63 active mining claims are included in or adjacent to the proposed RWAA. Of those, 25 are lode claims, all in the vicinity of the Benton Mine; the rest are scattered placer claims. The location of the 27 claims that are within the proposed RWAA are shown in Figure 5.

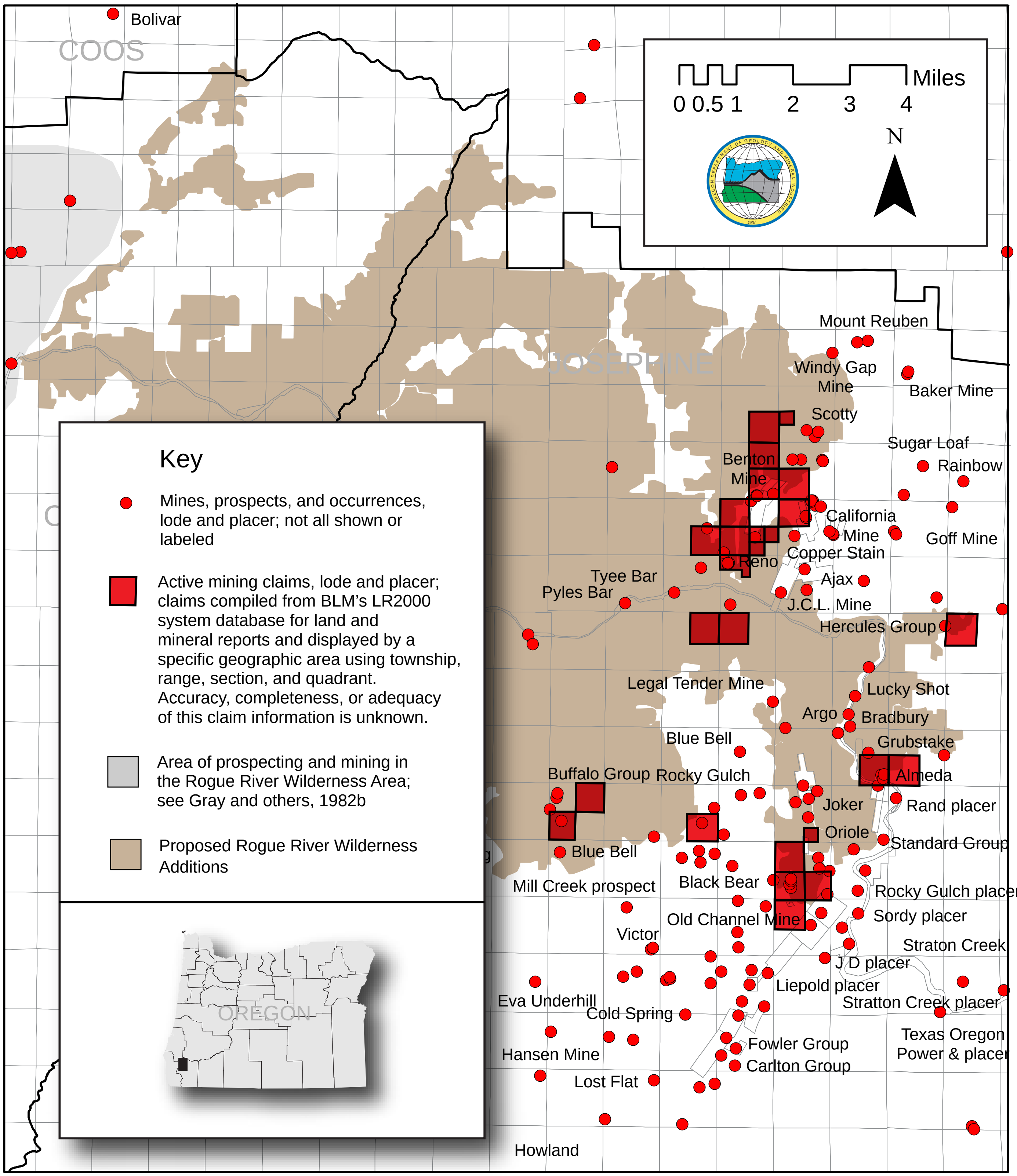

Figure 5. Locations of active mining claims within the proposed Rogue Wilderness Area Additions and Wild and Scenic River Additions.

Figure 6 is a map showing the location of mines and prospect in or adjacent to the proposed RRWA. These mines and prospects lie mostly along a northeast-trending zone, approximately 5 miles wide and 15 miles long, from Mount Reuben across the Rogue River to the Howland mine near Cedar Mountain on the headwaters of Silver Creek.

According to Ramp and Peterson (1979), gold production came largely from the Benton Mine (18,500 oz), Gold Bug (37,500 oz), and J.C.L. (5,000 oz). Production of gold and silver was also credited to the Ajax, Copper Stain, and Golden Wedge Mines (not labeled in Figure 6). These mines are concentrated in the northern part of the Galice area, north of the Rogue River, in what was referred to as the Mount Reuben district (see Figures 7 and 8).

Youngberg (1947, p. 8) called attention to the general relationships for the Mount Reuben district between the geology and lode mineralization (Figure 8). He indicated that the "...greenstone rock...contains numerous veins from which considerable amounts of gold have been mined..." and points out the "...favorability of metavolcanics for gold deposits...". He further stated that "...this production has come largely from short and narrow ore shoots along rather prominent major shear zones, usually at their junction with a minor fissure."

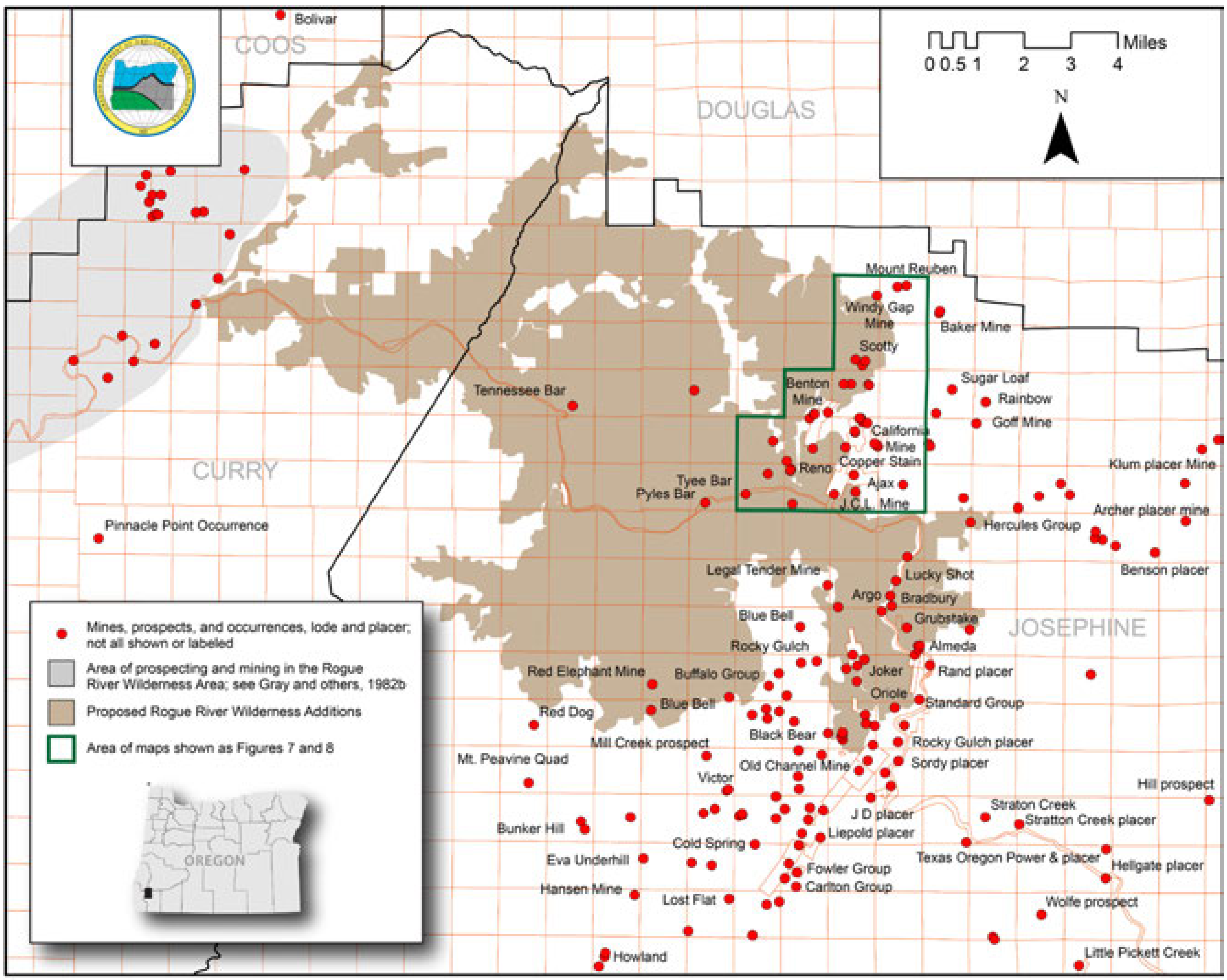

Figure 6. Mineral locality map showing mines and prospects included in or adjacent to the proposed Rogue Wilderness Area Additions. Data from Mineral Information Layer for Oregon database (Niewendorp and Geitgey, 2010).

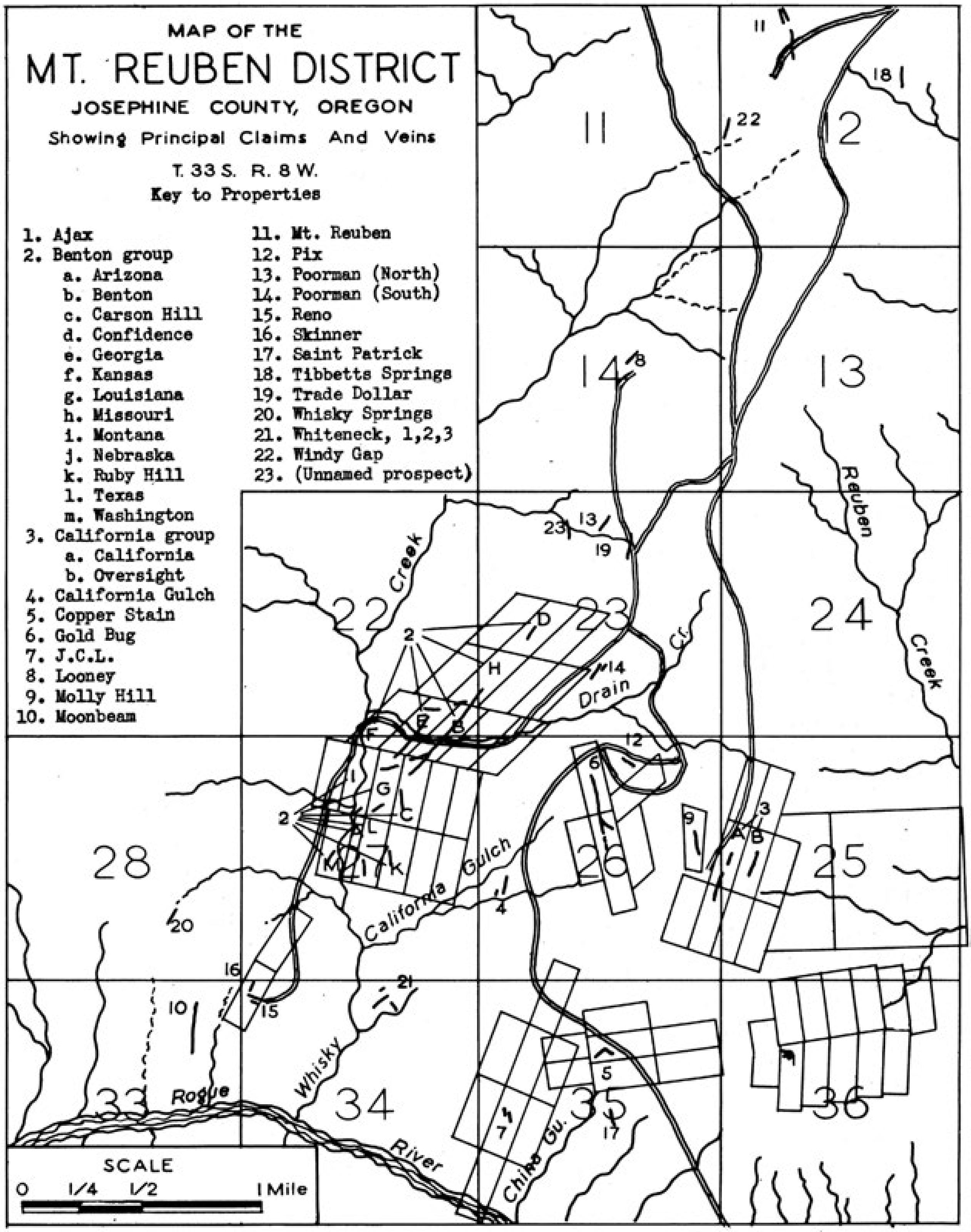

Figure 7. Map of the gold deposits in the Mount Reuben mining district (Youngberg, 1947); see Figure 6 for location of map.

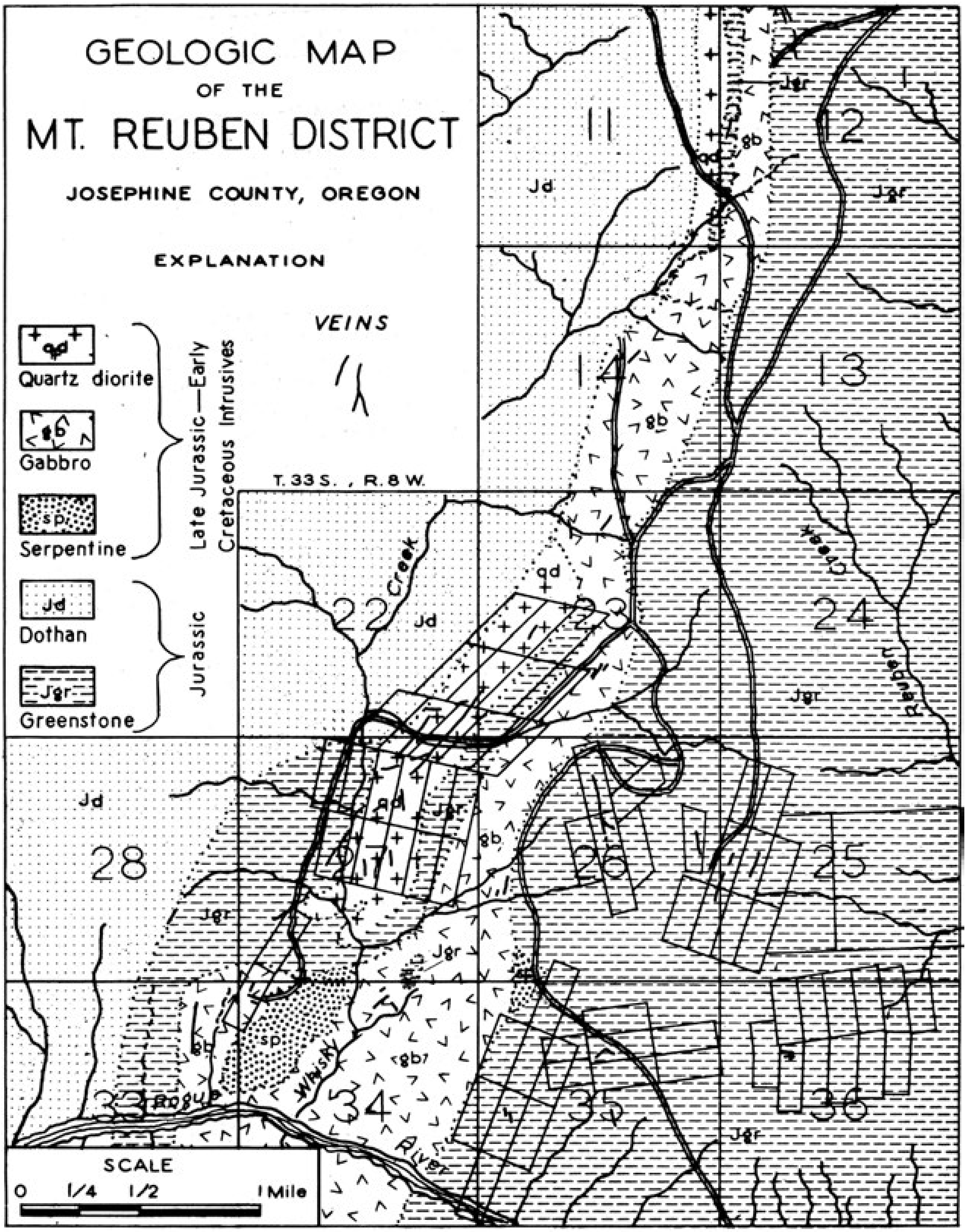

Figure 8. Map showing the relationship between geology and mineralization in the Mount Reuben mining district (Youngberg, 1947); see Figure 6 for location of map.

The most productive veins, however, were in a quartz diorite stock at the Benton Mine, where eight persistent veins containing ore shoots as much as several hundred feet long were found hosted in a fault system either in an oblique-slip fault system or in shear couplet structures (David Brown & Associates, 2007). This stock is about 1.75 miles long with an average outcrop width of about 2,500 feet (Youngberg, 1947).

Veins in the gabbros have been essentially nonproductive in terms of gold, although they are fairly persistent with chalcopyrite and pyrite as the principal sulfide minerals. Rare gold-quartz veins crop out near and in serpentine.

Lode veins consist of quartz-filled fissures; quartz in the veins is typically massive and contains inclusions of silicified and altered wall rock. The principal mineralogy of the veins is quartz and pyrite with gold associated with pyrite. The quartz-vein systems in the metavolcanics are as thick as 1 to 4 feet and as long as 2,000 feet. Veins of the greater size are associated with the quartz diorite stock. Gold content, especially if high, is generally unevenly distributed. Overall, minable gold content in mineralized quartz veins is probably 0.06 ounces to several ounces per ton.

Deposits in the southern part of the Galice area are mainly east of the gabbro intrusive complex (see Figure 2). Most of the mines and prospects are in a belt of amphibolite gneiss (amphibolite-grade metamorphic rocks) that lies between a narrow wedge of metavolcanic rocks of the Rogue Formation and the gabbroic intrusive complex. A few are in Rogue Formation greenstones, and a few are in the gabbroic rocks of the complex. Vein structure and mineralogy overall in the southern part of the Galice area are similar to those in the northern portion (Hotz, 1971).

The exception is the Almeda Mine, a volcanogenic deposit (see Figure 6 for mine location; Figure 2 for geologic setting). This mine is situated on the north bank of the Rogue River at the contact between the Galice and Rogue Formations. The geologic setting, stratigraphy, and composition of the Almeda deposit has Kuroko-type characteristics, similar to black smokers on the sea floor, associated with massive sulfides and barite deposition. The mine produced by-product gold and silver from copper ores (with barite), and the deposit yielded 259,800 pounds of copper, 7,197 pounds of lead, 1,540 ounces of gold, and 48,387 ounces of silver (Koski, 1981).

Assessment of Mineral Resource Potential

On the basis of this desktop mineral scoping investigation by DOGAMI, areas within the RWAA have been classified according to their mineral resource potential. Figure 9 delineates general areas in the proposed RWAA in which potential for mineral deposits exists.

The potential for more gold and silver — together with copper — production within the proposed RWAA is in the areas where the early-day mining was done. Mineral deposits that have identifiable resource potential in the RWAA include massive sulfides, lode gold, and placer gold. The geologic criteria and mining history favorable for the occurrence of these deposits are evaluated in Tables 1 through 3, respectively.

The potential for copper, lead, and zinc resources exists in volcanogenic deposits in the form of massive sulfide deposits in felsic and intermediated volcanic rocks (Figure 9; see unit dp [dacite porphyry] in Figure 4). Previous investigations by Shenon (1933) and Libbey (1967) suggest that there may still be a large deposit of mineralized rock at the Almeda Mine and that others may possibly occur associated with similar host rocks along the contact between the Galice and Rogue Formations.

Gold and silver potential, considered **Medium** to **High** (certainty level D; see Part IV, Appendix) in the eastern one quarter of the proposed RWAA, exists as vein gold and silver in quartz veins. Favorable host rocks include metavolcanic (the most common host), quartz diorite, amphibolite, and gabbroic rocks (Figures 4, 8, and 9). The creeks with these bedrock sources of gold also contain associated placer gold deposits.

The existence of a mineral resource is permissive (a **Low** potential, certainty level C) in the Dothan Formation, as well as areas composed of landslides and ultramafic rocks (serpentine and peridotite) (Figures 4 and 9).

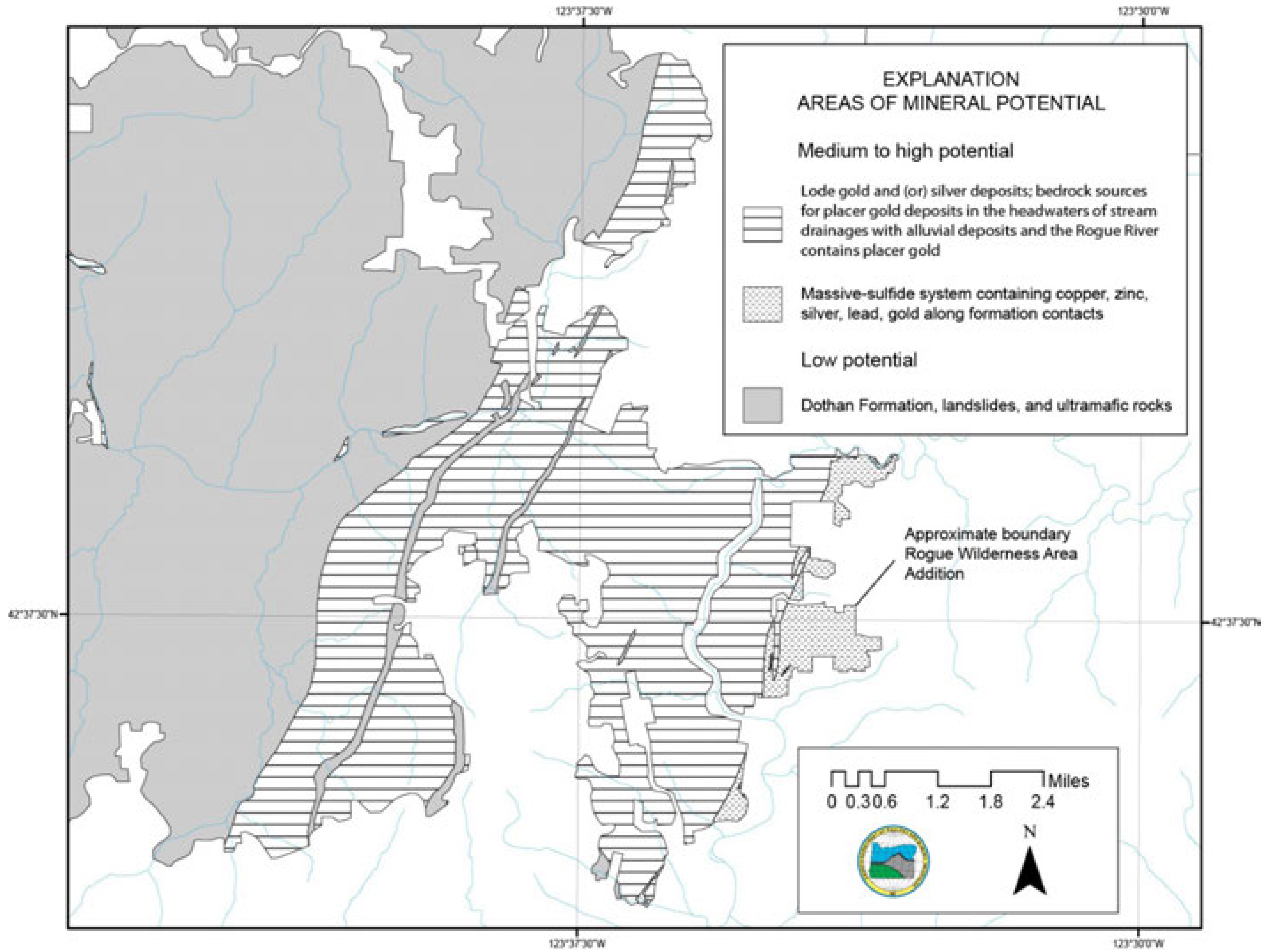

Figure 9. Sketch map showing areas of mineral resource potential in the eastern half of the proposed Rogue Wilderness Area Additions.

Table 1. Conditions favorable for the occurrence and mining of mineral resources for copper, zinc, lead, silver, and gold in volcanogenic deposits of the proposed RWAA (modified after Gray and others, 1982b).

Conditions	Conditions met in the RWAA?
Presence of compositionally intermediate to felsic calc-alkaline volcanic rocks indicative of late-stage volcanic activity in a subaqueous island-arc environment; for example, pyroclastic rocks interbedded with immature volcaniclastic sedimentary rocks and silicic volcanic rocks	yes
Occurrences of strata-bound lenses of pyritic base-metal sulfide in clusters with intragroup spacing of one to several miles	partially to yes
Low-grade dissemination of vein mineralization, and hydrothermal alteration is typically stratigraphically lower than strata-bound lenses	yes
Abundance of pyroclastic and rhyolitic rocks in the volcanic sequence, usually restricted to the late stages of volcanism in the area	yes
Adequate tonnage and grade	partially
Simple geology with limited faulting	partially
Ease of underground mining	partially to yes
Ease of milling and concentration techniques available for this type of deposit; flotation would probably work well for concentration	yes

Table 2. Conditions favorable for the occurrence and mining of mineral resources for lode gold deposits of the proposed RWAA (modified after Gray and others, 1982b).

Conditions	Conditions met in the RWAA?
Occurrence of gold in quartz veins	yes
Presence of favorable host rocks, including metavolcanic, quartz diorite, and gabbroic rocks	yes
Presence of rocks broken up by faults/shearing along with gold-bearing veins may occur	yes
Presence of quartz veins on the surface with hydrothermal circulation patterns superimposed on host rocks	yes
Grades in the range of ≥2 oz gold per ton for small deposits, and ≥0.5 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 at 50 tons per day (1982 conditions)†	partially to yes
Ease of underground mining	partially to yes
Concentration techniques available for this type of deposit	yes

† *Cutoff grades could be substantially less given today's higher market gold price.*

Table 3. Conditions favorable for the occurrence and mining of mineral resources for placer gold deposits of the proposed RWAA (modified after Gray and others, 1982b).

Conditions	Conditions met in the RWAA?
Presence of known resources of placer gold	yes
Occurrence of alluvial and river-terrace deposits	yes
Presence of a bedrock source for gold in the headwaters of stream drainages with alluvial deposits	yes
Presence of quartz veins on the surface with hydrothermal circulation patterns superimposed on host rocks	yes
Grades in the range of ≥0.05 oz per cubic yard (when mined at 5 yds^3 per day), or ≥0.005 oz 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 to yes
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

† *Cutoff grades could be substantially less given today's higher market gold price.*

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PART IV. APPENDIX

Method and Limitations

For this mineral scoping report, DOGAMI did not conduct site-specific work (a field examination) or related activities (e.g., systematic geological, geophysical, and geochemical and hydro-geochemical examination) as a basis for determination or confirmation that a mineral resource potential, deposit, or mineral occurrence exists. Statements in this mineral scoping report relating to geology and mineral resource potential are based solely on basic desktop research, the outcome of which is limited to the available literature sources — including any deficiencies — as the means to profile the mineral potential.

For the desktop research, heavy reliance is made on review of published and unpublished geology and mineral/material resource literature available at DOGAMI. Also, extensive use is made of two DOGAMI geospatial datasets: the Mineral Information Layer for Oregon (MILO-release 2) and the Mineral Lands Regulation and Reclamation (MLRR) database of mining operations permitted since 1972.

Where this review indicates a low resource ranking might exist, it is important to understand that the ranking could reflect a lack of information rather than a lack of a potential resource. Users of this report are advised to consult with DOGAMI to gain a better understanding of inherent limitations of the information presented in this report and its scope of inference. Users of this report are also responsible for the appropriate use of the information contained herein. Definitions for the levels of mineral resource potential and levels of certainty of the assessment are below (modified after Goudarzi, 1984).

Finally, one more area is relevant to this statement of context. From an inventory of mineral occurrences it is not possible to accurately identify the concentration and occurrence of material in relation to its particular geographical controls, its inherent physical (volume of material present or removed, and reserves remaining) and chemical properties, the quantity of valuable mineral or rock that it contains, its applicable extraction and processing methods, or its geographic location with respect to the markets for its products. An inventory of mineral occurrences alone cannot be used for appraisal or basis for other generally accepted industrial standard for valuing the property.

Levels of Resource Potential

HIGH mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of the data indicate high degree of likelihood for resource accumulation, where data support mineral-deposit models indicating presence of resource, and where evidence indicates that mineral concentration has taken place. Assignment of high resource potential to an area requires some positive knowledge that mineral-forming processes have been active in at least part of the area.

MEDIUM mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics indicate a geologic environment favorable for resource occurrence, where interpretations of the data indicate high degree of likelihood for resource accumulation, and (or) where an application of mineral-deposit models indicates favorable ground for the specified type(s) of deposits.

LOW mineral resource potential is assigned to areas where geologic, geochemical, and geophysical characteristics define a geologic environment in which the existence of resource is permissive. This broad category embraces areas with dispersed but insignificantly mineralized rock as well as areas with obvious site limitations and little or no indication of having been mineralized.

NO mineral resource potential is a category reserved for a specific type of resource in a well-defined area.

UNKNOWN mineral resource potential is assigned to areas where information is inadequate to assign a low, moderate, or high level of resource potential.

Levels of Certainty

A. Available information is not adequate for determination of the level of mineral resource potential.
B. Available information only suggests the level of mineral resource potential.
C. Available information gives a good indication of the level of mineral resource potential.
D. Available information clearly defines the level of mineral resource potential.