The Mineral Potential of Lands Proposed for Wilderness Classifications in Idaho with Emphasis on the Rare II Roadless Area

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Idaho Geological Survey
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THE MINERAL POTENTIAL OF LANDS PROPOSED FOR WILDERNESS CLASSIFICATION IN IDAHO WITH EMPHASIS ON THE RARE II ROADLESS AREAS

by

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and

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INTRODUCTION

This report reviews the mineral potential of areas within Idaho that are being studied for possible inclusion in the Wilderness System by the Department of Agriculture, U. S. Forest Service. In particular, it examines the mineral potential of land in the Roadless Area Review and Evaluation program, RARE II.

Data on the mineral potential in Idaho have been collected from several published and unpublished studies and compilations that are now combined for the first time. It is unfortunate that more thorough studies cannot be conducted for each of the RARE II areas. However, the data as presented will show that if many of the RARE II areas are closed to mineral entry, such closures may have a drastic impact on the state and national mineral economy. A few short paragraphs are included at

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the beginning of this report to familiarize the reader with some background in mineral economics as related to land-use planning.

THE IMPORTANCE OF MINERALS IN THE U. S. ECONOMY

Without an abundant supply of minerals for energy and industrial production, the life-style and general economy of the United States would deteriorate alarmingly, and the position of the U.S. as the world's leading industrial nation would also be in jeopardy. Almost everything that we use in our daily lives and everything that has allowed us to form our industrial society is based on minerals. In 1972, for example, domestic raw materials valued at $32 billion were converted into energy and processed goods valued at over $150 billion. For that year these products formed the base for much of the gross national product of $1.1 trillion (Mining and Minerals Policy, 1973). Looking at it in another way, the total mineral production for the eleven contiguous western states plus Alaska from 1924-74 was $370 billion (Table 1). Total mineral production in the entire U.S. during the same 50-year period exceeded $2 trillion or about $10,000 for each person living in the United States (Task Force Report, 1977, p. 17).

HOW LONG WILL OUR MINERALS LAST?

Table 2 lists sixteen metals (Group 3) that are probably available as "estimated undiscovered resources" in quantities adequate to meet domestic needs for the next 25 years and the six metals (Group 4) that are probably not in adequate supply even in undiscovered ore bodies

Map Number	Area Name	Total Acres	USFS[1] Classification Alternatives c d e f g h i	USFS[2] Mineral Appraised C NC O/G G U C	USGS[3] Mineral Potential	Mining District	District[4] Production	Recent Activity	# of[5] Mines/ Prosp. MILS	Geoth.[6] from MILS	Environ.[7] Group Suggestions
4454	Pinnacle Peak	44,257	w w w w		100% H	Edwardsburg	$		33		w
4456	Placer Creek	7,141	w	y y	100% H	Edwardsburg	1,047,963	Yes	4		w
4457	Smith Creek	2,257	w	y y	100% H	Edwardsburg			0		w
4505	McEleny	33,625	w w	y	100% H	Yellowjacket	4,837,500	Yes	27		w
4553	S. Fk. Boise-Yuba River	167,047	w	y y	100% H	Yuba, Skeleton Ck. Big Smokey, Vienna	2,150,000 1,327,290		16	Yes	
4453	Meadow Creek	22,315	w	y	100% H	Yellowpine	113,850,000[8] 66,650,000	Yes	6		
1922 + 4922	Rapid River	28,100		y y	100% H	Crooks Corral[9] Mountain View, Seven Devils		Yes	20		
4207	Loon Creek	155,210	w	y y y y	100% H	Loon Creek	7,637,058	Yes	48	Yes	w
4504	Panther Creek	94,474	w w	y	85%H 15%M	Blackbird	477,135,000[10]	Yes	4		w
4611	Garns Mtn.	114,790		y y y	80%H 20%L	Horseshoe Basin, Pine Creek		Yes	11		
4503	Lemhi Range	194,700	w	y	75%H 15%M 10%L	McDevitt, Junction Bluewing Texas	27,299,644 2,500,000		48		
4202	Camas Creek	142,600	w	y	75%H 25%L	Gravel Range				Yes	w
4066	Sulphur	336,955	w w w	y y y	75%H 25%L	Seafoam, Loon Creek, Sheep Mountain Parker Mtn.	11,650,140 537,500	Yes	19	Yes	w w
4201	Pioneer Mtn.	58,368	w	y	50%H 40%M 10%L	Alto, (Copper Basin), Little Wood River	230,000	Yes	18		
4945	Italian Peaks	5,240	w		40%H 20%M 40%L	Nicholia, Birch Creek	5,000,000		36		w
1941 + 4941	Blue Joint	20,000	w w w		100%M	None			0	Yes	w
1981	Salmo Priest	8,330	w w w w w	y	100%M	Priest Lake		Yes	1		w
1125	Selkirks	110,630	w w w		100%M	Porthill			1		w
1845	Meadow Creek	105,600		y y	85%M 15%L	None			0		
4551	White Cloud-Boulder	242,688		y y	80%M 20%L	Alto, E. Fk. Boulder Ck.		Yes	2	Yes	
1846	Middle Bargamin	12,800	w w w		80%M 20%L	Green Mtn.			0		w
1921	Gospel Hump	134,330		y y	75%M 25%L	Dixie	16,125,000	Yes	9		w
4601	Diamond Peak	89,033	w	y	10%H 70%M 20%L	Spring Mtn. Hamilton, Dome	13,992,340		17		
4921	Gospel Hump	168,020	w	y	20%H 40%M 40%L	Warren Marshall Lake	37,217,972	Yes	1		w
A1301 + H1301	Hoodoo	151,400	w w		95%L 5%M	Moose Creek Blacklead			9		w
4455	Lick Creek	165,771	w w	y	75%L 25%M	Resort			40	Yes	w
4461	French Creek	127,363			60%L 40%M	Resort			3		
1306	Big Horn-Weitus	261,900			70%L 30%M	Moose Creek Blacklead			0		
1847	Mallard	23,300	w w w		100%L	None			0		w
4210	Borah Peak	138,304	w w		100%L	None			4		
1300 + 1799	Mallard Larkin	138,600	w w	y y	100%L	St. Joe Moose Creek			2		w
1662	Scotchman	506	w w w w	y y	100%L	Clark Fork		Yes	9		w

1. Classification based on USDA Forest Service Environmental Statement Roadless Area Review and Evaluation II (RARE II) 1978.
2. C-critical minerals, NC-non-critical, O/G-oil and gas, G-geothermal, U-uranium, C-coal, Y-yes (USDA Forest Service Environmental Statement, 1978).
3. From U. S. Geological Survey Open-File Report 78-36, Map of Idaho RARE II Mineral Resource Potential, (H-High, M-moderate, L-low).
4. Based on best available estimates. District production figures converted to current price of gold, $215/oz.
5. Number of mineral prospects from U. S. Bureau of Mines MILS data.
6. Presence of geothermal resources from U. S. Bureau of Mines MILS data.
7. From RARE II in Idaho: A Citizen's Alternative, 1978.
8. Value of antimony reserves at present prices. Mines also produced in excess of 310,000 oz/gold (value today $66,650,000).
9. The Crooks Corral, Seven Devils and Mountain View districts produced 420,000 pounds of copper and there has been a great deal of recent exploration activity in this area. Considerable reserves are known to exist in some of the old mines.
10. Estimated value of reserves in the Blackbird mine. This mine has produced approximately 14,000 oz/gold (value today $3,010,000). Cobalt/copper production was $36,110,946.

Table 1: Summary minerals data for selected RARE II areas, central Idaho.

Table 1.

Land used for mining except oil and gas (1930-71)
and the cumulative value of raw mineral production (1924-74) in 1975 prices

	Total State Land Area (1,000 acres)	Area Used for Mining[1] (1,000 acres)	Percent of Total	Mineral Lands Reclaimed (1,000 acres)	Percent Reclaimed	Value of Mineral Production (billion dollars)
Alaska	365,482	29.6	0.01	10.6	35.8	7.2
Arizona	72,688	102.0	.14	6.9	6.7	34.4
California	100,207	227.0	.23	43.9	19.3	134.2
Colorado	66,486	48.8	.07	14.0	28.7	27.2
Idaho	52,933	41.3	.08	8.6	21.0	9.4
Montana	93,271	42.8	.05	10.6	24.8	19.6
Nevada	70,264	41.1	.06	4.0	9.8	8.3
New Mexico	77,766	47.8	.06	9.8	20.5	53.3
Oregon	61,599	34.0	.06	8.9	26.3	2.1
Utah	52,697	66.7	.13	6.4	9.6	34.8
Washington	42,694	35.9	.08	9.7	27.1	4.1
Wyoming	62,343	28.3	.05	8.9	31.4	35.6
12 state total	1,118,412	745.3	.07	142.4	19.1	370.1
Total U.S.	2,271,304	3,650.0	0.16	1,460.0	40.0	2,016.9

[1]Includes surface area actually excavated, used for disposal of overburden and waste, subsided or disturbed because of underground mining, used for disposal of underground mine waste, and used for disposal of mill or processing waste.

Source: Task Force Report, 1977, p. 17.

Table 2.

General outlook for domestic reserves and resources through 2000 A.D.

[Within each group commodities are listed in order of relative importance as determined by dollar value of U.S. primary demand in 1971. An asterisk marks those commodities which may be in much greater demand than is now projected because of known or potential new applications in the production of energy.]

Group 3: Estimated *undiscovered* (hypothetical and speculative) *resources* in quantities adequate to fulfill projected needs beyond 25 years and in quantities significantly greater than *identified subeconomic resources*; research efforts for these commodities should concentrate on geologic theory and exploration methods aimed at discovering new resources.

Iron	Platinum
*Copper	Tungsten
*Zinc	*Beryllium
Gold	*Cobalt
*Lead	*Cadmium
Sulfur	*Bismuth
*Silver	Selenium
*Fluorine	*Niobium

Group 4: *Identified subeconomic* and *undiscovered resources* together in quantities probably not adequate to fulfill projected needs beyond the end of the century; research on possible new exploration targets, new types of deposits, and substitutes is necessary to relieve ultimate dependence on imports.

Tin	*Antimony
Asbestos	*Mercury
Chromium	*Tantalum

Source: U. S. Geological Survey, 1976, p. 6, part of Table 2.

(USGS, 1976, p. 17). These two groups contain most of the essential and strategic metals that the U.S. needs to sustain its life-style and economy. Note that all are shown as adequate in "undiscovered" resources. *This means that we will only have these minerals in the quantity needed in the future if we continue with constant exploration and development.* Known domestic reserves of many strategic minerals represent only a few years' supply.

HOW MUCH OF OUR MINERAL SUPPLY IS IMPORTED?

Many people are unaware that the United States is highly dependent on foreign sources for some commodities. This lack of awareness was made painfully clear by the shock of U. S. citizens over the Arab oil embargo. The balance of payments deficit in the U.S. and the declining value of the dollar against foreign currencies are directly related to the United States' dependence on foreign oil and to the trade deficit in other commodities, including mineral imports and exports.

Unfortunately, foreign oil is not the only commodity imported by the U.S. From 50 to over 90 percent of many important metals are imported (Table 3). These metals include gold, silver, tungsten, nickel, aluminum, chromium, and platinum. One of the major sources for several of these metals is southern Africa, where political unrest could curtail the export of these commodities. At the present time, there are no known domestic sources that can provide these metals in the quantities required. Recycling, substituting one metal in place of another, or a technologic breakthrough in replacing a metal by other materials can help alleviate part of this reliance upon foreign imports, but these

Table 3.

Dependence of United States on foreign sources

for some of its minerals

A.	Less than one-half imported from foreign sources:	
	Copper	Tellurium
	Iron	Stone
	Titanium (Ilmenite)	Cement
	Lead	Salt
	Silicon	Gypsum
	Magnesium	Barite
	Molybdenum	Rare earths
	Vanadium	Pumice
	Antimony	
B.	One-half to three-fourths imported from foreign sources:	
	Zinc	Nickel
	Gold	Cadmium
	Silver	Selenium
	Tungsten	Potassium
C.	More than three-fourths imported from foreign sources:	
	Aluminum	Tantalum
	*Manganese	Bismuth
	Platinum	Fluorine
	Tin	*Strontium
	*Cobalt	Asbestos
	*Chromium	*Sheet mica
	*Titanium (Rutile)	Mercury
	*Niobium	

*Commodities more than 90 percent imported.

Source: Mining and Minerals Policy, 1973.

alternatives cannot provide the metals that the U.S. will need for future orderly economic growth and security. Indeed, even a subsistence level at present day requirements may not be maintained. If at all possible, domestic sources of these metals should be located to help alleviate the dependence on foreign suppliers.

WHERE WILL WE FIND THE MINERALS FOR PRESENT AND FUTURE USE?

The federal government owns or manages approximately 762 million acres or about one-third of the land in the U.S. Almost one-half of this land is in Alaska, and 90 percent of the rest is in the 11 contiguous western states (Figure 1). In Idaho 64 percent of the land is federally controlled (Table 4). It is estimated that 85 percent of the mineral potential of this country is in the eleven western states and Alaska. Obviously in the years ahead, many of the new minerals must come from the western U.S.

HOW MUCH LAND IS USED FOR MINING?

There are 52,933,000 acres of land in Idaho. Of this, 41,300 acres, or 0.08 percent of the area of the entire state, are used for mining (Table 1). This 0.08 percent of the land produced $9.4 billion (1975 dollars) from 1924 to 1974 (Task Force Report, 1977, p. 17). A very small part of the U.S. has been disturbed by mining. Throughout the entire country less than 0.2 percent of the land has been used to provide the great mineral wealth upon which the nation's economy is based (Ohle, 1975, p. 6-14).

Table 4.

Federally owned land in 11 western states

and Alaska as of June 30, 1971

State	Federal Lands (millions of acres)	Percent of total area of State
Arizona	31.9	44.0
California	44.9	44.8
Colorado	23.9	36.0
Idaho	33.8	63.8
Montana	27.6	29.6
Nevada	60.8	86.5
New Mexico	26.0	33.5
Oregon	32.2	52.3
Utah	34.8	66.0
Washington	12.6	29.6
Wyoming	30.0	48.1
Total in 11 Western States	358.5	
Alaska	353.5	96.7

Source: U. S. Bureau of Land Management, 1972.

HOW MUCH OF THE FEDERAL LANDS IN THE WEST ARE CLOSED TO MINERAL ENTRY?

Several studies have shown that, in one way or another, approximately two-thirds of the federal lands in the west are removed from, or have restrictions imposed upon, mineral exploration and development (Task Force Report, 1977, p. 47). As has been previously noted, a large portion of these lands are highly favorable for providing the minerals that the U.S. will need in the near future. A wide variety of federal lands, other than wilderness areas, are restricted, including Native lands, Military reservations, National Parks and Monuments, and many others. Major controversies concerning withdrawals from possible mineral entry have recently focused on the U. S. Forest Service-administered lands. The U. S. Forest Service (USFS) controls approximately 160.2 million acres throughout the U.S. (Figure 2). More controversy can be anticipated as the Bureau of Land Management (BLM) under the Organic Act of 1976 begins studying and classifying lands as the USFS has done. The BLM controls approximately 463.3 million acres in the U.S. On the basis of past events, large acreages may be expected to be withdrawn from mineral entry as these studies get under way.

WHY IS IT SO DIFFICULT TO EVALUATE THE MINERAL POTENTIAL OF AN AREA?

Minerals are difficult to inventory because they are buried beneath the ground and the surficial evidence of their existence may be nil or minimal. Unfortunately, most mineral deposits cannot be inventoried

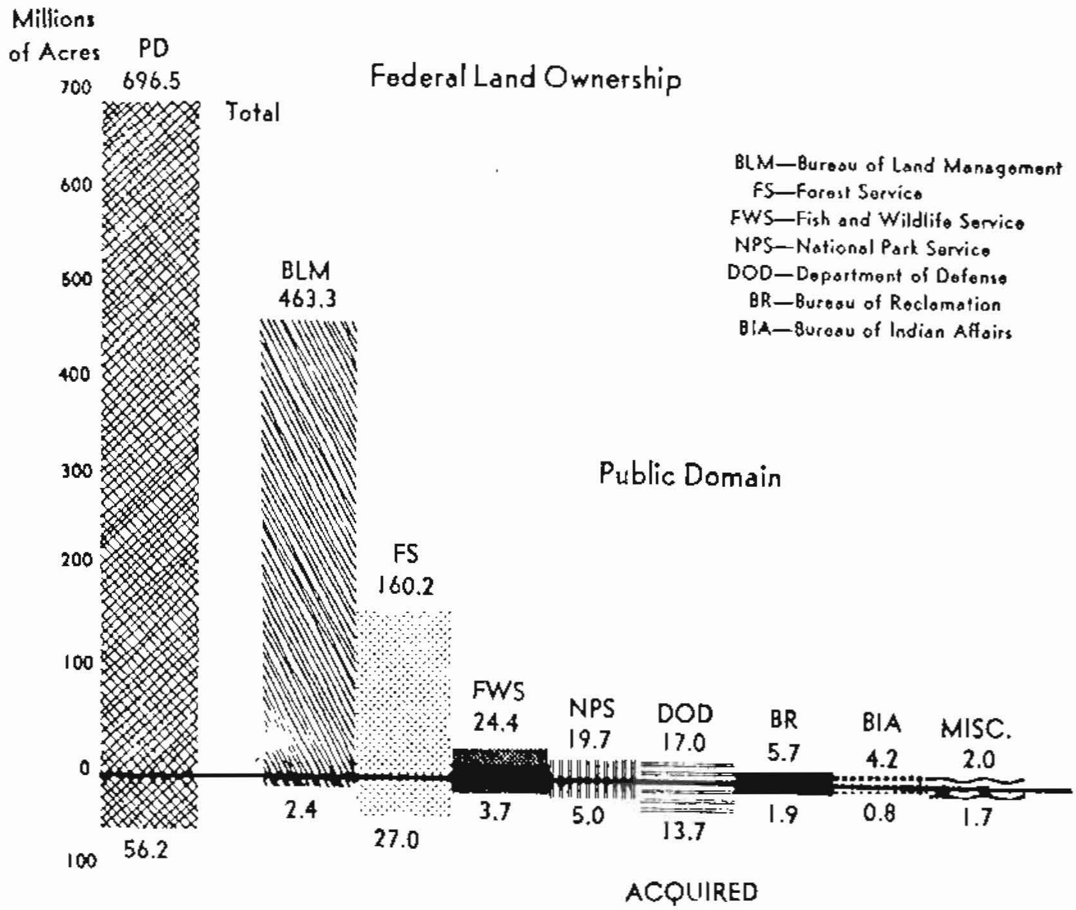

Figure 2. Federal land ownership (Task Force Report, 1977, p. 37).

like trees, plants, and animals that can be easily counted. Minerals are site specific; they occur only in places where the geology is favorable for mineral deposition.

The proper geologic conditions for mineral deposition are also the proper geologic conditions that form mountains and other scenic landforms that, in turn, are often judged as having an esthetic or intrinsic value as wilderness areas. Not uncommonly, such value is judged differently by people with different interests.

Because most of the ore deposits that are exposed at the surface have been found by early prospectors, it is difficult and costly to find deeper, hidden mineral resources. Exploration today requires more sophisticated techniques that use geochemistry, geophysics, geology, and remote sensing. Important discoveries still require a great deal of luck.

Mineral deposits are unique geologic occurrences requiring a concentration of elements many times the amount normally widely disseminated in the earth's crust. It takes 60 times the concentration of copper and 3,500 times the normal concentration of gold to make a mineral deposit of potential value (Ohle, 1975, p. 614). Even when this degree of concentration occurs, the deposit must be large enough to constitute ample reserves for economic development. The exploration geologist does not, unfortunately, find a mineable ore body at every site of mineralization. It is estimated that *only one in a thousand prospects* has the potential to become a mine.

Minerals are nonrenewable; a hillside cannot be "planted" with copper crystals to "grow" a new mineable copper deposit. Therefore, before an ore body is depleted, it is vital that continual exploration be conducted to locate new ore resources. Otherwise the production of strategic minerals could be disrupted.

A statement that is frequently heard from advocates for wilderness areas is that we can get the minerals from areas that are designated as wilderness if and when we need them. Unfortunately, this is far from the truth. By the time a mineral shortage becomes critical, it may be too late to do anything about it because of the "lag time" between finding the ore body and then developing it. Examples are as follows:

a. Copper Range in White Pine, Michigan, was first discovered in 1929. Production started in 1955 at an initial investment of $61.7 million.

b. The Henderson-molybdenum deposit in Colorado required eight years to develop at a cost of $250 million.

The ultimate problem with any type of mineral inventory that relies on surface data alone is that it is impossible to tell what lies below the surface without some type of direct observation, for example, in core samples from a diamond drilling program. Drilling is the most objective way to determine the presence or absence of ore.

WILDERNESS IN IDAHO--A BRIEF HISTORY

The history of classification and withdrawal from mineral entry of federally administered, high-potential mineral lands in Idaho is shown in Figure 3:A-D. The original areas proposed for wilderness classification include the Idaho Primitive Area (designated primitive in the 1930's), the Salmon River Breaks Primitive Area (combined acreage 1.5 million acres), the Selway-Bitterroot Wilderness Area (1.25 million acres), and the Sawtooth Wilderness Area (0.25 million acres). The four areas together cover more than 4,600 square miles (Harper, 1973, p. 2). Other closed areas include the National Reactor Test Site and the Craters of the Moon National Monument (Figure 3:B). All of these areas, combined with the areas originally proposed in RARE I, are shown in Figures 3:C and 3:D. This land amounts to 12 million acres, much of it in high-potential mineral resource areas that are withdrawn or may be closed to mineral entry. RARE II affects approximately 8.2 million acres of land out of the 35.8 million acres under federal management in the state, and much of this area is believed to have a high mineral potential. Several million acres of RARE II land is expected to be classified as wilderness.

The U. S. Geological Survey and the U. S. Bureau of Mines are charged with evaluating the mineral potential of proposed wilderness areas by the Wilderness Act of 1964. For the three areas originally proposed for wilderness in Idaho, two evaluations are completed. Field mapping and reconnaissance mineral exploration is finally scheduled to start this year in the Selway-Bitterroot area. Most of the RARE II areas that may be designated for possible wilderness classification obviously cannot receive much attention by the 1984 deadline stipulated in the Wilderness Act. The U. S. Geological Survey has too few people and resources to be able to carry out a comprehensive mineral evaluation over such a vast area before the deadline.

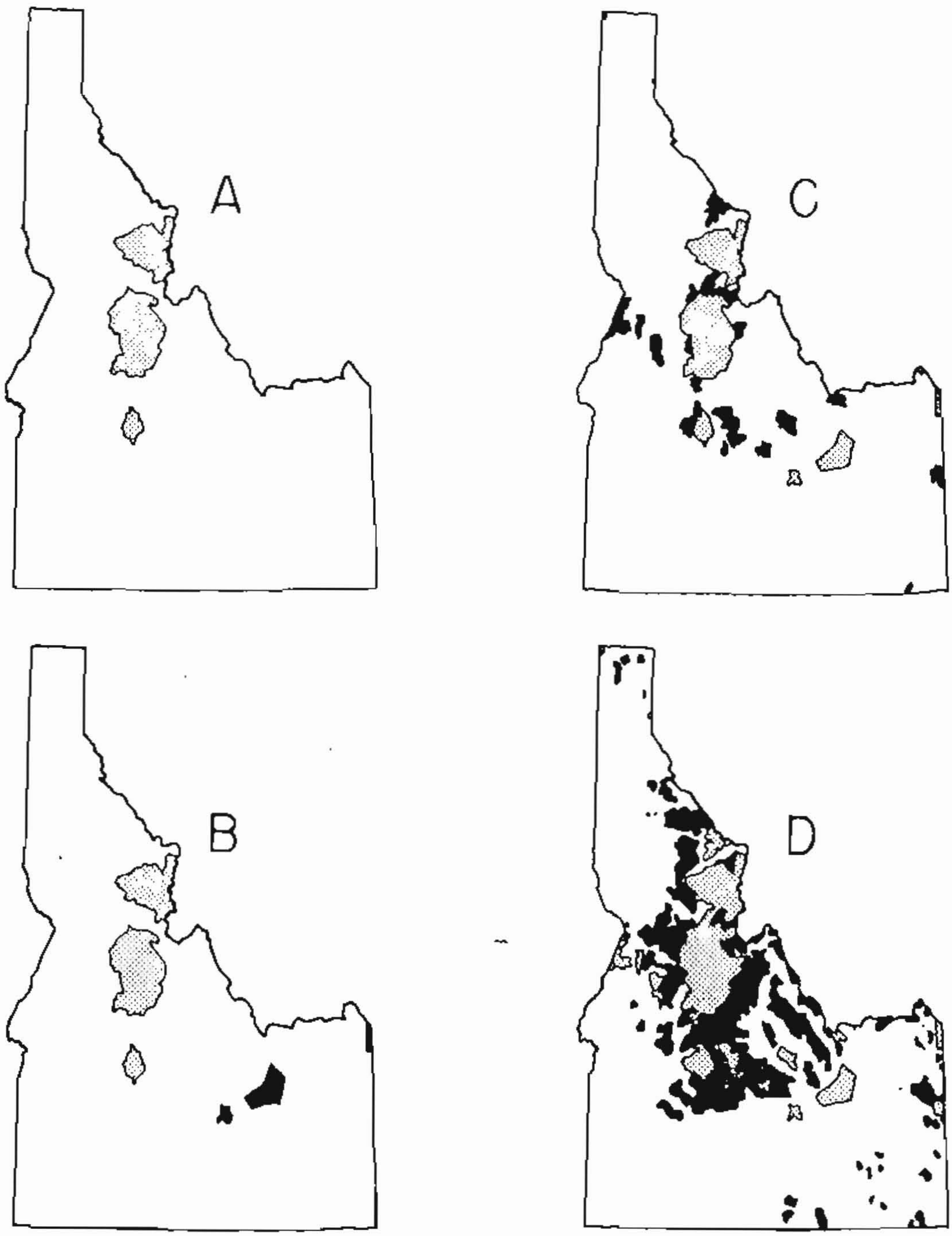

Figure 3. Stages in the evolution of the Wilderness Program in Idaho: [A] The originally proposed areas (stipple pattern). [B] Other areas in which mining activity is restricted (in black). [C] Additional areas subsequently withdrawn (in black). [D] More "roadless areas" being promoted for withdrawal (in black). (Ohle, 1975, p. 670).

TWO EXAMPLES OF MINERAL INVENTORY STUDIES IN IDAHO: THE IDAHO PRIMITIVE AREA STUDY AND THE SAWTOOTH NATIONAL RECREATION AREA STUDY

As noted, the U. S. Geological Survey and the U. S. Bureau of Mines are charged with doing mineral potential evaluations in areas proposed for wilderness classification by the Wilderness Act of 1964. A brief synopsis of two of these studies that have been completed in Idaho follows.

THE IDAHO PRIMITIVE AREA STUDY

The Idaho Primitive Area is a 1,915 square mile area in central Idaho. An additional 272 square miles is included in this study from land surrounding the original primitive area. Techniques used in the evaluation include reconnaissance geologic mapping, reconnaissance geochemical sampling (more than 3,000 stream sediment, soil, and rock samples were analyzed), and aeromagnetic survey interpretation by the U. S. Geological Survey and detailed mapping and sampling of all known mines and prospects in the area by the U. S. Bureau of Mines.

The summary statement of the U. S. Geological Survey is as follows (Cater and others, 1973):

> Our study of all aspects of the mineral resources led us to conclude that some localities in the primitive area contain or may contain a few small mineable metal deposits. Possibly some worthwhile deposits exist beneath the thick sequence of Challis Volcanics, but they would be extremely difficult and prohibitively costly to find.

The U. S. Geological Survey report devotes 55 pages to a discussion of the geology, geochemistry, and aeromagnetic survey of this vast area.

In the same report, the U. S. Bureau of Mines devotes 334 pages to describing mines and prospects that are part of the 5,400 recorded mining claims in the primitive area. Early mineral production from the primitive area and adjacent areas has a value of $95,232,000 (Cater and others, 1973, p. 55).

A different interpretation of the data collected by the U. S. Geological Survey and the U. S. Bureau of Mines in the Idaho Primitive Area is proposed by S. Norman Kesten (1973), an environmental scientist with the American Smelting and Refining Company. An adaptation of Kesten's evaluation of the USGS-USBM publication, Cater and others (1973), was prepared in 1973 by H. E. Harper, vice-president of Hecla Mining Co. The pertinent points of Harper's presentation follow (the figure numbers are changed from the original and the number substitutions herein refer to figure numbers in this document):

> While the large number of known mineral occurrences in the Idaho Primitive Area is the most obvious and direct evidence of its mineralized character, there are numerous other basic geologic criteria that are important in assessing or judging the mineral potential of the area. A number of these factors are well documented in the USGS-USBM mineral survey of the Idaho Primitive Area and I would like to briefly discuss and illustrate a few of them. . . .
>
> Figure [4] is a simplified geologic map of the Idaho and Salmon River Breaks Primitive Area-Study Area. There are 4 main rock types exposed in the Study area. The oldest are the Precambrian rocks (p€) shown as isolated remnants extending across the north central part of the area. Next are the intrusive rocks of the Idaho batholith (Ku) covering about the northerly one-third of the area, and also covering a smaller area in the southwest portion. Intruding and overlying these older rocks are younger Tertiary intrusives (Ti) and volcanic rocks (Tv) which cover much of the central and southeasterly part of the area. These younger intrusive rocks and those adjacent to them are considered the most favorable for mineral occurrences in the area. A large proportion of the important mineral deposits in the mountainous areas of western North and South America are related to similar types of Tertiary intrusive rocks. The presence of these favorable type rocks exposed at the surface along the

easterly portion of the Study area and in numerous smaller, isolated exposures intruding the older rocks in the central and southwesterly part of the area provides a favorable geologic environment for mineralization in almost all of the southerly two-thirds of the Study area.

The mineralized character of this portion of the area is also indicated by the geochemical sampling undertaken by the U. S. Geological Survey in their study of the area. Geochemistry is used extensively in modern day exploration for minerals and involves analyzing samples of rock, soil and stream sediments for a variety of metals. When a sample contains an unusual amount of any metal it is said to be anomalous. Groups or clusters of anomalous samples are referred to as geochemical anomalies, and often signify areas of exploration interest. Figure [5] shows the location of anomalous samples collected and analyzed by the U. S. Geological Survey. You will note the greatest density of anomalous sample is in the southerly two-thirds of the Study area.

As mentioned earlier, the known mines and prospects are the most direct evidence of mineralization in the Primitive areas. The USGS-USBM minerals survey report describes and gives the locations of a great many of these mineral occurrences. . . . The locations are shown in Figure [6]. Please note that while the known occurrences are scattered throughout the entire area, the greatest concentration is again in the southerly two-thirds of the area.

The distribution of the mineral prospects and the anomalous geochem samples is somewhat similar. The locations of both are shown in Figure [7] to show this relationship. This figure also shows the main rock types of the area so the spatial relation of anomalous geochem samples and known mineral occurrences to these rocks can be seen. As pointed out earlier, the Tertiary intrusive rocks (Ti) are thought to be most directly related to mineralization and these rocks together with the older rocks effected and altered by the Tertiary intrusions provides the favorable geologic environment for minerals.

Other favorable geologic criteria, the extension of mineral belts into the Study area and the presence of numerous aeromagnetic anomalies, tend to further indicate the favorableness of portions of the area for mineral exploration. The mineral belts were delineated by the Idaho Bureau of Mines and Geology (Green, 1972). . . .

To summarize and emphasize our views, we think a large portion of the Study area has a favorable and yet untested potential for mineral development. These favorable areas cannot be adequately tested if left under a restrictive

> Primitive or Wilderness type classification, but development of the mineral resources can proceed along with that of timber and other surface resources if the lands are made available to mining and placed under multiple-use type management.

An omission in these USGS-USBM projects is that the commodities that may be important in the future, such as uranium, are generally not evaluated in mineral studies for wilderness areas, because a different type of analysis and sampling technique is required to explore for uranium than for other metals. Because President Carter has committed the nation to using new, as opposed to recycled, uranium for energy, more and more new supplies of uranium ore will be needed. The Department of Energy (DOE) started the National Uranium Resource Evaluation Program (NURE) during 1977. Idaho is a prime state for having uranium potential and, therefore, is scheduled for intensive exploration in the NURE program. The Idaho Primitive Area will be resampled and examined for uranium potential, according to recent decisions. It will be most interesting to view future events. If indeed new uranium deposits are found by DOE in an area designated for possible wilderness classification by the Department of the Interior or the Department of Agriculture, will any such potential reserves be developed?

THE SAWTOOTH NATIONAL RECREATION AREA STUDY

The Sawtooth National Recreation Area study produced quite different results from the Idaho Primitive Area study. The overall mineral potential of the Sawtooth National Recreation Area (approximately 820 square miles) is described by the U. S. Geological Survey and the U. S. Bureau of Mines as follows:

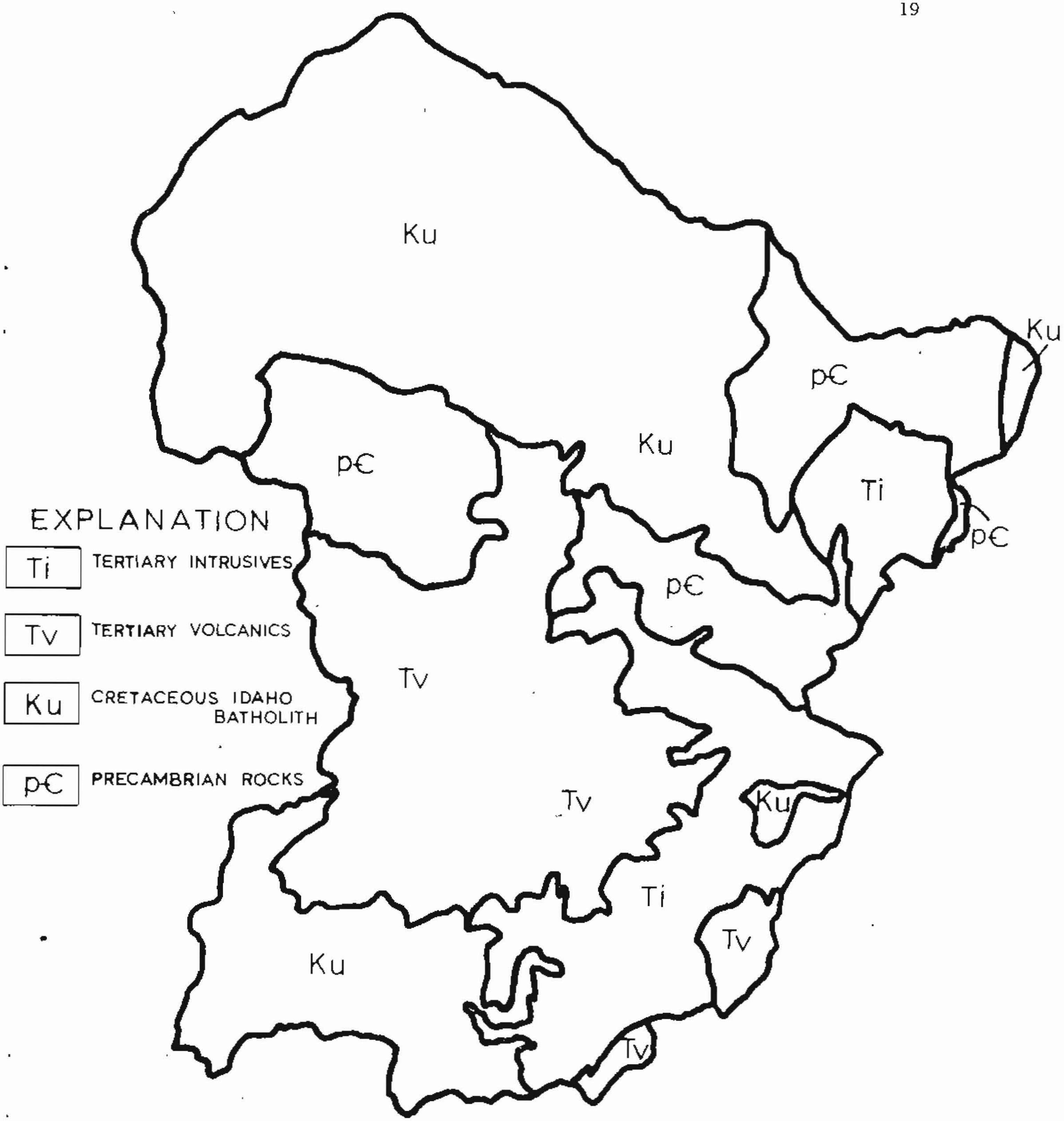

Figure 4. Geology of the Idaho Primitive Area (Kesten, 1973).

Figure 5. Samples that are anomalous in copper, lead, zinc, molybdenum, silver, cold extractable heavy metals, and cold extractable copper in the Idaho Primitive Area (Kesten, 1973).

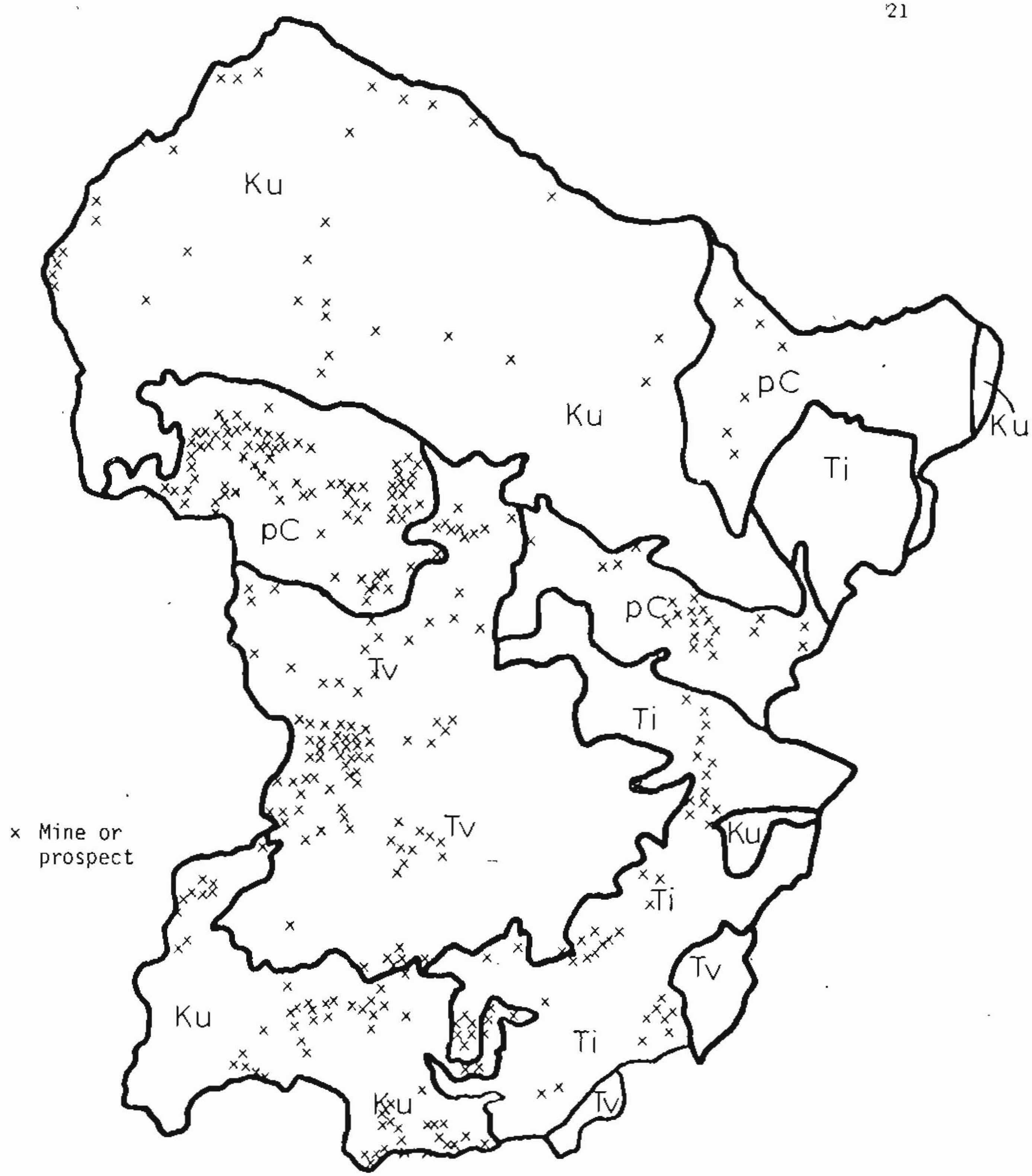

Figure 6. The location of mines and prospects in the Idaho Primitive Area (Kesten, 1973).

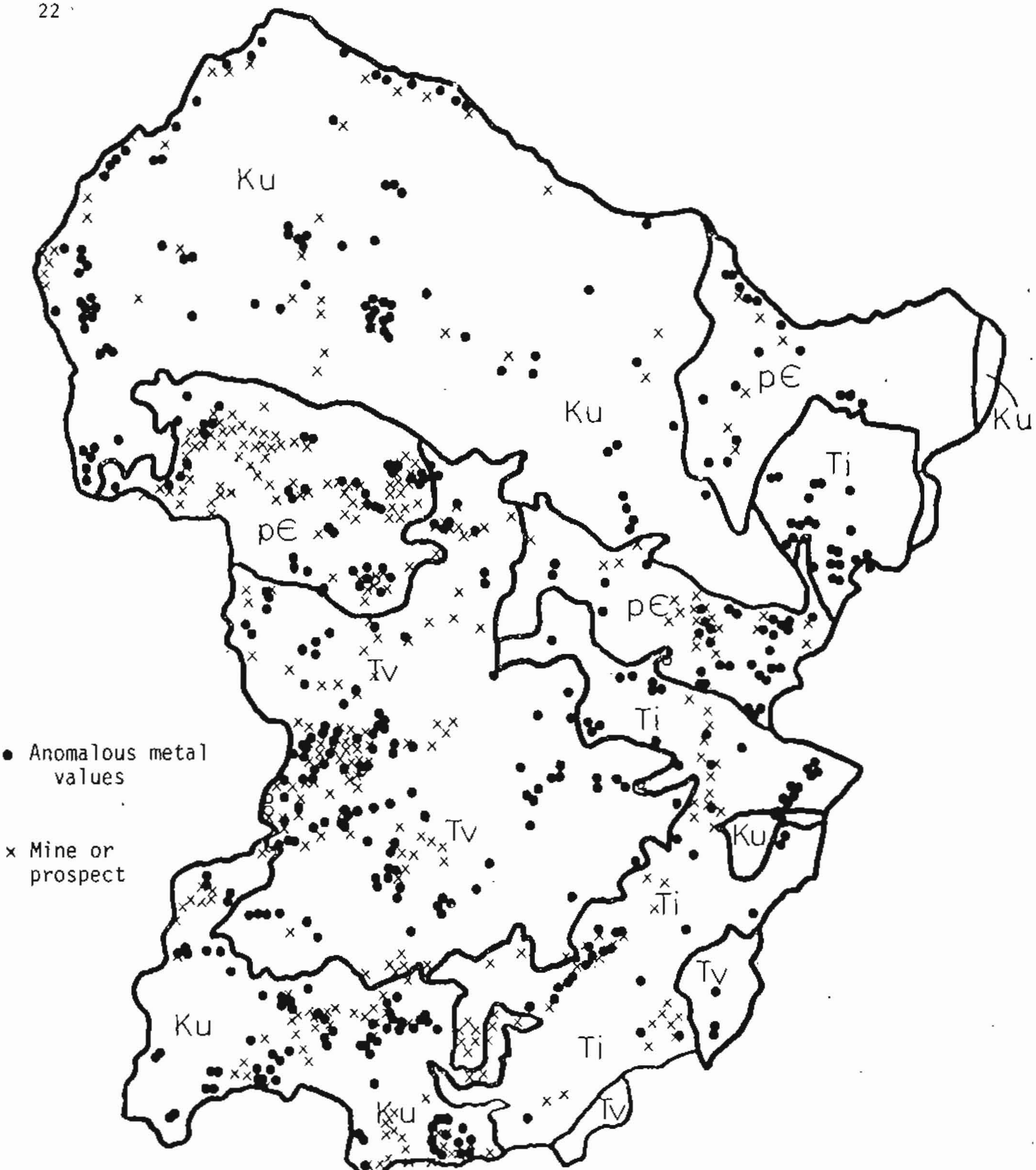

Figure 7. Anomalous samples, mines and prospects, and geology of the Idaho Primitive Area (Kesten, 1973).

> The economic potential of large parts of the study area is high and new mineable deposits of many metals will probably be developed by further exploration. . . . The potential value of the known mineral resources in the study area that are well enough known to be evaluated in this report at prices in mid-May 1973 exceeds the total historic production value by a factor of about 100 to 200. (Tschanz and others, 1973, p. 33).

Past production within the study area has been estimated at $5 million; however, production from mines within 15 miles of the study area is close to $50 million (Tschanz and others, 1973, p. 2). This area was dedicated as a National Recreation area in 1972 before the USGS' field work for that year was finished, and the data, not fully analyzed by the time of dedication, became irrelevant.

It is apparent from these two case histories that the wilderness studies were rushed to completion or completely ignored. Mining interests are concerned that there will be a similar lack of thoroughness in evaluating the mineral potential of the RARE II areas.

A MINERAL INVENTORY OF THE RARE II AREAS IN IDAHO

One of the main goals of the RARE II inventory (Figure 8) was to speed up the procedure whereby lands can be selected for wilderness classification. Yet, this speed-up has curtailed thorough mineral inventories that rely on extensive sampling and other costly and necessarily time-consuming studies. As a consequence, planners have had to resort to general studies that are based on the presence or absence of known ore deposits in the area, extrapolation, and regional geologic interpretations.

The first of these studies to be examined is based on an experiment conducted by the U. S. Forest Service for a portion of Idaho lying north of the Salmon River (Hintzman, 1976). The mineral potential of the area was estimated by the presence of known occurrences, by the presence or absence of strong faulting or other structural criteria, and by the type of rock within the area (certain rock units are considered more likely to contain mineralization than others).

The following quotation from USFS' report highlights one of the problems in this type of study:

> Stratabound mineralization was not considered in this evaluation as these deposits can occur anywhere in the Precambrian belt series rocks [sic]. This creates a situation that is difficult to appraise. It is sufficient to say that all Precambrian belt series rocks [sic] are potential hosts for stratabound mineralization.

Figure 9 shows the approximate outcrop pattern of Belt Supergroup rocks as related to RARE II areas in northern Idaho. Stratabound deposits within these rock units could be similar to the Spar Lake deposit in western Montana that is currently being developed by ASARCO. Figure 10 (Hintzman, 1976) is the map of the mineral potential for northern Idaho from the U. S. Forest Service's compilation with the RARE II areas outlined. On the basis of the USFS' study most of the RARE II areas north of the Salmon River have proven mineral potential or probable mineral potential.

A similar type of study was conducted by geologists from the U. S. Geological Survey. Their report and mineral potential map of the RARE II areas in Idaho should be open-filed shortly. USGS personnel participating in this study are some of the most competent earth scientists in mineral resource evaluation. Some are nationally recognized experts on the geology of Idaho. The map shows that extensive tracts of RARE II lands in central and southeastern Idaho are given a high priority for having mineral resource potential.

Another study evaluating the mineral potential of the RARE II areas is shown in Figure 11, a plot of known mines and prospects in or near RARE II areas in Idaho. The illustration was adapted from the U. S. Bureau of Mines Mineral Inventory Location System (MILS) map showing the location of mines and prospects, gravel pits, and geothermal springs in the state. Each point represents a cluster of up to five or more occurrences. There are a total of 5,860 entries in Idaho. Practically every RARE II area has mines or prospects enclosed within its boundaries. As noted, the presence of a mine or prospect is an obvious indication of past mineral location or production and may represent possible future mineral potential.

Figure 12 shows the same type of data more graphically. There are 183 mining districts in Idaho. A mining district is an area that at some time in the past had some substantial production of minerals. Again, it is obvious that most of the RARE II areas are covered in part, or wholly, by one or several mining districts.

Another excellent source of information similar to the MILS data is the Computerized Resources Information Bank (CRIB) system of the U. S. Geological Survey. There are currently over 3,500 mines and prospects in this system for Idaho. Unfortunately, the short time in preparing this IBMG open-file report has not permitted including a resource map on the RARE II areas from the CRIB data base.

A different type of inventory technique is shown in Figure 13. This map shows (1) the trend of "mineral belts" in Idaho (several broad structural trends that are important to the location of mineral deposits), (2) the location of recent mineral exploration in Idaho that exceeds an investment of $50,000 a year, (3) the sites of recent oil and gas activity, (4) areas with proven mineral resources exceeding $25,000,000, and (5) mining districts with past production in excess of $25,000,000. The "mineral belts" contain significant mineralization that is probably related to large scale geologic features. The Idaho porphyry belt, for example, is a corridor extending across Idaho that is characterized by numerous porphyry dikes of Tertiary age; the belt also contains significant mineralization.

It should be noted that unlike several of the previous illustrations that show only mine and prospect locations, Figure 13 shows areas with significant mineral production. As with the previous illustrations many of the RARE II areas lie within the mineral belts or have had significant past mineral production or recent major development or exploration efforts.

The last illustration is perhaps the least complicated. If the distribution of only a single metal is examined, the mineral potential in many RARE II areas becomes immediately obvious. Figure 14 is the first in a series of commodity maps in preparation by geologists at the Idaho Bureau of Mines and Geology, and it shows the location of all known gold in placer and lode deposits in the state. There is a high concentration of these gold locations in the central part of Idaho, and most of the RARE II areas in this same part of the state contain numerous gold deposits.

The previous illustrations (Figures 8-14) point out that a review of the literature shows that past production and future mineral potential are present in most, if not all, of the areas proposed for RARE II. It should be noted that this estimate of possible mineral potential is incomplete because of many unpredictable factors and a serious lack of data including the following important omissions: (1) Certain mineral commodities were not sought out in the past, and these may be of great importance in the future. Beryllium and tin are two of these commodities. Tin is an especially important strategic mineral that is in short supply in the continental U.S. Extensive granite outcrops of Tertiary age in Idaho may well be favorable hosts for tin mineralization; however, very few, if any, federal or other published studies have looked for tin in particular. (2) As old mines played out and the ore grade decreased, the mines were abandoned. However, some of these low-grade deposits may well be the high-grade ore bodies of tomorrow. An example of such an ore body is Earth Resources' DeLamar mine in Owyhee County, Idaho. High-grade lode mining within this area played out at the turn of the century. Earth Resources has recently developed a low-grade open-pit mine with an expected annual yield of 2.5 million ounces of silver and 16,500 ounces of gold. This mine may become the nation's third largest silver producer and eventually may be the largest open-pit silver mine in the world.

THE PUBLIC'S OPINION OF RARE II

Rupert Cutler, assistant secretary for Conservation Research and Education, U. S. Department of Agriculture, reported on May 6, 1977, that "in 1964 the newly established wilderness system contained 9.1 million acres, all national forest land. Since then, Congress has expanded the system in an orderly way to 14.4 million acres 86 percent of it on National Forest lands." Mr. Cutler goes on to note that "there is support for prompt action on wilderness among environmentalists, but also among those whose livelihood depend on the availability of timber and other industrial raw material from the National Forests."

On the other hand, questionnaires filled out by the public in response to the RARE II program reveal the following (Northwest Mining Association Bulletin, February 1978):

> No group considered the need for more wilderness near population centers important.
>
> Little importance was credited to the need for more wilderness for scientific or educational endeavors.
>
> Less than moderate importance was attached to preservation of a variety of landscapes.
>
> More wilderness for mental challenge attracted few.
>
> There was almost no demand that wilderness areas be large.
>
> Most thought a wilderness should be scenic.
>
> Few felt the need to establish new wilderness areas within a day's travel.
>
> Moderate importance was given to the ability to manipulate wildlife habitat.

It is notable that this compilation of questionnaire results shows that the majority of the 50,000 respondents consider the production of timber, mineral, and energy resources to be the most important use of U. S. Forest Service's land now being studied for RARE II. According to the report, the need to provide areas within the USFS' lands for motorized or intensive recreational uses has been judged to be second most important.

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