

# CHAPTER 3

## AFFECTED ENVIRONMENT

Chapter 3 describes existing conditions in the Garnet Resource Area that will be affected by resource management options. The information in this chapter is a summary of the Garnet Resource Area Management Situation Analysis (MSA). The MSA is available for review at the Garnet Resource Area office.

### SETTING

The Garnet Resource Area (GRA) includes the nine northwestern counties of Montana (see the Percent of Public Surface Ownership map). Of these nine, only three counties have a large amount of public land: Missoula, Granite, and Powell. Therefore this chapter will focus on the core area formed by these three counties.

The core area has timbered mountain ranges with narrow canyons. The ranges are separated by the Clark Fork and Blackfoot rivers and lie between the Bob Marshall Wilderness area to the north and the Anaconda/Pintler Range to the south. The city of Missoula is west of the core area and Helena, east (see the Land Status map in the map packet).

There is a total of 4,277,120 acres in the three counties. The Garnet Resource Area manages 145,660 acres.

The GRA is part of the Butte District, which was organized in 1976. The resource area was named for the Garnet Mountain Range.

Other large landholders in the core area are the Lolo and Deerlodge National Forests; Plum Creek Timber Company Inc.; Champion Timberlands; the Department of State Lands; the University of Montana, School of Forestry; and the Montana State Prison Ranch. Most of the lands are rural in character with forestry and agriculture being the most important resource uses. A few small towns dot the area; Seeley Lake, Philipsburg, Drummond, Deer Lodge, and Garrison are the largest of these.

The climate is a modified coastal type. Precipitation and number of cloudy days are greater than would be expected in a continental mountain range. This coastal influence also keeps temperatures and wind speeds within moderate ranges.

Elevations range from 10,240 feet along the Continental Divide to 3,000 feet along the Clark Fork River. This limits the growing season to an average of 70 days during the summer.

Air quality is generally good. However, the coastal weather influence can cause air inversions with cold air settling in the valleys and warm air layering above. Pollutants and dust generated from forest, agricultural, residential, and industrial activity can be caught in the inversion and cause significant deterioration in air quality.



### SOIL AND WATER RESOURCES

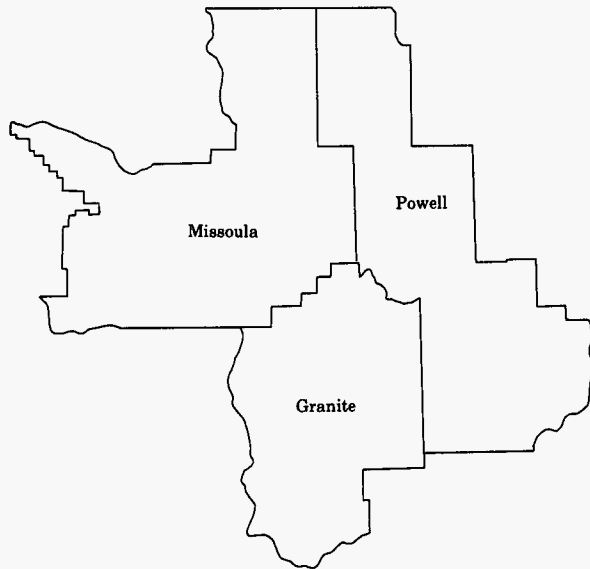
#### Soils

Seven major soil types are found in the Garnet Resource Area. Table 3-1 summarizes the locations and characteristics of each soil type.

Granitic soils are found in the Wales Creek and Chamberlain Meadows area and other scattered areas in the GRA. These soils are highly susceptible to erosion and loss of nutrients.

Soils formed in tertiary-age sediments are found in the Upper Willow Creek and Ram Mountain area and other scattered areas. These soils, while erosion prone, are not as erosive as the granitics and are susceptible to compaction when wet.

3 — AFFECTED ENVIRONMENT



**Percent Public Land/County  
(Surface)**

Powell 5.6% Public Land  
 Granite 4% Public Land  
 Missoula 1% Public Land

**TABLE 3-1  
 MAJOR SOIL TYPES AND THEIR SELECTED CHARACTERISTICS**

Parent Material	Acres	Road Construction Problems	Erosion Susceptibility	Soil Nutrients Concentrated in Surface Mineral Horizon	Compaction Susceptibility	Area
Granitics	17,500	Severe	Moderate to severe	Yes	Slight to moderate	Wales Cr., Chamberlain Meadows. Portions of Elk Cr., Kennedy Cr., Keno Cr., the W.F. of Ashby Cr., Upper Willow Cr., Ram Mtn. and E. of Blackfoot City.
Tertiary-age sediments	4,500	Moderate to severe	Moderate to severe	No	Moderate to severe	Upper Willow Cr., Ram Mtn. & small areas near Garrison & Helmville.
Tertiary-age Volcanics	45,000	Slight to severe	Slight to severe	Varies	Slight to severe	Large areas in Garnet & Hoodoo Mtn.
Limestone	32,000	Generally slight	Slight	Varies	Slight to moderate	Throughout resource area except for Upper Willow Cr., Ram Mtn., & Marcum Mtn.
Alluvium	1,500	Slight to moderate	Moderate	No	Slight to moderate	Waterways in the Garnet Range, Marcum Mtn., Rock Cr., & Upper Willow Cr.
Belt Series Rock	42,000	Slight to moderate	Generally slight	Yes	Slight to moderate	Throughout resource area
Tertiary-age rhyolite	2,000	Slight to moderate	Generally slight	Yes	Slight	Hoodoo area.

Large areas of the Garnet and Hoodoo mountain ranges are made up of soils formed in tertiary-age volcanics. Gravel and clay content is highly variable. Soils with low clay content usually have high gravel content and cause few problems due to erosion and compaction. However, where high clay content occurs with gravel content less than 35 percent, compaction and erosion problems can be severe.

Limestone bedrock occurs generally throughout the resource area. Soils formed in limestone materials have low erosion and compaction potential. Soils with deep silt and silt loam horizons are unstable when wet and dusty when dry.

Soils formed in alluvium are found along waterways in the Garnets, Marcum Mountain, Rock Creek, and Upper Willow Creek. These areas are usually highly susceptible to the effects of traffic.

Soils formed in Belt series rock can be found throughout the resource area and usually are highly resistant to erosion and compaction. Where an ash cap is present, the surface horizon may be susceptible to compaction.

Soils formed in tertiary-age rhyolite materials are found in the Hoodoo area. These soils are generally resistant to compaction and erosion.

All the public land in the Garnet Resource Area has been soil surveyed by either the BLM or Soil Conservation Service (SCS 1975). A reconnaissance geology survey (Morrison and Maierle 1978; Geo/Resource 1983) is used with the soil surveys to identify areas subject to problems of erosion, mass failure, soil compaction, and forest regeneration. The Surface Geology map shows the boundaries of the major geologic formations.

## Water

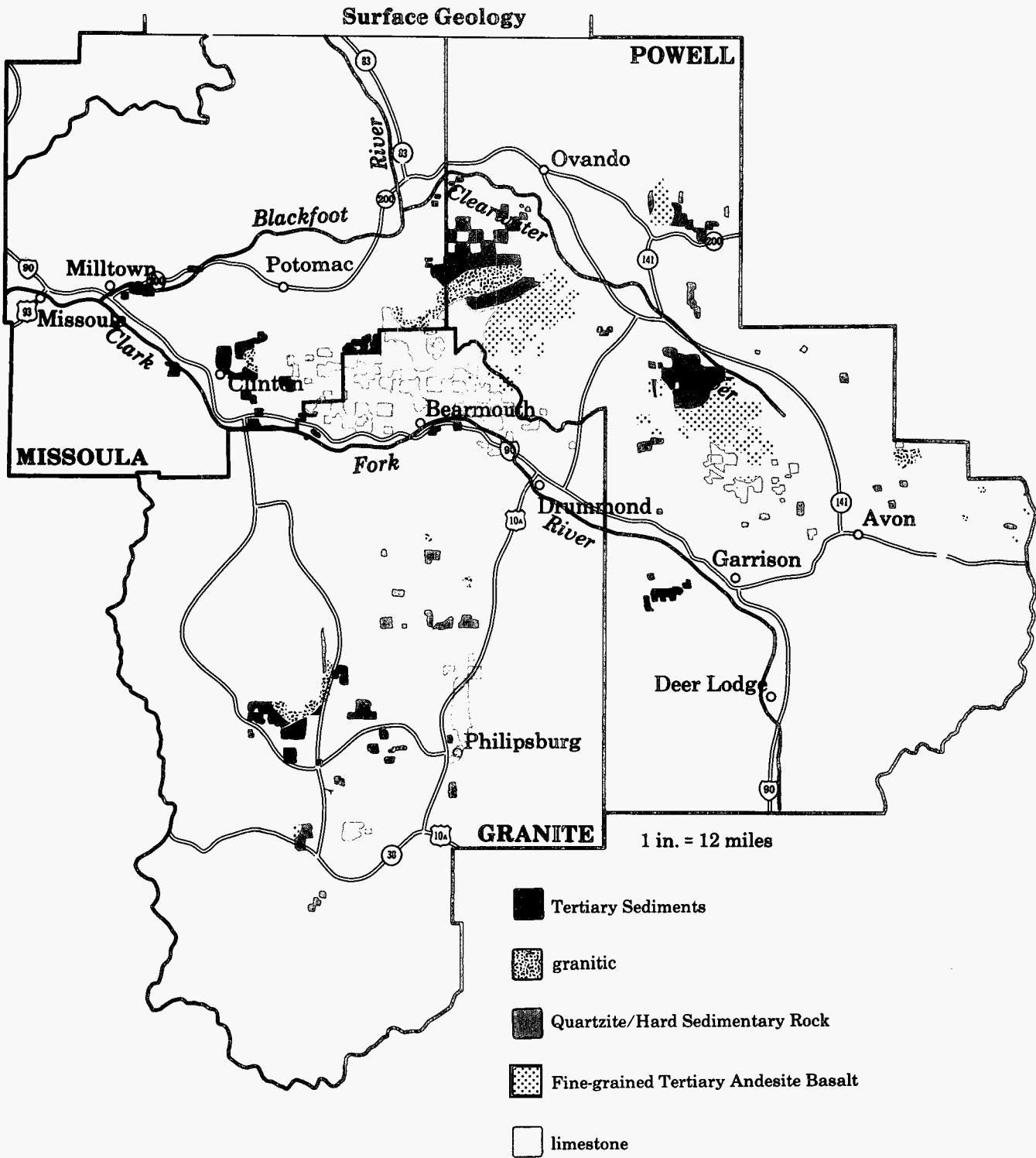
### Surface Water

The Garnet Resource Area lies in the headwaters of the Clark Fork and Blackfoot rivers. Major drainage basins and subbasins within the GRA are illustrated in the Hydrologic Unit map. Water quality is presently monitored on 18 streams. Table 3-2 summarizes stream monitoring data collected in the last five years. Streams are monitored to detect the effects of management activities on water quality, evaluate Best Management Practices (see Appendix B), provide a baseline on water quality, and address problem areas. Water quality is generally excellent. Some problem areas exist from past resource management activities, primarily mining.

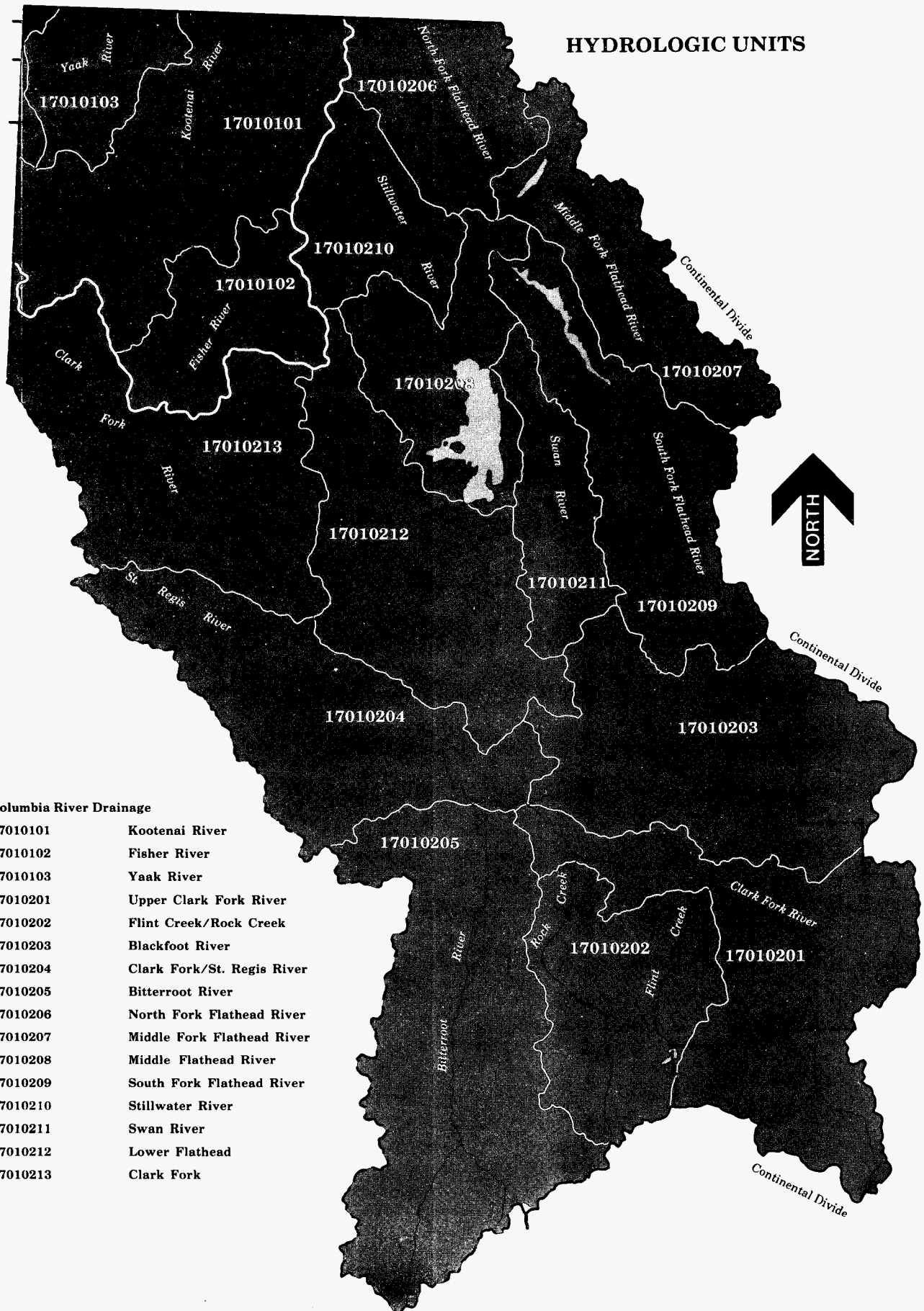
### Groundwater

The reconnaissance geology surveys (Morrison and Maierle 1978; Geo/Resource 1983) estimated location and quantity of available groundwater in the GRA. There are about 2,000 undeveloped springs. Forty-four springs have been developed for stock use and watershed protection.





**HYDROLOGIC UNITS**



**Columbia River Drainage**

- 17010101 Kootenai River
- 17010102 Fisher River
- 17010103 Yaak River
- 17010201 Upper Clark Fork River
- 17010202 Flint Creek/Rock Creek
- 17010203 Blackfoot River
- 17010204 Clark Fork/St. Regis River
- 17010205 Bitterroot River
- 17010206 North Fork Flathead River
- 17010207 Middle Fork Flathead River
- 17010208 Middle Flathead River
- 17010209 South Fork Flathead River
- 17010210 Stillwater River
- 17010211 Swan River
- 17010212 Lower Flathead
- 17010213 Clark Fork

**TABLE 3-2**  
**STREAM MONITORING SUMMARY**

Stream Name <sup>1</sup>	Basin Area Above Station (sq. mile)	Suspended Sediment (ave. t/sq mi/yr) <sup>5</sup>	Predominant Bedrock Geology (rock type)	Years of Record <sup>4</sup>
Ashby, E. Fk.	5.2	3.0	limestone	5
Ashby, W. Fk.	3.6	2.2	argillites, quartzite, and granodiorite	5
Brazil	1.3	169 <sup>3</sup>	Tertiary volcanics	3
Chamberlain #1	10.2	2.2	argillites & quartzite (hard sedimentary rock)	5
Cottonwood	15.3	3.4	argillites, quartzite, Tertiary volcanics	1
Cramer, E. Fk.	15.1	5.5	limestone	3
Cramer, W. Fk.	6.4	3.0	argillite & quartzites (hard sedimentary rock)	3
Douglas	1.8	0.84	limestone & Tertiary volcanics	1
Elk at Cap	30.9	10.0 <sup>2</sup>	granodiorite	2
Wallace Gulch				
Elk #1	3.6	23.4 <sup>2</sup>	limestone & granodiorite	5
Kennedy	4.1	3.7	granodiorite	5
Keno	2.6	7.2	limestone & granodiorite	5
Marcum #12	0.4	1.1	Tertiary volcanics	4
Marcum #18	1.7	1.1	argillites, quartzites, & Tertiary volcanics	4
McElwain	4.2	3.1	Tertiary volcanics	4
Scotchman Gulch	5.7	0.4	granodiorite	2
Union Creek	4.8	0.9	argillites, quartzites & limestone	1
Warm Springs #2	1.8	7.2	Tertiary volcanics	4
Warm Springs #4	6.9	25.0	Tertiary volcanics & limestone	4
Warm Springs #6	10.7	15.8	limestone	3

<sup>1</sup>Refer to Table 3-3 for locations

<sup>2</sup>Related to placer mining

<sup>3</sup>Badly eroded stream section at north side of Sec. 22

<sup>4</sup>Streams sampled 8 to 10 times per year

<sup>5</sup>Total sediment load evaluation from "Guide for Predicting Sediment Yields from Forested Watersheds." These data can be used to place basin sediment production in perspective. Generally granodiorite basins have almost 50% of total sediment load as suspended sediment, whereas in hard sediment and tertiary volcanic basins suspended sediment represents 70-80% of total sediment load.

	Granodiorite Basins	Hard Sediment Basins (argillites, quartzites, limestone)	Tertiary Volcanic Basins
High sediment producing areas	100 t/sq mi/yr	52 t/sq mi/yr	42 t/sq mi/yr
Normal sediment producing areas	25 t/sq mi/yr	13 t/sq mi/yr	11 t/sq mi/yr
Low sediment producing areas	10 t/sq mi/yr	5 t/sq mi/yr	4 t/sq mi/yr

### Stream Channel Analysis

Fifty-five streams were evaluated to determine their resistive capacity to bed and bank erosion, and to provide information about their ability to recover from potential changes in flow and increases in sediment production (see Table 3-3). The methodology provides the following rating system: excellent is 0 to 38; good is 39 to 76; fair is 77 to 114; and poor is 115 and above. The lower the numerical rating the more stable the stream channel. Of the 222 miles of stream channel analyzed, 80 miles were on public land. None of the stream channels were in excellent condition, 22 miles were in good condition, 58 miles were in fair condition, and 0.1 mile was in poor condition. Braziel Creek, Section 22, contains the stream channel that is in poor condition.

## ENERGY AND MINERAL RESOURCES

### Geology

The geology of the Garnet Resource Area is very diverse with all three categories of rocks present: igneous, metamorphic, and sedimentary. The rock types range in age from the late Precambrian Belt series sediments (1 to 2 billion years ago), to the very recent (10 thousand years ago and less).

Igneous rocks such as basalt, andesite, and rhyolite are found in the eastern part of the Garnet Range and in Upper Willow Creek. As a result of granitic intrusions, metamorphic rocks such as marble, hornfels, and garnetite can be found around the mining areas of Garnet, Coloma, Ashby and Wallace creeks, Blackfoot City, Philipsburg, Gold Creek, Upper Willow Creek, Sluice Gulch, Top O'Deep, and Henderson Gulch. Sedimentary rocks such as limestone, argillites, dolomites, quartzites, and shale can be found generally throughout the resource area.

Most of the resource area was not directly affected by glacial activity. However, glacial till can be found in moraines in Fred Burr and Upper Willow creeks. Clay sediments were deposited in the Upper Willow Creek area by a glacial lake. In the Drummond area traces of ancient shorelines of glacial Lake Missoula are visible. Detailed information on the geologic structure of the Garnet Resource Area is contained in two surveys, Morrison-Maierle 1978 and Geo/Resource Consultants, Inc. 1983.

### Oil and Gas

The Overthrust Belt of the Rocky Mountains extends through the resource area (see Overthrust Belt in the Rocky Mountains and Garnet Resource Area maps). This structure is known to contain oil and gas in Wyoming and Alberta.

The Garnet Resource Area administers oil and gas rights beneath 205,586 acres. Ninety-eight percent is leased for oil and gas or currently under application

for lease. Seismic exploration is underway in western Montana. Exploratory drilling has recently started within the northwest boundary of the GRA. Producible quantities of hydrocarbons have yet to be discovered (see Table 3-4 for reserve rating).

### Metallic Mineral Deposits

The historic mining districts in the resource area contain the mineral deposits of gold, silver, copper, lead, zinc, tungsten, and manganese. Much of the mineralization is associated with small granitic intrusions similar in age and rock type to the Boulder batholith. The most important districts are Clinton/Wallace, Coloma, Garnet/First Chance, Ophir, Blackfoot City, Elk Creek, Top O'Deep, Copper Cliff, Henderson, Philipsburg, and Gold Creek. The Minerals map shows the location of the districts.

The deposits include gold placers, vein deposits, replacement deposits, and contact metamorphic deposits in bedrock. The gold placers are the only deposits currently being mined. However, exploration for lodes as well as placers is occurring on the resource area. The exploration methods are backhoe test holes, bulldozer trenching, diamond and rotary-air drilling, geologic mapping, and geochemical sampling (see Table 3-4 for reserve rating).

### Other Geologic Resources

The industrial minerals of barite, phosphate, and limestone are found in the GRA. Barite occurs in vein deposits in the Coloma/Washoe Creek area and in the North Fork of Elk Creek. Phosphate is actively mined by underground methods in the Warm Springs Creek area, and high-calcium limestone occurs in the Rattler and Spring gulches (see Table 3-4 for reserve rating).

Construction materials of crushed stone, riprap, sand, and gravel occur throughout the resource area. Geothermal springs exist in Wales Creek, Bearmouth, and Warm Springs. They offer recreational use but are not hot enough for commercial power production (see Table 3-4 for reserve rating).

### Unusual Geologic Features

A formation of brightly colored pinnacles is found on public land about one mile east of Gilles Bridge on Rock Creek. Another feature of geologic interest is a large slump earthflow located on the southeast slope of Mount Baldy. The landslide is unique because of its size and presence of natural levees.

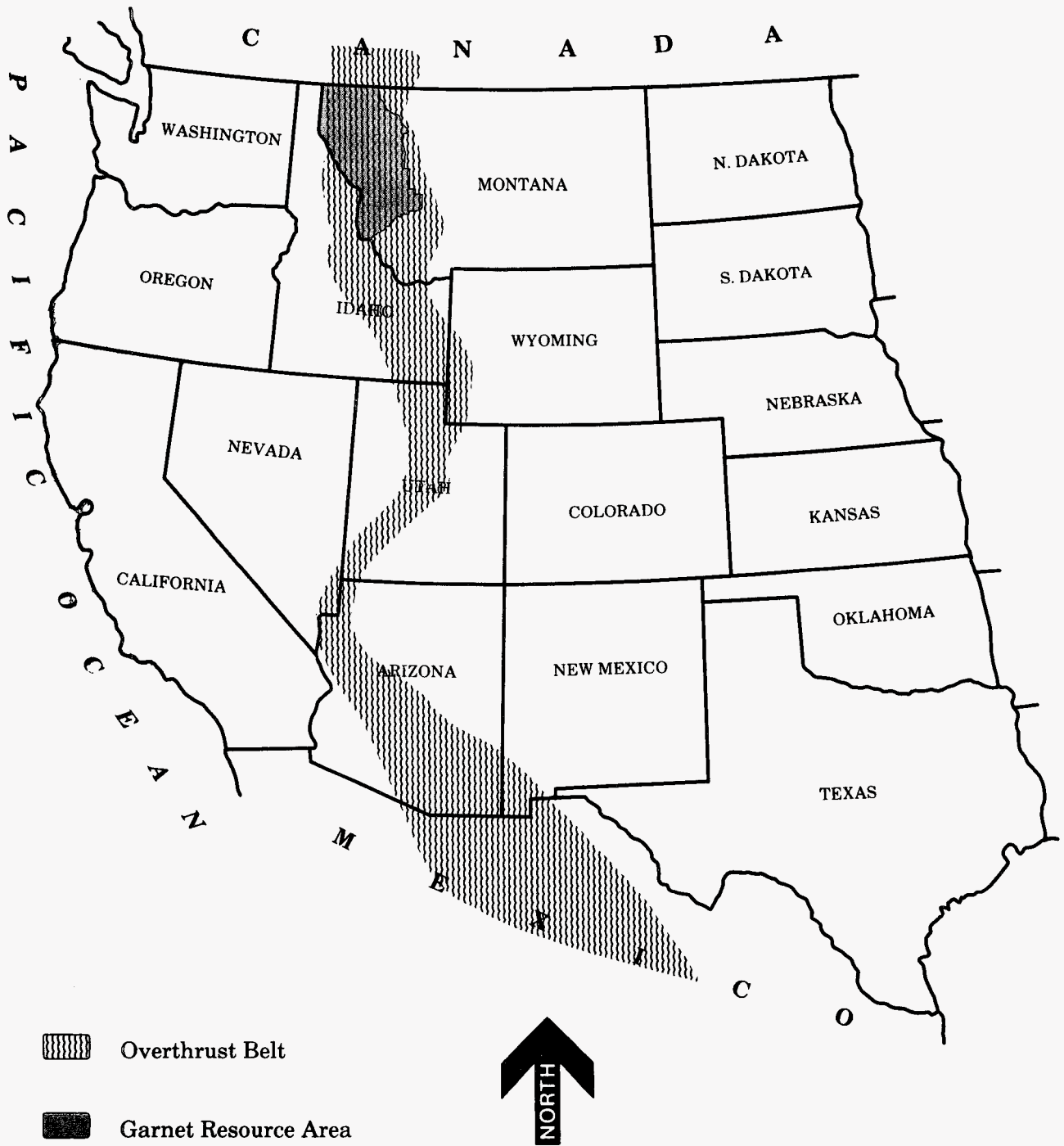
A well exposed outcrop of Madison Limestone lies in Rattler Gulch. The cliffs are used by several colleges and high schools for geologic mapping projects. The accessibility and outcrop exposure encourage its use by both local schools and others outside the immediate area.

Other areas of interest are abandoned mine dumps where minerals are found such as orpiment, bornite,

**TABLE 3-3**  
**STREAM REACH INVENTORY AND CHANNEL STABILITY ANALYSIS**

Stream	Rating	Numerical Rating	Location	Miles Inventoried Total	BLM
Miners Gulch	fair	84	T. 8 N., R. 15 W.	2.5	0.5
Beaver Creek	fair	89	T. 8 N., R. 15 W.	2.7	1.1
Bear Creek	good	75	T. 8 N., R. 15 W.	3.2	1.1
Huepeck Gulch	fair	85	T. 8 N., R. 15 W.	2.0	0.8
Alder Gulch	fair	85	T. 8 N., R. 15 W.	1.4	1.0
Niles Gulch	good	76	T. 8 N., R. 15 W.	1.1	0.9
Unnamed (between Beaver & Bear creeks)	good	69	T. 8 N., R. 15 W.	0.5	0.5
Huepeck Gulch tributary (S.F.)	fair	95	T. 8 N., R. 15 W.	1.2	0.9
Flat Gulch	fair	74	T. 7 N., R. 16 W.	2.3	1.5
Scotchman Gulch	fair	91	T. 7 N., R. 16 W.	3.3	3.3
Mill Gulch	good	56	T. 7 N., R. 16 W.	0.9	0.8
Windlass Gulch	good	65	T. 7 N., R. 16 W.	3.0	2.0
Indian Creek	poor	151	T. 12 N., R. 10 W.	0.6	0
Indian Creek, E.F.	fair	94	T. 12 N., R. 10 W.	2.9	1.8
Indian Creek, W.F.	fair	98	T. 12 N., R. 10 W.	3.7	2.0
Hall Creek	good	65	T. 12 N., R. 10 W.	2.5	0.6
Gallagher Creek	fair	87	T. 11 N., R. 10 W.	6.8	3.5
Cottonwood Creek (WSA 79)	fair	91	T. 12 N., R. 10 W.	17.0	5.8
Cooper Creek	fair	88	T. 12 N., R. 10 W.	3.0	1.0
Braziel Creek (poorest Section-132)	fair	100	T. 12 N., R. 10 W.	3.2	1.5
Braziel Creek, W.F.	fair	98	T. 12 N., R. 10 W.	3.1	1.1
Warm Springs Creek	fair	93	T. 10 N., R. 9 W.	14.2	1.0
Ten Mile	fair	96	T. 12 N., R. 14 W.	5.5	2.9
Elk Creek, N.F.	good	71	T. 13 N., R. 14 W.	2.4	2.0
Deep Creek	fair	89	T. 12 N., R. 14 W.	4.2	0.6
Secret Gulch	fair	92	T. 12 N., R. 14 W.	1.2	0
First Chance Gulch	good	74	T. 12 N., R. 14 W.	1.1	0.9
Deer Gulch	good	69	T. 13 N., R. 12 W.	2.6	1.6
Bear Creek	good	76	T. 13 N., R. 17 W.	2.6	0
Turah Creek	good	68	T. 13 N., R. 17 W.	1.0	0
Kendall Creek	good	69	T. 12 N., R. 17 W.	2.3	0
Donovan Creek	good	72	T. 12 N., R. 17 W.	2.1	0
Dirty Ike Creek	fair	82	T. 12 N., R. 17 W.	4.1	0.4
Wallace Creek	fair	97	T. 12 N., R. 17 W.	3.9	2.1
Starvation Creek	fair	95	T. 11 N., R. 16 W.	3.2	0.8
Cramer Creek	fair	91	T. 12 N., R. 15 W.	9.5	0.6
Ryan Creek	fair	85	T. 11 N., R. 15 W.	3.0	0.9
Marcella Creek	fair	83	T. 11 N., R. 15 W.	3.9	0.6
Dry Gulch	fair	105	T. 11 N., R. 15 W.	5.0	2.3
Bear Gulch and tributaries	fair	90	T. 12 N., R. 14 W.	8.9	0.8
Mulkey Gulch (Dry Mulkey-80)	fair	110	T. 11 N., R. 13 W.	7.7	2.1
Little Bear	fair	88	T. 11 N., R. 14 W.	1.7	0
Rattler Gulch	good	71	T. 11 N., R. 13 W.	1.2	0.4
Douglas Creek	fair	102	T. 12 N., R. 13 W.	6.8	3.3
Murray Creek	good	75	T. 12 N., R. 12 W.	4.3	2.5
McElwain Creek	fair	78	T. 13 N., R. 12 W.	4.2	3.4
Yourname Creek	good	63	T. 13 N., R. 13 W.	7.1	0.8
Wales Creek	good	63	T. 13 N., R. 13 W.	8.2	3.8
Pearson Creek	fair	78	T. 14 N., R. 13 W.	4.7	0
Chamberlain	good	75	T. 13 N., R. 13 W.	5.3	4.0
Elk Creek (poorer in 1983 because of placer mining)	fair	96	T. 13 N., R. 14 W.	4.9	2.4
Keno Creek	fair	93	T. 13 N., R. 13 W.	1.9	1.3
Kennedy Creek	fair	98	T. 13 N., R. 13 W.	2.9	2.5
Union Creek	fair	95	T. 12 N., R. 15 W.	4.1	1.6
Camas Creek	fair	99	T. 12 N., R. 15 W.	4.0	0.9
Ashby Creek, E.F.	fair	104	T. 12 N., R. 16 W.	3.1	1.1
Ashby Creek, W.F.	fair	83	T. 12 N., R. 16 W.	2.6	0.8





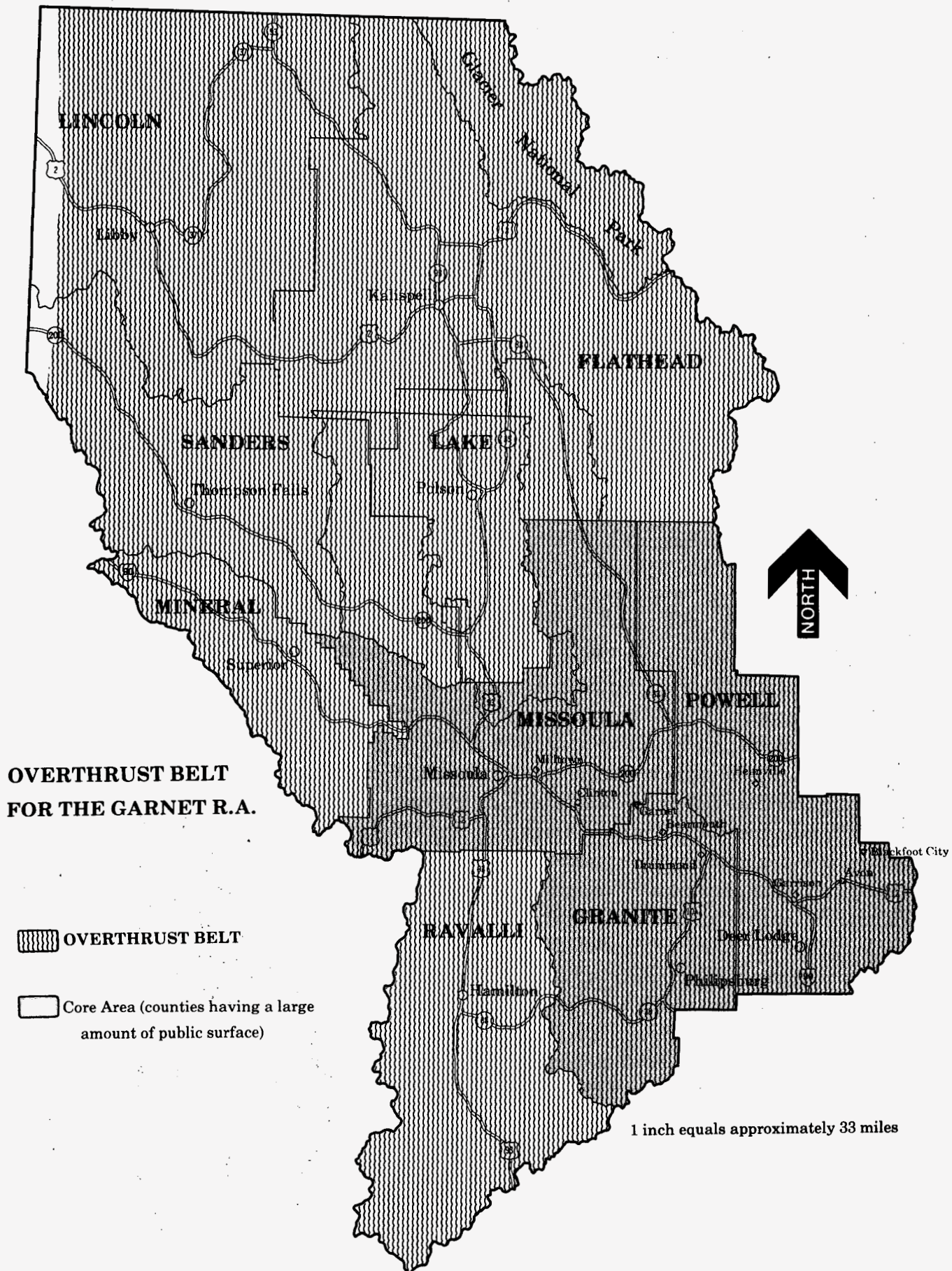


TABLE 3-4  
ENERGY AND MINERAL POTENTIAL IN THE GARNET RESOURCE AREA

Energy/Mineral	Potential & Known Reserve Rating*	Acres of Surface	Acres of Subsurface
Oil and Gas	High	—	—
	Medium	133,747	59,926
	Low	11,900	—
Metallic Minerals (gold, silver, copper, lead, zinc, etc.)	High	46,386	19,883
	Medium	87,781	39,767
	Low	11,380	—
Industrial Minerals (phosphote, limestone, barite, etc.)	High	7,300	
	Medium	121,867	
	Low	11,380	
Geothermal	High	5,000	
	Medium	139,527	
	Low	520	
Construction Materials (stone, sand, gravel)	High	3,400	
	Medium	142,147	
	Low	—	

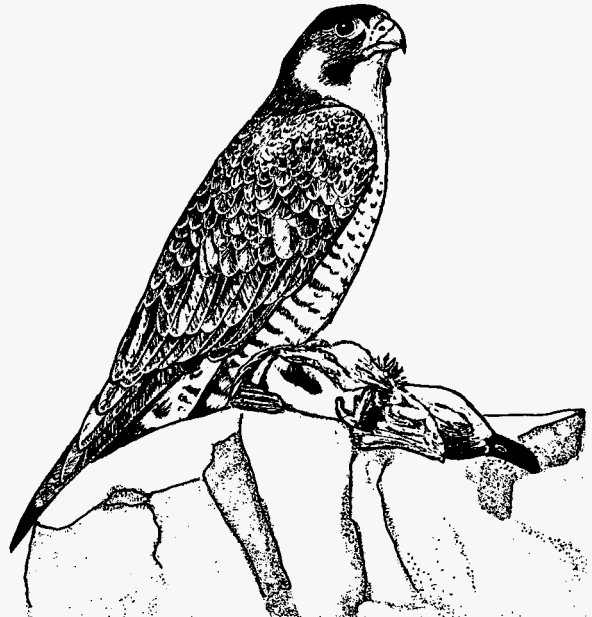
\*Rating is established from industry data gathered on GEM forms and from BLM inventory data.

fluorite, galena, malachite, azurite, rhodonite, garnet, epidote, quartz, chalcedony, magnetite, and calcite. Areas in the Madison Limestone contain good crystals of calcite, and sapphires can be found in the tributaries of Rock Creek.

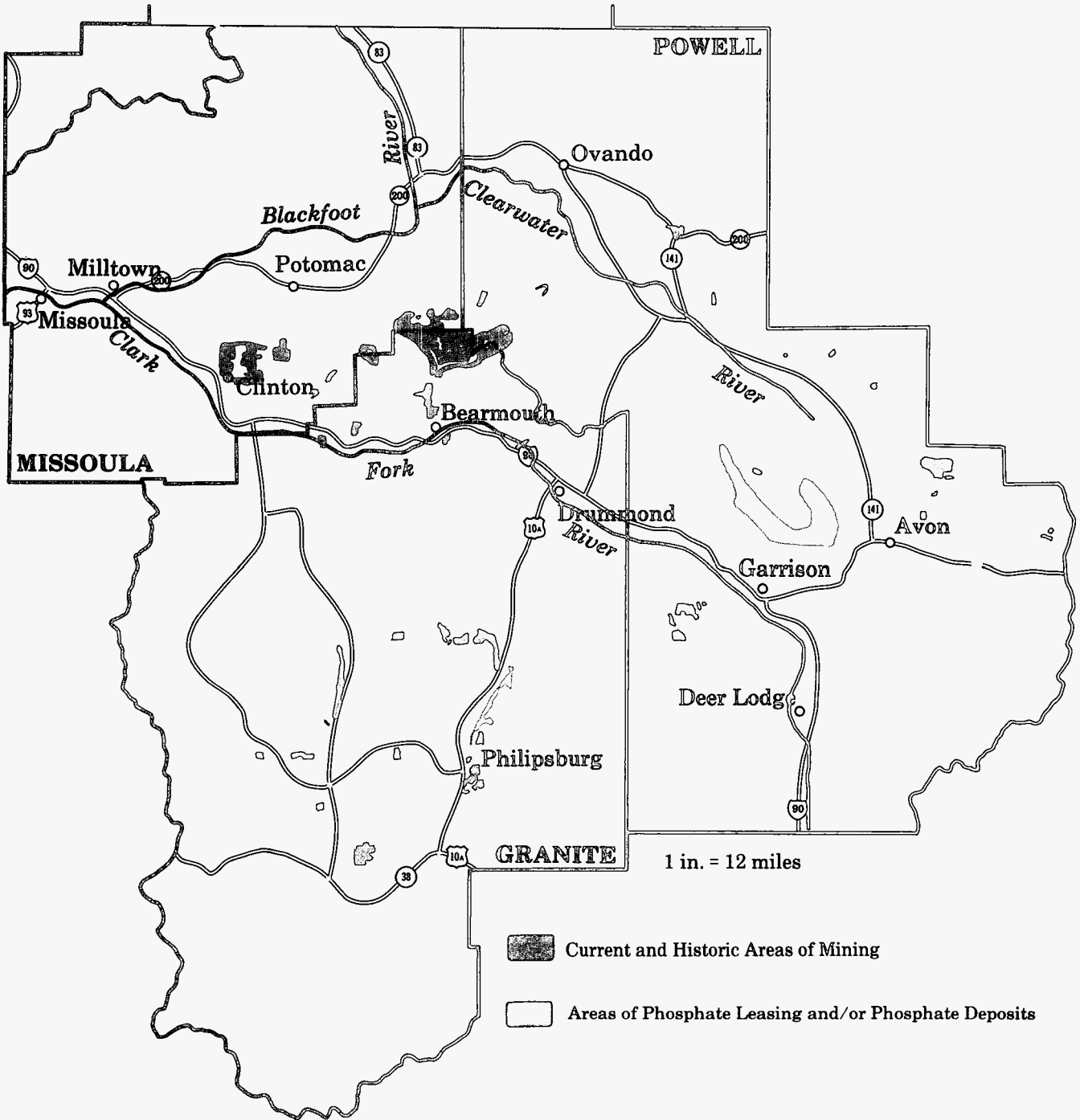
Invertebrate and vertebrate fossils occur in the resource area. The Madison Limestone Formation contains invertebrate fossils such as crinoid debris, spirifers, bryozoans, and corals; the Kootenai Formation contains gastropod fossils; and the Swift Formation contains brachiopod fossils. Vertebrate fossils are found in Tertiary sediments at sites throughout the resource area.

## Geologic Hazards

Several sites in the resource area contain geologic hazards that may threaten economic loss. The most likely loss would be to land and timber productivity or to a road. Under severe naturally occurring phenomena, these sites could be life or health threatening. These sites are classified into seven categories: alluvial fan, shallow groundwater, rotational bedrock slide, debris slide, earthflow, soil creep, and accelerated erosion. The sites were identified in two geologic surveys, Morrison and Maierle 1978 and Geo/Resource Consultants, Inc. 1983.



3 — AFFECTED ENVIRONMENT



**LANDS**

The surface ownership for public lands in Granite, Powell, and Missoula counties is 145,660 acres; the subsurface ownership is 213,385 acres. Table 3-5 shows the breakdown of surface acres by county and the breakdown of subsurface acres by county and mineral type.

BLM-managed land includes 349 separate tracts intermingled with private and state lands. Table 3-6 shows the relative number of tracts by size class and acreage. Fifty-three tracts abut national forest. These tracts total about 22,800 acres or 15 percent of the public lands.

BLM-managed lands are only a small percentage of land ownership in Granite, Powell, and Missoula counties. Six percent of Powell County is public land, four percent of Granite, and one percent of Missoula. Table 3-7 shows total surface ownership in the three counties.

Unauthorized use of public land is minimal.

**TABLE 3-5  
BLM SURFACE AND SUBSURFACE OWNERSHIP BY COUNTY**

	Surface Acres	Subsurface Acres*			
		All Min	O&G	Coal	Phosphate
Missoula County	15,115	17,452	17,452	—	—
Granite County	46,259	77,603	77,603	2,240	600
Powell County	84,286	110,256	110,372	23	4,936
Totals	145,660	205,310	205,586	2,263	5,536

\*Federal subsurface ownership underlying private surface ownership equals 67,725 acres.

**TABLE 3-6  
SURFACE OWNERSHIP BY TRACT SIZE**

Size/Acreage	Number of Tracts	Approx. Acreage	Percent of Total Tracts	Percent of Total Acreage
15,000 or greater	2	67,000	1	46
4,000 - 14,999	0	0	0	0
1,000 - 3,999	11	25,000	3	17
640 - 999	22	15,000	6	10.5
320 - 639	31	13,000	9	9
160 - 319	61	12,000	18	8
41 - 159	60	5,500	17	4
40 or less	162	8,000	46	5.5
Totals	349	145,500	100	100

**TABLE 3-7  
SURFACE OWNERSHIP BY COUNTY**

County	Total Acres	BLM	FS	State	Plum Creek and Champion	Other Private and Other Federal
Missoula	1,672,320	15,115	676,663	75,525	452,234	451,521
Granite	1,109,120	46,259	661,481	19,247	43,658	338,114
Powell	1,495,680	84,286	638,484	97,617	88,860	588,169
Totals	4,277,120	145,660	1,976,628	192,389	584,752	1,377,804

Several major transportation and utility corridors pass through public lands in the Garnet Resource Area. These include but are not limited to Interstate 90 and State Highway 200, Burlington Northern Railroad, BPA Twin 500 kV transmission line, and Montana Power 230 kV transmission line. The locations of these facilities is shown on the Major Transportation and Utility Corridors map.

### RECREATION RESOURCES

Recreation is an important resource in western Montana. The Garnet Resource Area offers many of the important recreational opportunities that western Montana is known for: hunting, visiting historical sites, camping, fishing, prospecting, snowmobiling, etc. Highway 200 and Interstate 90 are major tourist routes leading to the recreation areas of the mountain west. Tourist travel and use in the area is heaviest in summer and fall.

The Garnet Resource Area offers primarily dispersed recreation. Dispersed recreation is defined as recreation that requires a variety of sites yet needs no special facilities. Table 3-8 lists the types of dispersed recreation and their relative frequency of use in the GRA. The BLM has no developed campgrounds in the GRA.

In addition, the resource area has six important recreation areas that receive special management consideration. These Special Recreation Management Areas (SRMAs) require more intensive recreation management and investment. They also require recreation activity plans to provide specific management guidance for recreation and other resources. The SRMAs identified in this plan include:

- Garnet National Winter Recreation Trail;
- Lewis and Clark Trail, Blackfoot River;
- Garnet Ghost Town;
- Blackfoot Special Management Area;
- Wilderness Study Areas; and
- Clark Fork River.

### Garnet National Winter Recreation Trail

The Garnet National Winter Recreation Trail consists of 30 miles of snowmobile and cross-country ski trails in the Garnet Mountains. The trail starts at

**TABLE 3-8  
DISPERSED RECREATION ACTIVITIES IN  
THE GARNET RESOURCE AREA**

Activity	Visitor Use
Auto Touring	High
Camping	Moderate
Canoeing	Low
Climbing	Low
Enjoying Scenery or Natural Features	Moderate
Fishing	Low
Hiking	Moderate
Horseback Riding	Moderate
Hunting (big game, small game, upland bird, waterfowl)	High
Interpretive Use (includes historical site visitation)	High
Nature Studies	Moderate
ORV Use (4-WD, dirt bike, snowmobile)	High
Photography	Moderate
Picnicking	Low
River Running	Low
Rock Collecting	Moderate
Ski Touring and Snowshoeing	Moderate
Swimming	Low
Wood Gathering	High

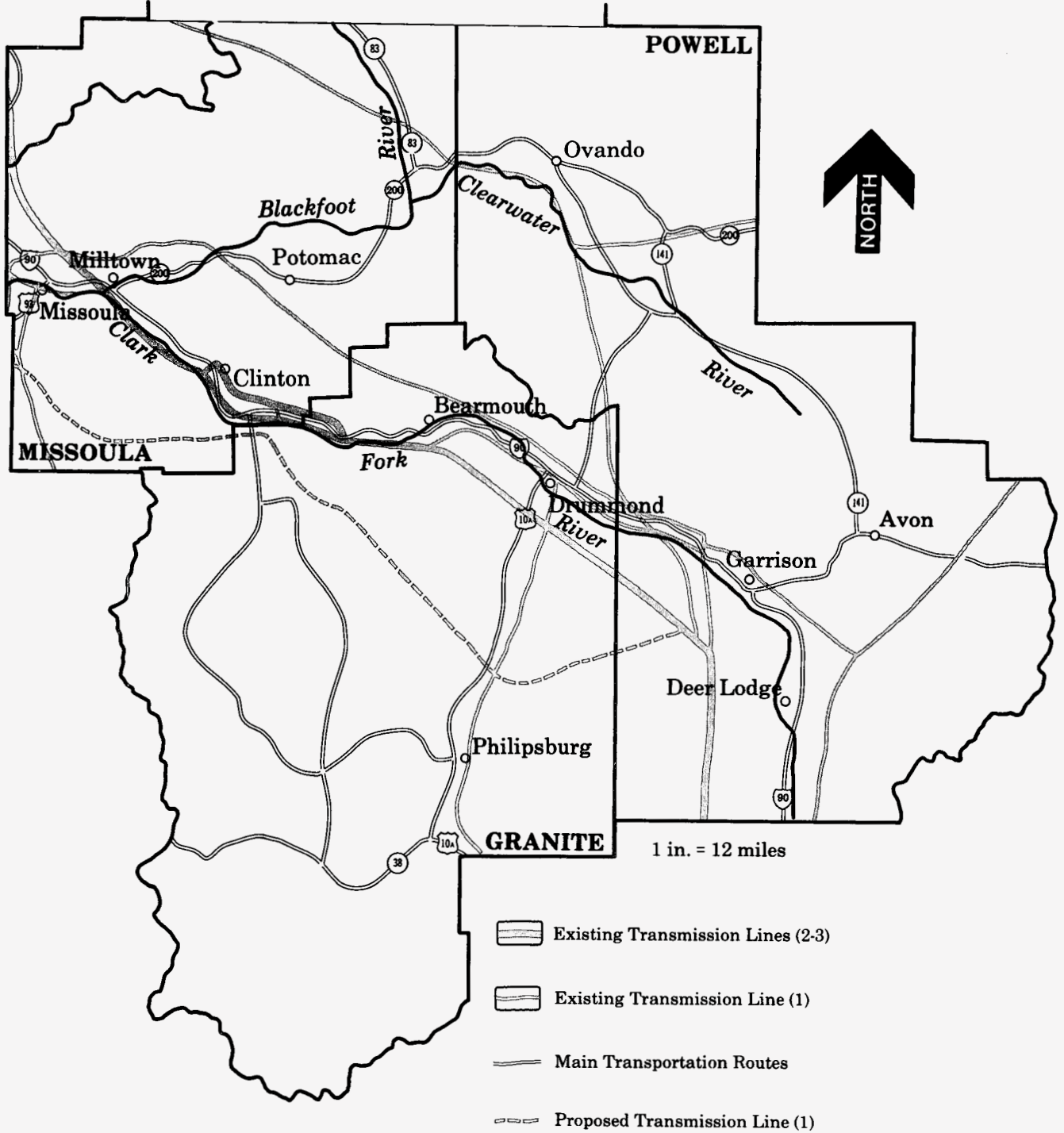
Highway 200 near Greenough Post Office. The elevation varies from 4,200 feet at the highway to 7,073 feet on Elevation Mountain.

The trail follows existing roads and is suitable for winter use from January 1 through March 31. During the summer these roads are open to motorized vehicles.

The trail offers both easy and difficult terrain. Therefore both experienced and beginner skiers and snowmobilers can enjoy using the trail.

The trail offers panoramic views of the Blackfoot River and Swan Valley, and the mountains of the Mission and Pintler ranges as well as the Bob Marshall Wilderness. The Garnet Ghost Town is a central point of interest along the trail system.

MAJOR TRANSPORTATION CORRIDORS



## Lewis and Clark Trail, Blackfoot River

The Blackfoot River valley historically has been used as a major travel route through western Montana. Indian tribes used this route, which they named Cokahlarish Kit, to get to bison hunting areas. Trappers and missionaries later used the Blackfoot River route. Captain Meriwether Lewis returned to St. Louis via the Cokahlarish Kit trail. The exact trail and campsite locations are unknown in the vicinity of public lands.

The river, adjacent to the historic trail and Montana Highway 200, offers over 100 miles of floatable water. The upper and lower river offer challenging stretches while the middle can be navigated by less experienced floaters. The scenery, highlighted by dense forest and rocky cliffs, is enhanced by abundant wildlife and historical river sites.

The float experience is dependent on the river flow. Low flows usually begin in August and continue into the fall while high flows normally peak in June. Only experienced floaters should use the river during high flow. May through August, with the exception of high runoff periods, is the best time for floating.

Access sites and management on the upper sections of the river are limited. The upper Blackfoot River passes through three tracts of public land. The Montana Department of Fish, Wildlife, and Parks owns additional river tracts that provide the land base for a cooperative river management program. Downstream from the Missoula and Powell county line, BLM participates in cooperative management on a section of the river officially designated the Blackfoot River Recreation Corridor.

## Garnet Ghost Town

The abandoned mining town of Garnet is located 45 miles east of Missoula. The ghost town can be reached via Highway 200 using the Garnet Range Road or via Interstate 90 using the Bear Gulch Road.

Garnet was settled in 1895 around gold bearing deposits. The town got its name from the gem stones found in the mountains around the town. After the town was abandoned during World War II, its remoteness preserved the site. In 1960, when fire and vandalism threatened the site, the BLM began an active management program to save the site from further destruction.

In 1971, two mining claims, making up much of the original townsite, were donated to the BLM. An estimated 7,500 to 8,500 people annually visited the site between 1971 and 1980. In the early 1980s, visitors have increased to 12,000 per year. Sixty percent of the use is in June, July, and August. About 40 percent of the visitors are from outside Montana. In 1983, Garnet received visitors from 46 states and 11 foreign countries.

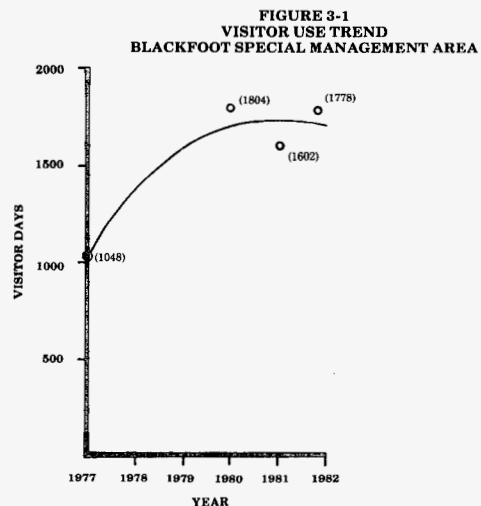
Garnet is currently being managed under a cooperative agreement with the Garnet Preservation Association (GPA), a nonprofit corporation. The GPA solicits funding from private sources to assist the BLM in management and preservation activities. The goals of the GPA, defined in the cooperative agreement, correspond to BLM goals stated in the Garnet Ghost Town Management Plan.

The ghost town has been determined to be eligible for the National Register of Historic Places.

## Blackfoot Special Management Area

The Blackfoot Special Management Area (BSMA) covers 42,000 acres in the Garnet Range about 35 miles east of Missoula, Montana. The BSMA is a cooperatively managed road closure designed to improve the quality of elk hunting, protect soils and vegetation, and gain hunting privileges on private lands previously closed to the general public.

The BLM conducted an intensive study of hunter use in the area during the 1977 season, and less detailed surveys were done in recent years. Figure 3-1 shows the trend in visitor use between 1977 and 1982.





## Wilderness Study Areas

These areas are described in detail in the Wilderness Resources section of this chapter and Appendixes O and P.

### Clark Fork River

The Clark Fork River corridor is a historical transportation route. It was part of the Mullan Road and major railroad routes. Early mining activity opened up the Clark Fork Valley to settlement, and agricultural development soon followed. As a result most land in the river corridor is in private ownership with only scattered tracts still under BLM management.

The Clark Fork River is suitable for boating from the Kohrs Bend, upstream from Garrison, to Bonner Dam, a distance of 86 river miles. Physical access to the river is generally good. However, legal access needs to be acquired in some areas. Detailed information on access sites, approximate float times, and estimated recreation use are available in the Management Situation Analysis available in the Garnet Resource Area office.

## General Recreation Areas

### Walk-in Hunting Areas

A cooperative management effort between the BLM, private landowners, Forest Service, and MDFWP to establish walk-in hunting areas began in 1974. Eleven walk-in hunting areas similar to the Blackfoot Special Management Area were created totalling 104,140 acres. Access is controlled by gates on existing roads.

Management of these areas is designed to improve the quality of hunting, open up additional private land to hunting, reduce erosion, and protect wildlife security areas. Each area is unique and therefore managed differently to achieve the above goals. Table 3-9 describes each walk-in hunting area.

Recreation use of the walk-in areas is substantial; most involve hunting and related activities such as camping, horseback riding, etc. The heaviest use occurs in the fall and most users are from the local area. Use has been increasing each year and is expected to follow this trend in the future.

### Hiking, Horseback Riding, and Off-road Vehicle Trails

The Montana Department of Fish, Wildlife, and Parks (MDFWP 1983) noted that, as compared to other areas of Montana, the Missoula area has the state's highest demand for nonmotorized trails, the second highest demand for camping and cross-country ski areas, and the fourth highest demand for motorized vehicle trails. BLM-administered lands contain many trails appropriate for such uses.

Many historic trails and wagon roads came into being during early mining and sheep ranching periods. The fire protection efforts of the Blackfoot Forest

Protection Association (BFPA) maintained these trails and constructed additional fire trails.

These trails are open to all types of recreation use unless specifically closed to vehicle use. Hunters, snowmobilers, and skiers are the main groups using these trails. The trails for the most part are not signed or maintained.

Snowmobiling as a sport has increased rapidly in the late 1960s and early 1970s. Gradual decreases in snowmobile use are evident since then. The Garnet Range offers many areas to enjoy this form of recreation. Most trails converge on Garnet Ghost Town. In 1971, an estimated 6,000 snowmobilers visited Garnet. After this peak year, snowmobile visits have leveled off at about 1,200 visitors per year. In contrast, cross-country skiing is increasing in the area. Winter trails are managed cooperatively with the MDFWP. Interest has been expressed in expanding the cooperative management programs to include Lubrecht Forest lands owned by the University of Montana.

### Undeveloped Recreation Sites

Undeveloped recreation sites are areas suitable for camping and picnicking; but facilities such as toilets and garbage cans have not been provided. These sites are scattered throughout the resource area and receive the greatest use in the summer and fall. A listing of the undeveloped recreation sites is available in the MSA.

## VISUAL RESOURCES

The Garnet Resource Area lies in the physiographic province known as the Northern Rocky Mountains (Fenneman 1938). Areas of high scenic value, Class A, were identified on one percent of the resource area; areas of moderate scenic values, Class B, were identified on ninety-four percent; and areas of low scenic values, Class C, were identified on five percent.

Class A lands have a landscape character of high, rugged, and forested mountains; tree-lined river bottoms; river gorges; or major lakes. Class C lands are usually valley floors, foothills, or plains with few trees and water features. Lands between these two landscape characters are Class B lands.

Areas visible from major travel routes and sensitivity levels were also evaluated. A combination of these three values determines the Visual Resource Management (VRM) class. Wilderness study areas were designated VRM Class I to retain the existing scenic values. Table 3-10 lists the number of acres in each VRM class.

The resource area has several scenic corridors or zones. The visually sensitive scenic corridors are along the Blackfoot and Clark Fork rivers, Rock Creek, the Anaconda/Pintler Scenic Route, and the Helmville/Avon Road; Garnet, Coloma, Chicken Run Spring, Southern Cross Spring, Sand Park, and Reynolds City are classified as visually sensitive areas.

**TABLE 3-9**  
**WALK-IN HUNTING AREAS IN THE GARNET RESOURCE AREA**

Name	Approximate Size	Visitor Use	Road Closure Dates	Year Started	Type	Admin.	Reason for Closure*
Morrison Peak Special Management Area (SMA)	24,000 ac. (40 ac. BLM)	High	Sept. 1 - Nov. 30	1976	Formal Cooperative (23 Cooperators)	MDFWP	1, 2, 3
Marcum Mtn. Special Management Area	8,000 ac. (4,560 ac. BLM)	High	Sept. 1 - Nov. 30 on private land; Sept. 1 - April 30 on BLM	1974 (Formal since 1977)	Formal Cooperative (22 Cooperators)	MDFWP and BLM	1, 2, 3, 4
Deer Cr.	2,600 ac. (400 ac. BLM)	Moderate	Sept. 1 - Nov. 30	1976	Admin. closure of BLM road	BLM	2, 3
Wales, Yourname Creeks	15,400 ac. (14,120 ac. BLM)	Low	Yearlong	1974	Formal Cooperative on boundary road (BLM & BN)	MDFWP and BLM	2, 3
McElwain Douglas Creeks	8,500 ac. (7,840 ac. BLM)	Moderate	Murray Cr. Rd., Deer Gu. Spur & Trail Spring Spur closed Sept. 1 - Nov. 30. McElwain Fire Rd., Boiler connecting road & Snowcap Trail closed yearlong except open to over snow vehicles Jan. 1 - April 30.	1978 for Murray Cr. Rd. 1976 for Deer Gu. & Trail Spring 1974 for remain- ing roads.	BLM Admin. closure	BLM	2, 3, 5
Blackfoot SMA	42,000 ac. (9,500 ac. BLM)	High	Sept. 1 - Nov. 30 Elk logging study area portion, yearlong	1974 (Formal since 1976)	Formal Cooperative (10 Cooperators)	MDFWP and BLM	1, 2, 3, 5, 7
Ram Mtn.	11,100 ac. (4,800 ac. BLM)	Moderate	Closed yearlong	1974	Informal Cooperative (3 Cooperators)	BLM	1, 2, 3, 4, 6

Name	Approximate Size	Visitor Use	Road Closure Dates	Year Started	Type	Admin.	Reason for Closure*
W.F. Buttes	18,000 ac. (1,160 ac. BLM)	Low	General big game season	1976	Informal Cooperative (10 Cooperators)	USFS and BLM	1, 2, 3
W.F. Braziel, Gobbler's Knob, Dry Cottonwood Creek	15,000 ac. (12,000 ac. BLM)	Moderate	Sept. 1 - Nov. 30	1978	Informal Cooperative (3 Cooperators)	BLM	1, 2, 3
Summit Cabin	900 ac. (870 ac. BLM)	Moderate	Sept. 1 - Nov. 30	1980	BLM admin. closure	BLM	2, 3, 7
Karshaw Mtn.	240 ac. (240 ac. BLM)	Low	Yearlong	1978	BLM admin. closure	BLM	2, 3, 7
Keno Cr. Spur	400 ac. (400 ac. BLM)	Moderate	Yearlong	1982	BLM admin. closure	BLM	2, 3, 7
TOTAL		104,140 acres					
TOTAL BLM		46,430 acres					

## \*Reasons for Closure

1. To gain hunting privileges on private land.
2. To improve the quality of hunting.
3. To prevent vehicular damage to soils & vegetation.
4. To reduce harassment of wintering big game.
5. To reduce harassment of elk on spring/summer/fall range.
6. To reduce pressure on big horn sheep herd.
7. To provide security for big game after logging.

**TABLE 3-10**  
**VISUAL RESOURCE MANAGEMENT CLASSES**

VRM Class	Description	Acres	Percent
I	Natural changes and very limited management activity allowed.	27,737	19%
II	Management activity should not be evident in the landscape.	1,455	1%
III	Management activity should not attract attention from the landscape.	24,800	17%
IV	Management activity may be a major element of the landscape but should follow existing line, form, color, and texture.	90,297	62%
V	Management activity should improve the altered landscape.	1,372	less than 1%

## CULTURAL RESOURCES

Cultural resources range from prehistoric campsites dating from 10,500 years ago to the Garnet Ghost Town, which was abandoned during World War II. Most of the cultural resources, 40 percent, are related to the mining activity of the 1864 to 1942 period. About 37 percent are prehistoric campsites. Other sites are townsites, homesteads, logging-related sites, camps, steam-powered mill sites, and historical graves and cemeteries.

Presently, no cultural property on public lands in the GRA is listed on the National Register of Historic Places. Garnet Ghost Town and other properties have been determined to be eligible. A total of 43 cultural properties on public lands are judged as potentially eligible for the National Register. Blackfoot City, the Mullan Road, the Gold Creek Historic District, the Garnet Historic District, Bearmouth, and the Granite Historic District include portions of public lands (MT, FGC 1975). See Appendix G for a description of the Cultural Resource Management Procedures.

## WILDERNESS RESOURCES

An intensive inventory completed by the BLM in 1981, identified four Wilderness Study Areas (WSAs). These are Wales Creek (MT-074-150), Hoodoo Mountain (MT-074-151A), Gallagher Creek (MT-074-151B), and Quigg West (MT-074-155).

Quigg West is located in Granite County; Wales Creek, Hoodoo Mountain, and Gallagher Creek are in Powell County. They cover 27,737 acres or about 19 percent of the public land in the GRA. Table 3-11 lists the WSAs and their acreage.

Wales Creek and Hoodoo Mountain meet the size criteria of 5,000 acres as stated in the *Wilderness Inventory Handbook* (USDI, BLM 1978). Gallagher Creek is being studied for its wilderness qualities under Section 202 of FLPMA because it is less than 5,000 acres. Quigg West is studied as a possible tack-on to the 60,050-acre Quigg RARE II area (Q1807). A wilderness recommendation for the tack-on would be contingent on the Quigg RARE II area being recommended for wilderness.

## Wilderness Opportunities

The National Wilderness Preservation System (NWPS) contains 271 units and covers 80,497,805 acres. Of this, 56,521,416 acres (about 70 percent) are in Alaska and 23,976,389 acres in the other 49 states.

A three-state area including Montana, Idaho, and Wyoming make up the affected region for the purposes of this study. Table 3-12 lists by state the areas that have been designated wilderness by Congress, those that have been endorsed by the President for wilderness status, and those areas that are still being studied.

About 51 percent of the acreage still being studied in the three-state area is on BLM-administered land. The Bear Trap Canyon in Madison County, Montana contains 6,000 acres and is the first BLM-administered wilderness area.

Great Falls is the only standard metropolitan statistical area within a five-hour drive of the WSAs located in the resource area. Missoula, with a county population of 75,432, is also within a five-hour drive of the WSAs. The wilderness opportunities near both cities are plentiful and varied (see Table 3-13). Appendix P contains a summary of the status of wilderness and wilderness study areas in Montana.

The National Wilderness Preservation System (NWPS) contains mainly examples of high elevation mountain ecosystems and alpine, subalpine, and glacial landscapes. Only 50 of the 241 basic ecosystems listed by Bailey-Kuchler (Davis 1980; Kuchler 1964; USDA FS 1976, 1978a) are represented. An additional 62 ecosystems will be added to the NWPS if the presidentially endorsed areas are added. The areas still being studied contain an additional 78 ecosystems. Appendix Q outlines the characteristics of the ecosystem represented in the wilderness study areas in the GRA.

TABLE 3-11  
WILDERNESS STUDY AREAS IN THE GARNET RESOURCE AREA

WSA Name	WSA Number	Acreage	Study Authority
Wales Creek	MT-074-150	11,580	FLPMA, Sec. 603
Hoodoo Mountain	MT-074-151A	11,380	FLPMA, Sec. 603
Gallagher Creek	MT-074-151B	4,257	FLPMA, Sec. 202
Quigg West	MT-074-155	520	FLPMA, Sec. 202
Total		27,737	

**TABLE 3-12**  
**REGIONAL WILDERNESS OPPORTUNITIES**

State	Designated Wilderness Areas			Presidentially Endorsed Areas			Further Study Areas		
	Agency	Number of Areas	Acres	Agency	Number of Areas	Acres	Agency	Number of Areas	Acres
Montana	FS	12	3,666,342	NPS	2	1,084,660	FS	23	1,207,769
	FWS	3	64,997	FS	32	681,355	BLM	36	437,642
	BLM	1	6,000	FWS	15	161,580			
Idaho	FS	5	2,944,435	FS	17	1,240,424	FS	11	571,931
	NPS	1	43,243				BLM	54	1,326,799
Wyoming	FS	6	2,193,750	FS	17	627,100	FS	7	414,870
				NPS	2	1,848,744	BLM	36	565,260

BLM — Bureau of Land Management  
 FS — Forest Service  
 FWS — Fish and Wildlife Service  
 NPS — National Park Service

**TABLE 3-13**  
**PROXIMITY OF WILDERNESS TO POPULATION CENTERS**

Status	Population Center	Total Wilderness Acres Within a 5-Hour Travel Time	State	BLM		Other Agencies	
				Number of Areas	Acres	Number of Areas	Acres
Statutory Wilderness	Missoula	8,313,760	Montana	1	6,000	13	3,164,646
			Idaho	—	—	5	2,944,435
			Wyoming	—	—	3	1,595,547
			Oregon	—	—	3	603,132
	Great Falls	4,387,934	Montana	1	6,000	12	3,292,917
			Idaho	—	—	1	1,089,017
Presidentially Endorsed Areas	Missoula	3,656,217	Montana	—	—	29	1,365,702
			Idaho	—	—	39	2,105,559
			Wyoming	—	—	6	123,876
			Oregon	—	—	1	34,000
			Washington	—	—	1	27,080
	Great Falls	2,569,180	Montana	—	—	31	1,392,102
			Idaho	—	—	1	163,857
			Wyoming	—	—	1	1,013,221
Other Study Areas	Missoula	3,320,477	Montana	19	220,783	27	1,262,514
			Idaho	7	372,993	16	1,165,057
			Oregon	3	18,660	13	280,470
	Great Falls	1,484,908	Montana	34	394,477	11	1,014,066
			Idaho	2	21,255	1	6,700
			Wyoming	2	48,460	—	—

### Wilderness Supply and Demand

Wilderness areas provide opportunities for primitive types of recreation and for enjoyment of a variety of ecosystems in their natural state. The demand for these types of recreational experiences has increased since the mid-1960s. There was a threefold increase in hiking and backpacking by the late 1970s. Use has leveled off in the 1980s in most cases except snow-based activities, day use, and family recreation, which continue to increase (Spencer et al. 1980).

As more people seek recreation in a fixed amount of wilderness areas, the chance to have a wilderness experience declines. In 1971, a survey of hikers in wilderness areas showed more than half were dissatisfied with the opportunities for solitude (Stankey 1971). Another survey found that managers of existing wilderness areas considered 49 percent of the areas to be crowded (Cole and Washburne 1980).

Wilderness use increases in the summer months. Most areas in the NWPS are high elevation and best suited for summer use. The NWPS contains few low elevation areas that could provide year-round use.

### Wilderness in the Local Area

The local area is considered to be Powell and Granite counties. This is the site of the BLM wilderness study areas. In addition these counties contain portions of four designated wilderness areas, three proposed wilderness areas, and three areas still being studied. Table 3-14 lists the areas by county.

### Consistency with Other Plans

The BLM and the Deerlodge National Forest have agreed to consider complementary management alternatives for contiguous lands and to coordinate the recommendations that are submitted to Congress.

The BLM, Forest Service, and the Montana Governor created the Natural Resources Council to discuss pending decisions and natural resource issues of mutual concern. Associated with the Natural Resources Council is an expanded committee of groups interested in forest resources, the Governor's Ad Hoc Committee on Forest Resources. The committee discusses forest resource issues, including wilderness, and attempts to reach a consensus or a balanced opinion on ways to resolve the issues. Participation in these groups allows for coordination and consistency with other agency programs.

Neither Powell nor Granite counties' comprehensive plans address the issue of wilderness designation.

**TABLE 3-14  
EXISTING AND PROPOSED WILDERNESS AREAS  
AND AREAS UNDER WILDERNESS STUDY**

County	Type	Area Name	Unit Number	Agency
Powell	Existing Wilderness	Bob Marshall	NF005	FS
		Scapegoat	NF073	FS
	Proposed Areas	Great Bear, Bob Marshall, Scapegoat, Swan	B1485	FS
		Clearwater/Monture	Q1485	FS
		Further Study Area	Flint Range	1428
	Dolus Lake		1429	FS
	Sapphires		1421	FS
	Wales Creek		MT-074-150	BLM
	Hoodoo Mountain	MT-074-151A	BLM	
Gallagher Creek	MT-074-151B	BLM		
Granite	Existing Wilderness	Anaconda/Pintler	NF003	FS
		Welcome Creek	NF103	FS
	Proposed Areas	Quigg (Slide Rock)	Q1807	FS
	Further Study Areas	Flint Range	1428	FS
		Dolus Lake	1429	FS
		Sapphires	1421	FS
		Quigg West	MT-074-155	BLM

## Description of Individual Areas

Each wilderness study area is described briefly. A more detailed description on each area can be found in Appendix O.

### Wales Creek

The Wales Creek WSA lies in the western portion of the Garnet Mountain Range about 40 miles east of Missoula, Montana. Highway 200 leads to two access routes on the west, the Cap Wallace Gulch Road and the Garnet Range Road. Highway 271 leads to an access route on the east up McElwain Creek (see the Wales Creek WSA Topographic map).

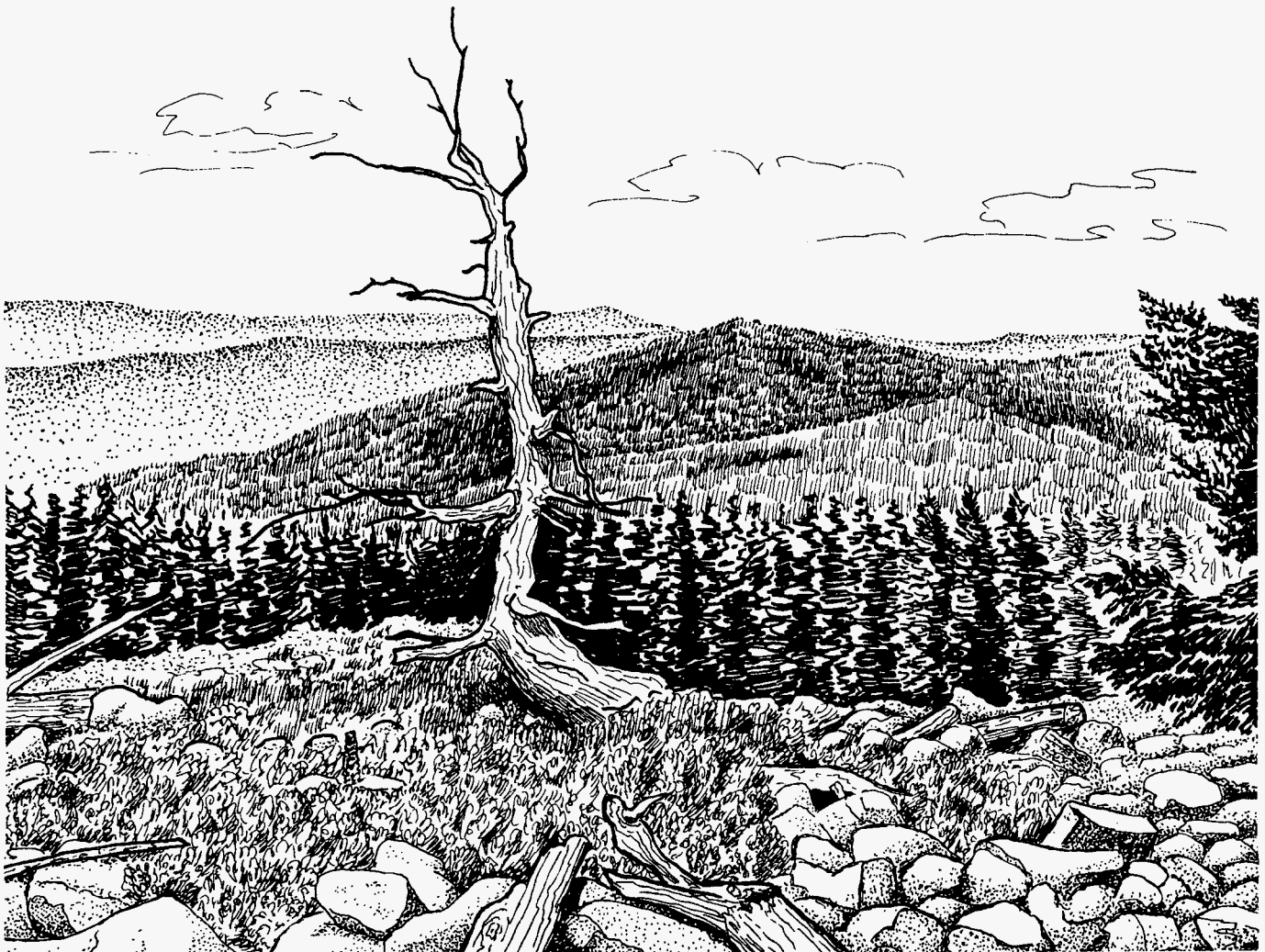
The Wales Creek WSA is about four miles wide by six miles long and covers 11,580 acres. The WSA is bounded by private land on the east, McElwain fire road on the south, the Chamberlain Creek and Elevation Mountain fire road on the west, and state and Plum Creek Timber Company lands on the north. The WSA has cherrystemmed roads on the ridge separat-

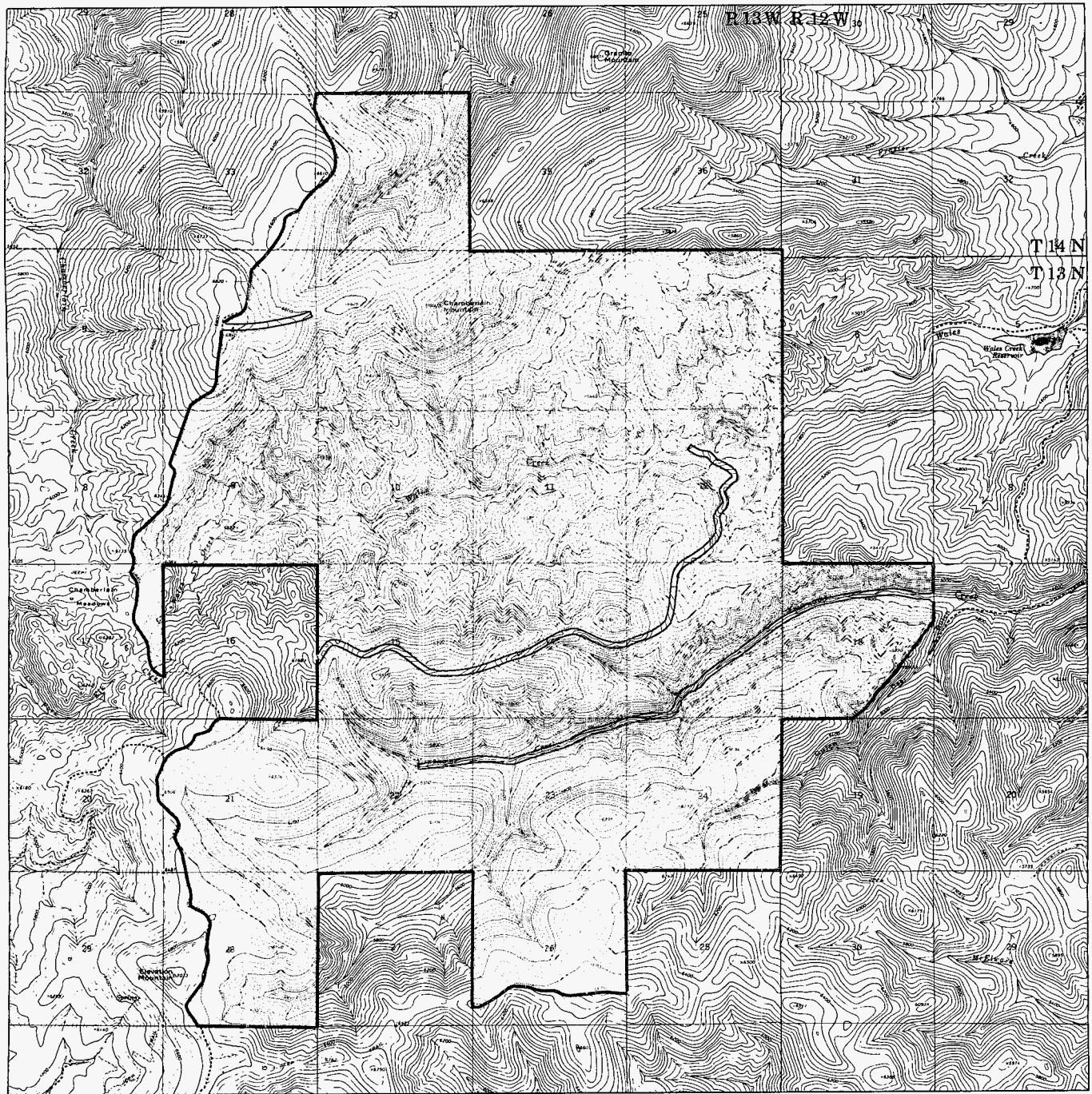
ing Wales and Yourname creeks and in the north on Chamberlain Mountain. A patented placer mining claim along Yourname Creek also protrudes into the WSA.

The topography ranges from 4,680 feet on Wales Creek to over 7,000 feet on Elevation Mountain. Chamberlain Mountain on the north side of the WSA is 6,860 feet high.

The WSA offers several fishable streams flowing east into the Blackfoot River. The streams produce the native cutthroat trout. In addition, the Wales Creek drainage has several thermal springs.

The WSA is heavily forested with stands of spruce, lodgepole pine, Douglas-fir, and subalpine fir. Mining, grazing, and firefighting activities have left structures and other imprints of human activity on portions of the WSA. However, the majority of the WSA is essentially undisturbed by human activity.

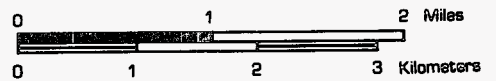




**WALES CREEK  
TOPOGRAPHIC MAP**

— WSA Boundary

□ WSA



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The WSA contains habitat for moose, elk, deer, beaver, black bear, and mountain lion. The WSA also is used by nesting goshawks. Recreational use of the WSA includes hunting, fishing, hiking, cross-country skiing, camping, and snowmobiling.

#### Hoodoo Mountain

The Hoodoo Mountain WSA lies in the Garnet Range between Avon and Helmsville, Montana. Access is from Highway 141 at Nevada Lake Reservoir. The northern, western, and southern boundaries are roads and private and state lands. The eastern boundary is shared with the Gallagher Creek 202 WSA (see the Hoodoo Mountain WSA Topographic map).

The Hoodoo Mountain area is about three miles wide by six miles long and covers 11,380 acres. The width narrows at one point to less than a mile.

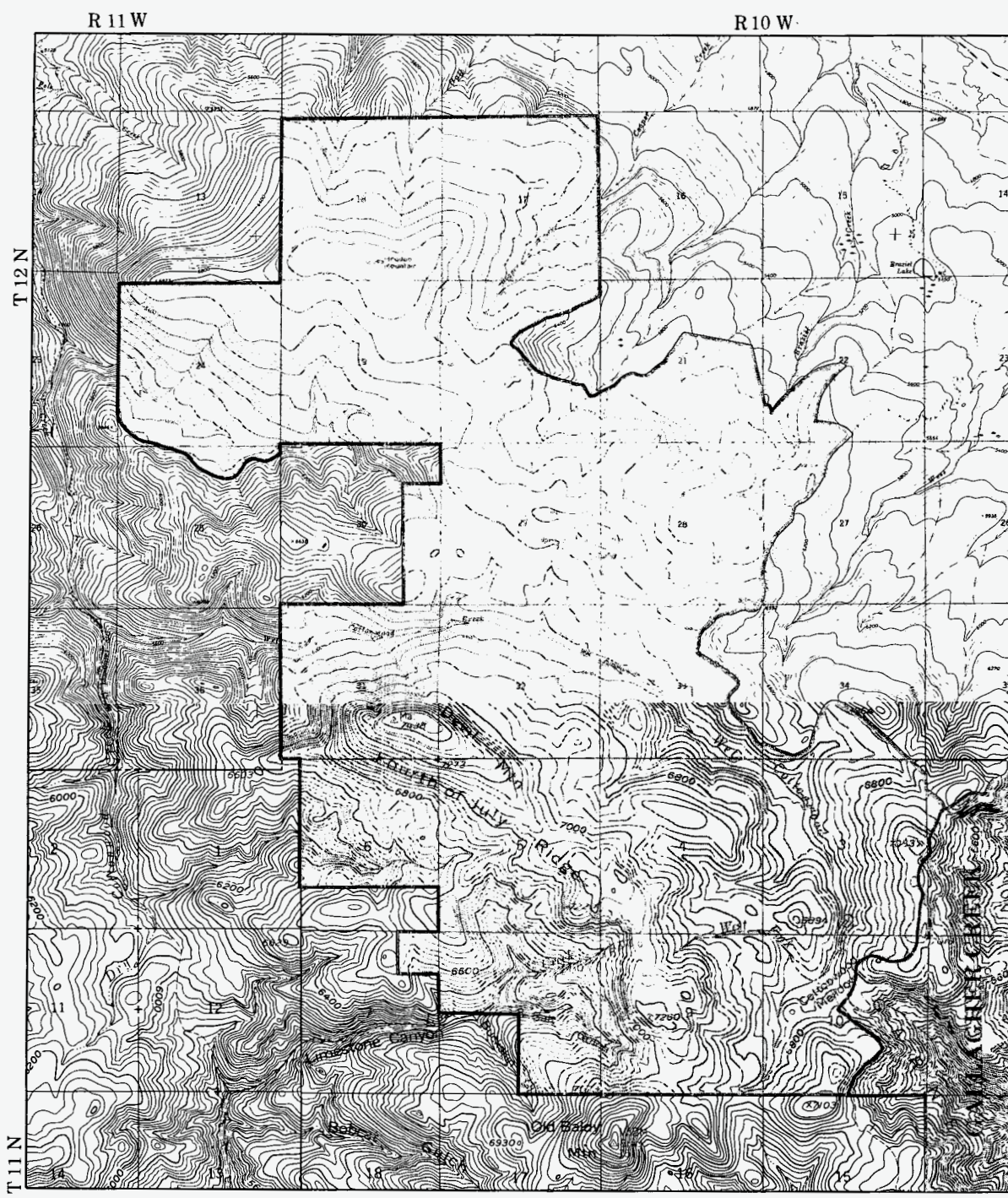
The elevations range from 7,438 feet at Devil Mountain to 5,200 feet on Cooper Creek. Hoodoo Mountain and Fourth of July Ridge are also visible landmarks.

The WSA is a forested area dotted with rock outcrops, open grassland parks, and numerous large and small wet meadows. High, open sites offer spectacular views of broad mountain valleys and distant mountain ranges.

The WSA contains habitat for elk, moose, deer, black bear, porcupine, grouse, and eagles. Martin, fishers, wolverine, and mountain lion also use the area. Wet Cottonwood Creek contains a fishable population of cutthroat trout.

Grazing and logging have left only a few imprints of human activity on the WSA. Recreational use of the area includes hunting, hiking, rock climbing, and camping. Limited snowmobile use occurs in the WSA.



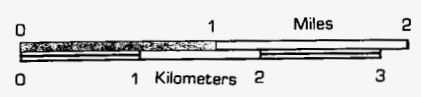


— WSA Boundary

□ WSA

HOODOO MOUNTAIN  
TOPOGRAPHIC MAP

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### Gallagher Creek

Gallagher Creek 202 WSA lies just east of the Hoodoo WSA between Helmsville and Avon, Montana. Access is from Highway 141 at Nevada Lake Reservoir. The WSA is bordered on the north by the Indian Creek Road, on the west by the Hoodoo Mountain fire road, and on the east and south by private lands (see the Gallagher Creek 202 WSA Topographic map).

The topography of the 202 WSA is quite rugged ranging from 7,016 feet to 5,240 feet in the Gallagher Creek drainage. The 202 WSA is about three miles wide by three miles long and contains 4,257 acres.

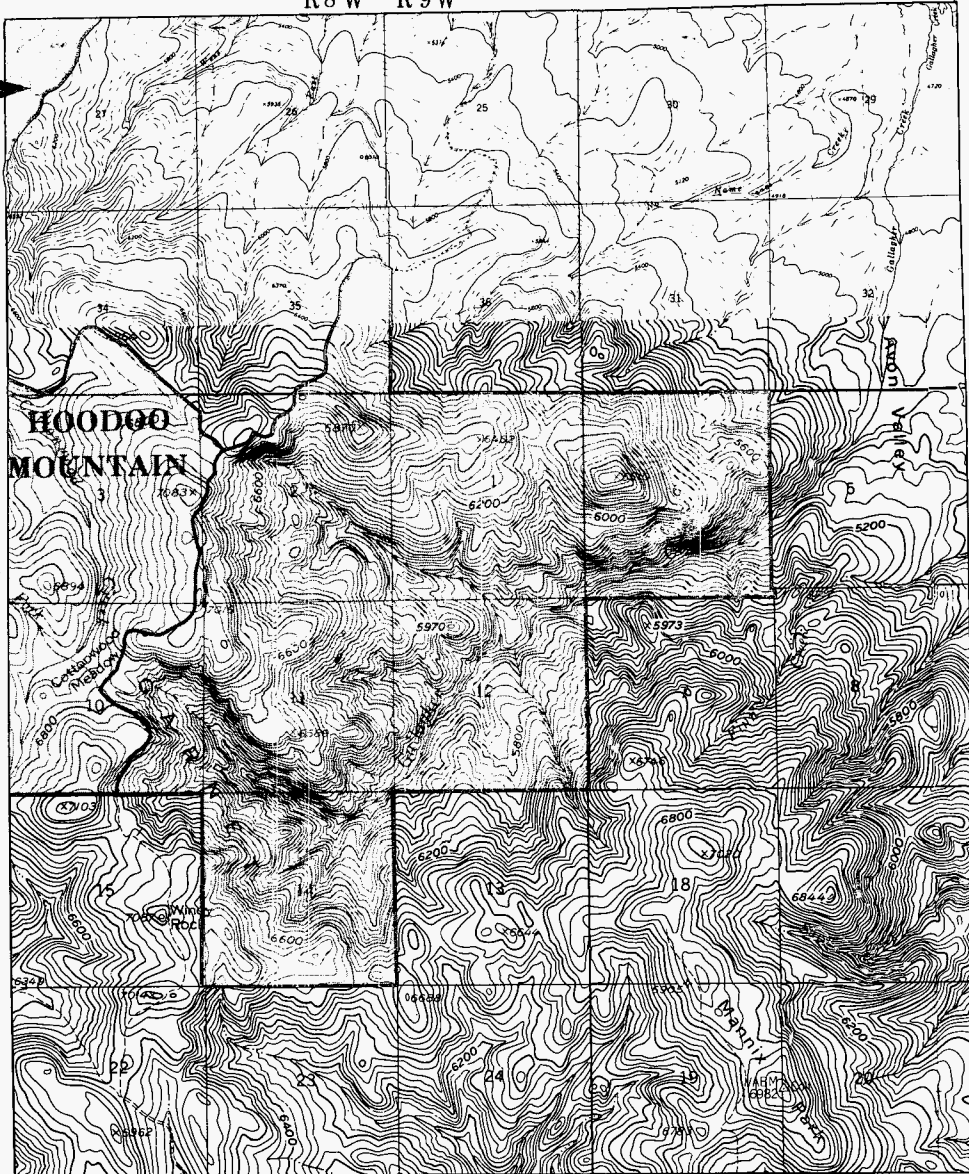
The Gallagher Creek drainage is forested and also contains narrow meadows and steep rocky bluffs. The creek itself contains the native cutthroat trout. The 202 WSA contains habitat for elk, deer, black bear, mountain lion, and moose. The 202 WSA contains a limited amount of peregrine falcon habitat.

Grazing and prospecting activities have left a limited number of human imprints. Recreational use of the 202 WSA includes hiking, hunting, camping, and rock climbing. The 202 WSA contains specimens of petrified wood to attract recreationists.



R 8 W R 9 W

HOODOO MOUNTAIN



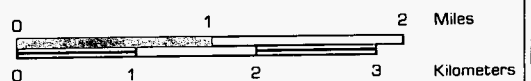
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### GALLAGHER CREEK TOPOGRAPHIC MAP

— WSA Boundary

□ WSA



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### Quigg West

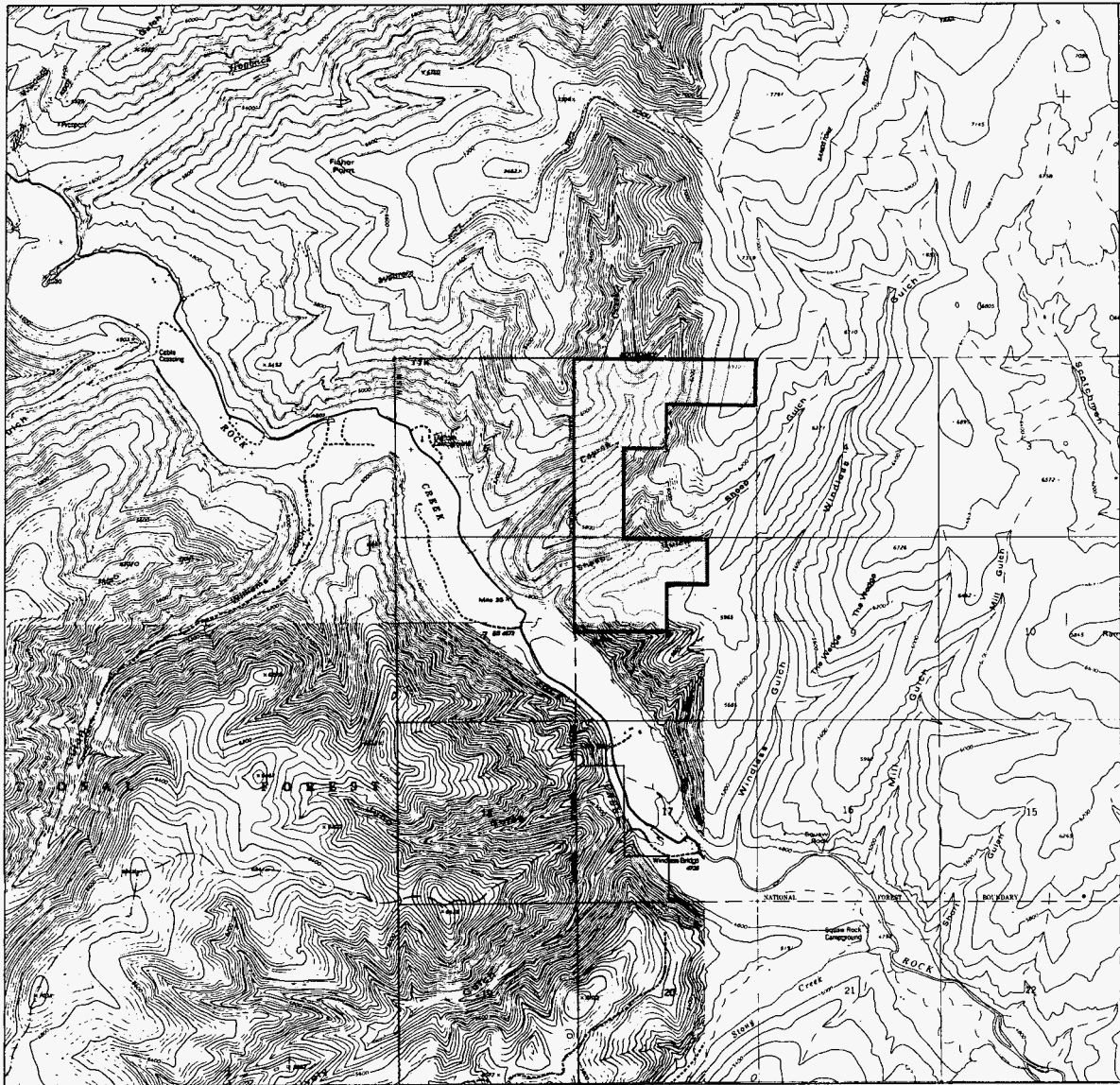
The Quigg West 202 WSA is a tack-on to the Forest Service 60,050-acre Quigg (Slide Rock) RARE II area (Q1807). The 202 WSA lies 20 miles west of Philipsburg, Montana. Access is via the Rock Creek Road (see the Quigg West 202 WSA Topographic map).

The tack-on is one-half mile wide by two miles long and covers 520 acres. National forest borders the north and west; private land borders the south and east.

Elevation in Quigg West varies between 4,920 feet and 6,930 feet. The area contains two narrow, steep drainages, Capron Creek and Sheep Gulch. The forested ridges are dotted with open talus areas. The tack-on is essentially untouched by human activity and is in a natural state. Heavy vegetation and steep slopes make travel difficult, therefore recreational opportunities are limited.

The tack-on offers yearlong habitat for bighorn sheep, as well as habitat for elk and mule deer. It is part of the Ram Mountain walk-in hunting area, which is closed yearlong to motorized vehicles.





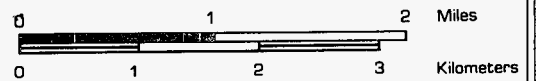
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T 7 N

**QUIGG WEST  
TOPOGRAPHIC MAP**

— WSA Boundary

□ WSA



1:63,360

## FOREST RESOURCES

Forest stands on public lands in the Garnet Resource Area occur at elevations from 3,600 to 7,000 feet. Precipitation below 5,000 feet is less than 20 inches per year; between 5,000 and 6,200 feet it averages 20 inches per year; and above 6,200 feet it averages 30 inches per year. Soils vary considerably in depth, texture, and fertility. This variability in abiotic factors creates a mosaic of vegetative communities. These communities or habitat types are distinguished by distinct combinations of overstory and understory vegetation.

The hierarchical classification of vegetative communities as described in *Forest Habitat Types in Montana* (USDA, FS 1977) is used to evaluate site potential of forest lands in the resource area. Table 3-15 lists the habitat types identified and gives timber productivity data for each. Approximately half the CFL produces 20 to 49 cu ft/ac/yr and half produces 50 to 84 cu ft/ac/yr. Although complete acreage data for each habitat type is not available, inventory data shows that the Douglas-fir series occupies over half of the forested area and produces about 60 percent of the annual harvest volume.

Six commercial tree species occur in the GRA. Table 3-16 shows the relative harvest volume of each species during a seven-year period.

The present age structure of the stands is old-growth surplus, with over 50 percent of the forested acreage over 150 years old. The forest industry in Montana is generally set up to harvest old-growth timber and produce lumber and plywood from large diameter logs.

**TABLE 3-16**  
**TIMBER SOLD IN THE GARNET**  
**RESOURCE AREA**

Species	% Volume Sold 1977-1983
Alpine fir	3%
Douglas-fir	59%
Engelmann spruce	4%
Lodgepole pine	28%
Ponderosa pine	3%
Western larch	3%

The public lands in the GRA have been subject to a continuous timber sale program since 1944. The total volume sold to date is 228,329 mbf with a stumpage value of \$4,772,988. Within this period, there has been an average of 4.6 sales per year. Most of these sales were sold by competitive bidding, and all of the sales that were offered were sold.

FLPMA directs that the timber resource be managed for a sustained yield and even flow of forest products. Therefore, the harvest of old-growth timber is not accelerated even though an economic analysis shows that the annual growth in old-growth, unmanaged stands is considerably less than in managed stands.

Although harvest level in the GRA from 1977 to date has been designated at 6,500 mbf/year, actual harvest volumes averaged 5,300 mbf/year. Net volumes in the unmanaged stands will vary from 3 to 25 mbf/acre. Average inventoried volume is 7 mbf/acre.

**TABLE 3-15**  
**FOREST HABITAT TYPES AND PRODUCTIVITY DATA FOR THE GRA**

Series	Habitat Types	Comparative Yield Capability	Yield Capability cu ft/ac/yr @ CMAI
Douglas-fir	bluebunch wheatgrass	Low	20-35
Douglas-fir	Idaho fescue	Low	20-35
Douglas-fir	rough fescue	Low	20-35
Douglas-fir	ninebark	Moderate-Low	30-60
Douglas-fir	blue huckleberry	Moderate-Low	30-55
Douglas-fir	twin flower	Moderate-Low	35-50
Douglas-fir	snowberry	Moderate-Low	30-45
Douglas-fir	pinegrass	Moderate-Low	30-60
Alpine fir	dwarf huckleberry	Moderate-Low	30-55
Alpine fir	grouse huckleberry	Moderate-Low	30-55
Alpine fir	twin flower	Moderate	30-85
Alpine fir	menziesia	Moderate	40-85
Alpine fir	blue huckleberry	Moderate	40-85
Alpine fir	beargrass	Moderate	40-85
Alpine fir	queencup beadlily	High	85+
Alpine fir	sweetscented bedstraw	High	85+
Alpine fir	bluejoint	High	85+

Road construction averages 1.5 miles of road built for every million board feet of timber harvested. Through the timber sale program the GRA has constructed over 300 miles of road, most of which are maintained as a permanent transportation system and used by the public.

### Reforestation

One measure of success of a timber management program is how quickly the harvested forest land is adequately restocked with acceptable tree species. Through a program called TPCC forest sites are evaluated for regeneration potential. Table 3-17 summarizes the CFL base acreage into four broad TPCC categories, and Appendix C details the full TPCC classification system.

**TABLE 3-17  
TPCC CATEGORIES AND ACREAGES**

TPCC Category	BLM Acres in GRA
CFL* Withdrawn from base	(3,186 acres)
CFL Restricted	43,322 acres
CFL Restricted with 30 year regeneration lag	11,542 acres
CFL Nonproblem	57,606 acres
CFL Base Acres	112,470 acres

\*Commercial Forest Land

The withdrawn category contains sites that are too fragile to log. The restricted category contains sites where natural regeneration should occur within 15 years with shelterwood cutting, good seedbed preparation, and protection from grazing in areas where cattle concentrate. The restricted with 30-year regeneration lag category contains sites where natural restocking should occur within 30 years; and underplanting prior to final shelterwood cut is recommended. The nonproblem category contains sites where regeneration can be established within 15 years.

Reforestation through silvicultural treatment on habitat types in the Douglas-fir series is extremely difficult in the Garnet Range. Several factors contribute to this difficulty.

Several understory species common to the Douglas-fir series tend to be sod forming as the canopy cover is opened. This process is further compounded when heavy livestock grazing occurs on these understory species.

Cone crops are infrequent in Douglas-fir. Heavy cone crops will occur every five to seven years. The Western Spruce Budworm (WSB) is endemic throughout the GRA, and spotty epidemic outbreaks occur just about every year. The WSB feeds on existing foliage,

may cause up to 30 percent net loss in height growth, and can damage up to 70 percent of a cone crop.

The first appropriated-fund, reforestation work was done in 1963. To date, 4,893 acres have been planted with bare root stock, 475 acres have been planted with containerized seedlings, and 649 acres have been seeded. Natural regeneration in clearcuts on north and east slopes and in larch seed tree units has been very successful. Shelterwood cutting in Douglas-fir is usually successful on the TPCC nonproblem sites.

Beginning in 1982 all TPCC restricted sites in a timber sale were reforested under the terms of the timber sale contract. To date, 553 acres have been identified for planting with some 308,000 seedlings.

The GRA is actively involved in genetic tree improvement through the Inland Empire Tree Improvement Cooperative (IETIC). Superior trees are selected and their seeds collected for the ponderosa pine, Douglas-fir, and lodgepole pine species programs. In addition, one of the IETIC lodgepole pine progeny test plantations is on public land.

Timber stand improvement was started in 1963 and some 2,266 acres of precommercial thinning has been completed. Under the terms of the timber sale contract, timber stand improvement is indicated when the contract includes overstory removal.

### Insect and Disease

The mountain pine beetle is active in the Blackfoot drainage. The damage from this beetle is not significant at this time on BLM-administered land. However, if the infestation increases to epidemic levels, it would threaten lodgepole pine stands in the Chamberlain Creek, Wales Creek, and Yourname Creek drainages.

Although the WSB is the most widespread cause of productivity loss in the Garnet Range, there are a number of other factors that either cause significant volume losses or have the potential to do so (see Table 3-18).

## RANGE RESOURCES

### Vegetation

The Garnet Resource Area is predominately forested. Shrub and grasslands make up a very small portion (7 percent) of the GRA.

### Riparian

Riparian zones also occupy a relatively small acreage along streams and in wet meadows but are important for range management. The 84 allotments contain about 4,841 acres or 80 percent of the total (6,078 acres) riparian habitat. There are currently 4,204 acres of riparian in unsatisfactory condition occurring in 28 of the 84 allotments and 637 acres of satisfactory riparian in some of the remaining allotments. Figures 3-2 and 3-3 show how satisfactory riparian habitat compares to unsatisfactory riparian habitat.



TABLE 3-18  
FACTORS AFFECTING FOREST PRODUCTIVITY

Cause of Productivity Loss	1980	1981	1982	1983
Western Spruce Budworm	decreasing	decreasing	increasing	decreasing
Mountain Pine Beetle	present	decreasing	decreasing	decreasing
Douglas-fir Beetle	present	present	present	increasing
Balsam Bark Beetle	not present	not present	not present	present
Pine Engraver	present	not present	not present	not present
Porcupine	present	present	present	increasing
Fire	very minor	very minor	very minor	very minor
Root Rot	present	present	present	becoming more evident
Mistletoe (LPP)	present in old-growth	present in old-growth	present in old-growth	present in old-growth
Mistletoe (DF)	present*	present*	present*	present*
Mistletoe (WL)	present*	present*	present*	present*

\*not found east of R. 17 W.

Information from Forest Service Region I Cooperative Forestry and Pest Management and BLM inventory.

### Noxious Weeds

The resource area contains several species of toxic and noxious plants. These are leafy spurge, spotted knapweed, musk thistle, Canadian thistle, and Dalmatian toadflax. Of these, knapweed and musk thistle present the most significant problems for grazing management. These plants thrive in areas where the soil is disturbed. The seeds are easily dispersed by vehicles, contaminated hay, and winds. Almost all drainages have some weed growth. However, heavy growth of weeds can be found in the lower reaches of Mulkey Gulch, Rattler Gulch, Ashby Creek, and Braziel Creek.

### Transitory Range

Between logging and the reestablishment of the forest, transitory range is created. Transitory range in the Douglas-fir series produces most of the resource area's forage. Transitory range can produce forage for up to 40 years before shading from the trees restricts the growth of the understory forage. Depending on site and habitat type, timber harvest areas may produce from 200 to 1,800 pounds of usable forage per acre per year. The greatest forage production should occur in the sixth through fifteenth year after harvest.

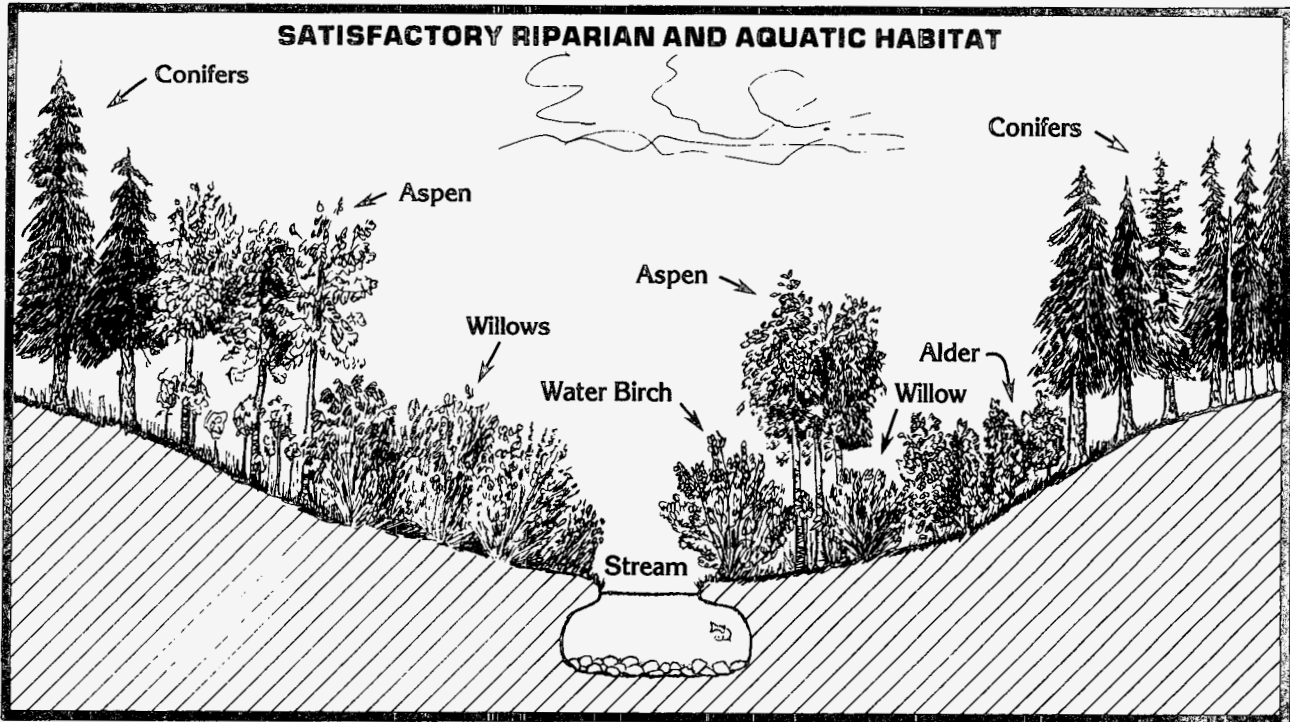
### Livestock Grazing

The resource area has 110,269 acres (76 percent) leased for livestock grazing. Twenty-four percent or 35,391 acres are unleased. The leased lands are separated into 84 allotments with a forage allocation of 5,930 Animal Unit Months (AUM). All allotments are cow/calf operations. The grazing season generally runs from June 1 to October 15 each year. The allotments are shown on the Garnet Resource Area Grazing Allotment map located in the map packet.

Between 1976 and 1982 range resources were evaluated as to existing site condition and recommended stocking rate. The information was used to assign the number of acres available for livestock grazing and the estimated carrying capacity for each grazing lease. The vegetative condition was assigned a rating of excellent, good, fair, or poor condition using the Montana Grazing Guides (USDA, SCS 1977 and revisions 1983).

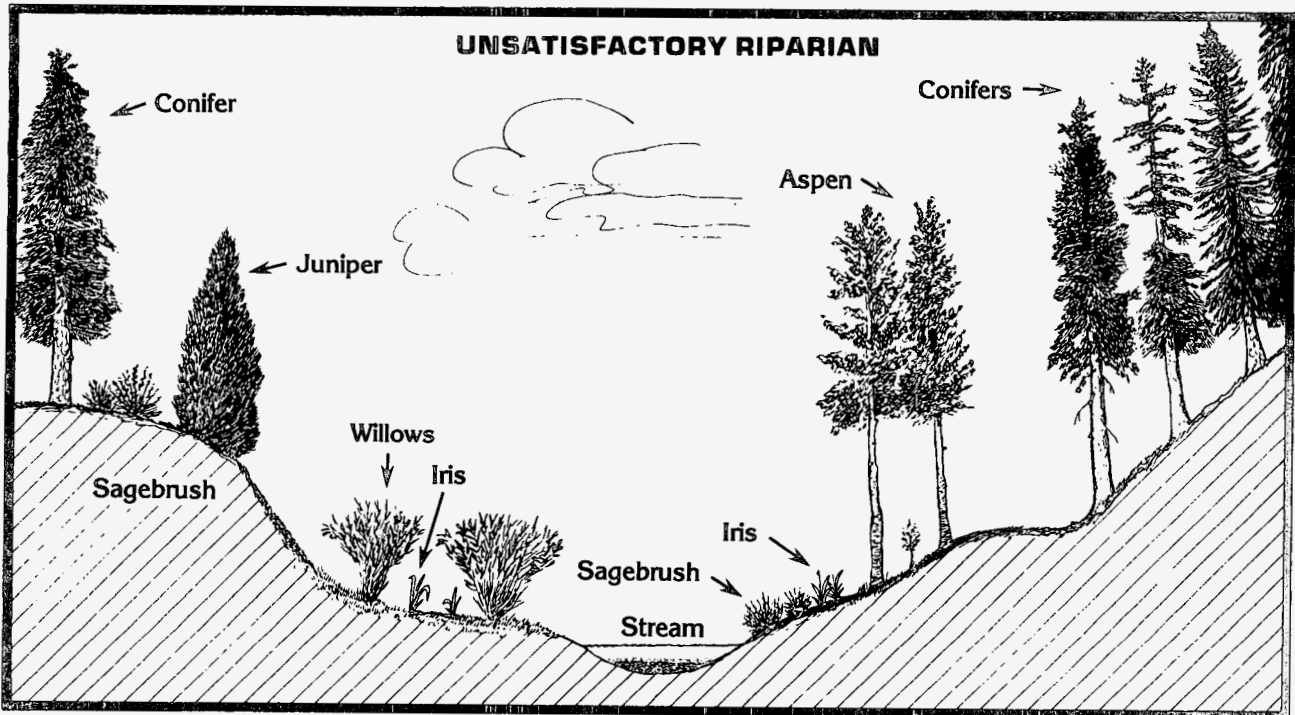
Appendix L lists the condition and authorized use for each grazing allotment and explains how the vegetative condition ratings were assigned. Table 3-19 summarizes the range condition for the resource area.

FIGURE 3-2



Satisfactory riparian habitat is characterized by good vigor and canopy coverage, abundant reproduction of palatable plant species, and well developed, overhanging stream banks. Gravels dominate the stream substrate, which provides good habitat for fish spawning and aquatic invertebrates.

FIGURE 3-3



Unsatisfactory riparian habitat is characterized by poor vigor and canopy coverage, low species diversity, and a lack of reproduction of woody plant species. Unpalatable plants, such as sagebrush and iris, are increasing in abundance. Streams have eroded stream banks and shallow water (because the banks are not overhanging). Silt dominates the stream substrate, which provides poor habitat for fish spawning and aquatic invertebrates.

**TABLE 3-19**  
**SUMMARY OF PRESENT VEGETATIVE CONDITIONS AND CLASSIFICATION FOR THE GRA**

Condition/ Classification	Acres Currently Leased						Unleased Areas <sup>2</sup>		Areas Closed To Grazing		GRA Total	
	Improvement (I) Category		Maintenance (M) Category		Custodial (C) Category		Acres	%	Acres	%	Acres	%
	Acres	%	Acres	%	Acres	%						
Excellent	5,699	12	5,549	11	691	6	0	0	35	Trace	11,974	8
Good <sup>1</sup>	7,196	15	12,264	24	1,653	15	0	0	3,892	14	25,005	17
Fair	4,352	9	7,761	15	2,146	19	0	0	66	1	14,325	10
Poor	293	1	1,004	2	39	Trace	0	0	0	0	1,336	1
Waste	23,635	50	20,061	39	2,899	25	0	0	23,207	85	69,802	48
Unclassified	170	Trace	1,163	2	3,594	32	6,141	75	0	0	11,068	8
Logged	6,244	13	3,493	7	363	3	2,050	25	0	0	12,150	8
Column Totals	47,589	100	51,295	100	11,385	100	8,191	100	27,200	100	145,660	100

<sup>1</sup> Does not include acres classified as logged, all of which are assumed to be in good vegetative condition.

<sup>2</sup> Areas available for leasing but not currently leased; mostly small, widely-scattered tracts; generally steep and forested.

The vegetative condition rating system ranks an area as excellent if the vegetative community has stabilized and the forage is the climax species for that site. A good or fair rating may also represent quality livestock forage that is in transition toward the climax species. This is especially true in the Garnet Resource Area where most forage is in a transitional stage.

There are a variety of range improvements in place on several grazing allotments. These include 73.6 miles of fence, 27 spring developments, 15 cattle-guards, and 3 miles of pipeline.

Allotment Management Plans (AMP) have been completed on 73,490 acres of public and adjacent private lands. Table 3-20 lists the AMPs and their acreages. The AMPs set management objectives for improving the range, watershed, soils, wildlife, and forest resources. The areas are monitored and evaluated each grazing cycle to determine if progress is made toward achieving the AMP objectives.

**TABLE 3-20**  
**ALLOTMENT MANAGEMENT PLANS**

AMP Name	Acres Public	Acres Private	Total
Five Mile Creek	480	—	480
McElwain Creek	6,358	3,485	9,843
Wales Creek	856	640	1,496
Devil Mountain	2,018	8,991	11,009
Braziel Creek	8,105	2,080	10,185
Warm Springs Creek	7,361	13,567	20,928
Marcum Mountain	3,443	2,319	5,762
Ram Mountain	4,151	2,825	6,976
West Fork Buttes	640	1,280	1,920
Stewart Lake	2,251	2,640	4,891
Total	35,663	37,827	73,490

## WILDLIFE HABITAT RESOURCES

The Garnet Resource Area contains the mountain coniferous, mountain grasslands, riparian, and aquatic wildlife habitats.

The mountain coniferous habitat has a forest canopy on gentle to steep terrain. The mountain grasslands are located in small mountain parks or expansive grasslands lower in elevation than the coniferous habitat. Forest clearcuts are not included in the grassland habitat.

The riparian habitat lies along stream courses and within mesic areas. There are about 6,078 acres of riparian habitat along stream courses. Riparian also includes lakes, reservoirs, seeps, springs, bogs, marshes, and wet meadows but will not be measured or mapped.

The aquatic habitat occurs in permanent bodies of water capable of producing fish. The aquatic habitat is found within the riparian habitat. There are 67 miles of fish producing streams (58 miles) and rivers (9 miles) on public land in the GRA.

## Threatened and Endangered Species Habitat

The resource area contains current and historic habitat for four threatened or endangered species: the bald eagle, peregrine falcon, northern Rocky Mountain wolf, and grizzly bear. The only species currently using the habitat is the bald eagle.

Bald eagles from northern populations migrate into Montana in late fall and early winter. Five to thirty eagles have wintered along the Blackfoot and Clark Fork rivers between 1979 and 1983. The Blackfoot River also provides excellent nesting habitat and has the highest density of breeding pairs in Montana.

## Big Game Species Habitat

The resource area supports habitat for mule deer, white-tailed deer, elk, moose, bighorn sheep, black bear, and mountain lion (see the Big Game Winter Range map by species).

### Mule Deer Habitat

Mule deer are the most abundant big game species in the GRA and occupy nearly all habitats. The deer prefer open areas with adequate forage near trees and shrubs that provide escape cover. Seasonal forage in the GRA is generally good on the summer and fall ranges and varies from poor to good on the winter ranges. On summer and fall ranges, security cover is an important habitat component while thermal cover on winter and spring ranges is a prime management component.

Mule deer are opportunistic feeders. During spring, grasses are preferred until forbs are available. Forbs and browse are preferred in summer. In winter the deer use all available sources. Winter browse is the limiting factor on mule deer populations. Preferred winter browse includes serviceberry, chokecherry, bitterbrush, ceanothus, juniper, mountain maple, sagebrush, rose, rabbitbrush, Douglas-fir, and ponderosa pine. Approximately 273,432 acres of deer winter range have been identified in the GRA. Ten percent or 27,635 acres is public land.

### White-tailed Deer Habitat

White-tailed deer most often occur at low elevations along major creeks and river valleys. White-tailed deer use mostly forbs in the spring and summer with increased use of browse and grasses in fall and winter. Use of agricultural lands increase in the winter.

### Elk Habitat

Elk prefer the mountain coniferous habitat. They can be found near the interface between forest and non-forest communities. They move from moist sites at the heads of drainages in the summer to dense timber and dry open parks in the fall. In the winter and spring they occupy grassland habitats near mature timber stands.

Elk are primarily grazing animals. Grass is the preferred forage in spring. Forbs and shrubs are used in the summer, then dry grasses and browse in the fall and winter. Elk diet includes bunchgrass, wheatgrass, mountain brome, junegrass, sedge, thistle, sweetclover, penstemon, dandelion, arnica, bitterbrush, serviceberry, sagebrush, mountain maple, willow, chokecherry, aspen, and lichens (Thomas and Toweill 1982; BLM Observations).

About 231,346 acres of elk winter range have been identified in the GRA. Eleven percent or 24,975 acres is public land. The lands provide an abundance of summer and fall range for elk compared to a limited amount of winter range.

The Chamberlain Creek Elk Logging Study area is located on the resource area. The study area is used to

describe elk distribution, movement, and habitat use of the area before, during, and after logging operations.

### Moose Habitat

Moose occur in limited numbers in riparian and other browse-producing habitats. Browse is the most important forage throughout the year. In the spring and summer grass and forbs are also used.

About 15,504 acres of moose winter range occur in the GRA. Twenty-six percent or 4,014 acres is public land. The forage condition trend is rated stable to declining.

### Rocky Mountain Bighorn Sheep Habitat

Bighorn sheep habitat is found along the upper Rock Creek and Willow Creek area. The current population is estimated at 175 to 200 animals (information supplied by MDFWP, March 1984).

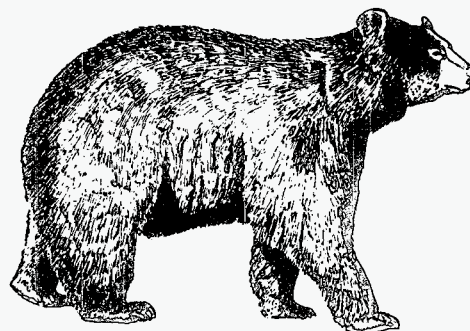
Grass and grasslike plants provide the major diet (Berwick 1968; Cooperrider 1969). Green forbs are always used when available, and browse provides supplemental winter forage. About 5,804 acres of bighorn sheep winter range occur in the Ram Mountain area. Fifteen percent or 905 acres is public land. The forage is in fair to good condition. The bighorn sheep compete for winter and spring forage with deer, elk, and livestock.

### Black Bear Habitat

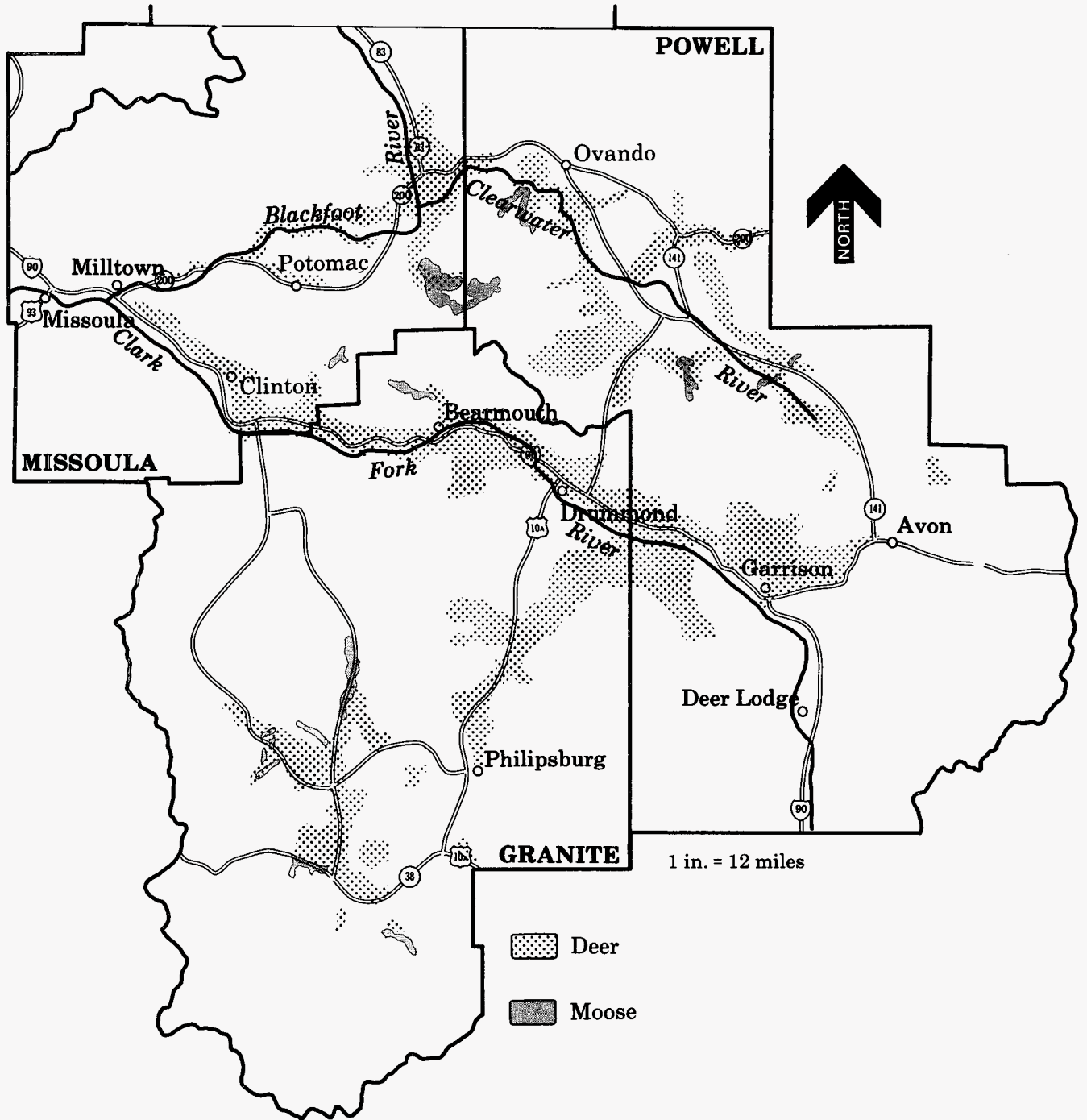
Black bear use a variety of habitats but prefer forested and riparian areas. These areas provide food, cover, and winter denning sites. The black bear feeds on berries, nuts, roots, grasses, and forbs as well as insects, fish, rodents, carrion, and occasionally large mammals.

### Mountain Lion Habitat

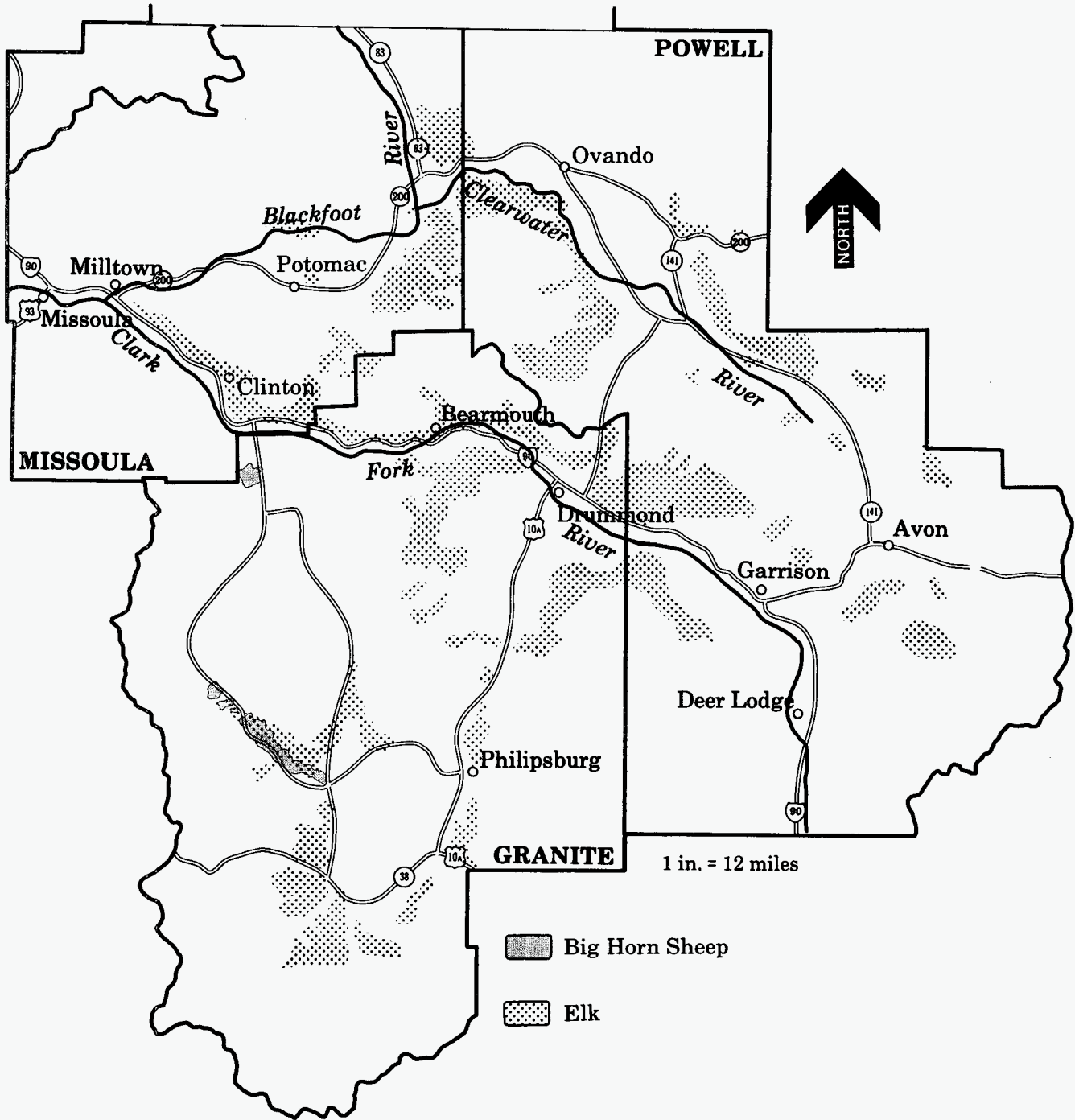
Mountain lions use a variety of habitats that provide food, cover, and den sites. The primary food of the mountain lion is deer; other sources are porcupines, rabbits, and rodents.



# BIG GAME WINTER RANGE DEER/MOOSE



### BIG GAME WINTER RANGE BIG HORN SHEEP/ELK



## Upland Game Birds and Waterfowl Habitat

### Grouse Habitat

The resource area offers habitat for four species of mountain grouse: blue, spruce, ruffed, and Columbian sharp-tailed grouse.

Blue grouse use Douglas-fir and ponderosa pine stands, thickets, and parks. The habitat provides territorial and display sites, brooding areas, and food sources. Food includes insects, fruits, berries, flowers, buds, twigs, leaves, and conifer needles. The blue grouse move to higher elevations in September for the winter and return to lower habitat in spring and summer.

Spruce grouse use dense conifer stands, usually lodgepole. They prefer stands with good ground cover and small trees and shrubs. Conifer needles are the staple food in winter.

Ruffed grouse are most often found in riparian habitat. Suitable drumming logs are an important factor in spring habitat. The basic winter diet for ruffed grouse is buds, twigs, and catkins.

The Columbian sharp-tailed grouse (a relic population near Helmville, Montana) is found in sagebrush, grasslands, open woodland, and brushy draws. Spring habitat must contain dancing grounds that are sparsely vegetated and elevated sites. Wheat and alfalfa can provide food and cover. Winter foods are buds and catkins (Johnsgard 1973).

### Waterfowl Habitat

The most important waterfowl habitat is found on a 160-acre wetland area on Kleinschmidt Lake and along the Blackfoot and Clark Fork rivers (9 linear miles). Ducks common to the inland Pacific Flyway are found in the area in the spring and fall. Seventeen breeding pairs of Canada geese have been reestablished on Kleinschmidt Lake by using artificial nest structures, gosling releases, and hunting restrictions.

## Nongame Species Habitat

The diversity of habitats found in the GRA provide for a wide variety of nongame species. The concept of old-growth forest is an important aspect of managing habitat for nongame species. Of the 274 nongame species on the GRA, 28 are dependent to some degree on old-growth habitat.

## Fisheries

Sixty-seven miles of fishing streams and rivers produce cutthroat, rainbow, cutthroat/rainbow hybrids, brown, brook, and dolly varden trout; bullhead; whitefish; squawfish; sucker; red-sided shiner; and sculpin (see Table 3-21). An additional nine miles of stream produces no fish but contributes high quality water for downstream fisheries.

Thirty-four miles of streams can be rated as optimum aquatic habitat. Eighteen miles of streams are rated as suboptimum aquatic habitat. The suboptimum habitat has little bank stability, inadequate bank cover, a low pool to riffle ratio, or undesirable bottom materials. Portions of the suboptimum aquatic habitat will respond to changes in grazing and timber management alone while others will require structural improvements. There are 15 miles of unsurveyed, fish producing streams.

## SOCIAL AND ECONOMIC CONDITIONS

### Population

The total population in Granite, Missoula, and Powell counties was 85,674 in 1980. Missoula County grew by 30 percent between 1970 and 1980. Powell and Granite counties had little change in population. In comparison, the State of Montana as a whole grew by 13 percent. Table 3-22 shows the projected population changes for each county through the year 2005.

The largest city in the area is Missoula with a city population of 33,388. Other towns include Deer Lodge with a population of 4,011; Philipsburg, population 1,131; and Drummond, population 410.

The median age of the people living in Granite County is 33, 31 in Powell County, and 27 in Missoula County. The young, median age of people in Missoula County is attributed mainly to the university student population. The older, median ages of Powell and Granite is probably caused by the outmigration of young people seeking jobs.

Population density varies between the counties. Missoula County has twenty-nine people per square mile, while Powell County has three and Granite has two people per square mile. Missoula County's population is becoming more urban as the city of Missoula gains population, while Powell County is becoming more rural as Deer Lodge loses population. The population in Granite County is rural.

### Employment and Income

Timber related businesses are one of the primary employers in the Garnet Resource Area. The primarily rural counties, Granite and Powell, rely on mining and agriculture as well as timber. Powell County also has a large number of people working at the Montana State Prison in Deer Lodge. Missoula County offers jobs in timber processing, retail trade, and the University of Montana.

Employment related to agriculture is expected to decline in the three-county area through 2005, while employment in other areas is expected to increase. Table 3-23 shows the projected employment rates for Missoula, Granite, and Powell counties as predicted by the BLM Economic/Demographic Model.

**TABLE 3-21**  
**FISHABLE STREAMS AND RIVERS IN THE GRA**

Stream Name	Total Miles	BLM Miles Producing Fish	Optimum Habitat (70%)	Suboptimum Habitat (69-%)	Fishable Miles In BLM Grazing Allot.	Type of Fish
Ashby Creek, E. Fork	2.6	1.4	81	—	.75	CT
Ashby Creek, W. Fork	2.5	0.6	74	—	.6	CT
Bear Creek, E. Fork (Blackfoot)	2.7	0.8	75	—	—	CT
Beaver/Bear Creek (Upper Willow)	1.5	1.2	NS	NS	1.2	CT
Boulder Creek	2.7	0.3	NS	NS	0.3	CT, RT, BT, BnT, DV, WF
Camas Creek	4.2	0.8	—	30	0.5	CT
Chamberlain Creek	9.8	4.0	76	—	—	CT, DV
Copper Creek	3.4	0.8	NS	NS	0.8	CT
Cottonwood Creek (Silver King)	—	0.75	NS	NS	0.75	CT
Cramer Creek, E. Fork	8.0	0.8	72	—	0.8	CT, BT
Deer Gulch	2.8	1.6	—	51	1.6	CT
Douglas Creek (Section 6)	—	0.25	NS	NS	0.25	CT
Douglas Creek	10.0	2.6	76	—	1.75	CT
Dry Cottonwood Creek	9.5	1.3	—	39	1.3	CT
Elk Creek	11.5	1.8	71	—	—	CT, RT, BT
Flint Creek	—	1.25	79	—	1.25	CT, BnT, RT, SK
Fred Burr Creek	8.0	0.3	NS	NS	—	CT, RT
Gallagher Creek	6.9	3.4	94	—	—	CT
Greenough Creek	5.0	0.2	NS	NS	—	CT
Kennedy Creek	3.8	2.5	72	—	0.9	CT
McElwain Creek	11.0	4.9	70	—	3.5	CT
Murray Creek	10.0	2.1	80	—	1.5	CT
Pearson Creek	6.9	1.1	—	53	—	CT
Scotchman Creek	5.5	1.7	NS	NS	1.7	CT
Tenmile Creek	4.0	2.5	82	—	2.25	CT
Union Creek	14.0	1.6	79	—	1.25	CT
Upper Willow Creek	17.4	0.8	NS	NS	0.8	CT, RT, BnT, BT, DV
Wales Creek	4.7	3.4	84	—	—	CT, RT
Wallace Creek	3.5	2.0	—	53	1.25	CT
Warm Springs Creek	12.0	1.0	NS	NS	0.5	CT, BnT
Wet Cottonwood Creek	6.8	6.8	—	65	—	CT
Yourname Creek	9.0	3.5	—	68	1.75	CT, BT
Blackfoot River	—	2.8	NS	NS	0.95	All
Clark Fork River	—	5.1	NS	NS	0.25	All, except DV
Rock Creek	—	1.1	NS	NS	0.2	All

CT = Cutthroat trout      RT = Rainbow trout  
 BT = Brook trout        SK = Sucker  
 BnT = Brown trout        WF = Whitefish  
 DV = Dolly Varden        SF = Squawfish  
                                   NS = Not Surveyed

**TABLE 3-22**  
**POPULATION PROJECTIONS FOR MISSOULA, GRANITE, AND POWELL COUNTIES**

County	1980	Population			2000	Change Between 2000-2005	Projection 2005
		Change Between 1980-1990	Projection 1990	Change Between 1990-2000			
Missoula	76,016	23%	93,728	25%	116,891	10%	128,829
Granite	2,700	36%	3,664	26%	4,597	10%	5,046
Powell	6,958	33%	9,225	28%	11,780	10%	12,938



**TABLE 3-23**  
**EMPLOYMENT PROJECTIONS FOR MISSOULA, GRANITE, AND POWELL COUNTIES**

County	Agricultural Employment				Nonagricultural Employment			
	1980	1990	2000	2005	1980	1990	2000	2005
Missoula	532	500	474	464	37,954	46,766	58,695	65,964
Granite	210	198	188	184	653	940	1,257	1,430
Powell	288	270	255	252	2,102	2,761	3,583	3,957

### Lifestyle and Attitudes

Lifestyle in western Montana is oriented towards the outdoors for both work and recreation. As a result, residents take an interest in issues concerning the land and how it is managed.

The population is in general well educated. Seventy-four percent have graduated from high school. The schools form the social center for the communities, and academic quality is an important community concern.

The residents take interest in local, state, and federal government concerns. The population has a high percentage of registered voters, and voter turnouts tend to be higher than the national average. The population also lends support to a wide variety of organizations that are interested in land management. These groups virtually cover the entire spectrum of opinion on land management issues.

Among the negative aspects of life in Montana are the relatively low per capita income, the high traffic death rates, and the relative remoteness from national trade centers. Unemployment rates in western Montana are currently among the highest in the state.

Attitudes in the area tend to favor local control over resource issues. Recreation, wildlife, and wilderness all have strong advocates in the community. The use of natural resources are also viewed as being vitally important to the economic well-being of the area.

### Federal Payments to County Governments

The Taylor Grazing Act and the Mineral Leasing Act shares grazing and lease fees with the county governments. Likewise, the payment in lieu of taxes program reimburses county governments for loss of tax revenues on public lands. Table 3-24 shows the amounts received by each county in 1982.

### Socioeconomic Relationships

#### Forestry

Timber production is the major use of the BLM-managed lands in the GRA. The timberlands are in checkerboard ownership with corporate lands owned by Champion Timberlands and Plum Creek. Most of the timber produced in western Montana comes from private and national forest lands. Timber harvest from BLM-managed lands amounted to only 0.5 percent of the total harvest in Missoula, Powell, and Granite counties. Cutting and processing this amount of timber contributes about 57 jobs in the private sector. In comparison there are a total of 3,275 jobs in timber processing in Powell, Granite, and Missoula counties.

#### Recreation

Recreation in the form of hunting, fishing, camping, hiking, and off-road vehicle use is also an important use of public lands. Habitat protection and access are concerns raised by recreationists.

**TABLE 3-24**  
**FEDERAL PAYMENTS TO COUNTY GOVERNMENTS IN 1982**

Funding Authorization	Missoula County	Granite County	Powell County	Montana
Taylor Grazing Act	\$ 406	\$ 2,900	\$ 2,240	\$ 167,266
Mineral Leasing Act	12,036	165,207	153,365	17,652,679
Payment In Lieu of Taxes	210,086	65,222	68,806	7,213,567
<b>Total</b>	<b>222,528</b>	<b>233,329</b>	<b>224,411</b>	<b>25,033,512</b>

Habitat protection allows for maximum production of wildlife. The presence of abundant wildlife encourages hunting and fishing. Western Montana supported 339,671 hunter days for deer and elk in 1982 and 419 days for waterfowl. Of this, 30,000 hunter days occurred on BLM-managed lands. Hunting is estimated to bring \$1,400,000 into the economies of Granite, Missoula, and Powell counties.

An estimated 10,051 recreational days per year occur on BLM-administered land for other recreational activities. This estimate does not include sight-seeing or viewing of public lands; recreational days would increase significantly if they were counted for all public lands. For instance, an estimated 12,000 visitor days per year occur at Garnet Ghost Town. This represents only a small percent of the total recreation days spent on all lands in Granite, Powell, and Missoula counties.

#### Land Adjustment

Both Champion Timberlands and Plum Creek Timber Company have expressed interest in land ownership adjustment to consolidate their land holdings. The lands are currently in a checkerboard ownership pattern. Consolidation of holding offers advantages to both the public and private sector in terms of effective management and efficient use of resources.

#### Utility Corridors

In 1983 work was in progress on two major utility lines: the Montana Power's natural gas pipeline through Powell County and the BPA powerline through all three counties. During this same period the proposed Northern Tier oil pipeline route, which would have passed through the GRA, was canceled. All three lines attracted considerable public attention and controversy. While very little BLM-administered lands were in the corridor routes, the BLM was the authorizing agency.

#### Energy and Minerals

Prospecting for silver and gold has increased recently in the three-county area. Producing mines include a major phosphate mine; a large silver mine; and small gold, silver, and barite operations.

Public land is favored for prospecting because claims may be staked. Ten placer gold mines, one barite mine, and a phosphate mine presently operate on public land. The ten placer mines employ approximately four persons each for a total employment of forty persons. Occasional, temporary employment is available for exploratory handrock core drilling.

Oil and gas exploration is beginning in the three-county area and on public lands. Temporary employment is available from time to time for workers on seismic crews. In 1983 three core drilling companies were working in the area for two to three months each.

#### Cultural

Garnet Ghost Town and other abandoned mining towns are the most significant cultural sites on the public lands. These BLM sites are also among the most important cultural sites in the entire three-county area. Citizens in and around Missoula have formed the Garnet Preservation Association to help protect and stabilize the town site.

#### Livestock Grazing

The BLM supplies a total of 5,930 AUMs of grazing. As of 1984, the BLM charges ranchers \$1.37 per AUM while the state charges \$3.00, Plum Creek Timber Company \$5.40, Champion Timberlands \$4.50, and other private grazing averages \$9.45.

The dependency of ranches on BLM grazing in all size classes (see Appendix R) is relatively small as shown in Table 3-25. This dependency is based on the percentage of total needed forage provided by BLM lands. Relative dependency could be higher for individual ranches if BLM grazing is concentrated in a specific season where the ranch does not have enough forage from other sources.

TABLE 3-25

#### DEPENDENCY OF LESSEES ON LIVESTOCK FORAGE ON PUBLIC LANDS IN THE GARNET RESOURCE AREA

Size Class	Number of Ranches	Average Dependency*
1	22	8.1%
2	12	2.1%
3	22	1.7%
4	20	2.1%

\*Percent of AUMs on public land compared to total AUMs on both public and private lands in an allotment.

#### Wilderness

The supply of wilderness land in the vicinity of the GRA is relatively large. The addition of Wales Creek, Hoodoo Mountain, Gallagher Creek, and Quigg West to the wilderness system would not significantly add to the total wilderness opportunity in the area. The areas do contain commercial timber and unknown potential for minerals, oil, and gas. These areas are currently used primarily during the hunting season for walk-in hunting for elk. A large percentage of the hunter days on BLM-administered lands in the resource area occur in these areas.

## CHAPTER 8

# TEXT CHANGES

This chapter lists the changes to the text of the draft RMP/EIS. The text was changed in response to comments from the public and from agency review. The changes that respond to public comments are identified by the alphabetical letters that identify the comments. The changes that respond to agency review are not given an identification letter.

**The specific changes in wording are highlighted in bold print.**

### TEXT CHANGES TO THE SUMMARY

The Summary of this document shows changes in bold print that respond to Comment P.

## TEXT CHANGES TO CHAPTER 3

The reference to Table 3-2 in the Surface Water section on page 63 should become **Table 3-2a**. Table 3-2 on page 66 should become **Table 3-2a**.

The following changes should be made to footnote 5 on page 66.

	<b>GRANODIORITE BASINS</b>	<b>HARD SEDIMENT BASINS (ARGILLITE, QUARTZITES, LIMESTONE)</b>	<b>TERTIARY VOLCANIC BASINS</b>
High sediment producing areas	100 t/sq mi/yr	39 t/sq mi/yr	42 t/sq mi/yr
Normal sediment producing areas	25 t/sq mi/yr	10 t/sq mi/yr	11 t/sq mi/yr
Low sediment producing areas	10 t/sq mi/yr	4 t/sq mi/yr	4 t/sq mi/yr

**In response to Comment B**, the following should be added to the Surface Water section on page 63. The **problem areas and proposed actions are listed in Table 3-2b.**

**TABLE 3-2b**  
**STREAMS HAVING AREAS OF DECREASED WATER QUALITY**

Site	Proposed Action
Black Bear Creek	Control livestock, improve road drainages, reseed exposed soil, relocate the road.
Braziel Creek	Develop activity plan to rehabilitate the site in 1987.
Keno Creek	Redesign and reconstruct road drainage (work in progress).
Marcum Mountain	Install check dams to control sediment production (work in progress).
McElwain Creek	Install check dams to control sediment production (work in progress).
Streamside riparian	Expand use of AMPs to reduce stream impacts.
Active mining areas	Resolve water quality problems through use of 3809 Regulations and coordination with the State Water Quality Bureau.

**In response to Comments E, F, G, and H**, the Geology section on page 67 should read as follows.

“The geology of the Garnet Resource Area is very diverse with all three categories of rocks present: igneous, metamorphic, and sedimentary. The rock types range in age from the late Precambrian Belt **supergroup** sediments (600 to 1,600 million years ago), to the very recent (ten thousand years ago and less).

“Igneous rocks such as basalt, andesite, and rhyolite are found in the eastern part of the Garnet Range and in upper Willow Creek. As a result of granitic intrusions, metamorphic rocks such as marble, hornfels, and garnetite can be found around the mining areas of Garnet, Coloma, Ashby, and Wallace creeks; Blackfoot City; Philipsburg; Gold Creek; upper Willow Creek; Sluice Gulch; Top O’Deep; and Henderson Gulch. Sedimentary rocks such as limestone, argillite, dolomite, quartzite, shale, **and sandstone** can be found generally throughout the resource area.

“Most of the **public lands in the** resource area were not directly affected by glacial activity. However, glacial till can be found in moraines in Fred Burr and upper Willow creeks. Clay sediments were deposited in the upper Willow Creek area by a glacial lake. In the Drummond area, traces of ancient shorelines of glacial Lake Missoula are visible. Detailed information on the geologic structure of the Garnet Resource Area is contained in two surveys, Morrison-Maierle 1978 and Geo/Resource Consultants, Inc. 1983.”

The third sentence in the second paragraph of the Oil and Gas section on page 67 should read, “Exploratory drilling has recently started within the northwest boundary of the GRA **as well as locations on private land near Drummond and Deer Lodge.**”

**In response to Comment D**, the second sentence of the first paragraph of the Other Geologic Resources section on page 67 should read, “Barite occurs in vein deposits **and is actively mined** in the Coloma/Washoe Creek area and in the North Fork of Elk Creek.”

**In response to Comment J**, the footnote to Table 3-4 on page 71 should read, “Rating is established from industry data gathered on GEM forms and from BLM inventory data.

**“Low Potential: Very few geologic characteristics favorable for the accumulation of a given resource are known to be present.**

**Medium Potential: Some geologic characteristics are present that are favorable for the accumulation of a given resource.**

**High Potential: Many geologic features are present that indicate the occurrence of a given resource.”**

The third sentence of the third paragraph of the Recreation Resources section on page 74 should read, "Except for wilderness study areas, they also require recreation activity plans to provide specific management guidance for recreation and other resources."

In response to Comment L, the following addition should be made to the first paragraph of the Lewis and Clark Trail, Blackfoot River section on page 76. **Congress has designated the Lewis and Clark Trail as a National Historic Trail.**

The first paragraph of the Walk-in Hunting Areas section on page 77 should read as follows.

"A cooperative management effort between the BLM, private landowners, and MDFWP to establish walk-in hunting areas began in 1974. Ten walk-in hunting areas similar to the Blackfoot Special Management Area were created totalling **86,140** acres. Access is controlled by gates on existing roads."

The West Fork Buttes walk-in hunting area should be eliminated from Table 3-9 on page 79. The total acreage then becomes **128,140** and the total BLM acreage becomes **54,770**.

A new paragraph should be inserted after the first paragraph of the Cultural Resources section on page 80. **A Class I cultural resource inventory, consisting of a literature search, has been completed for the public lands. The literature search helped identify known sites for further evaluation and define future inventory needs.**

In response to Comment N, the first sentence of the third paragraph of the Wilderness Opportunities section on page 80 should read, "About **26** percent of the acreage still being studied in Montana is on BLM-administered land."

In response to Comment N, Table 3-12 on page 81 should read as follows.

**TABLE 3-12  
REGIONAL WILDERNESS OPPORTUNITIES**

State	Designated Wilderness Areas			Presidentially Endorsed Areas			Further Study Areas		
	Agency	Number of Areas	Acres	Agency	Number of Areas	Acres	Agency	Number of Areas	Acres
Montana	FS	12	3,333,594	NPS	2	1,084,660	FS	180	5,611,789
	FWS	3	64,997	FWS	15	161,480	BLM	35	438,801
	BLM	1	6,000				NPS	1	7,645
Idaho	FS	5	2,944,435	FS	17	1,240,424	FS	11	571,931
	NPS	1	43,243				BLM	54	1,326,799
Wyoming	FS	6	2,193,750	FS	17	627,100	FS	7	414,870
				NPS	2	1,848,744	BLM	36	565,260

BLM — Bureau of Land Management  
 FS — Forest Service  
 FWS — Fish and Wildlife Service  
 NPS — National Park Service

# APPENDIX T

## ERRATA FOR CHANGES TO DRAFT RMP/EIS

Table T-1 lists the changes to the draft RMP/EIS. These changes have been made in response to agency review.

<u>Section</u>	<u>Page Number</u>	<u>Location</u>	<u>Change</u>
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Chapter 3	71	Table 3-4, Energy/Mineral column, list of Industrial Minerals	Change “phosphate” to <b>phosphate</b> .
	71	first word of the narrative	Change “flourite” to <b>fluorite</b> .
	71	second paragraph, second sentence	Delete the word “Limestone”.
	76	Garnet Ghost Town, second paragraph, last sentence	Change “1960” to <b>1969</b> .
	77	General Recreation Areas, second subheading	Change title to “Hiking, Horseback Riding, <b>Cross Country Skiing</b> , and Off Road Vehicle Trails.”
	77	Visual Resources, fourth paragraph, second sentence	Add the word <b>while</b> between the word phrases “Helmville/Avon Road” and “Garnet.”
	78	Table 3-9, Road Closure Dates for Marcum Mtn. Special Management Area	Change dates to read, <b>Sept. 1 — Nov. 30 on private and BLM; Sept. 1 — Apr. 30 on BLM along Blackfoot Canyon face</b> .
	80	Wilderness Opportunities, third paragraph, first sentence	Change to read, “About <b>7</b> percent of the acreage still being studied in <b>Montana</b> is on BLM-administered land.”
Chapter 3, Appendix O	82, 89, 270	Table 3-14, Quigg West, first sentence	The Quigg (Slide Rock) RARE II wilderness study area is variously identified by Q1-807 and Q1807. The correct identification number is <b>1807</b> .
Chapter 3	92	Reforestation, last paragraph, last sentence	Change “is indicated” to <b>may be included</b> .
	93	Livestock Grazing, first paragraph, second sentence	The sentence should read, “ <b>Most</b> allotments are cow/calf operations.”
	96	first sentence	Change the word “supports” to <b>provides</b> .
	102	Energy and Minerals, second sentence	Delete the phrase “a large silver mine;”