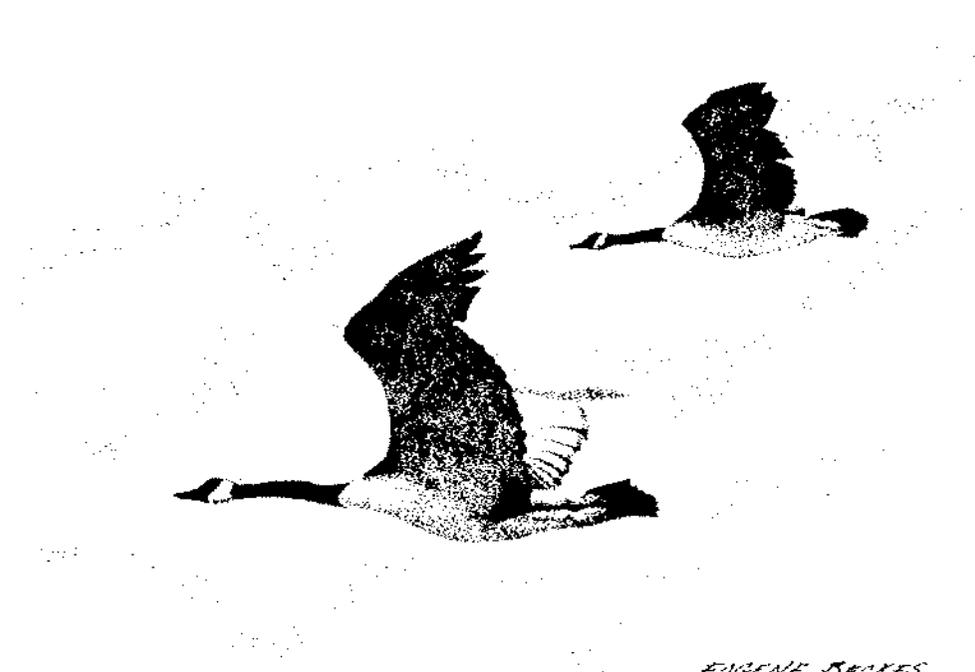


**INVENTORY OF CONSERVATION
RESOURCES
FOR
MISSOULA COUNTY, MONTANA**



EDGENE BECKES

October 1992 Update



BCC-92-524

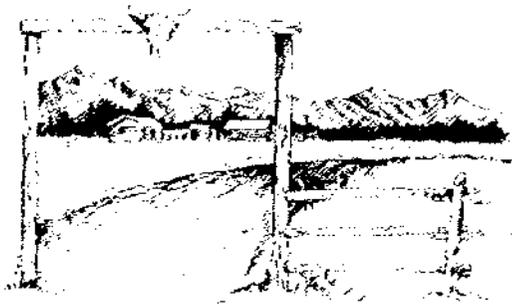
October 21, 1992

This Inventory of Conservation Resources is used to help direct growth and to protect valuable resources in Missoula County. Area residents and visitors are fortunate to have such abundant resources in relatively sound health and Missoula County is committed to protecting these resources for coming generations.

Special thanks is due to the numerous private and public agencies that contributed to the updating of the Inventory. Without the cooperation of individual landowners, management agencies and local interest groups, the resources we have today would not be here to pass on to future inhabitants of Western Montana. It is with appreciation to these people and groups that this document is dedicated.

Sincerely,

Barbara Evans, Chairman



Ann Mary Dussault, Commissioner

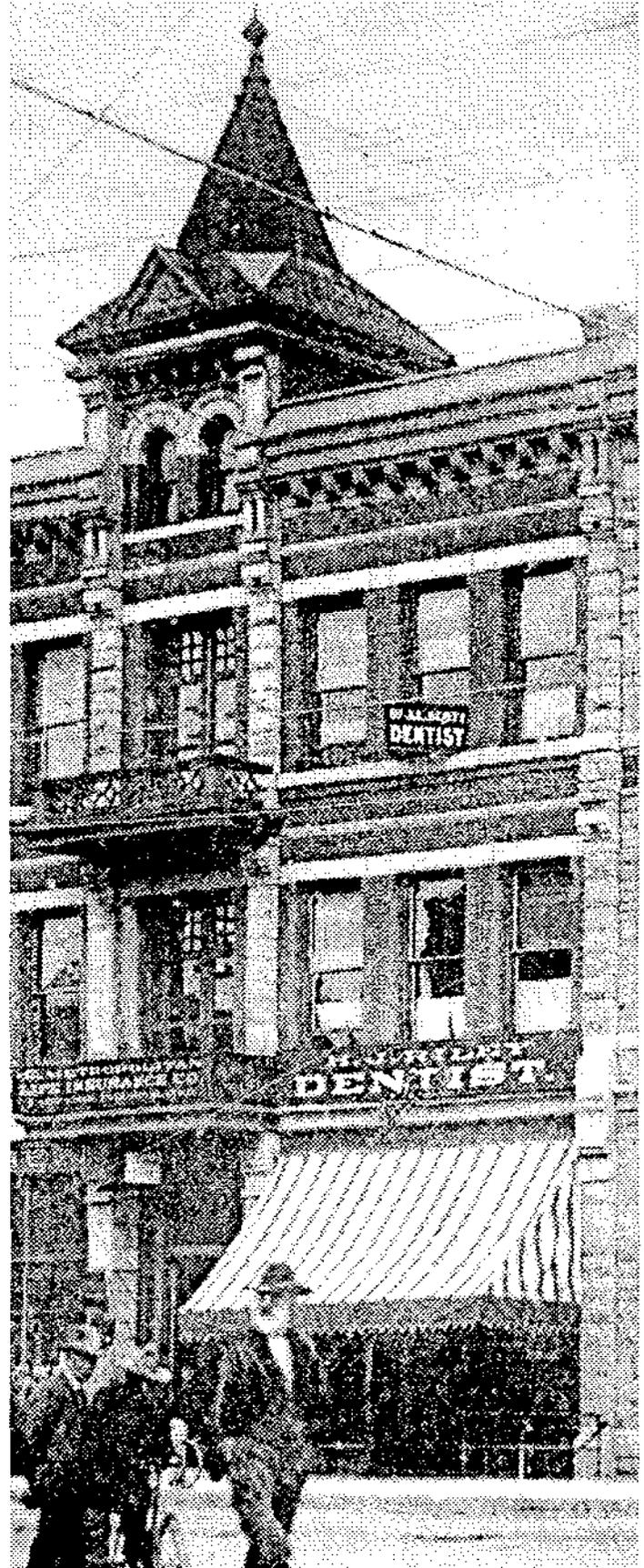
Janet Stevens, Commissioner

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INTRODUCTION

Focus



The following report is an inventory of conservation resources found in Missoula County with a focus on private lands. This inventory was developed as part of a program to supplement non-regulatory forms of land conservation by use of voluntary conservation techniques. This document is not a county plan, nor is it intended to become the basis for any new regulations. Rather, this report is an examination of known public resources and how they relate to the quality of life enjoyed by both visitors and residents of Missoula County.

This study is first and foremost an inventory of what conservation resources exist within the county. The character and distribution of significant natural and cultural resources are described. Clean water, wildlife, open space, recreation and cultural identity are valued by the people who live here and contribute to the special quality of life found in this portion of western Montana. It is not

intended that recognition in this document of the importance of a particular area or landscape feature requires landowners to conserve it, but rather offers owners choices regarding such conservation.

Expected Readership

Although this document was designed for use by Missoula government officials, it is expected the readership will include professionals in areas of expertise such as wildlife, botany, zoology, geology, history and environmental studies. Additionally, it is expected that individual landowners who are interested in voluntary techniques of land conservation will wish to read this material. This report was designed to meet the needs of each of these specialized audiences.

Study Area

Missoula County is located astride an ecologically rich portion of the northern Rocky Mountains (see Page i). The study area encompasses the entire county, but privately-owned lands are the primary focus (see Page 5a). Private lands consist mostly of valley bottoms and foothills which were originally homesteaded. Corporate-owned private lands tend to occupy forested mountain slopes and are interspersed among public lands.

Conservation Categories Addressed In This Inventory

Five categories of conservation resources are addressed in this report: historic resources, open space resources, recreation resources, ecological resources, and agricultural resources. There are many ways in which the broad variety of natural resources could have been considered. However, because the focus of the Missoula Open Space and Agricultural Land Conservation Program is on voluntary, compensating conservation techniques, categories have been chosen for compatibility with conservation purposes defined in federal law (P.L.96-541; Tax Treatment Extension Act of 1980) and supported by Montana law (Montana Open Space Land and Voluntary Conservation Easement Act of 1975).

History of this Project

Although there is a substantial amount of public land in the county, many of the conservation resources important to local residents occur on private land. In the past, agriculture and forestry were the dominant land uses. Forest harvest, cattle ranching and farming activities were not incompatible with the maintenance of the above-described resources. However, during the last twenty years, the land use pattern has changed. The Missoula urban area grew from 58,263 residents in 1970 to 76,016 residents in 1980, an increase of 30%. In 1990, the population grew to 78,687, an increase of 3.5%. A population of 96,800 residents has been projected by the year 2000 (27% increase). Extensive land subdivision and residential development in rural areas, as well as rising recreational use pressures, are displacing Missoula County's natural and historic resources.

In 1983, Missoula County planning officials, faced with this and other issues, initiated public involvement aimed at updating the Missoula County Comprehensive Plan. Rural residents expressed a variety of concerns. While many indicated they would like to see open space, recreational lands and wildlife habitats remain undeveloped, concern was expressed regarding zoning and subdivision regulations which could be used to implement the comprehensive plan. In response, the County Commissioners and Planning Board began to look for alternatives.

In May of 1984, the Missoula Department of Parks and Recreation developed a list of four goals for open space. These goals were:

- 1) Develop a strategy for conservation of Mount Jumbo using voluntary, compensating means.
- 2) Work with county officials to identify areas of high environmental, recreational, historical or open space value.
- 3) Work with county officials to develop a coordinated approach for identifying and preserving open space.
- 4) Establish a procedure for the donation of open space land or conservation easements.

Missoula land use and conservation planning consultants, Bruce A. Bugbee & Associates, invited by the City to discuss implementation of these goals, was subsequently asked to prepare a proposal outlining how each could be addressed by voluntary methods. The proposal described a two year program to be funded jointly by the City and County of Missoula.

The first year of the program called for a countywide inventory of conservation resources found on private land, as well as a specific project on Mount Jumbo to protect its open space and recreational values. The second year was to be used to identify conservation opportunities and to train city and county personnel in use of voluntary conservation techniques, such as conservation easements, land exchanges and partial development approaches. Missoula County Commissioners voted to fund the resource inventory. The City funded the Mount Jumbo project.

Use Of This Inventory

Voluntary conservation techniques provide an effective complement to regulatory systems of land use control. In order for programs which utilize voluntary conservation techniques to succeed, conservation priorities must be set. In this inventory, areas where public values are concentrated on private lands are defined, and the importance of these values to the public is examined. This inventory is a foundation for the voluntary protection of private lands.

Each chapter in this report is similarly formatted. First, there is a general overview. Second, the geographic distribution of key resources is mapped. Then, significant conservation resources found in each of the eight regions of the county are described. The last chapter of the report provides discussion which combines critical resource components and their relationship to each other and to subdivision development patterns in the county.

This report incorporates existing resource information and did not develop new data except for the section on open space. Field reconnaissance was minimal except during the open space inventory. Research was systematically conducted to collect and analyze as many studies about Missoula as could be found. That material has been con-

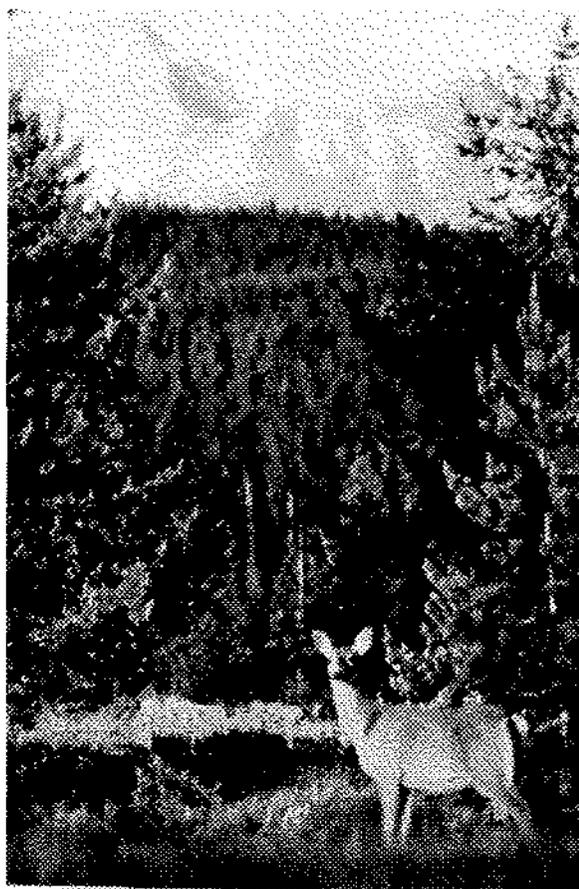
solidated, and the information in this report represents a previously unprecedented collation of information about the natural values of this area. Individuals were contacted who were considered to be especially knowledgeable about the county's various resources. However, the authors of this report are solely responsible for its contents.

As an inventory of resources, this study's purpose is to assist the County in identification of areas which contain key natural resources and in identification of the type or types of resources recognized by federal and state law as worthy of conservation. Implementation of strategies for such conservation is not within the scope of this inventory. This report illustrates how natural resources relating to recreation, open space, ecology, history, and agriculture are extensively integrated. It becomes apparent the constituency for one of these resources has reason to work with the constituency for others in order to successfully accomplish mutually-beneficial resource conservation.

The County transferred a natural resources specialist to its staff in 1986 to address the concerns of rural residents and to help implement the goals of private property owners who wish to protect the conservation resources found on their lands. Based on the need for additional services in rural areas, the Five Valleys Land Trust was formed in 1989 to undertake projects that are unsuitable for, or beyond the capabilities of, local government. As of October of 1992, the Trust has assisted in the acquisition or protection of close to 600 acres of valuable resources and continues to work with the private sector on additional projects.

Updates to this report were supervised by Missoula County's Rural Planning Office in 1988 and 1992.

REGIONAL OVERVIEW



Missoula County encompasses an area of 2,625 square miles, or about 1,700,000 acres. The county's landforms provide the broad framework on which the complex pattern of climate and vegetation is expressed. The present landforms and vegetation of this county are contained within a broad region of the west known as the Rocky Mountain Forest Province - Douglas Fir and Cedar/Hemlock/Douglas Fir Forest Section (Bailey). This region is typified by rugged, glaciated mountains separated by structural valleys occupied by rivers. Local relief ranges from approximately 3,000 to 10,000 feet.

Vegetation

The Missoula County portion of the Rocky Mountain Forest Province is characterized by well-defined vegetation zones. The uppermost zone in elevation is the alpine zone, characterized by alpine meadows and the absence of trees. Below the alpine is the

subalpine zone, dominated in most areas by whitebark pine, subalpine fir, Englemann spruce and alpine larch. The next lower zone is the montane zone which is characterized by the prevalence of Douglas fir and ponderosa pine in most of the county and by cedar, hemlock and western larch in the Seeley-Swan region. Within the montane zone, the occurrence of fire favors the development of seral aspen, lodgepole pine and western larch forests. Below the montane is the foothill zone, a dry area of basin-fill and rocky slopes dominated by shrubs and grasses with areas of open ponderosa pine parklands and pockets of Douglas fir/ponderosa pine forests in moist areas and on north slopes. In drier portions of the region, high altitude grasslands may be bordered directly by the montane zone with forests absent of ponderosa pine. These bunchgrass prairies stand out as inclusions in a forested landscape. River and creek wetlands, which support deciduous cottonwood forests, moisture-loving shrubs and herbaceous vegetation, comprise the floodplain zone.

Climate

The climate of Missoula County, including the amount of precipitation, varies greatly with elevation. Each vegetation zone, from valley bottom to mountain peaks, has a distinct climate. Missoula Valley is semi-arid with only about 13 inches of precipitation annually and a 120-day frost-free period. The Seeley-Swan area receives twice as much precipitation. The high mountains experience 60 inches or more per year, mostly in the form of snow. May and June are usually the wettest months, and July, August and September the driest. The county is influenced predominantly by Pacific air masses from the west. Occasionally Arctic air intrudes from the north. The valleys are generally sheltered from winds, and inversions can develop during winter months. Strong easterly winds occur occasionally when Arctic air spills over the Continental Divide from eastern Montana. Summers are sunny and dry, with highs generally in the upper 80s and lows in the 40s and 50s. However, lows can dip into the 30s at any time throughout the summer. Winters are cloudy in the valleys and cold. January is the coldest month with lows as much as 30

below zero. Snowpack varies from a few inches in Missoula to 12 feet in the high mountains. This snowpack feeds rivers and creeks in the spring and a late May or early June discharge peak is the norm. Although flooding can occur at this time, ice dams can cause rivers and creeks to leave their channels in winter months, too. Gradual snowmelt, groundwater inflows and occasional summer showers sustain stream flows and irrigation ditches during the dry summer months.



Wildlife

Missoula County possesses diverse and high-quality wildlife habitat. Large-hoofed browsers include elk, mule deer, white-tail deer, and moose. The county has large deer and elk herds sustained by critical winter range habitats. Big horn sheep and mountain goats find favorable habitats in mountainous terrain. Black bear are found throughout the county. The threatened grizzly bear is found in remote mountains and along rivers and streams of the Evaro and Seeley-Swan regions. Small mammals include beaver, muskrat, otter, mink, skunk, porcupine, weasel and raccoon, among others. Predators consist of mountain lion, bobcat, lynx, coyote, red fox, wolf and badger. Raptors include bald and golden eagle, red-tailed hawk, osprey, prairie falcon, turkey vulture, kestrel, several species of owl, and others. Ground squirrels, voles, gophers, mice, rabbits, fish and small birds form a substantial prey base for these birds. Blue, spruce, and roughed grouse occupy forested terrain and grassland edges. Ring-necked pheasants have been introduced along rivers and are doing well in some places. Sharp-tailed grouse may be found in the upper portions of the Blackfoot River drainage. Sandhill cranes and great blue heron utilize wetlands throughout the county. Waterfowl include Canada geese, trumpeter swan, mallard, pintail, gadwall, teal, widgeon, merganser and golden-eye. The fishing resource includes rainbow, cut-throat, brown, brook and other species of trout as well as mountain whitefish.

The Regions

Eight regions have been recognized within Missoula County, based on settlement, land use pattern, topography, watershed boundaries and other factors (see Page 5a). These regions are Seeley-Swan, Potomac-Greenough, Clinton-Turah, Evaro, Missoula Valley, Lolo, Frenchtown-Huson, and Ninemile. Each region has a distinct character and its residents possess a specific, local identity.

The large, forested Seeley-Swan region is characterized by a wide valley containing numerous lakes, rivers and creeks. Seeley Lake is its main community in the south, Condon in the north. Private, non-corporate land is not plentiful and tends to be located around lakes and along Route 83. Recreational homes, tourism and related activities are co-dominant with forest products and its related activities. Champion International Corporation and Burlington Northern (Plum Creek) own substantial acreage. The Bob Marshall and Mission Mountain Wilderness Areas border this region to the east and west.

The chief feature of the Potomac-Greenough region is the Blackfoot River. The privately-owned lands within the agricultural valleys at Potomac, Ninemile Prairie (Greenough) and Clearwater Junction are bordered by rolling, forested mountains in mostly corporate ownership. The forest products industry is a key segment of the local economy. Recreational use within the Blackfoot River corridor is intense during summer months. Subdivision and residential development is occurring in the forested, edge of the Potomac Valley. Potomac is the region's only community.

The Clinton-Turah region, named for those communities, is centered along the Clark Fork River. This region is primarily a travel corridor, and I-90 bisects it. Non-corporate private land exists as a mile-wide corridor along the river. The Garnet and Sapphire ranges border this region to the north and south, respectively. These mountains are in corporate, state, and federal ownership. Substantial subdivision and residential development activity is taking place.

The lightly-populated Evaro region consists almost entirely of land within the

Flathead Indian Reservation. However, the Evaro area itself is not within the reservation. The land pattern is mixed between tribal and non-tribal ownership. Agricultural land uses are still common, but subdivision and commercial development is occurring at an alarming rate. The Jocko River flows through the eastern half of this region and the Rattlesnake Mountains form its south-easterly border.

The Missoula Valley region lies at the center of the county and is dominated by the City of Missoula, East Missoula, Bonner, Milltown and surrounding urban development. The Bitterroot River and numerous creeks flow into the Clark Fork River within this heavily populated area. The Rattlesnake, Garnet, Sapphire and Bitterroot Ranges rim the valley. This region has the most non-corporate private land of any in the county. Subdivision and residential, commercial and industrial development outside the city limits are significant features. Rattlesnake, Grant, Butler, O'Brien, Pattee Canyon and Miller Creek valleys contain significant stringers of development radiating from the urban core.

The Lolo region contains the Bitterroot River, Lolo Creek and their adjacent valleys. Lolo and the surrounding area has grown tremendously in the last two decades. The Lolo Creek area contains some non-corporate private land between Grave Creek and Lolo. Champion International Corporation and Burlington-Northern (Plum Creek) own substantial acreage in the mountains above the creek in a checkerboard pattern with Forest Service lands. The Bitterroot Valley is a broad, structural feature bordered by the Bitterroot Range on the west and the Sapphire Mountains on the east. The valley bottom and basin-fill bedrock benches are in private ownership and the mountains are in federal and corporate hands.

The Frenchtown-Huson region contains the Clark Fork Valley from the old Harper's Bridge site west to the county line. Agricultural use and residential development are mixed throughout the valley. The Stone Container mill is the largest employer. Frenchtown and Huson are the local communities. The mountains are mostly in corporate and federal ownership.

The Ninemile region extends from Siegel Pass along Ninemile Creek to its confluence with the Clark Fork River. The region is bordered by Reservation Divide to

the north and Ninemile Divide to the south. A narrow strip of private agricultural land exists in the valley bottom from Pine Creek to the Clark Fork River. The mountains are in Forest Service ownership. The Ninemile Ranger Station and Ninemile Store are community focal points in this rural region. Subdivision and residential development is rapidly occurring in the region.

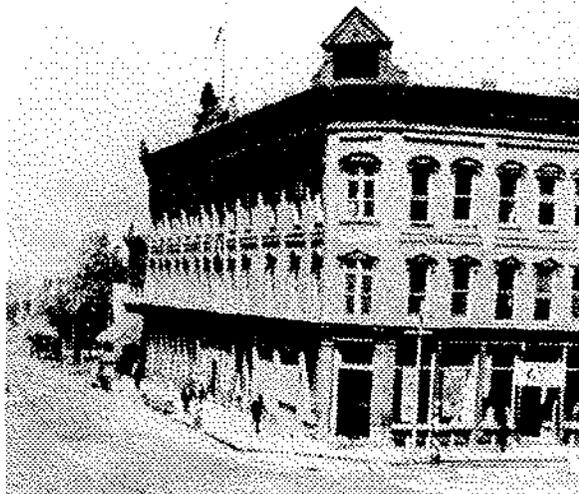
Cultural Legacy

The history of Missoula County has had a lasting impact on the economy of today's residents. Native Americans, explorers, trappers, miners, loggers, farmers and ranchers shaped the county's cultural legacy. The present land ownership pattern began when homesteaders, railroad and mining companies first came to the state. Farmers and ranchers chose irrigable and sub-irrigated valley lands in proximity to water or they chose areas suitable for dry-land cropping or range. Railroad land grants covered similar areas as well as adjacent forested slopes in checkerboard ownership with public land. Mountainous terrain generally has remained in public ownership. However, large corporate interests own significant amounts of forested mountain slopes. The early economy of the county was firmly based in agriculture, mining and the timber industry.

Today, only the timber industry and agriculture have maintained their importance. The character of the county has changed dramatically over the years. While, technically, agriculture is still the predominant land use, it accounts for less than 1% of the total earnings in the county (Missoula County Agricultural Protection Study). Tremendous growth has taken place in non-farm activities. The current economy of Missoula County is based on the wood-products industry, trucking, government, the University of Montana, wholesale/retail trade, recreation/tourism, service and manufacturing.



HISTORIC RESOURCES



A great diversity of historic and archaeological resources are found on private land in Missoula County. These resources include paleo-Indian and Native American artifacts, occupation sites and trails, as well as historic structures and land areas associated with Caucasian settlement which began in 1805 with the Lewis and Clark expedition.

The National Register of Historic Places' inventory was extensively used to provide information in this section. Some resources are described and mapped in detail, while others are mentioned only in general terms. Rural historic buildings and sites are located on Map Three. Urban structures, since they are more well-known are not. Archeological sites are not mapped due to the sensitive problem of unauthorized "digs" by the public. However, references are made to artifacts in sites which exist county wide. Areas along major river, creeks and lakes are believed to harbor some 95% of all cultural resources in the county. Specific cultural resource data for a particular property is available from the Office of Community Development by requesting a file search from the State Historic Preservation Office, Lolo National Forest, UM Library, or UM Department of Anthropology in the event of a proposal for development or conservation project.

Historic Overview

The human story began long ago in Africa, and later spread to Europe and Asia. Many of us come from ancestors of those who wandered to Europe, but the first to

enter Montana and the Missoula area came by way of Asia.

Some 12,000 years ago, near the end of the last Ice Age, much of the earth's water was frozen in glacial ice. This resulted in a lower sea level and the creation of a land bridge between present day Alaska and Siberia. It is believed the first humans entered North America by foot across this now-submerged land mass. These hunter-gatherers followed herds of caribou, woolly mammoth, camel and giant bison through an ice-free corridor into Montana, the Missoula area, and beyond.

The first Indian artifacts found in the county are of the Paleolithic period and come from the Clearwater Junction area. These are "Clovis" spear points, some 12,000 years old. Massive Glacial Lake Missoula filled most of the valleys within the county until about 10,000 years ago. Once the lake drained, these early Indians were able to hunt and gather food in these low-lying areas. For thousands of years, small groups moved around the landscape leaving behind the most lasting evidence of their presence - scattered projectile points.

The first known semi-permanent occupation sites developed about 5,500 years ago. The Columbia Plateau and Snake River cultures strongly influenced local bands during this "Plains Archaic" period. There was an increased use of plant food and fibers. What is now the Lolo Trail may have been used during this time as a migratory and trading route.

During the following centuries, Missoula County was occupied by a succession of Native American tribes. In the 1500's, Spanish explorers unintentionally introduced horses to Indians in the New Mexico area. Horses were traded throughout the west, and the resulting mobility caused considerable shifts in the already loose system of tribal territories. When the Europeans settled the east coast of America a chain reaction of conflicts in tribal relocations was sent westward. Colonization and the introduction of the horse sent shock waves through the Montana tribal landscape. The results proved dramatic. By 1700, the Flathead, Pend Oreille and Kootenai had been pushed from the Great Plains into western Montana by the Blackfeet and other tribes. Occasional trade with European trappers during this period provided the first contact between Indian

and white cultures. Horses allowed the Flatheads greater hunting success and initiated seasonal trips to eastern Montana to kill bison and west to harvest salmon for winter larders. The Lolo Trail was used by Nez Perce, Flathead and other tribes as a major travel route. Flathead Lake was a cultural center and a meeting place for nearly all western Montana tribes. At the time of white settlement, the Missoula County area was used by Flathead, Kootenai, Pend Oreille, Blackfoot, Nez Perce and Shoshone tribes.

The evidence for the long-standing presence of various Indian cultures in Missoula County comes from a wide array of artifacts and sites. The culture of Stone-Age people has been transmitted to us through flake knives, scrapers, spear and arrow points, awls, mauls and pipes. They worked in black obsidian (from the Yellowstone and Snake river areas), brown basalt, red jasper, white silicate, green mudstone and various hues of chert, flint and quartzite. Pictographs of animals and hunters adorn bedrock walls. Stone cairns, scarred trees, and bent marker trees defined ridgeline trails. Rock shelters on mountain tops provided places out of the wind and may have had ceremonial purposes. Tipi rings and hearths tell of occupation sites. Rock quarries, chipping sites, tool manufacturing sites, look-out trees, and piles of bison bones provide the further details of how Native Americans lived on this landscape.

River and creek corridors and hot and cold springs are the areas in which 95% of archeological and cultural artifacts have been found. Flat terraces, lake outlets and stream confluences appear to have been favored for camping, much as they are today. Low terraces were occupied during fall and winter, due to cottonwood forests which provided a source of firewood near water and offered protection from cold winds. Spring and summer camps were made on windier, higher terraces in order to escape mosquitoes. Because arrowheads or other artifacts may be found on terraces beside nearly every river, large creek and lake in the county, the mere presence of a projectile point or other feature is not evidence of a significant archeological find. However, many sites in the county have had their archeological importance confirmed and recorded. The presence of a known archeological site may be a determinant in public

protection or aid in prioritizing a property for conservation.

In 1805, the Lewis and Clark expedition was sent by President Thomas Jefferson to explore the territory contained in the Louisiana Purchase. Present-day Missoula County was included in that massive area which encompassed some of the least chartered wilderness on the continent. In the fall of 1805, the expedition entered the Bitterroot Valley and camped for three days near Lolo Creek at a site they called Traveler's Rest. Indian guides then led the explorers over Lolo Pass and eventually on to the Pacific Ocean. On their return trip east to St. Louis, Lewis and Clark again traversed the Lolo Trail and reached Traveler's Rest on June 30, 1806. On July 3, the expedition separated in order to explore more terrain. Clark and his party made their way up the Bitterroot and eventually reached Yellowstone country. Lewis took a smaller party and passed through the Missoula Valley, crossed the Clark Fork River at Rattlesnake Creek, moved through Hellgate Canyon, and proceeded up the well known "Trail to the Buffalo" along the Blackfoot River.

English and French explorers, traders and trappers moved through the county during the next decades. A trapper named David Thompson who worked for the Northwest Company is generally credited with naming Missoula, based on a collection of Indian references to the area. "Missoula" roughly means "at the water of surprise," referring to numerous Indian ambushes which took place in what French trappers called "Porte d'Enfer" or Hell's Gate.

In 1841, a Jesuit priest, Father DeSmet, arrived in Missoula Valley to work with the Flatheads. Many Indians had been converted to Catholicism years before by a French priest named Ignace LaMousse. Father DeSmet established St. Mary's mission in the Bitterroot Valley near Stevensville. This mission would become a private trading post known as Fort Owen, until purchased back by the "Blackrobes" in 1866. Still later, a grander St. Mary's mission would be built at St. Ignatius in the present Flathead Reservation. The DeSmet School (1895) was named for Father DeSmet.

By the 1850's, more whites were moving west in search of fortune in the gold fields of California, Colorado and Oregon. Some stayed to farm and ranch. In 1853,

Isaac Stevens was appointed territorial governor of Washington, which then included Montana. Because confrontations were increasing between Indians and whites, Stevens saw the Indian presence as an obstacle for transcontinental roads and railroad lines. On July 9, 1855, Stevens met with Flathead, Kootenai and Pend Oreille chiefs. The site for this gathering was Council Grove, a favorite meeting place of the Indians, located west of Missoula on the Clark Fork River. The resulting treaty established the Flathead Reservation in the Mission Valley where the three tribes would live together as the Flathead Nation. But the last Flatheads under Chief Charlo did not leave the Bitterroot Valley until 1860's.

The Homestead Act fostered the development of many ranches in Missoula County. In 1861, Francis Worden, C.P. Higgins and Frank Woody opened a general store in Hellgate Canyon. The Higgins and Worden store was built with timbers provided by David Pattee. It was the first structure ever built in Missoula County. More would follow.

Gold soon changed many things. Strikes at Bannock, Virginia City, Alder Gulch, Marysville, Helena and Garnet brought thousands of people up the Missouri to Fort Benton. Some prospectors followed the Mullan Road to Missoula County. Gold was soon discovered at Garnet-Coloma, Elk Creek, Ninemile, Lolo Creek and other areas. The productive Garnet-Coloma district contained a series of strikes which caused a sequence of short-lived towns to spring up and die out.

In response to increased mining and population growth, C.P. Higgins, Frank Worden and David Pattee formed the Missoula Mills Company. A sawmill was built next to the Clark Fork River about four miles downstream from the Hellgate Store. This development marked the birth of what we now call Missoula.

During the summer of 1877, Fort Missoula was built by the U.S. Army. This military installation was one of eleven constructed in Montana between 1866 and 1892. Included in the Fort's history are noteworthy periods such as the 25th Negro Infantry Regiment (1888), Civilian Conservation Corps (1933-1940), World War II Prison Camp (1941-1947) and the present use of the area as a recreation center. However, the most

famous episode associated with the Fort took place in the summer of 1877, during the first year of its existence.

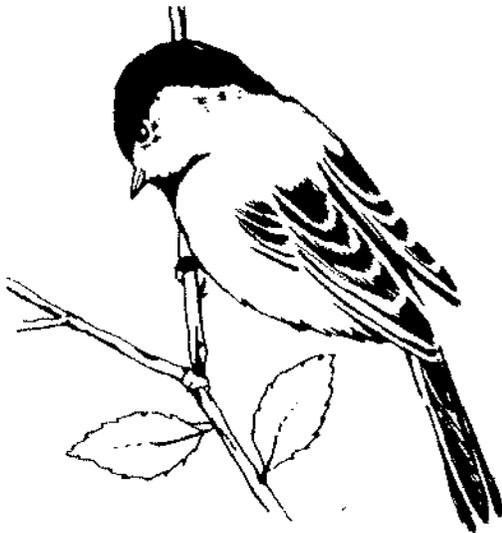
Word reached Missoula that Chief Joseph and Chief Looking Glass were leading a large band of non-reservation Nez Perce east across the Lolo Trail. The Indians were moving to the camas digging grounds of the Big Hole Valley and then on to the bison herds of eastern Montana. On July 25, Captain Rawn's cavalry led five volunteers to a site some five miles up Lolo Creek. Trenches and earth breastworks were built for protection. The Nez Perce arrived and camped to the northwest. A conference was held between Captain Rawn and Nez Perce chiefs. The chiefs only wanted peaceful passage through the Bitterroot Valley, as they and their ancestors had made for hundreds of years. Rawn said he would grant permission only if the Indians surrendered all their weapons and ammunition. The chiefs did not agree to these terms. The citizen volunteers, after hearing the Nez Perce were peaceful, left Rawn and returned to their ranches and homes. At dusk, on July 28, Chief Joseph and the Nez Perce ascended a ridge to the south and simply skirted the cavalry, who were dug-in at what is now called Fort Fizzle. Later, the U.S. Cavalry, under Colonel Gibbon, chased the Indians to the Big Hole and attacked. This site is now recognized as the Big Hole National Battlefield. Chief Joseph's band escaped after heavy losses, only to be caught in winter, some 30 miles south of the Canadian border. It was then that Joseph said, "I will fight no more forever" and surrendered.

Ranching, farming, logging and commercial business increased markedly in Missoula County during the late 1800's and early 1900's. The coming of the Northern Pacific Railroad to Missoula in 1883 caused an economic boom. Dozens of sawmills existed to supply lumber for the railroad and growing town. Mining operations continued in the mountains. More homesteaders spread out over all portions of the county, lured by the prospect of owning their own land, creating an independent existence and perhaps achieving substantial wealth. In the early 1900's, a land speculation scheme in the Bitterroot Valley caused thousands of acres to be subdivided into "Apple Orchard" tracts, which were sold at unheard of prices of up to \$1,000 per acre. This land boom soon

busted. However, huge areas remain subdivided.

Missoula experienced relative economic prosperity and a tremendous building expansion from the 1890s through 1915. As the county seat and regional commercial center, the city soon had banks, a courthouse, a university, a library, churches, blocks of retail stores and numerous hotels. The Forest Service was formed in 1905, and Missoula became an administrative center. The coming of the Milwaukee Railroad in 1910 strengthened the city's economy further. Prosperous businessmen built fine homes. By 1915, most of Missoula's familiar landmark buildings had been constructed, and the city had taken on much of its modern aspect. Private rural land remained in agricultural use. The forested mountains were managed by the Forest Service and various private corporations. The economy was based on the wood products industry, government and retailing.

The 1960's marked the beginning of the most significant change in the county's landscape during its 12,000 years of human occupation. Rural lands, once the domain of ranches, farms and small settlements, began to be subdivided and developed for non-farm purposes. As a result, wildlife habitat, open space, recreational opportunities, historic features and agricultural enterprises began to disappear.



The Regions

The following information provides details for historic and cultural resources found in each of the county's eight regions. Information includes sites and structures on or officially eligible for the National Register of Historic Places (NRHP), sites and structures locally recognized as significant and summaries of archeological features. Land areas adjacent to significant properties which contribute to their historic or cultural integrity may also have public value.

Secley-Swan

An Indian trail heading to the buffalo herds once ran from the Jocko Valley down Finley Creek to Placid Lake and then on to the Blackfoot River. Occupation sites and rock tool manufacturing sites exist around many lakes within this region.

NRHP Sites and Structures:

Camp Paxson Boy Scout Camp, Secley Lake.

Eligible Sites and Structures: none.

Potomac-Greenough

Indian occupation sites and artifacts are common along the Blackfoot River. The most ancient artifacts (12,000 years old) found in the county have been discovered near Clearwater Junction. Going-to-the-Buffalo Trail, used by the Indians, paralleled the Blackfoot river and was traversed by Merriwether Lewis in 1806. The mining camps and towns of the Garnet, Coloma and Yreka districts are still partially intact. Numerous buildings, railroad grades and stamp mills remain from the mining era. Garnet is a ghost town preserved by efforts of the Bureau of Land Management and is popular with recreationists year round. The history of the Blackfoot River Valley encompasses trapping, homesteading and logging activities of the Anaconda Company and others.

NRHP Sites and Structures: none.

Eligible Sites and Structures: none.

Other significant Sites and Structures:

The Potomac and Sunset Hill (Greenough) Schoolhouses are historic buildings whose importance awaits evaluation.

Clinton-Turah

Indian artifacts are found on the terraces along the Clark Fork River. The Mullan Road and two railroad lines run its entire length.

NRHP Sites and Structures: none.

Eligible Sites and Structures:

The Mullan Road. Much of the Mullan Road route is now believed to be followed by I-90 or local frontage roads.

The Emmet P. Richard Homestead, (1911). This early homestead is located on Rock Creek.

Evano

The Mission Valley and Flathead Lake was once a cultural trading center for many Native American tribes. Sites and artifacts are common. This region is entirely within the Flathead Indian Reservation.

NRHP Sites and Structures: none.

Eligible Sites and Structures: none officially recognized.

Missoula Valley

Much has been written about the history of Missoula and the surrounding valley. References are available in this report's bibliography. Numerous archeological sites exist in the Missoula Valley. Many structures and land areas have achieved various degrees of officially-recognized historical significance.

Sites and Structures on the NRHP:

Flynn Farm: The 1872 homestead of Michael Flynn, an Irish immigrant, located west of Missoula off Mullan Road. A red brick house was built in 1883. It is an example of early Missoula county homesteads. The surrounding area is subdivided with increasing residential development.

St. Francis Xavier Church. This large, Romanesque Revival structure has been a Missoula landmark since 1892 when it was constructed at the corner of Orange and Pine Streets.

Higgins Block. This 1899 landmark structure was originally C.P. Higgins' Western Bank Building. It is a fine example of Queen Anne style architecture, due to its varied materials such as stone, brick, terra cotta and metal. It is currently the First Federal Savings Building and was rehabilitated in 1993 with street-level shops and second and third story offices.

Grand Pacific Hotel. This large hotel was built in 1902 across Railroad Street from the Northern Pacific (BN) Railroad Line. Rehabilitated in 1984 for apartments, now called Park Place, it is located at 118 West Alder.

Carnegie Public Library. This small, Neo-Classical masonry structure built in 1903 is now the Missoula Museum of the Arts and is located at 335 North Pattee Street.

John R. Toole House. Home of a Missoula businessman who held a prominent position in the Anaconda Copper Mining Company under Marcus Daly. This well-preserved example of Neo-Classical architecture was built in 1903. It is presently the Kappa Kappa Gamma Sorority House located at 1005 Gerald Avenue.

Missoula County Courthouse. The present Neo-Classical sandstone courthouse was built in 1908 following the plans of Missoula architect A.J. Gibson. 200 West Broadway.

Palace Hotel. This is one of Missoula's early downtown hotels (1909). The bottom floor was renovated for a restaurant and other businesses. It is located at 147 West Broadway.

Belmont Hotel. This brick hotel was built near the Northern Pacific (BN) depot in 1909 and was part of early downtown Missoula. In 1982 the Belmont was rehabilitated into apartments. It is located at 430 North Higgins Avenue.

Northern Pacific Railroad Depot. This turn-of-the-century depot presently houses a micro-brewery and other uses. For years it was the BN's passenger and freight depot.

University Apartments. These turn-of-the-century row apartments are located on Roosevelt Street.

Milwaukee Depot. This 1910 structure was the first and only depot of the Chicago, Milwaukee and St. Paul Railway in Missoula. The depot was sold to private investors and extensively rehabilitated in 1980. It now houses offices. 250 Station Drive.

J.M. Keith House. This was the home of an influential businessman and three time mayor of Missoula. It is now a fraternity located at 1110 Gerald.

US. Post Office. The basic structure of the present Federal Building was built in 1911 with several subsequent additions. This

Italian Renaissance Revival building is located at 200 East Broadway.

Fred T. Sterling House. Constructed in 1912, this Arts-and-Crafts Bungalow-style home was designed by A.J. Gibson and built by a prominent Missoula businessman. It is located at 1310 Gerald Avenue.

John S. Johnson House. This fine Queen Anne-style residence was constructed in 1912. It is located at 412 West Alder.

A.J. Gibson House. This was the home of the noted Missoula architect who designed the County Courthouse, Main Hall and numerous Missoula mansions. This 1913 renovation of an 1889 structure is located at 402 South Second Street.

The Wilma Theater. Since its construction in 1921, the stage of this theater has been graced by the Los Angeles Philharmonic Orchestra, Will Rogers, John Philip Sousa, Ethel Barrymore, Carlos Montoya, Mahalia Jackson, Mark Twain and many other notable performers. It is also used as a movie theater.

Forkenbrock Funeral Home. This Colonial Revival structure (1929) is now the Geraghty Funeral Home at 234 East Pine Street.

Fort Missoula Historic District. "The Fort" complex, which dates to 1877, includes numerous buildings and grounds. It was listed on the register April 29, 1987.

Old DeSmet School. This 1895 building was constructed of brick made from pink Glacial Lake Missoula clays from the nearby airport terrace. This structure was a school and community center for the town of DeSmet, which once existed nearby. Listed February 28, 1991.

Prescott House. This large, frame house on the University of Montana campus was built by the Prescott family in 1897. The University owns the structure, but Mr. Prescott, Jr., continues to live in the house and to maintain extensive flower gardens. The house is continually the subject of discussion regarding its removal or relocation to make room for traffic improvements. After public forums in 1991, the Campus Development Committee recommended saving the building with a number of suggested uses for the structure.

East Pine Street Historic District, (roughly between East Pine Street, Madison Street, East Broadway and Pattee Street).

J. M. Herzog House, 1210 Toole Avenue.

Knowles Building, 200-212 South Third Avenue West

Southside Historic District, (roughly bounded by the Clark Fork River, Higgins Avenue South, South Sixth West and Orange Street).

Montgomery Ward Building, 201 North Higgins Avenue.

Zip Auto Building, 251 West Main Street. Built in 1938, this Art Moderne, poured concrete building still operates as an automobile repair service.

Dixson-Duncan Block, 232-236 North Higgins.

Graham Apartments, 315 East Broadway.

Missoula Hotel, 141-147 West Main Street.

E.S. Paxson House. This structure at 611 Stephens was the former home of the well-known Montana artist who painted the murals in the Missoula County courthouse.

Apartment Building, 116 West Spruce Street.

Atlantic Hotel, 519 north Higgins Avenue.

Brunswick Hotel, 223 Railroad Street.

Garden City Drug, 118 North Higgins Avenue.

Gleim Building, 265 West Front Street.

Hammond Arcade, 101 South Higgins Avenue.

Hellgate Lodge 383 BPOE, 120 North Pattee Street.

Independent Telephone Company Building, 207 East Main Street.

Labor Temple, 208 East Main Street.

Lucy Building, 330 North Higgins Avenue.

Marsh and Powell Funeral Home, 224 West Spruce Street.

Masonic Lodge, 120-136 East Broadway.

Missoula Laundry Company, 111 East Spruce Street.

Missoula Mercantile (Bon), 114 North Higgins Avenue. The "Merc" was established in 1866 and rapidly became one of the largest mercantile enterprises between the Twin Cities and Seattle. Most of the building was constructed between 1882 and 1891.

Model Laundry and Apartments, 131 West Alder.

For further information and updated listings, contact the Missoula Historic Preservation Officer, 200 West Spruce, Missoula, Montana 59802. Phone: 406-523-4650, attention Allan Mathews.

Sites and structures eligible for NRHP:
Miller Creek Site. A scatter of rock paleo-Indian artifacts such as side-notched projectile points, mortar bases, fire cracked hearths and net sinker weights are located at this site in the lower reaches of the Miller Creek drainage basin.

University of Montana Campus (listing pending in summer, 1992).

Miscellaneous Historic Buildings. Several buildings in Missoula have been identified as eligible for the Register as part of a HUD-funded inventory of the City. Contact the City of Missoula for additional information (406) 523-4650.

Other significant sites and structures:
Lewis and Clark Route. This 1806 route through Missoula of explorer Merriwether Lewis is described in his journals.

Council Grove. This is the site of the 1885 Stevens Treaty with the Flatheads, Kootenai, and Pend Oreille Indians establishing the Flathead Reservation.

Mullan Road. This 1862 military road through Missoula County is now extensively covered by paved roads. It was the first significant effort at surveying and road-building in Montana.

Hellgate. This was a trading center on the Mullan Road during the 1860's and the site of the Higgins-Worden Store, the first-known commercial structure in the Missoula area.

Main Hall. This stone building was erected in 1898 and was the first structure on the University of Montana campus.

Milltown Dam. This dam was built in 1908 to generate power for a rapidly growing Missoula.

Lolo

The rich history of this region encompasses Indian trails and occupation sites, the route of the Lewis and Clark expedition, mining, logging and homesteading.

Sites and structures on the NRHP:

The Lolo Trail. This prehistoric and historic travel route is still visible on the landscape. The route, used by Native Ameri-

cans and Lewis and Clark, fell into disuse in the late 1800s. The first rough road over Lolo Pass was built by the Civilian Conservation Corps in 1935, and the modern highway was constructed in 1962. Current use of the old trail includes backpacking and bicycling tours.

Traveler's Rest. This campsite near Lolo was used by the Lewis and Clark expedition on both legs of their journey west to the Pacific and east to St. Louis (1805-1806)

Fort Fizzle. Rough fortifications used in 1877 by cavalry from Fort Missoula in their failed attempt to stop the Nez Perce Indians under Chiefs Joseph and Looking Glass. Breastworks are still slightly visible and military buckles, spurs, and rifle cartridge cases are occasionally found.

Sites and structures eligible for NRHP:
Mud Creek Ranger Stations. These are log structures built in 1922 as Forest Service facilities.

Other significant sites and structures:
Woodman Schoolhouse. The frame schoolhouse was built in 1902 to serve the now-vanished town of Woodman. Woodman existed because of homesteading and mines such as the Chickaman and Lawyers Combination.

Frenchtown-Huson

Homesteading and the wood products industry dominate the history of this region. Settling of the area by families of French ancestry accounts for the name of its central community. Archaeological artifacts are found along the Clark Fork River. Pictographs exist on the bedrock walls of Alberton Gorge.

Sites and structures on the NRHP: none.

Sites and structures eligible for the NRHP:

Isaac Eddy Ranch. This 1860s homestead has several historic buildings and an intact portion of the Mullan Road.

Other significant sites and structures:
Smokejumpers' site. The abandoned smokejumpers' site near Huson is historically significant as a Forest Service base of operations during the 1940s.

Mullan Road. This 1862 road traverses the region.

St. John the Baptist Catholic Church. Built in 1885 as a two story wood frame church in Frenchtown, the building is signifi-

cant for its architecture as a well-preserved example of the vernacular Greek Revival ecclesiastical style, and for its ethnic associations with the settlement and development of Frenchtown

Ninemile

Early Indians quarried rock for points and knives in the mountains of this region. Artifacts and occupation sites also exist, mostly near water. Features related to Forest Service activities and private homesteading characterize the history of this region.

Sites and structures on the NRHP:

Ninemile Ranger Station. Numerous significant structures exist in this Forest Service facility which originated during the early 1900s. It was known as the "Remount Station " due to horseback duty common to the era.

Sites and structures eligible for the NRHP:

Whitetail Archaeological Site. Located on a side drainage of Ninemile Creek, the surface and subsurface contain projectile point fragments, ovoid knives, scrapers and other ancient artifacts.

Upper Eustache Cabin. This isolated log structure was built in 1918 but is typical of cabins used during the 1860s gold rush.



RECREATION RESOURCES

Recreation can be the most extensive non-consumptive human use of the Missoula County landscape. The opportunity to enjoy outdoor recreational experiences is a central component of a desirable quality of life to residents of the county, and a wide variety of recreational amenities is available. Recreation features are attractive to non-residents as well and help support related businesses such as motels, restaurants, sporting good supplies, and outfitting and guide services.

Recreation Overview

Missoula County is included in Region II of the Montana Department of Fish, Wildlife and Parks (MDFWP). This relatively small region encompasses Missoula, Mineral, Granite, Ravalli, Powell and Deer Lodge counties. Despite its size, Region II has among the highest activity levels of any of MDFWP's seven regions.

The Missoula Parks, Recreation, and Open Space Plan, as well as the recreation plans of the MDFWP, Forest Service, Bureau of Land Management and other agencies provide detailed recommendations for recreation use in Missoula County and will not be addressed in this report. While many plans and location-specific studies have been prepared, a comprehensive view of the current recreational needs on public and private lands does not exist. To meet these needs, Missoula County, the Lolo National

Forest and the Montana Department of Fish, Wildlife and Parks, Confederated Salish and Kootenai Tribes cooperated in the implementation of Memorandums of Understanding which pledge cooperation between agencies. These "MOUs" help limit overlap, decrease regulatory review of major development proposals and provide a proactive method of predicting, and meeting, future recreation needs in the area.

Recreation Demand

MDFWP's 1988 State-Wide Comprehensive Outdoor Recreation Plan indicates Region II, which includes Missoula County, has the greatest percent of people participating in backpacking, bicycling, hunting, jogging, nature study/bird watching, walking/day hiking, canoeing, sailing, x-country skiing and soccer. It ranks second in horseback riding, off-road ATV, rafting, lake-swimming, wind surfing, downhill skiing, and tennis. Region II has the lowest percent of people participating in snowmobiling. Missoula County contains some of Region II's main recreational attractions or access to those attractions. These include the Blackfoot, Bitterroot and Clark Fork river corridors, the Selway-Bitterroot, Welcome Creek, Bob Marshall, Mission Mountain, and Rattlesnake wilderness areas, the Rattlesnake National Recreation Area, the Seeley-Swan chain of lakes, the Blue Mountain and Pattee Canyon recreational areas and miles of high quality fisheries.

Hunting and fishing are actively pursued by both residents and non-residents. Pressure is increasing tremendously from out-of state-hunters. In 1983, all the state's non-resident big game combination licenses were sold in 45 days. In 1984, all such licenses were sold in less than 30 days. In 1985, it took six days to sell all 17,000 non-resident big game combination licenses. By 1988 all 17,000 licenses plus 6,000 special big game which excludes elk hunting were sold in 3 days. Region II absorbs a significant share of this use and other hunting and fishing pressure. In 1990, 59,433 individuals purchased conservation licenses in Region II.

These licenses are a pre-requisite for acquiring a fishing or any of the various hunting licenses. The number of all licenses is increasing moderately according to MDFWP personnel and in 1990 total license sales exceeded 150,500 in Region II.

Region II averages about 287,000 fisherman days annually. About one-third of local residents fish. Fishing license sales increase two to three percent per year. Due to population increases angling pressure is rising. Habitat is being lost due to stream bank alterations, dewatering, land subdivision and development.

Region II ranks second of all seven MDFWP regions in hunting recreation days for elk, mule deer, moose, and black bear, and is third in hunting activity related to white-tailed deer and mountain goat. Elk provide the greatest attraction to hunters, and therefore, contribute significant economic benefit to the county. The majority of big game hunting takes place on public lands, but substantial numbers of white-tailed, upland game birds, and water fowl are taken on private lands. Significant quantities of big game winter range are privately owned. Winter range is a critical factor in determining the size of the herds. Upland game birds and water fowl also attract significant hunting activity. Trapping takes place for mink, muskrat, beaver, weasel, bobcat, skunk, coyote, raccoon, badger, fox, Canada lynx (a total of one is permitted state-wide), wolverine, and martin. Nearly all species of interest to both recreational hunters and non-hunters depend on private land for some critical phase of their lifecycles.

Most of the land along rivers and major creeks is privately owned. The demand for access across private land to public land and waterways is rising and will be a major issue in future decades. Therefore, all private lands bordering government ownerships which are managed for recreation can be considered a key resource value (see Page 18a).

Relations between landowners and hunters, off-road vehicle users, and river users are particularly prone to problems due to high demand and occasional irresponsible recreation. Landowners elsewhere in Montana are selling long-term hunting leases to private user groups who agree to police the property during hunting season and pay a fee to the landowner for the privilege of

using their land. If conflicts continue to result in limited hunting access to private land, public pressure will come to bear on government agencies to manage public lands for recreational purposes rather than for other values such as commercial timber harvest and livestock grazing.

Landowner conflicts with river and lake users are also a significant issue. Irresponsible public use, inadequate facilities, and insufficient numbers of public sites have caused problems related to garbage disposal, law enforcement, trespass, fires, and destruction of private property. The Montana Legislature passed a law in 1985 which assures public use of rivers between seasonal high-water marks. This law was a compromise designed to meet the needs of both landowners and recreationists.

Recreational use of Lolo and Flathead National Forest is increasing steadily. The majority of use is dispersed. In 1989, 1,338,500 total recreation visitor days (RVDs) occurred on the Lolo National Forest and in 1991 1,496,900 days were logged. Of the 1989 RVDs, 955,000, or 71%, were for dispersed activities and 383,500, or 28.6%, occurred on developed Forest Service campgrounds and other facilities. Of the dispersed activities 71% of the total RVDs occurred in non-wilderness areas. From 1983 through 1989, total RVDs increased 11.5%, dispersed activities have decreased 0.5%, and use in developed areas have increased 62%. Although a relatively small amount of the Flathead National Forest is located in Missoula County, recreation use patterns are similar. The primary conflicts on National Forests are between motorized and non-motorized recreationists such as snowmobilers/cross-country skiers, powerboats/paddlers or hikers/horseback riders.

Surveys cited by the Missoula County Parks, Recreation and Open Space Plan indicate the most popular recreation activity in Missoula County is pleasure driving. This reinforces the strong relationship between this activity and scenic open space resources shown on Map Five. The next most popular activities are picnicking, walking (preferably near water), camping and fishing. Many residents of Missoula County live in the urban area and are also concerned with developed neighborhood facilities ranging from tennis courts, pool, ice skating rinks, playgrounds and athletic fields. Major land ac-

quisitions along the Clark Fork River in the urban area have significantly expanded the opportunities for non-motorized recreation on both north and south river banks. Additional purchases and development are anticipated by several groups, including the Missoula Redevelopment Agency.

The Missoula County Parks, Recreation and Open Space Plan outlines four levels of developed parks: regional, district, community and neighborhood. Regional parks provide outdoor recreation in a natural setting. The Blackfoot River Corridor and the Clearwater River chain of lakes and canoe trail are examples of recreation complexes of regional significance. District parks are generally improved recreation sites of 100-300 acres, such as Fort Missoula. Community parks cover about 50 acres and are exemplified by Playfair, McCormick and Greenough parks. Neighborhood parks are 4-16 acre sites (often located at schools) which are the focal point of a neighborhood. Greenway preservation provides passive recreational use and is best exemplified by the Rattlesnake Greenway which connects the urban area with the Rattlesnake National Recreation Area and Wilderness. All levels except neighborhood parks are addressed in the following regional descriptions.

Recreational Needs

A detailed county map indicating all areas of existing or potential recreation use would not be meaningful - almost all public and private lands would be included for one reason or another. The Lolo Forest Plan as well as state, county and city planning documents provide detailed lists of recreation areas, parks, campsites, picnic areas, fishing access sites, boat ramps and other facilities. While not all the following types of land are shown on Page 18a, they all serve important recreational functions. These include lands:

1. bordering rivers, creeks and lakes;
2. visually and/or physically accessible, adjacent to public roads;
3. of scenic interest;
4. of historic or archaeological importance;
5. suitable for recreational development;

6. possessing ecological importance (for example, the importance of elk winter range to wildlife viewing);
7. of educational importance (nature study, local history, agricultural methods);
8. providing access to public lands;
9. suitable for district, community or neighborhood parks; and
10. providing public trails.

High quality natural environments provided major recreation opportunities. Recreation demand is substantial and is escalating. These natural areas are also in great demand for conversion to potentially discordant intensive land uses such as residential and recreational subdivision and development. Ironically, the same qualities which attract recreational use also attract development pressure.

The Regions

The following summaries highlight the recreational character of each of Missoula County's eight regions. Proximity to rivers, creeks and lakes is the common thread which unifies the recreation resources of the regions. These resources are largely found on private lands. The MDFWP and the U.S. Fish and Wildlife Service (FWS) have evaluated and rated fisheries and recreation potential of almost all of Montana's rivers and creeks. The ranking criteria include occurrence of state or federally designated threatened or endangered fish species, fish species of high interest to the state, and habitat restoration, reclamation or mitigation potential. In Missoula County, the absence of threatened or endangered fish species resulted in rankings based on the habitat quality for species with strong recreational interest such as rainbow, cutthroat, brown and other trout. The ranking system includes five designations.

- | | |
|------------|---------------------------------|
| Class I: | Highest Value Fishery Resource; |
| Class II: | High Priority Fishery Resource |
| Class III: | Substantial Fishery Resource |
| Class IV: | Moderate Fishery Resource |
| Class V: | Limited Fishery Resource |

Specific updated visitation figures for some sites in each region are unavailable due to funding restrictions in the MDFWP. However, according to both Forest Service and Fish, Wildlife and Parks sources, general recreational use continues to grow, especially in Western Montana.

Seeley-Swan

This lightly populated region provides diverse, high quality, year-round recreation experiences of national significance. The spectacular Mission Mountains and Bob Marshall Wilderness Area draw Montanans as well as recreationists from all over the country, to hike or ride horseback into this backcountry. This is a headwaters region of lakes and small streams. The valley bottom portion of the region is a moist forested landscape. The Clearwater River is a Class II fishery. Owl and Placid Creeks are Class III fisheries. Class IV fisheries include Marshall, Deer and the West Fork of the Clearwater. Salmon, Seeley, Inez, Alva, Rainy and Clearwater are the principle lakes located along the Clearwater River. These, along with Placid and Marshall lakes, comprise a regionally important recreation complex. Boating, camping, picnicking, hiking, wildlife watching and fishing are focused on the Clearwater River chain of lake resources. Agency personnel indicate greater access is needed to the Clearwater River between Seeley and Salmon lakes. Public recreation facilities and private interests mingle throughout this area. Facilities are reported to be adequate, but strained and during summer weekends, campgrounds are full. The Salmon Lake and Placid Lake State Recreation Areas are particularly popular. Recreation pressure on the Seeley Lake Ranger District, according to the most recent (July, 1992) estimates of the District Ranger, increased in excess of 100% from 1990 - 1992.

The Seeley/Swan region is the most heavily used snowmobiling area in Missoula County. In 1988 there were 1,530 registered snowmobiles in the county but in 1990 the figure dropped to 1,227. The Seeley Lake area has about 300 miles of groomed trails. According to Montana Department of Fish, Wildlife and Parks' 1988-89 snowmobile traffic counts, the trails in Seeley/Swan area received 9,130 snowmobiles or 48% of Region

II's snowmobile activity. State-wide, 1989-1990 snowmobile use increased approximately 7.4% over 1988-89 totals with 21,364 vehicles being counted. Popular trails in the Seeley Lake complex include Seeley Lake to Ovando, Rice Ridge-West Morrell, Double Arrow, Marshall-Mount Henry and Fawn Creek. This system is managed by MDFWP, using gas tax funds. Current facilities appear sufficient to meet present and projected demands. Cross-country skiing is also popular. Some 12 miles of recently constructed groomed trail exist northeast of Seeley Lake. The Ovando to Seeley Lake 50 kilometer cross-country ski race takes place in February.

The Seeley Lake-Jocko Road is a three season recreation travel route linking the Evaro region with Seeley Lake. Many logging roads which wind through this region are similarly used for vehicular recreation.

The Swan River is rated a Class II fishery. Numerous informal access points exist on the Swan River. Class III streams include Glacier, Holland, Beaver, Kraft, Condon and Cold Creeks. Elk, Rumble and Cooney Creeks are Class IV although Elk Creek was recently identified as the most important bull trout spawning area in the Flathead Forest. Lindbergh and Holland Lakes serve significant recreation functions. The Holland Lake area is the region's principal access point for entry to the Bob Marshall Wilderness. Holland Lake Lodge is a well known commercial establishment providing lodging, meals and access to lake and wilderness activities. Lindbergh Lake has a Forest Service campground. This lake and nearby Glacier Creek are the main trailheads for entry into the Mission Mountain Wilderness.

The Seeley-Swan region is a popular hunting area. White-tailed deer is the principal big game species taken, although elk, mule deer, black bear and mountain goat are also successfully hunted. Grizzly bear have been hunted in the past but are not longer hunted due to their threatened status under the Endangered Species Act. Trapping of furbearers occurs throughout this region.

On the Clearwater River, immediately upstream of Seeley Lake, is a 3 1/2 mile canoe trail. The Clearwater River Canoe Trail offers canoeists an opportunity to pass through an undisturbed wetland ecosystem

filled with wildlife. Along with osprey, bald eagles, white-tailed deer, moose, mink and an occasional otter, many songbirds, thrushes and waterfowl inhabit the riparian corridor. Species of fish include trout, bass, perch and kokanee salmon. The Clearwater's slow moving waters and easy return shuttle, a 1/2 mile hike, make this a particularly unique and attractive resource. The Seeley Lake Ranger District is in the process of developing disabled access along the canoe trail. A rapidly growing clientele also visits the District's newly (1992) constructed wildlife viewing blind near the District office at the north end of Seeley Lake. The blind overlooks a valuable and extremely diverse wetland.

The MDFWP and Forest Service have a keen interest in supporting water related recreation here. Water access points, campgrounds, boat ramps, bird viewing blinds and other facilities may need to be expanded as demand rises. The conservation of river and lake corridors is fundamental for high quality recreation experiences within this region.

Potomac-Greenough

Like the Seeley-Swan, the major recreation demand in this region is for access to and use of water and riparian areas. The Blackfoot and Clearwater rivers are the principal recreation resources found here. The Blackfoot River, from its confluence with the Clearwater to its mouth at the Clark Fork near Bonner, is a Class I fishery. Upstream of the Clearwater River, the Blackfoot is rated Class II. In 1972, the State of Montana recognized the Blackfoot as a free flowing "state recreational waterway." Agency personnel and recreation groups consistently stress the importance of the Blackfoot River for fishing, floating, swimming, picnicking and camping. Unfortunately, American Rivers, a national river conservation organization, ranked the Blackfoot as one of the 10 Most Threatened rivers in the U.S. in 1992.

The Blackfoot has also achieved national attention as the site of an innovative and very successful conservation and recreation program which began in the 1970's.

In the early 1970's increased recreation, subdivision and residential development and a federal proposal to designate the river "Wild and Scenic" was perceived to

threaten the beauty and past use of this scenic river corridor. Private, corporate and public land owners, together with The Nature Conservancy, joined to address the future of the corridor. After some five years of work, *The Blackfoot River Conservation and Recreation Management Plan* was completed (TNC, U.S. Bureau of Outdoor Recreation, 1976). Two general topics were addressed: land conservation and recreational use.

In 1976, long before the river access law was passed, landowners along the Blackfoot recognized the river as a recreational resource of significant public importance. River use and related problems of trespass, litter and fires were increasing. The landowners' options were to either tackle these problems as individuals or to seek partners to comprehensively address the spectrum of river use problems and concerns. All the parties agreed that it was in their best interest to cooperatively manage the river's recreational use. *The Blackfoot River Conservation and Recreation Management Plan* became the basis for management regulations. It was then incorporated into a Recreation Management Agreement which was signed by all related public and private parties. Upon its expiration one year later, the agreement was renewed for an additional two years. This was followed by a five-year agreement. In April of 1985, a ten year renewal of the Recreation Management Agreement was signed by all parties.

Today, a complete system of access points with parking (many on private land), recreation corridor signs and recreation maps exist. A walk-in hunting area is also available in the Greenough portion of the Blackfoot drainage. The MDFWP supplies seasonal wardens to police the recreation corridor, while Missoula County contributes \$5,000 annually for management. Land conservation efforts have thus far resulted in over 5,000 acres and seven miles of river being voluntarily protected by perpetual conservation easements. However, the majority of the river corridor is not presently protected by easement, and while existing conservation easements assure the existence of open space in the areas covered, they do not provide public access for recreational purposes.

This innovative approach to managing recreational use has been an outstanding success. As a result of the Recreation Man-

agement Agreement, the public has the right to responsibly enjoy the Blackfoot River. And the private landowners receive a partner in monitoring public use and enforcing rules stated in the agreement. This private-public partnership concept can be applied to any river corridor in Missoula County.

The MDFWP compiles visitor use statistics at various sites, based on estimates and automatic vehicle counter data. During the summer of 1976, an estimated 15,000 visits occurred within the Blackfoot Corridor. By 1983, this had increased to at least 48,000 for the same period. This is more than a 300% increase. During the same period in 1986, visits fell to 33,500. Primary use areas and their 1986 summer visitors are: County Line-1,700; Roundup-5,000; Ninemile Prairie-2,000; Riverbend-3,300; Belmont Creek-1,300; Whittaker Bridge-1,900; Thibideau-1,000; Sheep Flats-1,500; Johnsrud Park-13,300 and Marco Flats-2,500. All but Whittaker Bridge and Thibideau have increased visitor numbers since 1976. These numbers do not translate directly into user days, as an unknown percentage of visitors may be counted at several sites.

The Clearwater River in this region is rated a Class III fishery. The principle use areas are Clearwater Crossing (14,200 1986 visits) and Harper's Lake (32,600 1986 visits). Use is increasing for these two sites. The same activities common to the Blackfoot River are popular along the Clearwater. However, access is more limited and floating opportunities were, until recently, greatly hampered by wire fencing. On June 1, 1985, the MDFWP and two dozen volunteers installed new fences with "Smith River Gates" to allow floaters to pass unimpeded. This effort represented a landmark of cooperation between recreationists and landowners.

Gold, Belmont, East Twin and West Twin Creeks are Class I fisheries. Burnt Creek is the only Class III fishery while Elk, Bear, West Fork of the Gold and Blanchard Creeks are Class IV fisheries.

Snowmobiling is popular at the Gold Creek-Seeley Lake Trail, Garnet-Coloma area and Mineral Peak Trail. Some 1,690 snowmobiles used these groomed trails in 1988-89, an increase of 149% from 1976. Cross-country skiing is extremely popular at the Lubrecht Forest nordic ski area during winters with sufficient snow. Ski touring, lessons, races, parties and biathlon competitions all

take place here. The Coloma-Garnet area is popular with both skiers and snowmobilers. The BLM rents cabins in Garnet to the public.

Hunting for elk, mule deer, moose and black bear occurs in various hunting districts throughout this area. Walk-in only hunting exists in the Greenough area. Substantial elk herds move about the region and winter in the Clearwater Game Range or on nearby private lands. In 1985, five hunting licenses for antlered bull moose were issued for the district while six will be issued in 1992. Furbearers are trapped in the mountains.

Clinton-Turah

Again, water-oriented recreation dominates the pattern of use in this region, which is split by the Clark Fork River. The Clark Fork is rated a Class II fishery despite its history of mining related pollution problems. Access to the river is generally adequate. A minimum of 24,900 recreational visitors used the river in the summer of 1986. The most popular developed sites are Turah (12,900 visitors, 1986), Beavertail Hill (10,400 visitors, 1986), and Schwartz Creek (1,600 visitors, 1986). Use of the Clark Fork is believed higher than the data indicates due to substantial fishing at informal sites. Conservation of the river corridor will ensure a scenic recreation resource and help maintain the present fishery.

Rock Creek is a Class I fishery. This nationally acclaimed stream received recognition in 1972 as a "state recreational waterway." Special fishing regulations imposed in the late 1970's have greatly improved the creek's trout fishery. MDFWP personnel indicate that the confluence of Rock Creek and the Clark Fork River has outstanding potential as a state park or other recreational area.

Evano

Because the Evano region is largely within the Flathead Indian Reservation, permits from the tribe are required to recreate here. Sacred tribal lands exist here, particularly in the mountains. Recreational use carries with it a responsibility to visit only those areas designated "open" by tribal authorities. Seasonal or day-use permits can be purchased. The most popular activities

are fishing, hiking and camping. The Jocko River and its forks are Class I fisheries. This nationally significant resource is accessed from the Jocko-Seeley Lake Road and adjacent logging roads. Access to the Rattlesnake Wilderness is possible from the South Fork of the Jocko River. Access to the Mission Mountain Wilderness exists from the Middle Fork of the Jocko. Snowmobile use occurs at Jocko Pass. Agency Creek is a Class III fishery and Finley Creek is a Class IV fishery.

Missoula Valley

Most Missoula County residents live in and enjoy the diverse recreation resources of this region. It is not possible in the scope of this report to address the many detailed, site specific developed and dispersed recreation resources available. Numerous recreation plans and programs exist simultaneously in this populated core of the county. Agencies and programs include Missoula County Parks, Recreation and Open Space; City of Missoula Park Board and department; Missoula Redevelopment Agency; County Golf Course Board; Fort Missoula Recreation Complex as well as state and federal recreation facilities and planning. Recreation is an issue of interest to nearly everyone. The variety and quality of recreational opportunities available in this region rival those found near any urban or suburban center in the country.

The Rattlesnake National Recreation and Wilderness Area lies within a twenty minute drive of most residents. In no other American city do residents live so close to a similar resource. The Area also serves important educational functions as an outdoor classroom. Visitor use currently focuses on hiking and camping, although running, horseback riding, bicycling and cross-country skiing are also popular activities.

The Blue Mountain, Pattee Canyon, and Fort Missoula recreation complexes are important district parks. About 370 snowmobile days per year occur in the Blue Mountain area. Inner-tubing is a popular activity limited in recent years by a lack of parking sites. Pattee Canyon has two Forest Service day use picnic areas, hiking trails and ten miles of nordic ski trails. Nearby Mount Sentinel is a major hang-gliding take off point and Mount Jumbo has been used for para-gliding launches. Mount Jumbo also

supplies critical winter-spring habitat for a local elk herd which provides wildlife viewing from homes and commercial downtown locations - one local bar/restaurant provides binoculars for elk viewers. Pattee Canyon has been closed to large groups because of traffic safety, vandalism and littering problems. Recreation agencies indicate that a suitable large group picnic site with a ball field and shelters is needed close to town. The Pattee Canyon-Deer Creek loop road is popular with bicyclists. The Fort Missoula complex provides golf, baseball, tennis and fitness course facilities. There is also an access point to the Bitterroot River at Fort Missoula.

The mountain ranges which border Missoula Valley contain many well known peaks. Lolo Peak, Blue Mountain, Squaw Peak, Point Six, Stuart Peak, Mount Jumbo, Mount Sentinel and Mount Dean Stone are frequent destination of hikers. Trail access is more developed to some peaks than others. These peaks, along with Waterworks Hill, McCauley Butte and many other hills, form the framework for an informal but comprehensive trail system.

The Clark Fork River is rated a Class II fishery. Missoula is fortunate to have a waterway suitable for fishing, floating and swimming flowing directly through its urban center. Maintaining the river's water quality is crucial to the success of the riverfront parks and numerous other recreation projects in the region. Upstream of the city, the Milltown Reservoir Wildlife Refuge provides the flat-water paddling in this region. This area, which is off limits to hunting, is also popular for bird watching. Canada geese nest here in boxes provided by MDFWP. Downstream of the city, the Council Grove State Monument (5,200 annual visitors in 1986) and Kelly Island Fishing Access Site (15,400 annual visitors, 1986) are very popular day use areas on the Clark Fork River. Numerous other river access points such as Jacobs Island, Milltown Dam and bridge crossings combine to create an excellent waterway recreation resource. Recreation specialists indicate the principal need is for river corridor conservation and coordination of city-county planning and parks activities with those of federal and state agencies.

The Bitterroot River is a Class II fishery. The recreational use of the river from the county line to its confluence with the

Clark Fork River at Kelly Island is increasing. However, unlike the Clark Fork, there are significant gaps in its access system. Substantial river recreation issues remain unresolved. *The Lower Bitterroot River Recreation Management Plan* (Stolba, et al.) identified the following as chief problems: lack of safe, convenient public access; unauthorized use of illegal or dangerous access points; lack of adequate and safe parking; littering and trash dumping and unsafe swimming at certain places. Existing access points in the Missoula Valley Region from south to north include Buckhouse Bridge, Fort Missoula, Blue Mountain, Maclay Bridge and Kelly Island Fishing Access Site. Maclay Flats was developed in response to the need for a 5-10 acre fishing access site. The Buckhouse Bridge site has major parking and safety problems. The Fort Missoula site has high, steep banks. The Blue Mountain access area is presently restricted by limited parking and water access. The usefulness of the Maclay Bridge site is severely hampered by the land ownership pattern, limited parking and steep banks. In addition to access and facilities issues, the conservation of the riparian corridor is also widely recognized as the foundation for all recreation resource management.

Rattlesnake Creek is a Class II fishery. Miller, Grant, O'Brien, Deer and Plant Creeks are Class IV fisheries. Rattlesnake Creek lies at the heart of the Rattlesnake Wilderness and National Recreation Area. In 1989, 1991 and 1992 the City of Missoula purchased land adjacent to Rattlesnake Creek between Greenough Park and the Recreation Area and along selected hillsides. In addition to connecting Missoula's trails with the Rattlesnake Recreation area, this greenway will protect Rattlesnake Creek's water quality but will preserve wildlife habitat only if it is managed for wildlife in addition to recreational values.

The Miller Creek-Schwartz Creek loop road is used for vehicular recreation, berry picking, firewood gathering and as access for snowmobiling (150 visitor days in 1986). The 13 mile Plant Creek-Holloman Saddle cross-country ski trail is popular in years when there is enough snow.

Hunting for big game, upland game birds and waterfowl occur in the region, although not as intensely as in more rural areas. Big horn sheep are hunted in the Black Mountain and upper Miller Creek

areas. The MDFWP and Champion International installed a public rifle range in the Deep Creek area.

Use of Snowbowl and Marshall downhill ski areas is increasing substantially. New runs have been created at Snowbowl. Marshall has also expanded its runs, and both areas have added snow-making machines and increased the available hours of night skiing. Skiing has also diversified to include telemark skiers and snowboarders, both of whom are increasingly common on the slopes.

Bicycle recreation and commuting is increasingly popular in this region. The City of Missoula has a bicycle coordinator to conduct safety classes and other educational programs. Maps of urban and mountain biking routes are available. Races are held frequently. The route of the annual Tour of the Swan River Valley (TOSRV) begins in Missoula, winds up Highway 200 along the Blackfoot River to Clearwater Junction, turns north through the Seeley-Swan region and leads back to Missoula via the Evaro region. In 1990 there were over 500 riders and in 1991 a cap of 700 riders was installed.

With the increasing popularity of mountain biking, the Rattlesnake Recreation Area has become a favored destination. Primary activities are fishing, day-trips and camping. Pattee Canyon and the old Milwaukee Railroad right-of-way along the Clark Fork are also among the bike routes most commonly used. Missoula-based Bikecentennial, in conjunction with the Lolo National Forest, produced a mountain biking map covering over 240 miles of trails throughout Missoula County. Since the majority of rural biking occurs on public land, there are relatively few obstacles confronting this sport. Forest Service road closures have often benefited bicycling by eliminating conflicts with motorized vehicles. However, occasional hiker-biker conflicts are noted in the Rattlesnake, mountain biking on some trails can increase erosion and wildlife can be displaced from critical spring range.

An inventory of all county owned land has long been a goal of the county. Parcel size, present use and other factors pertinent to recreation suitability and other public uses is warranted to determine how county lands can be used to benefit recreation and conservation efforts.

Wildlife viewing is a periodically important recreational activity in the Milltown-East Missoula area when a local herd of Rocky Mountain Sheep venture onto hillsides and during spring break-up when they visit meadows and fields in the area.

Lolo

The Lolo region provides year round recreation opportunities near water and in the mountains. The Bitterroot River here is a Class II fishery. This extremely popular waterway has several significant recreation management problems. The primary access points are the Chief Looking Glass fishing access (25,100 visitors annually) located at the county line, Riverside Park and the sewage treatment plant at Lolo. MDFWP identifies the gap between Chief Looking Glass and Lolo as one of two top priorities for land or easement acquisition. Lolo Creek, from the confluence of its east and west forks, is also a Class II fishery. Formal access is provided at Lee Creek and Lewis and Clark campgrounds. Other access sites are common and include Fort Fizzle, bridge crossings and roadside turnouts. Lolo Creek is primarily used for fishing. The shallow, boulder-strewn channel makes floating and swimming difficult. The Lolo Trail has potential as a recreational resource.

The east and south forks of Lolo Creek, Grave, Howard, Lee and Butte Creeks as well as west fork of Lolo Creek and Mill Creek are Class IV fisheries.

Lolo Pass is a major winter recreation area with approximately 15,000 recreation visitor days (RVDs) per year recorded through 1991. The pass is busiest from December to April in good snow years. The State of Idaho and Clearwater National Forest share management responsibility for the area. About 1,000 "Park and Ski" stickers were sold in the winter of 1991. A sticker is needed to use the parking lot at the Lolo Pass Visitor Center, and the parking lot is usually full on weekends. About 90% of all RVDs on Lolo Pass are associated with cross-country skiing. About 60 miles of ski trails exist in the area, although substantially fewer miles are groomed. Approximately 80-100 miles of snowmobile trails are available, but the number of groomed miles varies from year to year. Conflicts between snowmobilers and skiers have been avoided, primarily

due to the creation of separate trails. The problem of dogs on ski trails continues. Co-operative management of this area by various agencies has thus far been successful in providing high quality recreation to an increasing number of recreationists.

Vehicle use on logging roads is popular in this region, particularly the Graves Creek-Petty Creek loop road. Hunting for elk, moose, deer and black bear occur. Access to Lolo Peak and The Selway-Bitterroot Wilderness Area is provided from formally designated trailheads on Mormon Creek Road and the south fork of Lolo Creek.

Frenchtown-Huson

The Class II Clark Fork River provides the focus for recreation in this region. Harper's Bridge, Erskine Fishing Access near Huson (5,600 annual visitors), Petty Creek Fishing Access site (7,100 annual visitors) are the main developed access points. Undeveloped informal sites exist at Frenchtown and at railroad and highway bridges over the river. Access appears adequate on the last stretch of placid water prior to Alberton Gorge. Frenchtown Pond is also a favorite place for sunbathers, swimmers and novice canoers/kayakers. Petty and Sixmile Creeks are Class II fisheries. Class IV fisheries include Deep, Rock, Mill and Albert Creeks.

Vehicular recreation occurs on the logging and agricultural roads of the region. The Petty Creek-Grave Creek loop road provides a link with the Lolo region. Motorcyclists and the MDFWP indicate a need for motorcycling facilities in the Harper's Bridge - Deep Creek area.

Hunting is popular in this region. Big horn sheep are sought in Petty Creek and Albert Creek drainages. Elk, mule deer, white-tailed deer, moose and black bear are also hunted. Waterfowl hunting takes place on the Clark Fork River. The area near the pulp mill is favored.

Ninemile

Ninemile Creek is a Class II fishery which bisects this region composed primarily of public land. Fishing is the most common activity on Ninemile Creek which is generally unsuitable for floating. Butler and Stoney Creeks are Class III fisheries. McCormick and Pine Creeks are Class IV fisheries.

The rural landscape of the Ninemile attracts many people for pleasure drives and informal, low-key activities. The area may also be used for hiking. Squaw Peak is a popular climb. Formally designated trail-heads exist in Stoney and Sixmile drainages. McCormick Peak is reached by trail from McCormick Creek Road. Reservation Divide provides many other hiking options.

Vehicular recreation is pursued over Siegel Pass in Sanders County. This route can be used as a loop back to Missoula via I-90 or Highway 93.

Elk, deer, black bear and other species are hunted in the mountains which form the Ninemile Reservation Divide ranges. Horseback riding is popular with both hunters and non-hunters.



EUGENE BRUCKS

ECOLOGICAL RESOURCES



Missoula County residents live in a landscape filled with an impressive array of ecological resources. Wildlife, some of which are threatened and endangered species, high quality mountain and plains ecosystems, and unique riparian ecosystems are distributed throughout the county's mountains and valleys. Although public land harbors substantial quantities of natural resources, many species and ecological communities are found on private land. Deer, grizzly bear, waterfowl, raptors, fish, and upland game birds are among the many creatures which are highly dependent on private land for all or critical phases of their lifecycles. Presence of important ecological qualities on private land generally attests to the fact that many private land uses are not incompatible with wildlife and other resources. However, there are other land uses which can threaten these resources. The conversion of open space and agricultural lands to intensive development, recreation activities, timber harvest in certain areas, and agricultural practices such as over-grazing and de-watering of streams are often in conflict with long-term maintenance of the county's ecological inheritance.

As additional developments occur in Missoula County, homeowners should be aware of the hazards to flowers, gardens, fruit trees, and ornamental shrubs caused by feeding deer or bears. Homeowners should use bear proof containers for garbage. Domestic animals, such as dogs, should be confined to the property or leashed. Landowners should be aware of the potential problems that can occur and take responsibility to protect their vegetation, property and domestic animals. Intentional

wildlife feeding can actually cause wildlife fatalities in numerous cases, and wildlife/human conflict in most cases.

The following reconnaissance, although not a detailed account, provides a description of the significant ecological resources found in Missoula County. Emphasis has been placed on private land. The accompanying maps illustrate areas which contain those resources.

Ecological Overview

Missoula County is ecologically wealthy. Some 300 species of birds, 23 species of waterfowl, 20 species of small game, nine species of big game, and numerous reptile, amphibian, and insect species use the various ecosystems. Riparian, grassland, parkland, forest, and alpine communities which mantle the county's landforms contain a diverse array of plants on which all species of wildlife ultimately depend. Highly productive river, creek, and lake habitats support fisheries and the complex food webs on which fish rely. Individual ecosystems are not islands unto themselves, but are linked to every other ecosystem in the area. Every facet of the ecological resources in Missoula County is important, but this section focuses on resources which have been clearly recognized by the public.

Four threatened or endangered wildlife species are known to utilize habitat in Missoula County: the grizzly bear, gray wolf, bald eagle and peregrine falcon.

Big Game

Big game species are probably the most well-known of the county's wildlife because they are highly visible and provide hunting and wildlife viewing opportunities. Elk, moose, mule, deer, white-tailed deer, big horn sheep, mountain goat, grizzly and black bear and mountain lion are big game species which attract outside people who contribute to the local economy.

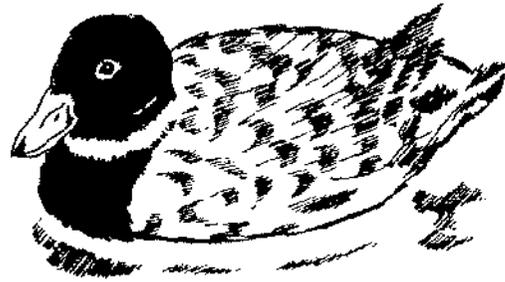
Most big game moves up and down in elevation in response to seasonal changes. Important habitats include breeding and birthing areas, wallows, mineral licks, escape cover, seeps, wet meadows, and productive forage sites. However, winter range is the single most limiting factor in the lifecycles of most big game. The amount and quality of winter range habitat largely determines the

physical condition, number and distribution of big game animals which will survive the winter. Big game have two major biological requirements which must be met on winter range: available forage and thermal cover. Forage for elk and mule deer is generally found on lower elevation south and west facing slopes where grasses and shrubs provide food. Scattered trees at the edges of forests often have snow free areas around their trunks, even when the more open sites are buried in snow. Winter thermal cover is provided within forest stands adjacent to feeding areas. Such stands reduce wind velocities and resulting low chill factors; they intercept snow, reducing snow depths under the trees which allows for more available forage and offers some insulation which keeps bedded animals warm. The winter habitat needs of moose and white-tailed deer are similar, although these animals tend to stay near river and creek corridors. Big horn sheep and mountain goats also seek lower elevations during winter. However, goats remain high in the mountains, on wind swept slopes, the entire year if no suitable winter range exists downslope.

Page 34a reveals substantial amounts of big game winter range found on private land in Missoula County. These habitats are vulnerable to development due to their low elevation, scenic amenities, proximity to access such as county or logging roads, and the unstable viability of agriculture. Although all big game animals tend to move away from roads, elk use of winter range and other habitats is generally most severely impacted by the presence of roads. Inadequate cover at the edges of openings also reduces elk usage.

Big game management is a significant issue on both public and private lands. The Lolo National Forest Plan contains a policy for resolving big game and livestock grazing conflicts so that big game receive 100% of the forage required to meet their biological needs. The Montana Department of Fish, Wildlife and Parks has acquired winter range habitats in certain portions of the county. About 10,000 elk roam the Lolo Forest, and additional elk are found in the Flathead Forest north of Seeley Lake and in the Bitterroot National Forest southwest of Lolo.

Birds



Missoula County is unique in its habitat diversity for all bird species, and in particular, birds of prey. Many of these species are listed as "Species of Special Concern" by the Montana Department of Fish, Wildlife and Parks, or as "endangered" or "threatened" by the U.S. Fish and Wildlife Service. For example, Missoula County contains the only known Flammulated Owl nest, is home to American Bald Eagles and there are reliable peregrine falcon sightings within the county.

Other species of raptors that can be found in Missoula County include: rough-legged hawk, ferruginous hawk, red-tailed hawk, Swainson's hawk, northern goshawk (particularly the Swan Valley), Cooper's hawk, sharp-shinned hawk, American kestrel, merlin, prairie falcon and occasionally gyrfalcons. All river drainages in the county are important osprey habitat. Harriers hunt over swampland and open fields, as do Turkey vultures. The Potomac Valley is especially important to the harrier.

Owls that live in or use the County include: long-eared owl, great-horned owl, great gray owl (Swan Valley), barred owl (Swan Valley), northern saw-whet owl, boreal owl, short-eared owl (in abundance in 1990), northern pygmy owl and possibly the northern hawk-owl (5-6 sightings). Other species occurring are uncertain.

These creatures have diverse habitat requirements. Important habitats include rock outcrops, cliffs, remote nesting and roosting trees, grassland and forest hunting grounds, old forest stands, and riparian ecosystems. Some raptors, such as kestrel and osprey, tolerate human proximity well. Others, such as bald eagles, are easily dis-

turbed, particularly during the nesting season.

Many of the upland game birds are found on private land in the county. Habitat potential is generally greater than present distribution. Upland game birds consist of ruffed grouse, blue, spruce, and possibly sharp-tailed grouse, ringed-neck pheasant, grey or Hungarian partridge, white-tailed ptarmigan, and Merriam's turkey. Any sharp-tailed grouse sited would be the Columbian race and would represent the eastern most occurrence of this sub-species. Blue grouse are common in the warmer and drier habitats typical of ponderosa pine; Spruce grouse prefer the cooler, moister habitats of spruce-fir forests. Ruffed grouse generally dwell in riparian and low elevation firs. Pheasants have been introduced into open farm country along the Bitterroot and Clark Fork Rivers where they feed on grain, seeds, berries, and insects. Gray partridge occupy cultivated terrain along the Bitterroot, Clark Fork and upper Blackfoot. Ptarmigan occupy high country alpine and subalpine settings. Merriam's turkeys are found along river corridors, on benches and within forests on lower mountain slopes.

Missoula County lies in the Pacific Flyway. This major waterfowl migration route provides resting, feeding, and breeding habitat for many species of water birds. Canada geese and a variety of ducks migrate through and breed in the county. Ducks include wood, mallard, pin-tail, cinnamon teal, northern shoveler, harlequin, Barrow's golden-eye and common merganser. Waterfowl which use the county's riparian ecosystems during spring and fall migrations include trumpeter swan, lesser snow goose, Ross' goose, American widgeon, gadwell, green-winged teal, lesser scaup and bufflehead duck.

Lakes, rivers creeks, and marshes are the principal habitats of waterfowl. This water/wetland pattern is virtually identical to recreation corridors shown on Page 18a. Of particular importance are ice-free areas, such as spring-fed sloughs, spring creeks, areas below dams, riverbanks, and feeding grounds within two miles of water. The Fish and Wildlife Service has identified three "aquatic habitats of substantial benefit to waterfowl" in western Montana. One of these is the Swan River wetland complex. The Milltown Reservoir and Clark Fork River

valley in the Frenchtown area are also important habitat for nesting and migrating waterbirds.

Fish

Fish are an important component of riverine ecosystems. Some 30 fish species are found in the county and range from rainbow, brown, cutthroat, and bull trout to perch, whitefish, sculpins, bass, pumpkinseeds, and suckers. The Blackfoot and Jocko Rivers and Rock Creek are rated Class I, or nationally significant, fisheries while Elk Creek is an important bull trout spawning creek. Ninemile, Rattlesnake, and other tributaries are important spawning areas. Lakes have mixed fish populations due to stocking activities and diverse habitat conditions. Kokanee salmon are caught in several lakes in the Clearwater River watershed. Water pollution problems such as heavy metal accumulation, siltation, nutrient enrichment, and de-watering are the principal threats to the county's fishery resource.

Currently, trout fishing in streams provides the most fishing opportunity in Missoula County. The future of this recreational opportunity will depend upon how well stream habitats can be maintained and enhanced. The Montana Department of Fish, Wildlife and Parks manages the trout streams to produce wild trout, or trout that maintain their own populations and are not planted. This places additional importance on the maintenance of prime aquatic habitat. High demand on stream trout fisheries and relatively slow fish growth rates have resulted in very restrictive creel limits and seasons.

Special fish management programs designed to enhance native fish species have been incorporated into the fish management program in the area. Due to low abundance and dwindling statewide habitat, westslope cutthroat and bull trout are both species of special concern. These fish have been restricted from harvest in the Blackfoot drainage.

The MDFWP's fishery management program puts the greatest emphasis on establishing in-stream flow reservations, enforcing laws relating to habitat alteration, encouraging floodplain management in harmony with stream environment, responding to conflicting water development projects and monitoring the fish populations and habitats in selected areas.

The lake environments in Missoula County include both lowland moraine lakes in the Clearwater River drainage as well as high elevation mountain lakes. The Rattlesnake drainage, the Swan and Clearwater watersheds drain most of the higher elevation lake basins.

Most of the high elevation lakes are currently managed as either wild trout or hatchery stocked fisheries. Lakes capable of sustaining natural reproduction are so managed. Most high elevation lakes were barren of fish prior to stocking in the early 1900's. Since stocking, some naturally reproducing populations of brook, yellowstone and westslope cutthroat have developed. Today, high elevation fish plants are completed with westslope cutthroat that were native to the drainage.

The lowland lakes have presented fish management difficulties dating back to the early 1900's. The problems are associated with the introduction of perch, pumpkinseed, sunfish, and largemouth bass. The environments are only marginally suitable for these warm water species. Yellow perch, which have a competitive edge over trout, have caused poor growth rates and survival of the planted trout. Attempts at removal of perch from these waters failed in the 1960's. Today's approach is to focus on the perch's natural predators (bass) and known perch eating salmonids strain introductions.

Species of Limited Distribution:



Wildlife

The federal Endangered Species Act of 1973 provided legal protection for plants

and animals listed by the U.S. Fish and Wildlife Service as threatened or endangered. The grizzly bear, bald eagle, gray wolf, and peregrine falcon occur in Missoula County and have received this recognition.

A number of federal, state, county and private agencies work to protect wildlife species which are threatened, endangered, or of special interest or concern. Because such species are vulnerable to disturbance, only general locations are located on Map Seven.

The grizzly bear is considered a nationally-threatened species. The Department of the Interior has delineated "recovery zones" for the recovery of grizzly bear populations in Montana. In Missoula County, grizzly habitat and recovery areas include the Seeley, Swan and Jocko valleys, the lower Mission valley and portions of the upper Rattlesnake Creek watershed. On-going studies (1992) indicate that the recovery zone in Missoula County is being fragmented by human development into small portions that cannot support the bear's habitat needs. This is particularly true in the Swan and Evaro areas.

Portions of Missoula County in the Selway-Bitterroot Wilderness have been designated as a potential recovery zone for the grizzly. Although believed to be extinct in this section of its former range, federal-state studies will determine the desirability/feasibility of reintroducing the grizzly to the Selway-Bitterroot.

The endangered gray wolf is establishing itself Missoula County. There have been numerous wolf sightings in Missoula County, with research, capturing and monitoring in the Ninemile and Seeley-Swan valleys. The large number of sightings in the Seeley-Swan Valley indicate that there may be a breeding pair or pack in that area. There have also been recent sightings west of Missoula near Fish Creek and Lolo Pass and an established gray wolf pack in the Ninemile Valley has been the object of considerable publicity, research and mortality, including at least one poaching and one road-caused wolf death. No human injuries have been inflicted by Montana wolves, nor are any anticipated.

The endangered bald eagle nests and winters in the county. Six known nests exist along the Clark Fork, Bitterroot, Blackfoot, and Clearwater rivers. Eagles also winter

within these same riparian areas. Bald eagles feed on fish, waterfowl and carcasses of ungulates. Two and one-half miles up and downstream of a nest is considered primary foraging habitat. A one-half mile biological protection area around an active bald eagle nest is necessary to minimize disturbance during the nesting season. The Montana Bald Eagle Working Group has published management guidelines for bald eagles.

The last peregrine falcons nested in Missoula County about 30 years ago in the Clark Fork River valley near Alberton. Their numbers declined sharply due to pesticide use. Although their numbers are increasing as a result of captive breeding and planned releases, peregrines now migrate through the county but no known nesting activity is taking place despite the existence of suitable habitat for this endangered species. Re-introduction is underway around the state and Missoula County may have nesting peregrines in the near future.

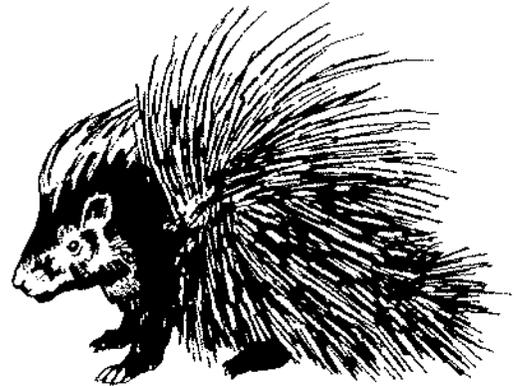
MDFWP has identified "Vertebrate Species Of Special Concern" for Montana. Mammals on this list and found in Missoula County include fringed bat, California myotis (bat), Townsend's big-eared bat, hoary marmot, spotted skunk, fisher, lynx, wolf, grizzly bear, and northern bog lemming. There are two amphibians (the Coeur d'Alene salamander and the tailed frog) and two fishes (the cutthroat trout and arctic grayling) which are considered to be of special interest or concern. Other fish include the cutthroat trout, arctic grayling, the Westslope cutthroat and bull trout. Birds recognized are osprey, bald eagle, Cooper's hawk, northern goshawk, ferruginous hawk, golden eagle, merlin, peregrine and prairie falcon, upland sandpiper, long-billed curlew, northern pygmy owl, burrowing owl, barred owl, great gray owl, northern saw-whet owl, pileated woodpecker, olive-sided fly catcher, western bluebird, clay-colored sparrow, Brewer's sparrow, and bobolink. All raptors are legally protected by federal or state law and the Convention on International Trade in Endangered Species (CITES).

Plants

No Montana plants have officially been listed as threatened or endangered by the federal government. Montana laws such

as the Montana Environmental Policy Act and the Major Facilities Siting Act reveal the public's general concern for the protection of unique, fragile, or ecologically significant lands and species. Plants with limited distributions achieve public significance for many reasons. Certain plants are easily damaged by environmental changes and have value in monitoring the effects of pollution. Many have value as resources for medicinal, food, fiber, and gene pool purposes. Some members of the public believe that a plant's existence is the sole criteria of value.

Climatic, geological, and biological change combined with human uses have created a deceptively intricate flora in the county. Species of limited distribution, relict populations, unusual species relationships, and unique habitat types lie veiled behind the seemingly simple pattern of cottonwood groves, golden grasslands, green forests, and rocky summits.



The following list of plants of limited distribution was drawn from a review of available literature, data from The Nature Conservancy, and interviews. Other species exist in the county within certain environments, but detailed site data was unavailable. The status of each plant follows recommendations by Lessica and others. These are: Threatened, Endangered, Rare, Endemic (found only in Montana), and Believed Extinct.

Plants of Limited Distribution

Threatened

- Three-leaved Foamflower
- Adder's Tong
- Oregon Bluebells

Endangered

Howell's Gumweed
Howellia

Rare

Poor Sedge
Western Witchgrass
White Glacier Lily

Kittentail
Buckler Fern
Yellow Beardtongue
Alpine Saxifrage

Obscure Evening Primrose
Northern Bentgrass
Pygmy Water Lily
Water-shield
Coville's Rush
Pointed Broom Sedge

Endemic

Bittercress
Missoula Phlox

Believed Extinct

Bitterroot Trisetum



The National Park Service's inventory of potential ecological landmarks in the northern Rocky Mountains revealed eleven such areas in Missoula County. Sites ranked within this study contain species, geological features, or high quality habitat types of importance in conserving a complete system of representative ecosystems in the United States. The potential ecological landmarks in Missoula County are shown on Page 45a. These are:

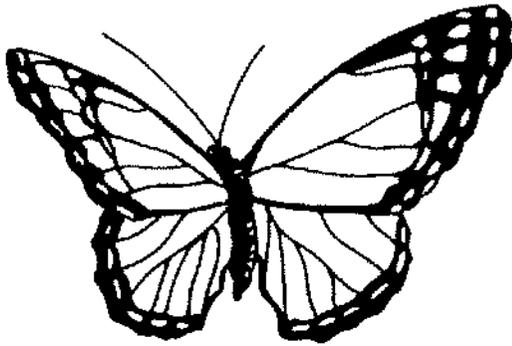
Blackfoot-Clearwater Game Range
Carlton Ridge
Council Groves
Fort Missoula Pine Bottomlands Forests
Kelly Island
Lubrecht Forest Sites
Mount Sentinel
Park Homestead
Plant Creek
Sheep Mountain Bog
Waterworks Hill

Riparian Corridors

The riparian zone surrounds rivers, creeks, and lakes. These moist ecosystems are the single most important habitat type in Missoula County. Over 200 wildlife species are dependent upon riparian communities. Species such as osprey, bald eagle, great blue heron, spotted sandpiper, and most waterfowl are totally dependent on riparian corridors. For example, great blue heron nesting areas, or rookeries, are found in large cottonwood trees along the Bitterroot and Clark Fork rivers. Fish account for 90% of the herons' diet. Many other species, including big game, spend a great deal of time in bottomlands. Elk are estimated to spend as much as 40% of their time near water. Riparian areas attract big game because of cooler summer temperatures and natural mi-

gration routes. The presence of water in semi-arid valleys, the great habitat diversity along the edge of riparian lands and adjacent ecosystems, and the resulting high wildlife and vegetation productivity makes riverine and lakeside areas critical ecological resources.

The Regions



Seeley-Swan

Forests of the Seeley-Swan Region are unlike those found throughout the rest of the county. This region lies at the border of the maritime and continental climates and thus has a mixture of Pacific Coastal Forest trees. Western red cedar, grand fir, western hemlock, and western larch grow in the valleys, along with more familiar species such as Douglas fir, Englemann spruce, ponderosa pine and lodgepole pine. The Pacific Coastal Forest habitat type once extended over most of western Montana but retreated northward with the warming climate. The Swan Valley wetland complex is ideal for Pacific Coast tree species. The Clearwater drainage is similar, although less moist. No natural grasslands exist in the region.

White-tailed deer winter range is found on Glacier and Smith creeks and along the Swan River. The populous Swan Valley white-tailed herds winter in mature timber stands where snow depths are less than in adjacent timber harvest sites. Winter foods consist of Oregon grape, serviceberry, mountain maple, grasses, forbs, tender Douglas fir branches, and tree-grown lichens. About two-thirds of the Swan Valley white-tailed winter range is in private ownership. Some deer move across the Swan/Clearwater Divide to join other herds who winter on the ridge west of Salmon

Lake and in the Blackfoot-Clearwater game range east of Salmon Lake. As many as 500 deer have been observed in a seven square-mile area east of this lake. Elk and mule deer winter upslope and east of the Swan River. Mountain goats winter in or near the Mission-Swan ranges. Moose reside in riparian areas but may move into the mountains during warmer months.

The threatened grizzly bear roams throughout much of the region. This species was classified as "threatened" by the U.S. Fish and Wildlife Service in 1975 due to the grizzlies' greatly reduced numbers and range. The Convention on International Trade in Endangered Species (CITES) has also recognized the grizzly bear as a threatened species. CITES was established to eliminate the marketing of threatened species and their body parts. The present status of the grizzly bear in Montana is under debate between those who believe numbers are rising and range is expanding and those who either disagree or feel insufficient data exist to make a clear determination.

There is general consensus that over the past few years, the grizzly population in the Mission Range has been declining. As late as 1985, there were approximately 25 grizzly bears and in 1991 the estimate fell to between eight and ten bears. Sightings and bear signs have almost vanished since then. Leading conservation and population biologists, such as Franklin, Soule, Servheen, et. al. disagree on the number of bears needed to sustain a healthy population for the short term and long term. However, all would seem to agree that the current low population, coupled with increasing habitat destruction and human use of former bear habitat, severely jeopardize the future of the grizzly in this portion of the Northern Continental Divide Ecosystem.

Maintenance of a travel corridor between the Mission and Swan ranges is viewed by biologists as extremely important to allow for breeding between those two populations. The primary travel corridor used by grizzlies runs east-west between the Swan and Mission Mountains, generally north of the Swan River/Clearwater River Divide. The Swan River riparian zone is used by grizzlies in the spring. Riparian corridors from the Missions to the river are key travel areas. Roads and recreation also tend to occur in valley bottoms. Since grizzlies develop

a pattern of seasonal habitat use, a change in habitat availability caused by land subdivision and home or road construction is usually detrimental to the bears. However, grizzly bears are not shy of people, as long as cover is available. Confrontations occur when grizzlies are attracted to dwellings by garbage, fruit trees, apiaries, poultry, swine, and other livestock, or processing of meat for human consumption. When individual animals come to rely on such foods, significant problems arise for both people and bears.

The Swan River drainage is part of the Flathead National Forest's Grizzly Bear management program and is designated "Management Situation 1" - areas necessary for survival and recovery of the species. Also contiguous with and carrying the same designation are the Great Bear Wilderness, Bob Marshall Wilderness, and Mission Mountain Wilderness areas.

Seven reliable sightings of the endangered Gray wolf have occurred in this region over the last 10 years. According to the U.S. Fish and Wildlife Service, the large number of sightings may indicate a breeding pair or a wolf pack in that area. Biologists speculate many wolf travel corridors exist between the Mission and Swan ranges.

Fishers reside in the forests of Swan Valley. Seven animals were transplanted to the Holland Lake area in 1958. This transplant effort apparently has been successful. The wolverine also roams these forests. Mountain lion, lynx, black bear, and numerous other mammals are found in this forest landscape.

The endangered bald eagle uses this region year round. Osprey nest along the Clearwater and its chain of lakes. The Clearwater River and its lakes also have a mixed fishery of numerous species. Kokanee salmon are taken from the lakes. The Swan River fishery is characterized by cutthroat and bull trout (dolly varden). Both The Swan River and the Clearwater are Class II fisheries.

Two plants in this region have been recommended for endangered status. Howell's gumweed occurs in a moist meadow near Holland lake. Howellia grows at the margins of shallow ponds and potholes just downstream of Lindbergh Lake and in the Smith Creek drainage. The rare white glacier lily grows in the forests surrounding Seeley Lake. Englemann spruce

growing in this region's valley bottoms show cone characteristics and chemical compositions akin to white spruce which is common to the north in Canada. Spruce hybrids of this region display similarities to both species.

Potomac-Greenough

Large numbers of elk winter in this essentially undeveloped region. The Blackfoot-Clearwater Game Range is the most heavily used expanse of elk winter range in the county. Approximately 1,100 to 1,200 elk use this area each year, although use varies with the severity of winters. Pockets of elk winter range also exist in the open in the Greenough area. Numerous elk and white-tailed deer use winter range along the Blackfoot and Clearwater rivers. White-tailed deer winter range also exists in the open, south-facing pine forests north of Potomac. Mixed elk, mule deer and white-tailed deer wintering areas are found in several portions of this region. Moose are year-round residents of the Elk Creek drainage.

Grizzly bears use upper Gold Creek as part of a travel corridor between the Rattlesnake and Mission Mountain wilderness areas. Two bald eagle nests exist on the Blackfoot River upstream of Johnsrud Park. Bald eagles have built huge stick nests there. Another nest occurs just across the county line from Sperry Grade. An active nest is also found on the Clearwater River south of Salmon Lake. The Blackfoot and Clearwater watersheds are also frequented by transient eagles. During many years, winter use along the rivers is limited by ice. Osprey nest in tall snags along the Blackfoot upstream of Ninemile Prairie. Prairie falcon nest in ledges on bedrock cliffs near Sperry Grade. Peregrine falcons have been observed in this region, but historical nesting areas remain unused. Three other species of concern occur here. Bobolinks nest from June to mid-August in the tall grass of wet meadows near Potomac. Olive-sided flycatchers nest in tall snags which stand above new-growth forests or recent timber harvest areas in the Gold Creek watershed. Western bluebirds, cavity nesters, are using boxes along the highway just north of Clearwater Junction. Columbian Sharp-tailed grouse may occupy grassland habitat in the Ninemile Prairie and Clearwater Junction areas. If verifiable, this would represent a significant extension of

their range. Columbian Sharp-tails are known to occur further east near Ovando.

The Blackfoot River is a Class I fishery. Rainbow, brown, cutthroat, and bull trout are the most common species. MDFWP estimates fish populations between 1,000 and 1,500 per river mile near Gold Creek. This makes the lower reaches of the Blackfoot one of the more productive fisheries in the county. Tributary streams are important for spawning. In 1979, the U.S. Army Corps of Engineers identified two places in Missoula County as potential dam sites. Both were on the Blackfoot river. A dam and storage reservoir were discussed for the Ninemile Prairie area with a re-regulation dam downstream at McNamara near Johnsrud Park. The status of these potential projects is unknown. At present, over-harvesting, siltation and upstream mining are the principal threats to the Blackfoot River fishery.

Other ecological resources of interest are isolated western red cedar forests found in the Gold Creek watershed. The Coloma area contains diverse sulfide ores which once were mined for gold. At many sites along the Blackfoot River, maroon Pre-Cambrian age argillite rocks display remarkable features. These shale like rocks originated a billion years ago on tidal mud flats. Ripple marks, mud cracks, and even raindrop imprints can be observed on exposed bedrock.

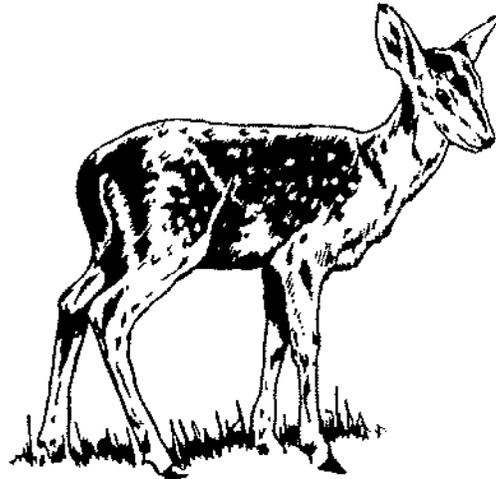
Clinton-Turah

White-tailed deer use winter range habitat along the Clark Fork River. However, many of these deer share winter range with mule deer and elk along the lower south-facing slopes of the Garnet Range. Elk wintering areas occur at Bonner Mountain and in Crystal, Allen, Greenough, Schwartz, and Gilbert Creeks. Moose find winter habitats along Cramer and Schwartz Creeks. Big horn sheep winter in the Babcock Mountain area of lower Rock Creek.

Bald eagles winter along the Clark Fork and Rock Creek, but no nests are known to exist here. There have been documented sightings of peregrine falcons along lower Rock Creek. A small great blue heron rookery exists on the river near Clinton. Extensive black cottonwood bottomland forests parallel the Clark Fork throughout this region. This forest type has been identified by The Nature Conservancy as a "plant community of special concern." Bob-

cats are known to reside in the Cramer Creek watershed.

The Clark Fork River is a Class II fishery consisting primarily of brown and rainbow trout. Upstream of Rock Creek, the river has low productivity for game fish. Biologists suspect that, for many years, heavy metals from industrial operation in Anaconda accumulated in this stretch of river. Sedimentation and irrigation withdrawals are also suspected of impacting fishery production. Rock Creek adds substantial clean water to the Clark Fork. This Class I creek contains about 1,000 fish per mile. Although rainbow trout are most common, lesser numbers of cutthroat, brook, brown and bull trout exist. Downstream of Rock Creek, the Clark Fork fishery improves enough to support about 400 fish per mile.



Evavo

Elk and mule deer winter range exists in the lower portions of Jocko River drainage. Some white-tailed deer winter along Finley Creek in adjacent lower elevation forests.

The upper Jocko River watershed contains terrain identified by wildlife biologists as important grizzly bear habitat. Bears have been increasingly observed near Evavo. Conflicts with livestock producers and other private landowners have been reported. Some researchers speculate that grizzlies may travel west of Evavo. Others believe that Reservation Divide lacks sufficient habitat to sustain year-round use. However, if the Selway-Bitterroot Wilderness is to harbor a successful repopulation of the grizzly or the endangered gray wolf, the

Evaro travel corridor or linkage zone may be crucial to sustaining the bear in the Selway.

Golden eagles nest southeast of Evaro. Aeries are located in a variety of settings ranging from cliffs to tall trees and even utility poles.

The Jocko River is a Class I fishery which sustains "planted" rainbows with limited cutthroat, brown, brook and bull trout.

Missoula Valley

This region contains substantial and varied big game winter range habitats. Elk winter range exists in the Mount Jumbo/Woody Mountain area. Strawberry Ridge and adjacent lands of the Rattlesnake Creek drainage are highly important mule deer wintering areas. White-tailed deer winter in riparian habitat along the Clark Fork and Bitterroot rivers and are also making extensive use of lower benches and mountain slopes. Miller Creek has large wintering populations of white-tails. White-tailed population in the Miller Creek area declined from 1965 to 1977 due to increased subdivision and hunting, but since the early 1980's populations have increased substantially. Moose also winter in this drainage. Elk and mule deer share winter range on south-facing benches in the lower mountains in the O'Keefe, Butler, and Grant Creek watersheds. Elk, mule deer and white-tailed deer winter in the lower forested area from O'Brien Creek to Harper's Bridge. Mountain goats spend winter months on sunny slopes near High Fall's Creek in the Rattlesnake National Recreation Area (RNRAW) while elk and deer winter on Mount Jumbo.

Bighorn Sheep, transplanted into the Bonner area in 1987 and 1990, are becoming established along the north side of the Blackfoot River.

Grizzly bears are residents of RNRAW, and denning is occurring in the wilderness area. Bears move west to Evaro on occasion and commonly use the Jocko Divide as a travel corridor to the Mission Mountains and Seeley-Swan region. Bald eagles winter on the Clark Fork and Bitterroot Rivers.

A great blue heron rookery exists in the vicinity of Kelly Island. Herons require large cottonwoods in which to nest. Preferred sites are adjacent to slow-moving sloughs which remain clear and provide excellent fishing when the main river is muddy

during peak flows. Rookeries tend to be abandoned every five to fifteen years. The trend in the county is for smaller, and perhaps more numerous, rookeries. If bald eagle nests become established in the region, they may occur in the same habitat as heron rookeries.

The Five Valleys Audubon Society's inventory of birds in the upper Rattlesnake watershed discovered 85 species from April to December. Harrier, screech and barred owls, pileated woodpecker, and golden eagle are among the birds seen in Spring Gulch. Biologists also have discovered hoary marmots around Wrangle Creek and northern bog lemmings in Shoo Fly Meadows. This is believed to be one of the southernmost population of northern bog lemmings in the United States.

Bobolinks nest in tall meadow grass in lower Miller Creek, one of only two nesting areas in the county. Golden eagles nest south of the creek. Merlin are fall migrants and winter residents of the region and have been observed hunting waxwings in the City of Missoula. Golden eagles nest in the Miller Creek watershed. Long-billed curlew are occasional spring migrants and have been seen in short-grass steppes on Waterworks Hill and near the airport. Pileated woodpeckers nest in tree cavities of ponderosa pine and Douglas fir forests and winter in riparian cottonwood forests. Pileateds are often observed in the lower Rattlesnake during winter months.

The Clark Fork River downstream of Bonner Dam is predominantly a rainbow trout fishery. Populations are low, with only 250-300 fish per mile. Productivity of the fishery is believed to be reduced by municipal sewer discharges, sediment, river channelization and industrial discharges of heavy metals. A team of hydrologists and geologists concluded the pollution of drinking water in Bonner was caused by accumulations of heavy metals such as arsenic, zinc, manganese and iron in the sediments of Milltown Reservoir. These metals are believed to have entered the river via Warm Springs Creek in Anaconda.

Waterworks Hill, located just north of the city, is a unique habitat. The ridge lies in the direct path of intense winter winds which are funneled through Hellgate Canyon. Snow is swept off the hill and the rocky soils become extremely dry. The resulting vegetation

resembles an alpine area with low-growing plants such as mountain douglasia, cushion buckwheat and Missoula phlox. This white-petaled variety of phlox was thought to grow only on Waterworks Hills, but is now known to occur in patchy distribution as far east as Meagher County. Missoula phlox is not known to exist outside Montana. The rare poor sedge grows in boggy conditions in the Rattlesnake watershed.

Six potential ecological landmarks exist in the Missoula Valley Region (see Page 45a). Waterworks Hill is known for its unusual flora. The Fort Missoula Pine bottomland, Kelly Island and Council Grove site contain excellent examples of black cottonwood and ponderosa pine riparian forests and excellent wildlife habitats. Mount Sentinel is known primarily for its prairie grassland vegetation, providing excellent opportunities for studies of fire ecology. The Plant Creek site contains spruce and Douglas fir forest habitat types and groves of 300-year-old western larch. Plant Creek is also a possible Forest Service Research Natural Area.

Remnants of Pacific Coastal Forest habitat types from a cooler, wetter climate exist around Missoula. Strands of western red cedar, grand fir, western white pine and western larch exist in Holloman, Hayes, Deer, and to some extent, Plant creeks. Pattee Canyon contains stands of 400-500 year old ponderosa pine. The oldest known ponderosa pine in western Montana has lived 730 years in what is now Glacier National Park. The stump of a pine cut in Pattee Canyon in 1900 had 707 rings, and began its growth in 1093, about 18 years before the Magna Carta.

During the Ice Age an ice dam periodically formed near Spokane creating Glacial Lake Missoula. This huge lake flooded valleys throughout the county. Mount Sentinel and Mount Jumbo have approximately 35 ancient shorelines etched on their west slopes. As the lake repeatedly drained and filled, westerly winds sent waves into the mountain sides eroding shorelines into the bedrock. These features are most easily seen in the spring when snow lies in horizontal lines on the ancient "beaches". For centuries, pinkish clay and silt settled to the bottom of Glacial Lake Missoula in layers. These "varved" sediments, laid down as dark winter bands and light summer bands, are

useful in geological dating. Excellent remnants of lake varves occur at the airport and along I-90 west of Huson in the Frenchtown-Huson Region. About 15-20 million years ago, during the Miocene Age, a forest of hardwood trees (maple, oak, ash) grew in the Missoula area. Fossil leaf imprints exist in shale rock found along a railroad cut near O'Keefe Creek.

LOLO

Substantial numbers of elk winter on the south-facing grasslands and forests above Lolo Creek. Moose winter range exists in the upper portion of the watershed. White-tailed deer make use of riparian winter range along the Bitterroot River and Lolo Creek, but the most intensively used areas occur on eastside benches from Davis Creek south to the county line. Baldy Mountain is a key mixed big game wintering area. Mountain goats use south-facing slopes at mid-elevations above Carlton Creek.

Bald eagles winter along the Bitterroot River and Lolo Creek and are observed year-round. An active nest exists near the river. Species of special interest or concern include nesting osprey, prairie falcon, Cooper's hawk and long-eared owl along the Bitterroot River, nesting golden eagles near Baldy Mountain, spotted skunk in the Bitterroot floodplain and hoary marmot in the Dick Creek area. Townsend's big-eared bat and California myotis are believed to exist along the benches west of the river. These nocturnal bats prefer caves and mine shaft roosting areas. The rare Coeur d'Alene salamander may exist in the upper Lolo Creek area.

The Bitterroot River and Lolo Creek are both Class II fisheries. The Bitterroot is known mostly for rainbow with smaller amounts of brown and cutthroat trout. Mountain whitefish are becoming increasingly popular as a game fish.

The threatened three-leaved foamflower grows in remote subalpine forests along Carlton Ridge. Rare western witch grass is found near Lolo Hot Springs. Bitterroot trisetum once grew near the hot springs but is now believed extinct.

A site on Carlton Ridge along the border of the Selway-Bitterroot Wilderness area has been recognized by the federal government, both as a nationally-significant potential ecological landmark, and as a pos-

sible Research Natural Area. Unusual alpine larch forests grow on broad, gentle slopes. Hybridization between alpine and western larch may be occurring. The area is also important for pristine examples of numerous subalpine fir habitat types. Hoary marmot may also occur here.

Other important ecological areas in the region include a great blue heron rookery, excellent black cottonwood forests along the Bitterroot River, high elevation prairies on Skookum Butte, the Lolo Hot Springs/Idaho batholith geological features and Mary's Frog Pond botanical area. Mary's Frog Pond, in the Lolo Creek drainage has been used by botanists who analyze peat deposits for ancient pollen. The pollen, which settled to the bottom of the lake thousands of years ago, accumulated in layers which are useful in reconstructing past vegetation patterns and climatic cycles.

FRENCHTOWN-HUSON

White-tailed deer make some use of the Clark Fork floodplain during winter months. However, white-tails, mule deer and elk tend to winter in lower forested mountains southwest of the river and in foothills north of Frenchtown. Substantial numbers of elk and mule deer use winter range in the Petty Creek drainage. In the past, elk were transplanted into the Sixmile area. Approximately 60 head of big horn sheep are found in the mountains west of the Clark Fork River. Two major winter concentration areas are found near Petty Mountain and Frenchtown Gulch. Big horns may be found on winter range from Petty Creek east to Deep Creek.

A bald eagle nest is located along the Clark Fork River downstream of Harper's Bridge. Eagles winter along the entire river and osprey nest in the same general areas. Golden eagles are year-round residents of the Grave Creek range and near the Petty Creek/Clark Fork River confluence. Prairie falcons nest near Harper's Bridge. Falcon aeries are generally located on remote south and east facing cliffs overlooking grassland hunting grounds. Falcons are extremely intolerant of human disturbance during nesting. As recently as the mid-1950's, peregrine falcons nested in the cliffs along the Clark Fork upstream of Alberton. Such historical use areas are possible sites for re-introduction of peregrines.

The Class II Clark Fork River fishery is dominated by rainbow trout. Productivity is low to moderate. Occasionally, waste water discharges from the Missoula city sewer treatment plant and the pulp mill decrease river water clarity. Impacts of waste water in the Clark Fork River are currently being monitored by Stone Container, the State of Montana, and others.

Other ecological resources of note include black cottonwood forests along the Clark Fork River, a great blue heron rookery near Ninemile Creek, bobcats in the Petty Creek watershed, Glacial Lake Missoula sediments in an I-90 roadcut west of Huson and Cambrian aged fossil trilobites in a railroad cut in lower Sixmile Creek.

NINEMILE

Numerous white-tailed deer use winter range along Ninemile Creek and adjacent mountain slopes. Elk and mule deer winter on south-facing slopes near Butler and Pine creeks. Approximately 80 elk winter in the area.

Bald eagles are known to visit the region during the winter, but most spend the season along the Clark Fork. Herons are frequently observed. Various raptor species migrate through or nest in the region.

Ninemile Creek is a Class II fishery used extensively as a spawning area by trout moving out of the Clark Fork River.

The Ninemile Valley continues to be home for endangered gray wolves although the pack make-up has changed. In 1991 the Ninemile Pack consisted of two adults and six pups. The adult female was illegally killed and the adult male was killed on Interstate 90. Four of the six pups constituted a new pack while the fate of the other two young wolves is unknown.

The four remaining wolves traveled exclusively in the Ninemile area. No residents reported conflicts with the wolves and the animals showed no interest in cattle or other livestock. However, in April, the pack left the valley on an excursion to the Dixon area where they killed two cows. Three of the four wolves were captured and relocated in Glacier National Park. The fourth wolf escaped capture and its fate is unknown. One of the relocate wolves killed sheep several weeks after its transplant to Glacier and was captured and placed in captivity. The other two wolves were illegally shot.

A short time after the pack left the Ninemile area, a three year old radio-collared female that was born in Glacier traveled to the Valley. Since her arrival, two other wolves arrived from unknown locations, forming a "new" Ninemile Pack which has traveled throughout the Valley and into the Clark Fork drainage. This pack has been ob

served on numerous occasions but has not caused conflict with local residents although conflict with livestock remains a concern. The 1992 denning season brought a new litter of endangered gray wolves to Missoula's Ninemile Valley.



AGRICULTURAL RESOURCES

The value of conserving agricultural land in Missoula County is three-fold. First, agriculture has economic importance. As a locally important industry, it generates approximately \$8,000,000 annually. Second, agricultural lands which contain the most productive soils are considered important for long-term food and fiber production. Finally, as agriculture is a major land use in the county, loss of a farm or ranch often means loss of open space, wildlife habitat, recreation opportunities and a way of life. Retention of agricultural landscapes which remain relatively intact is the most cost effective way of conserving a variety of resources.

The agricultural land/conservation issue is much debated. Forests and ranges are being converted to farmland, while existing highly productive agricultural lands are subdivided and developed. With no national net loss of farmland, with rising production, with surpluses and falling food costs, many argue there is no need to conserve farmland. Others indicate that the conversion of marginal land for crop production has substantial impacts, such as loss of wetlands and riparian forests, increased fertilizer/biocide expenses and impacts, reduced wildlife habitat, and increased soil erosion and siltation problems.

In 1981, this debate spurred passage of the National Farmland Protection Policy Act. This was the first Congressional recognition of the conversion trend from agricultural land to non-farm uses. This bill was passed, in part, due to information contained in the National Agricultural Lands Study (NALS). This study determined the extent of farmland conversions and their environmental and financial impacts. NALS also showed how programs sponsored by the federal program often contribute to loss of agricultural land.

Implementation of the Farmland Protection Policy Act required a nationwide system to evaluate farmland quality. The information generated was to be used in thousands of federal decisions which might affect agricultural land. These include highway construction, water development projects, mining and energy development, recreation and home loan procedures. The Land Evaluation and Site Assessment (LESA) program was developed by the Soil Conserva-

tion Service to assist this process. LESA helps determine long-term agricultural value of a particular piece of land. LESA considers current land use plans and maps, zoning, utility service patterns, adequacy of local services, commodity shipping and processing facilities, distance to nearest non-farm land uses, growth trends, soil characteristics such as long-term productivity, availability of irrigation water, growing season, erodibility and other factors unique to the site (Steiner, et al).

Agricultural land uses are generally compatible with maintenance of most conservation resources. However, economic returns from agricultural operations are declining and the market value of land for non-agricultural uses, such as subdivision and development, is much greater than its agricultural value. As a result there is intense pressure to convert farmland to uses incompatible with conservation of natural and cultural resources. Much of the county's productive farmland is already developed for non-farm purposes or is subdivided into 20-acre or smaller tracts. Some subdivided land has remained in agricultural use, as an interim measure. Only a few unsubdivided, large farms and ranches remain. In most areas, it is no longer a question of "Will the county's farms and ranches be subdivided and developed?" but rather "How will they be developed?"

OWNERSHIP OF AGRICULTURAL LAND

Agriculture is a major private land use in Missoula County. Of the 1.67 million acres in the county, 944,000 (56%) are privately owned. One-half of that land is held by large timber management companies or is Confederated Salish-Kootenai tribal land. Of the remaining 26% (434,000 acres), two-thirds (284,000) are in some form of agricultural use. An additional 275,000 acres of public and corporate lands are leased by county ranchers for grazing.

Forests cover the majority of Missoula County's landscape. Trees are the most important "crop" to the local economy. The management of commercial forests for timber production occurs on public as well as corporate and other private lands. Commercial forests tend to be located at low to moderate elevations. Forests in the upper mountain slopes are usually either in-

accessible, of low productivity, or legislatively protected from harvest.

The privately-owned, non-corporate landscape of Missoula County is undergoing a rapid transition from a rural, agricultural scene to an urban, suburban and recreational one. While about 20% of the county's prime and important agricultural soils have been put to non-farm uses, the total amount of agricultural land has, by some estimates, increased (Montana Department of Administration). This situation mirrors national trends where net cropland acreage figures are holding steady or increasing despite urbanization of substantial amounts of farmland each year. However, unlike the country as a whole, agricultural production in Missoula County has declined markedly over the years, due to conversion of less productive soils into agricultural land.

SIGNIFICANT COUNTY TRENDS

Compared to the economy of other Montana counties, Missoula County does not significantly benefit from agricultural production. Over the last seven years, the county ranked 52nd of Montana's 56 counties in total agricultural receipts. Hay production usually ranks about 24th but varies year to year. Livestock and livestock products account for at least 70% of total county agricultural receipts. *The Missoula County Agricultural Protection Study* found less than one percent of the county's total net income was derived from raising livestock and crops. This same study reported that, since 1950, nearly every facet of county agriculture production has declined.

Production figures for hay, barley and cattle vary from year to year. For example, in 1983 the County ASCS office calculated that 3,162 acres were planted into barley. This is more than a 50% increase from 1979. However, hay and grain rotations are a common agricultural practice which causes cyclic changes in the hay to grain ratio. Overall the trends illustrated are accurate and significant (Missoula County Extension Office). *The Missoula County Agricultural Protection Study* indicated low prices for products, rising costs for production, high interest rates, increasing taxes, periods when a "strong dollar" reduces export potential, increased interstate competition, lack of local markets and increased costs of farmland were among the principal reasons for the

decline in the importance of agriculture in Missoula County. Some ranchers, faced with continuing poor economic conditions and an intolerable ratio of debt to income, have sold their property for non-farm purposes. Others have sold simply due to the attractive profit for non-farm purposes.



Farm Size

Statewide, farm numbers have been decreasing and farm sizes increasing steadily since 1950. This trend probably reflects agglomeration of small farm units into larger, more economically feasible units, since the establishment of 160 acre homesteads in the late 1800's. Missoula County followed this trend until the late 1960's. Average county farm size increased about 215% from 482 acres in 1950 to 1,038 acres in 1969. After 1969 the trend has reversed. There has been a steady decrease in average size and substantial growth in the number of farms. A small farm is considered to be less than 500 acres, but major growth has occurred in the number of farms between 10 and 49 acres.

Production Economics

A review of agricultural production sales for Missoula County between 1974 and 1978 (Missoula County Profile, Montana Department of Agriculture) provides additional information about the small farm growth trend in the county. While total farm income increased slightly for the four year period, the number of farms reporting income in the range of \$2,500 to \$10,000 nearly doubled. The number of farms increased for all income groups, except those reporting income of between \$20,000 and

\$39,999, which dropped almost one-third in number. In 1978, 285 of 385 farms in the county produced less than \$10,000 from agricultural operations. 166 of those farms produces less than \$2,500, of which only 47% listed farming as their principal occupations. About three of every four farms in 1978 were operated by persons who were primarily employed in non-farm occupations and worked away from their farms to supplement their incomes.

Uses of the County's Agricultural Land

Of the remaining agricultural land, irrigated and irrigable croplands are the economic cornerstone of farm operations in the county. Cow-calf production on integrated cropland/range units and mixed livestock and grain operations are the most common type of agricultural enterprises. At least two dairy operations exist. Cropland located on valley bottoms, benchlands and foothills produces winter forage and cash crops vital to agricultural landowners. The availability of irrigation water for crop production is of primary importance to farm operations due to limited precipitation and the enhanced productivity of irrigated land. Irrigated cropland acreage varies by as much as four to five thousand acres per year. A 1959 peak of 36,630 irrigated acres is nearly twice the current average of 20,000 acres. Irrigated cropland accounts for about 70% of all harvested acres. Subdivision has occurred on some lands which were formerly cropped. To make up for croplands lost to development, agricultural landowners have put formerly untilled lands into production. Some of these lands are less productive, contain sensitive wildlife habitats and/or are more susceptible to erosion. The loss of highly productive irrigated and irrigable croplands to residential subdivision and other non-farm uses removes the foundation on which viable ranching, and therefore, the agricultural landscape depends.

Hay is the most abundant crop grown locally. Some operators grow sufficient crops to sell hay to others. Hay can be raised for about \$40 per ton and purchased for about \$80 per ton, or more, during winters following drought like the county experienced in 1985. Operators feel they must produce at least 50% of their hay on-farm or face unmanageable expenses for winter forage. Valley bottom hay fields are also important

because they provide winter shelter and calving areas. Hay and grain are grown alternatively in crop rotations on many fields. This helps maintain good soil quality and reduces the potential for damage to hay crops by fungus. Most hay is an alfalfa/grass mixture. "Wild" hay is found in the higher valleys.

Wheat, barley, and oats are the most common grains produced in the county. In 1959, grain was harvested from nearly 23,000 acres. In the 1980's, the number of acres used to produce grain crops varied between 3,000 and 5,000 acres. Some grain is sold at market and some types, such as awnless oats, are cut and fed to livestock.

Rangeland is an important component of the county's agricultural operation outside the urban influence of Missoula Valley. The availability of spring grass and the lease of public and corporate rangeland are of critical importance. Few farmers and ranchers have enough pasture on their property. Agricultural uses are increasingly in competition with other uses of mountain land, such as wildlife habitat, timber harvest and recreation.

Soils

The Missoula Conservation District, in conjunction with the Soil Conservation Service, has evaluated the agricultural productivity of all soils found in the county (Missoula County Conservation District). The three classes which were identified are prime soils (if irrigated), soils of statewide importance (if irrigated) and soils of local importance. Specific characteristics of a soil, such as chemical makeup, depth, productivity and slope were used by the SCS in determining the eligibility of soils for each class. Prime soil has the best soil quality, growing season, is irrigable and other characteristics needed to economically produce a sustained yield of crops when treated and managed according to generally acceptable farming methods. Soils of statewide importance have good soil quality but are somewhat less productive than prime land. Soils nominated as locally important are in productive agricultural use, but have insufficient soil characteristics to warrant placement in a higher category and have been tentatively identified as important by the Missoula Conservation District. This classification reflects the Montana perspective on what is "prime" and does not com-

pare Montana soil with the highly fertile and productive soils found in the humid Midwest. Some soils have changed class since preparation of the Missoula Conservation District materials. The following data and Page 39a reflect current classifications.

The pattern of prime and important agricultural land is shown on Page 39a. Also mapped by the SCS were areas considered to be "urban and built-up land." These areas are densely developed and average one or more structures per 1.5 acres. Almost all urban and built-up areas were formerly in agriculture production. Many such areas are underlain by prime or important soils.

The floodplains and adjacent sub-irrigated land around rivers and large creeks in the county are extensively used as hayfields, pastures, and calving and wintering areas. Due to infertile, gravelly soils and alternatively wet and drought conditions, these areas are not shown on Page 39a. However, their location along principal sources of irrigation water makes them critical segments of many agricultural operations.

Agricultural Land, Subdivision and Conservation

Missoula County has 25,9545 acres of prime farmland. Of this, 5,535 acres are presently considered to be urban and built-up lands. In other words, over 20% of the county's best soil is no longer available for agricultural uses. Farmland of statewide importance covers 10,107 acres of which 1,282 or 13% is urban and built-up land. Locally important farmland covers approximately 35,000 acres with an undetermined amount urbanized. Substantial agricultural lands have also been subdivided or are on the market for that purpose. The 1980 Environmental Information Center inventory of subdivision in Missoula County estimated 48% of prime land and 33% of land of statewide importance was subdivided.

Historically, the integration of publicly significant conservation resources on private lands has produced relationships which have not been wholly positive between landowners and wildlife and recreation managers. As public demand for enjoyment of private land increases, opportunities for conflict also escalate. Hunter access and policing, stream access, lack of concern for weed control, and lack of continuity in

public agency policies and management are often cited by agricultural landowners as sore spots.

The price of agricultural land no longer reflects its productivity for crops or forage but rather its value for non-agricultural use. Agricultural landowners view the sale of their land for non-farm purposes as the only way to recapitalize after years of work. Therefore, regulations aimed at restricting the sale of such lands for non-farm purposes may be perceived as a severe threat to borrowing power. Farmers, ranchers and rural residents react strongly against the word "preservation" when it is applied to their land or livelihood. The majority of non-corporately owned agricultural land in Missoula County is controlled by fewer than 400 landowners. This means there is a voting majority of urban residents who have the capacity to inadvertently ignore the needs of agricultural landowners and encourage the recent trend of reduction in average farm size. The general public tends to discover too late the loss of public values which currently coexist with traditional agricultural land use. By the time subdivision trends are visible on the land, the loss of the conservation resources is irreversible.

The Regions

Secley-Swan

The agricultural land use pattern in this area is distinguished by small ownerships and the absence of irrigated cropland. Agricultural use is limited by a short frost-free season, deep winter and spring snowpacks. The glacial soils found here are not highly fertile. No prime or important statewide farmland exists. A small quantity of locally important farmland is located south of Secley Lake. Many small, non-corporate private land and agricultural land uses are centered along the Swan and Clearwater Rivers. Agricultural production consists primarily of cattle and horses. Hay crops and pasture consist of "wild" hay. No alfalfa is planted. Corporate and public land is leased as summer pasture and provides woodland grazing. No grain crops are grown due to an abbreviated growing season. Pigs have been raised in places, and operators have experienced periodic problems with grizzly bears. Timber harvest is often used to supplement farm income.

Potomac-Greenough

This region contains some of the largest farms and ranches in Missoula County. Valleys at Clearwater Junction, Ninemile Prairie-Greenough and Potomac contain nearly all the region's agricultural operations. Substantial quantities of locally important farmland mantle the gentler slopes. Soils considered to be prime and of statewide importance exist in the Ninemile Prairie-Greenough area and other portions of the region. However, due to a short frost free season, no farmland is officially classified as prime or of statewide importance. Cow-calf operations predominate and small grains are grown in the Ninemile Prairie area. Irrigated and sub-irrigated hay lands allow operators to be self-sufficient in winter forage production during most years. Alfalfa hay suffers winter kill at times. Both irrigated and dryland crops are raised, federal, state and corporate forest lands serve as vital summer pastures from June through October. Farms and ranches are increasingly subdivided and sold. Absentee owners are becoming more common with ranch managers in charge of agricultural operations. Timber harvesting often adds to farm income.

Clinton-Turah

A significant amount of prime farmland exists in the Clark Fork River valley from Turah east. Much of this land has been subdivided into small homesites and 20-40 acre rural residential homesteads which are being used to raise cattle and horses. Some traditional cow-calf agriculture takes place along the Clark Fork east of Rock Creek, Schwartz Creek and other lateral drainages. Public and corporate lands in the Garnet and Sapphire mountains provide summer woodland grazing on which the larger operators rely. The Clark Fork River floodplain provides pasture, hayland and cover for livestock.

Evaro

Cow-calf pairs are raised in the Jocko Valley and are supported by irrigated hay and pasture. Ownerships are generally small. An eight square mile expanse of prime farmland is located north of Evaro at the county line. Pigs are presently raised north of Evaro.

Increased development due to expansion of, and improvements to, Highway 93 north of Evaro will place added development pressure on existing agricultural lands.

Missoula Valley

This densely settled region contains a complex mosaic of rural residential areas, urban and built-up land and agricultural land. Most farms and ranches raise cow-calf pairs and grow irrigated hay crops. Most pasture and hay is provided on-farm most years. Grain is grown by many operators either in rotation with hay or as a cash crop. Small grains are traditionally grown on the old lake terrace on which Missoula International Airport is located. Grain crops are also raised on the foothills north of I-90. The floodplains of the Clark Fork and Bitterroot rivers serve as hayland, pasture, and calving or cover areas for livestock. Summer pasture is leased from corporations and public agencies west of Big Flat. Ranchers truck cattle from outside the valley to graze on leased pasture in the mountains surrounding Deer Creek. A dairy farm exists west of Target Range. Land subdivision and residential, commercial and industrial developments have occurred on substantial amounts of former farmland. The Missoula urban area extends from Mount Sentinel to Kelly Island. O'Brien Creek, Grass Valley, Grant Creek and Miller Creek are experiencing considerable residential development. A large amount of prime farmland occurs just west of Reserve Street, at Grass Valley, along Miller Creek, and up Grant and Butler creeks. Farmland of statewide importance is common on the airport terrace. Locally important farmland is intermingled in the main valley, in the foothills north of I-90, and south of Buckhouse Bridge in the South Hills. Horse and cattle raising on hobby farms is common throughout the region.

Lolo

Several of the largest ranches in the county exist in the Bitterroot Valley. These ranches primarily raise cow-calf pairs and sheep. Irrigated hay fields and pastures occur on benchlands. The Bitterroot riparian zone is used as pasture and for calving areas. Coyote predation occurs during lambing season. Irrigated and dryland grain crops are grown on some benches. Locally important farmland occurs west of Highway 93 and on

east side basin-fill benches. Scattered pockets of prime farmland also exist in these same areas. West side benches provide cropland, pasture, and rangeland adjacent to the valley bottom. The Lolo area has grown tremendously in population during the last decade. Visually, the agricultural landscape persists, yet subdivision and residential development is increasing, primarily west of Highway 93. The narrow Lolo Creek valley is experiencing substantial subdivision and residential development. A great deal of the valley bottom is prime farmland. Cow-calf ranches and smaller rural residential homesteads exist along Highway 12. Irrigated hay and pasture parallels Lolo Creek. Summer pasture is leased in the surrounding mountains. A mink farm exists in this area.

Frenchtown-Huson

This rural region is still strongly oriented to agriculture. Several working farms and ranches remain. Most operations are integrated cow-calf cattle ranches with hay and grain crops grown on irrigated fields in the valley bottom. The Clark Fork River bottomland, although not containing highly productive soils, is critical for hay base, pasture and calving. Summer pasture is leased in the nearby mountains. A dairy farm is located in the region. Prime farmland exists in the Frenchtown and Huson areas. Subdivision activity is primarily located along I-90 at Frenchtown and in Sixmile and Mill creeks.

Ninemile

The narrow band of private land along Ninemile Creek contains a complex pattern of residential and agricultural uses. The most common agricultural use is a cow-calf operation with hay base and leased summer pasture. Larger ranches exist in the upper portion of the drainage basin. Mining claims are worked adjacent to several ranches. Timber harvesting supplements farm and ranch income. As in the rest of Missoula County, non-farm income provides major support to many families engaged in agriculture. Subdivision activity continues here as in other areas although conservation easement activity may preclude development of select parcels.

Open Space Resources

Open space, in the simplest sense, is an area containing little or no human development or obvious resource extraction. These essentially open portions of the landscape are generally used for agriculture or forestry. In this broad context, each region possesses open space. This section will address open space which is significant in its own right. Agricultural lands, however, are treated in a separate chapter.

Open Space Overview

Significant open space includes those areas which are for the scenic enjoyment of the general public or which are identified as "important" pursuant to a clearly-delineated government conservation policy (Tax Treatment Extension Act of 1980 and Montana Open Space Land and Voluntary conservation Easement Act of 1975). Therefore the definition of open space is separated into lands which are "scenic" and lands which serve "important non-scenic functions" (referred to in the text and maps as "Other Significant Open Space"). In both cases, the open space must yield a significant public benefit and may be oriented to farmland and forest preservation.

Significant public benefit is demonstrated by:

- 1) The uniqueness of the property, its scenic or other qualities which make it unusual or important.
- 2) The intensity of development pressure relative to open space, considering both existing development and foreseeable trends.
- 3) The compatibility of the proposed use with public programs for non-scenic conservation in the region. These programs can include water supply protection, water quality maintenance or enhancement, flood prevention or control, erosion control, shoreline protection, and the protection of land included in or related to a go-

vernment-approved master plan and land management area.

- 4) Specific government policy intended to protect property identified as worthy of protection or conservation.

Scenic Open Space

Federal law considers scenic open spaces to be those areas which contribute to scenic panoramas which can be enjoyed from a park, nature preserve, public road, water body, trail, historic structure or land area, or which provide a visual buffer around important open space features. Visual, not physical access, may be sufficient for the public to appreciate such values.

Conservation of scenic open space around highways, waterways, visually-accessible scenic sites and public land gives rise to linear corridors and nodes where open space values are concentrated. The Missoula County Parks, Recreation and Open Space Plan (1976) indicates that "because they are viewed by the most people for the longest period of time, areas seen from Missoula or from travel corridors such as roads and water bodies are most significant as visual resources." Approximately 40% of Missoula County is visually accessible to the public from main travel corridors (see Page 43a) with the percentage increasing as additional roads are developed and "improved" throughout Western Montana.

Driving for pleasure is the most common recreational activity enjoyed by people in the County. Roadside lands comprise the visual foreground for the traveling public. Features of the foreground control the quality of the entire view, so that a small percentage of development can change the visual character of a much larger area. Increments of change may seem unimportant, but the cumulative effects of development can be significant.

For this report, easily visible, essentially undeveloped lands within the foreground along all major roads were

identified during field work. Scenic lands around rivers, major creeks and lakes, were mapped mostly by interpretation of topographic maps and aerial photographs and supported by field analysis for portions of the Blackfoot, Clark Fork and Bitterroot Rivers. Mile-wide buffers are important adjacent to large blocks of public land, particularly those areas managed for recreation, wildlife, and scenic values. However, in the interest of clarity, the entire open space buffer is not shown on Page 43a. Only more critical scenic open space is delineated, as well as lands which the Bureau of Land Management has determined to be Class A Scenery - Highest Scenic Value. Important scenic areas which are visible from the Missoula urban area and recognized in the 1980 Conservation Bond as well as other important urban fringe lands are delineated on Map Five.

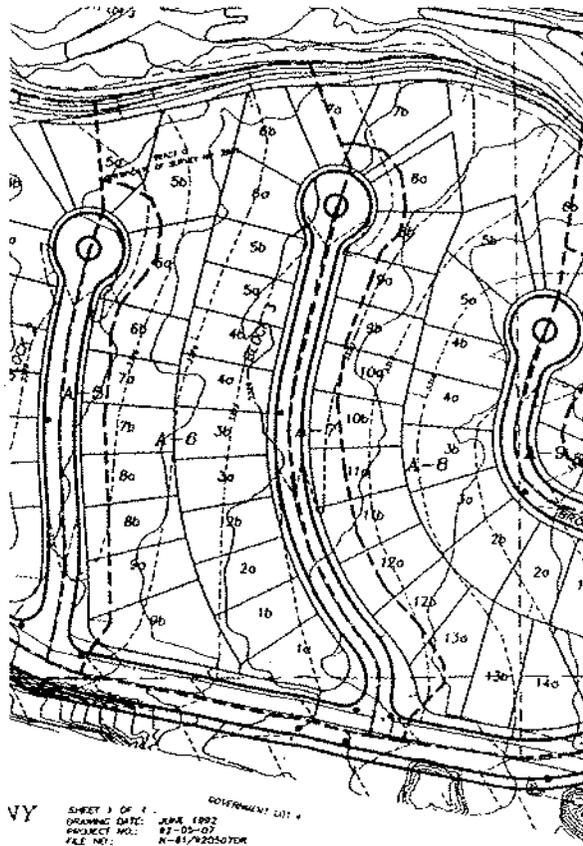
Other Significant Open Space

"Non-scenic" or "other" open space is simply open space which is not readily visually accessible. Land adjacent to rivers, major creeks and lakes, including floodplains and high groundwater areas, serve many high-priority, non-scenic open space functions. Conservation of these areas is recommended by a variety of public programs, including floodplain protection and erosion control programs. Floodplains store water and release it slowly, thus reducing flood peaks and providing higher in-stream flows throughout the summer. This aquifer recharge benefits the local water supply as well as serving the needs of wildlife. Floodplains play a major role in water purification as they filter pollutants for both point and non-point sources. Riparian vegetation helps prevent erosion which reduces the sediment loads found in rivers. Sediment can significantly reduce local fishery production.

The floodplains of rivers and major perennial creeks are shown on Page 43a. Official Federal Emergency

Management Agency Flood Insurance Rate Maps were used where such designations exist. In areas where no official maps exist, air photo interpretation was used to conservatively approximate floodplains. High groundwater areas are generally located next to rivers and lakes. However, substantial numbers of marshes, sloughs, swamps and sub-irrigated meadows exist in areas other than floodplains, particularly in the Seeley-Swan, Potomac-Greenough and Lolo regions. Due to the complexity of distribution, these latter high ground water areas have not been mapped.

Buffer zones for airport noise and safety, municipal water supply and pollution sources have non-scenic open space value.



LAND DIVISION ACTIVITY

Residential, commercial-industrial, and certain types of recreational development are the principle threats to open space and wildlife. Of these types of development, residential building is the most prevalent land-use affecting open space and related values. Secondary threats may include billboard advertising, concentrated recreational use, mineral exploration and development, littering, certain forms of unregulated off-road vehicle use, power lines, overgrazing, logging and road building.

Residential land development in Missoula County, as in any region, is a function of major economic, political and natural events. Increased land division activity, in this county, can be correlated with historical events like the extension of railroad lines and the opening of the University of Montana. More recently, it has become associated with the growing tourism industry which is promoted by a multi-million dollar (\$6.5 million in 1992), multi-year state effort. This promotion brings not only visitors but also new

residents to the scenic and sensitive areas of the state, primarily in western Montana.

Land development can also be attributed to national economic trends and local population increases of the 1960's, 1970's, 1980's and the first two years of the 1990's. State laws governing subdivision development and, to a lesser extent, agricultural land taxation, have also had an affect on local land development rates and patterns over the last 20 years. The rate of residential subdivision, location of areas experiencing subdivision and total subdivided land area have a substantial influence on the continuation of existing patterns of open space and related public values on private land.

The process of land division currently includes two methods. One, referred to as "formal subdivision" in this text, is subject to environmental assessment and public opinion. The other method, Certificate of Survey (COS), is generally exempt from public review. The criteria considered through local formal subdivision regulations and applied to approximately 10% of land divisions is as follows: 1) Need, 2) Expressed Public Opinion, 3) Effects on Agriculture, 4) Effects on Local Service, 5) Effects on Taxation, 6) Effects on the Natural Environment, 7) Effects on Wildlife and Wildlife Habitat, and 8) Effects on Public Health and Safety.

Approximately 90% of the acreage being divided is not subject to such formal public review. Unless local government attorneys find that a COS may be an attempt to evade formal subdivision review, the COS process requires only a review of the land survey by the County Surveyors Office or the City Engineering Department and a review of sanitary requirements by the Missoula Health Department.

Land development trends from the 1960's to the present demonstrate a substantial growth in the number of acres subdivided. Approximately 8,000 acres were divided in 1974, 1978, 1980, and 1984, and relatively small acreages were divided in intervening periods. This division activity includes both subdivision of raw land and redivision of existing lots. The urban built-up or developed areas of the county amounted to 19,949 acres as of 1979. In 1980-1985, 23,537 acres were divided (see Table 1). Since approximately 90% of the splits were created through the Certificate of Survey process, and half the COS's in the late 1970's

were redvisions, we can estimate conservatively that nearly 10,000 acres of previously undivided land was divided in the early 1980's. This is equal to half the cumulative total of developed land.

SUBDIVISION ACTIVITY IN THE 1980's

Year	#COS	#Plats	COSacres	Plat acres
1980	236	13	4,981	304
1981	144	14	4,534	317
1982	66	9	1,037	136
1983	81	9	1,654	362
1984	124	29	7,047	221
4/85	28	2	724	220
Total:	678	76	21,977	1,560

(Office of Community Development)

Gross figures from 1985 through 1990 indicate similar if not escalating trends. The following data show the total number of acres subject to the COS process versus the acres divided through formal subdivision review. Note that overlap can occur with some acres being subject to more than one COS, both the COS process and the subdivision process, or other similar combinations.

July, 1985 through December 1990: COS: 23,818 acres; Subdivision: 944 acres.

January through July 1991: COS: 3,754 acres; Subdivision: 210 acres.

August 1991 through July 1992: COS: 2,867.65 acres; Subdivision: 424.19 acres.
(County Surveyor)

The rapid nature of the COS process lends credibility to the fear of problems based on unregulated development of land crucial to natural resource protection. One 20 acre parcel in the City of Missoula (formerly split from an 87 acre parcel) was divided into 7 lots ranging in size from .79 acres to 11.9 acres in five weeks in 1991. Five owners now share the formerly one-owner 20 acre parcel along Rattlesnake Creek.

The Missoula Office of Community Development oversees subdivision review but does not maintain figures for total lands platted vs. built or comprehensive regional subdivision maps. The Missoula County Surveyor provides mapping and subdivision/COS listing coverage in select rural and urban areas. Complete county-wide coverage should be available by the mid-1990's if funding levels are not substantially reduced for the Surveyor.

From 1980 to 1990, Missoula County increased in population from 76,016 to 78,687, a 3.5% gain. However, while growth seemed slow in the 1980's, it appears to have gained momentum in the early 1990's. Urban area single family building permits increased 165% from 96 (July 1990 through January, 1991) to 158 (July 1991 through January 1992) in Missoula County. In addition, county-wide electrical permits (an indicator of county wide building activity) in Missoula County exceeded those issued in Flathead County on a per capita basis from July 1991 through January 1992 in spite of Flathead's exceptional 1980 -1990 population growth rate (14%).

Population projections indicate a continuation of growth in Missoula County. The area experienced a 30% increase in population in the period of 1970 to 1980 while the rate fell, as noted, to 3.5% from 1980 to 1990. However, most of the 1980 -1990 growth was concentrated in those areas of the County which harbor a significant portion of open space and wildlife resources: Lolo, Nine Mile/Frenchtown, Potomac, Clearwater, Seeley Lake - Swan Valley, and Evaro.

Existing vacant land already subdivided will capture some of the expected demand for new housing. However, periods of population growth have always been associated with land division activity. Together with population increases, political and economic factors, although not discussed in this text, will help determine the rate and location of subdivision activity during the next eight to ten years.

The combination of population growth and division of land (both through the certificate of survey process and the formal subdivision process) does not bode well for natural resources in Missoula County or other western Montana areas. The continual eroding of wildlife habitat results in in-

creased conflicts between humans and wildlife, between recreationists and private property owners and between recreationists themselves who will find once available resources besieged by increasing numbers of users as well as "privatization" or outright removal of resources by new human developments. Unfortunately, reduced habitat directly results in diminished wildlife numbers and wildlife species in the County.

COMPOSITE VALUES

Four conclusions are readily apparent from analysis of conservation resources in Missoula County. First, the variety and quality of resources is impressive. Second, the distribution of resources is extensive. Third, conservation resources tend to aggregate in certain areas. Fourth, conservation of many resources is closely integrated with maintenance of floodplains, riparian corridors and lands in agricultural use.

The conservation resources of Missoula County are distributed in a pattern which can be described as "rooms and corridors." "Rooms" are broad clusters of concentrated resources. "Corridors" are lineal features such as waterways and roads which connect these clusters and other portions of the county.

The largest "room" in the county is the Missoula Valley, itself a cluster of smaller rooms and corridors. The combination of open space, recreation opportunities, historic areas and key wildlife habitat creates a complex mosaic of conservation qualities. Also contained in Missoula Valley is the largest expanse of prime and important agricultural soils and irrigated and irrigable agricultural land in the county. Subdivision activity, too, is an intrinsic component of the land use pattern.

"Corridors" of conservation values parallel major waterways and roads. Waterways contain a dense assemblage of important conservation attributes. Riparian corridors are the principal focus of active recreational use as well as passive enjoyment of open space. Public purposes of protecting water quality and supply, flood control and controlling erosion are met primarily in these areas. Critical habitats for a diverse array of creatures including fish, waterfowl, raptors, bears and big game are unalterably linked with wetland ecosystems. Roadway corridors

offer primary visual access to county landscapes. In many cases, these passageways overlap with adjacent waterways to create a further aggregation of important conservation qualities. Therefore, it is near water that open space, ecological and recreation resources tend to converge and coalesce to form unique and sensitive terrain prized by county residents.

The combined area of concentrated resource patterns (where various resources overlap) covers about 20% of the county. Within this total, lands which contain three categories of conservation values (typically recreational, open space and ecological) are found near rivers, creeks and lakes as well as on a few upland sites near Missoula. These areas form the foundation for maintaining the integrity of the total landscape. However, only about 5%, or 80,000 acres, of the county is classified in this category. Sites which contain two categories of conservation resources typically include recreation areas which are also visually accessible to the public or have ecological importance. Except for critical grizzly bear habitat which occurs primarily on public lands but which is also dependent on private land, areas with two categories of conservation resources also comprise less than 5% of the county landscape. Lands with one category of conservation resource are generally big game winter range habitats located on benches and lower mountain slopes. Exclusive of wilderness and national recreation areas, lands with one resource category comprise about 10% of Missoula County. As the combined resource patterns are primarily confined to valley bottom corridors, private, non-corporate ownership is predominant. Upland sites are in a mixture of public, corporate, and non-corporate private ownership.

Areas which contain the same number of categories do not necessarily have the same importance. Reference should be made to the preceding sections in this report for clarification and comparison of individual areas and their resources.

Subdivision and Conservation Values

Significant conservation resources on private lands have survived a history of agriculturally related land uses. Some of these values have been displaced by urban development. Subdivision patterns tend to indi-

cate the direction of future urban and suburban development. There, comparison of major resource patterns of areas exhibiting subdivision activity indicate potential for future displacement of these resources and traditional forms of forest and agricultural land use.

The majority of farmland rated by the SCS as prime or of statewide importance occurs in the Missoula Valley, Frenchtown-Huson, and Evaro regions. Pockets of "important farmland" also occur in the Lolo, Clinton-Turah and Ninemile regions. The total area of this type of farmland is estimated to be 36,000 acres. Of this total, about 6,800 acres have been intensively developed in urban uses. Approximately 11,700 acres, or more than one-third of the remaining important farmland, is experiencing subdivision activity. Areas of important farmland are relatively modest in size when compared to combined resource patterns. However, these lands provide basic support to traditional agricultural land use and individual properties tend to include important farmland as well as conservation resource lands.

About 77,000 acres of land has been subdivided out-side prime agricultural and existing urban lands. Subdivision activity in the county is most pronounced in Missoula Valley, Evaro, Lolo, Frenchtown-Huson and Clinton-Turah areas with COS activity occurring throughout the county. Locations within a short commute of Missoula which still possess rural characteristics appear to be preferred. Growing popularity of rural residential "hobby farms" is the land use trend which typifies the style of development in many areas outside the city. Due to ease of development, access, health regulations, availability of services and the desire to maintain horses and other livestock, valley bottoms and gently sloping benches are experiencing great development pressure. Steeper foothills are being developed where year-round access roads and utility lines already exist. These upland areas are often big game winter range. Recreation-oriented residential subdivisions occur in river corridors throughout the county but are most extensive along the Clark Fork upstream and downstream of Missoula and in the Seeley-Swan region.

Wildlife Corridors

Missoula County's wildlife habitats are becoming fragmented by increased subdivision, road building and human population. Habitats which have been isolated and reduced are less likely to receive migrating species and are less likely or simply unable to support species which require large areas. This has a profound effect on the area's biological diversity and the kinds of species it can support (MacKintosh). Wildlife corridors enable animals to travel between habitats, increasing the available habitat while preserving important migration routes.

Island biogeography theory has become the conceptual backbone for wildlife corridors. Originally proposed for islands and archipelagoes it has been adapted to "terrestrial islands". Noted as early as 1855 by ecologist deCandolle and more fully developed in the late 1960's (MacKintosh), the theory states that the smaller and more remote an island the less likely it will be to receive migrating species. The theory has been extended (Forman, Godron) to state that species diversity is a function of habitat diversity, disturbance, area (size), isolation and age.

Sustaining biological diversity is a critical component of a healthy ecosystem. A fragmented landscape is a direct threat to this diversity. The interior area of a habitat island is generally comprised of one group of species. The edges of that island have different species. It is critical that interior areas are large enough to support the habitat needs of the interior forest species. Eliminating individual species can have a radical effect on the food chain and on an entire ecosystem.

Types of wildlife corridors vary but there are at least three qualities which are important for animals. The first is water. Ninety percent of the rocky mountain wildlife depend on the riparian zone and its water. In turn, the presence of riparian vegetation is critical for a healthy and clean aquatic system. Animals naturally follow stream corridors from area to area. Unfortunately for the wildlife these lands are also considered prime for human development.

A second critical consideration is visual cover. The type of visual cover is as important as the size of the area. Wooded or dense shrub areas often provide the best cover.

Roads are the third critical quality. A habitat divided by roads has less interior area, more edge space and increased danger from human interaction. A road becomes a permanent boundary for some smaller species, limiting their movement and drastically reducing their migration potential (MacKintosh). Roads also contribute to erosion and sedimentation which can seriously degrade habitat.

Missoula County's growing human population is a direct threat to its wildlife. The two must be managed appropriately to coexist for Missoula County to remain attractive for future residents. Maintaining wildlife corridors may be the most significant tool to do this successfully.

Conclusion

Virtually all private lands in the county contain conservation resources. However, a relatively limited area contains

conservation resources of significance to the general public. The existence of any pattern of conservation resources shown on maps contained in this report is not meant as a recommendation that no development occur. While development within fragile ecosystems or floodplains may have severe impacts, some building is possible in most areas. The style, density and precise location of improvements are the critical variables. In addition, it must be noted that private land conservation is a viable approach to ensure past, present and future stewardship of important natural resources. Astute development designs can assure long-term maintenance of many of the county's most desirable conservation resources. Proper control of domestic animals and wild animal attractants (garbage, pet food, compost, bone yards, feeds, orchards, apiaries, etc.) will help avoid human-wildlife encounters and protect threatened wildlife species.



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- Allan Mathews, Missoula Historic Preservation Officer
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- Mavis McKelvey

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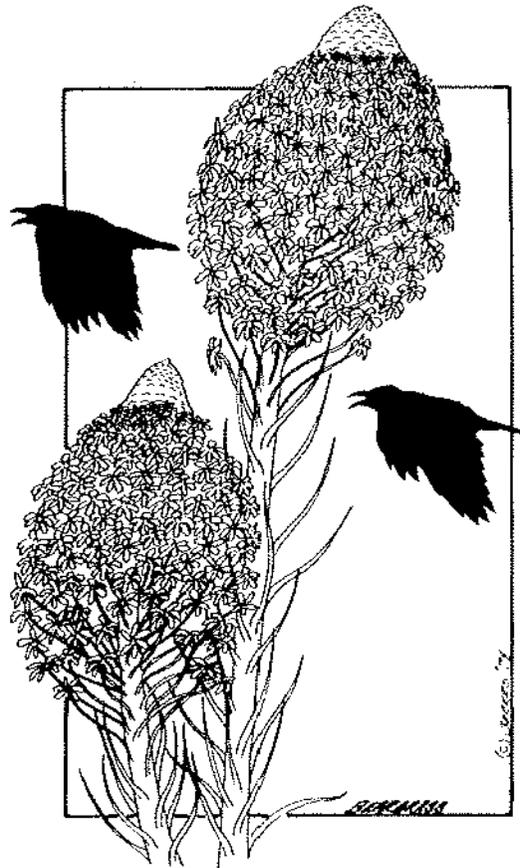
Five Valleys Land Trust
315 South 4th East
Missoula, MT 59801

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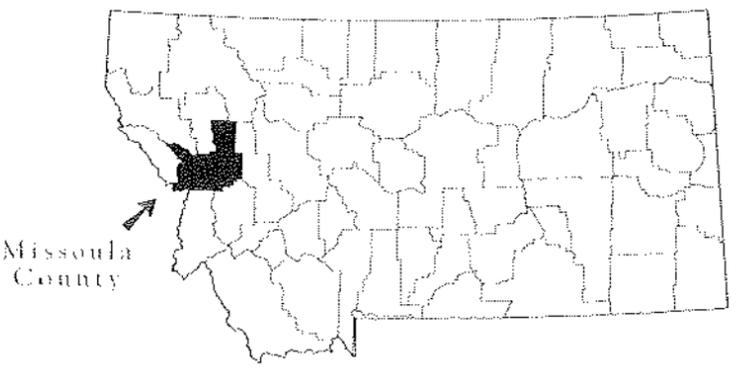


Eugene Beckes is a Montana artist living near the Mission Mountains . His commitment to native species, both plant and animal, is displayed in his excellent work. Missoula County is grateful to Mr. Beckes for his contributions to this document and to Montana's conservation resources.

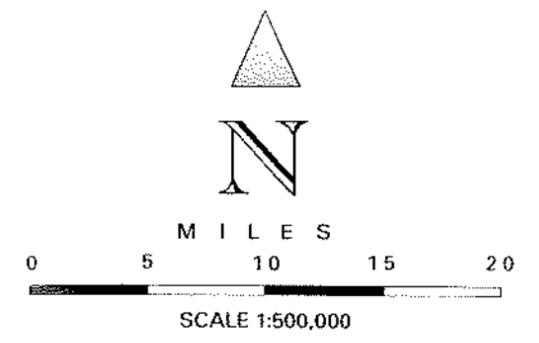
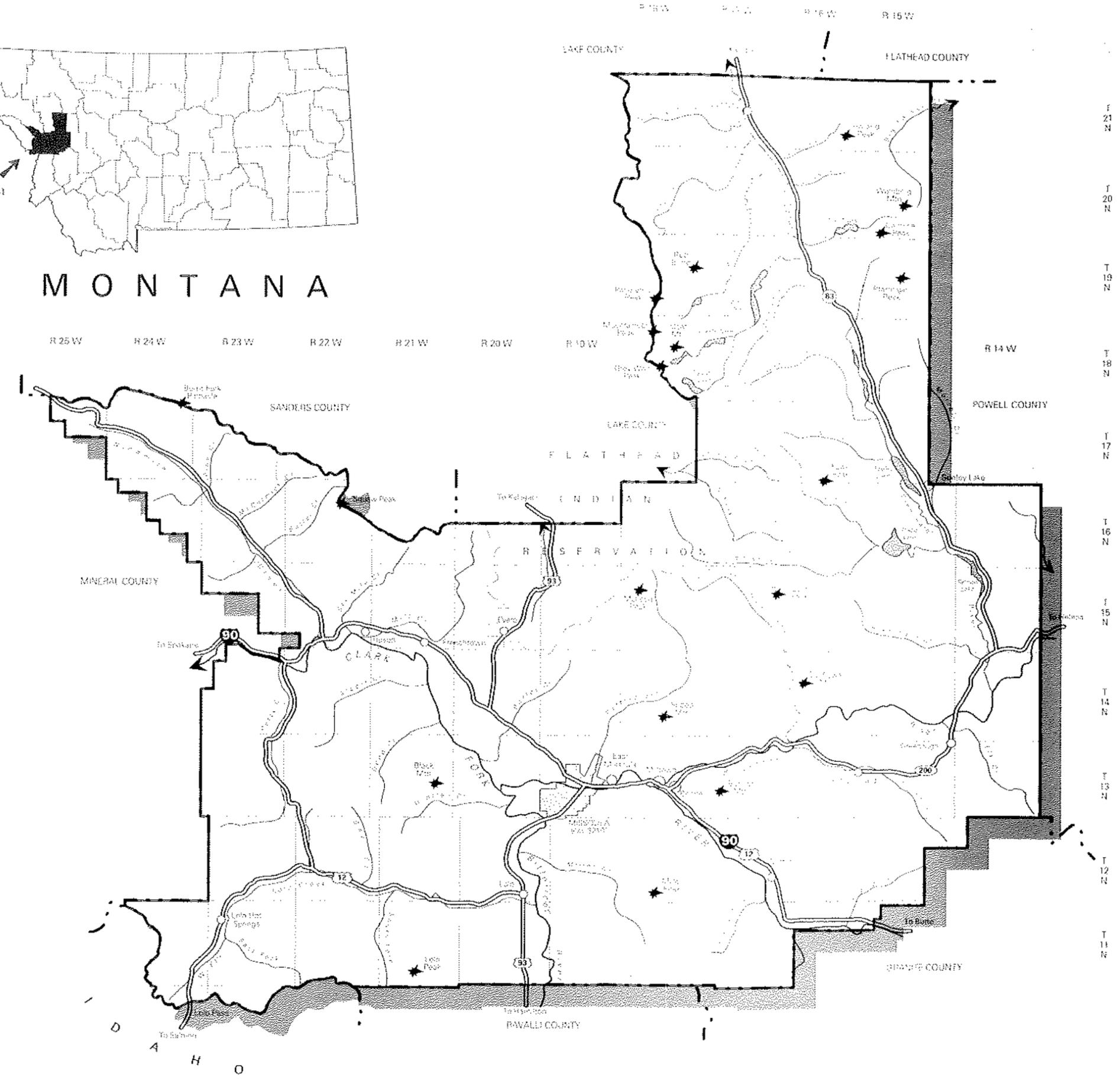
For Additional Information contact the Missoula County Rural Planning Office , 200 West Broadway, Missoula, Montana 59802. (406) 724-5700.

LOCATION
 MISSOULA COUNTY
 INVENTORY OF
 CONSERVATION RESOURCES
 Missoula County, Montana

◆ MAP 1 ◆



MONTANA



REGIONS

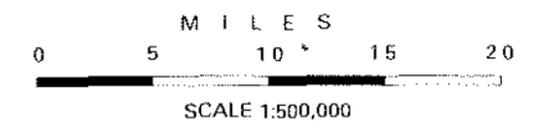
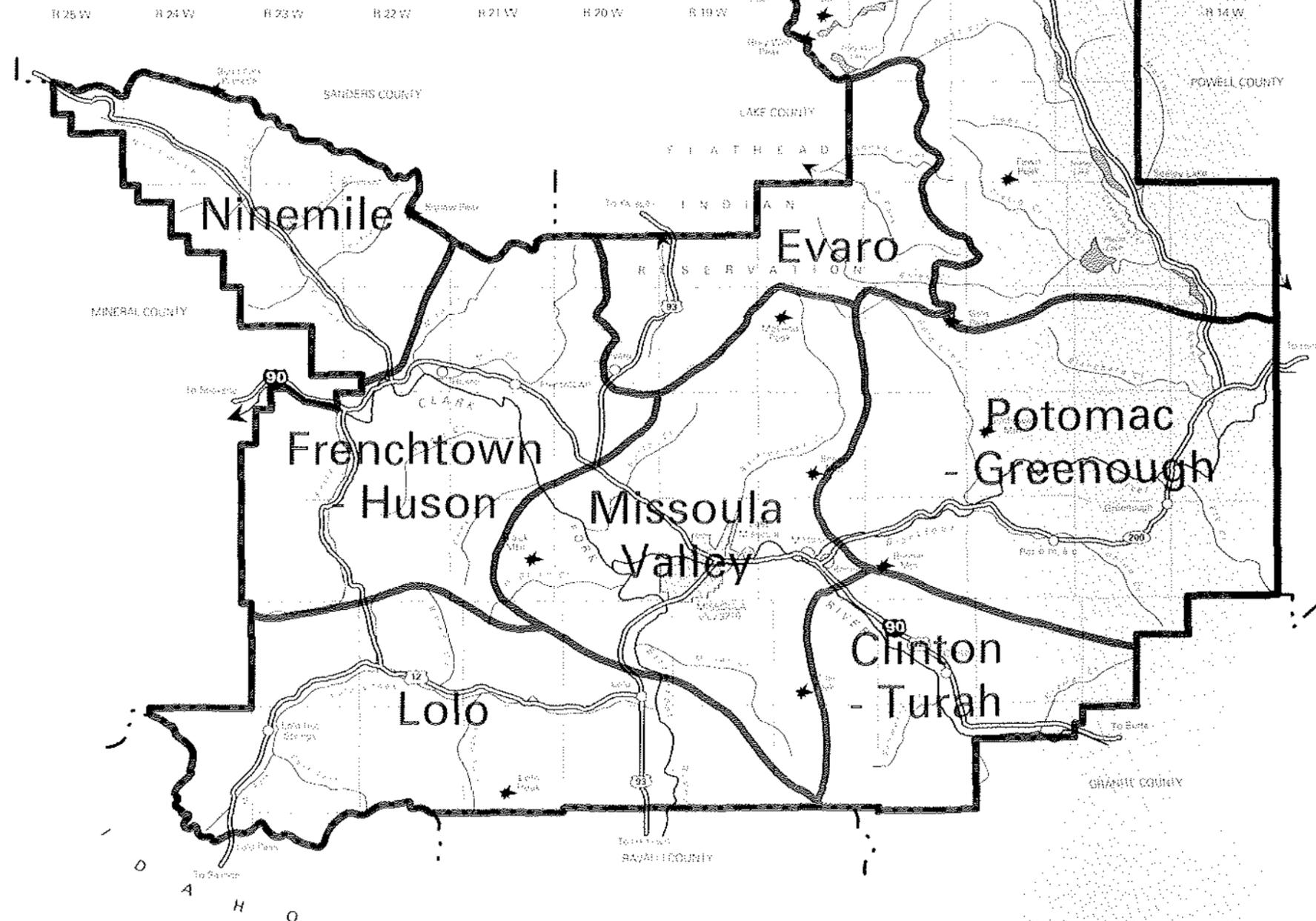
- Clinton-Turah
- Evaro
- Frenchtown-Huson
- Lolo
- Missoula Valley
- Potomac-Greenough
- Seeley-Swan

REGIONS

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

♦ MAP 2 ♦



HISTORIC RESOURCES

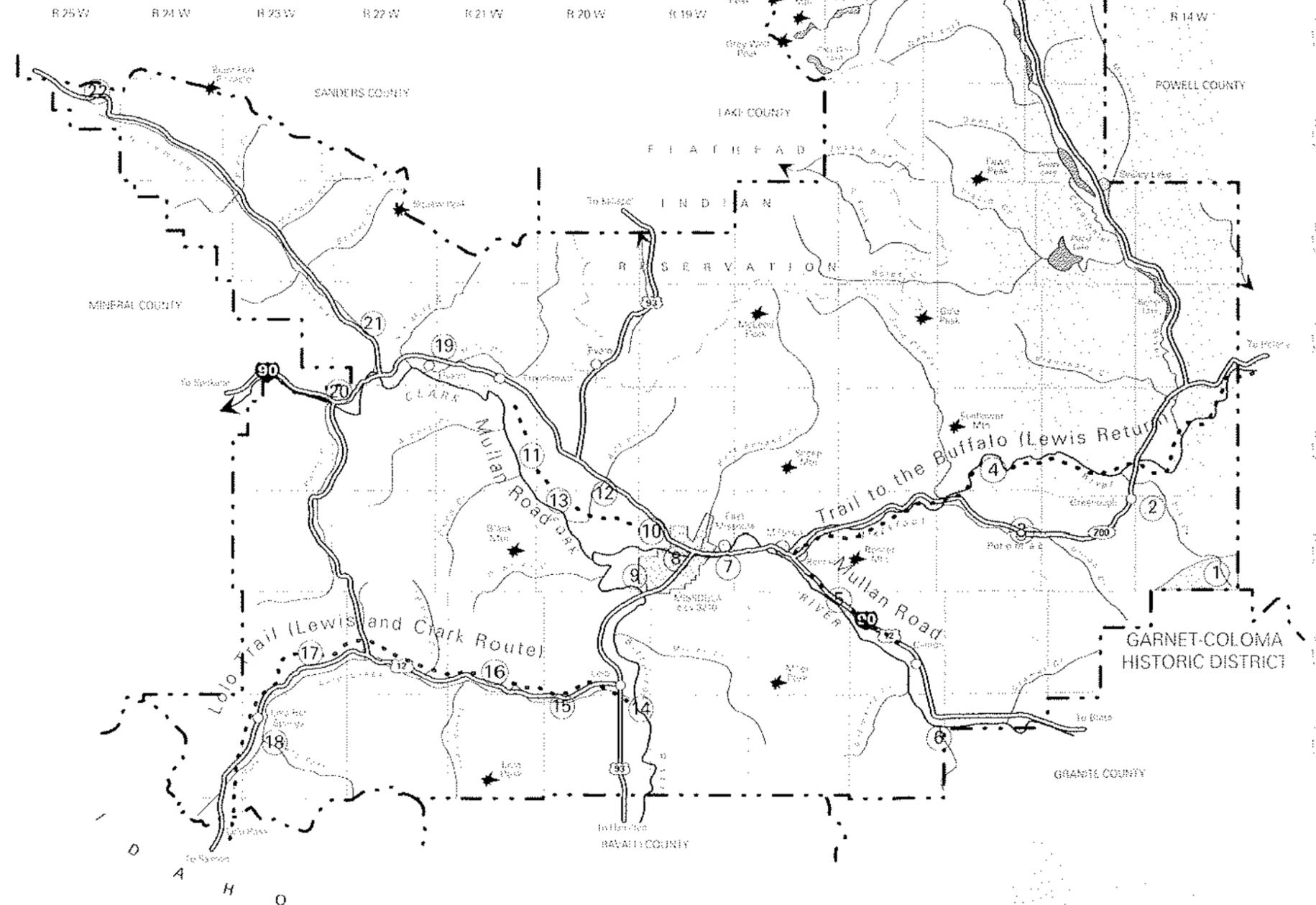
- | | |
|------------------------------------|------------------------------|
| 1. Garnet-Coloma Historic District | 13. Council Grove |
| 2. Sunset Hill Schoolhouse | 14. Traveler's Rest |
| 3. Potomac Schoolhouse | 15. Fort Fizzle |
| 4. Trail to the Buffalo (approx.) | 16. Woodman Schoolhouse |
| 5. Mullan Road (approx.) | 17. Lolo Trail (approx.) |
| 6. Emmett P. Rickard Homestead | 18. Mud Creek Ranger Station |
| 7. Hellgate | 19. Smokejumper's site |
| 8. Missoula Historic Buildings | 20. Issac Eddy Homestead |
| 9. Fort Missoula Historic District | 21. Ninemile Ranger Station |
| 10. Flynn Farm | 22. Upper Eustache Cabin |
| 11. Mullan Road (approx.) | |
| 12. Old DeSmet School | |
- Numbers indicate approximate location*

HISTORIC RESOURCES

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

◆ MAP 3 ◆



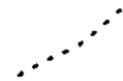
RECREATION

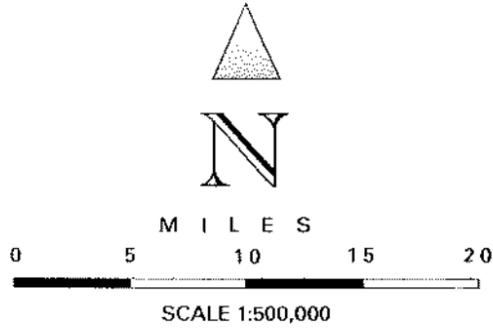
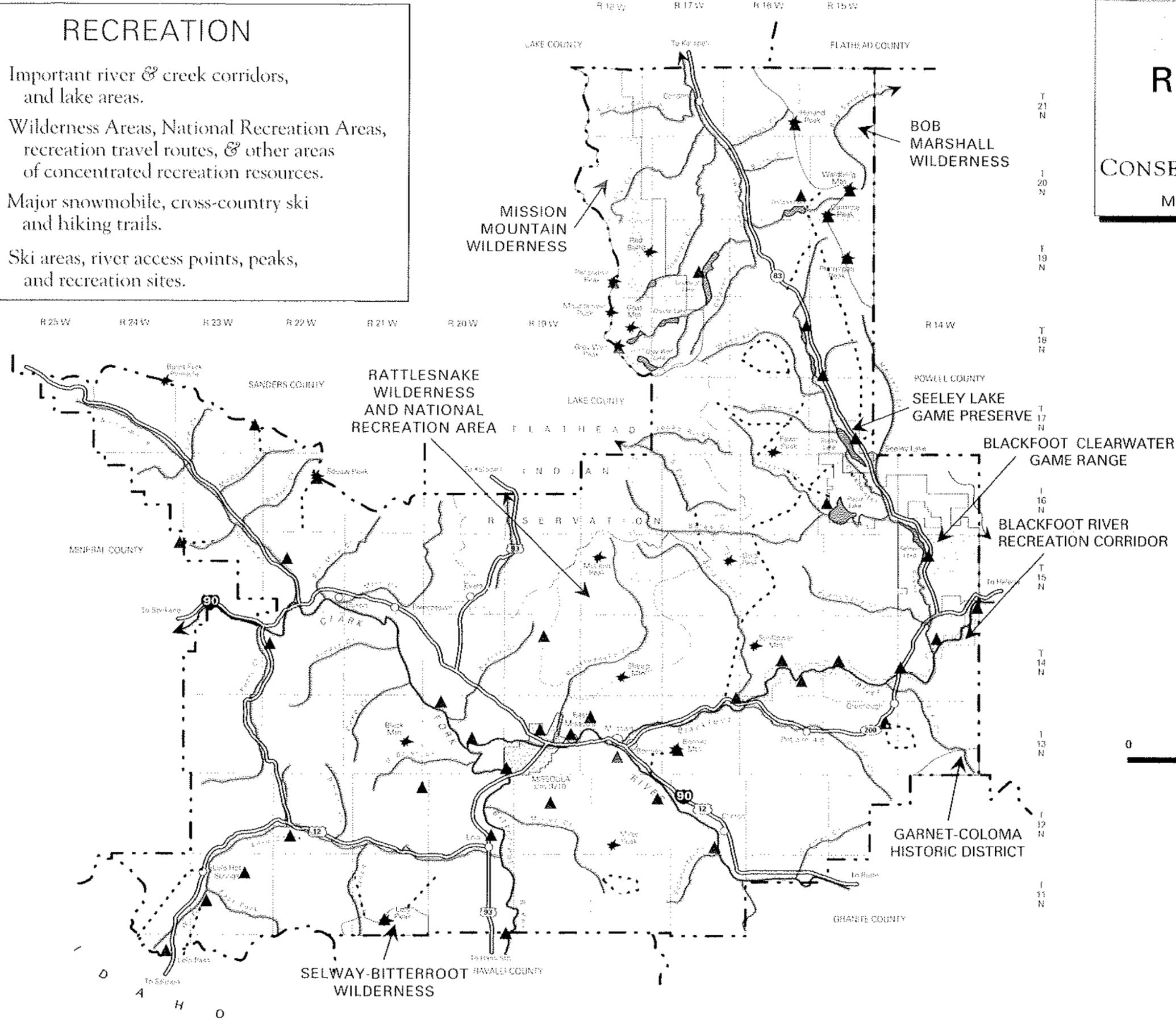
INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

◆ MAP 4 ◆

RECREATION

-  Important river & creek corridors, and lake areas.
-  Wilderness Areas, National Recreation Areas, recreation travel routes, & other areas of concentrated recreation resources.
-  Major snowmobile, cross-country ski and hiking trails.
-  Ski areas, river access points, peaks, and recreation sites.



SPECIES

ANIMALS

- 1. Grizzly Bear - Nationally Threatened
- 2. Grey Wolf - Nationally Endangered
- 3. Bald Eagle - Nationally Threatened
- 4. Peregrine Falcon - Nationally Endangered
- 5. Wolverine - SCM
- 6. Golden Eagle - SCM
- 7. Prairie Falcon - SCM
- 8. Osprey - SCM
- 9. Fisher - SCM
- 10. Hoary Marmot - SCM
- 11. Northern Bog Lemming - SCM
- 12. Spotted Skunk - SCM

- 13. Bobolink - SCM
- 14. Olive-sided Flycatcher - SCM
- 15. Loon - SCM
- 16. Blue Heron - SCM
- 17. Great Gray Owl - SCM
- 18. Barred Owl - SCM
- 19. Saw Wheat Owl - SCM
- 20. Northern Goshawk - SCM

PLANTS*

- 21. Howella
- 22. Howells Gunweed
- 23. Missouia Phlox
- 24. Bittercross
- 25. Kittenail
- 26. Poor Sedge
- 27. Western Witchgrass
- 28. White Glacier Lily
- 29. Three-leafed Foam Flower

SCM - species of special interest or concern in MT

*SOURCE: Lessner et al. 1991 and The Nature Conservancy

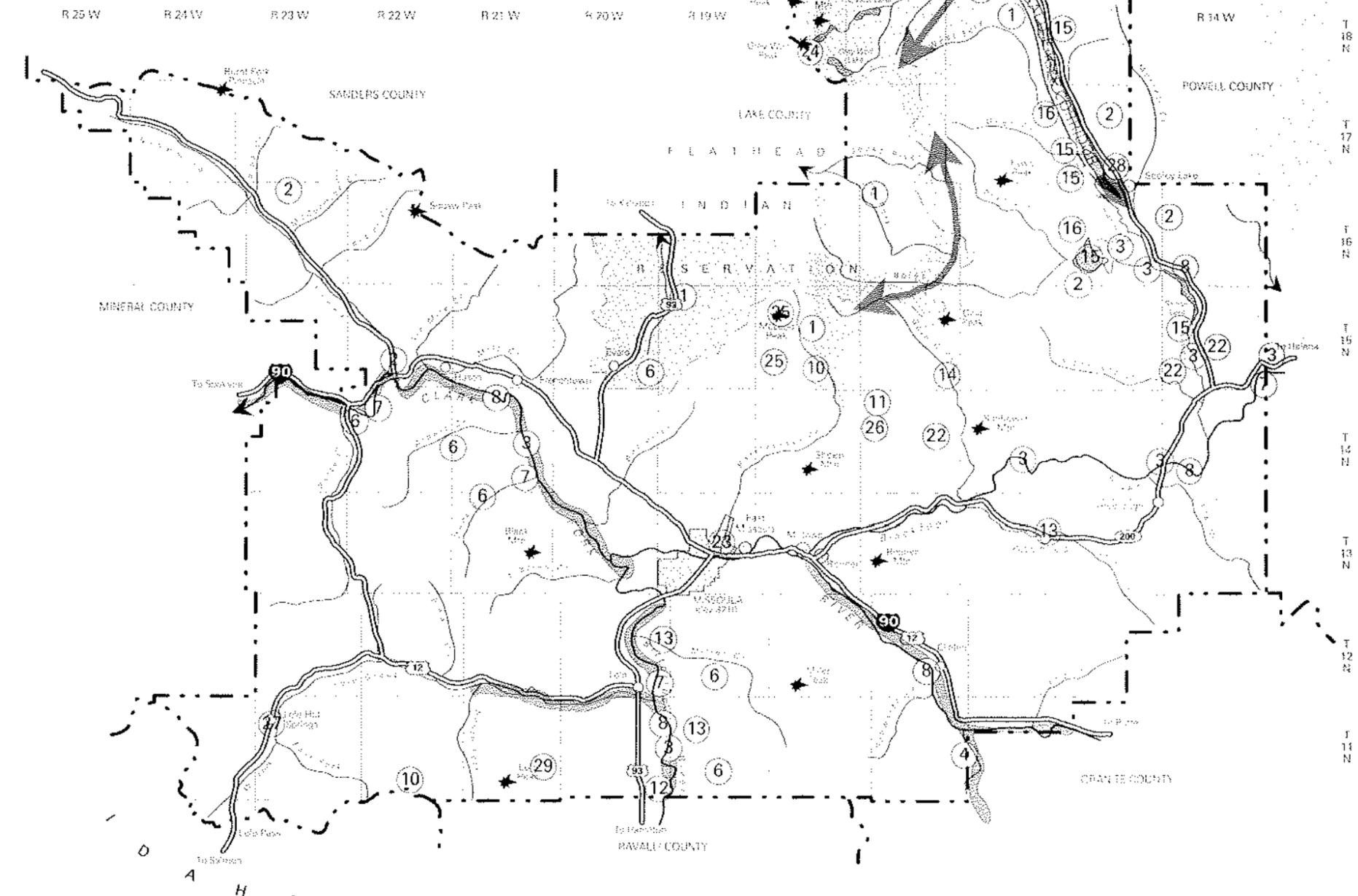
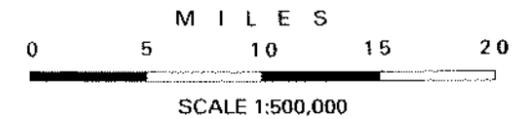
SPECIES OF LIMITED DISTRIBUTION

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

MAP 7

Migration Corridor



BIG GAME

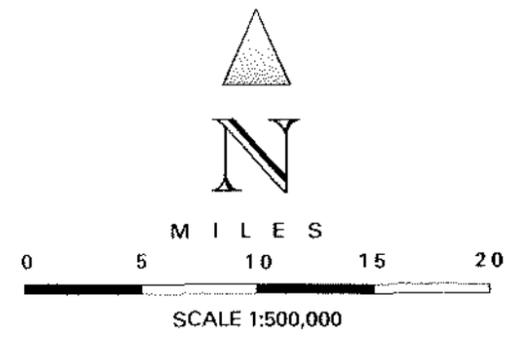
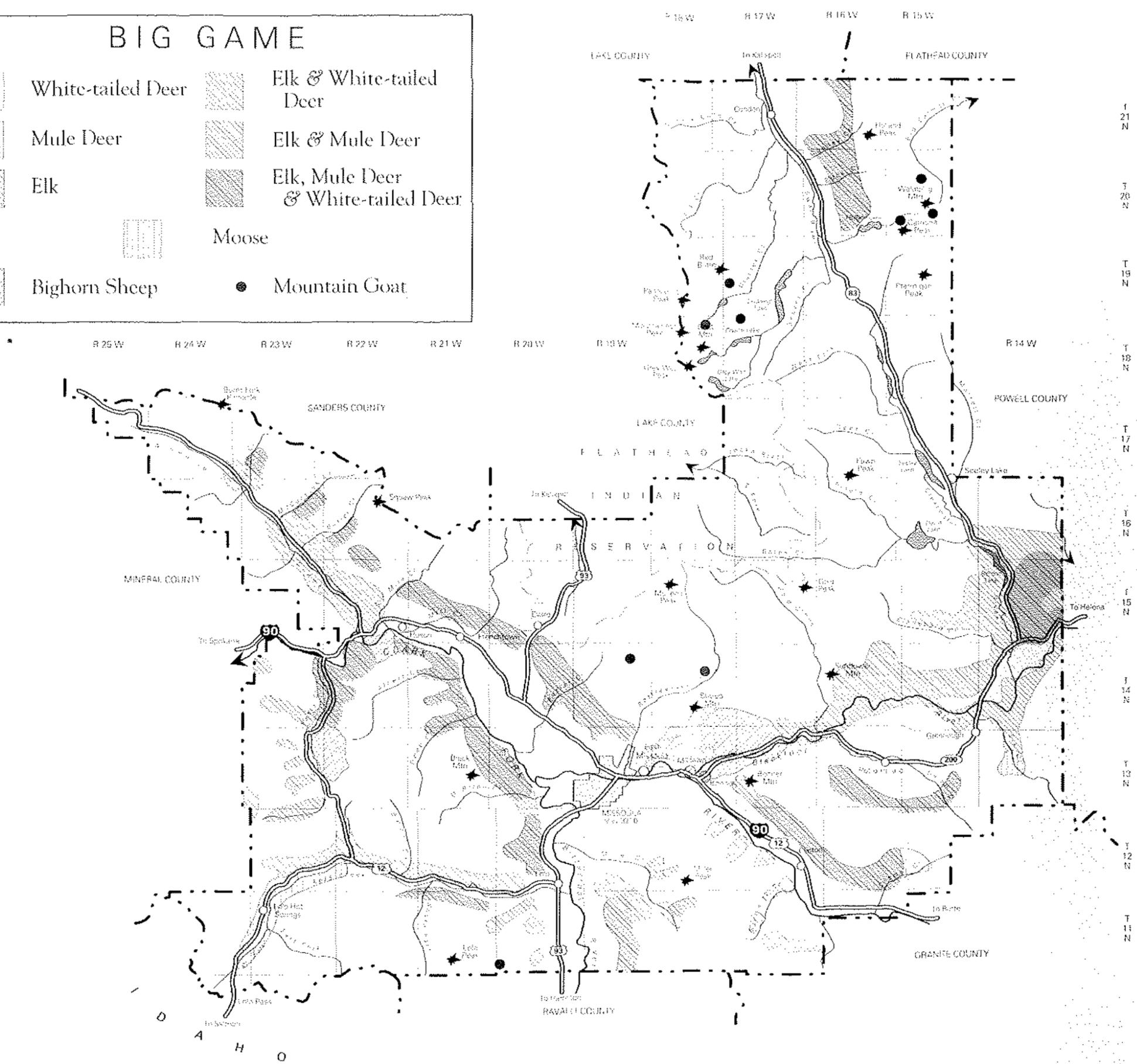
<p> White-tailed Deer</p> <p> Mule Deer</p> <p> Elk</p> <p> Bighorn Sheep</p>	<p> Elk & White-tailed Deer</p> <p> Elk & Mule Deer</p> <p> Elk, Mule Deer & White-tailed Deer</p> <p> Moose</p> <p> Mountain Goat</p>
---	--

BIG GAME WINTER RANGE

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

• MAP 6 •



AGRICULTURAL RESOURCES

	Prime Farmland (if irrigated)
	Important Farmland - Statewide
	Important Farmland - Local
	Developed Farmland

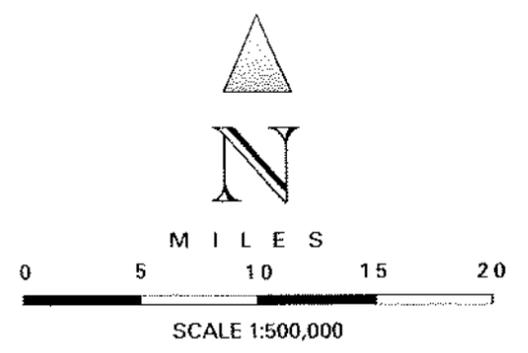
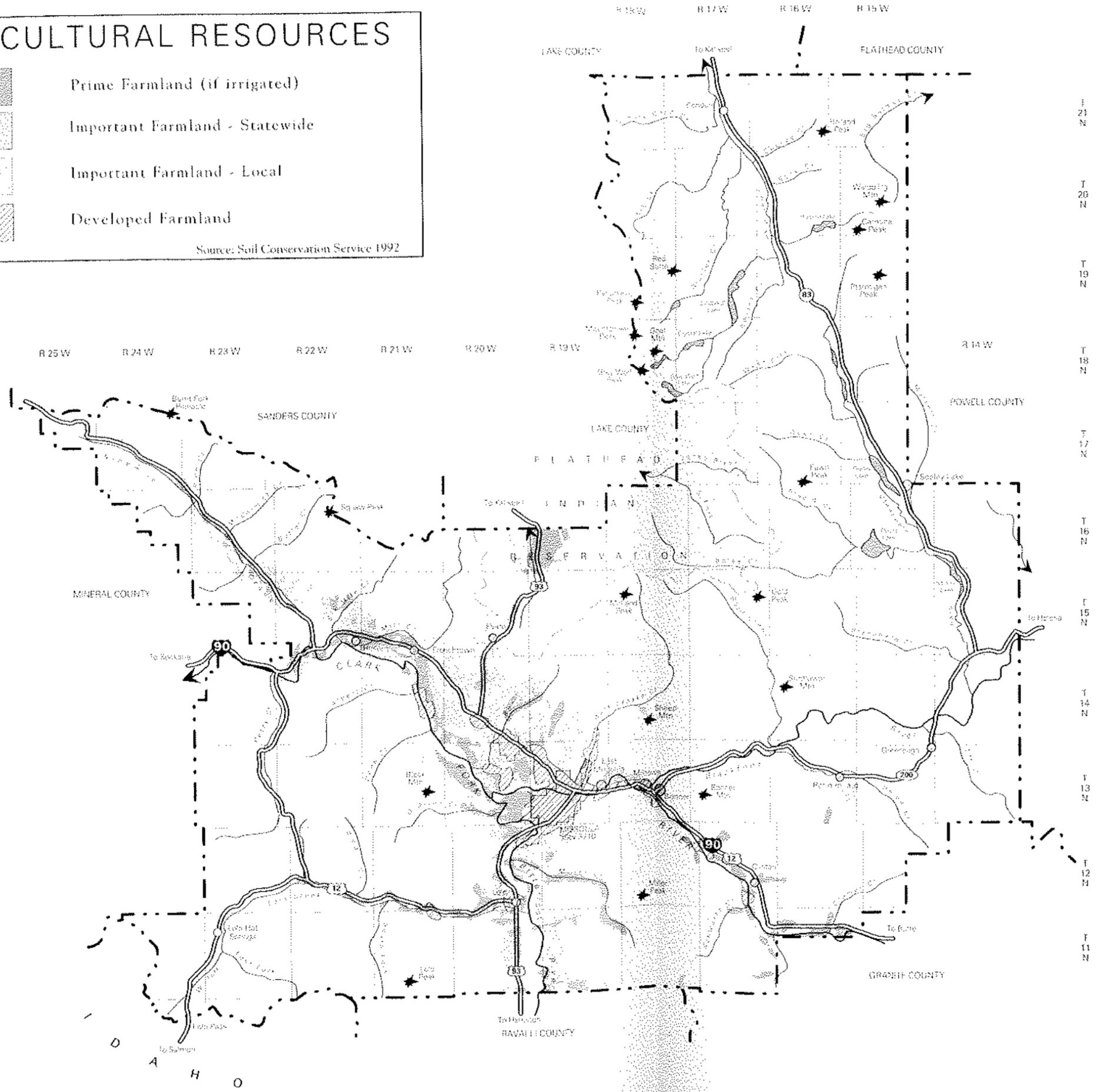
Source: Soil Conservation Service 1992

AGRICULTURAL RESOURCES

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

♦ MAP 9 ♦



OPEN SPACE RESOURCES

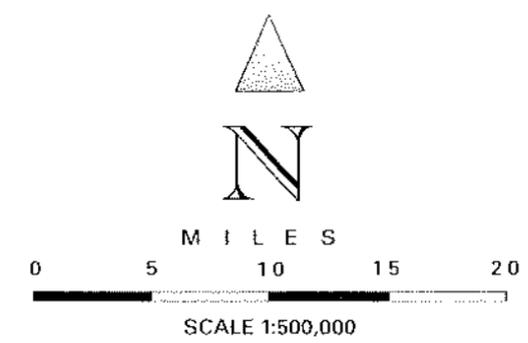
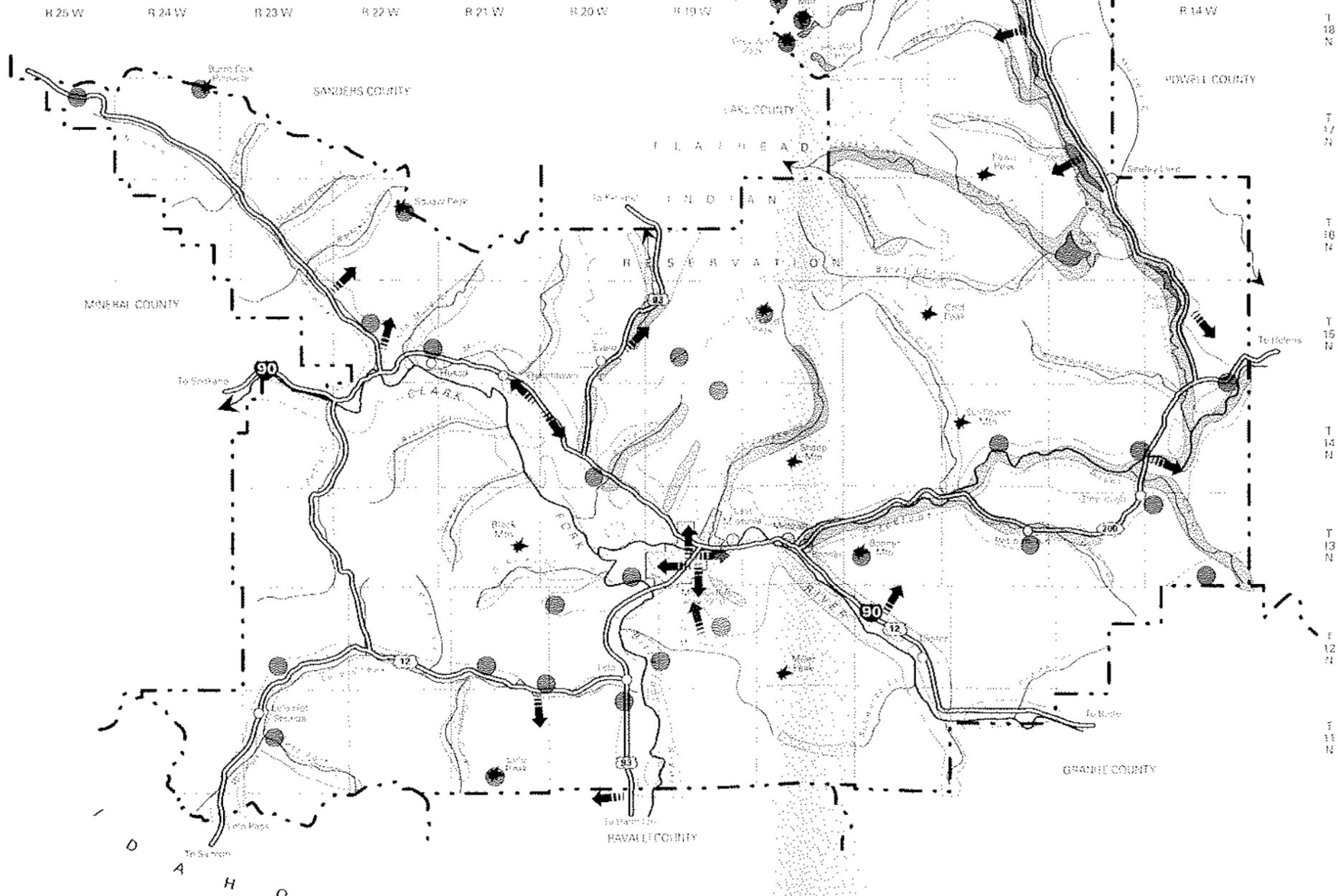
-  Scenic Open Space: as seen from major roads, waterbodies, and the Missoula Urban Area.
-  Other Significant Open Space: river and creek corridors, lakeside lands, high ground water areas, floodplains, and airport influence zones.
-  Both: land possessing both scenic and other significant open space values.
-  Scenic Features: peaks, river rapids, and historic sites & structures.
-  Scenic Vistas

OPEN SPACE RESOURCES

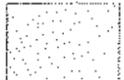
INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

◆ MAP 5 ◆



COMPOSITE RESOURCES

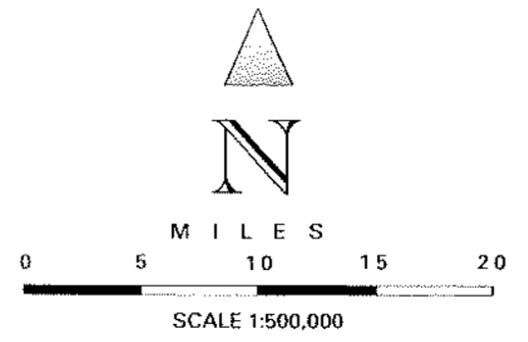
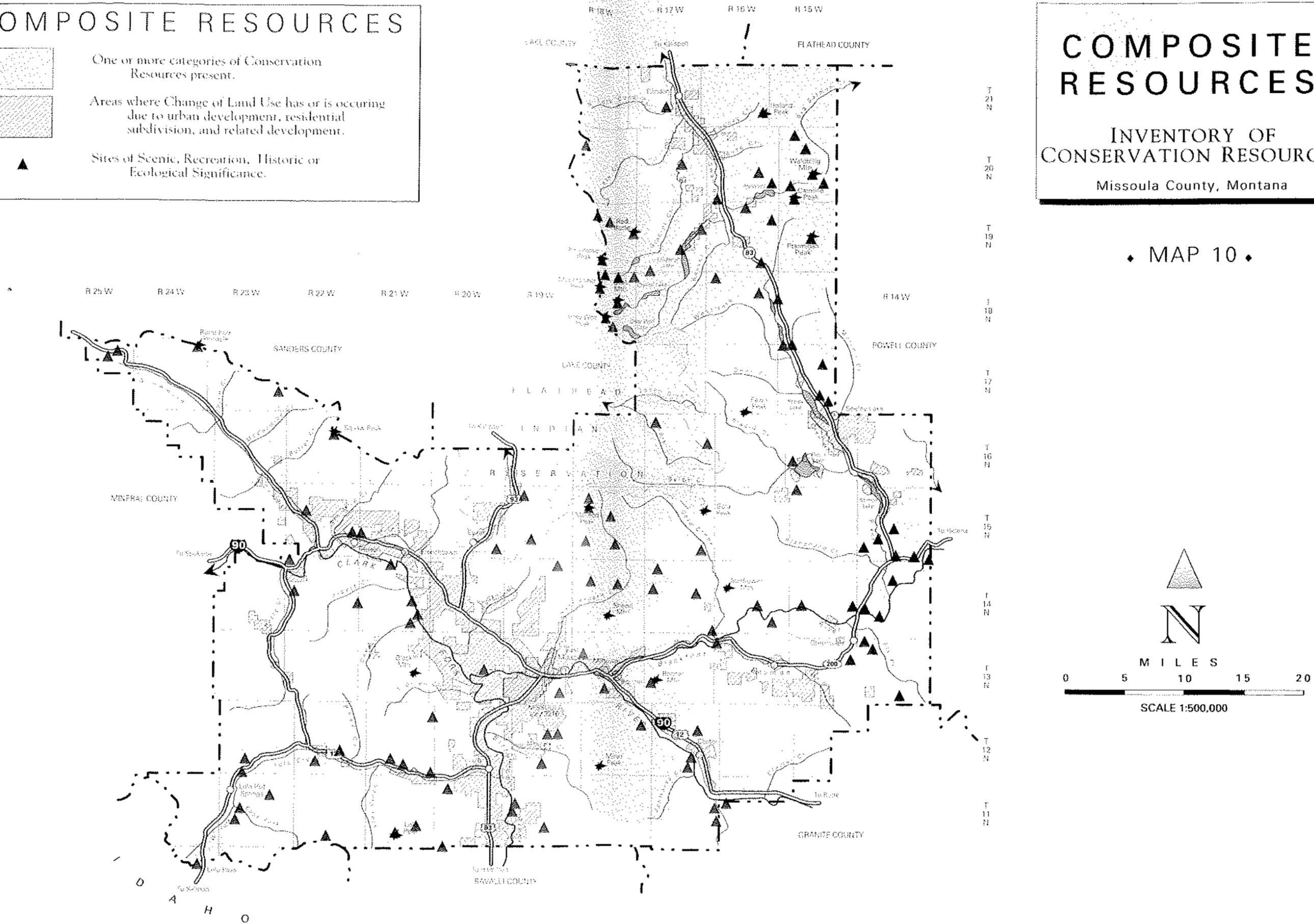
-  One or more categories of Conservation Resources present.
-  Areas where Change of Land Use has or is occurring due to urban development, residential subdivision, and related development.
-  Sites of Scenic, Recreation, Historic or Ecological Significance.

COMPOSITE RESOURCES

INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

◆ MAP 10 ◆



ECOLOGICAL RESOURCES

- | | |
|--|--|
| 1. Blackfoot Clearwater Game Range (PEL) | 14. Great Blue Heron rookery |
| 2. Carlton Ridge (PEL & RNA) | 15. White/Englemann spruce hybridization |
| 3. Council Grove (PEL) | 16. Western red cedar grove |
| 4. Fort Missoula Pine Bottomland (PEL) | 17. Glacial Lake Missoula varved clay |
| 5. Kely Island (PEL) | 18. Miocene-age fossil leaves |
| 6. Lubrecht Forest Sites (PEL) | 19. Lolo Hot Springs / Idaho Batholith |
| 7. Mount Sentinel (PEL) | 20. Mary's Frog Pond Botinical Area |
| 8. Parker Homestead (PEL) | 21. Cambrian-age fossil trilobites |
| 9. Plant Creek (PEL & RNA) | 22. Glacial Lake Missoula shorelines |
| 10. Sheep Mountain Bog (PEL & RNA) | 23. Coloma Sulphide ore |
| 11. Waterworks Hill (PEL) | 24. PreCambrian-age ripple marked rocks |
| 12. Mountain Lion | 25. High elevation prairie |
| 13. Bobcat | 26. Black cottonwood bottomland forest |

OTHER SIGNIFICANT ECOLOGICAL RESOURCES INVENTORY OF CONSERVATION RESOURCES

Missoula County, Montana

MAP 8

NOTE: Rivers, creeks, lakes and wetlands are highly significant resources.
 PEL = Potential Ecological Landmark (Johnson & Pfister, 1981) RNA = Research Natural Area

NOTE: For protection of these potentially sensitive species, all locations indicate general vicinity only. Actual distribution may occur within an area of several square miles.

