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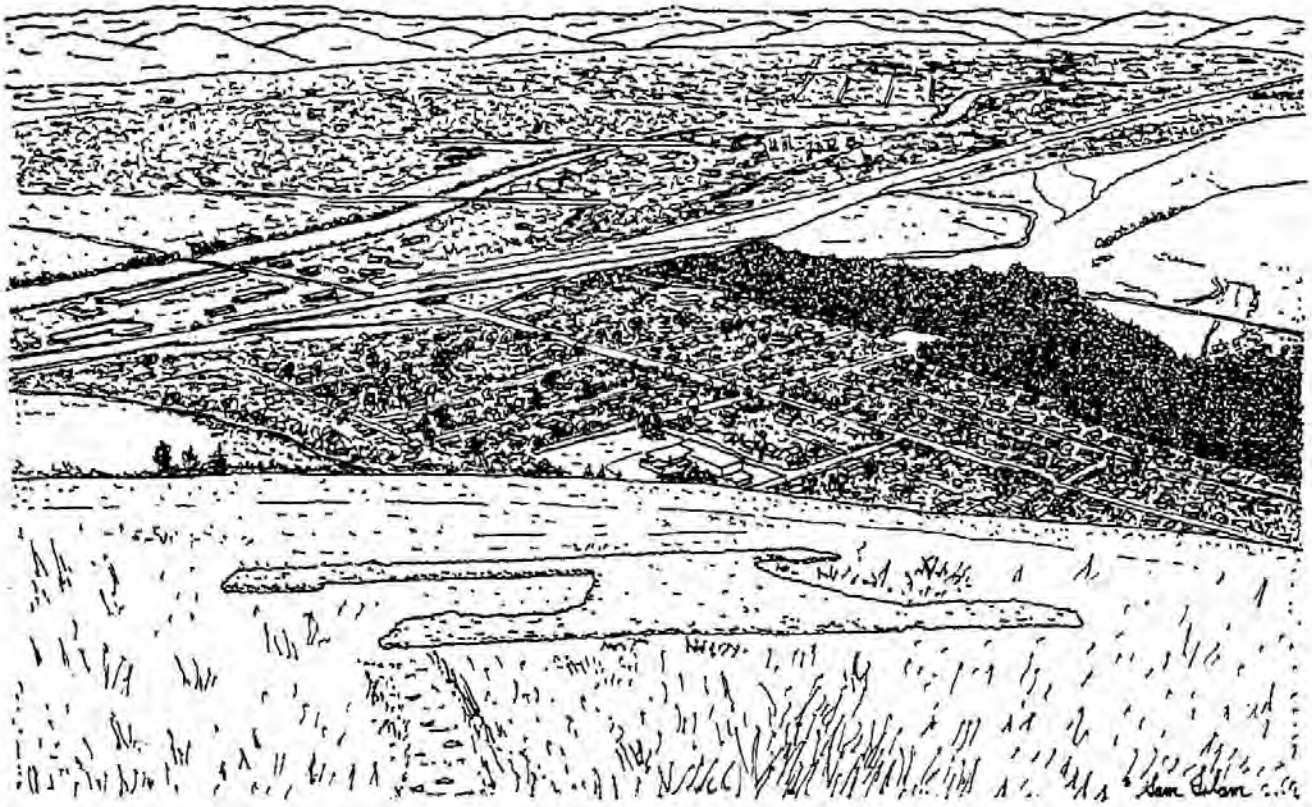
Rattlesnake Valley Comprehensive Plan Amendment: 1995 Update



Original Document:	October 1988
Limited-Scope Update (approved by Missoula City Council):	May 1992
Full Update:	November 1995

Prepared by the
Missoula Office of Community Development
in Cooperation with the
Missoula Public Works Department
and
Citizens of the Rattlesnake

Acknowledgements

ALL CITIZENS WHO PARTICIPATED IN THE PUBLIC INVOLVEMENT PROCESS, ESPECIALLY:

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BOARD OF COUNTY COMMISSIONERS: Barbara Evans, Fern Hart, & Michael Kennedy.

MAYOR: Dan Kemmis.

CITY COUNCIL: Mike Bennett & Elaine Shea (Ward 1), Kelly Rosenleaf & Linda Tracy (Ward 2), Marilyn Cregg & Chris Gingerelli (Ward 3), Doug Harrison & Bob Hermes (Ward 4), Curtis Horton & Jack Reidy (Ward 5), Al Sampson & Craig Sweet (Ward 6).

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ALL CITY, COUNTY, STATE, & FEDERAL AGENCIES AS WELL AS PRIVATE ORGANIZATIONS WHO ASSISTED IN UPDATING THIS DOCUMENT.

RESOLUTION NUMBER 5789

A RESOLUTION TO ADOPT THE RATTLESNAKE VALLEY COMPREHENSIVE PLAN AMENDMENT: 1995 UPDATE.

WHEREAS, 76-1-604 M.C.A. authorized the City Council to adopt and amend comprehensive plans; and

WHEREAS, the City Council did adopt a comprehensive plan for the county in 1961; and

WHEREAS, the City Council has updated this comprehensive plan in 1968, 1975, and 1990 and has amended parts of it by adopting subarea and neighborhood plans, including Rattlesnake Valley Comprehensive Plan Amendment; and,

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Update was drafted through a public planning process; and

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Amendment represents an update of the 1988 Rattlesnake Valley Plan

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Update received extensive public review including four public hearings, all duly advertised, three before the Missoula Consolidated Planning Board on July 18, August 1, and August 15, 1995 and one before the Missoula City Council on August 28, 1995; and

WHEREAS, the Missoula Consolidated Planning Board recommended adoption of the 1995 Plan with a few revisions;

WHEREAS, such revisions have been incorporated into the final draft form of the 1995 Plan; and

WHEREAS, the Missoula City Council voted to adopt the 1995 Rattlesnake Valley Comprehensive Plan Update on October 2, 1995;

NOW, THEREFORE BE IT RESOLVED that the Missoula City Council hereby adopts the Rattlesnake Valley Comprehensive Plan Amendment: 1995 Update in its final draft form, a copy of which is available in the Missoula Office of Community Development.

BE IT FURTHER RESOLVED THAT:

This the *Rattlesnake Valley Comprehensive Plan Amendment: 1995 Update* is an amendment to the *Missoula Urban Comprehensive Plan*. It is a policy document intended to provide the City and other agencies and districts with a coordinated guide for change over a long period of time. When making decisions based on the Plan, not all of the goals, policies, and proposals for action can be met to the same degree in every instance. Use of the Plan requires a balancing of its various components on a case-by-case basis, as well as a selection of those goals, policies and proposals most pertinent to the issue at hand.

The common theme of all the goals, policies, and proposals for action is acceptance of them as suitable approach toward problem-solving and goal realization. Other valid approaches may exist and may at any time be used. Adoption of the Plan does not necessarily commit the City to immediately carry out each policy to the letter, but does put the City on record as having recognized the desirability of the goals, policies, and proposals for actions and the decision or actions they imply. The City can then begin to carry out the goals, policies and proposals for action to the best of its ability, give sufficient time and resources.

PASSED AND ADOPTED by the Mayor this 13th day of November, 1995.

ATTEST:

Martha L. Baker
City Clerk

APPROVED:

Daniel Kemmis
Mayor

(SEAL)

RESOLUTION NUMBER 95-102

A RESOLUTION TO ADOPT THE RATTLESNAKE VALLEY COMPREHENSIVE PLAN AMENDMENT: 1995 UPDATE.

WHEREAS, 76-1-604 M.C.A. authorized the Board of County Commissioners to adopt and amend comprehensive plans; and

WHEREAS, the Board of County Commissioners did adopt a comprehensive plan for the county in 1961; and

WHEREAS, the Board of County Commissioners has updated this comprehensive plan in 1968, 1975, and 1990 and has amended parts of it by adopting subarea and neighborhood plans, including the Rattlesnake Valley Comprehensive Plan Amendment; and,

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Update was drafted through a public planning process; and

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Amendment represents an update of the 1988 Rattlesnake Valley Plan

WHEREAS, the 1995 Rattlesnake Valley Comprehensive Plan Update received extensive public review including four public hearings, all duly advertised, three before the Missoula Consolidated Planning Board on July 18, August 1, and August 15, 1995 and one before the Missoula Board of County Commissioners on August 30, 1995; and

WHEREAS, the Missoula Consolidated Planning Board recommended adoption of the 1995 Plan with revisions; and

WHEREAS, such revisions have been incorporated into the final draft form of the 1995 Plan;

WHEREAS, the Board of County Commissioners adopted a Resolution of Intent to amend the Rattlesnake Valley Comprehensive Plan on October 4, 1995.

NOW, THEREFORE BE IT RESOLVED that the Board of County Commissioners hereby adopts the Rattlesnake Valley Comprehensive Plan Amendment: 1995 Update in its final draft form, a copy of which is available in the Missoula Office of Community Development.

BE IT FURTHER RESOLVED THAT:

This the *Rattlesnake Valley Comprehensive Plan Amendment: 1995 Update* is an amendment to the *Missoula Urban Comprehensive Plan*. It is a policy document intended to provide the City and other agencies and districts with a coordinated guide for change over a long period of time. When making decisions based on the Plan, not all of the goals, policies, and proposals for action can be met to the same degree in every instance. Use of the Plan requires a balancing of its various components on a case-by-case basis, as well as a selection of those goals, policies and proposals most pertinent to the issue at hand.

The common theme of all the goals, policies, and proposals for action is acceptance of them as suitable approach toward problem-solving and goal realization. Other valid approaches may exist and may at any time be used. Adoption of the Plan does not necessarily commit the City to immediately carry out each policy to the letter, but does put the City on record as having recognized the desirability of the goals, policies, and proposals for actions and the decision or actions they imply. The City can then begin to carry out the goals, policies and proposals for action to the best of its ability, give sufficient time and resources.

PASSED AND ADOPTED this 28th day of November, 1995.

ATTEST:

Vicki M. Zeier
Vicki Zeier
Clerk and Recorder

BOARD OF COUNTY COMMISSIONERS
Missoula County, Montana

OPPOSED
Barbara Evans, Chairman

Fern Hart, Commissioner

Michael Kennedy, Commissioner

Signed this 28th day of November, 1995.

APPROVED AS TO FORM AND CONTENT

Deputy County Attorney

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PREFACE

The questions outlined below have been the focus of much community discussion for several years, without a clear resolution. They are questions which this 1995 Plan Update must address, if it is to effectively guide the community's decisions about land use and services in the Rattlesnake Valley over the next 5 to 10 years. The questions are:

- Which areas are best suited for future development?
- What characteristics and design features should new development exhibit?
- Which areas are best suited to remain relatively unchanged?
- What tools do we use to conserve open space with development?
- How do we finance the Rattlesnake's current and future sewer and transportation needs in a fair and affordable way?
- How do we adequately address safety concerns (e.g., traffic, emergency services) without sacrificing the special quality of life in the Rattlesnake?
- How do we better track the cumulative effects of Rattlesnake Valley development, so that we know at any point in time how close we are to the carrying capacity of the Valley?
- As the Missoula urban area continues to grow and change, what role and responsibilities does the Rattlesnake Valley share as a part of this larger community?

Many of these questions parallel those currently under consideration for the Missoula urban area in the City-County growth management process. Realizing that this process will clarify future directions and development strategies for the overall urban area, this Plan provides an update of goals, land use recommendations, and other recommended actions to guide land use decisions in the Rattlesnake for the next 5 to 10 years. Some further fine-tuning of these recommendations may need to occur as the scenarios planning and tool development phases of the growth management process are completed.

RESOURCE MAPS

1. Planning Area
2. Vegetation Dominance Types
3. Vegetation Habitat Types
4. Wildlife Habitat and Corridors
5. Soil Types
6. Geology
7. Slope Classifications
8. Historic and Cultural Features
9. Rattlesnake Creek Floodplain
10. Areas of 1989 Annexation
11. Land Subdivisions and Building Permits Since 1990
12. Existing Land Use
13. Proposed Land Use
14. Existing Zoning
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18. Major Utility Corridors
19. Community Facilities

INTRODUCTION

Missoula County and the City of Missoula adopted comprehensive land use planning guidelines in 1975 known as the *Missoula County Comprehensive Plan* (rural areas) and *Missoula- A Policy Guide for Urban Growth* (for the Missoula urban area). Both documents include written information and maps designed to help local residents and governing agencies evaluate and direct land uses and land use proposals (including zoning and subdivision requests) within their respective areas.

Due to the large land area each document covered, both were broadly based. Since new information is frequently forthcoming as communities and counties grow, more specific documents called "area or neighborhood" plans were proposed and adopted by the County and the City which amend the Urban Comprehensive Plan and the Policy Guide in specific locations. Examples include the 1986-'87 South Hills Comprehensive Plan and the 1988 Rattlesnake Valley Comprehensive Plan.

The City and the County adopted an update to the overall Missoula Urban Comprehensive Plan in July of 1990. Since then, several additional area plans have been adopted by the City and/or County. Included among these is the limited-scope update of the *Rattlesnake Valley Comprehensive Plan*, adopted by the City in May, 1992.

As this brief chronology suggests, the planning process in Missoula County and the City of Missoula does not stop and start at prescribed moments. It is an ongoing process. And in that spirit, this 1995 Rattlesnake Valley Comprehensive Plan replaces the 1992 limited-scope update and offers an overall update of the 1988 Rattlesnake Valley Comprehensive Plan Amendment.

This 1995 update of the Rattlesnake Valley Comprehensive Plan Amendment to the Missoula Urban Comprehensive Plan is a policy document intended to provide the City, County, other agencies and districts, and citizens with a coordinated guide for change.

When making decisions based on this Plan, not all of the goals, policies, and proposals for action can be met to the same degree in every instance. Use of the Plan requires a balancing of its various components on a case-by-case basis. It also requires a selection of those goals, policies, and proposals for action most pertinent to the issue at hand.

The common theme of all the goals, policies, and proposals for action is acceptance of them as suitable approaches toward solving problems and reaching goals. Other valid approaches may exist and may at any time be used. Adoption of the Plan does not necessarily commit the jurisdictions to immediately carry out each policy to the letter, but does put them on record as having recognized the desirability of the goals, policies, and proposals for action to the best of their ability, given sufficient time and resources.

HISTORY

The Rattlesnake Watershed is an 82 square mile drainage located immediately north of the City of Missoula in Western Montana. While only the southern six square miles are densely settled, the entire watershed has played a major role in the history of Missoula County.

Kootenai, Salish and Blackfoot tribes frequently used the Missoula valley, and presumably its adjoining drainages, prior to the first visits by white explorers in 1806. During that summer, Meriwether Lewis crossed Rattlesnake Creek on his return to St. Louis. David Thompson reportedly visited the area in later years, but the first permanent buildings were not constructed until 1858. Six years later, Christopher P. Higgins established a sawmill along the Clark Fork River, giving rise to the town of Missoula.

As this settlement grew, several families moved into the Rattlesnake drainage to establish farms and a few isolated mining claims. The Greenough Estate (now known as Greenough Park), located just above the confluence of Rattlesnake Creek and the Clark Fork River, was built in part from Tom Greenough's success in selling railroad

ties to the Northern Pacific Railroad. These ties were cut in the upper Rattlesnake and were floated out on the spring floods. As the railroad itself moved through Missoula, the familiar "checkerboard" pattern of land ownership emerged, with the railroad obtaining ownership to alternating sections of land (each one square mile in size) in the Rattlesnake drainage.

While logging continued to be a mainstay of the economy in the early 1900's, dairy farms, a fox farm, orchards and a sawmill were also established in the Rattlesnake Valley. The first school, established in 1907, was a small one-room building located at the confluence of Spring Gulch and the Rattlesnake inside of what is now the Rattlesnake Recreation Area.

Rattlesnake Creek has always been an important source of water for the residents of Missoula. Early entrepreneurs hauled water from the creek to Missoula residents for five-cents per barrel. Later efforts to deliver water included underground wooden culverts (some of which still exist) consisting at times of hollowed lodge pole pine tree trunks. Water disputes were not uncommon, and the first adjudication occurred in 1903.

The Montana Power Company began acquiring land from the Northern Pacific Railroad in the upper Rattlesnake in the 1920's and operated the current water system until its sale to Mountain Water in 1979. In an effort to protect its investment in Missoula's domestic water supply, Montana Power attempted to purchase all private lands above the current intake dam between 1934 and 1935. This effort was largely successful and helped reduce the contamination of Missoula's source of potable water by domestic animals.

The County Hospital and Poor Farm once occupied the site of the current Rattlesnake School. The Poor Farm was a precursor of today's rest homes, housing elderly and disabled county residents. Bordering the farm were extensive orchard developments to the north and residential housing to the south. The 1920's saw several farms split into five acre residential tracts. With extensive irrigation occurring to the north, these "new" homes often faced flooding by springs that were found throughout the Valley; however, as residential development increased at the expense of farmlands, irrigation ditches carried most of the water past the new homesites and on to the Clark Fork River.

With the limiting of the upper portion of the Rattlesnake Valley by the Montana Power Company to resource management and recreational use, development was forced into the lower six square miles of the Valley. Two schools were built, private retirement homes and churches were constructed, and the completion of Interstate 90 in 1967 across the mouth of the Valley forced the removal of the Greenough Mansion but left most of the Mansion's park lands intact.

Major developments in the Rattlesnake Valley since 1970 include new home construction, expansion of the city sewer into the middle portion of the Valley, open space preservation and acquisition, and the formation of several neighborhood associations. Besides serving as the gateway to a national recreation area and wilderness, the Rattlesnake Valley also contains open spaces of particular value to the greater Missoula community. Between 1989-1992, the City of Missoula, with the assistance of Missoula County and Five Valleys Land Trust, purchased 418 acres of land in the middle Rattlesnake from Sunlight Development Company (a subsidiary of Montana Power Company), commonly known as the Rattlesnake Greenway purchase. The purpose of these purchases was to preserve and manage the acquired lands as public open space. In 1980, the Rattlesnake National Recreation Area and Wilderness (RNRAW) was created by an act of Congress. This act mandates that the 63,000 acres contained in the RNRAW be managed for educational purposes, wilderness, wildlife, watershed protection and recreational values. While the wilderness and recreation area is not included within the planning area for this comprehensive plan, over 80% of the visitors to the area access the site through the planning area itself. Since this is a national recreation and wilderness area, local traffic is supplemented by visitors from outside the immediate neighborhood. The traffic significantly influences the lands which border the main transportation routes through the Valley. A 1989 sewer service agreement between Sunlight Development Company, the City of Missoula, and Missoula County addressed some of the financial and administrative details of the Rattlesnake sewer system extension project.

In the last 100 years, the character of the Rattlesnake has evolved from a sparsely settled rural valley to an area which functions as:

- A set of interconnected neighborhoods whose households total approximately 2,100 in 1995;

- An integral part of the Missoula community, where all citizens must share the responsibility for providing safe transportation, aquifer and watershed protection, park and open space opportunities, affordable housing, and other municipal services and facilities; and

- An integral part of an ecosystem which contains wildlife, vegetation, water, topography, visual and cultural resources, and recreation opportunities of local, regional, and national significance.

EXISTING CONDITIONS

The Place and the People

The following resource maps are associated with this discussion:

Map 1:	Planning Area
Map 2:	Vegetation Dominance Types
Map 3:	Vegetation Habitat Types
Map 4:	Wildlife Habitat and Corridors
Map 5:	Soil Types
Map 6:	Geology
Map 7:	Slope Classifications
Map 8:	Historic and Cultural Resources
Map 9:	Rattlesnake Creek Floodplain

These maps are intended to illustrate, supplement, and in some cases update the information presented in the text.

This 1995 Plan Update places great emphasis upon the resource information contained in this section because it provides the basis for an evaluation of:

- Which lands are best suited for development
- How much development can the land sustain
- What kinds of design/build standards should be in place to guide this development

Topography

Map 1: Planning Area &
Map 6: Geology

The planning area is approximately 12 square miles located at the southern end of the Rattlesnake Drainage. Rattlesnake Creek flows from north to south through the planning area, exiting the Valley one-quarter mile above its confluence with the Clark Fork River. The elevation of Rattlesnake Creek at the confluence is 3,180 feet above sea level, a drop of 5,440 feet from its headwaters on McLeod Peak 17 miles to the north. The planning area is less than a mile wide at its southern end, bordered on the west by the crest of Waterworks Hill and on the east by the top of Mount Jumbo. The Valley bottom, composed mostly of old creek deposits overlaid by shallow soils, widens from 2,800 feet at the top of Greenough Park to almost one mile wide near Lincolnwood Estates before narrowing again to less than 1,000 feet in the northern portion of the planning area.

The eastern hillsides are generally steeper than those found to the west, with Mount Jumbo providing the greatest local relief (1,148 feet from Van Buren Street to the crest at 4,768 feet).

A major geologic break in the hillside boundaries to the east and west is found along the Clark Fork Fault. This somewhat active earthquake fault runs from the southeast to the northwest, beginning immediately north of Mount Jumbo and continuing approximately 2.5 miles diagonally across the Valley, exiting the planning area west and south

of the Montana Power Substation (Map 6). Utility companies have utilized this break in topography to locate a gas line (the Yellowstone Pipeline) and electrical distribution and transmission lines (Montana Power's Rattlesnake Substation). The fault is marked not only by the break in slope on adjacent hills, but also by several soil slumps which are most notable as the fault exits the Valley to the west. An old jeep trail (the former Coal Mine Road) follows the faultline to the west, forming a loop by entering an adjacent drainage then returning via Interstate 90 to the south.

Several small tributaries of the Rattlesnake enter the planning area in the northern region, including those in Spring Gulch and Sawmill Gulch on the west and Woods Gulch, Danny O'Brien Gulch and Ray Creek on the east. However, stream flow is generally minimal in these areas.

Two former gravel pits exist in the area, one on Waterworks Hill just north of the water reservoir and one at the lower end of O'Brien Gulch. Several other areas, including Mount Jumbo, have been used for limited gravel extraction.

Vegetation

Map 2: Vegetation Dominance Types & Map 3: Vegetation Habitat Types

The Missoula Valley is relatively arid, with surrounding vegetation reflecting the sparsity of moisture. The southern end of the planning area outside the developed Valley bottom is very dry, with grass dominating the bordering slopes. Ponderosa and lodgepole pine occasionally dot the lower slopes, while fir and spruce trees are found in the more moist gullies and draws. Cottonwoods, alder and various shrubs dominate the undisturbed riparian areas along Rattlesnake Creek.

The northern portion of the planning area includes steep north-facing slopes which retain moisture and support a more varied vegetative cover. Grand fir, larch, cedar and other indicators of increased moisture are found in the Sawmill Gulch and Woods Gulch areas of the Valley. Douglas fir also begin to dominate the northern slopes and at one time provided a harvestable crop for local sawmills.

Introduced vegetation include a large number of boulevard trees in the lower Rattlesnake (maple, elm, locust) and scattered blue spruce exist throughout the Valley bottom. Ponderosa pine have thrived very well in some residential developments while apple trees have survived from the early 1900's in isolated pockets. Additional introduced species include mountain ash, various fruit trees, and a large number of other residential plantings.

One small wild flower has attracted national attention to the Rattlesnake drainage: the Missoula phlox. This species of phlox is considered very rare since it is found only in limited quantities in North America. It grows on a small portion of Waterworks Hill.

The planning area, especially on Mount Jumbo and Waterworks Hill, has experienced a steady spread of noxious weeds over the last 50 years, especially leafy spurge. Specialists feel that the leafy spurge found in the Valley is part of the Waterworks Hill infestation that began in the 1930's. After the completion of Interstate 90 in 1967, spotted knapweed began to be identified at the southern end of the Valley. Today spotted knapweed can be found almost anywhere in the Rattlesnake. Dalmatian Toadflax was identified on Mount Jumbo in the early 1950's. Specialists believe that its course of travel has followed Interstate 90 from the east entering Missoula on Mount Jumbo.

There are approximately 600 public street trees in the lower Rattlesnake. Species are comprised of Norway maple, Ponderosa pine, green ash, Siberian elm, boxelder, horsechestnut, and sugar maple. The value of these trees as appraised in 1993 by the Council of Landscape and Tree Appraisers is over $1.2 million.

The forested areas of the Valley make the residential areas highly vulnerable to forest fire, especially houses located in steeper forested hillsides. Fire education programs educating residents of wildfire safety have not changed people's behavior, according to the Forest Service.

Montana Department of State Lands, Forest Service, and University of Montana are sources of technical information in wild land fire.

Wildlife

Map 4: Wildlife Habitat and Corridors

The Montana Department of Fish, Wildlife and Parks and the Forest Service have identified Rattlesnake Creek as an important spawning stream for rainbow, cutthroat, bull, and brown trout as well as mountain whitefish. The stream is identified as a Class III stream (a "substantial fisheries resource"). According to the Forest Service, the Mountain Water dam prevents trout movement to and from the Clark Fork for spawning and rearing young.

The Rattlesnake Valley is an important habitat for numerous big game animals, including elk, mule deer, white-tailed deer, black bear, mountain lions, and mountain goats. Two areas in the Rattlesnake Valley have been identified as critical winter/spring range for big game. The remaining open hillsides, while not critical, do provide winter feeding areas for deer in lower reaches and elk in the upper ridge areas. In addition, bald eagles, beaver and blue heron have frequently been sighted in the area around the Mountain Water Intake Dam. Viewing of elk, deer, bear, red fox and other smaller mammals on Mount Jumbo and on the northern hills is an early morning and late evening pastime of many residents in the middle and upper Valley. In addition, the Hungarian partridge is found in the planning area. There have been and still are several coveys of "Huns" in the middle Rattlesnake and pairs nest and raise broods here each year.

For a more complete discussion of wildlife, please consult the Inventory of Conservation Resources for Missoula County which is available in the Office of Planning and Program Development.

Soils

Map 5: Soil Types

Soils in the Rattlesnake Valley may be described as less than adequate for sanitation purposes. A primary concern is the possible contamination of groundwater from onsite disposal systems or community subsurface disposal systems that fail to adequately treat effluent.

The Moise Gravelly Loams, found in the middle and upper portions of the Valley are very porous and, therefore, make poor filters for septic tanks and absorption fields. The Argiborollis-Haploborollis Complex, found on the east and west side of the Valley, is also problematic for wastewater disposal due to its mixture of clayey soils and excessively well drained sands and gravels. While isolated soils, such as the Big Arm Gravelly Loams on slight slopes (below 15%), pose moderate limitations, according to the Health Department, soils on slopes in excess of 15% are classified as posing "severe" problems for septic tanks and absorption fields. Even the Totelake Gravelly Loams on 2% to 8% slopes are classified as "severe" due to their poor filtering capabilities.

Soils in the lower portion of the Valley are "urban" (topsoils, extensive pavement over soils, etc.) and pose few problems for development in the Valley bottom due to the presence of the city sewer. A complete description of each soil type is available at the Soil Conservation Service.

The coarse soils at various locations in the Valley provide only minimal ground water protection from the contaminants that originate above the aquifer (septic wastes, gasoline, animal wastes, etc.); however, in areas where there is a sufficient layer of topsoil, the Health Department believes treatment to be adequate.

Geology

Map 6: Geology

The Rattlesnake Valley evolved through several geologic time periods. Millions of years ago, seas deposited numerous layers of mud, sand, and other calcareous materials. The bedrock outcrops in today's landscape are the result of the compression of the sea's sediments during the Precambrian Period (575 million years ago). This

bedrock is somewhat resistant to erosion. Thus, the waterways of the last several thousand years have found their way through the least resistant layers of the Precambrian bedrock.

During the Tertiary Period (50 million years ago), a thin veneer of additional sediments from a new sea covered the now-hardened bedrock; however, these new sediments are partially composed of expandable clays and are usually very unstable.

The youngest material consists of glacial debris and alluvial (stream/river) deposits originating as early as 10 thousand years ago. Glacial Lake Missoula was continually drained and refilled, which resulted in various depositional and erosional landforms found throughout western Montana. Lakeshore lines from Glacial Lake Missoula are clearly visible on the western slopes of Mount Jumbo.

Additional geologic references for the Rattlesnake Valley are available at the University of Montana library and include Van Der Poel's thesis (1979), Watson's essay (1984), and Hall's dissertation (1968).

Slope

Map 7: Slope Classifications

Development on slopes of 15% to 25% increases construction costs and site disturbance. Development on slopes greater than 25% is discouraged, because high slope requires increased use of sand for traction in winter which also leads to dust pollution. In addition, cars burn additional fuel which pollutes air.

Air

The Rattlesnake Valley lies entirely in Missoula's Air Stagnation Zone and High Impact Zone. Because of air quality problems in the Missoula Valley, high emission wood stoves are no longer permitted to be installed or remain in a house after the house is sold. In 1994, the Missoula City-County Health Department adopted regulations which allow pellet stoves in new houses. Upon sale of an existing house with a wood stove which releases 6 grams or more particulate per hour, the owner must replace the stove which meets the Health Department regulations. Air quality in the Rattlesnake and throughout Missoula is expected to improve with these more stringent air quality regulations.

Sand continues to be used for traction. This practice has led to Missoula's non-attainment of federal PM_{10} (particulate matter) emission standard. The Health Department has taken several steps to reduce particulate matter from becoming airborne. New public and private roads, private driveways, and parking lots communitywide are required to be paved. In addition, effective September 1994, property owners waived their right to protest an RSID or an SID for paving improvements in the Air Stagnation Zone as a part of subdivision approval.

A continuing concern is development on slopes where sand is used for traction in winter contributing to dust pollution. In addition, cars which travel up steep slopes emit more particulates.

Water Resources

The planning area is entirely within the Rattlesnake watershed. The principal stream in the watershed is Rattlesnake Creek which flows for a distance of 22 miles. Along its route to the Clark Fork River, nine perennial streams and numerous intermittent tributaries contribute to the flow of the Rattlesnake. A significant portion of the stream flow in Rattlesnake Creek originates from snow which falls in the higher mountain areas between November and April each year.

The Montana State Water Quality Bureau classifies the stream as "A - Closed System". This classification applies to the stream above the intake dam to protect the water from contamination as a potential water reserve for the City

of Missoula. Below the intake dam the stream is classified as "B-1", good quality cold water and the department advises boiling of water before drinking.

Rattlesnake Creek had served as a principal source of water for over a hundred years for residents of the Missoula valley. Prior to 1983, the Creek provided 40 percent of Mountain Water Company's water supply. In 1983, Mountain Water Company switched its water source to wells which tap the Missoula aquifer. This switch was precipitated by an outbreak of giardia lamblia, an intestinal parasite, from the creek's water. At the time of the outbreak, the Rattlesnake water was treated with chlorine which does not always deactivate giardia cysts.

Mountain Water currently uses the Rattlesnake Creek only as an emergency back up. It may use the Creek for regular water supply sometime in the future. There continues to be conflicting views on the extent of impact of septic systems on Rattlesnake Creek and the aquifer.

Population

The Rattlesnake Valley is considered a highly desirable place to live. As a result, population in the Rattlesnake Valley has increased from approximately 3,500 people in 1970 to approximately 5,000 in 1990, according to the U.S. Bureau of Census, and 5,330 in 1995, based on the most recent estimate. This represents a 52% increase since 1970. As a percent of the total population of the Missoula Urban Area, the Rattlesnake's population has increased from 7% in 1970 to 8% in 1990 and nearly 12% in 1995. Further information on population statistics, age group data, relative income, and other variables may be found in the 1990 Census of Population.

Area Associations

A complete listing of neighborhood/homeowner associations and related groups with their mailing addresses is available in the Office of Community Development.

There are several neighborhood associations in the Rattlesnake Valley. They include: the Rattlesnake Valley Alliance (formed in 1982), the Lower Rattlesnake Neighborhood Association (1982), the West Rattlesnake Neighborhood Association (1983), and the Rattlesnake Homeowners Association (1992). Each group, together with the Lincoln Hills Homeowners Association (1967), the Lincolnwood Homeowner's Association (1977), and the Friends of the Rattlesnake (1971), has been active in representing the views of area residents on a variety of neighborhood and communitywide issues.

LAND USE

The following resource maps pertain to this discussion:

Map 10:	Areas of 1989 Annexation
Map 11:	Land Subdivisions and Building Permits Since 1990
Map 12:	Existing Land Use
Map 13:	Existing Zoning

These maps are intended to illustrate, supplement, and update the information presented in the text.

Virtually all of the planning area has historically been zoned for residential development, at maximum allowable densities ranging from 1 unit per 40 acres to 8 units per acre. The prevailing land use in the Rattlesnake Valley is residential, with the associated support services provided by schools and churches. Agricultural use of several parcels remains evident. The houses are primarily single family homes with some multi-family housing in the lower part of the Valley. The City of Missoula annexed nearly 1,500 acres of the Rattlesnake in 1989. The City interim

zoning of these lands expired in 1992, and they remained unzoned as of September 1995.

Lower Rattlesnake

Residential densities are highest in the lower Rattlesnake, with densities approaching six to eight units per acre. This area is almost completely occupied by residential construction, with one elementary school (Prescott), and two major apartment complexes (Alpha East: 60+ units and Mountainwood Apartments: 40 units) in the neighborhood. There are also a number of uncounted "non-conforming" uses in the area, including a significant number of non-conforming apartments within existing homes located primarily at the southern end of the neighborhood.

Housing construction dates to the 1940's and 1950's, with a few isolated older structures. Most units are in good repair, and newer and more expensive units have been constructed along Greenough Drive above Greenough Park.

Two parks are found in the area: Greenough Park (42 acres) and the significantly smaller Gregory Park (two tennis courts and a small children's play area).

The lower Rattlesnake is dominated by two major roads. Van Buren Street experiences on average 9,240 vehicle trips per day (capacity is approximately 12,000) while Greenough Drive handles roughly 3,960 vehicle trips per day (capacity is approximately 10,000). These two routes provide the only access into and out of the Rattlesnake Valley.

Although Mount Jumbo and Waterworks Hill remain in private ownership, they provide additional open space in this area. A conservation easement of over 100 acres was recently placed upon Waterworks Hill and an additional 1,500 to 1,600 acres of Mount Jumbo are presently a focus of conservation fund raising efforts.

Middle Rattlesnake

The densities of established neighborhoods in the middle Rattlesnake generally range from two to four units per acre, with some areas approaching six units. More than half of the area is sparsely settled or used as pasture land.

Zoning in this portion of the planning area has traditionally allowed only residential development. A business site located on Rattlesnake Drive has housed several different uses over the years and was most recently utilized as a flower and garden shop.

One factor which limited growth in the middle Rattlesnake during the 1970's was the failure of individual and community septic systems in the Valley, most notably in the Lincoln Hills Subdivision. In addition, the shallow depth to ground water along the eastern bank of Rattlesnake Creek and the width of the floodplain in the Rattlesnake Valley limited the development potential of these lands.

During the mid to late 1980's, Missoula County and the City of Missoula extended community sanitary sewer service into the Rattlesnake Valley. The project was funded jointly by the Environmental Protection Agency (50%), City of Missoula (25%), Missoula County (4%) and three neighborhood Rural Special Improvement Districts (21%). The purpose of extending sewer into the Valley was to provide sewer connections to existing and future development. The total design capacity of the sewer system is the equivalent of 5,350 homes. It is estimated that a total of 11 new and existing homes can be located north of the Mountain Water dam under current septic regulations; however, this number does not consider existing zoning or possible connection to a municipal sewer.

Portions of the City-owned open space lie along the Rattlesnake Creek. Some of the land is subject to major power line easements. Much of it is open grassland along the northwest hills. Two parks provide public outdoor recreational facilities for organized sports: Pineview Park, adjacent to Rattlesnake School and Montana Power Park, just north of Lincolnwood. Additional parks and common areas include several undeveloped open spaces in newer

subdivisions as well as land along Rattlesnake Creek adjacent to Rattlesnake School.

Open grasslands border the planning area to the west. The Montana Power Substation is located on the western bank of the creek, just below an intake dam which was once the source of Missoula's domestic water supply. Two buried thirty-inch diameter pipes lead from the dam to the reservoir on top of Waterworks Hill, crossing under the substation's transmission and distribution lines. Portions of the eastern boundary are forested and newer, large lot residential construction has occurred here over the last decade.

A majority of the construction took place in the 1960's and 1970's, with high quality housing being built in later years on the hillsides overlooking the Valley and along the creek.

Van Buren Street/Rattlesnake Drive provides access for dwellings on the east side of the Valley. Lolo Street, the only east-west road which crosses Rattlesnake Creek above Greenough Park, carries on average 2,090 vehicles per day across a relatively narrow (with a sidewalk on one side) two-lane bridge. Duncan Drive provides access along the western side of the planning area to existing dwellings as well as to the open space and lightly developed lands just south of the Montana Power Substation.

Upper Rattlesnake

The upper Rattlesnake portion of the planning area is comprised of heavily forested lands, the entrance to the Rattlesnake National Recreation and Wilderness Area and limited residential development along the eastern edge of the creek.

Densities in the upper reaches of the Valley are very low, often less than one unit per acre where development has occurred. Much of this housing was constructed in the 1960's and 1970's and consists of ranchettes with stables and other related buildings. Some lots on the eastern slopes are being developed for exclusive residential dwellings. Only a few new homes have been constructed on the western fringes of the area. To conserve subsurface and "Class - A" surface water quality, the Missoula City-County Health Code prohibits more than one drainfield per existing property owner or lot. This restriction depends on individual circumstances for all the area of the upper Rattlesnake upstream from the Mountain Water Company dam.

One major road, Rattlesnake Drive, services the area east of Rattlesnake Creek. A private road through the Montana Power electrical substation has been used to provide pedestrian access to lands west of the creek. New homes occupying the northwestern slopes are served primarily by unimproved private roads that intersect North Duncan Drive at the entrance to the substation.

The major entrance to the Rattlesnake National Recreation and Wilderness Area is located in the upper portions of the planning area. Use of this U.S. Forest Service operated site exceeds 24,000 visitors per year with a steady trend of increasing use. Two Rattlesnake trailheads have been constructed. One provides car parking, restrooms (one handicap accessible), an information sign, and bike rack; the other serves horseback riders and provides parking for trucks and horse trailers.

Recent Developments

Map 11: Land Subdivisions and Building Permits Since 1990

During the period from January 1988 to December 1994, 22 subdivisions were approved in the Rattlesnake Valley, nearly all of them within the City limits. When all of these developments are fully "built out", the properties will hold 440 dwelling units on 268 lots, covering 388 acres. Two of the more recently approved subdivisions contain a conservation easement as a part of their overall development plan; most of the approved subdivisions include some area set aside for outdoor recreational use by the residents of the particular development.

Currently, based upon recent subdivision approvals and densities of one dwelling unit per acre, there remains the opportunity to construct at least 284 additional dwelling units within the boundary of the unzoned part of the City.

SERVICES AND FACILITIES

Introduction

The following resource maps illustrate and supplement this discussion:

Map 15:	Water and Sewer Service Areas
Map 16:	Designated Open Space
Map 17:	Existing Transportation System
Map 18:	Major Utility Corridors
Map 19:	Community Facilities

Waste Water Disposal Map 15: Water and Sewer Service Areas

While the cost of extending waste water disposal services throughout the Valley may be prohibitive to individual building lots, sewer service may be provided to Valley residents. Special Improvement Districts (SIDs) are one method used to bring a sewer main into a neighborhood. The City and County completed a *1985 Rattlesnake Sanitary Sewer Report* which led to the development of a *Master Service Plan* for the Rattlesnake Valley. The *Master Service Plan* created RSIDs 414, 416, and 426 which constructed the Rattlesnake Valley interceptor in 1987 and made waste water disposal service available to the Valley.

There are approximately 1,900 dwelling units in the planning area. Of these, approximately 900 are connected to the city's sewer. The remaining 1,000 units (including some schools, churches, and rest homes) are on individual or community septic systems. For a complete description of the sanitation systems in the Rattlesnake, please consult the *Rattlesnake Sanitary Sewer Report*.

There are five major concerns regarding waste water disposal in the Rattlesnake Valley:

1. Ground and surface water contamination due to the inability of most soils in the Rattlesnake to effectively treat septic wastes

2. Possible failure to provide adequate treatment by private septic systems themselves and, thus, resulting in groundwater pollution

3. Cost of expanding sewer and residents' ability to pay for it

4. Possible exposure of the public to disease from contaminated ground water

5. Contamination of surface water in Rattlesnake Creek by waste water

The sewer expansion plan is intended to help alleviate the need for private septic systems and to help prevent the contamination of ground water and surface water in the planning area. The plan has divided the area into six geographic neighborhood areas (Basin A through F) each of which represents a single construction project or zone of service. They are as follows:

Basin A: The east side of the Rattlesnake south of Mountainview and north of Holly (and includes Martinwood)

Basin B: The west side of the Valley from Traynor Drive to West Mountainview

Basin C: Rattlesnake Drive and lands east to Lincoln Hills from Stanley North to Creekwood Crossing

Basin D: The Lincolnwood Subdivisions, Creek Crossing Court, and Rattlesnake Drive 1,000 feet east of Lincolnwood

Basin E: The area east of Rattlesnake Drive from Tamarack North to Choke Cherry Loop and includes the Elk Ridge Road development

Basin F: The area north of Choke Cherry Loop

Basin A has the least costs and the most number of dwelling units. Providing only sewer mains to the area will cost approximately $4 million, according to the City Public Works Department. For more details, please refer to the 1990 Rattlesnake Valley Sanitary Sewer Cost Estimate.

The City-County Health Department and the Missoula Valley Water Quality District are conducting a study to determine priority areas for sewer extension in Missoula. The Rattlesnake Valley is one of many unsewered areas that are a part of this study. Once the study is completed, the City of Missoula may extend sewer to recommended priority areas, where needed. While grants used to be available for sewer extension, they are now very limited. The City can create Special Improvement Districts to provide long term, low interest financing for residents to pay sewer construction costs. The City is exploring additional funding sources and ways to generate revenue to help pay the costs of extending sewer service.

Water

Map 15: Water and Sewer Service Areas

Mountain Water Company (MWC) provides water to an estimated 1,600 customers in the Rattlesnake Valley north of Interstate 90. Water is pumped from wells located in downtown Missoula to a one million gallon reservoir located on Waterworks Hill. At this reservoir, two boosters pump water to an additional one million gallon buried reservoir located below the MWC intake dam. This reservoir provides water to the Rattlesnake service area.

Additional boosters pump water to smaller reservoirs which serve the Lincolnwood, Elk Ridge, and Lincoln Hills areas. In 1994, approximately 467 million gallons of water were pumped into the Rattlesnake service area from the Waterworks Hill booster station. There are approximately 150 private water wells in the Valley. The wells are broken into three use categories: domestic, irrigation, and commercial. A majority of these wells are located in the alluvial till sediments within the Valley proper. Other important water sources are the draws in the upper valley, including Woods Gulch, Spring Gulch, and Ray Creek. A few deep wells are located in the Precambrian bedrock; however, this is an expensive water source due to the costs of drilling.

Based on current capacity, Mountain Water can provide service to an additional 2,300 new homes in the Rattlesnake. It has a long term plan to build a 300,000 gallon reservoir in Lincoln Hills. In the lower Rattlesnake, Mountain Water plans to replace some old water mains in the near future.

Police and Fire

The Missoula Police Department and the Missoula Sheriff's Department are comfortable with the current level of service available to residents in the planning area. Since there are no major commercial or industrial centers in the Rattlesnake, crimes in the area are typical of those in other residential neighborhood (bicycle and car vandalism, underage drinking in parks, etc.). Generally, a population increase in Missoula County requires the addition of approximately two deputies/police officers for each 1,000 residents added to the population base. The same formula can be used for determining police/sheriff staffing in the Rattlesnake planning area.

The 1986 *City of Missoula Master Plan*'s fire station location study and the 1990 *City of Missoula/Missoula Rural Fire District Joint Station Location Study* indicated that the current City of Missoula Headquarters Fire Station should be relocated to an area on East Broadway between Madison Avenue and Van Buren Street. According to these studies, a station in this area would provide the City with both adequate initial response into the Rattlesnake

Valley and the downtown area of the City and back up response into other specified areas of the City. A new headquarters fire station opened in September of 1995 on the 600 block of East Pine Street. This location falls within the recommendations of both station location studies. The Missoula Fire Department will have special train warning systems in its new station on Pine Street and will utilize the railroad crossing at Madison and Spruce Street.

The Missoula Rural Fire District's Rattlesnake Fire Station on Gilbert Street was identified as unnecessary by the joint station location study. The future need for this station is currently being reviewed by the District.

There is concern by both the City of Missoula Fire Department and the Missoula Rural Fire District about the lack of both an east-west access across the Rattlesnake Creek and a third means of egress out of the Valley.

Montana Department of State Lands is responsible for wildfire control south of the major electrical power line (vicinity of Danny O'Brien Gulch). The Forest Service is responsible for the area north of the power line.

Parks and Other Open Spaces Map 16: Designated Open Space

Open Space

Although much of the land in the Rattlesnake may appear as open space, the majority of these undeveloped lands are privately owned. The 1995 Open Space Plan, adopted by the City Council and the Board of County Commissioners in July 1995, shows existing areas which are preserved as open space and identifies portions of Mount Jumbo and the North Hills as existing and potential cornerstone elements of the urban area open space system. The Rattlesnake Valley's designated open spaces are described below:

Conservation Lands

As mentioned earlier, the City owns over 400 acres of conservation lands previously held by Sunlight Development Company. The land encompasses a creek corridor and hillsides in the Rattlesnake. It is valuable for wildlife habitat, visual open space, and recreational uses including walking, biking, jogging, horseback riding, and cross-country skiing.

The City owns a 125-acre parcel on the west side of Mount Jumbo. The land is in steep hillsides with large acreage in timber and other native vegetation. Among its many open space values, the land provides critical wildlife habitat, especially for wintering elk. Both the Inventory of Conservation Resources and the 1995 Urban Area Open Space Plan identify major portions of Mount Jumbo and Waterworks Hill as having significant open space value.

There are also conservation easements on limited portions of Waterworks Hill and additional stretches of Mount Jumbo.

Trails

A number of trails have formed through human use. The majority of these trails are undeveloped although some of them have been recently improved with bridges and surfacing.

A loop trail system in Greenough Park includes both asphalt and natural paths. There is presently a great interest in extending this system to create a Rattlesnake greenway trail from Greenough Park to the National Recreation Area. Such a system would serve the greater Missoula community toward this end. In 1990, Congress appropriated $633,000 for the City of Missoula to purchase 346 acres along and around Rattlesnake Creek. The City is also purchasing trail easements along the corridor.

Agricultural Lands

There are a few large tracts of privately-owned agricultural lands in the Valley used as pasture land for livestock. These tracts are located both on the hillsides and the valley floor. As elsewhere in western Montana, weed control concerns both agricultural landowners and their neighbors. Since 1988, the single most significant division of land was the sale of approximately 940 acres of Montana Power lands to private interests and the City of Missoula.

Urban Forest

The Rattlesnake has a diverse urban forest, from riparian corridors and cottonwood stands to Ponderosa Pine hillside. The urban forest also includes numerous exotic species in private yards.

Views and Vistas

Residents and visitors enjoy wonderful views of Mount Jumbo, Mount Sentinel, the mountains of the Rattlesnake wilderness, and the Bitterroot from the valley floor and surrounding hillsides. Mount Jumbo and the North Hills provide a backdrop for downtown Missoula. Both the 1995 Urban Area Open Space Plan and the County Inventory of Conservation Resources discuss the value to the community of scenic open space resources.

Parks

The Rattlesnake Valley includes one community park- Greenough Park which features a mix of conservation and recreation. Many people enjoy the streamside trail system and picnic area.

There are two neighborhood parks in the Rattlesnake. Pineview Park has a playground, picnic shelter, athletic field, open play area, ice skating rink, and several tennis courts. Gregory Park, consisting of a tennis court, is a small neighborhood park in the lower Rattlesnake.

Lincolnwood has several developed parks including lineal green spaces between houses and active recreation parks which include basketball and sand volleyball courts and an athletic field that can be used for baseball or soccer. These parks function mainly for the residents of the 125 homes built in the Lincolnwood subdivision.

Currently, there are no developed pocket parks.

Common Areas

None of the Lincoln Hills common areas is developed. These common areas, managed by homeowner's associations, are vegetated open space with some trails and drainages. Lincoln Meadows North and South have some common areas. There is a 4-acre common area in the Cornerstone subdivision.

There are additional undeveloped public parks in the Rattlesnake which have the potential for developing into pocket parks for surrounding neighborhood.

National Forest Lands

The Rattlesnake Recreational Area and Rattlesnake Wilderness draw people from the greater Missoula area and beyond. The area represents the closest vestige of wilderness to Missoula providing opportunities for walking, hiking, fishing, and camping. The land provides habitat for deer, elk, bear, moose, mountain lions, big horn sheep, mountain goats, and small mammals and birds.

There is a great danger of fire for any neighborhood close to such forest lands.

Schools

Two public schools operate in the Valley: Prescott Elementary School (grades 4, 5 - 178 students) and Rattlesnake Middle School (grades 6, 7, 8 - 428 students). Approximately 264 students from kindergarten through third grade students attend Mount Jumbo School in East Missoula.

The Missoula County Public School District has no plan to build additional elementary schools in the Rattlesnake in the foreseeable future. Rattlesnake Middle School can accommodate another 75 students, and a plan to add another modular unit will allow an additional 75 students. Given current development patterns, these capacities have been determined to be adequate.

There appears to be no need for high school facilities in the Valley at this time; however, the school district owns 15 acres of vacant land near Lincoln Hills as well as 12 acres on the west side of Rattlesnake Creek just north of Mountainview Drive.

Transportation

Map 17: Existing Transportation System

The Rattlesnake Valley is served by two major automobile routes: Greenough/Duncan Drive on the west and Van Buren/Rattlesnake Drive on the east. Both are bordered by residential development or vacant land. Improvements (curbs, gutters, sidewalks) are generally absent. Vehicle bridges cross the creek at the entrance to the Wilderness Area, on Lolo Street in the middle Rattlesnake, and on Vine Street in the lower Valley. Two bicycle-pedestrian bridges are located in Greenough Park, and a third crosses the creek at the Rattlesnake School. The Mountain Water Intake Dam in the past served as a means to cross Rattlesnake Creek; however, Mountain Water recently has erected a fence and other barriers to prevent crossing on the top of the dam due to potential liability from recreational uses on their property. A fourth bridge is currently listed in the Missoula County Capital Improvements Program (CIP) to be funded in 1996-97.

Streets are generally paved in the Valley, but few improved pedestrian or bicycle facilities have been developed. Mountain Line buses serve all the major automobile routes in the Rattlesnake. Funds are not currently available to expand service in the planning area.

A major federal transportation facility serves the Valley: Interstate 90. This route crosses Rattlesnake Creek at the southern boundary of the planning area, with off- and on-ramps located within the planning area. I-90 provides excellent access to the Rattlesnake Recreation and Wilderness Area for those from outside the community. The Interstate is also a significant source of noise for residential areas bordering it to the north. A second important offsite facility, located just outside the planning area to the south, is the bicycle-pedestrian bridge located over the Clark Fork River on Van Buren Street. This bridge facilitates pedestrian and bicycle movement from the Valley to the University and the south side of Missoula. This non-motorized access helps reduce Rattlesnake residents' motorized trips per day. Approximately seven vehicle trips per day are generated by each home in the Valley (total number of trips divided by total number of residences), according to 1994 traffic counts. The national average for single family homes is over ten trips per day per residence. Consequently, it appears that the footbridge allows a significant number of people to walk or bicycle to the university area and the south side of Missoula instead of using

an automobile (unofficial counts in 1984 totaled 1,000+ pedestrians and bicyclists in one twelve hour period crossing the footbridge).

In 1994, 9,240 vehicles on average used Van Buren Street in one twenty-four hour period, while 3,960 vehicles used Greenough Drive per day. These roads are approaching their capacity limits. An analysis of these roads needs to be conducted to determine precisely how much capacity is left. It is generally accepted that a two-lane road has a capacity of 12,000 vehicles per day. This capacity is, however, reduced by such factors as driveways, intersections, lack of bicycle lanes, curbs, and so on. For additional traffic counts and locations, please contact the Office of Community Development.

Changes in the transportation network would impact air and water quality as well as adjacent land uses. With any redesign or expansion of the transportation network, issues of drainage, dust abatement, pedestrian and bicycle access, lighting, landscaping, and affordability should be considered. Any expansion of the roadway network would also result in an increase in impervious surfaces. This will increase runoff into Rattlesnake Creek. While many of the streambanks in the lower Valley are bermed or diked, additional streambank reinforcement might be required.

Finally, there is a significant concern among area residents for the safety of pedestrians walking to and from schools, play areas, and other publicly used areas in the Rattlesnake Valley. Very few pedestrian or bicycle facilities have been constructed in the middle and upper portions of the planning area. As a result, pedestrians and bicyclists must often compete with automobiles for space on existing roadways.

Summary

Due to the number of projects currently under way or planned for the Rattlesnake Valley, a unique opportunity exists to reduce the problems associated with unplanned and uncoordinated growth. The expansion of sewer services, together with possible annexation of county land into the city limits and the ongoing review of land use in the Recreation Area, all combine to provide a unique opportunity for local government to address future land uses in the Rattlesnake Valley. Existing public policies regarding parks and open space along the creek, the concepts of preservation of resource areas on the hillsides, and other policies were reviewed to determine the current and future needs of such areas to the community. This information will allow the public and governing bodies to review and solve problems of runoff, air quality degradation, the need for improved and expanded pedestrian and bicyclist facilities and roadways, water quality, school attendance and construction, police and fire protection, wildlife needs and open space/park acquisitions in a comprehensive manner. A coordinated and comprehensive planning effort helps preserve, share and expand those values which make the Rattlesnake Valley a positive asset to all community residents and land owners.

GOALS AND GUIDING PRINCIPLES

Introduction

The 1975 Comprehensive Plan recommended a density of approximately 9,600 dwelling units and limited commercial development for the Valley. Previous zoning of the area would have permitted more than 7,600 dwelling units. The 1988 Rattlesnake Valley Comprehensive Plan Amendment suggested a density limitation of 5,500 households, but in 1992 the City Council eliminated that cap as a part of its limited-scope plan update process. Eliminating the cap was not a "the sky's the limit" message; rather, such policy action reflected the notion that "...future development in the Rattlesnake is not simply a numbers game. The number of additional dwelling units to allow is only a part of the equation in looking to guide future development. Future development should occur where it is most appropriate generally, and in a manner which is appropriate for the particular site conditions.

Appropriate in this context means two things: (1) the natural environment is protected, and (2) public health, safety, and welfare are protected." (1992 Limited-Scope Update, Rattlesnake Valley Comprehensive Plan Amendment).

This 1995 Plan Update reorganizes, but does not substantially alter any of the 13 goals adopted as a part of the 1988 Rattlesnake Valley Comprehensive Plan Amendment. It does provide an updated discussion of how best these goals might be achieved, given: (1) a set of guiding principles identified by Rattlesnake citizens during the 1995 planning and zoning process; (2) the set of communitywide goals outlined in the Missoula Urban Comprehensive Plan; (3) the themes document prepared by the City-County Growth Management Task Force in 1994; and (4) the issues identified in the Preface of this plan update.

List of Goals and Guiding Principles

Following is a list of goals identified in the 1988 Rattlesnake Valley Comprehensive Plan Amendment, Missoula community goals, as stated in the Missoula Urban Comprehensive Plan (which includes the Non-Motorized Transportation Plan) and the 9/9/94 City-County growth management working document, titled *Planning for Growth in Missoula County*, and guiding principles identified by the citizens of the Rattlesnake:

Air and Water Quality

Rattlesnake Valley Comprehensive Plan Amendment Goals:

- Minimize air pollution emissions: by encouraging increased pedestrian, bicycle, and transit use, by requiring new public and private roadways to be paved, by encouraging driveways, parking areas and existing unpaved roads to be paved, by encouraging future developments on less steep property where extra sanding materials will not be required, by limiting traffic congestion, by encouraging the availability and use of the least expensive form of utility energy, by encouraging the use of low emission heating appliances, and by encouraging the use of well-insulated buildings.

- Reduce groundwater pollution and pollution of Rattlesnake Creek by limiting development and roadways adjacent to the creek, by expanding sewer service into the priority portions of the Rattlesnake Valley.

Missoula Community Goals:

- Maintain and improve air quality.

- Protect water quality.

Open Space and Natural Resources

Rattlesnake Valley Comprehensive Plan Amendment Goals:

- Preserve the scenic views of Waterworks Hill, the hills occurring at the northwest corner and along the northern boundaries of the planning area, Mount Jumbo, and the slopes north of Mount Jumbo by encouraging clustered homesites, conservation easements, and other land preservation techniques.

- Establish where needed, and preserve where existing, an open space corridor along Rattlesnake Creek for the enjoyment of all Missoula residents.

- Preserve wildlife habitat, especially elk and deer winter and spring range on Mount Jumbo and in the

northwestern portion of the planning area.

- Continue the legacy of the "Garden City" by preserving existing trees, planting new trees, and maintaining these trees on both private and public land.

- Facilitate the development of a community forestry plan that includes an inventory of existing trees, a maintenance program which adopts standards and operating procedures that are in accordance with accepted arboricultural practices, and provisions for planting trees.

- Promote citizen awareness of the value of trees and means for proper selection and maintenance of trees.

Missoula Community Goals:

- Improve accessibility, especially for pedestrians and bicyclists, to designated open spaces and recreational areas.

- Protect natural resources such as wildlife corridors and habitat.

- Cluster developments to protect environmentally sensitive lands.

Citizen Identified Guiding Principles:

- Preserve the maximum amount of open space.

- Protect and buffer the Rattlesnake Wilderness Area.

- Protect wildlife habitat and corridors.

- In making future development decisions, be sensitive to the fact that Rattlesnake neighborhoods serve as a GATEWAY to the Rattlesnake Recreation Area/Wilderness and other wildlands.

Transportation

Rattlesnake Valley Comprehensive Plan Amendment Goals:

- Improve traffic circulation by improving streets while minimizing adverse impacts on adjacent property owners.

- Improve pedestrian and bicycle safety through the acquisition and development of bicycle lanes or trails and pedestrian walkways.

- Encourage the highest density of residential development in the southern portions of the Rattlesnake Valley and gradually lower density of development to the northern portions of the Valley.

- Improve bicycle and pedestrian opportunities by linking neighborhoods, open spaces, and pocket parks with different classes of trails and paths to existing destinations and by developing an on-street network of bicycle routes and pedestrian facilities.

Missoula Community Goals:

- Improve traffic safety- both motorized and non-motorized.

- Reduce traffic congestion- both motorized and non-motorized.
- Increase non-motorized travel and facilities.

Citizen Identified Guiding Principles:

- Reduce single-occupant vehicle use by encouraging transit, ridesharing, and non-motorized travel.
- Develop bicycle and pedestrian facilities that permit safe, linked travel and minimize conflicts with motorized vehicles.

Neighborhood Character and Quality of Life

Rattlesnake Valley Comprehensive Plan Amendment Goals:

- Design new land use development to be compatible with and enhance the characteristics of the different neighborhoods in the Rattlesnake Valley.
- Preserve and enhance the health, safety, and welfare of Missoula and Rattlesnake Valley residents by creating a sound basis for growth which preserves the amenities of the Rattlesnake, including but not limited to, critical open space and water quality and which limits increases in air pollution.
- Provide connections between neighborhoods to parks, open spaces, churches, commercial areas, and schools.

Missoula Community Goals:

- Protect the community's beauty (e.g., trees, views, historic buildings).
- Create a diversity of housing opportunities; in particular, address the current shortage of housing for lower and moderate income households.
- Value diversity of neighborhoods, and recognize the importance of protecting existing neighborhood character.
- Provide adequate neighborhood commercial services.
- Create a diverse economy.
- Provide adequate parkland and developed playfields.
- Have new development pay its own way on the one hand, and not expect new development to take care of current needs on the other.
- Locate new development near existing public services or where public services can be readily extended.
- Protect property values.
- Protect private property owner rights (develop their land on the one hand and accept cultural and physical limits to development on the other).
- The overall vision of Missoula 2000 expressed at the beginning of the Missoula Urban Comprehensive

Plan:

...Missoula as the center of cultural and economic activity in Western Montana; a community which provides an urban environment that protects valuable natural resources and complements its scenic setting, insures a high quality living environment for all of its residents; where people work together to plan and build a livable community.

Citizen Identified Guiding Principles:

- Limit overall development to the Rattlesnake Valley's carrying capacity.
- Develop community park lands for recreation.
- Include only "neighborhood friendly" commercial use.
- Promote, preserve, and enhance the quality of public life and neighborhood characteristics in the Rattlesnake.
- Recognize the Rattlesnake as a part of the Missoula community, supporting the same quality of life enjoyed by all Missoula residents.

RECOMMENDED POLICIES AND ACTIONS

Air and Water Quality Policies and Actions

1. Determine and monitor the cumulative effect of development on the quality of air in the Rattlesnake Valley and adjacent neighborhoods.
2. Increase transit access and routes.
3. Increase and encourage non-motorized transportation.
4. Explore other transportation demand management (TDM) strategies to reduce dependency on single occupancy vehicles.
5. Provide development incentives within the area served by sewer.
6. Expand sewer service to prioritized additional areas of the Rattlesnake Valley in order to protect the quality of ground and surface waters. Develop a policy to encourage and facilitate the extension of sanitary sewer and storm drainage systems into existing neighborhoods.
7. Determine and monitor the cumulative effect of new development and existing development on water quality. Encourage connection to the municipal sewer system, and identify affordable financing strategies.
8. Use grassy swales for commercial parking lot storm drainage. Grassy swales enable a landscaped area to serve as a temporary infiltration bed that retains initial runoff from storms. Such systems:

    a. Protect the Missoula aquifer from contaminants originating from storm runoff (gasoline, oil, antifreeze, etc.); and

    b. Protect rivers and creeks from similar contaminants.

Incorporate this infiltration system into commercial land use development proposals whenever possible.

9. Study the riparian and floodplain areas downstream from the Intake Dam for use as open space through the use of conservation easements, land dedication, transfer of development rights, and purchase of land or development rights to preserve water quality, fragile ecosystems, and the Rattlesnake fishery.

10. Reserve, with assistance from the Montana State Department of Fish, Wildlife and Parks, in-stream flow rights to protect the aquatic ecosystem, especially downstream of the Intake Dam, for the recreational and aesthetic benefit of community residents.

11. Continue a groundwater monitoring program in the Rattlesnake Valley. The program will concentrate on water quality monitoring and also include water level measurements. City and County governments will be the principal advisors in this program. The Missoula Water Quality District will be responsible for bringing together the appropriate parties who will form the goals and objectives of this monitoring program.

12. Encourage, where appropriate, development which provides for connection to city sewer.

13. Rattlesnake Creek above the Intake Dam is protected by stringent State Water Quality Standards. Several of these standards do not allow pollutants caused by human activities to enter the creek; however, septic systems, grazing, irrigation, road use and other human activities appear to violate the standards to varying degrees. The City and County governments, along with other land owners, continue to develop polices, management practices, and controls to minimize these impacts.

14. Rattlesnake Creek provides a natural reservoir of available water utilizable in emergency fires conditions. The respective jurisdictions preserve and protect the availability of the resource in the event of emergency.

15. Maintain the "A - Closed" classification of Rattlesnake Creek.

Cooperating Parties:

- Missoula City-County Health Department
- Missoula Office of Community Development
- Missoula Valley Water Quality District
- Soil Conservation Service
- Montana Department of Fish, Wildlife and Parks
- Rattlesnake residents and visitors
- Missoula residents

Open Space and Natural Resources Policies and Actions

1. Continue to work with property owners of identified conservation resources (open space, historic, ecological, recreational, wildlife, agricultural) to encourage their use of voluntary land preservation techniques.

2. Cooperate with non-profit organizations, local, state, and federal agencies that acquire and manage land for conservation purposes and public access.

3. Continue efforts, consistent with the 1995 Urban Area Open Space Plan and the Missoula County Parks, Recreation and Open Space Plan, to:

a. Preserve open space on Mount Jumbo, Waterworks Hill, and the North Hills.

b. Establish open space areas along Rattlesnake Creek from Greenough Park to the Rattlesnake National Recreation Area.

c. Expand the neighborhood park system with appropriate mechanisms for acquisition, construction of recreation facilities, improvements, and maintenance.

d. Expand the trail system Valleywide providing:

- A continuous non-motorized pathway from Greenough Park to the Rattlesnake National Recreation Area; and

- Additional pathways in the vicinity of schools and any neighborhood commercial services. Construct a significant portion of these pathways to comply with accessibility standards contained in the Americans with Disabilities Act.

4. Protect the riparian area along Rattlesnake Creek. This may mean, in some cases, prohibiting public access, devegetation, and building activity along Rattlesnake Creek, where such activities would likely damage the riparian area resources. In those cases where the resources can be adequately protected, promote public access to and enjoyment of Rattlesnake Creek, while respecting adjacent land uses and private property owner rights.

5. Prepare and implement a Rattlesnake Greenway Management Plan, protecting the hillsides and the Rattlesnake Creek corridor.

6. Discourage land use development in areas that have been identified by the appropriate agencies as critical winter range or on areas that provide secure access to this winter range.

7. Keep the big game winter range data current.

8. Expand domestic animal control measures to adequately protect wildlife.

9. Reduce the number of wildlife and human conflicts in the following ways:

a. Encourage within new residential subdivisions (especially those proposed in the middle and upper portions of the Valley and adjacent to the hillsides), indoor or bear-proof garbage containers and central trash pickup areas.

b. Encourage homeowners to install indoor or bear-proof garbage containers.

c. Encourage property owners to take care of their fruit orchards, compost piles, pet food, and any other outside food sources and restrict wildlife access to them.

d. Educate residents about the possible hazards of raising of chickens and pigs, operating beehives, etc.

10. Coordinate landowners, neighborhood groups, and wildlife management agencies to establish guidelines and priorities related to wildlife and development. Form sound land management and development guidelines which will minimize future confrontations.

11. Enhance existing wildlife habitat through weed control and other appropriate management practices to preserve wildlife carrying capacities.

12. Minimize the clearing of vegetation in wildlife travel corridors (such as wooded draws), and provide an

adequate buffer strip between dwellings and the corridor.

13. Use the Rattlesnake Valley as the initial study area for development of a community forestry plan.

14. Preserve healthy trees, whenever possible, in the case of development or improvement of property. Modify development plans, as needed, to minimize development impacts on these trees.

15. Encourage planting of suitable trees in parklands and public right-of-ways.

16. Provide for on-going maintenance and care of trees utilizing standard arboricultural practices.

17. Encourage the preservation, planting, and maintenance of trees on private land.

18. Pay careful attention to the potential for wildfire on lands to be developed that are too close to forests and grass lands and avoid areas where the fire potential is greatest.

Cooperating Parties:

- Missoula Office of Community Development
- Missoula Office of Planning and Program Development
- Missoula Parks and Recreation Department
- Montana Department of Fish, Parks and Wildlife
- Montana Department of State Lands
- Rattlesnake residents

Transportation Policies and Actions

Based on existing conditions, the land use plan proposed by this Plan update, and continuing discussions with Rattlesnake citizens, the major roadways may be improved. Alternatives include building bicycle/pedestrian lanes, turning lanes, and wider shoulders. Additional automobile lanes are not desirable, according to public input. All road improvement projects should consider the long term planning goals and objectives for the Valley.

The Plan recommends the following general policies for transportation and infrastructure improvements:

- Ensure that new development pays its full share of the cost of transportation improvements.

- Design cost sharing formulas and plans in cooperation with area property owners prior to the construction of each project.

- Limit additional individual lot vehicle access onto Van Buren Street/Rattlesnake Drive and Greenough/Duncan Drive.

- Hold public discussions to evaluate transportation issues. If proposals are made to improve the transportation system in order to accommodate existing and additional traffic more safely, continue public discussions to assess their benefits to the community, impacts on adjacent residents, level of public support, and methods of mitigating such impacts on adjacent residents.

- Continue to compile data regarding traffic flows, air and water quality data, as it becomes available from the Health Department, noise levels, traffic accidents, and street improvement programs. Establish an ongoing monitoring program, and review each new subdivision and rezoning request within the planning area in terms of the cumulative impacts and overall carrying capacity of the Rattlesnake Valley for additional traffic.

- The Rattlesnake Valley has existing patterns of development that are often semi-rural. Full "urban" transportation infrastructure treatments may be neither necessary nor desirable.

- Development should take into account the capacity of the existing road network. The Plan does not envision the construction of new arterial roads for the purpose of expanding capacity.

- Discourage high vehicular speeds and enhance pedestrian crossings upon collector streets by the usage of speed control structures such as islands and medians within any street improvements.

- Enhance the existing nature of quiet neighborhoods upon non-collector residential streets with the usage of traffic calming improvements and narrower than standard street widths.

In addition to the general policies stated above, it is the goal of the City of Missoula to safely accommodate all who use our transportation systems to minimize conflicts among users and to provide facilities that will encourage non-motorized travel and enhance mobility and access for all citizens.

Facilities to serve bicyclists and pedestrians can range from paths and trails, to sidewalks and bicycle lanes, to shoulder widening and striping, to curbs and gutters. Travel systems must be designed and constructed so that they take into account traffic volumes and speeds; coherence with adjacent facilities; and the characteristics, competencies, and expected mix of potential users. For example, on arterials and collectors, a blend of bicycle lanes, sidewalks, turn bays, boulevards, and adequate lane widths may be necessary in order to safely accommodate all users and minimize conflicts. On more "local" types of streets or situations, less intensively "engineered" facilities may be acceptable.

To the greatest extent possible, bicycle and pedestrian facilities in the Rattlesnake Valley should be constructed within existing right-of-way and in a manner that maintains neighborhood character. At the same time, we recognize that the Rattlesnake area is an extremely popular destination point for local citizens and for visitors from outside the immediate Rattlesnake "neighborhood". That "outsider" use must be taken into account when designing a transportation system to adequately serve the Rattlesnake Valley.

Cooperating Parties:

- Missoula Office of Community Development
- Missoula Public Works Department
- City and County emergency service agencies
- Feet First
- Montana Power
- U.S. West Communications
- Rattlesnake residents

Neighborhood Character and Quality of Life Policies and Actions

Map 13: Proposed Land Use

1. Encourage location of higher density residential development in the southern portion of the Rattlesnake Valley due to its proximity to services, the University of Montana, and existing roadway and pedestrian networks, as long as air quality problems and traffic do not adversely impact the health of residents in the Lower Rattlesnake.

2. All subdivision, zoning and rezoning requests should substantially comply with the land use recommendations of this Plan.

3. Keep a log of all new construction within the Rattlesnake Valley. As each new subdivision, zoning or

rezoning request is reviewed, evaluate the proposed development's impact on air quality, water quality, and transportation.

4. Establish an interagency task force to study methods of insuring proper development and use of city, county and federal lands within the Valley. Pay particular attention to issues such as the impact of traffic generated by the Rattlesnake National Recreation and Wilderness Area on residential life in the Valley.

5. Encourage neighborhood commercial land uses in the areas designated "Mixed Neighborhood Commercial/Residential Overlay Zone" (see Rattlesnake Zoning Map). The City or County will base it's final decision, on whether or not a particular use is allowed on the criteria established in Chapter 19.63 of City Zoning Ordinance for evaluating conditional uses and the extent to which the site plan meets the design standards established in the mixed use overlay zone, in addition to the following criteria:

   a. Facilities that dispense fuel and those which dispense alcoholic beverages (other than beer and wine sold for home consumption or served with food) are prohibited.

   b. Neighborhood commercial sites be architecturally compatible with the neighborhood in which they are located. Guidelines should be developed by the Office of Community Development which address building material, landscaping type and amount, design, color, and signs for the commercial site and buildings.

6. Residential development such as nursing homes and extended care facilities with self-contained commercial services (laundry facilities and cafeteria) are permitted. Such commercial services, however, be limited in size and scope and designed to service residents of the facility within which it is located.

7. Provide wildfire safety information for the protection of life, property and resources through fire education programs where wildfire problems exist.

8. Include in zoning ordinance standards for development in wildland-urban interface areas which provide protection of improvements.

9. Reduce fuel and promote land stewardship in residential areas surrounded by dense forest to reduce the risk of fire.

10. Development proposals within 200 feet of the area of the fault in the middle Rattlesnake shown on the geology map (map #6) should include a careful geologic, hydrologic, and soils analysis.

11. Require a traffic study with neighborhood commercial and intensive residential development proposals to exhibit the impacts of such developments on the existing transportation network and surrounding neighborhood.

12. Continue the City Fire/Rural Fire First Response cooperative agreement to provide fire and emergency medical services. Develop a plan which analyzes the fire and other disaster hazards in the Rattlesnake Valley, and adopt a comprehensive strategy for providing efficient and timely service to the area.

Rather than assign a development density threshold for the Rattlesnake Valley, this Plan Update recommends the following:

13. Establish and apply residential zoning districts which recognize the urban, suburban, semirural, and, in some cases, rural character of the lands which have recently been annexed into the City of Missoula. With sound site planning and municipal services planning, the Rattlesnake Valley can support additional incremental development. This development should be at a scale which is compatible with the development patterns of existing Rattlesnake neighborhoods and the natural ecosystem which underlies and surrounds the entire study area.

14. Establish and apply development and design standards to guide land use activities on environmentally sensitive lands. Guidelines like the *Hillside Design Guideline Handbook* would address development constraints posed by the physical characteristics of certain areas (e.g., steep slopes and unstable soils); the natural and cultural resources (e.g., water, riparian vegetation, wildlife, and historic sites); and the presence of public investments (e.g., utility corridors and open space), where adjacent lands may merit special attention to protect the investment and/or public health and safety. The intent of these development standards would be to enable development to occur on sensitive lands in an environmentally sound manner applicable consistently throughout the community. These standards could take the form of a development permit checklist, an overlay zone, or some other regulations which take into account the expertise and interests of both resource specialists and developers.

Cooperating Parties:

- Missoula Office of Community Development
- Missoula Public Works Department
- Missoula Consolidated Planning Board
- City and County emergency service providers
- State and Federal land management agencies
- Missoula City Council
- Missoula Board of County Commissioners
- Rattlesnake residents

CONCLUSION

This update of the Rattlesnake Valley Plan recognizes and reaffirms the original goals of the 1988 Rattlesnake Valley Comprehensive Plan Amendment while incorporating community goals derived from the Missoula Urban Comprehensive Plan, the Non-Motorized Transportation Plan and the City-County Growth Management process. The plan also incorporates the guiding principles formulated by the Rattlesnake residents through an intensive public involvement process.

The implementation of the recommended policies and actions to implement the goals and guiding principles does not rest solely with local government. The government and residents, working together as a partnership, are able to base future decisions on the neighborhood vision found in this plan.

DATA REFERENCES

The Rattlesnake Valley Comprehensive Plan Amendment is based upon the sources cited within the document itself, information received from numerous federal, state, and local agencies (private and governmental), and several documents, including but not limited to, the following:

1. *Missoula- A Policy Guide for Urban Growth* (1975)

2. *Missoula County Comprehensive Plan*, 1975

3. *Missoula County Parks, Recreation, and Open Space Plan* (1976)

4. *Missoula County Population Analysis*, October 1983

5. *1990 Census Information*

6. *1965 Missoula Urban Transportation Plan*

7. *Inventory of Conservation Resources, Missoula County* (1992)

8. *Rattlesnake Sanitary Sewer Report* (1985)

9. *Sewer Service Agreement between Sunlight Development Corporation, City of Missoula, and Missoula County.* Book 292, page 782, Missoula County Clerk & Recorder.

10. *Missoula Urban Transportation Plan 1985 Update*

11. *Guidelines for Creating a Non-Motorized Travel Network for the Greater Missoula Area* (1994)

12. *Missoula County Recreation Needs Assessment Survey* (1986)

13. *Missoula County Capital Improvement Program*, 1987-1991

14. *Home Sales Demand-* Lambros Realty

15. *1990 Update, Missoula Urban Comprehensive Plan*

16. *1995 Urban Area Open Space Plan*

17. *1988 Rattlesnake Comprehensive Plan Amendment*

18. *1992 Limited-Scope Update of Rattlesnake Comprehensive Plan Amendment*

19. *Planning for Growth in Missoula County* - working document (9-9-94)

20. *Hillside Design Guidelines Handbook*, 1995

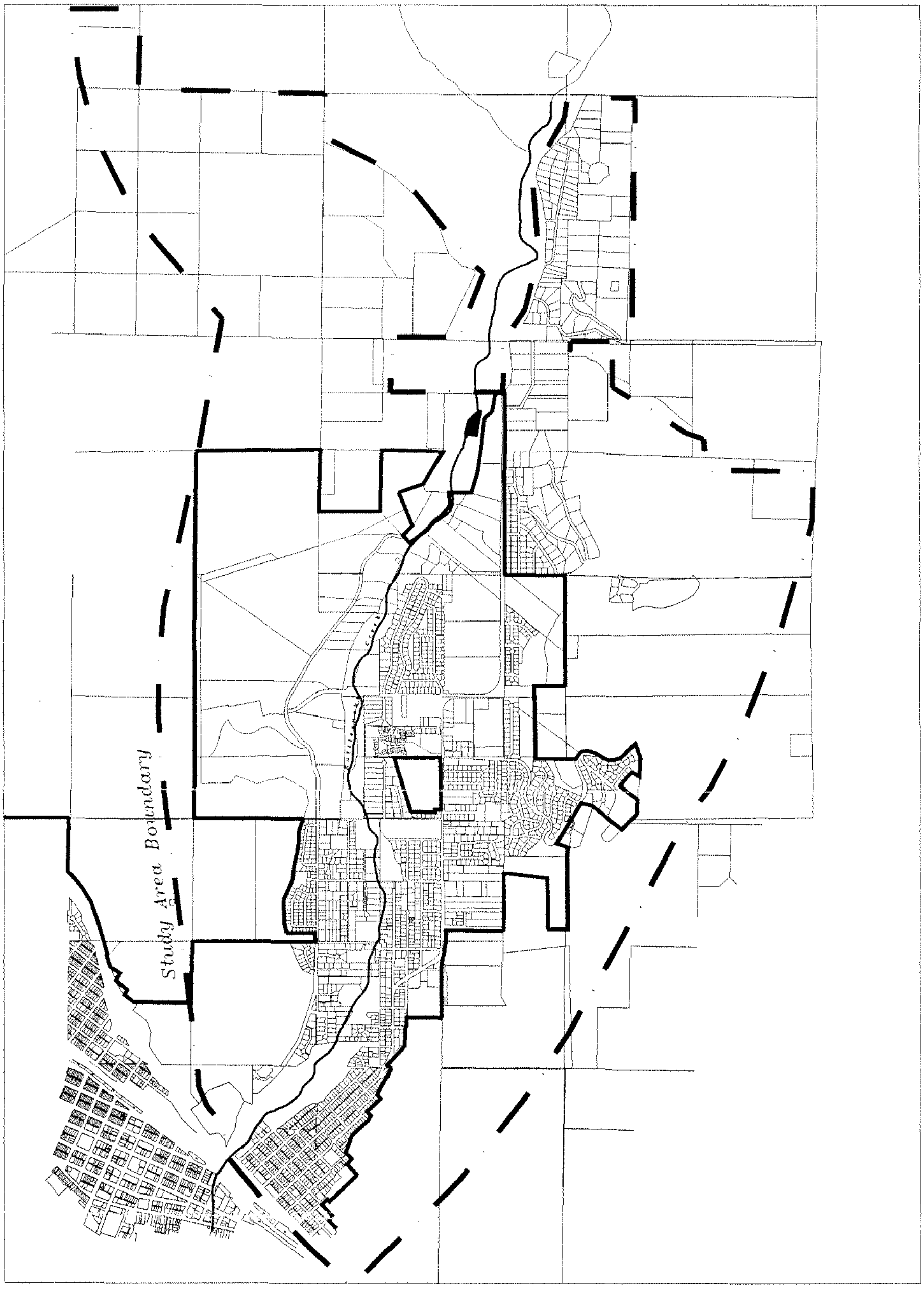
21. *Inventory of Conservation Resources*, 1985

In addition, information was gathered and future development options were discussed at length at numerous community forums, neighborhood meetings, and citizen group work sessions held between 1990 and 1995. This input, combined with correspondence from area property owners, Missoula County residents, City, County, State and Federal agencies was invaluable to the preparation of this document.

MAPS

1. Traffic counts

2. Rattlesnake land use and zoning



Rattlesnake Valley Planning Area

Planning Area

Study Area Boundary

Missoula City Limits

The Study Area Boundary includes all the area that would be in the Rattlesnake Creek Watershed.

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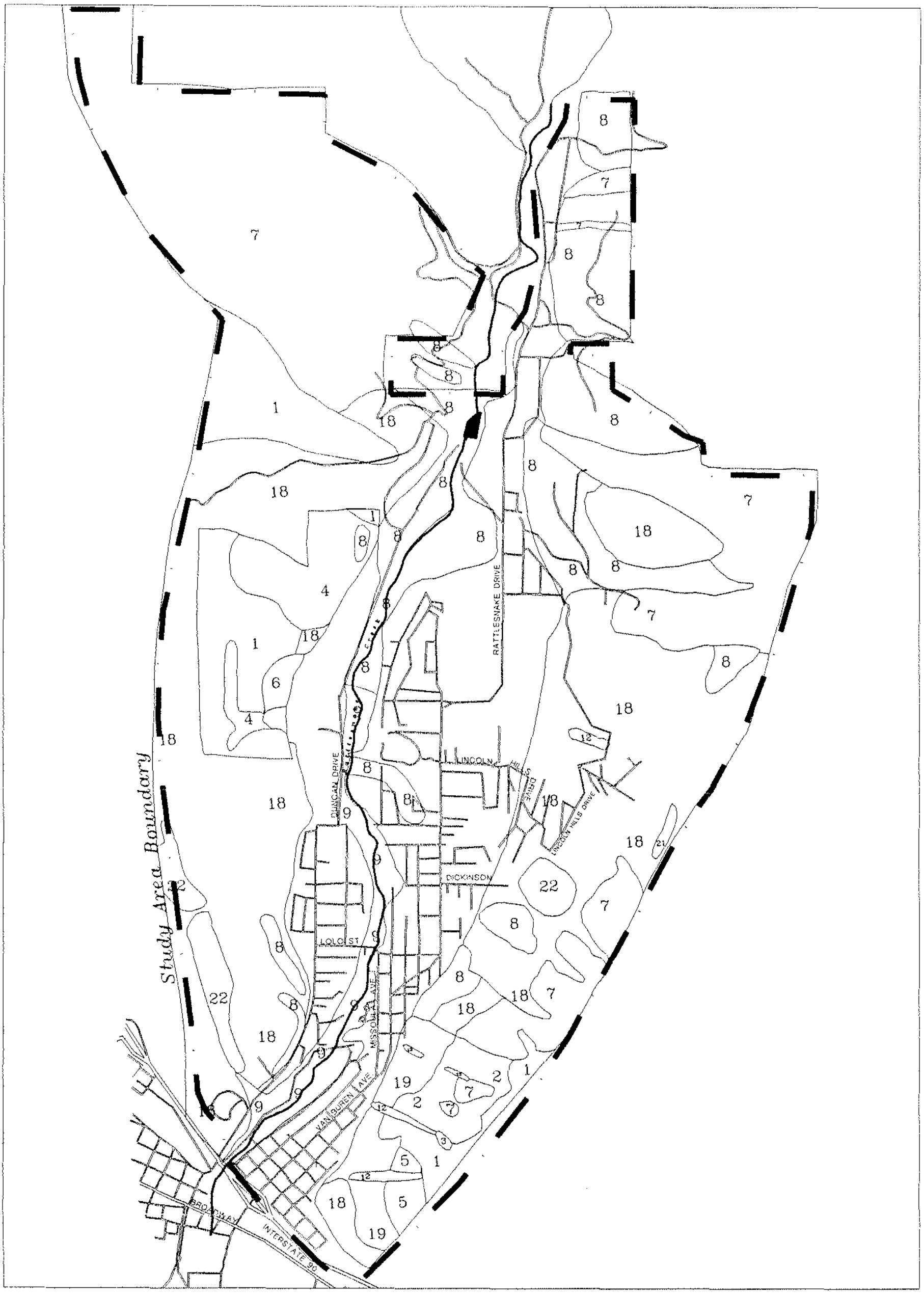
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Source: Office of Community Development

Map #1



Rattlesnake Valley Planning Area

Vegetation Dominance Types

1. Argropyron spicatum
2. Festuca idahoensis
3. Festuca scabrella
4. Poa pratensis
5. Bromus tectorum
6. Bromus japonicus
7. Pseudotsuga menziessii
8. Pinus ponderosa
9. Populus trichocarpa
10. populus tremuloides
11. Crataegus douglasii
12. Amelanchier alnifolia
13. Physocarpus malvacues
14. Cornus stolonifera
15. Symphoricarpos albus
16. Stipa comata
17. Poa sandbergii
18. Centautea maculosa
19. Potentilla recta
20. Douglasia montana
21. Selaginella densa
22. Euphorbia psula

Source: John Pierce, Botanist, Missoula, Montana

Map #2

N

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MISSOULA CITY COUNTY

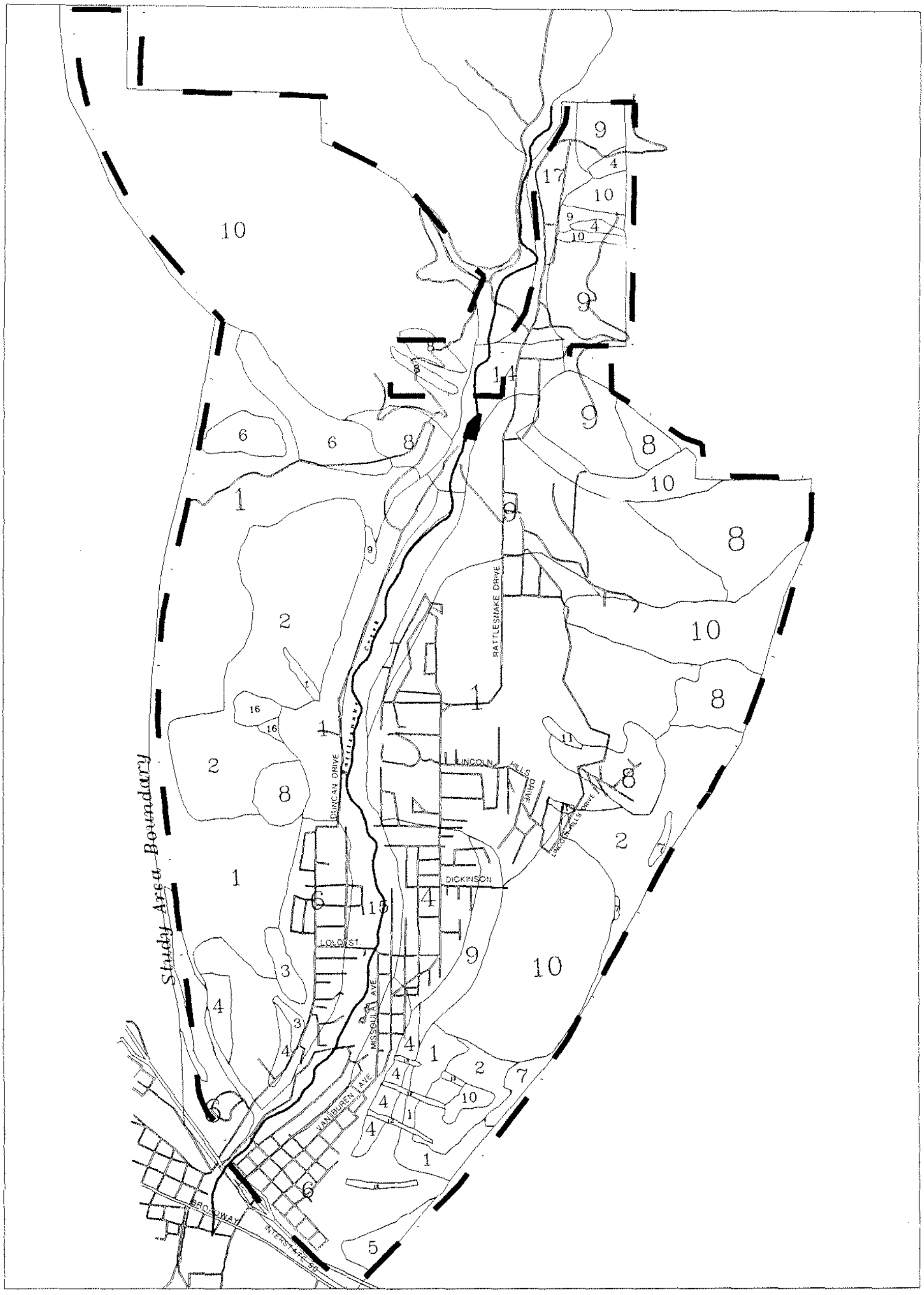
OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

DOMINANCE TYPE

1. *Agropyron spicatum* -AGRSPI - AGSP - Bluebunch Wheatgrass
2. *Festuca idahoensis* - FESTIDA - FEID - Idaho Fescue
3. *Festuca scabrella* - FESSCA - FESC - Rough Fescue
4. *Poa pratensis* - POAPRA - POPR - Kentucky Bluegrass
5. *Bromus tectorum* - BROTEC - BRTE - Cheatgrass
6. *Bromus japonicus* - BROJAP - BRJA - Japanese Brome
7. *Pseudotsuga menziessii* - PSEMEN - PSME - Douglas Fir
8. *Pinus ponderosa* - PINPON - PIPO - Pondersa Pine
9. *Populus trichocarpa* - POPTRI - POTR - Black Cottonwood
10. *Populus tremuloides* - POPTRE - POTE - Quaking Aspen
11. *Crataegus douglasii* - CRADOU - CRDO - Black Hawthorne
12. *Amelanchier alnifolia* - AMEALN - AMAL - Western Serviceberry
13. *Physocarpus malvacues* - PHYMAL - PHMA - Ninebark
14. *Cornus stolonifera* - CORSTO - COST - Red Osier Dogwood
15. *Symphoricarpos albus* - SYMALB - SYAL - Common Snowberry
16. *Stipa comata* - STICOM - STCO - Needle-and-thread
17. *Poa sandbergii* - POASAN - POSA - Sandberg's Bluegrass
18. *Centautea maculosa* - CENMAC - CEMA - Spotted Knapweed
19. *Potentilla recta* - POTREC - PORE - Sulphur Cinquefoil
20. *Douglasia montana* - DOUMON - DOMO - Rocky Mountain Douglasia
21. *Selaginella densa* - SELDEN - SEDE- Spikemoss Selaginella
22. *Euphorbia psula* - EUOOSU - EUPS - Leafy spurge

SOURCE: John Pierce, Botanist, Missoula, Montana



Rattlesnake Valley Planning Area

Vegetation Habitat Types

See reverse side of map
for complete descriptions.

N

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1:25200

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Source: John Pierce, Botanist, Missoula, Montana

Map #3

HABITAT TYPE

1. *Argropyron spicatum* - AGRISP - AGSP - Bluebunch Wheatgrass
   Festuca idahoensis - FESIDA - FEID - Idaho Fescue

2. *Agropyron spicatum* - AGRISP - AGSP - Bluebunch Wheatgrass
   Festuca scabrella - FESSCA - FESC - Rough Fescue

3. *Argropyron spicatum* -AGRISPI - AGSP - Bluebunch Wheatgrass
   Pseudotsuga menziessii - PSEMEN - PSME - Douglas Fir

4. *Agropyron spicatum* - AGRISP - AGSP - Bluebunch Wheatgrass
   Pinus ponderosa - PINPON - PIPO - Ponderosa Pine

5. *Agropyron spicatum* -AGRISP - AGSP - Bluebunch Wheatgrass
   Stipa comata - STICOM - STCO - Needle-and-thread

6. *Agropyron spicatum* - AGRISP - AGSP - Bluebunch Wheatgrass
   Poa sandbergii - POASAN - POSA - Sandberg's Bluegrass

7. *Agropyron spicatum* - AGRISP - AGSP - Bluebunch Wheatgrass
   Douglasia montana - MOUMON - DOMO - Rocky Mountain Douglasia

8. *Festuca idahoensis* - FESIDA - FEID - Idaho Fescue
   Pseudotsuga menziessii - PSEMEN - PSME - Douglas Fir

9. *Festuca idahoensis* - FESIDA - FEID - Idaho Fescue
   Pinus ponderosa - PINPON - PIPO - Ponderosa Pine

10. *Pseudotsuga menziessii* - PSEMEN - PSME - Douglas Fir
    Physocarpus malvaceus - PHYMAL - PHMA - Ninebark

11. *Crataegus douglasii* - CRADOU - CRDO - Black Hawthorne

12. *Amelanchier alnifolia* - AMEALN - AMAL - Western Serviceberry

13. *Physocarpus malvaceus* - PHYMAL - PHMY - Ninebark

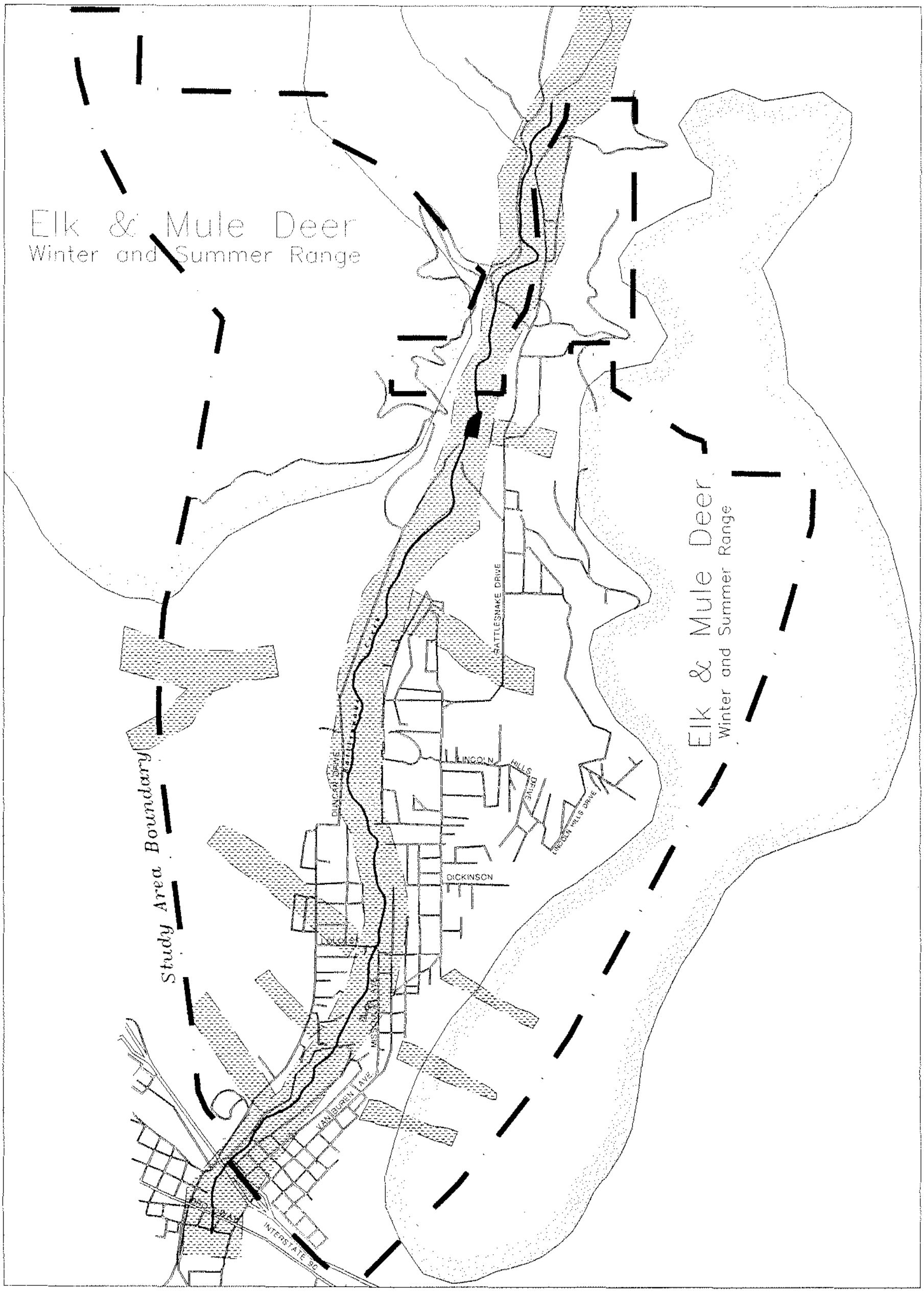
14. *Pinus ponderosa* - PINPON - PIPO - Ponderosa Pine
    Symphoricarpus albus - SYMALB - SYAL - Common Snowberry

15. *Pinus ponderosa* - PIPON - PIPO - Ponderosa Pine
    Cornus stolonifera - CORSTO - COST - Red Osier Dogwood

16. *Poa pratensis* - POAPRA - POPR - Kentucky Bluegrass
    Populus trichocarpa - POPTRI - POTR - Black Cottonwood

17. *Pseudotsuga menziessii* - PSEMEN - PSME - Douglas Fir
    Symphoricarpus albus - SYMALB - SYAL - Common Snowberry

Source: John Pierce, Botanist, Missoula, Montana



Rattlesnake Valley Planning Area

Wildlife Habitat and Corridors

Wildlife Corridors or Crossings

Note: The Rattlesnake Valley is abundant with wildlife. Whitetail deer are found throughout the study area, as are many different species of birds and animals.

N

0 1/2 Mile 1 Mile

1:25200

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Source: Bob Henderson, Montana Department of Fish, Wildlife and Parks

Map #4

Maps Created by: Dave Dewing & Erik Benson

Rattlesnake Valley Planning Area

Soil Types

- Argi – Argiborolls–Haploborolls
- B–A – Big Arm Gravelly Loam
- GL – Glaciercreek Variant–Glaciercreek Complex
- Mse – Moiese Gravelly Loam
- MT – Mitten–Tevis Complex
- Rep – Repp Very Gravelly Loam
- TL – Totelake Gravelly Loam
- U – Urban Land
- WKR – Winkler Very Gravelly Sandy Loam

N

0 1/2 Mile 1 Mile

1:25200

Source: United States Department of Agriculture: Soil conservation Service
Missoula County Soil Survey (September 1983)
W.I. Vanderpool and Candis Stewart, Geologists, Missoula, Montana

Map #5

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

SOILS

MAP UNIT	SCS APPROVED MAP UNIT NAME
AGRI-HAPLO	7-10 AGRIBOROLLS-HAPLOBOROLLS Derived from Tertiary sediments, texture is highly variable, strongly mixed on hillsides and landslides. Drainage is generally good; high-swelling clay lenses reduce drainage locally, sand lenses increase drainage locally. Permeability is very slow to moderate, runoff is medium, hazard of water erosion is moderate. Requires on site investigation to determine suitability for development. Susceptible to mass failure.
BIGARM	16-19 BIGARM GRAVELLY LOAM Derived from alluvium. Consist of sandy loam with some pebbles and cobbles present. Drainage is excessive; very low water capacity. Permeability is moderate, runoff is slow and hazard of erosion is slight. Well to moderately suited for development on slopes < 15%, poorly suited for development on slopes > 15%. Susceptible to cutbank failure.
GLACIER	44 GLACIERCREEK VARIANT - GLACIERCREEK COMPLEX Derived from alluvium over glacial outwash. Consists of sandy loam and gravelly silt loam. Drainage is moderate, water capacity is low to moderate. Permeability is moderately rapid, runoff is medium and the hazard of erosion is moderate. Development is constrained by rapid permeability and cutbank instability.
MIT.-TEV.	71 MITTEN-TEVIS COMPLEX Derived from colluvium of agrillite and quartize with high component of volcanic ash. Consists of gravelly silt loam and gravelly loam. Drainage is moderate, water capacity is low to moderate. Permeability is moderately rapid, runoff is slow and hazard of water erosion is high. Development is constrained by steepness of slope.
MOIESE	72 MOIESE GRAVELLY LOAM Derived from sandy and gravelly alluvium. Consists of gravelly loam, may be very sandy. Drainage is excessive, extremely low water capacity. Permeability is very rapid, runoff is slow and hazard of water erosion is slight. Development constrained by rapid permeability and cutbank instability.
REPP	89-92 REPP VERY GRAVELLY LOAM Derived from limestone and calcareous agrillite bedrock. Consists of gravelly loam with rocky or bedrock component. Drainage is good, water capacity is low to moderate. Permeability is moderate, runoff is medium to high and the hazard of water erosion is moderate to high. Development is constrained by steepness of slope and rock outcrops.
TOTELAKE	105 TOTELAKE GRAVELLY LOAM Derived from alluvium and glacial outwash. Consists of gravelly loam, may be very sandy. Drainage is excessive, extremely low water capacity. Permeability is moderately rapid, runoff is slow and the hazard of water erosion is slight. Development constrained by moderately rapid permeability and instability.
URBAN	114 URBAN LAND
WINKLER	131 WINKLER VERY GRAVELLY SANDY LOAM Formed from colluvium derived from agrillite and quartzite bedrock. May contain angular cobbles and boulders. Drainage is excessive, extremely low water capacity. Permeability is moderately rapid, runoff is rapid and the hazard of water erosion is high. Development is restricted because of slope restrictions.

Data from USDA, Soil Conservation Service, Missoula County Soil Survey (September, 1983).

Rattlesnake Valley Planning Area

Geology

- Qal – Alluvial Deposits
- pT – Pre-Tertiary Rocks
- Qat – Alluvial Deposits
- Qc – Colluvial Deposits
- Qf – Fan Deposits
- Qls – Landslide Deposits
- Qo – Outwash
- Tu – Teritary Deposits

N

0 1/2 Mile 1 Mile

1:25200

Source: Nelson & Dobell, 1961
Van der Poel, 1979
W.I. Van der Poel & Candis Stewart, Geologists, Missoula, Montana

Map #6

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewang & Erik Benson

GEOLOGY

Qal ALLUVIAL DEPOSITS (HOLOCENE)- Gravel, sand and silt transported by recent fluvial activity; deposits of recent floodplains.

Qc COLLUVIAL DEPOSITS (HOLOCENE)- Angular to sub-rounded accumulations of rock fragments derived from pre-existing deposits; regolith estimated or observed to exceed 2 meters in thickness.

Qf FAN DEPOSITS (HOLOCENE-PLEISTOCENE)- Alluvial deposits with surface which approximate conic sections in profile: slopes are variable. Locally included reworked till and grade into talus laterally.

Qls LANDSLIDE DEPOSITS (HOLOCENE-PLEISTOCENE)- Mass movement deposits from slope failures; parent material varies.

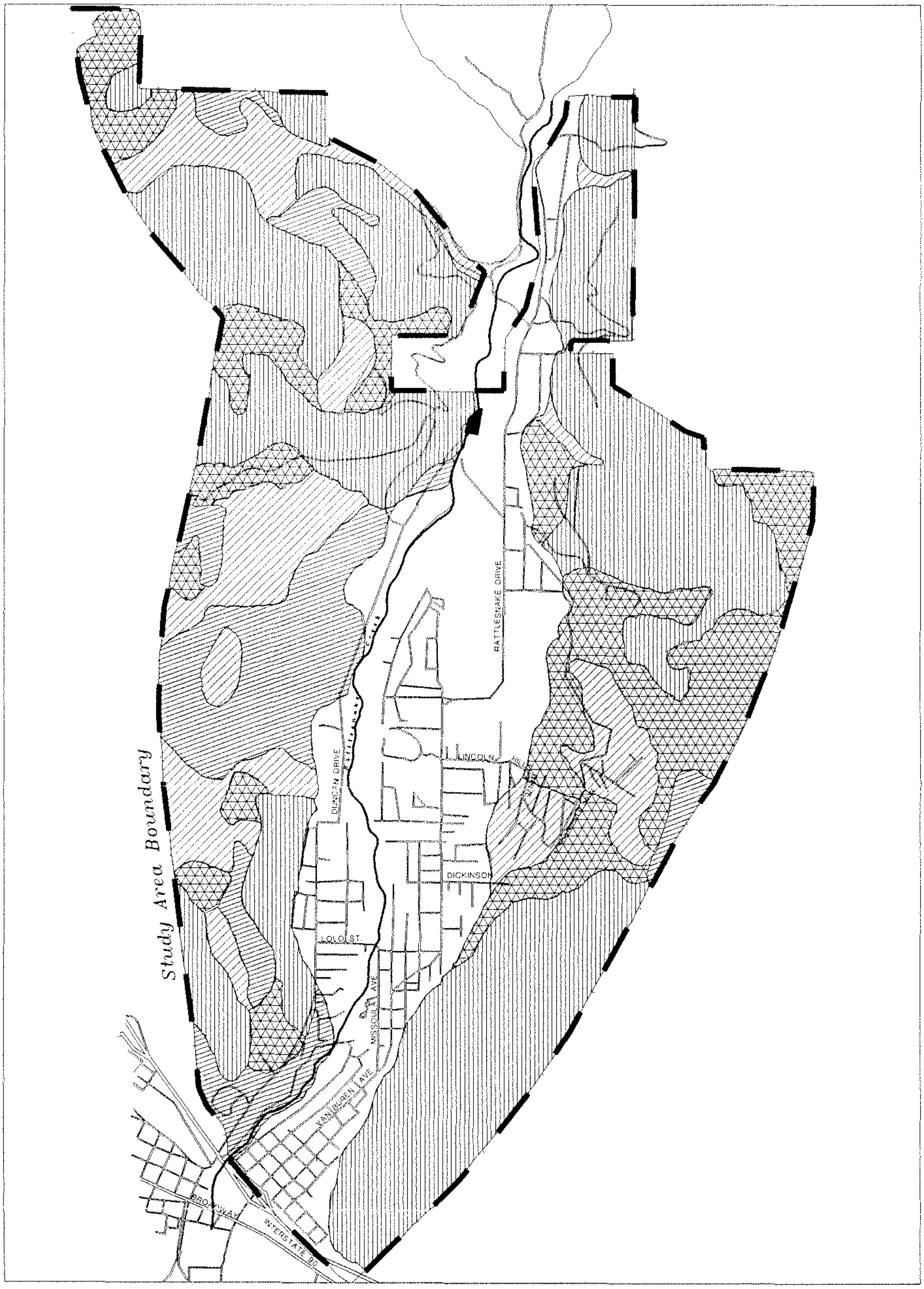
Qat ALLUVIAL DEPOSITS OF TERRACES (PLEISTOCENE)- Gravel, sand and silt composing terraces which occupy a geomorphic position below the uppermost outwash surface in the valley bottom.

Qo OUTWASH (PLEISTOCENE)- Boulders, gravel, sand and silt composing the uppermost alluvial surface in the canyon bottom; interfingers with till. Age varies with location.

Tu TERTIARY DEPOSITS, UNDIFFERENTIATED- Conglomerate shale, sandstone and siltstone with some coal and ash beds; shales typically contain high-swelling clays derived from volcanic ash.

pT PRE-TERTIARY ROCKS- Precambrian and Cambrian sediments; dominantly argillites, siltites, quartzites and limestone; locally include malic or felsic intrusives. strike and dip of beds strike and dip of overturned beds

SOURCE: Geologic mapping modified from Nelson and Dobell, 1961 and Van der Poel, 1979.



Rattlesnake Valley Planning Area

Slope Classifications

- 0 To 5%
- 5 TO 10%
- 10 TO 15%
- 15 TO 25%
- OVER 25%

N

0 1/2 Mile 1 Mile

1:25200

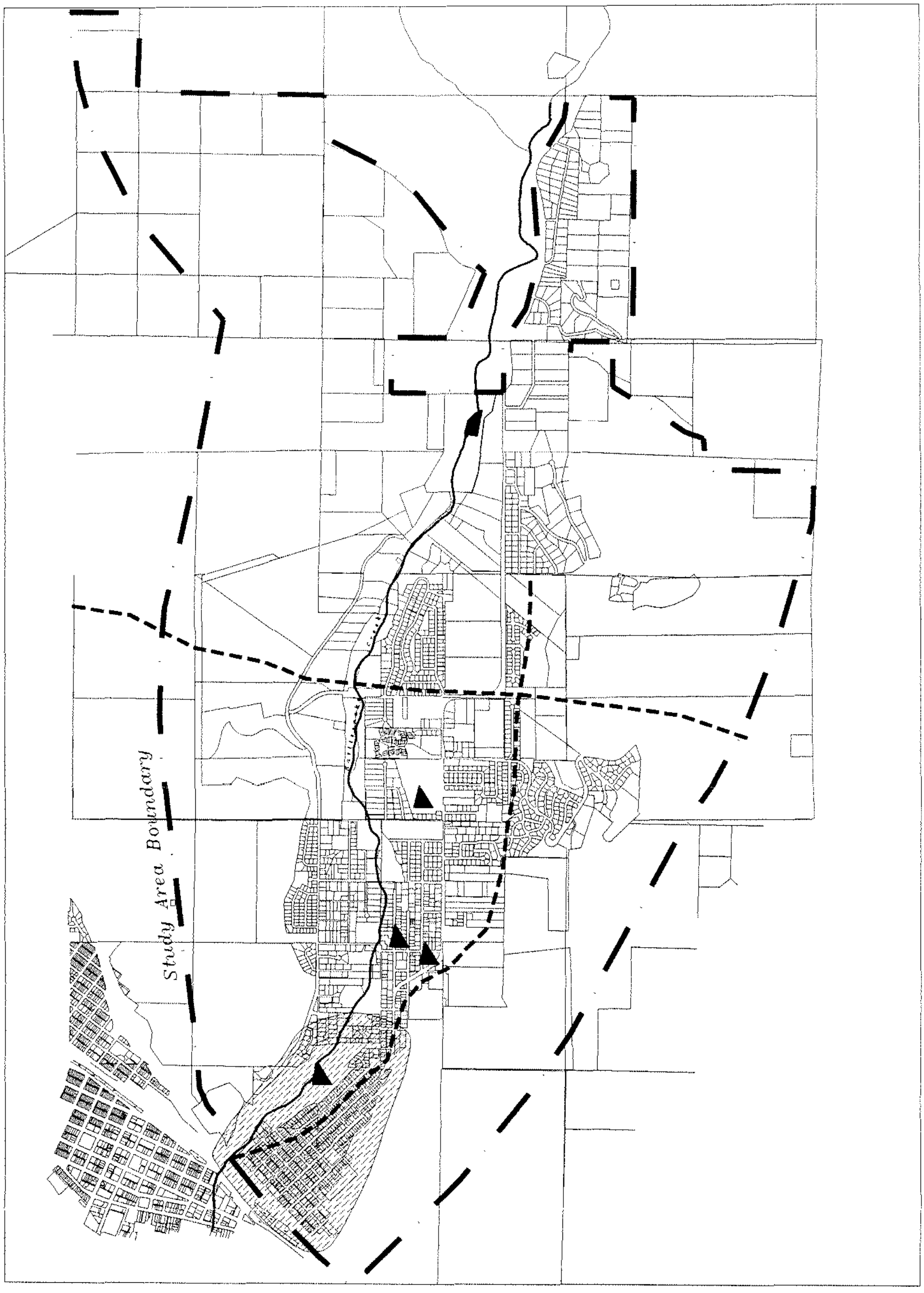
Source: United States Geological Survey
Office of Community Development

Map #7

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Historic and Cultural Features

Potential Historic District

Potential Historic and/or Archeological Site

Trail/Road (Old Trail to Walla Walla; U.S. Military Road; Early Roads of Rattlesnake Valley, etc.)

N

0 1/2 Mile 1 Mile

1:25200

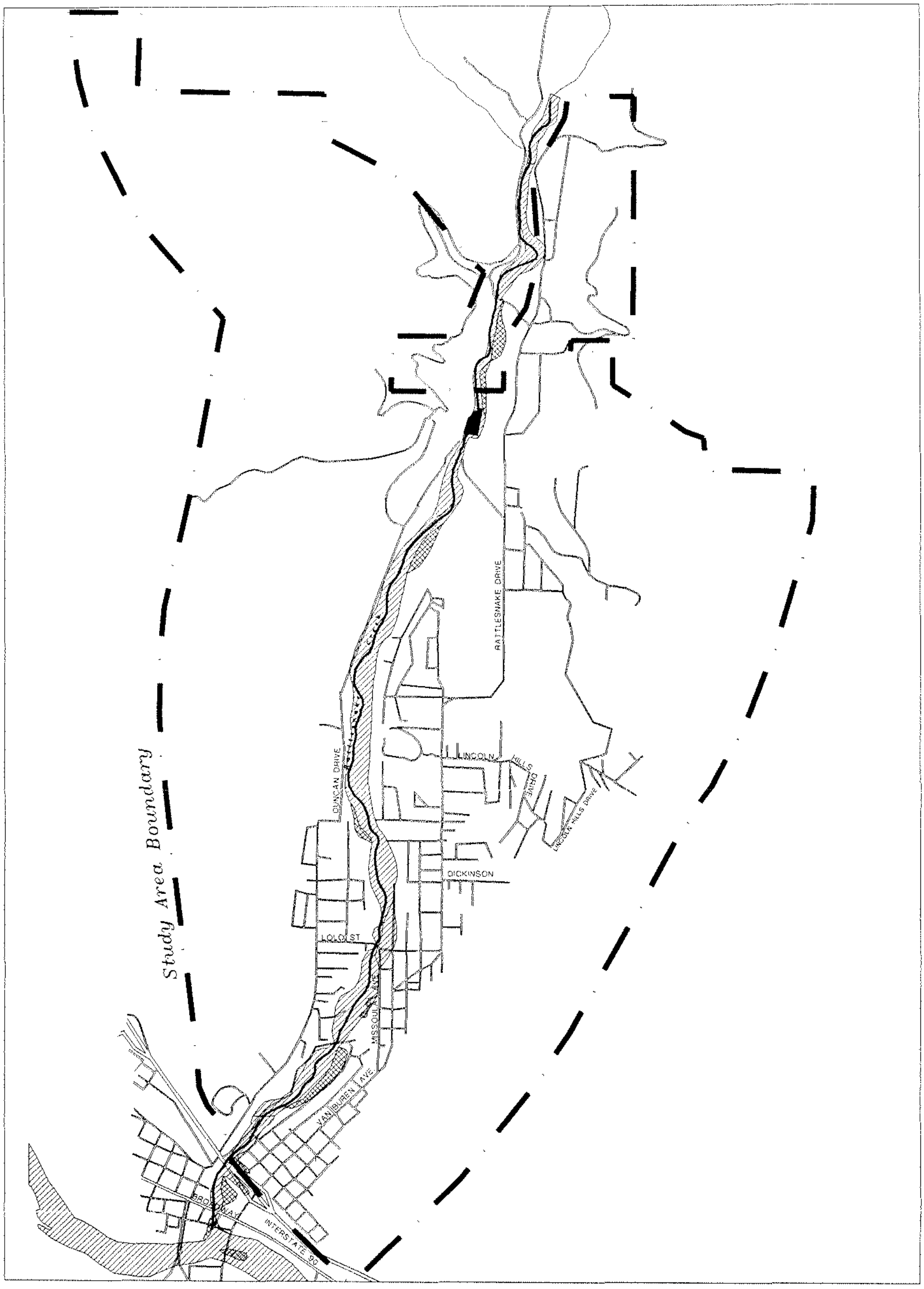
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Source: Office Of Community Development, Allan Mathews, Historic Preservation Officer

Map #8



Rattlesnake Valley Planning Area

Rattlesnake Creek Floodplain

Floodway Areas

Special Flood Hazard Areas Inundated By 100-Year Flood

N

0 1/2 Mile 1 Mile

1:25200

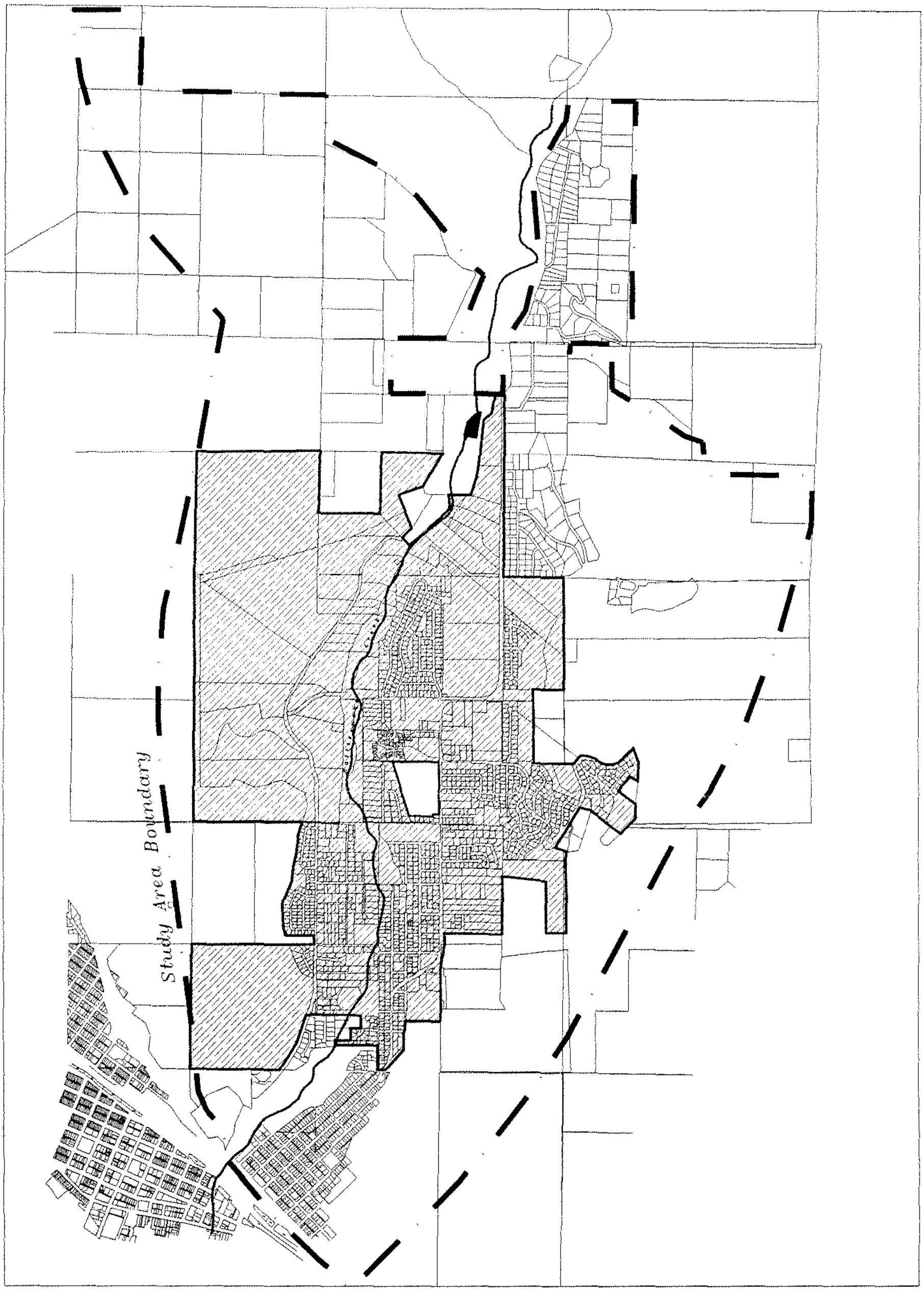
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Source: Federal Emergency Management Agency, 1988
Office of Community Development

Map #9

Maps Created by: Dave Dowing & Erik Benson



Rattlesnake Valley Planning Area

Areas of 1989 Annexation

Lands Annexed in 1989

N

0 1/2 Mile 1 Mile

1:25200

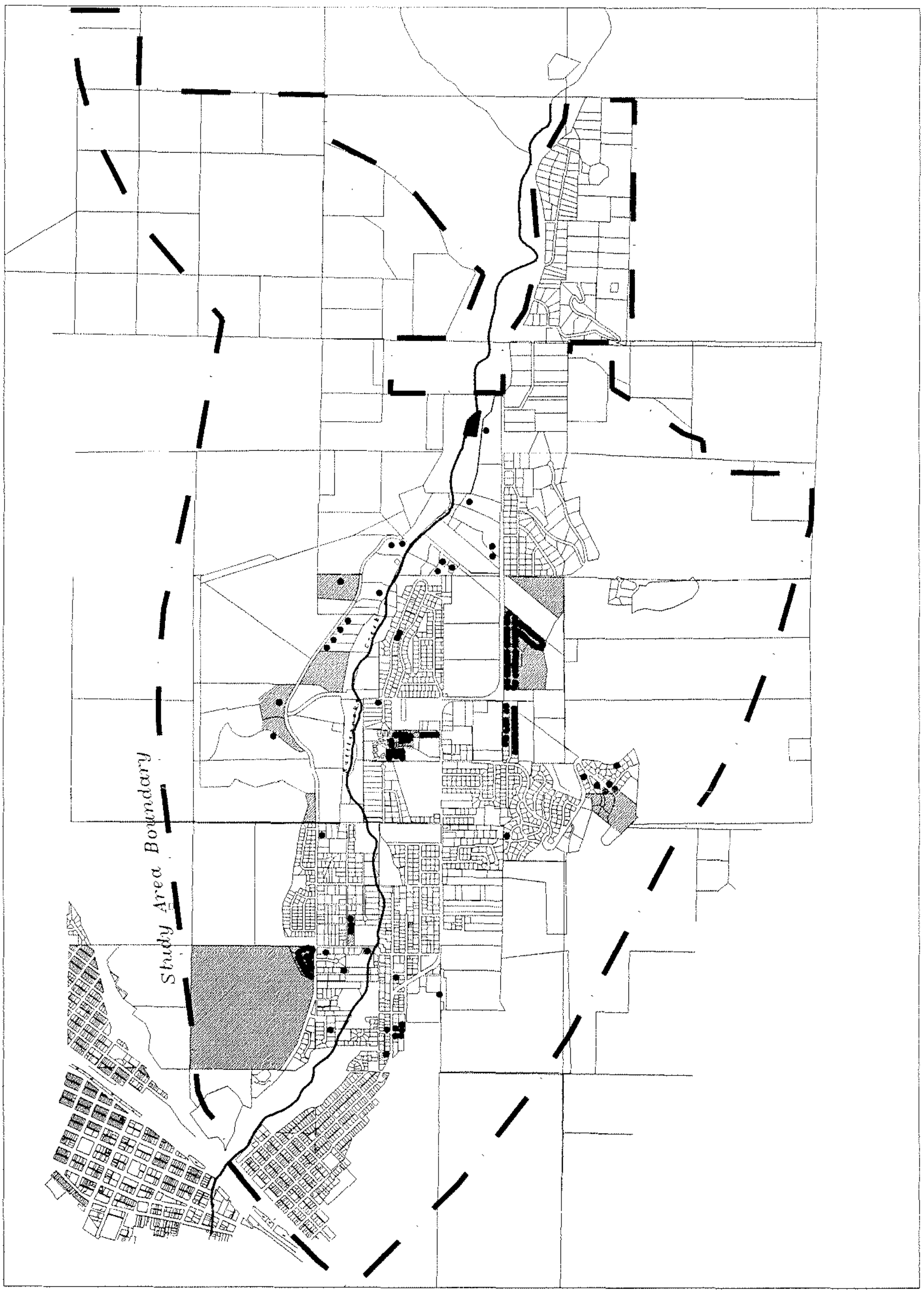
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Source: Office of Community Development

Map #10



Rattlesnake Valley Planning Area

Land Subdivisions and Building Permits Since 1990

Lands that have been subdivided since 1990 in the Rattlesnake Valley

• Building Permits Issued Since 1990
(Over 150 Building Permits Have Been Issued)

N

0 1/2 Mile 1 Mile

1:25200

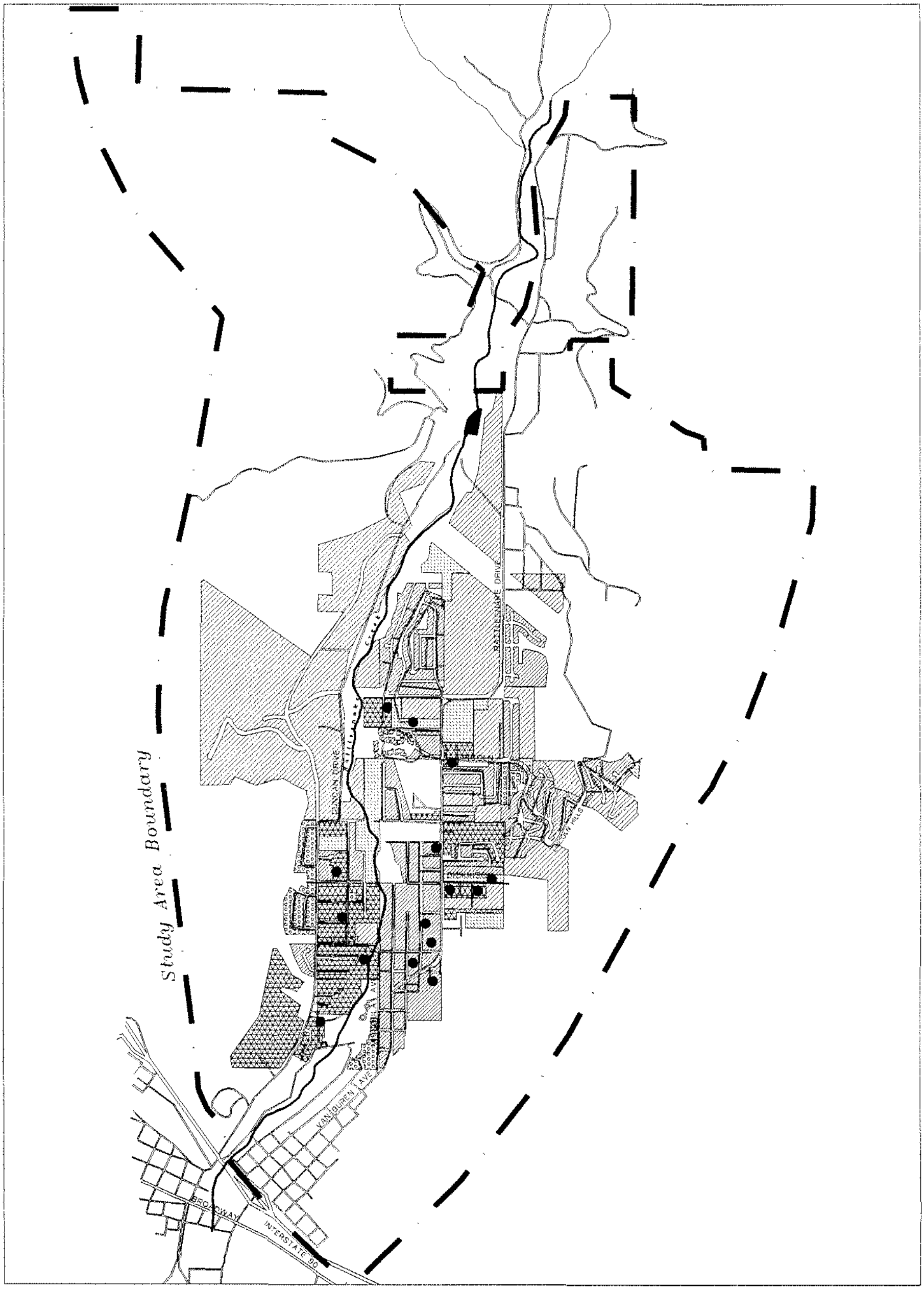
Source: Office of Community Development
Missoula Public Works

Map #11

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dowing & Erik Benson



Rattlesnake Valley Planning Area

Existing Land Use

(Assuming One Dwelling Unit per Parcel)

- 0 to .5 Dwelling Units per Acre
- 0.5 to 1 Dwelling Units per Acre
- 1 to 2 Dwelling Units per Acre
- 2 to 3 Dwelling Units per Acre
- 3 or More Dwelling Units per Acre
- ● Duplexes or Multi-Family Units

Note: Some areas actually contain more density than is shown on this map where duplexes and multi-family units exist on the parcel.

N

0 1/2 Mile 1 Mile

1:25200

Source: Office of Community Development

Map #12

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Rattlesnake Valley Planning Area

Proposed Land Use

- Open and Resource Lands
- 1 Dwelling Unit per 5-10 Acres
- 1 Dwelling Unit per 2 Acres
- 1 Dwelling Unit per 1 Acre
- 2 Dwelling Units Per 1 Acre
- 4 Dwelling Units per 1 Acre
- 6 to 8 Dwelling Units per 1 Acre
- Public Lands
- ★ Potential Future Parks

N

0 1/2 Mile 1 Mile

1:25200

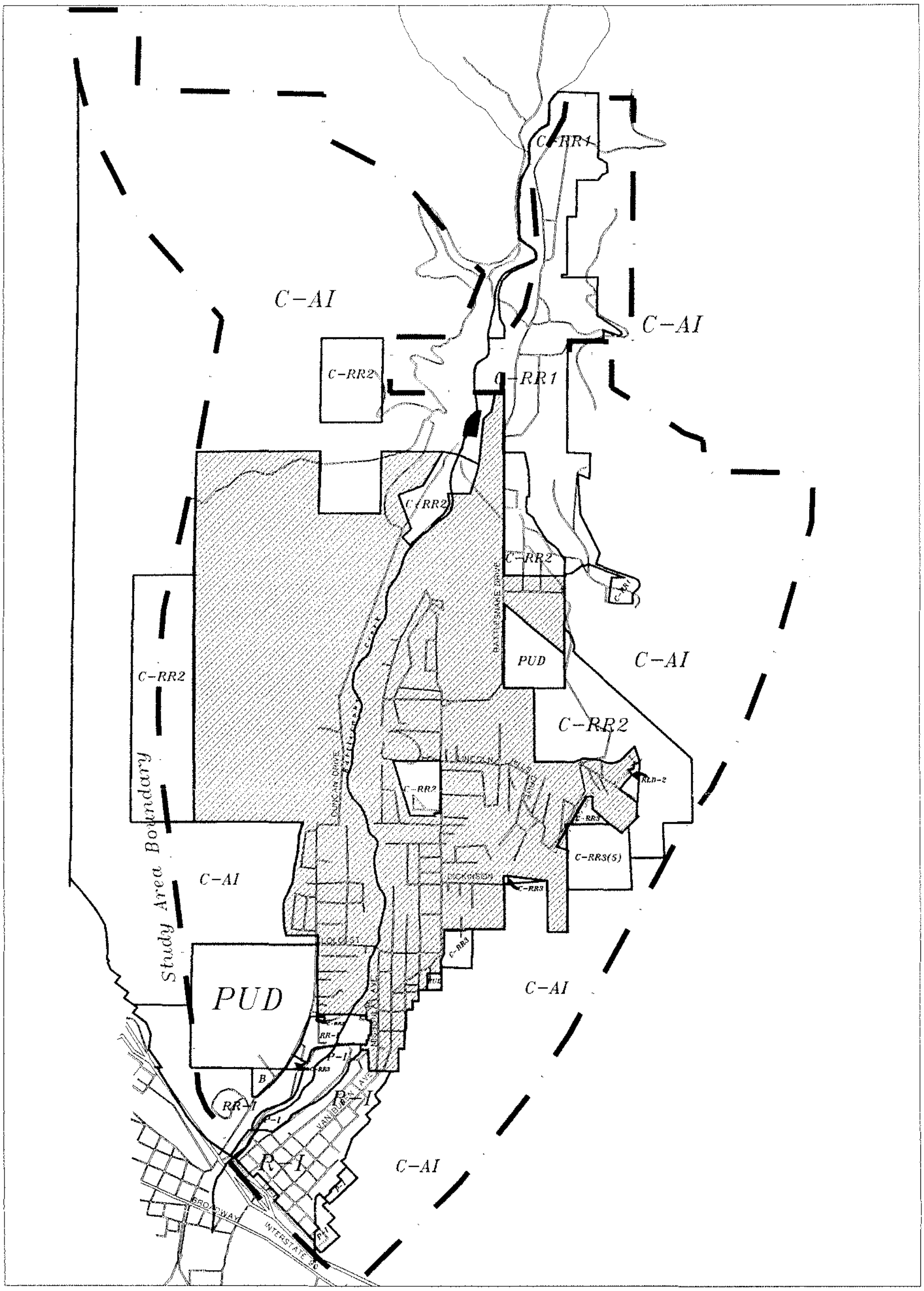
Source: Office of Community Development
Missoula Public Works

Map #13

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
August 23, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Existing Zoning

Unzoned

Zoning Lines

B - Residential District
C-A1 - Open and Resource Lands; 1 Dwelling Unit per 40 Acres (County)
C-RR1 - Residential - 1 Dwelling Unit per 1 Acre (County)
C-RR2 - Residential - 2 Dwelling Units per 1 Acre (County)
C-RR3 - Residential - 4 Dwelling Units per 1 Acre (County)
P-1 - Open Space District
PUD - Planned Unit Development
R-1 - Residential District; 8 Dwelling Units per 1 Acre
RLD-2 - Residential Low Density; 2 Dwelling Units per 1 Acre
RR-1 - Restricted One Family Residential District;
Approximately 5 Dwelling Units per 1 Acre

N

0 1/2 Mile 1 Mile

1:25200

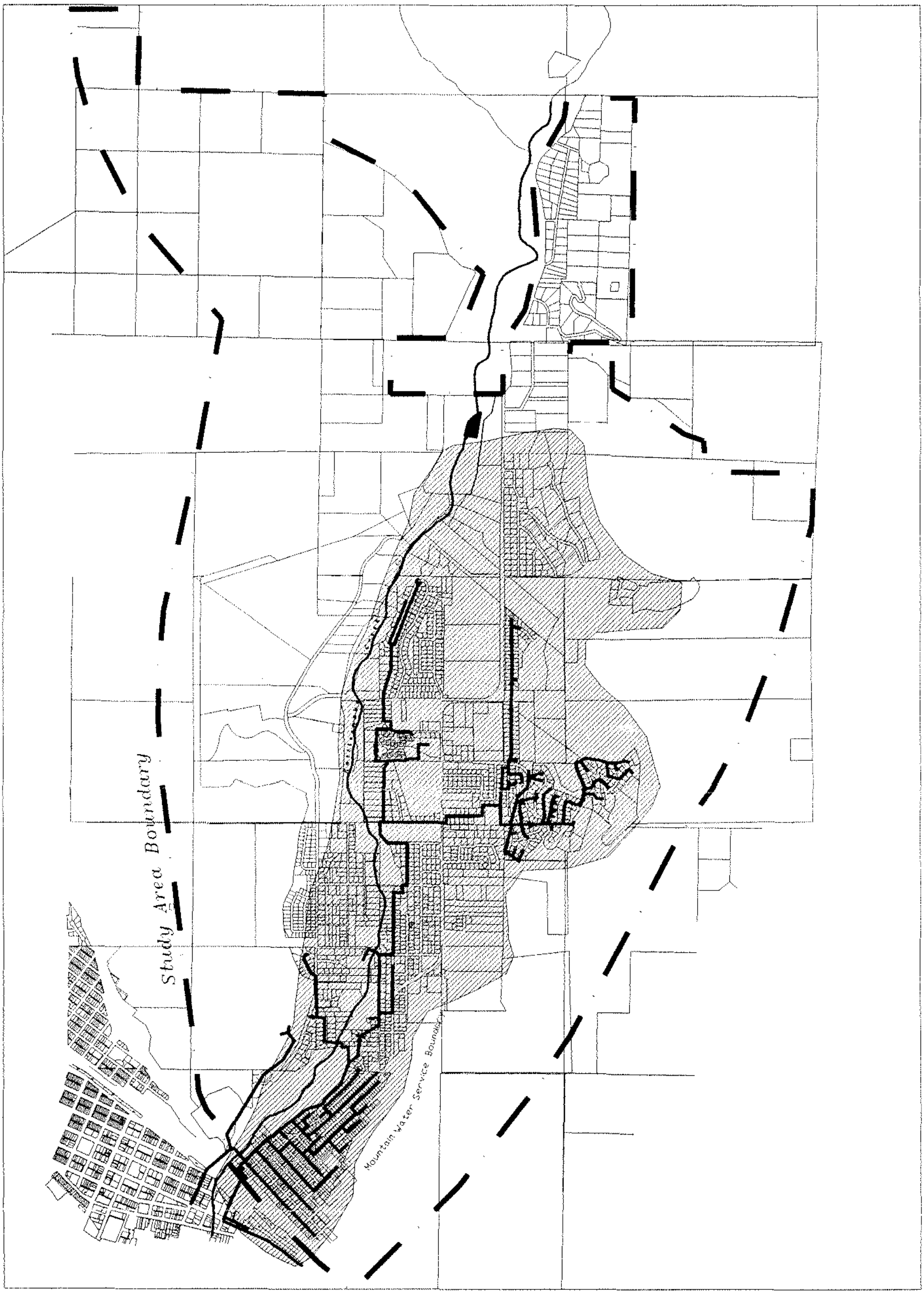
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Source: Office of Community Development

Map #14

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Water and Sewer Service Areas

Mountain Water Company Service Area

Sewer Lines

Private Wells (not mapped)

Note: An estimated 150 private wells provide water to Rattlesnake Valley households. (according to a local hydrologist's count of private wells in November 1991.)

N

0 1/2 Mile 1 Mile

1:25200

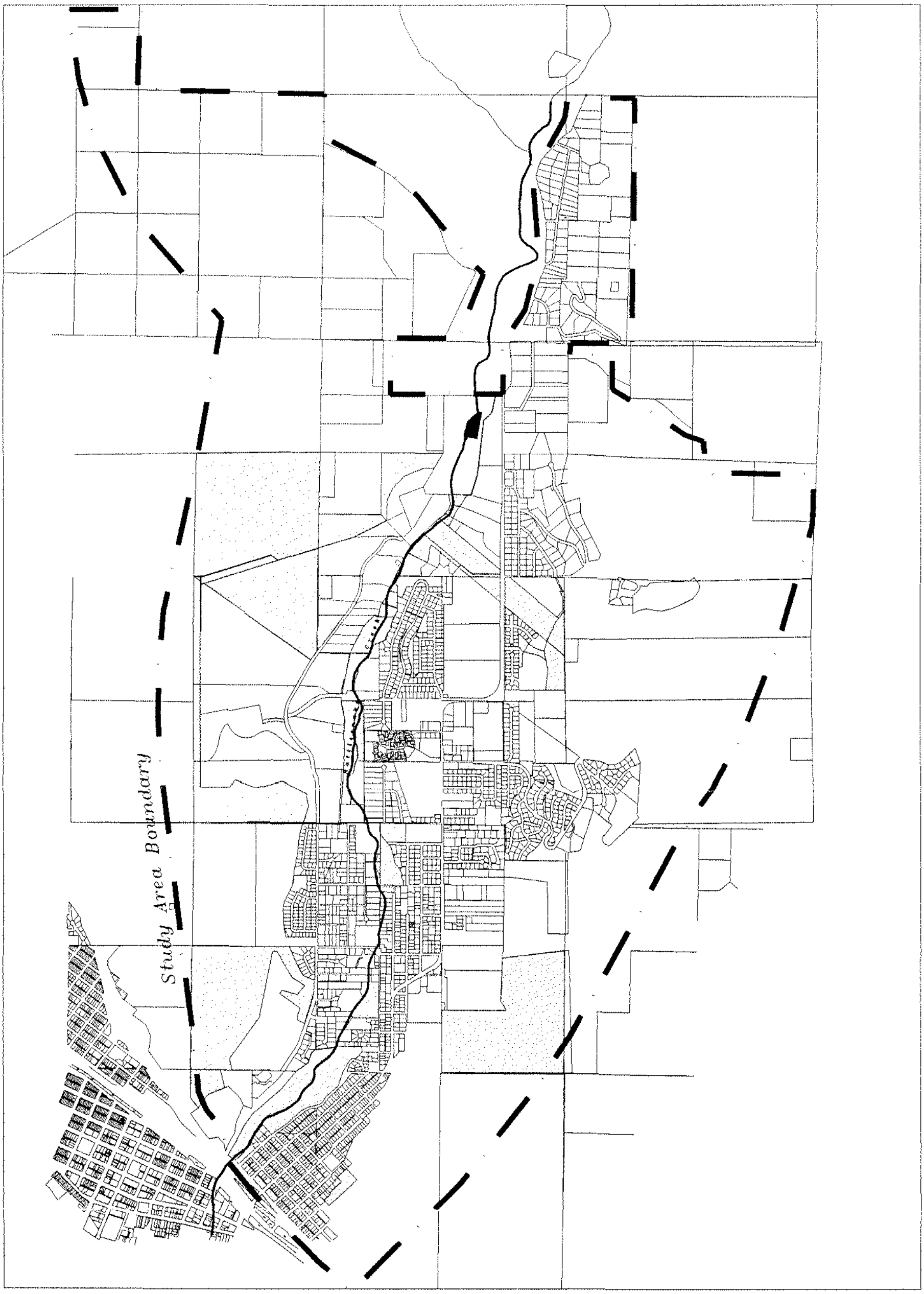
Source: *Office of Community Development*
City of Missoula Public Works Department
Howard Newman, Hydrologist, Missoula, Montana

Map #15

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Designated Open Space

Open Space

The Areas Shaded are City and County Parks, Common Areas, Conservation Easements and other Designated Open Spaces.

N

0 1/2 Mile 1 Mile

1:25200

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dowing & Erik Benson

Source Office of Community Development

Map #16

Rattlesnake Valley Planning Area

Existing Transportation System

– · · – Mountain Line Bus Routes

☆ Traffic Count Stations
(1990 Count, 1994 Count)

NOTE: The functional classifications are:
Minor Arterials – Rattlesnake Drive and Van Buren Street
Collectors – Greenough/Duncan and Lolo Street

N

0 1/2 Mile 1 Mile

1:25200

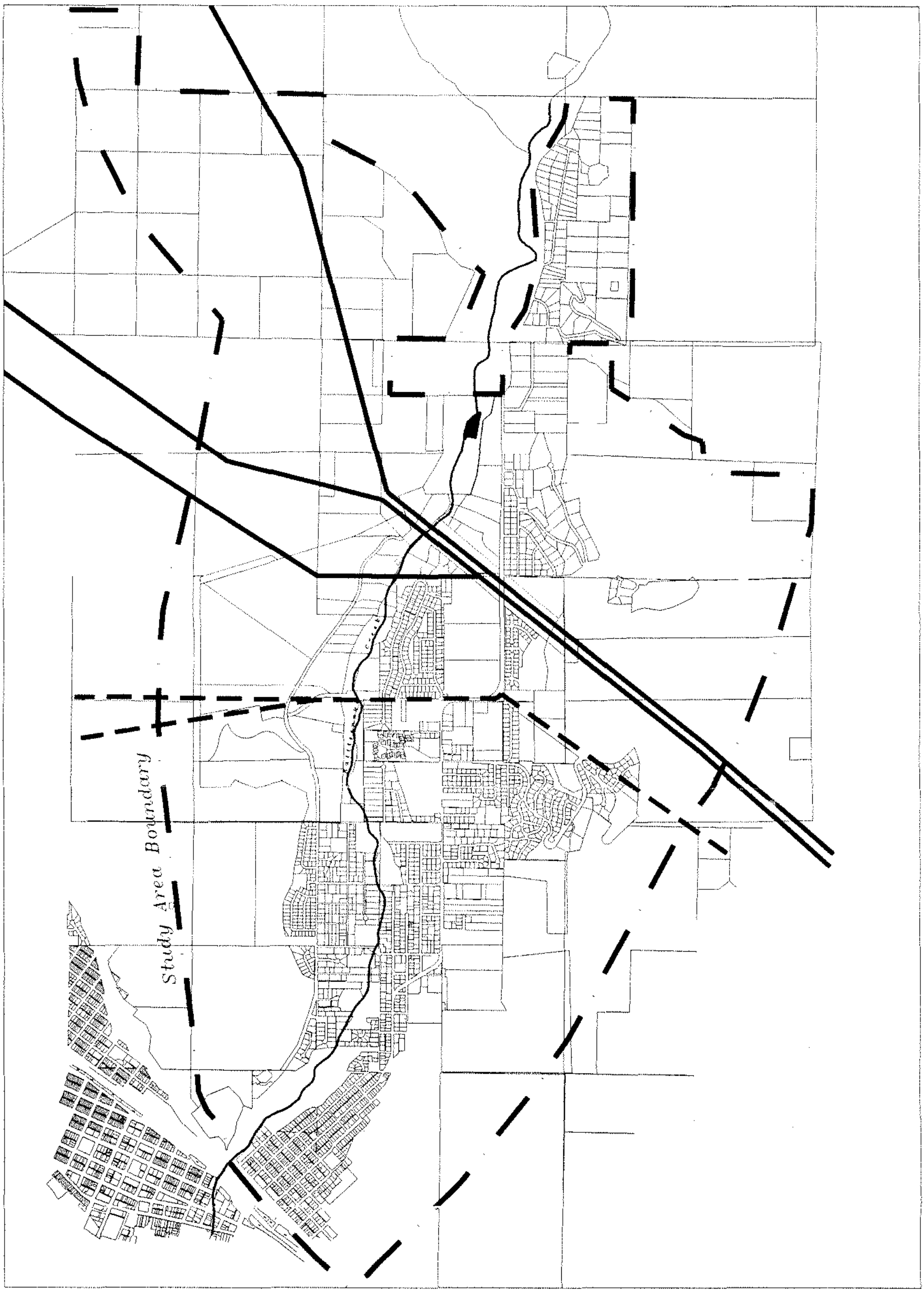
MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Source: Mountain Line, Missoula Urban Transportation District
Office of Community Development

Map #17

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Major Utility Corridors

Power Lines

Natural Gas Lines
Yellowstone Pipeline

N

0 1/2 Mile 1 Mile

1:25200

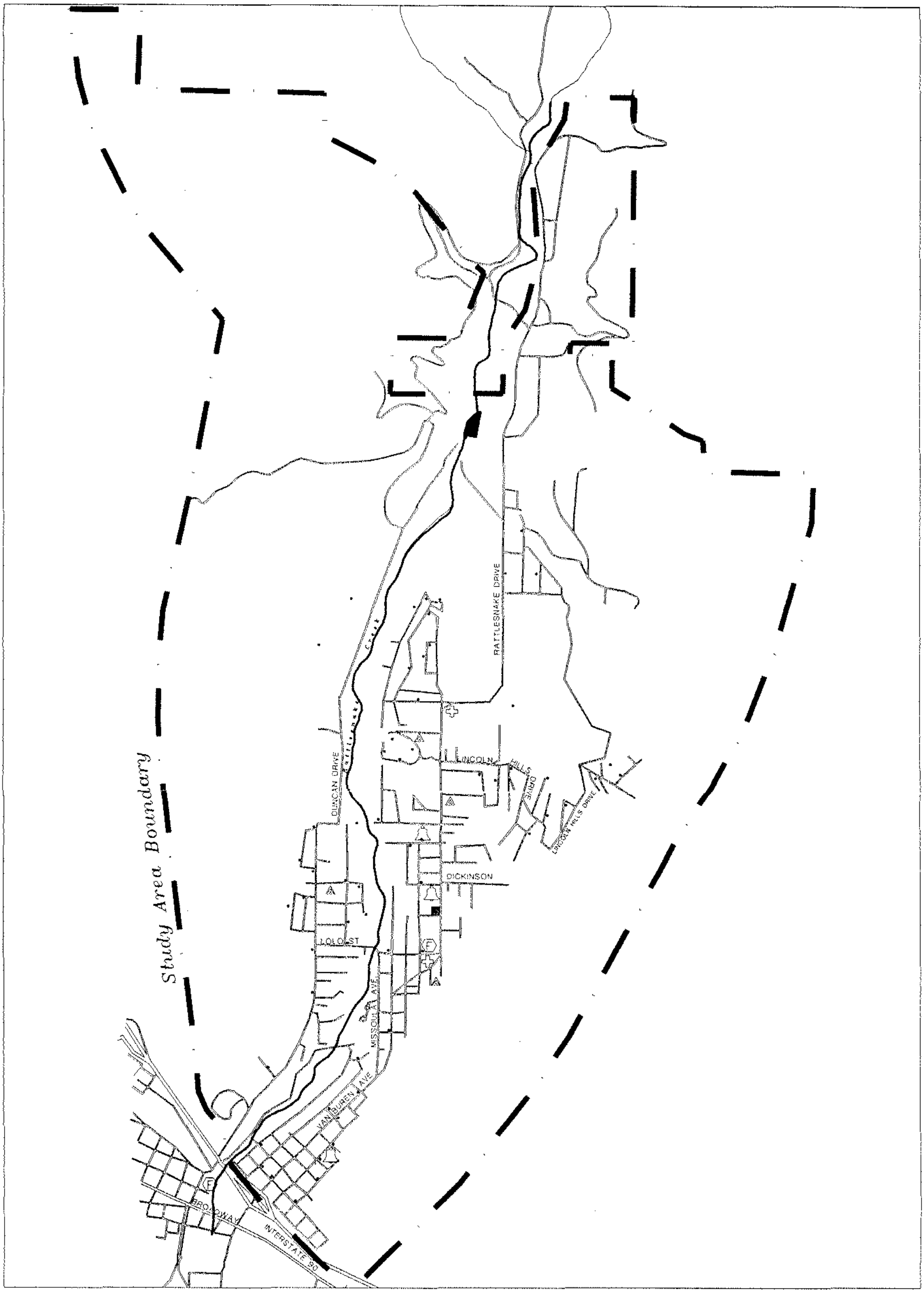
Source: Office of Community Development
Conoco, Montana Power
Donneville Power Administration

Map #18

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson



Rattlesnake Valley Planning Area

Community Facilities

- ■ Commercial Facilities
- ✣ Churches
- · Fire Hydrants
- Ⓕ Fire Stations
- ⍋ Human Service Facilities
- 🔔 Schools

N

0 1/2 Mile 1 Mile

1:25200

MISSOULA CITY COUNTY

OFFICE OF COMMUNITY DEVELOPMENT
MISSOULA, MONTANA
June, 1995
GRAPHICS DEPARTMENT

Maps Created by: Dave Dewing & Erik Benson

Source: Office of Community Development

Map #19

RATTLESNAKE VALLEY PLAN AMENDMENT 1995 UPDATE

ADOPTED LAND USES

By City Resolution 5765 Oct. 2, 1995 and County Resolution 95–102, Nov. 28, 1995

- Plan Boundary
- 6–8 dwelling units/acre
- 4 dwelling units/acre
- 2 dwelling units/acre
- 1 dwelling unit/acre
- 1 dwelling unit per 2 acres
- 1 dwelling unit per 5–10 acres
- Parks and Open Space
- Potential Park
- Public & Quasi–public Lands & Facilities
- 1 dwelling unit per 40 acres
- Property Line

N

Scale:
1 inch = 1500 feet

0 1500

Contour Interval 40 Feet.

filename: P1320RAT.PLT
Sources: County Surveyors and Office of Planning & Grants
Reprinted from map by D.Dewing & E. Benson, 4/5/1996.

Office of Planning & Grants