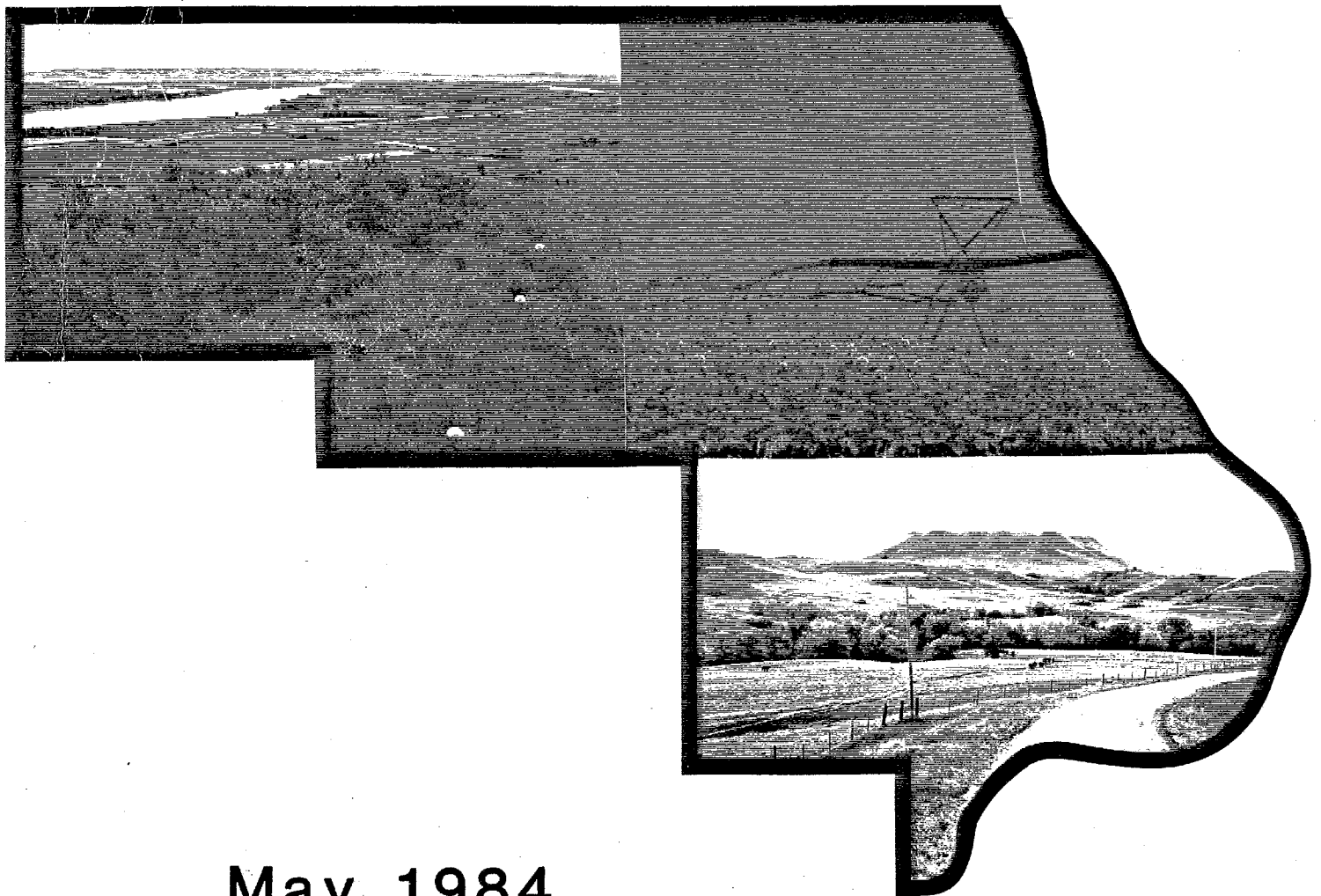
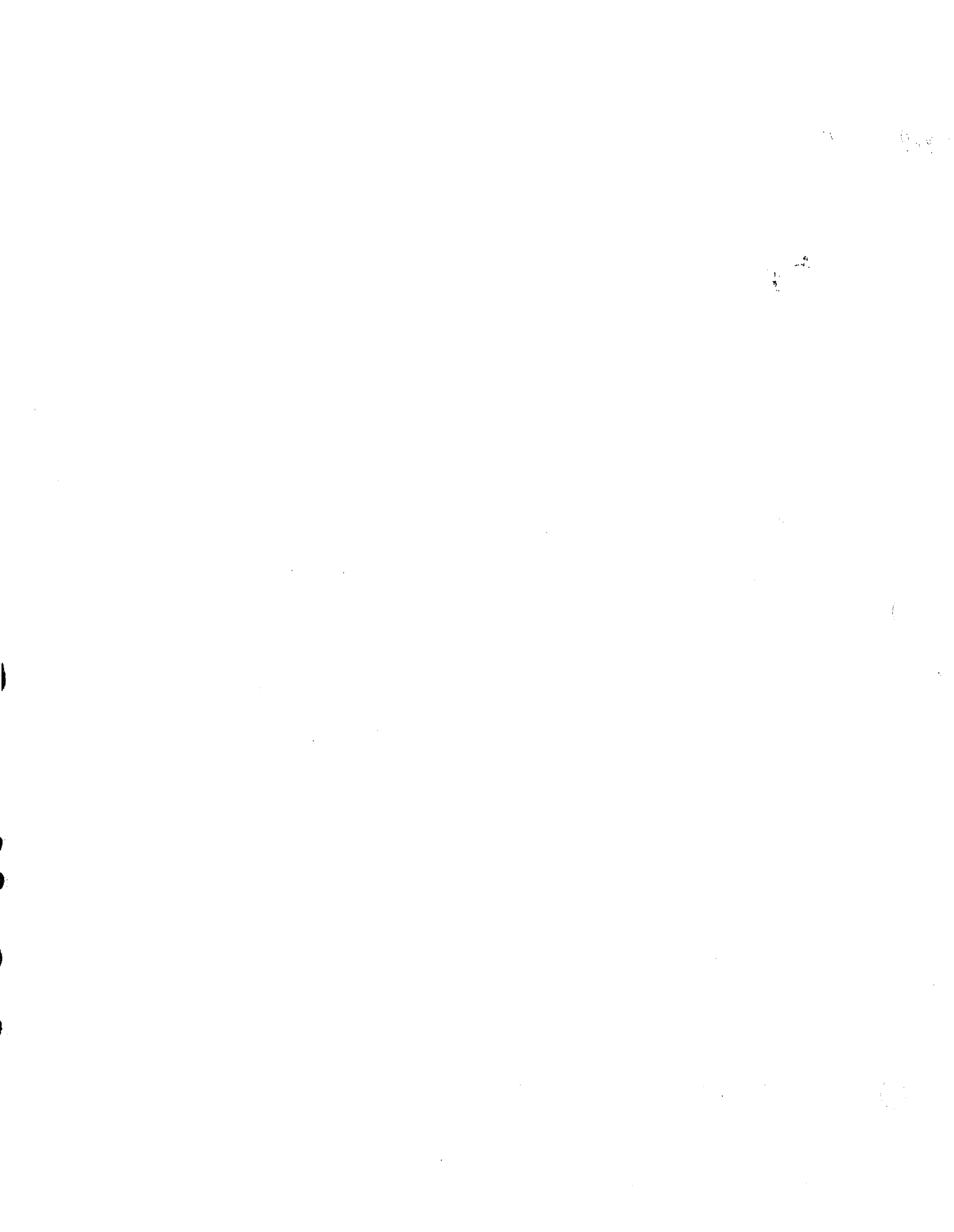


THE MORTON COUNTY COMPREHENSIVE LAND USE PLAN



May 1984



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C E R T I F I C A T E O F A D O P T I O N

MORTON COUNTY, NORTH DAKOTA

THIS DOCUMENT is adopted by resolution of the Board of County Commissioners as the official Comprehensive Land Use Plan for Morton County, North Dakota for the purpose of protecting and guiding physical development; to secure safety from fire and other dangers; to protect the tax base; to encourage a distribution of population and utilization of land which will facilitate economic growth of the area and to make recommendations providing for adequate transportation, roads, water supply, drainage, sanitation, education, recreation, or other public requirements; to lessen government expenditures, to conserve and develop natural resources; and to foster the areas of agriculture or other industries. Also, all maps, charts or other descriptive matter accompanying this document and all other matters intended to form the whole or part hereof are hereby made a part of this document the same as if set forth in full herein.

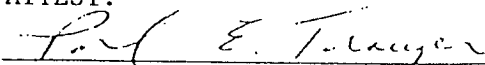
ADOPTED THIS 1st DAY OF May A.D.
19 84 BY THE COUNTY COMMISSION OF MORTON COUNTY.

SIGNED:



Chairman, Board of County Commissioners

ATTEST:



County Auditor

COMPREHENSIVE LAND USE PLAN

MORTON COUNTY, NORTH DAKOTA

May 1984

ACKNOWLEDGEMENTS

The Comprehensive Land Use Plan for Morton County was prepared by the staff of the Lewis and Clark 1805 RCD in conjunction with the Morton County Planning Commission, the Morton County Commission and the citizens of Morton County.

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A SPECIAL ACKNOWLEDGEMENT TO COUNTY COMMISSIONER CHARLES ENGELTER, WHO SERVED AS THE CHAIRMAN OF THE PLANNING FROM 1971 to 1983, DURING WHICH TIME THE DRAFTING OF THIS AMENDED DOCUMENT WAS INITIATED. CHARLES ENGELTER DIED IN OFFICE ON MARCH 10, 1984.

CHAPTER I

INTRODUCTION, PURPOSE AND SCOPE

INTRODUCTION

Morton County will continue to experience considerable growth and development as a result of a number of factors which include extensive energy development, diversification of the county's industrial base, and the resultant in-migration of a work force due to growth in the economic sector. Realizing that these trends will continue for some time to come, the Morton County Planning Commission has taken upon itself the task of preparing for this growth, in order to insure that it occurs in a manner harmonious with the environment as well as the existing lifestyles of the residents within the county. This comprehensive land use plan for Morton County endeavors to identify existing and future areas of need or conflict regarding land use and provides guidelines for effective resolution or prevention of such conflicts.

The Morton County Comprehensive Land Use Plan has been developed under the supervision and authority of the Morton County Planning and Zoning Commission and has been developed in compliance with Section 11-33-03 of the North Dakota Century Code. Section 11-33-03 stipulates that all zoning regulations shall be made or revised to be in accordance with the comprehensive plan.

PURPOSE

A comprehensive land use plan is a document composed of goals, objectives, policies, and recommendations for future development. The comprehensive land use plan does not in itself serve as a legal document but as a comprehensive, long-range policy guide for the development of the county as a whole. For the plan to be effective in promoting proper management and planning of future growth and development, two requirements must first be met: First, the goals and policies within the plan must represent the public's attitude toward the future use of resources within the

county. The Morton County Planning Commission has met this requirement by sponsoring several public meetings in the county at which residents identified what they believed to be the major goals, problems or conflicts concerning land use. Secondly, a comprehensive land use plan must be consistent in thought with the county's zoning ordinance and subdivision regulations. A comprehensive plan is no more than a statement by the public about how growth and development should occur in the future. The zoning ordinance and the subdivision regulations on the other hand are mechanisms available to the County Planning Commission to insure that growth does, in fact, occur in a manner consistent with the land use goals identified in the comprehensive plan. Utilization and enforcement of the ordinances within the county must be consistent with the goals of the comprehensive plan. Only in that manner will implementation of the plan actually occur. Proper implementation of the comprehensive land use plan through the use of zoning ordinances and subdivision regulations will result in growth and development occurring in rate, location or style which will not threaten the health, safety, or general welfare of the public.

SCOPE

Except for the specific measures identified in the recommendation section of this plan, the plan is intended to serve as a general guide for growth and development in Morton County. Background data such as geography, history, economics, etc., serves as a very brief and general introduction to the County. The goals and objectives are based on citizen input and serve as the framework of the plan and illustrates how citizens of the county feel existing as well as anticipated growth and development should be handled. Policies are presented as rather specific measures for insuring realization of the goals and policies, as well as means for achieving plan consistency. The plan implementation chapter discusses mechanisms available to the planning commission which will insure the plan is properly used in their decision making process. Finally, the appendix section contains data which supports the text of the plan.

CHAPTER II
GENERAL CHARACTERISTICS

A. GEOGRAPHY

Morton County (comprising approximately 1,237,120 acres) is located on the Missouri Plateau and lies near the center of the State of North Dakota with the Missouri River and the Oahe Reservoir composing its eastern boundaries. The Bismarck-Mandan metropolitan area, with the Mandan portion lying in eastern Morton County, is the second largest urban area in the state.

Despite the urban environment of Mandan-Bismarck and its environs, Morton County remains predominantly a rural area based on an agricultural economy. Until recently, Mandan represented the only municipality in the county which experienced a considerable level of growth. However, with the introduction of coal energy development in two adjacent counties and the potential for such development in Morton County, the rural-fringe of Mandan, Mandan itself and several of the smaller communities in the area are anticipating increased growth and development in the future.

B. HISTORY

Prior to 1738, the area comprising Morton County had only been inhabited by a variety of nomadic as well as sedentary Indian tribes. The most well-known of these were the Mandans who inhabited villages up and down the Missouri River for hundreds of years. In 1738 the first white men (a French expedition party) entered the Morton County area and visited one of the Mandan Indian villages located on the banks of the Missouri River. The next visit to the area made by white men was 66 years later in 1804 when Lewis and Clark wintered approximately 40 miles up the river from present-day Mandan. Prior to 1820, most whites consisted of fur traders and trappers working along the Missouri River and its tributaries. Military settlements sprang up in the county in the early 1860's, with Fort Rice becoming the first permanent white settlement in

1864. Shortly thereafter, Fort Lincoln and Fort McKeen were constructed. Fort Lincoln is well known as General George Armstrong Custer's point of departure to the Battle of the Little Big Horn. White settlement was further spurred by completion of the Northern Pacific Railroad in 1880. The largest stream of settlers and homesteaders, however, came from the migration of Northern Europeans from 1900 to 1910. Organization of Morton County became a reality in 1878, but present boundaries weren't established until 1916.

C. PHYSICAL CHARACTERISTICS

GEOLOGY, TOPOGRAPHY AND DRAINAGE

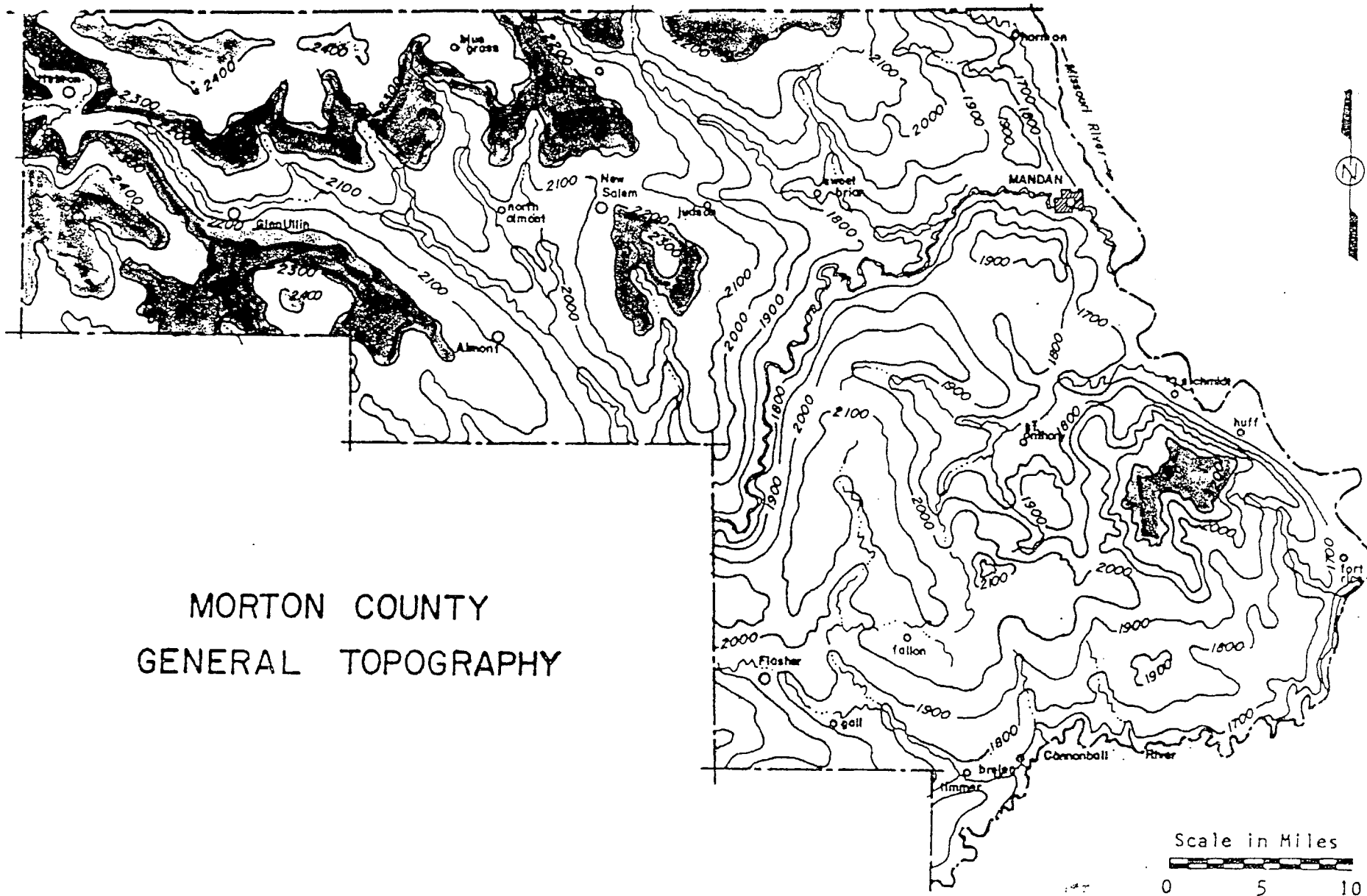
Morton County is located on the Missouri Plateau on the west side of the Missouri River, commonly known as the Missouri Slope. The Missouri slope area is characterized by large tracts of undulating land reaching an elevation of approximately 2,400 feet above sea level in the western part of the county to 1630 feet in the eastern portion. The entire area comprising Morton County is thought to have been overridden by a glacial ice. Very little evidence of glaciation now remains in the southwestern half of the county, but in the remaining sections glacial boulders are abundant. The rolling to steep terrain has an average ridge to valley floor elevation difference of 280 feet. As the land approaches the Missouri River Valley, fluctuations in elevation become much less evident.

The drainage system of Morton County is well developed with all coulees, streams, and rivers draining east to the Missouri River. Other than the Missouri, principal rivers in the county are the Heart, Cannonball, Little Heart and Square Butte Creek.

CLIMATE

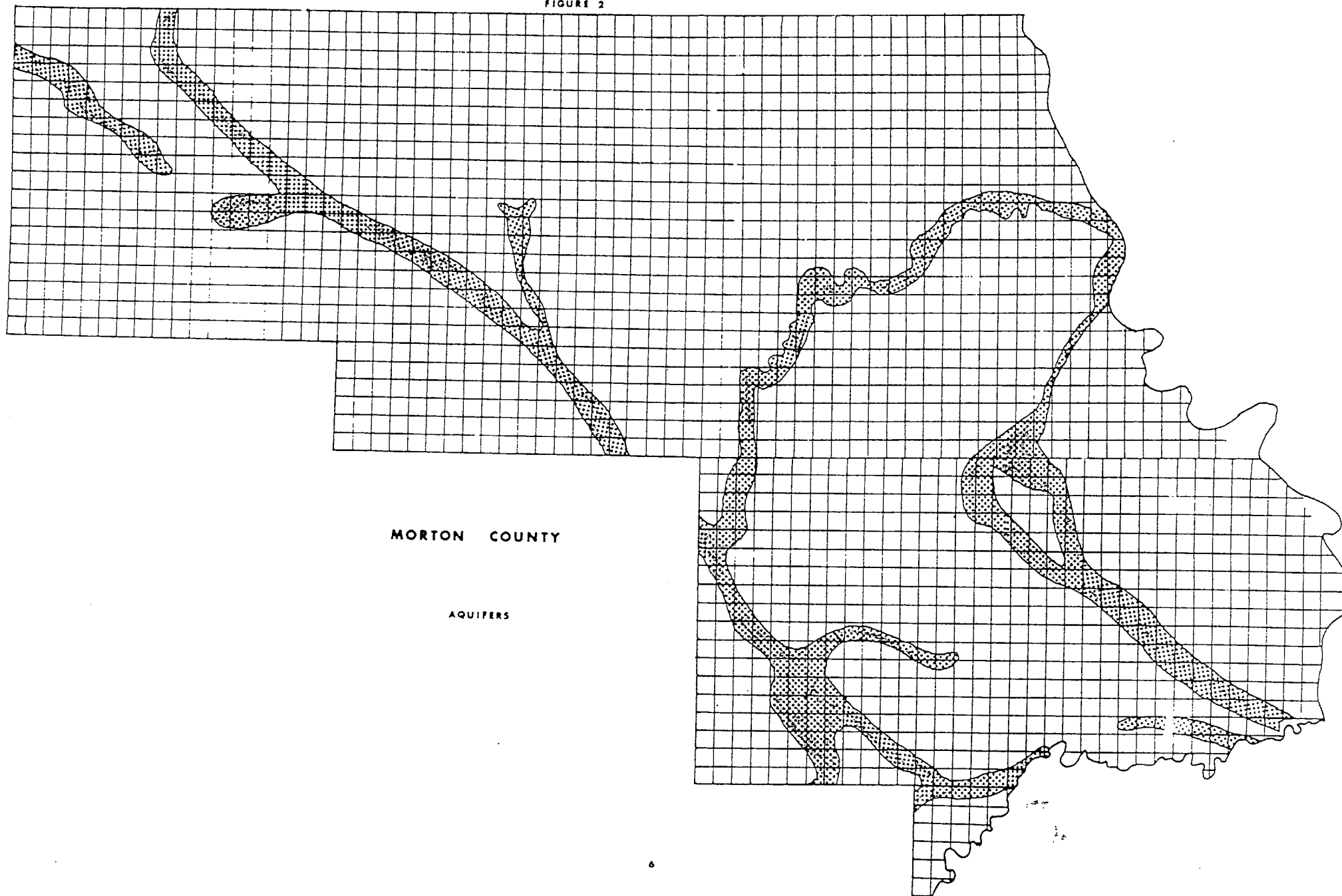
Morton County's climate is typically semi-arid and continental, characterized by long severe winters, and short, warm summers. The mean annual precipitation is 15.77 inches and falls mostly in early summer.

FIGUR



-5-

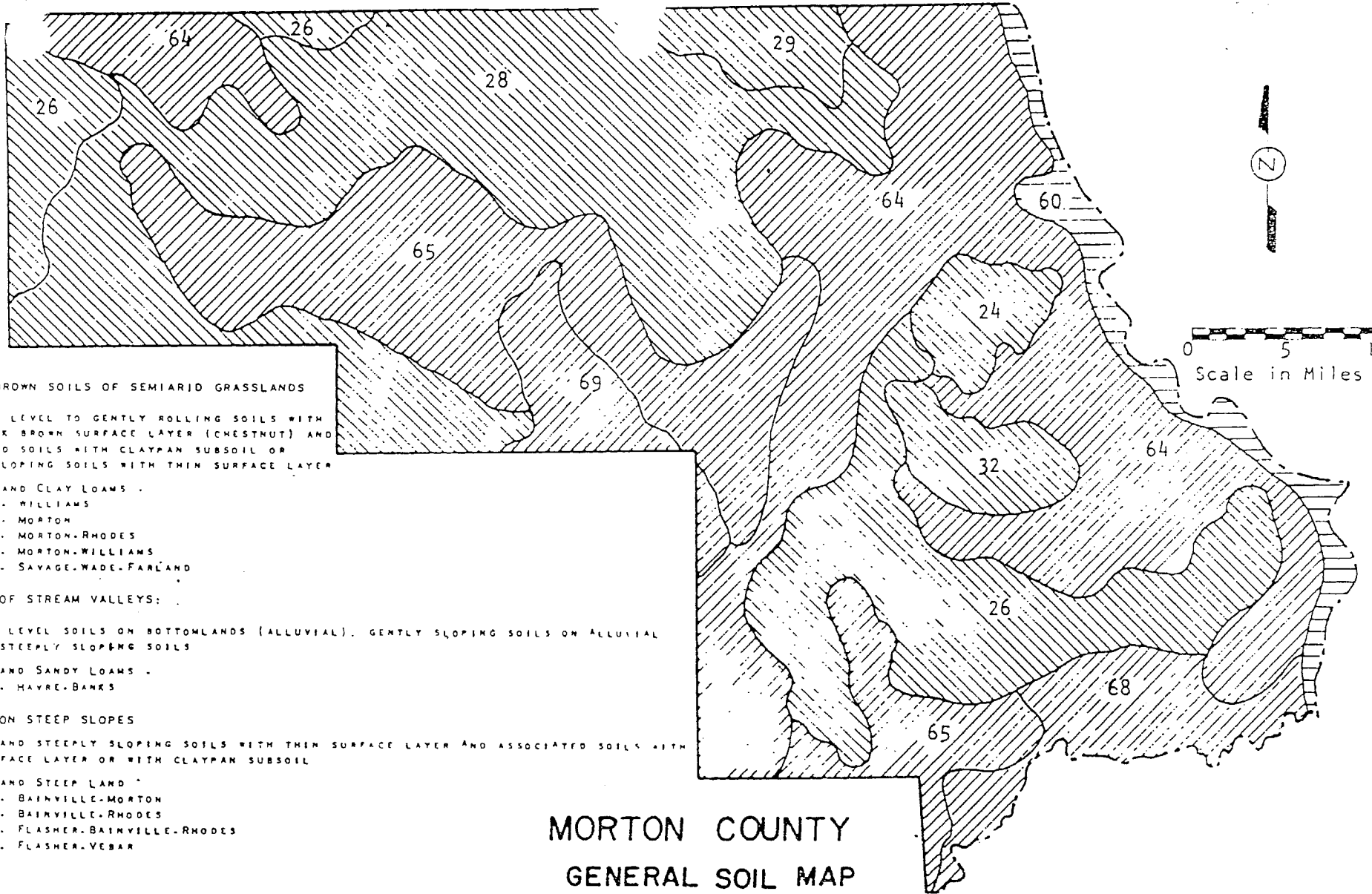
FIGURE 2



MORTON COUNTY

AQUIFERS

FIGURE 3




LEGEND: DARK BROWN SOILS OF SEMIARID GRASSLANDS

 NEARLY LEVEL TO GENTLY ROLLING SOILS WITH THICK DARK BROWN SURFACE LAYER (CHESTNUT) AND ASSOCIATED SOILS WITH CLAYPAN SUBSOIL OR STEEPLY SLOPING SOILS WITH THIN SURFACE LAYER

- LOAMS AND CLAY LOAMS -
- 24 - WILLIAMS
 - 26 - MORTON
 - 28 - MORTON-RHODES
 - 29 - MORTON-WILLIAMS
 - 32 - SAVAGE-WADE-FARLAND

SOILS OF STREAM VALLEYS:

 NEARLY LEVEL SOILS ON BOTTOMLANDS (ALLUVIAL), GENTLY SLOPING SOILS ON ALLUVIAL FANS AND STEEPLY SLOPING SOILS

- LOAMS AND SANDY LOAMS -
- 60 - HAYRE-BANKS

SOILS ON STEEP SLOPES

 HILLY AND STEEPLY SLOPING SOILS WITH THIN SURFACE LAYER AND ASSOCIATED SOILS WITH THICK SURFACE LAYER OR WITH CLAYPAN SUBSOIL

- HILLY AND STEEP LAND -
- 64 - BAINVILLE-MORTON
 - 65 - BAINVILLE-RHODES
 - 68 - FLASHER-BAINVILLE-RHODES
 - 69 - FLASHER-VEBAR

MORTON COUNTY
GENERAL SOIL MAP

SOURCE:

N.D. Agricultural Experiment Sta.
Soil Survey Staff
N.D. State University
U.S.D.A. Soil Conservation Service

The late fall and summer months are comparatively dry. Temperatures vary greatly from a mean of 9.1^oF in January to 69.9^oF in August. Precipitation in the winter months is light and irregular.

VEGETATION

The native vegetation of Morton County consists of mixed tall and short grasses, the latter by far predominating. The smooth heavy soils of the upland growth usually consists of the blue grama, western wheat grass, and needlegrass species. Niggerwool, sandgrass, and blue grama grow in sandy areas, while little bluestem and niggerwool are common on exposed knobs and steeper slopes. Salt grass grows in areas where there is an accumulation of salts.

Natural forests are confined to parts of bottom land along the larger streams, narrow strips of drainage ways and clumps on the stronger north facing slopes. Forest cover in steep-sided gullies is principally ash, elm and some quaking aspen. Oaks are generally confined to eastern parts of the state while cottonwoods are common along the banks of the Missouri, Cannonball, and Heart Rivers.

SOILS

Soil types in Morton County are varied, in fact, 77 different mapping units exist within the county. The predominant soil types within the county include glacial till, windblown sediment, mixed alluvium and materials weathered from bedrock. Figure 3 illustrates the general categories of soil types within the county and the use of soils according to their suitabilities or limitations. Use of the soils according to their suitabilities is one of the best means available for insuring that the resources of the county are conserved and the environment protected. Knowledge of soil suitabilities is crucial if growth and development is to be managed properly. Maps on the next several pages (Figures 4 through 11) show land currently being irrigated as well as soil suitabili-

FIGURE 4

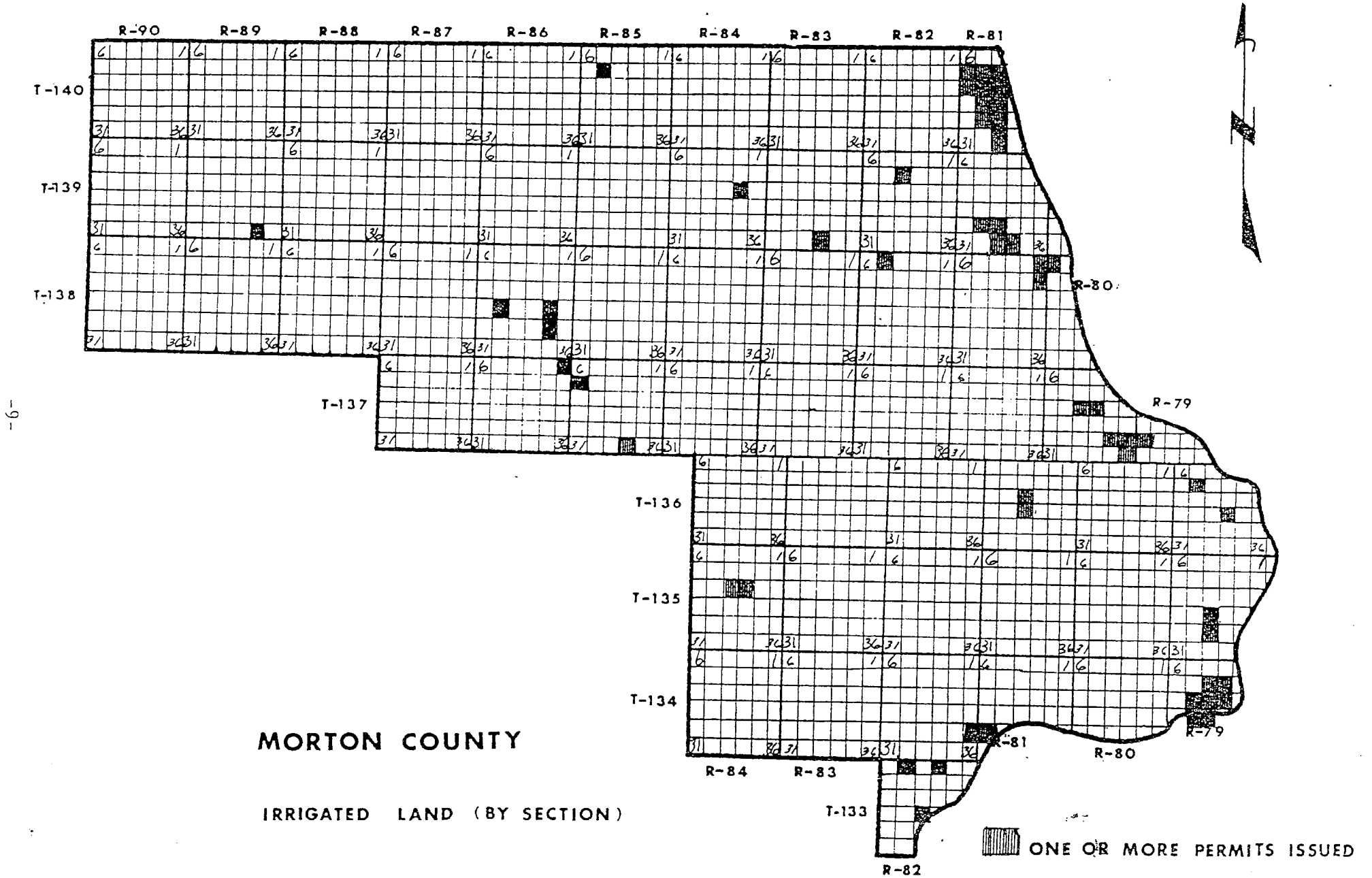
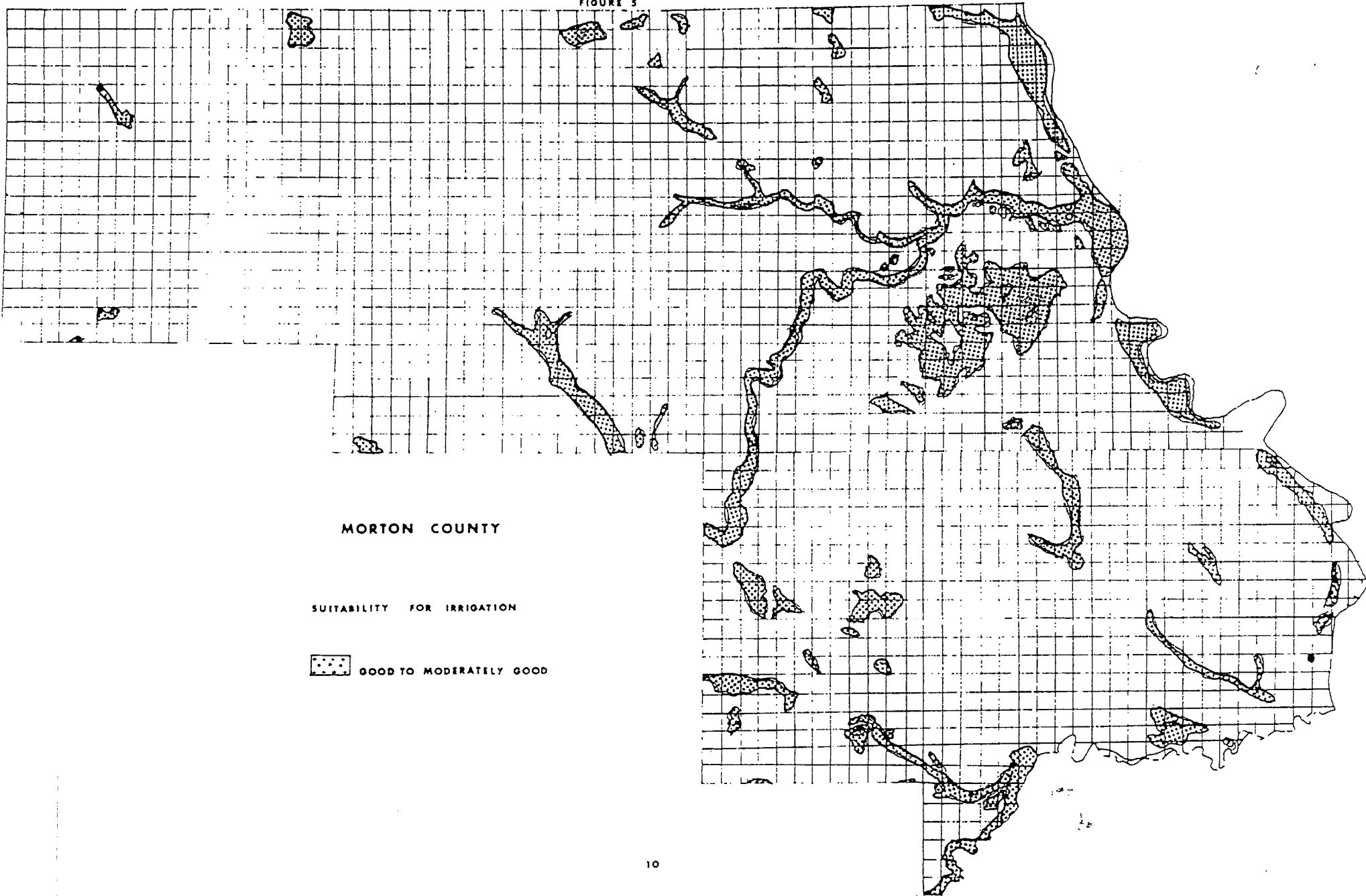
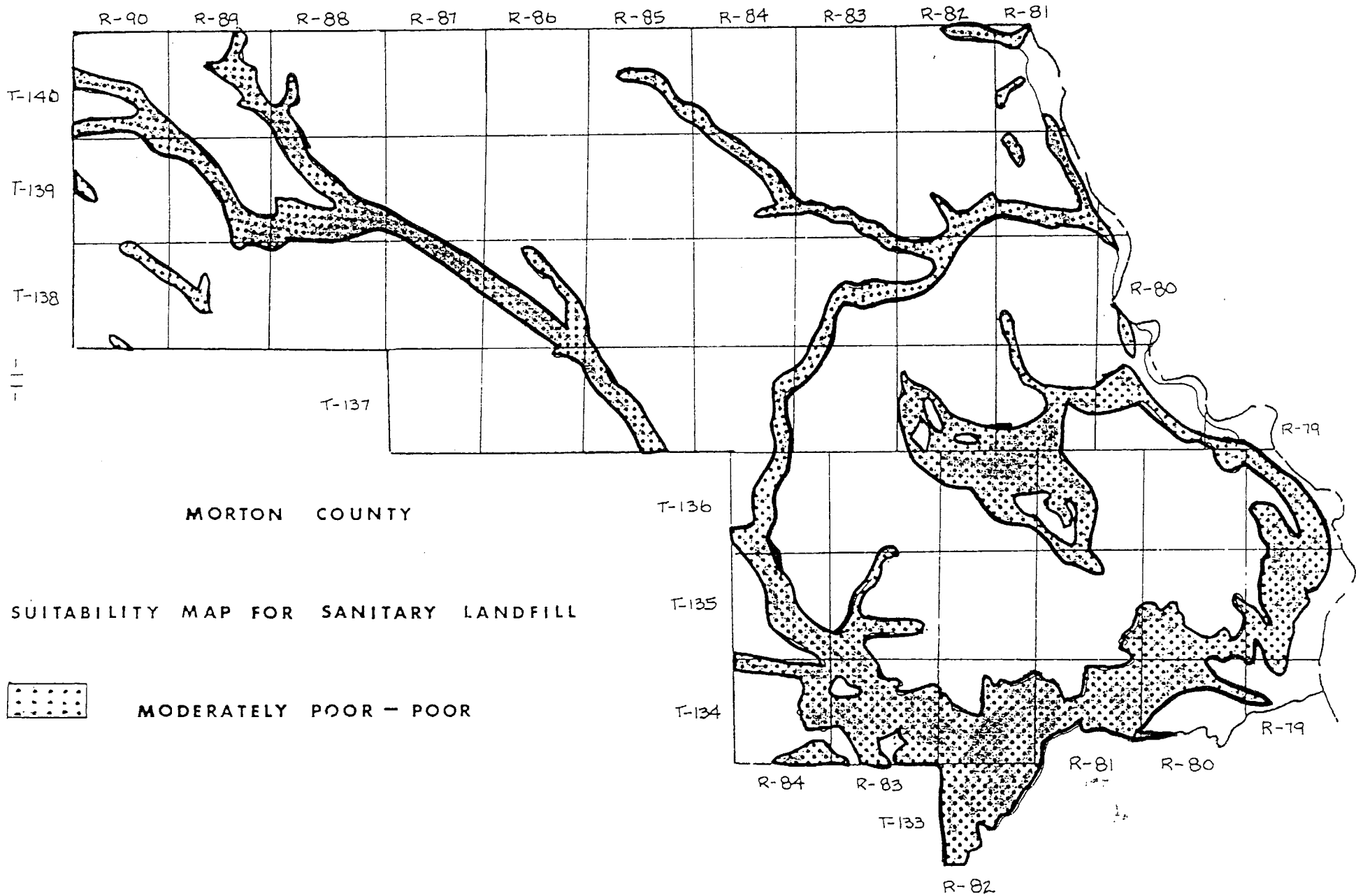


FIGURE 5



FIGURE



FIGURE

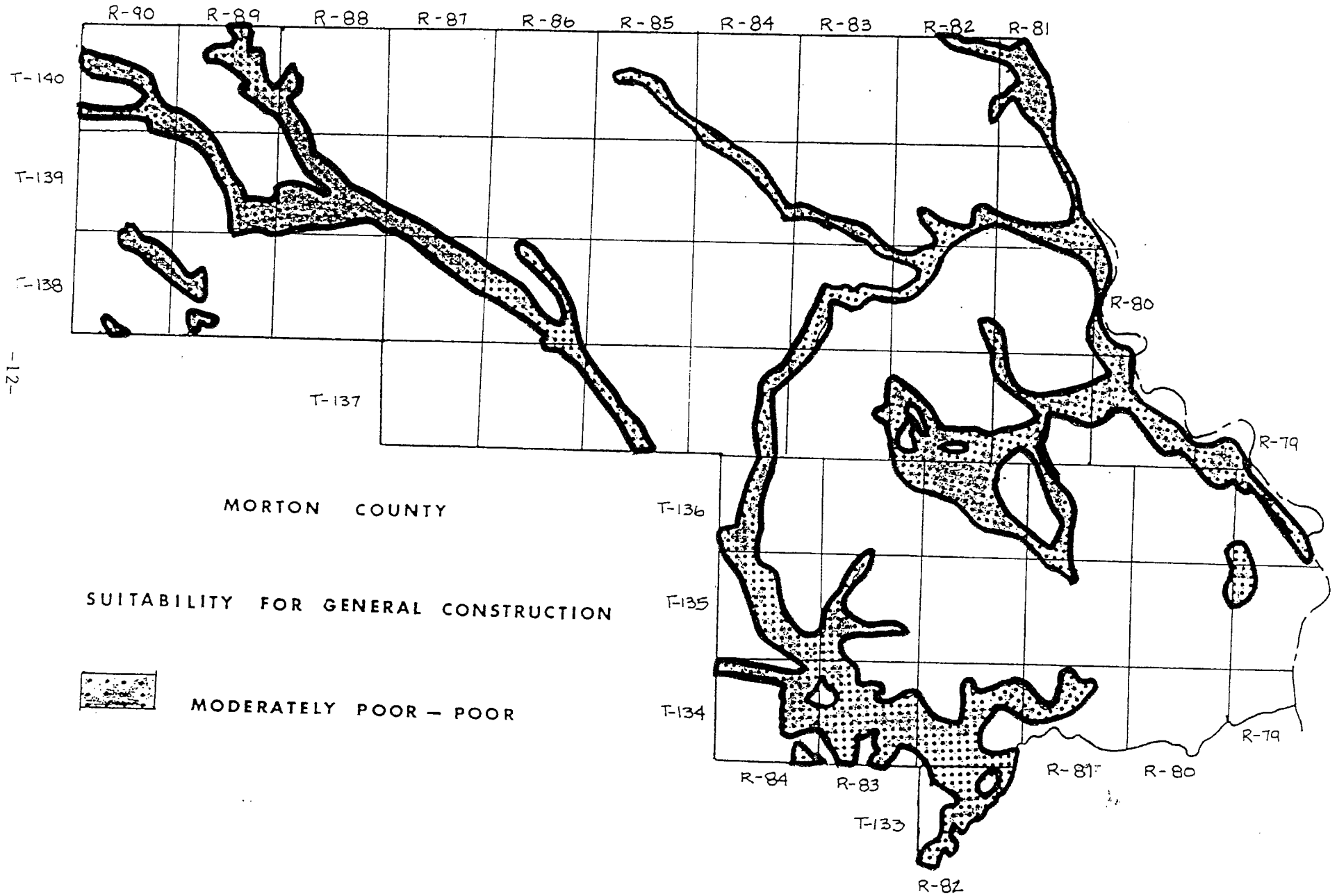
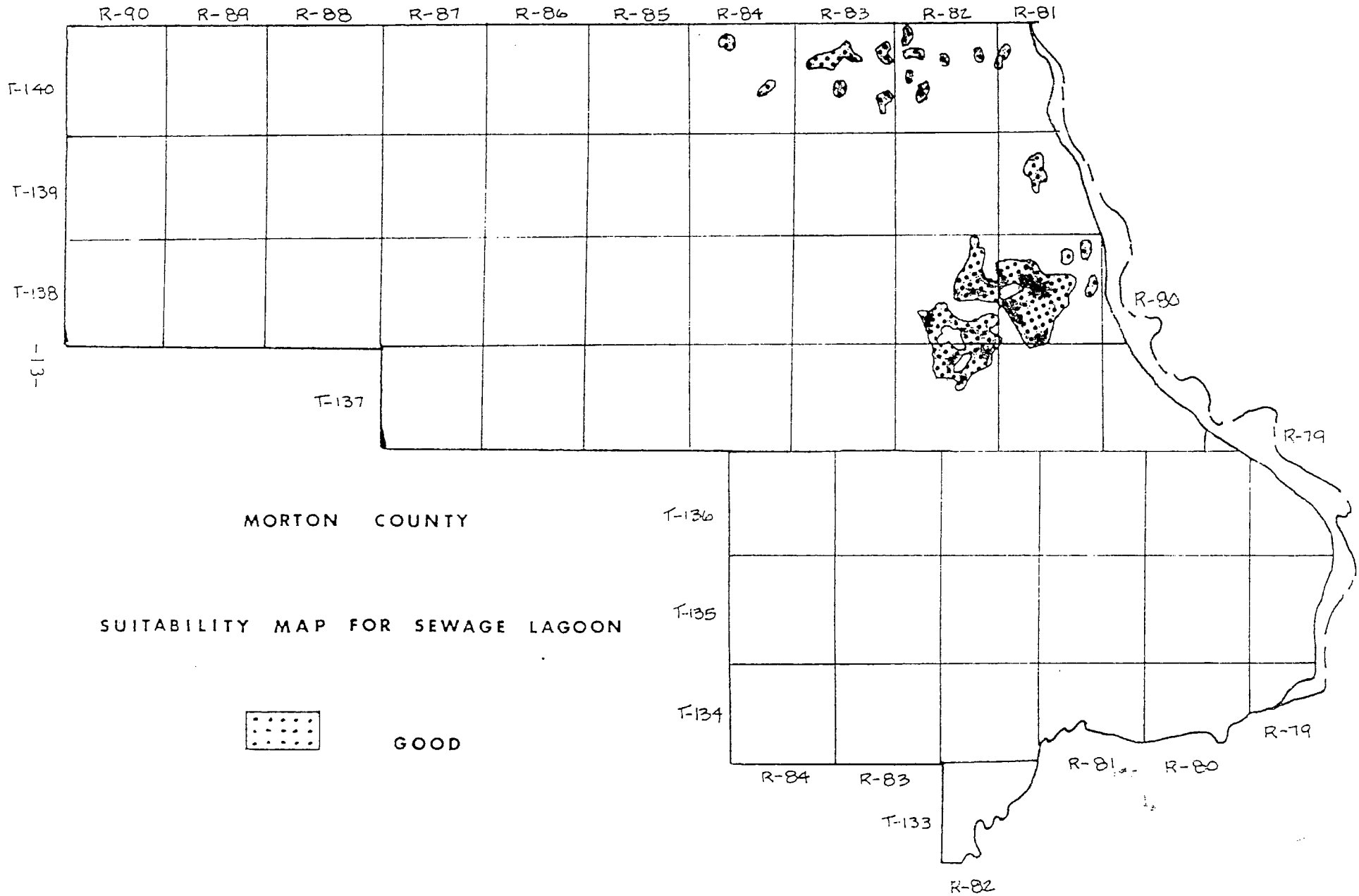


FIGURE 8



FIGURE

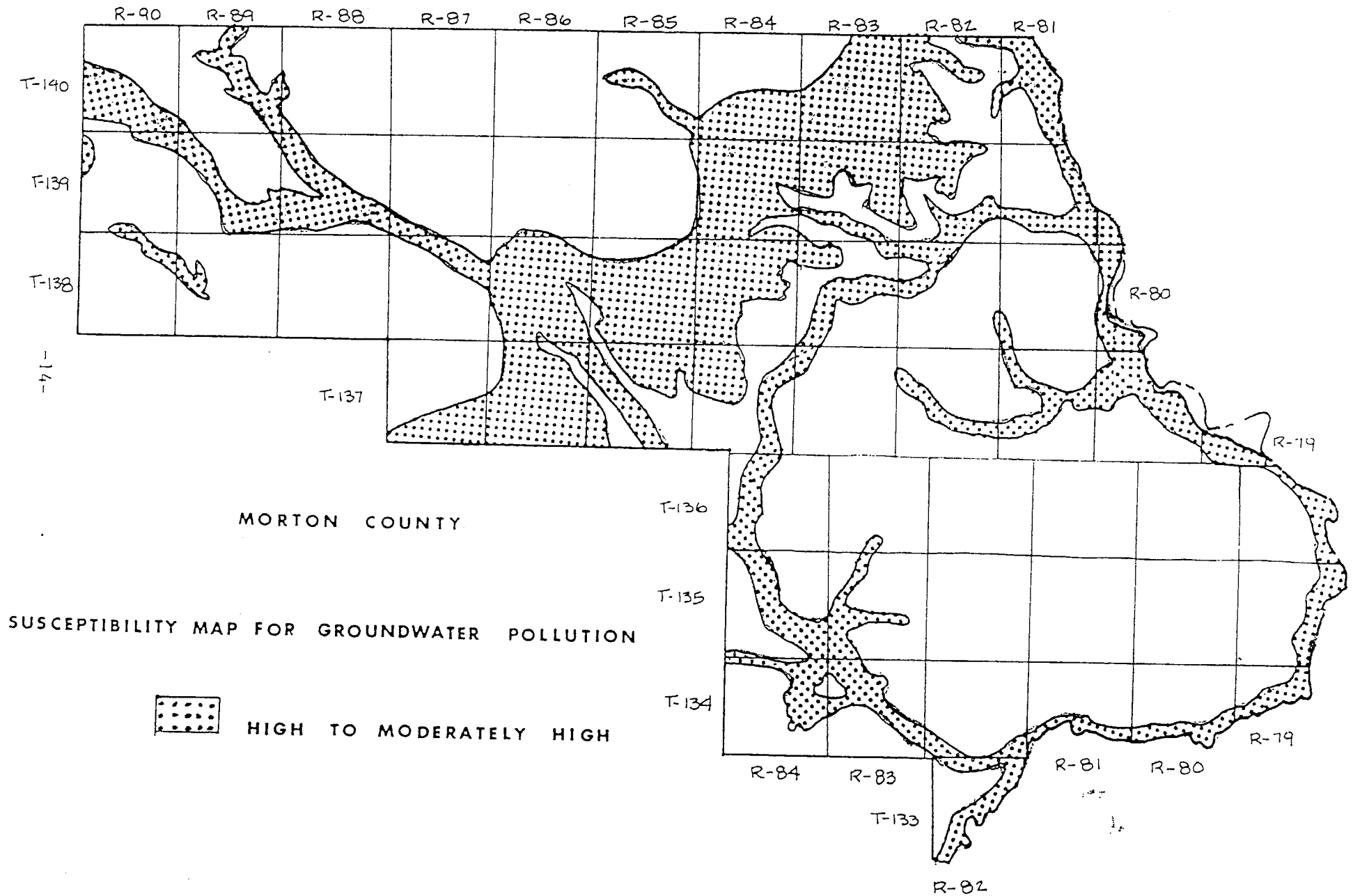


FIGURE 1

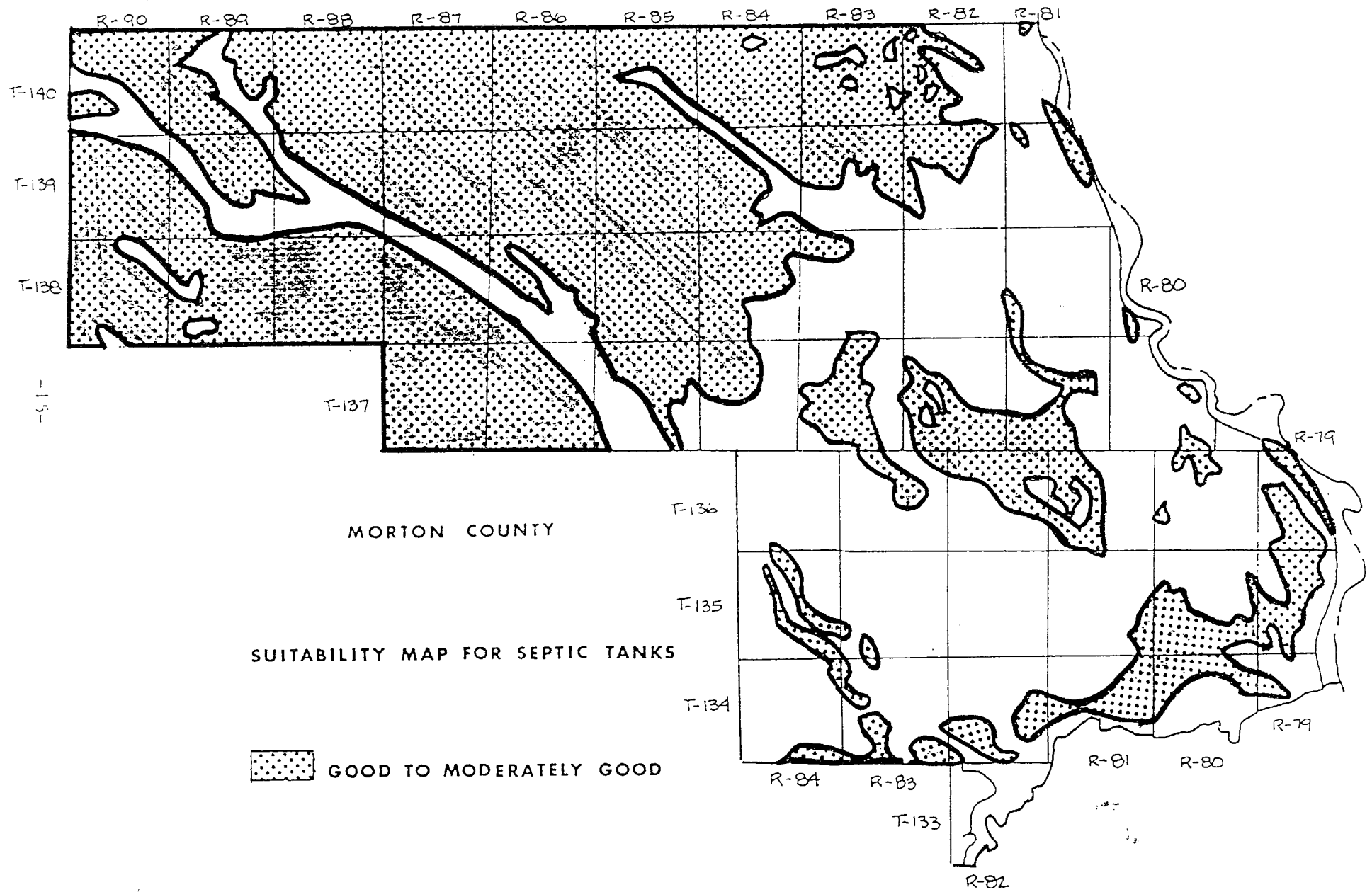
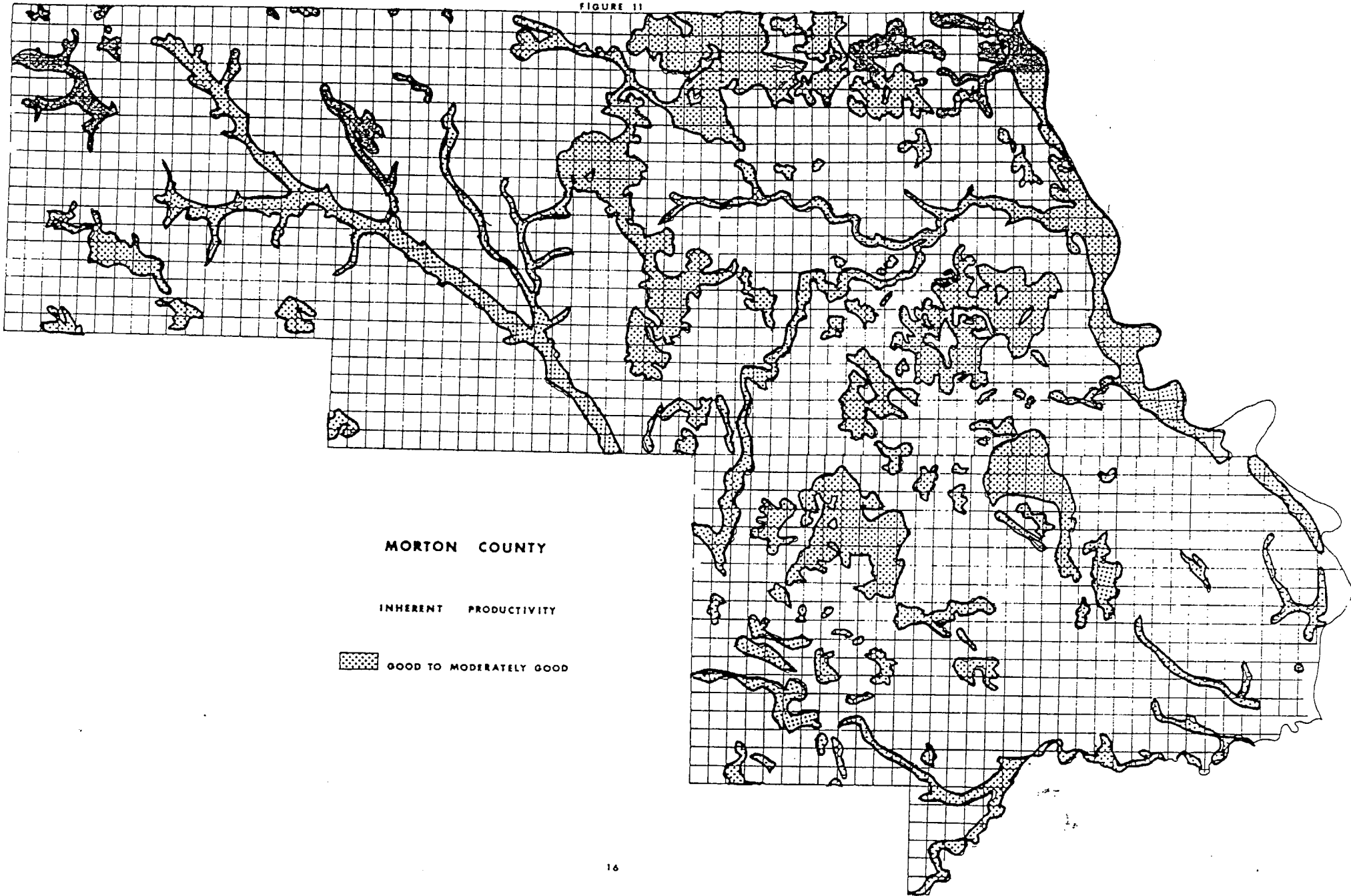


FIGURE 11



ties within the county for irrigation, cropland,¹ sanitary landfills, general construction, groundwater pollution, sewage lagoons, and septic tanks. A further breakdown of specific suitabilities is provided in Appendix A.

D. SOCIO-ECONOMIC CHARACTERISTICS

ECONOMY

It is indisputable that the basis of Morton County's economy is agriculture. The primary source of income within the county comes from small grain cash crops, beef and dairy cattle and the production of forage crops and swine. Income from sheep and poultry is of secondary importance. According to the (1975) Census of Agriculture, the amount of agricultural products sold accounted for over 36 million dollars worth of sales in the county with both livestock sales accounting for \$25 million and crop sales totaling over \$11 million.

The remaining sectors of the economy are comprised mostly of agriculturally related industries and businesses with the county. Almont, Flasher, Glen Ullin, Hebron, and New Salem are all small rural agri-service centers dependent largely upon the stability of agriculture for their growth. With increased urbanization Mandan has maintained its role as the major agri-business center in the county, but is increasingly becoming a multi-faceted urban service center with a much broader economic base than other areas of the county. The magnitude of the agricultural economy of the county can be best exemplified by statistics that show in 1978 of the 1,237,000 acres in the county, 352,605 were harvested and 683,534 used as pasture. In 1978, 1,032 farms in the county comprised 1,193,584 acres,² or about 96 percent of the county's total land area.

¹Cropland or inherent productivity is based on the productivity of soils in terms of yield for four prime crops (spring wheat, corn, alfalfa and oats) over a period of years. Those areas designated represent inherent productivity from excellent to good based on a comparative rating with the county done by the SCS in conjunction with Basin Electric.

²1978 Census of Agriculture

POPULATION

Although still very sparsely settled, approximately 10.6 people per square mile, and being almost entirely rural in an economic sense, Morton County as indicated earlier is showing indications of becoming increasingly more urban in terms of where the population now resides and will live in the future. This trend is consistent with similar movements from rural to urban areas throughout the country. In general, larger (and therefore fewer) farms, as a result of increased mechanization, and the search for more complete services are the major casual factors for this migration to urban areas (Mandan in Morton County). Tables 2 and 3 illustrate Mandan's increasingly larger percentage of the total county population which is anticipated to reach almost 75 percent by the turn of the century. Other municipalities, as has been the case in the past, are expected to maintain a somewhat stable position. The construction of Interstate Highway #94 and the potential for coal energy development apparently have stopped the decline of many small communities in the county.

As has been evident for many years, rural (or farm) populations are expected to continue to decline significantly through the year 2000. Decline of these areas is a result of a number of economic factors as well as the rural-urban movement previously discussed. The Census of Agriculture shows us that from 1969 to 1978, the number of farms decreased from 1,146 to 1,032 while the average size of those farms increased from 1,030 acres to 1,157 acres.³ While the number of farms are expected to continue to experience a downward trend, rural residential subdivisions adjacent to existing communities are expected to increase in number. It should be pointed out at this time, however, that at some point farm numbers and population will stabilize. However, there are

³U.S. Department of Commerce, Bureau of the Census, U.S. Census of Agriculture, 1978 Morton County, North Dakota.

no mechanisms available to predict the point at which that stabilization will occur.

TABLE 1

POPULATIONS 1950 - 2000
FOR THE
COUNTY AND ITS INCORPORATED COMMUNITIES*

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Almont	190	190	109	144	148	147
Flasher	413	515	467	402	407	413
Glen Ullin	1,324	1,210	1,070	1,125	1,315	1,309
Hebron	1,412	1,340	1,103	1,078	1,132	1,129
Mandan	7,298	10,525	11,093	15,345	20,784	24,119
New Salem	942	986	943	1,076	1,118	1,106
County	19,295	20,992	20,310	24,936	30,119	32,461

*Population projections derived from an adjustment of the Regional Environmental Assessment Program (REAP), the Mandan City Planning Office and the linear regression method.

Source: U.S. Department of Commerce, Bureau of the Census, United States Census of Population: 1950, 1960, 1970, 1980 Characteristics of Population, North Dakota, Morton County Growth Management Plan 1980-2000, Glen Ullin Comprehensive Plan 1980-2000.

TABLE 2

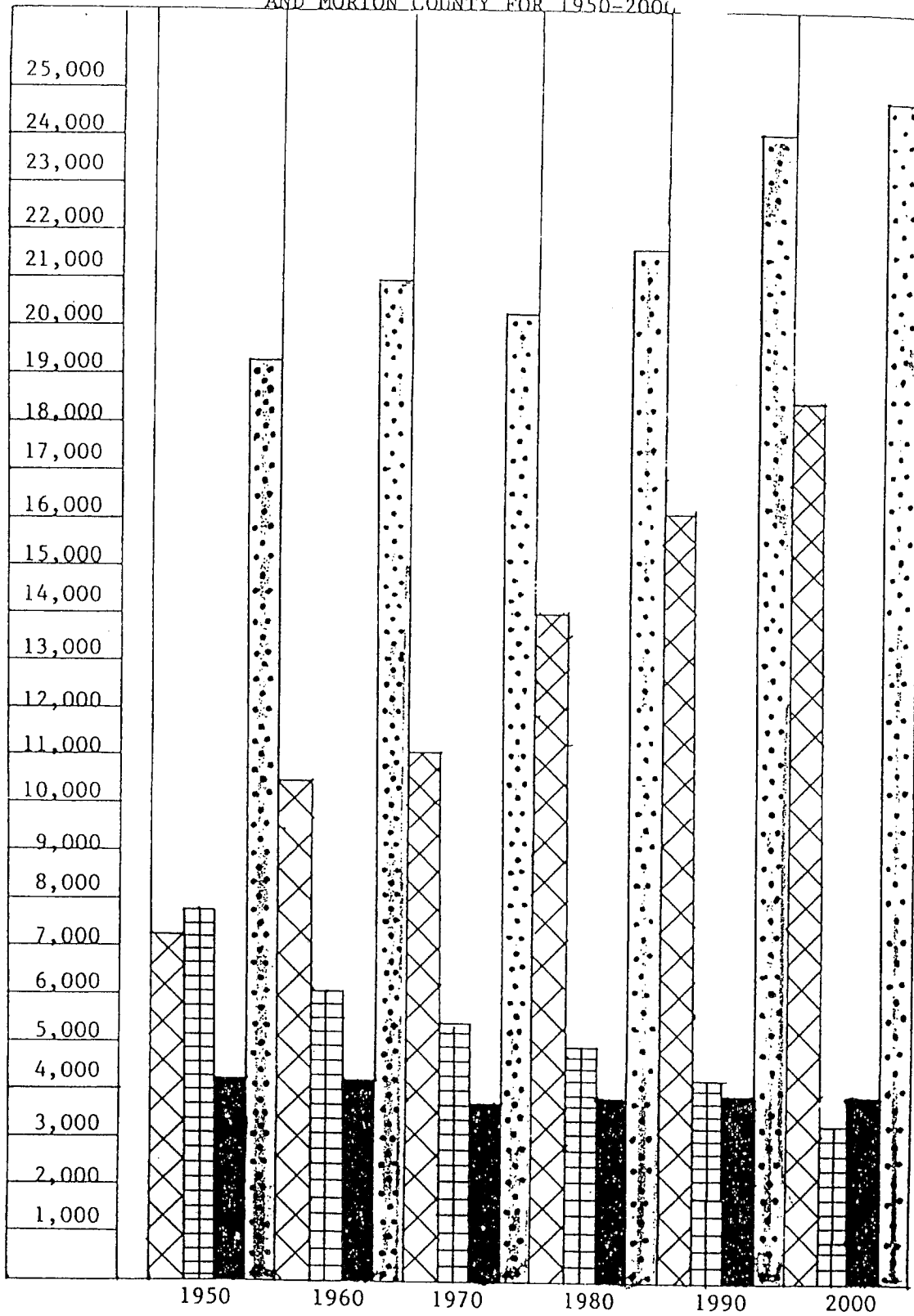
DISTRIBUTION OF POPULATION*
PERCENT OF COUNTY TOTAL
(1950-2000)

	<u>1950</u>	<u>%</u>	<u>1960</u>	<u>%</u>	<u>1970</u>	<u>%</u>	<u>1980</u>	<u>%</u>	<u>1990</u>	<u>%</u>	<u>2000</u>	<u>%</u>
Urban	7,298	37.8	10,525	50.1	11,093	54.6	15,345	61.6	20,784	69.0	24,119	74.3
Rural	7,716	40.0	6,226	29.7	5,525	27.2	5,766	23.1	5,215	17.3	4,238	13.1
Rural- onfarm	4,281	22.2	4,241	20.2	3,692	18.2	3,825	15.3	4,120	13.7	4,104	12.6
COUNTY TOTAL	19,295		20,992		20,310		24,936		30,119		32,461	

*Population projections derived from an adjustment of the Regional Environmental Assessment Program (REAP), the Mandan City Planning Office and the linear regression method.





Source: U.S. Department of Commerce, Bureau of the Census, United States Census of Population: 1950, 1960, 1970, 1980 Characteristics of Population, North Dakota, Morton County Growth Management Plan (1980), Hebron Comprehensive Plan 1980-2000, Glen Ullin Comprehensive Plan 1980-2000.

TABLE 3



*According to the U.S. Census, urban areas are those incorporated communities with a population higher than 2,500, rural-nonfarm are incorporated communities with a population of less than 2,500 and rural areas are unincorporated area and farm population.

LEGEND

-  Urban
-  Rural
-  Rural Nonfarm
-  County Total

Source: U.S. Census of Population for North Dakota, 1950, 1960, 1970.

Source: Mandan City Planning Office

Source: Regional Environmental Assessment Program (REAP) Economic Demographic Model.

CHAPTER III

LAND USE

In order to properly plan for and promote acceptable forms of physical development, it is necessary that the existing land use patterns within the county be identified and briefly discussed. Only in this manner can the public officials of Morton County hope to establish and maintain the proper relationships between existing and future land use types within the county. The existing land uses within Morton County are identified in the remainder of this chapter and Figure 12 illustrates their existing relationship within the county.

AGRICULTURAL LAND

Morton County comprises a land mass of 1,237,120 acres. Of that total, more than 95% is used for agricultural purposes. Rangeland is by far the largest single land use within the county comprising approximately 683,000 acres.⁴ Rangeland in Morton County is typified by grasses and shrubs and is used primarily for hay, silage production, and livestock grazing. Cropland generally occurs on the highest quality farmland within the county and comprises approximately 530,000 acres⁵ within the county. Cropland occurs on the highest quality farmland within the county and is primarily utilized in growing red spring wheat, oats, barley, rye, flax and alfalfa. Crop rotation and summer fallow are commonly used management practices on cropland such as this. Of the agricultural land within the county, 3,502 acres was under irrigation in 1978.⁶ Figure 4 shows the potentially irrigable land in the county as well as those quarter sections under irrigation in 1975.

Of all land uses, urban and rural residential growth presents the greatest threat to agricultural land. Existing urban areas and their expanding rural fringes threaten the best cropland within the county.

⁴1978 Census of Agriculture, 1978

⁵ibid.

⁶ibid.

Early trends toward development of rich and fertile river valleys is largely responsible for this trend. As the highest use in the county it is of the utmost importance that agricultural land be preserved or the loss of such land at least be minimized by the use of proper planning practices.

URBAN LAND USES

The urban land uses within the county for the purposes of this plan comprises all commercial, industrial, residential, and recreational uses which take place in the incorporated municipalities of the county.

According to the Regional Environmental Assessment Program (REAP) approximately 4,400 acres of the county comprised this classification in 1976. Although this acreage represents a relatively small percentage of the total county, it perhaps holds one of the greatest possibilities of expansion. The aforementioned rural to urban exodus is mainly responsible for this trend. However, all incorporated municipalities within the county at the present time do have sufficient land to accommodate growth for at least several decades without expanding their existing boundaries. One way of reducing rural fringe growth is for those communities to make their lands more appropriate for development. These would normally entail reduced taxes and the provision for modern street, sewer, and water facilities.

RESIDENTIAL LAND USES

Residential uses within Morton County are those land uses of a residential nature occurring outside incorporated communities, in rural fringe corridors, near scenic or recreation areas and in the unincorporated villages located throughout the county which are of a nonfarm nature. In recent years there has been a decided trend for people to build residences outside urban areas for the purpose of enjoying a rural environment, escaping taxes, and residing in lower density developments. Other causes of such rural subdivisions have been the completion of the interstate highway system, improved over-all transportation systems, and the availability of farm home loans.

Rural fringe and subdivision growth presents the greatest problem for Morton County. In general, the county does not have the revenues to provide adequate services to all such subdivisions and secondly, residential developments of this nature are responsible for taking the largest amount of prime farmland out of agricultural production, hence the county's great source of revenue is even further reduced. Disproportionate assessments of agricultural land near city limits is also a cause of urban sprawl because farmers simply can make more of a profit by subdividing their land than using it to grow crops.

Strip and linear types of developments in rural areas are by far the most costly in terms of providing services. If growth in the rural sector continues, as it is anticipated to do so, strict zoning and subdivision regulations should be enforced so as to ensure the most appropriate type of development possible. Appropriate, for the county's purposes, would mean developments of a relatively compact nature, developed in a manner suitable to the soil and topography and which would take the least amount of agricultural land out of production.

COMMERCIAL LAND USES

Commercial areas in the rural sector of Morton County are located in relatively few areas throughout the county. In general, such areas are located on junctions of highways and cater to services and entertainment for motorists. The development of the interstate highway system promulgated several such areas in the county. Discretion must be used in approving further commercial areas, especially of the highway-strip variety, for they have a tendency of attracting rural residential developments as their adjacent uses.

INDUSTRIAL LAND USES

For the most part industrial uses outside the cities of Morton County are few. Those industrial sites that do exist are primarily sand and gravel operations scattered throughout the county. Most notable of the industrial uses in the county is the Standard Oil Refinery located

immediately north of the city of Mandan and the R.M. Heskett power plant. Because of the Mandan Municipal Airport's separateness from that community, that area is also classified industrial for this plan's purposes. In general, industrial uses are unusual in that they are considered compatible with few other uses of the land, therefore in planning for such uses, consideration must be given for appropriate open space or buffers to separate industrial uses from those of a commercial, residential or recreational nature.

The potential for further expansion of industry in the rural sector of Morton County largely depends on whether or not the identifiable lignite resources within the county are mined. If and when this occurs, large tracts of land will undoubtedly be moved into the industrial classification. Figure 13 illustrates the approximate location of lignite reserves within the county that have been identified.

PUBLIC AND RECREATION LAND USES

The land uses categorized under public and recreation areas designates those areas throughout the county owned, managed or leased by either state, federal or local government for the purposes of promoting recreation, leisure-time activities, game management, waterfowl production or for the preservation of historical, scenic, archeological, or natural areas. Such areas as the Fort Lincoln State Park and the Northern Great Plains Experiment Station are also included within this classification. A detailed inventory of not only county but municipal parks and recreation areas is presented in Appendix D.

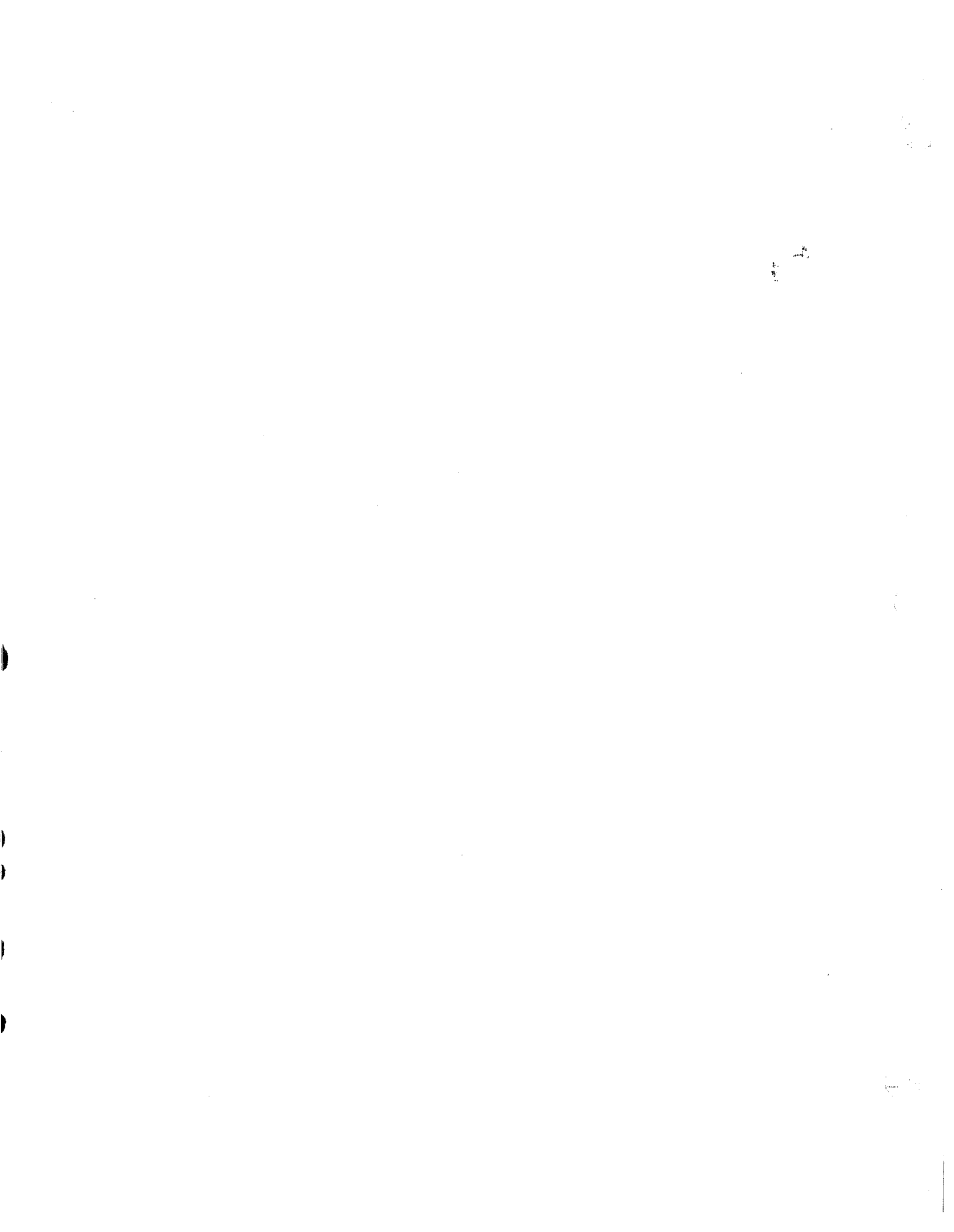
Public park and recreational areas only account for approximately 10,000 acres⁷ within the county, but contain some of the most varied scenic, historical and wooded areas the county has to offer. These areas include most notably large sections of the Missouri River Valley and game management areas throughout the county. Recreational dwellings

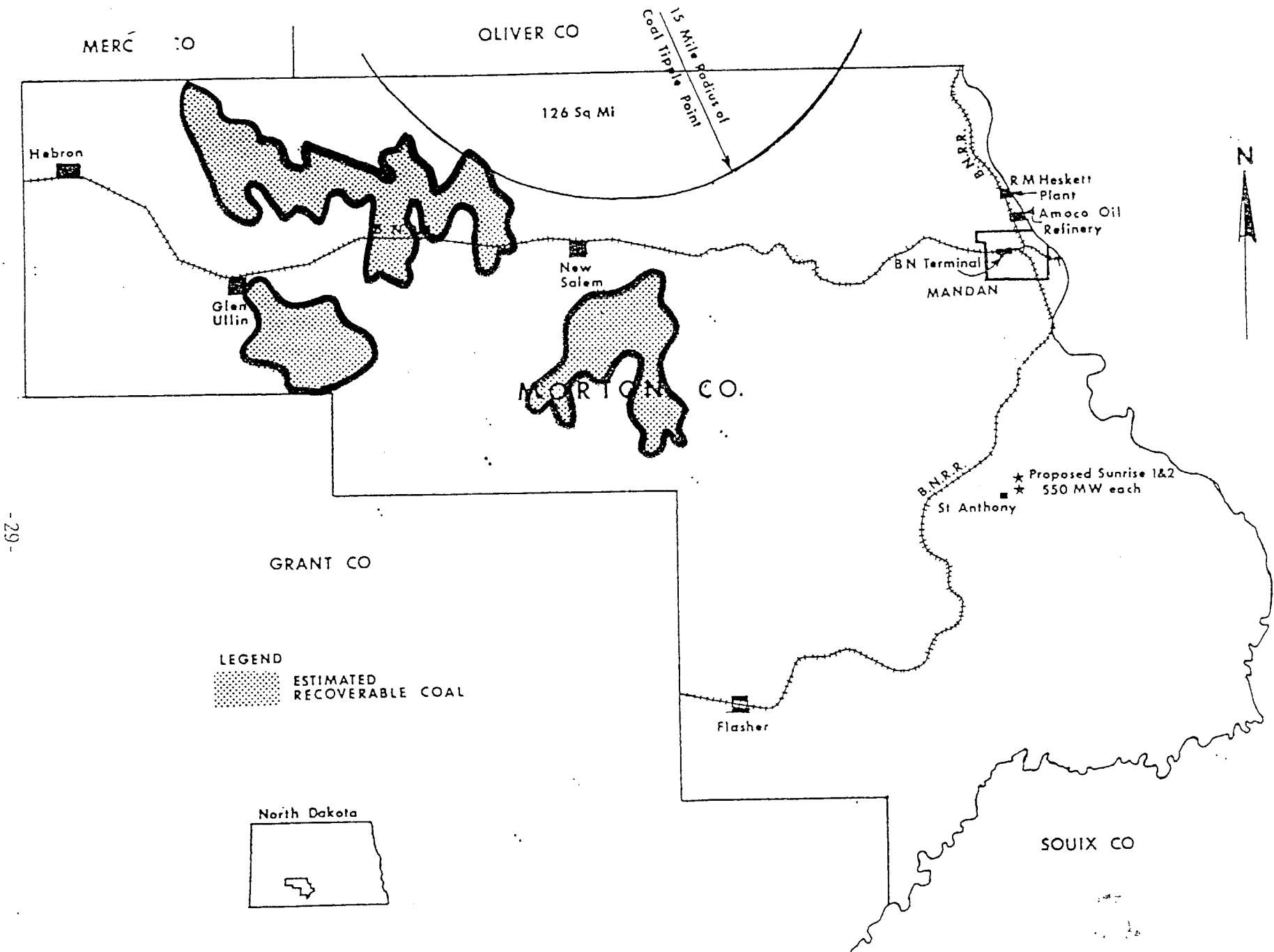
⁷The total acreage for park and recreation areas does not include municipal parks, surface water acres on any rivers within the county, nor does it include the lands comprising the Agricultural Experiment Station in the county. (See Appendix D)

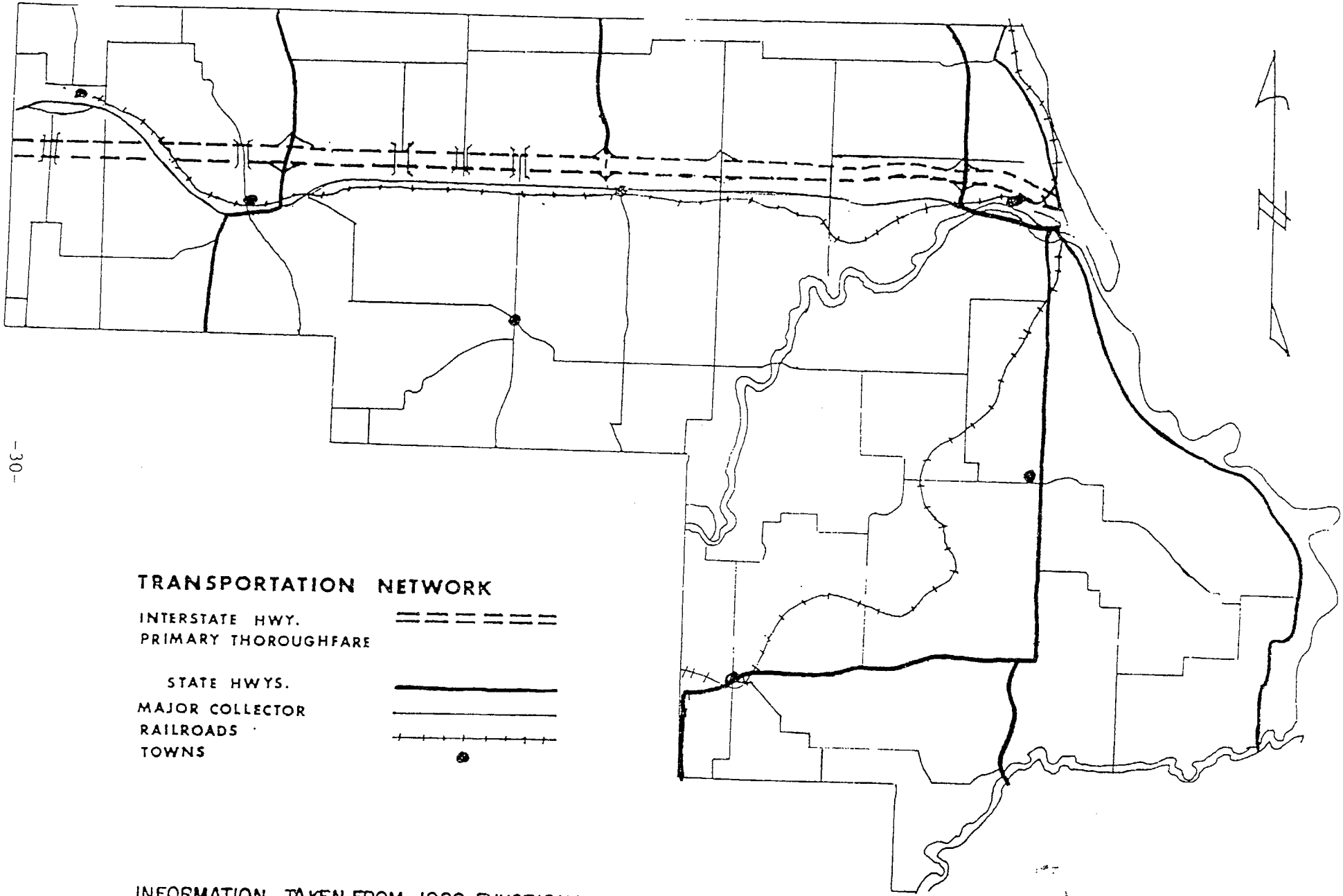
are becoming popular in or near such areas and pose a definite threat to their fragile environments.

TRANSPORTATION

As are other rural counties, Morton County is very dependent on its transportation network for the provision of goods and services. The county highway system and the county (farm-to-market) roads are especially important to the agricultural sector for they represent the only means for getting produce to the market areas. Figure 14 identifies the primary transportation routes in the county and their relationship to the county's incorporated communities. The principal grain market for Morton County is Minneapolis, Minnesota with goods being shipped there through the Burlington Northern Railway or on the interstate highway system.

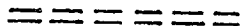





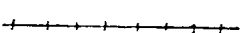



-30-

TRANSPORTATION NETWORK

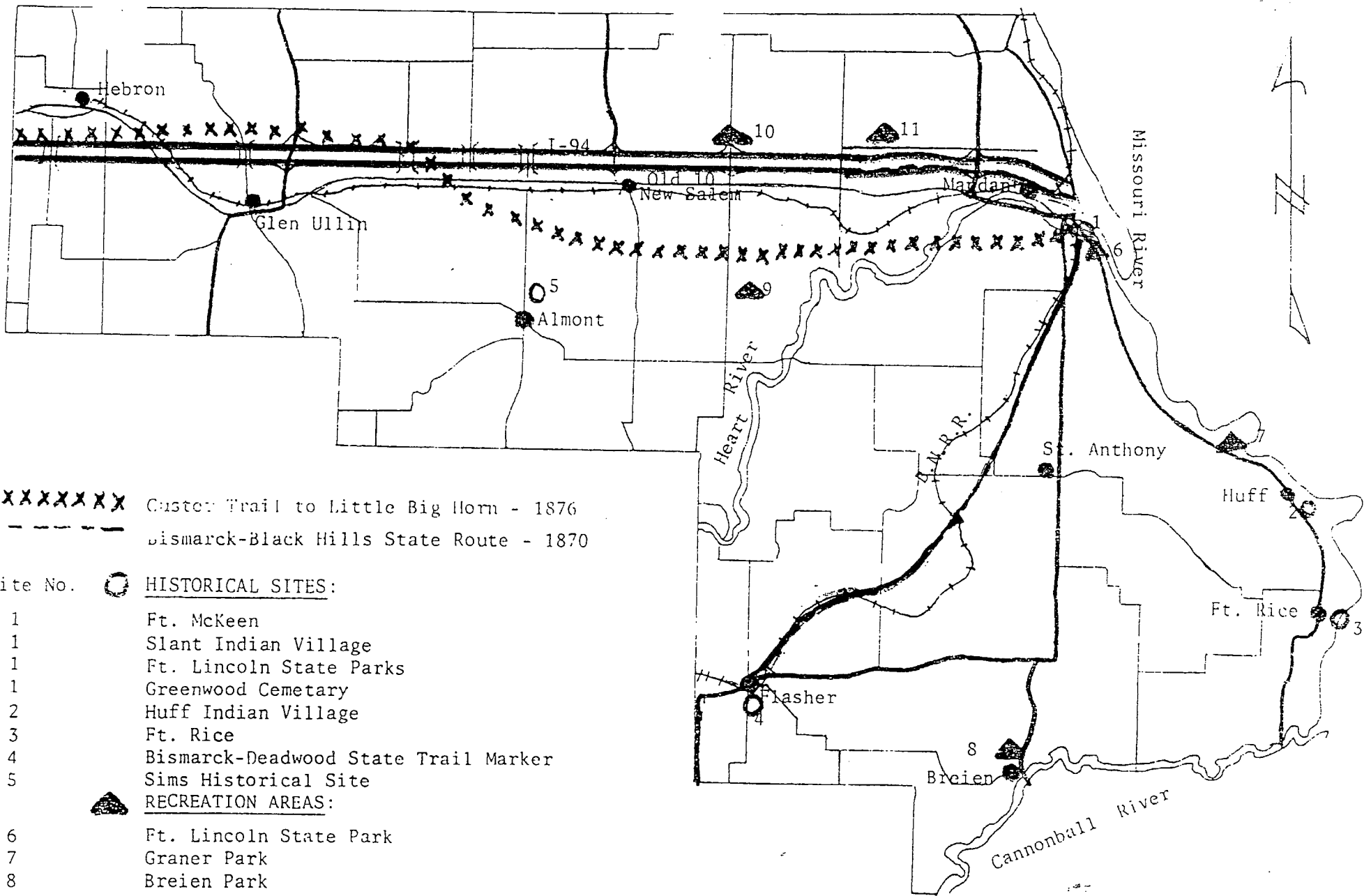
INTERSTATE HWY. 
 PRIMARY THOROUGHFARE

STATE HWYS. 
 MAJOR COLLECTOR

RAILROADS 
 TOWNS 

INFORMATION TAKEN FROM 1980 FUNCTIONAL CLASSIFICATION MAP
 AS SHOWN BY STATE HIGHWAY DEPARTMENT


MORTON COUNTY



XXXXXXXXXX

Custer Trail to Little Big Horn - 1876

Bismarck-Black Hills State Route - 1870

Site No.  HISTORICAL SITES:

- 1 Ft. McKeen
- 1 Slant Indian Village
- 1 Ft. Lincoln State Parks
- 1 Greenwood Cemetary
- 2 Huff Indian Village
- 3 Ft. Rice
- 4 Bismarck-Deadwood State Trail Marker
- 5 Sims Historical Site

 RECREATION AREAS:

- 6 Ft. Lincoln State Park
- 7 Graner Park
- 8 Breien Park
- 9 Fish Creek
- 10 Sweetbriar Lake
- 11 Crown Butte Dam

MORTON COUNTY

CHAPTER IV
COUNTY LAND USE GOALS AND OBJECTIVES

The goals and objectives regarding land use within this chapter, as well as the policies in the following chapter, are the core of Morton County's Comprehensive Land Use Plan. All decisions made regarding planning and zoning should be made with consideration of the goals, objectives and policies. For the purposes of this plan, goals are desirable points to be reached, objectives comprise rather general avenues of approach which, when satisfied, will lead to ultimate achievement of the goal statements, and policies are specific guidelines for action to help meet the objectives and thus get closer to achieving the goals.

In order to insure that this plan is representative of public attitude in the county, these goals and policies were drafted from input received at a series of public meetings throughout the county.⁸

⁸The nominal group approach was the methodology employed at the county-wide public meetings. The approach is one which insures that all in attendance have an equal opportunity to participate and voice their opinions. Using the nominal group approach, a series of land use priorities were developed at each meeting. The goals and policies discussed in this chapter are the cumulative results of those meetings.



GOAL I: THE PROMOTION AND PROTECTION OF AGRICULTURAL ACTIVITY BY
PRESERVING FARMLAND AND AGRICULTURALLY-RELATED INDUSTRIES

1. Strictly regulate the type, number and location of commercial, residential, and industrial developments in farming or agricultural areas.
2. Use soils according to type and regulate nonfarm development according to soil suitability and type.
3. Maintain low traffic volumes on rural roads frequently carrying farm machinery.
4. Prevent rural areas from becoming dumpgrounds for uses not wanted elsewhere.
5. Insure a stable economic base by promoting and encouraging the growth of agriculturally-related industries.

GOAL II: PROMOTE USES OF THE LAND NOT HARMFUL TO THE IRREPLACEABLE SOIL
BASE AND WHICH ARE BEST SUITED TO SOIL QUALITIES AND TYPE

1. Discourage nonfarm developments in areas where soil is most suitable for agricultural purposes.
2. Discourage land practices or uses which contribute to or are the causes of wind and water erosion and the resultant loss of topsoil.
3. Insure that natural or steep slopes are subject to development only when the natural topography is not drastically altered or construction practices are done in a manner which will not create or promote drainage problems and wind or water erosion.
4. Insure that proper measures are taken to reduce runoff and retain natural vegetation at construction sites.

5. Require that large scale land uses involving considerable land modification submit detailed erosion control plans.
6. Pursue road designs involving minimal amounts of land coverage and a minimal feasible disturbance to the soil.
7. Carefully examine strip mine plans and procedures to insure that soils disturbed by mining operations can and, in fact, will be reclaimed to a productive level.
8. Restrain topsoil removal whenever possible, but when unavoidable, make certain topsoil is banked and saved for future respreading.

GOAL (III): PROMOTE WELL PLANNED RESIDENTIAL, COMMERCIAL AND INDUSTRIAL GROWTH THROUGHOUT THE COUNTY.

1. Prohibit incompatible uses from locating in close proximity to one another.
2. If incompatible or conflicting uses do, however, locate in close proximity to each other, make sure an appropriate buffer zone or green space is provided to separate those conflicting uses.
3. Develop and keep continually up-to-date an official map which designates existing zones, existing uses, and platted uses.
4. Adequate and proper enforcement of existing zoning ordinances, subdivision regulations, and building codes.
5. Discourage nonfarm development within the 100 year flood plain unless certain conditions are met by the developer.
6. Promote the enhancement or rehabilitation of existing areas in order that they may accommodate future growth.
7. Develop a transportation plan for the county to be done in conjunction with existing municipalities within the county (update annually).

GOAL (IV): ENCOURAGE SUCH DEVELOPEMENT WHENEVER POSSIBLE TO OCCUR IN OR IMMEDIATELY ADJACENT TO EXISTING INCORPORATED MUNICIPALITIES (AND EXISTING UNINCORPORATED COMMUNITIES).

1. Promote high to moderate density housing complexes whenever possible within existing incorporated limits.
2. Accommodate new commercial and industrial areas in existing appropriate zoning districts.
3. Attract growth to vacant areas in communities and subdivisions before new areas are allowed to be acquired and/or developed.
4. Insure that sewer and water facilities and streets are planned in a manner allowing for simple extension to future developments in adjacent areas.
5. Prevent strip type commercial development.
6. Provide for adequate recreation areas, school sites, and open space by including mandatory school and park dedications for subdivisions (land or fees in lieu of land transfers.)
7. Heavy industrial or commercial developments should be prevented from occurring on secondary roads.

GOAL (V): MAINTAIN ADEQUATE LEVELS OF WATER QUALITY AND AVAILABILITY
THROUGHOUT THE COUNTY

1. Deter developments proposed for areas with high water table or on flood plains.

2. Promote the establishment of rural water districts for rural sectors of the county.
3. Promote the minimization of water erosion and sedimentation through utilization of effective soil conservation techniques.
4. Insure that proper measures are taken to reduce runoff and retain natural vegetation and topography.
5. Encourage development readily tied to existing sewer and water facilities whenever possible.
6. Lessen the chance of groundwater pollution or excessive nutrient enrichment by requiring that lots, unable to be tied into sewer and water facilities, be of adequate size for ground sewage disposal septic tank systems.
7. Take measures to insure the preservation of rural water table by discouraging high-intensity non-farm development and water usage in agricultural areas.
8. Establish minimum distances between commercial animal feedlot operations and lakeshores, streams and rivers.
9. Insure that mining endeavors and other energy-related uses do not interfere with or affect aquifers and groundwater levels.

GOAL (VI): PROMOTE GREATER PARTICIPATION BY THE GENERAL PUBLIC IN THE
DECISION MAKING PROCESS

1. Maintain a continuing program of public information in order to keep the planning goals of the county constantly before the eyes of the public.
2. Continue to solicit public input and involvement regarding land use decisions and in plan or ordinance preparation or update.

3. Make all important documents available for review by the public.
4. Make sure all proceedings follow the required publication and hearing process.
5. Develop clear and understandable procedure for changes and amendments to plans as well as ordinances.

GOAL (VII): PLAN AND PROVIDE FOR NEEDED PUBLIC FACILITIES AND SERVICES IN ORDER TO PROMOTE PUBLIC HEALTH, SAFETY, AND WELFARE

1. Insure that when sewer and water services are provided they are done so in a manner readily amendable to change or extension.
2. Promote consolidation of city and county contractual services as much as possible.
3. Restrict uses adversely affecting air quality, water quality, and noise levels.
4. Assure that utilities meet established health and safety standards.
5. Require that storm drains and protection works be constructed where needed to prevent flood damage.
6. Prohibit uses which threaten the physical well-being of residents due to flood hazards, fire, erosion, subsidence or other avoidable areas.
7. Assure the development of adequate lot sizes necessary for safe separation of wells, septic tanks, etc.
8. Assume minimum side, front, and rear requirements for safety purposes.

9. Make sure access points on major roads are spaced properly so as to not create interference with traffic flow.
10. Provide sufficient off-street parking.
11. Maintain clear driving site lines.
12. Support multiple school usage.
13. Continue to establish priorities for recognized needs.
14. Develop a (five year) county capital improvement program to be updated annually.
15. Public officials at both the municipal and county level should annually update and review existing plans, ordinances, and regulations in order to insure that needs are being adequately addressed and codes are enforced.

GOAL(VIII) PROVIDE ADEQUATELY FOR MEETING THE RECREATIONAL AND LEISURE
TIME NEEDS OF THE PUBLIC

1. Preserve and enhance the historic, scenic, recreational and valuable natural and wildlife areas in the county.
2. Develop recreational areas which are accessible by all the public including the elderly and the physically handicapped.
3. Promote tourism by enhancing local features of interest and conserving the natural beauty of the area.
4. Encourage special provisions for the acquisition and protection of scenic easements within the county.

GOAL (VIII): PRESERVE PROPERTY VALUES AND MAINTAIN A DIVERSE HOUSING STOCK

1. Encourage growth of existing developments and investment patterns by discouraging diffuse growth.
2. Promote proper design, construction, and maintenance standards.
3. Protect residential areas from heavy through traffic.
4. Promote the use of accepted modern subdivision practices in subdivision platting.
5. Minimize advertising and noise disturbance particularly in residential areas.
6. Support activities providing a variety of housing opportunities and types suitable to a wide cross-section of the population.
7. Enhance the attractiveness of residential areas by preventing junkyards, other unsightly industries and incompatible uses from locating in or near such neighborhoods. When necessary, use buffer zones or barriers to separate existing conflicting uses.

CHAPTER V
PLAN POLICIES

In order to meet the goals and objectives listed in Chapter IV, the following policies were devised. Policies are the specific guidelines which need to be followed in order to attain the objectives and the goals.

1. To assure fair and consistent actions, all motions to approve, dis-approve or modify any request under the Morton County Zoning Resolution or any amendments thereto should include reference to applicable goals, objectives and policies.
2. No consideration to approving a variance from the acreage minimum for a farm should be considered unless it can be demonstrated that:
 - a. No conflict would exist with surrounding or existing uses.
 - b. A significant majority of the property would be used for agricultural purposes.
 - c. Enforcement of the minimum acreage requirement would create a hardship.

Among other issues which must be considered are:

- d. Access.
 - e. Extension of services.
 - f. Soil types.
 - g. Whether buildings already exist on the property.
3. No rezoning or conditional use to permit a non-farm residential use in an agricultural district shall be approved unless a hardship can be shown. Additionally, all or most of the following points should be substantially met:
 - a. Access to the property should be from a well graded and regularly maintained road.
 - b. The use will not require an extension of services, or, as an alternative, that the user can prove that any cost resulting from an extension of services will be offset by additional income to the County as a result of the use.
 - c. The use is in close proximity to other non-farm uses.
 - d. The use will not conflict with existing or surrounding agricultural uses.

- e. The use will not take good farmland (particularly prime and state-important soils) out of production.
 - f. The user will devote all or part of his efforts to agricultural activities, such as providing assistance to a nearby farmer.
- 4.
1. Because it is the goal of the County to encourage residential growth and development in already developed areas, and because unincorporated communities were platted and partially developed well in advance of existing planning and zoning regulations, it should be assumed that a hardship exists for any applicant proposing residential development in the communities of Judson, Huff, Fort Rice, Breien, St. Anthony, or in any rural subdivision partially developed before 1806. Denial of any variance or rezoning request in those communities should be based on the County's findings that approval would create a hardship on the County or on surrounding property owners.
 5. Prior to approving rezoning, a variance, or a special use permit to allow a commercial or industrial use in a non-commercial or non-industrial area, all or most of the following must be met:
 - a. The area should be suitable for all uses permitted under the new zoning classification, not just for the use being proposed.
 - b. Existing roads can adequately and safely handle changes in traffic patterns or types of vehicular traffic as a result of the change.
 - c. The applicant must be able to show that no suitable property in already developed or suitably zoned areas is available.
 - d. The rezoning will not require any extension of services, or that any cost resulting from extension of services will be offset by additional income to the County as a result of the proposed use.
 - e. The commercial or industrial use will not conflict with surrounding uses.
 6. No subdivision plat shall be approved unless need can be demonstrated to the satisfaction of the County Planning Commission and the County

Board of Commissioners, the applicant must be able to show:

- a. That the proposed plat location will not conflict with the goals, objectives and policies of this plan.
- b. That all zone districts and subdivision requirements have been met or exceeded.
- c. The requirement to show need is not intended to stifle competition; rather, competition should be encouraged.

In demonstrating need, the applicant must show there is a market for the type of development proposed and that there is not already platted land available for similar development in terms of type, size, location, price and desirability.

CHAPTER VI
PLAN IMPLEMENTATION

This chapter's purpose is to identify those measures necessary to insure implementation of the comprehensive land use plan through proper execution of the planning process at the county level. Although these mechanisms have been touched on briefly in previous chapters, they will be discussed in much greater detail in this chapter.

IMPLEMENTATION

The initial steps to effective implementation of the plan occur when all necessary revisions of the plan have been made and the document is officially adopted by the Morton County Planning Commission according to the procedures set forth in the North Dakota Century Code. Following adoption of the plan, proper implementation is dependent upon a variety of mechanisms available for such implementation. Such mechanisms as proper zoning enforcement, control of subdivisions, and enforcement of building codes which, when done in conjunction with the recommendations mentioned in the preceding chapter, can promote well planned growth and development at the county level. Such a plan can only serve as a general framework for decision making and policy development when the following tools are available and put to proper use.

ZONING

Preparation of the comprehensive plan should serve as the foundation for the zoning ordinance. The responsibility for this preparation, according to the North Dakota Century Code, lies with the County Planning Commission. State statutes recognize zoning as the principle method for achieving orderly growth. These statutes also exclude agricultural activity and incorporated municipalities from county zoning regulations.

The County Planning Commission, as the designated legal authority for administering and enforcing zoning ordinances and subdivision regulations, must base its land use decisions on well-defined criteria.

Generally, there are two such sources for that criteria--the county comprehensive plan and five specific purposes adopted by the North Dakota Legislature which establishes county zoning in order to promote health, safety, morals, public convenience, general prosperity, and general welfare. These five purposes which follow should serve as the general guide for review of zoning changes or other land use proposals. The applicant or advocate of change would need to offer convincing evidence that the proposed change is in compliance with this guide and the comprehensive plan.

Purpose #1 "To protect and guide the development of nonurban areas."

- 1) Is the proposed change consistent with the comprehensive plan?
- 2) Is the proposed change a logical extension of existing ordinances?
- 3) Is the proposed change compatible with existing land uses on adjacent property?
- 4) How will the proposed change affect both adjacent and county wide⁴ property values?
- 5) How will the proposed change affect the existing transportation network within the county?
- 6) Does the change reinforce present development where substantial public and private investment already exists?

Purpose #2 "To secure safety from fire, flood and other dangers."

- 1) How will the proposed change affect the following vital environmental concerns?
 - a) water quality
 - b) air quality
 - c) noise
- 2) Will the proposed change endanger, in any way, the physical well-being of citizens due to floods, fire, erosion, subsidence, or other avoidable dangers?
- 3) Will the proposed change intensify traffic in a manner which results in congestion and traffic hazards?

Purpose #3 "To regulate and restrict erection, construction, or use of buildings and structures, the height, number of stories, and rise of buildings and structures, the percentage of lot area that may be occupied, the size of court yards and other open spaces, the density of population, and the location and use of buildings, structures and land for trade, industry, residence or other purposes."

- 1) Is the appropriate technique (i.e. rezoning, planned unit development, subdivision, conditional use, variance, etc.) being used to obtain the desired land use?
- 2) Is the proposed change in accordance with the zoning ordinance requirements regarding procedures, notices, etc.?

Purpose #4 "To lessen governmental expenditures."

- 1) Will the proposed change overload existing public facilities?
- 2) Will the impact of the proposed change increase the burden and cost of local government (i.e. sewer and water, police and fire protection, schools, street and highway maintenance) without an equivalent increase in revenues?
- 3) If increased revenues as a result of the proposed change are anticipated, when will this revenue be realized and can governmental units meet immediate needs if it is not readily available?
- 4) Will the proposed change result in an unnecessary spread of development adding to governmental expenditures?
- 5) How will the proposed change affect property values and the local tax base?

Purpose #5 "Conserve and develop natural resources."

- 1) Will this change result in the removal of good agricultural land or potentially irrigable lands for production?
- 2) What effect will the proposed change have on the valuable soil base?
- 3) How will the proposed change affect efforts to conserve area water resources?
- 4) Will the proposed change hinder future development of sand, gravel, coal, oil or other mineral resources?
- 5) How will the proposed change affect the following:
 - a) scenic areas?
 - b) historic sites or landmarks?

SUBDIVISIONS

Subdivision regulations generally affect the conversion of undeveloped land. The regulations mainly address those initial and long term improvements--streets, sewer, and water main locations, widths and standards for these improvements, park and school site locations, and lot size--affecting the character of the subdivision and the provision of public services. The regulations insure that the interest of the public as well as the purchaser and developer of the land are properly protected. Such regulations also foster a beneficial pattern of development conforming with the goals of the comprehensive plan.

Established subdivision procedures require that a plat of the proposed subdivision be submitted to the Planning Commission for their review. There, approval or disapproval is based upon compliance with the standards set forth in the subdivision regulations and assures that the cost of public improvements is split equitably between new residents and taxpayers. The regulations will also result in new development which meets the standards set forth in the zoning ordinance.

APPENDIX A

SOIL LIMITATIONS FOR DEVELOPMENT IN MORTON COUNTY*

The estimated interpretations listed on the following pages are based on the engineering properties of soil, on test data for soils in the survey area and adjoining areas, and on the experience of engineers and soil scientists with soils of the Mandan area.

The soils indicated below are rated by slight, moderate, and severe. Slight means soil properties generally favorable for the rated use, or in other words, limitations that are minor and easily overcome. Moderate means that some soil properties are unfavorable but can be overcome or modified by special planning and design. Severe means soil properties so unfavorable and so difficult to correct or overcome as to require major soil reclamation, special designs or intensive maintenance. For the most part, severe areas should be considered avoidance areas.

* Judgements made on these soil limitations must be based on the use of a detailed soils map for the county and not the general soils map contained within the plan. Detailed soils maps of Morton County can be obtained from the local Soil Conservation District offices.

DEGREE AND KIND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Alluvial clay soils	Ac	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding
Alluvial loam soils	Al	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding
Arnegard silt loam	As	MODERATE-- moderate permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost action
Alluvial sandy soils	Ay	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding
Bainville clay loam, 0-8% slopes	Bc	SEVERE-- slow permeability	SEVERE-- texture	SEVERE-- high shrink-swell	MODERATE-- depth to bedrock	SEVERE-- high shrink-swell
Bainville clay loam, 9-15% slopes	Bc	SEVERE-- slow permeability	MODERATE-- slope	MODERATE-- slope	MODERATE-- slope	MODERATE-- slope
Bainville clay loam, hilly phase	Bch	SEVERE-- depth to slow permeability	MODERATE-- slope	MODERATE-- slope	MODERATE-- slope	MODERATE-- slope
Bainville clay loam, smooth phase	Bcm	SEVERE-- slow permeability	SEVERE-- texture	SEVERE-- high shrink-swell	MODERATE-- depth to bedrock	SEVERE-- high shrink-swell
Bainville clay loam, steep phase	Bcz	SEVERE-- slope, slow permeability	SEVERE-- slope, texture	SEVERE-- slope	SEVERE-- texture	SEVERE-- slope

DEGREE AND KIND OF LIMITATION FOR:

Local Roads and Streets	Sanitary Landfill (Trench)	Dwelling With Basement	Shallow Excavation	Septic Tank Absorption Fields	Published Symbol	Published Name
MODERATE--*1 flooding	SEVERE--*1 seasonal, waterable, flooding	SEVERE--*2 seasonal, waterable, flooding	SEVERE--*1 seasonal, waterable, flooding	SEVERE--*1, 3 seasonal, waterable, flooding	Bf	Banks loamy fine sand
MODERATE-- moderate fros action	MODERATE-- depth to bedrock	MODERATE-- slope	MODERATE-- slope	SEVERE-- depth to bedrock	B1	Bainville loam
SEVERE-- slope	MODERATE-- depth to bedrock	SEVERE-- slope	SEVERE-- slope	SEVERE-- depth to bedrock, slope	B1h	Bainville loam hilly phase
MODERATE-- moderate fros action	MODERATE-- depth to bedrock	MODERATE-- low strength	SLIGHT	SEVERE-- depth to bedrock	B1m	Bainville loam, smooth
SEVERE-- slope	SEVERE-- depth to bedrock, slope	SEVERE-- slope	SEVERE-- slope	SEVERE-- depth to bedrock, slope	B1z	Bainville loam, steep phase
SEVERE-- high shrink-swell	MODERATE-- depth to bedrock	SEVERE-- high shrink-swell	SEVERE-- texture	SEVERE-- slow permeability	Bn	Bainville-Rhoades clay loams *2
SEVERE-- high shrink-swell	MODERATE-- depth to bedrock	SEVERE-- high shrink-swell	SEVERE-- texture	SEVERE-- slow permeability	Bng	Bainville-Rhoades clay loams, rolling phases *2
SEVERE-- high shrink-swell	SEVERE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- slow permeability	BR	Bainville-Rhoades loams *2
MODERATE-- slope	MODERATE-- slope	MODERATE-- slope	MODERATE-- slope	SEVERE-- slow permeability	BRg	Bainville-Rhoades loams, rolling phases *2

DEGREE AND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Banks silty clay	Bs	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, soil permeability	MODERATE-- flooding
Banks silty clay, poorly drained phase	Bsd	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, soil permeability	MODERATE-- flooding
Banks very fine sandy loam	Bv	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, soil permeability	MODERATE--*1 flooding
Cherry clay	Cc	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- moderate shrink-swell	SEVERE-- texture	MODERATE-- moderate shrink-swell
Cheyenne fine sandy loam	Cf	SLIGHT *3	SLIGHT	SLIGHT	SEVERE-- rapid permeability in substratum	MODERATE-- moderate frost action
Cheyenne gravelly loam, steep phase (0-8% slopes)	Cgz	SLIGHT--*3 slopes of 0-8%	SLIGHT-- slopes of 0-8%	SLIGHT-- slopes of 0-8%	SEVERE-- very rapid permeability in substratum	SLIGHT-- slopes of 0-8%
Cheyenne gravelly loam, steep phase (8-15% slopes)	Cgz	MODERATE--*3 slopes of 8-15%	MODERATE-- slopes of 8-15%	MODERATE-- slopes of 8-15%		MODERATE-- slopes of 8-15%

DEGREE AND KIND OF LIMITATION FOR:

Local Roads and Streets	Sanitary Landfill (Trench)	Dwelling With Basement	Shallow Excavation	Septic Tank Absorption Fields	Published Symbol	Published Name
SEVERE-- slopes of more than 15%	SEVERE-- very rapid permeability in substratum	SEVERE-- SLIGHT-- frost action	SEVERE-- SLIGHT frost action	SEVERE--*3 SLIGHT*3	C1	Cheyenne loam gravelly loam, steep phase (greater than 15% slopes)
SEVERE-- flooding, very poorly drained	SEVERE-- flooding, very poorly drained	SEVERE-- flooding, high shrink-swell	SEVERE-- flooding, very poorly drained	SEVERE-- slow permeability	Dc	Dimtick clay
SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	MODERATE-- depth to bedrock	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	Fs	Flasher loamy fine sand
SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock, slope	Fsh	Flasher loamy fine sand, hilly phase
MODERATE-- depth to bedrock	SEVERE-- depth to bedrock	MODERATE-- depth to bedrock	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	Fsm	Flasher loamy fine sand, smooth phase
SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	Fsz	Flasher loamy fine sand, steep phase
MODERATE-- depth to bedrock	SEVERE-- depth to bedrock	MODERATE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	Fy	Flasher fine sandy loam

Published Name	Published Symbol	Septic Tank Absorption Fields	shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Flasher fine sandy loam, rolling phase	Fyg	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock	MODERATE-- depth to bedrock, slope	SEVERE-- depth to bedrock	MODERATE-- depth to bedrock, slope
Grail silty loam	Gc	SEVERE-- moderately slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Grail silty clay loam, slope phase	Gcx	SEVERE-- moderately slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Grail silt loam	Gs	SEVERE-- moderately slow permeability	MODERATE-- texture	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate shrink-swell
Grail silt loam, slope phase	Gsx	SEVERE-- moderately slow permeability	MODERATE-- texture	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate shrink-swell
Grail-Moline silty clay loams *2	GM	SEVERE-- moderately slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Grail-Moline silty clay loams, slope phases *2	GMx	SEVERE-- moderately slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Grail-Moline silt loams *2	Gr	SEVERE-- moderately slow permeability	MODERATE-- texture	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate shrink-swell

DEGREE AND KIND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Havre silty clay	Hc	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	MODERATE--*1 flooding, seasonal watertable
Havre silty clay, poorly drained phase	Hcd	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	MODERATE--*1 flooding, seasonal watertable
Hall-Wade silt loams *2	Hd	MODERATE-- moderate permeability	SLIGHT	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate frost action
Havre fine sandy loam	Hf	MODERATE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	MODERATE-- flooding
Huff loamy fine sand	Hl	SEVERE--*1,3 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	MODERATE-- flooding
Hall silt loam	Hm	MODERATE-- moderate permeability	SLIGHT	MODERATE-- moderate shrink-swell	SLIGHT	MODERATE-- moderate frost action
Hall loam	Ho	MODERATE-- moderate permeability	SLIGHT	MODERATE-- moderate shrink-swell	SLIGHT	MODERATE-- moderate frost action
Havre silt loam	Hs	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable	SEVERE--*1 flooding, seasonal watertable
Huff silt loam	Hu	SLIGHT	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost action

DEGREE AND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Huff very fine sandy loam	Hv	SLIGHT	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost actio
Hall-Wade *2 silty clay loams	HW	SEVERE-- slow permeability	SEVERE-- texture	SEVERE-- high shrink-swell	SEVERE-- texture	SEVERE-- high shrink-swel
Hall silty clay loam	Hy	SEVERE-- slow permeability	SEVERE-- texture	SEVERE-- high shrink-swell	SEVERE-- texture	SEVERE-- high shrink-swel
McKenzie clay	Mc	SEVERE-- flooding, slow permeability	SEVERE-- flooding, texture	SEVERE-- flooding, high shrink-swell	SEVERE-- flooding, texture	SEVERE-- flooding, high shrink-swel
Moline-Grail silty clay loams *2	MG	SEVERE-- very slow permeability	SEVERE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swel
Morton-Rhoades clay loams *2	Mh	SEVERE-- depth to bedrock	SLIGHT	MODERATE-- low strength strength	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Morton-Rhoades clay loams, *2 rolling phases	Mhg	SEVERE-- depth to bedrock	SLIGHT	MODERATE-- low strength	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Morton loam	Ml	SEVERE-- depth to bedrock	SLIGHT	MODERATE-- low strength	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Morton loam, rolling phase	Mlg	SEVERE-- depth to bedrock	MODERATE-- slope	MODERATE-- low strength, slope	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio

DEGREE AND KIND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Morton clay loam	Mo	SEVERE-- depth to bedrock	SLIGHT	MODERATE-- low strength	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Morton clay loam, rolling phase	Mog	SEVERE-- depth to bedrock	MODERATE-- slope	MODERATE-- low strength, slope	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Morton-Rhoades loams *2	MR	SEVERE-- depth to bedrock	SLIGHT	MODERATE-- low strength	MODERATE-- depth to bedrock	MODERATE-- moderate frost actio
Moline-Patent clay loams *2	Ms	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Moline-Patent clay loams, slope phases*2	Msx	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swei
Patent-Moline fine sandy loams *2	Pf	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost actio
Patent clay loam	P1	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost actio
Patent clay loam, slope phase	Plx	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost actio
Patent-Moline clay loams *2	PM	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost actio

DEGREE AND KIND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Patent-Moline clay loams, slope phases *2	Pmx	SEVERE-- moderately slow permeability	SLIGHT	MODERATE-- low strength	SLIGHT	MODERATE-- moderate frost action
Rhoades-Bainville clay loams *2	RB	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Rough brokenland	Rb	SEVERE-- slope	SEVERE-- slope	SEVERE-- slope	SEVERE-- slope	SEVERE-- slope
Rhoades- *2 Bainville clay loams, rolling phases	RBg	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Rhoades-Morton clay loams *2	RM	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Rhoades-Morton clay loams *2 rolling phases	RMg	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Riverwash	Rv	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding	SEVERE-- flooding
Scoria	Sc	SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock, slope	SEVERE-- depth to bedrock	SEVERE-- depth to bedrock, slope
Timmer fine sandy loam	Tf	SLIGHT	SLIGHT	SLIGHT	SLIGHT	MODERATE-- moderate frost action

DEGREE AND KIND OF LIMITATION FOR:

Published Name	Published Symbol	Septic Tank Absorption Fields	Shallow Excavation	Dwelling With Basement	Sanitary Landfill (Trench)	Local Roads and Streets
Williams clay loam	Wc	SEVERE-- moderately slow permeability	MODERATE-- texture	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate shrink-swell
Wade-Hall silty clay loams *2	WH	SEVERE-- very slow permeability	MODERATE-- texture	SEVERE-- high shrink-swell	MODERATE-- texture	SEVERE-- high shrink-swell
Williams silt loam	Ws	SEVERE-- moderately slow permeability	MODERATE-- texture	MODERATE-- moderate shrink-swell	MODERATE-- texture	MODERATE-- moderate shrink-swell

- *1 The hazards of flooding are reduced by controlled flow from Garrison Dam, but hazard not entirely eliminated.
- *2 Interpretations are based on the first soil name of a soil complex. Additional information can be obtained by referring to name of second soil of the soil complex for interpretation. Soils are listed alphabetically in tables by first soil name. Field investigations may be necessary in some cases.
- *3 Pollution hazard.

APPENDIX B

AREAS CLASSIFIED UNDER PUBLIC AND RECREATIONAL LAND USES
STATE AND NATIONAL HISTORIC SITES, MARKERS
AND ARCHEOLOGICAL SITES IN MORTON COUNTY*

<u>SITE</u>	<u>TOWNSHIP/RANGE/SECTION</u>	<u>ACRES*</u>
Fort Lincoln State Park	138-81-13	900
Bismarck Deadwood Stage Trail	135-84-34	.03
Huff Indian Village	136-79-5&8	14
Fort Rice	135-79-15	7
Fort McKeen (in Fort Lincoln State Park)		
Slant Indian Village (in Fort Lincoln State Park)		NA
Northern Pacific Depot Mandan		NA
Cannonball Stage Station		NA
Cadell Homestead Site		NA
Greenwood Cemetary	138-81-2	NA
Memorial Bridge	139-80-31	NA

* Another 79 historical and 107 archeological sites have been identified but have not yet been evaluated by the State Historical Society.

<u>Name</u>	<u>Location</u>	<u>Total Acres</u>	<u>Hunting Acres</u>	<u>Fishing Acres</u>	<u>Boating & Fishing Acres</u>	<u>Canoeing Miles</u>
<u>State Game Refuges & Game Management Areas:</u>						
Fish Creek Dam	138-84-36	200	142	58	58	
Sweet Briar Dam	139-84-10	888		351	351	
Crown Butte Lake	139-82-7	83	84	38		
Morton County	137-81-27	642	642			
Lake Patricia	135-84-36	631	631	251		
Glen Ullin	139-88-30	230	230			
Storm Creek	140-87-36	480		123	123	
Oahe	137-79-80	5,737	5,737			

County Parks:

Dawson Pond	137-83-36	10		6		
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Federal Properties: (for recreational use)

Bureau of Land Management National Resource lands	135-81-6	236	236			
Lake Oahe	County	15,256		10,679	10,679	
Missouri River	County	2,865		2,006	2,006	27
Heart River	County					50

Private Non-Profit Areas:

Nygren Dam	136-84-14	17		12		
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MUNICIPAL PARK AND OUTDOOR RECREATION AREAS

Mandan	208 acres
Flasher	24 acres
New Salem	176 acres
Almont	1 acre
Glen Ullin	25 acres
Hebron	11 acres

FEDERAL PROPERTIES (CONSERVATION AND AGRICULTURE)

Northern Great Plains Experiment Station	2.080 acres
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