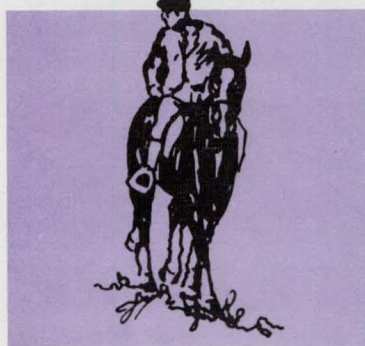


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Statewide Recreational Trails Plan



Prepared by:



Barton-Archman Associates, Inc.

In Association With:

Dunbar/Jones Partnership

Kirkham, Michael & Associates, Inc.

Zimmerman, Laurent & Richardson, Inc.

February 1990

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IOWA STATEWIDE RECREATIONAL TRAILS PLAN

Prepared For:

Iowa Department of Transportation (DOT)

In Consultation With:

**Iowa Department of Natural Resources (DNR)
Iowa Department of Economic Development (DED)
Iowa Department of Cultural Affairs (DCA)**

Prepared By:

Barton-Aschman Associates, Inc.

In Association With:

**Dunbar/Jones Partnership
Kirkham, Michael and Associates, Inc.
Zimmerman, Laurent and Richardson, Inc.**

February 1990

DEPARTMENT OF
TRANSPORTATION

JUN 24 1990

MASTERS OF TRAVEL



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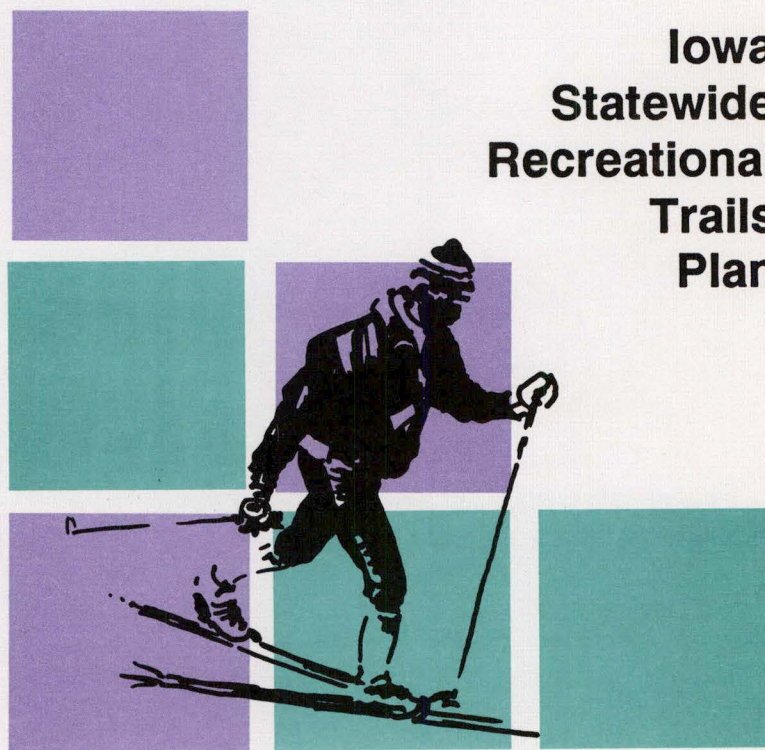
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FORWARD

Preparation of a statewide, multimodal trails plan of this scope and magnitude could not have been possible without the cooperation of many agencies and individuals. On behalf of the Iowa Department of Transportation and the consultant team, we would like to thank the Project Management Team, Technical Advisory Committee and others for their hard work, information and service toward the preparation of this trails plan.

**Iowa
Statewide
Recreational
Trails
Plan**



Chapter 1

Introduction

CHAPTER 1 INTRODUCTION

A. PRECEDENCE FOR THE PLAN

The precedence for the Iowa Statewide Recreational Trails Plan was established in 1987 when the Iowa State Legislature directed the Iowa Department of Transportation (DOT) to undertake a comprehensive trails plan. According to Iowa Code Chapter 111F, the objective of the statewide trails plan is to: "prepare a long-range plan for the acquisition, development, promotion, and management of recreation trails throughout the state. The plan shall identify needs and opportunities for recreation trails of different kinds having national, statewide, regional and multicounty importance."

The Legislature then appropriated \$1 million annually toward the plan's preparation and implementation.

B. PURPOSE OF PLAN/MISSION STATEMENT

The Iowa Statewide Recreational Trails Plan was developed in response to the Iowa State Legislature's recognition of the increased public demand for quality outdoor recreational facilities and the numerous economic, ecological and health benefits associated with the development and usage of trail systems.

The plan presents a statewide trails system that will serve as a basis for trail planning efforts throughout the state. The plan provides a framework of existing and proposed trails of statewide significance to form a unified trails system. The plan is also intended to encourage development of more recreational trails in the state and guide the future expansion of the system.

The components of the proposed statewide trails system should have significant natural, cultural, historic or recreational attributes (qualities), or connect major outdoor recreational facilities (areas) in order to maximize the use, conservation and enjoyment of these areas. A statewide system must also provide opportunities and respond to the needs of a wide variety of both existing and future trail users and modes. The proposed trail system is designed to capitalize on existing trail segments and to guide future trail developments which will complement the state's natural, cultural and recreation resource base.

The statewide trails plan will assist state agencies in evaluating future candidate recreational trail projects for funding priorities. Development of the proposed statewide system will represent an interest by the State of Iowa to protect and preserve existing and future trails and to ensure that present and future generations will have the opportunity to enjoy various types of trail experiences.

C. ROLE OF AGENCIES

1. DOT Involvement

The Iowa Department of Transportation's (DOT) involvement in the statewide trails plan stems from a directive from the 1987 Iowa State Legislature to prepare the statewide trails plan. The DOT's objective was to identify needs and opportunities for various kinds of recreational trails having national, regional, statewide and local importance.

The DOT's undertaking of the trails plan was a cooperative effort with the Department of Natural Resources (DNR), Department of Economic Development (DED) and Department of Cultural Affairs (DCA). Because the DOT lacked the in-house staff with expertise needed to prepare an exhaustive and thorough inventory of trails and the resulting trails plan, it sought a consultant to provide in-depth knowledge and broad-based national experience. The DOT also wanted to involve other agencies to complement the process, incorporating expertise from user groups, property owners and local governments. The DOT and consultant team established the Project Management Team and Technical Advisory Committee to assist in the planning effort.

2. Project Management Team (PMT)

The Project Management Team (PMT) was formed to solicit and gain state agency input. The PMT's purpose was to serve as a core group of individuals representing the State of Iowa, and provide management and technical guidance to the consultants during the study. The team served as the decision-making and policy-forming group during the plan's formation.

The team included representatives from the Department of Transportation, Department of Natural Resources, Department of Economic Development, Department of Cultural Affairs and project consultants. The group's eight members met monthly during the trails plan's preparation. A listing of PMT members can be found in Appendix A of this document.

3. Technical Advisory Committee (TAC)

The Technical Advisory Committee (TAC) was formed to provide the process with technical support regarding trail user needs, design input and trail location input. The TAC served as a forum for input from various trail user groups, land owners and local government. The committee also acted as a liaison to larger organized groups, and discussed the needs and concerns of competing trail user and interest groups.

Members of Iowa state agencies and trail user groups attended TAC meetings. The meetings were held regularly during the planning process and were attended by representatives from the same agencies as the PMT.

The TAC was not a decision-making or approval committee. It focused on obtaining the recommendations or "informed consent" of the statewide trails plan by special-interest groups. It also functioned to develop mutual

respect and understanding between special-interest groups and the planning body.

Specific tasks undertaken by the TAC included the establishment of corridor location objectives and trail design standards. A listing of TAC members can be found in Appendix B, page B-1, of this document.

D. PUBLIC PARTICIPATION

Public opinions and participation were an important key in the creation of the trails plan. Throughout the planning process, the public was offered numerous opportunities to learn about and contribute to the plan.

A series of project newsletters informed Iowa residents about the plan's progress. The newsletters were produced by the consultant team for DOT distribution. Some subjects covered in the newsletters included the events leading to the trails planning effort, the project's mission statement, results of the household opinion survey, corridor location objectives and the preferred trails plan. The newsletters also informed readers about dates and locations of public meetings during which they could hear presentations and ask questions about the plan.

Representatives from the DOT and the consultant team led five public meetings in Red Oak, Cherokee, Oelwein, Ankeny and Washington during August, 1989. People attending the public meetings included trail user groups such as snowmobile and biking clubs, property owners who may be affected by plan implementation and representatives from city and county governments.

The presentations were about the history and background of the trails plan, the preferred trails locations and project implementation. The meetings afforded the public the opportunity to ask questions of agency members and consultants, and to offer them feedback.

A more in-depth exploration of the trails plan's public participation components can be found in Appendix F, page F-1, of this document.

E. DESCRIPTION OF PLAN'S CONTENT

1. Trails Plan Content

This trails plan is intended to be a comprehensive planning process which establishes a statewide multimodal recreation trails plan. This phase assesses needs and benefits, conducts an inventory of existing natural resource features and cultural data, and establishes location objectives from which plan alternatives could be generated.

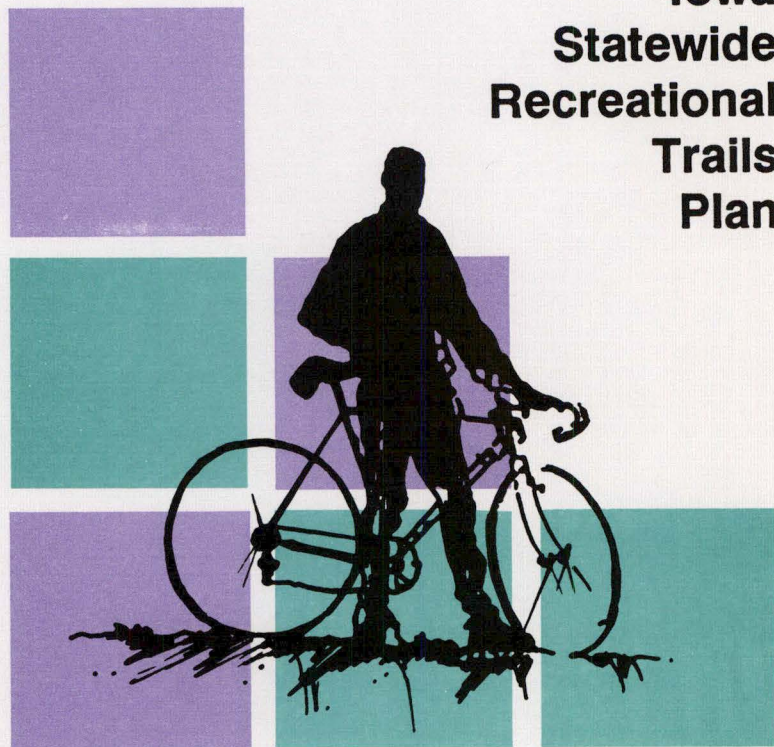
Through agency and public participation the preferred plan could be chosen which locates trail corridors within the state based upon the state's resources. The planning process also establishes general trail design guidelines and preliminary cost estimates of the plan's implementation. Alternative financing and implementation responsibilities were also examined.

The plan's intent is not to establish specific corridor alignments that must be adhered to. Rather, Phase I identifies general corridors that local governments can examine and make specific recommendations about trail alignment and determine specific trails modes which should utilize the corridors.

2. Intention of Future Studies

The process and resulting trails plan are not intended to address trail operations, management and maintenance. While the DOT and consulting team realize the importance of these issues, they are intended to be analyzed as part of the future studies. During the trails plan study, numerous questions, comments and conflicts pertaining to operations, management and maintenance became apparent. These items will be addressed in future studies.

Iowa Statewide Recreational Trails Plan



Chapter 2

Needs and Benefits of a
Statewide Recreational Trails System

CHAPTER 2

NEEDS AND BENEFITS OF A STATEWIDE RECREATIONAL TRAILS SYSTEM

A. INTRODUCTION

This chapter explores the current and future need for recreational trails in the State of Iowa. It traces events that happened more than 20 years ago as the precursor of the modern trails system planning effort. Four types of trails are defined, and Iowa's earlier efforts to address provision of trails in the state are examined.

In the 1988 State Comprehensive Outdoor Recreation Plan (SCORP), the Iowa Department of Natural Resources identified several critical issues to which the statewide trails plan could respond. Other state plans mention or support the development of a statewide trails network.

The 1986 federally prepared National Trails Assessment, referenced on page 8, showed that trail activity participation is substantial and increasing, but that the supply of trails does not keep pace with the demand. Urban areas were deemed to be most deficient in trail opportunities. The elderly and those with lower incomes and education levels tended to participate least in trail activities. Walking and bicycling were found to be the most popular trail activities. A 1989 household survey in Iowa explored these trends further.

Numerous recreational and economic benefits are realized through trail development. A large market for trail usage among walkers, hikers and bicyclists exists in Iowa. Residents of other states spend money using Iowa's trail corridors.

B. PRECEDENT FOR TRAILS ESTABLISHED

The federal government has been a leader in recognizing the need to expand recreational trail opportunities. In 1968, Congress adopted the National Trails System Act [Public Law 90-543] which established the following policy for a national system of trails:

"In order to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of public access to travel within, and enjoyment and appreciation of the open-air, outdoor areas, and historic resources of the Nation, trails should be established, primarily, near the urban areas of the Nation, and secondarily, within scenic areas and along historic travel routes of the Nation, which are more often remotely located."

National Trails System

The 1968 Act further specified that the National Trails System be composed of the following four types of trails:

1. National Recreation Trails. These trails provide a variety of outdoor recreation uses in or reasonably near urban areas. With increasing demands for recreation opportunities near urban areas, National Recreation Trails are continuously being designated throughout the country.
2. National Scenic Trails. These are extended trails which provide both for maximum outdoor recreation use and for the conservation and enjoyment of nationally significant scenic, historic, natural, or cultural areas. There are eight trails in the system.
3. National Historic Trails. These are extended trails following the original trails or routes of national historical significance as much as possible and practical. In this way historic routes are identified and protected for public use and enjoyment.
4. Connecting or Side Trails. These trails provide access to national recreation, scenic or historic trails.

The National Trails System Act stresses the need for individual states to assume the responsibility and legislative authority for the development of trail systems. Presently, Iowa has seven trails designated as National Recreation Trails and two trails in the National Historic Trail inventory. These trails are discussed in Chapter IV, Trail Inventory of this plan.

State Programs

In 1987, the Iowa State Legislature recognized the value of and the need for a statewide recreational trails system by directing the Iowa Department of Transportation (DOT), under Iowa Code Chapter 111F to "prepare a long-range plan for the acquisition, development, promotion and management of recreation trails throughout the state." Iowa Code Chapter 111F also states that an objective of a statewide trails program shall be for the acquisition and development of 2,000 miles of new recreational trails and completion of existing trail projects before the year 2000. DOT has been credited with revenues from the road user tax fund of an amount of \$1 million annually for implementation of that program.

There are a number of state plans, programs and policies adopted by various state agencies that support the development of a statewide trails system in the context of the recreational, transportation, conservation and economic value of such a system.

1988 Iowa SCORP

The Iowa Department of Natural Resources (DNR) prepared the 1988 State Comprehensive Outdoor Recreation Plan (SCORP) and identified several critical recreational management issues which would require planning and action during the next five years. The following issues are those for which a statewide trails plan has been judged as a partial resolution or management tool.

1. Increased resource protection to provide continued high quality recreation experiences.
2. Expand resource protection areas to meet current and future demands.
3. Demand for recreational opportunities in unique natural settings.
4. Expanding and maintaining facilities to meet existing demands.
5. Public access to Iowa's rivers and streams.
6. Increasing demands for interpretive programs on park and recreation areas.
7. Demand for winter sports on parks, forests and state recreation areas.
8. Develop a statewide trails program.

1988 Iowa Open Spaces Plan

Another document prepared by DNR which addresses outdoor recreational issues is the 1988 Iowa Open Spaces Plan. This plan focuses on the acquisition and protection of the state's significant natural and cultural open spaces. The Open Spaces Program states several goals which are compatible with and could be enhanced by a statewide trails system such as:

1. Increase public opportunities to use, enjoy and benefit from Iowa's protected open spaces.
2. Protect representative examples of Iowa's land and water areas containing natural and cultural resources, including those in a range from common to rare and unique.
3. Maintain and improve Iowa's scenic resources.
4. Increase public awareness of the economic and social benefits of protecting Iowa's open spaces.

Iowa Transportation 2000 Plan

Support of a recreational trails system was also documented in the Iowa Transportation 2000 proposal prepared by the State DOT which advocated the building of at least 400 miles of new trails for biking, hiking and cross-country skiing.

In response to the interest in and apparent need for recreational trail opportunities as discussed in these various management programs and policies dealing with the state's natural, cultural and recreational resources, two separate statewide trail development plans were prepared and are summarized below.

Corridor Trail Network for Iowa's Landscape

The first plan prepared in 1973, by consultants for the Iowa State Conservation Commission (currently the Department of Natural Resources), was based upon a systematic approach of examining the significant natural, cultural and historic features of the state to provide a basis for identifying potential trail routes. This plan proposes that a combination of the natural corridor features of Iowa's watersheds, topography and natural vegetation with the state's cultural features and historic landmarks forms a pattern of landscape corridors providing the best areas for trail development. This landscape corridor concept places a priority on trail development along rivers and ridge corridors creating a system of linear routes along the state's major waterways. The plan also suggests that these natural corridors delineate the most scenic and aesthetically important areas of the state and contain most of the points of cultural and historic interest as a result of early settlement patterns. The plan recommended that the composite landscape corridor system serve as a framework in planning a statewide trail network which would link major corridors by overland ties that are adjacent to population centers. The plan does not discuss in detail implementation and management of such a system, nor the issues of trail user needs and impacts, design standards or costs and financing of trails.

Iowa Statewide Trails Assessment - Draft 1987

A more comprehensive statewide trails assessment which provided an overview of the existing and proposed trail developments and related activities in Iowa was prepared by the DNR in 1987. The assessment defined specific goals and objectives that would guide future trail development in the state and concluded with recommended actions to implement those goals. The assessment also states that although trail planning and interest exists at all levels of the public and private sector, there is currently no statewide or regional program to bring these efforts together and that there is a clear need for a comprehensive plan to coordinate and facilitate trail proposals and development to ensure a quality statewide system of recreational trails.

C. PUBLIC INTEREST AND DEMAND FOR RECREATIONAL TRAILS

National Assessment of Trail Usage and Related Trends

A federal report entitled National Trails Assessment, prepared in 1986 by the U.S. Department of the Interior - National Park Service, provided information on trail activities participation, trail needs perceived by users, and the scope and extent of a National Trails System discussed earlier. A nationwide survey of trail user needs was conducted and the results indicate the following:

1. Participation in recreational trail activities is substantial and is showing significant growth.
2. The nationwide supply of trail opportunities does not meet the demand, especially in and near urban areas where the need is greatest.

3. Walking for pleasure is by far the nation's most popular trail-type activity.
4. Approximately one-third of the respondents participate in bicycling; the annual volume of bicycling per participant exceeds all other trail activities.
5. Among population segments, the elderly and those in lower income and education categories tend to participate in fewer trail activities than the general population.

A national, non-profit organization known as the Rails-to-Trails Conservancy was established in 1986 for the purpose of facilitating the conversion of abandoned railroad corridors to recreational trails. The Conservancy has had a great deal of private and public support at all levels and has been successful in the designation of 201 rail-trails during the past three years by providing financial and administrative assistance. The Conservancy's mission is also supported by federal laws administered through the Interstate Commerce Commission (ICC) which is responsible for the approval of proposed railroad abandonments. Once an abandonment is approved, the ICC can, and must upon proper request, take steps to prevent the immediate destruction of a corridor's continuity by encouraging the railroad company to negotiate with a public body or a qualified private group for conversion of the corridor to trail use (Rails-to-Trails Conservancy, 1986).

State Assessment of Trail Usage and Related Trends

The nationwide trend of increased population of trail-related activities is reflected in Iowa which has a diverse cross-section of trail users including hikers, bicyclists, horse-back riders, off-road vehicle users, canoeists, cross-country skiers and snowmobilers. The DNR draft statewide trails assessment reported on trail user trends in the state based on a broad cross-section of the population and participation data gathered to monitor outdoor recreation in Iowa. It was determined that two variables, age and income (Table 2.1 and Figures 2.1 and 2.2), seem to have the most influence on which Iowans participate in which trail activities. Iowans below 40 years of age tend to participate in the more physical trail activities (bicycling, canoeing, hiking) and motorized activities (off-road vehicle driving and snowmobiling). Those Iowans from 40 to 50 years old participate in a mixture of activities while those over 50 tend to participate in the more passive activities (driving for pleasure and walking).

These statistics were generated from a 1985 Recreation/Tourism Survey conducted by a consultant and the results are summarized in the 1988 Iowa SCORP report. A review of 24 types of outdoor activities shows that Iowa's participation rate tends to be generally higher than the national rates, and that two trail-related activities, biking and hiking, were among the five most popular outdoor recreation activities in Iowa for 1985. The survey projections concerning outdoor recreation indicate an increasing demand for trail-oriented activities such as biking, hiking, all-terrain vehicle driving, horseback riding, canoeing and cross-country skiing. The 1988 Iowa SCORP report states that future facility priority needs will be in the area of developing multi-use trails and support facilities.

TRAIL PARTICIPATION - IOWA

| Activity | Total Sample | Age | | | | | Family Income | | | | |
|--------------------------|-----------------|-------|-------|-------|-------|-----|-----------------|------------------------|------------------------|------------------------|-----------------------|
| | | 18-29 | 30-39 | 40-49 | 50-59 | 60+ | Under 10,000 | 10,000 to 19,999 | 20,000 to 29,999 | 30,000 to 49,999 | 50,000 and Over |
| Driving for pleasure | 70 | 67 | 67 | 68 | 72 | 76 | 72 | 70 | 73 | 69 | 65 |
| Hiking | 36 | 27 | 43 | 51 | 28 | 29 | 22 | 38 | 36 | 44 | 32 |
| Bicycling | 33 | 43 | 45 | 32 | 23 | 10 | 25 | 29 | 29 | 50 | 22 |
| Canoeing | 11 | 14 | 16 | 10 | 8 | 4 | 6 | 9 | 10 | 18 | 11 |
| Off-road vehicle driving | 9 | 22 | 7 | 10 | 3 | 1 | 3 | 10 | 10 | 13 | 8 |
| Horseback riding | 7 | 9 | 10 | 10 | 4 | 1 | 5 | 7 | 6 | 10 | 3 |
| Snowmobiling | 6 | 13 | 8 | 3 | 4 | 1 | 8 | 4 | 8 | 5 | 11 |
| Cross country skiing | 4 | 4 | 6 | 3 | 8 | 0 | 2 | 3 | 5 | 4 | 11 |
| Percent of total sample | 100 | 21 | 26 | 19 | 16 | 18 | 13 | 24 | 31 | 24 | 8 |

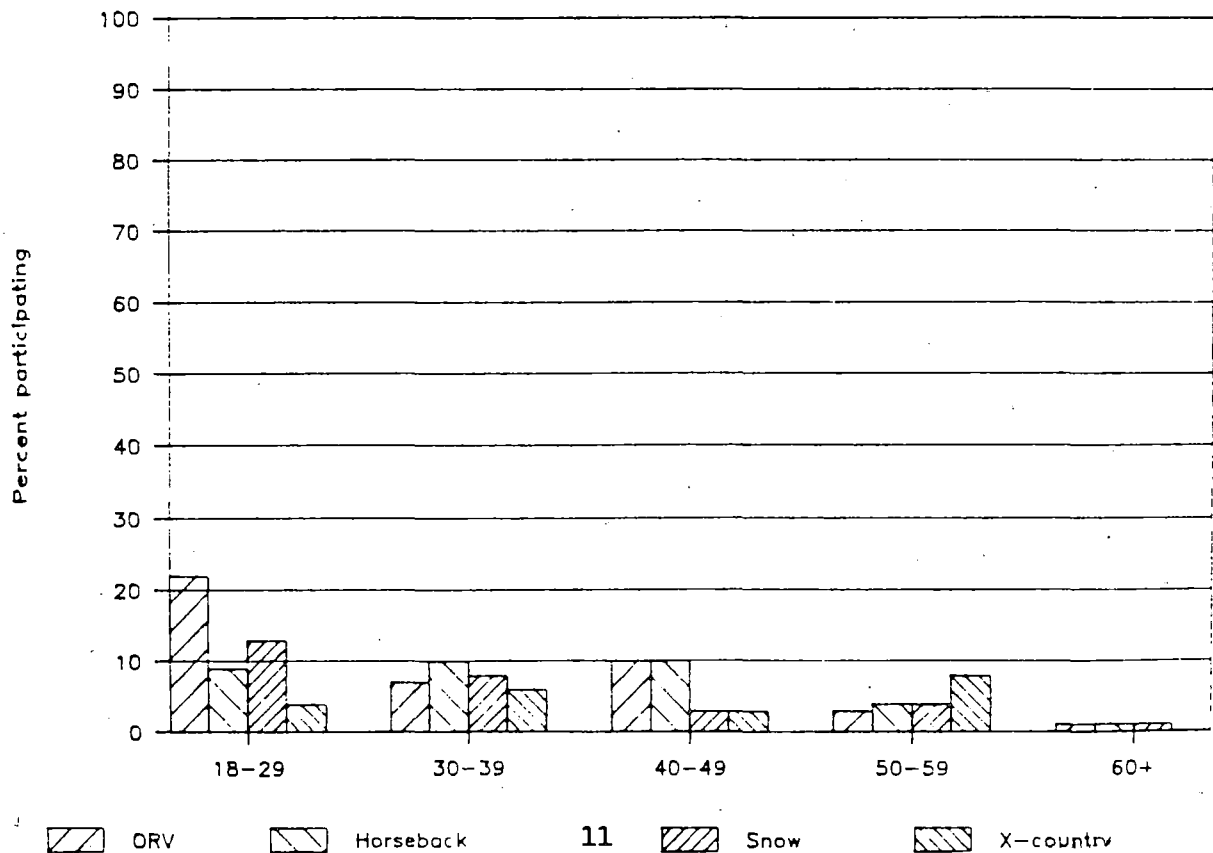
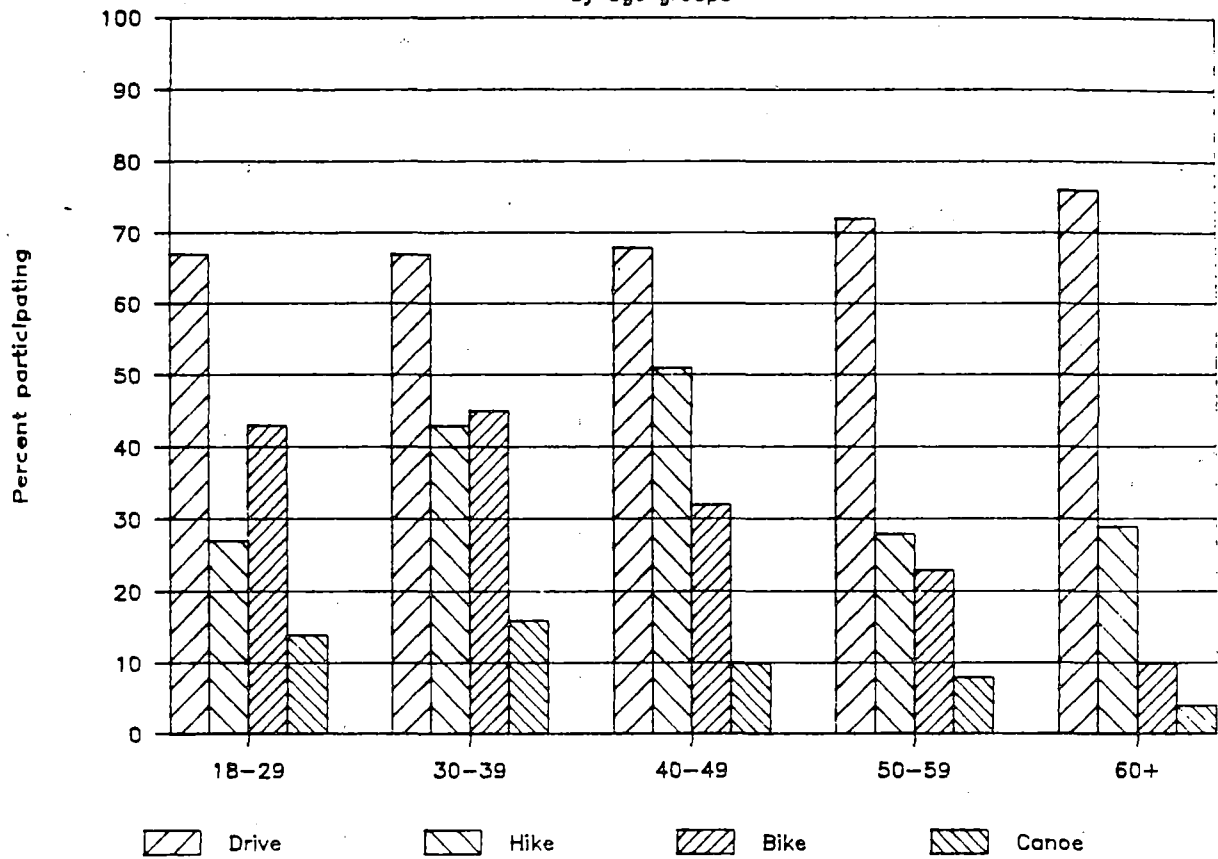
TRAIL PARTICIPATION - U.S.

| Activity | Total Sample | Age | | | | Family Income | | | | | Education | | |
|--------------------------|-----------------|-------|-------|-------|-----|----------------|-----------------------|------------------------|------------------------|-----------------------|--------------------------------|------------------------------------|----------------------------------|
| | | 12-24 | 25-39 | 40-59 | 60+ | Under 5,000 | 5,000 to 14,999 | 15,000 to 24,999 | 25,000 to 49,999 | 50,000 and Over | Less than High School | H.S. & < 4 yrs of College | 4 or more years College |
| Walking for pleasure | 53 | 57 | 58 | 53 | 42 | 45 | 46 | 54 | 61 | 62 | 35 | 56 | 67 |
| Bicycling | 32 | 55 | 37 | 22 | 7 | 23 | 24 | 35 | 41 | 42 | 11 | 28 | 37 |
| Running or jogging | 26 | 51 | 31 | 13 | 2 | 21 | 20 | 27 | 33 | 37 | 6 | 20 | 34 |
| Day Hiking | 14 | 19 | 17 | 12 | 5 | 10 | 10 | 13 | 18 | 25 | 3 | 13 | 25 |
| Off-road vehicle driving | 11 | 20 | 11 | 6 | 2 | 9 | 8 | 10 | 15 | 13 | 3 | 10 | 10 |
| Horseback riding | 9 | 18 | 10 | 5 | 1 | 7 | 6 | 9 | 11 | 15 | 2 | 8 | 9 |
| Canoeing or kayaking | 8 | 14 | 9 | 6 | 1 | 6 | 5 | 8 | 12 | 10 | 1 | 7 | 13 |
| Backpacking | 5 | 9 | 5 | 2 | x | 3 | 3 | 5 | 7 | 5 | x | 4 | 7 |
| Cross country skiing | 3 | 5 | 4 | 3 | x | 2 | 2 | 3 | 5 | 8 | x | 2 | 8 |
| Snowmobiling | 3 | 6 | 3 | 2 | x | 2 | 2 | 4 | 4 | 4 | 1 | 3 | 2 |
| Percent of total sample | 100 | 27 | 29 | 25 | 19 | 10 | 30 | 27 | 28 | 5 | 26 | 55 | 19 |

Source: IDNR - Draft Statewide Trails Assessment (1987)

IOWA TRAIL USER PROFILE

by age groups

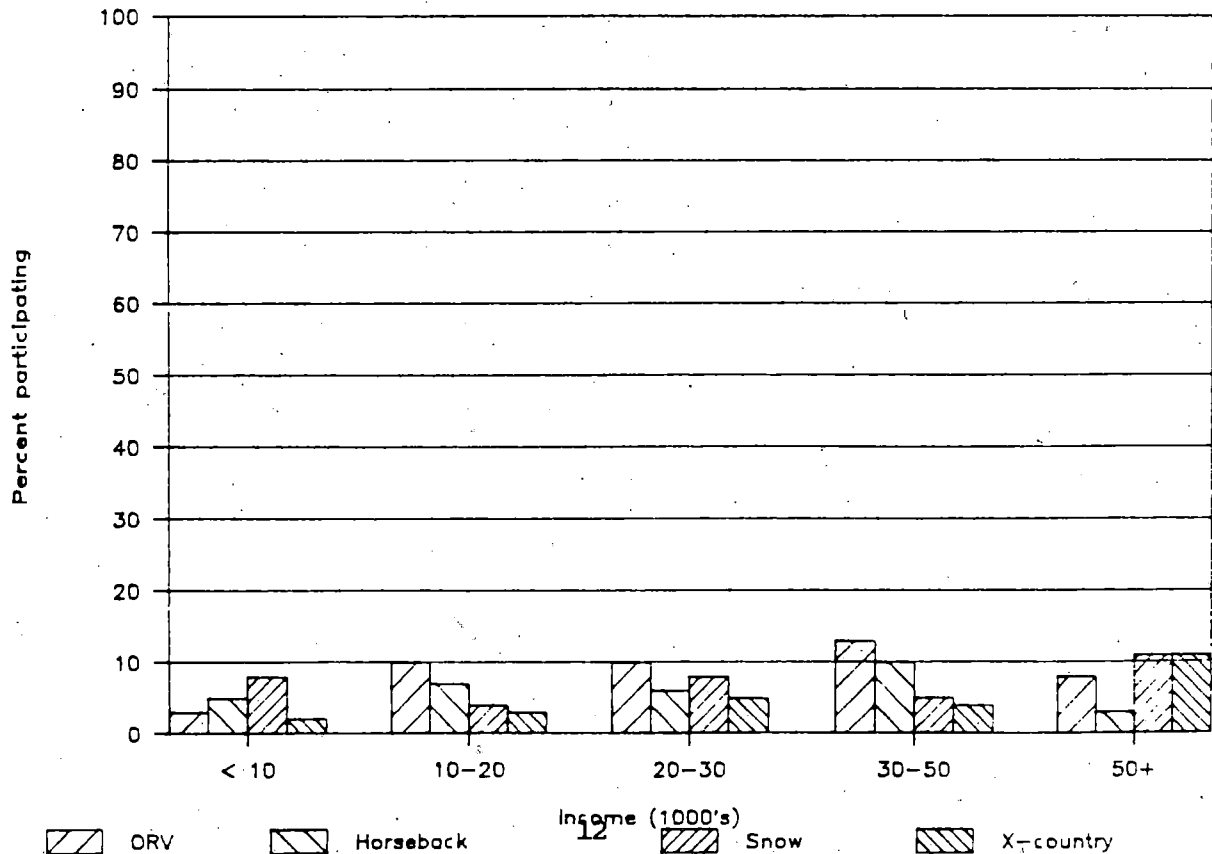
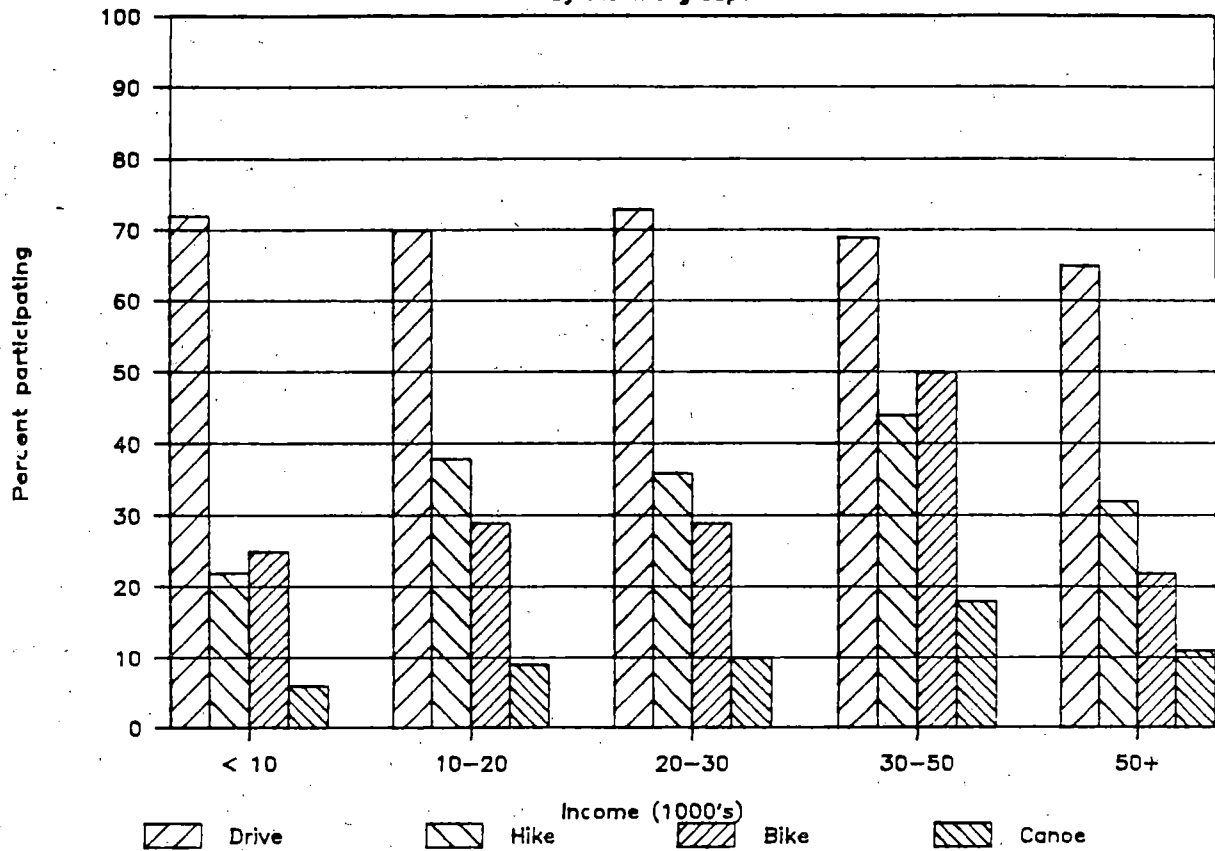


Source: IDNR - Draft Statewide Trails Assessment (1987)

Figure 2.1

IOWA TRAIL USER PROFILE

by income groups



Source: IDNR - Draft Statewide Trails Assessment (1987)

Figure 2.2

Additional findings of the survey are that some respondents are dissatisfied with the number and quality of Iowa's outdoor recreational facilities and rate Iowa the lowest on these types of resources when compared to the surrounding states of Wisconsin, Minnesota and Illinois--the states to which respondents most frequently mentioned traveling for recreational trips or vacations. Consequently, a state strategy of becoming more competitive in terms of outdoor recreational resources could include the development of a statewide trails system.

Economic factors are expected to have a significant effect on demand for trails by providing close-to-home, inexpensive recreational opportunities that are available as alternatives to more expensive, long-distance vacation trips and leisure pursuits.

Another public survey related to outdoor issues was conducted in 1988 and the results were presented in a report titled "Survey of Public Attitudes on Open Spaces in Iowa." The purpose of this survey was to evaluate the attitudes and opinions of Iowans about protection and public acquisition of open space which includes a wide range of natural and recreational resources. The survey found that:

1. Nearly all Iowans (90%) visit open spaces in the state with the four most popular types being: lakes, ponds, dams and reservoirs; parks and camping areas; rivers, riverfronts and streams; woodlands, forests and forest trails.
2. Eighty-two percent of respondents considered open spaces, including trails, "very important" to the quality of life in Iowa.
3. Reasons why open spaces should be protected were recorded as being 75 percent related to human use and enjoyment of these areas and 25 percent related to protection of wildlife, vegetation, and soil and water conservation.
4. Abandoned railroad beds, considered by many as a major open space opportunity for the future if converted to multi-use recreational trails, received a 60 percent share of the "important" responses.

D. IOWA HOUSEHOLD PUBLIC SURVEY ON STATEWIDE RECREATION TRAILS USAGE

A survey of trail use in Iowa was conducted as a component of this trails planning process to assess current demand and potential for improvement and augmentation of the trails system. Public opinions and participation are vital components of the trails planning process.

1. Research Method

To measure Iowa residents' perceptions about trails, a random telephone survey was conducted by an independent survey firm in May, 1989. The objective of this survey was to determine:

- a. Attitudes of Iowa residents about current and future recreational trails in the state.
- b. Trail activities in which they want to increase their participation.
- c. Reasons why they are unable to participate in more trail activities.
- d. Iowa residents' overall satisfaction with Iowa trails, and opinions regarding improvement of state trail facilities.
- e. Specific trail participation by corridor.

A sample size of 500 was used, distributed by population density throughout Iowa and evenly divided between males and females. The telephone survey lasted about 15 minutes.

Initially, participants were asked questions pertaining to demographics: their age, employment status, residence and number of children. They were then asked to estimate the number of times during the previous year that they participated in trail activities, such as walking, bicycling, canoeing and horseback riding.

To determine the convenience and accessibility of trail activities, survey respondents were asked to indicate how many miles from home they had to travel to trails. They also named the activities in which they wanted to participate more often, and why they are currently unable to participate more. Respondents were asked to name trail characteristics that add to their overall enjoyment of trail activities.

2. Results

The survey established a demographic portrait of the typical heavy trail user (respondents who participated in four or more trail activities during 1988). They tended to be younger in age, married with children and have above-average incomes. They also tended to have lived in Iowa for at least 10 years. Female heads-of-households reported a slightly higher participation level in trail activities. One-half of all respondents indicated that children participate along with the adults in these activities.

The most frequently mentioned trail activities were "walking near home for recreation or exercise" and "walking at a park, picnic area or other place away from home."

In all cases, the median number of miles that participants traveled away from home for trail activities was generally less than 40 miles or less than an hour's drive from their home. The greatest median number of miles traveled was for horseback riding, approximately 66 miles. The fewest number of miles traveled was for cross-country skiing, approximately three miles.

Bicycling was the trail activity mentioned most often as the one respondents want to do more often. It was followed by walking, hiking, horseback riding and canoeing. The reason given for not being able to do more trail activities was related to limited recreational areas in the state.

Overall, fewer than one-third of the people surveyed indicated that they were "very satisfied" with Iowa's trail resources. Of the remainder, 41 percent said they were "somewhat satisfied," 16 percent were neutral, 8 percent "somewhat dissatisfied" and 2 percent "very dissatisfied."

Respondents evaluated a variety of trail activities with regard to whether the State of Iowa should spend more money to provide them or improve the areas in which activities can be enjoyed. The highest-rated trail activity was "walking near home for recreation or exercise," followed by "walking at a park, picnic area or other place away from home," "bicycling at a park, picnic area or bike trail away from home" and "bicycling near home." The lowest-ranked trail activities were horseback riding, snowmobiling and driving off-road vehicles.

Resources that contribute most to a trail user's enjoyment were indicated by respondents. They included:

- a. Going through a variety of landscapes, such as river valley, bluff overlooks and wildlife refuges.
- b. Presence of water resources such as lakes, rivers and streams.
- c. Trail corridors separate from roadways.
- d. Presence of historical landmarks.

3. Conclusions

The responses to the survey questions were compiled for the total sample of respondents as well as categorizing respondents according to the number of trail activities in which they participated during 1988. The following conclusions were reported in the Executive Summary:

1. Demographic Profiles of Heavy Trail Users. Compared to light trail users (respondents who participated in fewer than three trail activities in 1988), heavy trail users (respondents who participated in four or more trail activities in 1988) tend to be younger in age, married with children, have lived in the State of Iowa for at least 10 years and have above average incomes.
2. Trail Participation. The most frequently mentioned trail activities were "Go walking near home for recreation or exercise," "Go walking at a park, picnic area or other place away from home," and "Go bicycling near home."
3. Median Number of Miles Away From Home Where Respondent Participated in An Activity. In all instances, the median number of miles traveled

away from home to participate in any trail activity was generally fewer than 40 miles--less than an hour's drive from the respondent's home. The greatest median number of miles traveled for a trail activity was approximately 66 miles for "Horseback riding away from home," and, the fewest median miles traveled was approximately 3 miles for "Cross country skiing."

4. Household Participation by Activity. Female heads-of-households reported a slightly higher participation level in the trail activities examined in this survey than was reported by male heads-of-households; however, over half of all respondents reported that children participate along with the adults in these activities.
5. Activities Respondents Want to do More of in Iowa. Overall, bicycling was mentioned most frequently, followed by walking, backpacking/hiking, horseback riding and canoeing. The primary reason for not being able to do more of these activities was related to limited recreational areas in the state.
6. Trail Satisfaction. Overall, 31 percent of the respondents reported that they were "very satisfied" with Iowa's trail resources. Conversely, 69 percent reported that they were less than "very satisfied" with Iowa's trail resources.
7. Trail Improvements. Respondents evaluated a variety of trail activities with regard to whether the State of Iowa should spend more money to provide or improve areas in which these trail activities can be pursued. The highest rated trail activities were "Walking near your home for recreation or exercise," "Walking at a park, picnic area or other place away from home," "Bicycling at a park, picnic area or bike trail away from home," and "Bicycling near home." The lowest ranked activities were horseback riding, snowmobiling and "Driving an off-road recreational vehicle."
8. Resources that Contribute to Trail Enjoyment. The three trail characteristics most often associated with the enjoyment of using a trail were as follows:
 - A. Going through a variety of landscapes such as a river valley, bluff overlooks and wildlife refuges.
 - B. The presence of water resources such as lakes, rivers, and streams.
 - C. Trail corridors separate from roadways.
9. Iowa Trail Awareness. Overall, the Cedar Valley Nature Trail was recalled by the greatest number of respondents (55 percent) followed by the Saylorville Trail (51 percent); Dubuque Heritage Trail (39 percent); and the Comet Trail (2 percent). Approximately 18 percent of the respondents did not recall any of these trails when prompted.

Some of the implications drawn from the survey results were that there exists a large market for trail usage by walkers, hikers and cyclists and because of a high level of resident interest, the development of trails can contribute to the economic growth of the state. The survey also indicates that trails should be designed to meet the needs of the family and should be convenient to the state's largest population centers and/or located near major tourist attractions in order to accommodate the greatest number of potential trail users.

E. ECONOMIC IMPACTS

Direct Benefits

Quantifying the economic impacts of recreation-based activities, such as trail use, is somewhat difficult because the economic gain is realized in many different sectors and levels of the economy. Standardized economic statistics directly related to recreation, or more specifically, trail-related activities, are not regularly compiled as they are for other industries. However, some useful measures have been developed to indicate the relative scope of the contribution of recreational activities to the economy.

The quantifiable economic benefits can be categorized as direct or indirect benefits. Direct benefits include:

1. Trail related expenditures made by nearby residents and visitors for goods and services such as food, lodging, equipment, clothing, supplies, gasoline and automotive services, souvenirs and entertainment.
2. Employment at recreational sites and service communities.
3. Entrance charges and other user fees.

Indirect Benefits

Indirect benefits are usually the result of or in response to direct income such as:

1. Expenditures by local recreation-based businesses and support facilities in the private sector such as equipment producers, resort operators, suppliers, instructors and outfitters.
2. Tax revenues to state and local governments from sales and real estate taxes.
3. Construction and maintenance services for trail development.

Recent studies indicate that major economic gain has been experienced by communities located near trails. This fact is supported by research conducted by the Rails-to-Trails Conservancy which finds:

"One positive outcome of the relentless contraction of the nation's rail system has been the conversion of abandoned railroad rights-of-way into multipurpose recreational trails. In rural areas, particularly those hard hit by the impact of railroad abandonments, a rail-trail can be a significant stimulus to a local economy. Since trail users spend money on food, beverages, camping, hotels, bed-and-breakfasts, bicycle rentals, crafts, souvenirs and gasoline, development of these rail-trails can help municipalities recoup some of the income lost when the railroads pulled out. All across the country, rail-trails are proving to be more than recreational resources. Decision-makers are realizing that the high demand for 'close to home recreation' reported by the President's Commission on Americans Outdoors can be translated into dollars by rural rail-trails which attract the regional tourist."

The following "case studies" are documented examples of the significant economic impact of recreational trails in Iowa as well as other Midwestern states. The length, surface, corridor origin and types of usage are listed for each trail.

Iowa

Cedar Valley Trail - 52 miles, packed crushed limestone, railroad right-of-way, hiking, biking, cross-country skiing. Snowmobiles are also allowed on Benton County segments only.

This trail of abandoned railroad corridor from Cedar Rapids to Waterloo had an estimated 75,000 visitors/users in 1986 and predictions are that the number will increase to 100,000 within five years. The communities along the trail as well as Cedar Rapids and Waterloo have received increased revenue generated by trail users which are mostly bikers. As reported in various newspaper articles, several businesses, restaurants, taverns, bed and breakfast inns and campground facilities have either been newly established or revitalized by the money being spent by the trail users. Some small towns along the trail have plans to organize some civic activities and summer celebrations to coincide with the periods of increased trail use.

Heritage Trail - 26 miles, packed crushed limestone, railroad right-of-way, hiking, biking, cross-country skiing, snowmobiling

An overview of the utilization and economic impact of the Heritage Trail was provided by the Vice President of the non-profit Heritage Trail, Inc. organization. This information was compiled from observations and records of trail use during 1986-87 and projections were then made for 1988.

The Heritage Trail had 40,000 visitors in 1986, 50,000 in 1987, and 60 - 65,000 were expected in 1988. Approximately 25 percent were non-local residents, from outside of Dubuque County. Many of those out-of-town visitors came from the Chicago area; an estimated 5 to 8 percent were overnight guests in local motels. Approximately 90 to 95 percent of the

trail's use is during the warm months, from April through October. During warm months, about 85 percent of the users are on bicycles and the remainder on foot. Skiers and snowmobilers use the trail in about equal proportions during the winter.

Using 1988's projection of 60,000 annual visitors as a basis of calculating the trail's economic impact on Dubuque County, it was estimated that between \$360,000 and \$840,000 would be generated that year based on the following assumptions:

1. Of the 60,000 expected trail visitors, about 25 percent, or 15,000, will be from outside of Dubuque County. The majority of these (about 12,000) will not be overnight guests and therefore can be expected to spend about \$4 per day, resulting in total estimated expenditures of about \$48,000.
2. The remaining estimated 3,000 out-of-town guests who stay overnight will spend an average of about \$40 each on lodging, meals, and gasoline and supplies, for a \$120,000 direct contribution to the economy.
3. Out-of-towners, therefore can be expected to spend a conservative estimate of \$168,000 in Dubuque County in 1988.
4. Turnover of these dollars (estimated between three and seven times) before finally leaving the community would add further to the economic impact, building the total new-dollar direct and indirect impact to between \$360,000 and \$840,000.

Based on past patterns and utilization projections, total trail user fee revenue during calendar year 1988 will be approximately \$17,000. Of this amount, 29 percent will come from daily pass sales (@ \$1) and the remaining 71 percent from annual passes (@ \$5), assuming about a 77 percent compliance rate of people using the trail with a valid pass.

User fees presently cover all operating costs of the trail, including the salary for a ranger, the expenses of operating a patrol vehicle, grass cutting, and minor surface repairs. As trail utilization and pass compliance continue to improve, some surplus funds will be generated for trail improvements and major repairs.

Wisconsin

Elroy-Sparta Trail - 32 miles, packed crushed limestone, railroad right-of-way, hiking, biking, snowmobiling

Results of a research survey conducted by the University of Wisconsin and published in 1989 estimated that approximately 50,000 people visited the trail in 1988 and spent an average of \$25.14 per person; a total expenditure of \$1,257,000 during 1988. The average stay was 1.43 nights and nearly one-half of the users come from out-of-state. The average distance traveled to reach the trail was 228 miles. These statistics indicate that the trail

which runs from the Cities of Elroy to Sparta is one of the major tourist attractions for the state. The 25-year mayor of the Village of Wilton stated that "the towns along the trail have benefited tremendously from the trail activities and consider it to be the best economic development the area has ever had."

Sugar River Trail - 23.5 miles, packed crushed limestone, railroad right-of-way, hiking, biking, cross-country skiing and snowmobiling

This state trail in southwestern Wisconsin follows an abandoned rail line from New Glarus to Brodhead and was the subject of a 1986 study which investigated the economic impact of the trail based on user surveys from 1979 through 1985. The data collected indicates a higher trail usage rate by non-residents (mostly from Illinois and Iowa) than residents and that such users spend an average of twice the amount spent by resident users. The statistical analysis of the average amount spent per person was adjusted for resident and non-resident use and other variables. The analysis shows a low average in 1979 of \$5.20 per person and a high average in 1984 of \$10.99 being spent per trail user. Based on these estimates and the number of trail participants recorded in the annual surveys, the total amount spent by trail users was estimated to range from \$158,704 in 1979 to a high of \$522,025 in 1984. This expenditure represents a significant contribution to the local economy of the communities along the trail.

Minnesota

A trail user survey of several Minnesota Department of Natural Resources (MnDNR) state trails was conducted during 1986-88. The results of number of trail users, amount of dollars spent and average distance traveled to reach the trail varied considerably depending on the location of the trail and trail user attracted to that area. The majority of these trails have been developed along abandoned railroad lines.

Luce Line Trail - 30 miles, packed crushed limestone, railroad right-of-way, hiking, biking, cross-country skiing, snowmobiling

Although this state trail has the highest number of users per year of 50,000 people, the trail is in a suburban area and primarily used by local residents and therefore has the lowest estimated expenditure of \$0.60 per person per day.

Hinckley Fire Trail - 32 miles, asphalt, railroad right-of-way, hiking, biking

The paved trail serves approximately 31,000 user days/year with an average expenditure per person per day of \$7.75.

Heartland Trail - 28 miles, asphalt, railroad right-of-way, hiking, biking, equestrian, cross-country skiing

This trail that travels from Park Rapids to Cass Lake has approximately 41,000 user days per year who spend an average of \$19.23 per day.

Carlton-Duluth (Willard Munger) Trail - 14 miles, asphalt, railroad right-of-way, hiking, biking, cross-country skiing

This paved trail travels from Carlton to West Duluth and averages 42,000 users each year. The average expenditure per person per day is \$5.06.

Douglas Trail - 13 miles, asphalt, railroad right-of-way, hiking, biking, equestrian, cross-country skiing, snowmobiling

This trail is paved from Pine Island to northwest Rochester and has an average of 47,000 users each year. The average expenditure per person per day is \$3.14.

Sakatah Singing Hills Trail - 42 miles, packed crushed limestone, railroad right-of-way, hiking, biking, cross-country skiing, snowmobiling

This limestone trail in southern Minnesota runs from Fairbault to Mankato and has an average of 22,000 users per year. The average expenditure per person per day is \$3.05.

Minnesota Snowmobile Trails - State trails, Grant-in-Aid trails, state park and forest trails

The Minnesota Department of Natural Resources conducted a statewide snowmobile trail usage survey during the 1985-86 and 1986-87 winter seasons to determine the relative use of trails during the "brown" winter experienced by much of the state in 1986-87 as compared to the normal snowfall winter of 1985-86. The survey also documented the average distances traveled to snowmobile and average expenditures for these trips.

The survey estimates that there were 2.4 million snowmobiling activity occasions in 1985-86 and 1.5 million occasions during 1986-87 resulting in a 38 percent decrease during the year of little snowfall. The snow conditions also influenced the distance traveled to use the trails. An average of 91 miles was traveled to reach snowmobile trails in 1986-87, compared to 28 miles in 1985-86. The average distance snowmobiled per trip was 67 miles in 1986-87 and slightly more, 74 miles, during the good snow year of 1985-86.

Those who reported snowmobiling in 1986-87 spent an average of \$26.22 per person per day on trail trips, compared to \$16.96 per person per day in 1985-86. It is estimated that recreational snowmobilers spent more than \$20 million on trail trips statewide during the 1986-87 winter. This amount is nearly the same as was spent during the brown winter of 1985-86, even though there were 38 percent fewer trail activity occasions in 1986-87 than in the previous year. This seems to indicate that snowmobilers will travel farther and spend more to pursue trail experiences during a mostly brown winter.

Illinois

Fox River Trail - 22 miles, asphalt, railroad right-of-way, hiking, biking, cross-country skiing

This trail in northern Illinois (Kane County) parallels the Fox River and links communities, parks, marinas, nature center and other recreational facilities to create a linear park system. The trail system has stimulated economic growth in the towns of Aurora, Batavia, Geneva, St. Charles and South Elgin by attracting tourists and increased business at bike shops, restaurants, shops and taverns. Several riverfront festivals are now organized to capitalize on the tourist trade. A portion of the trail right-of-way will provide a route for a new sewer line to be constructed saving the city considerable expense compared to the cost of excavation of the city street system.

Arkansas

A 1985 public survey of state citizens' opinions and use of recreational trails indicates that Arkansas residents who participate in trail-related activities spend an average of \$277 per household each year. The impact of this annual expenditure on Arkansas's economy is estimated to be about \$133 million. This figure includes equipment, products and services supplied for trail types of activities.

Impact on Property Values

Limited research has been conducted on the impact of trails on real estate/property values; however, the information available indicates that trails seem to have a generally positive effect.

According to a 1986 study conducted by the City of Seattle Engineering Department, Community Affairs Division, on the 12-mile Burke-Gilman Trail in Seattle, Washington, 75 percent of those living near the trail thought their houses would sell more readily because of the trail. Real estate agents estimated that housing in the vicinity of the trail brought an average increase of six percent to the property value because of the proximity to the trail.

A 1988 study of the Luce Line and Root River Trails in Minnesota found that the majority of owners (87 percent) believe the trail either contributed to an increase in the value of their property or had no effect on it.

A real estate appraiser in Batavia, Illinois estimates that the value of the properties along the Fox River Trail have appreciated rather than depreciated during the last six years.

To determine what effect, if any, trail development may have had on property values within Iowa, county tax assessors, county conservation board directors and trail managers were contacted in those areas through which a trail (e.g., Cedar Valley Trail, Chicaqua Valley Trail, Heritage Trail) has been established for several years. These contacts were surveyed as to

their observations and/or opinions about what impact (past and present) the trail may have on the values of local agricultural, residential or commercial properties. Although no specific studies of this issue had been done, none of the people contacted were aware of any decrease in property values or negative effect on those areas adjacent to or near the trail. However, it was reported that some residential properties for sale near the Heritage Trail Corridor had been advertised as such, indicating that the nearby location of the trail was considered to be a positive element contributing to the sale of the property. Also, it was noted that some commercial properties (taverns, restaurants, campgrounds) in the towns of Graf and Durango had experienced an increase in value due to increased business from trail users.

The general trend or impact of these trails on agricultural property values was considered to be neutral since no effect, positive or negative, was recognized in the sale of these types of properties based upon comments made by affected county assessors. Agricultural properties generally experience high turnover rates as compared to residential or commercial areas.

Although a complete survey of this issue is beyond the scope of this plan, the responses received thus far seem to indicate that the existing trails in Iowa and other parts of the country have had no significant effect on the value of properties along the trail corridor.

Another economic impact of trail development which is related to property value is the loss of property tax revenues by the conversion of privately owned land to the public domain. Most of the existing and proposed trails in Iowa are abandoned rail corridors which are assessed by the State Department of Revenue based on the taxable value of the total capital assets of a particular railroad company. The tax allocation process to the counties considers the number of miles of track that are located within a county relative to the taxable value of the railroad company. Therefore, the loss of tax revenues as a result of the conversion of private land to public is not itemized only on the basis of the land ownership; several factors must be considered in this evaluation.

F. RECREATION

The 1988 Iowa SCORP report specified the need for more and better managed recreational facilities throughout the state and recommended that one of the actions necessary to meet that need was to develop a statewide trails plan. The Iowa Open Spaces Plan also reflects the citizen's support for acquiring and maintaining open spaces for the recreational opportunities they provide. A public survey of reasons why people use the Elroy-Sparta Trail indicates the primary reasons were for safety and recreational enjoyment.

A statewide trails system can provide opportunities for a variety of recreational activities and user interests. Recreational uses of trails includes walking/hiking, bicycling, jogging, horseback riding, cross-country skiing, snowmobiling and nature study. Such activities serve as a diversion from work or regular activities, provide physical fitness and refresh the

spirit or mind. Socializing is often an integral part of this recreational enjoyment.

Recreational trails are considered by most communities, especially those with existing trails, as an important, positive element in the quality of life and image of that area. The value of recreation in improving physical and mental health and reducing illness and stress is proving to be substantial according to several recreational specialists and economists who presented their findings at a 1986 Governor's Conference on the Economic Significance of Recreation in Illinois. Studies conducted by these specialists indicate that recreation and exercise produce these benefits and result in better job performance, increased productivity and reduced absenteeism. Although the exact value of these benefits can not be quantified, they are important elements in the economic contribution of recreation.

G. MANAGEMENT AND PRESERVATION OF NATURAL AND CULTURAL RESOURCES

The protection and proper management of the state's natural environment and cultural resources is important to Iowans as shown in the 1988 Statewide Survey of Public Attitudes on Open Spaces in Iowa. The majority of respondents felt that the following types of open space were the most important areas to be protected: wildlife habitats (88%), woodlands (82%), areas with endangered plants and animals (80%). Respondents also felt that the most important reasons for protecting these areas were to prevent soil erosion and preserve the natural landscape and cultural heritage.

The 1988 SCORP plan listed the following issues as some of those that should be addressed by outdoor recreation management programs including a recreational trails program:

1. Demand for recreation opportunities in unique natural settings
2. Expansion of resource protection areas to meet current and future demands
3. Recreation management to prevent degradation of unique areas
4. Acquisition and development of non-game wildlife resources
5. Enhancement of urban habitat for wildlife on public lands

One of the key benefits of a recreational trails system is the conservation and maintenance of a natural environment providing hundreds of acres of valuable wildlife habitat. Most of Iowa is an intensively cropped monoculture. Natural areas and the diverse plant and animal communities that trail corridors can support, while comprising a small percentage of the land, constitutes an important part of the Iowa landscape. In addition, a system of trail corridors can provide a wind shelter belt and reduce soil erosion and moisture losses.

The state's Corridor Trails Network Plan (1973) focused on the landscape corridor concept, which parallels the rivers and streams, and offers the most intrinsically suitable areas for trail development since they possess most of the prime natural and cultural resources of the state. The concept of waterway-based trail systems is also discussed in the draft DNR Statewide

Trails Plan (1987) and emphasizes the unique natural character of Iowa's rivers and streams as an outstanding trails resource. A statewide trails system which utilizes some of these areas would also complement the goals of the DNR Protected Water Areas Program (PWA). This program seeks to designate portions of selected lakes, rivers, streams and marshes for the purpose of preserving, protecting, and enhancing outstanding natural and cultural resources of water and associated land areas. The criteria for selection of these areas may include water, fish, wildlife, forest and scenic resources and geologic, archaeological and educational features. This type of program could link river and land routes to offer contiguous multiple trail use opportunities and provide access sites at land and water trail intersections.

H. TRANSPORTATION

The variety of recreation trails envisioned by this plan will be predominately used for leisure purposes. However, some recreational trails do serve a transportation function and people can and do use them for that purpose. Of the trail modes considered by this study, the greatest transportation benefit will be realized from bicycle and pedestrian users within urban or suburban communities.

According to a recent Des Moines Register editorial, "bikes outnumber automobiles worldwide by 2 to 1" and "the U.S. total of 95 million (bicycles) was second only to China's 270 million." Opportunity obviously exists for bicycle use if the demand is met by appropriate facilities.

Transportation-motivated and recreational bicyclists do not materially differ. Both user types require clean, functional surfaces which offer safety and ease of movement. Regional recreation trails can offer these virtues for intracommunity movement, especially commuting from home to commercial, office and school areas. Regular commuter biking is prone to street use because of expedience and access. Regional trails which emphasize these same objectives would motivate the greatest transportation use.

Pedestrian transportation trips resulting from the recreational system will occur if origin and destinations are linked. The greatest probability of this happening is, once again, in urban and suburban areas in close proximity to commercial areas, multifamily residential neighborhoods and near schools. Seasonal weather changes factor into trip frequency as well.

The Des Moines-Saylorville Trail represents a regional recreational trail whose urban location and abutting land uses show transportation use. These trips would undoubtedly increase if local trails would be connected to the regional trail.

I. CORRIDOR MULTIPLE-USE

The linear corridors which most trails require are becoming increasingly valuable for other shared uses. We live in a society with growing needs for rapid communication and transportation. Trails provide a compatible use for

many linear rights-of-way (ROWs) and an effective means for keeping corridors intact and preserving future options.

Right-of-way logically falls into three categories; abandoned, pending abandonment, or presently used. Abandoned ROWs, usually railroad, are in danger of being fragmented and can be rendered functionally useless. Presently used ROWs include rail, power, gas and other utilities. Often utilities do not own the ROW in fee but rather they lease the right to use the corridor via a legal agreement.

The value of corridor ROW comes in part from the land possessed. The real value is achieved from title consistency and dimensional uniformity given the multiple owners which abut the corridor. Corridors should be kept intact to every degree possible such that future uses and developing technology can capitalize upon their value.

Fiber optic transmission is a prime example of a new communication technology reliant upon linear ROW. The Washington State Department of Natural Resources is currently working with the Burlington Northern Railroad and AT&T to promote joint use of a valuable fiber optics cable and a non-motorized trail. The 38-mile corridor will connect King County (Seattle) with the existing John Wayne Trail via a mountain pass. Each of the parties involved benefit from the shared use.

The State of Wisconsin also sees the virtues of trail and fiber optic joint cooperation. The state is authorizing leasing of corridor right-of-way for fiber optics and other sub-surface lines with fees generated to its Department of Natural Resources for trail construction within the same corridor.

Iowa Statewide Recreational Trails Plan



Chapter 3

Project Inventory

CHAPTER 3 PROJECT INVENTORY

A. APPROACH TO DATA GATHERING

The inventory assembled for the recreational trails plan contains detailed information about Iowa's physical, economic, cultural and recreational resources.

This information creates a "data base" from which Iowa's position as a provider of recreational trails can be assessed. The data was gathered from numerous sources, including local agencies such as city governments and county conservation boards, and other special-interest groups like the Iowa Natural Heritage Foundation. Requests for information about existing, proposed and potential trails and other data were mailed to these groups. The first request was followed up by a second request to those county conservation commissions that did not respond initially. A third request by telephone followed the second request. All Iowa counties except 8 responded to the request for information.

In addition to this information, substantial data was obtained from Iowa state agencies, such as the Iowa Department of Natural Resources (DNR), Iowa Department of Cultural Affairs (DCA), Iowa Department of Revenue and Finance and Iowa Bureau of Tourism and Visitors. The consultant team compiled this data into detailed maps and tables. Because of its magnitude, the data cannot be included as part of this document. The inventory can be found in a separate, free-standing document, "Trails Plan Resource Inventory," and can be consulted regarding related questions.

B. TRAILS

Iowa's existing recreational trails are shown in Figure 3.1. The legend on the map identifies each trail as a county, state, or nationally designated trail. In addition, each trail was classified according to its use as a bike, hiking, nature, equestrian, cross-country skiing or snowmobiling trail. Many of Iowa's existing trails have been developed by private groups or organizations.

New trails and extensions or updates of existing trails have been planned. The currently proposed new trails or extensions are shown on the map in Figure 3.2. Potential trail segments were identified by various groups. These are shown on the map in Figure 3.3.

Abandoned railroad corridors were included in the inventory. The chronology of their abandonment is shown in Figure 3.4.

The inventory of trails also included other categories. The total trail mileage per county was included, along with a breakdown by trail type, such as foot trails, bike trails, equestrian, snowmobile and off-road vehicle trails. This trail information can be found in the separate inventory document.



Iowa's Recreation Trails

1. Cedar Valley Nature Trail
Linn and Black Hawk County CCBs
52 mi. - BHNX
Hiawatha to Evansdale

2. Heritage Trail
Dubuque County CCB
26 mi. - BHNSX
Dubuque to Dyersville

3. Cedar Valley Trail
Cedar County CCB
22 mi. - HNX
Tipton-West Branch on Cedar River

4. Chichaqua Valley Trail
Polk/Jasper Counties CCBs
21 mi. - BHNSX
Bondurant to Baxter

5. Saylorville Greenbelt Trail
Iowa Department of Natural Resources
16 mi. - BHNSX
Des Moines Area

6. Great River Road
Department of Transportation
15 mi. - BH
Guttenberg to McGregor

7. Grundy County Nature Trail
Grundy County CCB
12 mi. - BHNX
Holland to Reinbeck

8. Sauk Rail Trail
Carroll County CCB
22 mi. - BHNSX
Swan Lake to Carnarvon

9. Cinder Path
Lucas County CCB
10 mi. - BHNSX
Chariton to Derby

10. Praeri Rail Trail
Story County CCB
10 mi. - HNX
Roland to Zearing

11. Chickasaw County Trail
Chickasaw County CCB
10 mi. - HNX
Alta Vista to New Hampton

12. Matseil Bridge Trail
Linn County CCB
8.4 mi. - HEX
Marion

13. Lake Trail
Iowa Department of Natural Resources
7 mi. - BHNX
Okoboji

14. Duck Creek Parkway
City of Davenport
6 mi. - BHNX
Davenport

15. East River Trail
City of Des Moines
6 mi. - BHNX
Des Moines

16. Shelby County Wildlife Area
Shelby County CCB
5 mi. - HNX
Near Kirkman and Irwin

17. Bill Riley Bike Trail
City of Des Moines
5 mi. - BHNX
Des Moines

18. Sac and Fox Natl. Rec Trail
Indian Creek Nature Center
5 mi. - HNBX
Cedar Rapids

19. Dickinson County Trail
Dickinson County CCB
4-6 mi. - BHNSX
Milford to Spirit Lake

20. Riverside/Wythe
Iowa Department of Natural Resources
4.5 mi. - BHNSX
Cedar Falls

21. Hubbard Prairie Preserve
Hardin County CCB
4 mi. - HN
Between Hubbard and Radcliffe

22. Sac & Fox Trail Extension
Indian Creek Nature Center
3 mi. - HNX
Cedar Rapids

23. Yellow River Forest
Iowa Department of Natural Resources
3.5 mi. - HNX
Near Waukon Junction

24. Russell White Nature Trail
Carroll County CCB
3 mi. - HNX
Lanesboro to Highway 286

25. Big Creek State Park Trail
Iowa Department of Natural Resources
3 mi. - BHX
Polk City

26. Pony Hollow Trail
Clayton County CCB
2.5 mi. - BHNSX
Elkader

27. The Ringgold Trailway
Ringgold County CCB
2.5 mi. - HN
Near Mount Ayr

28. Shimek Forest Trail
Iowa Department of Natural Resources
2.5 mi. - HNE
East of Farmington

29. Cedar Green Belt
Indian Creek Nature Center
2.3 mi. - HN
Cedar Rapids

30. Clive Greenbelt Trail
City of Clive
2 mi. - BHNX
Clive

31. Puddle Jumper Trail
Jackson County CCB
2 mi. - BHNSX
Orange City to Alton

32. Dubuque Floodwall Trail
City of Dubuque
2 mi. - BHNX
Dubuque

Trail Uses
C Canoe
B Bike
H Hiking
N Nature
E Equestrian
X Cross Country Skiing
S Snowmobiling
U Undeveloped

33. Recreational Trail
Clinton Parks Department
1.5 mi. - BHNX
Clinton Riverview Park

34. Ledyard Wildlife Area
Kossuth County CCB
1.5 mi. - HN
Ledyard and South

35. Mad Creek Greenbelt
Muscatine Parks Department
1.2 mi. - BH
Muscatine

36. Wapsi River Access
Jones County CCB
1 mi. - HN
North of Olin

37. Herbert Hoover Natl Rec Trail
Herbert Hoover Historic Site
1 mi. - HN
West Branch

38. Brookfield Wildlife Trail
Jackson County CCB
0.5 mi. - HN
Near Maquoketa

39. Humboldt County Nature Trail
Humboldt County CCB
0.5 mi. - HNX
Near Humboldt

40. Blackhawk Trail
Burlington Parks Department
0.5 mi. - H
Burlington

41. Raccoon River Valley Nature Trail
Dallas & Guthrie County CCBs
35 mi. - BHNX
Waukeo to Yale

42. Mormon Trail
Iowa Department of Natural Resources
National - U
Montrose to Council Bluffs

43. Lewis and Clark Trail
Iowa Department of Natural Resources
National Historic Trail - U
Follows Missouri River

44. North Raccoon River Canoe Trail
Carroll County CCB
- C
North of Ulmer to Perry

45. Lake of Three Fires
Iowa Department of Natural Resources
13 mi. - HEN
North of Bedford

46. French Reserve Trail
Taylor County CCB
1.5 mi. - HE
10 Mi. East of Bedford

47. Cedar River Canoe Trail
Bremer County CCB
30 mi. - C
Nashua to Finchford

48. Wapsipinicon River
Bremer County CCB
20 mi. - C
Tripoli to Littleton

49. Butler County CCB
6 mi. -
Clarksville to Shell Rock

50. Kate Shelley Trail
Boone County CCB
3 mi. - HN
Boone

51. Inkpaduta Canoe Trail
Clay, Buena Vista, Cherokee, Woodbury Cos.
73 mi. - C
Spencer to Smithland

52. North Raccoon Envi. Corridor
Sac County CCB
20 mi. - C
West of Newell to West of Lanesboro

53. Kiwanis Trail
City of Spirit Lake
3 mi. - HN
South of Spirit Lake

54. Kenue Park Fitness Trail
Dickinson County CCB
1.5 mi. - HN
South of Spirit Lake

55. Gull Point
Dickinson County CCB
1.5 mi. - HN
South of Spirit Lake

56. Horseshoe Bend
Dickinson County CCB
1.5 mi. - HN
South of Spirit Lake

57. Gilbertson Education Area
Fayette County CCB
1.5 mi. - HN
East of Elgin

58. City of Fort Dodge
3 mi. - HBN
Fort Dodge

59. Red Rock Trail
U.S. Army Corps of Engineers
11 mi. - HEN
Below Red Rock Dam

60. Lake Greenfield Trail
City of Greenfield
2 mi. - H
East of Greenfield

61. Ken Sidey Nature Area
Adair County CCB
3.5 mi. - H
East of Bridgewater

62. Solon Trail
Iowa Department of Natural Resources
5.25 mi. - BHNSX
Solon to Lake Macbride

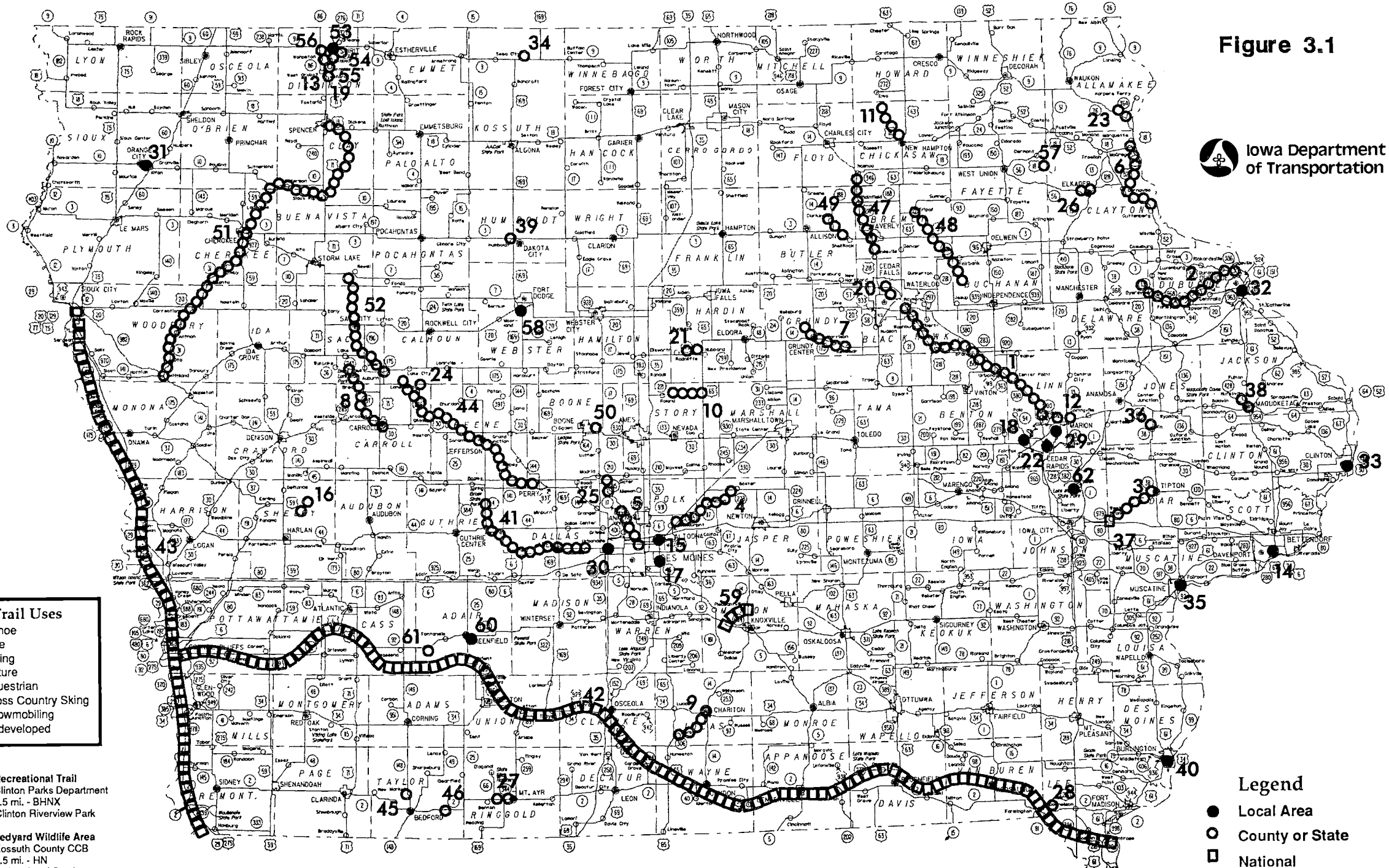
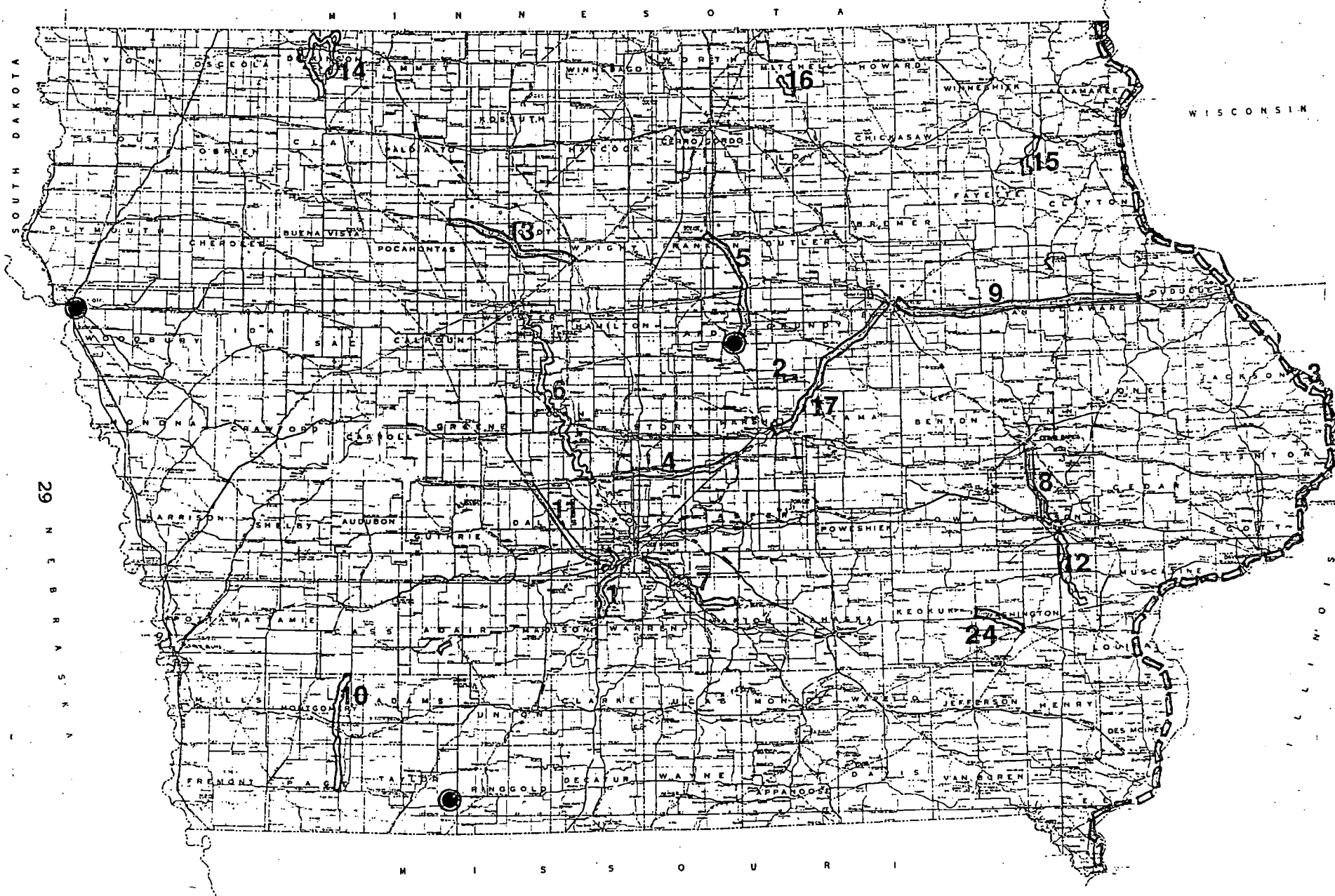


Figure 3.1

Iowa Department
of Transportation

Legend

- Local Area
- County or State
- National



● SITE SPECIFIC TRAILS

PROPOSED RECREATION TRAILS

PHASE ONE

SOURCE: LOCAL AGENCY SURVEY

Figure 3.2

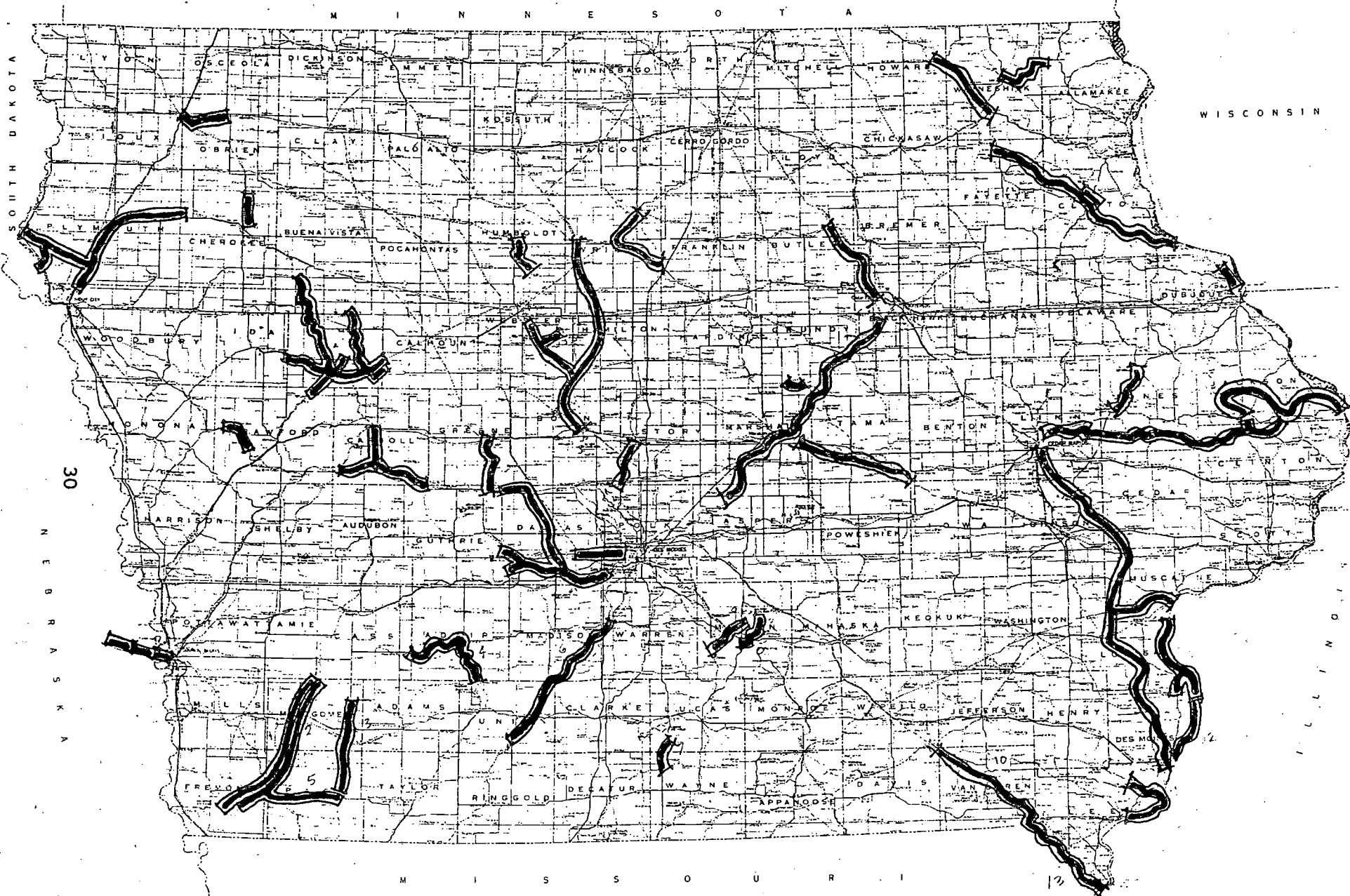
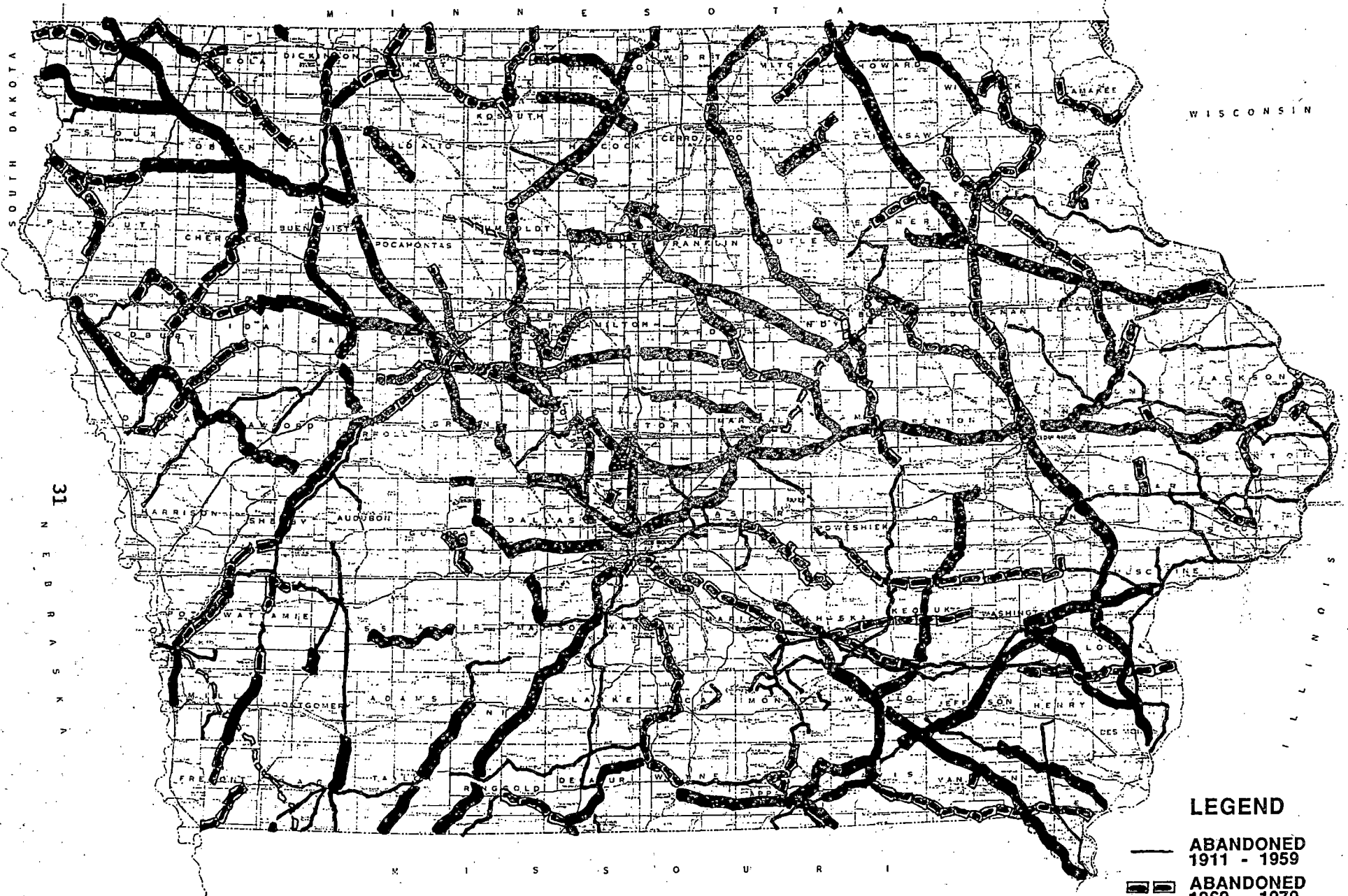


Figure 3.3

POTENTIAL RECREATION TRAILS

PHASE ONE





LEGEND

- ABANDONED 1911 - 1959
- ▬ ABANDONED 1960 - 1979
- ~ ABANDONED 1980 - 1988
- ABANDONED 1989

Figure 3.4

CHRONOLOGY OF RAILROAD ABANDONMENTS

PHASE ONE

SOURCE: IOWA DEPARTMENT OF NATURAL RESOURCES



C. DEMOGRAPHICS

As part of the inventory, demographic information was tabulated for each county in Iowa. Major population centers were identified based on current census data and other information.

Figures for 1984 population, projected 1990 population and projected 2010 population were compared for the eight largest metropolitan areas. Also shown in the inventory were the projected average annual rate of population growth from 1984 to 2010 and the projected change in total population from 1984 to 2010. Population figures for each county were also part of the inventory.

Economic information for each county rounded out the inventory of demographic information. The information that was studied included the 1988 per capita income, number of families, median household income, and purchasing level for each county in Iowa.

Complete demographic and economic information about Iowa can be found in the separate inventory document.

D. NATURAL FEATURES/PHYSIOGRAPHY

This portion of the inventory dealt with Iowa's natural topographic features, vegetation and water resources.

A look at Iowa's topographic range shows a change in elevation of more than 1,000 feet occurs. The highest point in the state is in northern Osceola County, which is above elevation 1600. The lowest point is in southeastern Lee County, which is below elevation 600.

Natural vegetation is categorized in three areas, as defined by the North Central Forest Experiment Station-Forest Service of the U.S. Department of Agriculture:

- o Oak-Hickory - Forests in which white oak, northern red oak, black oak, northern pin oak, bur oak, shagbark or bitternut hickory, singly or in combination, comprise a plurality of the stocking. Common associates include white or green ash, sugar maple, an occasional black cherry, butternut, bigtooth aspen, and black walnut.
- o Elm-Ash-Cottonwood - Forests in which elm, ash, or cottonwood, singly or in combination, comprise a plurality of the stocking. Associates include black willow, sycamore, boxelder, silver maple, river birch, and other moist hardwood species.
- o Productive-Reserve - Forest land withdrawn from commercial timber use through statute or administrative regulation, or exclusively used for Christmas tree production.

Forest land is divided into two categories by the Forest Service. They are defined as:

- o Commercial - Forest land producing or capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.
- o Non-Commercial - Unproductive forest land incapable of yielding crops of industrial wood because of adverse site conditions and productive public forest land withdrawn from commercial timber production through a statute or administrative regulation.

Iowa has numerous water resources. The state is bordered by three rivers - Mississippi, Missouri and Big Sioux, all offering numerous opportunities for public access and use. The interior of the state has over 1,000 miles of rivers and streams eligible for the Federal Protected Waters Act for public use and enjoyment. Plus the state's numerous lakes can be integrated into the recreational experience. These include both natural and man-made lakes, ponds, sloughs, reservoirs and other bodies of water.

E. RECREATIONAL AND CULTURAL RESOURCES

Iowa's many existing recreational features include state and local parks, recreation areas, beaches and other facilities. The inventory gives detailed information about each county's recreational features, including whether the area offers camping, picnicking, water and electricity.

In addition to recreational features, Iowa's many cultural attractions can be integrated into the trails plan. The inventory includes the historical sites listed on the National Register of Historic Places. Among these sites are historic buildings, districts, and multiple resources areas.

The state's 87 community theatres and 49 museums and art galleries offer other cultural opportunities for trail users. Virtually every community holds some kind of festival during the year, drawing visitors into the city or town. All of these cultural features were studied and documented as part of the separate inventory document.

Lodging facilities are the final component of the inventory. Hotels/motels, campgrounds, camp and conference facilities, and bed and breakfast establishments offer a range of accommodations to suit travelers and trail users.

F. APPENDIX OF INVENTORY DATA

The resource inventory is an extensive collection of maps, tables and other data. It is contained in a separate, free-standing document, "Trails Plan Resource Inventory," that should be consulted for complete inventory information.

**Iowa
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Chapter 4

Location Objectives and Evaluation Criteria

CHAPTER 4

LOCATION OBJECTIVES AND EVALUATION CRITERIA

A. INTRODUCTION

Various factors influence the planning process for designating Iowa state recreational trail corridors. These factors include the state's natural resource characteristics, cultural resources, operational issues and long-term maintenance considerations.

The purpose of these factors is threefold. First, the list serves to assist in screening the collected inventory material into a meaningful compilation of information. From this information screening, also referred to as synthesis, emerge mapping patterns which in turn designate potential regional corridors.

Secondly, the factors can be used as locational objectives to generate trail plan alternatives. The objectives serve as guidelines to establish corridors and reasoning for their continuity.

Finally, the factors will be used as criteria to evaluate plan alternatives from which a preferred plan will emerge. In the purest sense, the criteria's evaluation is somewhat limited due to the lack of quantified data. Their most useful purpose may be in directing discussion of the alternative corridors.

B. OBJECTIVES AND CRITERIA

The following list outlines factors which could influence trail locations.

1. Topographic Characteristics

Trails should take advantage of topography consistent with each mode's ability to pass over it. Topography provides a distinct component to scenic areas and the visual element requested by most trail users. Topographic needs and restrictions vary by mode type. For example, restrictions for bicyclists are more extensive than those for cross country skiers, however, each user group desires terrain change for variety and aesthetics.

2. Diverse Landscape Types

The state's vegetative diversity and geographic landscape types should be represented by the trail system. Varying the vegetative type enhances user experience by providing interesting landscapes, appealing corridors and wildlife habitat. Exposure to differing geographic landscape types found within Iowa not only enhances the user's trip but also provides an educational process both by exposure and through interpretive facilities.

3. Proximity to Water

Contact with water of all types complements trail facilities. Rivers, lakes, wetlands, creeks and springs attract people and expand user interest. Water resources also provide exposure to good wildlife habitat viewing and opportunities for other recreation. Trail development should not negatively impact water resources.

4. Agricultural Suitability

The use of agricultural land should be largely avoided due to a number of reasons. From a user's perspective, agricultural fields do not provide the variety or interest typically desired by trail users. In addition, extensive trail development within agricultural areas consumes parcels more appropriate for farming. Trail corridors along private property within agricultural land should be limited to connections that cannot be made in any other way to minimize diagonal severance and operations conflicts.

5. Historic and Cultural Resources

Iowa's historical and cultural resources should be linked or accessed when possible by state-wide recreational trails. These resources provide destination opportunities aside from the obvious interpretive and educational benefit.

6. Proximity to Resorts and Campgrounds

Access to resorts and campgrounds, both public and private, should be made by the trail system. These facilities provide a needed resource for overnight travelers and enhance the economic benefits which tourism can provide to local communities.

The state trail corridors should allow for commercial access but not provide for it.

7. Proximity to Population Centers

Convenient access and close proximity to population centers is key to a successful trail system. Logical connections to user origins and their destinations should be made by both urban areas and smaller communities linked by the trail corridors. Close proximity and convenient access encourage leisure use and commuter use, reduce driving time and encourage local trail links.

8. Use of Public Land

Public land and right-of-way should be utilized for trail purposes whenever practical and consistent with its intended use. Existing financial resources can be extended if trails can capitalize upon existing public parcels rather than requiring private property acquisition. Trails should also provide access to other public lands if these uses are consistent with recreational and educational purposes. This criteria should not preclude

right-of-way acquisition but it is intended to emphasize public parcel use when it is logical and convenient.

9. Environmental Impact

Trail corridors should be developed consistent with regulated or sensitive resources. Wetlands, wildlife habitat, and pristine river corridors are examples of resources which should remain intact with no impact by trail facilities. Trail corridors are to be developed within state and federal environmental and cultural resources regulations.

10. Corridor Continuity

Continuity is an important aspect of any linear system. State trail corridors by their very nature are intended to span some distance with minimal disruption due to cultural or physical constraints. Desirable trail lengths vary by individual mode type and should be considered on a case-by-case basis.

11. Multiple Use

Multiple use of trail corridors by differing mode types should be maximized consistent with the restrictions inherent by each use. Iowa legislation establishes that priority be given to multiuse trails. "Trendy" trail uses such as roller-skating or skateboards should be examined closely and to the extent practical as a part of multiple use options.

12. Linkages with Local Trails

Local trails should provide a feeder system which connects to the regional recreational trail system. The local trails will generate participants from which the regional trails can benefit. In response, the regional trail system can provide convenient linkages from one local trail to another.

13. Cross State Corridors

The need for cross state corridors, border to border, will vary according to mode type. For example, bicyclists and snowmobilers may desire a state trail which connects one state border to another whereas it is not practical for the other modes. Corridors of this type will be most attractive to enthusiasts or special trail events.

14. Interstate Linkages

Iowa abuts a variety of states whose regional and state trails should be connected to. These connections provide regional continuity and enhance opportunities for tourism and economic benefit. Connections with Minnesota, South Dakota, Nebraska, Missouri, Illinois and Wisconsin should be strived for where physical resources, traveler origins and destinations allow.

15. Natural Scenic Beauty

Sites or areas of natural scenic beauty such as bluff lines, ridge tops and other features should be accessed for trail users. These resources provide destinations for trail users and the variety of experiences desired by most individuals.

16. Support Facilities

Existing support facilities which can operate as trail heads or comfort stations should be capitalized upon to minimize duplication and provide efficient use of available resources.

17. Logical Termini

Trail corridors should have logical termini which enhance access, provide security and are convenient to users. Communities, existing trail heads, and other recreational resources are examples of desirable termini.

18. SCORP Documentation

Information contained within the State DNR SCORP document, especially that which pertains to user needs, should be taken into consideration for trail access and corridor locations.

19. Private Investment and Economic Impact

Corridor location and development which stimulates private-sector investment and positive economic impact should be strived for. Economic spin-off resulting in tourism dollars can result from food, lodging, equipment and entertainment.

Whenever possible and logical, trail corridors should be located to minimize negative economic impact upon adjacent properties and allow for their continued use.

20. Existing Trails

Existing trails represent an investment and service to current trail users. These trails may be considered a part of the state system or a local trail which feeds the state system.

21. Cost Implications

Acquisition and construction costs for corridor development vary by location and by mode. Cost factors contribute to development phasing and ultimately to what extent a system becomes developed.

22. Facility Maintenance

Post construction maintenance is a major consideration in determining facility use and agency participation. Maintenance objectives and

guidelines should be established by the state to ensure acceptable quality. Required maintenance will vary by trail mode and corridor location.

C. TECHNICAL ADVISORY COMMITTEE (TAC) PRIORITIES

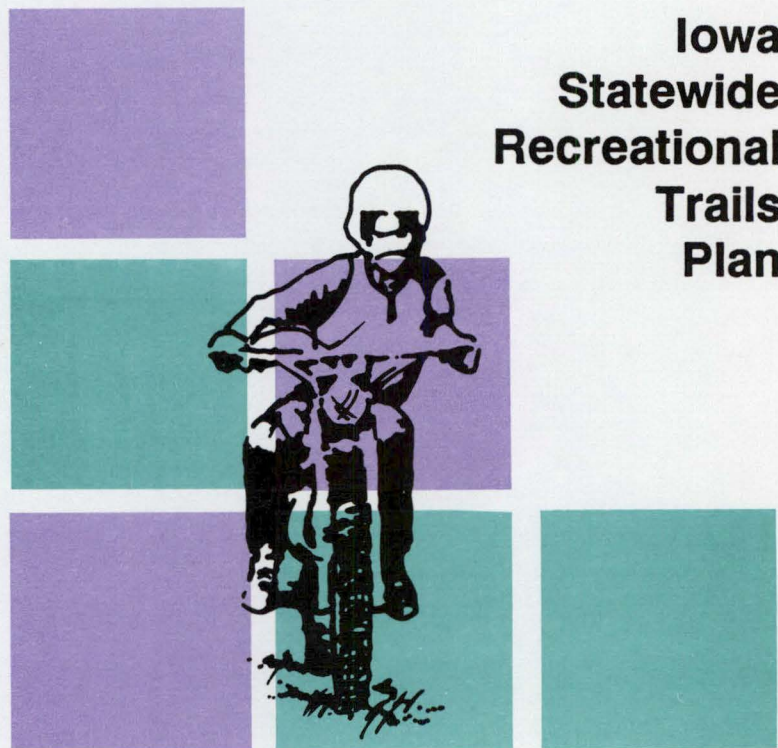
The Iowa State Recreational Trails TAC was given the opportunity to weight or prioritize each of the aforementioned factors based upon their individual needs. Committee members were requested to rank each factor 1 to 10 with 10 being the highest priority. No restrictions were made in the distribution of scoring.

The TAC's affiliation with physical elements became evident through this exercise. The group's top 10 scores related primarily to land characteristics or trail and land impacts.

| <u>Rank</u> | <u>Criteria</u> | <u>Score (maximum = 100)</u> |
|-------------|----------------------------|------------------------------|
| 1 | Environmental impact | 81 |
| 2 | Natural scenic beauty | 80 |
| 3 | Linkages with local trails | 76 |
| 4 | Facility maintenance | 74 |
| 5 (T) | Support facilities | 72 |
| 5 (T) | Use of public land | 72 |
| 7 (T) | Corridor continuity | 71 |
| 7 (T) | Cross state corridors | 71 |
| 9 | Diverse landscape types | 69 |
| 10 | Interstate linkages | 64 |

The next five factors in their respective order were: topographic characteristics, private investment and economic impact, proximity to water, multiple use (multi-modal), and proximity to population centers.

**Iowa
Statewide
Recreational
Trails
Plan**



Chapter 5

Plan Alternatives

CHAPTER 5 PLAN ALTERNATIVES

A. SYNTHESIS OF PERTINENT INVENTORY

An intermediate analysis step was completed to provide a logical transition between the project's inventory and the generation of concept alternatives. The "synthesis" of similar inventory information was completed to compile geographical patterns. These patterns indicate broad corridors within the state which trail planning should take into consideration.

Four general topics were identified into which inventory material could be divided. Each was based upon desirable characteristics for trails as acknowledged by the household survey, the PMT or TAC. Divisions for the synthesis step included:

- A. Demographic and economic-related information
- B. Natural resource-based information
- C. Cultural resource characteristics
- D. Recreational resources in trail facilities

Appendix D - Synthesis of Inventory Data contains tables and figures used to compile the information. A concise description of the project synthesis follows by composite.

1. Demographic/Economic Resources Composite

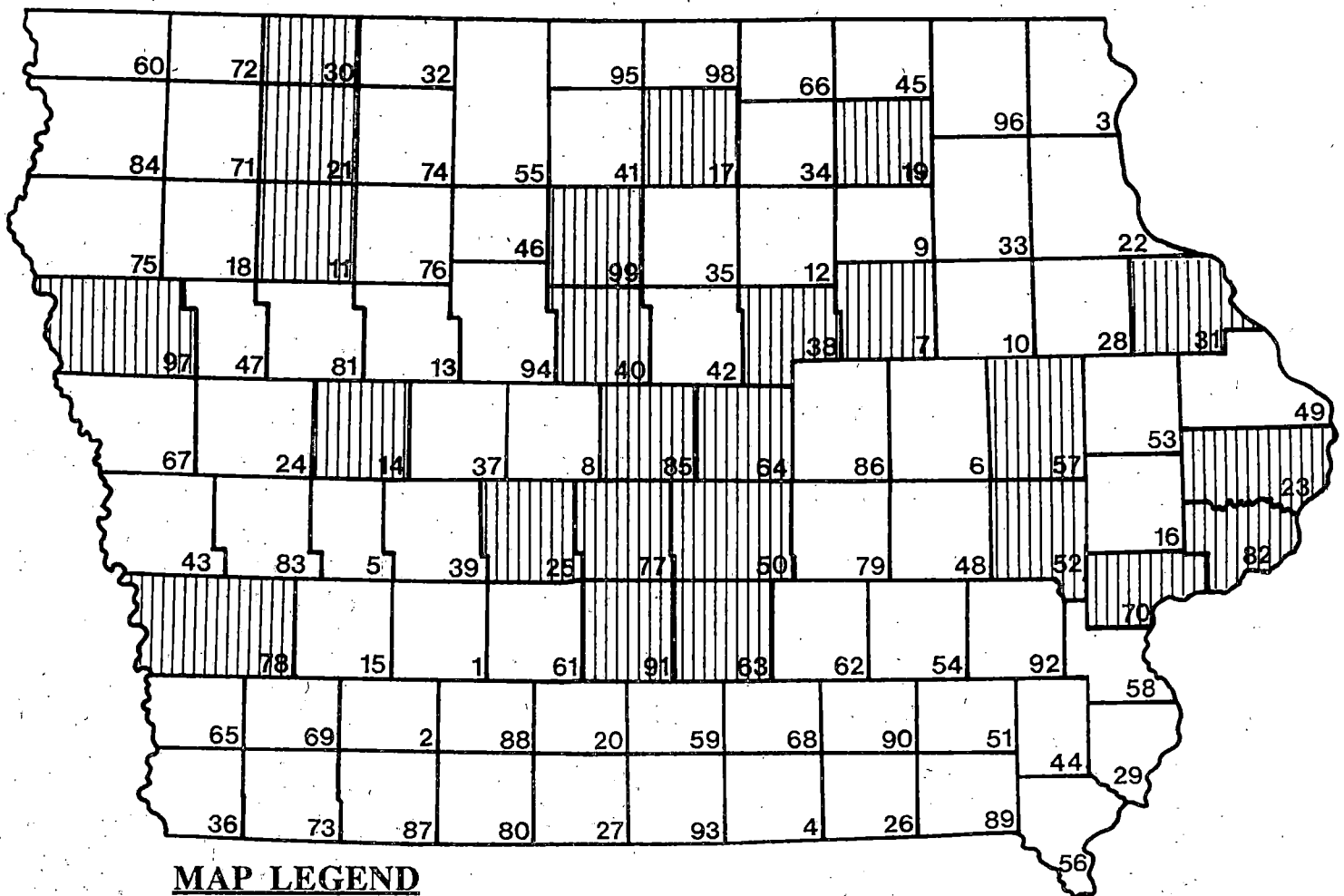
Figure 5.1 is a compilation of all the demographic/economic resource information. This information was used to help identify potential recreational trails based upon the characteristics of perceived users. (Please refer to Chapter 2 - Section D for household survey conclusions.) The counties identified on Figure 5.1 meet two or more of the following requirements:

- 1. 69,823 or more population
- 2. 10 percent or greater projected population growth
- 3. 19,001 or more families
- 4. \$10,594 or more per capita income

OR, the counties meet one of the above and one or more of the following requirements:

- 1. 28,816 to 69,822 population
- 2. 4 percent to 9.99 percent projected population growth
- 3. 8,000 to 18,999 families
- 4. \$9,711 to \$10,593 per capita income

OR, the counties meet any three of the following requirements:



MAP LEGEND



COUNTIES IDENTIFIED ON DEMOGRAPHIC/
ECONOMIC RESOURCES COMPOSITE

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|---|
| | 1 | Adair | | 26 | Davis | | 51 | Jefferson | | 76 | Pocahontas | DEMOGRAPHIC/ECONOMIC COMPOSITE |
| | 2 | Adams | | 27 | Decatur | * | 52 | Johnson | * | 77 | Polk | *- Two or more of the following: |
| | 3 | Allamakee | | 28 | Delaware | | 53 | Jones | * | 78 | Pottawatomie | 69,823 or more County population |
| | 4 | Appanoose | | 29 | Des Moines | | 54 | Keokuk | | 79 | Poweshiek | 10% or more projected growth |
| | 5 | Audubon | * | 30 | Dickinson | | 55 | Kossuth | | 80 | Ringgold | 19,000 families |
| | 6 | Benton | * | 31 | Dubuque | | 56 | Lee | | 81 | Sac | \$10,594 or more per capita income |
| * | 7 | Black Hawk | | 32 | Emmet | * | 57 | Linn | * | 82 | Scott | OR |
| | 8 | Boone | | 33 | Fayette | | 58 | Louisa | | 83 | Shelby | One of the above and one or more of |
| | 9 | Bremer | | 34 | Floyd | | 59 | Lucas | | 84 | Sioux | the following OR any three of the |
| | 10 | Buchanan | | 35 | Franklin | | 60 | Lyon | * | 85 | Story | following: |
| * | 11 | Buena Vista | | 36 | Fremont | | 61 | Madison | | 86 | Tama | 28,816 to 69,822 County population |
| | 12 | Butler | | 37 | Greene | | 62 | Mahaska | | 87 | Taylor | 4% to 9.99% projected growth |
| | 13 | Calhoun | * | 38 | Grundy | * | 63 | Marion | | 88 | Union | 8,000 to 18,999 families |
| * | 14 | Carroll | | 39 | Guthrie | * | 64 | Marshall | | 89 | Van Buren | \$9,711 to \$10,593 per capita income |
| | 15 | Cass | * | 40 | Hamilton | | 65 | Mills | | 90 | Wapello | |
| | 16 | Cedar | | 41 | Hancock | | 66 | Mitchell | * | 91 | Warren | See previous tables for complete figures. |
| * | 17 | Cerro Gordo | | 42 | Hardin | | 67 | Monona | | 92 | Washington | |
| | 18 | Cherokee | | 43 | Harrison | | 68 | Monroe | | 93 | Wayne | |
| * | 19 | Chickasaw | | 44 | Henry | | 69 | Montgomery | | 94 | Webster | |
| | 20 | Clarke | | 45 | Howard | * | 70 | Muscatine | | 95 | Winnebago | |
| * | 21 | Clay | | 46 | Humboldt | | 71 | O'Brien | | 96 | Winneshiek | |
| | 22 | Clayton | | 47 | Ida | | 72 | Osceola | * | 97 | Woodbury | |
| * | 23 | Clinton | | 48 | Iowa | | 73 | Page | | 98 | Worth | |
| | 24 | Crawford | | 49 | Jackson | | 74 | Palo Alto | * | 99 | Wright | |
| * | 25 | Dallas | * | 50 | Jasper | | 75 | Plymouth | | | | |

Figure 5.1
DEMOGRAPHIC/ECONOMIC
RESOURCE COMPOSITE
STATE OF IOWA
RECREATIONAL TRAILS PLAN

40



Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180



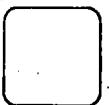
Blue Creek Office Building, Suite 115, 1432 29th Street
West Des Moines, Iowa 50265 (515) 223-1093
ARCHITECTS/ENGINEERS/PLANNERS DES MOINES CHAMBER OF COMMERCE



ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



1. 28,816 to 69,822 population
2. 4 percent to 9.99 percent projected population growth
3. 8,000 to 18,999 families
4. \$9,711 to \$10,593 per capita income

Twenty-five counties meet the above criteria and are listed on Figure 5.1.

Figure 5.2 shows the eight Standard Metropolitan Statistical Areas (SMSAs) within the state and three nearby SMSA's. A 60 mile radius is shown from each SMSA, representing the distance which surveyed residents said they would travel in one day to get to a recreation facility. The SMSA's are:

- o Sioux City
- o Council Bluffs/Omaha
- o Des Moines
- o Waterloo/Cedar Falls
- o Iowa City
- o Cedar Rapids
- o Dubuque
- o The Quad Cities
- o Sioux Falls, South Dakota
- o Rochester, Minnesota
- o La Crosse, Wisconsin

2. Natural Resources Composite

The synthesis of pertinent natural resources information is found on Figures 5.3 and 5.4. Counties with 15,800 or more acres of natural forest and woodland cover are identified in Figure 5.3. The state's principle woodlands are located in the eastern one-third and southeast corner of the state.

Additional natural resources have been mapped on Figure 5.4. The state border and interior rivers and streams, and prominent natural vegetation or forest preserves have been delineated.

3. Cultural Resources Composite

Figure 5.5 is a compilation of cultural resource information including cultural attractions and historic sites. The cultural resources information will be used to help identify potential recreation trails which can link these cultural resources. The counties identified on this figure meet one or both of the following requirements.

1. Sixteen or more cultural attractions occurring within the county.
2. Eleven or more individual National Register sites occurring within the county.

Thirty-seven of the state's counties meet these criteria.

SIoux FALLS, SOUTH DAKOTA

ROCHESTER, MINNESOTA
LA CROSSE, WISCONSIN

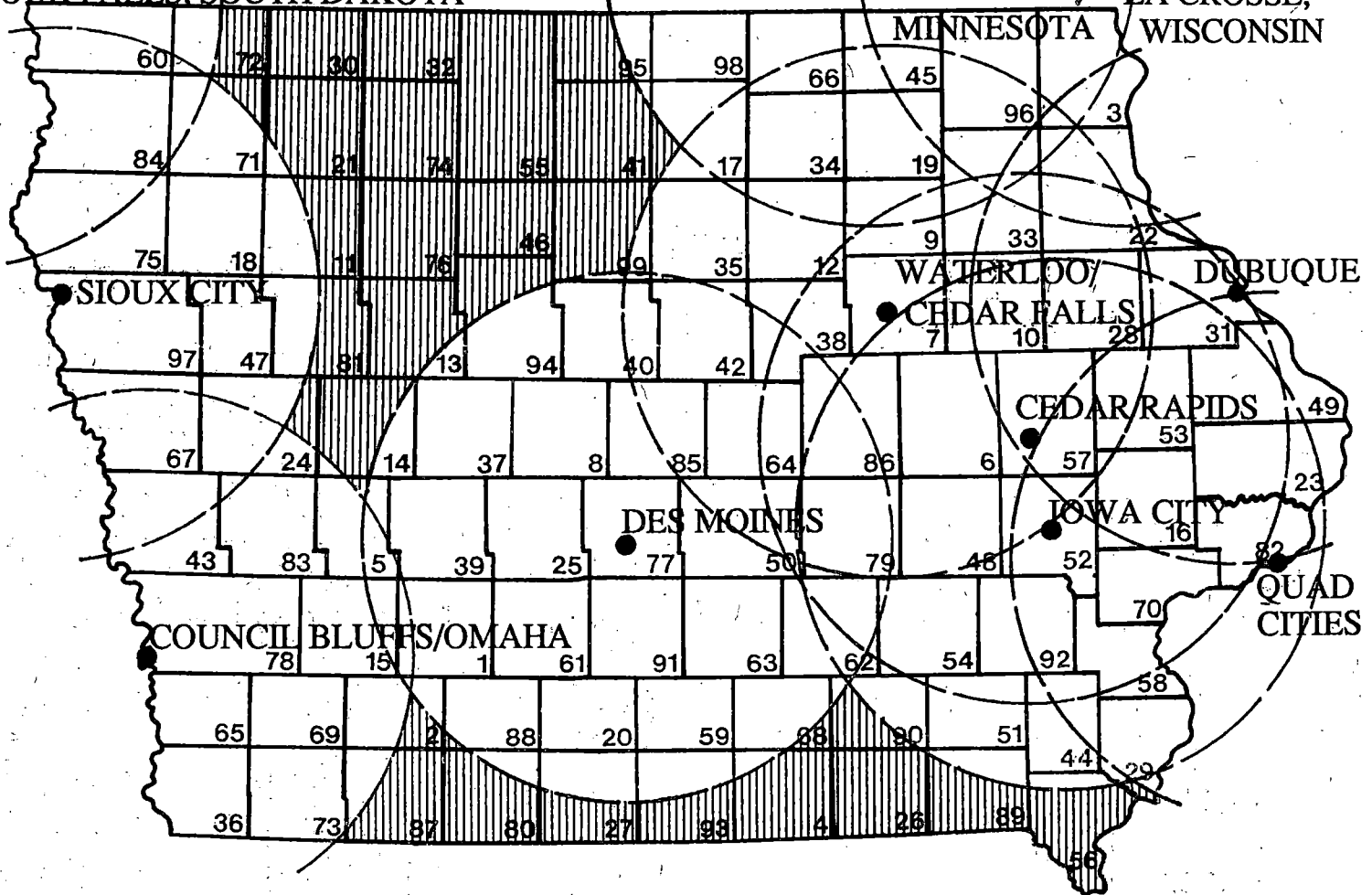
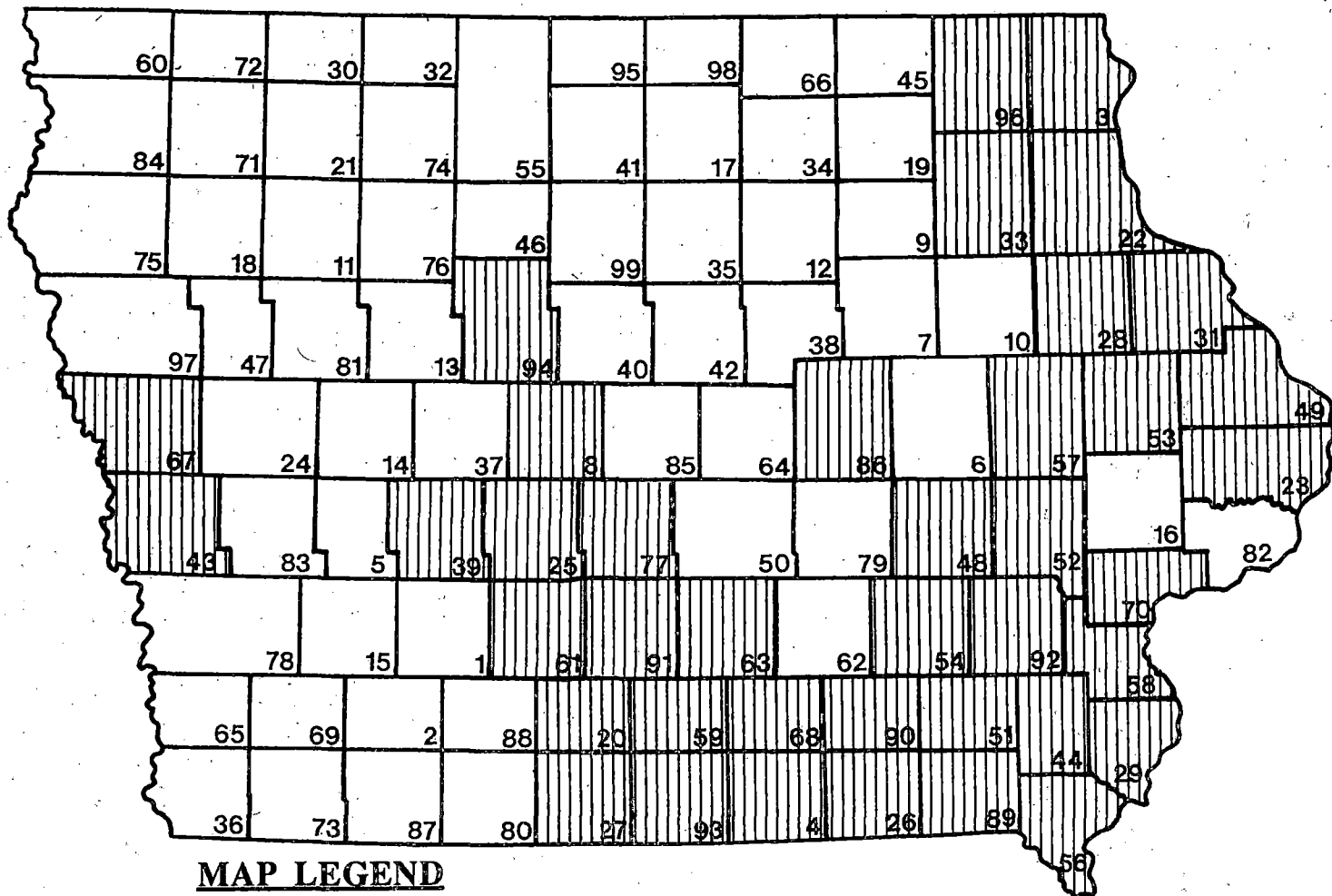


Figure 5.2
METROPOLITAN AREAS
STATE OF IOWA
RECREATIONAL TRAILS PLAN





MAP LEGEND



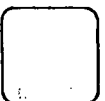
COUNTIES IDENTIFIED ON NATURAL
RESOURCES COMPOSITE

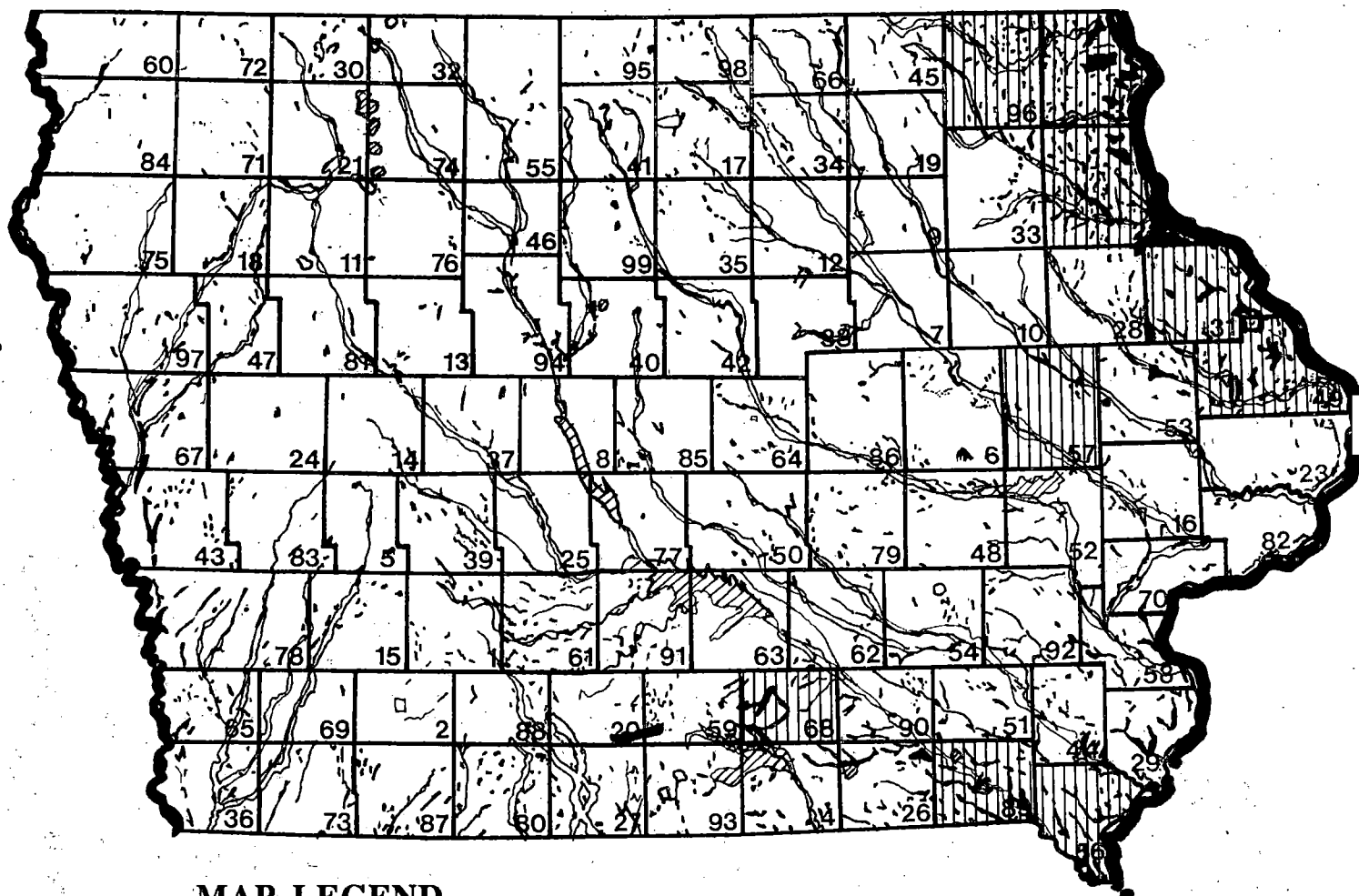
| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|---|
| | 1 | Adair | * | 26 | Davis | * | 51 | Jefferson | | 76 | Pocahontas | NATURAL RESOURCES COMPOSITE |
| | 2 | Adams | * | 27 | Decatur | * | 52 | Johnson | * | 77 | Polk | *- 15,800 or more acres of |
| * | 3 | Allamakee | * | 28 | Delaware | * | 53 | Jones | | 78 | Pottawatomie | natural vegetation |
| * | 4 | Appanoose | * | 29 | Des Moines | * | 54 | Keokuk | | 79 | Poweshiek | |
| | 5 | Audubon | | 30 | Dickinson | | 55 | Kossuth | | 80 | Ringgold | See previous tables for complete figures. |
| | 6 | Benton | * | 31 | Dubuque | * | 56 | Lee | | 81 | Sac | |
| | 7 | Black Hawk | | 32 | Emmet | * | 57 | Linn | | 82 | Scott | |
| * | 8 | Boone | * | 33 | Fayette | * | 58 | Louisa | | 83 | Shelby | |
| | 9 | Bremer | | 34 | Floyd | * | 59 | Lucas | | 84 | Sioux | |
| | 10 | Buchanan | | 35 | Franklin | | 60 | Lyon | | 85 | Story | |
| | 11 | Buena Vista | | 36 | Fremont | * | 61 | Madison | * | 86 | Tama | |
| | 12 | Butler | | 37 | Greene | | 62 | Mahaska | | 87 | Taylor | |
| | 13 | Calhoun | | 38 | Grundy | * | 63 | Marion | | 88 | Union | |
| | 14 | Carroll | * | 39 | Guthrie | | 64 | Marshall | * | 89 | Van Buren | |
| | 15 | Cass | | 40 | Hamilton | | 65 | Mills | * | 90 | Wapello | |
| | 16 | Cedar | | 41 | Hancock | | 66 | Mitchell | * | 91 | Warren | |
| | 17 | Cerro Gordo | | 42 | Hardin | * | 67 | Monona | * | 92 | Washington | |
| | 18 | Cherokee | * | 43 | Harrison | * | 68 | Monroe | * | 93 | Wayne | |
| | 19 | Chickasaw | * | 44 | Henry | | 69 | Montgomery | * | 94 | Webster | |
| * | 20 | Clarke | | 45 | Howard | * | 70 | Muscatine | | 95 | Winnebago | |
| | 21 | Clay | | 46 | Humboldt | | 71 | O'Brien | * | 96 | Winneshiek | |
| * | 22 | Clayton | | 47 | Ia | | 72 | Osceola | | 97 | Woodbury | |
| * | 23 | Clinton | * | 48 | Iowa | | 73 | Page | | 98 | Worth | |
| | 24 | Crawford | * | 49 | Jackson | | 74 | Palo Alto | | 99 | Wright | |
| * | 25 | Dallas | | 50 | Jasper | | 75 | Plymouth | | | | |

Figure 5.3

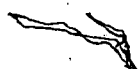
NATURAL RESOURCES
COMPOSITE

STATE OF IOWA
RECREATIONAL TRAILS PLAN





MAP LEGEND



RIVERS AND STREAMS



AREAS OF VEGETATION



BORDER RIVERS



COUNTIES W/ 32,000 +
ACRES OF VEGETATION



FOREST PRESERVES

44

Figure 5.4
BORDER & INTERIOR
RIVERS AND STREAMS,
AND NATURAL VEGETATION

STATE OF IOWA **RECREATIONAL TRAILS PLAN**



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ARCHITECTS ENGINEERS PLANNERS DESIGNERS

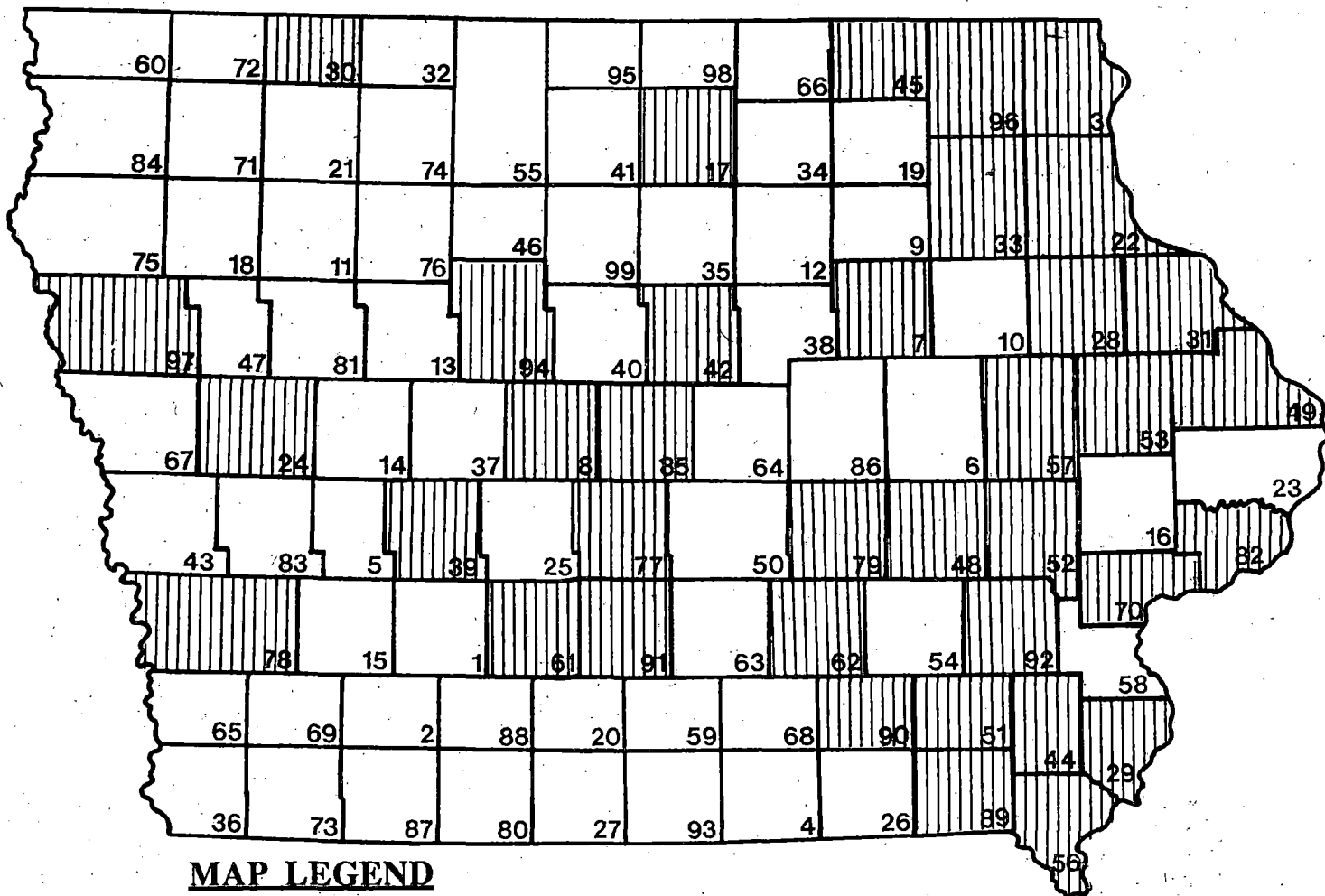


DUNBAR/JONES
ARTNERSHIP
ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS





MAP LEGEND



COUNTIES IDENTIFIED ON CULTURAL
RESOURCES COMPOSITE

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|------------------------------------|
| | 1 | Adair | | 26 | Davis | * | 51 | Jefferson | | 76 | Pocahontas | CULTURAL RESOURCE COMPOSITE |
| | 2 | Adams | | 27 | Decatur | * | 52 | Johnson | * | 77 | Polk | * One or both of the following: |
| * | 3 | Allamakee | * | 28 | Delaware | * | 53 | Jones | * | 78 | Pottawatomie | 16 or more cultural attractions |
| | 4 | Appanoose | * | 29 | Des Moines | | 54 | Keokuk | * | 79 | Poweshiek | 11 or more National Register sites |
| | 5 | Audubon | * | 30 | Dickinson | | 55 | Kossuth | | 80 | Ringgold | |
| | 6 | Benton | * | 31 | Dubuque | * | 56 | Lee | | 81 | Sac | |
| * | 7 | Black Hawk | | 32 | Emmet | * | 57 | Linn | * | 82 | Scott | |
| * | 8 | Boone | * | 33 | Fayette | | 58 | Louisa | | 83 | Shelby | |
| | 9 | Bremer | | 34 | Floyd | | 59 | Lucas | | 84 | Sioux | |
| | 10 | Buchanan | | 35 | Franklin | | 60 | Lyon | * | 85 | Story | |
| | 11 | Buena Vista | | 36 | Fremont | * | 61 | Madison | | 86 | Tama | |
| | 12 | Butler | | 37 | Greene | * | 62 | Mahaska | | 87 | Taylor | |
| | 13 | Calhoun | | 38 | Grundy | | 63 | Marion | | 88 | Union | |
| | 14 | Carroll | * | 39 | Guthrie | | 64 | Marshall | * | 89 | Van Buren | |
| | 15 | Cass | | 40 | Hamilton | | 65 | Mills | * | 90 | Wapello | |
| | 16 | Cedar | | 41 | Hancock | | 66 | Mitchell | * | 91 | Wartn | |
| * | 17 | Cerro Gordo | * | 42 | Hardin | | 67 | Monona | * | 92 | Washington | |
| | 18 | Cherokee | | 43 | Harrison | | 68 | Monroe | | 93 | Wayne | |
| | 19 | Chickasaw | * | 44 | Henry | | 69 | Montgomery | * | 94 | Webster | |
| | 20 | Clarke | * | 45 | Howard | * | 70 | Muscatine | | 95 | Winnebago | |
| | 21 | Clay | | 46 | Humboldt | | 71 | O'Brien | * | 96 | Winneshek | |
| * | 22 | Clayton | | 47 | Ida | | 72 | Osceola | * | 97 | Woodbury | |
| | 23 | Clinton | * | 48 | Iowa | | 73 | Page | | 98 | Worth | |
| * | 24 | Crawford | * | 49 | Jackson | | 74 | Palo Alto | | 99 | Wright | |
| | 25 | Dallas | | 50 | Jasper | | 75 | Plymouth | | | | |

Figure 5.5 CULTURAL RESOURCES COMPOSITE STATE OF IOWA RECREATIONAL TRAILS PLAN



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ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

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IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



4. Recreation Resources Composite

Figure 5.6 is a compilation and analysis of all the recreation resources information, which will be used to help identify potential recreational trails which can capitalize upon the resources. The counties identified on this figure meet one or more of the following requirements:

1. There are three or more state recreation areas within the county.
2. There are three or more county recreation areas with camping, electricity, water and/or picnic facilities within the county.
3. There are 10 or more county recreation areas with equestrian, hiking and/or cross-country ski trails within the county.

Forty-three counties within the state met these criteria.

Figure 5.7 illustrates Iowa's existing, proposed and potential trail corridors.

Information contributing to the graphic was drawn from local agency inventories. Existing trails are those facilities currently in place and recognized as public trail corridors. Proposed trails are those corridors which local units of government have previously submitted as candidates for state trails funding. Potential trails are those areas which local units of government have suggested as future corridors.

B. ALTERNATIVE TRAILS PLAN CONCEPTS

Alternative concepts for the state trails plan were established to assist in progressing toward a preferred plan. The four concept alternatives were based upon logical factors which influence trail locations, identify trail user needs or provide benefits from trail implementation.

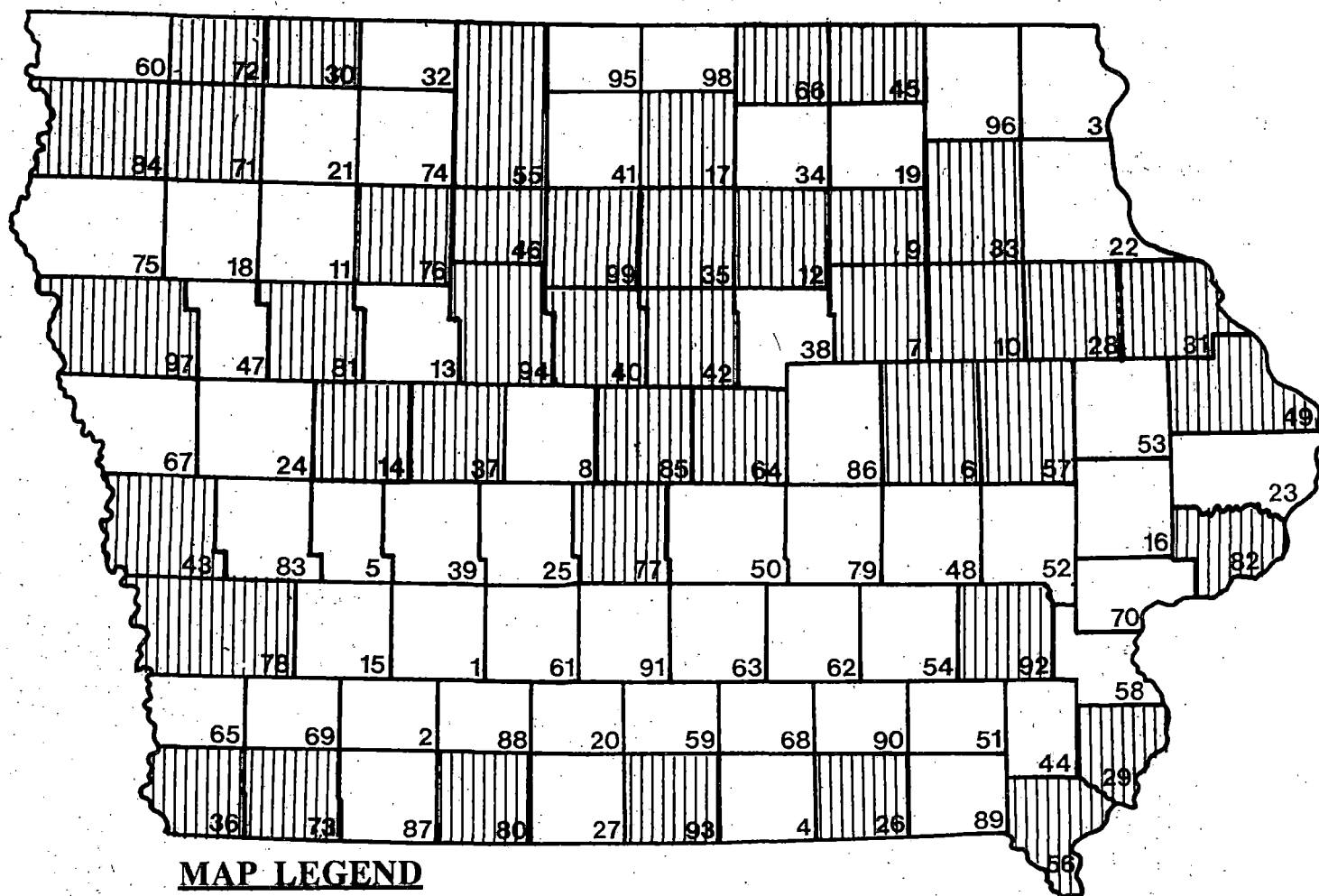
None of the four concept alternatives was destined to be the preferred plan. Their intention, rather, was to provide differing approaches or philosophies which lead to a trails system plan. The alternatives served to stimulate constructive input from the PMT, TAC and consulting team. The strengths and weaknesses of each alternative could then be assessed and improvements made as a result.

A summary of each of the four alternatives and rationale for their development occurs in the following discussion.

Alternate I - Trails Motivated by Demographic and Economic Factors

The first alternative responds to user demands with trail access to population centers and user demographics. Principal contributing factors include:

- A. State population centers
- B. Metro area population projections
- C. County population projections
- D. Economic demographics (by county)
- E. Trail access by proximity and driving time (60 minutes or less)



MAP LEGEND



COUNTIES IDENTIFIED FOR
RECREATION RESOURCES COMPOSITE

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--------------------------------------|
| | 1 | Adair | * | 26 | Davis | | 51 | Jefferson | * | 76 | Pocahontas | RECREATION RESOURCE COMPOSITE |
| | 2 | Adams | | 27 | Decatur | | 52 | Johnson | * | 77 | Polk | *- One or more of the following: |
| | 3 | Allamakee | * | 28 | Delaware | | 53 | Jones | * | 78 | Pottawatomie | 3 or more State areas |
| | 4 | Appanoose | * | 29 | Des Moines | | 54 | Keokuk | | 79 | Poweshiek | 3 or more County areas w/camp., etc. |
| | 5 | Audubon | * | 30 | Dickinson | | 55 | Kossuth | * | 80 | Ringgold | 10 or more County areas w/trails |
| * | 6 | Benton | * | 31 | Dubuque | * | 56 | Lee | * | 81 | Sac | |
| * | 7 | Black Hawk | | 32 | Emmet | * | 57 | Linn | * | 82 | Scott | |
| | 8 | Boone | * | 33 | Fayette | | 58 | Louisa | | 83 | Shelby | |
| * | 9 | Bremer | | 34 | Floyd | | 59 | Lucas | * | 84 | Sioux | |
| * | 10 | Buchanan | * | 35 | Franklin | | 60 | Lyon | * | 85 | Story | |
| | 11 | Buena Vista | * | 36 | Fremont | | 61 | Madison | | 86 | Tama | |
| * | 12 | Butler | * | 37 | Greene | | 62 | Mahaska | | 87 | Taylor | |
| | 13 | Calhoun | | 38 | Grundy | | 63 | Marion | | 88 | Union | |
| * | 14 | Carroll | | 39 | Guthrie | * | 64 | Marshall | | 89 | Van Buren | |
| | 15 | Cass | * | 40 | Hamilton | | 65 | Mills | | 90 | Wapello | |
| | 16 | Cedar | | 41 | Hancock | * | 66 | Mitchell | | 91 | Warren | |
| * | 17 | Cerro Gordo | * | 42 | Hardin | | 67 | Monona | * | 92 | Washington | |
| | 18 | Cherokee | * | 43 | Harrison | | 68 | Monroe | * | 93 | Wayne | |
| | 19 | Chickasaw | | 44 | Henry | | 69 | Montgomery | * | 94 | Webster | |
| | 20 | Clarke | * | 45 | Howard | | 70 | Muscatine | | 95 | Winnebago | |
| | 21 | Clay | * | 46 | Humboldt | * | 71 | O'Brien | | 96 | Winneshiek | |
| | 22 | Clayton | | 47 | Ida | * | 72 | Osceola | * | 97 | Woodbury | |
| | 23 | Clinton | | 48 | Iowa | * | 73 | Page | | 98 | Worth | |
| | 24 | Crawford | * | 49 | Jackson | | 74 | Palo Alto | * | 99 | Wright | |
| | 25 | Dallas | | 50 | Jasper | | 75 | Plymouth | | | | |

Figure 5.6

RECREATION RESOURCES
COMPOSITE

STATE OF IOWA RECREATIONAL TRAILS PLAN



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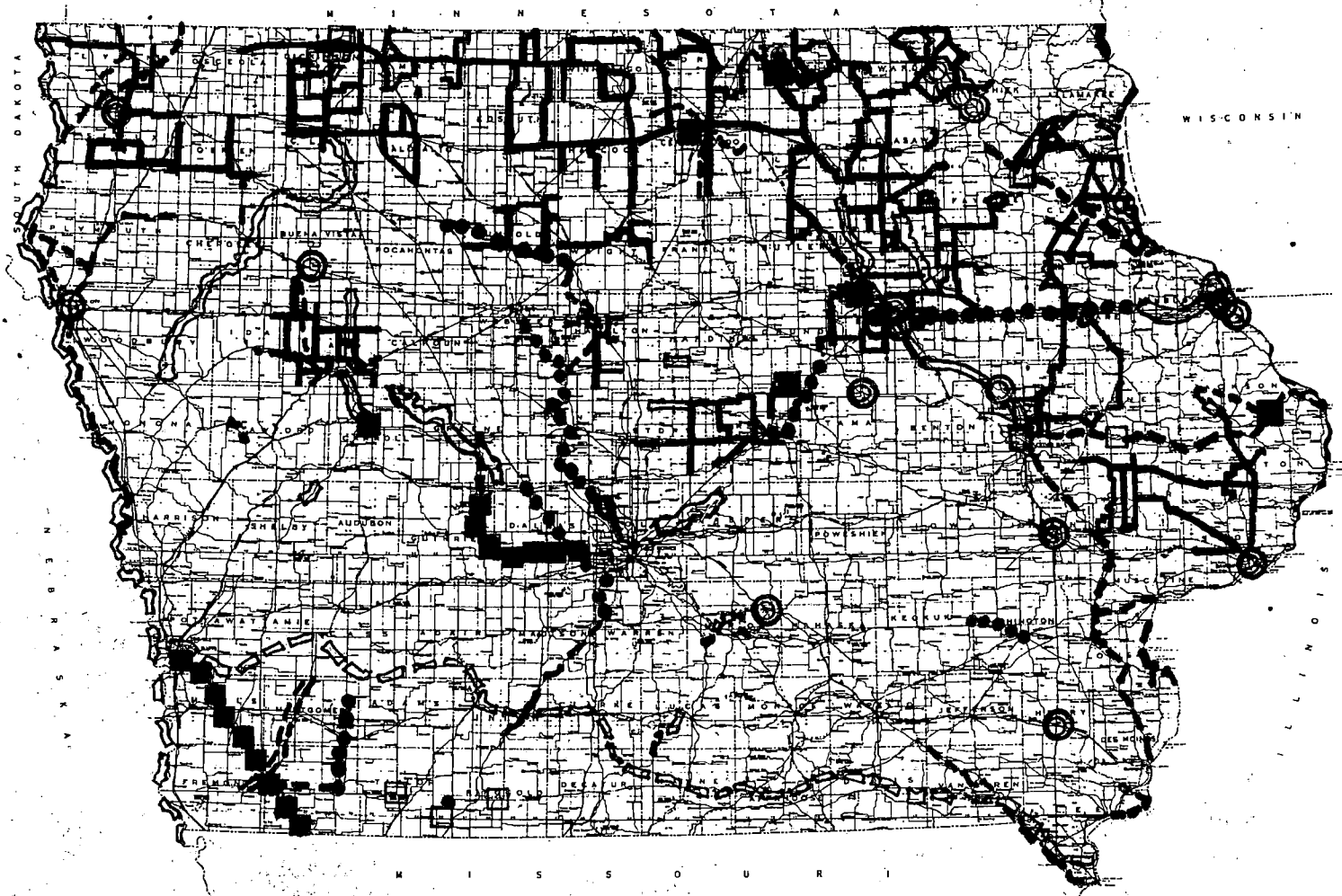
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MAP LEGEND








- | | | | |
|---|---------------------------|---|---------------------------|
|  | EXISTING TRAILS |  | POTENTIAL TRAILS |
|  | TRAILS FUNDED 1989 |  | PROPOSED TRAILS |
|  | TRAILS APPLIED FOR 1989 |  | NATIONAL DESIGNATE TRAILS |
|  | PRIMARY SNOWMOBILE TRAILS | | |



Figure 5.8 portrays the trail corridors advanced by this concept. The concept's primary corridors amount to approximately 1,340 miles with support corridor trails of approximately 980 miles in length. The 2,320 total miles of these trails are intended to provide maximum exposure to those users whose economic and demographic characteristics most closely correspond with findings of the household survey. Survey results indicated that families in medium and upper income urban areas would be the most likely candidates to use trails especially if facilities were located within a 60 minute drive of their homes. This concept, as a result, concentrates trail corridors in close proximity to Iowa's larger cities and urban or growing counties. Trails are concentrated within Iowa's central heartland, west edge and eastern boundary.

Alternate II - Trails Motivated by Natural Resources

The second concept would capitalize upon Iowa's physiographic characteristics with logical trail corridors. Contributing factors to this concept include:

- A. Natural topography
- B. Natural vegetation (forest cover)
- C. Acres of natural vegetation (by county)
- D. Rivers and streams
- E. Lakes and water basins

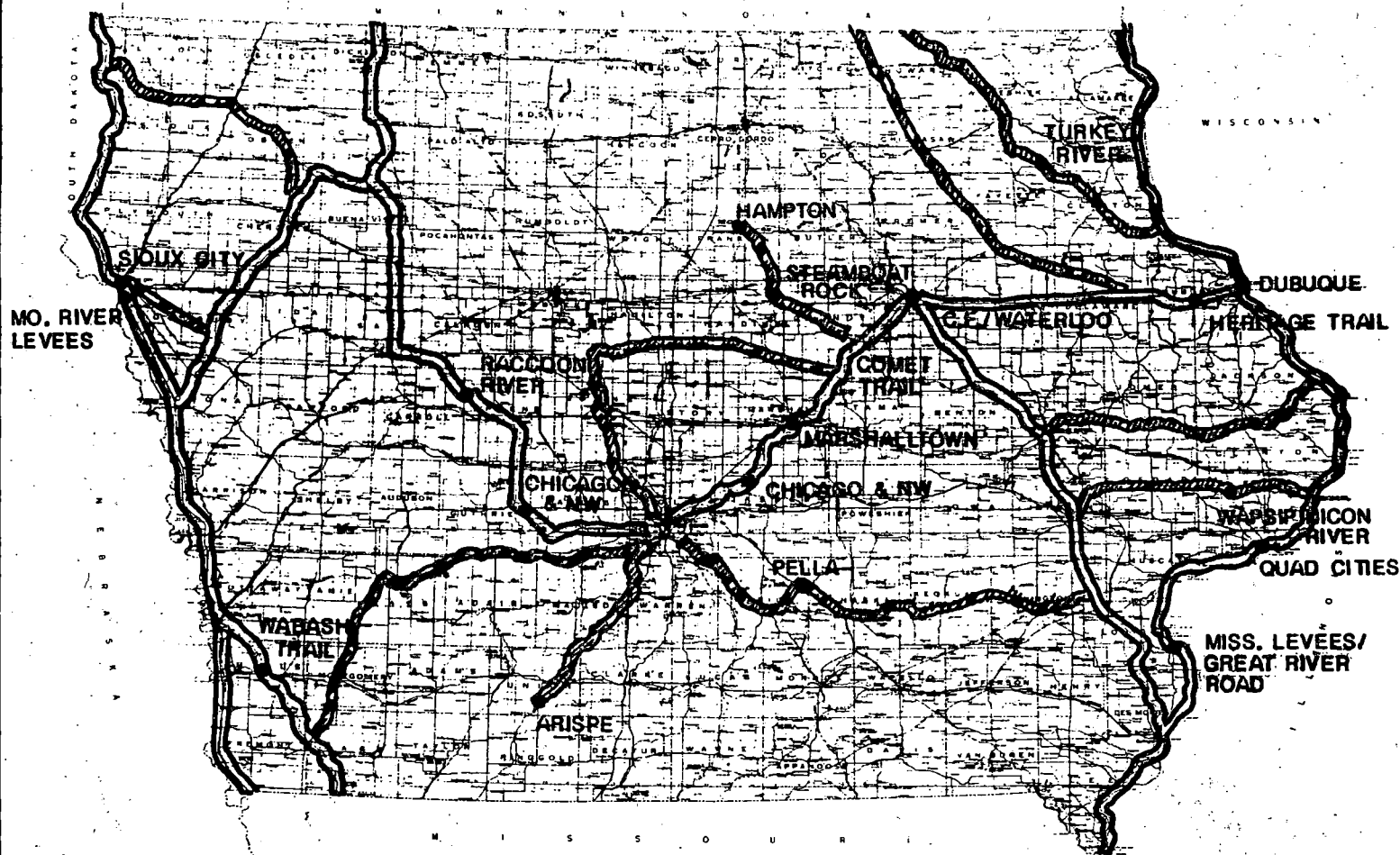
The 2,250 linear miles outlined in Figure 5.9 are composed of 1,340 miles of primary trails and 910 miles of support trails. The concept identifies trail corridors capitalizing upon natural features consistent with the household survey findings and input from the Technical Advisory Committee (TAC). Water features and visually interesting landscapes would be accessed by trail corridors within riverways and natural vegetation cover.

Trail corridors identified by this concept are prone to aligning northwest to southeast consistent with the state's natural features. Corridors are distributed throughout most of Iowa with the exception of the north-central area.

Alternate III - Trail Corridors Motivated by Cultural Resources

The third alternate would link and provide trail access to Iowa's cultural, historic and archaeological resources. Contributing factors include:

- A. Historical features
- B. Archaeological sites
- C. Community theaters
- D. Farmer's markets
- E. Festivals and community events
- F. Galleries and museums
- G. Cultural attractions
- H. Theaters and auditoriums





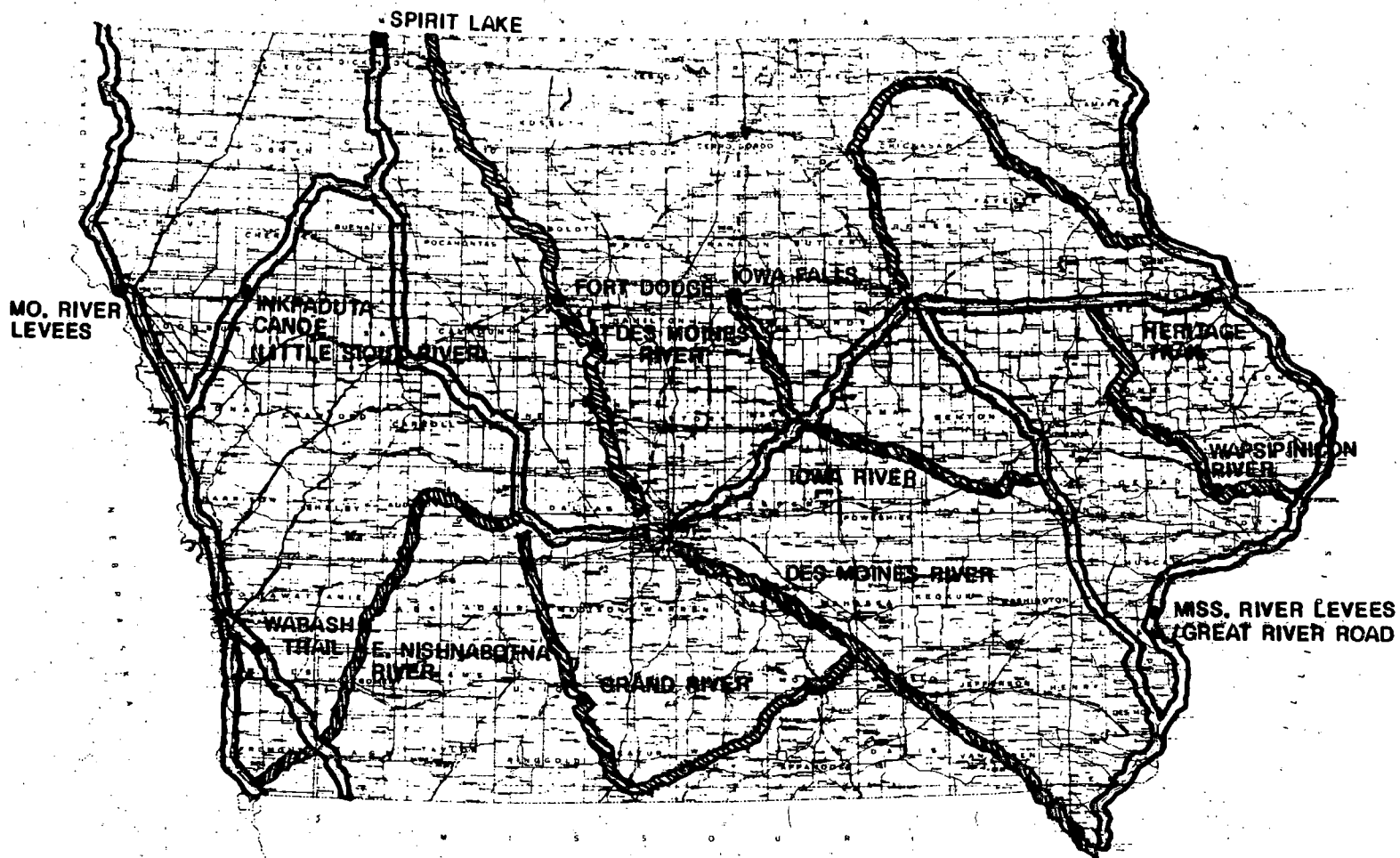
 PRIMARY CORRIDOR - 1340 MILES
 SECONDARY CORRIDOR - 980 MILES
2320 TOTAL

Figure 5.8



ALTERNATIVE 1 **USERS/ECONOMICS/DEMOGRAPHICS DRIVEN**





 PRIMARY CORRIDOR - 1340 MILES
 SECONDARY CORRIDOR - 910 MILES
2250 TOTAL

Figure 5.9



ALTERNATIVE 2 **PHYSIOGRAPHY DRIVEN**

Trail corridors generated by this concept link sites together to form a network of trails, shown in Figure 5.10. The 1,900 linear miles comprise 1,340 miles of primary trails and 560 miles of support system.

Corridor distribution within the state is concentrated through the central area, and east and west boundaries. This concept's trail corridors tend to be destination-oriented with a series of cultural sites linked together.

Alternate IV - Trail Corridors Which Capitalize Upon State Recreation Resources

This alternate maximizes existing trail and recreational resources and acknowledges proposed or potential trail corridors. Contributing factors include:

- A. Existing recreational trails
- B. Proposed recreational trails
- C. Potential recreational trails
- D. DNR trails
- E. Recreational features - county and state
- F. Snowmobile trails
- G. Campgrounds
- H. Canoe float streams
- I. Inventory responses from local agencies
- J. Trails funded by the state DOT in 1989
- K. Trails applied for state DOT funding in 1989, but not funded

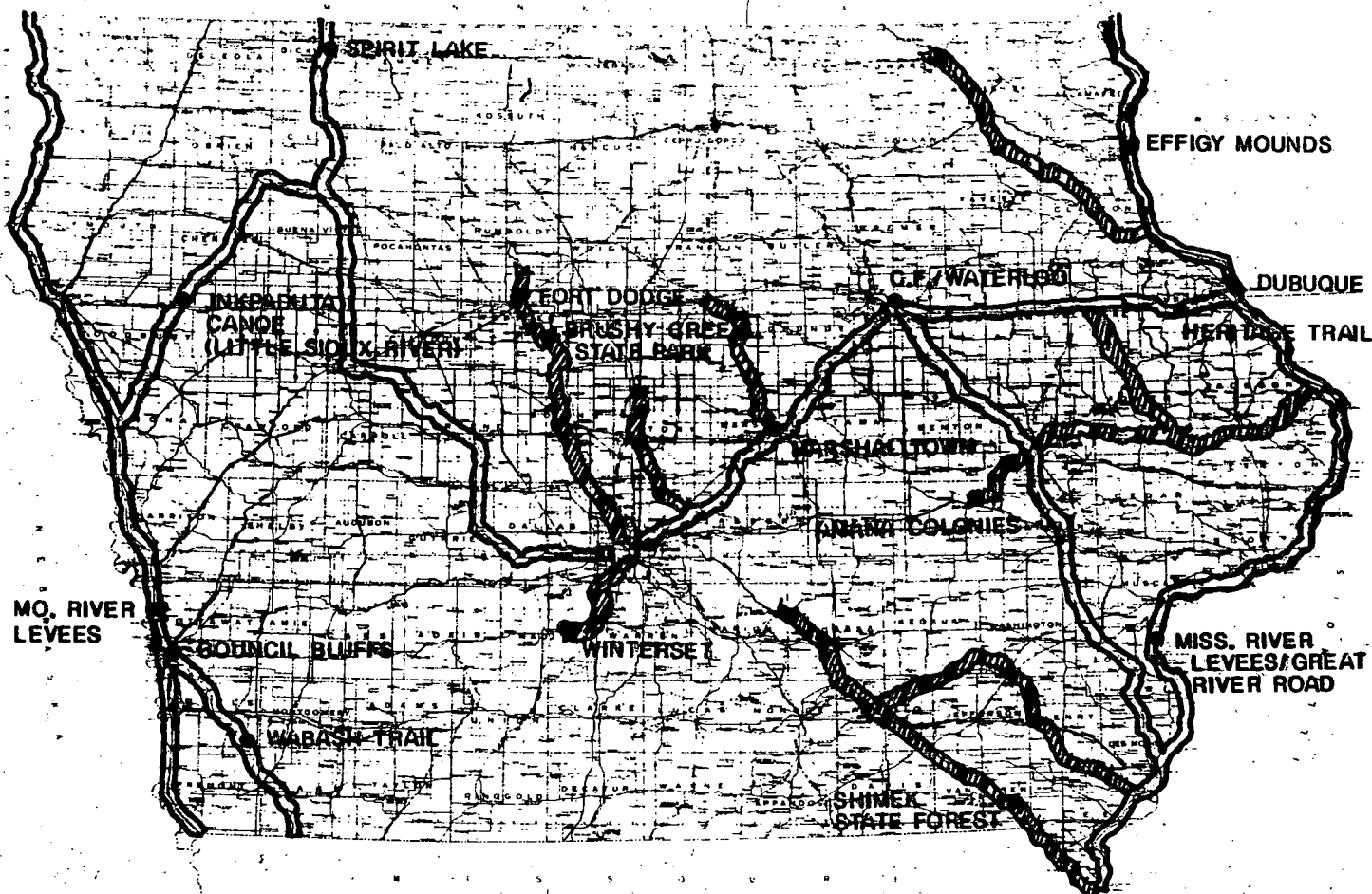
Existing recreational resources motivate this concept. Existing trails were capitalized upon and used to interconnect site-specific recreational resources. Proposed or potential trails identified by the local agency inventory were also recognized as system corridors.

Figure 5.11 illustrates the concept plan generated. Approximately 2,675 linear miles are contained within this trail system with an even balance between primary and support trails. Corridors are evenly distributed throughout Iowa with access provided to urban areas and opportunities for connections to other state trails.

Constructive Comments on Concept Alternatives

The Project Management Team and Technical Advisory Committee reviewed the aforementioned alternatives both as a group and in small workshop sessions. Committee members were given the opportunity to expand or delete corridors and provide written comments on the plan's contents. General comments received from the sessions included:

- A. An east-west snowmobile corridor should be considered in the northern one-third of Iowa running the length of the state.
- B. Opportunities for commercial river float trips should be considered as a tourist resource.





 PRIMARY CORRIDOR - 1340 MILES
 SECONDARY CORRIDOR - 560 MILES
1900 TOTAL

Figure 5.10



ALTERNATIVE 3 **CULTURAL/HISTORICAL RESOURCE DRIVEN**

- C. A trans-Iowa bicycle route should be included in the plan.
- D. Designated national historic trail routes should be identified. Representative proportions of the Mormon trail should be considered for use, however, the entire length should not be utilized.
- E. Summer tourist attractions including Spirit Lake, Okoboji and the Amana Colonies should be accessed.
- F. Site-specific ATV loop trails should be identified adjacent to population centers. Further information from user groups is needed to accomplish this task.
- G. Site-specific areas for cross-country ski loop trails should be identified in the north-central and the northeast portions of the state.
- H. The implications of trail corridors within highway right-of-way must be thoroughly studied including specific location, trail modes and safety considerations.
- I. The group concurred on the primary or backbone system, one which includes the Mississippi, Missouri, Des Moines, and other river corridors.

These comments were instrumental in arriving at a preferred plan.

**Iowa
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Chapter 6

Description of Preferred Plan

CHAPTER 6

DESCRIPTION OF PREFERRED PLAN

A. PURPOSE OF PLAN GRAPHIC

The illustrative plan graphic on Figure 6.1 depicts proposed state system corridors within Iowa. These corridors are intended to be general in nature with specific alignments to be determined by trail owners previous to state funding requests. Trails other than those portrayed on the plan are still eligible for state funding especially if they complement its intent and emphasize system continuity. However, projects within the recognized corridors may receive the highest priority for the issuance of state grants. Site-specific locations have also been identified where looping trails are consistent with trail mode needs such as cross-country skiing.

The relationship between the proposed and local trails is an important aspect of the trails plan. The proposed trails are intended to provide for multimodal use; however, certain corridors may be better suited for specific modes than others. Trail owners will be responsible for selecting those mode types which they feel most appropriate for the area's physical characteristics, the local demand for trails and general public interest. The proposed trails will provide a coordinated system for recreational use of longer trip lengths and should generate both tourism and economic benefits both for local communities as well as the state. Uniform design intentions should be encouraged to maintain consistency between statewide needs and local agency jurisdictions. Support facilities such as trail heads and rest stops should occur at logical increments. Trail corridors which enable cross state trips and cross state boundaries for interstate links should be accommodated. The proposed trail system is intended to be funded primarily by the state trails program. Trail owners will be responsible for development, maintenance, operations and policing.

In contrast, local trails will probably be designed and developed entirely by local units of government primarily with local financing. Design standards may vary from agency to agency. Trip use is intended for shorter trip lengths and these trails will function for both local transportation and local recreation purposes. The local trail system should also serve as a feeder or access corridor to the statewide recreational trails system.

B. FORMATION OF THE PLAN

The preferred plan evolved from input provided on the four plan alternatives described in Chapter 5. Input from the Project Management Team (PMT) provided a conduit for informal state agency review to ensure compatibility with the resources which each agency is responsible for. The Technical Advisory Committee (TAC) also contributed to the preferred plan. A workshop session held during one of the regular TAC meetings gave committee members an opportunity to review the four plan alternatives in detail and provide an assessment of each plan's strengths and weaknesses.

Public input was an important ingredient in arriving at the final plan product. The DOT and consulting team presented the preferred plan at each of the public meetings held throughout the state. Citizens were given the opportunity to contribute comments at the meeting or through correspondence. The consultant's newsletter, which was distributed during the planning process, also requested comments from interested parties regarding corridor location.

Suggestions and comments from the aforementioned groups were considered by the PMT and consulting team before arriving at the plan graphic illustrated in Figure 6.1.

C. HIGHLIGHTS OF THE PREFERRED PLAN

The preferred trail plan is comprised of approximately 2,928 linear corridor miles. Approximately 400 miles of this system currently exist or have been funded by the DOT in 1989. Slightly more than one-half of the mileage comprises the "backbone" system with the remainder designated as the support system. Five specific sites have been designated for group cross-country ski trail development areas.

A number of fundamental objectives have been met or surpassed by the preferred plan's corridors. These include:

- A. The preferred plan maximizes principal existing trails which are recognized for their popularity. In addition, the plan capitalizes upon corridors which are acknowledged for their potential trail development.
- B. The plan is responsive to a variety of trail mode types. Each of the modes considered by this plan has differing locational requirements based upon the means of transportation or the experience desired. The corridors outlined by the preferred plan allow ample opportunity for developing the multimodal system.
- C. User needs and demands were inventoried previous to identifying the preferred plan. Criteria such as proximity, access, natural setting and other user requests have been realized.
- D. The plan interconnects and provides convenient access to Iowa's principal population centers. The plan's crisscrossing character and sense of overall continuity provides access to the greatest amount of users within the state.
- E. Natural resource corridors which were identified during the inventory and synthesis process have been capitalized upon where appropriate and accessible. These corridors include rivers, vegetation patterns and major topographic features.

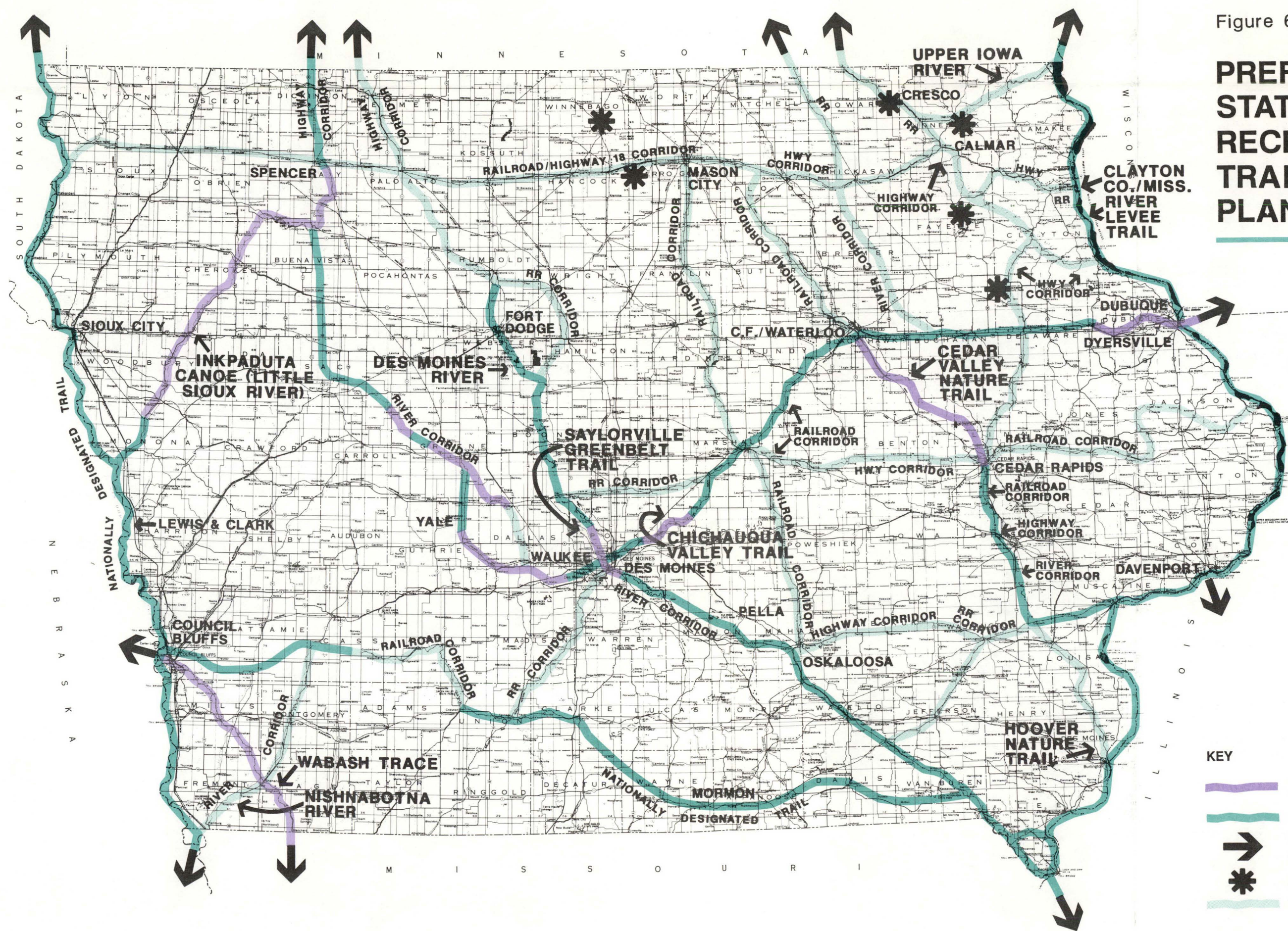
Figure 6.1

PREFERRED STATE RECREATION TRAILS PLAN






NOVEMBER 17, 1989



 Barton-Aschman Associates, Inc.



NOTE
THE TRAIL CORRIDORS SHOWN REPRESENT
A GENERAL LOCATION AND ARE NOT
NECESSARILY WITHIN EXISTING RIGHT-OF-WAY.

- KEY**
-  BACKBONE SYSTEM (EXISTING TRAILS OR THOSE FUNDED IN 1989)
 -  BACKBONE SYSTEM
 -  POTENTIAL OUT OF STATE CONNECTIONS
 -  CROSS COUNTRY SKI LOOP SITE TRAILS
 -  SUPPORT SYSTEM TRAILS

- F. Cultural resources will be accessed by the statewide system. The trails will provide linkage to many of the state's historical sites, interpretive sites and other features such as the Amana Colonies.
- G. Interstate connections with Iowa's neighboring states have been emphasized to allow for cross-country trips and to promote Iowa tourism. Where possible, trails interconnect with existing corridors in the abutting states.
- H. Intrastate corridors will promote lengthy trail trips for users such as snowmobilers, bicyclists and equestrian trail riders. Once again, the system's interconnecting nature will ultimately allow trail users the opportunity for numerous trip combinations. A "backbone" and support designation has been utilized to emphasize trail continuity, access and corridor linkages.

D. BACKBONE SYSTEM

The "backbone" system consists of trail corridors which have greater priority or significance to the statewide trails plan. Backbone trails are intended to provide longer corridors paralleling the state's most significant natural resources, corridors which span state boundaries or those corridors which provide principal connections to major population centers.

In the preferred plan, backbone trails include the following corridors:

- A. The Missouri River corridor will be paralleled extending the length of Iowa from South Dakota to Missouri. Trails within this corridor could be on the river's levies and/or through adjacent foothills. This corridor corresponds with the nationally designated Lewis and Clark Trail. Larger communities having easy access to the trail corridor would include Sioux Falls, South Dakota, Sioux City and the Omaha/Council Bluffs area.
- B. Trails will extend the length of the Mississippi River corridor from Minnesota and Wisconsin to Missouri. Projects such as the Great River Road program have provided precedence for this corridor which would benefit many of Iowa's population centers including Dubuque, Clinton, the Quad Cities, and Burlington. This corridor will also capitalize upon many of the state's cultural and physical resource-intensive areas. Interstate connections to Minnesota, Wisconsin, Illinois and Missouri can easily be made along this corridor.
- C. The Des Moines River corridor will provide a cross state link from the northwest to the southeast corners through the central portion of the state. This corridor will connect Iowa's principal population center, Des Moines, with numerous cultural and physical features.

The backbone system will also emphasize both existing and funded trail segments. Examples include the Heritage Trail in the vicinity of Dubuque, the Cedar Valley Trail, the Wabash Trace in the state's southwest corner,

the Raccoon River Valley Trail, the Saylorville Greenbelt Trail and the Chichaqua Valley Trail amongst others. Integration of these existing prominent trails into the state system will stress their importance as fundamental building blocks. Interstate trail connections are emphasized by the preferred plan. As shown in Figure 6.1, logical connections can be made to each of Iowa's abutting states with many linking with existing trail corridors.

E. SUPPORT TRAIL SYSTEM

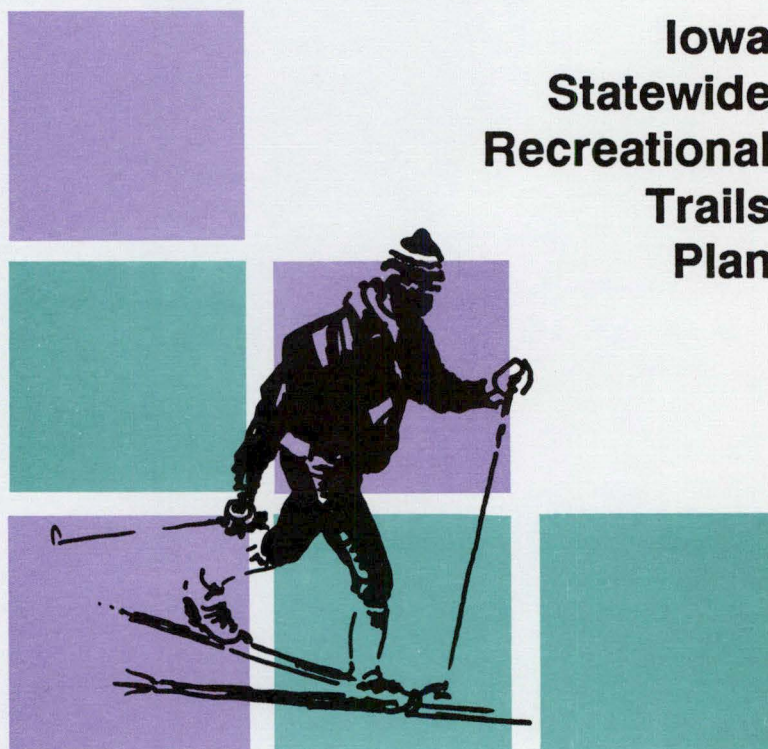
The support trail system is intended to augment the trails plan by providing secondary corridors which loop, interconnect or provide single use trails within the state. Key features include:

- A. A cross state snowmobile route designated in the northern one-third of the state within a zone of probable snow. The trail corridor would interconnect many communities including Spencer, Algona, Clear Lake, Mason City and Charles City.
- B. A corridor would extend southwest from Des Moines interconnecting river valleys, abandoned rail lines and highway corridors. Portions of the federally designated Mormon Trail, state parks and state cultural features are linked by this corridor.
- C. Tourism areas and recreational designations alike will be benefited by the support trails. Northern tourist lakes including the Okoboji area, Clear Lake and others would have access to the system. Northeast recreational counties will have a crisscrossing trail pattern corresponding with the area's attractive natural resources. Three site-specific cross-country ski areas have been designated for loop systems. A specific corridor has also been provided linking the Amana Colonies area to Cedar Rapids and the remainder of the state system.
- D. Five site-specific cross-country ski areas have been designated. These sites would provide multiple trails which loop back to a central trail head providing opportunities for varying skill levels and racing events. Other linear trail corridors were also eligible for cross-country ski designation.
- E. Site-specific areas could also be recognized for all-terrain vehicle (ATV) loop trails if logical candidate parcels can be located. In general these sites should have good access to the state's principal population centers including Des Moines and the Quad Cities. The plan does not provide specific designations for the ATV loops. If continued user interest exists, representative user groups should advance specific recommendations to the Project Management Team for their review and inclusion in the plan.

The preferred trails plan is based upon a variety of corridor types. These include rivers, abandoned rail, active rail, highway, developed property/agricultural uses and existing or funded trails. Each of these corridor

types will provide different opportunities for trail development and demand differing sensitivity during implementation. The trail design guidelines provided in Chapter VII outline these considerations.

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Chapter 7

Trail Design Guidelines

CHAPTER 7

TRAIL DESIGN GUIDELINES

A. INTRODUCTION

The Iowa statewide trail system should be developed in a manner which responds to user needs, enjoyment and safety. The ability and skills posed by trail users are diverse and difficult to respond to by a single set of design suggestions. Equally diverse are the physical characteristics and environmental conditions of potential corridors.

This chapter provides general design criteria for the system's multimodal facilities. In formulating the guidelines, a wide variety of factors were considered including user skills, corridor diversity, trail modes and precedence set by other agencies. Where possible, other agencies were consulted, including the Federal Highway Administration, AASHTO, and other Midwest state trail offices.

Guideline application must be considered on a case-by-case basis. The guidelines should not be considered unilateral or all-encompassing. Local agencies must use their own discretion to emphasize user safety, enjoyment and welfare.

Previous to implementing trails, specific alignments should be reviewed by the DNR Natural Areas inventory staff to review conflicts with threatened, protected or endangered species, whether they carry state or federal designation.

B. PURPOSE OF GUIDELINES

The chapter's design statements will serve several purposes which include the following:

1. The statements will assist in promoting consistent trail facility development in response to user needs and individual trail mode requirements. This point is especially important as the system will be developed on an incremental basis.
2. The design objectives will establish a hierarchy between state and local trails and emphasize the state system as the backbone of Iowa's recreational trails.
3. Cost estimates of the proposed statewide system will be generated based upon this material and the characteristic cross sections which they represent. Cost estimates arrived at as a part of this effort will be instrumental in determining priorities for project implementation and requirements for future financing and phasing.

4. The guidelines will also establish a precedence to which submissions from trail owners should adhere. Evaluation of these proposals may be made in part by their ability and desire to adhere to the state system's overall design objectives.

This section also contains several other design considerations. These include:

1. Analysis approach for considering trail bridges, underpasses and pedestrian crossings of roadways.
2. Design guidelines for wheelchair accessible trails.
3. Recreation trails compatibility with farmland.
4. Recreation trails within highway right-of-way.
5. Design guidelines for trail signing.

C. DESIGN GUIDELINES FOR BIKE TRAILS

The following design guidelines are intended to guide the future bike trail construction of trails in Iowa.

Difficult trail design issues frequently exist, and they may require special design consideration. Individuals using the design guidelines must review on a case-by-case basis whether the design conflicts require deviation from the guidelines. In arriving at such exceptions, attention should be given to issues pertaining to user safety, liability, comfort, construction costs and consistency with abutting trail segments.

Bicycle Dimensions and Operating Characteristics

The space requirements for safe and comfortable bicycle operation are dictated by the following factors:

1. Dimensions of the bicycle and rider
2. Operating characteristics
3. Bicycle clearances
4. Site characteristics

Dimensions of the Bicycle and Rider

The actual dimensions of the bicycle and rider serve as the starting point for developing minimum bicycle facility design standards. Though bicycle dimensions may vary slightly with model and size, the typical dimensions of the average adult rider and his or her bicycle by bike type are shown in Table 7.1 and Figure 7.1.

TABLE 7.1
BICYCLE AND RIDER DIMENSIONS

| Characteristics | Average Dimension (Feet) | |
|-------------------------------------|--------------------------|---------------|
| | Touring Bike | Mountain Bike |
| Width (measured by handlebar width) | 1' - 4" | 2' - 3" |
| Length | 6' - 0" | 6' - 0" |
| Height | 7' - 4" Minimum | 7' - 6" |
| Vertical Pedal Clearance | 0' - 6" | 0' - 6" |

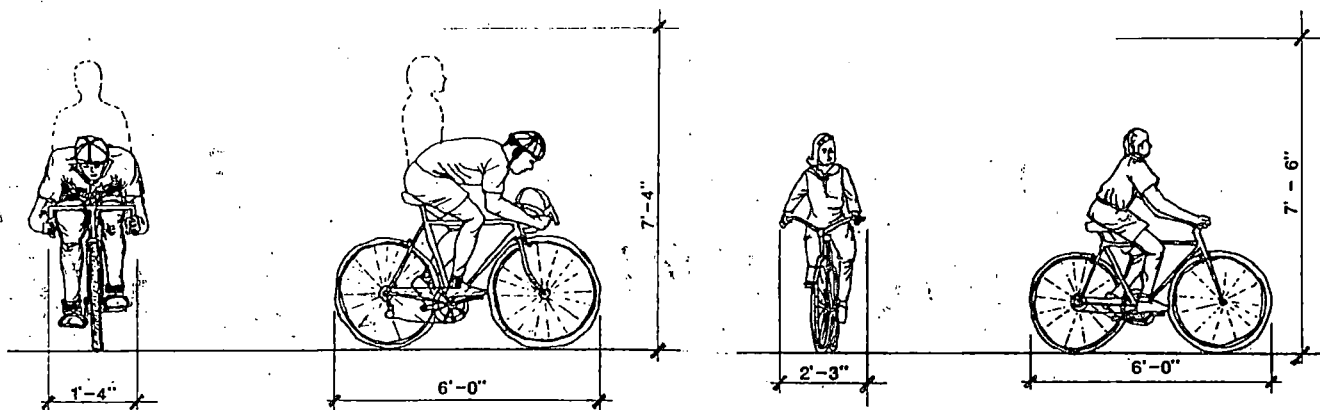


FIGURE 7.1
BICYCLE AND RIDER DIMENSIONS

Bicycle Operating Characteristics

The speed at which a bicyclist travels may vary according to several factors including:

1. Route geometrics
2. Surface condition
3. Type and characteristics of the bicycle
4. Physical fitness and proficiency of the rider
5. Weather and related conditions
6. Trip purpose

According to AASHTO, "the speed that a bicyclist travels is dependent on several factors; including the type and condition of the bicycle, the purpose of the trip, the condition and location of the bicycle path, the speed and direction of the wind, and the physical condition of the bicyclist." In addition, paved bicycle paths should be designed for a selected speed that is at least as high as the preferred speed of the faster bicyclists. A minimum design speed of 20 mph should be used; however, when the grade exceeds four percent, or where strong prevailing tailwinds exist, a design speed of 30 mph is advisable.

On unpaved paths, where bicyclists tend to ride slower, a lower design speed of 15 mph can be used. Similarly, where the grades or the prevailing winds dictate, a higher design speed of 25 mph can be used. Since bicycles have a higher tendency to skid on unpaved surfaces, horizontal curvature design should take into account lower coefficients of friction.

Bicycle Clearances

Perhaps the most critical factor in developing safe and comfortable bicycle facilities is the provision of adequate clearance to a wide variety of potential obstructions that may be found along a prospective route. Guidelines for lateral and vertical clearance are particularly important in view of the wide range of riding proficiency that is found among riders. Clearance consideration must include:

1. Normal bicycle maneuvering allowances
2. Lateral clearances to static obstructions
3. Lateral clearances to dynamic obstructions
4. Vertical clearances to overhead obstructions

Minimum and desirable clearance guidelines for safe and comfortable bicycle operation are indicated in Table 7.2. It should be noted, however, that these guidelines are minimum recommendations. Where possible, additional space should be provided to permit passing within the bikeway and to allow more adequate hazard avoidance. For example, the door of a parked car could extend over four feet into a bike lane (normal extension is about three feet). A three-foot lateral clearance plus one foot maneuvering space will not provide adequate space for comfortable and safe passage around this obstruction.

Recommended Bicycle Trail Width

Bicycle trails designated for the statewide system should be 10 feet wide if they are located on an independent alignment. This preferred dimension is important as the trail width will allow two bicycles to pass with safety whether they be loaded with side pack panniers, pulling "bugger" trailers or free from burden. The 10 foot wide dimension will also allow bicycle traffic to comfortably pass pedestrian traffic using the trail. Deviations

TABLE 7.2
BIKEWAY CLEARANCE GUIDELINES

| Type of Clearance | Minimum Dimension (feet/inches) | Desirable Dimension (feet/inches) |
|--|---------------------------------------|---|
| Maneuvering Allowances ¹ | | |
| - each outside edge | 9 inches | 1 foot |
| - between bicycles, regardless of direction | 1 foot-6 inches | 2 feet-6 inches |
| Lateral Clearance to Static Obstructions ² | | |
| - utility poles, trees, hydrants, etc. | 1 foot | 2 feet |
| - raised curb | 6 inches | 1 foot |
| - curb drop-off | 1 foot-6 inches | 2 feet |
| - sloped drop-off | 1 foot | 1 foot |
| - parked vehicles | 3 feet-6 inches | 4 feet |
| Lateral Clearances to Dynamic Obstructions | | |
| - moving vehicles | 4 feet | 6 feet |
| - pedestrian traffic | 3 feet | 4 feet |
| Vertical Clearances to Overhead Obstructions | | |
| | 8 feet-6 inches | 9 feet |

¹Maneuvering allowances should be provided for by additional bikeway pavement width, as specified.

²Lateral clearances can be provided for by either additional bikeway pavement width or separation. It is recommended that these clearances be provided for by simple distance separations, where possible, for poles, trees, rocks, hydrants and similar objects.

from the 10 foot width should take into consideration user volume, the frequency of peak events and the percentage of pedestrian users. Physical constraints may also require variation, however, any reduction should not adversely affect user safety. Grass shoulders one foot-six inches to three feet wide adjacent the trail on either side are also recommended. The shoulders provide a recovery area which is desirable if a user veers off the trail. At a minimum, a clear zone free of obstructions should be maintained two feet in width. Refer to Figure 7.2, Recommended Bicycle Trail Widths.

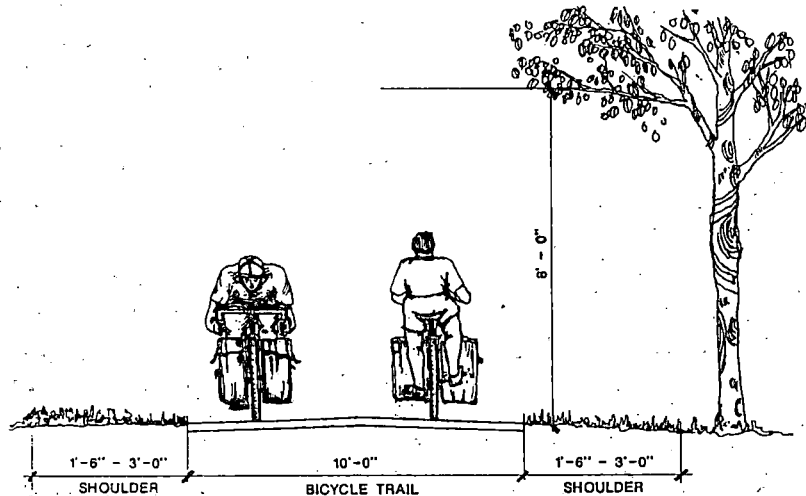


FIGURE 7.2
RECOMMENDED BICYCLE TRAIL WIDTHS

Bikeway Grades

The grades over which bicyclists can be expected to safely and comfortably travel depend on a number of factors, including:

1. General topography
2. Length of the grade
3. Proficiency of the bicyclist
4. Characteristics of the bicycle
5. Route surface conditions
6. Weather and related factors

Because of the variability of these factors, it is difficult to establish detailed and absolute design guidelines for determining bicycle facility grades. In general, grades greater than five percent and greater than 500 feet long should be avoided wherever possible. The relationship between grades and their length should be viewed as a major consideration in bikeway development. Where terrain dictates compromises, a higher design speed and wider pavement should be provided.

Recommended Curves

The design of bikeway curvature is dependent upon the average rate of travel of the cyclist. An increased rate of travel due to downhill slope requires a longer radius of curvature.

For design purposes, a speed of 15 mph or more is desirable to use in setting guidelines for the curvature of bikeways unless intervening conditions exist which pose design difficulties.

An added approach to making bikeway curves more safe and comfortable may include providing some degree of super-elevation or banking on all horizontal curves. (Super-elevation relates to the slope of the banked segment in terms of the amount of vertical rise at the outside edge versus the width of the surface.) Some super-elevation is advisable on such curves, but in the absence of available data for determining these rates, the American Association of State Highway and Transportation Officials (AASHTO) recommends that a cross slope of 0.02 foot per foot be established as an absolute minimum (the minimum rate required for drainage) and that 0.05 foot per foot be used as a maximum design value. Curve data for super-elevations is contained within the Bikeway Design Manual, Minnesota Department of Transportation - 1983.

Finally, it is suggested that widening the pavement width on curves be considered to provide increased safety and comfort. By doing so, the tendencies of the bicyclist to "lean into" turns and stray from the centerline can be accommodated without jeopardizing either his or her actual or psychological safety or comfort. Figure 7.3 and Table 7.3 indicate the recommended means by which curve-widening designs should be developed. In extreme cases, where curve radii are greater than 100 feet, no widening is required. On curves of less than 100 feet radius, widening is recommended up to a maximum of four feet depending on the radius of the curve and the design speed being used.

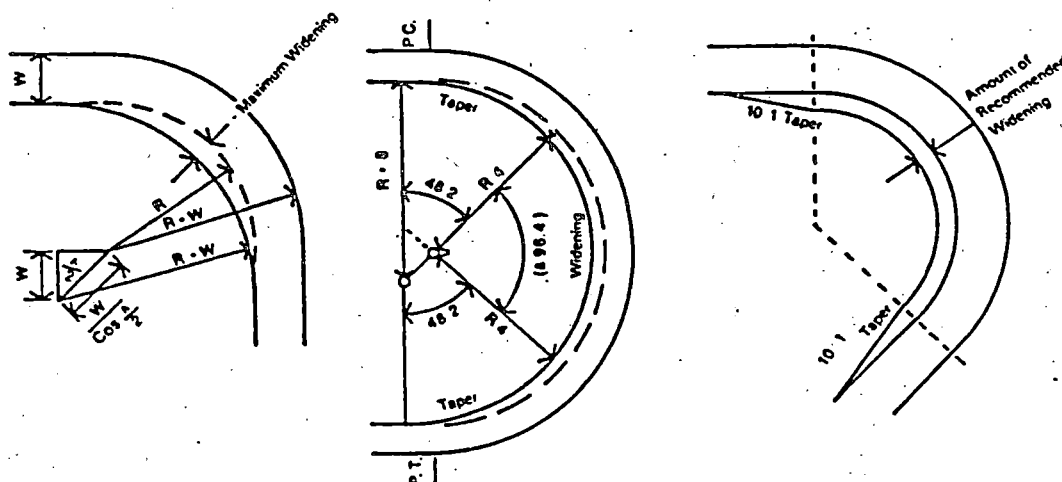


FIGURE 7.3
BIKEWAY CURVE-WIDENING TECHNIQUES

TABLE 7.3
BIKEWAY CURVE WIDENING GUIDELINES FOR VARIOUS RADII AND DESIGN SPEEDS

| Design Speed | Recommended Curve Widening (feet) | | | | | | | |
|--------------|-----------------------------------|-----|-----|-----|--------------------------------|-----|-----|-----|
| | Absolute Minimum of Radii of: | | | | Recommended Standard Radii of: | | | |
| | 20 | 27 | 33 | 39 | 35 | 70 | 90 | 125 |
| 15 mph | 4.0 | 3.6 | 2.4 | 2.0 | 2.3 | 1.1 | 0.9 | --- |
| 20 mph | | 4.0 | 3.2 | 2.8 | | 1.5 | 1.2 | --- |
| 25 mph | | | 4.0 | 3.4 | | 1.9 | 1.5 | --- |
| 30 mph | | | | 4.0 | | 2.2 | 1.7 | --- |

Stopping Sight Distances

The degree of safety which a bikeway offers relates in part to how easily conflicting cross-movements are perceived, whether they be pedestrians, other bicyclists, automobiles, animals or other obstructions. However, the ability of a bicyclist to react to specified cross movements is dependent on the stopping sight distance that is provided. Safe stopping sight distances are a function of bicycle speed, user ability and grade profile of the facility. Table 7.4 summarizes recommended stopping sight distances for various design speeds and gradients as developed by the American Association of State Highway and Transportation Officials (AASHTO) and adopted for table reference. These values are for concrete or bituminous surfaces. Bicycles have a higher tendency to skid on unpaved surfaces. AASHTO's Guide for Development of New Bicycle Facilities should be consulted for both horizontal and vertical curve sight distance information.

TABLE 7.4
DESIGN STOPPING SIGHT DISTANCES FOR BICYCLES (on bituminous surface)

| Design Speed (mph) | Stopping sight distances for downhill gradients of: | | | |
|--------------------|---|-----------|------------|------------|
| | 0% (feet) | 5% (feet) | 10% (feet) | 15% (feet) |
| 10 | 50 | 50 | 60 | 70 |
| 15 | 85 | 90 | 100 | 130 |
| 20 | 130 | 140 | 160 | 200 |
| 25 | 175 | 200 | 230 | 300 |
| 30 | 230 | 260 | 310 | 400 |

NOTE: Design values for stopping sight distances on bikeways can be developed in the same manner as on highways. The values shown were based on the following factors and developed by AASHTO:

| | |
|--------------------------------|-----------------------|
| coefficient of skid resistance | = 0.25 (hard surface) |
| perception-reaction time | = 2.5 seconds |
| eye height | = 3.75 feet |
| object height | = 6 inches |

At-Grade Railroad Crossing

Whenever it is necessary to cross railroad tracks with a bikeway, special care must be taken to assure that the safety of bicyclists is protected. The bikeway crossing should be at least as wide as the approaches of the bikeway. Whenever possible, the crossing should be straight, and at right angles to the rails. For on-road bikeways, where a skew is unavoidable, the shoulder should be widened, if possible, to permit bicyclists to cross at right angles. Special construction and materials should be considered to keep the flangeway depth and width to a minimum. Pavement should be maintained, so ridge build-up does not occur next to the rails. In some cases, timber plank crossings can be justified, and can provide for a smoother crossing. Appropriate signs should be installed to warn bicyclists of the crossing and any dangers or hazards. For off-road bikeways, it is also desirable to cross at 90 degrees. When it is not possible to cross at 90 degrees, the bikeway should be widened to allow the cyclist to cross at as close to 90 degrees as possible.

Drainage

Drainage should be provided for all bike trails. Trails should be cross-sloped or crowned 0.02 feet to 0.03 feet per foot. In addition to drainage ditches, culverts may be needed for cross drainage.

Design Cross-Section and Materials

Bike trail construction, in general, should conform to the design cross-section as shown in Figure 7.4. For most applications, a compacted limestone surface will provide a cost effective trail surface yet sufficient for both touring and mountain bike use. An optional bituminous surface can be considered for urban, high traffic or high maintenance areas. The bituminous can be applied on top of the limestone surface after initial trail construction with minor preparatory work.

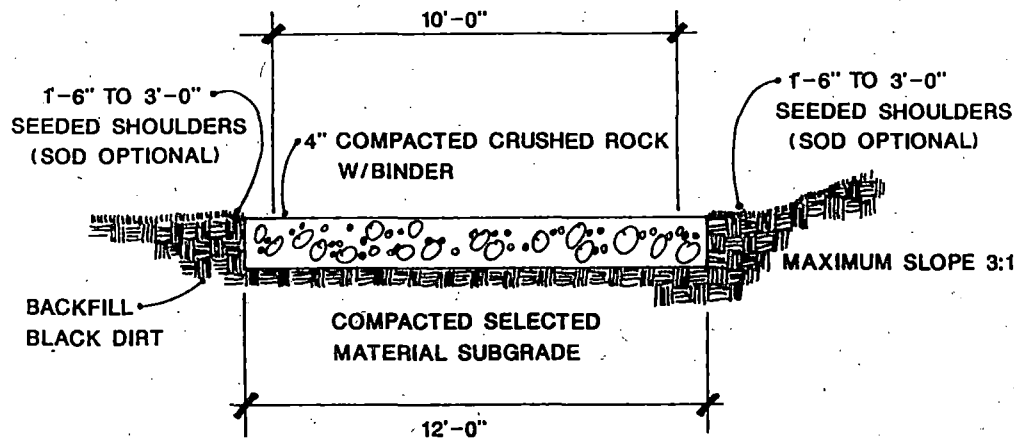
Limestone for trail construction is commonly referred to as "ag-lime." Quality control for both material and installation procedures should be carefully specified and monitored. Limestone neutralizing value (calcium carbonate equivalent) shall not be less than 80 percent. Material gradient should be:

| <u>Sieve Size</u> | <u>Percent Passing</u> |
|-------------------|------------------------|
| 3/8"-1/2" | 100% |
| No. 4 | 90-100 |
| No. 10 | 45-90 |
| No. 40 | 15-45 |
| No. 200 | 10-30 |

Plasticity Index - 0-8
Liquid Limit Maximum - 25
Los Angeles Rattler Loss Maximum - 50

Material should be compacted once it has been applied and compacted with a smooth steel-wheeled roller or vibrator compactor using standard compaction methods until there is no further evidence of consolidation.

Adjacent trail shoulder, graded flat and grassed, should be 1'-6" to 3'-0" wide. The shoulders should provide a safety recovery area and reduce erosion.



NOTE: 2" bituminous surface can be considered in areas of high traffic, erosion problems or urban applications.
 Sod should be laid so that the finished sod surface is 0.5" to 1.0" below the edge of the pavement and sloped away for drainage.
 A two percent (2%) cross-slope would enhance surface drainage and hopefully reduce maintenance efforts.
 Engineering fabric placed under the pavement in marsh or consistently wet areas will extend the life of the pavement.

FIGURE 7.4
 BIKE TRAIL CONSTRUCTION CROSS SECTION

Sources: Bikeway Design Manual, Minnesota Department of Transportation, 1983.
Bikeway Planning Criteria and Guidelines, California Division of Highways.
City of Eden Prairie, Minnesota Comprehensive Park and Open Space Plan, Barton-Aschman Associates, Inc., 1989.
"Guide for Development of New Bicycle Facilities," American Association of State Highway and Transportation Officials (AASHTO), 1981
"Green Book" A Policy on Geometric Design of Highways and Streets, The American Association of State Highway and Transportation Officials, 1984.
Manual on Uniform Traffic Control Devices, Federal Highway Administration, 1978 (revised 1986).

D. DESIGN GUIDELINES FOR HIKING TRAILS

Pedestrian movement and hiking trails pose the least design restrictions of the trail modes considered by the state trails plan. Hiking trails can be designed and implemented as simple as a forest nature trail or they can become more sophisticated such as a hard surfaced sidewalk. Within the statewide trails context, many hiking trails are likely to coexist with other modes. This discussion will be limited to general design comments affecting hiking trails.

General Dimensions

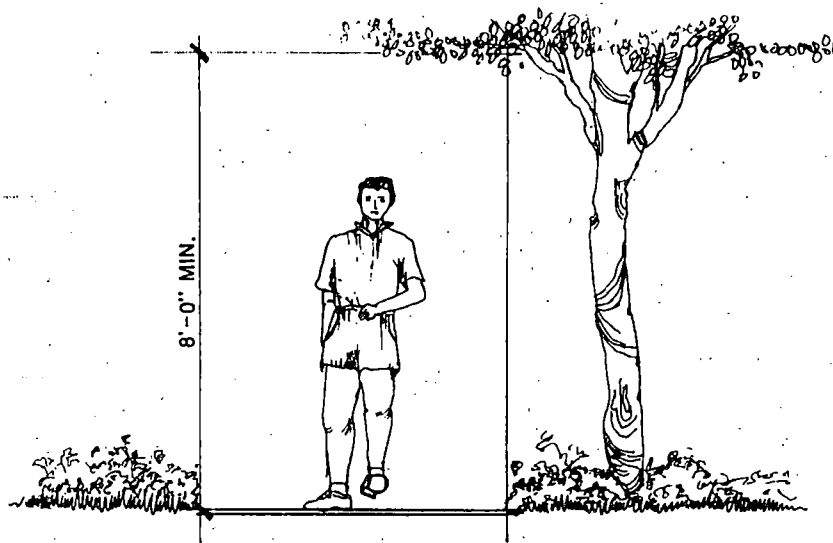


FIGURE 7.5
GENERAL USER DIMENSIONS FOR HIKING TRAILS

Trail Width

Hiking trail widths will vary according to trail location, function and mix with other trail modes. The following minimum standards will apply.

1. Independent hiking trails in a rural or natural setting should be a minimum four feet wide, adequate to allow for two-way pedestrian movement.
2. Independent hiking trails in an urban or suburban location should be a minimum of five feet wide and desirably set back a minimum of six feet from any roadway curb.
3. Where hiking trails are combined with other trail modes, the widest recommended trail width will prevail.

Vertical Clearance

A minimum vertical clearance of eight feet should be maintained.

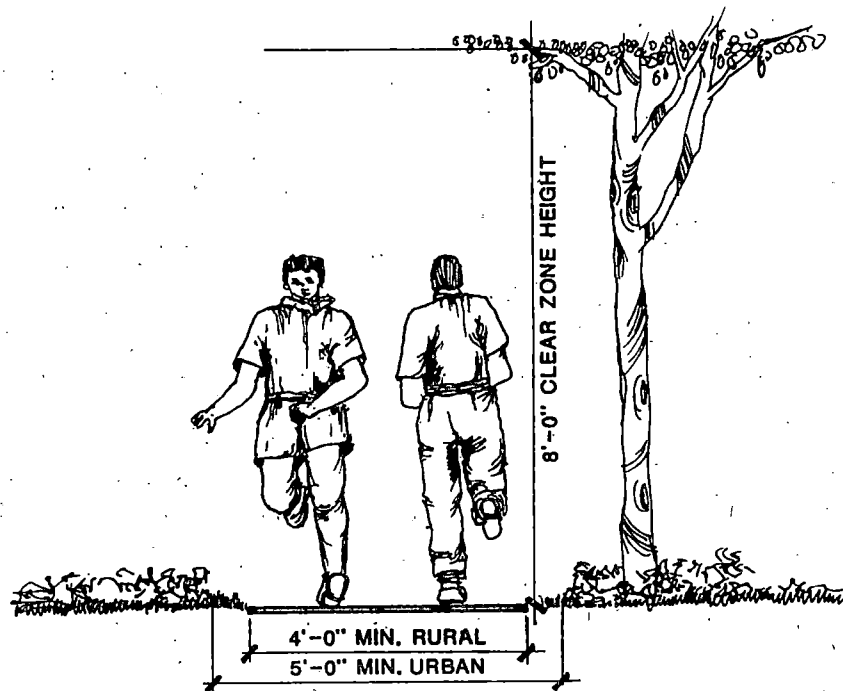


FIGURE 7.6
SUGGESTED HIKING TRAIL DESIGN WIDTHS

Grade

| | |
|----------------------------------|----------|
| Desirable grade | 0 to 10% |
| Maximum grade for extended slope | 10% |
| Maximum grade for shorter slope | 15% |

Switchbacks should be used to negotiate slopes greater than 15 percent.

Surfaces

Hiking trails will be used by a wide variety of user groups. Varied trail use will include fitness, casual walking, organized group events, nature walks, backpacking and jogging. This diversity of user types poses different tolerances for surface types. In general, all users desire a well drained trail with a predictable, even surface.

State designated hiking trail surfaces can vary within the system although the construction material should be compatible with the environment through which it passes. Hiking trails in rural or natural environments should be a compacted limestone (see definition in bikeway section) material also referred to as agricultural limestone. Suburban or urban trails should be hard surfaced, bituminous or concrete. Sensitive natural areas or those seasonally wet areas could employ wood chip surfaces or graded site material which has been reseeded.

Hiking trails may often be combined with bicycle trails. In this circumstance, the desired bicycle trail material will establish precedence.

Support Facilities

Hiking trails should be developed with or have convenient access to support facilities. Water and restroom accommodations should be available every three to five miles in urban areas. Rural facilities should be available every eight to ten miles and can be provided with simple construction methods.

Trailheads which incorporate parking, trail information and other support facilities should occur at regular but selective locations compatible with abutting land uses. Parking lots should be sized consistent with user demands and trail activity.

Sources: City of Eden Prairie, Minnesota Comprehensive Park and Open Space Plan.

Barton-Aschman Associates, Inc., 1989.

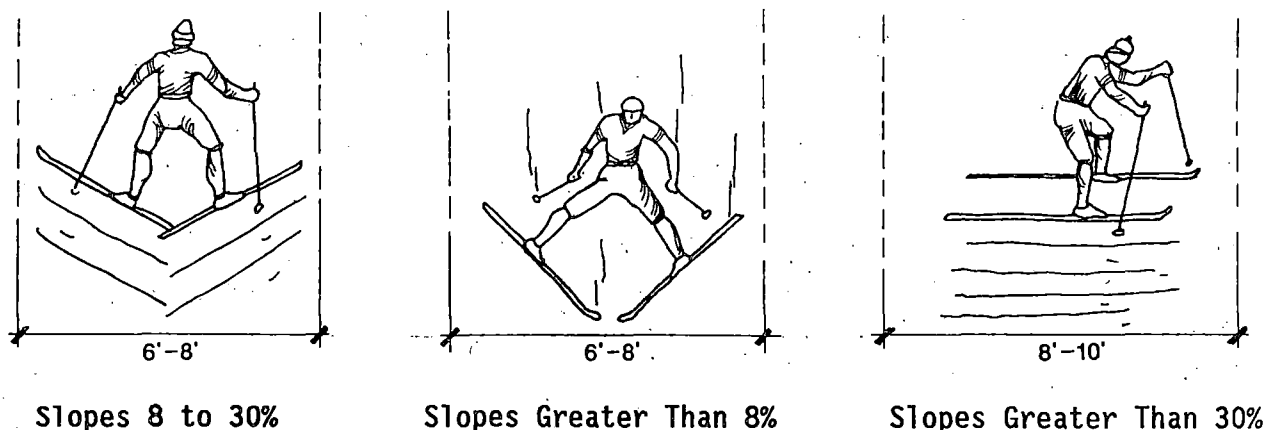
South Dakota Recreational Trails Plan, South Dakota Department of Game, Fish and Parks, Parks and Recreation Division, January, 1980.

Trail Design, Construction and Maintenance, Appalachian Trail Conference, 1981.

E. DESIGN GUIDELINES FOR CROSS-COUNTRY SKI TRAILS

General Dimensions

Ski touring, like hiking, must reflect the dimensions of the person using the trail. In ski touring you must allow for the depth of snow when providing vertical clearance. Suggested cross-country ski trail widths are shown in Figure 7.7. These dimensions apply for both traditional touring and skating ski techniques.



Trail width should be increased as slope increases.

FIGURE 7.7
SUGGESTED CROSS-COUNTRY SKI TRAIL MINIMUM WIDTHS ON SLOPES

Grade

Cross-country ski gradients should vary according to user skills. Individuals with greater skill levels can negotiate greater and more extensive slopes. Table 7.5 identifies recommended gradients by skill level.

TABLE 7.5
CROSS-COUNTRY SKI TRAIL GRADIENT GUIDE

| | Easiest | Intermediate | Advanced |
|---|-------------|--------------|------------|
| <u>Greatest Single Climb</u> (elevation gain of single continuous climb) | 35 feet | 70 feet | 140 feet |
| <u>Elevation Differential</u> (lowest to highest point on trail) | 100 feet | 250 feet | 500 feet |
| <u>Total Climb</u> (sum of all elevation gains) | 150 feet | 400 feet | 650 feet |
| <u>Greatest Sustained Gradient</u> (over 300 feet trail distance) | 7.5 percent | 12 percent | 17 percent |
| <u>Greatest Short Gradient</u> (under 100 feet trail distance) | 10 percent | 25 percent | 40 percent |

Trails should avoid exhausting the user by providing sections of level trails in trail areas with many slopes. Trails should provide a variety of terrain. A trail should offer one-third uphill, one-third downhill and one-third flat terrain. Trail layout should provide separation between two trail directions when on a slope.

Exposure

Trails should avoid areas of cold, gusty winds to get the longest and most comfortable seasonal use. Trails should also attempt to direct trail use to the low, wind-protected and tree shaded, sun-protected areas and avoid areas of wind erosion or wind slab (hard, wind-packed snow).

Trails should be laid out to hold snow. Methods of achieving this are:

1. North-facing slopes; avoid south-facing slopes where possible
2. Valleys

3. Areas of vegetation

4. Woods

5. Tree lines

Trail Alignment

Clearing and widening the trail in areas of turns is especially important when they occur on a hill. Sharp corners should be avoided. Adequate run-out at the bottom of all slopes should be provided to allow the skiers to slow down.

Trail Length

Recreational ski-touring trails should be set up in a loop system varying from one to three miles in length thereby allowing skiers optional distances. General trail classifications are described in Tables 7.6 and 7.7.

TABLE 7.6
CROSS COUNTRY TRAIL LENGTHS BY SKILL LEVELS

| | Easy | Intermediate | Advanced |
|--------|-------------|--------------|---------------|
| Short | 0 - 6 miles | 1 - 3 miles | 5 - 8 miles |
| Day | 6 - 8 miles | 8 - 12 miles | 15 - 25 miles |
| System | 15+ miles | 15+ miles | 25 - 40 miles |

TABLE 7.7
TRAIL DIFFICULTY RATING

| | |
|---------------|--|
| Easy: | Slopes less than 10 percent Smooth turns Trails clear of obstruction |
| Intermediate: | Slopes less than 25 percent Sharp turns with overshoot areas One-third of course is uphill |
| Advanced: | Slopes less than 40 percent Sharp curves Rough trail surface |

Trail Width

The advancement and acceptance of the skating style of cross-country ski techniques has altered the recommended ski trail widths. Trails should be designed and operated to accommodate both traditional and skating methods.

Figure 7.8 illustrates a one-way system designed for one traditional and one skating track. Figure 7.9 allows for a one-way system comprised of two traditional tracks and one skating lane.

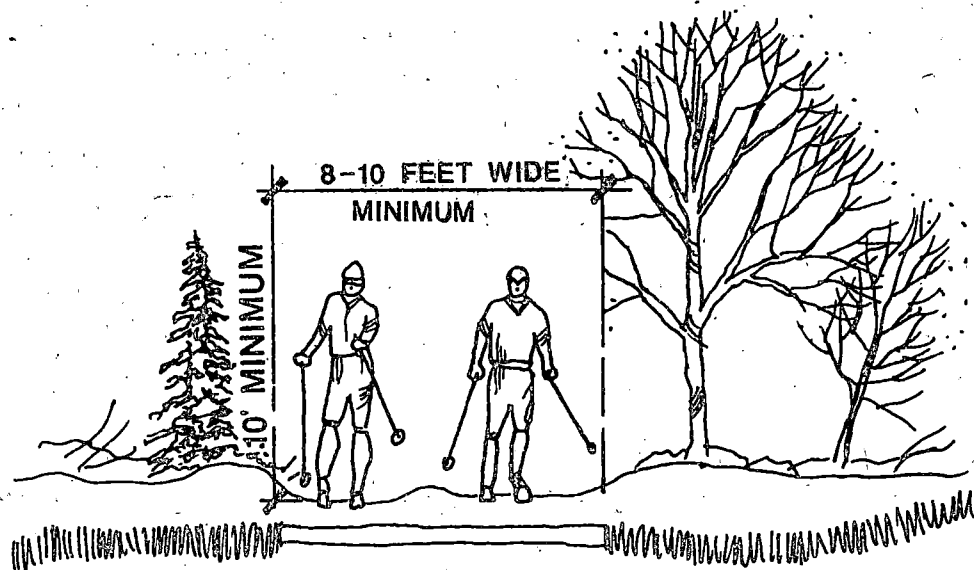


FIGURE 7.8
TWO-TRACK SKI TRAIL
(ONE TRADITIONAL AND ONE SKATING)

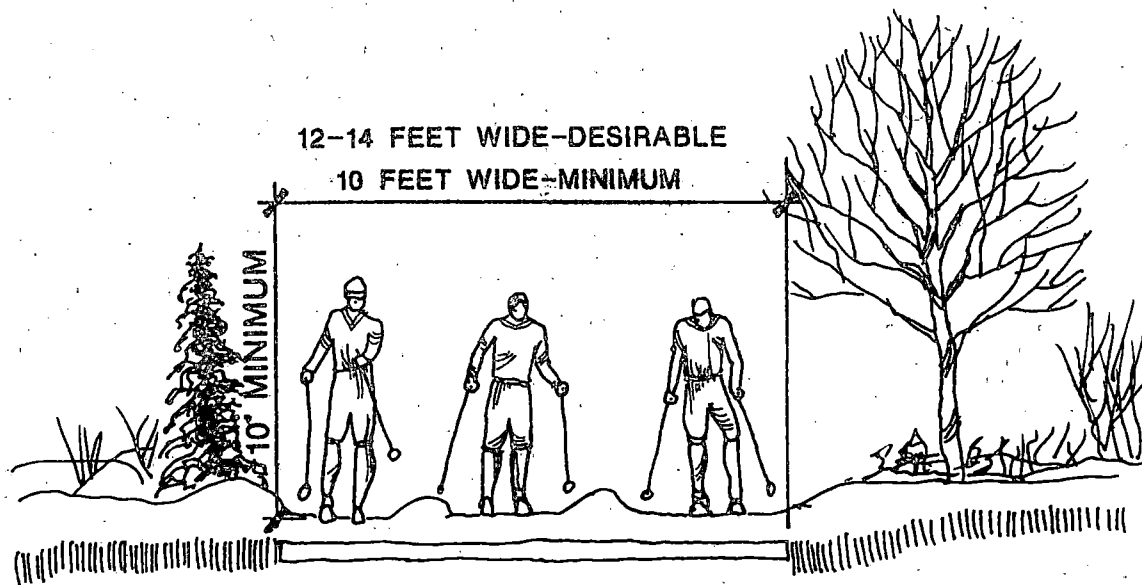


FIGURE 7.9
THREE-TRACK SKI TRAIL
(TWO TRADITIONAL AND ONE SKATING)

Other Trail Considerations

Cross-country ski trails will be designated specifically for winter travel but should also be considered for use during the snow-free seasons. Multiple use opportunities to enjoy the natural setting during hiking or horseback should be considered. Ski trails should be located or reviewed during the winter months to understand snow and wind conditions.

Locating trails under dense canopies, especially in tall, old-growth stands, may cause conflicts. The canopy intercepts much of the snowfall, and when the air temperature rises, large chunks of snow fall on the trail.

The minimum width for all snow trail bridges is six feet. All ski trail bridges must be designed to allow skiers to stop safely before crossing and must provide adequate track width under maximum snow cover. Bridges on groomed trails must accommodate the width and weight of grooming equipment.

Approaches to trail intersections should have grades of five percent or less to allow for speed control. Relocate intersection if criteria cannot be conformed to. Clear intersections should have a diameter twice the trail width.

Signing

Signing is important for indicating trail direction and giving important trail information, such as distance, difficulty, hazards, rules and regulations and locations of ski trail facilities. A trailhead sign is important for showing length and direction of overall trail.

Course Layout

Ski trails can be laid out either within a linear trail corridor or looping within a specific parcel. The latter approach allows for a series of varying length loops emanating from a trail head/parking area. The trail loops, as shown in Figure 7.10, provide for differing skill levels and a diversity of trail types.

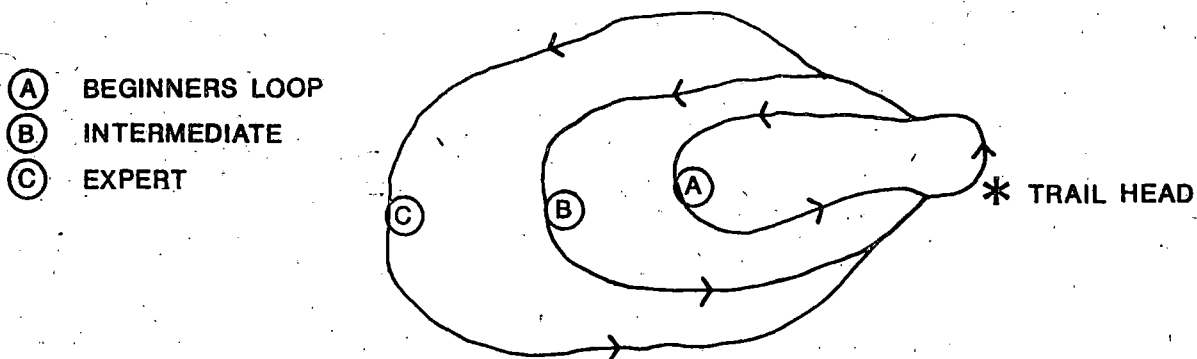


FIGURE 7.10
CROSS-COUNTRY SKI AREA WITH LOOPS

Sources: City of Eden Prairie, Minnesota Comprehensive Park and Open Space Plan, Barton-Aschman Associates, Inc., 1989.
South Dakota Recreational Trails Plan, South Dakota Department of Game, Fish and Park, Parks and Recreation Division, January, 1980.
City of Grand Rapids, Minnesota Comprehensive Trail Plan, Barton-Aschman Associates, Inc., 1980.
 Wisconsin Department of Natural Resources memorandum, "Cross Country Skiing on Department Lands," (date unknown).

F. DESIGN GUIDELINES FOR SNOWMOBILE TRAILS

General Dimensions

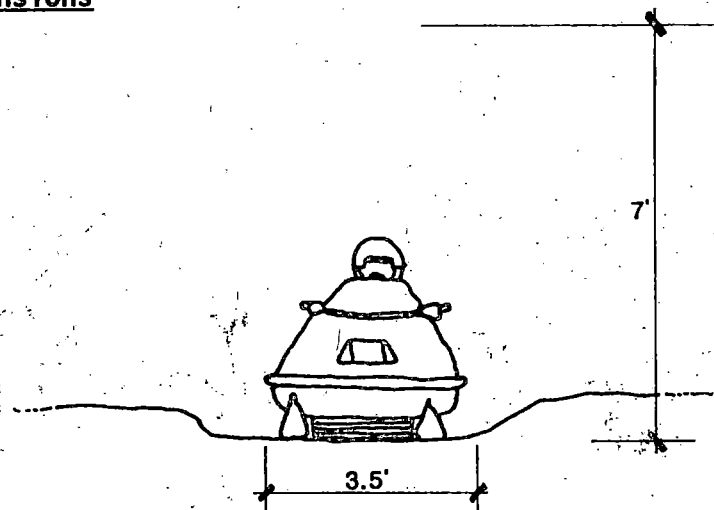


FIGURE 7.11
 GENERAL USER DIMENSIONS FOR SNOWMOBILE TRAILS

Trail Width

The determining factors for trail width are snowmobile safety and the size of the grooming equipment. Snowmobilers must be able to see oncoming vehicles or hazards; i.e., fencing or posts, and trail grooming equipment must be able to operate safely and efficiently. Based on these factors, the following dimensions are recommended and are shown in Figure 7.12:

| | Minimum Groomed Surface | Desirable Groomed Surface | Cleared Trail Width |
|-----------------|-------------------------------|---------------------------------|------------------------|
| One-way traffic | 8'-0" | 8'-0" | 12'-0" |
| Two-way traffic | 8'-0" | 10'-0" | 14'-0" |

The cleared trail should be free of brush, roots, stumps, stones, rocks or other material that will cause an uneven surface. In addition, all leaning, dead or damaged trees which have the potential of falling into the trail should be removed at least 30 to 35 feet back from the trail to prevent them from blowing onto the trail.

There may be occasions, such as sharp corners, permanent obstacles or exceptionally rugged terrain, which dictate widening the trail in order to provide user safety and to allow the grooming equipment to maneuver.

Vertical Clearance

Because of the height of the grooming equipment, trails need to maintain a vertical clearance of at least 10 feet above the trail snow level.

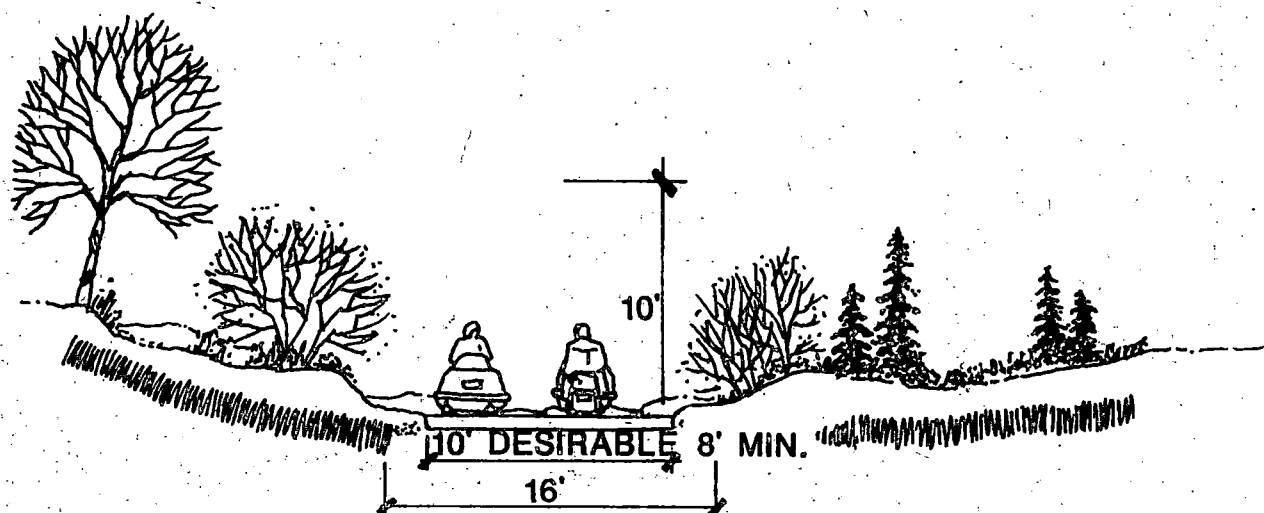


FIGURE 7.12
SUGGESTED SNOWMOBILE TRAIL DESIGN

Grade

Maximum continuous slope = 12%

Maximum for shorter slope = 25%

Trails should avoid sharp curves and corners for safety reasons. Trails should be directed at right angles to steep contours. Trails on steep side slopes can cause easy sliding of snowmobiles and promote slope erosion.

Curves

A forward visibility of 50 feet should be maintained around curves. The minimum radius for curves is 25 feet. Wherever hazards exist adjacent to a curve (such as a steep drop-off), the trail should be super-elevated. If there are no hazards, curves should remain flat.

Trail Location

The physical environment through which a snowmobile trail passes should be carefully reviewed. User safety must be understood when crossing rocky, wooded or wet terrain. Environmental impact should be considered with sensitive wildlife habitat or similar areas.

Wet Areas

Terrain which is often or constantly wet should be avoided if possible. Trails should avoid large bodies of water and should never require ice crossings.

If stream crossings are necessary, a bridge should be provided. Bridges should be at least eight feet wide and have a minimum four-inch toe rail on both sides to prevent snowmobile skis from running over the edge. Permanent bridges which are to remain open year round or those which allow other trail modes should also have rails or fencing installed at a 54-inch height on both sides of the bridge. The deck surface should be non-slip and capable of retaining snow cover.

When feasible, the bridge should cross the stream at the stream's narrowest point and at a right angle to the flow of water. Snowmobile traffic speed should be reduced before approaching the bridge by the use of moderate smooth curves and warning signs.

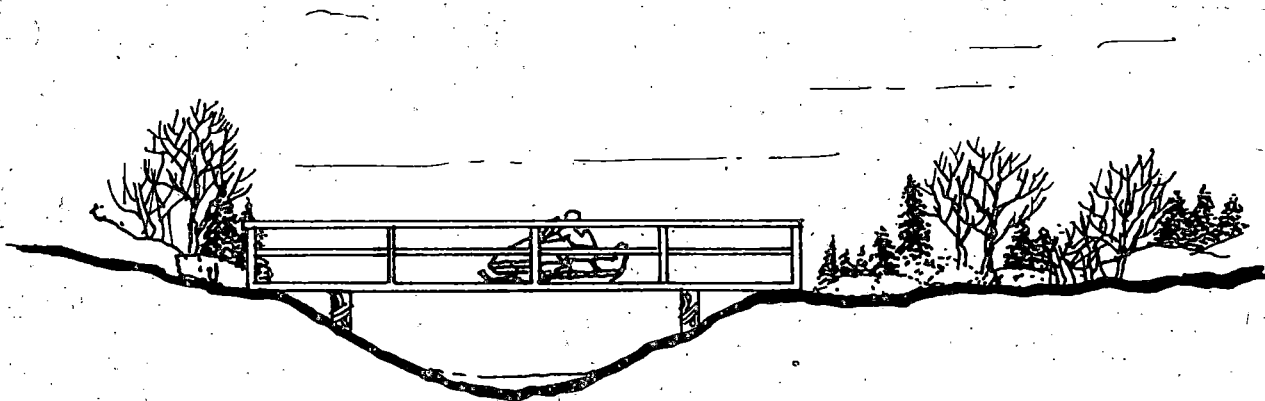


FIGURE 7.13
BRIDGE CROSSING

Roadway Crossings

Roadway crossings should be avoided if possible. However, if it becomes necessary for the trail to cross a road, certain recommendations should be followed for safety reasons.

- o Roadway crossings should be made as close to a right angle to the road by Iowa code.
- o Adequate sight distance in both directions must be maintained as calculated by AASHTO design standards.
- o Both the roadway and the trail should have adequate signs to warn drivers and snowmobilers of the approaching crossing.
- o Iowa code allows snowmobiles to use highway shoulders and bridges to cross streams.

Trail Intersections

At any one point, not more than two trails should intersect each other. All T intersections should be at right angles. At the actual trail intersection, a clear sight distance should be maintained. All crossings then should be made at grade level. Proper signing will serve to warn the snowmobiler of the approaching intersection.

Exposure

To increase usability and enjoyment of the trail, it should be oriented in such a way to maximize the snow cover. Tree lines, woods, valleys and areas of vegetation provide a buffer which helps maintain snow cover on the trail. If possible, south-facing slopes should be avoided in order to reduce the trail's exposure to the sun.

Environmental Concerns

Snowmobiles are capable of producing noise levels up to 78 dBA or greater. Iowa Code Chapter 321G.11 restricts motor noise to less than 86 decibels measured on the "A" scale at a distance of 50 feet. The orientation of the trail can help buffer the snowmobile noise from nearby residents. One simple way to reduce the noise level is to locate the trail as far as possible from any residence. Sound levels decrease by roughly four dBA each time the distance is doubled. For example, a house 50 feet from the trail will experience sound levels up to 78 dBA; whereas, if the trail were to be 100 feet away, the sound level would be 74 dBA; if the trail was 200 feet away, 70 dBA. Coniferous shrubs, trees or ground cover used between the trail and nearby residents would also help reduce the noise effects. Another option is the use of grade variation to buffer the sound.

The most important environmental concern is protection of Iowa's natural heritage. Sensitivity must be exercised in laying out trails in wetlands, archaeological sites and pristine natural areas. Designated natural or wildlife areas, because of their special value, also require special consideration but should be avoided where possible.

Support Facilities

Snowmobilers require plowed parking facilities at the trailhead. Parking stalls must be available to accommodate cars with trailers up to 40 feet in length. The lot should be laid out to allow unloading areas and should allow enough room for the trailers to turn around.

An information board at the beginning of the trail is desirable. An explanation of standard signing, maps, brochures, a copy of snowmobiling laws and regulations, a directory to local services and businesses, and a wind-chill factor table are all examples of information which could be posted to aid the trail user.

Trash receptacles should also be available. A warming hut and restrooms, although not necessary, would also enhance the trail.

Maintenance

During the snowmobiling season, the trails need to be groomed at a minimum of once a week or more frequently during periods of heavy snowfall. Signs that have been damaged or removed need to be replaced promptly. Signs also need to be cleaned of snow so they remain readable. The groomer also needs to ensure that the trail is kept clear of fallen branches and other debris. The parking areas must be kept plowed and clear.

Previous to each winter, the trail should be inspected and off-season maintenance completed. Clearing should be done each year in order to maintain the minimum clear width and vertical clearance. The signs should be posted and any temporary bridges should also be erected.

After the snowmobile season has ended, signs should be removed and temporary bridges taken out.

Trail Signing and Blazing

For safety and convenience to the snowmobiler, the Department of Natural Resources has adopted uniform signing for snowmobile trails. The DNR provides the signs as well as reflectorized hot dots to call attention to the signs. Since trail signs are often poorly visible due to darkness or storms, it is essential that reflectorization be used on "Stop Ahead", "Stop" and "Warning" signs and on directional arrows. Reflectorization is recommended for use on all signs, however.

The signs should be posted before winter and taken down again in the spring. They should be placed to the right of traffic (three to six feet off the trail, depending on visibility) and approximately 40 to 45 inches above the normal height of snow accumulation. Signs should be used wherever failure to recognize a hazard or loss of direction could cause property damage or injury.

Sources: City of Eden Prairie, Minnesota Comprehensive Park and Open Space Plan, Barton-Aschman Associates, Inc., 1989.

Forest Recreation, 3rd edition, Robert W. Douglass, 1982.

Highway Engineering, 4th edition, Clarkson H. Oglesby and R. Gary Hicks, 1982.

Iowa Snowmobile Trail Manual, Iowa Department of Natural Resources, 1987.

A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, 1984.

South Dakota Recreational Trails Plan, South Dakota Department of Game, Fish and Parks, Parks and Recreation Division, January, 1980.

G. DESIGN GUIDELINES FOR OFF-ROAD VEHICLE TRAILS (TWO-, THREE- and FOUR-WHEELED OFF-ROAD VEHICLES)

General Dimensions

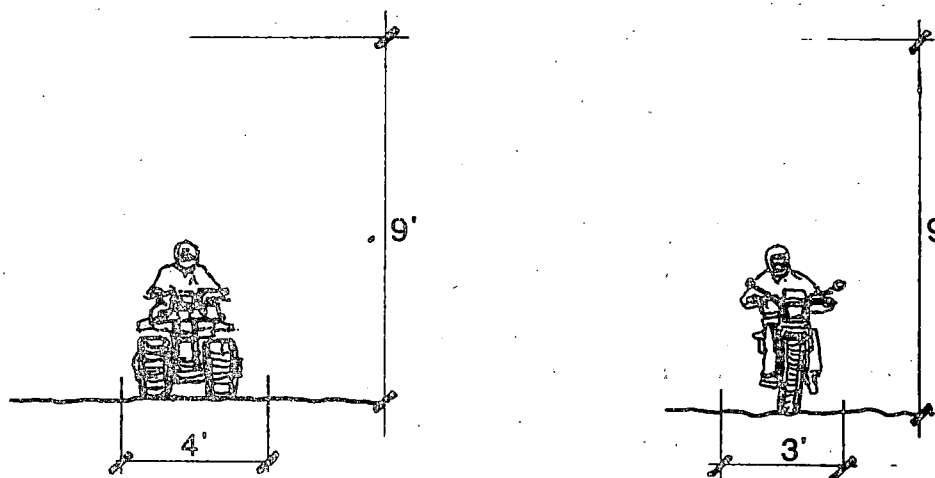


FIGURE 7.14
GENERAL USER DIMENSIONS FOR ORV TRAILS

These off-road vehicle (ORV) trail guidelines were developed for three- and four-wheeled all-terrain vehicles (ATV) and two-wheeled off-road motorcycles. The ATVs are much larger and therefore govern the width of the trail. They are also slower and have less maneuverability than trail bikes. Although trail bikes can handle any trail designed for ATVs, the reverse is not true. While beginning trailbike riders will find ATV trails adequate, experienced trail bikers will not be challenged and as a result, they may not use the trail.

Therefore, design criteria for two different trails will be discussed: an ATV/trailbike trail and a trailbike-only trail.

Trail Width

| <u>Application</u> | <u>Trail Bike Trail</u> | <u>ATV/Trail Bike Trail</u> |
|-----------------------|-------------------------|-----------------------------|
| Wooded Area | | |
| One-way trail width | 3'-0" | 5'-0" |
| Two-way trail width | 6'-0" | 8'-0" |
| Open Area (Grassland) | | |
| One-way trail width | 2'-0" | 4'-0" |
| Two-way trail width | 6'-0" | 8'-0" |

An additional 1'-0" clear zone free of fixed impediments should occur at both sides of the trail for safety purposes in all applications.

The tread width should be increased 6 to 20 inches on switchbacks and areas with steep (>50%) side slopes. On curves, the tread width should increase two feet.

Vertical Clearance

All trails should maintain a vertical clearance of nine feet.

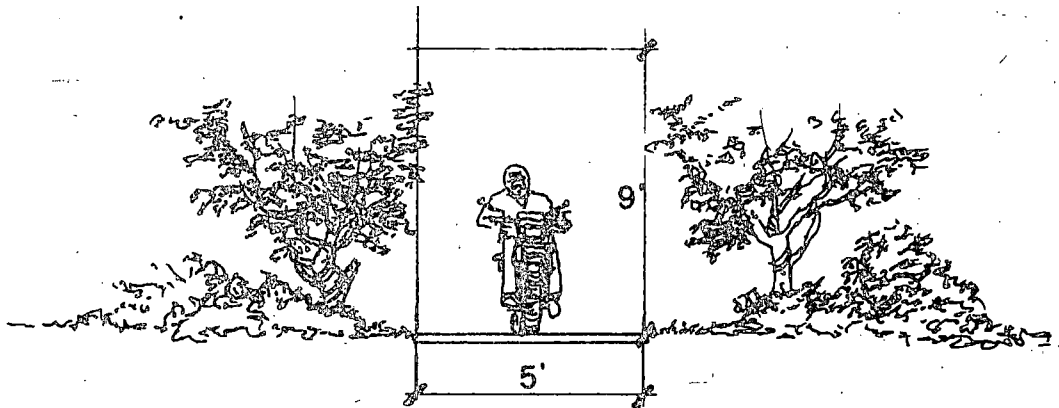


FIGURE 7.15
SUGGESTED TRAILBIKE TRAIL

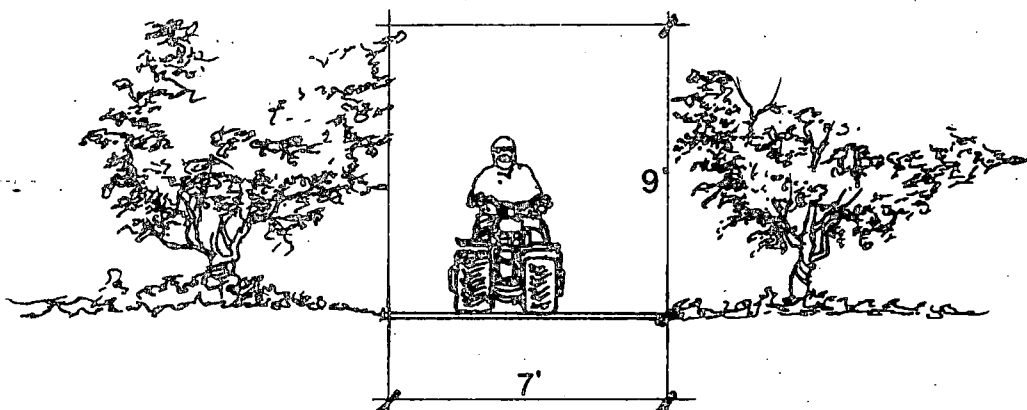


FIGURE 7.16
SUGGESTED ATV/TRAILBIKE TRAIL

Grade

| | <u>ATV/Trailbike Trail</u> | <u>Trailbike Trail</u> |
|---------------------------|----------------------------|------------------------|
| Maximum Continuous Slope | 8% | 12% |
| Maximum for Shorter Slope | 15% | 30% |

A minimum slope of two percent should be maintained to provide drainage. It is important to provide the rider with a challenging experience - if the rider does not find the trail challenging, he or she will not use it.

Therefore, it is important to provide an occasional steep grade. But it is even more important that the soil is capable of withstanding trail use. If necessary, switchbacks should be used to climb elevations. If the need for trail switchbacks arises, the trail's planner is advised to consult the references listed for detailed information pertaining to their construction.

Curves

Straight level sections of trail provide the rider with a chance to relax and pass slower riders if the trail is wide enough. However, these sections also invite excessive speeds. By incorporating changes in grade as well as curves, the possibility of high speeds is reduced.

ATVs have difficulty maneuvering tight turns. These vehicles require a minimum turning radius of 10 feet. Trailbikes, on the other hand, can handle tighter curves and require a minimum turning radius of six feet. The width of the trail should be widened at all curves for safety reasons.

Trail Surface

The most important criteria of the trail surface is that it is able to withstand heavy use and it should be resistant to soil erosion. Inexperienced trail riders need a surface that is relatively smooth, free of obstructions and relatively hazard-free. These trails should avoid sand and loose materials. A more experienced rider, however, can handle some loose sand and some sections of rough terrain.

Trail Location

Off-road vehicle trails lend themselves to a loop layout. The ATV/trailbike loop, because it is for inexperienced riders, must complete a loop of its own, but the trail for trailbikes only can branch off that loop to form a larger loop. This corresponds to the fact that more experienced riders desire a longer trail.

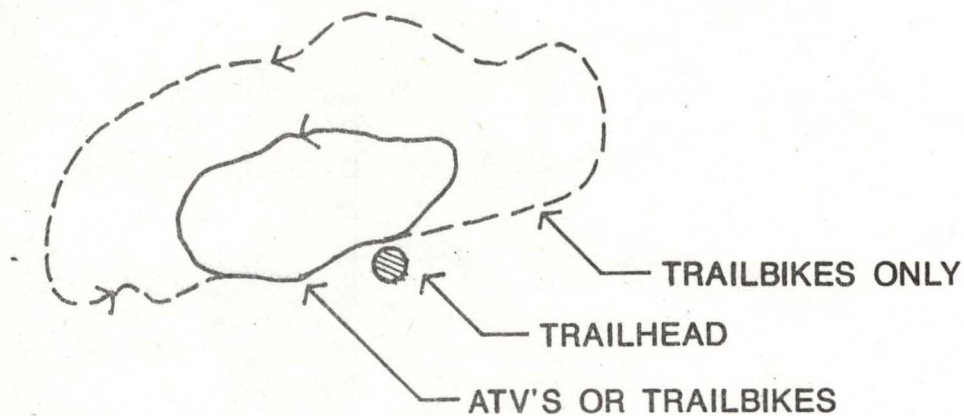


FIGURE 7.17
POSSIBLE LOOP LAYOUT FOR ORV PARK

Ideal location for off-road vehicle trails is an area that will provide interesting and challenging terrain to the riders. But the soil must be stable enough to withstand the traffic. Areas that are very wet or very dry should be avoided. It is important that Iowa's natural heritage be protected. Trails should be routed away from sensitive areas and areas which have been previously disrupted. Because of their special value, designated natural or wildlife areas should also be avoided.

The trail should never be designed to cross water except by way of a bridge. The bridge should be eight feet wide with four-inch toe rails on each side and hand rails at approximately 54 inches high.

For safety reasons, road crossings should be avoided.

If two trails need to cross, it is preferable to design the junctions as T intersections spaced at least one-quarter mile apart rather than having a four-way intersection. Adequate sight distance should be maintained at all intersections.

Sound Control

Off-road vehicles can reach sound levels of 98 dBA. Iowa State Code 321G.11 restricts motor noise to 86 decibels as measured on the "A" scale at a distance of 50 feet. Because of this high level, the trail should be located in an isolated area. Natural buffers such as hills, ridges or tree lines should be used to help minimize the sound impact.

Erosion Control

One of the most important factors to consider when designing a trail is proper drainage. Erosion can cause damage or even destroy sections of a trail. Methods of controlling surface water include drain dips, water bars, culverts and ditches.

Several of the references listed give detailed information regarding the planning and construction of erosion controls.

Support Facilities

Trail riders require a minimum amount of support facilities. They need an area to park and unload their trail vehicles. A "warm-up" area 200 feet by 200 feet is desirable. Although not necessary, restrooms and water facilities would enhance the trail users' comfort.

Maintenance

The trail surface needs to be maintained for continued use. The ATV/trailbike trail should remain relatively smooth and free of obstructions. The more difficult trail should be free of large obstructions.

Wet spots along the trail may develop ruts that should be routed around, drained, or bridged before posing a dangerous threat to the riders. During very wet periods, it may be advisable to close the trail.

Trail facilities, including running surfaces, signs and bridges, need to be inspected regularly and repairs or replacements made as necessary.

Signing

Proper trail signing can provide off-road vehicle users with important safety information as well as information about the surrounding area. At trailheads, trail intersections, and periodically along the trail, trail identification signs and signs indicating the level of difficulty should be posted. Trail regulations should also be posted at the beginning of the trail and at other areas along the trail where needed.

Trail users should be given advanced warning before intersections, bridges or other obstructions that warrant a decreased speed.

Sources: AMC Field Guide to Trail Building and Maintenance, 2nd Edition, Robert D. Proudman and Reuben Rajala, Appalachian Mountain Club, 1981.

*A Guide to Off-Road Motorcycle Trail Design and Construction, American Motorcyclist Association, 1984.

Motorized Trails/An Introduction to Planning and Development, Pennsylvania Department of Environmental Resources, Bureau of State Parks, 1980.

*NPS Trails Management Handbook, U.S. Department of Interior, National Park Service, 1983.

South Dakota Recreational Trails Plan, South Dakota Department of Game, Fish and Parks, Parks and Recreation Division, January, 1980.

*Standard Specifications for Construction of Trails, U.S. Department of Agriculture, Forest Service, 1984.

*Good source for detailed information about switchbacks and erosion control.

H. DESIGN GUIDELINES FOR EQUESTRIAN TRAILS

General Dimensions

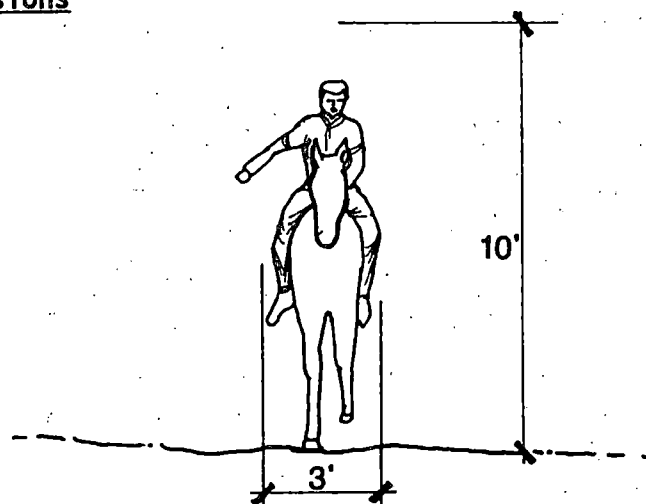


FIGURE 7.18
GENERAL DIMENSIONS FOR EQUESTRIAN TRAILS

Trail Width

Recommended minimum trail width for equestrian trails:

| | |
|---------------------|-------|
| Tread Width | 4'-0" |
| Cleared Trail Width | 8'-0" |

Vertical Clearance

A minimum vertical clearance of 10 feet should be maintained.

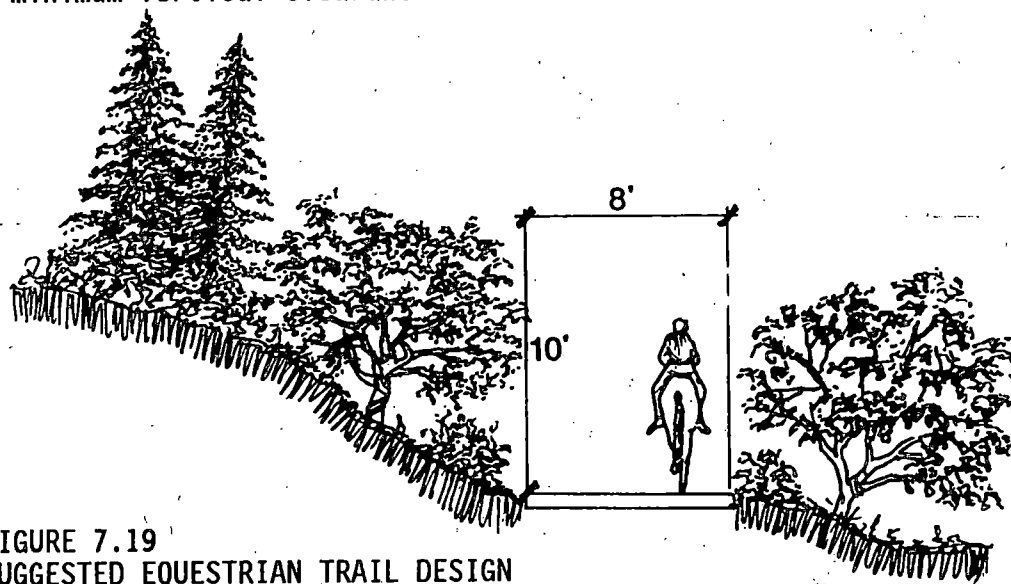


FIGURE 7.19
SUGGESTED EQUESTRIAN TRAIL DESIGN

Grade

| | |
|---------------------------|--------|
| Maximum Extended Slope | 10% |
| Maximum For Shorter Slope | 15-20% |

If necessary, switchbacks should be used to climb slopes that are too steep.

Trail Surface

The trail corridor should be cleared of all brush, logs, stumps and projecting limbs. If possible, the ground surface should be undisturbed.

Trail Location

If possible, the equestrian trail should be located away from roads. If, however, the trail must cross a road, a grade-separated crossing is preferable. If an at-grade crossing is unavoidable, both the trail and the road should have warning signs. The crossing should be in an area with adequate sight distance and not at curves.

The trail should not cross water except at bridges. The bridge must be at least eight feet wide and placed above the high water mark. Hand rails at approximately 42 inches high should also be installed.

As of June 1, 1989, the Iowa DNR has prohibited any trail crossing a waterway except where designated. Equestrians should be informed of the new rule and the fording of streams should be discouraged.

Erosion Control

Erosion can be very damaging to equestrian trails. Switchbacks, outslopes, drain dips, water bars and steps are all methods which can be utilized to help control erosion.

Support Facilities

The primary support facility needed by equestrians is adequate parking facilities. Parking lots must be able to accommodate trailers turning around, loading and unloading, and parking. Vehicle lengths will approach 40 feet.

Watering facilities for the horses are necessary at the trailheads. On long trails, facilities are needed on the trail, generally, every five miles.

Maintenance

The trail corridor needs to be kept clear of all obstructions and the trail surface should remain usable. Occasional clearing will need to be done and additional steps may have to be taken to control erosion.

All signs and structures need to be replaced or repaired as needed.

Signing

At the beginning of the trail, users should be informed of trail regulations, trail length, any restrictions and hazards. Local points of interest and services may also be pointed out.

Along the trail, signs should be posted periodically to assure the rider he or she is still on the trail. Warning signs should be posted in advance of intersections and bridges. Watering facilities should be well marked.

Sources: AMC Field Guide to Trail Building and Maintenance, 2nd Edition, Robert D. Proudman and Reuben Rajala, Appalachian Mountain Club, 1981.

City of Eden Prairie, Minnesota Comprehensive Park and Open Space Plan, Barton-Aschman Associates, Inc., 1989.

Forest Recreation, 3rd Edition, Robert W. Douglass, 1982.

NPS Trails Management Handbook, U.S. Department of Interior, National Park Service, 1983.

Proceedings of National Trails Symposium, Bureau of Outdoor Recreation, 1971.

South Dakota Recreational Trails Plan, South Dakota Department of Game, Fish and Parks, Parks and Recreation Division, 1980.

Standard Specifications for Construction of Trails, U.S. Department of Agriculture, Forest Service, 1984.

I. GUIDELINES FOR CANOE ROUTE DESIGNATION

Rivers and streams that will be used as canoe routes should generally meet the following guidelines:

1. The river or stream should be canoeable at least two months between April 15 and October 15.
2. The route should be free of numerous snags, manmade obstacles and unavoidable safety hazards. There should be no more than an average of one portage per mile.
3. River shorelands should be suitable for campsite and rest area development, preferably on land that is already publicly owned.
4. The river corridor's present uses should be compatible with the canoeing or rafting. Existing or potential accesses should be compatible with the river resource, current recreational use and the river's classification.

5. The route should be capable of sustaining controlled amounts of recreational use without substantial negative effects on the resource, adjacent lands or land uses.
6. Water quality should allow for body contact without posing health problems from contaminants.
7. The water resource should have scenic qualities which contribute to the user's recreational experience.
8. The resource should be located in reasonable proximity to potential users.
9. Convenient public access should be maintained at four to six mile intervals.
10. Trail head facilities should be developed at the heaviest used locations.
11. Canoe route hazards such as dams or fences should be marked with warning signs.
12. Provisions for safe portaging and barbed wire fence crossings should be accommodated.

Source: Minnesota Department of Natural Resources. New Jersey Trails Plan.

J. TRAIL BRIDGES, UNDERPASSES AND PEDESTRIAN CROSSINGS OF ROADWAYS

Before any type of major roadway crossing is considered, a traffic study including an analysis should be conducted for the proposed facility.

The three primary types of roadway crossings are:

1. At-Grade :
 - A. No delineation or signs, i.e., urban crossing
 - B. With sign-delineation, i.e., cautionary signs or flashing lights
2. Overpass :
 - A. This would be a bridge structure over the roadway, usually mid-block.
3. Underpass :
 - A. This would be a culvert-type structure under the roadway, usually mid-block.

According to the federal Manual on Uniform Traffic Control Devices, the recommended thresholds which call for further evaluation of a pedestrian crossing facility are:

1. 100 or more pedestrian crossings for each of any four hours; or
2. 190 or more crossing during any one hour

Once a possible roadway crossing need is indicated, a more in-depth traffic study should be undertaken. At a minimum, the study should include the following:

1. A capacity analysis of the adjacent roadways and intersections.
2. The average running speed and posted speed limit on the adjacent roadways.
3. An analysis of the type and amount of traffic which would use the facility (i.e., bikes, pedestrians).
4. The time of day and day of the week when the heaviest trail traffic would occur.
5. An analysis of vehicle gap acceptance (gap study of existing traffic).
6. A sight distance analysis for the roadway traffic and trail traffic.
7. The spacing of controlled and uncontrolled intersections.
8. The existing and protected land uses in the area to determine future pedestrian traffic.
9. The accident history in the area (vehicle to trail user).
10. The peak-hour and average daily traffic in the area, both existing and projected.

If the detailed traffic study indicates a trail crossing facility is desired, the next step should be to conduct a site analysis to determine the best crossing facility (i.e., at-grade signal, overpass, underpass) given the site's physical characteristics.

Although each facility location design should be evaluated separately, minimum design guidelines should be maintained. They are as follows:

1. 8'-0" wide - two-way pedestrian-only trail at grade
2. 12'-0" wide - two-way pedestrian/bike trail at grade
3. 12'-0" wide - two-way pedestrian-only overpass/underpass
4. 10'-0" to 12'-0" wide - two-way pedestrian/bike overpass/underpass
5. Five percent maximum grades

6. 20 mph design for bike trails

7. Handicap accessible

Other trails should be examined on a case-by-case basis.

The analysis and design of any pedestrian facility should use standards found in the Federal Highway Administration's (FHWA's) Manual on Uniform Traffic Control Devices and The American Association of State Highway and Transportation Officials (AASHTO) "Green Book" A Policy on Geometric Design of Highways and Streets.

The evaluation of trail crossings is very subjective and each case should be analyzed on its own. The preceding criteria stated are not standards, but guidelines to facilitate a sound engineering judgment of the situation.

K. DESIGN GUIDELINES FOR WHEELCHAIR ACCESSIBLE TRAILS

Because recreational trails are public facilities, they should be accessible to all people. Minor modifications to bituminous or crushed limestone trails would make those trails accessible to recreational users who are restricted to wheelchairs. According to the Federal Bureau of Outdoor Recreation, the following unofficial guidelines should be used when designing a wheelchair accessible trail:

| | |
|----------------------------|-----------|
| Minimum Trail Width. | 5'-0" |
| Minimum Vertical Clearance | 7'-0" |
| Maximum Extended Slope | 5 percent |
| Maximum Cross Slope | 2 percent |

Trail Surface: Bituminous or Crushed Limestone

Level rest areas should be provided at a maximum spacing of 200 feet. Steeper grades, up to 8.33 percent, may be used for very short segments. The maximum rise for any run that is greater than five percent is 30 inches. Rest areas should be provided at every 30 inches of vertical rise. They should be five feet by five feet to allow for passing and maneuvering.

Safety rails 42 inches high should be installed at hazardous areas.

Trails with grades greater than five percent are considered ramps. Ramps that are longer than six feet or rise higher than six inches should have handrails on both sides which meet the following guidelines:

- o Diameter of grip surface should be 1-1/4 to 2 inches.
- o Rails should be placed at a height of 32 to 34 inches in ramp locations. A second handrail at a height of 24 inches should be provided for children.

- o The handrails should be extended 12 to 18 inches past the top and bottom of the ramp.
- o A clear space of exactly 1-1/2 inches or more than 18 inches must be maintained between the railing and vertical surfaces.

A two-inch high curb on both sides of the ramp is also recommended.

All trail amenities (parking, restrooms, picnic tables, etc.) should also be designed for use by the wheelchair restricted.

Sources: Accessible Fishing: A Planning Handbook, New Mexico Energy, Minerals and Natural Resources Department, State Park and Recreation Division, 1984.

Barrier-Free Planning & Design Guide for Outdoor Recreational Boating Facilities, Michigan Department of Natural Resources, Recreation Division, 1988.

A Guide to Designing Accessible Outdoor Recreation Facilities, U.S. Department of the Interior, Heritage Conservation and Recreation Service, 1980.

Recreation Areas Without Barriers: Design Criteria, Indiana Department of Natural Resources, Division of Outdoor Recreation, 1984.

"Self-Evaluation Survey of Facilities and Their Accessibility to Sportsmen and Others with Disabilities", Ohio Department of Natural Resources, Division of Wildlife, 1988.

L. RECREATIONAL TRAILS' COMPATIBILITY WITH FARMLAND

Agriculture is an important aspect of Iowa's culture and heritage. Special attention needs to be given to neighboring farmland when a recreational trail abuts it.

If an abandoned railroad is going to be converted to a recreational trail, the owner of the trail must assume certain responsibilities that had belonged to the railroad. According to the Iowa Code, the railroad is responsible for fencing both sides of the right-of-way, for keeping the right-of-way free of weeds and preventing drainage from being diverted to adjacent property. These tasks become the responsibility of the trail owner unless an agreement can be reached with the adjoining landowner.

Another concern is allowing the farmer, and his or her machinery and livestock to cross the trail if the trail severs his or her property. There are a couple of possible solutions to this problem. One is to provide a trail underpass for the livestock. This method would not interfere with trail activities. Underpasses should be a minimum of six feet by six feet to allow for more than one animal abreast and animals to turn around.

However, it could be quite costly and it would not provide access for machinery. A gate at each field entrance and an at-grade crossing would provide access for both livestock and equipment; however, it could interfere with trail traffic. Gates could be approximately 16 feet wide to allow for equipment access. At-grade crossings must accommodate heavy equipment movement such as tractors. Steel slatted grates could also be employed to minimize animal conflicts. Signing and responsible action by both the farmer and the trail users would help to diminish some of the conflicts. Figure 7.20 illustrates several livestock trail crossings utilized by other states including Minnesota.

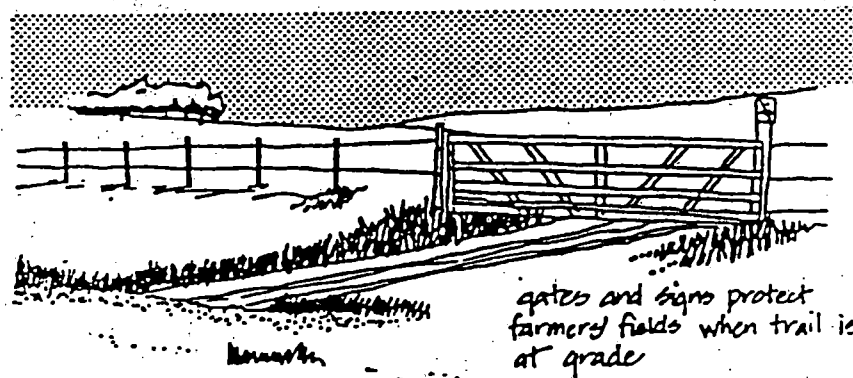
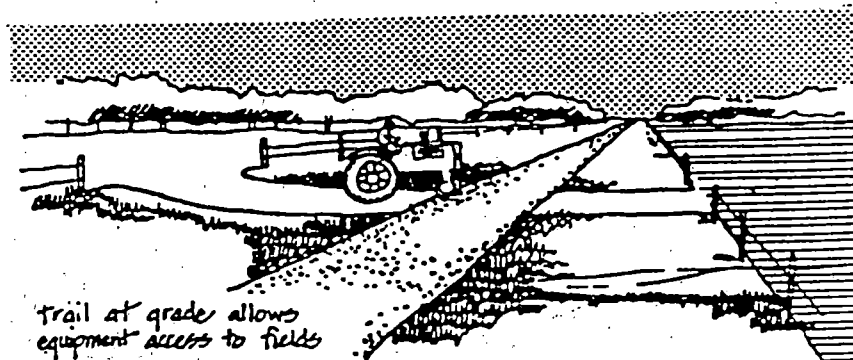
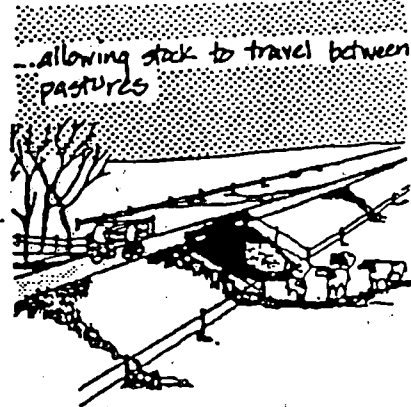
Major concerns of neighboring landowners are vandalism, littering and trespassing. These problems have been found to be relatively minor on existing trails. Adjacent landowners on two of Minnesota's recreational trails responded to a survey from the Minnesota Department of Natural Resources. The survey indicated that vandalism and trespassing were seldom a problem. Littering can be minimized by providing trash receptacles along the trail. Areas that may be particularly prone to trespassing, such as areas with scenic views, can be addressed individually. Vegetation or fencing would help deter trespassers. Vandalism, as well as littering and trespassing, could be controlled by providing volunteers or personnel to occasionally patrol the trail and issue fines for violations. A permanent trail manager may be necessary if it is found that problems persist.

For a recreational trail to be successful, it is imperative that the concerns of neighboring landowners be addressed. Many of their concerns are going to be questions of liability. For example, who's responsible if a farmer's livestock gets out because a fence has not been repaired? In one instance in Iowa, an aerial sprayer would not spray within one mile of a recreational trail for fear of a lawsuit: this fear could be minimized if trail management would temporarily close the trail to enable spraying. If one thinks of a recreational trail as a linear park, perhaps concern will be diminished. There may not always be a solution that satisfies both parties; however, compromises can be reached.

M. RECREATION TRAILS WITHIN HIGHWAY RIGHT-OF-WAY

Highway right-of-way is a potential source of land for recreational trail use. However, trails within the right-of-way raise many operational, design and safety questions. The following issues, and others, will require additional study in the future.

1. The recreational trail must abide by the Iowa Department of Transportation's Primary Road Access Policy which establishes minimum widths, sight distances and minimum spacing of access locations. These requirements, therefore, may govern the location or design of the trail.
2. The recreational trails' maintenance needs must be considered without conflicting with highway maintenance practices or creating a safety hazard to motorists.



SOURCE: MN. D.N.R.

FIGURE 7.20
POSSIBLE SOLUTIONS FOR TRAIL CROSSINGS

3. Vehicles on the roadway use bridges to cross water, ravines, railroad tracks, or even other roads. The recreational trail user must also get across; however, the roadway bridge may not always be a feasible crossing for the trail user because of safety concerns.
4. A major concern is safety and liability. Locating a trail within the right-of-way implies that the location is a safe place to bike, walk, etc. Because of this potential increase in tort liability, the State has been cautious to locate trails within the right-of-way. Other contributing factors include maintenance, costs/financing and vehicle conflicts.

In addition to the above concerns, the location of the trail can pose additional problems. There are three feasible locations within the right-of-way: the shoulder, the ditch and the top of the backslope. Each of these locations poses unique problems.

The purpose of the highway shoulder is to provide a recovery zone and safe storage area for disabled vehicles. If the trail were located on the shoulder, an impaired vehicle would actually be pulling over onto the trail. Shoulder width, surface and cross-section design would be made more difficult with trail designation.

If a trail is to be located along the ditch, it must be recognized that the ditch is the desired course of water. Water will flow down to and along the ditch. This would cause silt to build up on the trail as well as causing erosion of both the trail surface and the sides of the trail. In addition, there are many obstructions in the ditch, such as culverts and field entrances that are not an obstacle on the shoulder or the backslope. There is also the safety problem of the trail user not always being visible to the motorist because of the grade difference between the ditch and the roadway.

Trails located on the top of the backslope create the fewest user conflicts because they are the furthest removed from the flow of traffic. However, the last 10 feet of the right-of-way have been used for utility easements. In the future, power, cable television, fiber optics and telephone cables will continue to request easements within this area of the highway right-of-way. The utility companies should be made aware that in the future this section of the highway right-of-way may be made available for use as a trail.

On state highway right-of-way, no activities shall be allowed until an approved permit has been received from the DOT. When the recreational trail is proposed to utilize a portion of highway right-of-way, the sponsor is encouraged to contact the DOT's local Resident Maintenance Engineer in the preliminary stages of development and discuss the trail occupancy proposal.

If the trail is to be located within the highway right-of-way limits, the DOT would prefer the trail be located as close to the existing right-of-way limits as physically possible.

Location of the trail shall take into consideration existing utility corridors and the rights owners have in maintaining these facilities.

Regardless of where the trail is located, some modes of recreation are incompatible within the right-of-way. Because of the incompatibility between horses and motorized vehicles, it would be undesirable to locate equestrian trails within the right-of-way. Trails within the right-of-way are best suited for lineal trails; therefore, off-road vehicle trails and cross-country ski trails, which are best served by a loop network, would also not be desirable within the right-of-way except for short segments.

It may be possible to have recreational trails within the highway right-of-way. However, all of these concerns and issues need to be adequately addressed before locating a recreational trail within the right-of-way.

N. DESIGN GUIDELINES FOR TRAIL SIGNING

Introduction

A key element of the Iowa recreation trail system will be its information signing system. Consistent signing is especially important given the trail system's multiagency approach for system development. General guidelines should direct basic signing information for visitor use without becoming obtrusive or posing conflicts.

Signs must be part of the trail's initial design effort. They should convey basic information such as trail identification, user information, trail direction and regulations to be adhered to. Sign appearance should be visually consistent and emphasize the state system of which each trail corridor is a part.

Signs convey the signature of the agency having jurisdiction over the trail facility and serve as the primary influence to user impressions. The use of signing should be clear and concise with conservative use of regulatory or warning signs. Oversigning will reduce the signs' effectiveness which can pose hazards to trail users and become obtrusive to the trail corridor environment.

Precedence set in other outdoor recreation projects has indicated that oversigning or improper signing is as bad as inadequate signing. The liability inherited by agencies during trail development is most effectively reduced by clear, concise messages notifying trail users of existing conditions. This liability is extended through the life of the system including regular review of sign conditions with subsequent maintenance as necessary.

The Minnesota Department of Natural Resources has identified six steps to effective sign implementation.

1. Identify the total need for all signs based upon the visitor/user's perspective.

2. Identify any problem areas where a sign might solve the problem.
3. Prepare an inventory of all existing signs and their relationship to the proposed improvement.
4. Develop priorities for ordering and installing new signs as a part of facility development.
5. Establish schedules for regular sign inspection.
6. Complete maintenance tasks identified as a part of inspection as soon as possible.

Local agencies should be encouraged to follow similar steps in developing and maintaining trail corridor signing.

Placement of Signs

Sign location or placement may be the most critical element of an effective sign. The sign should be positioned with respect to a point, object or situation to which it applies so that a trail user has an adequate amount of time to react and provide a proper response. It should be located obviously so that it will command immediate attention. Signs should also be placed in a uniform and consistent manner so that trail users can properly respond to the sign message based on having encountered similar situations at previous occasions. Specific questions which should be asked to help locate signs and clarify their role include:

1. Is this the best location for the sign?
2. How good are the sight lines? (Users traveling at higher speeds, such as snowmobiles, need increased sight lines.)
3. Will vegetation or snow cover obstruct the sign?
4. How will erecting this sign effect existing activities or traffic patterns if such exist?

During sign placement, it must be remembered that the agency having jurisdiction may incur liability for an accident or injury if signs are not erected where danger or possible hazard exist for the user. Once an area has been signed with a cautionary sign warning users of a specific hazard, it must be continually signed that way unless the hazard or danger no longer exists. In addition, liability for maintenance of badly damaged signs or the replacement of missing signs remains with that agency.

Sign Design

The primary goal of the Iowa trail system signing is to provide a consistent approach which reinforces the statewide approach, yet allows design flexibility for individual trail mode requirements and flexibility for implementing agencies.

The following design comments are intended as guidelines for interpretation by the local agencies.

Trail identification signs are to be located at access points, trailheads and at regular intervals along the trail corridors. As shown in Figure 7.21, the identity signs should have a common state system logo which also credits those agencies responsible for development and maintenance. Signs are intended to be post-mounted approximately seven feet above grade to the bottom of the sign. Images should be silk-screened on a plastic or fiberglass panel. The symbols suggested in Figure 7.22 would augment trail identification signs informing which trail modes are allowed within specified corridors. Logos could be printed on an adhesive, reflective material and affixed to an aluminum panel backing.

Directional signs, shown in Figure 7.23, are intended to be simple diagrams informing trail users as to corridor direction and changes in alignment. Direction signs are especially important in urban areas or where more than one trail exists.

Regulation signs and warning signs are to be used where hazards, cautions or other trail information is displayed. Figure 7.24 shows an example of such trail signs.

Several simple criteria should be exercised in locating signs.

1. Sign posts should be set back a consistent dimension from edge of trail. Six feet is a preferred distance.
2. A hierarchy of letter size should occur, however, letter height of less than two inches is generally not recommended.
3. Regulatory signs should be located a minimum of six feet from the intersection. Warning signs should be located 150 to 200 feet from the intersection.
4. Multiple messages may be mounted on the same post, however, the primary message as determined by the regulating agency should always be mounted at the top.
5. Signs directing or regulating canoe or float trips on rivers should be located so that the bottom of the sign is a minimum vertical height of one foot above the ordinary high water mark of the river.

Trails should adhere to the Manual on Uniform Traffic Control Devices for Streets and Highways, prepared by the Federal Highway Administration, where applicable, or those guidelines which are agreeable to the Iowa DOT.



FIGURE 7.21
TRAIL IDENTIFICATION SIGN - COLOR: WHITE ON BROWN

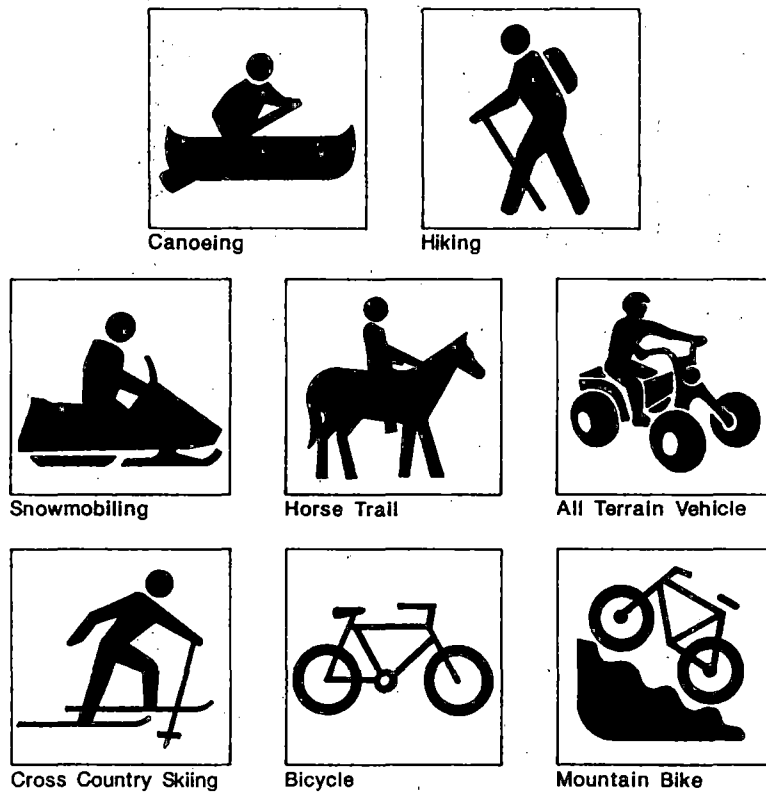
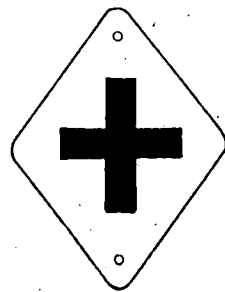
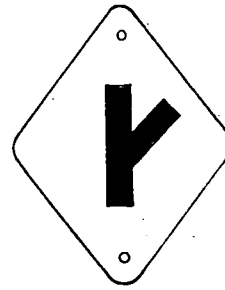


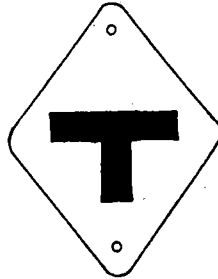
FIGURE 7.22
TRAIL IDENTIFICATION SYMBOLS - COLOR: WHITE ON GREEN



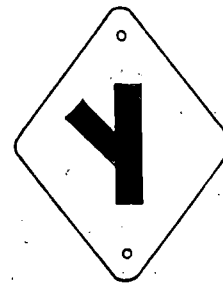
Intersection



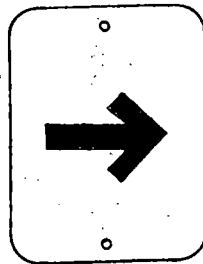
"Y" Junction (right)



"T" Junction



"Y" Junction (left)



Directional Arrow
(right or left)

FIGURE 7.23
DIRECTIONAL SIGN - COLOR: BLACK ON YELLOW OR BLACK ON ORANGE

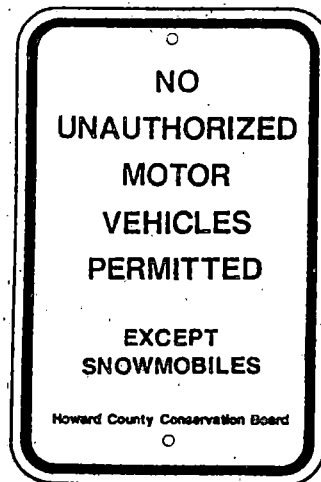
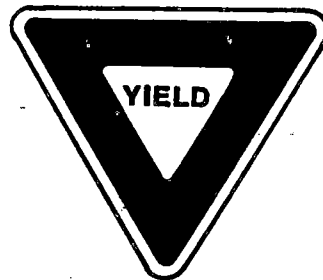


FIGURE 7.24
REGULATORY SIGN - COLOR: BLACK ON WHITE



COLOR: WHITE ON RED



COLOR: BLACK ON YELLOW



COLOR: WHITE ON GREEN

FIGURE 7.25
ADDITIONAL RECOMMENDED TRAIL SIGNS

Sources: Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation - Federal Highway Administration, 1978, revised 1989.

"Sign Manual," Minnesota Department of Natural Resources - Engineering Division, (no date available).

Iowa Statewide Recreational Trails Plan



Chapter 8

Estimates of Implementation Costs

CHAPTER 8 ESTIMATES OF IMPLEMENTATION COSTS

A. INTRODUCTION

This chapter establishes general development costs for implementing the trail system plan. Estimates contained within the chapter are intended to provide a general sense of the program's financing requirements rather than specific estimates of construction costs.

Estimate of system development costs were arrived upon by determining corridor right-of-way and allocating values for its acquisition. Typical trail cross-section designs were provided and construction values established. Costs have also been determined for potential multimodal corridors.

B. LAND ACQUISITION

All of the segments that make up the preferred plan can be categorized by corridor type. There are six corridor types: river, abandoned railroad, active railroad, highway, existing trail and developed property. Occasionally, river, railroad and/or roadway corridors may all coincide. For the purposes of planning in these situations, the corridor was assumed to be abandoned railroad if applicable. River corridors took priority over highway corridors and active railroad or private property was assumed only when all other corridors were infeasible.

Average trail right-of-way acquisition costs were estimated based on trail segments and corridor types. Values from the Iowa Realtors Land Institute, as published in the September 18, 1989 issue of Landowner, were used to estimate land costs. The crop land values are given by state region and are based on excellent, fair and poor crop yields. An average cost for pasture is also given. These values can be found on Table 8.1.

The average value of land for each particular region was used to estimate land acquisition costs for private property, highway right-of-way and the land adjacent to railroads. Traditionally, railroads have sold their abandoned right-of-way for one-half the value of the adjacent property. Therefore, for recreational trails on abandoned railroad right-of-way, one-half the average land value was the assumed acquisition cost. If the railroad is still active, it was assumed that the acquisition cost was equal to adjacent land value, and therefore was not factored.

Right-of-Way Width

The preferred right-of-way width for most trail corridors in the Iowa statewide system should be 75 feet. Actual right-of-way width is subject to interpretation based upon physical characteristics, abutting land uses, land value and parcel availability.

TABLE 8.1
IOWA LAND VALUES

| Region in Iowa | Cropland Values, \$/A | | | Pasture ¹ | Average Value for Region ² |
|----------------|-----------------------|--------------|-------------|----------------------|---------------------------------------|
| | 135 bu/A | 100-135 bu/A | 85-100 bu/A | | |
| Northwest | 1,847 | 1,484 | 1,008 | 375 | 1,179 |
| North Central | 1,708 | 1,353 | 849 | 298 | 1,052 |
| Northeast | 1,450 | 1,144 | 846 | 355 | 950 |
| West Central | 1,825 | 1,500 | 1,053 | 455 | 1,210 |
| Central | 1,691 | 1,376 | 888 | 420 | 1,094 |
| East Central | 1,752 | 1,305 | 903 | 477 | 1,109 |
| Southwest | 950 | 700 | 450 | 300 | 600 |
| South Central | 1,074 | 638 | 547 | 333 | 648 |
| Southeast | 1,532 | 1,011 | 611 | 306 | 865 |
| State Average | 1,537 | 1,168 | 795 | 369 | 968 |

Source: Iowa Realtors Land Institute

¹Pasture was the assumed land adjacent to rivers

²This average was used to estimate the value of private property, and the land adjacent to railroad and highway right-of-way

For example, abandoned railroad right-of-way is one of the principal corridor types within the recommended trail system. Rail right-of-way is normally not uniform in width and may vary from 50 to 200 feet wide or more. Acquisition may be required to adhere to existing widths due to grading and drainage requirements or due to legal complications. Trail system right-of-way in Michigan, Wisconsin and Minnesota was found to vary widely from one trail corridor to another, and within the same corridor. Existing property or rail right-of-way lines often set precedence for future trail acquisition.

The desirable 75 foot width allows for trail surface, shoulders and safety clear zones, grading, drainage and edge buffering from adjacent land uses. The width also allows for adequate spacing between complimentary trails such as bicycle/pedestrian and equestrian. This width may be adjusted in urban areas or due to unique circumstances.

Land Acquisition Costs

Land adjacent to rivers is usually less than prime cropland. To reflect regional variations consistent with the values used for estimating the cost of abandoned railroad right-of-way, it was assumed that the cost of land for a river corridor was equal to the average cost of pasture land for that region of the state.

The estimated costs per mile for trail right-of-way acquisition are shown in Table 8.2. Each segment is identified by corridor types and the mileage for each corridor is shown. Figure 8.1 illustrates corridors designations and locations. Acquisition costs for highway corridors are based on the assumption that a 15'-0" wide strip of right-of-way is required in addition to the existing highway right-of-way. Acquisition costs are also not indicated for existing trails, unless the existing trail is a canoe trail. For canoe trails, the cost for acquiring the land adjacent to the river was estimated.

These figures are estimates only based on very broad averages. The cost of acquisition will vary considerably from one area to another. Also, the cost of acquiring land diagonally through private property may be required to compensate for severance of adjacent agricultural fields or related economic impacts due to access, proximity and operations. These estimates are intended only as a means of arriving at a general estimate for land acquisition and are not to be construed as precise values.

TABLE 8.2
ESTIMATED COST OF TRAIL R.O.W. ACQUISITION
BY CORRIDOR TYPE

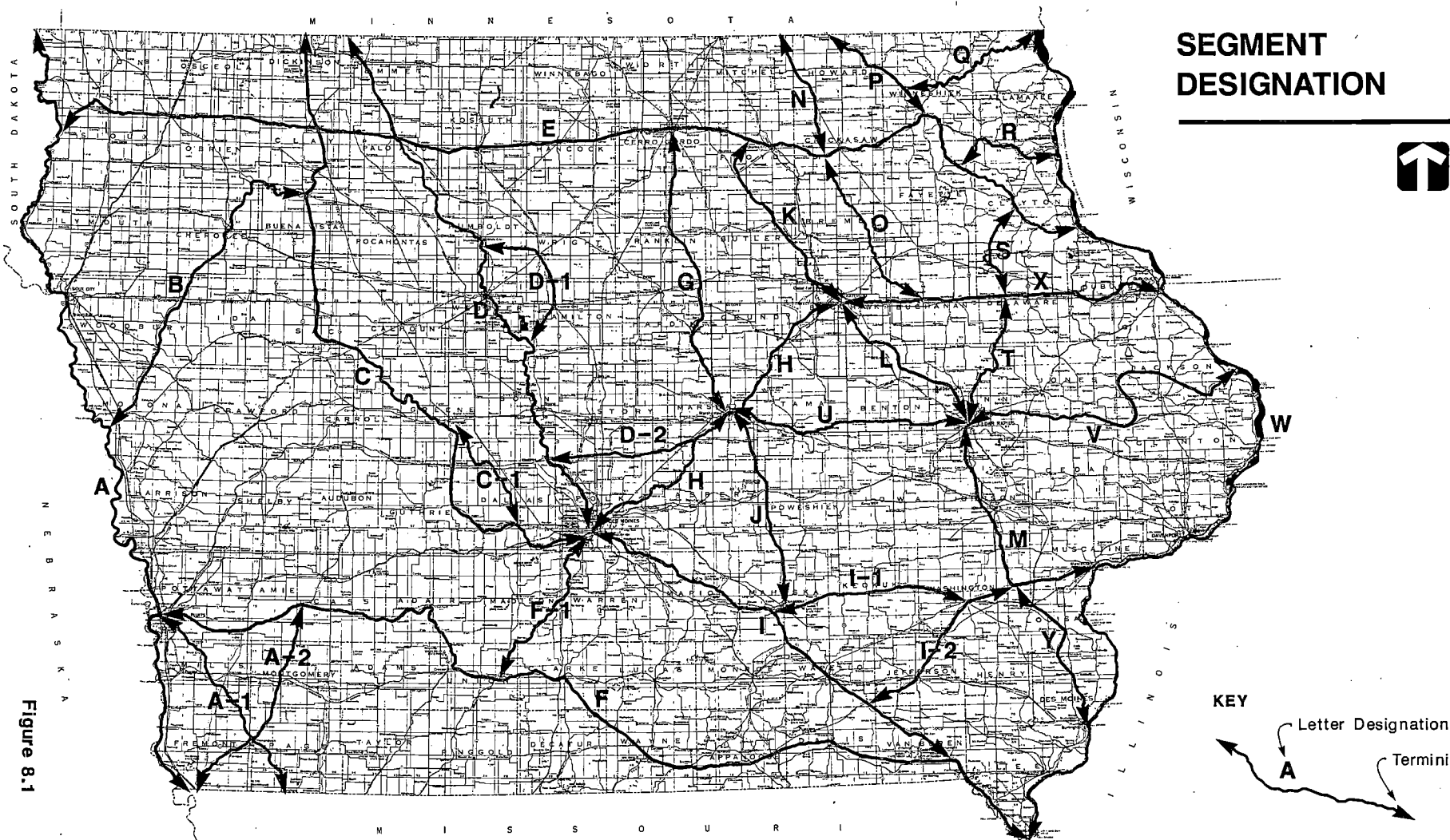
| Segment ¹ | Corridor Type | Linear Mileage | Average Cost/Mile |
|----------------------|---|-------------------|----------------------|
| A | Lewis and Clark Trail: River (Missouri River) | 220 | \$3,409 |
| A-1 | Existing (Wabash Trace Trail) | 63 | (0) |
| A-2 | River (East Nishnabotna River) | 39 | \$2,727 |
| | Abandoned Railroad | 16 | \$2,727 |
| B | Abandoned Railroad | 63 | \$5,448 |
| | Existing (Inkpaduta Canoe Trail) | 92 | \$3,654 |
| C | Existing (North Raccoon River Canoe Trail) | 31 | \$4,136 |
| | Existing (Raccoon River Valley Trail) | 35 | (0) |
| | River (Raccoon River) | 37 | \$4,136 |
| | Abandoned Railroad | 20 | \$5,354 |
| | Active Railroad | 24 | \$9,945 |
| C-1 | Existing (North Raccoon River Canoe Trail) | 17 | \$3,817 |
| | River (Raccoon River) | 14 | \$3,817 |
| D | River (Des Moines and West Fork Des Moines Rivers) | 141 | \$3,345 |
| | Existing (Saylorville Greenbelt Trail) | 16 | (0) |
| D-1 | Abandoned Railroad | 34 | \$4,882 |
| D-2 | Abandoned Railroad | 10 | \$9,563 |
| E | Abandoned Railroad | 50 | \$5,354 |
| | Highway | 240 | \$1,913 |
| F | Mormon Trail: Abandoned Railroad | 123 | \$3,024 |
| | Highway | 44 | \$1,178 |
| | Private Property | 95 | \$6,585 |
| F-1 | Abandoned Railroad | 46 | \$3,452 |
| G | Abandoned Railroad | 12 | \$4,877 |
| | Active Railroad | 68 | \$9,658 |
| H | Existing (Chichauqua Valley Trail) | 21 | (0) |
| | Abandoned Railroad | 72 | \$4,972 |
| I | Existing (East River Trail) | 5 | (0) |
| | Abandoned Railroad | 138 | \$3,822 |
| I-1 | Abandoned Railroad | 43 | \$3,931 |
| | Active Railroad | 6 | \$7,862 |
| | Highway | 7 | \$1,573 |
| I-2 | Abandoned Railroad | 72 | \$4,300 |

TABLE 8.2 (Continued)

| Segment ¹ | Corridor Type | Linear Mileage | Average Cost/Mile |
|----------------------|---|-------------------|-------------------------------|
| J | Active Railroad | 52 | \$9,424 |
| K | Abandoned Railroad River (Shell Rock River) | 22 29 | \$4,850 \$2,709 |
| L | Existing (Cedar Valley Nature Trail) | 52 | (0) |
| M | Abandoned Railroad River (Iowa River) Highway | 8 21 19 | \$5,040 \$4,336 \$2,017 |
| M-1 | Active Railroad | 16 | \$10,080 |
| N | Abandoned Railroad River (Wapsipinicon River) | 26 21 | \$4,318 \$3,227 |
| O | River (Wapsipinicon River) | 40 | \$3,227 |
| P | Abandoned Railroad River (Turkey River) | 34 8 | \$4,318 \$3,227 |
| Q | Abandoned Railroad River (Upper Iowa River) | 8 34 | \$4,318 \$3,227 |
| R | Abandoned Railroad Highway | 10 19 | \$4,318 \$1,726 |
| S | Abandoned Railroad Highway | 5 22 | \$4,318 \$1,726 |
| T | Active Railroad | 31 | \$10,080 |
| U | Abandoned Railroad Highway Active Railroad | 32 11 20 | \$5,040 \$1,989 \$9,944 |
| V | Abandoned Railroad | 97 | \$5,040 |
| W | River (Mississippi River) | 291 | \$3,537 |
| X | Existing (Heritage Trail) Active Railroad | 26 60 | (0) \$8,636 |
| Y | Proposed (Hoover Nature Trail) | 44 | \$5,700 |

¹Segment letter designations refer to map figure

Source: Kirkham, Michael and Associates



C. ESTIMATED CONSTRUCTION COSTS BY TYPICAL CROSS SECTION PER MODE

The following construction cost estimates are based on the typical cross sections of each mode as explained in Chapter 6 - Design Guidelines. These are estimated values only and are to be used as a guide to the local trail planner in arriving at rough construction cost estimates. Prices will vary depending on location, conditions of right-of-way and availability of material. These values do not include the cost of right-of-way acquisition. The prices used are based on the average costs from various sources including the Department of Transportation, the Department of Natural Resources and cost estimates from existing trails and proposed trails.

The following unit costs were used in developing the construction cost estimates:

| <u>Item</u> | <u>Unit Cost</u> |
|-----------------------------------|------------------|
| Clearing and Grubbing | \$1,400/acre |
| Grading (biking and hiking only) | \$1,500/mile |
| Grading (other trails) | \$1,000/mile |
| Seeding, Fertilizing and Mulching | \$ 675/acre |
| Crushed Limestone - Placed | \$ 12/ton |
| Asphalt - Placed | \$ 38/ton |
| Signs - Installed | \$ 45/each |

A further explanation of the development of these unit costs is given in Appendix E, page E-1. The following cost estimates do not include features such as bridges, culverts or fencing which may be required. Cost estimates for these items are explained separately.

Bicycle Trails

Based on the typical cross section that was developed in the Design Guidelines, the bicycle trail was assumed to be 10'-0" wide with 2'-0" seeded shoulders on each side. The desirable surface would be 4" of crushed limestone. An alternate design of 2" asphalt with a 4" limestone subbase could be considered where heavy traffic, or local conditions dictate.

Using a unit weight of 115 pounds per cubic foot, approximately 810 tons per mile of crushed limestone are required to provide a 4" surface that is 10'-0" wide. Asphalt has an approximate unit weight of 145 pounds per cubic foot. Therefore, for one mile of trail, a 2" asphalt surface requires approximately 640 tons of asphalt.

Based on these assumptions, the following costs per mile are estimated for the construction of a bicycle trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--|----------------------|-------------------|------------------|
| Clearing and Grubbing | 1.7 acres | \$1,400/acre | \$ 2,380 |
| Grading | 1.00 mile | \$1,500/mile | \$ 1,500 |
| Seeding, Fertilizing & Mulching | 0.55 acres | \$ 675/acre | \$ 370 |
| Signing | 3 each | \$ 45/each | \$ 135 |
| Crushed Limestone for Surface or Subgrade | 1,012.00 tons | \$ 12/ton | \$12,144 |
| Granular Subbase (for Asphalt Surfaced Trails) | 1,012.00 tons | \$ 10/ton | \$10,120 |
| Asphaltic Cement Concrete | 638.00 tons | \$ 38/ton | \$24,244 |

Estimated construction cost per mile for a bicycle trail with crushed limestone surfacing is \$16,530.

Estimated construction cost for asphalt surfacing is \$38,750. This cost includes 4" of aggregate to provide a suitable trail bed.

Inquiries made of other midwestern state's Department of Natural Resources indicated that these projected values are representative of 1988-1989 construction values.

Hiking Trails

Based on the typical cross section that was developed in the Design Guidelines, the hiking trail is assumed to be 4'-0" wide with 4" of crushed limestone surfacing and seeded edges up to 2'-0" wide. Assuming the unit weight of limestone is 115 pounds per cubic foot, approximately 410 tons of crushed limestone are required for each mile of trail.

From these assumptions, the following costs per mile are estimated for the construction of a hiking trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|-----------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 1.0 acres | \$1,400/acre | \$1,400 |
| Grading | 1.0 mile | \$1,500/mile | \$1,500 |
| Crushed Limestone Surface | 410.0 tons | \$ 12/ton | \$4,920 |
| Seeding, Fertilizing and Mulching | 0.55 acres | 675/acre | \$ 370 |
| Signing | 2.0 each | \$ 45/each | \$ 90 |

Estimated construction cost per mile for a hiking trail is \$7,580.

Cross Country Ski Trails

A 6'-0" wide trail with a grass surface is the assumed cross section for a cross country ski trail. Based on this assumption, the following costs per mile are estimated for the construction of a cross-country ski trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 0.75 acres | \$1,400/acre | \$1,050 |
| Seeding, Fertilizing and Mulching | 0.75 acres | \$ 675/acre | \$ 506 |
| Grading | 1.00 mile | \$1,000/mile | \$1,000 |
| Signing | 2.00 each | \$ 45/each | \$ 90 |

Estimated construction cost per mile for a cross-country ski trail is \$2,645.

Snowmobile Trails

Based on the typical cross section that was developed in the Design Guidelines, the snowmobile trail was assumed to be a 10'-0" tread width with 14'-0" total cleared width. The surface of the trail is assumed to be grass.

From these assumptions, the following costs per mile for the construction of a snowmobile trail were developed:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 1.7 acres | \$1,400/acre | \$2,380 |
| Grading | 1.0 mile | \$1,000/mile | \$1,000 |
| Seeding, Fertilizing and Mulching | 1.7 acres | \$ 675/acre | \$1,148 |
| Signing | 3.0 each | \$ 45/each | \$ 135 |

Estimated construction cost per mile for a snowmobile trail is \$4,663.

Off-Road Vehicle Trails

A 7'-0" cleared trail width is the cross section suggested in the Design Guidelines. The surface is assumed to be grass. Based on these assumptions, the following costs per mile were developed for the construction of an off-road vehicle trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit/Cost</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|------------------|------------------|
| Clearing and Grubbing | 0.85 acres | \$1,400/acre | \$1,190 |
| Grading | 1.00 mile | \$1,000/mile | \$1,000 |
| Seeding, Fertilizing and Mulching | 0.85 acres | \$ 675/acre | \$ 574 |
| Signing | 3.00 each | \$ 45/each | \$ 135 |

Estimated construction cost per mile for an off-road vehicle trail is \$2,900.

Equestrian Trails

Based on the Design Guidelines, a 8'-0" wide cleared trail with a grass surface was assumed. From this cross section, the following costs per mile are estimated for the construction of an equestrian trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 1.0 acre | \$1,400/acre | \$1,400 |
| Grading | 1.0 mile | \$1,000/mile | \$1,000 |
| Seeding, Fertilizing and Mulching | 1.0 acre | \$ 675/acre | 675 |
| Signing | 2.0 each | \$ 45/each | \$ 90 |

Estimated construction cost per mile for an equestrian trail is \$3,165.

Multimodal Trails

When designing a multimodal trail, the widest recommended trail governs the design. Therefore, the wider trail generally also dictates the cost estimate to be assumed for a multimodal trail. However, it is sometimes necessary to alter the cross sections when combining certain modes of recreation, thereby creating the need for a new cost estimate.

The most probable and cost effective multi-use trail would be one which incorporates bike, hike and snowmobile use. Increased cost would be limited to additional signing.

Other multi-use corridors include the following.

Bicycle/Pedestrian/Equestrian Corridor

A corridor that would encompass bicycling, walking and horseback riding would require a wider area than any of the individual modes. A typical width for the bicycle/pedestrian trail would be 10'-0" with 2'-0" shoulders.

An equestrian trail has a recommended tread width of 4'-0" with 2'-0" shoulders. Assuming a buffer zone of 6'-0" between the two trails brings the overall cleared width to 26'-0" as shown in Figure 8.2.

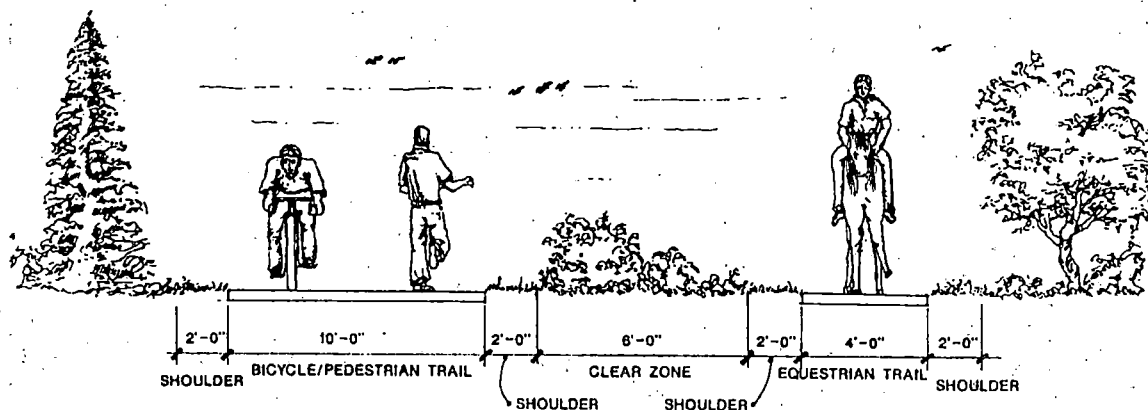


FIGURE 8.2
TYPICAL MULTIMODAL CORRIDOR: BICYCLE/PEDESTRIAN AND EQUESTRIAN CORRIDOR

Based on those assumptions, the following costs per mile for a bicycle/pedestrian and equestrian corridor were developed:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 3.0 acres | \$1,400/acre | \$4,200 |
| Grading* | | | \$2,400 |
| Seeding, Fertilizing and Mulching | 2.1 acres | \$ 675/acre | \$1,418 |
| Crushed Limestone Surface | 945.0 tons | \$ 12/ton | \$11,340 |
| Signing | 5.0 each | \$ 45/each | \$ 225 |

*The cost of grading was assumed to be 80 percent of twice the cost of grading a single trail.

The estimated construction cost per mile for a limestone surfaced bicycle/pedestrian and equestrian corridor is \$19,583.

Snowmobile/Cross-County Ski Trail

Cross-country skiing and snowmobiling are two forms of recreation that could be combined on one trail in limited circumstances with few alterations to the design. A snowmobile trail requires a 10'-0" cleared width and a 6'-0" width is suggested for cross-country ski trails. Additional signing would also be recommended to accommodate both modes. Based on these assumptions, the following costs per mile are estimated for the construction of a snowmobile/cross-county ski trail:

| <u>Item</u> | <u>Quantity/Mile</u> | <u>Unit Price</u> | <u>Cost/Mile</u> |
|--------------------------------------|----------------------|-------------------|------------------|
| Clearing and Grubbing | 2.45 acres | \$1,400/acre | \$3,430 |
| Grading | 2.0 mile | \$1,000/mile | \$2,000 |
| Seeding, Fertilizing and Mulching | 2.5 acres | \$ 675/acre | \$1,685 |
| Signing | 6.0 each | \$ 45/each | \$ 270 |

Estimated construction cost per mile for a snowmobile/cross-country ski trail is \$7,385.

A combined snowmobile/cross-country ski trail is likely to have limited application despite using separate paths. In general, most skiers prefer trails which are of varying lengths and loop back to a point of beginning. Snowmobile users prefer trails of longer length. The combined trail should only be considered where snowmobile speeds are limited to low levels. Above average sight lines, such as on flat surfaces, should exist.

Additional Costs

The estimates for construction cost per mile were based on items that occur every mile throughout the length of the trail. Some necessary features, however, do not occur with such regularity and therefore were not figured into the cost per mile estimates. These items are instead estimated separately.

Fencing

Currently, Iowa law requires railroads and the owners of abandoned railroad rights-of-way to fence both sides of the right-of-way. This obligation can be waived if the adjacent landowner agrees. On corridors other than abandoned railroad, adjacent landowners may still ask that fencing be put up to establish property limits. Therefore, fencing can become a rather costly item in constructing a trail.

For a five-strand barbed wire fence, an average cost to use for estimating is \$1.00/linear foot of fence. For one mile of fencing both sides of the right-of-way, fencing would cost approximately \$10,500.

Bridges

The type of construction required for trail bridges will vary considerably depending on the recreational mode it needs to serve, the physical feature it is crossing, and the anticipated traffic. Based on bridges that the Iowa Department of Natural Resources and the Wisconsin Department of Transportation have built for recreational trails, an approximate cost for a new bridge constructed of steel or prestressed concrete is \$42/square foot. To build a new 10'-0" - 12'-0" x 30'-0" bridge, for example, would cost approximately \$12,600 to \$15,120. Laminated or timber bridges may be less expensive especially for span distances of 40 feet or less. Square foot prices for such lengths would range from \$30 to \$35.

Often times, trails located on abandoned railroads can make use of the railroad trestle if they are still in place. These frequently require some surfacing and installation of guardrails which cost considerably less than a new bridge. The Wisconsin Department of Natural Resources estimates that it costs approximately \$35/linear foot to convert a trestle. Therefore, to convert a 30'-0" bridge would cost about \$1,050. Other decking options including a poured concrete surface have been employed. In this application, portland cement concrete paving is poured to a depth of 4" installed with 6" x 6" 10-10 wire mesh. Galvanized sheet metal is used for decking. Transverse contraction joints are installed as per normal practices with expansion joints typically occurring at each end of the structure.

Bridge width, in general, should be two feet wider than the cross trail surface to allow for a one foot "shy zone" setback from both bridge rails.

Culverts

Proper drainage is imperative for a well-constructed, well-maintained recreational trail. The size of pipe needed is dependent on the amount of anticipated drainage. Based on bid prices received by the Iowa Department of Transportation, a 12" diameter corrugated metal roadway pipe is approximately \$14/linear foot. An 18" CMP is about \$16/linear foot and the average cost of a 24" CMP is \$22/linear foot. Concrete pipes range from \$19/linear foot to \$25/linear foot for the same sizes.

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Chapter 9

Financing and Implementation

CHAPTER 9

FINANCING AND IMPLEMENTATION

A. INTRODUCTION

Trail financing is a critical link between planning the system and enjoying the facilities. Iowa legislation established an annual expenditure for trail implementation. However, complimentary funding could help extend the annual development of trails. This chapter describes potential funding mechanisms and their limitations.

The chapter also explores the roles and responsibilities between agencies in planning, implementing and operating facilities. These roles are critical to minimizing future conflicts and establishing cooperation.

B. PROJECT FINANCING

As the cost estimates illustrate, developing a recreational trail system is an expensive venture. There are several sources of funding available to local entities. The primary source, if no other significant fund becomes available, is the Iowa Department of Transportation Recreational Trails Program. The purpose of the recreational trails program is to "provide funds to establish recreational trails in Iowa for the use, enjoyment and participation of the public."

Each year one million dollars from the Road Use Tax Fund is scheduled to be appropriated for the recreational trails program which is administered by the Department of Transportation. State or local government agencies, municipal corporations, counties or non-profit organizations are eligible to apply for funds to help finance trail development. According to the rules of the program, a proposed recreational trail is eligible for funding if it meets the criteria outlined in the Administrative Rules, Appendix H, page H-1.

The rules of the recreational program also outline what costs are eligible for project funding. These costs include land acquisition, trail surfacing, bridge and culvert repair, roadway intersection and interchange improvements, construction or improvement of rest areas, design engineering and construction inspection costs for the trail, trail drainage costs, utility relocation costs on private property as needed, trail signs, fencing, landscaping parking areas and walkways. Generally, most of the costs associated with the construction of a recreational trail are eligible for funding. Costs incurred before applying for funds are not eligible for reimbursement, except for advanced ROW purchases where waiver has been obtained by the DOT, nor are any operating and maintenance costs.

Twice a year the Department of Transportation funds the recreational trail program. In 1989, the first time applications were accepted, a total of 52 applications were received (nine applications were resubmitted a second

time). Of the 52 requests, the amount requested from the recreational trails fund ranged from a low of \$6,200 to a high of \$2,307,514. Eleven projects were funded. Total project cost equaled \$3,691,749 of which \$2,380,840 will be provided from the recreational trail program.

The competition for funding is tough and the program does not cover maintenance and operating expenses. These expenses must be borne by the local group. Alternate funding sources can be examined.

C. ALTERNATIVE FINANCING

Resource Enhancement and Protection (REAP) Act

In 1989, the Iowa Legislature passed the Resource Enhancement and Protection (REAP) Act. For the 1990 fiscal year, \$15 million was set aside for REAP and \$20 million has been promised for each fiscal year 1991-2000 with the possibility of additional funding.

County Conservation Boards receive 20 percent of the REAP funds. Of that amount, 30 percent is split evenly among all counties, 30 percent is dispersed based on population and the remaining 40 percent is held by the Department of Natural Resources to award to the counties on a competitive grant basis. Cities receive 15 percent of the REAP funds. These competitive grants fund 100 percent of project costs for projects selected.

The REAP fund is an excellent source for cities and counties to use to finance the construction of trails. REAP funds may be used for both acquisition and development costs. However, the Recreational Trails Program, routine maintenance and operating costs can be secured from REAP's funds only for those projects which have been bought and developed with REAP funds.

Land and Water Conservation Fund

The National Park Service distributes money to the State Department of Natural Resources under the Land and Water Conservation Fund. The DNR distributes one-half of each year's apportionment to government subdivisions such as county conservation boards and cities for cost share programs. In the past, several multi-use recreational trails have received financing from this fund to acquire land and/or to develop the trail.

Because money from the Land and Water Conservation Fund is actually federal funds from the National Park Service, the money granted could be used as part of the 25 percent local match required by the recreational trails program. The Land and Water Conservation Fund amounts to only \$250,000 annually for the State of Iowa, one-half of which is used for state projects.

User Fees

User fees may provide the local sponsor with the best source of income to cover maintenance and operating costs. Recreational trails in Iowa that

have user fees charge an average of \$1.00 per day or \$5.00 per year. Many recreational users have expressed the opinion that they would not object to paying a user fee to use a well-built and well-maintained recreational trail. However, not everyone will agree. The fee may discourage some people from using that trail.

Vehicle Registration

Currently, snowmobiles and all-terrain vehicles (ATV) are required to be registered with the DNR. The cost of registration is \$20 for every two years. The ATV registration program is just developing. The snowmobile fund averages \$300,000 a year although the decrease in snowfall has been reflected by a decrease in registrations. The funds from registration can be used for development, maintenance and land acquisition for trails. Because grooming equipment for snowmobile trails is very expensive, the registration funds are a great help. Part of the rules, however, state that if registration revenues are used to develop snowmobile trails or facilities, user fees cannot be charged.

The feasibility of registering other recreational vehicles or equipment is uncertain. However, bicycles frequently need to be registered within cities. A city or other political unit could appropriate some of these funds for trail maintenance and operations or development.

Nationally Designated Trails

There are two trails in Iowa, the Lewis and Clark Trail and the Mormon Trail, which have been designated as National Trails by the National Park Service. The National Park Service does not provide funding for development of these trails, however, they do advise on trail development of the National Designated Trails. Future federal funding is dependent upon future legislation.

Federal Highway Funds

Of the total federal funds provided to Iowa for highway improvements and maintenance, the Iowa DOT Commission could elect to utilize up to five percent of the funds for transportation-related trails. However, these trail projects must compete on a priority basis with highway improvement, maintenance and safety projects.

Volunteer Help

One of the greatest resources for maintenance and operation is volunteer labor. Volunteers from the community can donate their time in helping to maintain the trail. Mowing the right-of-way, cleaning up litter, minor fence repairs, spring clearing and even patrolling are all tasks with which trail enthusiasts may be eager to help. National forests have found tremendous success with their Adopt-A-Trail Program. Local groups, such as bicycling clubs or even scout troops, volunteer their services to maintain a certain portion of the trail. Organized volunteer groups not only provide an inexpensive means of maintaining the trail, but they build local pride in the trail project.

Other Potential Funds

One idea for providing state or federal funds for recreational trail development is to place an excise tax on recreational equipment. A given percentage of the cost of the equipment could be put into a fund to promote recreational trails. An excise tax, however, would take legislative action to implement properly.

Iowa's lottery funds could be directed toward trails projects. Lottery funds are to be obligated for projects which enhance Iowa's economy. Positive economic impact for state businesses would result from trail-generated tourism.

General funds could also be utilized by the state legislature. Monies would be obligated by legislative action.

D. AGENCY ROLES AND RESPONSIBILITIES

Continued cooperation between Iowa agencies is imperative to developing and operating a comprehensive recreational trail system the size of the one currently proposed. Cooperation must exist between state, federal and local agencies as well as organized user groups to promote the well-being of the entire system.

Agency cooperation will be required well into the future as the system passes through its planning stage and into questions of development funding, implementation phasing and detail design. Agency cooperation must also resolve issues pertaining to operations, maintenance and facility policing. The following descriptions highlight the responsibility foreseen for each principal agency type.

Iowa Department of Transportation (DOT)

Iowa legislation directed the state DOT to prepare and undertake a number of specific tasks including:

1. The determination of acquisition needs, development needs, funding levels and use of abutting recreational resources for trail corridors.
2. The arrival at specific functional classifications for recreational trails which involve the state, counties, cities and private organizations.
3. The contractual obligation for trails planning and preparation of a system plan. The department can enter into agreements with other state agencies, political subdivisions of the state, and private organizations for the planning, acquisition, development, promotion, management, operations and maintenance of recreational trails.

DOT's responsibility includes a number of other specific tasks. DOT should serve as the liaison to the state legislature regarding trails, their

implementation, financing, and ultimate management. The agency should also analyze its role in developing trails within highway right-of-way and cooperating with other agencies where trail development within the right-of-way is feasible. The DOT should communicate with adjacent state trail agencies to ensure logical interstate connections which strengthen the Iowa system.

Other State Agencies

The Department of Natural Resources (DNR), Department of Economic Development (DED) and the Department of Cultural Affairs (DCA) by legislation will continue to cooperate with DOT in preparation of the system plan. The supporting state agencies represent the resources they are charged with managing, but also provide creative input in capitalizing upon opportunities for trail development, its use as an economic development tool, and ability to interconnect specific state resources. DNR, DED, and DCA can support and implement trail corridors where they are compatible with each agency's resources.

Local Agencies

Local agencies including cities and county conservation boards are charged with implementing specific trail segments based upon applications made to the state DOT. Bi-annual applications made to the DOT will be judged in part upon their individual contribution to the statewide system. Local agencies are responsible for refining specific trail alignments within designated corridors and determining the most appropriate trail mode for each corridor. Local agencies submitting successful applications will be responsible for preparing detail design, bidding and monitoring trail construction. The agencies will also be required to operate, maintain and police facilities to preserve their integrity and provide for user safety.

Other non-agency organizations are also eligible to make trail applications contingent upon their ability to develop, operate and maintain facilities if funding is made available.

PMT/TAC Involvement

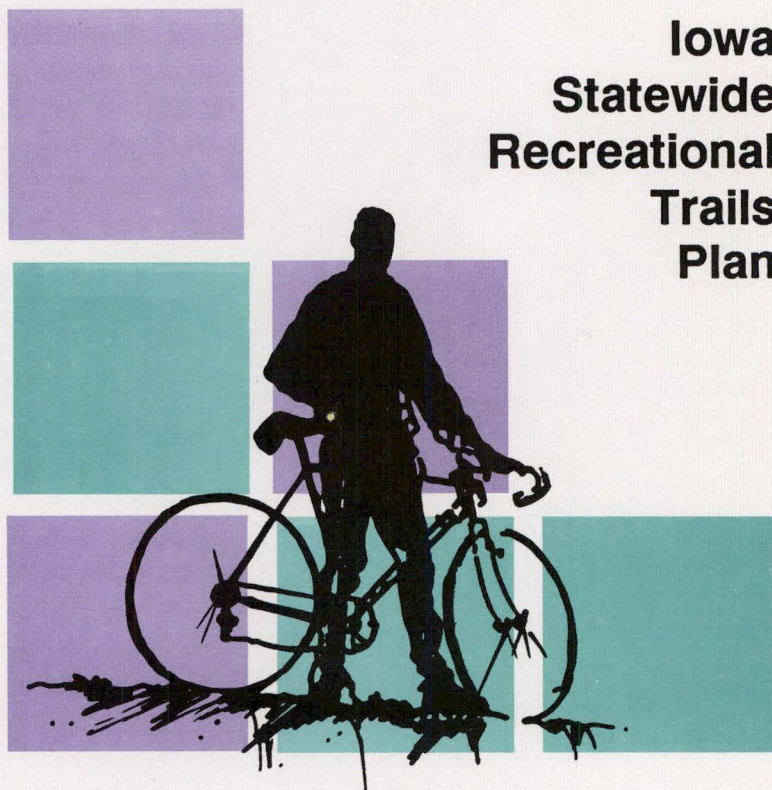
At completion of the trails planning process, the Project Management Team (PMT) and the Technical Advisory Committee (TAC) should continue to serve in a productive way. The PMT should meet on a regular basis to discuss and negotiate coordination of the state system in response to legislative requests and the need to manage each agency's resources.

The TAC, a group oriented to trail users and other interested parties, should continue to serve as a liaison between trail users, abutting land owners and trail-related industries. Input from this group to state and local agencies will be especially important in maintaining and operating the trail system.

Federal involvement in trails development will not occur on a large scale without a change in federal legislation and available funding. The state

DOT and other state agencies should continue dialogue with federal agencies to capitalize upon any cooperative ventures or changes in funding that become apparent. The four reservoirs in Iowa managed by the United States Army Corps of Engineers offer potential for trail system development and expansion.

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Chapter 10

Need for Additional Study

CHAPTER 10

NEED FOR ADDITIONAL STUDY

During the preparation of this statewide recreational trails study, it became apparent that a wide variety of topics and concerns should be examined through additional study. The following categories have been used to organize the issues collected during the trails planning process, which should be analyzed during a subsequent study phase.

A. OPERATION AND MAINTENANCE POLICIES

A wide variety of operations and maintenance issues became apparent to the consulting team, the PMT and TAC during the planning process. These topics range from the maintenance requirements of the trail surface and corridor right-of-way to the operations commitments which local agencies inherit once a corridor has been developed. Specific policies should be developed with input from both state agencies and user groups to clarify local agency responsibilities and provide for the health, safety and welfare of trail patrons.

Input from public information meetings and the Technical Advisory Committee acknowledged concerns on the part of adjacent property owners. Rural corridors encounter legitimate agricultural concerns ranging from right-of-way maintenance to the compatibility with agricultural pesticides. Urban concerns include impact on property values and questions of security. Property owner concerns need to be addressed as part of corridor implementation.

B. TOURISM, TRAIL MARKETING AND PUBLIC RELATIONS

The Iowa legislation which mandated preparation of the trails plan acknowledged the economic development incentives which trails can mean for the state's economy. However, the economic incentives can not be fully maximized unless potential users are fully identified and a marketing effort is exercised which invites their participation.

A specific marketing and public relations strategy must be identified to stimulate trail use, tourism dollars and local economic benefits. Mechanisms which could be investigated include tourism guides, multimedia presentations, brochures which highlight public and private facilities, and regular user newsletters.

C. IMPLEMENTATION STRATEGY

An evaluation strategy to assist the DOT and other state agencies in evaluating annual trail applications should be established. This strategy would assist decision-makers in making clear, objective decisions in ranking submittals according to state needs. Factors which may influence application rankings include:

1. Local funding participation
2. Completion of existing trail corridors
3. Economic development opportunities
4. User demands
5. Geographic distribution
6. Ability to leverage other available funds
7. Corridor continuity

D. TRAIL AMENITIES AND SUPPORT FACILITIES

User groups emphasize the need to provide trail heads and comfort facilities for user enjoyment and safety. An analysis should be conducted which examines user needs by different trail modes and produces typical site plans providing for these functions. Cost estimates should be made available to assist local agencies in determining funding requirements.

E. CASE STUDIES OF COMPARABLE PROJECTS

The most frequently asked question during the planning process was "How do other states accomplish this?" or "How have existing Iowa trails responded to this problem?" Case studies documenting other comparative regional trail corridors would be helpful in capitalizing upon their strengths and weaknesses and ultimately benefiting the Iowa system. Studies should examine a variety of locations in state and out, both urban and rural, and trail types by differing modes. Interviews with trail managers, sponsoring agencies and user groups could convey helpful experiences relating to development, operations, maintenance and policing.

F. CORRIDOR MULTIPLE USE

Shared use of trail right-of-way for a variety of trail users has been emphasized by involved users and agencies. Further documentation is desirable to understand which trail modes are compatible, appropriate design considerations and operation consistency from one jurisdiction to another. Resolution of these issues and others is important to realize the full benefit of the trail system and the investment made.

G. HIGHWAY RIGHT-OF-WAY

The use of highway right-of-way whether it be county- or state-operated will require additional analysis and discussion. Trail users and agencies alike recognize the opportunities for multiple use of highway right-of-way. Questions of trail location, safety, agency priorities, maintenance and funding should be considered by additional analysis.

H. STATE AGENCY INVOLVEMENT IN TRAIL DEVELOPMENT

This planning process has arrived at a comprehensive plan involving trails throughout Iowa. Its completion and continuity is important to maintaining the system's vitality and minimizing user disruption. Questions of state agencies' roles in completing difficult segments of the system should be

addressed. Dialogue should continue between state agencies, local agencies and legislators to determine when, why and how state agency participation should occur.

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Appendices

APPENDIX A
COMMITTEE LISTING - PROJECT MANAGEMENT TEAM

**APPENDIX A
PROJECT MANAGEMENT TEAM**

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**APPENDIX B
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APPENDIX C
1989 HOUSEHOLD SURVEY - TABLES AND CHARTS

DEMOGRAPHICS

| <u>Response</u> (Base) | <u>Total</u> (500) | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|-------------------------------------|-----------------------|--|-------------------|-------------------|-------------------|--------------------|
| | | <u>Under 2</u> (71) | <u>2</u> (100) | <u>3</u> (103) | <u>4</u> (100) | <u>5+</u> (126) |
| Average Age | 44.7 | 56.4 | 51.9 | 43.8 | 40.0 | 37.0 |
| Percentage | | | | | | |
| Married | 74 | 59 | 73 | 78 | 79 | 75 |
| Widowed | 7 | 27 | 8 | 6 | -- | 3 |
| Separated | 8 | 7 | 7 | 8 | 7 | 10 |
| Single | 11 | 7 | 12 | 9 | 14 | 12 |
| Percentage Employed | | | | | | |
| Full-time | 58 | 28 | 45 | 67 | 69 | 67 |
| Part-time | 13 | 7 | 12 | 13 | 17 | 16 |
| Unemployed | 13 | 14 | 17 | 11 | 11 | 13 |
| Retired | 16 | 51 | 26 | 10 | 3 | 4 |
| Percentage | | | | | | |
| Respondents Without Children | 57 | 86 | 76 | 50 | 50 | 36 |
| Respondents With Children | 43 | 14 | 24 | 50 | 50 | 64 |
| Average Number of Children At Home | | | | | | |
| Under 5 | .5 | .2 | .3 | .5 | .6 | .6 |
| 6-12 Years | .9 | .9 | .7 | .7 | 1.1 | 1.0 |
| 13-18 Years | .7 | 1.0 | .5 | .7 | .5 | .7 |
| Location | | | | | | |
| Rural/Farm | 25 | 25 | 22 | 27 | 21 | 29 |
| Small Town (0-10,000) | 33 | 31 | 31 | 38 | 34 | 31 |
| Large Town (10-50,000) | 18 | 24 | 19 | 13 | 22 | 15 |
| Average Length at Residence (Years) | | | | | | |
| Whole Life | 20 | 20 | 19 | 21 | 23 | 17 |
| Over 10 Years | 48 | 65 | 61 | 48 | 35 | 40 |
| 5 to 10 Years | 14 | 7 | 9 | 18 | 17 | 14 |
| Less Than 5 Years | 18 | 8 | 11 | 13 | 25 | 29 |
| Average Household Income (000) | 32.0 | 26.5 | 28.8 | 32.0 | 34.9 | 34.7 |

TABLE 1. TRAIL PARTICIPATION

| <u>Response</u> (Base) | Number of Trail Activities in Which Respondent Participated | | | | | |
|--|--|-----------------------------|------------------------|------------------------|------------------------|-------------------------|
| | Total <u>%</u> (500) | Under 2 <u>%</u> (71) | 2 <u>%</u> (100) | 3 <u>%</u> (103) | 4 <u>%</u> (100) | 5+ <u>%</u> (126) |
| Go walking near home for recreation or exercise | 90 | 59 | 96 | 91 | 96 | 96 |
| Go walking at a park, picnic area or other place away from home | 72 | 6 | 59 | 82 | 91 | 97 |
| Go bicycling near home | 61 | 4 | 31 | 70 | 78 | 95 |
| Go bicycling at a park, picnic area or bike trail away from home | 27 | 1 | 2 | 10 | 40 | 67 |
| Backpacking or hiking | 18 | 1 | 3 | 10 | 19 | 47 |
| Go canoeing | 16 | -- | 2 | 9 | 19 | 41 |
| Drive an off road, motor- ized recreational vehicle | 13 | -- | 1 | 12 | 20 | 27 |
| Go horseback riding near home | 13 | -- | 3 | 7 | 13 | 34 |
| Go horseback riding at a park or trail away from home | 10 | -- | 2 | 6 | 7 | 29 |
| Go snowmobiling | 7 | -- | 1 | 3 | 8 | 18 |
| Go cross country skiing | 6 | -- | -- | 2 | 9 | 17 |

TABLE 2. AVERAGE NUMBER OF TIMES RESPONDENT PARTICIPATED IN ACTIVITY (1988).
(BASED TO ACTIVITY PARTICIPANTS).

| <u>Response</u> | <u>Total</u> | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|--|--------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| Go walking near home for recreation or exercise | 89.8 | 129.3 | 97.8 | 79.8 | 81.3 | 85.6 |
| Go bicycling near home | 39.3 | --- | 27.2 | 40.2 | 40.1 | 41.1 |
| Go horseback riding near home | 22.6 | --- | 55.0 | 55.3 | 8.9 | 18.9 |
| Go walking at a park, picnic area or other place away from home | 17.1 | 6.8 | 22.8 | 9.8 | 17.1 | 19.4 |
| Go bicycling at a park, picnic area or bike trail away from home | 15.7 | --- | 10.0 | 8.6 | 13.6 | 17.9 |
| Drive an off road, motor- ized recreational vehicle | 12.2 | --- | --- | 7.9 | 13.7 | 13.2 |
| Go horseback riding at a park or trail away from home | 8.2 | --- | 27.0 | 13.2 | 1.7 | 6.3 |
| Go snowmobiling | 7.6 | --- | 5.0 | 6.5 | 3.4 | 9.9 |
| Backpacking or hiking | 6.4 | --- | 2.0 | 6.6 | 9.3 | 5.5 |
| Go cross country skiing | 3.1 | --- | --- | --- | 3.3 | 3.0 |
| Go canoeing | 2.8 | --- | 1.0 | 1.8 | 2.5 | 3.0 |

TABLE 3.

MEDIAN NUMBER OF MILES AWAY FROM HOME RESPONDENT PARTICIPATED
IN ACTIVITY

| <u>Response</u> | <u>Total</u> | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|--|--------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| Backpacking or hiking | 38.3 | --- | 10.7 | 27.0 | 91.8 | 39.5 |
| Go horseback riding at a park or trail away from home | 65.9 | --- | 69.5 | 16.3 | 44.5 | 100.6 |
| Drive an off road, motor- ized recreational vehicle | 17.4 | --- | --- | 17.2 | 15.6 | 19.5 |
| Go canoeing | 24.9 | --- | 59.5 | 99.5 | 17.4 | 19.5 |
| Go walking at a park, picnic area or other place away from home | 13.9 | 14.5 | 10.9 | 15.5 | 17.5 | 15.8 |
| Go cross country skiing | 2.8 | --- | --- | --- | 2.3 | 5.7 |
| Go bicycling at a park, picnic area or bike trail away from home | 7.3 | --- | 1.5 | 6.5 | 7.9 | 7.5 |
| Go snowmobiling | 16.2 | --- | --- | 73.0 | 8.5 | 19.5 |
| Go horseback riding near home | 5.3 | --- | .5 | 23.3 | 3.5 | 6.2 |

TABLE 4.

HOUSEHOLD PARTICIPATION BY ACTIVITY

| <u>Response</u> | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|--|-------------------|--|---------------|---------------|---------------|----------------|
| | | <u>Under 2</u> % | <u>2</u> % | <u>3</u> % | <u>4</u> % | <u>5+</u> % |
| Go bicycling near home (Base) | (304) | (3) | (31) | (72) | (78) | (120) |
| Male head-of-household | 58 | -- | 39 | 54 | 67 | 61 |
| Female head-of-household | 68 | 33 | 68 | 67 | 67 | 72 |
| Children | 59 | 100 | 52 | 54 | 55 | 65 |
| Go bicycling at a park, picnic area or bike trail away from home (Base) | (137) | (1) | (2) | (10) | (40) | (84) |
| Male head-of-household | 63 | -- | 50 | 60 | 58 | 67 |
| Female head-of-household | 64 | -- | 50 | 60 | 65 | 65 |
| Children | 51 | -- | 50 | 10 | 53 | 56 |
| Go walking near home for recreation or exercise (Base) | (449) | (42) | (96) | (94) | (96) | (121) |
| Male head-of-household | 69 | 64 | 66 | 67 | 75 | 71 |
| Female head-of-household | 88 | 76 | 84 | 89 | 92 | 90 |
| Children | 34 | 12 | 15 | 39 | 39 | 50 |
| Go walking at a park, picnic area or other place away from home (Base) | (360) | (4) | (59) | (84) | (91) | (122) |
| Male head-of-household | 77 | 75 | 76 | 76 | 79 | 77 |
| Female head-of-household | 89 | 100 | 85 | 89 | 91 | 90 |
| Children | 42 | -- | 7 | 42 | 45 | 57 |
| Backpacking or Hiking (Base) | (92) | (1) | (3) | (10) | (19) | (59) |
| Male head-of-household | 74 | -- | -- | 60 | 95 | 75 |
| Female head-of-household | 67 | -- | 100 | 70 | 74 | 64 |
| Children | 52 | 100 | 33 | 30 | 58 | 54 |
| Driving off road motorized recreational vehicles (Base) | (67) | (-) | (1) | (12) | (20) | (34) |
| Male head-of-household | 78 | -- | 100 | 75 | 80 | 76 |
| Female head-of-household | 37 | -- | -- | 58 | 25 | 38 |
| Children | 34 | -- | -- | -- | 40 | 44 |
| Snowmobiling (Base) | (35) | (-) | (1) | (3) | (8) | (23) |
| Male head-of-household | 69 | -- | 100 | 33 | 88 | 65 |
| Female head-of-household | 40 | -- | -- | 33 | 63 | 35 |
| Children | 57 | -- | -- | 67 | 63 | 57 |

TABLE 4. - CONTINUED

| <u>Response</u> | <u>Total</u> <u>%</u> | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---|--------------------------|--|----------------------|----------------------|----------------------|-----------------------|
| | | <u>Under 2</u> <u>%</u> | <u>2</u> <u>%</u> | <u>3</u> <u>%</u> | <u>4</u> <u>%</u> | <u>5+</u> <u>%</u> |
| Cross Country Skiing (Base) | (32) | (-) | (-) | (2) | (9) | (21) |
| Male head-of-household | 53 | -- | -- | 50 | 56 | 52 |
| Female head-of-household | 50 | -- | -- | -- | 67 | 48 |
| Children | 25 | -- | -- | 50 | -- | 33 |
| Canoeing (Base) | (82) | (-) | (2) | (9) | (19) | (52) |
| Male head-of-household | 84 | -- | 50 | 89 | 100 | 79 |
| Female head-of-household | 52 | -- | -- | 22 | 58 | 58 |
| Children | 34 | -- | 50 | 11 | 26 | 40 |
| Horseback riding near home (Base) | (66) | (-) | (3) | (7) | (13) | (43) |
| Male head-of-household | 52 | -- | 67 | 57 | 38 | 53 |
| Female head-of-household | 41 | -- | 67 | 57 | 46 | 35 |
| Children | 50 | -- | 67 | 43 | 46 | 51 |
| Horseback riding at a park or trail away from home (Base) | (52) | (-) | (2) | (6) | (7) | (37) |
| Male head-of-household | 65 | -- | 100 | 100 | 14 | 68 |
| Female head-of-household | 48 | -- | 100 | 50 | 57 | 43 |
| Children | 50 | -- | 50 | -- | 71 | 54 |

TABLE 5. AMONG TRAIL PARTICIPANTS, THE PERCENTAGE WHO PARTICIPATED IN THE ACTIVITY OUTSIDE THE STATE OF IOWA.

| <u>Response</u> | <u>Total</u> | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|--|--------------|--|-------------|-------------|-------------|--------------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| (Base) Go walking at a park, picnic area or other place away from home | (360) 38% | (4) 50% | (59) 42% | (84) 40% | (91) 37% | (122) 34% |
| (Base) Go bicycling at a park, picnic area or bike trail away from home | (137) 18% | (1) 0% | (2) 50% | (10) 20% | (40) 23% | (84) 14% |
| (Base) Backpacking or hiking | (92) 50% | (1) 0% | (3) 33% | (10) 30% | (19) 58% | (59) 53% |
| (Base) Go canoeing | (82) 24% | (0) 0% | (2) 50% | (9) 11% | (19) 26% | (52) 25% |
| (Base) Drive an off road, motor- ized recreational vehicle | (67) 15% | (0) 0% | (1) 0% | (12) 25% | (20) 10% | (34) 15% |
| (Base) Go horseback riding at a park or trail away from home | (52) 19% | (0) 0% | (2) 100% | (6) 17% | (7) 14% | (37) 14% |
| (Base) Go snowmobiling | (35) 17% | (0) 0% | (1) 0% | (3) 0% | (8) 0% | (23) 26% |
| (Base) Go cross country skiing | (32) 9% | (0) 0% | (0) 0% | (2) 0% | (9) 22% | (21) 5% |

TABLE 6. ACTIVITIES RESPONDENTS WANT TO DO MORE OF IN IOWA

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---------------------------|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (500) | (71) | (100) | (103) | (100) | (126) |
| Bicycling | 17 | 8 | 11 | 12 | 17 | 29 |
| Walking | 9 | 11 | 8 | 15 | 8 | 6 |
| Backpacking/Hiking | 8 | - | 5 | 7 | 11 | 12 |
| Horseback Riding | 6 | 3 | 4 | 4 | 7 | 10 |
| Canoeing | 3 | 1 | - | 3 | 5 | 5 |
| None | 59 | 79 | 74 | 64 | 54 | 37 |

TABLE 7. WHY ARE YOU UNABLE TO DO MORE BACKPACKING/HIKING IN IOWA?

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|--|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (39) | (-) | (5) | (7) | (11) | (16) |
| Limited Recreational Areas | 77 | -- | 60 | 43 | 91 | 88 |
| Too Busy Doing Other Things | 13 | -- | 20 | 29 | 9 | 6 |
| Prefer Undeveloped Areas | 8 | -- | -- | 29 | -- | 6 |
| Prefer Developed Areas | 8 | -- | -- | 14 | 9 | 6 |
| Have to Pay a Park Fee to Get Into the Park | 5 | -- | 20 | 14 | -- | -- |

TABLE 8. WHY ARE YOU UNABLE TO DO MORE HORSEBACK RIDING IN IOWA?

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|--|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | (29) | (2) | (4) | (4) | (7) | (12) |
| Limited Recreational Areas | 79 | -- | 75 | 100 | 86 | 83 |
| Don't Have the Equipment | 28 | 50 | 25 | 75 | 29 | 8 |
| Too Many Restrictions on Where to Ride | 7 | -- | 25 | -- | -- | 8 |

TABLE 9. WHY ARE YOU UNABLE TO DO MORE CANOEING IN IOWA?

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|-----------------------------|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | (15) | (1) | (-) | (3) | (5) | (6) |
| Limited Recreational Areas | 53 | 100 | -- | 67 | 60 | 33 |
| Don't Have the Equipment | 27 | -- | -- | 67 | 40 | -- |
| Water Level is Too Low | 13 | -- | -- | -- | 20 | 17 |
| Too Busy Doing Other Things | 7 | 100 | -- | -- | -- | -- |
| Limited Access to Rivers | 7 | -- | -- | -- | -- | 17 |
| Prefer Shallow, Clean Water | 7 | -- | -- | 33 | -- | -- |

TABLE 10. WHY ARE YOU UNABLE TO DO MORE BICYCLING IN IOWA?

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|-----------------------------|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (83) | (6) | (11) | (12) | (17) | (37) |
| Limited Recreational Areas | 83 | 50 | 91 | 92 | 82 | 84 |
| Too Busy Doing Other Things | 8 | -- | 9 | -- | 18 | 8 |
| Prefer Developed Areas | 5 | -- | -- | 17 | -- | 5 |

TABLE 11. WHY ARE YOU UNABLE TO DO MORE WALKING IN IOWA?

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|--|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (46) | (8) | (8) | (15) | (8) | (7) |
| Limited Recreational Areas | 67 | 63 | 75 | 60 | 88 | 57 |
| Too Busy Doing Other Things | 17 | 25 | 13 | 20 | 13 | 14 |
| Have to Pay a Park Fee to Get Into the Park | 9 | -- | 25 | 7 | -- | 14 |

TABLE 12.

OVERALL SATISFACTION WITH IOWA TRAILS

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---|-------------------|--|---------------|---------------|---------------|----------------|
| | | <u>Under 2</u> % | <u>2</u> % | <u>3</u> % | <u>4</u> % | <u>5+</u> % |
| | (500) | (71) | (100) | (103) | (100) | (126) |
| Very Satisfied (5) | 31 | 28 | 32 | 26 | 33 | 34 |
| Somewhat Satisfied (4) | 41 | 32 | 38 | 46 | 41 | 44 |
| Neither Satisfied Nor Dissatisfied (3) | 16 | 30 | 16 | 14 | 17 | 11 |
| Somewhat Dissatisfied (2) | 8 | 4 | 9 | 10 | 6 | 9 |
| Very Dissatisfied (1) | 2 | 3 | 1 | 2 | 3 | 2 |
| Average | 3.9 | 3.8 | 3.9 | 3.9 | 4.0 | 4.0 |

TABLE 13. IMPORTANCE OF IOWA INVESTING MORE RESOURCES TO IMPROVE OR PROVIDE AREAS FOR STATE TRAIL ACTIVITIES. (4 - VERY IMPORTANT; 1 - VERY UNIMPORTANT).

| <u>Response</u> (Base) | <u>Total</u> (500) | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---|-----------------------|--|-------------------|-------------------|-------------------|--------------------|
| | | <u>Under 2</u> (71) | <u>2</u> (100) | <u>3</u> (103) | <u>4</u> (100) | <u>5+</u> (126) |
| Walking near your home for recreation or exercise | 3.3 | 3.2 | 3.3 | 3.3 | 3.3 | 3.3 |
| Walking at a park, picnic area or other place away from home | 3.3 | 3.1 | 3.2 | 3.3 | 3.4 | 3.3 |
| Bicycling at a park, picnic area or bike trail away from home | 3.2 | 3.1 | 3.0 | 3.0 | 3.2 | 3.5 |
| Bicycling near home | 3.2 | 2.9 | 3.0 | 3.1 | 3.3 | 3.5 |
| Backpacking or hiking | 2.7 | 2.6 | 2.5 | 2.6 | 2.7 | 3.0 |
| Canoeing | 2.7 | 2.6 | 2.3 | 2.7 | 2.7 | 3.1 |
| Cross country skiing | 2.5 | 2.6 | 2.2 | 2.3 | 2.6 | 2.8 |
| Go horseback riding near home | 2.4 | 2.6 | 2.3 | 2.3 | 2.3 | 2.5 |
| Go horseback riding at a park or trail away from home | 2.4 | 2.7 | 2.3 | 2.3 | 2.4 | 2.5 |
| Snowmobiling | 2.1 | 2.2 | 1.9 | 2.0 | 1.9 | 2.3 |
| Driving an off road, motorized recreational vehicle | 2.0 | 2.2 | 1.8 | 2.0 | 1.9 | 2.0 |

TABLE 14. CHARACTERISTICS OF TRAILS THAT ENHANCE USER ENJOYMENT. (10 - MAKES TRAIL VERY ENJOYABLE; 0 - MAKES TRAIL NOT ENJOYABLE).

| <u>Response</u> (Base) | <u>Total</u> (500) | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|---|-----------------------|--|-------------------|-------------------|-------------------|--------------------|
| | | <u>Under 2</u> (71) | <u>2</u> (100) | <u>3</u> (103) | <u>4</u> (100) | <u>5+</u> (126) |
| Going through a variety of landscapes such as a river valley, bluff overlooks and wildlife refuges | 8.5 | 8.4 | 7.9 | 8.6 | 8.8 | 8.8 |
| The presence of water resources such as lakes, rivers, streams | 8.2 | 7.6 | 8.1 | 8.3 | 8.3 | 8.6 |
| Trail corridors separate from roadways | 7.8 | 7.1 | 7.5 | 7.8 | 8.0 | 8.3 |
| Going through or connecting outdoor recreational facilities such as a state or county park or lake resort | 7.6 | 7.5 | 7.2 | 7.7 | 7.6 | 7.7 |
| The presence of historical landmarks | 7.2 | 7.8 | 7.3 | 7.1 | 7.1 | 6.9 |
| Going through wooded, undeveloped areas | 6.8 | 5.6 | 6.2 | 6.7 | 7.1 | 7.9 |
| Going through or connecting communities/towns | 5.7 | 5.9 | 5.2 | 5.3 | 5.7 | 6.4 |
| Going through flat, open areas | 5.1 | 5.5 | 4.9 | 5.2 | 5.4 | 4.8 |
| Going through farmlands, agricultural areas | 4.7 | 4.6 | 3.9 | 4.9 | 5.0 | 4.9 |

TABLE 15. AIDED TRAIL AWARENESS

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (500) | (71) | (100) | (103) | (100) | (126) |
| Cedar Valley Nature Trail (Cedar Rapids to Waterloo) | 55 | 55 | 52 | 52 | 61 | 53 |
| Saylorville Trail (Along the Des Moines River) | 51 | 54 | 49 | 48 | 50 | 56 |
| Dubuque Heritage Trail (Dubuque to Dyersville) | 39 | 30 | 41 | 44 | 39 | 39 |
| Comet Trail (Grundy County: Holland to Reinbeck) | 2 | 6 | -- | -- | 1 | 3 |
| Aware of None | 18 | 20 | 19 | 18 | 14 | 17 |

TABLE 16. TRAIL PARTICIPATION

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | | % | % | % | % | % |
| | (500) | (71) | (100) | (103) | (100) | (126) |
| Cedar Valley Nature Trail (Cedar Rapids to Waterloo) | 11 | 3 | 5 | 9 | 18 | 16 |
| Dubuque Heritage Trail (Dubuque to Dyersville) | 6 | -- | 6 | 6 | 7 | 9 |
| Saylorville Trail (Along the Des Moines River) | 15 | 4 | 10 | 17 | 18 | 22 |
| Comet Trail (Grundy County: Holland to Reinbeck) | -- | -- | -- | -- | -- | -- |

TABLE 17. MEDIAN NUMBER OF MILES TRAVELED TO TRAILS

| <u>Response</u> | <u>Total</u> | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|---|--------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| Dubuque Heritage Trail (Dubuque to Dyersville) | 52.2 | --- | 34.3 | 80.0 | 27.0 | 65.0 |
| Saylorville Trail (Along the Des Moines River) | 29.3 | 50.5 | 30.5 | 27.0 | 30.5 | 29.2 |
| Cedar Valley Nature Trail (Cedar Rapids to Waterloo) | 14.1 | 4.5 | 3.3 | 11.3 | 27.3 | 21.7 |

TABLE 18. ACTIVITIES PARTICIPATED IN: CEDAR VALLEY TRAIL

| <u>Response</u> | <u>Total</u> | <u>Number of Trail Activities in Which Respondent Participated</u> | | | | |
|----------------------|--------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| <u>(Base)</u> | <u>%</u> | <u>%</u> | <u>%</u> | <u>%</u> | <u>%</u> | <u>%</u> |
| | (54) | (2) | (5) | (9) | (18) | (20) |
| Walking | 48 | 50 | 80 | 44 | 50 | 40 |
| Bicycling | 35 | -- | 20 | 33 | 22 | 55 |
| Backpacking/Hiking | 19 | -- | -- | 33 | 11 | 25 |
| Picnicking | 6 | 100 | -- | -- | 6 | -- |
| Jogging/Running | 4 | -- | -- | -- | -- | 10 |
| Horseback Riding | 2 | -- | -- | -- | -- | 5 |
| Camping | 2 | -- | -- | -- | 6 | -- |
| Cross Country Skiing | 2 | -- | -- | -- | 6 | -- |

TABLE 19. ACTIVITIES PARTICIPATED IN: DUBUQUE HERITAGE TRAIL

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---------------------------|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | (30) | (-) | (6) | (6) | (7) | (11) |
| Walking | 80 | -- | 83 | 100 | 71 | 73 |
| Bicycling | 33 | -- | -- | -- | 71 | 45 |
| Backpacking/Hiking | 13 | -- | -- | 17 | -- | 27 |
| Picnicking | 10 | -- | -- | -- | 14 | 18 |
| Camping | 3 | -- | -- | -- | -- | 9 |
| Cross Country Skiing | 3 | -- | -- | -- | -- | 9 |

TABLE 20. ACTIVITIES PARTICIPATED IN: SAYLORVILLE TRAIL

| <u>Response</u> (Base) | <u>Total</u> % | <u>Number of Trail Activities in</u> <u>Which Respondent Participated</u> | | | | |
|---------------------------|-------------------|--|----------|----------|----------|-----------|
| | | <u>Under 2</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5+</u> |
| | (77) | (3) | (10) | (18) | (18) | (28) |
| Walking | 62 | 67 | 70 | 67 | 67 | 54 |
| Bicycling | 30 | 33 | -- | 17 | 39 | 43 |
| Backpacking/Hiking | 13 | -- | 10 | 11 | 22 | 11 |
| Picnicking | 9 | 33 | -- | 17 | 6 | 7 |
| Boating | 8 | -- | 10 | 6 | 22 | -- |
| Fishing | 8 | -- | 20 | 17 | -- | 4 |
| Camping | 8 | -- | -- | 17 | 6 | 7 |
| Swimming | 3 | -- | -- | -- | 11 | -- |
| Horseback Riding | 1 | -- | 10 | -- | -- | -- |

APPENDIX D
SYNTHESIS OF INVENTORY DATA

APPENDIX D - SYNTHESIS OF INVENTORY DATA DEMOGRAPHIC/ECONOMIC RESOURCES

The demographic/economic resources figures and tables document and analyze the population and income figures for each county. Seven figures and four tables are used to illustrate and analyze the information.

1. **County Population.** The 1980 census figures are shown for each county in Table A-1. The table also separates the information into four divisions.

RANK #1 - 69,823 or more county population
RANK #2 - 28,816 to 69,882 county population
RANK #3 - 12,191 to 28,815 county population
RANK #4 - 12,190 or fewer county population

The average county population is 28,816.2 people and 22 counties exceed the average, led by Polk County with a population of 315,800. Nine counties are above 69,823, 13 have between 28,816 and 69,822 people, 51 counties have between 12,191 and 28,815 people and 26 counties have 12,190 people or fewer. Figure A-1 shows the individual counties.

2. **Projected County Population Growth, 1980 to 1995.** Table A-2 lists the projected population and percentage of growth per county from 1980 to 1995. The counties are separated into four divisions based upon the projected growth rate.

RANK #1 - 10 percent or greater growth rate
RANK #2 - 4 to 9.99 percent growth rate
RANK #3 - minus 4 percent to plus 3.99 percent growth rate
RANK #4 - minus 4 percent or below growth rate

The average projected growth is 1.99 percent and 48 counties are projected to exceed the average, led by Muscatine, Wright and Johnson Counties with 37.94 percent, 25.79 percent and 23.54 percent, respectively. Thirty-two counties are projected to have negative growth with 10 counties projected at a 10 percent or greater loss. Figure A-2 shows the individual counties.

3. **Number of Families.** Table A-3 lists the number of families in each county and separates the counties into four divisions based upon those numbers.

RANK #1 - 19,001 or more families per county
RANK #2 - 8,000 to 19,000 families per county
RANK #3 - 3,000 to 7,999 families per county
RANK #4 - 2,999 or fewer families per county

The county average is 7,525 families and 21 counties exceed the average. Seven counties have over 19,001 families, 14 have between 8,000 and 19,000 families, 66 have 3,000 to 7,999 families and 12 have fewer than 2,999 families. Figure A-3 shows the individual counties.

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|-----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winneshago |
| 6 | Benton | 21 | Clay | 36 | Frederick | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshiek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

RECREATIONAL TRAILS PLAN

| | | | | | | | | | | | |
|---------------------|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| COUNTY NUMBER | | 35 | 54 | 13 | 58 | 32 | 74 | 46 | 66 | 39 | 37 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| COUNTY POPULATION | | 12,300 | 12,300 | 12,200 | 12,000 | 11,900 | 11,700 | 11,600 | 11,600 | 11,400 | 11,200 |
| RANK= | | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | | | | | | | | | |
| COUNTY NUMBER | | 76 | 45 | 67 | 59 | 26 | 27 | 36 | 47 | 1 | 98 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| COUNTY POPULATION | | 10,900 | 10,600 | 10,600 | 9,800 | 8,900 | 8,900 | 8,900 | 8,900 | 8,800 | 8,800 |
| RANK= | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| | | | | | | | | | | | |
| COUNTY NUMBER | | 20 | 68 | 89 | 5 | 72 | 87 | 93 | 80 | 2 | |
| EVALUATION CRITERIA | | | | | | | | | | | |
| COUNTY POPULATION | | 8,600 | 8,600 | 8,200 | 7,900 | 7,900 | 7,800 | 7,400 | 5,600 | 5,400 | - |
| RANK= | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | |

| | | | | | | | | | | | |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|---------------|
| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawattamie |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello |

TABLE A-1

COUNTY POPULATION
(CONT.)

D-3

STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 Inlio Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax (612) 332-6180

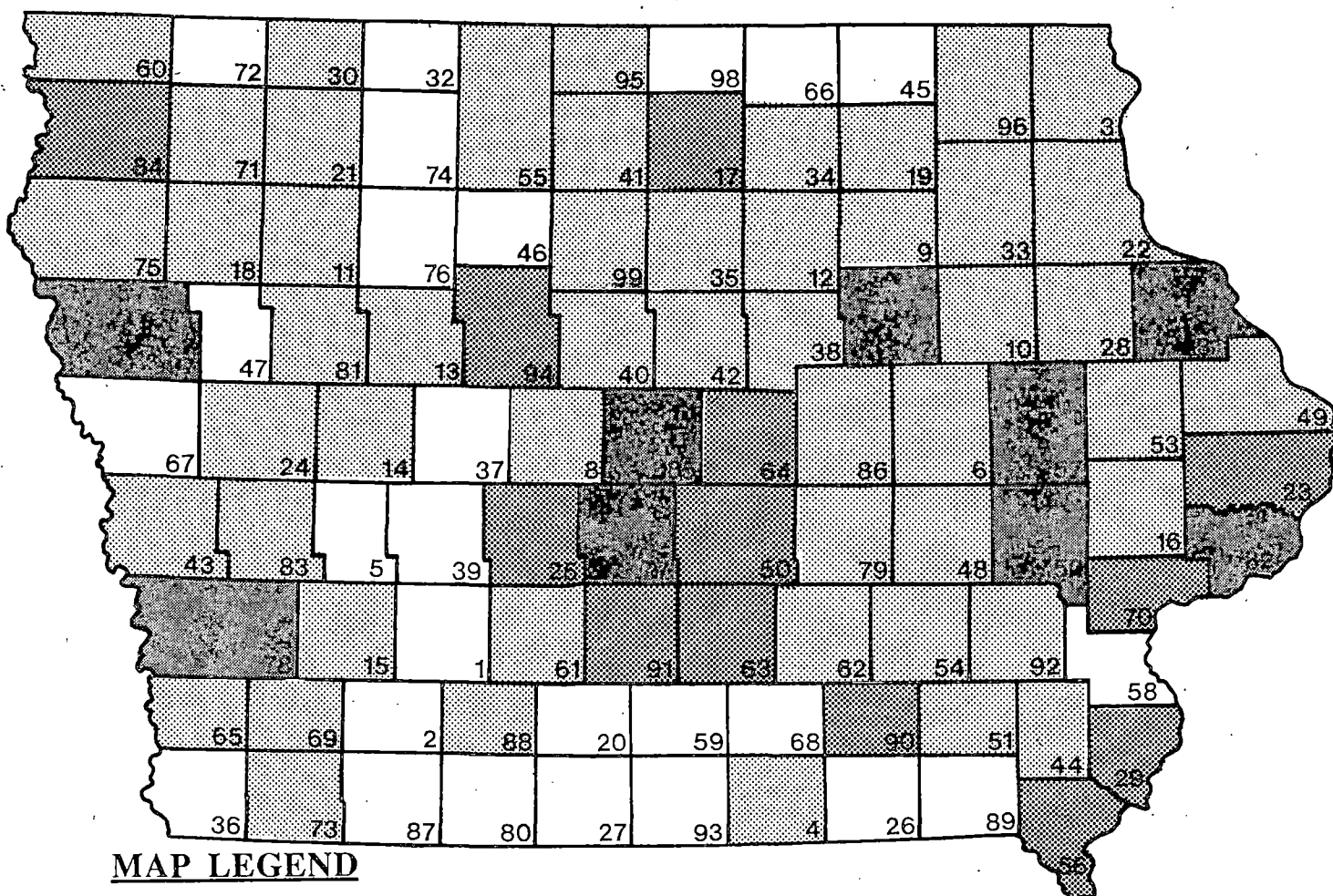


K&W
KIRCHHAM, MICHAEL AND ASSOCIATES
Architects/Engineers/Planners
One Adams Drive, Suite 115, 1422 2nd Street
West Des Moines, Iowa 50265 (515) 223-1051
FAX (515) 223-1051



PUNBAR/JONES
IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 4 | 1 | Adair | 4 | 26 | Davis | 3 | 51 | Jefferson | 4 | 76 | Pocahontas | COUNTY POPULATION 1980 CENSUS |
| 4 | 2 | Adams | 4 | 27 | Decatur | 1 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 69,823 or more |
| 3 | 3 | Allamakee | 3 | 28 | Delaware | 3 | 53 | Jones | 1 | 78 | Pottawatomie | RANK #2- 28,816 to 69,822 |
| 3 | 4 | Appanoose | 2 | 29 | Des Moines | 3 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- 12,191 to 28,815 |
| 4 | 5 | Audubon | 3 | 30 | Dickinson | 3 | 55 | Kossuth | 4 | 80 | Ringgold | RANK #4- 12,190 or fewer |
| 3 | 6 | Benton | 1 | 31 | Dubuque | 2 | 56 | Lee | 3 | 81 | Sac | See accompanying table for complete listing. |
| 1 | 7 | Black Hawk | 4 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | |
| 3 | 8 | Boone | 3 | 33 | Fayette | 4 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 4 | 59 | Lucas | 2 | 84 | Sioux | |
| 3 | 10 | Buchanan | 3 | 35 | Franklin | 3 | 60 | Lyon | 1 | 85 | Story | |
| 3 | 11 | Buena Vista | 4 | 36 | Fremont | 3 | 61 | Madison | 3 | 86 | Tama | |
| 3 | 12 | Butler | 4 | 37 | Greene | 3 | 62 | Mahaska | 4 | 87 | Taylor | |
| 3 | 13 | Calhoun | 3 | 38 | Grundy | 2 | 63 | Marion | 3 | 88 | Union | |
| 3 | 14 | Carroll | 4 | 39 | Guthrie | 2 | 64 | Marshall | 4 | 89 | Van Buren | |
| 3 | 15 | Cass | 3 | 40 | Hamilton | 3 | 65 | Mills | 2 | 90 | Wapello | |
| 3 | 16 | Cedar | 3 | 41 | Hancock | 4 | 66 | Mitchell | 2 | 91 | Warren | |
| 2 | 17 | Cerro Gordo | 3 | 42 | Hardin | 4 | 67 | Monona | 3 | 92 | Washington | |
| 3 | 18 | Cherokee | 3 | 43 | Harrison | 4 | 68 | Monroe | 4 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 3 | 44 | Henry | 3 | 69 | Montgomery | 2 | 94 | Webster | |
| 4 | 20 | Clarke | 4 | 45 | Howard | 2 | 70 | Muscatine | 3 | 95 | Winnebago | |
| 3 | 21 | Clay | 4 | 46 | Humboldt | 3 | 71 | O'Brien | 3 | 96 | Winneshiek | |
| 3 | 22 | Clayton | 4 | 47 | Ida | 4 | 72 | Osceola | 1 | 97 | Woodbury | |
| 2 | 23 | Clinton | 3 | 48 | Iowa | 3 | 73 | Page | 4 | 98 | Worth | |
| 3 | 24 | Crawford | 3 | 49 | Jackson | 4 | 74 | Palo Alto | 3 | 99 | Wright | |
| 2 | 25 | Dallas | 2 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-1 COUNTY POPULATION STATE OF IOWA RECREATIONAL TRAILS PLAN

Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

KIRKHAM MICHAEL AND ASSOCIATES 111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

DUNBAR/JONES
PARTNERSHIP
ENVIRONMENTAL PLANNING WITH A HUMAN RESPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



D-4

| COUNTY NUMBER | 70 | 99 | 52 | 9 | 30 | 21 | 11 | 14 |
|-------------------------------|---------|--------|---------|--------|--------|---------|--------|--------|
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 41,300 | 15,200 | 85,300 | 23,900 | 15,200 | 18,300 | 20,500 | 22,500 |
| PROJECTED 1995 CO. POPULATION | 56,970 | 19,120 | 105,380 | 28,180 | 17,650 | 21,100 | 23,420 | 25,570 |
| POPULATION CHANGE 1980-1995 | 15,670 | 3,920 | 20,080 | 4,280 | 2,450 | 2,800 | 2,920 | 3,070 |
| % POPULATION CHANGE 1980-1995 | 37.94% | 25.79% | 23.54% | 17.91% | 16.12% | 15.30% | 14.24% | 13.64% |
| RANK= | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| AVERAGE= | 1.99% | | | | | | | |
| STANDARD DEVIATION= | 9.13% | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| COUNTY NUMBER | 82 | 44 | 51 | 40 | 85 | 7 | 19 | 91 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 156,900 | 18,600 | 16,500 | 17,000 | 72,500 | 127,600 | 14,800 | 35,800 |
| PROJECTED 1995 CO. POPULATION | 176,970 | 20,900 | 18,420 | 18,860 | 80,150 | 141,030 | 16,320 | 39,450 |
| POPULATION CHANGE 1980-1995 | 20,070 | 2,300 | 1,920 | 1,860 | 7,650 | 13,430 | 1,520 | 3,650 |
| % POPULATION CHANGE 1980-1995 | 12.79% | 12.37% | 11.64% | 10.94% | 10.55% | 10.53% | 10.27% | 10.20% |
| RANK= | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| | | | | | | | | |
| | | | | | | | | |
| COUNTY NUMBER | 65 | 63 | 24 | 10 | 20 | 73 | 12 | 26 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 13,400 | 29,700 | 18,700 | 21,900 | 8,600 | 17,700 | 16,700 | 8,900 |
| PROJECTED 1995 CO. POPULATION | 14,720 | 32,530 | 20,400 | 23,770 | 9,330 | 19,070 | 17,880 | 9,480 |
| POPULATION CHANGE 1980-1995 | 1,320 | 2,830 | 1,700 | 1,870 | 730 | 1,370 | 1,180 | 580 |
| % POPULATION CHANGE 1980-1995 | 9.85% | 9.53% | 9.09% | 8.54% | 8.49% | 7.74% | 7.07% | 6.52% |
| RANK= | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | |
| | | | | | | | | |
| COUNTY NUMBER | 75 | 38 | 15 | 71 | 41 | 42 | 69 | 62 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 23,900 | 13,200 | 16,100 | 16,000 | 13,300 | 20,800 | 12,600 | 22,300 |
| PROJECTED 1995 CO. POPULATION | 25,430 | 14,010 | 16,920 | 16,790 | 13,920 | 21,700 | 13,130 | 23,210 |
| POPULATION CHANGE 1980-1995 | 1,530 | 810 | 820 | 790 | 620 | 900 | 530 | 910 |
| % POPULATION CHANGE 1980-1995 | 6.40% | 6.14% | 5.09% | 4.94% | 4.66% | 4.33% | 4.21% | 4.08% |
| RANK= | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|---------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawattamie |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lec | 71 | O'Brien | 86 | Tama |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello |

TABLE A-2

PROJECTED COUNTY POPULATION
GROWTH, 1980 TO 1995

D-5

STATE OF IOWA RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 First Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax (612) 332-6180



One Green Office Building, Suite 115, 1457 2nd Street
West Des Moines, Iowa 50265 (515) 281-0027
ARCHITECTS ENGINEERS PLANNERS (SINCE 1965) DESIGN GROUP



1100 West 1st St., Des Moines, IA 50319-0001

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS

| COUNTY NUMBER | 58 | 88 | 79 | 1 | 55 | 53 | 98 | 33 |
|-------------------------------|---------|--------|--------|--------|--------|---------|--------|--------|
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 12,000 | 13,200 | 18,700 | 8,800 | 20,300 | 20,000 | 8,800 | 23,500 |
| PROJECTED 1995 CO. POPULATION | 12,470 | 13,710 | 19,410 | 9,120 | 21,020 | 20,670 | 9,090 | 24,270 |
| POPULATION CHANGE 1980-1995 | 470 | 510 | 710 | 320 | 720 | 670 | 290 | 770 |
| % POPULATION CHANGE 1980-1995 | 3.92% | 3.86% | 3.80% | 3.64% | 3.55% | 3.35% | 3.30% | 3.28% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 13 | 18 | 92 | 16 | 67 | 64 | 95 | 72 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 12,200 | 15,200 | 19,800 | 18,500 | 10,600 | 40,500 | 12,700 | 7,900 |
| PROJECTED 1995 CO. POPULATION | 12,580 | 15,630 | 20,360 | 19,020 | 10,890 | 41,480 | 12,990 | 8,080 |
| POPULATION CHANGE 1980-1995 | 380 | 430 | 560 | 520 | 290 | 980 | 290 | 180 |
| % POPULATION CHANGE 1980-1995 | 3.11% | 2.83% | 2.83% | 2.81% | 2.74% | 2.42% | 2.28% | 2.28% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 45 | 27 | 74 | 46 | 66 | 77 | 97 | 96 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 10,600 | 8,900 | 11,700 | 11,600 | 11,600 | 315,800 | 98,600 | 22,000 |
| PROJECTED 1995 CO. POPULATION | 10,800 | 9,060 | 11,890 | 11,780 | 11,760 | 320,040 | 99,880 | 22,250 |
| POPULATION CHANGE 1980-1995 | 200 | 160 | 190 | 180 | 160 | 4,240 | 1,280 | 250 |
| % POPULATION CHANGE 1980-1995 | 1.89% | 1.80% | 1.62% | 1.55% | 1.38% | 1.34% | 1.30% | 1.14% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 6 | 61 | 56 | 34 | 17 | 50 | 84 | 78 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 22,700 | 12,400 | 41,300 | 18,600 | 48,800 | 35,900 | 32,500 | 88,000 |
| PROJECTED 1995 CO. POPULATION | 22,830 | 12,470 | 41,440 | 18,650 | 48,930 | 35,990 | 32,580 | 88,200 |
| POPULATION CHANGE 1980-1995 | 130 | 70 | 140 | 50 | 130 | 90 | 80 | 200 |
| % POPULATION CHANGE 1980-1995 | 0.57% | 0.56% | 0.34% | 0.27% | 0.27% | 0.25% | 0.25% | 0.23% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 57 | 35 | 47 | 68 | 2 | 49 | 22 | 48 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 168,800 | 12,300 | 8,900 | 8,600 | 5,400 | 22,100 | 20,700 | 15,000 |
| PROJECTED 1995 CO. POPULATION | 168,920 | 12,300 | 8,900 | 8,590 | 5,380 | 22,010 | 20,610 | 14,920 |
| POPULATION CHANGE 1980-1995 | 120 | 0 | 0 | -10 | -20 | -90 | -90 | -80 |
| % POPULATION CHANGE 1980-1995 | 0.07% | 0.00% | 0.00% | -0.12% | -0.37% | -0.41% | -0.43% | -0.53% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| | | | | | | | |
|----------------|----------------|-------------|--------------|---------------|------------------|---------------|------------|
| NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY |
| 1 Adair | 16 Cedar | 31 Dubuque | 46 Humboldt | 61 Madison | 76 Pocahontas | 91 Warren | |
| 2 Adams | 17 Cerro Gordo | 32 Emmet | 47 Ida | 62 Mahaska | 77 Polk | 92 Washington | |
| 3 Allamakee | 18 Cherokee | 33 Fayette | 48 Iowa | 63 Marion | 78 Pottawattamie | 93 Wayne | |
| 4 Appanoose | 19 Chickasaw | 34 Floyd | 49 Jackson | 64 Marshall | 79 Poweshiek | 94 Webster | |
| 5 Audubon | 20 Clarke | 35 Franklin | 50 Jasper | 65 Mills | 80 Ringgold | 95 Winnebago | |
| 6 Benton | 21 Clay | 36 Fremont | 51 Jefferson | 66 Mitchell | 81 Sac | 96 Winneshiek | |
| 7 Black Hawk | 22 Clayton | 37 Greene | 52 Johnson | 67 Monona | 82 Scott | 97 Woodbury | |
| 8 Boone | 23 Clinton | 38 Grundy | 53 Jones | 68 Monroe | 83 Shelby | 98 Worth | |
| 9 Bremer | 24 Crawford | 39 Guthrie | 54 Keokuk | 69 Montgomery | 84 Sioux | 99 Wright | |
| 10 Buchanan | 25 Dallas | 40 Hamilton | 55 Kosciusko | 70 Muscatine | 85 Story | | |
| 11 Buena Vista | 26 Davis | 41 Hancock | 56 Lee | 71 O'Brien | 86 Tama | | |
| 12 Butler | 27 Decatur | 42 Hardin | 57 Linn | 72 Osceola | 87 Taylor | | |
| 13 Calhoun | 28 Delaware | 43 Harrison | 58 Louisa | 73 Page | 88 Union | | |
| 14 Carroll | 29 Des Moines | 44 Henry | 59 Lucas | 74 Palo Alto | 89 Van Buren | | |
| 15 Cass | 30 Dickinson | 45 Howard | 60 Lyon | 75 Plymouth | 90 Wapello | | |

TABLE A-2

PROJECTED COUNTY POPULATION
GROWTH, 1980 TO 1995
(CONT.)

D-6

STATE OF IOWA RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180



K&W Associates, Inc.
Blue Creek Office Building, Suite 110, 1432 20th Street
West Des Moines, Iowa 50265 (515) 223-1081



PURRAR JONES ASSOCIATES, INC.
1000 Kinnick Drive, Des Moines, Iowa 50319
IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS

| | | | | | | | | |
|-------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|
| COUNTY NUMBER | 8 | 93 | 25 | 23 | 31 | 83 | 28 | 3 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 25,700 | 7,400 | 29,800 | 53,600 | 91,100 | 14,400 | 19,100 | 15,100 |
| PROJECTED 1995 CO. POPULATION | 25,540 | 7,320 | 29,400 | 52,390 | 88,810 | 14,010 | 18,500 | 14,620 |
| POPULATION CHANGE 1980-1995 | -160 | -80 | -400 | -1,210 | -2,290 | -390 | -600 | -480 |
| % POPULATION CHANGE 1980-1995 | -0.62% | -1.08% | -1.34% | -2.26% | -2.51% | -2.71% | -3.14% | -3.18% |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 54 | 32 | 76 | 90 | 86 | 39 | 29 | 89 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 12,300 | 11,900 | 10,900 | 38,000 | 18,800 | 11,400 | 44,600 | 8,200 |
| PROJECTED 1995 CO. POPULATION | 11,880 | 11,200 | 10,250 | 35,620 | 17,540 | 10,490 | 40,940 | 7,460 |
| POPULATION CHANGE 1980-1995 | -420 | -700 | -650 | -2,380 | -1,260 | -910 | -3,660 | -740 |
| % POPULATION CHANGE 1980-1995 | -3.41% | -5.88% | -5.96% | -6.26% | -6.70% | -7.98% | -8.21% | -9.02% |
| RANK= | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| COUNTY NUMBER | 60 | 87 | 94 | 37 | 59 | 80 | 81 | 4 |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 12,500 | 7,800 | 42,700 | 11,200 | 9,800 | 5,600 | 12,800 | 14,300 |
| PROJECTED 1995 CO. POPULATION | 11,330 | 6,930 | 37,930 | 9,840 | 8,510 | 4,810 | 10,850 | 12,000 |
| POPULATION CHANGE 1980-1995 | -1,170 | -870 | -4,770 | -1,360 | -1,290 | -790 | -1,950 | -2,300 |
| % POPULATION CHANGE 1980-1995 | -9.36% | -11.15% | -11.17% | -12.14% | -13.16% | -14.11% | -15.23% | -16.08% |
| RANK= | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| COUNTY NUMBER | 5 | 43 | 36 | | | | | |
| EVALUATION CRITERIA | | | | | | | | |
| COUNTY POPULATION 1980 CENSUS | 7,900 | 15,800 | 8,900 | | | | | |
| PROJECTED 1995 CO. POPULATION | 6,590 | 13,120 | 7,080 | | | | | |
| POPULATION CHANGE 1980-1995 | -1,310 | -2,680 | -1,820 | | | | | |
| % POPULATION CHANGE 1980-1995 | -16.58% | -16.96% | -20.45% | | | | | |
| RANK= | 4 | 4 | 4 | | | | | |

| | | | | | | | |
|-----------------|-----------------|--------------|---------------|----------------|------------------|----------------|------------|
| NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY |
| 1. Adair | 16. Cedar | 31. Dubuque | 46. Humboldt | 61. Madison | 76. Pocahontas | 91. Warren | |
| 2. Adams | 17. Cerro Gordo | 32. Emmet | 47. Ida | 62. Mahaska | 77. Polk | 92. Washington | |
| 3. Allamakee | 18. Cherokee | 33. Fayette | 48. Iowa | 63. Marion | 78. Pottawatomie | 93. Wayne | |
| 4. Appanoose | 19. Chickasaw | 34. Floyd | 49. Jackson | 64. Marshall | 79. Poweshiek | 94. Webster | |
| 5. Audubon | 20. Clarke | 35. Franklin | 50. Jasper | 65. Mills | 80. Ringgold | 95. Winnebago | |
| 6. Benton | 21. Clay | 36. Fremont | 51. Jefferson | 66. Mitchell | 81. Sac | 96. Winneshiek | |
| 7. Black Hawk | 22. Clayton | 37. Greene | 52. Johnson | 67. Monona | 82. Scott | 97. Woodbury | |
| 8. Boone | 23. Clinton | 38. Grundy | 53. Jones | 68. Monroe | 83. Shelby | 98. Worth | |
| 9. Bremer | 24. Crawford | 39. Guthrie | 54. Keokuk | 69. Montgomery | 84. Sioux | 99. Wright | |
| 10. Buchanan | 25. Dallas | 40. Hamilton | 55. Kossuth | 70. Muscatine | 85. Story | | |
| 11. Buena Vista | 26. Davis | 41. Hancock | 56. Lee | 71. O'Brien | 86. Tama | | |
| 12. Butler | 27. Decatur | 42. Hardin | 57. Linn | 72. Osceola | 87. Taylor | | |
| 13. Calhoun | 28. Delaware | 43. Harrison | 58. Louisa | 73. Page | 88. Union | | |
| 14. Carroll | 29. Des Moines | 44. Henry | 59. Lucas | 74. Palo Alto | 89. Van Buren | | |
| 15. Cass | 30. Dickinson | 45. Howard | 60. Lyon | 75. Plymouth | 90. Wapello | | |

TABLE A-2

PROJECTED COUNTY POPULATION
GROWTH, 1980 TO 1995
(CONT.)

D-7

STATE OF IOWA RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

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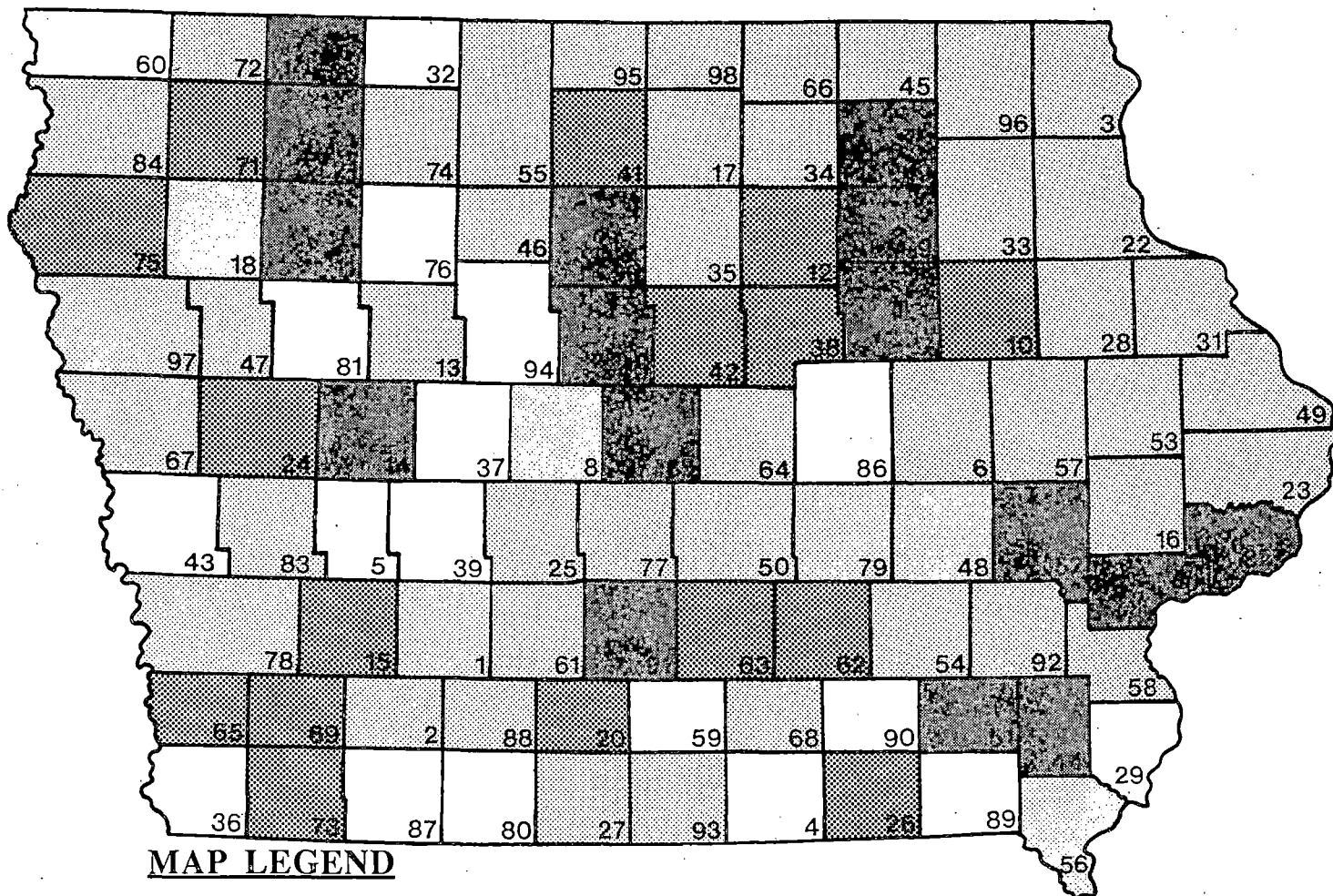
K&M KIRKHAM, MICHAEL, AND ASSOCIATES ARCHITECTS ENGINEERS PLANNERS ONE HOME DRIVE DELTA



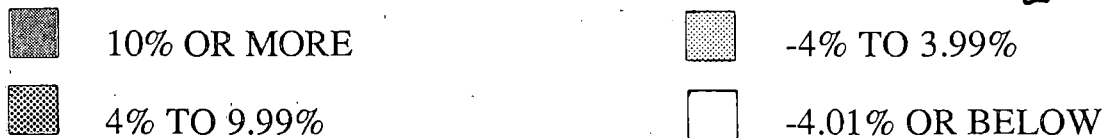
IOWA DEPARTMENT OF TRANSPORTATION

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT

IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 3 | 1 | Adair | 2 | 26 | Davis | 1 | 51 | Jefferson | 4 | 76 | Pocahontas | PROJECTED POPULATION GROWTH, 1980 TO 1995 |
| 3 | 2 | Adams | 3 | 27 | Decatur | 1 | 52 | Johnson | 3 | 77 | Polk | RANK #1- 10% or more |
| 3 | 3 | Allamakee | 3 | 28 | Delaware | 3 | 53 | Jones | 3 | 78 | Pottawatomie | RANK #2- 4% to 9.99% |
| 4 | 4 | Appanoose | 4 | 29 | Des Moines | 3 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- -3.99% to 3.99% |
| 4 | 5 | Audubon | 1 | 30 | Dickinson | 3 | 55 | Kossuth | 4 | 80 | Ringgold | RANK #4- -4% or greater |
| 3 | 6 | Benton | 3 | 31 | Dubuque | 3 | 56 | Lee | 4 | 81 | Sac | See accompanying table for complete figures. |
| 1 | 7 | Black Hawk | 4 | 32 | Emmet | 3 | 57 | Linn | 1 | 82 | Scott | |
| 3 | 8 | Boone | 3 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | |
| 1 | 9 | Bremer | 3 | 34 | Floyd | 4 | 59 | Lucas | 3 | 84 | Sioux | |
| 2 | 10 | Buchanan | 3 | 35 | Franklin | 4 | 60 | Lyon | 1 | 85 | Story | |
| 1 | 11 | Buena Vista | 4 | 36 | Fremont | 3 | 61 | Madison | 4 | 86 | Tama | |
| 2 | 12 | Butler | 4 | 37 | Greene | 2 | 62 | Mahaska | 4 | 87 | Taylor | |
| 3 | 13 | Calhoun | 2 | 38 | Grundy | 2 | 63 | Marion | 3 | 88 | Union | |
| 1 | 14 | Carroll | 4 | 39 | Guthrie | 3 | 64 | Marshall | 4 | 89 | Van Buren | |
| 2 | 15 | Cass | 1 | 40 | Hamilton | 2 | 65 | Mills | 4 | 90 | Wapello | |
| 3 | 16 | Cedar | 2 | 41 | Hancock | 3 | 66 | Mitchell | 1 | 91 | Warren | |
| 3 | 17 | Cerro Gordo | 2 | 42 | Hardin | 3 | 67 | Monona | 3 | 92 | Washington | |
| 3 | 18 | Cherokee | 4 | 43 | Harrison | 3 | 68 | Monroe | 3 | 93 | Wayne | |
| 1 | 19 | Chickasaw | 1 | 44 | Henry | 2 | 69 | Montgomery | 4 | 94 | Webster | |
| 2 | 20 | Clarke | 3 | 45 | Howard | 1 | 70 | Muscatine | 3 | 95 | Winnebago | |
| 1 | 21 | Clay | 3 | 46 | Humboldt | 2 | 71 | O'Brien | 3 | 96 | Winneshick | |
| 3 | 22 | Clayton | 3 | 47 | Ida | 3 | 72 | Osceola | 3 | 97 | Woodbury | |
| 3 | 23 | Clinton | 3 | 48 | Iowa | 2 | 73 | Page | 3 | 98 | Worth | |
| 2 | 24 | Crawford | 3 | 49 | Jackson | 3 | 74 | Palo Alto | 1 | 99 | Wright | |
| 3 | 25 | Dallas | 3 | 50 | Jasper | 2 | 75 | Plymouth | | | | |

FIGURE A-2

PROJECTED COUNTY POPULATION GROWTH, 1980 TO 1995

STATE OF IOWA RECREATIONAL TRAILS PLAN



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K&M CONSULTING, INC.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180



PUNBAR/JONES
ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

D-8

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



| | | | | | | | | | | | | | | | | | | | | |
|---------------------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | | 77 | 57 | 82 | 7 | 97 | 78 | 31 | 52 | 85 | 23 | 17 | 29 | 64 | 56 | 94 | 90 | 91 | 50 | 25 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 84 | 44 | 41 | 33 | 26 | 24 | 22 | 19 | 16 | 14 | 13 | 12 | 11 | 11 | 11 | 11 | 10 | 10 | 8 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| AVERAGE= | 7.5253 | | | | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 10.717 | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 63 | 84 | 8 | 11 | 42 | 14 | 6 | 75 | 9 | 33 | 49 | 10 | 22 | 62 | 40 | 16 | 21 | 15 | 86 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 8 | 8 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 |
| RANK= | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 24 | 44 | 55 | 92 | 79 | 12 | 34 | 53 | 28 | 96 | 73 | 99 | 30 | 70 | 48 | 38 | 18 | 19 | 41 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 88 | 69 | 81 | 71 | 83 | 43 | 65 | 51 | 3 | 4 | 36 | 95 | 35 | 66 | 46 | 76 | 13 | 37 | 67 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 54 | 74 | 32 | 39 | 61 | 45 | 58 | 59 | 60 | 20 | 26 | 98 | 72 | 5 | 47 | 68 | 2 | 1 | 93 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| COUNTY NUMBER | | 87 | 80 | 89 | 27 | | | | | | | | | | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF FAMILIES (THOU) | | 2 | 2 | 2 | 2 | | | | | | | | | | | | | | | |
| RANK= | | 4 | 4 | 4 | 4 | | | | | | | | | | | | | | | |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshiek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-3
NUMBER OF FAMILIES
D-9 STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

111 First Avenue South, Suite 200, Phoenix, Arizona 85001
 Minneapolis, Minnesota 55401 Fax: (612) 332-6180

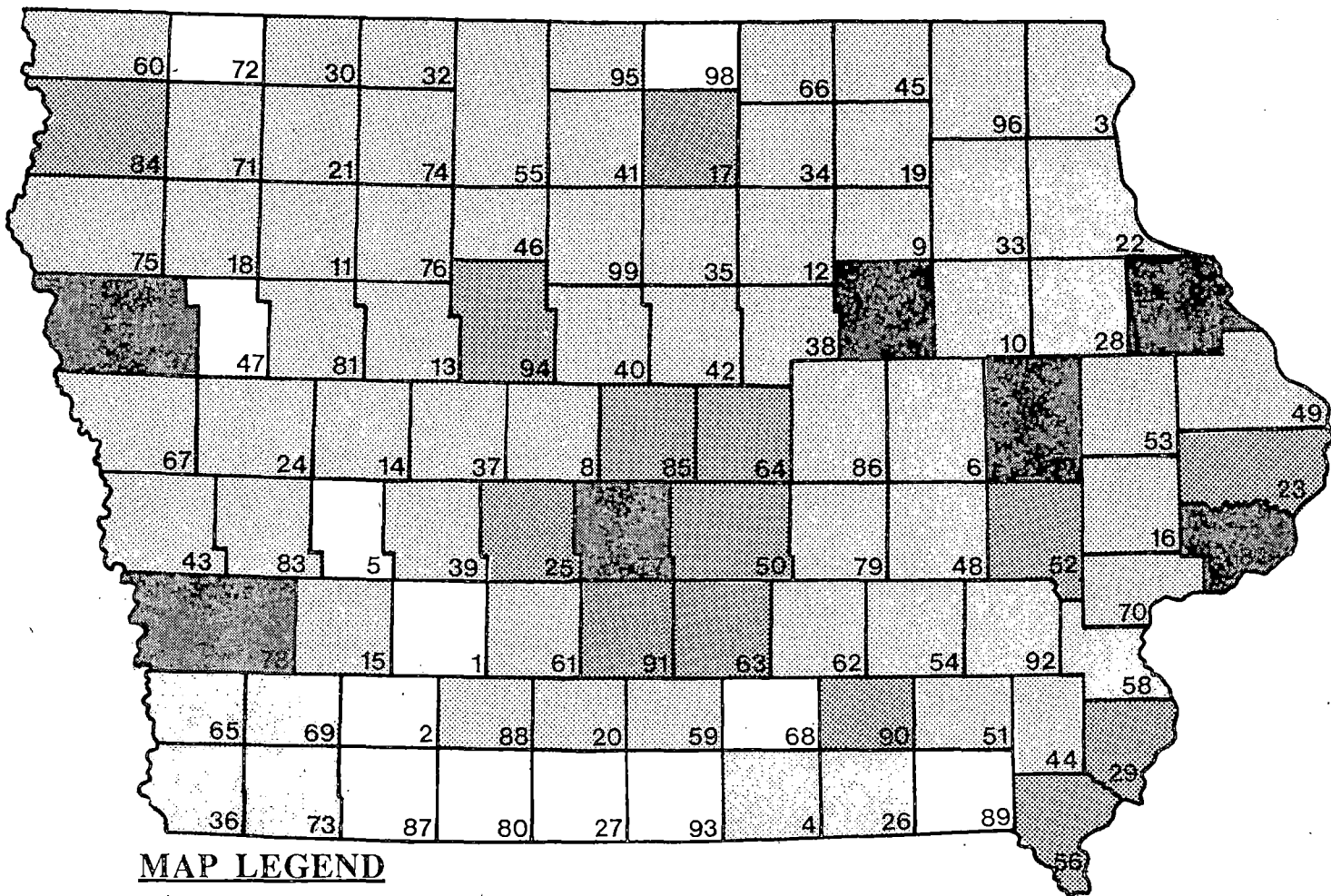


K&M CONSULTING
 111 First Avenue South, Suite 200, Phoenix, Arizona 85001
 Minneapolis, Minnesota 55401 Fax: (612) 332-6180

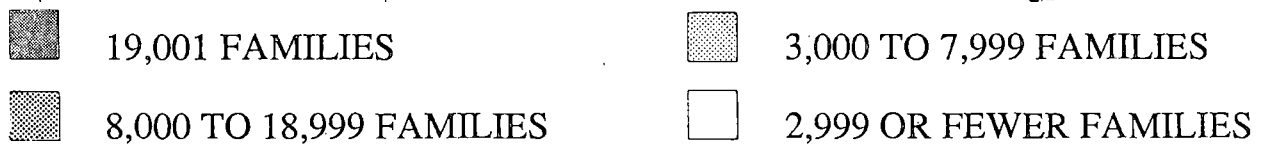


IOWA DEPARTMENT OF TRANSPORTATION
 IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
 IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 4 | 1 | Adair | 3 | 26 | Davis | 3 | 51 | Jefferson | 3 | 76 | Pocahontas | NUMBER OF FAMILIES PER COUNTY |
| 4 | 2 | Adams | 4 | 27 | Decatur | 2 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 19,001 or more |
| 3 | 3 | Allamakee | 3 | 28 | Delaware | 3 | 53 | Jones | 1 | 78 | Pottawatomie | RANK #2- 8,000 to 19,000 |
| 3 | 4 | Appanoose | 2 | 29 | Des Moines | 3 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- 3,000 to 7,999 |
| 4 | 5 | Audubon | 3 | 30 | Dickinson | 3 | 55 | Kossuth | 4 | 80 | Ringgold | RANK #4- 2,999 or fewer |
| 3 | 6 | Benton | 1 | 31 | Dubuque | 2 | 56 | Lee | 3 | 81 | Sac | |
| 1 | 7 | Black Hawk | 3 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | See accompanying table for complete figures. |
| 3 | 8 | Boone | 3 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 3 | 59 | Lucas | 2 | 84 | Sioux | |
| 3 | 10 | Buchanan | 3 | 35 | Franklin | 3 | 60 | Lyon | 2 | 85 | Story | |
| 3 | 11 | Buena Vista | 3 | 36 | Fremont | 3 | 61 | Madison | 3 | 86 | Tama | |
| 3 | 12 | Butler | 3 | 37 | Greene | 3 | 62 | Mahaska | 4 | 87 | Taylor | |
| 3 | 13 | Calhoun | 3 | 38 | Grundy | 2 | 63 | Marion | 3 | 88 | Union | |
| 3 | 14 | Carroll | 3 | 39 | Guthrie | 2 | 64 | Marshall | 4 | 89 | Van Buren | |
| 3 | 15 | Cass | 3 | 40 | Hamilton | 3 | 65 | Mills | 2 | 90 | Wapello | |
| 3 | 16 | Cedar | 3 | 41 | Hancock | 3 | 66 | Mitchell | 2 | 91 | Warren | |
| 2 | 17 | Cerro Gordo | 3 | 42 | Hardin | 3 | 67 | Monona | 3 | 92 | Washington | |
| 3 | 18 | Cherokee | 3 | 43 | Harrison | 4 | 68 | Monroe | 4 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 3 | 44 | Henry | 3 | 69 | Montgomery | 2 | 94 | Webster | |
| 3 | 20 | Clarke | 3 | 45 | Howard | 3 | 70 | Muscatine | 3 | 95 | Winnebago | |
| 3 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 3 | 96 | Winneshiek | |
| 3 | 22 | Clayton | 4 | 47 | Ida | 4 | 72 | Osceola | 1 | 97 | Woodbury | |
| 2 | 23 | Clinton | 3 | 48 | Iowa | 3 | 73 | Page | 4 | 98 | Worth | |
| 3 | 24 | Crawford | 3 | 49 | Jackson | 3 | 74 | Palo Alto | 3 | 99 | Wright | |
| 2 | 25 | Dallas | 2 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-3

NUMBER OF FAMILIES

STATE OF IOWA

RECREATIONAL TRAILS PLAN

Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

KW KIRKHAM, MICHAEL AND ASSOCIATES ARCHITECTS/ENGINEERS/PLANNERS, DESIGN/CONSTRUCTION

DUNBAR/JONES PARTNERSHIP ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

D-10

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



4. **Per Capita Income.** Table A-4 lists the per capita income for each county. The table also separates the income into four divisions.

RANK #1 - \$10,594 or more per capita income
RANK #2 - \$9,711 to \$10,593 per capita income
RANK #3 - \$8,828 to \$9,710 per capita income
RANK #4 - \$8,827 or less per capita income

The average per capita income is \$9,710.60 per county and 51 counties exceed the average. Fourteen counties exceed \$10,594 while 16 are below \$8,827. Figure A-4 shows the individual counties.

5. **Demographic/Economic Resources.** Figure A-5 combines the information from Tables A-1, A-2, A-3 and A-4 and the information from Figures A-1, A-2, A-3 and A-4. The combined information is used to separate the counties into three divisions based upon the demographic/economic resources in each county.

RANK #1 - Those counties with one or more of the following:

1. 69,823 or more population
2. 10 percent or greater projected growth
3. 19,001 or more families
4. \$10,594 or more per capita income

RANK #2 - Those counties with one or more of the following:

1. 28,816 to 69,822 population
2. 4 percent to 9.99 percent projected growth
3. 8,000 to 18,999 families
4. \$9,711 to \$10,593 per capita income

RANK #3 - Those counties with all of the following:

1. less than 28,815 population
2. less than 3.99 percent projected growth
3. fewer than 7,999 families
4. less than \$9,710 per capita income

Twenty-seven counties are in the top ranking, 32 are ranked second and 40 are ranked third.

| | | | | | | | | | | | |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| COUNTY NUMBER | | 77 | 52 | 82 | 99 | 57 | 40 | 30 | 70 | 48 | 17 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 11,947 | 11,730 | 11,470 | 11,282 | 11,129 | 11,108 | 11,104 | 11,007 | 10,987 | 10,984 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| AVERAGE= | 9710.6 | | | | | | | | | | |
| STANDARD DEVIATION= | 882.83 | | | | | | | | | | |
| COUNTY NUMBER | | 38 | 25 | 98 | 36 | 95 | 16 | 64 | 35 | 11 | 91 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 10,880 | 10,877 | 10,711 | 10,619 | 10,582 | 10,475 | 10,411 | 10,353 | 10,328 | 10,322 |
| RANK= | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 23 | 66 | 46 | 76 | 42 | 50 | 29 | 18 | 13 | 21 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 10,318 | 10,312 | 10,283 | 10,276 | 10,261 | 10,257 | 10,237 | 10,219 | 10,166 | 10,128 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 56 | 78 | 7 | 15 | 86 | 24 | 8 | 14 | 44 | 97 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 10,126 | 10,121 | 10,113 | 10,106 | 10,098 | 9,960 | 9,949 | 9,928 | 9,891 | 9,853 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 19 | 37 | 41 | 85 | 67 | 94 | 54 | 74 | 55 | 88 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 9,812 | 9,799 | 9,794 | 9,785 | 9,783 | 9,763 | 9,760 | 9,747 | 9,746 | 9,725 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 32 | 69 | 72 | 81 | 71 | 6 | 5 | 39 | 92 | 75 |
| EVALUATION CRITERIA | | | | | | | | | | | |
| PER CAPITA INCOME | | 9,719 | 9,695 | 9,693 | 9,682 | 9,646 | 9,633 | 9,612 | 9,607 | 9,593 | 9,587 |
| RANK= | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-4

PER CAPITA INCOME

D-12

STATE OF IOWA

RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

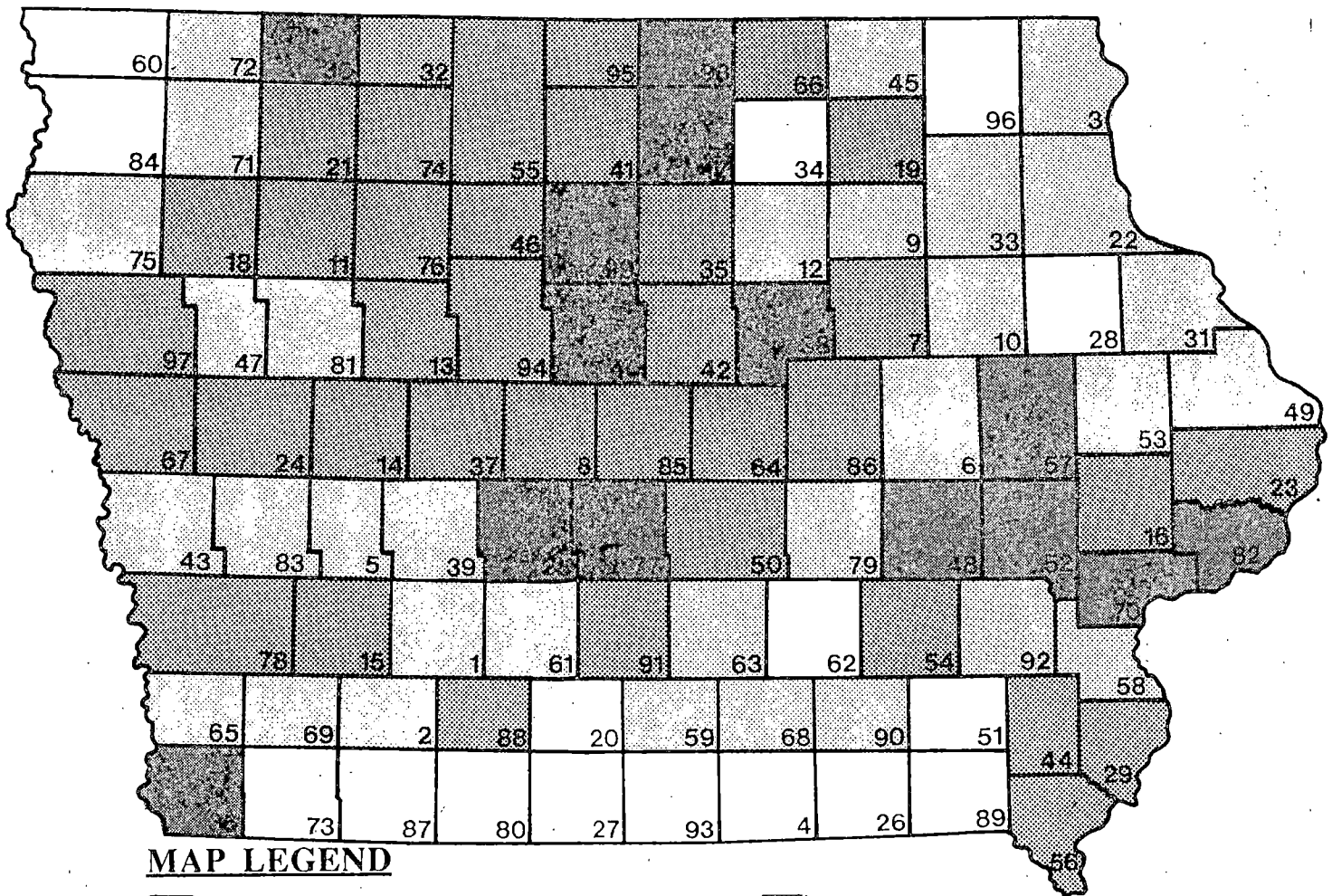


One Green Office Building, Suite 118, 1132 29th Street
West Des Moines, Iowa 50265 (515) 223-1092
ARCHITECTS ENGINEERS PLANNERS (508) 508-0100 Green Island



IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



\$10,594 OR MORE



\$8,828 TO \$9,710



\$9,711 TO \$10,593



\$8,827 OR LESS

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 3 | 1 | Adair | 4 | 26 | Davis | 4 | 51 | Jefferson | 2 | 76 | Pocahontas | PER CAPITA INCOME |
| 3 | 2 | Adams | 4 | 27 | Decatur | 1 | 52 | Johnson | 1 | 77 | Polk | RANK #1- \$10,594 or more |
| 4 | 3 | Allamakee | 4 | 28 | Delaware | 3 | 53 | Jones | 2 | 78 | Pottawatomie | RANK #2- \$9,711 to 10,593 |
| 4 | 4 | Appanoose | 2 | 29 | Des Moines | 2 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- \$8,828 to 9,710 |
| 3 | 5 | Audubon | 1 | 30 | Dickinson | 2 | 55 | Kossuth | 4 | 80 | Ringgold | RANK #4- \$8,827 or below |
| 3 | 6 | Benton | 3 | 31 | Dubuque | 2 | 56 | Lee | 3 | 81 | Sac | |
| 2 | 7 | Black Hawk | 2 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | See accompanying table for complete figures. |
| 2 | 8 | Boone | 3 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 3 | 59 | Lucas | 4 | 84 | Sioux | |
| 3 | 10 | Buchanan | 2 | 35 | Franklin | 4 | 60 | Lyon | 2 | 85 | Story | |
| 2 | 11 | Buena Vista | 1 | 36 | Fremont | 3 | 61 | Madison | 2 | 86 | Tama | |
| 3 | 12 | Butler | 2 | 37 | Greene | 4 | 62 | Mahaska | 4 | 87 | Taylor | |
| 2 | 13 | Calhoun | 1 | 38 | Grundy | 3 | 63 | Marion | 2 | 88 | Union | |
| 2 | 14 | Carroll | 3 | 39 | Guthrie | 2 | 64 | Marshall | 4 | 89 | Van Buren | |
| 2 | 15 | Cass | 1 | 40 | Hamilton | 3 | 65 | Mills | 3 | 90 | Wapello | |
| 2 | 16 | Cedar | 2 | 41 | Hancock | 2 | 66 | Mitchell | 2 | 91 | Warren | |
| 1 | 17 | Cerro Gordo | 2 | 42 | Hardin | 2 | 67 | Monona | 3 | 92 | Washington | |
| 2 | 18 | Cherokee | 3 | 43 | Harrison | 3 | 68 | Monroe | 4 | 93 | Wayne | |
| 2 | 19 | Chickasaw | 2 | 44 | Henry | 3 | 69 | Montgomery | 2 | 94 | Webster | |
| 4 | 20 | Clarke | 3 | 45 | Howard | 1 | 70 | Muscatine | 2 | 95 | Winneshago | |
| 2 | 21 | Clay | 2 | 46 | Humboldt | 3 | 71 | O'Brien | 4 | 96 | Winneshick | |
| 3 | 22 | Clayton | 3 | 47 | Ia | 3 | 72 | Osceola | 2 | 97 | Woodbury | |
| 2 | 23 | Clinton | 1 | 48 | Iowa | 4 | 73 | Page | 1 | 98 | Worth | |
| 2 | 24 | Crawford | 3 | 49 | Jackson | 2 | 74 | Palo Alto | 1 | 99 | Wright | |
| 1 | 25 | Dallas | 2 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-4

PER CAPITA INCOME

STATE OF IOWA

RECREATIONAL TRAILS PLAN

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

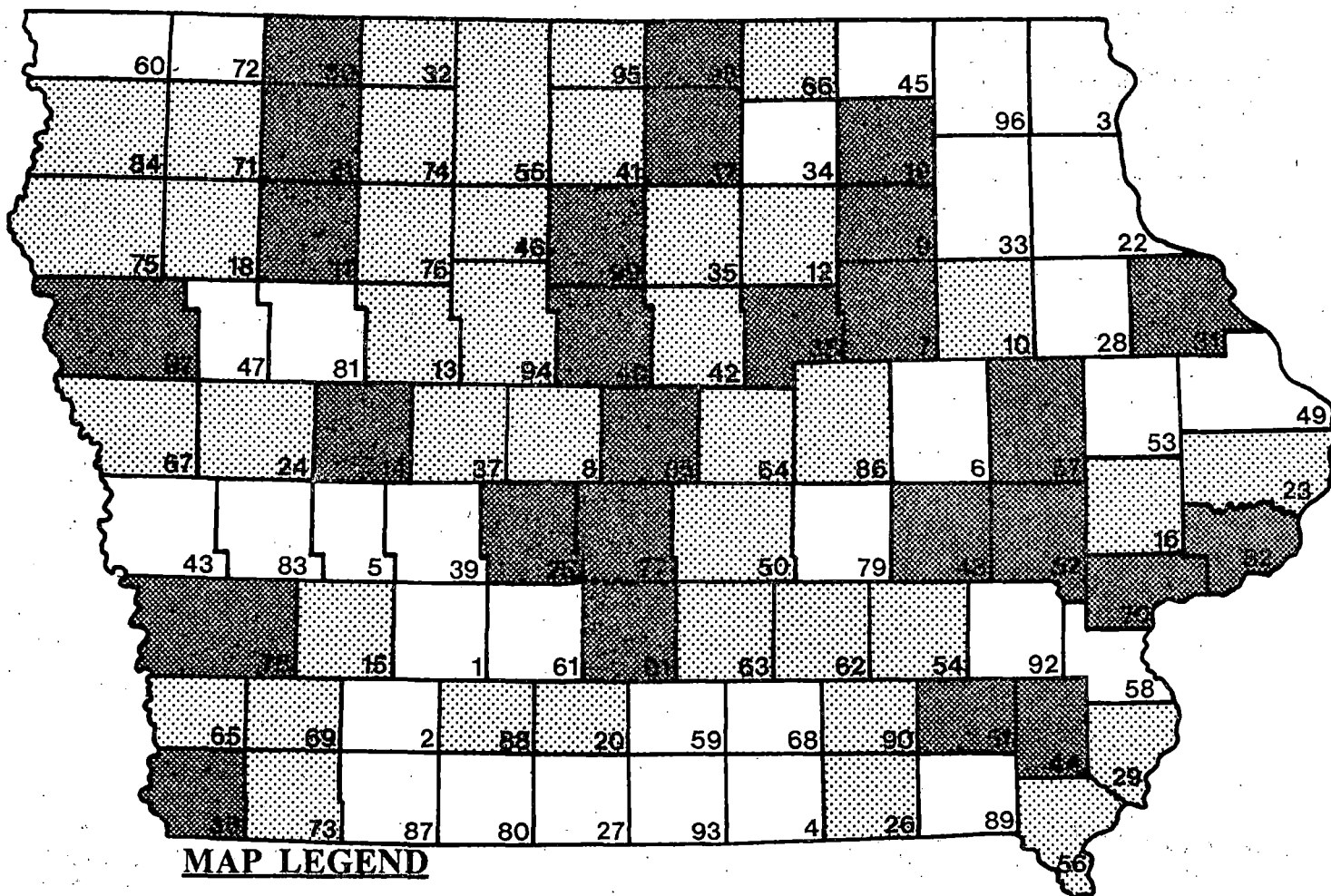
IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS

Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

KIRK-HALL
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AND ASSOCIATES ARCHITECTS ENGINEERS PLANNERS
Blue Creek Office Building, Suite 115, 1452 20th Street
West Des Moines, Iowa 50365 (515) 225-1093
FAX: (515) 225-1093

PUNBAR/JONES
ARCHITECTS
ENVIRONMENTAL PLANNING WITH A HUMAN RESPECT





MAP LEGEND



RANK #1



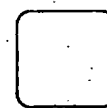
RANK #2



RANK #3

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|---|
| 3 | 1 | Adair | 2 | 26 | Davis | 1 | 51 | Jefferson | 2 | 76 | Pocahontas | DEMOGRAPHIC/ECONOMIC RESOURCES |
| 3 | 2 | Adams | 3 | 27 | Decatur | 1 | 52 | Johnson | 1 | 77 | Polk | RANK #1- One or more of the following: |
| 3 | 3 | Allamakee | 3 | 28 | Delaware | 3 | 53 | Jones | 1 | 78 | Pottawatomie | 69,823 or more County population |
| 3 | 4 | Appanoose | 2 | 29 | Des Moines | 2 | 54 | Keokuk | 3 | 79 | Poweshiek | 10% or more projected growth |
| 3 | 5 | Audubon | 1 | 30 | Dickinson | 2 | 55 | Kossuth | 3 | 80 | Ringgold | 19,000 families |
| 3 | 6 | Benton | 1 | 31 | Dubuque | 2 | 56 | Lee | 3 | 81 | Sac | \$10,594 or more per capita income |
| 1 | 7 | Black Hawk | 2 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | RANK #2- One or more of the following: |
| 2 | 8 | Boone | 3 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | 28,816 to 69,822 County population |
| 1 | 9 | Bremer | 3 | 34 | Floyd | 3 | 59 | Lucas | 2 | 84 | Sioux | 4% to 9.99% projected growth |
| 2 | 10 | Buchanan | 2 | 35 | Franklin | 3 | 60 | Lyon | 1 | 85 | Story | 8,000 to 18,999 families |
| 1 | 11 | Buena Vista | 1 | 36 | Fremont | 3 | 61 | Madison | 2 | 86 | Tama | \$9,711 to \$10,593 per capita income |
| 2 | 12 | Butler | 2 | 37 | Greene | 2 | 62 | Mahaska | 3 | 87 | Taylor | RANK #3- All of the following: |
| 2 | 13 | Calhoun | 1 | 38 | Grundy | 2 | 63 | Marion | 2 | 88 | Union | 28,815 or less County population |
| 1 | 14 | Carroll | 3 | 39 | Guthrie | 2 | 64 | Marshall | 3 | 89 | Van Buren | 3.99% or projected growth |
| 2 | 15 | Cass | 1 | 40 | Hamilton | 2 | 65 | Mills | 2 | 90 | Wapello | 7,999 or fewer families |
| 2 | 16 | Cedar | 2 | 41 | Hancock | 2 | 66 | Mitchell | 1 | 91 | Warren | \$9,710 or less per capita income |
| 1 | 17 | Cerro Gordo | 2 | 42 | Hardin | 2 | 67 | Monona | 3 | 92 | Washington | |
| 2 | 18 | Cherokee | 3 | 43 | Harrison | 3 | 68 | Monroe | 3 | 93 | Wayne | See previous tables for complete figures. |
| 1 | 19 | Chickasaw | 1 | 44 | Henry | 2 | 69 | Montgomery | 2 | 94 | Webster | |
| 2 | 20 | Clarke | 3 | 45 | Howard | 1 | 70 | Muscatine | 2 | 95 | Winnebago | |
| 1 | 21 | Clay | 2 | 46 | Humboldt | 2 | 71 | O'Brien | 3 | 96 | Winneshiek | |
| 3 | 22 | Clayton | 3 | 47 | Ia | 3 | 72 | Osceola | 1 | 97 | Woodbury | |
| 2 | 23 | Clinton | 1 | 48 | Iowa | 2 | 73 | Page | 1 | 98 | Worth | |
| 2 | 24 | Crawford | 3 | 49 | Jackson | 2 | 74 | Palo Alto | 1 | 99 | Wright | |
| 1 | 25 | Dallas | 2 | 50 | Jasper | 2 | 75 | Plymouth | | | | |

FIGURE A-5
DEMOGRAPHIC/ECONOMIC
RESOURCES
STATE OF IOWA
RECREATIONAL TRAILS PLAN



D-15



Barton-Aschman Associates, Inc.
 111 Third Avenue South, Suite 350 Phone: (612) 332-0421
 Minneapolis, Minnesota 55401 Fax: (612) 332-6180



KIRKHAM
 MICHAEL
 AND ASSOCIATES ARCHITECTS ENGINEERS PLANNERS DESIGN CONSULTANTS



PUNBAR/JONES
 ASSOCIATES
 ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
 IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
 IOWA DEPARTMENT OF CULTURAL AFFAIRS

NATURAL RESOURCES

NATURAL RESOURCES

1. **Acres of Natural Vegetation.** Table A-6 lists the number of acres of natural vegetation in each county and ranks the counties according to the following:

RANK #1 - 32,300 acres or more
RANK #2 - 15,800 to 32,199 acres
RANK #3 - 1,000 to 15,799 acres
RANK #4 - 999 acres or less

The state average is 15,770 acres of natural vegetation per county and 40 counties exceed the average with Allamakee County leading at 102,000 acres. Nine counties have more than 32,300 acres of natural vegetation, 31 have between 15,888 and 32,199, 50 have 1,000 to 15,799 and nine counties have fewer than 1,000 acres. Figure A-6 shows the individual counties.

| | | | | | | | | | | | | | |
|------------------------------------|-------|------|------|------|------|------|------|------|------|------|------|------|------|
| COUNTY NUMBER | | 3 | 22 | 49 | 56 | 96 | 31 | 89 | 68 | 57 | 59 | 4 | 43 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 102 | 84.4 | 57.6 | 50.7 | 39.8 | 38.2 | 38.2 | 34.4 | 32.3 | 31.7 | 30.5 | 30.5 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 |
| AVERAGE= | 15.77 | | | | | | | | | | | | |
| STANDARD DEVIATION= | 16.46 | | | | | | | | | | | | |
| COUNTY NUMBER | | 27 | 53 | 33 | 26 | 63 | 29 | 61 | 39 | 52 | 67 | 91 | 23 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 29.2 | 28.3 | 28 | 26.8 | 26.7 | 26 | 26 | 25.5 | 25.2 | 25.1 | 24.2 | 24 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 90 | 44 | 20 | 8 | 58 | 86 | 28 | 25 | 70 | 92 | 48 | 94 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 23.3 | 23 | 22.5 | 22.4 | 22.2 | 19.8 | 19.4 | 19.2 | 19.2 | 18.7 | 18.2 | 17.9 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 51 | 77 | 54 | 93 | 16 | 62 | 88 | 6 | 80 | 97 | 36 | 78 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 17.8 | 17.3 | 16 | 15.9 | 15.6 | 15.5 | 15.4 | 15.3 | 15.2 | 14.5 | 14 | 13.9 |
| RANK= | | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 7 | 65 | 9 | 50 | 10 | 82 | 87 | 42 | 12 | 64 | 19 | 34 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 12.9 | 12.7 | 12.6 | 12 | 11.2 | 10.8 | 10.3 | 9.5 | 9.3 | 8.5 | 8.1 | 7.7 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 2 | 79 | 73 | 45 | 37 | 1 | 40 | 85 | 75 | 66 | 18 | 69 |
| EVALUATION CRITERIA | | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | | 7.6 | 7.6 | 7.3 | 6.5 | 6.4 | 6.2 | 6.2 | 5.5 | 5.2 | 5 | 4.7 | 4.7 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-6
ACRES OF
NATURAL VEGETATION
D-18 STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 333-3421
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KIRKHAM,
 MICHAEL
 AND ASSOCIATES

One Civic Office Building, Suite 115, 1432 2nd Street
 West Des Moines, Iowa 50265 (515) 225-1082
 ARCHITECTS/ENGINEERS/PLANNERS DESIGNS/CONSTRUCTION SERVICES



DUNBAR JONES
 IOWA DEPARTMENT OF TRANSPORTATION
 IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
 IOWA DEPARTMENT OF CULTURAL AFFAIRS

| | | | | | | | | | | | | |
|------------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| COUNTY NUMBER | 24 | 21 | 35 | 15 | 32 | 99 | 46 | 55 | 11 | 83 | 60 | 81 |
| EVALUATION CRITERIA | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | 4.6 | 3.9 | 3.3 | 2.7 | 2.7 | 2.6 | 2.5 | 2.5 | 2.4 | 1.8 | 1.7 | 1.7 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 98 | 74 | 5 | 71 | 14 | 84 | 17 | 41 | 76 | 38 | 13 | 30 |
| EVALUATION CRITERIA | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | 1.6 | 1.5 | 1.3 | 1.3 | 1 | 1 | 0.9 | 0.9 | 0.8 | 0.7 | 0.6 | 0.6 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| COUNTY NUMBER | 47 | 95 | 72 | | | | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | |
| ACRES OF NATURAL VEGETATION (THOU) | 0.5 | 0.3 | 0.1 | | | | | | | | | |
| RANK= | 4 | 4 | 4 | | | | | | | | | |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|---------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawattamie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshiek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Gundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louis | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-6

ACRES OF
NATURAL VEGETATION
(CONT.)

D-19

STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180



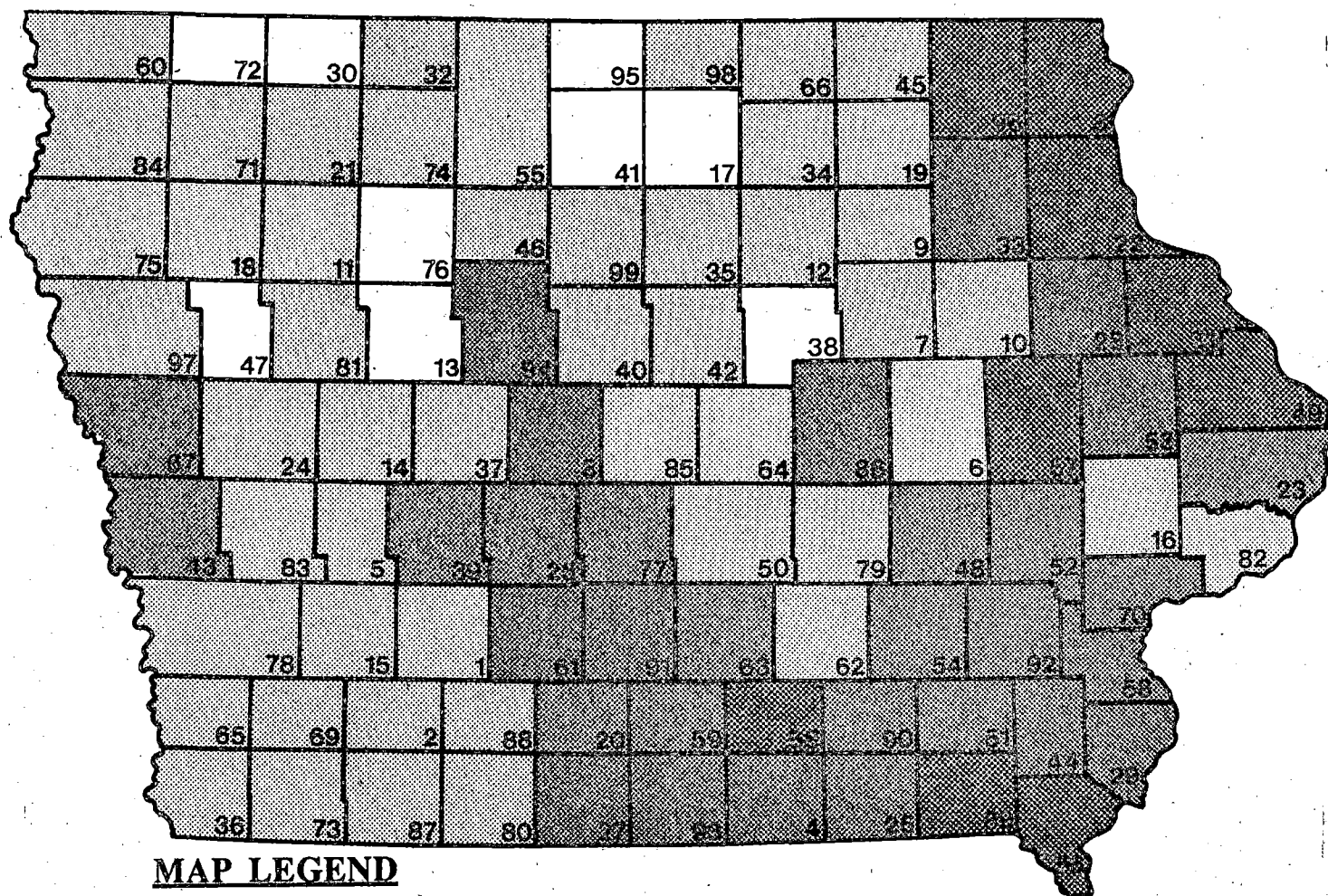
Kirkham, Michael and Associates
2100 Oak Creek Office Building, Suite 115, 1432 29th Street
West Des Moines, Iowa 50265 (515) 273-1092
ARCHITECTS ENGINEERS PLANNERS DESIGNERS CONSULTANTS



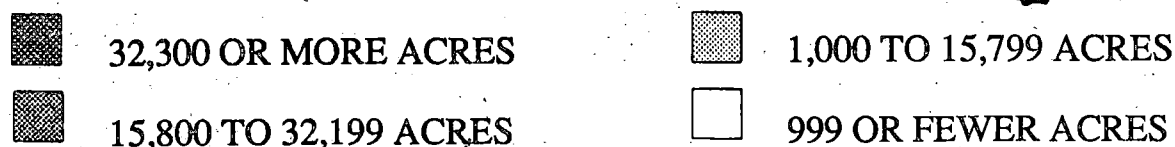
DUNBAR JONES
ARCHITECTS ENGINEERS PLANNERS DESIGNERS CONSULTANTS

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 3 | 1 | Adair | 2 | 26 | Davis | 2 | 51 | Jefferson | 4 | 76 | Pocahontas | ACRES OF NATURAL VEGETATION |
| 3 | 2 | Adams | 2 | 27 | Decatur | 2 | 52 | Johnson | 2 | 77 | Polk | RANK #1- 32,300 acres or more |
| 1 | 3 | Allamakee | 2 | 28 | Delaware | 2 | 53 | Jones | 3 | 78 | Pottawatomie | RANK #2- 15,800 to 32,199 acres |
| 2 | 4 | Appanoose | 2 | 29 | Des Moines | 2 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- 1,000 to 15,799 acres |
| 3 | 5 | Audubon | 4 | 30 | Dickinson | 3 | 55 | Kossuth | 3 | 80 | Ringgold | RANK #4- 999 or fewer acres |
| 3 | 6 | Benton | 1 | 31 | Dubuque | 1 | 56 | Lee | 3 | 81 | Sac | |
| 3 | 7 | Black Hawk | 3 | 32 | Emmet | 1 | 57 | Linn | 3 | 82 | Scott | See accompanying table for complete figures. |
| 2 | 8 | Boone | 2 | 33 | Fayette | 2 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 2 | 59 | Lucas | 3 | 84 | Sioux | |
| 3 | 10 | Buchanan | 3 | 35 | Franklin | 3 | 60 | Lyon | 3 | 85 | Story | |
| 3 | 11 | Buena Vista | 3 | 36 | Fremont | 2 | 61 | Madison | 2 | 86 | Tama | |
| 3 | 12 | Butler | 3 | 37 | Greene | 3 | 62 | Mahaska | 3 | 87 | Taylor | |
| 4 | 13 | Calhoun | 4 | 38 | Grundy | 2 | 63 | Marion | 3 | 88 | Union | |
| 3 | 14 | Carroll | 2 | 39 | Guthrie | 3 | 64 | Marshall | 1 | 89 | Van Buren | |
| 3 | 15 | Cass | 3 | 40 | Hamilton | 3 | 65 | Mills | 2 | 90 | Wapello | |
| 3 | 16 | Cedar | 4 | 41 | Hancock | 3 | 66 | Mitchell | 2 | 91 | Warren | |
| 4 | 17 | Cerro Gordo | 3 | 42 | Hardin | 2 | 67 | Monona | 2 | 92 | Washington | |
| 3 | 18 | Cherokee | 2 | 43 | Harrison | 1 | 68 | Monroe | 2 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 2 | 44 | Henry | 3 | 69 | Montgomery | 2 | 94 | Webster | |
| 2 | 20 | Clarke | 3 | 45 | Howard | 2 | 70 | Muscatine | 4 | 95 | Winnebago | |
| 3 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 1 | 96 | Winneshiek | |
| 1 | 22 | Clayton | 4 | 47 | Ia | 4 | 72 | Osceola | 3 | 97 | Woodbury | |
| 2 | 23 | Clinton | 2 | 48 | Iowa | 3 | 73 | Page | 3 | 98 | Worth | |
| 3 | 24 | Crawford | 1 | 49 | Jackson | 3 | 74 | Palo Alto | 3 | 99 | Wright | |
| 2 | 25 | Dallas | 3 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-6

ACRES OF
NATURAL VEGETATION

D-20

STATE OF IOWA RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

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KW KIRKHAM, MICHAEL AND ASSOCIATES
111 Third Avenue South, Suite 115, 1412 29th Street
West Des Moines, Iowa 50265 (515) 222-1092
ARCHITECTS ENGINEERS PLANNERS DESIGN CONSULTANTS

PUNBAR/JONES
ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



CULTURAL RESOURCES

CULTURAL RESOURCES

The cultural resources figures and tables document and analyze the number and type of cultural attractions and the number of individual National Register sites for each county. Three figures and two tables illustrate and analyze the information.

1. **Cultural Attractions.** The number and type of cultural attractions in each county are listed in Table A-7. The number of community theatres, farmer's markets, festivals, attractions, galleries and museums, cultural attractions, theatres/auditoriums and historical sites are listed. The table separates the counties, by number of attractions listed, into four divisions.

RANK #1 - Counties with 31 or more cultural attractions

RANK #2 - Counties with 16 to 30 cultural attractions

RANK #3 - Counties with 8 to 15 cultural attractions

RANK #4 - Counties with seven or fewer cultural attractions

Table A-7 shows an average of 16.2 cultural attractions per county and 14 counties have 31 or more, 16 have between 16 and 30, 48 have 8 to 15 and 21 counties have fewer than seven cultural attractions. Figure A-7 shows the individual counties.

2. **Number of Individual National Register Sites.** The number of individual sites listed on the National Register within each county are shown on Table A-8. The table also separates the counties into four categories based upon the total number of sites within the county.

RANK #1 - Counties with 37 or more individual National Register sites

RANK #2 - Counties with 11 to 36 individual National Register sites

RANK #3 - Counties with 2 to 10 individual National Register sites

RANK #4 - Counties with one or no individual National Register sites

The state average is 10.7 sites per county ranging from Scott County with 253 sites to Adams County with no sites listed. Four counties have 37 or more sites, 19 have 11 to 34 sites, 68 have 2 to 10 sites and eight counties have one or no sites listed. Figure A-8 shows the individual counties.

| | | | | | | | | | | | | | | | | | | | | | | |
|----------------------|---------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | | 77 | 57 | 7 | 82 | 31 | 56 | 96 | 22 | 78 | 29 | 52 | 30 | 28 | 92 | 85 | 94 | 97 | 89 | 49 | 44 | 39 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| COMMUNITY THEATRES | | 4 | | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 1 | 1 | 2 | 1 | 1 | 1 | | 1 | 1 |
| FARMERS MARKETS | | 5 | 2 | 4 | 3 | 1 | 3 | 1 | 2 | 2 | 1 | 3 | | 1 | 2 | 2 | 1 | 2 | | 1 | 1 | 3 |
| FESTIVALS | | 8 | 28 | 15 | 11 | 8 | 12 | 5 | | 5 | 8 | 7 | 5 | 6 | 7 | 1 | 2 | 1 | | 7 | 4 | 10 |
| ATTRACTIONS | | 16 | 6 | 8 | 15 | 15 | 4 | 5 | 8 | 6 | 6 | 4 | 8 | 1 | 4 | 4 | 1 | 2 | 1 | 2 | 2 | |
| GALLERIES & MUSEUMS | | 6 | 4 | 4 | 2 | 6 | 1 | 1 | | 1 | 1 | 5 | 1 | | | 4 | 1 | 1 | | | | |
| CULTURAL ATTRACTIONS | | 2 | 1 | | 1 | | | | | 1 | | 1 | | | | 2 | 1 | 1 | | | | |
| THEATRES/AUDITORIUMS | | 6 | 2 | 3 | | 2 | | | | 1 | | 1 | 1 | | | 1 | | 2 | | | | |
| HISTORICAL SITES | | 36 | 30 | 17 | 19 | 11 | 21 | 27 | 27 | 21 | 17 | 11 | 14 | 22 | 17 | 10 | 19 | 15 | 23 | 14 | 15 | 7 |
| TOTALS= | | 83 | 73 | 53 | 52 | 45 | 43 | 41 | 39 | 37 | 35 | 32 | 32 | 31 | 31 | 26 | 26 | 25 | 25 | 24 | 23 | 21 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| AVERAGE= | 16.202 | | | | | | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 14.0007 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 33 | 45 | 48 | 42 | 8 | 91 | 90 | 24 | 53 | 17 | 34 | 37 | 64 | 19 | 84 | 70 | 4 | 3 | 61 | 23 | 63 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| COMMUNITY THEATRES | | 1 | 1 | 2 | 3 | 2 | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | | 1 | 1 | | 1 | 1 | 1 | |
| FARMERS MARKETS | | 2 | 2 | 1 | 2 | | 1 | | 1 | | 2 | 2 | | 1 | 1 | 4 | | 2 | | 1 | 2 | 2 |
| FESTIVALS | | 10 | 10 | 5 | 4 | 3 | 7 | 1 | 7 | 7 | | | 1 | 6 | 2 | 1 | 2 | 6 | 4 | 3 | 1 | 2 |
| ATTRACTIONS | | 2 | 2 | 5 | | 6 | 1 | 4 | 2 | 1 | 4 | 2 | 3 | 1 | 2 | 4 | 1 | 2 | 1 | 3 | 3 | 4 |
| GALLERIES & MUSEUMS | | | | | | | | | | 1 | | | | 1 | | | 1 | | | | 1 | 1 |
| CULTURAL ATTRACTIONS | | | | | | | | | | | | | | | | | 1 | | | | | |
| THEATRES/AUDITORIUMS | | | | | | | | | | 1 | | | | | | | | | | | | |
| HISTORICAL SITES | | 5 | 5 | 6 | 9 | 6 | 7 | 10 | 5 | 6 | 7 | 11 | 10 | 5 | 10 | 4 | 8 | 4 | 8 | 6 | 5 | 4 |
| TOTALS= | | 20 | 20 | 19 | 18 | 17 | 17 | 16 | 16 | 16 | 15 | 15 | 15 | 15 | 15 | 14 | 14 | 14 | 14 | 14 | 13 | 13 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 5 | 50 | 41 | 46 | 58 | 59 | 35 | 86 | 15 | 1 | 36 | 54 | 32 | 74 | 16 | 18 | 25 | 68 | 98 | 88 | 99 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| COMMUNITY THEATRES | | 1 | 1 | | 1 | 1 | | | | 1 | 1 | | | 1 | 1 | 1 | 1 | 2 | | | 1 | |
| FARMERS MARKETS | | 2 | 1 | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 3 | 2 | 1 | 1 | |
| FESTIVALS | | 5 | 1 | 6 | 2 | 9 | 6 | 1 | 4 | 1 | | 1 | | 1 | 5 | 1 | | | 3 | | 1 | |
| ATTRACTIONS | | 2 | 3 | | 1 | | | | 2 | | | 3 | 1 | 1 | | 2 | 2 | 1 | | | 1 | 3 |
| GALLERIES & MUSEUMS | | | | | | | | | | | | | | | | | | | | | | |
| CULTURAL ATTRACTIONS | | | | | | | | | | | | | | | | | | | | | | 1 |
| THEATRES/AUDITORIUMS | | | | | | | | | | | | | 1 | | | | | | | | | |
| HISTORICAL SITES | | 3 | 7 | 7 | 8 | 3 | 6 | 10 | 5 | 8 | 9 | 6 | 8 | 6 | 3 | 5 | 7 | 4 | 5 | 9 | 5 | 5 |
| TOTALS= | | 13 | 13 | 13 | 13 | 13 | 13 | 12 | 12 | 11 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 9 | 9 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshek |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-7
CULTURAL ATTRACTIONS
D-23 STATE OF IOWA
RECREATIONAL TRAILS PLAN

Barton-Aschman Associates, Inc.
 111 Third Avenue South, Suite 350 Phone (612) 332-0421
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 ARCHITECTS-ENGINEERS-PLANNERS ONE WOMEN OWNED OFFICE

PUNBAR/JONES
 ATTORNEYS
 1000 PINE STREET, PLANNING WITH A HUMAN RESPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
 IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
 IOWA DEPARTMENT OF CULTURAL AFFAIRS

| | | | | | | | | | | | | | | | | | | | | | |
|----------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | 11 | 73 | 55 | 71 | 6 | 12 | 66 | 75 | 14 | 83 | 2 | 9 | 10 | 67 | 47 | 79 | 27 | 59 | 65 | 76 | 62 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | |
| COMMUNITY THEATRES | 1 | | | 1 | 2 | | 1 | 2 | 1 | | | 2 | 1 | | 1 | 1 | | 1 | | | 1 |
| FARMERS MARKETS | 1 | 2 | 1 | 3 | 1 | | 1 | 2 | 1 | 1 | | 1 | | 1 | | 1 | 1 | | | | 1 |
| FESTIVALS | 2 | 2 | | | | 1 | | | 2 | 1 | 5 | | | 1 | 6 | | | | | | |
| ATTRACTIONS | 2 | | 2 | 1 | | 1 | 2 | 1 | 1 | 3 | 2 | 2 | 3 | 1 | | 1 | 1 | 1 | 1 | | 1 |
| GALLERIES & MUSEUMS | 2 | | | | | | | 1 | | | | | | | | | 2 | | | | |
| CULTURAL ATTRACTIONS | | | | | | | | | | | | | | | | | | | | | |
| THEATRES/AUDITORIUMS | | | | | 1 | | | | | | | | | | | | | | | | |
| HISTORICAL SITES | 1 | 5 | 6 | 4 | 5 | 7 | 5 | 2 | 3 | 3 | 1 | 3 | 4 | 5 | 1 | 4 | 3 | 5 | 6 | 7 | 3 |
| TOTALS= | 9 | 9 | 9 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 7 | 6 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 |
| COUNTY NUMBER | 21 | 43 | 69 | 81 | 38 | 72 | 93 | 51 | 20 | 26 | 80 | 40 | 95 | 13 | 87 | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | |
| COMMUNITY THEATRES | 1 | | | | 1 | 1 | | 1 | 1 | | | | | 1 | | | | | | | |
| FARMERS MARKETS | | | 1 | | | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | | | | | | | |
| FESTIVALS | | | 1 | 1 | | 1 | 1 | | | | | | | | | | | | | | |
| ATTRACTIONS | | 2 | 1 | | | | 1 | | | 1 | 1 | | 1 | 1 | | | | | | | |
| GALLERIES & MUSEUMS | | | | | | | | 1 | | | | | | | | | | | | | |
| CULTURAL ATTRACTIONS | | | | | | | | | | | | | | | | | | | | | |
| THEATRES/AUDITORIUMS | | | | | | | | | | | | | | | | | | | | | |
| HISTORICAL SITES | 5 | 4 | 3 | 5 | 5 | 3 | 4 | 2 | 3 | 3 | 3 | 3 | 2 | 1 | 2 | | | | | | |
| TOTALS= | 6 | 6 | 6 | 6 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 4 | 4 | 3 | 2 | | | | | | |
| RANK= | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | |

| | | | | | | | | | |
|----------------|----------------|-------------|--------------|---------------|-----------------|---------------|------------|------------|------------|
| NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY |
| 1 Adair | 16 Cedar | 31 Dubuque | 46 Humboldt | 61 Madison | 76 Pocahontas | 91 Warren | | | |
| 2 Adams | 17 Cerro Gordo | 32 Emmet | 47 Ida | 62 Mahaska | 77 Polk | 92 Washington | | | |
| 3 Allamakee | 18 Cherokee | 33 Fayette | 48 Iowa | 63 Marion | 78 Pottawatomie | 93 Wayne | | | |
| 4 Appanoose | 19 Chickasaw | 34 Floyd | 49 Jackson | 64 Marshall | 79 Poweshiek | 94 Webster | | | |
| 5 Audubon | 20 Clarke | 35 Franklin | 50 Jasper | 65 Mills | 80 Ringgold | 95 Winnebago | | | |
| 6 Benton | 21 Clay | 36 Fremont | 51 Jefferson | 66 Mitchell | 81 Sac | 96 Winneshiek | | | |
| 7 Black Hawk | 22 Clayton | 37 Greene | 52 Johnson | 67 Monona | 82 Scott | 97 Woodbury | | | |
| 8 Boone | 23 Clinton | 38 Grundy | 53 Jones | 68 Monroe | 83 Shelby | 98 Worth | | | |
| 9 Bremer | 24 Crawford | 39 Guthrie | 54 Keokuk | 69 Montgomery | 84 Sioux | 99 Wright | | | |
| 10 Buchanan | 25 Dallas | 40 Hamilton | 55 Kosciusko | 70 Muscatine | 85 Story | | | | |
| 11 Buena Vista | 26 Davis | 41 Hancock | 56 Lee | 71 O'Brien | 86 Tama | | | | |
| 12 Butler | 27 Decatur | 42 Hardin | 57 Linn | 72 Osceola | 87 Taylor | | | | |
| 13 Calhoun | 28 Delaware | 43 Harrison | 58 Louisa | 73 Page | 88 Union | | | | |
| 14 Carroll | 29 Des Moines | 44 Henry | 59 Lucas | 74 Palo Alto | 89 Van Buren | | | | |
| 15 Cass | 30 Dickinson | 45 Howard | 60 Lyon | 75 Plymouth | 90 Wapello | | | | |

TABLE A-7
CULTURAL ATTRACTIONS
(CONT.)

D-24

STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 332-0421
 Minneapolis, Minnesota 55401 Fax (612) 332-6180



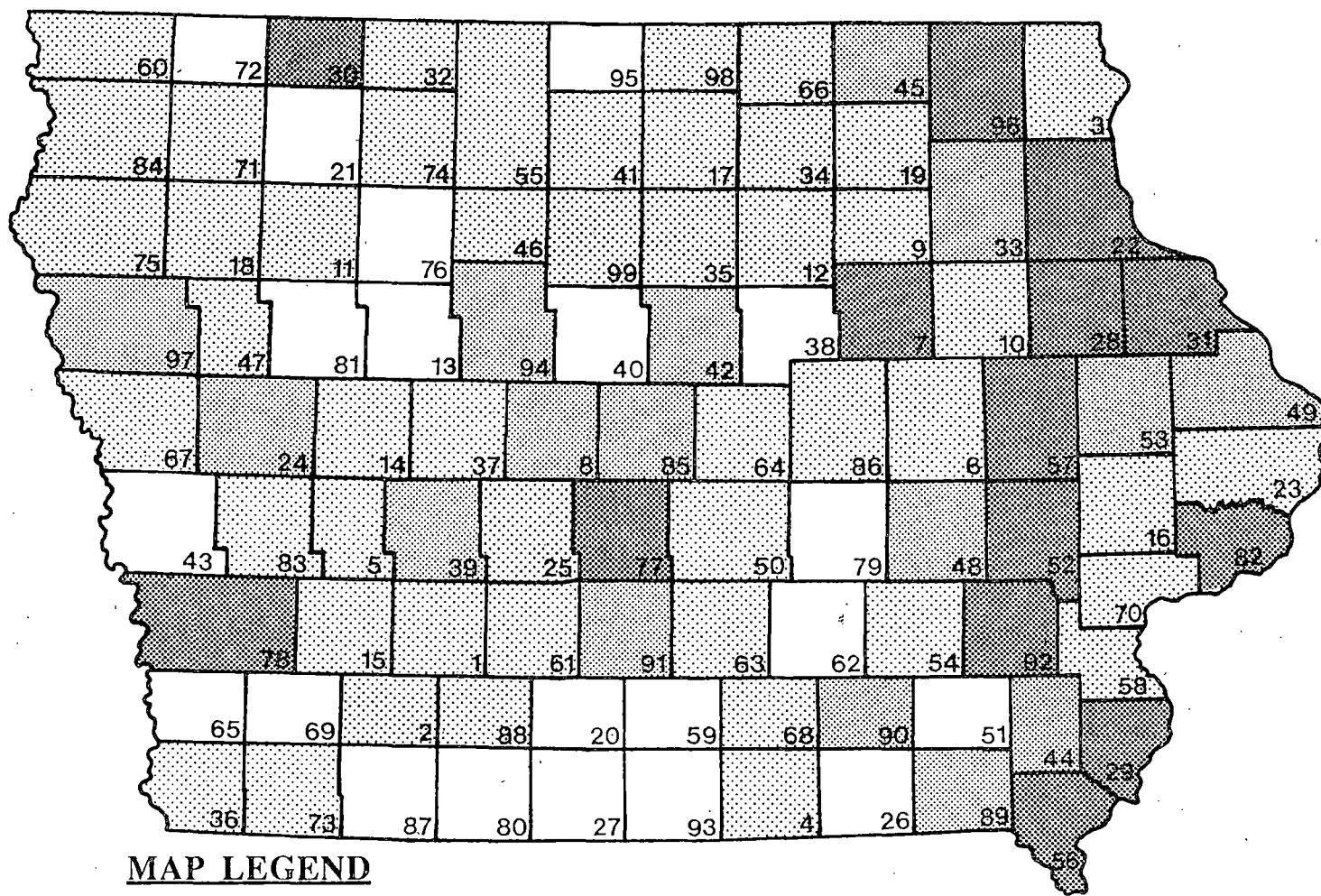
K&M KIRSHBAUM, MICHAEL AND ASSOCIATES ARCHITECTS/ENGINEERS/PLANNERS, 605 HOMES DRIVE DENVER



DUNBAR/JONES ASSOCIATES

IOWA DEPARTMENT OF TRANSPORTATION
 IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
 IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



31 OR MORE ATTRACTIONS



8 TO 15 ATTRACTIONS



16 TO 30 ATTRACTIONS



7 OR LESS ATTRACTIONS

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|---------------|---|
| 3 | 1 | Adair | 4 | 26 | Davis | 4 | 51 | Jefferson | 4 | 76 | Pocahontas | CULTURAL ATTRACTIONS PER COUNTY |
| 3 | 2 | Adams | 4 | 27 | Decatur | 1 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 31 or more attractions |
| 3 | 3 | Allamakee | 1 | 28 | Delaware | 2 | 53 | Jones | 1 | 78 | Pottawattamie | RANK #2- 16 to 30 attractions |
| 3 | 4 | Appanoose | 1 | 29 | Des Moines | 3 | 54 | Keokuk | 4 | 79 | Poweshick | RANK #3- 8 to 15 attractions |
| 3 | 5 | Audubon | 1 | 30 | Dickinson | 3 | 55 | Kossuth | 4 | 80 | Ringgold | RANK #4- 7 or fewer attractions |
| 3 | 6 | Benton | 1 | 31 | Dubuque | 1 | 56 | Lee | 4 | 81 | Sac | |
| 1 | 7 | Black Hawk | 3 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | See accompanying table for complete listings. |
| 2 | 8 | Boone | 2 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 4 | 59 | Lucas | 3 | 84 | Sioux | |
| 3 | 10 | Buchanan | 3 | 35 | Franklin | 3 | 60 | Lyon | 2 | 85 | Story | |
| 3 | 11 | Buena Vista | 3 | 36 | Fremont | 3 | 61 | Madison | 3 | 86 | Tama | |
| 3 | 12 | Butler | 3 | 37 | Greene | 4 | 62 | Mahaska | 4 | 87 | Taylor | |
| 4 | 13 | Calhoun | 4 | 38 | Grundy | 3 | 63 | Marion | 3 | 88 | Union | |
| 3 | 14 | Carroll | 2 | 39 | Guthrie | 3 | 64 | Marshall | 2 | 89 | Van Buren | |
| 3 | 15 | Cass | 4 | 40 | Hamilton | 4 | 65 | Mills | 2 | 90 | Wapello | |
| 3 | 16 | Cedar | 3 | 41 | Hancock | 3 | 66 | Mitchell | 2 | 91 | Warren | |
| 3 | 17 | Cerro Gordo | 2 | 42 | Hardin | 3 | 67 | Monona | 1 | 92 | Washington | |
| 3 | 18 | Cherokee | 4 | 43 | Harrison | 3 | 68 | Monroe | 4 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 2 | 44 | Henry | 4 | 69 | Montgomery | 2 | 94 | Webster | |
| 4 | 20 | Clarke | 2 | 45 | Howard | 3 | 70 | Muscatine | 4 | 95 | Winnebago | |
| 4 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 1 | 96 | Winneshiek | |
| 1 | 22 | Clayton | 3 | 47 | Ia | 4 | 72 | Osceola | 2 | 97 | Woodbury | |
| 3 | 23 | Clinton | 2 | 48 | Iowa | 3 | 73 | Page | 3 | 98 | Worth | |
| 2 | 24 | Crawford | 2 | 49 | Jackson | 3 | 74 | Palo Alto | 3 | 99 | Wright | |
| 3 | 25 | Dallas | 3 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-7

CULTURAL ATTRACTIONS

D-25

STATE OF IOWA

RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-0100



Kornblum, Michael and Associates
Due Green Office Building, Suite 115, 1452 29th Street
West Des Moines, Iowa 50265 (515) 223-1093
ARCHITECTS ENGINEERS PLANNERS DESIGNS IOWA DESIGN CENTER



DUNBAR/JONES
ENVIRONMENTAL PLANNING WATER QUALITY RESPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



| | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|---------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | | 82 | 77 | 52 | 61 | 31 | 22 | 57 | 17 | 96 | 7 | 56 | 97 | 78 | 29 | 49 | 70 | 79 | 85 | 3 | 92 | 44 | 51 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | |
| NO. NAT'L REG. HIST. SITES | | 253 | 55 | 52 | 37 | 34 | 31 | 29 | 22 | 20 | 18 | 18 | 18 | 17 | 14 | 14 | 14 | 13 | 13 | 12 | 12 | 11 | 11 |
| RANK= | | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| AVERAGE= | 10.7071 | | | | | | | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 26.3978 | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 62 | 33 | 34 | 54 | 86 | 89 | 26 | 48 | 64 | 69 | 90 | 6 | 23 | 42 | 68 | 4 | 43 | 45 | 50 | 53 | 58 | 63 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | |
| NO. NAT'L REG. HIST. SITES | | 11 | 10 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 8 | 8 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 6 | 6 | 6 | 6 |
| RANK= | | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 66 | 8 | 10 | 18 | 28 | 35 | 36 | 47 | 73 | 75 | 1 | 13 | 16 | 19 | 24 | 25 | 27 | 30 | 40 | 60 | 80 | 91 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | |
| NO. NAT'L REG. HIST. SITES | | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 94 | 95 | 98 | 9 | 11 | 15 | 20 | 21 | 37 | 59 | 67 | 71 | 83 | 87 | 93 | 99 | 12 | 14 | 38 | 39 | 46 | 74 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | |
| NO. NAT'L REG. HIST. SITES | | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 76 | 84 | 88 | 5 | 32 | 41 | 55 | 65 | 72 | 81 | 2 | | | | | | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | | |
| NO. NAT'L REG. HIST. SITES | | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | | | | | | | | | | | |
| RANK= | | 3 | 3 | 3 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | | | | | | | | | | | |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|---------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawattamie |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello |

TABLE A-8



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax (612) 332-6180



Two Creek Office Building, Suite 115, 1432 29th Street
West Des Moines, Iowa 50265 (515) 223-1062
ARCHITECTS ENGINEERS PLANNERS DESIGNERS



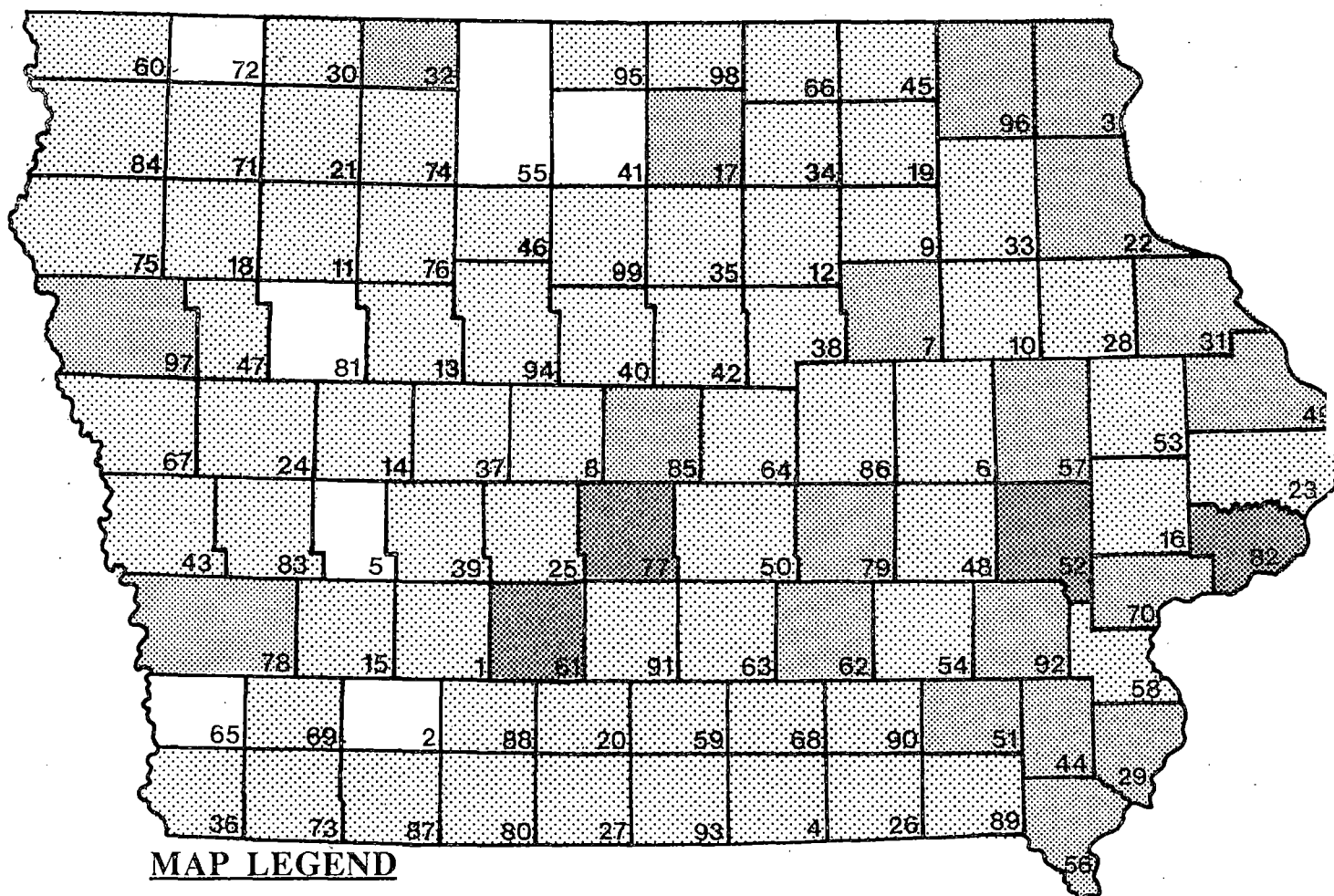
TRANSPORTATION PLANNING AND DESIGN

NUMBER OF INDIVIDUAL NATIONAL HISTORIC SITES STATE OF IOWA RECREATIONAL TRAILS PLAN

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS

D-26



| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|---|
| 3 | 1 | Adair | 3 | 26 | Davis | 2 | 51 | Jefferson | 3 | 76 | Pocahontas | NATIONAL REGISTER SITES |
| 4 | 2 | Adams | 3 | 27 | Decatur | 1 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 37 or more sites |
| 2 | 3 | Allamakee | 3 | 28 | Delaware | 3 | 53 | Jones | 2 | 78 | Pottawatomie | RANK #2- 11 to 36 sites |
| 3 | 4 | Appanoose | 2 | 29 | Des Moines | 3 | 54 | Keokuk | 2 | 79 | Poweshiek | RANK #3- 2 to 10 sites |
| 4 | 5 | Audubon | 3 | 30 | Dickinson | 4 | 55 | Kossuth | 3 | 80 | Ringgold | RANK #4- 0 to 1 sites |
| 3 | 6 | Benton | 2 | 31 | Dubuque | 2 | 56 | Lee | 4 | 81 | Sac | |
| 2 | 7 | Black Hawk | 4 | 32 | Emmet | 2 | 57 | Linn | 1 | 82 | Scott | See accompanying table for complete listings. |
| 3 | 8 | Boone | 3 | 33 | Fayette | 3 | 58 | Louisa | 3 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 3 | 59 | Lucas | 3 | 84 | Sioux | |
| 3 | 10 | Buchanan | 3 | 35 | Franklin | 3 | 60 | Lyon | 2 | 85 | Story | |
| 3 | 11 | Buena Vista | 3 | 36 | Fremont | 1 | 61 | Madison | 3 | 86 | Tama | |
| 3 | 12 | Butler | 3 | 37 | Greene | 2 | 62 | Mahaska | 3 | 87 | Taylor | |
| 3 | 13 | Calhoun | 3 | 38 | Grundy | 3 | 63 | Marion | 3 | 88 | Union | |
| 3 | 14 | Carroll | 3 | 39 | Guthrie | 3 | 64 | Marshall | 3 | 89 | Van Buren | |
| 3 | 15 | Cass | 3 | 40 | Hamilton | 4 | 65 | Mills | 3 | 90 | Wapello | |
| 3 | 16 | Cedar | 4 | 41 | Hancock | 3 | 66 | Mitchell | 3 | 91 | Warren | |
| 2 | 17 | Cerro Gordo | 1 | 42 | Hardin | 3 | 67 | Monona | 2 | 92 | Washington | |
| 3 | 18 | Cherokee | 3 | 43 | Harrison | 3 | 68 | Monroe | 3 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 2 | 44 | Henry | 3 | 69 | Montgomery | 3 | 94 | Webster | |
| 3 | 20 | Clarke | 3 | 45 | Howard | 2 | 70 | Muscatine | 3 | 95 | Winnebago | |
| 3 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 2 | 96 | Winneschick | |
| 2 | 22 | Clayton | 3 | 47 | Ida | 4 | 72 | Osceola | 2 | 97 | Woodbury | |
| 3 | 23 | Clinton | 3 | 48 | Iowa | 3 | 73 | Page | 3 | 98 | Worth | |
| 3 | 24 | Crawford | 2 | 49 | Jackson | 3 | 74 | Palo Alto | 3 | 99 | Wright | |
| 3 | 25 | Dallas | 3 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-8

NUMBER OF INDIVIDUAL NATIONAL HISTORIC SITES **STATE OF IOWA** **RECREATIONAL TRAILS PLAN**

Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

KIRKHAM, MICHAEL AND ASSOCIATES
One Green Office Building, Suite 115, 1432 29th Street
West Des Moines, Iowa 50265 (515) 223-1092
ARCHITECTS-ENGINEERS-PLANNERS ONE WORKS-OWNERS DESIGN

DUNBAR/JONES
PARTNERSHIP
ENVIRONMENTAL PLANNING WITH A HUMAN RESPECT

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



RECREATION RESOURCES

RECREATION RESOURCES

The recreation resources figures and tables document and analyze the recreation information for each county. Five figures and three tables illustrate and analyze the information. A summary of each follows.

1. **Number of State Areas.** The number of state parks, recreation areas, beaches and other recreation facilities in each county are listed in Table A-9. The table also separates the counties into three divisions based upon the total number of facilities per county. Divisions are:

RANK #1 - Counties with three or more state recreation areas
RANK #2 - Counties with one or two state recreation areas
RANK #3 - Counties with no state recreation areas

Figure A-9 shows individual counties. The average number of areas is just under 1 per county. Dickinson County has the most at 12, Polk and Webster follow with three, 13 counties have two, 38 have one and the remaining 45 counties have no state recreation areas.

2. **Number of County Recreation Areas with Camping, Electricity, Water and/or Picnic.** Table A-10 shows the number of county recreation areas with camping, electricity, water and/or picnic facilities within the areas. The table also separates the counties into three divisions based upon the total number of recreation areas with the listed facilities.

RANK #1 - Counties with three or more county recreation areas with camping, electricity, water and/or picnic facilities
RANK #2 - Counties with one or two county recreation areas with camping, electricity, water and/or picnic facilities
RANK #3 - Counties with no county recreation areas with camping, electricity, water and/or picnic facilities

Figure A-10 shows the individual counties. The average per county is just over two county recreation areas with camping, electricity, water and/or picnic facilities, with 35 counties having three or more, 47 with one or two, and 17 listed as having none.

3. **Number of County Recreation Areas with Equestrian, Hiking and/or Cross-Country Ski Trails.** Table A-11 lists the number of county recreation areas with equestrian, hiking and/or cross-country ski trails per county. The table also separates the counties into four divisions based upon the total number of recreation areas with the listed trails in each county.

RANK #1 - Counties with 10 or more county recreation areas with equestrian, hiking and/or cross-country ski trails
RANK #2 - Counties with five to nine county recreation areas with equestrian, hiking and/or cross-country ski trails
RANK #3 - Counties with one to four county recreation areas with equestrian, hiking and/or cross-country ski trails
RANK #4 - Counties with no county recreation areas with equestrian, hiking and/or cross-country ski trails

| | | | | | | | | | | | | | | | | | | | | | | |
|-----------------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | | 30 | 77 | 94 | 17 | 22 | 32 | 33 | 39 | 49 | 52 | 55 | 56 | 57 | 59 | 61 | 67 | 3 | 4 | 7 | 8 | 10 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF STATE AREAS | | 12 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 |
| RANK= | | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| AVERAGE= | 0.8283 | | | | | | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 1.3705 | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 11 | 13 | 15 | 18 | 26 | 27 | 28 | 31 | 35 | 36 | 41 | 42 | 43 | 44 | 45 | 50 | 53 | 62 | 63 | 69 | 76 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF STATE AREAS | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 78 | 81 | 83 | 86 | 87 | 88 | 89 | 91 | 92 | 93 | 95 | 96 | 1 | 2 | 5 | 6 | 9 | 12 | 14 | 16 | 19 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF STATE AREAS | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 20 | 21 | 23 | 24 | 25 | 29 | 34 | 37 | 38 | 40 | 46 | 47 | 48 | 51 | 54 | 58 | 60 | 64 | 65 | 66 | 68 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF STATE AREAS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| | | | | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 70 | 71 | 72 | 73 | 74 | 75 | 79 | 80 | 82 | 84 | 85 | 90 | 97 | 98 | 99 | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | | | |
| NUMBER OF STATE AREAS | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | | | | | | |
| RANK= | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | | | | | | |

| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshiak |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Osceola | 87 | Taylor | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | |

TABLE A-9



Barton-Aschman Associates, Inc.

111 Third Avenue South, Suite 350 Phone (612) 332-0421
Minneapolis, Minnesota 55401 Fax (612) 332 6180



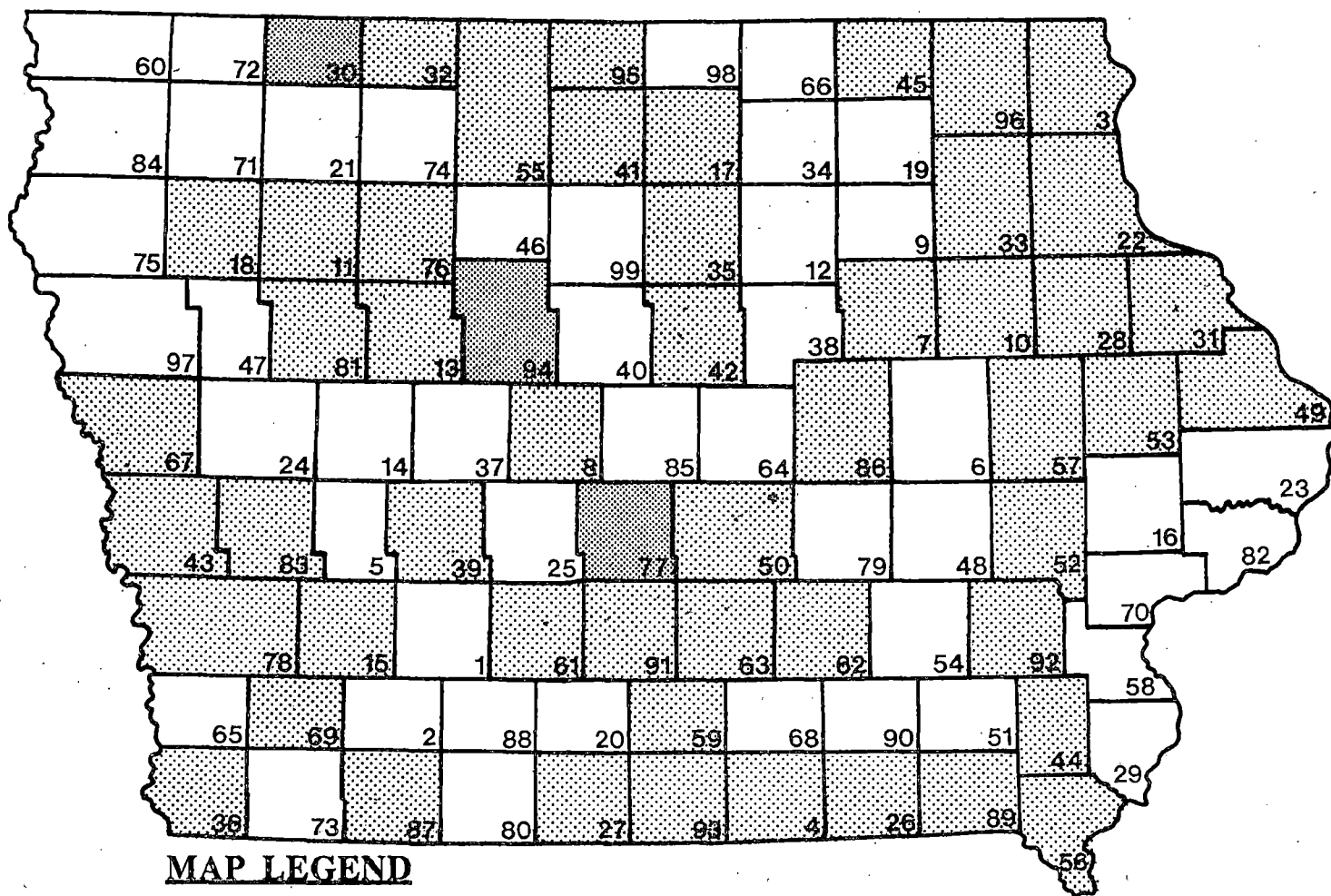
Blue Creek Office Building, Suite 118, 1432 28th Street
West Des Moines, Iowa 50265 (515) 223-1293
ARCHITECTS/ENGINEERS/PLANNERS DESIGNED/OWNED/OPERATED



PUNAR/JONES
IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES


NUMBER OF STATE RECREATION AREAS D-30 STATE OF IOWA RECREATIONAL TRAILS PLAN

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND

 3 OR MORE AREAS

 NO AREAS

 1 TO 2 AREAS

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|---|
| 3 | 1 | Adair | 2 | 26 | Davis | 3 | 51 | Jefferson | 2 | 76 | Pocahontas | NUMBER OF STATE AREAS PER COUNTY |
| 3 | 2 | Adams | 2 | 27 | Decatur | 2 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 3 OR MORE AREAS |
| 2 | 3 | Allamakee | 2 | 28 | Delaware | 2 | 53 | Jones | 2 | 78 | Pottawatomie | RANK #2- 1 TO 2 AREAS |
| 2 | 4 | Appanoose | 3 | 29 | Des Moines | 3 | 54 | Keokuk | 3 | 79 | Poweshiek | RANK #3- 0 AREAS |
| 3 | 5 | Audubon | 1 | 30 | Dickinson | 2 | 55 | Kossuth | 3 | 80 | Ringgold | |
| 3 | 6 | Benton | 2 | 31 | Dubuque | 2 | 56 | Lee | 2 | 81 | Sac | See accompanying table for complete listings. |
| 2 | 7 | Black Hawk | 2 | 32 | Emmet | 2 | 57 | Linn | 3 | 82 | Scott | |
| 2 | 8 | Boone | 2 | 33 | Fayette | 3 | 58 | Louisa | 2 | 83 | Shelby | |
| 3 | 9 | Bremer | 3 | 34 | Floyd | 2 | 59 | Lucas | 3 | 84 | Sioux | |
| 2 | 10 | Buchanan | 2 | 35 | Franklin | 3 | 60 | Lyon | 3 | 85 | Story | |
| 2 | 11 | Buena Vista | 2 | 36 | Fremont | 2 | 61 | Madison | 2 | 86 | Tama | |
| 3 | 12 | Butler | 3 | 37 | Greene | 2 | 62 | Mahaska | 2 | 87 | Taylor | |
| 2 | 13 | Calhoun | 3 | 38 | Grundy | 2 | 63 | Marion | 2 | 88 | Union | |
| 3 | 14 | Carroll | 2 | 39 | Guthrie | 3 | 64 | Marshall | 2 | 89 | Van Buren | |
| 2 | 15 | Cass | 3 | 40 | Hamilton | 3 | 65 | Mills | 3 | 90 | Wapello | |
| 3 | 16 | Cedar | 2 | 41 | Hancock | 3 | 66 | Mitchell | 2 | 91 | Warren | |
| 2 | 17 | Cerro Gordo | 2 | 42 | Hardin | 2 | 67 | Monona | 2 | 92 | Washington | |
| 2 | 18 | Cherokee | 2 | 43 | Harrison | 3 | 68 | Monroe | 2 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 2 | 44 | Henry | 2 | 69 | Montgomery | 1 | 94 | Webster | |
| 3 | 20 | Clarke | 2 | 45 | Howard | 3 | 70 | Muscatine | 2 | 95 | Winnebago | |
| 3 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 2 | 96 | Winneshiek | |
| 2 | 22 | Clayton | 3 | 47 | Ida | 3 | 72 | Osceola | 3 | 97 | Woodbury | |
| 3 | 23 | Clinton | 3 | 48 | Iowa | 3 | 73 | Page | 3 | 98 | Worth | |
| 3 | 24 | Crawford | 2 | 49 | Jackson | 3 | 74 | Palo Alto | 3 | 99 | Wright | |
| 3 | 25 | Dallas | 2 | 50 | Jasper | 3 | 75 | Plymouth | | | | |

FIGURE A-9

**NUMBER OF STATE
RECREATION AREAS**

STATE OF IOWA

RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

D-31



KRM
KIRKHAM, MICHAEL
AND ASSOCIATES
ARCHITECTS ENGINEERS PLANNERS DESIGNERS-CONSULTANTS



PUNBAR/JONES
ARCHITECTS
ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



| | | | | | | | | | | | | | | | | | |
|---|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | | 28 | 31 | 6 | 7 | 12 | 14 | 35 | 36 | 37 | 9 | 45 | 57 | 10 | 17 | 26 | 33 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 7 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| AVERAGE= | 2.0101 | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 1.5353 | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | | 40 | 42 | 43 | 46 | 55 | 56 | 66 | 71 | 73 | 76 | 77 | 78 | 80 | 81 | 82 | 84 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| RANK= | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| COUNTY NUMBER | | 93 | 97 | 99 | 1 | 8 | 15 | 19 | 24 | 29 | 32 | 39 | 41 | 49 | 51 | 58 | 60 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 3 | 3 | 3 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| RANK= | | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 63 | 64 | 67 | 69 | 83 | 85 | 86 | 88 | 89 | 96 | 2 | 5 | 11 | 13 | 22 | 25 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 27 | 34 | 47 | 48 | 53 | 54 | 61 | 62 | 65 | 68 | 70 | 74 | 75 | 79 | 87 | 92 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| RANK= | | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| COUNTY NUMBER | | 94 | 95 | 3 | 4 | 16 | 18 | 20 | 21 | 23 | 30 | 38 | 44 | 50 | 52 | 59 | 72 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| RANK= | | 2 | 2 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | | 90 | 91 | 98 | | | | | | | | | | | | | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | |
| CO. AREAS W/ CAMP., ELEC. ,WATER &PICNIC. | | 0 | 0 | 0 | | | | | | | | | | | | | |
| RANK= | | 3 | 3 | 3 | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | |
|-----|-------------|-----|-------------|-----|----------|-----|-----------|-----|------------|-----|--------------|-----|------------|-----|--------|-----|--------|
| NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY | NO. | COUNTY |
| 1 | Adair | 16 | Cedar | 31 | Dubuque | 46 | Humboldt | 61 | Madison | 76 | Pocahontas | 91 | Warren | | | | |
| 2 | Adams | 17 | Cerro Gordo | 32 | Emmet | 47 | Ida | 62 | Mahaska | 77 | Polk | 92 | Washington | | | | |
| 3 | Allamakee | 18 | Cherokee | 33 | Fayette | 48 | Iowa | 63 | Marion | 78 | Pottawatomie | 93 | Wayne | | | | |
| 4 | Appanoose | 19 | Chickasaw | 34 | Floyd | 49 | Jackson | 64 | Marshall | 79 | Poweshiek | 94 | Webster | | | | |
| 5 | Audubon | 20 | Clarke | 35 | Franklin | 50 | Jasper | 65 | Mills | 80 | Ringgold | 95 | Winnebago | | | | |
| 6 | Benton | 21 | Clay | 36 | Fremont | 51 | Jefferson | 66 | Mitchell | 81 | Sac | 96 | Winneshiek | | | | |
| 7 | Black Hawk | 22 | Clayton | 37 | Greene | 52 | Johnson | 67 | Monona | 82 | Scott | 97 | Woodbury | | | | |
| 8 | Boone | 23 | Clinton | 38 | Grundy | 53 | Jones | 68 | Monroe | 83 | Shelby | 98 | Worth | | | | |
| 9 | Bremer | 24 | Crawford | 39 | Guthrie | 54 | Keokuk | 69 | Montgomery | 84 | Sioux | 99 | Wright | | | | |
| 10 | Buchanan | 25 | Dallas | 40 | Hamilton | 55 | Kossuth | 70 | Muscatine | 85 | Story | | | | | | |
| 11 | Buena Vista | 26 | Davis | 41 | Hancock | 56 | Lee | 71 | O'Brien | 86 | Tama | | | | | | |
| 12 | Butler | 27 | Decatur | 42 | Hardin | 57 | Linn | 72 | Oceola | 87 | Taylor | | | | | | |
| 13 | Calhoun | 28 | Delaware | 43 | Harrison | 58 | Louisa | 73 | Page | 88 | Union | | | | | | |
| 14 | Carroll | 29 | Des Moines | 44 | Henry | 59 | Lucas | 74 | Palo Alto | 89 | Van Buren | | | | | | |
| 15 | Cass | 30 | Dickinson | 45 | Howard | 60 | Lyon | 75 | Plymouth | 90 | Wapello | | | | | | |

TABLE A-10

NUMBER OF COUNTY RECREATION
AREAS WITH CAMPING, ELECTRIC,
WATER AND/OR PICNIC
STATE OF IOWA
RECREATIONAL TRAILS PLAN



Barton-Aschman Associates, Inc.
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

D-32



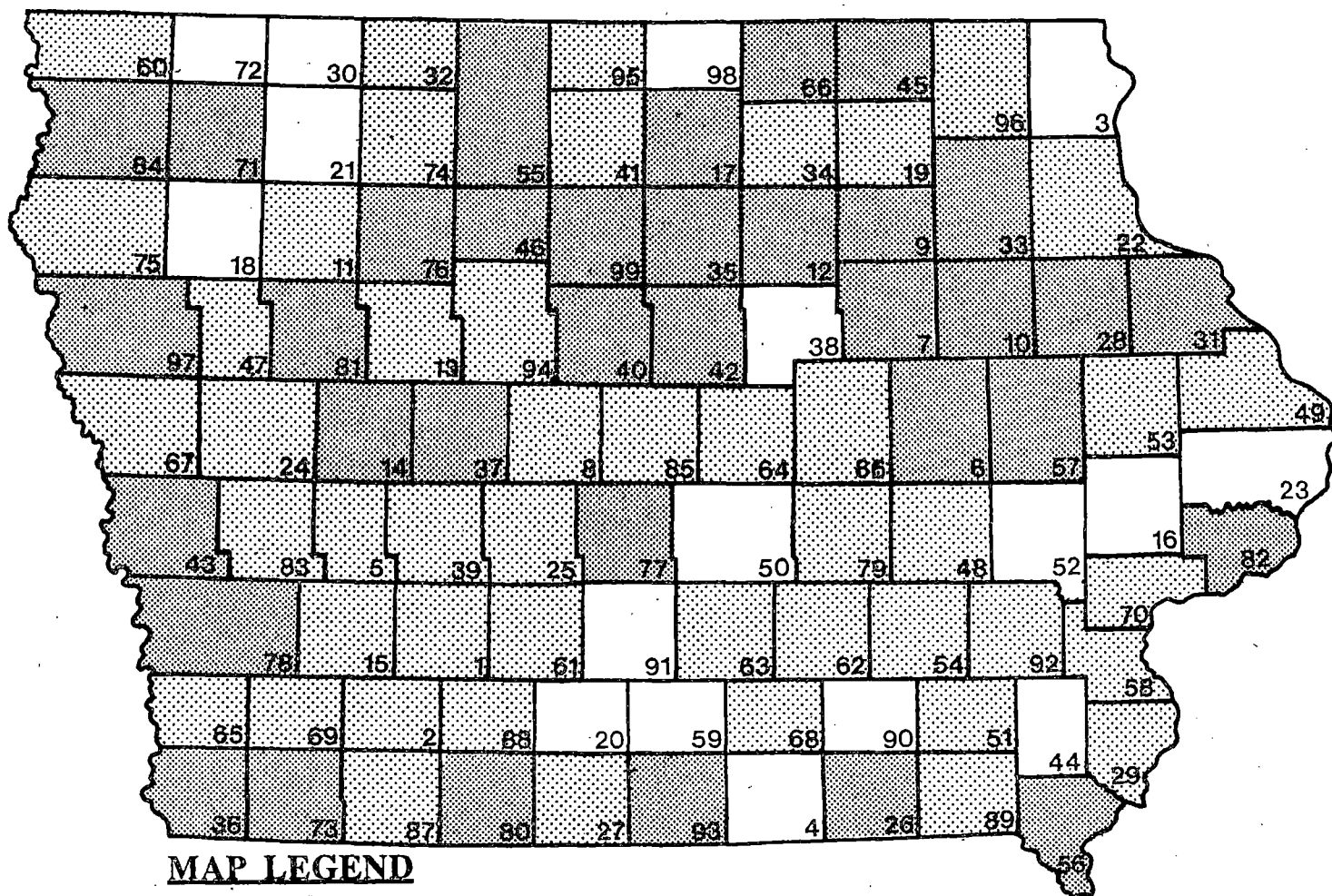
Kimberly Michael and Associates
1111 Oak Grove Building, Suite 115, 1111 1st Street
West Des Moines, Iowa 50265 (515) 225-1225
ARCHITECTS/ENGINEERS/PLANNERS DESIGN/CONSTRUCTION SERVICES



DUNBAR/JONES
ARCHITECTS/ENGINEERS/PLANNERS DESIGN/CONSTRUCTION SERVICES

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



MAP LEGEND



3 OR MORE AREAS



NO AREAS



1 TO 2 AREAS

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 2 | 1 | Adair | 1 | 26 | Davis | 2 | 51 | Jefferson | 1 | 76 | Pocahontas | COUNTY AREAS W/CAMP, ELECT., ETC. |
| 2 | 2 | Adams | 2 | 27 | Decatur | 3 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 3 OR MORE AREAS |
| 3 | 3 | Allamakee | 1 | 28 | Delaware | 2 | 53 | Jones | 1 | 78 | Pottawatomie | RANK #2- 1 TO 2 AREAS |
| 3 | 4 | Appanoose | 2 | 29 | Des Moines | 2 | 54 | Keokuk | 2 | 79 | Poweshiek | RANK #3- 0 AREAS |
| 2 | 5 | Audubon | 3 | 30 | Dickinson | 1 | 55 | Kossuth | 1 | 80 | Ringgold | |
| 1 | 6 | Benton | 1 | 31 | Dubuque | 1 | 56 | Lee | 1 | 81 | Sac | See accompanying table for complete listing. |
| 1 | 7 | Black Hawk | 2 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | |
| 2 | 8 | Boone | 1 | 33 | Fayette | 2 | 58 | Louisa | 2 | 83 | Shelby | |
| 1 | 9 | Bremer | 2 | 34 | Floyd | 3 | 59 | Lucas | 1 | 84 | Sioux | |
| 1 | 10 | Buchanan | 1 | 35 | Franklin | 2 | 60 | Lyon | 2 | 85 | Story | |
| 2 | 11 | Buena Vista | 1 | 36 | Fremont | 2 | 61 | Madison | 2 | 86 | Tama | |
| 1 | 12 | Butler | 1 | 37 | Greene | 2 | 62 | Mahaska | 2 | 87 | Taylor | |
| 2 | 13 | Calhoun | 3 | 38 | Grundy | 2 | 63 | Marion | 2 | 88 | Union | |
| 1 | 14 | Carroll | 2 | 39 | Guthrie | 2 | 64 | Marshall | 2 | 89 | Van Buren | |
| 2 | 15 | Cass | 1 | 40 | Hamilton | 2 | 65 | Mills | 3 | 90 | Wapello | |
| 3 | 16 | Cedar | 2 | 41 | Hancock | 1 | 66 | Mitchell | 3 | 91 | Warren | |
| 1 | 17 | Cerro Gordo | 1 | 42 | Hardin | 2 | 67 | Monona | 2 | 92 | Washington | |
| 3 | 18 | Cherokee | 1 | 43 | Harrison | 2 | 68 | Monroe | 1 | 93 | Wayne | |
| 2 | 19 | Chickasaw | 3 | 44 | Henry | 2 | 69 | Montgomery | 2 | 94 | Webster | |
| 3 | 20 | Clarke | 1 | 45 | Howard | 2 | 70 | Muscatine | 2 | 95 | Winnebago | |
| 3 | 21 | Clay | 1 | 46 | Humboldt | 1 | 71 | O'Brien | 2 | 96 | Winneshiek | |
| 2 | 22 | Clayton | 2 | 47 | Ida | 3 | 72 | Osceola | 1 | 97 | Woodbury | |
| 3 | 23 | Clinton | 2 | 48 | Iowa | 1 | 73 | Page | 3 | 98 | Worth | |
| 2 | 24 | Crawford | 2 | 49 | Jackson | 2 | 74 | Palo Alto | 1 | 99 | Wright | |
| 2 | 25 | Dallas | 3 | 50 | Jasper | 2 | 75 | Plymouth | | | | |

FIGURE A-10

NUMBER OF COUNTY RECREATION
AREAS WITH CAMPING, ELECTRIC,
WATER AND/OR PICNIC

D-33

STATE OF IOWA RECREATIONAL TRAILS PLAN

Barton-Aschman Associates, Inc.
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Minneapolis, Minnesota 55401 Fax: (612) 332-6180

KIRKHAM, MICHAEL AND ASSOCIATES 111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

DUNBAR/JONES 111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



| | | | | | | | | | | | | | | | | | | | | |
|----------------------------|--------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| COUNTY NUMBER | 57 | 85 | 14 | 64 | 7 | 28 | 29 | 92 | 42 | 49 | 72 | 77 | 18 | 35 | 51 | 91 | 9 | 31 | 66 | 17 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| AREAS W/ EQUESTRIAN TRAILS | 4 | 0 | 8 | 0 | 2 | 1 | 1 | 4 | 1 | 0 | 0 | 2 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 2 |
| AREAS W/ HIKING TRAILS | 12 | 24 | 12 | 9 | 5 | 10 | 7 | 7 | 9 | 6 | 10 | 8 | 4 | 7 | 5 | 6 | 8 | 6 | 4 | 4 |
| AREAS W/ XC SKI TRAILS | 10 | 0 | 2 | 4 | 5 | 0 | 3 | 0 | 0 | 4 | 0 | 0 | 4 | 0 | 4 | 3 | 0 | 2 | 4 | 1 |
| TOTAL= | 26 | 24 | 22 | 13 | 12 | 11 | 11 | 11 | 10 | 10 | 10 | 10 | 9 | 9 | 9 | 9 | 8 | 8 | 8 | 7 |
| RANK= | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| AVERAGE= | 4.7273 | | | | | | | | | | | | | | | | | | | |
| STANDARD DEVIATION= | 4.6463 | | | | | | | | | | | | | | | | | | | |
| COUNTY NUMBER | 22 | 38 | 45 | 62 | 97 | 6 | 37 | 74 | 33 | 44 | 50 | 56 | 70 | 75 | 79 | 81 | 83 | 10 | 20 | 21 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| AREAS W/ EQUESTRIAN TRAILS | 1 | 2 | 0 | 0 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 2 | 0 | 0 | 0 | 1 |
| AREAS W/ HIKING TRAILS | 4 | 5 | 7 | 4 | 5 | 6 | 6 | 2 | 3 | 4 | 4 | 5 | 4 | 2 | 3 | 3 | 5 | 3 | 3 | 3 |
| AREAS W/ XC SKI TRAILS | 2 | 0 | 0 | 3 | 1 | 0 | 0 | 2 | 2 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 1 | 1 | 0 |
| TOTAL= | 7 | 7 | 7 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 4 | 4 | 4 |
| RANK= | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 3 | 3 | 3 |
| COUNTY NUMBER | 23 | 30 | 34 | 40 | 43 | 82 | 94 | 96 | 15 | 25 | 27 | 53 | 55 | 61 | 76 | 78 | 80 | 90 | 95 | 98 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| AREAS W/ EQUESTRIAN TRAILS | 0 | 1 | 0 | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 1 | 1 | 0 | 1 | 0 |
| AREAS W/ HIKING TRAILS | 4 | 3 | 4 | 3 | 4 | 2 | 3 | 3 | 3 | 3 | 2 | 2 | 2 | 3 | 3 | 2 | 2 | 2 | 2 | 2 |
| AREAS W/ XC SKI TRAILS | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| TOTAL= | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 1 | 4 | 5 | 12 | 19 | 24 | 36 | 39 | 47 | 59 | 63 | 71 | 73 | 84 | 87 | 88 | 89 | 99 | 2 | 11 |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| AREAS W/ EQUESTRIAN TRAILS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| AREAS W/ HIKING TRAILS | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 1 |
| AREAS W/ XC SKI TRAILS | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL= | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| COUNTY NUMBER | 16 | 32 | 41 | 46 | 48 | 52 | 54 | 58 | 60 | 65 | 67 | 68 | 69 | 86 | 93 | 3 | 8 | 13 | 26 | |
| EVALUATION CRITERIA | | | | | | | | | | | | | | | | | | | | |
| AREAS W/ EQUESTRIAN TRAILS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| AREAS W/ HIKING TRAILS | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| AREAS W/ XC SKI TRAILS | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL= | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 |
| RANK= | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 4 | 4 | 4 | 4 |

| | | | | | | | |
|----------------|----------------|-------------|--------------|---------------|------------------|---------------|------------|
| NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY | NO. COUNTY |
| 1 Adair | 16 Cedar | 31 Dubuque | 46 Humboldt | 61 Madison | 76 Pocahontas | 91 Warren | |
| 2 Adams | 17 Cerro Gordo | 32 Emmet | 47 Ida | 62 Mahaska | 77 Polk | 92 Washington | |
| 3 Allamakee | 18 Cherokee | 33 Fayette | 48 Iowa | 63 Marion | 78 Pottawattamie | 93 Wayne | |
| 4 Appanoose | 19 Chickasaw | 34 Floyd | 49 Jackson | 64 Marshall | 79 Poweshick | 94 Webster | |
| 5 Audubon | 20 Clarke | 35 Franklin | 50 Jasper | 65 Mills | 80 Ringgold | 95 Winnebago | |
| 6 Benton | 21 Clay | 36 Fremont | 51 Jefferson | 66 Mitchell | 81 Sac | 96 Winneshiek | |
| 7 Black Hawk | 22 Clayton | 37 Greene | 52 Johnson | 67 Monona | 82 Scott | 97 Woodbury | |
| 8 Boone | 23 Clinton | 38 Grundy | 53 Jones | 68 Monroe | 83 Shelby | 98 Worth | |
| 9 Bremer | 24 Crawford | 39 Guthrie | 54 Keokuk | 69 Montgomery | 84 Sioux | 99 Wright | |
| 10 Buchanan | 25 Dallas | 40 Hamilton | 55 Kossuth | 70 Muscatine | 85 Story | | |
| 11 Buena Vista | 26 Davis | 41 Hancock | 56 Lee | 71 O'Brien | 86 Tama | | |
| 12 Butler | 27 Decatur | 42 Hardin | 57 Linn | 72 Osceola | 87 Taylor | | |
| 13 Calhoun | 28 Delaware | 43 Harrison | 58 Louisa | 73 Page | 88 Union | | |
| 14 Carroll | 29 Des Moines | 44 Henry | 59 Lucas | 74 Palo Alto | 89 Van Buren | | |
| 15 Cass | 30 Dickinson | 45 Howard | 60 Lyon | 75 Plymouth | 90 Wapello | | |

TABLE A-11



Barton-Aschman Associates, Inc.
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K&M KIRKHAM, MICHAEL, AND ASSOCIATES
Blue Cross Office Building, Suite 118, 1152 2nd Street
West Des Moines, Iowa 50268 (515) 273-1083
ARCHITECTS AND ENGINEERS PLANNERS DESIGNED CONSTRUCTION



D-34

NUMBER OF COUNTY RECREATION AREAS WITH EQUESTRIAN, HIKING AND/OR XC SKI TRAILS STATE OF IOWA RECREATIONAL TRAILS PLAN

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS

Figure A-11 shows the individual counties. The average per county is 4.7 recreation areas with trails. Twelve counties have 10 or more, 25 have five to nine, 58 have one to four, and four counties show no county recreation areas with trails.

4. **Recreation Resources.** Figure A-12 combines the information of Tables A-9, A-10 and A-11, and the information on Figures A-9, A-10 and A-11. The combined information is used to separate the counties into three divisions based upon the recreational resources in each county.

RANK #1 - Those counties with one or more of the following:

1. Three or more state recreation areas
2. Three or more county recreation areas with camping, electricity, water and/or picnic facilities
3. 10 or more county recreation areas with equestrian, hiking and/or cross-country ski trails

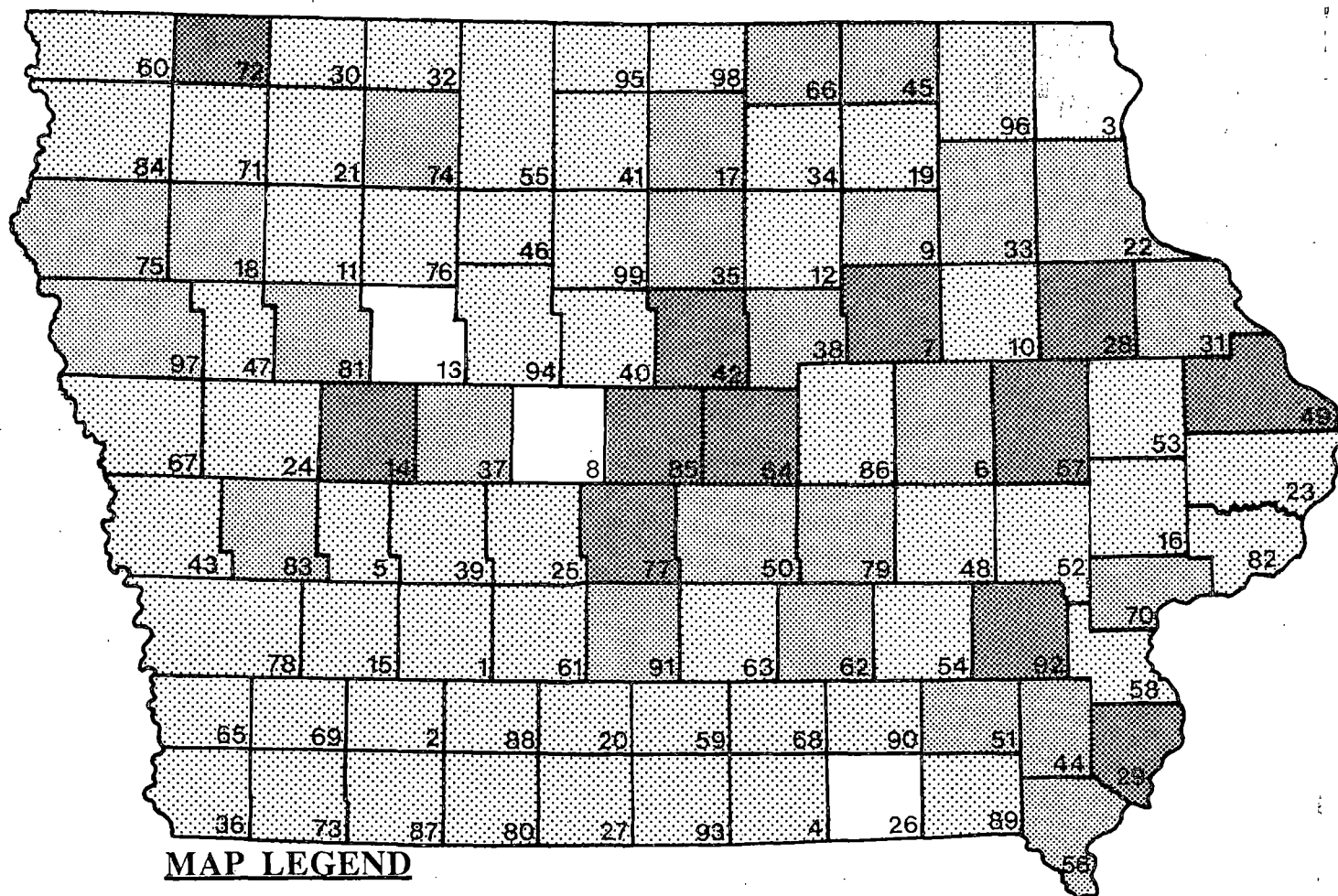
RANK #2 - Those counties with one or more of the following:

1. One to two state recreation areas
2. One to two county recreation areas with camping, electricity, water and/or picnic facilities
3. Five to nine county recreation areas with equestrian, hiking and/or cross-country ski trails

RANK #3 - Those counties with all of the following:

1. No state areas
2. No county recreation areas with camping, electricity, water and/or picnic facilities
3. Four or fewer county recreation areas with equestrian, hiking and/or cross-country ski trails

Forty-three counties are shown on the figure with the top ranking, 50 are shown second and six are ranked third.



MAP LEGEND



10 OR MORE AREAS



1 TO 4



5 TO 9 AREAS



NO AREAS

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|---------------|--|
| 3 | 1 | Adair | 4 | 26 | Davis | 2 | 51 | Jefferson | 3 | 76 | Pocahontas | COUNTY AREAS W/TRAILS |
| 3 | 2 | Adams | 3 | 27 | Decatur | 3 | 52 | Johnson | 1 | 77 | Polk | RANK #1- 10 OR MORE AREAS |
| 4 | 3 | Allamakee | 1 | 28 | Delaware | 3 | 53 | Jones | 3 | 78 | Pottawattamie | RANK #2- 5 TO 9 AREAS |
| 3 | 4 | Appanoose | 1 | 29 | Des Moines | 3 | 54 | Keokuk | 2 | 79 | Poweshiek | RANK #3- 1 TO 4 AREAS |
| 3 | 5 | Audubon | 3 | 30 | Dickinson | 3 | 55 | Kossuth | 3 | 80 | Ringgold | RANK #4- 0 AREAS |
| 2 | 6 | Benton | 2 | 31 | Dubuque | 2 | 56 | Lee | 2 | 81 | Sac | See accompanying table for complete listing. |
| 1 | 7 | Black Hawk | 3 | 32 | Emmet | 1 | 57 | Linn | 3 | 82 | Scott | |
| 4 | 8 | Boone | 2 | 33 | Fayette | 3 | 58 | Louisa | 2 | 83 | Shelby | |
| 2 | 9 | Bremor | 3 | 34 | Floyd | 3 | 59 | Lucas | 3 | 84 | Sioux | |
| 3 | 10 | Buchanan | 2 | 35 | Franklin | 3 | 60 | Lyon | 1 | 85 | Story | |
| 3 | 11 | Buena Vista | 3 | 36 | Fremont | 3 | 61 | Madison | 3 | 86 | Tama | |
| 3 | 12 | Butler | 2 | 37 | Greene | 2 | 62 | Mahaska | 3 | 87 | Taylor | |
| 4 | 13 | Calhoun | 2 | 38 | Grundy | 3 | 63 | Marion | 3 | 88 | Union | |
| 1 | 14 | Carroll | 3 | 39 | Guthrie | 1 | 64 | Marshall | 3 | 89 | Van Buren | |
| 3 | 15 | Cass | 3 | 40 | Hamilton | 3 | 65 | Mills | 3 | 90 | Wapello | |
| 3 | 16 | Cedar | 3 | 41 | Hancock | 2 | 66 | Mitchell | 2 | 91 | Warren | |
| 2 | 17 | Cerro Gordo | 1 | 42 | Hardin | 3 | 67 | Monona | 1 | 92 | Washington | |
| 2 | 18 | Cherokee | 3 | 43 | Harrison | 3 | 68 | Monroe | 3 | 93 | Wayne | |
| 3 | 19 | Chickasaw | 2 | 44 | Henry | 3 | 69 | Montgomery | 3 | 94 | Webster | |
| 3 | 20 | Clarke | 2 | 45 | Howard | 2 | 70 | Muscatine | 3 | 95 | Winnebago | |
| 3 | 21 | Clay | 3 | 46 | Humboldt | 3 | 71 | O'Brien | 3 | 96 | Winneshiek | |
| 2 | 22 | Clayton | 3 | 47 | Ida | 1 | 72 | Osceola | 2 | 97 | Woodbury | |
| 3 | 23 | Clinton | 3 | 48 | Iowa | 3 | 73 | Page | 3 | 98 | Worth | |
| 3 | 24 | Crawford | 1 | 49 | Jackson | 2 | 74 | Palo Alto | 3 | 99 | Wright | |
| 3 | 25 | Dallas | 2 | 50 | Jasper | 2 | 75 | Plymouth | | | | |

FIGURE A-11

NUMBER OF COUNTY RECREATION
AREAS WITH EQUESTRIAN, HIKING
AND/OR XC SKI TRAILS

STATE OF IOWA RECREATIONAL TRAILS PLAN

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



Barton-Aschman Associates, Inc.

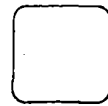
111 Third Avenue South, Suite 350 Phone: (612) 332-0421
Minneapolis, Minnesota 55401 Fax: (612) 332-6180

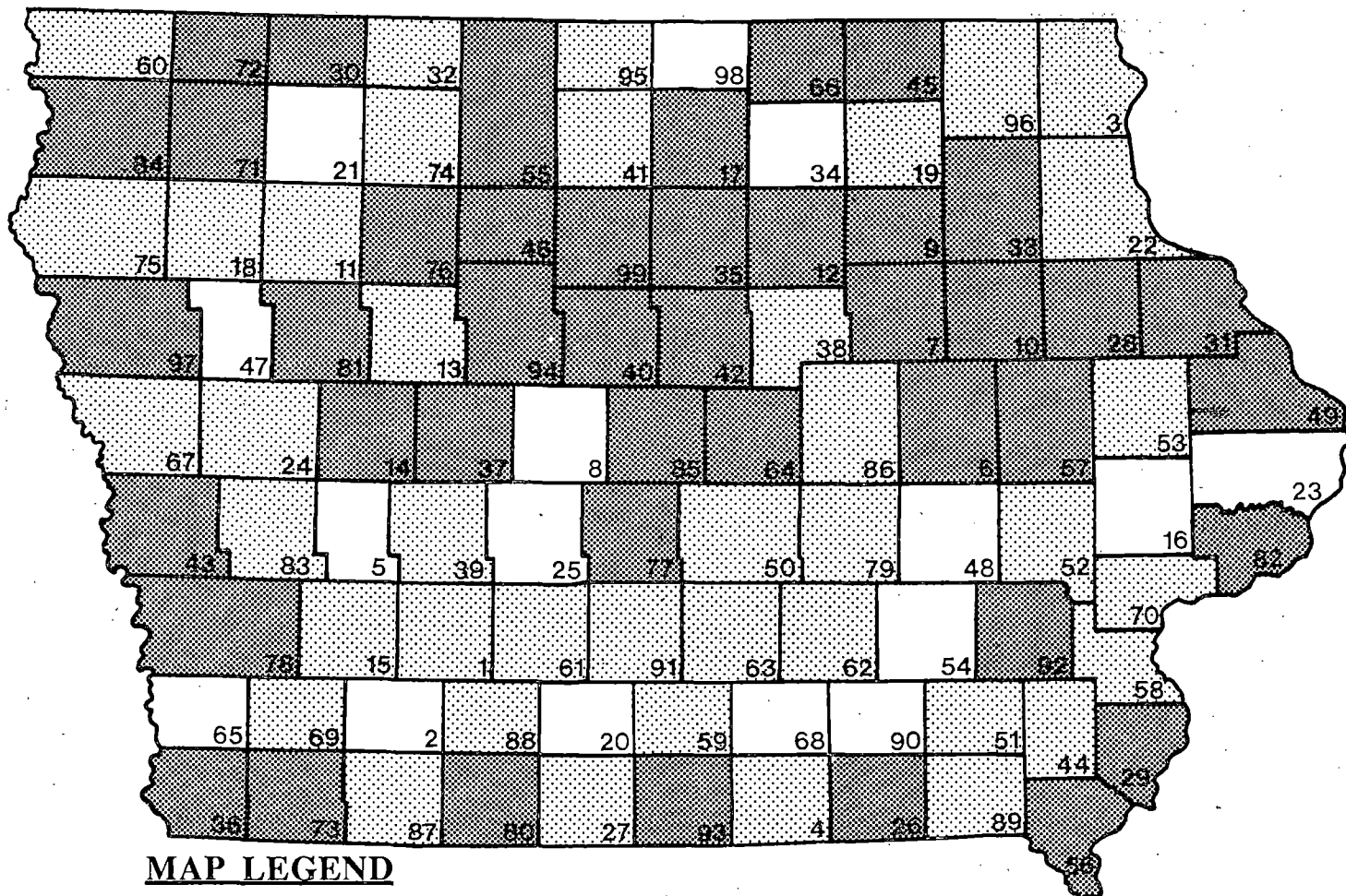


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ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE





MAP LEGEND



RANK #1



RANK #3



RANK #2

| RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | RANK | NO. | COUNTY | LEGEND |
|------|-----|-------------|------|-----|------------|------|-----|------------|------|-----|--------------|--|
| 2 | 1 | Adair | 1 | 26 | Davis | 2 | 51 | Jefferson | 1 | 76 | Pocahontas | RECREATION RESOURCES |
| 2 | 2 | Adams | 2 | 27 | Decatur | 2 | 52 | Johnson | 1 | 77 | Polk | RANK #1- One or more of the following: |
| 2 | 3 | Allamakee | 1 | 28 | Delaware | 2 | 53 | Jones | 1 | 78 | Pottawatomie | 3 or more State areas |
| 2 | 4 | Appanoose | 1 | 29 | Des Moines | 2 | 54 | Keokuk | 2 | 79 | Poweshiek | 3 or more County areas w/camp., etc. |
| 2 | 5 | Audubon | 1 | 30 | Dickinson | 1 | 55 | Kossuth | 1 | 80 | Ringgold | 10 or more County areas w/trails |
| 1 | 6 | Benton | 1 | 31 | Dubuque | 1 | 56 | Lee | 1 | 81 | Sac | RANK #2- One or more of the following: |
| 1 | 7 | Black Hawk | 2 | 32 | Emmet | 1 | 57 | Linn | 1 | 82 | Scott | 1 to 2 State areas |
| 2 | 8 | Boone | 1 | 33 | Fayette | 2 | 58 | Louisa | 2 | 83 | Shelby | 1 to 2 County areas w/camp., etc. |
| 1 | 9 | Bremer | 2 | 34 | Floyd | 2 | 59 | Lucas | 1 | 84 | Sioux | 5 to 9 County areas w/trails |
| 1 | 10 | Buchanan | 1 | 35 | Franklin | 2 | 60 | Lyon | 1 | 85 | Story | RANK #3- All of the following: |
| 2 | 11 | Buena Vista | 1 | 36 | Fremont | 2 | 61 | Madison | 2 | 86 | Tama | 0 State areas |
| 1 | 12 | Butler | 1 | 37 | Greene | 2 | 62 | Mahaska | 2 | 87 | Taylor | 0 County areas w/camp., etc. |
| 2 | 13 | Calhoun | 2 | 38 | Grundy | 2 | 63 | Marion | 2 | 88 | Union | 4 or fewer County areas w/trails |
| 1 | 14 | Carroll | 2 | 39 | Guthrie | 1 | 64 | Marshall | 2 | 89 | Van Buren | |
| 2 | 15 | Cass | 1 | 40 | Hamilton | 2 | 65 | Mills | 3 | 90 | Wapello | See previous tables for complete listings. |
| 3 | 16 | Cedar | 2 | 41 | Hancock | 1 | 66 | Mitchell | 2 | 91 | Warren | |
| 1 | 17 | Cerro Gordo | 1 | 42 | Hardin | 2 | 67 | Monona | 1 | 92 | Washington | |
| 2 | 18 | Cherokee | 1 | 43 | Harrison | 2 | 68 | Monroe | 1 | 93 | Wayne | |
| 2 | 19 | Chickasaw | 2 | 44 | Henry | 2 | 69 | Montgomery | 1 | 94 | Webster | |
| 3 | 20 | Clarke | 1 | 45 | Howard | 2 | 70 | Muscatine | 2 | 95 | Winnebago | |
| 3 | 21 | Clay | 1 | 46 | Humboldt | 1 | 71 | O'Brien | 2 | 96 | Winneschick | |
| 2 | 22 | Clayton | 2 | 47 | Ida | 1 | 72 | Osceola | 1 | 97 | Woodbury | |
| 3 | 23 | Clinton | 2 | 48 | Iowa | 1 | 73 | Page | 3 | 98 | Worth | |
| 2 | 24 | Crawford | 1 | 49 | Jackson | 2 | 74 | Palo Alto | 1 | 99 | Wright | |
| 2 | 25 | Dallas | 2 | 50 | Jasper | 2 | 75 | Plymouth | | | | |

FIGURE A-12

RECREATION RESOURCES

STATE OF IOWA

RECREATIONAL TRAILS PLAN

D-37



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ENVIRONMENTAL PLANNING WITH A HUMAN PERSPECTIVE

IOWA DEPARTMENT OF TRANSPORTATION
IOWA DEPARTMENT OF NATURAL RESOURCES

IOWA DEPARTMENT OF ECONOMIC DEVELOPMENT
IOWA DEPARTMENT OF CULTURAL AFFAIRS



APPENDIX E

DEVELOPMENT OF UNIT COSTS

The unit costs used for estimating construction costs of recreational trails were based on average costs from various sources. The following is an explanation as to how each unit cost was developed.

Clearing and Grubbing

The cost of clearing and grubbing for a new recreational trail is obviously dependent on the condition of the existing right-of-way. A trail developed on abandoned railroad right-of-way will require very little clearing and grubbing in comparison to a trail that is built in a heavily wooded area along a river.

If very little grubbing is required, the cost would be approximately \$200/acre. A moderately wooded area would cost about \$1,500/acre. A heavily wooded area costs approximately \$2,500/acre to clear and grub.

For the purposes of this example, \$1,400 per acre will be used for clearing and grubbing. The amount equals the average of the referenced values.

Grading

Like the cost of clearing and grubbing, the cost of grading is very dependent on existing conditions. If an 10'-0" wide trail with 3:1 foreslopes needs to be completely constructed with fill, the cost of grading would be approximately \$26,000 per mile of trail. It is unlikely that such construction would be required, however, it is possible. For trail construction on an abandoned railroad bed, generally the only grading required is leveling, some filling, and some shaping of the trail bed. The cost for this is about \$1,000/mile. This same rate can be applied in other situations where leveling and minimal shaping is all that is needed to prepare the trail bed.

Since there is such a wide range of costs between leveling and complete bank construction, it would not be appropriate to simply average the two rates. Because much of the trail construction will require only minimal grading, \$1,500/mile was used for bicycle/pedestrian trails and \$1,000/mile for other modes used in estimating the construction costs. This factor could be altered for localized conditions.

Seeding, Fertilizing and Mulching

Unlike grading and clearing, seeding, fertilizing and mulching is not as dependent on existing conditions. The average cost per acre that the Iowa Department of Transportation paid in 1988 for this item was \$675, with a range of bid prices from \$400 to \$4,000 per acre. \$675 per acre was the assumed unit cost used to prepare the cost estimates.

Crushed Limestone Surfacing

The cost of crushed limestone varies according to the proximity of a quarry. The cost of crushed limestone surfacing (which includes the cost of the aggregate, hauling, placing and rolling) according to the Department of Transportation's applications for trail funding, ranged from \$9.75/ton to \$20.00/ton. The average cost, which was used in preparing the cost estimates, is \$12/ton.

Asphalt Surfacing

According to funding applications received by the Department of Transportation, the cost of surfacing a trail with asphalt (including the cost of placing and rolling) ranged from \$31/ton to \$50/ton. The average was \$38/ton. The cost of asphalt, similar to the cost of crushed limestone, will vary depending on the proximity to an asphalt plant and the amount of asphalt needed.

Signing

The Department of Transportation pays \$40 to \$50 for signs (including installation) that range in size from two square feet to three square feet. These signs are comparable in size to those required on recreational trails. Therefore, \$45 per sign was the unit cost used for preparing the cost estimates.

The number of signs required per mile will vary depending on the geometrics and nature of the trail. For the purposes of arriving at a cost per mile for signing, it was assumed that hiking, equestrian and cross-country ski trails would have two signs per mile. Because bicycle, snowmobile and off-road vehicle trails generally involve traffic moving at higher speeds than the other modes, and thereby requiring more warning signs, three signs per mile were assumed instead of two signs per mile. These numbers were used only for cost estimating purposes and are not intended to be used as guidelines for sign placement.