DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING—P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:
Planning Division

May 18, 1988

SEE REPORT DISTRIBUTION LIST

The Rock Island District, U.S. Army Corps of Engineers, has completed the final General Design Memorandum (GDM) and the final Programmatic Environmental Impact Statement (PEIS) for the Des Moines Recreational River and Greenbelt, Des Moines River, Iowa. The draft PEIS for this project was officially filed with the U.S. Environmental Protection Agency on July 31, 1987.

The project was authorized by Public Laws No. 99-88 and 99-662 for the development, operation, and maintenance of an environmental greenbelt along the Des Moines River from U.S. Highway 20 in Fort Dodge, Iowa, to State Highway 92 below the Red Rock Dam. The project area includes portions of the Boone, Des Moines, and Raccoon Rivers in Boone, Dallas, Jasper, Hamilton, Mahaska, Marion, Polk, Warren, and Webster Counties.

Comments on the draft PEIS were received from Federal, State, and local governments and from private individuals. These comments contained no new information sufficient to warrant any change in project design.

The purpose of the project is to enhance the environment of central Iowa and the city of Des Moines by providing protection of scarce riverbottom timberlands and by providing increased opportunities for recreation.

The GDM describes the overall plan, the initial development plan, coordination of the project, and the conditions for Federal participation. The comprehensive initial development is divided into cost-shared, 100-percent Federal, and 100-percent non-Federal sections.

Due to the general nature of the GDM, plans have not been evaluated in detail in the PEIS. As plans are approved for implementation in the future, the Corps of Engineers will initiate detailed engineering and environmental studies to include site-specific project analyses.

A 30-day review period for the GDM and PEIS starts on the date of this letter or the date the filing notice appears in the Federal Register, whichever is later. Agencies, organizations, and individuals should send comments on the report within this review period to the Corps office at the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Questions concerning the PEIS may be addressed to Ms. Charlene Carmack, Environmental Analysis Branch, at 309/788-6361, Ext. 570. For information on the GDM, please call Mr. George Gitter, General Investigations and Special Studies Branch, at Ext. 214.

Sincerely,

Neil A. Smart
Colonel, U.S. Army
District Engineer

Enclosure

DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605-1592

AUG 2 1989

REPLY TO
ATTENTION OF
CENCD-DE (1105)

MEMORANDUM FOR: Commander, Rock Island District

SUBJECT: Final General Design Memorandum and Final Programmatic Environmental Impact Statement for the Des Moines Recreational River and Greenbelt, Des Moines River, Iowa

1. The signed Record of Decision is enclosed. As stated in the referenced letter, final approval of the GDM occurred upon the signature of the ROD.

2. I do not have the authority to increase the Federal cost estimate from $4,480,000 to $8,330,000 as you have requested in the GDM and in FY 1990 budget documents. Accordingly, I am providing the GDM to CEEC-EB as information to support an increase in the Federal cost estimate to $8,330,000.

3. Reference: CENCD-PD-PL 1st End, above subject, 28 Oct 1987.

Theodore Vander Els

THEODORE VANDER ELS
Brigadier General, USA
Commanding

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PD-C
PD-E ✓
PD-F
PD-P ✓
PD-R
Dnd

RECORD OF DECISION

Des Moines Recreational River and Greenbelt
Des Moines River, Iowa

The Environmental Impact Statement is a programmatic document assessing existing conditions and resources for the project area; addressing potential impacts associated with the types of actions outlined in the General Design Memorandum; and identifying future study requirements.

In response to specific Congressional interest and legislation (P.L. 99-88, and Section 102, P.L. 99-500) and based upon information in the Final General Design Memorandum and Programmatic Environmental Impact Statement, I find that it is in the public interest to continue the Des Moines Recreational River and Greenbelt program and implement the following nine projects, subject to the preparation and approval of individual Feature Design Memorandums.

Botanical Center Riverfront Park
Boone Waterworks Boat Ramp
Scenic Valley Road Route
Jester County Park Improvements
Upper Saylorville Boat Ramp
Raccoon River Sports Complex
Greenbelt Trail System - Lutheran Hospital Repair
Greenbelt Trail System - Red Rock (North Shoreline)
Johnston Nursery

As individual projects are proposed for implementation, each will be evaluated separately for anticipated site-specific impacts and compliance with NEPA requirements.

A total of 121 individual projects were proposed for the Greenbelt. Eleven of these projects were eliminated from further study. Of the remaining 110 projects, 4 involve development of trails or scenic routes, 21 propose land acquisition and/or environmental enhancement, 7 involve streambank stabilization, and 70 involve development or improvement of land- or water-based recreational facilities. The "no action" alternative is considered for each project.

Most of the project identified in the GDM are anticipated to have few adverse impacts to the natural and man-made environment, and many have the potential to benefit natural resources and enhance recreation opportunities in the region. Under the "no action" alternative, existing natural areas would continue to be threatened by pressure for agricultural and urban development. The increasing demand for recreational facilities would not be met, and existing Corps and non-Corps facilities would increasingly suffer from overuse, diminishing the quality of the recreational experience for many users.

Additional projects, as recommended by the Advisory Committee will be considered for possible future implementation. Future projects will be identified and submitted as additions to the Greenbelt in Annual Reports.

I have carefully considered the balance between the environmental and economic needs of the Nation, and find that continuation of the Des Moines Recreational River and Greenbelt program would contribute to national economic development consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

Technical and economic criteria used in the formulation of alternative plans were those specified in the Water Resources Council's Principles and Guidelines. The Greenbelt program is in full compliance with all applicable laws, executive orders, regulations, and local government plans and regulations, including the Fish and Wildlife Coordination Act, as amended; National Historic Preservation Act of 1966, as amended; the National Environmental Policy Act; the Clean Water Act, and Endangered Species Act.

I have found that the benefits to be gained with continuation of the Greenbelt program outweigh any adverse effects. All practicable means to avoid or minimize adverse effects have been adopted. In response to specific Congressional interest and legislation (P.L. 99-88 and Section 102, P.L. 99-500), and based on a review of the subject documents, I recommend continuation of the Des Moines Recreational River and Greenbelt program.

1 August 1988
DATE

Theodore Vander Els
THEODORE VANDER ELS
Brigadier General, USA
Commanding

DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605-1592

AUG 2 1988

REPLY TO ATTENTION OF
CENCD-DE (1105)

MEMORANDUM FOR: Commander, Rock Island District

SUBJECT: Final General Design Memorandum and Final Programmatic Environmental Impact Statement for the Des Moines Recreational River and Greenbelt, Des Moines River, Iowa

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3. Reference: CENCD-PD-PL 1st End, above subject, 28 Oct 1987.

Encl
as

THEODORE VANDER ELS
Brigadier General, USA
Commanding

[redacted] AUG 02 '88 14:23

FACSIMILE HEADER SHEET
(ER 105-1-8)

FROM (Name) HEMPFLING	OFFICE SYMBOL CENCD-PD-PL	TELEPHONE NO. 353-6351	RELEASER'S SIGNATURE		
TO (Name) GITTER	OFFICE SYMBOL CENCR-PD-PF	TELEPHONE NO. [redacted]	# PAGES 4	PRECEDENCE P	DTG
SUBJECT					

DD FORM 1 FEB 74

RECORD OF DECISION

Des Moines Recreational River and Greenbelt
Des Moines River, Iowa

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DATE 1 August 1988

THEODORE VANDER ELS
Brigadier General, USA
Commanding

DEPARTMENT OF THE ARMY
NORTH CENTRAL DIVISION, CORPS OF ENGINEERS
536 SOUTH CLARK STREET
CHICAGO, ILLINOIS 60605-1592

AUG 2 1988

REPLY TO ATTENTION OF
CENCD-DE (1105)

MEMORANDUM FOR: Commander, USACE (CEEC-EB), Washington, D. C. 20314-1000

SUBJECT: Des Moines Recreational River and Greenbelt, Iowa

1. In response to specific Congressional interest and legislation (P.L. 99-88 and Section 102, P.L. 99-500), this letter requests an increase in the approved Federal cost estimate for the subject project from $4,480,000 to $8,330,000.

2. The final GDM for the Greenbelt project is enclosed for supporting information. Enclosed separately for quick reference are the summary and recommendations sections of the report. The summary section includes a description of nine projects that could be implemented under the increased Federal cost estimate. The Rock Island District will obtain letters of assurance from non-Federal sponsors prior to undertaking design of cost-shared projects.

Theodore Vander Els

THEODORE VANDER ELS
Brigadier General, USA
Commanding

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as

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:
CENCR-PD-P

GENERAL DESIGN MEMORANDUM

DES MOINES RECREATIONAL RIVER AND GREENBELT

DES MOINES RIVER, IOWA

WITH PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

SEPTEMBER 1987

ACKNOWLEDGEMENT

This report was prepared by a multi-disciplinary study team from the Rock Island District, U.S. Army Corps of Engineers. Persons primarily involved in the conduct of the study who are familiar with the technical aspects of the report are listed below:

STUDY MANAGEMENT AND SITE PLANNING: George Gitter

TRAILS AND SITE PLANNING: John P. Adamski

ECONOMIC, SOCIAL, AND MARKET ANALYSIS: Patti Risser

ENVIRONMENTAL IMPACT STATEMENT COORDINATION: Charlene Carmack

ENVIRONMENTAL IMPACT STATEMENT COORDINATION AND CORRIDOR BIOLOGY: Ron Klump

CULTURAL RESOURCES: Charles Smith

BASIN HYDROLOGY: Roger Less

Others who are acknowledged but who are no longer with the District are:

RECREATION RESOURCES: Larry McLean

BASIN GEOLOGY: Ronald Pearson

EXECUTIVE SUMMARY

The project, as authorized by Public Law 99-88 and subsequent legislation, is for the development, operation, and maintenance of a recreation and greenbelt area on and along the Des Moines River, Iowa, between the point at which the Des Moines River is intersected by United States Highway 20 at Fort Dodge to the point downstream at which relocated State Highway 92 intersects the Des Moines River below the Red Rock Dam. The Greenbelt corridor consists of a unique collection of highly valuable natural areas and a variety recreational areas. The project's concept is to coordinate existing and future Federal, State, and local recreational and environmental enhancement projects by linking them collectively to maximize the attraction of recreation use and economic development.

In accordance with Public Law 99-88, the project shall include, but not be limited to: (1) the construction, operation, and maintenance of recreational facilities and streambank stabilization structures; (2) the operation and maintenance of this project (other than any such structure operated and maintained by any person under a permit or agreement with the Secretary) within the area described in the Des Moines Recreational River and Greenbelt Map and on file with the Committee on Public Works and Transportation of the House of Representatives; (3) such tree plantings, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes; and (4) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary.

The Rock Island District, Corps of Engineers, prepared the Plan for Engineering and Design to establish the appropriate scope and content of the General Design Memorandum, and to describe the role of the Advisory Committee, public involvement, and project administration. Key aspects of the General Design Memorandum are discussed in the Plan for Engineering and Design. Letters of Assurance are included as an appendix and are addressed in the main report to satisfy the local cooperation requirements at this stage of the study. The Plan for Engineering and Design was approved by the Office of the Chief of Engineers in February 1986 and was distributed to the public in March 1986.

The Corps of Engineers and the Iowa Department of Natural Resources executed a local cooperation agreement in June 1986 for the construction of a 50-percent Federal/50-percent local expense boat ramp and parking lot. The project is located at the Bennington Bridge site near the city of Runnells in extreme northwestern Marion County. Construction is scheduled for completion in the fall of 1987.

Additional Greenbelt legislation was provided in Section 102 of Public Law 99-500 and Section 604 of Public Law 99-662. Section 102 continued the preparation of the General Design Memorandum and set an October 1987 report completion date. Section 604 set a town and range description of the boundary as referenced in Committee Print 99-53, and the Joint Explanatory Statement of the Committee on Conference further described the composition of the Advisory Committee.

The General Design Memorandum covers the administration, comprehensive plan, plan for initial development and coordination of the project, and discusses the conditions for Federal participation. The comprehensive plan portion of the report addresses the entire Greenbelt. The plan for initial development is divided into cost-shared, 100-percent Federal, and 100-percent non-Federal sections. The draft report was released for a 45-day public review which began on July 31, 1987. The public review period ended on 14 September 1987. Comments concerning the draft report are addressed in the final document.

Completion of the General Design Memorandum is scheduled for October 1987 in accordance with Public Law 99-500. The report was completed on 30 September 1987 upon its submission to the Corps of Engineers' North Central Division.

In accordance with current Corps of Engineers budgetary policy, the General Design Memorandum does not offer any recommendations for projects in fiscal year 1988. Due to this constraint, plans have not been evaluated in detail in the Programmatic Environmental Impact Statement. As plans are identified for implementation in the future, the Corps of Engineers will initiate additional engineering and environmental studies which will include site-specific analyses.

PERTINENT DATA

Project Name: Des Moines Recreational River and Greenbelt

Authorization: Public Law 99-88

Additional Legislation: Public Law 99-500, Public Law 99-662

Boundary Description: Committee Print 99-53

Area: 362,000 acres

Letters of Assurance: 15

Advisory Committee Membership:
- 3 - Federal
- 5 - State
- 18 - County
- 19 - Local

Authorized Project Purposes:
1. Recreation
2. Streambank Stabilization
3. Operation and Maintenance of Existing Structures
4. Environmental Enhancement
5. Prohibition or Limitation on Taking Wildlife

GENERAL DESIGN MEMORANDUM
DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER, IOWA

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GENERAL DESIGN MEMORANDUM
DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER, IOWA

SECTION 1 - INTRODUCTION

GREENBELT AUTHORIZATION

The Des Moines Recreational River and Greenbelt (hereinafter referred to as the Greenbelt) was authorized on August 15, 1985, by Public Law 99-88, the 1985 Supplemental Appropriations Act (see figure 1). The portions of the legislation pertinent to this report are listed below:

> ... the Secretary of the Army acting through the Chief of Engineers is authorized and directed to proceed with planning, design, engineering, and construction of the following projects substantially in accordance with the individual report describing such project as reflected in the Joint Explanatory Statement of the Committee of Conference accompanying the Conference Report for H.R. 2577: ... Des Moines Recreational River and Greenbelt ... Provided, That none of the funds herein appropriated may be expended to undertake such projects except under terms and conditions acceptable to the Secretary of the Army (or under terms and conditions provided for in subsequent legislation when enacted into law) as shall be set forth in binding agreements with non-Federal entities desiring to participate in project construction. Each such agreement shall include a statement that the non-Federal entities are capable of and willing to participate in project cost-sharing and financing in accordance with terms of the agreement. At such time as the Secretary has executed a formal binding agreement and has determined that the non-Federal entities' financing plan demonstrates a reasonable likelihood of the non-Federal entities' ability to satisfy the terms and conditions of the agreement, the Secretary shall initiate construction of a project in accordance with such agreement: Provided further, That the funds appropriated herein shall lapse on June 30, 1986, if the agreement required herein for that project has not been executed: ...

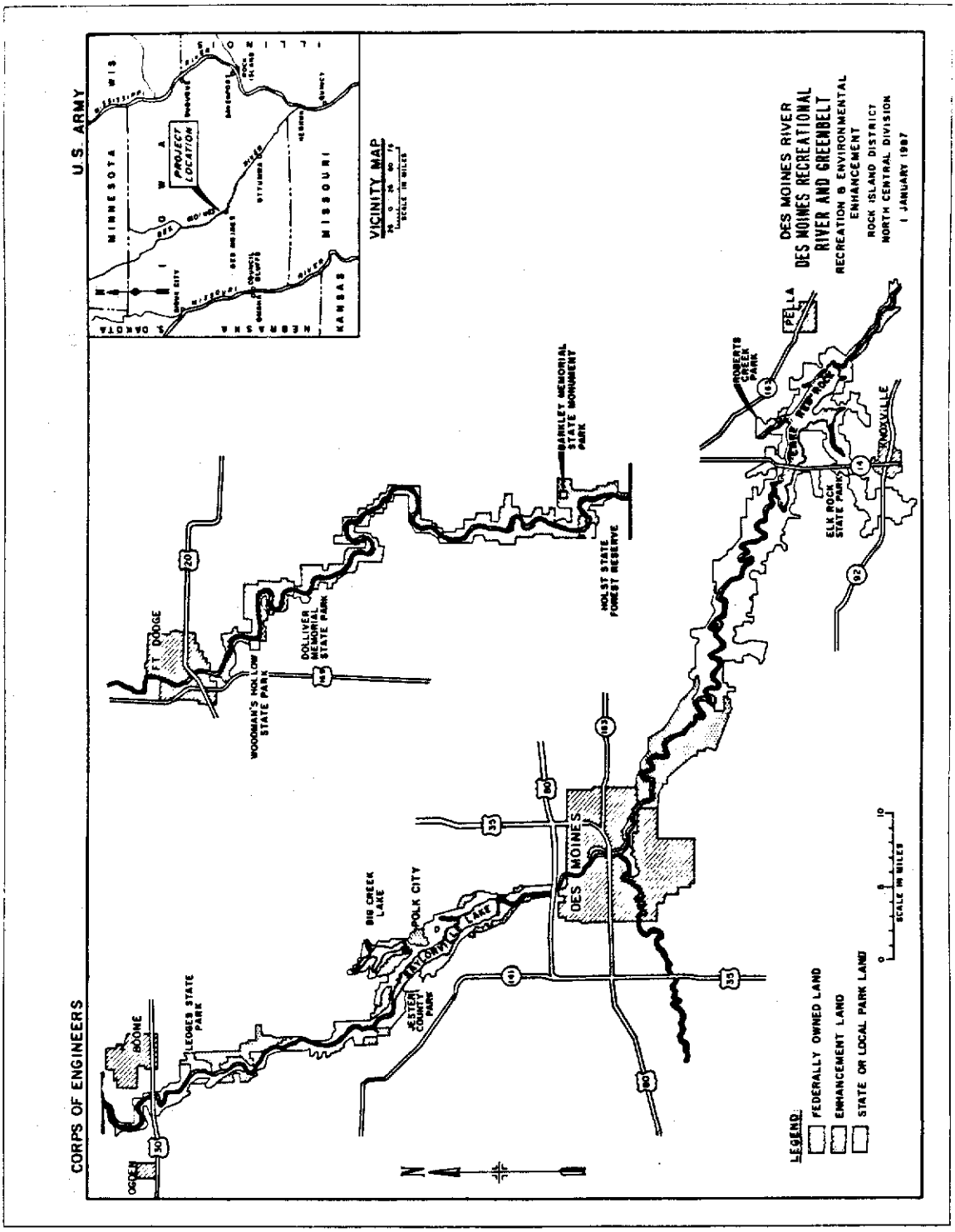


Figure 1. Des Moines Recreational River and Greenbelt.

The Conference Report on H.R. 2577, dated July 29, 1985, provides a description of the Des Moines Recreational River and Greenbelt:

> Des Moines Recreational River and Greenbelt, IA. - The project will provide central Iowa and the City of Des Moines with environmental protection of scarce river bottom timberlands and greatly enhance opportunities for recreation. The project is for the development, operation, and maintenance of a recreation and Greenbelt area on, and along the Des Moines River, Iowa, between the point at which the Des Moines River is intersected by United States Highway 20 to the point downstream at which relocated United States Highway 92 intersects the Des Moines River. The project shall include, but not be limited to: (1) the construction, operation, and maintenance of recreational facilities and streambank stabilization structures; (2) the operation and maintenance of all structures constructed before the date of authorization of this project (other than any such structure operated and maintained by any person under a permit or agreement with the Secretary) within the area described in the Des Moines Recreational River and Greenbelt Map and on file with the Committee on Public Works and Transportation of the House of Representatives; (3) such tree plantings, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes; and (4) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary.
>
> In carrying out the project described in subsection (a) of this section, the Secretary may acquire by purchase, donation, exchange, or otherwise land and interests therein, as the Secretary determines are necessary to carry out such project. If the Secretary purchases any land or interest therein from any State or local agency, he shall not pay more than the original cost paid by such State or local agency for such land or interest therein. No land or interest therein may be required by the United States to carry out such project without the consent of the owner and nothing herein shall constitute an additional restriction by an owner upon the use of any land or any interest therein which is not owned by the United States.
>
> An advisory committee shall be established for consultation with the Department of the Army and shall include: (A) five persons appointed by the Governor of Iowa; (B) two persons appointed by their respective board of supervisors to represent each county with the study area;

(C) one person appointed by the Mayor of the City of Des Moines and one additional person appointed by the mayor of each other incorporated municipality within whose boundaries a portion of such recreation area lies; and (D) three employees or officials of the Corps of Engineers.

Subsequent Greenbelt legislation was provided in Section 102 of Public Law 99-500, Fiscal Year 1987 Continuing Resolution Act. Section 102 is presented as follows:

> SEC. 102. The Secretary of the Army, acting through the Chief of Engineers, is directed to continue with planning, design, engineering, construction and the operation and maintenance of the Des Moines Recreational River and Greenbelt project described in Conference Report 99-236 using funds heretofore, herein and hereafter appropriated. Notwithstanding the language contained in the 1985 Supplemental Appropriations Act, Public Law 99-88, the Corps of Engineers shall continue their work on the General Design Memorandum, which shall be completed by October 1987 to serve as a master plan for the overall project. The design memorandum must address all enhancements contained in the list prepared by the Des Moines Recreational River and Greenbelt Advisory Committee. The project after construction will be operated and maintained at full Federal expense.

Additional Greenbelt legislation is contained in Section 604 of Public Law 99-662, the Water Resources Development Act of 1986. Section 604 is presented as follows:

> SEC. 604 DES MOINES RIVER GREENBELT.
> The project for the Des Moines Recreational River and Greenbelt, Iowa, authorized by Public Law 99-88, shall include the area described in the Des Moines Recreational River and Greenbelt Map, which description is printed in Committee Print 99-53 of the Committee on Public Works and Transportation of the House of Representatives (dated September 1986).

Section 604 was further discussed in the Joint Explanatory Statement of the Committee of Conference as follows:

> Des Moines River Greenbelt
> Section 604 of the conference agreement deletes the House provision because the basic authorization of the project was included in Public Law 99-88. The conferees intend that the Secretary consult with the advisory committee as provided for in the House provision.

The advisory committee is to be constituted as follows: Five persons appointed by the Governor of Iowa; two persons appointed by their respective boards of supervisors to represent Mahaska, Marion, Warren, Jasper, Polk, Dallas, Boone and Webster Counties; one person appointed by the Mayor of the City of Des Moines and one additional person appointed by the mayor or each other incorporated municipality within whose boundaries a portion of such recreation area lies; and three employees or officials of the Corps of Engineers designated by the Secretary.

PROJECT PURPOSES

The project is for the development, operation, and maintenance of a recreation and Greenbelt area on and along the Des Moines River, Iowa, between the point at which the Des Moines River is intersected by United States Highway 20 at Fort Dodge to the point downstream at which relocated State Highway 92 intersects the Des Moines River below the Red Rock Dam.

RECREATION

The first project purpose is for recreational development, as described in Public Law 99-88:

(1) the construction, operation, and maintenance of recreational facilities ...;

STREAMBANK STABILIZATION

The second project purpose is for streambank stabilization structures, as described in Public Law 99-88:

(2) the construction, operation, and maintenance of ... streambank stabilization structures;

OPERATION AND MAINTENANCE OF EXISTING STRUCTURES

The third project purpose is for the operation and maintenance of existing structures, as described in Public Law 99-88:

(3) the operation and maintenance of all structures constructed before the date of authorization of this project (other than any such structure operated and maintained by any person under a permit or agreement with the Secretary) within the area described in the Des Moines Recreational River and Greenbelt Map and on file with the Committee on Public Works and Transportation of the House of Representatives;

ENVIRONMENTAL ENHANCEMENT

The fourth project purpose is for environmental enhancement projects, as described in Public Law 99-88:

(4) such tree plantings, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes;

PROHIBITION OR LIMITATION ON TAKING WILDLIFE

The fifth project purpose is an authority given the the Secretary of the Army to prohibit or limit the taking of wildlife, as described in Public Law 99-88:

(5) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary.

ADVISORY COMMITTEE

ORGANIZATION

The Advisory Committee is organized in accordance with Public Law 99-88 and as further discussed in the Joint Explanatory Statement of the Committee of Conference for Public Law 99-662. The Joint Explanatory Statement does not include Hamilton County, which is located within the Greenbelt boundary. The Advisory Committee, at their February 27, 1987, meeting, recommended that Hamilton County be represented as a full member of the committee. The organization of the Advisory Committee is listed in table 1.

TABLE 1

Composition of the Advisory Committee
Des Moines Recreational River and Greenbelt

Number of Authorized Representatives	Source of Appointment
5	Governor of Iowa
2	Boone County Board of Supervisors
2	Dallas County Board of Supervisors
2	Jasper County Board of Supervisors
2	Hamilton County Board of Supervisors
2	Mahaska County Board of Supervisors
2	Marion County Board of Supervisors
2	Polk County Board of Supervisors
2	Warren County Board of Supervisors
2	Webster County Board of Supervisors
1	Mayor of the City of Des Moines
1	Mayor of the City of Boone
1	Mayor of the City of Carlisle
1	Mayor of the City of Dayton
1	Mayor of the City of Fort Dodge
1	Mayor of the City of Fraser
1	Mayor of the City of Hartford
1	Mayor of the City of Harvey
1	Mayor of the City of Johnston
1	Mayor of the City of Lehigh
1	Mayor of the City of Madrid
1	Mayor of the City of Pilot Mound
1	Mayor of the City of Polk City
1	Mayor of the City of Pleasant Hill
1	Mayor of the City of Runnells
1	Mayor of the City of Stratford
1	Mayor of the City of Swan
1	Mayor of the City of Webster City
1	Mayor of the City of West Des Moines
3	U.S. Army Corps of Engineers
Total - 45	

MEMBERSHIP

Members of the Advisory Committee are volunteers appointed by their respective governmental sponsors. The Advisory Committee represents Federal, State, county, and city units of government, as shown in table 2.

TABLE 2

Membership of the Advisory Committee
Des Moines Recreational River and Greenbelt

Committee Member	Mailing Address	Source of Appointment
Ralph Schlenker	Box 657 Des Moines, Iowa 50303	Governor of Iowa
Darlene Frazier	518 - 6th Street Boone, Iowa 50036	Governor of Iowa
Larry J. Wilson	Iowa Dept. of Natural Resources Wallace State Office Building Des Moines, Iowa 50319	Governor of Iowa
Lee Dallager	1818 High Street P.O. Box 1844 Des Moines, Iowa 50306	Governor of Iowa
Ruth Hoover	1403 W. 13th Street S. Newton, Iowa 50208	Governor of Iowa
Richard Woodard	RR 5 Boone, Iowa 50036	Boone County
Michael O'Brien	RR 4 Boone, Iowa 50036	Boone County
Jeff Logsdon	County Conservation Board Dallas County Courthouse Adel, Iowa 50003	Dallas County
Vacant	Board of Supervisors Dallas County Courthouse Adel, Iowa 50003	Dallas County
Vacant	Jasper County Courthouse Newton, Iowa 50208	Jasper County
Thomas Mott	704 W. 4th Street S. Newton, Iowa 50208	Jasper County
Linda Scheuerman	Rural Route Stratford, Iowa 50249	Hamilton County
Brian Holt	Hamilton County Conservation Board Webster City, Iowa 50595	Hamilton County

TABLE 2 (Cont'd)

Committee Member	Mailing Address	Source of Appointment
J.W. Else	Mahaska County Courthouse Oskaloosa, Iowa 52577	Mahaska County
Vacant	Board of Supervisors Mahaska County Courthouse Oskaloosa, Iowa 52577	Mahaska County
Dwight Johnston	Route 1 Knoxville, Iowa 50138	Marion County
Jeanne Visser	Route 1 Harvey, Iowa 50119	Marion County
Richard Brannan	Polk County Office Bldg. 2nd and Court Avenues Des Moines, Iowa 50309	Polk County
Douglas Smith	Hubbell Bldg - 10th Floor 904 Walnut Des Moines, Iowa 50309	Polk County
Ivan Richards	349-228th Avenue Hartford, Iowa 50118	Warren County
Jim Goodhue	R.R. 2 Carlisle, Iowa 50047	Warren County
Sid Sandholm	23 South Main Dayton, Iowa 50530	Webster County
Myron Groat	2735 - 20th Avenue N. Fort Dodge, Iowa 50501	Webster County
Ric Jorgensen	City Hall East First & Locust Des Moines, Iowa 50307	City of Des Moines
Tom Foster	1210 Tama Street Boone, Iowa 50036	City of Boone
Carl Weinbrecht	805 Parkview Carlisle, Iowa 50047	City of Carlisle
Sid Sandholm	23 South Main Dayton, Iowa 50530	City of Dayton

TABLE 2 (Cont'd)

Committee Member	Mailing Address	Source of Appointment
Honorable James Janvrin	Municipal Building 819 First Avenue South Fort Dodge, Iowa 50501	City of Fort Dodge
Mike Paris	Route 4 Boone, Iowa 50036	City of Fraser
Vacant	City Hall Hartford, Iowa 50118	City of Hartford
Vacant	City Hall Harvey, Iowa 50119	City of Harvey
Mary Jane Paez	7240 N.W. 58th Street Johnston, Iowa 50131	City of Johnston
Larry Larson	425 E. Hill Street Lehigh, Iowa 50557	City of Lehigh
Vacant	City Hall Madrid, Iowa 50156	City of Madrid
Vacant	City Hall Pilot Mound, Iowa 50223	City of Pilot Mound
William Burch	1201 Broadway, RR1 Polk City, Iowa 50226	City of Polk City
Honorable Kent M. Forbes	4450 Oakwood Drive Des Moines, Iowa 50317-7299	City of Pleasant Hill
Ron Tate	110 Brown Street Runnells, Iowa 50237	City of Runnells
Vacant	City Hall Stratford, Iowa 50249	City of Stratford
Alice Buckner	City Hall Swan, Iowa 50252	City of Swan
Vacant	City Hall Webster City, Iowa 50595	City of Webster City
Ted Ohmart	1206-31st Street West Des Moines, Iowa 50265	City of W. Des Moines

TABLE 2 (Cont'd)

Committee Member	Mailing Address	Source of Appointment
Dudley Hanson	Clock Tower Bldg.-P.O. Box 2004 Rock Island, Illinois 61204-2004	Corps of Engineers
Darrell Lewis	Office of the Chief of Engineers DAEN-CWO-R Washington, D.C. 20314	Corps of Engineers
Vacant	Clock Tower Bldg.-P.O. Box 2004 Rock Island, Illinois 61204-2004	Corps of Engineers

ADMINISTRATIVE ROLE

The role of the Advisory Committee is to formulate recommendations for the development and prioritization of Federally cost-shared, 100-percent Federal and non-Federal projects within the Greenbelt. The committee acts as a facilitator for any local cooperation agreements and cost-sharing arrangements that may be required for projects recommended for Federal participation, and as a catalyst for coordinating and developing elements of the plan which will not require Federal involvement.

The Planning Subcommittee of the Advisory Committee formulated the role of the Advisory Committee at their October 30, 1985, meeting. The Advisory Committee adopted the following roles on December 6, 1985, in accordance with the bylaws:

a. Acting as primary decision-makers for recommendations to the Corps of Engineers with respect to the Greenbelt's development and management. The Greenbelt is considered an Iowa project for which the Corps of Engineers processes and facilitates Advisory Committee recommendations in the format required to receive Federal funding. However, the ultimate responsibility for the project is vested in the Corps of Engineers.

b. Generating project ideas for the Greenbelt and establishing a priority list for their implementation.

c. Establishing and maintaining open communications with the constituents they represent while serving on the committee.

d. Advising Iowa's congressional delegation of the Advisory Committee's position on Greenbelt issues requiring legislative resolution; provided that Corps of Engineers' members on the Advisory Committee may need to be excluded from this activity, depending on the particular issue being addressed.

GREENBELT THEME

The Planning Subcommittee of the Advisory Committee developed the following purpose and concept statements for the Greenbelt at their October 30, 1985, meeting:

Purpose - "The purpose of the Des Moines River Area and Greenbelt is to develop and manage natural resources, cultural features, outdoor recreation facilities, and environmental education programs in a manner that makes wise use of land and water resources and that attracts outdoor recreation use and economic development to the area."

Concept - "The concept of the Des Moines River Area and Greenbelt is to coordinate existing and new Federal, State, county, and city conservation, recreation, cultural, and environmental education projects by linking them to collectively maximize the attraction of recreation use and economic development."

PLAN FOR ENGINEERING AND DESIGN

The initial report on the Greenbelt, the Plan for Engineering and Design, was prepared in accordance with the instructions contained in the Assistant Secretary of the Army's letter dated October 4, 1985. The key elements of the Plan for Engineering and Design are listed below:

a. Establish the appropriate scope and content of the General Design Memorandum;

b. Describe the role of the Advisory Committee, the responsibilities of cooperating agencies, real estate acquisition procedures, public involvement, and coordination procedures;

c. Define the scope of economic, environmental, and engineering analyses, which, within the framework of the Principles and Guidelines and in light of specific State and local concerns as provided for in Sections 3 and 5 of the Principles, are to be used to scope the plan in the General Design Memorandum;

d. Address other administrative processes necessary to the implementation and administration by the Corps of the project; and

e. Provide letters of assurance from potential project sponsors indicating that they are aware of the necessary local cooperation which will be required and that they are willing to meet those requirements.

REPORT AUTHORITY

This General Design Memorandum was prepared at the direction of the Assistant Secretary of the Army (Civil Works) as noted in his October 4, 1985, correspondence to Congressman Neal Smith of Iowa.

REPORT PURPOSE

In accordance with Public Law 99-88, the overall objective of the project will be to provide central Iowa and the city of Des Moines with environmental protection of scarce river bottom timberlands and greatly enhance opportunities for recreation.

The primary objectives of the Greenbelt study were outlined by the Assistant Secretary of the Army (Civil Works) in a letter to Congressman Neal Smith of Iowa dated October 4, 1985. Following approval of the Plan for Engineering and Design in February 1986, the Corps of Engineers proceeded to execute the following instructions:

> The General Design Memorandum will result in a comprehensive plan and a plan for initial development, should it be determined that the total cost of the comprehensive plan exceed resource availability for the near term. A division of responsibility between Federal and non-Federal interests, together with priorities for implementation as you envisioned during our September 25th meeting, also will be developed. In general, it is the Corps' intention during preparation of the General Design Memorandum to address issues such as the following:
>
> > > Identification of boundaries for, and features of, the Recreation and Greenbelt area;
> >
> > > Evaluation of benefits (outputs) and costs;
> >
> > > Responsibility for operation, maintenance, and replacement;
> >
> > > Concerns of State and local officials to be considered in developing the plan to be implemented; and
> >
> > > Assurances of local cooperation from local sponsors.

SECTION 2 - ADMINISTRATION

PRINCIPLES AND GUIDELINES

Project development will be conducted in accordance with The Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. The Principles and Guidelines (P&G) were implemented by President Reagan in 1983 to guide the formulation and evaluation studies of the major Federal water resources development agencies. Projects are recommended based upon economic justification, environmental soundness, and engineering feasibility. Various alternative plans are to be formulated in a systematic manner to ensure that all reasonable alternatives are evaluated as noted below:

(a) A plan that reasonably maximizes net National Economic Development (NED) benefits, consistent with the Federal objective, is to be formulated. This plan is to be identified as the NED plan.

(b) Other plans which reduce net NED benefits in order to further address other Federal, State, local, and international concerns not fully addressed by the NED plan also should be formulated.

(c) Plans may be formulated which require changes in existing statutes, administrative regulations, and established common law; such required changes are to be identified.

(d) Each alternative plan is to be formulated in consideration of four criteria: completeness, effectiveness, efficiency, and acceptability. Appropriate mitigation of adverse effects is to be an integral part of each alternative plan.

(e) Existing water and related land resources plans, such as State water resources plans, are to be considered as alternative plans if within the scope of the planning effort.

APPLICATION OF PUBLIC LAWS

The study was conducted in accordance with all applicable Federal laws and Executive Orders, and all State laws as they may apply. Construction and operation of all Greenbelt projects will be done in accordance with all applicable requirements including civil rights and equal access, environmental, historic preservation, cultural resources, and floodplain management regulations.

PROJECT ADMINISTRATION

The overall project will be administered by the Corps of Engineers in consultation with the Advisory Committee. The Greenbelt boundary indentifies those areas where projects may be constructed under this authority. Following construction of a separable element (individual project), the local sponsor will be responsible for the operation, maintenance, and replacement of the completed work.

RECREATION

Certain recreational developments may be eligible for cost-sharing between the Corps of Engineers and a local sponsor. Facilities eligible for consideration are listed in Engineer Regulation 1165-2-400 (see Appendix G, Engineer Regulation 1165-2-400 (Extract)). Other facilities may be approved on a case-by-case basis by the Office of the Chief of Engineers. Following construction of a separable element (individual project), the local sponsor will be responsible for the operation, maintenance and replacement of the completed work.

STREAMBANK STABILIZATION

Streambank stabilization structures will be cost-shared between the Corps of Engineers and the local sponsor. Projects must be justified based upon recreational or environmental enhancement benefits. Following construction of a separable element (individual project), the local sponsor will be responsible for the operation, maintenance, and replacement of the completed work.

OPERATION AND MAINTENANCE OF EXISTING STRUCTURES

Operation and maintenance of existing structures is the responsibility of the owning agency, and this activity will not be cost-shared with local sponsors. The Corps of Engineers will be responsible only for the operation and maintenance of Federally owned facilities at Saylorville Lake and Lake Red Rock.

ENVIRONMENTAL ENHANCEMENT

Environmental enhancement projects will be cost-shared between the Corps of Engineers and the local sponsor. Projects under this authority are limited to such tree planting, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes. Non-economic benefits are used to justify environmental enhancement projects. Cost-sharing for operation, maintenance and replacement of the completed work will be the same percentage as the construction cost, but the local sponsors have indicated a willingness to support 100-percent local cost for this item.

PROHIBITION AND LIMITATION ON TAKING WILDLIFE

The Secretary of the Army has the authority to prohibit or limit the killing, wounding, or capturing at any time of any wild bird or animal in areas as directed by the Secretary.

LAND ADMINISTRATION

Projects constructed under the Greenbelt authority must be located on lands, easements, or rights-of-way owned by a governmental body. The land could be owned by either the Corps of Engineers, State of Iowa, or a local governmental sponsor. The lands and associated project will be administered by the local sponsor in accordance with a local cooperation agreement.

ACQUISITION PROCEDURES

Lands and easements for the Greenbelt project may be acquired by the United States, when the owners consent to the acquisition, or by the local sponsors under the terms of cost-sharing agreements for individual projects. Where the lands are acquired by local sponsors, title to some of the lands may be transferred to the United States, and such lands may be leased back or otherwise made available to the local sponsor for operation and management of the individual project. Depending upon the type of project, a typical local cooperation agreement may require the local sponsor to bear a certain percentage of the total cost of the project; acquire the necessary lands and easements, the cost of which may be credited toward the sponsor's share of the project costs; and operate, maintain, and replace the lands and constructed facilities without cost to the United States. Schedules for right-of-way acquisition will be established as projects are developed by the Advisory Committee. Under the Greenbelt authority, the Corps of Engineers may not use eminent domain.

Real estate requirements will be determined, and a gross appraisal will be prepared, for each specific Federal project. The gross appraisal will contain estimates of the value of lands and improvements (fee and easement) to be acquired for the Federal project, severance damage payments, relocation assistance payments, and costs of acquisition. A discussion will be included to address the responsibilities and commitments of various agencies regarding the acquisition and management of Federal project lands. Responsibility for obtaining the necessary real estate interests will be addressed in the gross appraisal. If a specific cost-shared project involves acquisition of real estate interests by the Federal Government, the Corps of Engineers will prepare a separate Real Estate Design Memorandum.

RELOCATION ASSISTANCE

During the course of land acquisition, people (owners or tenants) may be displaced from their homes or businesses. If this happens, the Corps of Engineers or the local sponsor, whichever is acquiring the project lands, must help them find decent, safe, and sanitary housing that is comparable to the housing that they had to leave, and make any other payments or provide any other services required by Public Law 91-646 for those who are displaced.

GREENBELT SAFETY AND SECURITY MANAGEMENT

The safety and security of visitors to each Greenbelt project will be the responsibility of the local sponsor. The Corps of Engineers only has authority to provide park rangers at Saylorville Lake and Lake Red Rock.

LOCAL COOPERATION

QUALIFICATIONS OF LOCAL SPONSORS

In order to be eligible for Federal participation, local sponsors must meet the following criteria:

a. Must be a non-Federal governmental entity;

b. Responsible for cost-sharing (varies with type of project);

c. May be responsible for acquisition of project lands and easements;

d. Operates, maintains, and replaces the project at full non-Federal expense; and

e. Holds and saves the United States free from liability and claims.

LETTERS OF ASSURANCE

To proceed with subsequent studies, letters are required from qualified local sponsors which express their willingness to participate under current cost-sharing provisions and assure their understanding of such provisions. Appendix H, Pertinent Correspondence, contains 15 letters of assurance. These letters do not represent a legally binding commitment on the part of the local sponsors. A listing of local sponsors who have submitted letters of assurance is found in table 3.

TABLE 3

Letters of Assurance
Des Moines Recreational River and Greenbelt

Local Sponsor	Date of Letter of Assurance
Polk County	October 28, 1985
City of Johnston	November 11, 1985
City of Fort Dodge	December 5, 1985
Iowa Dept. of Nat. Resources	December 6, 1985
Town of Swan	December 7, 1985
Marion County	December 16, 1985
Jasper County	December 16, 1985
Boone County	December 18, 1985
Webster County	January 14, 1986
Town of Lehigh	March 13, 1986
City of Des Moines	April 7, 1986
City of Polk City	March 12, 1987
City of Dayton	May 20, 1987
City of West Des Moines	May 28, 1987
Hamilton County	September 1, 1987

COST-SHARING AND FINANCING

The law authorizing the Greenbelt requires project cost-sharing under terms and conditions acceptable to the Secretary of the Army (or under terms and conditions provided for in subsequent legislation when enacted into law). The Corps of Engineers is using the cost-sharing provisions of Public Law 99-662, the Water Resources Development Act of 1986, and as described in the Assistant Secretary of the Army's letter, dated October 4, 1985, as listed in table 4 and shown below:

a. Recreation would be cost-shared 50-50 percent, with local interests responsible for operation, maintenance, and replacement.

b. Environmental enhancement projects will be cost-shared in accordance with Section 906 of the Water Resources Development Act of 1986. Cost-sharing percentages are based upon the national importance of a project. If benefits accrue to a species of national importance, the project will be at 100-percent Federal expense. Otherwise, environmental enhancement projects will be cost-shared 75-percent Federal and 25-percent non-Federal. Criteria for determining national importance are as follows:

(1). Such enhancement provides benefits that are determined to be national, including benefits to species that are identified by the National Marine Fisheries Service as of national economic importance, species that are subject to treaties or international convention to which the United States is a party, and anadromous fish;

(2). Such enhancement is designed to benefit species that have been listed as threatened or endangered by the Secretary of the Interior under the terms of the Endangered Species Act, as amended (16 U.S.C. 1531, et seq.), or

(3). Such species are located on lands managed as a national wildlife refuge.

c. Prevention of erosion to Federal lands would be at Federal expense. Prevention of erosion to private lands would be 100-percent non-Federal. Prevention of erosion to lands purchased as part of the project would be based on the purpose for acquisition; for example, prevention of erosion on lands bought for recreational purposes would be cost-shared 50-50 percent, with local interests responsible for operation, maintenance, and replacement.

Projects generally will be financed by the local sponsor during the period of construction. In cases where the the local sponsor's share is not contributed during the construction period, a financing arrangement will be specified in the local cooperation agreement. The details of project financing will be established during negotiation of individual local cooperation agreements in accordance with current guidance.

An ability to pay analysis will be conducted by the Corps of Engineers in accordance with current guidance as part of the local cooperation agreement. The District Engineer will certify whether a local sponsor is capable of financing a cost-shared project.

TABLE 4

Federal Cost-Sharing Provisions
Des Moines Recreational River and Greenbelt

Project Category	Cost-Sharing (Percent) Federal	Non-Federal
Recreational Facilities	50	50
Streambank Stabilization Structures		
Federal Lands	100	0
Project Lands (for the purpose of:)		
Recreation	50	50
Environmental Enhancement		
National Importance	100	0
Not of National Importance	75	25
Private lands	0	100
Operation and Maintenance of Existing Structures		
Federal	100	0
Non-Federal	0	100
Environmental Enhancement		
National Importance	100	0
Not of National Importance	75	25
Prohibition or Limitation on Taking Wildlife	---	---

Notes: a. Cost-sharing for operation, maintenance and replacement of a completed environmental enhancement work will be the same percentage as the construction cost, but the local sponsors have indicated a willingness to support 100-percent local cost for this item.
b. Cost-sharing policy has not yet been determined for "Prohibition or Limitation on Taking Wildlife."

LOCAL COOPERATION AGREEMENTS

A legally binding local cooperation agreement will be required at the time of construction of a Greenbelt project. A local cooperation agreement is executed between the Department of the Army and the local sponsor. The document spells out responsibilities, the scope of the project, and a detailed cost-sharing estimate. The local sponsor will be responsible for operation, maintenance, and replacement of the completed work. A sample local cooperation agreement is found in Appendix E, Sample Local Cooperation Agreement.

OPERATION, MAINTENANCE, AND REPLACEMENT

Operation, maintenance, and replacement will be sole responsibility of the local sponsor in accordance with the local cooperation agreement.

LOCATION

The Des Moines Recreational River and Greenbelt is located along the Des Moines, Boone, and Raccoon Rivers in central Iowa. The Greenbelt includes portions of Boone, Dallas, Jasper, Hamilton, Mahaska, Marion, Polk, Warren and Webster Counties, and includes the city of Des Moines and a number of other communities. The project encompasses Federal, State, county, and local park areas, including two major Corps of Engineers reservoirs at Saylorville Lake and Lake Red Rock. The Greenbelt is shown on figure 1.

GREENBELT BOUNDARY

The Greenbelt boundary was defined in Committee Print 99-53 of the Committee on Public Works and Transportation of the House of Representatives, dated September 1986, as referenced in Public Law 99-662. Committee Print 99-53 references the map on file with the Rock Island District Engineer which also describes the Greenbelt boundary. The boundary encompasses an area of about 360,000 acres. A copy of the Committee Print is found in Appendix F, Committee Print 99-53.

The Advisory Committee, at their February 27, 1987, meeting, recommended that the boundary be slightly modified to correct minor errors, make the line simpler to follow, and add a specific area for proposed project. The modifications will add about 2,000 acres to the Greenbelt, for a total of 362,000 acres. Sections 22 and 27 of Township 83 North, Range 26 West, were added as a location for a large animal park development. This area is located just east of Ledges State Park. The large animal park development has been incorporated in the Ledges State Park improvements project. Changes in the boundary do not commit the Corps of Engineers to any future expenditures.

A listing of the boundary changes recommended by the Advisory Committee and endorsed by the Corps of Engineers is found in table 5. The boundary, including the Advisory Committee's recommended changes, is shown on plates 1 to 75.

TABLE 5

Boundary Modifications
Des Moines Recreational River And Greenbelt

Committee Print 99-53	Rock Island District Engineer's Map	Advisory Committee Recommendation
T89N, R28W: Sec. 30 - E 1/2	T89N, R28W: Sec. 30 - E 1/2	T89N, R28W: Sec. 30 - E 1/2 - All S of U.S. Highway 20
T88N, R25W: Sec. 6 - S 1/2, Sec. 32 - SW 1/4	T88N, R25W: Sec. 6 - All S of U.S. Highway 20	T88N, R25W: Sec. 6 - All S of U.S. Highway 20
T88N, R28W: Sec. 7 - E 1/2	T88N, R28W: Sec. 7 - all exc. SW 1/4	T88N, R28W: Sec. 7 - all exc. SW 1/4
Not present	T88N, R29W: Sec. 1, Sec. 2 - N 1/2, Sec. 12 - NE 1/4	T88N, R29W: Sec. 1, Sec. 2 - N 1/2, Sec. 12 - NE 1/4
T87N, R27W: Sec. 9 - W 1/2	T87N, R27W: Sec. 9	T87N, R27W: Sec. 9
Not present	Not present	T83N, R26W: Sec. 22, Sec. 27
T81N, R26W: Sec. 6 - NW 1/4	Delete	Delete
T80N, R25W: Sec. 1 and 2 - all exc. Polk City	T80N, R25W: Sec. 1, Sec. 2, Sec. 9 - NE 1/4	T80N, R25W: Sec. 1, Sec. 2, Sec. 9 - NE 1/4
T79N, R24W: Sec. 18 - S 1/2 N1/2 and SE 1/4	T79N, R24W: Sec. 18 - all exc. SW 1/4	T79N, R24W: Sec. 18 - all exc. SW 1/4
Not present	T78N, R23W: Sec. 7 - SW 1/4	T78N, R23W: Sec. 7 - SW 1/4
T77N, R20W: Sec. 3 - S 1/2	T77N, R20W: Sec. 3 - S 1/2	T77N, R20W: Sec. 3 - SW 1/4

TABLE 5 (Cont'd)

Committee Print 99-53	Rock Island District Engineer's Map	Advisory Committee Recommendation
T77N, R21W: Sec. 3 - E 1/2, Sec. 4 - W 1/2, Sec. 6 - all exc. NE 1/4	T77N, R21W: Sec. 3, 4, 5, 6	T77N, R21W: Sec. 3, 4, 5, 6
T76N, R18W: Sec. 32 - E 1/2	T76N, R18W: Sec. 32 - all exc. SW 1/4	T76N, R18W: Sec. 32 - all exc. SW 1/4
T76N, R19W: Sec. 23 - all exc. W 1/4	T76N, R19W: Sec. 23	T76N, R19W: Sec. 23
T76N, R20W: Sec. 35 - W 1/2	T76N, R20W: Sec. 35	T76N, R20W: Sec. 35
T75N, R17W: Sec. 7, 17, 18, Sec. 19 - N 1/2, Sec. 20 - NW 1/4	T75N, R17W: Sec. 7, 17, 18, Sec. 19 - N 1/2, Sec. 20 - NW 1/4	T75N, R17W: Sec. 7 - all N of State Highway 92
T75N, R18W: Sec. 11, 12, 13	T75N, R18W: Sec. 11, 12, 13	T75N, R18W: Sec. 11, Sec. 12 - all N of State Highway 92

LANDSCAPE FEATURES

The Des Moines River is the principal natural element and the most prominent landscape feature of the Greenbelt. The river, with its flowing waters, complements a diverse shoreline formed by terraces, bluffs, and surrounding hills. Trees, shrubs, grasses, and forbs cover the landscape, producing contrasting scenery to the farmlands within and adjacent to the Greenbelt.

The northern third of the project features steep, forested hills adjacent to the river. Common hardwood species of trees include oak, hickory, maple, and ash. Narrow ravines within this region form scenic panoramas at prominent vistas. County and State parks feature unique scenic natural attractions resulting from an interesting mix of streams, rock outcroppings, forest, and river. The narrow river, averaging 250 feet in width, has a gentle slope which forms a placid current, and the sparsely populated area adds to the tranquility of this region.

Landscape and waterscape scenery at Big Creek State Park, Saylorville Lake, and Lake Red Rock is diverse and of high quality. Shorelines formed by timber-covered slopes, cropland terraces, and waterfront recreation developments are associated with these impoundments. Roads and bridges adjacent and across these waters provide spectacular views of the landscape. Fishing, boating, and sailing provide interesting outdoor activities that can be viewed by travellers and visitors at these lakes. Views across large expanses of open waters are welcome attractions to residents in this region.

Landscape scenery adjacent to the river, within the city of Des Moines, has been heavily modified by urban development. City parks, parkways, buildings, levees, and private development abut the riverfront. Numerous wide bridges cross over the river, forming a link between the east and west halves of the capitol city. Parks and parkways, however, do provide public use of the riverfront for picnickers, walkers, and bicyclists. Boat ramps provide water access to boaters and fishermen who find this natural resources convenient, attractive, and beneficial; albeit in an urban setting. Upstream flood control structures regulate river flows so that shoreline developments can be utilized throughout the year without interruptions. This is a valuable natural resource to urban dwellers.

The Greenbelt contains a diverse variety of landscape scenery. Cultivated farmlands surround the Greenbelt, and the scenic beauty adjacent to the Des Moines River provides excellent contrast and relief. The perpetuation of existing high quality landscape elements and the judicious construction of harmonious recreational developments will enhance future natural outdoor resources within this region.

GEOLOGY

The topography of the Des Moines River Valley from the northern Greenbelt limits to 13 miles downstream of the Saylorville Lake Dam was influenced by Wisconsinan-age glaciation in the area known as the Des Moines Lobe. The rumpled appearance of the surface, the ponded water, the unsorted materials beneath the landscape, and the presence of large rocks and boulders foreign to Iowa are tell-tale signs of glacial occupation.

The final thrust of the continental ice sheets over large areas of North America took place during the Wisconsinan division of Pleistocene time. The southern margins of this ice sheet were quite irregular, and one particular active lobe of ice pushed briefly into north-central Iowa about 14,000 years ago. It lasted for around 1,000 years. The shape of this particular landform region corresponds to the lobate form of the extension of Late Wisconsinan ice into Iowa. The city of Des Moines is in the vicinity of the southern terminus of the ice lobe, and lends its name to this distinctive landform region-the Des Moines Lobe.

Variability best describes the appearance of the land within this region. Much of the land is flat to slightly irregular, but bands of rough, knobby terrain appear abruptly and are gone again within a few miles or less. Numerous ponds and marshes cluster in low areas between knobs have no drainage outlets. Small streams in the more level areas are shallow and sluggish. The few larger rivers that do drain this region and its borders have excavated deep valleys on whose sides remain extensive terraces of sand and gravel. In fact, some valleys appear excessively large for the size stream they now contain indicating they carried greater volumes of water and sediment in the past. Natural lakes dot the Des Moines Lobe, and numerous bogs, swales, and circular depressions indicate the sites of previously ponded water.

Soils often are poorly drained and dark-colored, and contain large amounts of organic material. Soils may appear strongly mottled, resulting from variations and metamorphic origin as seen scattered over the landscape without regard to topgraphic position. These surface erratics are components of glacial till, which, except for layered alluvium in the river valleys, underly nearly the entire region.

So far, only the larger rivers have had time to establish clearly defined valleys. In fact, these valleys, the Des Moines River Valley included, are the only large-scale erosional features on the Des Moines Lobe. They developed from melt water channels where glacial debris was carried away, sorted and deposited downstream as outwash. Some of these deposits are now the sites of commercial sand and gravel production.

The Des Moines River from Fort Dodge and the Boone River from Webster City, to their confluence, cover about 25 river miles. Both valleys are narrow ranging in width from 300- to 900-feet. Water depths range between 2- to 10-feet. Both valleys are V-shaped and very steep ranging from 150- to 200-feet high. Each river is slowly cutting away at the base of the bluffs. The soft clay tills, of which some of the bank are made of, would have fallen long ago except that the drainage of this area is away from the river and the banks are wooded and vegetated. The valley broadens to about one mile wide at the confluence of the two rivers.

The reach of the Des Moines River from its confluence with the Boone River downstream to Ledges State Park is about 35 river miles in length. The valley in this reach is relatively narrow at 1,000- to 3,000-feet and consists of broad, sweeping valley meanders. Late Wisconsinan benches and terraces are very abundant in this reach and occur both along the inside bend of valley meanders and in stair step fashion along straight valley segments. River gradient is 1.25 feet/mile in this reach. Pennsylvanian rocks (dominantly siltstone and shale) outcrop intermittently throughout the reach. Five large tributaries; Honey Creek (left bank), Noah Creek (right bank), Bluff Creek (right bank), Bass Point Creek (left bank), and Elkhorn Creek (left bank) join the main valley in this area. Smaller tributaries entering from both sides of the valley are abundant.

The reach of the Des Moines River from Ledges State Park to State Highway 210 covers about 11 river miles. The valley is very narrow in this reach, averaging about 2,000 feet and the gradient is 1.5 feet/mile. Late Wisconsinan benches and terraces are most abundant on the inside of the valley meanders where they occupy slip-off slopes. Tributaries are abundant along this reach including six large ones; Preston Creek (right bank), Caton Branch (right bank), Eversoll Creek (right bank), Richardson Branch (left bank), Bear Creek (right bank), and the Peese Creek (left bank). Pennyslvanian bedrock outcrops intermittently along the valley walls in this area. Extensive outcrops of Cherokee Group sandstone occur around Ledges State Park.

The reach of the Des Moines River from State Highway 210 to Big Creek State Park. This reach is approximately 10 river miles in length. The valley is narrow in this area ranging in width from 1,000- to 4,000-feet with a gradient of 1.45 feet/mile. One major left bank tributary, Murphy Branch, enters in this segment. Tributaries entering from the west are much more abundant than those entering from the east.

Benches are present along both valley walls and a high abandoned valley segment is present on the "upland" below the junction of Murphy Branch and the Des Moines River. Mosquito Creek occupies the downstream portion of the abandoned valley segment. Pennysylvanian rock outcrops extensively along both valley walls. Lower portions of the Holocene valley floor are innundated by Saylorville Lake in this area.

The reach of the Des Moines River from Big Creek State Park to the Saylorville lake dam has two major left bank tributaries, Mosquito Creek and Big Creek. Tributaries draining the western valley wall are shorter and steeper than those draining the opposite valley wall. The valley width averages slightly over 6,000 feet in this area. River gradient is 1.92 feet/mile, the steepest in the project area. Pennyslvanian rock outcrop along the western (right) valley wall and the extreme southern portion of the eastern valley wall. The western valley wall is much steeper than the eastern wall. Benches are present along both sides of the valley but are much more extensive along the eastern side. Blow sand is common on the eastern uplands southeast of Big Creek.

The reach of the Des Moines River from the Saylorville Lake dam to the city of Des Moines runs traversely across the former Beaver Creek Valley to the terminus of the Des Moines lobe. The valley is bordered by high outwash terraces associated with the Beaver Creek Valley. Numerous abandoned Holocene age Des Moines River meanders are present in this segment. Pennsylvanian age rocks (mainly sandstone and shale of the Swede Hollow Formation) outcrop along the valley walls only in the northern portion of this segment while the west side of the southern portion of the segment is madeup of gravel outwash.

The topography of the Des Moines River valley below the Des Moines Lobe tc the Lake Red Rock dam (approximately 60 river miles) lies within a region called the Southern Iowa Drift Plain. The regional physiography of the Southern Iowa Drift Plain consists of steeply rolling hills interspersed with areas of generally level upland divides and graded alluvial lowlands and valleys. Tablelands are progressively more extensive and level away from the valley, to the south and northeast, while more abrupt topographic breaks are associated with the secondary drainages feeding into the Des Moines River. The surface terrain, which is mostly weathered loess/paleosol, is generally underlain by undifferentiated glacial tills of Kansan (pre-Illinoian) glacial stage or by bedrock shales.

The principal tributaries are the Raccoon and Middle Rivers flowing northeastward in their lowest reaches. The lower order feeders emptying into the reservoir from the south, such as the Teter and Whitebreast Creeks and the South River, also trend in the same direction and reflect strong structural and topographic controls. Northern streams drain south-southeast, the chief ones being Prairie, Calhoun, and Brush Creeks. Glacial landforms that once dotted the landscape have been obliterated by erosive forces that have leveled prominent topographic features and left planar interfluve surface subject to slope wearing.

The Des Moines River Valley at Lake Red Rock has been increased to a depth of 30 to 80 feet, exposing a sequence of weathered loess/paleosol capping pre-Illinoian tills which rest unconformably over dipping shale beds. Till thickness is variable but does not exceed 24 feet, and loess thickness is between 10 to 18 feet.

The bedrock geology reveals a series of abrupt and unconformable erosional surfaces that were periodically over-ridden by the glacial surges of the Pleistocene. The majority of the bedrock outcrops and surfaces in the Lake Red Rock area are Mesozoic and chiefly basal Pennsylvanian rocks of the Cherokee group. The cherokee group consists of carbonaceous shale, siltstone, sandstone and thick coal beds with minor limestone beds.

LAND USE

Land use within the Greenbelt is typical for a major river corridor in an agricultural region of the mid-continental United States (see table 6). The majority of the gently sloping lands which are not urbanized or in Government ownership are used for mechanized apricultural purposes-primarily row crops. Non-agricultural rural areas are otherwise more steeply sloped and used for widely scattered residential areas or are maintained as forests and woodlands. In these areas, the banks of the Des Moines River are wooded.

In major urban areas, the Greenbelt corridor is heavily developed for industrial, commercial, and residential uses. The two largest urban areas on the Des Moines River are the cities of Des Moines and Fort Dodge.

Federally owned lands at Saylorville Lake and Lake Red Rock possess the unique characteristics of flood control reservoirs. Typically, the areas near the conservation pool shoreline are barren mudflat areas which gradually phase into fields or woods at higher elevations. The mudflat effect is more pronounced at Lake Red Rock due to the controlling geologic and hydrologic conditions. Upland areas near the dams are used for recreational purposes, and the upper reaches of the reservoirs are used for fish and wildlife management activities. Tailwater areas below the dams also are used for recreational purposes.

CLIMATE

CLIMATOLOGY

The Des Moines River Basin, including the Greenbelt corridor, has a continental climate where the average summers are hot and humid, and winters are cold and relatively dry. The seasonal distribution of average annual precipitation is highly favorable for agriculture, with over 70-percent falling during the crop growing season. Most precipitation, both summer and winter, comes from warm, moist air masses moving northward from the Gulf of Mexico. The prevailing southerly winds of spring and summer favor increased rainfall, while the dominance of cold polar air masses in winter often blocks the access of moist tropical air to the region.

All seasons are marked by storms that accompany the change from one type of air mass to another. In winter, precipitation occurs as rain, sleet, or snow, and severe winter blizzards occur periodically. In summer, thunderstorms are frequently intense, occasionally accompanied by hail, and on rare occasions, by tornados. The spring and autumn seasons are noted for rapid changes from one type of air mass to another, frequently resulting in precipitation of some type.

The mean annual temperature for the Greenbelt corridor is 49 degrees F., with the average summer and winter temperatures being 73 and 22 degrees F., respectively. The average date of the last freeze in the spring is April 20th and the average date of the first fall freeze is October 8th.

The normal annual precipitation is 32 inches, with June typically being the wettest month and January the dryest. Average annual snowfall on the Greenbelt corridor is 32.4 inches. The typical movement of water in the area's hydrologic cycle is shown on figure 2. As shown in the hydrologic cycle, annual streamflow amounts to 6 inches of basin runoff per year.

TABLE 6

County Land Use Data

County	Total Acres	Land	Water	State Land	Federal Land	Cropland	Pasture and Hay	Woodland	Wildlife Lands	Rec. Lands	Other Lands	Urban Lands
Boone	366,720	366,560	160	3,119	6,544	277,842	27,583	26,888	1,835	4,065	6,943	14,860
Dallas	382,080	382,000	80	295	2,850	270,160	43,505	21,900	1,800	495	22,251	19,039
Hamilton	369,920	369,210	710	0	0	321,623	15,000	6,000	679	835	8,774	16,229
Jasper	471,040	470,095	945	2,048	68	320,458	81,482	11,000	9,357	1,471	25,731	20,528
Mahaska	366,080	365,598	82	2,520	0	284,529	49,215	15,000	2,000	800	2,246	12,208
Marion	364,800	355,560	9,240	260	30,359	189,714	45,639	26,700	19,119	12,795	16,416	14,818
Polk	380,160	373,071	7,089	0	9,837	193,078	27,784	22,961	11,436	6,203	11,210	90,502
Warren	366,080	365,750	330	1,172	5,616	210,000	80,000	25,000	1,320	2,082	21,361	20,371
Webster	459,520	459,470	50	4,918	0	374,800	24,700	16,000	4,897	5,807	8,450	24,816

Source: U.S. Department of Agriculture, Soil Conservation Service
Note: All measuresments are in acres.

Records of streamflows at several points on the Des Moines River have been kept for intermittent periods since 1903. Flood stages were recorded at Des Moines as early as 1893. Newspaper files and historical records indicate that prior to 1903, significant floods occurred in June 1851, June 1858, April 1862, June 1865, July 1869, July 1875, April 1876, July 1881, April 1888, May 1892, April 1897, and July 1902. Of these floods, the June 1851 flood apparently was the greatest and most destructive.

Basinwide, the floods of 1903 and June 1947 were the most damaging since the 1851 event. The June 1944 flood was severe in the basin below Des Moines. Record peak flows for most stations above Des Moines were observed in the June 1954 flood even though the April 1965 flood contained a much larger floodwater volume.

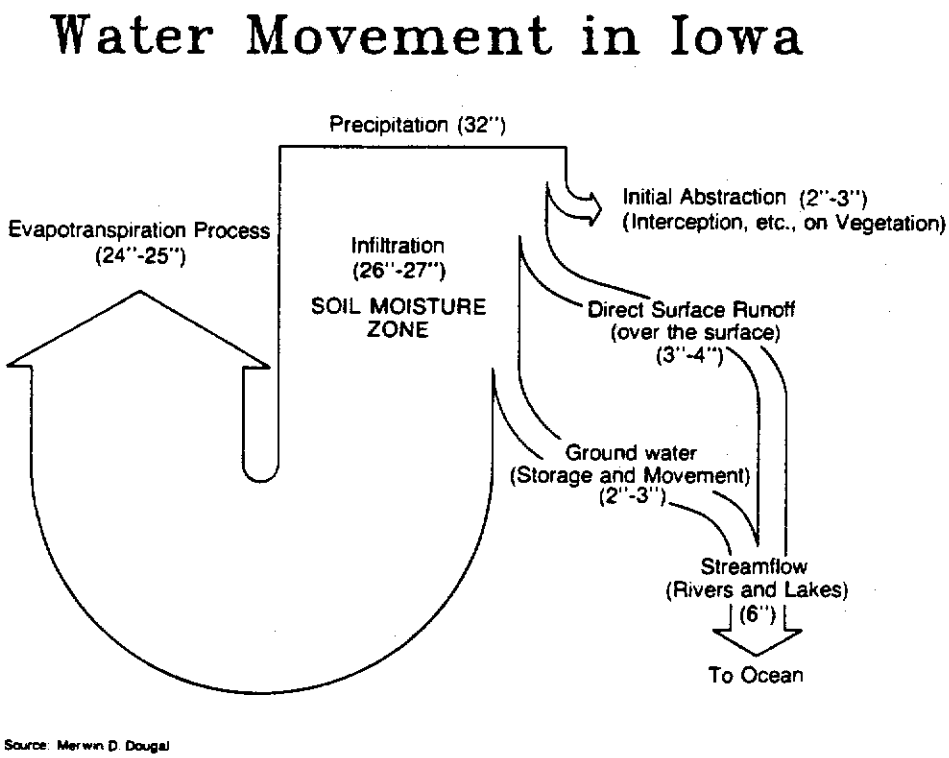


Figure 2. Water Movement in Iowa.

In June 1984, Saylorville Lake experienced its first emergency spillway discharge since it went into operation in April 1977. The hydrologic events leading up to the onset of spillway discharge started with spring runoff leaving the reservoir flood pool 42-percent filled before above-average June rains pushed the lake level above the spillway crest. The overall volume of the June 1984 flood, not the peak inflow, made it a major flood event.

Major floods have, in general, occurred during the period of May through July which corresponds to the heavier rainfall season. Although rises have been recorded in March and April, peak flows have not been comparable to those of the May and June floods. The March and April floods usually result from snow and ice melt augmented by moderate rainfall.

DROUGHTS

Analysis of climatic and soil moisture data since the early 1900's indicates that some degree of drought has occurred about 30-percent of the time, and severe droughts have been present approximately 10-percent of the time in Iowa. The drought conditions typically have occurred during the growing season. Severe droughts in the Des Moines River Basin and statewide in Iowa have, in general, followed a 20- to 22-year cycle, with the last being from 1976 to 1977.

Streamflow records show that several streams within the basin had zero streamflow periods during the drought. The gaging stations on the Des Moines River within the Greenbelt corridor recorded the minimum period-of-record streamflow during this drought with 13 cubic feet per second (ft3/s) recorded at Stratford and 26 ft3/s at SE. 14th Street in Des Moines.

HYDROLOGY

The Des Moines River basin is comprised of all or parts of 7 counties in Minnesota, 39 counties in Iowa, and 1 county in Missouri. The basin, shown on figure 3, is about 360 miles long and has an average width of 40 miles. The drainage area of the basin, totalling 14,540 square miles, covers 26-percent of Iowa, 2-percent of Minnesota, and less than 1-percent of Missouri. The Des Moines River flows for about 535 miles from its headwaters in southwestern Minnesota to its confluence with the Mississippi River just south of Keokuk, Iowa. Its major tributaries include the East and West Forks, and the Boone, Raccoon, Middle, and South Rivers.

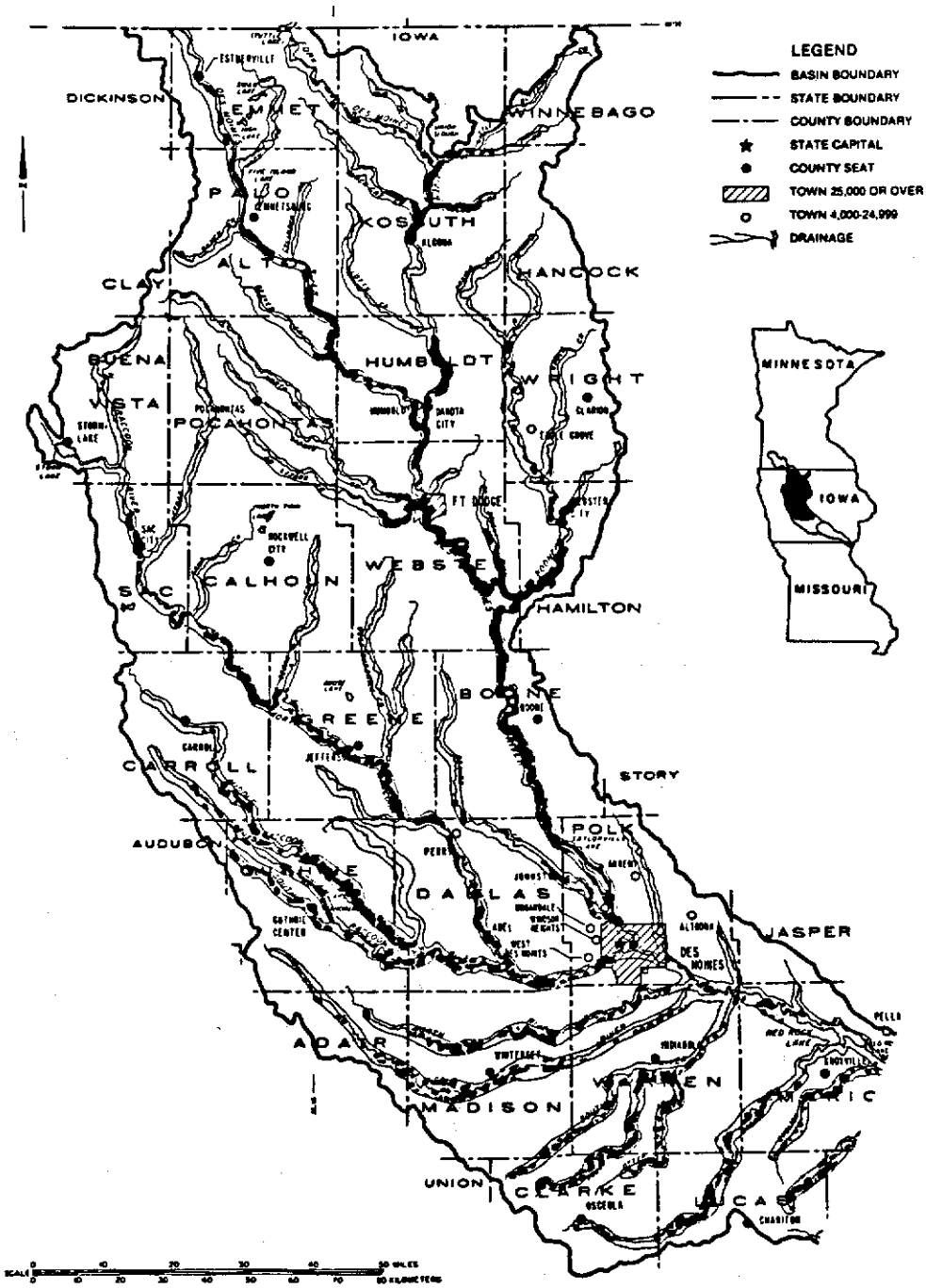


Figure 3. Des Moines River Basin.

The Des Moines River lies in a glaciated region characterized by moderate relief. In the upper area of the basin, southwestern Minnesota, the watershed is poorly defined, with numerous lakes, ponds, and marshy areas in the drainage network. Runoff rates, even from intense rainfalls, are low due to the natural storage in this area. In the reach between Jackson, Minnesota, and Lake Red Rock, Iowa, the uplands of the basin have immature drainage topography. The floodplains of the Des Moines River are well defined and bordered with rounded bluffs. Below Lake Red Rock, the basin topography is mature and mostly well drained. The average slope of the river ranges from 2 to 3 feet per mile.

Two principal flood control reservoirs are located on the Des Moines River: Lake Red Rock at river mile 142.9, and Saylorville Lake at river mile 213.7. The drainage area above Lake Red Rock is 12,323 square miles and 5,823 square miles above Saylorville Lake. There are a number of other small low-head dams on the upper Des Moines River with insignificant amounts of storage. Most of these dams were built for power generation in the early part of the century, with most now abandoned. In Iowa, these dams are at Scott and Center Streets in Des Moines, and in Boone, Fraser, Fort Dodge, Humboldt, and Rutland. In Minnesota, two dams are located at Jackson and Windom.

HYDROLOGICAL AND METEOROLOGICAL INSTRUMENTATION

Instrumentation related to the operation of the Lake Red Rock and Saylorville Lake includes equipment to collect and monitor meteorological conditions throughout the Des Moines River Basin, reservoir inflow and outflow, and reservoir pool levels. The system has 24 streamflow and continous recording tipping bucket rain gages located throughout the basin on the Des Moines River and key tributary streams.

These gages are equipped with Data Collection Platforms (DCP's) which collect the hydrometeorolgic data every 15 minutes and transmit it every 4 hours to the GOES satellite. The reflected signal is received at the downlink located at the Rock Island District headquarters. The data from the DCP's are stored on the Corps of Engineer's Data Storage System (DSS) and the OMNI computer system. The information is used to determine daily reservoir operation and gate settings. In addition, special meteorologic reports are received from the GALAXIE satellite for which the Rock Island District has a downlink through a commercial vendor.

The Des Moines River basin has 33 stream gaging stations for which data are reported at regular time intervals. The data from these stations are published annually by the U.S. Geological Survey in the water supply paper series. In addition, data from 61 rainfall observation stations are reported to the National Weather Service Office in Des Moines when specified reporting criteria has been reached or exceeded.

There are three subbasins in the Des Moines River Basin that have flash flood warning capabilities from locally heavy rainfall. These basins are Lizard Creek at Fort Dodge, and Walnut and Fourmile Creeks in Des Moines. Stations in these subbasins automatically call the National Weather Service Office in Des Moines when they experience their reporting criteria. This information is then sent to other agencies by the National Weather Service's AFOS communications system.

RESERVOIR REGULATION

Saylorville Lake and Lake Red Rock were authorized for the primary purpose of flood control. The reservoirs also operate for low-flow augmentation. Tandem operation of Saylorville Lake and Lake Red Rock provides flood control benefits in the reaches downstream of these dams, as well as areas along the Mississippi River below the confluence of the Des Moines River. Conservation storage at Saylorville Lake is utilized to provide water supply, low-flow augmentation, and recreation. A final objective is a drought contingency operation which would constructively ration water during extreme drought periods.

SAYLORVILLE LAKE

The conservation pool is normally maintained at elevation 836 feet NGVD (National Geodetic Vertical Datum) and is raised to elevation 838 feet NGVD on October 1 upon the request from the Iowa Department of Natural Resources for the benefit of wildlife management. The higher level is maintained until March 1. The normal minimum release at Saylorville Lake is 200 ft3/s plus water supply demand.

More than 200 ft3/s will be released, if necessary, to keep a flow of 270 ft3/s at SE. 14th Street in Des Moines and to maintain a flow of 300 ft3/s at Ottumwa. The 300 ft3/s at Ottumwa is controlled by the outflow from the Red Rock Dam. These minimum releases are met until the pool falls to elevation 827 feet NGVD, at which time rationing will begin for water quality releases.

Flood control regulation dictates that Saylorville Lake will operate with the downstream control point at SE. 14th Street, keeping the flood control storage in balance with Lake Red Rock within the framework of operational constraints. The primary constraints are:

a. Control point constraint. Flood stage at the SE. 14th Street gage is 23 feet, which corresponds to a flow of 30,000 ft3/s. If the lake level is between the conservation pool and elevation 875 feet NGVD, regulation of the flood storage will be made to limit the stage at the control point to below flood stage.

b. Downstream channel capacity constraint. If the lake level is between the conservation pool and elevation 875 feet NGVD and the outlet conduit capacity permits, reservoir inflows will be released up to a maximum outflow of 12,000 ft3/s in the growing season (April 21 - December 15), and a maximum outflow of 16,000 ft3/s in the non-growing season (December 16 - April 20).

LAKE RED ROCK

The present conservation pool is normally maintained at elevation 728 feet NGVD and is temporarily raised to elevation 730 feet NGVD for fall wildlife management when hydraulic conditions permit. The conservation pool allows for 50,000 acre-feet of conservation storage with the remaining storage serving as a sedimentation pool. During a 100-year project life, it is projected that the pool will need to be ultimately raised to elevation 742 feet NGVD to maintain the 50,000 acre-feet of conservation storage. Conservation regulation allows Saylorville Lake releases to be passed through Lake Red Rock in order to maintain 300 ft3/s at Ottumwa.

Flood control regulation at Lake Red Rock provides for protection along the Des Moines River below the dam by controlling releases. The objective is to limit the stage at two primary control points to non-damaging levels when the pool is below elevation 775 feet NGVD. The control stages are based on those points at which agricultural damage begins since urban damage occurs at substantially higher elevations. The gage at Ottumwa is the control point for the reach of river extending downstream from the dam to river mile 77. The control stage is 7.5 feet for the growing season, corresponding to a discharge of 18,000 ft3/s. The non-growing season can tolerate larger flows without causing excessive damages. At Ottumwa, a stage of 10.9 feet (30,000 ft3/s) is set as the upper release rate during the non-growing season.

The second control point is the stream gage at Keosauqua and is used for the reach from river mile 77 to the mouth of the Des Moines River. The control stage on this gage is 7.5 feet (22,000 ft3/s) for the growing season, and 10.8 feet (35,000 ft3/s) for the non-growing season. Control points also exist on the Mississippi River which provide additional constraints.

ENVIRONMENTAL RESOURCES

The Greenbelt study area lies along a 160-mile stretch of the Des Moines River Valley from U.S. Highway 20 in Fort Dodge to the State Highway 92 bridge in Mahaska County. Prior to modern settlement, the uplands were covered by tall grass prairie, and river and stream slopes were generally forested. Potholes within the prairie were concentrated along the upper reaches of the area. Today nearly all the prairies and potholes have been converted to farmland. The river and stream valleys are now a mosaic of cropland, pastureland, unused land (old field succession), urban land, and forest land. Wetlands such as backwater areas or oxbows are not as common as in many other major rivers, but occur more frequently in the lower half of the corridor where the river valley widens, permitting greater meandering of the streambed.

The lower half of the Greenbelt corridor is characterized by greater human disturbances. The city of Des Moines is by far the largest metropolitan area within the corridor. Concentrated urban development has completely eliminated naturally occurring vegetation within the city's center. Inundation of the river valley at Lake Red Rock and Saylorville Lake has destroyed most floodplain vegetation at these sites.

Forested lands occur throughout the Greenbelt corridor but are concentrated in the upper reaches above Saylorville Lake where the Des Moines River Valley is narrow with steep slopes and where there has been less human disturbance. Forest lands can have either an upland or bottomland classification.

BOTTOMLAND FORESTS

The bottomland (or floodplain) forests are located on the alluvial soils of the floodplains of the Des Moines River and its tributaries. Species are adapted to land subject to moist soil or annual flooding and to frequent additions of silt.

Bottomland forests within the major stream basins generally occur intermixed with cropland. Often these forests are limited to corridors immediately adjacent the shorelines, the widths of which can vary considerably. Larger patches of woods occur frequently in areas that are poorly drained, on lower terraces that frequently flood, or on silts that have poor access which discourages development.

Within the lower half of the study area, the bottomland forests have been greatly affected by human developments. At Lake Red Rock and Saylorville Lake they were eliminated upon the initial inundation of the old floodplain. Subsequent revegetation of the newer shorelines has not occurred because of the greatly fluctuating pool levels caused by floodwater storage.

Common species include silver maple (Acer saccharinum), American elm (Ulmus americana), cottonwood (Populus deltoides), peach leaf willow (Salix amydasordes), hackberry (Celtis occidentalis), and green ash (Fraxinus pennsylvanica). A list of known tree species found in the study area, including upland species, is on file at the Rock Island District Office.

Cottonwood and willow are the pioneer species of the floodplain. They are the first to establish along the river's edge on bare, moist mud and sand deposits. These species, however, cannot regenerate under shade, and, in the absence of further stream disturbance, tend to be replaced by silver maple and American elm. The willow and to some extent cottonwood, occupy the mudflats and transition zones between the upper reaches of the reservoirs and the Des Moines River. During periods of dry years, thickets will spring up. When flooding does come again, these thickets are killed back, only to resprout again during new dry periods.

Mature elms have been practically eliminated by the Dutch elm disease, although seedlings and saplings are abundant, with trees as young as 15 years producing seeds. Mast producing trees occur less frequently and are usually found on the higher terraces within the floodplain.

The ground cover of the floodplain forest can vary considerably from that of the uplands. In some years, flood conditions persist for extended periods of time so that spring blooming perennials are at a distinct disadvantage. During the best times, full development of the ground layer is frequently delayed until midsummer. Members of the grass, sedge, mint, nettle, and carrot families are common within the floodplain forest. In heavily shaded areas, there are occurrences of pure stands of wood nettle (Laportea canadensis), stinging nettle (Urtica dioica), and poison ivy (Rhus radicaus).

Lianas, climbing herbaceous or woody vines, are well adapted and have an unusually high occurrence within floodplain forests. Besides poison ivy, other vine species include grapes (Vitis spp.), bur cucumber (Sicyos angulatus), wild cucumber (Echinocytis lobata), common green briar (Smilax hispida), and moonseed (Menispermum canadensis).

UPLAND FOREST

The upland forest, because it is less tolerant of flooding and moist soil conditions, occurs along the slopes and bluffs. Two different associations occur within the upland forest. These are the oak-hickory and the maple-linden associations. The oak-hickory association is found on the more xeric, or drier, upland sites of south- and west-facing slopes and on thin soils of ridges and hilltops. The maple-linden association occurs on the more mesic, or moister, north- and east-facing slopes. Intermixing of species is quite common, and a distinct boundary between the two often does not occur.

The maple-linden association is dominated by sugar maple (Acer saccharinum) and black maple (A. nigrum). Seedlings of the maple are shade tolerant and will gradually replace other species where little disturbance occurs for long periods of time. Other common species include basswood (Tilia americana), red oak (Quercus rubra), slippery elm (Ulmus rubra), white ash (Fraxinus americana), and ironwood (Ostrya virginiana).

The oak-hickory association is not dominated by any single tree like the maple-linden association. The canopy coverage is generally thinner which allows for other than the most shade-tolerant species to regenerate. Additionally, disturbances on the higher, drier sites are greater than those down in the sheltered valley and often prevent the development of a single climax specie.

Oak species tend to dominate in some places. The more common oaks include white oak (Quercus alba), red oak (Q. macrocarpa), and to a lesser extent on the driest sites, black oak (Q. velutina). Hickories which are more common farther south also occur, with shagbark hickory (Carya ovata) and bitternut hickory (C. cordiformis) being the most representative.

Red cedar (Juniperus virginiana) is the only native conifer found within the Greenbelt area. It occurs primarily in "old field succession" and is more frequent in the upper reaches along the drier, rockier slopes. Other common "old field" species include elm, honey locust (Gleditsia triacanthos), and box elder (Acer negundo).

Ground cover varies within the upland forest. Spring bloomers are the predominant flowering plants within the mesic forest. Within the xeric forest with its drier conditions and more open canopy, there is a decrease in spring bloomers and a corresponding increase in plants that bloom in the summer and fall. Though no single plant family is dominant, the lily family comprises the largest number of species in mesic stands and the daisy family in xeric stands. Other prominent families, that combined with the previous two make up over half the species in the ground cover, are the buttercup, sedge, honeysuckle, grass, common fern, and rose (Curtis 1959).

Among the spring bloomers are the spring ephemerals. These are plants that grow rapidly in early spring, usually sending forth both flowers and leaves together. By the time the leaves of the trees have fully expanded, the ephemerals have died back completely to the ground. Some of the more common species include trout lilies (Erythronium albidum), spring beauty (Claytonia virginiana), Dutchman's breeches (Dicentra cucullaria), toothwort (Dentaria laciniata), and false rue anemone (Isopyrum biternatum). Other species that bloom in the spring but retain their leaves for all or part of the summer include bloodroot (Sanguinaria canadensis), wild ginger (Asarum canadense), mayapple (Podophyllum pellatum), trilliums (Trillium spp.), and hepatica (Hepatica acutiloba).

Shrubs and woody vines are much more abundant in the oak-hickory association, being concentrated along the forest edges. Common species include gray dogwood (Cornus racemosa), hazelnut (Corylus americana), smooth sumac (Rhyus glabra), and gooseberries (Ribes spp.). Both poison ivy and virginia creeper (Parthenocissus quinquefolia) are common throughout both mesic and xeric areas.

WETLANDS

Wetlands within the Greenbelt project area include potholes, ponds, limited sections of streambanks, ponds, and moist or poorly drained sites. Wetlands usually contain plants that are adapted to moist conditions and have soils that are often saturated. Cowardin, et al. (1979) describes them as:

> ... lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes, (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

Prairie potholes are depressions in the ground that were formed by glaciers thousands of years ago. They tend to be shallow, often less than 2 feet deep. Potholes occur in northern Iowa, Minnesota, and the Dakotas. Within the project area they are concentrated in its upper reaches. Most are located on the level uplands in the prime farm country and, as a result, nearly all have been drained. Historically, this has been done with open ditches and tile.

Streambanks and shorelines provide some habitat suited to the growth of aquatic macrophytes. This is often limited to narrow strips of vegetation, because the variable water depths and currents are often beyond the tolerance limits of most aquatic plants. Side channels, sloughs, and backwater lake area contain much more suitable conditions but are relatively infrequent within the study area of the Des Moines River and its tributaries.

The oxbows are segments of old channel bed where the river has changed its course. They occur most frequently below Saylorville Lake where the floodplain widens, permitting greater meandering. Oxbows are often found in close association with bottomland forests. In areas such as the broad floodplain below the city of Des Moines, the land is intensively farmed close to the oxbow edges and generally only a thin border of trees remains. The oxbows are in various stages of succession and can range from permanent water to wet meadow habitats.

Moist or poorly drained areas and ponds also provide good wetland habitat. Seeps form where the water volume is too small to create a stream or creek. They provide an oasis for aquatic plants in areas often surrounded by upland vegetation. Seeps occur infrequently in the project area. Ponds, when left undisturbed, can become well established with wetland vegetation.

Wetland vegetation can be placed into five separate plant groups: the wet meadow, emergent, floating leaved, submergent, and free-floating communities. However, these communities often may overlap.

Many wetlands contain mosaics of the different communities, and the same species often, but not always, may be found in the different wetland types. Wet meadow communities are found where the soil is normally saturated and may be covered by water only for a portion of the year (usually in the spring). These areas are often dominated by various sedges (Carex sp.) and grasses such as rice cut-grass (Leersia oryzoides), reed canary grass (Phalaris arundinacea), bluejoint (Calamagrostis sp.), and manna grass (Glyceria sp.). Mints (Mentha sp.) and smartweeds (Polygonum sp.) are also common.

Emergent communities occur where there is shallow standing water, though most species can tolerate short periods of drying out. Common species include bulrushes (Cyperus sp.), spike rushes (Eleocharis sp.), cattail (Typha latifolia), arrowheads (Sagittaria sp.), burreeds (Sparganium sp.), and giant reed grass (Phragmites communis).

Floating-leaved communities grow in much deeper water than most emergents. The plants have tubers rooted in the bottom and send up leaves on slender stalks to the surface. Pondweeds (Potamogeton spp.) are the dominant plants.

Submergent plants are generally rooted on the bottom and have most, if not all, their stems and leaves under water. Water depth and turbidity are important factors because of their relationship to the light intensity necessary for photosynthesis. Some of the more common plants include pondweeds, najas (Najas sp.), water milfoil (Myriophylum sp.), coontail (Ceratophyllum demersum), and bladderworts (Utricularia sp.).

The free-floating plants are small, not rooted, and usually remain on the surface of the water. They are strongly influenced by wind, tending to windrow or to remain between emergents. Common species include duckweeds (Lemna sp.) and watermeals (Wolfia sp.).

A different type of wetland occurs along the upstream ends of Lake Red Rock and Saylorville Lake. Increased water level fluctuations and sediment deposits have eliminated many of the perennial wetland species. Vegetation is frequently dominated by adventitious species adapted to pioneering open or barren ground. Common species include smartweeds, curly dock (Rumex crispus), sedges, and amaranths and pigweeds (Amaranthus sp.). On drier ground, there are foxtails (Setaria sp.) ragweeds (Ambrosia sp.) and velvet leaf (Abutilon theoprastis).

NATIVE PRAIRIES

Typical of the rest of Iowa, tall grass prairie originally covered much of the level uplands of the Greenbelt area. Prairie soils proved to be extremely fertile, and as a result, most were converted to cropland. Of the 30 million acres of original prairie once present in Iowa, today only a few thousand acres are known to remain.

The remnant prairies that have survived development are often found in odd corners of fields or out-of-the-way places such as along ridges or open areas within woods, old cemeteries, and along railroad rights-of-way. Restored prairies (areas that have been replanted back into native species) occur within State and local parks and on Corps of Engineers lands.

Prairie vegetation is dominated by grasses. The most common are the tall grass species which include big bluestem (Andropogon gerardi), Indian grass (Sorghastrum nutans), and prairie dropseed (Sporobalus heterolepis). Short and medium grasses occur more frequently on the drier (rockier and sandier) sites. They include little bluestem (Andropogon scoparius), sideoats grama (Bouteloua curtipendula), blue grama (B. gracilis), hairy grama (B. hirsuta), and buffalo grass (Buchloe dactyloides). These mid- and short-grasses become the dominant species in prairies of the drier states west of Iowa. In wet soil conditions, cordgrass (Spartina pectinata), switchgrass (Panicum virgatum), and blue-joint grass (Calamagrostis canadensis) become dominant.

The tall grass prairie contains a large diversity of forbs (herbaceous, broad-leaved plants). The well established remnant prairies contain a greater diversity than restored prairies. More common species include the compass plant (Silphium laciniciatum), lead plant (Amorpha canescens), pasque flower (Anemone patens), pale purple coneflower (Echinacea pallida), butterfly milkweed (Asclepias tuberosa), gray-headed coneflower (Ratibida pinnata), and downy gentian (Gentiana puberula)

WILDLIFE

The Greenbelt corridor provides habitat for a large number of wildlife species. In particular, the river valleys with a mosaic of habitats (such as woodland, grassland, cropland, and aquatic) provide the greatest amount of edge effect or variation required by many species. Thus, the greatest concentrations of most wildlife species occur within or near the river valleys.

Changes in habitat have caused dramatic changes within wildlife populations. The upper reaches of the corridor were within an area of tall grass prairie interspersed with wetlands that produced millions of waterfowl. Drainage and conversion to cropland have virtually eliminated waterfowl production while improving conditions for pheasant and gray partridge. The bison, elk, and prairie chicken common in presettlement times have been replaced by white-tailed deer and bobwhite quail as forest clearing, grazing, and cultivation altered the habitat.

Three residents once common have been introduced into the Greenbelt area by the Iowa Department of Natural Resources (IDNR). The wild turkey has been restored at seven different sites since 1973 and has been successfully reestablished. A total of 55 ruffed grouse were released in the Boone Forks Wildlife Area in September 1982. Several recent sightings of the species have been recorded. Sixteen (16) river otters were released at Lake Red Rock in March 1985 and 1 year later 20 otters were released near the confluence of the Des Moines and Boone Rivers. Preliminary evidence indicates that the majority of river otters have survived and are remaining in the general area of the release sites with occasional sallies up and down the river.

The most common mammals, by numbers, in the project area are mice, shrews, and voles. Surveys of small mammals done by the IDNR in the spring and summer of 1983 found the short-tailed shrew, masked shrew, eastern mole, prairie and woodland whitefooted mouse, meadow vole, and meadow jumping mouse to be common. A very rare species, the woodland vole (State threatened species), was found in the area.

Larger mammals that are common to the project area include the raccoon, cottontail rabbit, fox and gray squirrels, coyote, striped skunk, red fox, and white-tailed deer. A list of known species is on file at the Rock Island District Office.

The Des Moines River serves as a major waterfowl corridor in central Iowa. Over 20 species of ducks and geese have been observed at both Lake Red Rock and Saylorville Lake, which are used as refuges during migration. Common species include the blue-and green-winged teal, redhead, common merganser, common pintail, northern shoveler, lesser scaup, American widgeon, ring-necked and ruddy ducks, and snow and Canada geese. White pelicans, which also use the reservoirs as nesting and fishing areas, are common during migration.

Certain species of waterfowl use the corridor area for other than a migratory route. The mallard duck is both a summer and winter resident as well as a migrant. The wood duck is a summer resident that nests in the cavities of trees. It is the primary duck produced throughout the corridor. Since 1980, the IDNR has maintained a captive giant Canada goose flock in the hopes of establishing a resident population at Lake Red Rock with hatchlings and returning geese steadily increasing each year.

The wooded hillsides and adjacent open field provide habitat for a number of raptors. The majority of hawks are migrants to the corridor except the American kestrel and red-tailed hawk (both common) which are year-round residents. The rough-legged hawk is common during the winter months. The bald eagle, another winter resident, is found near areas of open water where fish, their main source of prey, are available. The tailwater areas below Lake Red Rock and Saylorville Lake provide this type of winter habitat for the eagle.

Other raptors within the project area include the owls. The barred, great-horned, and screech owl are common permanent residents of the wooded or wooded-to-open areas. The snowy and short-eared owls are uncommon to rare winter residents.

In a survey conducted during May 1984, the IDNR found that mature woodlands along the corridor are home to an excellent variety of cavity nesting birds such as woodpeckers, flickers, chickadees, and great-crested flycatchers. In more open habitats, bobolinks are numerous, and yellow warblers were common. A list of known bird species that occur within the project area is on file at the Rock Island District Office.

Various herpetofauna are found within the Greenbelt corridor. Many species, particularly the amphibians, are aquatic to semi-aquatic in nature. Others, specifically a number of snake species, are more often found in dryer upland habitats. Two species, the American toad and the garter snake, are cosmopolitan and found from upland to streamside habitat

Some of the more common aquatic and semi-aquatic species include the snapping turtle, smooth and spiny softshell turtles, and the northern water snake. Many of the species utilize a variety of habitats including lakes, ponds, lagoons, and creeks.

Other less aquatic species, or those found in close association with the water's edge, include the green, cricket, leopard, and bull frogs and the western ribbon snake, although the leopard frog will often travel considerable distances from water.

Certain species require moist habitats and are often found in damp woods under logs, rocks, and leaf detritus. Species found within the project area include the tiger salamander, the western earth snake (State threatened species), and the worm snake.

Species commonly associated with forested areas include the milk snake, fox snake, and eastern tree frog. Other species are associated with the forest-prairie edge and include such species as hognose snake, smooth green snake, and bull snake. Prairie species include the prairie king snake, western slender glass lizard (State endangered species), ornate box turtle, and chorus frog. A list of herpetofauna that is known to occur or likely occurs within the project area is on file at the Rock Island District Office.

FISH

The Greenbelt corridor provides two major habitats for fish: the lake-like habitat of the major impoundments and the stream habitat of the Des Moines River and its tributaries. The Des Moines River above Saylorville Lake is characterized by sand and gravel substrate interspersed occasionally with areas of rock riffles. Log jams, deep holes, and riffle areas provide good habitat for various fish.

The most common and important game fish are the channel catfish, crappie, and northern pike. Lowhead dams at Fort Dodge, Fraser, and Boone provide more still water for carp and concentrate other species.

The Boone River, which is a major tributary to the Des Moines River, lies within the Greenbelt corridor from Webster City downstream. Its bottom composition consists of sand, gravel, and rock rubble, with generally good habitat. The tributary streams to the Boone River itself are important spawning and nursery areas for both sport and non-game fish. Major game fish found in the Boone River are the channel catfish and smallmouth bass. Others include walleye, northern pike, flathead catfish, rock bass, and black bullhead.

Lake Red Rock and Saylorville Lake are characterized by lake-like habitat. The substrates generally consist of silt and a greatly reduced current. This has provided favorable conditions to the gizzard shad, river carpsucker, bigmouth buffalo, carp and freshwater drum. The gizzard shad serves as an important prey for several of the game fishes. The bigmouth buffalo, carp, and freshwater drum are commercially fished at Lake Red Rock.

The IDNR annually stocks certain game fish into Saylorville Lake and Lake Red Rock, including the walleye and northern pike. Additionally at Saylorville Lake, largemouth bass and wipers (hybrid striped bass) are stocked. Other gamefish within the reservoirs include the black and white crappie, channel and flathead catfish, and white bass. Various fish surveys have been performed within the Greenbelt corridor. A list of species found in the surveys is on file at the Rock Island District Office.

CULTURAL RESOURCES

As a result of nearly 40 years of archeological and historical research for Lake Red Rock, and 22 years of study for Saylorville Lake, approximately 967 sites have been recorded on Federal land in the Des Moines River valley. These investigations were primarily surficial in nature, sporadic in accomplishment, without a unified theme, and of varying quality until about 1980 when the Corps of Engineers developed a strong survey and testing program rooted in principles of anthropological theory, cultural-historical interpretation. Geomorphological models of Holocene landscape evolution were also produced as part of the program. While only 16-percent of the entire Greenbelt study acreage has been surveyed in previous archeological investigations, about 70-percent of the total Saylorville Lake and Lake Red Rock acreage has been covered by archeological examinations.

Since 1980, the Corps of Engineers has completed cultural resource overviews for Saylorville Lake and Lake Red Rock and has established regional criteria of site significance. Integrity and preservation quality requirements also have been developed to provide sound bases for discussing impacts and interpretation potentials of significant historic properties under Federal jurisdiction. Hence, few new policies, procedures, or concepts will be needed for the Greenbelt project. The existing cultural resource management program framework will be applied.

Detailed information on the Rock Island District cultural resource management program for the Des Moines River is presented in Appendix C, Cultural Resources. The appendix discusses the following topics:

a. Nature and adequacy of previous studies
b. Potential for cultural resources in Greenbelt area
c. Nature of known cultural resources as of 1986
d. Prehistoric/historic overview
e. Application of reservoir cultural-geomorphological predictive models
f. Additional studies required
g. Public interpretation opportunities

Investigations at Saylorville Lake and Lake Red Rock have uncovered evidence of archeological sites from the Archaic, Woodland, Great Oasis, and Oneota cultures from the prehistoric period; Iowa, Oto, Sauk, and Fox (Mesquakie) remains from the protohistoric and historic periods; and remnants of various 19th century EuroAmerican sites (mills, farmsteads, quarries, schools, churches, cemeteries, etc.) from the late historic period. Information on site types, site locations, diagnostic artifacts and remains, states of preservation, site ages, and site significance is presented in tables C-14 through C-17 of Appendix C, Cultural Resources.

The synthesis discussion of cultural resource investigations in the Des Moines River valley presented in appendix C is important because the archeological data base (Federal lands) was developed by studying lands that are now part of the Greenbelt project. Hence, culture histories, geomorphological considerations, and management processes already developed for the two reservoirs can be applied to the Greenbelt project. What has been learned about investigation methods and techniques at the reservoirs can be applied to non-reservoir lands in order to save significant amounts of time and money for the identification, evaluation, and preservation actions for significant historic properties. Detailed information on prehistoric and early historic characteristics of the Greenbelt corridor can be found in the technical report entitled Interpretive Overview of Cultural Resources in Saylorville Lake, Iowa (Benn and Rogers 1985:12-25).

The Rock Island District arranged to have comprehensive geomorphological studies done for Saylorville Lake and Lake Red Rock. These projects were designed to provide landscape evolution models, focused on the Holocene (post-ca. 12,500 B.P.), supplemented by landform maps illustrating archeological site preservation potentials. Experience has shown that traditional surface-focused methods of inquiry are wholly inadequate for exploring active alluvial environments.

River valleys are a complex, multi-faceted universe where erosional, depositional, biological, and cultural factors affect site preservation. Many sites exist as reworked lag components where context has been destroyed due to erosion, farming, or construction. Conversely, other sites have been nicely buried under sediments or colluvium (centimeters to several meters). Graded lag deposits are easy to find but least significant; buried sites are difficult to locate but typically are the most significant because preservation improves informational content. Some sites have been alternately eroded and buried over time and hold an intermediate position in terms of site significance.

Section 4 of appendix C summarizes the results of the geomorphological studies. The resulting landform models have been used to assess archeological fieldwork requirements and methods on Greenbelt projects. The models were applied specifically for Greenbelt projects within reservoir boundaries and extrapolated (using topographic maps and aerial photographs) to non-reservoir areas.

Drift Plain area projects south of Des Moines follow the Lake Red Rock models, while projects north of and including the city of Des Moines (and the Bemis Moraine) follow the Saylorville Lake models.

Benn and Bettis (1986) and Schuldenrein (1986) were able to determine relationships between site locations, site functions, site ages, and various landforms for the Des Moines River Valley. Historic materials are found in small quantities on low terraces but prehistoric sites are scarce because these landforms are too young, having formed during the last 200 years.

Site density increases on intermediate and high terraces. PaleoIndian sites and Early through Late Archaic sites occur most frequently on high terraces and on upland locations where erosion and historic disturbances have been great. These sites often are deflated and in poor condition. Woodland and Late Archaic sites tend to be concentrated on intermediate terraces and on alluvial fans; however, many of these sites are buried under post-settlement alluvium and are difficult to find. Prehistoric and historic mortuary sites tend to be located on bluff crests or high interfluves.

The reservoir studies have established that significant periods of real time are not represented by floodplain surfaces or contexts. Therefore, only limited segments of real time, or cultural time, have been dealt with by pre-1980 surface surveys. Since that time, the Corps of Engineers has begun to correct survey coverage biases and improved predictive capabilities to the point where Greenbelt projects can be evaluated, at least in a preliminary fashion, or impacts to cultural resources.

ADMINISTRATION

Section 106 of the National Historic Preservation Act, as amended in 1980, (Public Law 89-665) requires that Federal agencies take into account the effect of their undertakings on properties listed in or eligible for inclusion in the National Register of Historic Places (NRHP) before expending Federal funds for rehabilitation and construction projects. The Act also stipulates that the Advisory Council on Historic Preservation (ACHP) and the appropriate State Historic Preservation Officer (SHPO) be allowed a reasonable opportunity to comment on proposed projects affecting significant historic properties. The consultation process is fully described in Title 36 of the Code of Federal Regulations (CFR), Part 800. Executive Order 11593 (16 U.S.C., 470, Supp. 1, 1971) directs Federal agencies to take a leadership role in preserving, restoring, and maintaining the historic and cultural environment of the Nation. Federal agencies must survey, inventory, and nominate all qualified (36 CFR 60 and 63 and Engineer Regulation 1105-2-50155) historic resources under their jurisdiction to the NRHP.

Until these procedures are completed, agency heads must exercise caution to assure that potentially qualified Federal properties are not inadvertently demolished or substantially altered. The Corps of Engineers will follow the historic preservation legislation and regulations cited above for the Des Moines Recreational River and Greenbelt project. Federal agencies are directed to avoid impacts to significant historic properties (archeological, historical, architectural) if prudent and feasible measures can be found. This philosophy was applied to the projects evaluated in this GDM.

The Archeological and Historical Preservation Act of 1974 (Public Law 93-291) directs Federal agencies to preserve significant cultural resources that would be lost as a result of Federal construction or operation activities. Herein, the agency itself is authorized to undertake recovery, protection, and preservation measures utilizing up to 1-percent of project funds. Details on administration requirements can be found in Appendix C, Cultural Resources.

COORDINATION

The Corps of Engineers has been involved in cultural resource management along the Des Moines River for about 40 years, beginnning with the river basin surveys conducted under the auspices of the Smithsonian Institution for Lake Red Rock. The National Park Service sponsored and monitored early archeological survey and testing projects for Saylorville Lake after 1964. Since the ACHP and the position of SHPO were created as a result of the National Historic Preservation Act (1966), continuous coordination has been maintained for review of survey, testing, and mitigation programs resulting from various reservoir, permitting, leasing, levee, and bank stabilization projects. Coordination of archeological site data and project impacts for approximately 800 sites along the Des Moines River has been completed.

Iowa SHPO staff have been kept apprised of Greenbelt study developments through public meetings, bus tours, and newsletters. The Corps of Engineers also gave the SHPO a complete list of possible projects and project maps. A copy of the GDM will be provided to the SHPO for review and comment. Three prototype projects (i.e., Bennington Bridge Boat Ramp, Jester County Park Campground, and Boone Waterworks Boat Ramp) which were already checked for cultural resource impacts were coordinated with the SHPO by letter dated April 23, 1986. Since no significant historic properties were found in the project areas, no impacts are anticipated. The Iowa SHPO agreed with this determination by letter dated June 6, 1986. The report entitled Plan for Engineering and Design, Des Moines Recreational River and Greenbelt, Des Moines River, Iowa (March 1986) was sent to the Iowa SHPO in April 1986.

RECREATIONAL RESOURCES

The existing recreational resources in the Greenbelt consist of Federal, State, county and local park, recreation, and environmental areas. Existing parks are shown on figure 4 and listed in table 7.

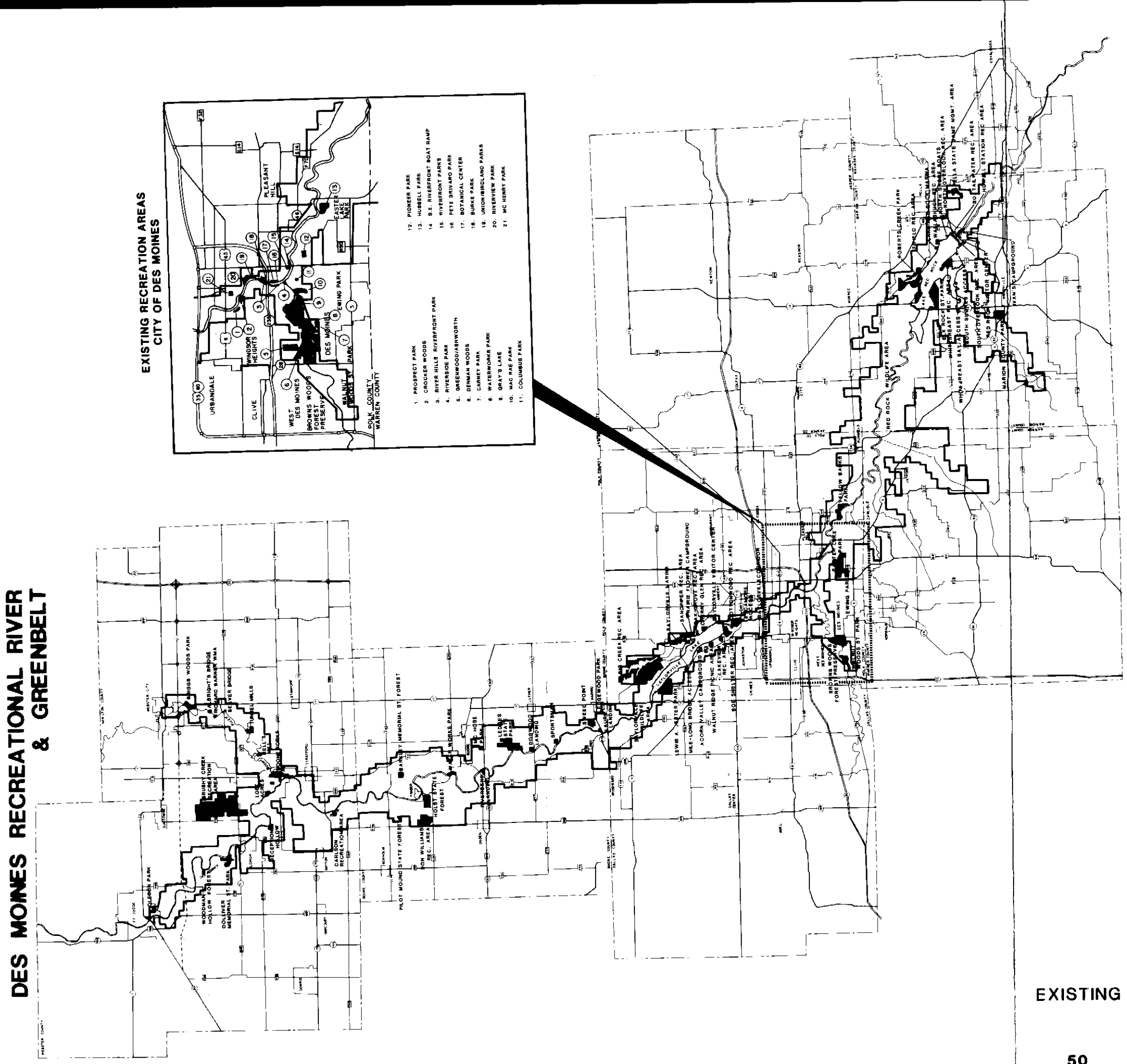
FEDERAL RECREATION AREAS

Federal recreation facilities located within the Greenbelt boundaries include Saylorville Lake and Lake Red Rock which are operated by the Corps of Engineers. Lake Red Rock was placed into operation in 1969, and the Saylorville Lake project began operation in 1975.

Lands acquired for the lake projects have been developed for general outdoor recreation under various Federal authorities. The Corps of Engineers administers general project lands for recreation purposes and resource management areas. Remaining areas are licensed or leased to other public entities.

Both the Saylorville Lake and Lake Red Rock projects are under an operation and maintenance status. However, Saylorville Lake also has remaining construction general funds for completion of initial recreational facilities. Any new recreational improvements located outside Corps of Engineers operated areas, except as identified by the master planning process, may be subject to cost-sharing.

Federally managed areas represent 23-percent of the total recreation lands located within the Greenbelt. The majority of the Federal lands are under the management of other public entities for either park or fish and wildlife purposes.



EXISTING PARKS WITHIN THE GREENBELT

FIGURE 4

TABLE 7

List of Existing Recreation Areas
Located Within the Greenbelt Boundaries

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Sport Fields Shelters
** County Boone												
Water Works Park	City of Boone	17	River	1	0.0	0.0	0.0	0.0	50	10	25	0 x
McHose Park	City of Boone	203	Lake	0	0.0	1.0	0.7	0.0	0	0	120	3 x
Edgewood Park	City of Madrid	20		0	0.0	0.0	0.0	0.0	2	0	30	2 x
Don Williams Rec Area	County of Boone	438	Lake	1	0.0	0.0	0.0	0.0	194	50	207	2 x
Swede Point	County of Boone	105	River	0	0.0	0.0	0.0	0.0	24	0	33	1
Dogwood Boat Landing	Federal	10	River	2	0.0	0.0	0.0	0.0	0	0	0	0
Laurie Boat Landing	Federal	20	River	2	0.0	0.0	0.0	0.0	0	0	0	0
Sportsman Boat Landing	Federal	10	River	2	0.0	0.0	0.0	0.0	0	0	0	0
Riverbend Boat Landing	Federal	27	River	1	0.0	0.0	0.0	0.0	0	0	0	0
Helst State Forest	IDNR	313		0	0.0	0.0	0.0	0.0	0	0	0	0
Ledges State Park	IDNR	1138	River	0	0.0	4.2	0.0	0.0	0	56	190	2
State Game Farm (Ledges)	IDNR	435		0	0.0	0.0	0.0	0.0	0	0	0	0
Pilot Mound State Forest	IDNR	33		0	0.0	0.0	0.0	0.0	0	0	0	0
Barkley Mem. St. Forest	IDNR	40		0	0.0	0.0	0.0	0.0	0	0	0	0
Saylorville Wildlife Area	IDNR	6348	River	0	0.0	0.0	0.0	0.0	0	0	0	0
Kate Shelley Mem. Park	Private	2		0	0.0	0.0	0.0	0.0	0	0	0	0
Camp Morrison	Private	200		0	0.0	0.0	6.0	0.0	30	70	40	0
Camp Sacajawea (GSA)	Private	400	River	1	3.0	0.0	5.0	0.0	0	50	0	0 x
YMCA Camp	Private	338	River	0	2.0	0.0	15.0	12.0	2	1	5	0 x
Iowa 4-H Camp	Private	1100	River	0	0.0	6.0	6.0	0.0	0	0	10	0 x
Camp Hantesa (Camp Girls)	Private	144		0	3.0	0.0	5.0	0.0	0	0	0	0 x
Camp Mitigwa (BSA)	Private	620	Lake	0	8.0	0.0	15.0	0.0	0	20	0	0 x
** Subtotal **		11957		10	16.0	11.2	52.7	12.0	302	257	680	10
** County Dallas												
Saylorville Wildlife Area	IDNR	3130	River	0	0.0	0.0	0.0	0.0	0	0	0	0
** Subtotal **		3130		0	0.0	0.0	0.0	0.0	0	0	0	0
** County Hamilton												
Albright's Bridge Access	County of Hamilton	11	River	1	0.0	0.0	0.0	0.0	0	0	0	0
Briggs Woods Park	County of Hamilton	337	Both	2	0.0	3.5	0.0	0.0	28	0	125	3 x
Bell's Mill Park	County of Hamilton	8	River	0	0.0	0.0	0.0	0.0	44	0	50	2
Tunnel Mill Access	County of Hamilton	116	River	1	0.0	0.0	0.0	0.0	0	0	0	0
Richard Barner WMA	County of Hamilton	28	River	0	0.0	0.0	0.0	0.0	0	0	0	0
Boone Forks WMA	IDNR	570	River	0	0.0	0.0	0.0	0.0	0	0	0	0
Beaver Bridge Access	Private	1	River	1	0.0	0.0	0.0	0.0	0	0	0	0
** Subtotal **		1071		5	0.0	3.5	0.0	0.0	72	0	175	5

TABLE 7

List of Existing Recreation Areas
Located Within the Greenbelt Boundaries

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Sport Fields	Sport Shelters
** County Jasper													
Red Rock Wldf Area	IDNR	63	River	0	0.0	0.0	0.0	0.0	0	0	0		0
** Subtotal **		63		0	0.0	0.0	0.0	0.0	0	0	0		0
** County Marion													
Whitebreast Bay Access	County of Marion	3	Lake	1	0.0	0.0	0.0	0.0	0	0	0		0
Marion County Park	County of Marion	103	Lake	0	0.0	0.0	0.0	0.0	190	100	130		4 x
Roberts Creek Park	County of Marion	1413	Lake	1	0.0	0.8	0.0	0.0	250	100	180		3 x
South Shores Access	County of Marion	4	Lake	1	0.0	0.0	0.0	0.0	0	0	0		0
Whitebreast Rec Area	Federal	405	Lake	6	0.0	0.0	0.0	0.0	140	0	180		3 x
Northshore Boats	Federal	18	Lake	1	0.0	0.0	0.0	0.0	0	0	0		0
North Overlook Rec Area	Federal	178	Lake	0	0.0	1.2	0.0	0.0	51	9	69		0 x
Ivan's Campground	Federal	39	River	0	0.0	0.0	0.0	0.0	22	0	25		0
Red Rock Res. Mgmt. Area	Federal	12138	Lake	0	0.0	0.0	0.0	0.0	0	0	0		0
Lake Red Rock Marina	Federal	135	Lake	2	0.0	0.0	0.0	0.0	0	0	0		0
South Overlook Rec Area	Federal	90	Lake	2	0.0	0.0	0.0	0.0	0	0	14		2 x
Red Rock Visitor Center	Federal	0		0	0.0	0.0	0.0	0.0	0	0	0		0
Howell Station Rec Area	Federal	223	River	1	0.0	1.7	1.1	0.0	120	0	127		0 x
Walleshuck Rec Area	Federal	280	Lake	2	0.0	2.1	0.0	0.0	80	0	84		0 x
South Tailwater Rec Area	Federal	30	River	0	0.0	0.0	0.5	0.0	0	0	28		1
North Tailwater Rec Area	Federal	17	River	0	0.0	0.0	0.6	0.0	0	0	24		1 x
Fifield Rec Area	Federal	141	Lake	0	0.0	0.0	0.0	0.0	0	0	31		4
Pella State Game Mgt Area	IDNR	277		0	0.0	0.0	0.0	0.0	0	0	0		0
Red Rock Wildlife Area	IDNR	21489	River	2	0.0	0.0	0.0	0.0	0	0	0		0
Elk Rock St Park	IDNR	2219	Lake	8	5.0	1.1	0.0	5.0	12	46	200		10
** Subtotal **		39212		25	5.0	6.8	2.2	5.0	865	255	1050		28
** County Polk													
Union/Birdland Parks	City of Des Moines	124	Both	2	0.0	0.0	3.4	0.0	0	0	100		5 x
Kreigh G. Carney Park	City of Des Moines	45		0	0.0	0.0	0.0	0.0	0	0	5		0 x
Grays Lake	City of Des Moines	88	Lake	2	0.0	0.0	0.0	0.0	0	0	30		0 x
SE Riverfront Boat Ramp	City of Des Moines	5	River	2	0.0	0.0	0.0	0.0	0	0	0		0
Riverside Park	City of Des Moines	18	River	0	0.0	0.0	0.0	0.0	0	0	2		0 x
Hawthorn Park	City of Des Moines	15		0	0.0	0.0	0.0	0.0	0	0	8		1 x
River Front Park (E & W)	City of Des Moines	14	River	0	0.0	0.0	0.0	0.0	0	0	2		0
Botanical Center	City of Des Moines	14	River	0	0.0	5.0	0.0	0.0	0	0	0		0
McHenry Park	City of Des Moines	17		0	0.0	0.0	2.0	0.0	0	0	50		2 x
Ewing Park	City of Des Moines	357	Lake	0	0.0	2.0	0.0	0.0	0	1	150		2 x
Denman Woods Water Works	City of Des Moines	1500	River	0	8.0	0.0	0.0	0.0	0	0	50		0 x
Saylorville Corridor	City of Des Moines	251	River	0	0.0	0.0	1.2	0.0	0	0	0		0

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Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Sport Fields Shelters	
Prospect Pk/Crocker Wds	City of Des Moines	77	River	2	0.0	0.0	0.0	0.0	0	0	10	1	x
Hubbell Park	City of Des Moines	82	River	0	0.0	0.0	0.0	3.0	0	0	0	0	
River Hills Park	City of Des Moines	47	River	0	0.0	0.0	0.0	0.0	0	0	0	0	
Pioneer Park	City of Des Moines	48		0	0.0	0.0	0.0	0.0	0	0	60	2	x
MacRae Park	City of Des Moines	61	Lake	0	0.0	0.0	0.0	0.0	0	0	50	2	x
Burke Park	City of Des Moines	5		0	0.0	0.0	0.0	0.0	0	0	4	1	
Ashworth/Greenwood Park	City of Des Moines	143	Both	0	0.0	2.0	2.5	0.0	0	0	50	0	x
City Park	City of Runnels	3		0	0.0	0.0	0.0	0.0	0	0	0	0	x
Browns Woods Forest Prsv	County of Polk	484	River	0	0.0	2.5	0.0	0.0	0	0	0	0	
Mile-Long Bridge Access	County of Polk	5	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0	
Yellow Banks Park	County of Polk	455	Both	0	0.0	0.0	0.0	0.0	80	0	145	3	x
Easter Lake Park	County of Polk	244	Lake	2	0.0	0.5	0.0	0.0	0	12	120	4	x
Lewis A Jester Park	County of Polk	1758	Lake	2	4.6	5.3	0.0	4.6	25	120	344	7	x
Cherry Glen Rec Area	Federal	185	Lake	8	0.0	0.0	3.3	0.0	135	10	88	8	x
Bob Shetler Rec Area	Federal	393	River	0	0.0	0.0	0.0	0.0	48	22	8	0	
Lakeview Rec Area	Federal	41	Lake	8	0.0	0.0	0.0	13.5	0	0	0	1	
Saylorville Marina	Federal	38	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0	
Say. Visitor Center	Federal	0		0	0.0	0.0	0.0	0.0	0	0	0	0	
Sandpiper Rec Area	Federal	0		0	0.0	0.0	0.0	0.0	0	0	0	0	
Saylorville RMA	Federal	4348	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0	
Walnut Ridge Picnic Area	Federal	100		0	0.0	0.0	0.0	0.0	0	0	90	3	
Oak Grove Rec Area	Federal	157	Lake	0	0.0	0.0	0.0	0.0	0	0	32	2	
Cottonwood Rec Area	Federal	310	River	0	0.0	0.0	0.0	0.0	0	0	210	9	x
Acorn Valley Campground	Federal	74		0	0.0	6.0	0.0	0.0	30	95	0	0	
Prairie Flower Campground	Federal	331	Lake	0	0.0	0.0	0.0	0.0	148	16	0	0	
Big Creek Rec Area	IDNR	1538	Lake	7	0.0	2.0	2.0	2.0	0	0	300	13	x
Saylorville Corridor	IDNR	70	River	0	0.0	0.0	4.1	0.0	0	0	0	0	
Saylorville Corridor WMA	IDNR	1403	River	0	0.0	0.0	0.0	0.0	0	0	0	0	
Sycamore Access	IDNR	3	River	1	0.0	0.0	0.0	0.0	0	0	0	0	
Walnut Woods St Park	IDNR	275	River	0	1.5	2.0	0.0	0.0	8	24	54	1	
Saylorville Wildlife Area	IDNR	3860	River	0	0.0	0.0	0.0	0.0	0	0	0	0	
Big Creek Wildlife Area	IDNR	883	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0	
** Subtotal **		19842		44	12.1	27.3	18.5	23.1	454	300	1918	65	
** County Warren													
Red Rock Wildlife Area	IDNR	3900	River	1	0.0	0.0	0.0	0.0	0	0	0	0	
** Subtotal **		3900		1	0.0	0.0	0.0	0.0	0	0	0	0	
** County Webster													
Oleson Park	City of Fort Dodge	64	Lake	0	0.0	2.0	0.0	0.0	0	0	50	8	x

TABLE 7

List of Existing Recreation Areas
Located Within the Greenbelt Boundaries

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Sport Fields Shelters
City Park #3	City of Lehigh	3	River	1	0.0	0.0	0.0	0.0	0	0	3	0
Carlson Area	County of Webster	93	River	1	0.0	0.0	0.0	0.0	0	0	12	1
Lost Acres	County of Webster	28		0	0.0	0.0	0.0	0.0	0	0	0	0
Dolliver Memorial St Park	IDNR	572	River	1	0.0	6.5	0.0	0.0	22	21	245	0
Brushy Creek Rec Area	IDNR	4192	Both	0	24.0	24.0	0.0	12.0	0	175	80	0
Woodman Hollow	IDNR	63	River	0	0.0	1.3	0.0	0.0	0	0	0	0
Deception Hollow	IDNR	40	River	0	0.0	0.0	0.0	0.0	0	0	0	0
Boone Forks WMA	IDNR	378	River	0	0.0	0.0	0.0	0.0	0	0	0	0
Lakota G. S. Camp	Private	175	River	0	5.5	4.0	1.0	0.0	0	0	6	1 x
Camp WaNoKi	Private	80		0	0.0	0.0	0.0	0.0	0	0	0	0
** Subtotal **		5688		3	29.5	37.8	1.0	12.0	22	196	396	10
*** Total ***		84863		68	62.8	86.7	74.4	52.1	1715	1008	4199	118

STATE OF IOWA RECREATION AREAS

The Iowa Department of Natural Resources (IDNR) manages a variety of public lands within the Greenbelt boundaries, representing 63-percent (53,228 acres) of the public recreation land, including State forests, preserves, and wildlife management areas. The majority of State-managed areas are on Federally owned lands licensed for either park or fish and wildlife management purposes. State-managed areas are found throughout the Greenbelt boundaries with the concentration of State-owned areas being primarily located in Boone, Webster, and Hamilton counties. The level of development for State-managed areas varies according to the primary purpose of the unit.

There are eight State parks located within the Greenbelt, which represent 19-percent of the total State-managed lands. In addition, IDNR manages four State forests (totaling 449 acres) and eight wildlife management areas.

COUNTY RECREATION AREAS

There are nine counties which lie partially within the Greenbelt, although only five have parks within the project boundaries. County-operated recreation lands represent 7-percent of the entire recreation acreage within the Greenbelt, and 11-percent of the entire public recreation acreage located within the nine-county area. Dallas, Jasper, Mahaska, and Warren Counties do not have any recreation areas located within the Greenbelt (see table 8).

TABLE 8

Public Recreation Land Acreage
Des Moines Recreational River and Greenbelt

Location	Management - City	County	State	Federal	Private	Total
BOONE						
County	240	545	8,305	67	2,842	11,999
Greenbelt	240	545	8,305	67	2,800	11,957
DALLAS						
County	136	67	3,410	0	33	3,646
Greenbelt	0	0	3,130	0	0	3,130
HAMILTON						
County	20	571	570	0	1	1,162
Greenbelt	0	500	570	0	1	1,071
JASPER						
County	14	1,178	734	0	1,351	3,427
Greenbelt	0	0	63	0	0	63
MAHASKA						
County	175	482	2,193	0	18	2,868
Greenbelt	0	0	0	0	0	0
MARION						
County	121	2,168	23,985	13,704	46	40,024
Greenbelt	3	1,523	23,985	13,704	0	29,215
POLK						
County	3,496	4,263	8,240	5,975	240	22,214
Greenbelt	2,887	2,947	8,030	5,975	0	29,839
WARREN						
County	230	466	5,046	0	126	5,868
Greenbelt	0	0	3,900	0	0	3,900
WEBSTER						
County	261	497	5,333	0	339	6,430
Greenbelt	67	138	5,245	6	255	5,705
TOTALS						
County	4,843	10,237	57,816	19,746	4,996	97,638
Greenbelt	3,197	5,653	53,228	19,746	3,056	84,880

MUNICIPAL RECREATION AREAS

City parks are operated by most of the municipalities located within the Greenbelt. Development varies from simple neighborhood parks to fully developed sports complexes and marinas.

PRIVATE RECREATION AREAS

There are a number of private recreational developments within the Greenbelt boundary. These include a limited number of campgrounds and youth group camps such as Camp Fire Girls and Iowa 4-H clubs.

MARKET AREA ANALYSIS

PRIMARY MARKET

For this analysis, the primary market area was defined as the area which contributes between 80- and 90-percent of the annual visitation to a recreation site. Survey data indicate that generally over 90-percent of the visits to the Rock Island District, Corps of Engineers, lake projects (includes Saylorville Lake and Lake Red Rock) are generated from locations within 1 hour's drive (50 road-miles) of the sites. On the basis of this criterion, the approximate primary market area for the Greenbelt was delineated, as depicted on figure 5. This market area not only accounts for a large portion of potential visitors to the Greenbelt, but also takes into account the factors of travel time and distance.

The Greenbelt primary market area includes portions of 44 Iowa counties, as listed in table 9. Since 1980, the population of this 44-county area has grown from approximately 1,162,700 to about 1,185,300. Population projections suggest that the primary market area population will continue to grow through 1995.

SECONDARY MARKET

The secondary market includes all areas beyond the primary market area. It accounts for the remaining 10- to 20-percent of potential visits to the Greenbelt. During the initial development of the Des Moines Recreational River and Greenbelt, this market will remain relatively low in importance due to competing recreational markets and current economic conditions. However, as development intensifies, visits from other regions of the state should become more frequent. Given this situation, the primary market could expand to incorporate portions of the secondary market.

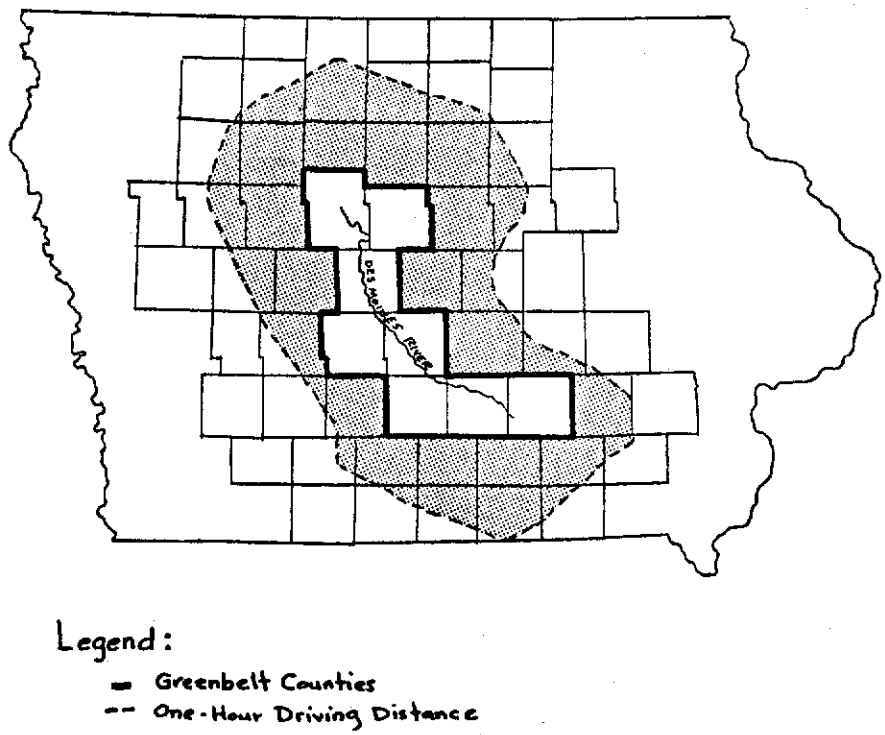


Figure 5. Primary Market Area.

RECREATION ATTENDANCE WITHIN THE GREENBELT COUNTIES

The Des Moines Recreational River and Greenbelt is contained within nine central Iowa counties: Boone, Dallas, Hamilton, Jasper, Mahaska, Marion, Polk, Warren, and Webster. Within these counties exist various private, city, county, State, and Federal park facilities. These facilities are summarized in table 10.

For the purposes of this analysis, the recreational needs of the 9-county area were assessed to equate to the needs for Greenbelt development. That is, development within the Greenbelt boundaries would fulfill needs within these nine counties.

Current Recreation Attendance

A summary of 1985 recreation attendance at city, county, State, and Federal parks within the Greenbelt counties is provided in table 11. These figures were based on visitor survey data, when available. When visitation figures for a given park were unavailable, data for similar parks within the Greenbelt were utilized as a basis for making a visitation estimate. In total, approximately 8,312,400 visits to parks within the Greenbelt counties took place in 1985.

TABLE 9

Primary Market Area Population Trends, 1975-1995

County	POPULATION 1980	1985	1990	1995
Adair	9,509	9,100	8,700	8,500
Appanoose	15,511	14,900	14,500	14,300
Audubon	8,559	8,300	8,200	8,100
Boone	26,184	25,900	25,800	25,600
Buena Vista	20,774	21,000	21,300	21,500
Butler	17,668	17,400	17,200	17,000
Carroll	22,951	17,400	17,200	23,500
Calhoun	13,542	13,200	12,900	12,600
Cerro Gordo	48,458	48,100	47,900	47,700
Clarke	8,612	9,100	9,400	9,800
Dallas	29,512	29,200	28,900	28,800
Davis	9,104	9,400	9,800	10,100
Franklin	13,036	12,500	12,100	11,700
Greene	12,119	11,800	11,600	11,400
Grundy	14,366	13,800	13,500	13,200
Guthrie	11,983	11,500	11,100	10,800
Hamilton	17,862	17,600	17,400	17,300
Hancock	13,833	13,600	13,600	13,600
Hardin	21,776	21,400	21,200	21,100
Humboldt	12,246	12,000	11,800	11,700
Iowa	15,429	15,200	15,100	15,000
Jasper	36,425	35,900	35,600	35,300
Jefferson	16,316	16,300	16,400	16,300
Keokuk	12,921	12,500	12,200	12,000
Kossuth	21,891	21,500	21,400	21,400
Lucas	10,313	10,400	10,600	10,700
Madison	12,597	12,600	12,600	12,700
Mahaska	22,867	22,500	22,200	22,100
Marion	29,669	30,500	31,300	32,000
Marshall	41,652	42,500	43,300	44,000
Monroe	9,209	9,100	9,000	8,900
Palo Alto	12,721	12,300	12,200	12,100
Pocahontas	11,369	11,000	10,700	10,600
Polk	303,170	309,900	316,100	321,600
Poweshiek	19,306	18,600	18,200	17,900
Sac	14,118	13,600	13,300	13,000
Story	72,326	72,900	73,300	75,200
Tama	19,533	19,200	19,000	18,800
Union	13,858	14,000	14,100	14,200
Wapello	40,241	39,100	38,100	37,300
Warren	34,878	35,400	36,100	36,900
Wayne	8,199	8,100	7,900	7,800
Webster	45,953	44,600	43,700	43,100
Wright	16,319	15,900	15,800	15,600
Totals	1,162,702	1,185,300	1,188,200	1,192,800
Percent Change		+1.9	+0.2	+0.4

Source: Iowa Development Commission, 1986 Statistical Profile of Iowa.

TABLE 10

Summary of Recreational Facilities
Nine-County Greenbelt Area

Activity		Facility
Swimming:	Pools	60 pools with approximately 270,000 square feet of surface area
	Beach	8,738 linear feet of beach front
Camping:	Modern	4,032 units
	Non-modern	2,374 units
Picnicking:		8,790 tables
Boating:		124 launch lanes plus 7 scheduled for construction
Hunting:		80,704 acres
Biking:		108 miles of trail
Hiking:		174 miles of trail
Horseback Riding:		100 miles of trail
Snowmobiling:		68 miles of trail
Cross Country Skiing:		200 miles of trail, approximately

Source: Iowa Department of Natural Resources

TABLE 11

Summary of 1985 Recreation Attendance at
Parks Within the Greenbelt, by Managing Agency

Facility Managing Agency	1985 Recreation Attendance Estimates
Federal Government	2,665,200
State Government	1,990,700
County Government	2,203,400
City Government	1,453,100
Total	8,312,400

Anticipated Recreation Attendance

An important part of the recreational analysis is the estimation of potential future recreation amenity use in the Greenbelt counties. Although there are many factors that can affect future recreation demand projections, there are essentially three basic items to be considered: population projections, activity use rate projections, and latent demand.

Population Projections

Population projections for the 44-county primary market area were used to estimate the change in the Greenbelt user population between 1985 and 1990, and between 1990 and 1995. The residents of these counties do not represent the entire park user population within the Greenbelt counties. However, these residents do account for the core of the yearly recreational visits to these parks. The projected increase amounts to 0.2-percent between 1985 and 1990 and 0.4-percent between 1990 and 1995.

1985 Activity Day Estimate

An activity day is defined as one person participating in one activity on a given day. For example, if an individual would picnic and hike on the same day, he or she would account for two activity days. The number of activity days which occurred in the nine-county Greenbelt area in 1985 was estimated based on the nine-county park visitation and on activity day data from other large Rock Island District-managed projects.

The 1985 visitation to parks within the Greenbelt area was approximately 8,312,400. However, the average visitor generally participates in more than one activity per recreation day. Based on data from visitor surveys at Rock Island District reservoir projects, the average visitor participated in 1.33 activities in 1986. Therefore, it was estimated that the typical user of parks within the nine-county Greenbelt area participates in 1.33 activities each day. On the basis of this estimate, approximately 11,055,500 activity days took place in Greenbelt area parks in 1985.

Activity Use Rate Projections

The projection of 1990 and 1995 activity use rates within the Greenbelt primary market area was based on the following assessments:

a. Activity use rates for the State of Iowa are representative of the participation rates for the Greenbelt primary market area.

b. Changes in activity use between 1985 and 1990 will follow the trend from 1975 to 1985.

c. Activity use between 1990 and 1995 will remain constant.

d. Latent demand for the State of Iowa is representative of latent demand for the Greenbelt primary market area.

Projections of 1990 activity use rates were based on data from two sources: (1) Iowa Department of Natural Resources (formerly the Iowa Conservation Commission) 1/ 2/; and (2) U.S. Department of Interior, National Park Service. 3/ Table 12 presents State of Iowa recreation participation trends for the past decade for 12 recreation activities. These have been identified as the predominant recreation activities within the nine-county Greenbelt area. The figures in this table indicate how demand to use the facilities in the Greenbelt counties can be expected to change between 1985 and 1990.

It should be noted that, in some instances, the rate of increase in activity participation between 1975 and 1985 was extreme. In these cases, the activity use rates were held constant from 1985 to 1990. These instances are identified, as appropriate, in the table.

1/ Iowa Department of Natural Resources, Draft 1986 Iowa SCORP

2/ Iowa Conservation Commission, 1978 Iowa SCORP

3/ U.S. Department of Interior, National Park Service, 1982-1983 Nationwide Recreation Survey.

TABLE 12

State of Iowa Recreation Participation Trends
(1975-1985)

Activity	Activity Days per 1000 Iowa Residents Age 12 Years and Older 1975 a/	1985 b/	Percent Change 1975-1985	5-Year Average Percent Change 1975-1985
Swimming	6,622	9,282	40.2	20.1
Camping	3,432	4,853	41.4	20.7
Picnicking	4,789	4,521	- 5.6	- 2.8
Boating	4,039	7,242	79.3	39.7
Fishing	5,908	12,369	109.4	54.7
Hunting	2,074	2,785	34.3	17.2
Nature Study	367	1,918	422.6	211.3 c/
Biking	5,313	8,330	56.8	28.4
Hiking	5,667	7,111	25.5	12.8
Horseback Riding	1,786	1,625	- 9.0	- 4.5
Snowmobiling	456	717	57.2	28.6
Cross County Skiing	15	337	2146.7	1073.4 d/

Notes: a/ 2,315,613 Iowa residents 12 years and older.
b/ 2,365,900 Iowa residents 12 years and older.
c/ This rate of change considered was too extreme to continue through 1990. For this activity, the recreation participation rate was held constant from 1985 to 1990.
d/ Ibid.

Latent Demand

Latent demand accounts for activities people would like to participate in more frequently, but cannot because of limited or unsuitable recreation areas. The 1985 IDNR survey identified the latent demand Iowan's had for various activities within the state (see table 13). The majority of this demand represents unfulfilled recreation needs. 4/ The remainder represents demand by persons who must currently travel out of state to participate in a preferred recreation activity. Latent participation must be taken into account when figuring the recreation need for facilities within the Greenbelt counties.

4/ The existence of unfulfilled recreational needs is discussed in more detail in the Facilities Needed Versus Existing/Proposed Facilities section.

TABLE 13

State of Iowa Recreation Participation Latent Demand
(1985)

Activity	Latent Demand in Activity Days per 1,000 Iowa Residents Age 12 Years and Older	Percent Increase from 1985 Actual Activity Days per 1,000 Iowa Residents Age 12 Years and Older (Table 12)
Swimming	1,305	12.8
Camping	1,407	29.2
Picnicking	64	1.4
Boating	1,542	21.4
Fishing	2,410	19.6
Hunting	772	28.6
Nature Study	115	5.9
Biking	1,380	16.7
Hiking	564	7.9
Horseback Riding	204	12.5
Snowmobiling	108	14.3
Cross Country Skiing	78	25.0

Calculation of Future Recreation Attendance

The final step in calculating the anticipated 1990 attendance at facilities within the Greenbelt counties was to apply the previously mentioned rates of change: latent demand, population growth, and activity participation rates. It should be noted that the projection of 1995 activity demand was conservative; as stated previously, the change in demand between 1990 and 1995 was assumed to be only that accounted for by population growth. The annual participation rates by activity projected for 1990 and 1995 are presented in table 14.

TABLE 14

Annual Activity Days Nine-County Greenbelt Area
(1985 through 1995)

Activity	Estimated Activity Days 1985	Estimated Activity Day Demand a/ 1985	Projected Activity Day Demand 1990	Projected Activity Day Demand 1995
Swimming	1,820,840	2,053,908	2,471,676	2,481,563
Camping	862,328	1,114,128	1,347,442	1,352,831
Picnicking	812,579	823,955	802,486	805,696
Boating	1,286,859	1,562,247	2,186,824	2,195,571
Fishing	2,197,832	2,628,607	4,074,588	4,090,886
Hunting	483,125	621,299	729,618	732,537
Nature Study	349,353	369,965	370,705	372,188
Biking	1,481,436	1,728,836	2,224,265	2,233,162
Hiking	1,278,015	1,378,978	1,558,598	1,564,833
Horseback Riding	291,865	328,348	314,200	315,456
Snowmobiling	134,877	154,164	198,652	199,497
Cross Country Skiing	56,383	70,479	70,620	70,902
Totals	11,055,492	12,834,914	16,349,674	16,415,122

Note: a/ Includes 1985 latent demand.

As stated previously, the number of activity days taking place annually is greater than annual visitation. This indicates that a visitor participates in more than one activity per recreation day. Visitation data indicates that the ratio of activity days to visitations equals 1.33. Projected annual visitation was derived by applying that ratio to the summation of the 1990 and 1995 activity days, as shown below:

Year	Summation of Activity Days	Projected Annual Visitation
1990	16,349,674	12,292,988
1995	16,415,121	12,342,196

FACILITY NEEDS

The number of facilities that will be needed in the years 1990 and 1995 must be determined. Therefore, the total projected activity days in each year were broken down to represent the maximum activity days that would take place on a design day. A design day is defined as an average weekend day during the peak month of facility use.

Data from Rock Island District recreation sites and city of Des Moines parks indicate that a design day accounts for about 2-percent of total activity days. For example, picnicking generally peaks during the month of July, with 20-percent of all picnics taking place during this time. Surveys at existing Rock Island District recreation facilities indicate that about 80-percent of all recreation activity takes place during the weekends. Therefore, peak activity day participation for picnicking (or other activities) on a design day equals:

$$\frac{\text{Activity Day Participation} * \text{20-Percent} * \text{80-Percent}}{\text{8 Weekend Days}} = \text{Activity Day Participation} * \text{2-Percent}$$

The Greenbelt area use demand on a design day was calculated for each type of activity (see table 15).

TABLE 15

Demand on a Design Day, Activity Days of Nine-County Greenbelt Area, 1990 and 1995

Activity	Actual Activity Days 1985	Activity Day Demand 1985	Activity Day Demand 1990	Activity Day Demand 1995
Swimming	36,417	41,078	49,434	49,631
Camping	17,247	22,283	26,949	27,057
Picnicking	16,252	16,479	16,050	16,114
Boating	25,737	31,245	43,736	43,911
Fishing	43,957	52,572	81,492	81,818
Hunting	9,663	12,426	14,592	14,651
Nature Study	6,987	7,399	7,414	7,444
Biking	29,629	34,577	44,485	44,663
Hiking	25,560	27,580	31,172	31,297
Horseback Riding	5,837	6,567	6,284	6,309
Snowmobiling	2,698	3,083	3,973	3,989
Cross Country Skiing	1,128	1,410	1,412	1,418
Totals	221,112	256,699	326,993	328,302

Design criteria (see figure 6) were utilized to determine how many facilities would be needed to fulfill the projected demand in both 1990 and 1995. The results are presented in table 16. (Table 10 summarized existing recreation facilities within the Greenbelt counties.)

Figure 6. Recreation Facility Design Criteria.

Swimming:	Pools:	27% of all swimming demand. turnover rate = 2. 30 sq ft surface per person in pool. 1/4 swimmers in pool at once.
	Beaches:	73% of all swimming demand. turnover rate = 3. 0.5 effective linear ft beach per person.
Camping:	Modern:	67% of all camping. turnover rate = 1. 4 persons per unit at once.
	Non-Modern:	33% of all camping. turnover rate = 1. 4 persons per unit at once.
Picnicking:		turnover rate = 2. 4 persons per table at once.
Boating:	Canoe:	11% of all boating. 2 persons per boat. turnover rate = 6. 1 canoe per 1/2 mile stream.
	Power:	70% of all boating. 3 persons per boat. turnover rate = 2. 80% car trailer drawn.
	Sails:	4% of all boating. 2 persons per boat. turnover rate = 2. 80% trailer drawn.
	Other:	15% of all boating. 2.2 persons per boat. turnover rate = 2. 80% trailer drawn.
Hunting:		turnover rate = 2. 5 acres per person.
Biking:		turnover rate = 4. 300 feet per person.
Hiking:		turnover rate = 8. 200 feet per person.
Horseback Riding:		turnover rate = 4. 440 feet per person.
Snowmobiling:		turnover rate = 3. 350 feet per person.
Cross Country Skiing:		turnover rate = 3. 600 feet per person.

(Sources of Information: U.S. Department of Interior, Bureau of Outdoor Recreation, Outdoor Recreation Space Standards, 1970; and U.S. Army Corps of Engineers, Master Plan Design Memorandum 6B, Saylorville Lake, Multi-Purpose Project, Des Moines River Basin, Des Moines, Iowa, September 1984).

TABLE 16

Recreation Facility Requirements Within the Nine-County Greenbelt Area
1985 through 1995

Activity		Facility Requirements to Fulfill Recreation Visitation 1985	Demand 1985	Demand 1990	Demand 1995
Swimming:	Pools, sq. ft. surface area	36,818	41,530	49,978	50,177
	Beach, linear ft.	4,433	5,000	6,018	6,042
Camping:	Modern units	2,887	3,730	4,511	4,529
	Non-Modern units	1,425	1,841	2,226	2,235
Picnicking:	Tables	2,032	2,060	2,006	2,104
Boating:	Power, launch lanes	60	73	102	102
	Sail, launch lanes	5	6	8	8
	Other, launch lanes	18	22	30	30
	TOTAL	83	101	140	140
Hunting:	Acres	24,158	31,066	36,480	36,628
Trail Use:	Biking, trail miles	421	491	632	634
	Hiking, trail miles	121	131	148	148
	Horseback Riding, trail miles	122	137	131	132
	Snowmobiling, trail miles	60	69	88	89
	Cross Country Skiing, trail miles	43	53	53	54

FACILITIES NEEDED VERSUS EXISTING/PROPOSED FACILITIES

Latent demand was discussed earlier in this analysis. As mentioned, a portion of this demand represents demand by persons who must travel out of the state to participate in a preferred activity. The major portion, however, represents recreation needs which remain unfulfilled in the Greenbelt area.

An adequate number of most recreational facilities exist within the Greenbelt nine-county area to support the user population's recreation demand through 1995. Most of these facilities were built before the recent trend of rapid population growth in smaller, more rural communities.5/ In reference to table 10, it can be seen that in 1985 there was a surplus of some types of facilities within the Greenbelt counties, compared to the number of facilities required to fulfill 1985 actual activity demand (table 16).

It would at first seem unlikely that latent demand within the market area (unfulfilled recreation needs) could exist for these activities in 1985. However, the existence of an adequate (or surplus) number of facilities does not ensure that the needs of the public are being met. Often, the existing facilities may not be located where they can best serve the public. In effect, some facilities may be under-used because they are no longer convenient for the majority of potential users. Therefore, latent demand for an activity may exist for potential Greenbelt users despite the fact that the overall number of facilities is considered adequate.

While this analysis attempts to examine recreation needs for the entire potential Greenbelt user population, data limitations make it impossible for this analysis to fully examine the distribution of existing recreation facilities as compared to the population distribution. Detailed study and analysis will be required to identify the specific needs and merits of each Greenbelt project submitted for consideration.

Identifying Needs

When comparing tables 10 and 16, conflicts become apparent between the number of facilities needed as compared with the number of facilities existing or proposed. Although 1995 demand for several activities is satisified (e.g., cross-country skiing), the need for other basic facilities remains unmet.

The most significant area of conflict exists between recreational boating demands and the supply of existing boat launching facilities. A more detailed analysis is required to clarify the situation. The total water surface area within the Des Moines Recreational River and Greenbelt area totals an estimated 18,225 acres (12,825 acres of lakes, and 5,400 acres of rivers). Based on recreation space standards, four water surface acres per boat must be allowed to provide for an adequate recreation experience, including an allowance for unusable shoreline and heavily foliated water. 6/ This means that 4,556 boats could be supported within the Greenbelt boundaries.

5/ U.S. Army Corps of Engineers, Master Plan Design Memorandum 6B, Saylorville Lake, Multi-Purpose Project, Des Moines River Basin, Des Moines, Iowa, September 1984.

6/ U.S. Department of Interior, Bureau of Outdoor Recreation, Outdoor Recreation Space Standards, 1970.

Space standards generally recommend one launch lane per 40 boats. 7/ A total of 114 launch lanes is, therefore, the maximum number justified within the Greenbelt boundaries. However, it is projected that 140 launch lane facilities for 5,600 boats would be needed in in the Greenbelt area by 1995. The demand for launch lanes which cannot be fulfilled within the Greenbelt will have to be met by other launch facility constructions within the nine-county area or at more distant, existing sites.

Other conflicts between existing facilities and future facility requirements exist for camping and various trail facilities. The 1995 demand for modern camping units within the nine-county Greenbelt area is projected to be 4,529. Another 497 modern units will be required to fulfill future demand through 1995. Transient use from outside the primary market area will provide additional support for this facility demand. The need for non-modern campground units appears satisfied through 1995, but recent trends indicate that the use of non-modern campground units is on the rise. This analysis may have underestimated the need for future non-modern units.

The current supply of trails for use by snowmobilers, equestrians, and bikers is inadequate to meet needs within the Greenbelt area. Additional miles of trail will be required to satisfy the high popularity of these forms of recreation. Over 500 miles of bike trails will be necessary to fulfill 1995 demand. The Greenbelt area offers an unusual opportunity to provide this length of trail due to the large area of publicly owned land for right-of-way.

Equestrians and snowmobilers must utilize trails separate from those used by bikers. An additional 21 miles of snowmobile trails and 32 miles of equestrian trails will be necessary to meet 1995 demand within the Greenbelt counties.

The supply of swimming areas and beaches within the Greenbelt counties is adequate for future demand through 1995. However, the distribution of these facilities may not adequately service area recreationists. Additional beach swimming areas or pools may by justified to fulfill individual recreation development needs.

The availability of picnic facilities is similar to that of swimming facilities. Additional picnic tables are not required to meet Greenbelt area needs. However, picnic tables are a necessary component of some types of recreational developments. Therefore, they may be required to provide proper recreation amenities at existing and proposed developments.

7/ U.S. Department of Interior, Bureau of Outdoor Recreation, Outdoor Recreation Space Standards, 1970.

Sufficient total acreage for hunting purposes is available. However, acreage figures by type of hunting were unavailable for this analysis. For example, it is unknown whether there is adequate waterfowl hunting acreage or excess small game hunting acreage. Needs for additional hunting grounds within the Greenbelt area will require more study and analysis on a project-by-project basis.

Canoe accesses are necessary approximately 12 miles apart on navigable streams and rivers. Additional canoe accesses may be required to assure a safe and pleasurable recreation experience on Greenbelt waterways.

The recreation facilities within the nine-county Greenbelt area are sufficient to meet the needs of cross-country skiiers or hikers through 1995.

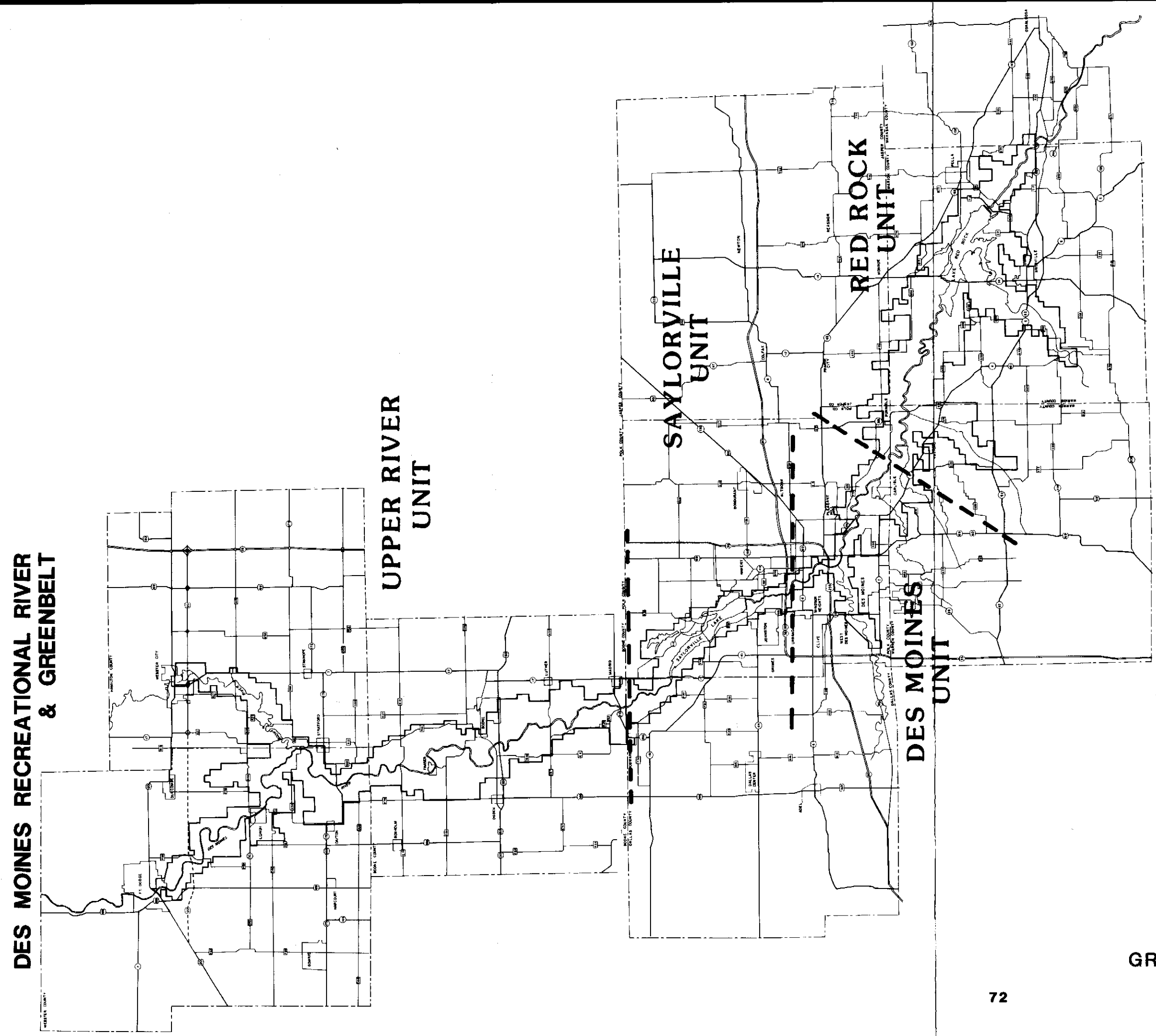
MARKET ANALYSIS RESULTS

The results of this analysis indicate the need to construct or renovate various types of recreation facilities within the Des Moines Recreational River and Greenbelt boundaries. However, before recommending development of a project submitted for consideration as part of the Greenbelt, a detailed economic analysis will be undertaken to determine project feasibility. This evaluation will follow the procedure detailed below:

a. Define the study area.
b. Estimate the recreation resource.
c. Forecast potential recreation use in the study area.
d. Determine the without-project condition.
e. Forecast recreation use with the project.
f. Estimate the value of recreation use with the project.
g. Forecast the recreation use diminished with the project.
h. Estimate the value of use diminished with the project.
i. Compute net project benefits.

GREENBELT UNITS

The Greenbelt was divided into four conceptual master planning units which characterized similar types of natural features and recreational resources. The development of the initial master plan concentrated on the unique features of each unit and the existing resources. Outdoor recreation opportunities in the Greenbelt include a range of settings and experiences. This would include passive enjoyment of the outdoors, active outdoor sports, primitive wilderness, and the highly developed urban environment. The units are pictured on figure 7.



GREENBELT UNITS

FIGURE 7

UPPER RIVER UNIT

This unit of the Des Moines Recreational River and Greenbelt extends from the project boundaries at U.S. Highway 20 in Ft. Dodge and Webster City to the Boone/Dallas County border near Madrid and Woodward, encompassing Boone, Hamilton, and Webster Counties. This 79 river mile stretch of the Des Moines River and 26 river mile stretch of the Boone River contains many interesting and unique natural settings.

The Upper River Unit lies within the Des Moines Lobe landform region of Iowa which is characteristic of gently-to-moderately rolling prairie terrain with low-to-moderate relief. This broad, open landscape is contrasted by the narrow, wooded floodplain of the Des Moines River valley with its steep, forest-covered slopes and high, vertical relief. Several major tributaries (Boone River, Brushy Creek, Prairie Creek, Crooked Creek, Skillet Creek, and Bluff Creek) drain into the Des Moines River, providing additional similar contrasting and unique natural settings.

A network of north-south and east-west Federal and State highways borders or intersects the Greenbelt boundary area and provides excellent intra-state transportation access. In addition, a system of county road routes exists which provides good secondary and primary access along the river valley. Commercial air services are available in Ft. Dodge, Boone, and Webster City. Several east-west railroad routes pass through the unit, but the only public rail service is a tourist line operating out of Boone.

The recreational opportunity in the Upper River Unit is primarily river oriented and adaptive to the preservation and interpretation of the unique and natural features in the valley. Popular outdoor recreational activities include camping, picnicking, canoeing, fishing, nature study, hiking, horseback riding, and sightseeing. Recreational facilities range from city, county and State parks to forest preserves, private camps, and river access points. A diversity of outdoor recreational opportunity exists for both active and passive users in a primitive wilderness setting.

SAYLORVILLE UNIT

This unit encompasses the Saylorville Lake project area and extends from the Boone/Dallas County border near Madrid the northern city limits of Des Moines (Aurora Avenue). The Des Moines river begins to flow in a northwesterly to southeasterly direction, and covers some 23 river miles (10 of which include Saylorville Lake). The recently created Saylorville and Big Creek lakes are predominant water resource features and unique landscape attractions within the unit. The Saylorville Unit includes portions of Polk and Dallas Counties.

The Saylorville Unit lies within the lower limits of the Des Moines Lobe landform region. The river valley begins to widen, and the valley and tributary slopes have a steep-to-moderate in relief. Two major tributaries (Big and Beaver Creeks) exist within the unit, which flow nearly parallel along each side of the Des Moines River. The normal pool limits of Saylorville Lake (5,900 acres) cover most of the valley floodplain, with remaining areas subject to periodic inundation as a result of flood control operations. Upland forest areas occur along the valley slopes and ravines. The river is bordered with a bottomland forest extending along former oxbows and depressions within the floodplain.

State highways parallel the valley along each side of the river, with several river crossings providing a convenient road access system which is well supplemented by county road networks. In addition, east-west and north-south interstate routes and several Federal highways within the immediate vicinity afford inter-state service to the area.

Major water-oriented recreation facilities have been developed to support the activity demands associated with the lake developments. Modern, intensively developed State and Federal recreation areas are in early stages of development and are concentrated around the main lake shorelines. These facilities are supplemented by city and county parks to provide a diversity of outdoor recreational opportunities. This highly developed rural setting is very popular and attractive to the major urban population in the surrounding area. The Saylorville Lake downstream corridor serves as a major link between these rural and urban environments. Major activities are boating (power, sculling, and sailing), swimming, camping, picnicking, bicycling, sightseeing, hunting, fishing, and outdoor winter sports.

DES MOINES UNIT

The Des Moines Unit occupies portions of the city of Des Moines and the surrounding area. The unit boundary extends from the northern city limits of Des Moines (Aurora Avenue) downstream to the community of Carlisle, including portions of the Raccoon River. The majority of the area is located within Polk County, with a small portion extending into Warren County. This 19 river mile stretch of the Des Moines River and 13 river mile stretch of the Raccoon River occupy a major urban riverfront corridor and represent an important natural resource.

This unit also lies within the Des Moines Lobe region and borders with the Southern Iowa Drift Plain landform region. The river valley is bordered by steep-to-moderately sloping hillsides with a wide, meandering floodplain. Most of the forest cover is limited to public lands located along the river and the steep slopes and ravines of the valley. In addition, some bottomland forests exists along the lower portions of the unit within low, wet areas of the floodplain. Four major tributaries (Raccoon River, Walnut Creek, Yeader Creek, and Four Mile Creek) are located within the Des Moines Unit which provide open space lands within the highly developed urban area.

The majority of riverfront property is public open space and portions of the riverfront is readily accessible by walkways, bridges, trails, and frontage drives. The Des Moines riverfront serves as a cultural focus as it flows by the central business district area just above the confluence of the Raccoon River. The scenic and recreational value of the river is a major attraction to the community.

The Saylorville Lake downstream corridor bicycle trail links the Des Moines Unit with the recreational opportunities north of the city. City parks, public attractions, and riverfront accesses are spaced along the Des Moines River. In addition, several city and State parks and a county forest are located along the banks of the Raccoon River. The Des Moines River in the lower part of the unit is wider and less developed then the urban stretch, with the city of Des Moines having open space lands along both banks. A subimpoundment (Easter Lake) on Yeader Creek has been developed by the county and adjoins a community park. Other recreational areas within the lower portion include a Yellow Banks county park along the north bluff, and a community park located in Carlisle.

RED ROCK UNIT

This unit extends from the city of Carlisle downstream to Lake Red Rock and the southern limits of the Greenbelt (State Highway 92). The Red Rock Unit covers a distance of 86 river miles (of which 15 flow through Lake Red Rock). The Des Moines River flows in a southeasterly direction within this segment. The large, open waters of Lake Red Rock (6,875 acres) is a dominant water resource feature in contrast to the surrounding agricultural uplands. The unit is located mainly within Marion and Warren Counties, with limited portions extending into Polk, Jasper, and Mahaska Counties.

The Red Rock Unit lies within the northern edge of the Southern Iowa Drift Plain landform region which is characterized by flat upland divides and broad, flat floodplains with steep, hilly areas dissecting the uplands. The river valley is very wide (3-4 miles) in the upper portions of the unit compared to the lower segment which is slightly narrower downstream of the dam. Tributaries with large drainage basins and broad floodplains (North, Middle and South Rivers, and Whitebreast Creek) are characteristic of the southern edge of the valley. In contrast, the northern edge of the valley has several major tributaries (Camp, Walnut, Calhoun, Brush, Roberts, and Wallashuck Creeks) but they are characteristically smaller drainages having steep, narrow valleys.

Forested land is very sparse within the unit and exists primarily along steep valley slopes and hillside drainages. Most of the bottomland forest has been altered by periodic inundation from flood pool operations at Lake Red Rock. However, some unaltered bottomland forest areas still exist within the extreme upper limits of the unit and the area below the dam. Upper reaches of the Lake Red Rock project are operated and maintained by the State of Iowa for fish and wildlife management purposes, which include two waterfowl refuge units.

A network of east-west and north-south State highways provides convenient rural access throughout the unit. Additional primary and secondary road access is provided by an extensive system of county roads. The unit is well served with a convenient and high quality rural transportation system. Several rural communities are located along each side of the river, with two major urban areas along each side of the lake in the lower limits of the unit.

Major water-oriented recreational facilities around the lake have been developed by Federal, State, and county agencies. Additional city, county, and State recreation areas are scattered throughout the unit and offer a range of recreational opportunities. Popular activities include camping, fishing, picnicking, boating, hunting, horseback riding, sightseeing, swimming, and bicycling.

EXISTING FACILITIES AND RESOURCES

Greenbelt project planning was conducted after consideration of existing and competing recreation areas in central Iowa. Existing recreation areas within the Greenbelt counties are listed in table 17. Competing recreation areas within the entire market area are listed in table 18.

TABLE 17

List of Existing Recreation Areas Located Within The Greenbelt Counties

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
** County Boone														
Water Works Park	City of Boone	17	River	1	0.0	0.0	0.0	0.0	50	10	25	0	x	
McHose Park	City of Boone	203	Lake	0	0.0	1.0	0.7	0.0	0	0	120	3	x	
Edgewood Park	City of Madrid	20		0	0.0	0.0	0.0	0.0	2	0	30	2	x	
Don Williams Rec Area	County of Boone	438	Lake	1	0.0	0.0	0.0	0.0	194	50	207	2	x	x
Swede Point	County of Boone	105	River	0	0.0	0.0	0.0	0.0	24	0	33	1		
Kate Shelley Mem. Park	County of Boone	2		0	0.0	0.0	0.0	0.0	0	0	0	0		
Dogwood Boat Landing	Federal	10	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Laurie Boat Landing	Federal	20	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Sportsman Boat Landing	Federal	10	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Riverbend Boat Landing	Federal	27	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Holst State Forest	IDNR	313		0	0.0	0.0	0.0	0.0	0	0	0	0		
Ledges State Park	IDNR	1136	River	0	0.0	4.2	0.0	0.0	0	56	190	2		
State Game Farm (Ledges)	IDNR	435		0	0.0	0.0	0.0	0.0	0	0	0	0		
Pilot Mound State Forest	IDNR	33		0	0.0	0.0	0.0	0.0	0	0	0	0		
Barkley Mem. St. Forest	IDNR	40		0	0.0	0.0	0.0	0.0	0	0	0	0		
Saylorville Wildlife Area	IDNR	6348	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Green Acres Campground	Private	1		0	0.0	0.0	0.0	0.0	50	1	0	0		
Inspiration Acres	Private	40	Lake	0	0.0	0.0	0.0	0.0	20	0	2	0	x	
Camp Morrison	Private	200		0	0.0	0.0	6.0	0.0	30	70	40	0		
Camp Sacajawea (GSA)	Private	400	River	1	3.0	0.0	5.0	0.0	0	50	0	0	x	
YMCA Camp	Private	336	River	0	2.0	0.0	15.0	12.0	2	1	5	0	x	
Iowa 4-H Camp	Private	1100	River	0	0.0	6.0	6.0	0.0	0	0	10	0	x	
Camp Hantesa (Camp Girls)	Private	144		0	3.0	0.0	5.0	0.0	0	0	0	0	x	
Camp Mitigwa (BSA)	Private	620	Lake	0	8.0	0.0	15.0	0.0	0	20	0	0	x	
Green Acres Campground	Private	1		0	0.0	0.0	0.0	0.0	50	1	0	0		
** Subtotal **		11999		10	16.0	11.2	52.7	12.0	422	259	662	10		
** County Dallas														
Island Park	City of Adel	35	River	0	0.0	0.0	0.0	0.0	25	50	30	1		
Kinnick-Feller Park	City of Adel	30	River	1	0.0	0.0	0.0	0.0	0	0	30	2	x	
Pattee Park	City of Perry	38		0	0.0	0.0	0.0	0.0	16	0	90	3	x	
Waukee Centennial Park	City of Waukee	33		0	0.0	0.0	0.0	0.0	0	0	20	0	x	
Sportsmen's Park	County of Dallas	40	River	0	0.0	0.0	0.5	0.0	0	0	20	3	x	
S Raccoon River Access	County of Dallas	27	River	0	0.0	0.0	0.0	0.0	0	0	2	0		
Lake Dallas	IDNR	133		0	0.0	0.0	0.0	0.0	0	0	0	0		
Booneville Access	IDNR	2	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Saylorville Wildlife Area	IDNR	3130	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Pleasant Valley	IDNR	145	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Timberline Ranch	Private	20		0	0.0	0.0	3.0	0.0	75	35	0	0		
KOA Campground	Private	13	Lake	0	0.0	0.0	0.0	0.0	65	35	0	0	x	
** Subtotal **		3646		2	0.0	0.0	3.5	0.0	181	120	192	9		
** County Hamilton														
Riverside Park	City of Webster City	7	River	1	0.0	0.0	0.0	0.0	10	0	16	0		
Riverview Nokomis Park	City of Webster City	13	River	1	0.0	0.0	0.0	0.0	0	0	8	1	x	

TABLE 17 (Cont'd)

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Albright's Bridge Access	County of Hamilton	11	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Little Wall Lake Park	County of Hamilton	61	Lake	4	0.0	0.7	0.0	0.0	104	0	175	2	x	x
Briggs Woods Park	County of Hamilton	337	Both	2	0.0	3.5	0.0	0.0	28	0	125	3	x	x
Bell's Mill Park	County of Hamilton	8	River	0	0.0	0.0	0.0	0.0	44	0	50	2		x
Rest Area 1 Hamilton Co	County of Hamilton	10		0	0.0	0.0	0.0	0.0	0	0	45	0	x	
Tunnel Mill Access	County of Hamilton	116	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Richard Barner WMA	County of Hamilton	28	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Boone Forks WMA	IDNR	570	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Bever Bridge Access	Private	1	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		1162		11	0.0	4.2	0.0	0.0	186	0	419	8		
** County Jasper														
Lewis Park	City of Colfax	21	River	0	0.0	0.0	0.0	0.0	0	0	14	1	x	
Westwood Park	City of Newton	10		0	0.0	0.0	0.0	0.0	0	0	10	1		
Holmdahl Park	City of Newton	15	River	0	0.0	0.0	0.0	0.0	0	0	16	2	x	
Woodland Park	City of Newton	50		0	0.0	0.0	0.0	0.0	0	315	30	4	x	
Fred Maytag Park	City of Newton	40		0	0.0	0.0	0.0	0.0	0	0	70	4	x	
Sports Complex	City of Prairie City	5		0	0.0	0.0	0.0	0.0	0	0	8	0	x	
Community Park	City of Prairie City	10		0	0.0	0.0	0.0	0.0	0	0	16	3	x	
City Park	City of Sully	13		0	0.0	0.0	0.0	0.0	0	0	35	3	x	
Beyers Access	County of Jasper	31	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Magaman Mill	County of Jasper	5	River	0	0.0	0.0	0.0	0.0	0	0	6	1		
Hoffman Wildlife Area	County of Jasper	144	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Ashton Wildwood Park	County of Jasper	113		0	0.0	1.4	1.0	0.0	0	18	36	0	x	
Mariposa Recreation Area	County of Jasper	130	Lake	0	0.0	1.0	0.0	0.0	0	38	60	1	x	
Skunk R. Wildlife Area	County of Jasper	162	Both	0	0.0	0.0	0.0	0.0	0	0	0	0		
AC Morris Prairie Preser	County of Jasper	20		0	0.0	0.2	0.0	0.0	0	0	0	0		
Jacob Krumm Nature Pres	County of Jasper	360	Both	0	0.0	6.5	0.0	0.0	0	0	10	2		
Bailey Wildlife Area	County of Jasper	45		0	0.0	0.0	0.0	0.0	0	0	0	0		
Foreman Nature Preserve	County of Jasper	15		0	0.0	0.4	0.0	0.0	0	0	0	0		
Woodcock Wdlf Area	County of Jasper	56	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Vandalia Wdlf Area	County of Jasper	97		0	0.0	0.0	0.0	0.0	0	0	0	0		
Colfax Area	IDNR	300	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Rock Creek Wildlife Area	IDNR	305	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Kellogg Game Area	IDNR	66		0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Wldf Area	IDNR	63	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Campers And Marine Unltd	Private	25		0	0.0	0.0	0.0	0.0	46	38	0	0		
Beacon Campground	Private	15		0	0.0	0.0	0.0	0.0	15	1	0	0	x	
Roxies Campground	Private	20		0	0.0	0.0	0.0	0.0	60	24	0	0		
Lake Pleasor Campground	Private	1		0	0.0	0.0	0.0	0.0	148	0	0	0	x	
Oakridge Game Farm	Private	1280		0	0.0	0.0	0.0	0.0	0	0	0	0		
KOA Campground	Private	10		0	0.0	0.0	0.0	0.0	28	32	0	0		
** Subtotal **		3427		2	0.0	9.5	1.0	0.0	297	466	311	22		
** County Mahaska														
Edmundson Park	City of Oskaloosa	175	Lake	0	0.0	0.5	0.0	0.0	0	0	150	5	x	

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Brestrom Area	County of Mahaska	141	Lake	1	0.0	1.5	0.0	0.0	0	0	30	2		
Eveland Access	County of Mahaska	23	River	1	0.0	0.2	0.0	0.0	0	28	45	1	x	
Union Mills Access-Part	County of Mahaska	13	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Quercus Wilderness Area	County of Mahaska	78		0	0.0	1.5	0.0	0.0	0	0	5	0		
Glendale Access	County of Mahaska	42	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Russell Mildlife Area	County of Mahaska	185	Both	0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Keoman St Park	IDNR	293	Lake	2	0.0	3.0	0.5	0.7	50	38	145	3		x
Hull Area	IDNR	378		0	0.0	0.0	0.0	0.0	0	0	0	0		
Hawthorn Lake	IDNR	1522	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Vanderwilt Park	Private	18		0	0.0	0.5	0.0	0.0	0	0	9	1	x	
** Subtotal **		2868		7	0.0	7.2	0.5	0.7	50	66	384	12		
** County Marion														
Auld Park Knoxville	City of Knoxville	12		0	0.0	0.0	0.0	0.0	0	0	30	3	x	
Young Park Knoxville	City of Knoxville	11		0	0.0	0.0	0.0	0.0	0	0	15	1	x	
Big Rock Park	City of Pella	80	River	0	0.0	0.0	0.3	0.0	0	0	10	1		
Swimming Pool Park	City of Pella	15	Lake	0	0.0	0.0	0.0	0.0	0	0	30	1	x	
City Park	City of Runnels	3		0	0.0	0.0	0.0	0.0	0	0	0	0	x	
Wilcox Mildlife Area	County of Marion	596	Lake	0	0.0	0.0	0.0	0.6	0	0	5	0		
Marion County Park	County of Marion	103	Lake	0	0.0	0.0	0.0	0.0	190	100	130	4	x	
Paul Todd Mdlf Area	County of Marion	49	Marsh	0	0.0	0.0	0.0	0.0	0	0	0	0		
Roberts Creek Park	County of Marion	1413	Lake	1	0.0	0.8	0.0	0.0	250	100	160	3	x	
South Shores Access	County of Marion	4	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Whitebreast Bay Access	County of Marion	3	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
North Overlook Rec Area	Federal	178	Lake	0	0.0	1.2	0.0	0.0	51	9	69	0	x	x
Howell Station Rec Area	Federal	223	River	1	0.0	1.7	1.1	0.0	120	0	127	0	x	
Whitebreast Rec Area	Federal	405	Lake	6	0.0	0.0	0.0	0.0	140	0	160	3	x	x
Mallashuck Rec Area	Federal	290	Lake	2	0.0	2.1	0.0	0.0	80	0	84	0	x	
Lake Red Rock Marina	Federal	135	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
South Overlook Rec Area	Federal	90	Lake	2	0.0	0.0	0.0	0.0	0	0	14	2	x	
Sadler Marina Access	Federal	18	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Ivan's Campground	Federal	39	River	0	0.0	0.0	0.0	0.0	22	0	25	0		
South Tailwater Rec Area	Federal	30	River	0	0.0	0.0	0.5	0.0	0	0	26	1		
North Tailwater Rec Area	Federal	17	River	0	0.0	0.0	0.6	0.0	0	0	24	1	x	
Fifield Rec Area	Federal	141	Lake	0	0.0	0.0	0.0	0.0	0	0	31	4		
Red Rock Res. Mgmt. Area	Federal	12138	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Mildlife Area	IDNR	21489	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Elk Rock St Park	IDNR	2219	Lake	6	5.0	1.1	0.0	5.0	12	46	200	10		
Pella State Game Mgt Area	IDNR	277		0	0.0	0.0	0.0	0.0	0	0	0	0		
Hickory Ridge Campground	Private	46		0	0.0	0.0	0.0	0.0	150	50	160	0		
** Subtotal **		40024		25	5.0	6.9	2.5	5.6	1015	305	1300	34		
** County Polk														
Crossroads	City N Des Moines	18		0	0.0	0.0	0.0	0.0	0	0	5	1	x	
Westwood Park	City of Ankeny	15		0	0.0	0.5	0.0	0.0	9	0	8	1	x	
Hawkeye Park	City of Ankeny	15	Lake	0	0.0	0.5	0.2	0.0	0	0	18	2	x	

TABLE 17 (Cont'd)

List of Existing Recreation Areas
Located Within The Greenbelt Counties

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Lake Peocka	City of Bondurant	24	Lake	0	0.0	0.0	0.0	0.0	0	0	14	1 x		
Greenbelt Park	City of Clive	135	River	0	0.0	3.0	3.0	0.0	0	0	18	1 x		
Grays Lake	City of Des Moines	68	Lake	2	0.0	0.0	0.0	0.0	0	0	30	0 x		x
Union/Birdland Parks	City of Des Moines	124	Both	2	0.0	0.0	3.4	0.0	0	0	100	5 x		
Riverside Park	City of Des Moines	16	River	0	0.0	0.0	0.0	0.0	0	0	2	0 x		
River Hills Park	City of Des Moines	47	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
River Front Park (E & W)	City of Des Moines	14	River	0	0.0	0.0	0.0	0.0	0	0	2	0		
Pioneer Park	City of Des Moines	46		0	0.0	0.0	0.0	0.0	0	0	60	2 x		
McHenry Park	City of Des Moines	17		0	0.0	0.0	2.0	0.0	0	0	50	2 x		
MacRae Park	City of Des Moines	61	Lake	0	0.0	0.0	0.0	0.0	0	0	50	2 x		
Witmer Park	City of Des Moines	22	Lake	0	0.0	0.0	0.0	0.0	0	0	20	1 x		
Grandview Park Golf Crse	City of Des Moines	174	Lake	0	0.0	0.0	0.0	0.0	0	0	90	4 x		
Denman Woods Water Works	City of Des Moines	1500	River	0	6.0	0.0	0.0	0.0	0	0	30	0 x		
Burke Park	City of Des Moines	5		0	0.0	0.0	0.0	0.0	0	0	4	1		
Prospect Pk/Crocker Wds	City of Des Moines	77	River	2	0.0	0.0	0.0	0.0	0	0	10	1 x		
Ashworth/Greenwood Park	City of Des Moines	143	Both	0	0.0	2.0	2.5	0.0	0	0	50	0 x		
Ashby Park	City of Des Moines	11		0	0.0	0.0	0.0	0.0	0	0	12	1 x		
Hubbell Park	City of Des Moines	82	River	0	0.0	0.0	0.0	3.0	0	0	0	0		
Kreigh G. Carney Park	City of Des Moines	45		0	0.0	0.0	0.0	0.0	0	0	5	0 x		
SE Riverfront Boat Ramp	City of Des Moines	5	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Hawthorn Park	City of Des Moines	15		0	0.0	0.0	0.0	0.0	0	0	6	1 x		
Botanical Center	City of Des Moines	14	River	0	0.0	5.0	0.0	0.0	0	0	0	0		
Ewing Park	City of Des Moines	357	Lake	0	0.0	2.0	0.0	0.0	0	1	150	2 x		
Saylorville Corridor	City of Des Moines	251	River	0	0.0	0.0	1.2	0.0	0	0	0	0		
Doanes Park	City of Pleasant Hill	49		0	0.0	0.0	0.0	0.0	0	0	30	1 x		
Lions Park	City of Urbandale	10		0	0.0	0.0	0.0	0.0	0	0	20	2 x		
Walker Johnston Park	City of Urbandale	61	Lake	0	0.0	0.1	0.1	0.0	0	0	35	2 x		
Lakeview Park	City of Urbandale	11	Lake	0	0.0	0.0	0.0	0.0	0	0	10	1 x		
Holiday Park	City of W Des Moines	64		0	0.0	0.0	0.0	0.0	0	0	6	0 x		
Chichaqua Wdlf Habitat	County of Polk	1136	Marsh	0	0.0	6.5	0.0	0.0	0	12	18	1		
Browns Woods Forest Prsv	County of Polk	484	River	0	0.0	2.5	0.0	0.0	0	0	0	0		
Mile-Long Bridge Access	County of Polk	5	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0		
Yellow Banks Park	County of Polk	458	Both	0	0.0	0.0	0.0	0.0	60	0	145	3 x		
Easter Lake Park	County of Polk	244	Lake	2	0.0	0.5	0.0	0.0	0	12	120	4 x		x
Wally's Wey-Wey-Neh-Kee	County of Polk	37	River	0	0.0	0.5	0.0	0.0	0	0	10	1 x		
Thomas Mitchell Park	County of Polk	143	Both	0	0.0	0.3	0.0	0.0	25	0	90	2 x		
Lewis A Jester Park	County of Polk	1756	Lake	2	4.6	5.3	0.0	4.6	25	120	344	7 x		
Cherry Glen Rec Area	Federal	185	Lake	8	0.0	0.0	3.3	0.0	136	10	66	6 x		
Bob Shetler Rec Area	Federal	393	River	0	0.0	0.0	0.0	0.0	48	22	8	0		
Lakeview Rec Area	Federal	41	Lake	8	0.0	0.0	0.0	13.5	0	0	0	1		
Saylorville Marina	Federal	38	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0		
Acorn Valley Campground	Federal	74		0	0.0	6.0	0.0	0.0	30	95	0	0		
Walnut Ridge Picnic Area	Federal	100		0	0.0	0.0	0.0	0.0	0	0	90	3		
Prairie Flower Campground	Federal	331	Lake	0	0.0	0.0	0.0	0.0	148	16	0	0		
Oak Grove Rec Area	Federal	157	Lake	0	0.0	0.0	0.0	0.0	0	0	32	2		x
Cottonwood Rec Area	Federal	310	River	0	0.0	0.0	0.0	0.0	0	0	210	9 x		
Saylorville RMA	Federal	4346	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Big Creek Rec Area	IDNR	1536	Lake	7	0.0	2.0	2.0	2.0	0	0	300	13 x		x

TABLE 17 (Cont'd)

List of Existing Recreation Areas Located Within The Greenbelt Counties

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Saylorville Corridor	IDNR	70	River	0	0.0	0.0	4.1	0.0	0	0	0	0		
Saylorville Corridor WMA	IDNR	1403	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Sycamore Access	IDNR	3	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Walnut Woods St Park	IDNR	275	River	0	1.5	2.0	0.0	0.0	8	24	54	1		
Saylorville Wildlife Area	IDNR	3860	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Big Creek Wildlife Area	IDNR	883	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
US Highway 65 WMA	IDNR	34		0	0.0	0.0	0.0	0.0	0	0	0	0		
Strasser Woods Preserve	IDNR	40		0	0.0	0.0	0.0	0.0	0	0	0	0		
Margo Frankel Woods	IDNR	136		0	1.0	1.5	1.5	0.0	0	0	20	2		
Cutty's Campground	Private	70	Lake	0	0.0	0.0	0.0	0.0	400	0	350	0		
Adventureland Campground	Private	100		0	0.0	0.0	0.0	0.0	300	200	0	0		
Adventureland	Private	70	Lake	0	0.0	0.0	0.0	0.0	300	200	300	0		
** Subtotal **		22214		44	13.1	40.2	23.3	23.1	1479	712	2992	89		
** County Warren														
Municipal Park	City of Carlisle	10	River	0	0.0	0.0	1.0	0.0	0	0	25	2	x	
Max McCord Park	City of Indianola	17		0	0.0	0.5	0.0	0.0	0	0	6	0	x	
Downey Mem	City of Indianola	20	Lake	0	0.0	0.0	0.0	0.0	0	0	8	1	x	
Pickard Rec Area	City of Indianola	161	Lake	0	0.0	2.0	0.0	0.0	12	0	37	1	x	
Veterans Memorial	City of Indianola	13		0	0.0	0.0	0.2	0.0	0	0	35	2	x	
Fairgrounds Park	City of Indianola	9		0	0.0	0.0	0.0	0.0	50	0	35	1	x	
Hickory Hills Cons Area	County of Warren	159	Lake	0	0.0	0.0	0.0	0.0	0	0	0	1		
Woodland Mounds Preserve	County of Warren	185		0	0.0	0.0	0.0	0.0	0	0	3	0		
Rolling Thunder Prarie	County of Warren	122		0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Ahquabi St Park	IDNR	644	Lake	2	0.0	16.0	0.0	16.0	36	130	300	4		x
Banner Strip Mine Area	IDNR	187	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Wildlife Area	IDNR	3900	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Hooper Area	IDNR	315	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Camp Deer Haven	Private	125	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0	x	
Webbs Country Camping Inn	Private	1	Lake	0	0.0	0.0	0.0	0.0	100	1	0	0	x	
** Subtotal **		5868		3	0.0	18.5	1.2	16.0	198	131	449	12		
** County Webster														
Nature Trail	City of Fort Dodge	35	River	0	0.0	2.9	0.0	0.0	0	0	0	0		
Oleson Park	City of Fort Dodge	64	Lake	0	0.0	2.0	0.0	0.0	0	0	50	8	x	
Loomis Park	City of Fort Dodge	70	River	0	0.0	3.0	0.0	0.0	0	0	60	5	x	
Hydro Electric Park	City of Fort Dodge	4	River	0	0.0	0.0	0.0	0.0	0	0	10	1	x	
Crawford Snell Park	City of Fort Dodge	18	River	0	0.0	2.0	0.0	0.0	0	0	18	2	x	
Rogers Field	City of Fort Dodge	36		0	0.0	0.0	0.0	0.0	0	0	20	2	x	
City of Gowrie	City of Gowrie	13		0	0.0	0.0	0.0	0.0	0	0	38	3	x	
Swimming Pool Park	City of Gowrie	5		0	0.0	0.0	0.0	0.0	0	0	14	1	x	
City Park #3	City of Lehigh	3	River	1	0.0	0.0	0.0	0.0	0	0	3	0		
City Park #1	City of Lehigh	10	River	0	0.0	0.0	0.0	0.0	0	0	6	1	x	
Lehigh City Park	City of Lehigh	3	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Kennedy Park	County of Webster	335	Lake	1	0.0	0.0	3.5	0.0	28	39	180	7	x	x
Carlson Area	County of Webster	93	River	1	0.0	0.0	0.0	0.0	0	0	12	1		

TABLE 17 (Cont'd)

List of Existing Recreation Areas
Located Within The Greenbelt Counties

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Modern	Camping Units Non-Modern	Picnic Tables	Picnic Units Shelters	Sport Fields	Swimming Beach
Rossow Prairie	County of Webster	24	Marsh	0	0.0	0.0	0.0	0.0	0	0	0	0		
Deer Creek	County of Webster	17		0	0.0	0.0	0.0	0.0	0	0	0	0		
Lost Acres	County of Webster	28		0	0.0	0.0	0.0	0.0	0	0	0	0		
Dolliver Memorial St Park	IDNR	572	River	1	0.0	0.0	6.5	0.0	22	21	245	0		
Brushy Creek Rec Area	IDNR	4192	Both	0	24.0	24.0	0.0	12.0	0	12	80	0		
Woodman Hollow	IDNR	63	River	0	0.0	1.3	0.0	0.0	0	0	0	0		
Lizard Creek Area	IDNR	88	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Deception Hollow	IDNR	40	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Boone Forks WMA	IDNR	378	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Gilbert Copper	Private	84	Lake	0	0.0	0.0	0.0	0.0	7	0	0	0		
Lakota G. S. Camp	Private	175	River	0	5.5	4.0	1.0	0.0	0	0	6	1	x	
Camp WaNoKi	Private	80		0	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		6430		4	29.5	39.2	11.0	12.0	57	72	742	32		
*** Total ***		97638		108	63.6	136.9	95.7	69.4	3885	2131	7451	228		

TABLE 18

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
** County Adair														
Lake Orient Recreation	County of Adair	62	Lake	0	0.0	0.0	0.0	0.0	18	0	35	2		
Mormon Trail Park	County of Adair	140	Lake	1	0.0	0.0	0.0	0.0	34	7	105	4	x	x
Meadow Lake	IDNR	278	Lake	0	0.0	0.0	0.0	0.0	0	0	25	0		
** Subtotal **		480		1	0.0	0.0	0.0	0.0	52	7	165	6		
** County Adams														
Lake Binder	City of Corning	113	Lake	2	0.0	0.0	0.0	0.0	20	0	15	1		
Lake Icaria	County of Adams	245	Lake	3	0.0	1.0	0.0	0.0	50	116	225	4		x
Lake Icaria	IDNR	1000	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		1358		7	0.0	1.0	0.0	0.0	70	116	240	5		
** County Appanoose														
Centerville City Park	City of Centerville	27		0	0.0	0.0	0.0	0.0	0	0	50	0	x	
City Park	City of Centerville	27		0	0.0	0.0	0.0	0.0	0	0	50	6	x	
Lelah Bradley Park	County of Appanoose	41	Lake	0	0.0	0.0	0.0	0.0	0	0	20	2	x	
Sharon Bluffs	County of Appanoose	144	River	0	0.0	3.0	0.0	0.0	0	0	20	1		
Rolling Cove Public Area	Federal	375	Lake	3	0.0	0.0	0.0	0.0	0	31	36	2	x	
Outlet Public Use Area	Federal	67	River	0	0.0	0.0	0.0	0.0	0	15	21	1	x	
So Fork Public Use Area	Federal	156	Lake	3	0.0	0.0	0.0	0.0	16	104	127	1	x	x
Glenwood Public Use Area	Federal	148	Lake	2	0.0	0.0	0.0	0.0	0	10	11	0		
Island View Public Area	Federal	1392	Lake	8	0.0	0.0	0.0	0.0	76	532	638	2	x	x
Bridgeview Public Area	Federal	610	Lake	3	0.0	0.0	0.0	0.0	46	193	250	1	x	
Honey Creek St Park	IDNR	796	Lake	8	0.0	5.0	0.0	5.0	402	100	335	3		x
Moravia	IDNR	5124	Lake	7	0.0	0.0	0.0	0.0	0	0	0	0		
Mickey Rooneys Res/Mar	Private/Mystic	1		0	0.0	0.0	0.0	0.0	100	100	0	0		
** Subtotal **		8908		34	0.0	8.0	0.0	5.0	640	1085	1558	19		
** County Audubon														
Albert Bull Park	City of Audubon	10		0	0.0	0.0	0.0	0.0	28	47	15	1	x	
Legion Park	City of Audubon	5		0	0.0	0.0	0.0	0.0	0	0	35	2	x	
Littlefield Rec Area	County of Audubon	374	Lake	1	0.0	8.0	3.0	0.0	72	0	170	3	x	x
** Subtotal **		389		1	0.0	8.0	3.0	0.0	100	47	220	6		
** County Black Hawk														
Leonard Katoski Greenbelt	City	1100	River	0	0.5	2.9	0.6	0.0	56	0	30	1		
Island Park Cedar Falls	City of Cedar Falls	104	River	2	0.0	0.0	0.0	0.1	0	0	210	2	x	
Lookout Park	City of Cedar Falls	40		0	0.0	1.0	0.0	0.0	0	0	40	1	x	
Deerwood	City of Evansdale	70	Both	1	0.0	0.0	0.0	0.0	50	0	80	2	x	
Cedar River Park	City of Waterloo	82	River	2	0.0	0.0	0.0	0.0	0	0	106	2	x	
Martin Park	City of Waterloo	189	Both	0	0.0	0.2	0.0	0.0	56	0	132	1	x	
Byrnes Park Waterloo	City of Waterloo	169		0	0.0	0.0	0.0	0.0	0	0	80	2	x	
Cedar Bend Waterloo	City of Waterloo	9	River	1	0.0	0.0	0.0	0.0	0	0	10	0		

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (Lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Shelters	Sport Fields	Swim Beac
Exchange Park	City of Waterloo	23	River	0	0.0	0.0	0.0	0.0	0	0	95	2	x	
Gates Park	City of Waterloo	235		0	0.0	0.0	0.0	0.0	0	0	75	3	x	
Siggelkow Park	County of Black Hawk	54	River	0	0.0	0.0	0.0	0.0	24	75	20	0	x	
Thunderwoman Park	County of Black Hawk	96	River	0	0.0	0.0	0.0	0.0	24	50	24	0	x	
Black Hawk Park	County of Black Hawk	1400	River	1	2.0	6.5	2.5	0.0	102	100	183	2	x	
Hickory Hills Park	County of Black Hawk	497	Lake	1	2.0	3.8	0.0	0.0	80	40	130	3	x	
Washington Union Access	County of Black Hawk	48	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Casebeer Heights Access	County of Black Hawk	20	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
McFarland Park - Part	County of Black Hawk	62	River	2	0.0	0.0	0.0	0.0	16	40	30	1	x	
Cedar River Access Area	County of Black Hawk	26	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Geo Myth Park	IDNR	392	Both	2	0.0	3.0	3.0	5.5	48	0	150	2		x
Riverview Park Rec Ctr	Private	27		0	0.0	1.0	1.0	0.0	28	0	25	1	x	
** Subtotal **		4643		14	4.5	13.4	7.1	5.6	484	305	1420	25		
** County Boone														
Mchose Park	City of Boone	203	Lake	0	0.0	1.0	0.7	0.0	0	0	120	3	x	
Water Works Park	City of Boone	17	River	1	0.0	0.0	0.0	0.0	50	10	25	0	x	
Fraser Dam	City of Fraser	5	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Edgewood Park	City of Madrid	19		0	0.0	0.0	0.0	0.0	2	0	30	2	x	
Don Williams Rec Area	County of Boone	438	Lake	1	0.0	0.0	0.0	0.0	194	50	207	2	x	x
Swede Point	County of Boone	102	River	0	0.0	0.5	0.0	0.0	24	6	30	1	x	
Riverbend Boat Landing	Federal	1		1	0.0	0.0	0.0	0.0	0	0	0	0		
Dogwood Boat Landing	Federal	1	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Sportsman Boat Landing	Federal	1	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Laurie Boat Landing	Federal	1	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
State Game Farm (Ledges)	IDNR	435		0	0.0	0.0	0.0	0.0	0	0	0	0		
Barkley Mem. St. Forest	IDNR	40		0	0.0	0.0	0.0	0.0	0	0	0	0		
Ledges State Park	IDNR	1136	River	0	0.0	4.2	0.0	0.0	0	56	190	2		
Saylorville Wildlife Area	IDNR	6348	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Pilot Mound State Forest	IDNR	33		0	0.0	0.0	0.0	0.0	0	0	0	0		
Meist State Forest	IDNR	313		0	0.0	0.0	0.0	0.0	0	0	0	0		
Inspiration Acres	Private	40	Lake	0	0.0	0.0	0.0	0.0	20	0	2	0	x	
Green Acres Campground	Private	1		0	0.0	0.0	0.0	0.0	50	1	0	0		
Camp Hantesa (Camp Girls)	Private	144		0	3.0	0.0	5.0	0.0	0	0	0	0	x	
Camp Morrison	Private	200		0	0.0	0.0	6.0	0.0	30	70	40	0		
Green Acres Campground	Private	1		0	0.0	0.0	0.0	0.0	50	1	0	0		
Camp Sacajawea (GSA)	Private	400		1	3.0	0.0	5.0	0.0	0	50	0	0	x	
Iowa 4-H Camp	Private	1100	River	0	0.0	6.0	6.0	0.0	0	0	10	0	x	
YMCA Camp	Private	336	River	0	2.0	0.0	15.0	12.0	2	1	5	0	x	
Camp Mitigwa (BSA)	Private	620	Lake	0	8.0	0.0	15.0	0.0	0	20	0	0	x	
** Subtotal **		11935		12	16.0	11.7	52.7	12.0	422	265	659	10		
** County Bremer														
City Park Frederika	City of Frederika	20	Both	1	0.0	0.0	0.0	0.0	0	1	8	0	x	x
Janesville City Park	City of Janesville	5	River	1	0.0	0.3	0.0	0.0	0	0	10	1	x	x

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Three Rivers Park	City of Waverly	20	Both	1	0.0	1.0	0.0	0.0	0	0	2	0		
Fairground Park	City of Waverly	17		0	0.0	0.0	0.0	0.0	20	0	50	1	x	
Cedar Bend Park	County of Bremer	185	River	0	0.0	0.0	1.1	1.5	50	8	57	0	x	
North Cedar County Park	County of Bremer	113	Both	0	0.0	0.6	0.0	0.3	30	0	0	0		
Seven Bridges Park	County of Bremer	105	River	0	0.0	0.0	0.3	0.0	0	41	16	0		
Alcock Park	County of Bremer	24	River	0	0.0	0.0	0.2	0.0	40	0	42	0	x	
North Woods	County of Bremer	79	River	0	0.0	0.0	0.6	0.0	50	0	40	0	x	
Sweet Marsh Area	IDNR	1124	River	6	0.0	0.0	0.0	0.0	0	1	0	0		
** Subtotal **		1692		9	0.0	1.9	2.2	1.8	190	51	225	2		
** County Buena Vista														
Manderville Park Lakeside	City of Manderville	6	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0	x	
City Park Sioux Rapids	City of Sioux Rapids	18	River	1	0.0	0.0	0.0	0.0	0	0	15	0	x	
Chautauqua Park	City of Storm Lake	17	Lake	1	0.0	0.3	0.0	0.0	0	0	45	1	x	x
Sunrise Park	City of Storm Lake	10	Lake	4	0.0	0.6	0.0	0.0	187	70	150	1	x	x
Buena Vista County Park	County of Buena Vista	304		0	0.0	0.0	0.0	0.0	18	0	30	0	x	
Casino Bay	IDNR	13	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
Pickerel Lake	IDNR	0	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		368		10	0.0	0.9	0.0	0.0	205	70	240	2		
** County Butler														
Perrin Park	City of Greene	4	River	1	0.0	0.0	0.0	0.0	0	0	32	0	x	
City of Parkersburg	City of Parkersburg	30		0	0.0	0.0	0.0	0.0	0	0	50	3		
City Boat Ramp	City of Shell Rock	1	River	1	0.0	0.0	0.0	0.0	0	0	2	0		
West Fork Forest Access	County of Butler	108	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Considine	County of Butler	90	River	0	0.0	0.0	0.0	0.0	0	0	24	1	x	
Camp Comfort Recreation	County of Butler	27	River	2	0.0	0.0	0.0	0.0	12	10	21	1	x	
Greene Recreation Area	County of Butler	2	River	1	0.0	0.0	0.0	0.0	20	0	15	1	x	
Henry Woods	County of Butler	384	Both	1	0.0	1.5	0.0	1.5	30	0	60	2	x	
Beaver Meadows	County of Butler	32	River	0	0.0	0.0	0.0	0.0	0	8	25	1		
Sportsman's Park	County of Butler	27	Lake	0	0.0	0.0	0.0	0.0	4	0	10	1	x	
Shell Rock Rec Area	County of Butler	85	River	1	0.0	0.3	0.0	0.0	30	0	33	1	x	
Big Marsh	IDNR	1763	River	2	0.0	0.0	0.0	0.0	0	30	0	0		
** Subtotal **		2553		9	0.0	1.8	0.0	1.5	96	48	272	11		
** County Calhoun														
University Forty Park	County of Calhoun	40		0	0.0	0.0	0.0	0.0	0	0	20	2		
Lake's End Access	County of Calhoun	5	Lake	1	0.0	0.0	0.0	0.0	0	0	3	0		x
Featherstone Park	County of Calhoun	21	Lake	0	0.0	0.0	0.0	0.0	0	50	30	2		x
North Twin Park	IDNR	15	Lake	2	0.0	0.0	0.0	0.0	0	0	112	1	x	x
Twin Lakes Trailer Camp	Private	6		0	0.0	0.0	0.0	0.0	40	60	10	0	x	
** Subtotal **		87		3	0.0	0.0	0.0	0.0	40	110	175	5		

TABLE 18 (Cont'd)

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Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
** County Carroll														
Breda City Park	City of Breda	25		0	0.0	0.0	0.0	0.0	0	0	50	0	x	
Middle Raccoon R. Acc.	County of Carroll	174	River	0	2.0	2.0	0.0	1.0	0	0	0	0		
Carroll Co Access	County of Carroll	40	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Swan Lake	County of Carroll	368	Lake	1	2.2	2.2	2.2	4.0	200	50	375	2	x	x
Dickson Timber Area	County of Carroll	155		0	2.0	2.0	0.0	2.0	8	10	25	1	x	
Bennett Area	County of Carroll	108	River	0	0.0	0.0	0.0	1.0	0	0	0	0		
** Subtotal **		870		1	6.2	6.2	2.2	8.0	208	60	450	3		
** County Cass														
Cocklin Fish Farm Griswo	City of Cocklin	30	Lake	0	0.0	0.0	0.0	0.0	50	50	24	2	x	
Nelson Park	County of Cass	153	Lake	1	0.0	1.5	0.0	1.4	48	30	159	4	x	x
Yellow Smoke Park	County of Cass	280	Lake	1	0.0	3.0	0.0	0.0	0	0	26	1		x
Lake Anita St Park	IDNR	771	Lake	2	0.0	0.0	0.0	0.0	36	139	225	8		x
** Subtotal **		1234		4	0.0	4.5	0.0	1.4	134	219	434	15		
** County Cerro Gordo														
Margaret Macnider Mason	City	23	River	0	0.0	0.0	0.0	0.0	36	0	45	0	x	
Georgia Hanford	City of Mason City	59	Lake	0	0.0	0.0	0.0	0.0	0	0	25	2	x	
Frederic L Hanford	City of Mason City	22		0	0.0	0.0	0.0	0.0	0	0	25	1	x	
East Park	City of Mason City	68	Both	0	0.0	0.0	0.0	0.0	0	0	150	0	x	
Lime Creek Cons Area	County of Cerro Gordo	256	Both	0	0.5	0.0	0.0	0.0	0	0	0	0		
Shell Rock Greenbelt & P	County of Cerro Gordo	590	River	0	4.5	0.0	4.5	4.5	0	30	15	2	x	
Linn Grove Park	County of Cerro Gordo	38	River	0	0.0	0.0	0.0	0.0	80	80	130	3	x	
Zirbel Slough	County of Cerro Gordo	100	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Ingebretson Park	County of Cerro Gordo	23	River	0	0.0	0.0	0.0	0.2	22	0	30	0	x	
Wilkinson Pioneer Park	County of Cerro Gordo	84	Both	0	1.3	0.0	1.3	1.3	40	0	63	3	x	
Clear Lake	IDNR	3	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		x
Ventura Marsh-Part	IDNR	243	Marsh	1	0.0	0.0	0.0	0.0	0	0	0	0		
Clear Lake St Pk	IDNR	102	Lake	0	0.0	0.4	0.4	0.0	46	179	280	0		x
McIntosh Woods	IDNR	279	Lake	2	0.0	0.6	0.0	0.0	0	48	100	0		x
Willow Inn Campground	Private	20		0	0.0	0.0	0.0	0.0	32	0	0	0	x	
Camp Gay Wood	Private	16		1	0.0	0.0	0.0	0.0	0	4	0	0	x	x
Twin Oaks Campground	Private	3		0	0.0	0.0	0.0	0.0	43	0	0	0	x	
Camp at the Woods	Private	10		0	0.0	0.0	0.0	0.0	56	0	0	0	x	
** Subtotal **		1929		8	6.3	1.0	6.2	6.0	365	341	863	11		
** County Clarke														
East Lake County Park	County of Clarke	57	Lake	1	0.0	2.0	0.0	0.0	0	0	25	1	x	
RR Campground	Private	420	Lake	0	1.0	0.0	1.0	0.0	56	60	60	0		
** Subtotal **		477		1	1.0	2.0	1.0	0.0	56	60	85	1		

TABLE 18 (Cont'd)

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** County Clay														
Leach Park Spender	City of Spencer	54	River	0	0.0	1.5	3.0	1.0	100	50	110	0	x	
Manata St Preserve	IDNR	145	River	0	0.0	0.0	0.0	0.0	0	0	30	0		
** Subtotal **		199		0	0.0	1.5	3.0	1.0	100	50	140	0		
** County Crawford														
Nelson Park	County of Crawford	153	Lake	1	0.0	1.5	0.0	1.4	48	30	159	4	x	x
Yellow Smoke Park	County of Crawford	280	Lake	1	0.0	0.0	0.0	0.0	0	0	26	1		x
** Subtotal **		433		2	0.0	1.5	0.0	1.4	48	30	185	5		
** County Dallas														
Island Park	City of Adel	35	River	0	0.0	0.0	0.0	0.0	25	50	30	1		
Kinnick-Feller Park	City of Adel	30	River	1	0.0	0.0	0.0	0.0	0	0	30	2	x	
Pattee Park	City of Perry	38		0	0.0	0.0	0.0	0.0	16	0	90	3	x	
Waukee Centennial Park	City of Waukee	33		0	0.0	0.0	0.0	0.0	0	0	20	0	x	
S Raccoon River Access	County of Dallas	27	River	0	0.0	0.0	0.0	0.0	0	0	2	0		
Sportsmen's Park	County of Dallas	40	River	0	0.0	0.0	0.5	0.0	0	0	20	3	x	
Saylorville Wildlife Area	IDNR	3130	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Dallas	IDNR	133		0	0.0	0.0	0.0	0.0	0	0	0	0		
Pleasant Valley	IDNR	145	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Booneville Access	IDNR	2	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
KOA Campground	Private	13	Lake	0	0.0	0.0	0.0	0.0	65	35	0	0	x	
Timberline Ranch	Private	20		0	0.0	0.0	3.0	0.0	75	35	0	0		
** Subtotal **		3646		2	0.0	0.0	3.5	0.0	181	120	192	9		
** County Davis														
Lake Fisher Rec Area	City of Bloomfield	210	Lake	1	0.0	0.0	0.0	0.0	0	0	11	2	x	
Davis City Park	City of Davis	5	River	0	0.0	0.0	0.1	0.0	0	0	2	0	x	
Shewmaker Park	County of Davis	6	River	0	0.0	0.0	0.0	0.0	0	2	4	1	x	
Lake Fisher Park	County of Davis	85	Lake	0	0.0	0.0	0.0	0.0	0	0	30	0	x	x
Lake Wapello St Pk	IDNR	1022	Lake	2	0.0	1.5	0.0	0.0	20	182	300	1		x
Sand Creek Wldf Area	IDNR	1719	River	0	8.0	8.0	8.0	0.0	0	0	0	0		
** Subtotal **		3047		3	8.0	9.5	8.1	0.0	20	184	347	4		
** County Decatur														
Davis City Park	City of Davis	5	River	0	0.0	0.0	0.1	0.0	0	0	2	0	x	
Shewmaker Park	City of Shewmaker	6	River	0	0.0	0.0	0.0	0.0	0	2	4	1	x	
Sand Creek Wldf Area	IDNR	1719	River	0	8.0	8.0	8.0	0.0	0	0	0	0		
** Subtotal **		1730		0	8.0	8.0	8.1	0.0	0	2	6	1		
** County Emmet														
Wolden Rec Area	City of Wallingford	90		0	0.0	0.0	0.0	0.0	120	0	0	0		

TABLE 18 (Cont'd)

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Tuttle Lake Rec Area	County of Emmet	12	Lake	1	0.0	0.0	0.0	0.0	53	0	36	0		
Eagle Lake	IDNR	11	Marsh	1	0.0	0.0	0.0	0.0	0	0	0	0		
Ft Defiance St Pk	IDNR	181		0	1.4	2.0	0.0	2.0	12	20	100	2		
Ikamanpedan St Pk	IDNR	19	River	1	0.0	0.0	0.0	0.0	0	0	0	1		x
Ingham-High Complex	IDNR	421	Lake	3	0.0	0.0	0.0	0.0	0	0	0	0		
Iowa Lake	IDNR	210	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
Four-Mile Lake	IDNR	25	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Cheever Lake	IDNR	102	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		1079		10	1.4	2.0	0.0	2.0	185	20	136	3		
** County Floyd														
Millwood Park	City of Charles City	72		0	0.0	2.0	2.0	0.0	0	0	50	4	x	
City Park	City of Marble Rock	15	River	1	2.0	4.0	0.0	2.0	10	5	16	2	x	
City Park	City of Nora Springs	0		1	0.0	0.0	0.0	0.0	0	0	0	0	x	
City Park	City of Rockford	4	River	1	0.0	0.0	0.0	0.0	14	20	12	1	x	
Mathers Forest	County of Floyd	50	River	0	0.5	0.5	0.0	0.0	0	0	0	0		
Idlewild	County of Floyd	126	River	0	2.1	0.0	0.0	0.0	0	0	4	0	x	
Ackley Creek Park	County of Floyd	40		0	0.0	1.6	0.0	0.0	15	30	27	2	x	
Gates Bridge	County of Floyd	4	River	1	0.0	0.0	0.0	0.0	0	0	2	0		
Camp Christie	Private	41	River	0	0.0	0.0	0.0	0.0	0	3	0	0	x	
** Subtotal **		352		4	4.6	8.1	2.0	2.0	39	58	111	9		
** County Franklin														
City Park	City of Coulter	2		0	0.0	0.0	0.0	0.0	0	0	18	1	x	
Harriman Park	City of Hampton	6	River	0	0.0	0.0	0.0	0.0	0	0	60	5	x	
Mallory Memorial Park	County of Franklin	71	River	0	1.0	1.0	1.0	1.0	20	14	30	0	x	
Elmer Ackerman Annex	County of Franklin	66	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Popejoy Conservation Park	County of Franklin	59	Both	0	1.0	1.0	1.0	1.0	15	10	17	1	x	
Sheffield Game Mgmt Area	County of Franklin	14	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
M&M Conservation Park	County of Franklin	54	River	0	1.8	1.8	1.8	1.8	0	0	16	1	x	
Interstate Lake Park	County of Franklin	4	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Beeds Lake St Pk	IDNR	189	Lake	2	0.0	2.0	2.0	2.0	7	74	280	1		
West Fork Access	IDNR	80	River	0	0.0	0.0	0.0	0.0	0	0	1	0		
** Subtotal **		545		3	3.8	5.8	5.8	5.8	42	98	422	9		
** County Greene														
Squirrel Hollow Park	County of Greene	57	River	1	0.0	0.0	1.0	0.0	24	30	30	0		
Spring Lake Park	County of Greene	191	Lake	0	0.0	0.0	1.5	0.0	36	130	158	0	x	x
Henderson Park	County of Greene	40	River	1	0.0	0.0	0.0	0.0	6	10	4	0		
Hyde Park	County of Greene	57	River	1	0.0	0.0	0.0	0.0	10	30	25	0		
Dunbar Slough	IDNR	282	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Mc Mahon Access	IDNR	287	River	0	0.0	0.0	0.0	0.0	0	0	0	0		

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
** Subtotal **		914		4	0.0	0.0	2.5	0.0	76	200	217	0		
** County Grundy														
Wolf Creek Rec Area	County of Grundy	93	River	0	0.0	0.0	0.0	0.0	0	0	16	0		
** Subtotal **		93		0	0.0	0.0	0.0	0.0	0	0	16	0		
** County Guthrie														
Mitchell Park	City of Guthrie Centr	10	River	0	0.0	0.0	0.0	0.0	6	0	42	2 x		
Nations Bridge	County of Guthrie	81	River	0	0.0	0.0	0.0	0.0	60	15	50	2 x		
Guthrie Grove Rlds Ch Ct	Guthrie Center	130		0	0.0	0.0	0.0	0.0	50	0	0	0 x		
Bays Branch Area	IDNR	532	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Springbrook St Park	IDNR	767	Both	2	0.0	3.0	3.0	1.5	72	168	325	1 x		x
Lake Panorama	Private	4480	Both	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		6000		5	0.0	3.0	3.0	1.5	188	183	417	5		
** County Hamilton														
Riverside Park	City of Webster City	7	River	1	0.0	0.0	0.0	0.0	10	0	16	0		
Riverview Nokomis Park	City of Webster City	13	River	1	0.0	0.0	0.0	0.0	0	0	8	1 x		
Briggs Woods Park	County of Hamilton	337	Both	2	0.0	3.5	0.0	0.0	28	0	125	3 x		x
Albrights Access	County of Hamilton	11	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Little Wall Lake Park	County of Hamilton	61	Lake	4	0.0	0.7	0.0	0.0	104	0	175	2 x		x
Bells Mill Park	County of Hamilton	8	River	0	0.0	0.0	0.0	0.0	44	0	50	2		x
Tunnell Mill Access	County of Hamilton	116	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Rest Area 1 Hamilton Co	County of Hamilton	10		0	0.0	0.0	0.0	0.0	0	0	45	0 x		
Boone Forks WMA	IDNR	570	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Boone Valley Izaak Walton	Private	140		0	1.0	0.0	0.0	0.0	40	0	0	0		
Bever Bridge Access	Private	1	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		1274		11	1.0	4.2	0.0	0.0	226	0	419	8		
** County Hancock														
Eldred Sherwood Park	County of Hancock	78	Lake	10	0.0	0.0	0.0	0.0	40	10	90	0 x		x
Ellsworth Pk Crystal Lk	County of Hancock	130	Lake	2	0.0	0.0	0.0	0.0	0	100	130	1 x		x
Eagle Lake	IDNR	26	Marsh	1	0.0	0.0	0.0	0.0	0	0	0	0		
Pilot Knob Pk-See 95 Co	IDNR	350	Lake	0	0.0	0.0	0.0	0.0	0	30	124	1		
East Twin Lake	IDNR	300	Marsh	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		884		15	0.0	0.0	0.0	0.0	40	140	344	2		
** County Hardin														
City Park Alden	City of Alden	7	River	0	0.0	0.0	0.0	0.0	0	0	0	0 x		x
City Park	City of Eldora	28	River	0	0.0	0.2	0.2	0.0	0	0	30	5 x		
Dougans Landing	City of Iowa Falls	1	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Ellsworth Park	City of Iowa Falls	10	River	0	0.0	0.0	0.0	0.0	0	0	8	1 x		

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Cross Ford River Access	County of Hardin	26	River	1	0.0	0.0	0.0	0.0	0	0	2	0		
Ilco Park	County of Hardin	3	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Tower Rock Area	County of Hardin	21	River	0	0.0	0.0	0.0	0.0	0	0	8	0		
Canoe Launching Fac	County of Hardin	4	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Eagle City Access	County of Hardin	70	River	1	0.0	0.0	1.0	2.0	0	0	19	0		
Logsdon Park Rest Area	County of Hardin	13	River	0	0.0	0.0	0.0	0.0	0	0	11	0	x	
Bessman Kemp Park	County of Hardin	10	River	0	0.0	0.0	0.0	0.0	0	0	4	0		
Pine Lake St Pk	IDNR	407	Lake	2	0.0	2.0	2.0	1.0	128	0	429	3		x
Iowa River Cons Club	Private	20	Lake	1	1.0	0.0	0.0	0.0	10	20	0	0		
Gehrkes Lake	Private	40	Lake	0	1.0	0.0	1.0	0.0	36	14	20	0		
Welshs Lake	Private	100	Lake	0	0.0	0.0	0.0	0.0	24	50	18	0		
** Subtotal **		760		9	2.0	2.2	4.2	3.0	198	84	549	9		
** County Humboldt														
Dakota City Park	City of Dakota	2	River	0	0.0	0.6	0.0	0.0	4	0	8	0	x	
Frank Gotch State Park	County of Humboldt	67	River	0	0.0	0.0	0.0	0.0	26	0	21	3	x	
Letts Area	County of Humboldt	33	River	0	0.0	0.0	0.0	0.0	23	0	9	2	x	
Joe Shelton Park	County of Humboldt	79	River	1	0.0	0.0	0.0	0.0	26	0	35	1	x	
** Subtotal **		181		1	0.0	0.8	0.0	0.0	79	0	73	6		
** County Ida														
City Park-Ida Grove	City of Ida Grove	11	River	0	3.5	3.5	3.5	3.5	0	0	40	2	x	
Moorehead Pioneer Park	County of Ida	244	Both	0	1.0	1.0	1.0	0.0	0	0	80	0	x	
Crawford Creek Rec Area	County of Ida	196	Lake	1	0.0	0.0	0.0	0.0	24	0	34	3	x	x
Mashta Access	IDNR	52	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		503		2	4.5	4.5	4.5	3.5	24	0	154	5		
** County Iowa														
Iowa County Lake Park	County of Iowa	377	Lake	4	5.0	0.0	0.0	0.0	57	0	57	0		
** Subtotal **		377		4	5.0	0.0	0.0	0.0	57	0	57	0		
** County Jasper														
Lewis Park	City of Colfax	21	River	0	0.0	0.0	0.0	0.0	0	0	14	1	x	
Fred Maytag Park	City of Newton	40		0	0.0	0.0	0.0	0.0	0	0	70	4	x	
Westwood Park	City of Newton	10		0	0.0	0.0	0.0	0.0	0	0	10	1		
Woodland Park	City of Newton	50		0	0.0	0.0	0.0	0.0	0	315	30	4	x	
Holmdahl Park	City of Newton	15	River	0	0.0	0.0	0.0	0.0	0	0	16	2	x	
Community Park	City of Prairie City	10		0	0.0	0.0	0.0	0.0	0	0	16	3	x	
Sports Complex	City of Prairie City	5		0	0.0	0.0	0.0	0.0	0	0	8	0	x	
City Park	City of Sully	13		0	0.0	0.0	0.0	0.0	0	0	35	3	x	
Woodcock Mdlf Area	County of Jasper	56	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Jacob Krumm Nature Pres	County of Jasper	360	Both	0	0.0	0.5	0.0	0.0	0	0	10	2		
Hagaman Mill	County of Jasper	5	River	0	0.0	0.0	0.0	0.0	0	0	6	1		

TABLE 18 (Cont'd)

List of Competing Recreation Areas Located Within The Des Moines Recreational River & Greenbelt Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Foreman Nature Preserve	County of Jasper	15		0	0.0	0.4	0.0	0.0	0	0	0	0		
Skunk R. Wildlife Area	County of Jasper	162	Both	0	0.0	0.0	0.0	0.0	0	0	0	0		
Mariposa Recreation Area	County of Jasper	130	Lake	0	0.0	1.0	0.0	0.0	0	38	60	1	x	
Ashton Wildwood Park	County of Jasper	113		0	0.0	1.4	1.0	0.0	0	18	36	0	x	
Beyers Access	County of Jasper	31	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
AC Morris Prairie Preser	County of Jasper	20		0	0.0	0.2	0.0	0.0	0	0	0	0		
Hoffman Wildlife Area	County of Jasper	144	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Vandalia Wdlf Area	County of Jasper	97		0	0.0	0.0	0.0	0.0	0	0	0	0		
Bailey Wildlife Area	County of Jasper	45		0	0.0	0.0	0.0	0.0	0	0	0	0		
Colfax Area	IDNR	300	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Wldf Area	IDNR	63	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Kellogg Game Area	IDNR	66		0	0.0	0.0	0.0	0.0	0	0	0	0		
Rock Creek Wildlife Area	IDNR	305	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Oakridge Game Farm	Private	1280		0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Planor Campground	Private	1		0	0.0	0.0	0.0	0.0	148	0	0	0	x	
Campers And Marine Unltd	Private	25		0	0.0	0.0	0.0	0.0	46	38	0	0		
Roxies Campground	Private	20		0	0.0	0.0	0.0	0.0	60	24	0	0		
Beacon Campground	Private	15		0	0.0	0.0	0.0	0.0	15	1	0	0	x	
KOA Campground	Private	10		0	0.0	0.0	0.0	0.0	28	32	0	0		
** Subtotal **		3427		2	0.0	9.5	1.0	0.0	297	466	311	22		
** County Jefferson														
Chatauqua Park	City of Fairfield	20		0	0.0	0.0	0.0	0.0	0	0	70	4	x	
Jefferson County Park	County of Jefferson	115	Lake	0	0.0	1.5	1.5	0.0	26	0	40	2	x	
** Subtotal **		135		0	0.0	1.5	1.5	0.0	26	0	110	6		
** County Keokuk														
Legion Park	City of Sigourney	10		0	0.0	0.0	0.0	0.0	0	0	50	5	x	
Yen-Nuo-Gis Park	County of Keokuk	67	Lake	1	0.0	0.0	0.0	0.0	0	0	16	3	x	
Delva Deer Rec Area	County of Keokuk	349	Lake	0	0.0	0.0	0.0	0.0	18	0	36	3	x	
Manhatten Park	County of Keokuk	1	River	1	0.0	0.0	0.0	0.0	0	0	4	0		
Marks Trails	Private	1		0	0.0	0.0	0.0	0.0	45	0	0	0	x	
** Subtotal **		428		2	0.0	0.0	0.0	0.0	63	0	106	11		
** County Kossuth														
North Park Algona	City of Algona	15	River	0	1.0	0.0	2.0	1.0	0	0	10	2	x	
Devine Wildlife Area	County of Kossuth	71	Lake	1	0.0	0.0	0.0	0.0	30	0	25	1	x	x
Smith Lake	County of Kossuth	0		0	0.0	0.0	0.0	0.0	0	0	0	0		
AA Call Park	IDNR	130		0	0.0	3.5	3.5	0.0	0	0	50	2		
** Subtotal **		216		1	1.0	3.5	5.5	1.0	30	0	85	5		
** County Lucas														
Ellis Lake Chariton	City	100	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		

TABLE 18 (Cont'd)

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Morris Lake Charlton	City	100	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Rathbun Corp. Land	Federal	14860		7	0.0	0.0	0.0	0.0	0	0	0	0		
Red Haw State Park	IDNR	348	Lake	1	0.0	0.0	0.0	0.0	18	0	200	0		
Colyn Area	IDNR	470	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		15878		12	0.0	0.0	0.0	0.0	18	0	200	0		
** County Madison														
City Park	City of Winterset	120		0	0.0	0.2	0.0	0.0	12	0	80	2	x	
Griffin Comm Fields	City of Winterset	12		0	0.0	0.0	0.3	0.0	0	0	4	0	x	
Middle River Ed. Area	County of Madison	50	River	0	0.0	0.2	0.0	0.0	0	0	3	0		
Clanton Creek Rec Area	County of Madison	319	River	0	0.0	3.5	0.0	0.0	0	4	10	0	x	
Pammel State Park	IDNR	281	River	0	0.0	0.0	0.0	0.0	0	0	80	2		
Badger Creek	IDNR	876	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		1658		2	0.0	3.9	0.3	0.0	12	4	177	4		
** County Mahaska														
Edmundson Park	City of Oskaloosa	175	Lake	0	0.0	0.5	0.0	0.0	0	0	150	5	x	
Brestrom Area	County of Mahaska	141	Lake	1	0.0	1.5	0.0	0.0	0	0	30	2		
Eveland Access	County of Mahaska	23	River	1	0.0	0.2	0.0	0.0	0	28	45	1	x	
Russell Wildlife Area	County of Mahaska	185	Both	0	0.0	0.0	0.0	0.0	0	0	0	0		
Union Mills Access-Part	County of Mahaska	13	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Quercus Wilderness Area	County of Mahaska	78		0	0.0	1.5	0.0	0.0	0	0	5	0		
Glendale Access	County of Mahaska	42	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Hawthorn Lake	IDNR	1522	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Keomah St Park	IDNR	293	Lake	2	0.0	3.0	0.5	0.7	50	38	145	3		x
Hull Area	IDNR	378		0	0.0	0.0	0.0	0.0	0	0	0	0		
Vanderwilt Park	Private	18		0	0.0	0.5	0.0	0.0	0	0	9	1	x	
** Subtotal **		2868		7	0.0	7.2	0.5	0.7	50	66	384	12		
** County Marion														
Young Park Knoxville	City of Knoxville	11		0	0.0	0.0	0.0	0.0	0	0	15	1	x	
Auld Park Knoxville	City of Knoxville	12		0	0.0	0.0	0.0	0.0	0	0	30	3	x	
Big Rock Park	City of Pella	80	River	0	0.0	0.0	0.3	0.0	0	0	10	1		
Swimming Pool Park	City of Pella	15	Lake	0	0.0	0.0	0.0	0.0	0	0	30	1	x	
Roberts Creek Park	County of Marion	1235	Lake	1	0.0	0.8	0.0	0.0	250	100	160	3	x	
Milcox Wildlife Area	County of Marion	596	Lake	0	0.0	0.0	0.0	0.6	0	0	5	0		
Paul Todd Wdlf Area	County of Marion	49	Marsh	0	0.0	0.0	0.0	0.0	0	0	0	0		
Marion County Park	County of Marion	103	Lake	0	0.0	0.0	0.0	0.0	190	100	130	4	x	
South Overlook Rec Area	Federal	92	Lake	2	0.0	0.0	0.0	0.0	0	0	9	1	x	
North Tailwater Rec Area	Federal	14	River	0	0.0	0.0	0.0	0.0	0	0	28	1	x	
Hallashuck East Rec Area	Federal	160	Lake	2	0.0	0.0	0.0	0.0	80	0	80	0	x	
Ivan's Campground	Federal	5	River	0	0.0	0.0	0.0	0.0	22	0	25	0		
Fifield Rec Area	Federal	120	Lake	0	0.0	0.0	0.0	0.0	0	0	24	4		
Knoxville Park	Federal	33	Lake	0	0.0	0.0	0.0	0.0	0	0	5	0		

TABLE 18 (Cont'd)

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North Overlook Rec Area	Federal	422	Lake	0	0.0	1.2	0.0	0.0	51	9	69	0	x	x
Howell Station Rec Area	Federal	254	River	1	0.0	0.0	0.5	0.0	120	0	120	0	x	
Hallashuck West Rec Area	Federal	145	Lake	2	0.0	0.0	0.0	0.0	0	0	1	0		
South Tailwater Rec Area	Federal	192	River	0	0.0	0.0	3.0	0.0	0	0	26	1		
Whitebreast Rec Area	Federal	659	Lake	6	0.0	2.0	0.0	0.0	115	0	133	2	x	x
Pella State Game Mgt Area	IDNR	277		0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Wildlife Area	IDNR	16679	River	3	0.0	0.0	0.0	0.0	0	0	0	0		
Elk Rock St Park	IDNR	2218	Lake	5	0.0	1.1	0.0	0.0	0	150	0	10		
Hickory Ridge Campground	Private	46		0	0.0	0.0	0.0	0.0	150	60	160	0		
** Subtotal **		23417		22	0.0	5.1	0.8	0.6	978	409	1060	32		
** County Marshall														
Riverview Park	City of Marshalltown	150	River	0	0.0	0.0	0.0	0.0	64	0	50	5	x	
Timmons Grove County Park	County of Marshall	198	River	1	0.0	1.5	0.0	1.5	22	10	29	2	x	
Three Bridges County Park	County of Marshall	13	River	1	0.0	0.0	0.5	0.0	0	6	3	0		
Meg Holland Access Area	County of Marshall	80	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Grammer Grove Wdlf Area	County of Marshall	121	River	0	1.0	1.0	0.0	0.0	4	10	12	2	x	
Marshall Co Forest Rsrv	County of Marshall	85	River	1	0.0	0.0	1.3	0.0	0	0	0	0		
Fiscus Grove	Private	50		0	0.0	0.0	0.0	0.0	18	0	8	0		
Riverview Park	Private	40		0	0.0	0.0	0.0	0.0	35	0	0	0	x	
** Subtotal **		737		4	1.0	2.5	1.8	1.5	143	26	102	9		
** County Mitchell														
City Park	City of Osage	9		0	0.0	0.0	0.0	0.0	0	0	45	2	x	
Spring Park	City of Osage	47	River	1	0.0	1.0	0.0	0.0	0	6	35	2	x	
Halvorson Park	County of Mitchell	11	River	2	0.0	0.0	0.0	0.0	36	0	40	1	x	
Riverside Park	County of Mitchell	12	River	0	0.0	0.0	0.0	0.0	4	0	18	0	x	
Interstate Park	County of Mitchell	27	River	2	0.0	0.0	0.0	0.0	8	0	18	0	x	
Pioneer State Park	County of Mitchell	19	River	0	0.0	1.0	0.0	0.0	0	0	15	0		
** Subtotal **		125		5	0.0	2.0	0.0	0.0	48	6	171	5		
** County Monroe														
Albia Waterworks Res	City of Albia	75	Lake	1	0.0	0.0	0.0	0.0	0	1	8	0		
Miami Lake Park	County of Monroe	40		0	0.0	0.0	0.0	0.0	20	40	18	0	x	
Miami Lake	IDNR	548	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		663		2	0.0	0.0	0.0	0.0	20	41	26	0		
** County Palo Alto														
Kearny Park	City of Emmetsburg	45		0	0.0	0.0	0.0	0.0	24	0	7	0	x	
Lost Island Huston Park	County of Palo Alto	70	Lake	1	1.0	1.0	1.0	0.0	40	40	122	2		x
Basswood Recreation Area	County of Palo Alto	47	River	1	1.0	1.0	0.0	0.0	0	0	12	8		
Virgin Lake	IDNR	113	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Rush Lake	IDNR	62	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Silver Lake	IDNR	17	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Five Island Lake	IDNR	166	Lake	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		520		7	2.0	2.0	1.0	0.0	64	40	141	10		
** County Pocahontas														
Sunken Grove Island	County of Pocahontas	35	Lake	1	0.0	0.5	0.0	0.0	0	0	3	0		
Lizard Lake Access	County of Pocahontas	67	Lake	1	0.0	0.0	0.0	0.0	0	8	10	1	x	
** Subtotal **		102		2	0.0	0.5	0.0	0.0	0	8	13	1		
** County Polk														
Crossroads	City N Des Moines	18		0	0.0	0.0	0.0	0.0	0	0	5	1	x	
Hawkeye Park	City of Ankeny	15	Lake	0	0.0	0.5	0.2	0.0	0	0	18	2	x	
Westwood Park	City of Ankeny	15		0	0.0	0.5	0.0	0.0	0	0	8	1	x	
Lake Peocka	City of Bondurant	24	Lake	0	0.0	0.0	0.0	0.0	0	0	14	1	x	
Greenbelt Park	City of Clive	135	River	0	0.0	3.0	3.0	0.0	0	0	18	1	x	
Macrae Park	City of Des Moines	61	Lake	0	0.0	0.0	0.0	0.0	0	0	50	2	x	
Riverside Park	City of Des Moines	16	River	0	0.0	0.0	0.0	0.0	0	0	2	0	x	
Hawthorn Park	City of Des Moines	15		0	0.0	0.0	0.0	0.0	0	0	6	1	x	
Witmer Park	City of Des Moines	22	Lake	0	0.0	0.0	0.0	0.0	0	0	20	1	x	
Ashworth/Greenwood Park	City of Des Moines	143	Both	0	0.0	2.0	2.5	0.0	0	0	50	0	x	
Prospect Pk/Crocker Wds	City of Des Moines	77	River	2	0.0	0.0	0.0	0.0	0	0	10	1	x	
McHenry Park	City of Des Moines	17		0	0.0	0.0	2.0	0.0	0	0	50	2	x	
Pioneer Park	City of Des Moines	46		0	0.0	0.0	0.0	0.0	0	0	60	2	x	
Grandview Park Golf Crse	City of Des Moines	174	Lake	0	0.0	0.0	0.0	0.0	0	0	90	4	x	
Ewing Park	City of Des Moines	357	Lake	0	0.0	2.0	0.0	0.0	0	1	150	2	x	
Hubbell Park	City of Des Moines	82		0	0.0	0.0	0.0	3.0	0	0	0	0		
SE Riverfront Boat Ramp	City of Des Moines	5	River	2	0.0	0.0	0.0	0.0	0	0	0	0		
Botanical Center	City of Des Moines	14	River	0	0.0	5.0	0.0	0.0	0	0	0	0		
Grays Lake	City of Des Moines	68	Lake	2	0.0	0.0	0.0	0.0	0	0	30	0	x	x
Ashby Park	City of Des Moines	11		0	0.0	0.0	0.0	0.0	0	0	12	1	x	
Burke Park	City of Des Moines	5		0	0.0	0.0	0.0	0.0	0	0	4	1		
Kreigh G. Carney Park	City of Des Moines	45		0	0.0	0.0	0.0	0.0	0	0	5	0	x	
Denman Woods Water Works	City of Des Moines	1500	River	0	6.0	0.0	0.0	0.0	0	0	30	0	x	
River Front Park (E & W)	City of Des Moines	14	River	0	0.0	0.0	0.0	0.0	0	0	2	0		
River Hills Park	City of Des Moines	47	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Union/Birdland Parks	City of Des Moines	124	Both	2	0.0	0.0	3.4	0.0	0	0	100	5	x	
Doanes Park	City of Pleasant Hill	49		0	0.0	0.0	0.0	0.0	0	0	30	1	x	
Lakeview Park	City of Urbandale	11	Lake	0	0.0	0.0	0.0	0.0	0	0	10	1	x	
Walker Johnston Park	City of Urbandale	61	Lake	0	0.0	0.1	0.1	0.0	0	0	35	2	x	
Lions Park	City of Urbandale	10		0	0.0	0.0	0.0	0.0	0	0	20	2	x	
Holiday Park	City of N Des Moines	64		0	0.0	0.0	0.0	0.0	0	0	6	0	x	
Mile-Long Bridge Access	County of Polk	5	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0		
Chichaqua Wdlf Habitat	County of Polk	1136	Marsh	0	0.0	6.5	0.0	0.0	0	12	18	1		
Wally's Wey-Wey-Neh-Kee	County of Polk	37	River	0	0.0	0.5	0.0	0.0	0	0	10	1	x	
Yellow Banks Park	County of Polk	458	Both	0	0.0	0.0	0.0	0.0	60	0	145	3	x	

TABLE 18 (Cont'd)

List of Competing Recreation Areas
Located Within The Des Moines Recreational River & Greenbelt
Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Browns Woods Forest Prsv	County of Polk	484	River	0	0.0	2.5	0.0	0.0	0	0	0	6		
Thomas Mitchell Park	County of Polk	143	Both	0	0.0	0.3	0.0	0.0	25	0	90	2	x	
Easter Lake Park	County of Polk	244	Lake	2	0.0	0.5	0.0	0.0	0	12	120	4	x	x
Lewis A Jester Park	County of Polk	1756	Lake	2	4.6	5.3	0.0	4.6	25	120	344	7	x	
Acorn Valley Campground	Federal	60		0	0.0	6.0	0.0	0.0	30	95	0	0		
Cottonwood Rec Area	Federal	180	River	0	0.0	0.0	0.0	0.0	0	0	210	9	x	
Saylorville Marina	Federal	105	Lake	4	0.0	0.0	0.0	0.0	0	0	0	0		
Oak Grove Rec Area	Federal	157	Lake	0	0.0	0.0	0.0	0.0	0	0	32	2		x
Cherry Glen Rec Area	Federal	185	Lake	0	0.0	0.0	3.3	0.0	135	10	66	6	x	
Lake View Rec Area	Federal	41	Lake	0	0.0	0.0	0.0	13.5	0	0	0	1		
Bob Shelter Rec Area	Federal	393	River	0	0.0	0.0	0.0	0.0	48	22	8	0		
Prairie Flower Campground	Federal	331	Lake	0	0.0	0.0	0.0	0.0	148	16	0	0		
Walnut Ridge Picnic Area	Federal	60		0	0.0	0.0	0.0	0.0	0	0	90	3		
Strasser Woods Pres	IDNR	40		0	0.0	0.0	0.0	0.0	0	0	0	0		
Flint Access	IDNR	35	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Big Creek Wildlife Area	IDNR	883		0	0.0	0.0	0.0	0.0	0	0	0	0		
Sycamore Access	IDNR	1	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Saylorville Wildlife Area	IDNR	3860		0	0.0	0.0	0.0	0.0	0	0	0	0		
US Highway 65 WMA	IDNR	34		0	0.0	0.0	0.0	0.0	0	0	0	0		
Walnut Woods St Park	IDNR	275	River	0	1.5	2.0	0.0	0.0	8	24	54	1		
Margo Frankel Woods	IDNR	136		0	1.0	1.5	1.5	0.0	0	0	20	2		
Big Creek Rec Area	IDNR	1536	Lake	7	0.0	2.0	2.0	2.0	0	0	300	13	x	x
Adventureland Campground	Private	100		0	0.0	0.0	0.0	0.0	300	200	0	0		
Adventureland	Private	70	Lake	0	0.0	0.0	0.0	0.0	300	200	300	0		
Cutty's Campground	Private	70	Lake	0	0.0	0.0	0.0	0.0	400	0	350	0		
** Subtotal **		16060		45	13.1	40.2	16.0	23.1	1479	712	2992	89		
** County Poweshiek														
Diamond Lake County Park	County of Poweshiek	203	Lake	1	3.7	0.0	3.7	0.0	30	10	78	3	x	
Arbor Lake Area	County of Poweshiek	64	Lake	1	0.0	1.0	1.0	0.0	0	0	20	1	x	
** Subtotal **		267		2	3.7	1.0	4.7	0.0	30	10	98	4		
** County Ringgold														
Leack Ayr Reservoir Mt A	City	160	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Fife's Grove Park	County of Ringgold	27	Lake	0	0.0	0.0	0.0	0.0	6	0	24	3	x	
Pee Hollow Park	County of Ringgold	72	Lake	0	0.0	1.5	1.5	0.7	0	0	24	3	x	
Ringgold Game Area	IDNR	1030	Both	0	5.0	5.0	0.0	0.0	0	0	0	0		
Mt Ayr Game Area	IDNR	1083	Both	1	7.0	7.0	0.0	0.0	0	0	3	0		
** Subtotal **		2372		1	12.0	13.5	1.5	0.7	6	0	51	6		
** County Sac														
Camp Crescent	City of Lakeview	4	Lake	2	0.0	0.0	0.0	0.0	74	350	205	0	x	x
Hagge Park	County of Sac	85	River	0	0.0	0.5	0.0	0.0	16	0	20	1	x	
Lubeck Forest	County of Sac	45	River	0	1.0	1.0	0.0	1.0	0	0	0	0		

TABLE 18 (Cont'd)

List of Competing Recreation Areas Located Within The Des Moines Recreational River & Greenbelt Market Area

Name of Park	Managing Agency	Land Area (ac.)	Type of Water Access (Lake/River)	Boat Ramps (lanes)	Horse Trails (mi.)	Hiking Trails (mi.)	Bike Trails (mi.)	Snowmobile Trails (mi.)	Camping Units Modern	Camping Units Non-Modern	Picnic Tables	Picnic Shelters	Sport Fields	Swimming Beach
Lake View Area	IDNR	284	Marsh	2	0.0	0.0	0.0	0.0	0	0	0	0		
Black Hawk St Pk	IDNR	86		0	0.0	0.0	0.0	0.0	62	150	485	0		x
** Subtotal **		504		4	1.0	1.5	0.0	1.0	152	500	710	1		
** County Story														
Iris Grove Park	City of Ames	45	River	0	0.7	0.0	1.4	0.0	0	0	71	2	x	
McCarthy Lee Park	City of Ames	30		0	0.0	0.2	0.0	0.0	0	0	47	1	x	
Gateway Park	City of Ames	25		0	0.0	2.0	0.0	0.0	0	0	12	0	x	
River Valley Park	City of Ames	165	River	0	2.5	0.0	5.0	0.0	0	0	82	2	x	
Brookside Park	City of Ames	84		0	2.5	0.0	5.0	0.0	0	0	204	3	x	
Centennial Park	City of Huxley	1		0	0.0	0.0	0.0	0.0	0	0	5	1	x	
Maxwell City Park	City of Maxwell	14	River	0	0.0	0.0	0.0	0.0	15	0	15	2	x	
4H City Park Nevada	City of Nevada	15		0	0.0	0.0	0.0	0.0	0	2	20	2	x	
West Side Park	City of Slater	15		0	0.0	0.0	0.0	0.0	0	0	6	1	x	
Soper's Mill	County of Story	18	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Mc Farland Park	County of Story	239	Lake	0	0.0	0.0	5.0	0.0	0	0	38	0		
Hickory Grove Park	County of Story	337	Lake	3	0.0	0.0	0.0	0.4	55	0	250	0	x	x
Hendrickson Marsh	IDNR	405	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Twin Anchors Campground	Private	43	Lake	2	0.0	2.0	0.0	0.0	130	20	0	0	x	x
KOA Whispering Oaks	Private	20		0	0.0	2.0	0.0	0.0	68	60	0	0	x	
** Subtotal **		1486		6	5.7	6.2	16.4	0.4	268	82	750	14		
** County Tama														
Mckinley Park	City of Creston	125	Lake	1	0.0	0.0	1.2	2.0	16	0	145	5	x	
Duffus Boat Landing	County of Tama	2	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Mannatts Landing	County of Tama	6	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Otter Creek Park	County of Tama	143	Lake	2	0.0	0.0	0.0	0.0	80	20	120	2	x	x
Otter Creek Marsh	IDNR	2384	River	2	0.0	0.0	0.0	0.0	0	0	220	0	x	
Union Grove St Pk	IDNR	172	Lake	1	0.0	3.5	0.5	0.5	15	17	220	1		x
Arrowhead Campground	Private	59	Lake	0	0.0	0.0	1.0	2.0	60	90	0	0	x	
Shady Hills Campground	Private	148	Lake	0	0.0	0.0	1.0	0.0	50	75	0	0		x
** Subtotal **		3039		8	0.0	3.5	3.7	4.5	221	202	705	8		
** County Union														
Mckinley Park	City	125	Lake	1	0.0	0.0	1.2	2.0	16	0	127	5	x	
Thayer Pond	County of Union	36	Lake	1	0.0	0.0	0.0	0.0	15	0	10	0		
Green Valley Lake	IDNR	600	Lake	3	0.0	2.0	0.0	0.0	54	84	180	0		x
** Subtotal **		761		5	0.0	2.0	1.2	2.0	85	84	317	5		
** County Wapello														
City of Eldon	City of Eldon	640	River	1	0.0	10.0	0.0	0.0	0	10	5	2	x	
Wildwood Pk Ottumwa	City of Ottumwa	54		0	0.0	0.0	0.5	0.0	0	0	94	3	x	
Union Park Ottumwa	City of Ottumwa	15		0	0.0	0.0	0.0	0.0	0	0	12	1	x	

TABLE 18 (Cont'd)

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Ottumwa Park Ottumwa	City of Ottumwa	248	Lake	0	0.4	1.5	0.1	1.0	40	40	100	4	x	x
Memorial Pk Ottumwa	City of Ottumwa	47	Lake	0	0.0	0.0	1.0	0.0	0	0	80	1	x	
Cliffland Access	County of Mapello	20	River	1	0.0	0.0	0.0	0.0	0	15	5	0		
Rock Bluff Pk Ottumwa	County of Mapello	32	River	0	0.0	1.0	0.3	0.0	0	0	5	0		
Blackhawk River Access	County of Mapello	4	River	2	0.0	0.0	0.0	0.0	0	0	4	0		
Chief Mapello Trail	Private	60		0	0.0	2.5	0.0	0.0	15	0	0	0		
** Subtotal **		1120		4	0.4	15.0	1.6	1.0	55	65	305	11		
** County Warren														
Municipal Park	City of Carlisle	10	River	0	0.0	0.0	1.0	0.0	0	0	25	2	x	
Pickard Rec Area	City of Indianola	161	Lake	0	0.0	2.0	0.0	0.0	12	0	37	1	x	
Veterans Memorial	City of Indianola	13		0	0.0	0.0	0.2	0.0	0	0	35	2	x	
Max McCord Park	City of Indianola	17		0	0.0	0.5	0.0	0.0	0	0	6	0	x	
Fairgrounds Park	City of Indianola	9		0	0.0	0.0	0.0	0.0	50	0	35	1	x	
Downey Mem	City of Indianola	20	Lake	0	0.0	0.0	0.0	0.0	0	0	8	1	x	
Woodland Mounds Preserve	County of Warren	185		0	0.0	0.0	0.0	0.0	0	0	3	0		
Hickory Hills Cons Area	County of Warren	159	Lake	0	0.0	0.0	0.0	0.0	0	0	0	1		
Rolling Thunder Prarie	County of Warren	122		0	0.0	0.0	0.0	0.0	0	0	0	0		
Red Rock Wildlife Area	IDNR	3900	Marsh	3	0.0	0.0	0.0	0.0	0	0	0	0		
Hooper Area	IDNR	315	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Banner Strip Mine Area	IDNR	187	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Lake Ahquabi St Park	IDNR	644	Lake	2	0.0	16.0	0.0	16.0	36	130	300	4		x
Camp Deer Haven	Private	125	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0	x	
Webbs Country Camping Inn	Private	1	Lake	0	0.0	0.0	0.0	0.0	100	1	0	0	x	
** Subtotal **		5868		5	0.0	18.5	1.2	16.0	198	131	449	12		
** County Wayne														
Corydon Lake Park	County of Wayne	78	Lake	1	0.0	0.0	1.8	0.0	24	0	48	1	x	
Humeston Lakeside Park	County of Wayne	46	Lake	0	0.0	0.0	1.0	0.0	0	20	28	0	x	
Bob White St Park	IDNR	266	Lake	1	0.0	0.0	0.0	0.0	16	16	60	1		x
** Subtotal **		390		2	0.0	0.0	2.8	0.0	40	36	136	2		
** County Webster														
Rogers Field	City of Fort Dodge	36		0	0.0	0.0	0.0	0.0	0	0	20	2	x	
Loomis Park	City of Fort Dodge	70	River	0	0.0	3.0	0.0	0.0	0	0	60	5	x	
Crawford Snell Park	City of Fort Dodge	18	River	0	0.0	2.0	0.0	0.0	0	0	18	2	x	
Hydro Electric Park	City of Fort Dodge	4	River	0	0.0	0.0	0.0	0.0	0	0	10	1	x	
Nature Trail	City of Fort Dodge	35	River	0	0.0	2.9	0.0	0.0	0	0	0	0		
Oleson Park	City of Fort Dodge	64	Lake	0	0.0	2.0	0.0	0.0	0	0	50	8	x	
City of Gowrie	City of Gowrie	13		0	0.0	0.0	0.0	0.0	0	0	38	3	x	
Swimming Pool Park	City of Gowrie	5		0	0.0	0.0	0.0	0.0	0	0	14	1	x	
City Park #3	City of Lehigh	3	River	1	0.0	0.0	0.0	0.0	0	0	3	0		
City Park #1	City of Lehigh	10	River	0	0.0	0.0	0.0	0.0	0	0	6	1	x	
Lehigh City Park	City of Lehigh	3	River	0	0.0	0.0	0.0	0.0	0	0	0	0		

TABLE 18 (Cont'd)

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Carlson Area	County of Webster	93	River	1	0.0	0.0	0.0	0.0	0	0	12	1		
Kennedy Park	County of Webster	335	Lake	1	0.0	0.0	3.5	0.0	28	39	180	7	x	x
Nessow Prairie	County of Webster	24	Marsh	0	0.0	0.0	0.0	0.0	0	0	0	0		
Boone Forks WMA	IDNR	378		0	0.0	0.0	0.0	0.0	0	0	0	0		
Brushy Creek Rec Area	IDNR	4192	Both	0	24.0	24.0	0.0	12.0	0	12	80	0		
Woodman Hollow	IDNR	63		0	0.0	1.3	0.0	0.0	0	0	0	0		
Lizard Creek Area	IDNR	88	Lake	0	0.0	0.0	0.0	0.0	0	0	0	0		
Deception Hollow	IDNR	40	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Dolliver Memorial St Park	IDNR	572	River	1	0.0	0.0	6.5	0.0	22	21	245	0		
Gilbert Copper	Private	84	Lake	0	0.0	0.0	0.0	0.0	7	0	0	0		
Lakota G. S. Camp	Private	175	River	0	5.5	4.0	1.0	0.0	0	0	6	1	x	
** Subtotal **		6305		4	29.5	39.2	11.0	12.0	57	72	742	32		
** County Winnebago														
Forest City Clark Woods	City of Forest City	37	River	0	0.2	0.0	0.4	0.2	0	0	40	6	x	
Pammel Park	City of Forest City	35	Both	0	0.2	0.0	0.4	0.2	44	0	16	2	x	
Rice Lake Area/ See 98 Co	IDNR	370	Lake	1	0.0	0.0	0.0	0.0	0	0	0	0		
Harmon Lake	IDNR	411	Marsh	1	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		853		2	0.4	0.0	0.8	0.4	44	0	56	8		
** County Worth														
Elk Creek Marsh	IDNR	967	Marsh	2	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		967		2	0.0	0.0	0.0	0.0	0	0	0	0		
** County Wright														
Swimming Pool Park	City of Belmond	4		0	0.0	0.0	0.0	0.0	0	0	10	2	x	
River Park Goldfield	City of Goldfield	11	River	1	0.0	0.0	0.0	0.0	0	0	3	1	x	
Rest Area 1 Troy	County of Wright	1	River	1	0.0	0.0	0.0	0.0	0	0	3	0		
Sportsman Park	County of Wright	17	River	0	0.0	0.0	0.0	0.0	0	0	0	0		
Pikes Timber Park	County of Wright	46	River	0	0.0	0.0	3.0	0.0	0	0	35	0	x	
Lake Cornelia-Part	County of Wright	56	Lake	2	0.0	0.0	0.0	0.0	30	30	85	3	x	x
1A DOT Transfer	IDNR	9	River	1	0.0	0.0	0.0	0.0	0	0	0	0		
Big Wall Lake	IDNR	73	Marsh	3	0.0	0.0	0.0	0.0	0	0	0	0		
** Subtotal **		217		8	0.0	0.0	3.0	0.0	30	30	136	6		
*** Total ***		*****		355	142.1	294.8	197.4	126.4	8969	6943	21124	511		

CONCEPTUAL UNIT PLANS

The Advisory Committee, at their April 3, 1987, meeting, endorsed an initial master plan of conceptual development for the Greenbelt. Projects identified vary in level of planning, detail, and scope of Federal involvement. Further coordination will be conducted by the Advisory Committee for the development of the Greenbelt and specific projects.

GREENBELT-WIDE

There are six projects which involve either several or all of the Greenbelt units (see table 19). These projects include a scenic road route, multi-purpose trail system, dispersed recreational features, and environmental enhancement projects. Greenbelt-wide projects will create a common unity or purpose in the overall program. Each project is complete within itself and there is no inter-dependency of each feature within a project. Individual project elements may be separately implemented according to the recommendations of the Advisory Committee and favorable action on the part of each cost-sharing partner. Site-specific details are presented in Section 4, Plan for Initial Development, and Appendix A, Site Plans for Cost-Shared Projects; Appendix B, Site Plans for 100-Percent Federal Projects; and Appendix D, Trail Plans.

TABLE 19

Proposed Greenbelt-Wide Projects
Des Moines Recreational River and Greenbelt

Number	Title
801	Scenic Valley Road Route
802	Greenbelt Trail System
803	Fishing Accesses
804	Forest/Prairie Conservation
805	Wildlife Conservation
806	Scenic Views/Easements

Scenic Road Route

This project was identified as a readily implementable action that would provide recognition along the entire reach of the Greenbelt. The public would become more aware of the Greenbelt's resources and unique features with minimal expense. This project consists of designating (special highway signs) a scenic valley road route along existing State highways, county roads, and city streets.

The Advisory Committee appointed a Trails Subcommittee to select and coordinate the proposed scenic road route. The Trails Subcommittee presented their results at the November 1986 Advisory Committee meeting. Additional coordination with city and county engineer offices will be conducted prior to the adoption of the final route.

Initial development of the scenic road will involve the placement of special highway signs for the demarcation of the route. Construction of rest stops, overlooks, vistas, information signs, historic markers, and road improvements will be coordinated in the future. Not all features may be eligible for Federal cost-sharing. Minimum roadway safety criteria desired by the Advisory Committee include the capability to handle a passenger car (minimum 3-ton load limit) with an alternate route for standard tour bus (approximately a 16-ton load limit). In addition, specific road hazard or conditional access restrictions would need to be posted by city, county or State engineers. Portions of the road route may be unaccessible during severe weather conditions or seasonal periods, and would need to be properly posted of any restrictions or access warnings.

Two road bank stabilization projects along the proposed route have been identified by the Advisory Committee. One is located upstream of Kalo, Webster County, on the Des Moines River along a county road. The other is located in Lehigh, Webster County, on the Des Moines River along route P73. Detailed descriptions of these projects are found in Appendix A, Site Plans for Cost-Shared Projects.

Within the upper river area, the scenic road route crosses back-and-forth along the east and west banks of the Des Moines River corridor, except for the portion above the confluence of the Boone River which lies entirely along the west bank. The segment extending down from Webster City along the Boone River has a similar criss-crossing pattern across the valley. The main route crosses the Des Moines River seven times (State Highway 210, Boone Co. E57, U.S. Highway 30, Logansport bridge, Fraser bridge, State Highway 175, and Bellville bridge) and the Boone River five times (Haskel, Bell's Mill, Tunnel Mill, Bever, and Albright's bridges). Alternate spur routes have been designated near Fraser and Stratford to connect with Don Williams County Park and local scenic features. The upper river route continually transects the heavily wooded river valley and open rural landscape settings presenting a panorama of natural settings.

The Saylorville portion of the scenic road route extends along the east bluff above Saylorville dam, crosses the dam, and follows the west riverbank downstream to the city of Des Moines. An alternate spur route circulates along the west shoreline of the lake near Polk City and crosses Saylorville Lake at the S & V bridge and at State Highway 17. This provides spacious views of the scenic Des Moines River valley and Saylorville Lake. A connection is made with Jester County Park. The scenery in the Saylorville Lake area is dominated by large bodies of open water and undeveloped portions of the river floodplain. Suburban development and scattered rural communities occupy much of the upland bluffs.

The scenic route through the Des Moines area is an urban setting which centers on the river and its wooded banks. Various urban attractions located along the route include riverfront parks, historic restorations (buildings and bridges), river's edge promenade, trails, riverfront drives, and the city botanical center. The scenic route makes six bridge crossings along the Des Moines River (6th Avenue, Grand Avenue, Locust Street, Scott Street, 6th Avenue East, and State Highway 46) and three bridge crossings along the Raccoon River (63rd Street, Fleur Drive, and First Avenue).

The Lake Red Rock portion of the scenic road route crosses the river only twice (State Highways 316 and 14) as it extends along the wildlife refuge and management area in the upper reaches, and the north shoreline of the lake in the lower reach. An alternate spur route along Whitebreast Creek connects with the city of Knoxville and Marion County Park. The scenic features within the area include panoramic views of the undeveloped rural landscape (pastures, wooded lots and ravines, and farmland), broad bottomland terraces, and a large body of water. This area is rich in cultural tradition and historic features which are highly popularized within the area communities. The scenic road route is presented in Appendix D, Trail Plans.

Greenbelt Trail System

This project is for a network of multi-purpose trails extending the entire length of the Greenbelt. The trail would provide a connecting link and cohesion for recreational opportunities. The Advisory Committee has identified the trail as a priority development and one of the essential features of the Greenbelt. Initial planning was for the development of a hard-surfaced bike and hike trail extending the entire length of the Greenbelt. Subsequently, the Advisory Committee recommended that wilderness trails be developed in the reaches north of the city of Boone.

An interconnecting hard-surfaced trail system would provide a continuous corridor for biking and hiking enthusiasts. No motor vehicle use would be allowed, except for portions which may be designated for snowmobile use. The main trail route will be developed along abandoned railroad rights-of-way, shoulders of rural and urban roads, or off-road alignments. Connections with existing trail facilities will provide additional access.

The Advisory Committee appointed a Trails Subcommittee to assist in the development and coordination of a Greenbelt-wide trail system. A description of the trail system is found in Appendix D, Trail Plans.

Fishing Accesses

Throughout the Greenbelt, there are popular fishing spots where improvements could be made for safe vehicular or pedestrian access. Minimum facilities would include walkways, parking lots, piers, and sanitary facilities. Similar features are included as part of other projects. Individual fishing accesses could be constructed independent of other components of the project.

The Advisory Committee has identified nine fishing access sites. There are six sites (Kate Shelley High Bridge, three in the proposed State Forest area, Boone Waterworks, and the confluence of Coal Valley Creek) in the upper river area. Two sites (Scott Street Dam Access and Prospect Park) have been identified within the city of Des Moines. Handicapped accessible fishing piers along the riverfront have been identified for future study. The remaining fishing accesses are located at Lake Red Rock (tailwater area) which consist of deck structures located within existing recreation areas.

Forest/Prairie Conservation

The purpose of this project is to develop and restore natural resources within the Greenbelt. This would involve planting native grasses (prairies) and trees (reforestation), or acquisition of selected property having high natural resource value. Projects included under this proposal are small, scattered areas ranging from 10- to 200-acres. Several sites have been identified by the Advisory Committee, most of which are a part of existing resource management programs of the State of Iowa or Corps of Engineers.

Two land acquisition projects have been identified under this proposal which involve a total of 349 acres. One is located in the Lake Red Rock area along Camp Creek (west of Runnells), and would be considered a valuable companion to the State's wildlife management area. The landowner has expressed a willingness to sell the 149-acre property. The other project involves the acquisition of 130 acres of riverfront property in the city of Des Moines for a public open space. The area has been identified as part of the southeast corridor in the city of Des Moines' 1982-83 Riverfront Acquisition and Development Project.

A combination land acquisition and tree planting project (tree belt) has been proposed along the riverbanks downstream of the Red Rock dam. The project involves the acquisition of a 200-foot-wide strip of land along each bank of the river to establish a tree line for bank stabilization, public access and environmental enhancement.

Wildlife Conservation

The purpose of these proposals is to enhance wildlife conservation. Development would include the construction of small ponds and the placement of heron nest structures or eagle platforms. observation. Projects have been proposed for heron nest structures and bald eagle platforms at Saylorville Lake and Lake Red Rock. A bald eagle platform was recently installed at Lake Red Rock by the Iowa Department of Natural Resources and the Advisory Committee will monitor the success of project. Additional proposals for pond development have been identified for future study.

Scenic Views/Easements

This project consists of the development of scenic overlooks and vistas adjacent to parks, the scenic road route and the trail system. Development would consist of (1) clearing of vegetation, brush, and debris; (2) planting of trees and hedges to frame and direct viewing angles; and (3) acquisition of easements to preserve natural settings. Eight projects have been proposed by the city of Des Moines, and involve clearing of vistas at selected city parks and riverfront overlooks.

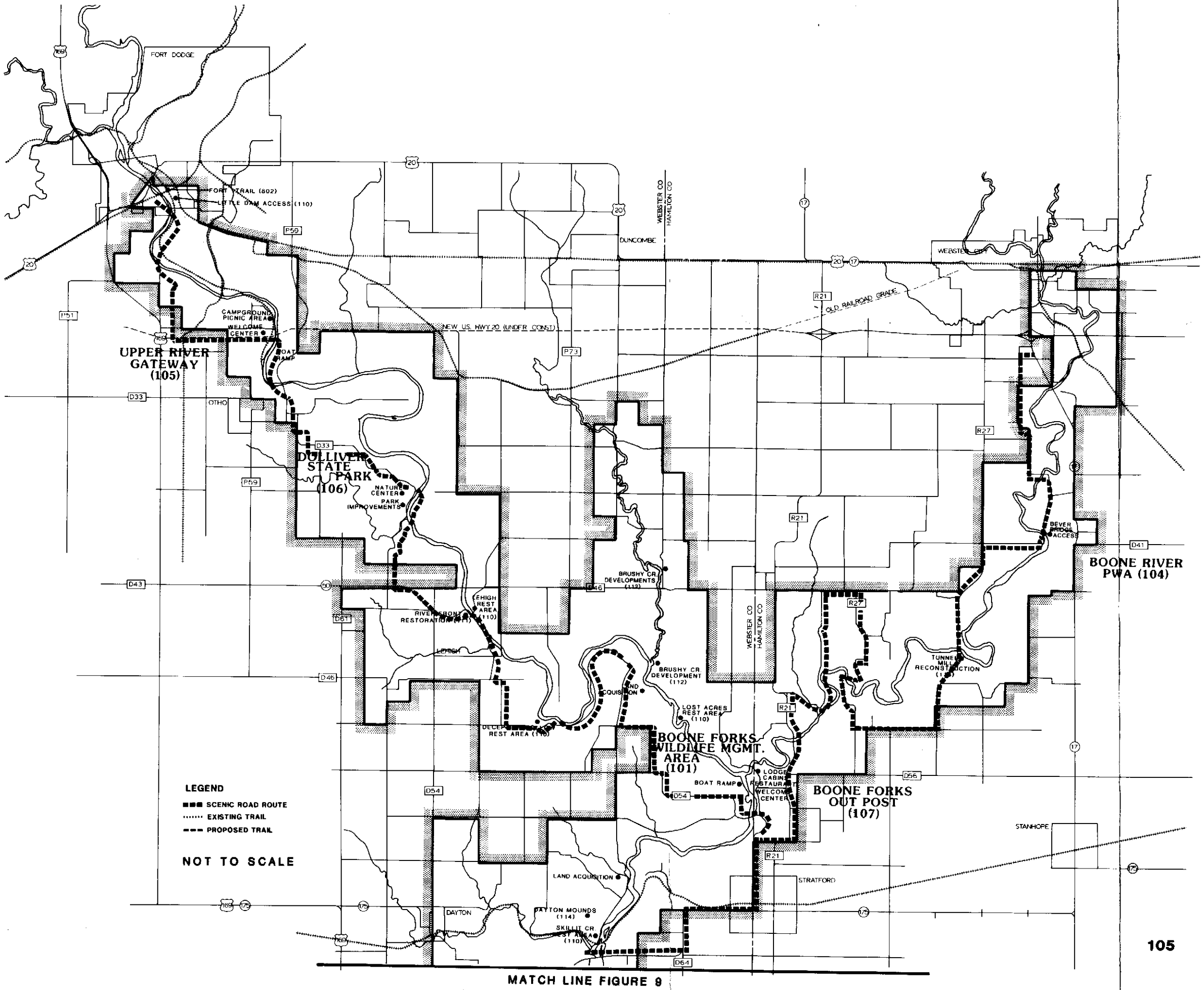
UPPER RIVER UNIT

Fourteen projects have been identified in the upper river area which include large areas of land acquisition, recreational developments, and rehabilitation or expansion of existing parks. Development is oriented toward maintaining existing wilderness conditions while providing recreational improvements for public access. The State of Iowa has identified approximately 66,000 acres for future long-term land acquisition for park development and environmental enhancment. Acquisition will be accomplished by donation or willing seller arrangements, and will not involve any condemnation of private property. Table 20 identifies the projects endorsed by the Advisory Committee as part of the master plan for the Upper River unit. The Upper River unit is shown on figures 8, 9, 10, and 11. Site-specific details are presented in Section 4, Plan for Initial Development, and Appendix A, Site Plans for Cost-Shared Projects.

TABLE 20

Proposed Upper River Unit Projects
Des Moines Recreational River and Greenbelt

Number	Title
101	Boone Forks Wildlife Management Area
102	State Forest Acquisition & Development
103	Ledges Recreation Area
104	Bever Bridge Canoe Access
105	Upper River Gateway
106	Dolliver State Park
107	Boone Forks Outpost
108	Carlson Recreation Area
109	Don Williams County Park
110	Waterway Trail
111	Lehigh Waterfront Restoration
112	Brushy Creek Developments
113	Tunnel Mill Reconstruction
114	Dayton Mounds



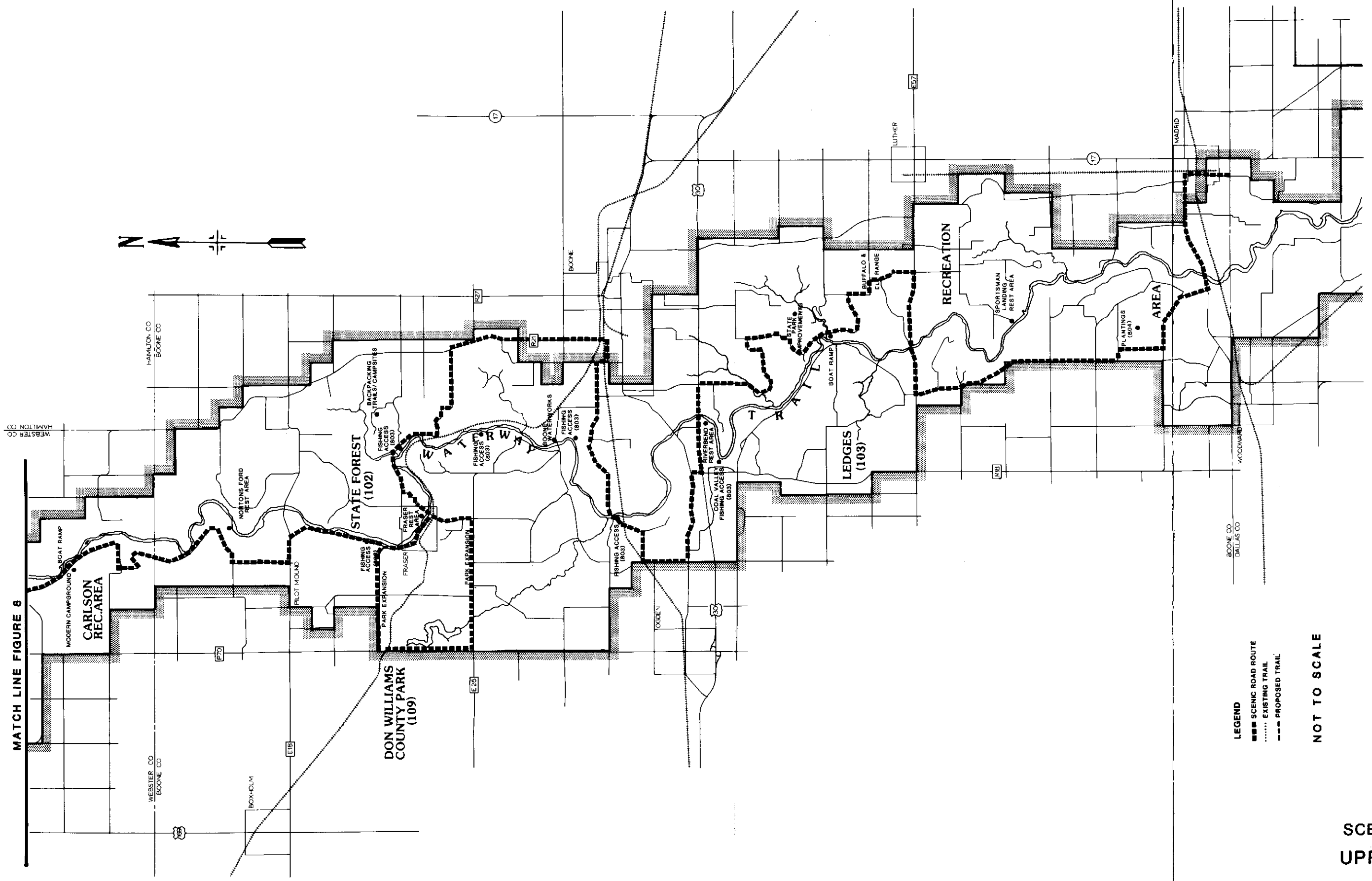
105

SCENIC ROAD ROUTE

UPPER RIVER UNIT

(Northern)

FIG

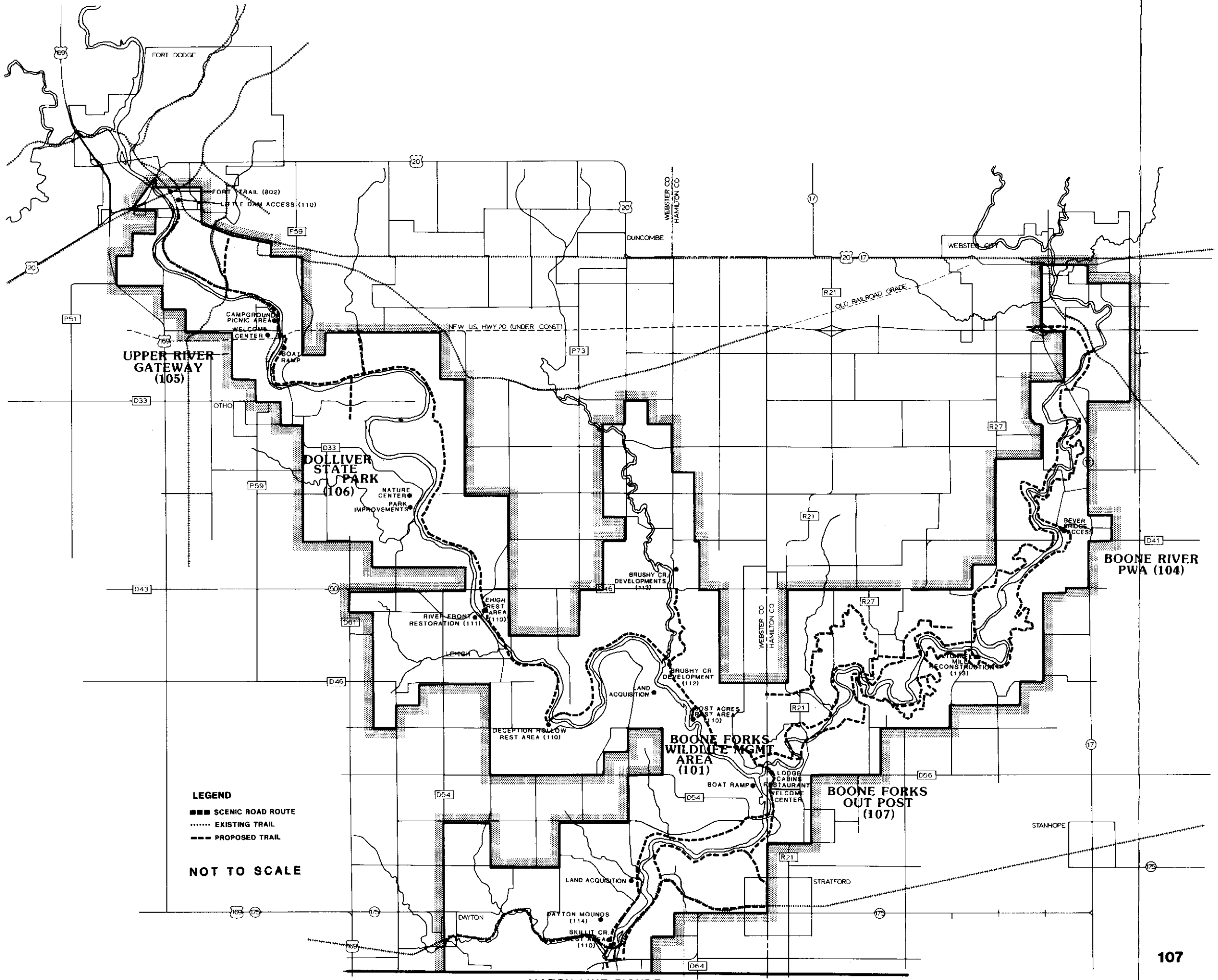


SCENIC ROAD ROUTE

UPPER RIVER UNIT

(Southern)

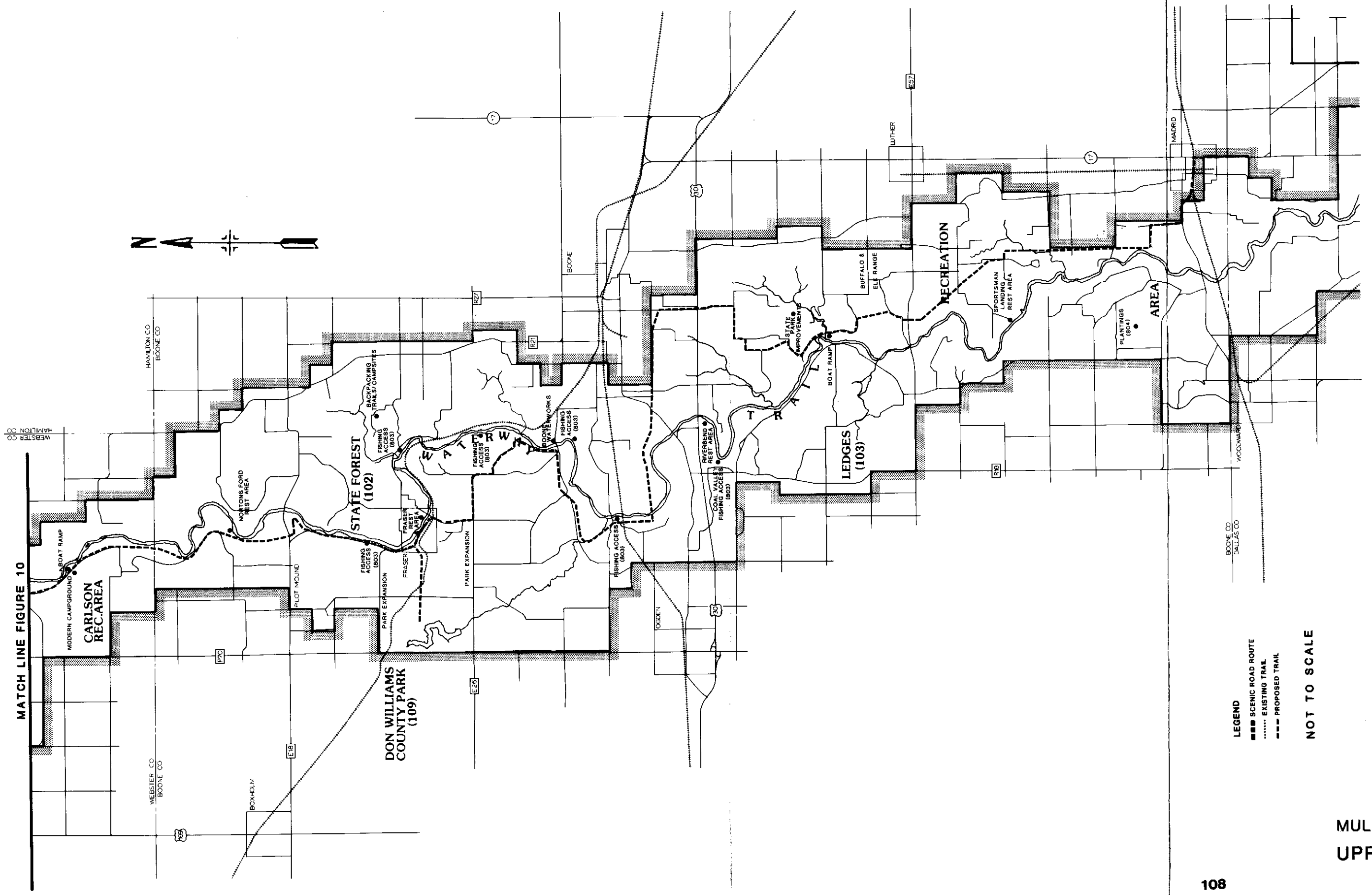
FIGU



107

MULTI-PURPOSE TRAIL
UPPER RIVER UNIT
(Northern)

FIGUR



MULTI-PURPOSE TRAIL

UPPER RIVER UNIT

(Southern)

FIG

Boone Forks Wildlife Management Area

The major component of this proposal involves the long-term acquisition of approximately 25,000 acres along the confluence of the Boone and Des Moines Rivers. The Greenbelt proposal extends the area of initial acquisition to include adjacent lands within the Greenbelt boundary. Development for this project would include parking lots, signs, and fencing.

The Boone Forks Wildlife Management Area is located along the Boone (near Tunnel Mill) and Des Moines Rivers (from Brushy Creek downstream to just above Skillet Creek). The project is for the acquisition of lands for the purpose of enhancing fish and wildlife resources. This program includes the Boone River PWA program. The Greenbelt proposal is an expansion of the State program to secure public domain of valued natural resources for wildlife conservation.

The State of Iowa has accomplished limited (non-Greenbelt) acquisition for the project. Two proposals for purchase of approximately 551 acres of private property bordering the Des Moines River within this area have been identified by the Advisory Committee. One property is located just upstream of Skillet Creek (225 acres) and the other property is located across from the confluence of Brushy Creek (326 acres).

State Forest Acquisition & Development

This project consists of the establishment of a 10,000-acre State forest along a 12.5-mile reach of the Des Moines River within the northern portion of Boone County. Some of this area already exists within State (Barkely State Forest-40 acres and Holst State Forest-333 acres) or Federal ownership. Development would include hiking trails, wilderness camp sites, horseback riding trails, and scenic vistas.

The forest cover in this area is of high quality and is a valued State resource. Placement of this property into public domain and trust will assure future generations the enjoyment and benefit of these resources. The State of Iowa presently owns approximately 136,000 acres (State-wide) of forestland, which includes areas classified as State forest, parks, recreation areas, wildlife areas, or preserves. Only 25,000 acres (State-wide) are within designated State forests, and there are no major forest units located within the Greenbelt.

Ledges State Park

This project is for the establishment of a 31,000-acre recreation area by combining an expanded Ledges State Park (1,136 acres) and existing State-managed lands at the Saylorville Wildlife Management Area. This area encompasses all of the lands within the Greenbelt boundaries extending from U.S. Highway 30 near the city of Boone to State Highway 210 at Madrid, a distance of approximately 17.3 river miles. Development would include park improvements within Ledges State Park (interpretive center, modern restrooms, new picnic shelters, renovation of stone shelters, hiking trails, small foot bridges, sanitary services, boat ramp, fishing accesses, and bank stabilization) and the establishment of a large (1,000 acres) buffalo/elk range.

In 1981, the State of Iowa completed a redevelopment master plan study for Ledges State Park. This plan defines recommended use areas, interpretive programs, facility development details, and land management programs for the existing park. Improvements proposed for Greenbelt projects are consistent with this plan. Expansion of Ledges State Park is intended to complement the existing park features and to expand available public access along the surrounding popular and unique natural resources of the Des Moines River valley.

Bever Bridge Canoe Access

This project consists of a canoe access point and parking lot at Bever Bridge on the Boone River in Hamilton County. The site would provide permanent access as a take-out point near the bridge.

The Bever Bridge access is presently privately-owned and under agreement with the Hamilton County Conservation Board for public use. The county maintains trash removal and patrols the public use. A parking area is not available, so use is presently made of the roadside shoulders. This location is a popular canoe access point and proper public facilities and access are needed. Acquisition of 5 acres of land and development of off-road parking are proposed.

Upper River Gateway

This project is located along the west bluff of the Des Moines River in Webster County adjacent to the new U.S. Highway 20 (520) alignment. A major new recreation complex is proposed to serve as an attraction for the public entering the Greenbelt area in the upper reaches. The proposal is considered a key feature for the Greenbelt program. Development associated with this project includes a large modern campground, family and group picnic grounds, a welcome center, and a boat launching facility.

Dolliver State Park

Improvements of existing park facilities are needed to upgrade and restore the park to accommodate existing and future demands. Development includes paving of roadways, new shower buildings and restrooms, picnic shelter, water distribution, and roadway culvert. An opportunity exists to acquire 20-acres of land adjacent to the park and this would be a valuable addition to the park property. During the initial master plan coordination process, the need for a major nature center facility was identified for location within park. The nature center would complement existing park features and would serve as an environmental education facility for the visiting public and school groups.

Boone Forks Outpost

This new area of development would be located at the confluence of the Boone and Des Moines Rivers and would consist of a combination of county and State recreational features. Proposed facilities include rustic style development of rental cabins or lodge rooms, restaurant, welcome center, and a boat launching facility. This area is intended to serve as a staging area for hunting, fishing, canoeing, and primitive camping.

Carlson Recreation Area

Improvements for this existing county park are proposed to upgrade the area for camping and boating. Proposed development includes a modern campground, boat ramp, and the placement of approximately 450 feet of riprap for bank. A facility is needed in this area since the nearest modern riverside facilities are Ledges State Park (29 river miles downstream) and Dolliver State Park (22 river miles upstream).

Don Williams County Park

Land acquisition is proposed to complement existing park features by expanding the natural setting and adding recreational opportunities. Expanding the county park boundaries to the east to the proposed State forest boundary will provide a continuous public access between these two areas. The connection will provide greater recreational opportunities for dispersed uses (e.g., primitive camping and hiking and nature trails). Complementary facilities associated with the Boone & Scenic Valley Railroad route which transects this area may be developed in the future.

Waterway Trail

Development of a waterway trail has been proposed to promote canoeing and boating along the entire unit. Support facilities along the route would include rest stops for picnicking or primitive camping, staging areas and boat ramps for river access, and access to cultural and natural features.

Rest areas would be spaced approximately 8 miles apart and coincide with existing park developments whenever possible. A mixture of modern and primitive facilities is planned, with the existing parks providing the modern facilities. Development of remote access sites for either water or trail access only is planned at various locations along the route.

Specific site locations have not been identified except for the Lost Acres location. Selected river access points or staging areas at the Little Dam Access (Ft. Dodge), Lehigh, Deception Hollow, Skillet Creek, Norton's Ford, Fraser, Boone Waterworks, Riverbend, and Sportsman Landing will provide support facilities for canoeing and camping. Individual site development needs will require detailed planning and coordination with the specific management agency (city, county, State, or Federal) for the area.

The level of development will vary for each site according to existing facilities, associated activities, and operation and maintenance considerations. The diversity of agency involvement and fragmented features of this project will require a cooperative effort to assure cohesion and full development of this concept.

Lehigh Waterfront Restoration

The city of Lehigh has proposed a project to restore Main Street store fronts to establish a historic appearance. Such improvements would help promote tourism and the historical significance of the community. This proposal was initially identified in a report prepared by the MIDAS Council of Governments for Webster County entitled: Des Moines Recreational River and Greenbelt, Webster County Plan for Development, dated February 1987.

Brushy Creek Developments

This project involves various improvements to complement the existing equestrian facilities and activities within the Brushy Creek State Recreation Area. Development would include an equestrian trail along Brushy Creek from the park to its confluence with the Des Moines River. A staging area is proposed near the confluence to facilitate public access to the main Greenbelt trail system, as well as connections to the equestrian trail spur along Brushy Creek. Another feature associated with this project is bank stabilization within the park to protect an access road.

Tunnel Mill Reconstruction

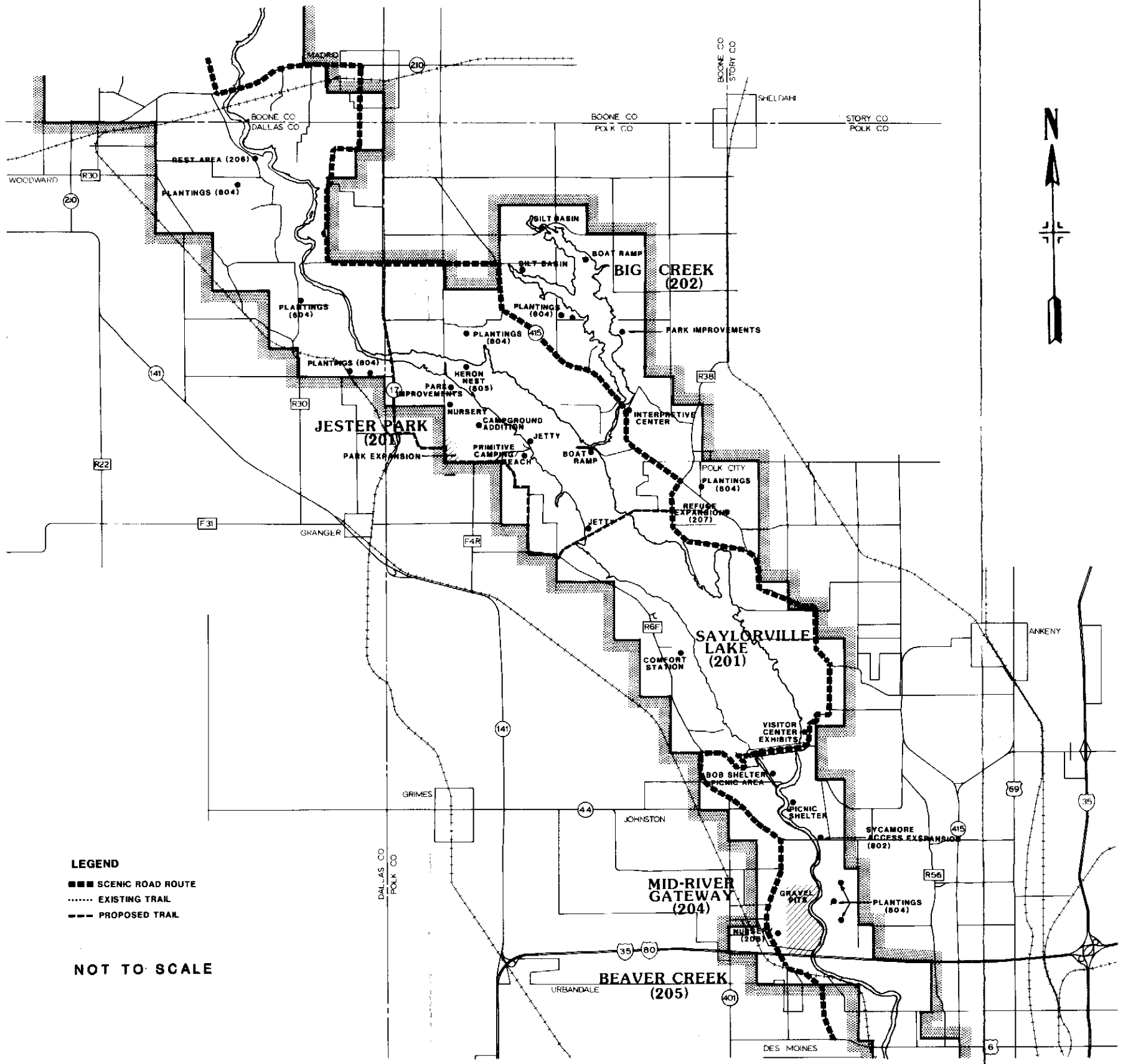
This project consists of the reconstruction (replica) of the original Tunnel Mill. The Boone River is noted for its many historic mill sites developed during early European settlement of the mid- to late-1800's, and reconstruction of such a facility is seen as a popular tourist attraction and historic interpretive feature. Tunnel Mill is the most unique of the 17 mills that were located along the Boone River. In 1852, Robert Watson constructed a 400-foot tunnel through a hillside around which the Boone River flowed, creating an 11-foot fall for the mill. This work is particularly noteworthy considering the tools and technique (pocket compass) used to dig a tunnel from both ends, and their meeting to within 18 inches in the center of the tunnel. The original mill was destroyed by a fire in 1889. Further coordination with the county and State is needed to develop detailed site plans and design.

Dayton Mounds

This area is located on a west bluff overlooking the Des Moines River valley east of Dayton. Development consists of the acquisition of 35-acres and construction of public interpretive facilities. The site is heavily vegetated and contains 10 conical and 7 linear Indian mounds. Development of this site will require careful attention to assure minimal disturbance of the cultural and natural resources. Specific site planning and development will require approval and cooperation with the appropriate State and Federal agencies.

SAYLORVILLE UNIT

There are eight conceptual projects located within the Saylorville unit. These projects include improvements within existing county, State, and Federal recreation areas; reclamation and development of abandoned gravel pits; establishment of a welcome center; wildlife management improvements; and various park and environmental improvement proposals. Table 21 identifies the projects endorsed by the Advisory Committee. Figures 12 and 13 provides a comprehensive illustration of the project locations. Site-specific details are presented in Section 4, Plan for Initial Development, and Appendix A, Site Plans for Cost-Shared Projects and Appendix B, Site Plans for 100-Percent Federal Projects.



LEGEND

■■■ SCENIC ROAD ROUTE
····· EXISTING TRAIL
– – – PROPOSED TRAIL

NOT TO SCALE

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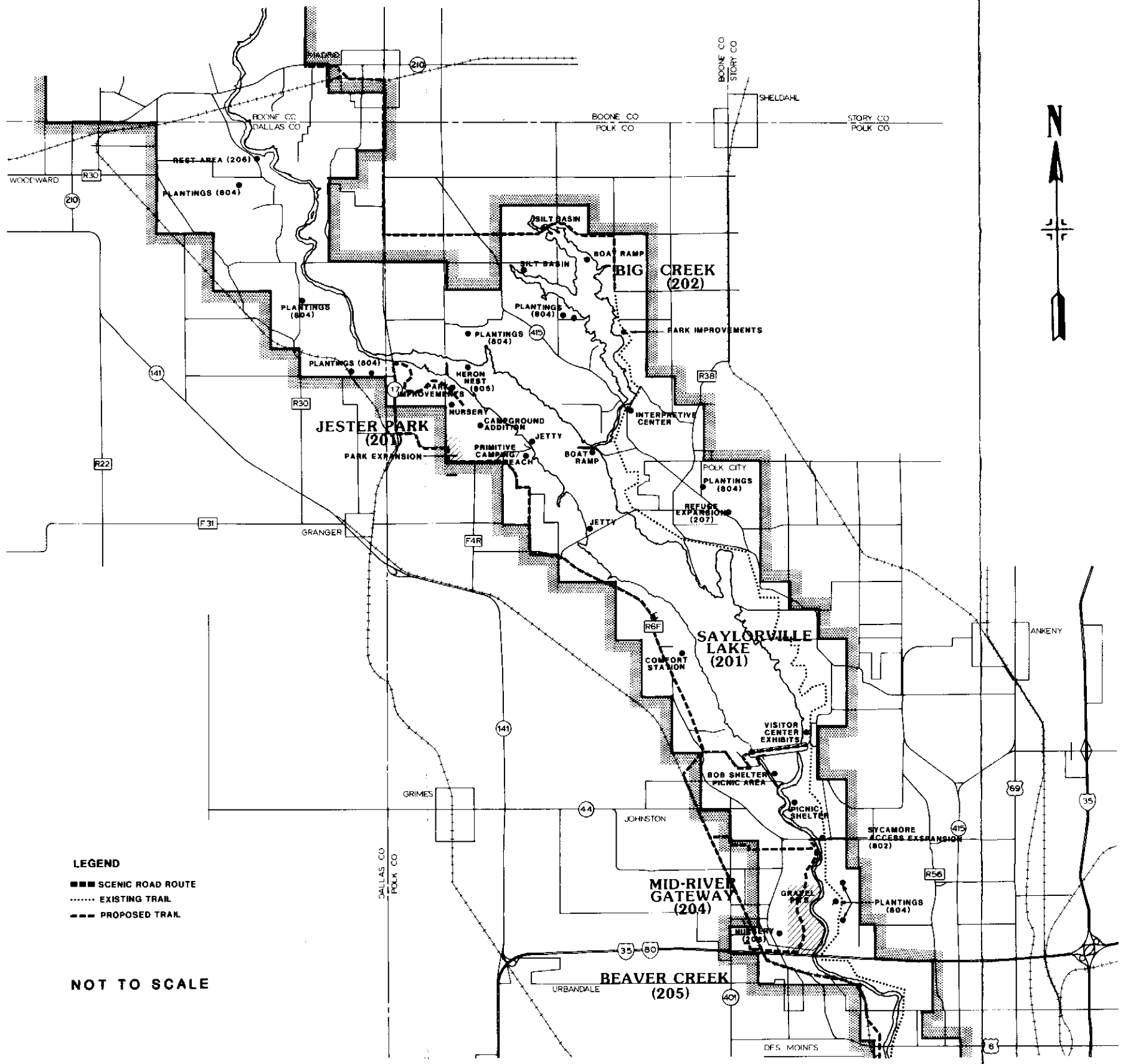
SCENIC ROAD ROUTE
SAYLORVILLE UNIT

FIGU



MULTI-PURPOSE TRAIL
SAYLORVILLE UNIT

FIGU

TABLE 21

Proposed Saylorville Unit Projects
Des Moines Recreational River and Greenbelt

Number	Title
201	Jester County Park
202	Big Creek Recreation Area
203	Saylorville Lake Developments
204	Mid-River Gateway
205	Beaver Creek Park
206	Upper Saylorville Rest Area
207	Saylorville Refuge Expansion
208	Johnston Nursery

Jester County Park

This project involves expansion and improvements to the existing park area. A need to increase the available recreational opportunities and to expand the park acreage has been identified to complement existing features and to accommodate future demand. Proposed development includes land acquisition, picnic grounds, boat ramps, development of a modern campground, swimming beach, and a nursery.

The Polk County Conservation Board has expressed a desire to acquire a 70-acre tract of land along the west border of the park for a day-use facility. This property is adjacent to the park's golf course and is bordered by county roads along the west and south edges. Proposed improvements are a golf driving range, two large shelters, baseball fields, volleyball courts, horseshoe pits, and a forest and sod nursery. A new park entrance from NW. 128th Street is proposed which will provide alternate access to the park during high-water on Saylorville Lake.

An alternative use of this 70-acre tract is expansion of the existing buffalo and elk pens. This option would be pursued only if the proposed buffalo/elk range presently sponsored by the IDNR is not implemented. The State feature is a part of the proposed Ledges Recreation Area (Project No. 103).

Expansion of the existing 25-trailer campground was considered early in the Greenbelt program as a prototype project. An overflow camping area which lies west of the existing campground is proposed for development of a modern 32-unit site. A circulation road, electrical hookups, a restroom/shower building, and water supply are planned as part of the proposal.

Additional campground development is proposed in conjunction with a new swimming beach in the area near the existing boat ramp along Jester Park Drive. Proposed campground facilities are limited in scope due to the flood-prone nature of the site. The shoreline area south of Jester Park Drive is proposed for development of a new swimming beach. All other existing natural swimming beaches along Saylorville Lake are located on the east side. The additional camping space would serve as an overflow area for the existing park campgrounds.

The proposed development in the extreme north-western portion of the park at the end of NW. 128th Street consists of an access road, two boat ramps (one at normal pool elevation and another at high water levels), and parking facilities. The area would be for for day use activities and access such as boating, hunting, fishing, hiking, and snowmobiling.

Expansion of the Polk County Conservation Board nursery would consist of establishing an additional 2- to 5- acres for native trees. Saplings from this nursery would be made available to landowners wishing to reforest erodible ground that drains into the Des Moines River. The nursery site is located along the west edge of the park near the end of NW. 128th Street.

Big Creek Recreation Area

Several proposed improvements have been identified to complement the existing park features. Environmental enhancement measures (shoreline riprapping and silt basin construction) have been identified to reduce and prevent degradation of the lake and shoreline. Proposed park improvements consist of construction of a large enclosed shelter, installation of several playground units, upgrading and relocation of a boat ramp, and development of an interpretive center. The shelter facility is proposed for large group activities on a rental basis. Development of a interpretive center would occur near the entrance to the park along the west end of the dam. This area presently contains a sheltered bulletin board and parking lot.

A boat ramp is proposed to facilitate fishing access in the upper reaches of Big Creek Lake. An existing unimproved boat ramp along the east shoreline near 150th Street is in poor condition due to insufficient water depths. Relocation and upgrading of this facility are proposed for an area located immediately downstream of the present site. Construction of the proposed silt basin within this branch should be undertaken before final siting is made for the boat ramp.

Environmental enhancement projects are proposed within the upper reaches of the lake and along the shorelines. These consist of silt basins for each branch of the lake to reduce siltation within the main lake. Proposed silt basin locations are at 149th and 150th Streets. In addition, 18 separate shoreline protection sites (riprapped banks) have been identified for areas along the east, west, and north shorelines of the lake.

Saylorville Lake Development

Proposals for this project involve improvements along the main body or tailwater area of Saylorville Lake. Improvements may involve either county, State, or Federal sponsorship. Proposed improvements include: additional facilities at existing recreation areas; development of a new day-use area; jetty protection for an existing boat ramp; construction of a new boat ramp; and modifications to the Corps of Engineers Saylorville Lake Visitor Center.

Two existing Corps of Engineers-operated recreation areas have been identified for additional facilities. A comfort station (flush toilet) has been proposed for the Walnut Ridge recreation area which is a picnic grounds along the west shoreline of the lake. A picnic shelter has been proposed for the Cottonwood recreation area located in the downstream tailwater. A new day-use area is proposed for the area located along the tailrace of the Saylorville Lake dam within the Bob Shetler Recreation Area. The proposed picnic grounds are part of the initial recreation development identified for the Saylorville Lake project. All of the proposed Corps of Engineers recreation areas are consistent with the approved (1984 revised) Master Plan.

Construction of a jetty at the county-maintained S&V Bridge boat ramp is proposed to improve launching and assure safe use of this existing facility. Prevailing winds and strong currents at this site produce difficult launching conditions. This area is located on Federal property along the west shoreline of the lake and was initially developed by the State of Iowa.

A boat ramp is proposed to facilitate fishing access at the Big Creek diversion channel outlet basin along the east shoreline of Saylorville Lake. This area is a very popular fishing spot and the nearest boat launch along the east shoreline of Saylorville Lake is several miles downstream at the Sandpiper Recreation Area.

Minor modification to the existing Saylorville Lake visitor center are proposed to accommodate information and displays for the entire Greenbelt. Modifications would include room for displays, exhibits and general information concerning the Greenbelt.

Mid-River Gateway

This proposed project would be located along the west bank of the Des Moines River upstream of Interstate Highway 35/80 within the city limits of Johnston. The area presently contains several abandoned gravel pits with large wooded tracts adjacent to the riverbanks. The gravel pits are privately owned and the wooded tracts are on Federal lands in the Saylorville Lake downstream corridor. Proposed development of the site includes reclamation of the gravel pits for fishing, facilities for lake and riverside recreation, and development of a welcome center.

The area was initially identified by the Polk County Conservation Board for a fishing access. However, the Advisory Committee recommended that a welcome center be located near the Interstate Highway system. This site is being considered since it is visible from the highway and has convenient access to State Highway 401. Additional coordination with the city, county, and State is needed during development of detailed site plans.

Beaver Creek Park

This project consists of the development of a day-use park located along the former confluence of Beaver Creek and the Des Moines River downstream of Interstate Highway 35/80. The existing 99-acre wetland would be converted into a 40-acre recreational lake. Careful attention will need to be given to any modification of wetlands to to avoid detrimental impacts to the overall natural resource. Additional coordination with conservation agencies and groups will be needed during the detailed planning stage.

Upper Saylorville Rest Area

This area would be developed for primitive camping to complement the proposed Waterway Trail in the Upper River unit. The proposed canoe route extends from the upper reaches of the Greenbelt to Jester County Park. Improvements would include an access road, primitive camping area and a boat ramp.

Saylorville Refuge Expansion

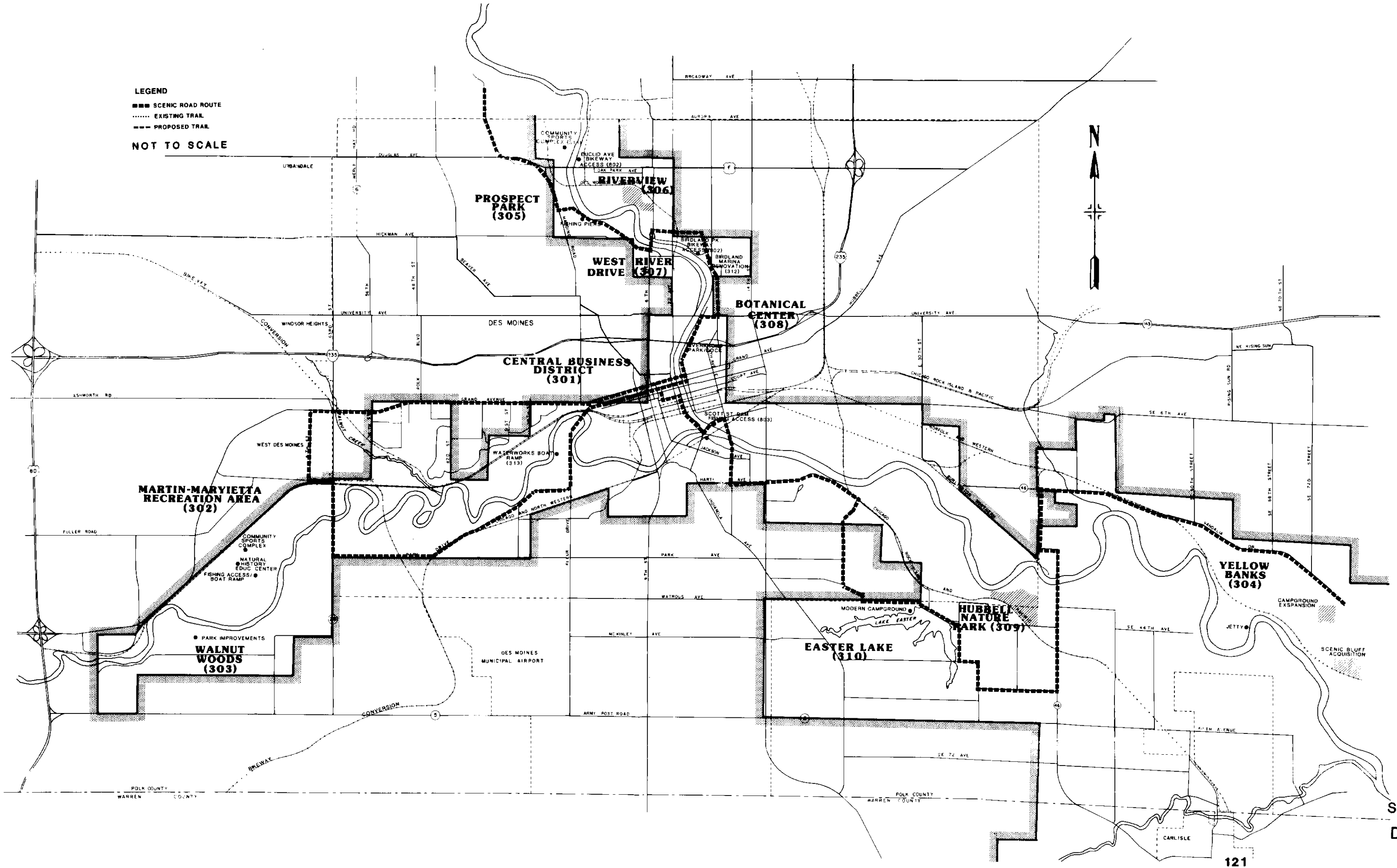
This proposal consists of expanding the State-managed 551-acre waterfowl refuge created by the Big Creek barrier dam near Polk City. Proposed improvements would include installation of a water control structure and improvements to the dike along the abandoned portion of old Iowa Highway 415. This will provide an additional 50- to 75- acres of prime waterfowl habitat. In addition, a wildlife observation platform would provide an opportunity for bird watching, photography, and educational programs.

Johnston Nursery

This proposal consists of the establishment of a nursery for the city of Johnston behind Bomber Park (baseball field) along NW. Beaver Drive. The 2- to 5-acre nursery would be planted with native trees and shrubs for reforestation and landscaping for city parks and property. The proposed nursery site is an open bottomland area used for agricultural purposes.

DES MOINES UNIT

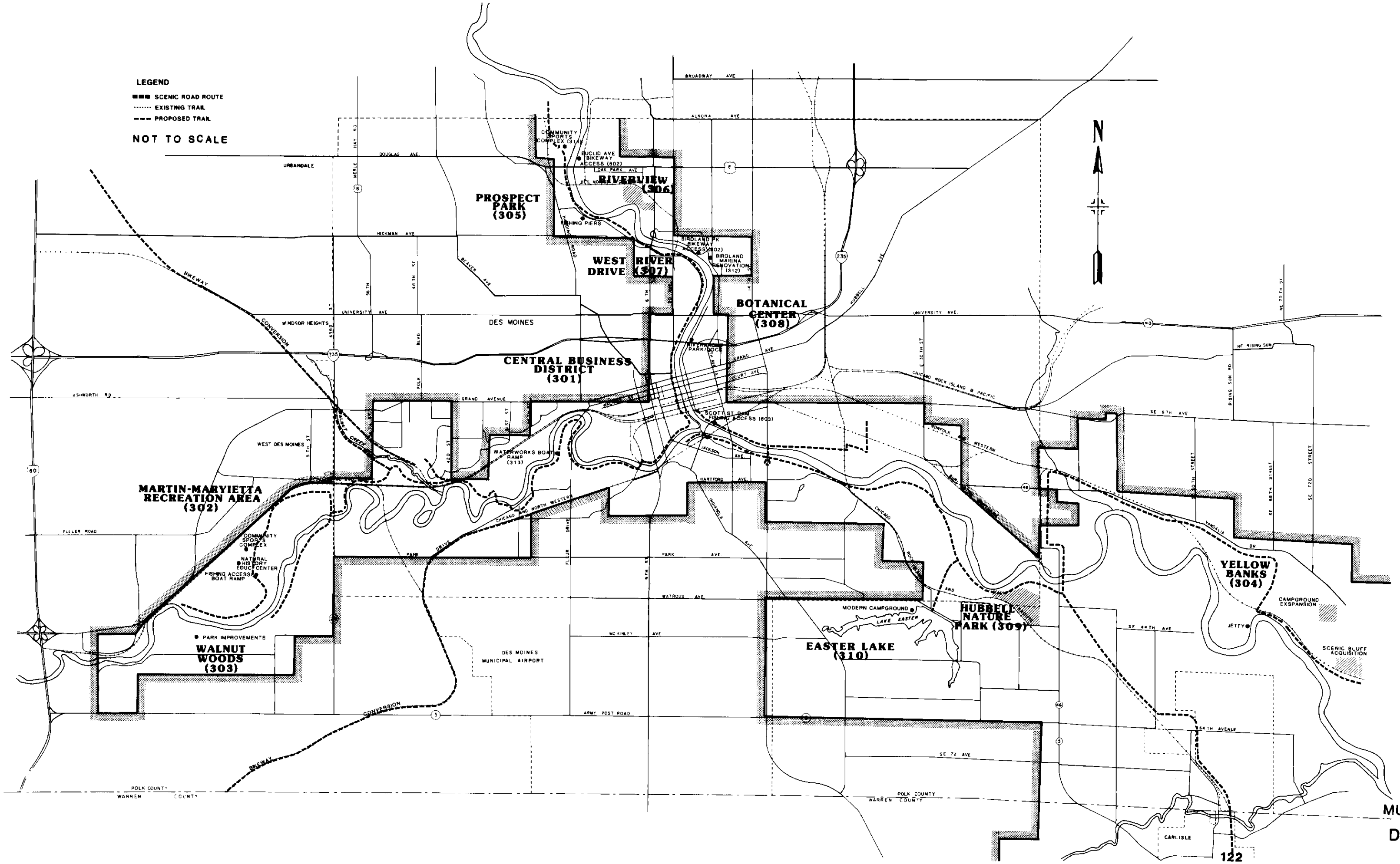
The Des Moines unit has 14 individually identified projects. These projects consist of riverfront development along the central business district, reclamation of abandoned gravel pits, development of an urban sport complex, and improvement of existing city, county and State parks. The Advisory Committee has recommended further study the possibility of establishing a continuous boatway between Saylorville Lake and Lake Red Rock along the Des Moines River. Figures 14, 15 and 16 provide a comprehensive illustration of project locations. Table 22 identifies the proposed projects endorsed by the Advisory Committee, and represents the initial master plan for the Des Moines unit. Site-specific details are presented in Section 4, Plan for Initial Development, and Appendix A, Site Plans for Cost-Shared Projects.



SCENIC ROAD ROUTE
DES MOINES UNIT

DOWNTOWN AREA
(Des Moines Unit)

NOT TO SCALE



MULTI-PURPOSE TRAIL
DES MOINES UNIT

TABLE 22

Proposed Des Moines Unit Projects
Des Moines Recreational River and Greenbelt

Number	Title
301	Des Moines Riverfront
302	Martin-Marietta Recreation Area
303	Walnut Woods State Park
304	Yellow Banks County Park
305	Prospect Park
306	Riverview Park
307	West River Drive Riverfront Park
308	Botanical Center
309	Hubbell Nature Park
310	Easter Lake Park
311	Community Sports Complex
312	Birdland Marina Renovation
313	Des Moines Waterworks Boat Ramp
314	Des Moines River Boat Traffic

Des Moines Riverfront

The downtown riverfront of the city of Des Moines contains public buildings (city hall, armory, Federal court house, county office building, and the library), civic buildings (civic center and YMCA), public parks (Riverside Park, Riverside Drive, and Pete Crivaro Park), and private commercial enterprises (see figure 17). The Des Moines River has been an instrumental part of the culture and history of the area, and has served as the heart of the city since the establishment of Fort Des Moines in 1843 (now Riverside Park). A 1976-1977 study of the city of Des Moines architectural and historic districts recommended that the riverfront area be nominated for listing in the National Register of Historic Places. Proposed improvements along the riverfront include a riverbank promenade, development of a riverfront plaza (along each bank), extension of an existing transit mall, bridge restorations, park improvements, rowing marina and development of a visitor center.

The proposed river's edge pedestrian promenade will include 6,000 feet of paved walkway adjacent to the existing ballustrade. The walkway would extend from the Center Street dam to Sec Taylor Stadium on the west side and from the Botanical Center to the Court Avenue bridge on the east side. Single globe lights will be mounted on the ballustrade extending south to the Scott Street bridge on the east and south to wrap around the fork with the Raccoon on the west. In addition, benches and landscaping will be provided to enhance the experience of strolling and relaxing by the river. The promenade will be of classical design, complementary to the existing historic buildings

Pedestrian underpasses will be restored on the east end of the Walnut Street bridge, the Locust street bridge, and the Grand Avenue bridge. Underpasses are still in place on the west side of each of these bridges. Access steps leading down to the promenade will be constructed as part of this proposal on the riverfront adjacent to Sec Taylor Stadium and on both sides of the river at each of the four main downtown bridges - Court, Walnut, Locust, and Grand. Handicapped access to the promenade will be provided at the site of the proposed downtown riverfront plaza on both sides of the river.

The proposed urban riverfront plaza will be the main location for gatherings and recreation, and a major access point to the proposed walkway. The urban plaza will include paved areas, folding floodwalls, seating areas, drinking fountains, extensive landscaping, lighting, art, and will provide access for the handicapped to the river promenade. It will be designed to accommodate events year around and function even in the winter.

The plaza will have coordinated east and west components and a connecting link. The west component of the plaza will provide for an extension the library with the addition of an outdoor reading court, landscaping and terraces. The east component will provide a major pavillion with fountains and public art. It will be designed for ice skating in the winter and outdoor events in the summer, such as concerts, fireworks, and festivals. The connecting component will be a pedestrian link from the Walnut Street Transit Mall on the west side to Locust Street on the east side.

Another proposal is a connection between the Walnut Street Transit Mall and the Des Moines River. The Walnut Street Transit Mall accommodates buses, pedestrians, and bicycles. Proposed plans are to extend the existing mall one block with improvements to include special paving, light fixtures, benches, street trees, storm water systems, pedestrian crosswalks, and concession buildings. Associated improvements will include bike racks to complement the bike trail along the riverfront and along Walnut Street.

Rehabilitation has been proposed for the early 20th century decorative features of the existing Walnut, Locust, and Grand Avenue bridges. The improvements would consist of retaining the existing primary structure of each bridge and incorporating the bridges into the city's Riverfront Plan by: (1) restoring a balustrade similar to that on the river wall; (2) installing period light fixtures; and (3) restoring or replacing decorative items on the sides of the bridges.

The proposed rehabilitation of the bridges will complement the improvements that are proposed for the Des Moines riverfront. Rehabilitation of the bridges will primarily enhance the recreational activities of walking and sightseeing, but also will promote a uniform and visually attractive environment in harmony with long-time city goals in character with the natural and human-made landscape.

Rehabilitation of the existing Pete Crivaro Park has been proposed to provide a formal, passive sitting park of classic design. The park provides a place for fishermen, roller skaters, joggers, walkers, and bicyclists. Improvements include paved walkways and steps, regrading, landscaping, benches and picnic tables, a drinking fountain, additional bike racks, trash receptacles and a major piece of public art, lighted and surrounded by special plantings. Proposed improvements will require removal of a portion of the earthen levee which would be replaced by a folding floodwall.

Another proposal is for a recreational rowing marina facility at the YMCA riverfront, designed for city-wide use and operated by the City of Des Moines Recreation Department. The facility would be oriented toward family activity and recreational rowing, as well as available for use by the YMCA for established recreational programs. There would be a floating dock area with piers, and a ramp for pulling boats into a preparation area and boat bays built on the bank of the river. A viewing deck with tables and covered picnic areas, accessed by formal stairs, would be provided for leisure watching of the river activities from the top level of the boat bays. The marina facility would be equipped with storage to house sculling boats, handicapped rowing equipment, canoes and kayaks, along with a restroom area.

Development of Riverside Park as a visitor center is proposed, which will emphasize the history of the city's growth. Other interpretive features will include archaeological information, environmental education, and various recreation information (e.g., bike trail, canoe trip, fishing, etc.). This will be built around the theme of this area as the original Fort Des Moines settlement which later became the city of Des Moines. It includes construction of visitor center, bank stabilization, extensive landscaping to create a park setting, road and parking improvements, picnic facilities, access point to the pedestrain walkway, and a canoe drop-off point.

The visitor center also will include concessions with a lookout located on a second level for scenic viewing and equipment rental for such items as tandem bicycles, skates, and cross country skis. It will function as a center of "non-boating" recreational activity for the urban river area. A large scale art piece will mark the juncture of the two rivers and this important historic site where Des Moines began.

Martin-Marietta Recreation Area

This project consists of the development of a 703-acre abandoned gravel pit area located along the north bank of the Raccoon River east of Interstate Highway 35 in the city of West Des Moines. Proposed development includes acquisition of 703 acres, paved access roads, an outdoor sports complex, picnic facilities, a boat ramp, nature trails, public beach, fishing access, modern restroon/shower buildings, parking lots, an environmental education center, marsh restoration, and a campground.

The outdoor sports complex will serve the needs of the three most popular, fastest growing active recreational activities in the State of Iowa: swimming, softball, and soccer. Considering the proposed trail system, existing road accesses, and the close proximity of State and county parks, this general area may serve as a multi-purpose recreational focal point for central Iowa.

Proposed development of the environmental education center consists of a building wherein Indian artifacts, taxidermy displays, and other environmental education aides could be stored and displayed for naturalist programs. The building would include a storage area, limited office space, large display area, and a conference room. Additional development might include a reproduction of an Indian burial mound.

Walnut Woods State Park

This project consists of several park improvements and a campground. Proposed improvements to the park are expansion of the existing campground (25 additional sites, restroom/shower building, and trailer sanitary dump station) and picnic area (four new picnic shelters and two modern restroom facilities). A proposal was identified to acquire additional land for the State park along its western edge of the river to connect with the Brown's Woods county forest preserve.

Yellow Banks County Park

Addition of a new campground, a scenic bluff acquisition, and a breakwater (jetty) for the existing boat ramp have been identified to enhance the Yellow Banks County Park area. The proposed campground addition includes acquisition of 40-acres. The site borders the eastern edge of the park and is presently in cropland (16 acres) and pasture (24 acres). The proposed development will include modern facilities (e.g., access road, camping pads, electrical hook-ups, combination restroom/shower building, and playground equipment). This additional camping area is needed to meet present public demand which is unable to be fulfilled by the existing facilities.

Acquisition of a 120-acre tract along the southeast edge of the park is proposed for wildlife management and limited recreation. The area presently consists of 10 acres of cropland, 45 acres of woodland, and 65 acres of pasture land. Resource management of the area will be primarily for wildlife habitat. Development will be limited to establishing a hiking trail as a link to the existing park system, and scenic overlook areas with picnic and primitive camping sites.

Another proposed park improvement is the construction of a breakwater at the existing boat ramp. The current at this site makes launching boats difficult. A breakwater would help to slow or divert the current from the bank and ramp. This may also reduce maintenance of the ramp by reducing the silt accumulation and stabilizing the shoreline.

Yellow Banks is an alternate location for the proposed nature education center identified for the Martin-Marietta recreation complex (project no. 302). Yellow Banks has a rich history of Indian occupation, and contains an Indian mound within its present boundaries.

Prospect Park

This project involves the proposed bank stabilization along a three-quarter mile stretch of the Des Moines River at Prospect Park. This park was recently renovated by the city of Des Moines and the Corps of Engineers as part of the Saylorville Lake downstream corridor project. However, additional improvements are needed to protect the new boat dock and ramps, and to prevent further erosion of the park's tree-lined banks.

Riverview Park

This project involves the development of the former 30-acre riverview amusement park site as a city park and riverfront recreation area. The site is owned by the city of Des Moines and lies adjacent to the Des Moines River. The development will complement existing recreational facilities within the area (East River, Saylorville Lake corridor trail, and McHenry Park). Proposed improvements include streambank stabilization, picnic areas, fishing (lagoon and river), water-based sports, utilities, restrooms, bike trail, landscaping, lighting, playground equipment, a small playfield, and wildlife habitat enhancement. Proposed facilities emphasize specialized recreation (paddle-boating, winter sports, handicapped accessible recreation area) generally not available in other parks.

West River Drive Riverfront Park

The proposed project provides for the continued upgrading and beautification of the levee and riverfront areas on the west side of the river from University Avenue north to Second Avenue. Proposed improvements include: trash and debris cleanup, clearing, grading, seeding, landscaping, signs, and picnic equipment. Also included is the extension of West River Drive along the top of the existing levee from University Avenue to Second Avenue at Franklin Avenue. This area of riverfront and levee has been neglected for many years and would greatly benefit from a project to beautify and enhance the riverfront.

Botanical Center

The project involves the proposed construction of a riverfront picnic area and boat dock along the east bank of the Des Moines River at the Botanical Center. Proposed facilities will provide a location for group activities and will expand the recreational opportunities along the downtown riverfront. Proposed park improvements include: picnic facilities, walkways along the riverbank and across East River Drive to the Botanical Center, landscaping, sitting areas, benches, security lighting, trash receptacles, ramped access for handicapped persons, and a deck or terrace overlooking the river. Also included are interpretive signs documenting the geological and natural history of the Des Moines River. The proposed dock development involves the construction of a courtesy dock to accommodate 8 to 10 boat slips/spaces. The new dock will provide improved tie-up facilities for recreational boaters and excursion boats

Hubbell Nature Park

The project is for the redevelopment of the 107-acre Hubbell Park adjacent to the Des Moines River at SE. Brooks Drive. This park surrounds a former gravel pit which forms an 80-acre lake which has no outlet to the Des Moines River. The park has been closed to the public since 1984, and is in need of complete renovation. Prior to 1984 it had been used for many years as an off-road-vehicle area. Principal development would be as a naturalistic park devoted to the interpretation of plants and animals in the urban setting, along with limited use for fishing and non-motorized boating. Proposed development includes: roads, trails, parking areas, wildlife habitat, waterfowl management areas, signs, small boat access, fishing platforms, and picnic areas.

Easter Lake Park

The proposed project involves establishment of a new modern campground area within Easter Lake County Park in southeast Des Moines. The proposed area of development in the park is along the north shoreline of the lake near the existing swimming beach. Proposed facilities include an access road, trailer camping spurs, electrical hook-ups, restroom/shower building, and a water distribution system. This new facility will complement existing park features. An existing primitive camping area is located along the west end of the lake's southeast finger.

Community Sports Complex

The project involves the proposed development of an outdoor sports complex on lands within the Saylorville Lake downstream corridor north of Euclid Avenue and east of Harding Road. Proposed improvements include six (6) lighted softball fields, two (2) soccer/flag football fields, concession buildings, park maintenance building, access roads, parking areas, hiking trails, signs, fences, softball fields, drinking fountains, playground equipment, picnic area with open shelter, and site utilities. This project will serve an immediate need in the north part of the city of Des Moines for additional softball fields. The development was identified in the master plan prepared by the Corps of Engineers for the Saylorville Downstream Corridor in 1981. The city of Des Moines continues to have an expressed interest in the development of this facility.

Birdland Marina Renovation

The proposed project involves the renovation of the city-owned Birdland Marina at Birdland Park. The marina was originally constructed in the mid-1960's, and is in serious need of complete upgrading in order to make it fully functional and usable by the boating public. The proposed reconstruction includes: dredging the harbor and entrance passage, new docks and slips, riprapping, fencing, utilities replacement, boat trailer parking (resurfacing an existing parking lot), boat ramp improvements, support facilities, concession building, and restrooms. The city proposes to lease the renovated facility to a private concessionnaire for long-term operation and maintenance. The project will greatly enhance recreational boating opportunities on the Des Moines River in the city.

Des Moines Waterworks Boat Ramp

The project consists of the development of a boat ramp along the south bank of the Raccoon River within the Des Moines Waterworks park area. Proposed improvements include a single lane concrete ramp and car-trailer parking. In addition to providing boating access for this portion of the river, the facility will serve as a staging area for canoes.

Des Moines River Boat Traffic

The project is for the opening the Des Moines River from Saylorville Lake to Lake Red Rock to boaters, rowers, and canoers for continuous travel between these two lakes and for direct access to downtown Des Moines. It will permit users to experience both the countryside and the urban centers on a single river trip of approximately 42 miles and to experience both lake and river boating.

Opening this stretch of the Des Moines River to continuous boat travel, in addition to the creation of a continuous system of recreation trails, will unify the Greenbelt. The project also may help to stabilize the streambank by eliminating the widely fluctuating water levels. The scope of such a proposal requires a comprehensive detailed study of environmental, social, and economic impacts.

This proposal will require removal of the Scott Street and Center Street dams at Des Moines, dredging of the Des Moines River, the establishment of an acceptable range for water fluctuation, and coordination of release flows from Saylorville Lake. Any new dams required will be constructed south of the existing Scott Street dam and equipped with movable gates which will be adjusted in unison with the gates of the Saylorville Lake project. An alternative is the construction of this type of dam as part of the on-going CBD Loop Arterial project. Dredging of the Des Moines and Raccoon Rivers may be required to provide additional water depth in the channel.

A significant feature of the boat traffic will be the proposed construction of a marina which will provide dock space for approximately 250 boats. The marina will serve the 30,420 boat owners registered in the 9 counties along the Greenbelt by providing docks, repair facilities, overnight tie-up facilities for houseboats and cabin cruisers, fueling facilities, sanitary dump stations for motorized boats, canoe and rowboat rentals, storage of rowing shells, and boat launch/take out ramps. The implementation of the marina proposal is dependent upon opening up the river to boat traffic adjacent to the downtown.

A part of the boat traffic proposal would be for the repair of levees. A specific proposal is removal of trees and placement of riprap on the north bank of the Des Moines River from SE. 6th Street to SE. 9th Street, and on the south bank of the Raccoon River between SW. 7th Street to Jackson Street. This also would include extension of some storm sewers and several flap gates. Sections of the Des Moines and Raccoon Rivers have become extremely susceptible to erosion, and riprapping may be necessary before the next major flood event. The existing levee on the Des Moines River is very narrow and steep and has been noted as requiring repair on Army Corps of Engineers' inspections the previous 2 years.

Another levee repair proposal is reconstruction of a damaged portion of the sloped concrete river wall on the west bank of the Des Moines River between the MacVicar Freeway and University Avenue. This portion of river wall was damaged during the prolonged high water in the spring of 1984 due to the increased discharge from Saylorville Lake. If the damaged sections are not replaced, further erosion and deterioration of the wall will occur.

The remaining levee repair need is for riprap revetment protection for an existing 10-foot-wide, sloped concrete river wall along both banks of the Des Moines River from Center Street Dam to University Avenue bridge (approximately 3,000 feet on each bank). These walls were originally constructed in the late 1960's. There is an immediate need to protect these river walls from further erosion since a portion of these walls has already failed due to prolonged high water during 1984.

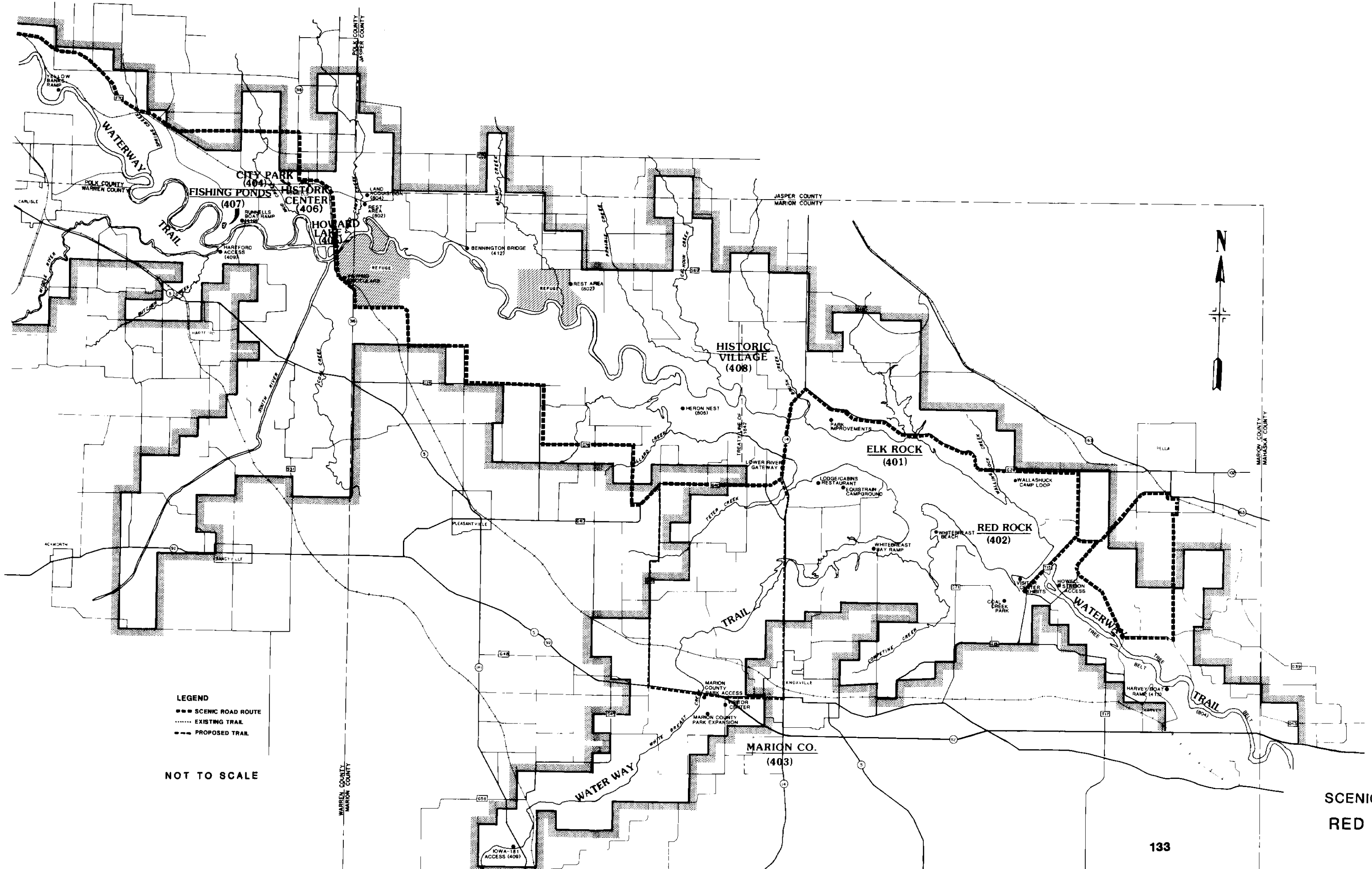
RED ROCK UNIT

There are 13 projects within the Red Rock Unit which include improvements within existing county, State, and Federal recreation areas, creation of a large bottomland subimpoundment (lake), development of an historic interpretive center, waterway trail accesses, and boat ramps. Table 23 identifies the projects endorsed by the Advisory Committee and represents the initial master plan for the Red Rock Unit. Figures 17 and 18 provide a comprehensive illustration of proposed projects within this unit. Site-specific details are presented in Section 4, Plan for Initial Development, and Appendix A, Site Plans for Cost-Shared Projects and Appendix B, Site Plans for 100-Percent Federal Projects.

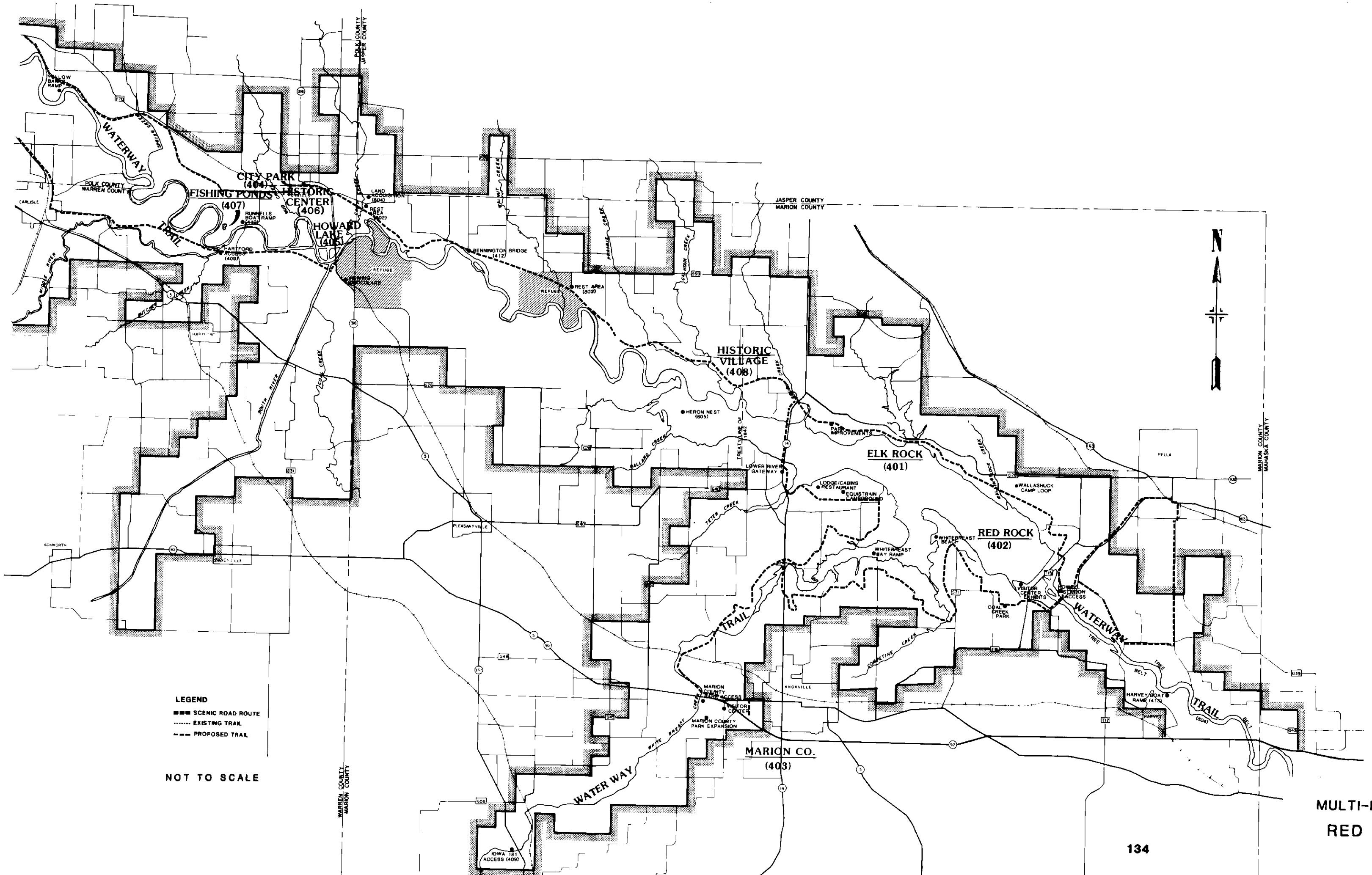
TABLE 23

Proposed Red Rock Unit Projects
Des Moines Recreational River and Greenbelt

Number	Title
401	Elk Rock State Park Improvements
402	Lake Red Rock Development
403	Marion County Park Expansion
404	Runnells City Park Improvements
405	Howard Lake Subimpoundment
406	Congregational Church Historic Center
407	Camp Township Fishing Pond(s)
408	Red Rock Line Historic Village
409	Waterway Trails
410	Runnells Boat Ramp
411	Refuge Viewing Binoculars
412	Bennington Bridge Access
413	Harvey Boat Ramp



SCENIC ROAD ROUTE
RED ROCK UNIT



MULTI-PURPOSE TRAIL
RED ROCK UNIT

Elk Rock State Park Improvements

Proposed development within the park includes a lodge/restaurant building, rental cabins, a new equestrian campground facility, establishment of a welcome center (Lower River Gateway), park improvements and bank protection.

Establishment of a welcome center in conjunction with development of a lodge/restaurant type has been identified by the State for the west unit of Elk Rock State Park. The lodge will provide accommodations for group gatherings. Incorporation of a welcome center attraction for the Greenbelt project will complement these proposed facilities, and serve as a major concentration point for public awareness.

Proposed park improvements in the north unit (day-use area) include paving of access roads, construction of an interpretive center, a shelter, a swimming beach, and a wildlife observation tower. A unique feature of these proposals is the modification of a 90-foot tubular water tower into an observation tower. A platform would be constructed on top of the tower with observation ports along an inside stairway.

In the south unit (campground area) of the park the proposed improvements include renovation of a sanitary lift station, improvements to two existing boat ramp parking lots, paving access roads, renovation of a sanitary dump station, installation of electrical hook-ups for camping units, construction of rental cabins, development of an equestrian campground, and a new amphitheater.

Selective riprapping has been proposed for approximately 5,000 linear feet of shoreline along the north and south units of the park. Additional on-site inspection of identified locations will be needed to determine the scope and extent of slope protection needed.

Lake Red Rock Development

Proposals involve improvements identified along the main body area of Lake Red Rock. Improvements would include a 340-acre park, modification to an existing swimming beach area, expansion of a modern campground facility, and minor modifications to the lake's visitor center.

Development of a new 340-acre park has been proposed along the west ridge of Coal Creek Bay near the South Overlook. This area is Federally owned and would be developed for day-use and primitive camping. Access is not available and would need to be acquired along the unmarked county road which parallels the west boundary of the area. This area contains several wooded tracts along the slopes and ridges, and trees have been planted on open slopes and ridges. A conceptual site plan was prepared in 1979 by the Corps of Engineers as a supplemental report to the project master plan. The report has not been approved.

The Corps of Engineers swimming beach at Whitebreast Recreation Area is in need of improvement as a result of wave erosion and shifting sand. Redevelopment of the area includes relocation of the beach and parking area, new access road, a new boat ramp facility, a beach house, a small fishing pond, and a bike trail. All the proposed improvements for this area will be designed to accommodate the proposed pool raise presently under study by the Corps of Engineers.

Expansion of the Corps of Engineers camping facilities at Wallashuck Recreation Area would consist of a 35-unit camping loop north of the existing campground. Improvements will include paved access road, sanitary facilities and utilities, camping pads, and a nature trail. This development is identified in the Resource Master Plan, Design Memorandum 24b, Red Rock Dam and Lake Red Rock, dated December 1976.

Minor modification to the existing Corps of Engineers Lake Red Rock visitor center is proposed to accommodate Greenbelt information. Modifications would include addition space for displays and exhibits pertaining to the entire Greenbelt.

Marion County Park Expansion

The project involves the expansion of the park to improve stream access and visitor center accommodations. Land would be acquired west of the existing park to connect with Federally owned property along Whitebreast Creek. Additional improvements include expansion of the existing campground, canoe access (including primitive campsites), and development of a large visitor center.

Runnells City Park Improvements

The city of Runnells has proposed improvements to the park including tree plantings, non-modern camping units, and sanitary facilities. These improvements will complement existing recreation facilities in the park and provide expanded opportunities.

Howard Lake Subimpoundment

The proposed project consists of developing a low-level dike within the Des Moines River floodplain southeast of Runnells. The subimpoundment would be divided by State Highway 316. There are currently three small lakes in this area, one of which is known as Howard's Pond. The pond was a popular fishing and recreation area even prior to the operation of Lake Red Rock. The other two lakes (east of the highway) are also popular fishing areas and were created as a result of borrow activities for the construction of the highway. Creation of a single large subimpoundment will provide additional leisure recreation and fishing opportunities and enhance the scenic quality of this area. Most of this area is in Federal ownership.

Congregational Church Historic Center

The proposed project involves the development of an historic visitor center and scenic overlook at the congregational church in Runnells. The church is privately owned and was built during the early statehood days of Iowa. Its prominent location on one of the highest elevations of the city lends for development of an observation deck to view the valley below. The observation deck would be separate from the church building, but would need to be architecturally compatible. The church is proposed for development as an historical center to document early European settlement and Indian occupations related to the city and southeast Polk County. The historic quality of the site and its location makes it attractive for tourism and recreation.

Camp Township Fishing Pond(s)

The Polk County Conservation Board has proposed development of fishing ponds from old abandoned gravel pits located in the extreme upper reaches of Lake Red Rock west of Runnells. Proposed improvements would include building access roads, parking lots, fishing docks, fish cleaning stations, small shelter houses, and a fish stocking program. Specific location and development plans will require further coordination with the county. Potential sites may involve Federal lands under wildlife management agreements with the State of Iowa.

Red Rock Line Historic Village

The project involves the establishment and development of a major historic complex for interpretive programs and tourism. A potential site is along the north shore of Lake Red Rock between Calhoun Creek and Brush Creek west of State Highway 14. This area lies along the Indian treaty line of 1842, known as the "Red Rock Line." Conceptual site planning for this project has not been accomplished and will require further coordination with local interests.

Waterway Trails

Three designated canoe routes with access facilities are proposed within the Red Rock Unit. The Refuge Route extends from the Des Moines Unit (either Yellow Banks or Southeast Riverfront Parks) along the Des Moines River, through the wildlife management area in the upper reaches of Lake Red Rock, to just upstream of State Highway 14. Proposed access points are at Yellow Banks County Park, city of Hartford, and Bennington Bridge boat ramp.

The Des Moines River below Red Rock dam downstream to Iowa Highway 92 has been identified as the Tailwater Route. Access at Howell Station and the proposed Harvey Access would serve as access points for the route. The other canoe route is proposed along Whitebreast Creek from State Highway 181 to the Whitebreast embayment at Lake Red Rock. New accesses at State Highway 181 and Marion County Park, and improvement of the existing Whitebreast Bay Access (county-maintained) are proposed for this route. Proposed improvements are similar in concept, design, and status as those described for the Upper River Unit Waterway Trail (Project No. 110).

Runnells Boat Ramp

The project involves development of a boat ramp along the north bank of the Des Moines River southwest of Runnells. Proposed improvements include a single-lane concrete boat ramp, car-trailer parking, and upgrading of an existing access road. Convenient boat access along the north side is needed within this reach since the nearest ramps are at Yellow Banks County Park and Bennington Bridge boat ramp.

Refuge Viewing Binoculars

The proposal consists of the installation of coin-operated, high-powered viewing binoculars at the existing refuge overlook along State Highway 316. Such equipment will enhance the visitors' opportunity to view the wildlife within the refuge area.

Bennington Bridge Boat Ramp

The project is the first to be constructed under the Greenbelt authority. Bennington Bridge is located southeast of the city of Runnells. Improvements included development of a boat ramp and a 15 car-trailer parking lot. Riprap protection will be placed along the ramp and riverward edge of the new parking lot. Additional improvements may be needed to accommodate proposed primitive camping activity at this site.

Harvey Boat Ramp

Development of a boat ramp on the south bank of the Des Moines River has been proposed northeast of Harvey. Improvements would include construction of a single-lane concrete ramp, crushed stone car-trailer parking lot, and an access road.

SUMMARY

The projects presented in the initial master plan for the Greenbelt project, as endorsed by the Advisory Committee, are listed in table 24. The initial master plan will serve as a general framework for subsequent studies and report revisions.

TABLE 24

Summary of Proposed Projects
Des Moines Recreational River and Greenbelt

Unit	Total Projects
Greenbelt Wide	6
Upper River	14
Saylorville	8
Des Moines	15
Red Rock	13

Note: Proposals are conceptual in nature, and would actually be implemented as definable project units.

FISH AND WILDLIFE ADMINISTRATION PLAN

The Corps of Engineers has existing agreements with the Iowa Department of Natural Resources (IDNR) for the management of the upper reaches of Saylorville Lake and Lake Red Rock. Lands have been outgranted to the IDNR for fish and wildlife purposes. The Corps of Engineers does not intend to acquire any tracts of land of significant size, and new fish and wildlife administration plans will not be required.

The IDNR has proposed several large land acquisition projects. These lands would be managed by the State, and the IDNR would be responsible for fish and wildlife administration.

GREENBELT PLAN

The Advisory Committee recommended a list of projects and adopted a list of key projects at their April 3, 1987, meeting. Greenbelt projects are discussed in Section 4, Plan for Initial Development. Key projects which best characterize the overall conceptual theme of the Greenbelt are listed in table 25.

TABLE 25

Key Greenbelt Projects
Des Moines Recreational River and Greenbelt

Number	Key Project
103	Ledges Recreation Area
105	Upper River Gateway
107	Boone Forks Outpost
110	Waterway Trail
201	Jester County Park
204	Midriver Gateway
301	Des Moines Riverfront
302	Martin-Marietta Recreation Area
401	Elk Rock State Park Improvements
801	Scenic Valley Road Route
802	Greenbelt Trail System
	Lutheran Hospital Repair
	SE. Des Moines
	SE. Des Moines to Carlisle
	Red Rock (north shoreline)
	Boone to Big Creek (east shoreline)
	Fort Trail to Boone Forks
	Boone River Segment
803	Fishing Accesses
804	Forest/Prairie Conservation

SECTION 4 - PLAN FOR INITIAL DEVELOPMENT

A total of 110 projects are being considered as part of the Greenbelt project. The majority of the projects could be cost-shared between the Corps of Engineers and a local sponsor. Qualifying local sponsors are government entities with taxing authority, such as a city, county, or the State of Iowa. Most of the project proposals are for recreational development, with the remainder being for environmental enhancement and streambank stabilization. The projects proposed by the local sponsors are largely for improvements to existing park areas.

In accordance with current Corps of Engineers policy, the GDM will not offer any recommendations for recreation projects in fiscal year 1988. Additionally, the report will not contain draft local cooperation agreements or detailed engineering design required for the preparation of local cooperation agreements.

COST-SHARED PROJECTS

A total of 89 cost-shared plans have been recommended by the Advisory Committee. These plans have only been developed in sufficient detail to produce a site plan, preliminary itemized cost estimate, and general environmental and social impacts. Prior to the construction of any Greenbelt projects, a site-specific environmental assessment will be prepared for public and agency review. The GDM does not recommend any recreation projects for fiscal year 1988 construction. Engineering data and an economic justification estimate for each project are found in Appendix A, Site Plans for Cost-Shared Projects, and Appendix D, Trail Plans.

RECREATION

Site plans were developed for cost-shared recreation projects as recommended by the Advisory Committee. These will require additional planning, engineering, and design work prior to the execution of local cooperation agreements and project construction. Cost-shared recreation projects are listed in table 26.

TABLE 26

Potentially Eligible Cost-Shared Recreation Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Local Sponsor
103.1	Ledges State Park Improvements	IDNR
104.1	Bever Bridge Canoe Access	IDNR
105.2	Upper River Gateway	IDNR
106.1	Dolliver State Park Improvements	IDNR
107.1	Boone Forks Outpost Boat Ramp	IDNR
108.1	Carlson Area Boat Ramp	IDNR
108.2	Carlson County Recreation Area Improvements	Webster County
109.1	Don Williams County Park Expansion	IDNR
110.2	Norton's Ford Boat Ramp	IDNR
110.3	Lower Fraser Boat Ramp	IDNR
110.4	Boone Waterworks Boat Ramp	Boone County
112.2	Brushy Creek Confluence Staging Area	IDNR
114.1	Dayton Mounds	Webster County
201.1	Jester County Park Improvements	Polk County
202.1	Big Creek State Park Improvements	IDNR
203.1	Big Creek Spillway Boat Ramp	IDNR
203.2	S&V Bridge Jetty	IDNR
205.1	Beaver Creek Park	Polk County
206.1	Upper Saylorville Rest Area	IDNR
301.1	River's Edge Pedestrian Walkway	City of Des Moines
301.2	Downtown Riverfront Plaza	City of Des Moines
301.3	Walnut Street Transit Mall Improvements	City of Des Moines
301.4	Crivaro Park Improvements	City of Des Moines

TABLE 26 (Cont'd)

Project Number	Project Title	Local Sponsor
301.5	Recreational Rowing Marina	City of Des Moines
302.1	Martin-Marietta Development	IDNR/W. Des Moines
303.1	Walnut Woods State Park Improvements	IDNR
304.1	Yellow Banks County Park Improvements	Polk County
306.1	Riverview Park Development	City of Des Moines
307.1	West River Drive Riverfront Park Extension	City of Des Moines
308.1	Botanical Center Riverfront Park	City of Des Moines
309.1	Hubbell Naturalistic Park Improvements	City of Des Moines
310.1	Easter Lake County Park Improvements	Polk County
311.1	Lighted Outdoor Sports and Athletic Complex	City of Des Moines
312.1	Birdland Marina Improvements	City of Des Moines
313.1	Des Moines Waterworks Park Boat Ramp	IDNR
314.1	Des Moines River Boat Traffic	City of Des Moines
314.2	Downtown Marina, Des Moines	City of Des Moines
401.1	Elk Rock State Park Improvements	IDNR
402.1	Red Rock 340 Acre Park	IDNR
403.1	Marion County Park Improvements	IDNR
404.1	Runnells City Park Improvements	City of Runnells
405.1	Howard's Lake Subimpoundment	City of Runnells
406.1	Congregational Church Overlook	City of Runnells
410.1	Runnells Boat Ramp	IDNR
413.1	Harvey Boat Ramp	IDNR
801.1	Scenic Valley Road Route	Multiple
802.1	Greenbelt Multi-Purpose Trail	IDNR

TABLE 26 (Cont'd)

Project Number	Project Title	Local Sponsor
802.2	Jester Park Trail	Polk County
802.3	Brown's Woods Trail	Polk County
803.1	Des Moines River Fishing Piers	IDNR
803.2	Kate Shelley Bridge Fishing Access	IDNR
803.3	Handicapped Fishing Piers	City of Des Moines
803.4	Prospect Park Fishing Piers	City of Des Moines
803.5	Scott Street Dam Fishing Access	IDNR
803.6	Red Rock Fishing Piers	IDNR
805.5	Bird Watching Stations	IDNR
806.1	Scenic View No. 1	City of Des Moines
806.2	Scenic View No. 2	City of Des Moines
806.3	Scenic View No. 3	City of Des Moines
806.4	Scenic View No. 4	City of Des Moines
806.5	Scenic View No. 5	City of Des Moines
806.6	Scenic View No. 6	City of Des Moines
806.7	Scenic View No. 7	City of Des Moines
806.8	Scenic View No. 8	City of Des Moines

ENVIRONMENTAL ENHANCEMENT

Plans were developed for cost-shared environmental enhancement projects as recommended by the Advisory Committee. These will require additional planning, engineering, and design work prior to the execution of local cooperation agreements and project construction. Cost-shared environmental enhancement projects are listed in table 27.

TABLE 27

Potentially Eligible Cost-Shared Environmental Enhancement Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Local Sponsor
101.1	Boone Forks Wildlife Management Area	IDNR
102.1	State Forest Acquisition and Development	IDNR
207.1	Saylorville Refuge Expansion	IDNR
208.1	Johnston Nursery	City of Johnston
801.4	Conservation Easements	IDNR
804.1	Native Plantings No. 1	IDNR
804.2	Native Plantings No. 2	IDNR
804.3	Reforestation No. 1	IDNR
804.4	Reforestation No. 2	IDNR
804.5	Reforestation No. 3	IDNR
804.6	Reforestation No. 4	IDNR
804.7	Reforestation No. 5	IDNR
804.12	Land Acquisition-Joe West Sr. Estate	IDNR
804.13	SE. Riverfront Land Acquisition	City of Des Moines
804.14	Tree Belt Below Lake Red Rock	IDNR
805.2	Bald Eagle Nest Platform	IDNR
805.3	Heron Nest Structures-Saylorville Lake	IDNR
805.4	Heron Nest Structures-Lake Red Rock	IDNR

STREAMBANK STABILIZATION

Plans were developed for cost-shared streambank stabilization projects as recommended by the Advisory Committee. These will require additional planning, engineering, and design work prior to the execution of local cooperation agreements and project construction. Cost-shared streambank stabilization projects are listed in table 28.

TABLE 28

Potentially Eligible Cost-Shared Streambank Stabilization Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Local Sponsor
112.1	Brushy Creek Bank Stabilization	IDNR
305.1	Prospect Park Riverbank Stabilization	City of Des Moines
314.3	Des Moines & Raccoon River Levee Protection	City of Des Moines
314.4	Reconstruction of West River Wall	City of Des Moines
801.2	Kalo Road Bank Stabilization	Webster County
801.3	Route P73 Bank Stabilization	City of Lehigh
801.5	Deception Hollow Bank Stabilization	IDNR

100-PERCENT FEDERAL PROJECTS

There are 11 projects in existing Federal recreation areas or on Federal fee land at Saylorville Lake and Lake Red Rock that are eligible for 100-percent Federal sponsorship. Saylorville Lake and Lake Red Rock are separately authorized and funded by the Federal government and 100-percent Federal projects are only included to make the Greenbelt master plan a complete concept. These developments are identified in Recreational Resource Master Plans or other planning documents prepared by the Corps of Engineers. The cost of detailed engineering and design studies, construction, and subsequent operation and maintenance of facilities would be 100-percent Federal. Engineering data is found in Appendix B, Site Plans for 100-Percent Federal Projects.

RECREATION

Projects may be constructed at full Federal expense at Saylorville Lake or Lake Red Rock as identified in approved Recreation Resource master plans or other Corps of Engineers reports. Table 29 lists 100-percent Federal recreation projects.

TABLE 29

100-Percent Federal Recreation Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Notes
203.3	Bob Shetler Picnic Ground	Approved Master Plan
203.4	Walnut Ridge Comfort Station	O & M Item
203.5	Cottonwood Picnic Shelter	O & M Item
203.6	Greenbelt Visitor Center Development-Saylorville Lake	Advisory Committee Recommendation
402.2	Whitebreast Beach	Draft Water Control Plan, Lake Red Rock
402.3	Wallashuck Camping Loop	Approved Master Plan
402.4	North Overlook Beach	Draft Water Control Plan, Lake Red Rock
402.5	East Wallashuck Boat Ramp	Draft Water Control Plan, Lake Red Rock
402.6	Greenbelt Visitor Center Development-Lake Red Rock	Advisory Committee Recommendation

NOTES: 100-percent Federal funding for all projects.
O & M = "Operation and Maintenance".

ENVIRONMENTAL ENHANCEMENT

Projects may be constructed at full Federal expense at Saylorville Lake or Lake Red Rock as identified in approved recreation resource master plans or other Corps of Engineers reports. Table 30 lists 100-percent Federal environmental enhancement projects.

TABLE 30

100-Percent Federal Environmental Enhancement Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Notes
804.9	Saylorville Prairies	O & M Item
804.10	Red Rock Reforestation	O & M Item

NOTE: 100-percent Federal funding for all projects
O & M = "Operation and Maintenance".

STREAMBANK STABILIZATION

Projects may be constructed at full Federal expense at Saylorville Lake or Lake Red Rock as identified in approved recreation resource master plans or other Corps of Engineers reports. Table 31 lists 100-percent Federal streambank stabilization projects.

TABLE 31

100-Percent Federal Streambank Stabilization Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Notes
none		

NOTE: 100-percent Federal funding for all projects

NON-COST-SHARED PROJECTS

The Advisory Committee has recommended that 10 projects be developed within the Greenbelt which are not eligible for Federal cost-sharing. These projects would be developed by the local sponsors at 100-percent non-Federal expense.

RECREATION

Projects not eligible for Federal cost-sharing may be built at 100-percent non-Federal expense by a local sponsor. Non-cost-shared recreation projects, as recommended by the Advisory Committee, are listed in table 32.

TABLE 32

Non-Cost-Shared Recreation Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title
107.1	Boone Forks Outpost Development Area
111	Lehigh Waterfront Restoration
113	Tunnell Mill Restoration
204	Mid-River Gateway
301.6	Bridge Restoration-Walnut, Locust & Grand Avenues
301.7	Visitor Center at Riverside Park
304.2	Natural History Interpretive Center
408	Red Rock Line Historic Village

ENVIRONMENTAL ENHANCEMENT

Projects not eligible for Federal cost-sharing may be built at 100-percent non-Federal expense by a local sponsor. Non-cost-shared environmental enhancement projects, as recommended by the Advisory Committee, are listed in table 33.

TABLE 33

Non-Cost-Shared Environmental Enhancement Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Local Sponsor
--	Turkeys a/	IDNR

NOTE: a/ The IDNR has an existing program which involves releasing wild turkeys for species repopulation.

STREAMBANK STABILIZATION

Projects not eligible for Federal cost-sharing may be built at 100-percent non-Federal expense by a local sponsor. Non-cost-shared streambank stabilization projects, as recommended by the Advisory Committee, are listed in table 34.

TABLE 34

Non-Cost-Shared Streambank Stabilization Projects
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Local Sponsor
none		

SECTION 5 - COORDINATION

GENERAL

The Corps of Engineers conducted an active coordination program during the preparation of the General Design Memorandum (GDM). Coordination was conducted with Federal, State, regional, county, and local planning organizations, and written correspondence is found in Appendix H, Pertinent Correspondence.

FEDERAL PLANS AND PROGRAMS

CORPS OF ENGINEERS

Federal lands acquired for the Corps of Engineers Lake Red Rock and Saylorville Lake flood control projects lie entirely within the Greenbelt boundary. These lands are managed either by the Corps of Engineers, State of Iowa, or county entities for recreation or fish and wildlife management. Both long-term and annual management plans are prepared to describe proposed development and use of project lands. Comprehensive recreation-resource master plans for the Federal projects were developed in 1976 for Lake Red Rock and in 1984 for Saylorville Lake. These plans serve as guides for Federal administration of the projects for recreation, fish and wildlife conservation, forestry, cultural, and scenic features. Proposed Greenbelt projects involving existing Federal lands are compatible with the existing master plans. Coordination with management agencies was made during preparation of the GDM.

NATIONAL PARK SERVICE

The National Park Service (NPS) directly administers the national cultural and natural heritage programs. Coordination with the National Park Service is limited to administrative review of project plans and activities to insure compliance with applicable laws and compatibility with their programs. There are not any national parks, monuments or areas managed by the NPS within the Greenbelt. Specific NPS programs which may influence with the Greenbelt project are the Land and Water Conservation Fund Administration (PL 88-578), National Wild and Scenic River System (PL 90-542), National Register of Historic Places (PL 89-665 and 96-515), and National Recreation Area Administration.

The NPS provides assistance to the states in preparing and maintaining State Comprehensive Outdoor Recreation Plans (SCORP), and reviews project plans for their relationship to the program. The agency also reviews these plans for potential impacts to any existing or potentially designated national wild and scenic river. In addition, the NPS reviews project plans concerning identification of any natural or historic properties listed or eligible for listing in various national registries. Letters of coordination with the NPS are contained in Appendix H, Pertinent Correspondence.

U.S. FISH AND WILDLIFE SERVICE

There are two national programs (Endangered Species Act and Fish and Wildlife Coordination Act) administered by the Fish and Wildlife Service (FWS) that directly concern the Greenbelt project. The Endangered Species Act of 1973 (PL 93-205), as amended, states the policy of Congress that all Federal agencies must seek to conserve federally listed endangered and threatened species.

The FWS administers formal consultation procedures established by the Secretary of Interior which require Federal agencies to ensure that their authorized actions neither jeopardize the continued existence of any endangered or threatened species nor result in adverse modification of critical habitat. The FWS reviews project plans in relation to this law. Prior to any implementation, specific coordination will be undertaken regarding individual actions during normal review procedures.

The Fish and Wildlife Coordination Act requires that all Federal agencies consult with the Regional Director, U.S. Fish and Wildlife Service, and the head of the agency responsible for fish and wildlife for the state in which the action or activity is to occur. The intent of the Act is to prevent the direct and indirect loss of and damage to wildlife resources due to the proposed actions. Letters of coordination are contained in Appendix H, Pertinent Correspondence, and Appendix 1 of the Programmatic Environmental Impact Statement.

BUREAU OF LAND MANAGEMENT

The U.S. Department of Interior, Bureau of Land Management, has the responsibility to ensure the availability for leasing and development of all Federal minerals where that development would not unduly impact surface resources or values.

SOIL CONSERVATION SERVICE

Three national programs (the Farmland Protection Policy Act, Water Resources Development Act, and Food Security Act) are administered by the Soil Conservation Service (SCS) that directly relate to the Greenbelt project. The Farmland Protection Policy Act (Subtitle I of Title XV of the Agriculture and Food Act of 1981, PL 97-98) recognizes the Nation's farmland as "a unique natural resource" and directs Federal agencies to take into account the adverse effects of Federal programs on the preservation of farmland. Part G58 of Title 7 of the Code of Federal Regulations establishes criteria and guidelines to be followed in accomplishing this objective. Coordination with the SCS will include completion of Farmland Conversion Impact Ratings (Form AD 1006) for all project plans involving alternatives which would convert farmland to non-agricultural uses.

Section 906 of the Water Resources Development Act of 1986 (PL 99-662) establishes criteria for cost-sharing environmental enhancement projects. Any environmental enhancement projects which benefit endangered species or species listed under international treaties may be eligible for 100-percent Federal funding. Title XIII of the Food Security Act of 1985, also referred to as the 1985 Farm Bill, provides mechanisms for protecting valuable fish and wildlife resources on Farmers Home Administration (FHMA) inventory lands and FMHA-financed lands. Potential actions on surplus lands include title transfer to units of State or local government, or protection through conservation easements or deed restrictions.

Title XII (Conservation) has provisions which, when implemented, would significantly reduce erosion and sedimentation from private lands by withholding Federal farm assistance from landowners who convert wetlands or previously unplowed erodible land into cropland. Letters of coordination with the SCS are contained in Appendix H, Pertinent Correspondence.

STATE PLANS AND PROGRAMS

FLOODPLAIN MANAGEMENT

The floodplains of all Iowa streams (border streams as well as interior) are subject to the comprehensive regulation of the IDNR, Environmental Protection Division. A floodplain is defined by statute as "the area adjoining a river or stream which has been or may hereafter be covered by flood water." The IDNR is charged with broad functions and duties regarding the State's water resources, but the essence of its flood-plain management function is found in the IDNR's regulatory permit powers. State statute requires IDNR approval for any structure, dam, obstruction, deposit, or excavation in, or on, any floodway or floodplain.

Application for, and approval of, a permit is required for any construction or activity within a floodplain area. The IDNR approval requirement extends to virtually all floodplain construction within the State and is not limited to those floodplains that have been identified as such by the State or Federal Government.

Other floodplain management functions of the IDNR include establishing encroachment limits, cooperating with and assisting local units of government in developing floodplain information and regulations, coordinating and approving all flood control works, and representing the State on interagency and interstate planning groups. The IDNR also has been designated as the State Coordinating Agency for the National Flood Insurance Program.

SCENIC RIVERS

The Iowa State Legislature enacted the Protected Water Area System, Chapter 108A, Code of Iowa, in 1970. The Act provides the IDNR with the authority to create and manage a system of scenic river corridors in the State. In 1978, the State prepared a "Protected Water Areas" (PWA) General Plan to develop a program for the protection of river and stream corridors in addition to lakeshores and marshes. Within the Greenbelt study area, the PWA plan identifies portions of the Des Moines and Boone Rivers as having the qualifications and potentials for being considered as candidates to be included as PWA's. On May 2, 1985, a 25-mile segment of the Boone River in Hamilton county was designated the first State PWA. A management plan for the Boone River PWA was prepared in August 1985 and serves as supporting documentation for related Greenbelt projects involving this area.

NATURE PRESERVES/REFUGES

Responsibility in the statewide natural area planning and program administration rests with the IDNR, Parks, Recreation, and Preserves Division. The official State natural areas program is entitled "The Iowa Natural Area's Inventory." IDNR recommends and approves all dedications to the natural areas's inventory, makes policy for the development and management of the areas, and is responsible for acquiring and managing the areas for the natural areas's inventory. Within the Division, this responsibility falls to the Preserves and Ecological Services Bureau. The Bureau, in turn, accepts recommendations from the State Preserves Advisory Board for preservation status for selected natural areas.

RECREATION

The SCORP is a statewide comprehensive plan prepared by the IDNR which identifies policy for the State concerning outdoor recreation and provides guidance to outdoor recreation decisionmakers at all government levels. Preparation of the plan is required by the State to qualify for Federal funding under the Land and Water Conservation Fund Act of 1965 (LAWCON). The LAWCON program is currently monitored on a Federal level by the NPS. The State prepared a SCORP in 1979 and a draft update was completed in 1986.

The IDNR will review the GDM to assure State interests are properly addressed and that respective programs are compatible. Recreation planning for the project will be consistent with the identified objectives of the State. Preparation of the Greenbelt GDM incorporates State-developed recreation statistics and related data as supporting documentation. The IDNR has assisted in the preparation of the initial Greenbelt master plan.

Eight State parks are located within the Greenbelt, consisting of approximately 10,000 acres. The majority of State-managed parks are on lands owned by the Federal Government and leased to the State for public park and recreation purposes. The initial master plan for the Greenbelt identifies facility improvements at existing State parks.

FISH AND WILDLIFE

The IDNR manages 17 areas as forest preserves, wildlife management areas, and game management areas within the Greenbelt The majority of these lands are owned by the Federal Government and licensed to the State for fish and wildlife management. State-owned areas are primarily located in Boone, Webster and Hamilton counties. The State prepares and submits annual management reports for licensed Federal lands to the Corps of Engineers for review of proposed management plans. The initial master plan for the Greenbelt includes wildlife and environmental enhancement projects to support on-going wildlife management plans identified by the State.

CULTURAL RESOURCES

Four state agencies have statutory responsibility for archeological resources: the IDNR, the Iowa Department of Transportation (IDOT), the Office of the State Archaeologist (OSA), and the State Historical Department (SHPO's office). The IDNR manages certain historical and archaeological properties. The IDOT conducts archeological surveys on their own projects. The OSA conducts research and public education programs, maintains the State artifact and document repository, is responsible for the State site inventory, and coordinates research on prehistoric cemeteries.

The State Historical Department manages historic and prehistoric properties, maintains the National Register inventory, and performs services under the grants-in-aid program utilizing matching Federal funds. The SHPO's office provides assistance regarding the presence and significance of historic properties in a project area, the likely effort needed to find and evaluate sites, whether a project will have a harmful effect on historic properties, and how to reduce or avoid harm to cultural resources. The SHPO administers the National Register of Historic Places listing process at the State level. Letters of Coordination with regarding cultural resources are contained in Appendix H, Pertinent Correspondence.

LOCAL AND REGIONAL PLANS AND PROGRAMS

REGIONAL PLANS

The MIDAS (Mid-Iowa Development Association) Council of Governments represents six counties, of which two, Webster and Hamilton, are within the Greenbelt. MIDAS has been actively involved in the Greenbelt study and has published an overview of mid-Iowa's history with a survey of locally significant features and suggested methods of preservation involvement entitled A Common Beginning.

COUNTY PLANS

Comprehensive plans are avilable for Hamilton, Marion, Polk, and Webster counties. Additional plans include: Outdoor Recreation Plan - Boone County; Recreation and Open Space Plan - Dallas County; Tunnel Mill Road - Hamilton County; Conservation, Recreation, and Open Space Plan - Hamilton County; and Recreation Plan - Webster County.

CITY PLANS

City plans are available from Des Moines and Lehigh. This includes comprehensive plans and several historic preservation plans for the city of Des Moines.

PUBLIC INVOLVEMENT

Public involvement activities deal with the coordination of input and review comments concerning the Plan for Engineering and Design, General Design Memorandum, and the approval process. The draft Plan for Engineering and Design was distributed for public and agency review on November 20, 1985, with review comments due by December 13, 1985. These comments were incorporated into the Final Plan for Engineering and Design which was approved by the Office of the Chief of Engineers on March 17, 1986, and distributed to the public in March 1986.

The draft GDM was distributed to the public on July 22, 1987, with the official 45-day review period ending on September 14, 1987. Comments on the draft report were received from Federal and State agencies, and the interested public. Comments and responses are found in the Public Review Comments and Responses section of the main report.

Guidance on State and local concerns is found in Section 3 of the Economic and Environmental Principles for Water and Related Land Resources Implementation Studies, as listed below:

> Federal water resources planning is to be responsive to State and local concerns. Accordingly, State and local participation is to be encouraged in all aspects of water resources planning. Federal agencies are to contact Governors or designated State agencies for each affected State before initiating studies, and to provide appropriate opportunities for State participation. It is recognized, however, that water projects which are local, regional, statewide, or even interstate in scope do not necessarily require a major role for the Federal government; non-Federal, voluntary arrangements between affected jurisdictions may often be adequate. States and localities are free to initiate planning and implementation of water projects.

Project planning will be coordinated with Federal, State, and local agencies and groups concerned with recreational, natural, cultural, and fish and wildlife resources. Coordination will be maintained with the NPS; U.S. FWS; U.S. Environmental Protection Agency; IDNR; Iowa SHPO; regional planning commissions; and public/civic organizations. The Advisory Committee has played a key role in interfacing with all concerned elements of the Greenbelt project and providing input into the GDM.

Planning workshops were held in April 1986 during the initial preparation of the GDM. Six meetings were held at 5 different locations throughout the Greenbelt as listed in table 35. Public meetings were held in August 1987 during the draft GDM review period as listed in table 36. Results of the August 1987 public meetings have been incorporated into the Public Review Comments and Responses section of the main report. Public input was incorporated into Advisory Committee recommendations for Greenbelt projects.

TABLE 35

Public Workshops
Des Moines Recreational River and Greenbelt

Location	Time	Date
Des Moines	afternoon	April 15, 1986
Des Moines	evening	April 15, 1986
Runnells	evening	April 17, 1986
Knoxville	evening	April 16, 1986
Fort Dodge	evening	April 21, 1986
Boone	evening	April 22, 1986

TABLE 36

Public Meetings
Des Moines Recreational River and Greenbelt

Location	Time	Date
Boone	evening	August 3, 1987
Fort Dodge	evening	August 4, 1987
Des Moines	afternoon	August 5, 1987
Knoxville	evening	August 5, 1987
Carlisle	evening	August 6, 1987

Following is a summary of questions and answers discussed during the six Des Moines Recreational River and Greenbelt project workshops held in April 1986:

What is the Des Moines Recreational River and Greenbelt?

The Des Moines Recreational River and Greenbelt Project is a concept proposed by Congressman Neal Smith and funded and authorized in the Supplemental Appropriations Act (Public Law 99-88) on August 15, 1985. The legislation provides for the development, operation, and maintenance of a recreation and greenbelt area along 169 miles of the Des Moines River from Highway 92 just south of the Lake Red Rock Dam to Highway 20 in Fort Dodge.

It will link together a number of parks, trails, recreation areas, and other types of development along the corridor. The Greenbelt will provide Iowans and visitors to Iowa with many types of outdoor recreational opportunities and preserve dwindling timberlands and other important environmental resources.

What types of projects will be covered in the Greenbelt?

There are three major types of projects which will be covered in the Greenbelt: environmental enhancement, streambank stabilization, and recreational developments. Some projects will be constructed with Federal/local cost-sharing, and others will be built completely with State or local funds. Examples follow:

Environmental Enhancement

Acquisition and improvement of wildlife lands; acquisition of forest lands; construction and placement of fishing riffles in streams; erosion control basins; wetland creation; tree, shrub, and native grass plantings; and oak/hickory forest management.

Streambank Stabilization

Riverwalls in city areas; reservoir, lakeshore, and riverbank riprapping.

Recreational Facilities

Boat ramps; boat docks; fishings docks; piers; marinas; riverfront parks; parking lots adjacent to the Des Moines River; park improvements and expansions; multipurpose trails to connect public parks and other areas of interest within the confines of the Greenbelt area; historical and nature center developments.

I have an idea for a Greenbelt project -- who do I contact?

All project ideas must be submitted through your local Advisory Committee member-he or she is your representative. When an Advisory Committee member receives a project idea from a local citizen, he or she submits the idea to the entire Advisory Committee. The Advisory Committee will rate and prioritize all of the projects and then will submit a project list to the Corps of Engineers. Each project will be considered for Federal cost-sharing.

How were the Advisory Committee members appointed?

Legislation introduced by Congressman Neal Smith, and enacted into law, established the Greenbelt Advisory Committee for consultation with the Department of the Army. The composition of the Advisory Committee is described in Public Law 99-88 as listed elsewhere in the GDM.

Who is my Advisory Committee Representative?

Your Advisory Committee member is the person who represents your locality. Advisory Committee members, their addresses, and their source of appointment are listed elsewhere in the GDM.

What happens when the Corps of Engineers studies a project submitted by the Advisory Committee?

The Corps follows the Principles and Guidelines, a document signed by President Reagan several years ago, which directs the Corps to consider three major criteria when looking at projects. These criteria are:

a. Is the project feasible in terms of its engineering? The project has to be something that can actually be built and that would function as proposed.

b. Is the project environmentally sound? The project should minimize adverse impacts or provide appropriate mitigation measures (e.g., damage to wetlands or cutting of trees should be avoided, if possible, or the impacted resources should be replaced).

c. Is the project economically justified in terms of benefits and costs? Benefits of a project must outweigh the costs of a project. For example, recreation benefits are based on: the potential use of the project, the need for the particular recreation facility in the area, and the economic value of the recreational facility.

What happens to projects that do not meet the above criteria?

Projects that do not meet the criteria for Federal participation will go back to the Advisory Committee and will be put on a list of non-Federal projects. Those projects could still be built, but not with Corps assistance. Other entities (city, county, State) would have to build those projects.

Who pays for Corps of Engineers assisted projects?

The Corps of Engineers and a local sponsor will cost-share each project that meets Federal criteria. The amount of Federal funding each project will receive depends upon the type of project. The Corps cannot cost-share with private individuals; it can cost-share only with public entities that have legal and financial ability to cooperate on a project with the Corps. Recreation projects are cost-shared 50 percent Federal and 50 percent by the local sponsor. Once the project is constructed, the sponsor is responsible for all operation, maintenance, and replacement costs. Streambank stabilization and environmental enhancement projects are cost-shared on a sliding scale depending upon their particular merits.

What is a local sponsor's responsibility?

Initially, the local sponsor (city, county, or State) must submit to the Corps a Letter of Assurance, which is a nonlegal document stating that the sponsor is interested in participating in a cost-shared project. Many Letters of Assurance from sponsors within the Greenbelt boundary have already been submitted to the Corps. Once a project is identified, costs have been justified, and the project has been approved, the Corps will enter into a Local Cooperation Agreement (LCA) with the local sponsor of the project. An LCA is a legally binding document in which the Corps and the local sponsor each agree to share in specified parts of the project. The local sponsor, in almost all cases, will be completely responsible for operation, maintenance, and replacement of the completed facility.

Is the Corps of Engineers going to purchase land within the Greenbelt boundary?

The Greenbelt boundary lines are marked to identify the authority area for possible cost-shared projects. The Federal administration does not favor massive land acquisition; however, small acquisitions may be made for specific projects.

Is the Corps of Engineers going to regulate and manage fish and wildlife within the Greenbelt boundary?

No. The Iowa Department of Natural Resources will continue to be the fish and wildlife regulatory and managing agency.

How does the Corps of Engineers get funding for the Greenbelt project?

The Federal Government operates on a fiscal year (FY) from 1 October through 30 September. We are currently in FY 1987 and have funding for the Plan for Engineering and Design (the report with the green cover which was discussed at the April workshops) and the General Design Memorandum (GDM). We are fairly certain that we will be funded to complete preliminary preconstruction planning (the GDM) in FY 1987. Our budget request for FY 1988 will be presented to Congress later this year. Since the Greenbelt project is really a series of individual projects which will be built year after year, funding will be requested and hopefully received each fiscal year, although the amount of funds received may vary from year to year.

What is the General Design Memorandum?

The General Design Memorandum (GDM) is a report which will be completed in October 1987. It will contain an all-inclusive boundary description. It also will list the projects which were submitted to the Corps by the Advisory Committee. Another portion of the GDM will be the Master Plan, which will give an overall view of the Greenbelt area, including looking at the environmental aspects of the Greenbelt and examining the possible project areas.

Will there be more public meetings?

Public meetings will be scheduled sometime during the summer of 1987, and at that time we will discuss the Greenbelt planning. However, an Advisory Committee member may hold meetings with the people in his or her area of representation at any time.

A complete set of transcripts from the public meetings is on file at the Rock Island District.

The Advisory Committee holds regular quarterly meetings at the Wallace State Office Building in Des Moines, Iowa. Topics of conversation typically deal with the Corps of Engineers' GDM, construction in the Greenbelt, and items of interest. Advisory Committee meetings are summarized as follows:

October 11, 1985 - Initial formulation meeting for the Advisory Committee, and designation of subcommittees.

December 6, 1985 - Adoption of bylaws, election of officers, and presentation of Corps of Engineers' Draft Plan for Engineering and Design.

February 21, 1986 - Planned construction in the Greenbelt, arrangements for the April public workshops, Advisory Committee project proposals, and Greenbelt boundary proposal.

June 6, 1986 - Summary of public workshops, Advisory Committee project ranking criteria, and the Bennington Bridge boat ramp prototype project.

August 14, 1986 - Trail system development, Corps' of Engineers temporary loss of study funding, and Advisory Committee project rating scheme.

November 14, 1986 - 1986 Farm Bill provisions, pending water resources development bill (H.R. 6), results of master plan subcommittee work on Greenbelt concept.

February 27, 1987 - Proposed State 4 cent gas tax, Corps of Engineers' Lake Red Rock Water Control Plan Study, designation of wildlife refuges, and Corps of Engineers' GDM.

April 3, 1987 - Master plan subcommittee presentation. Advisory Committee adopts master plan and designates 13 key projects.

May 15, 1987 - Discussion on Lake Red Rock pool raise study, review of preliminary draft GDM, and adoption of the Corps of Engineers recommendation for the draft GDM.

September 4, 1987 - Report of recent Advisory Committee bus trip, results of public meetings, and prioritization of first projects to be submitted to the Corps of Engineers.

A complete set of Advisory Committee meeting minutes is on file at the Rock Island District.

The Advisory Committee publishes an unofficial newsletter about once a month entitled Advisory Committee Notes. The newsletter is used as a means of keeping the Advisory Committee members and other interested parties informed of pertinent matters of interest within the Greenbelt. A complete set of Advisory Committee Notes is on file at the Rock Island District.

SECTION 6 - PROJECT ADMINISTRATION

SCHEDULE

The schedule for the completion of the GDM is listed in table 37. Construction has not been scheduled in accordance with current budgetary guidance.

TABLE 37

Study Schedule
Des Moines Recreational River and Greenbelt

Item	Date
Submit final report to the Office of the Chief of Engineers	Sep 87
Initiate study of additional projects for GDM yearly update	Oct 87
Distribute final report to the public	Nov 87
Submit draft 1988 yearly update to North Central Division	Apr 88
Submit final 1988 yearly update to North Central Division	Jun 88

FUNDING NEEDS

Funding needs for fiscal year 1988 are listed in table 38. Project administration would include coordination with the Advisory Committee and study of additional projects for inclusion into the GDM yearly update.

TABLE 38

Funding Needs for Fiscal Year 1988
Des Moines Recreational River and Greenbelt

Item	Amount ($)
Project Administration	35,000
Project Construction	0

MASTER PLANNING PROCESS

The Corps of Engineers, consistent with budgetary constraints, will manage a continuing program for the overall administration of the Greenbelt project. This will include additional planning, engineering, design and construction of projects within the Greenbelt in consideration of the recommendations of the Advisory Committee. This will include periodic updates of the GDM master plan and processing cost-shared projects for local cooperation agreements and construction. General administration will involve coordination with the Advisory Committee and execution of the project purposes as listed in Public Law 99-88.

FUTURE STUDIES

The Advisory Committee, at their May 15, 1987, meeting, recommended that the Corps of Engineers prepare an annual addition to the GDM which will address additional projects for cost-sharing consideration. The projects listed in table 39, as well as others which may be recommended by the Advisory Committee, will be studied in the first annual addition, which will be completed in 1988.

TABLE 39

Projects for Future Studies
Des Moines Recreational River and Greenbelt

Project	Purpose	Sponsor
Pond Development	Env	IDNR
Reforestation/Wildlife Habitat	Env	Des Moines
Johnston Ponds	Rec	Polk Co.
Land Acquisition	Rec	IDNR
Red Rock Marina Breakwater	Rec	IDNR
Riverside Park Campground	Rec	Webster City
Bell's Mill Park	Rec	Hamilton Co.
Briggs Woods Park	Rec	Hamilton Co.
Ubbens Overlook	Rec	Hamilton Co.
Tunnel Mill Overlook	Rec	Hamilton Co.
Hwy 175 W of Dayton Bridge Overlook	Rec	Hamilton Co.
Soder Overlook	Rec	Hamilton Co.
Boone Forks Overlook	Rec	Hamilton Co.
Reveiz Overlook	Rec	Hamilton Co.
Prairie Park	Env	Hamilton Co.
Stratford Marsh and Prairie	Env	Stratford
Camp Township Fishing Ponds	Rec	IDNR
Hartford Access	Rec	IDNR
Iowa Highway 181 Access	Rec	IDNR

SECTION 7 - SUMMARY

The Advisory Committee recommends proceeding with the implementation of projects described in the GDM including Appendix 1 for the Des Moines Recreational River and Greenbelt consistent with the budgetary constraints of the respective cost-sharing participants.

A total of 110 projects is being considered as part of the Greenbelt. This includes 89 potentially cost-shared projects, eleven 100-percent Federal projects at Saylorville Lake and Lake Red Rock, and 10 non-Federal projects which do not require Corps of Engineers involvement. The implementation of cost-shared and 100-percent Federal recreation projects is subject to Corps of Engineers policies and regulations. A Feature Design Memorandum will be prepared for each individual project for review and approval by the Office of the Chief of Engineers.

The near-term development of the following nine projects was recommended by the Advisory Committee at their April 15, 1988 meeting:

Advisory Committee Recommended Projects	Local Sponsor
Botanical Center Riverfront Park	City of Des Moines
Boone Waterworks Boat Ramp	Boone County
Scenic Valley Road Route	Multiple
Jester County Park Improvements	Polk County
Upper Saylorville Boat Ramp	Iowa DNR
Raccoon River Sports Complex	City of West Des Moines
Greenbelt Trail System - Lutheran Hospital Repair	City of Des Moines
Greenbelt Trail System - Red Rock (North Shoreline)	Not Applicable
Johnston Nursery	City of Johnston

Notes: Upper Saylorville Boat Ramp formerly Upper Saylorville Rest Area
Raccoon River Sports Complex formerly Martin-Marietta Recreation Area

All projects would be cost-shared in accordance with policies in effect at the time of implementation. The current policies will result in costs to be shared approximately 50-percent Federal and 50-percent non-Federal unless otherwise noted. The nine projects are described as follows:

1. Botanical Center Riverfront Park - The project involves the construction of a picnic park and the installation of a floating courtesy dock along the Des Moines River at the Botanical Center in the city of Des Moines. The Federal cost of the project is estimated at $54,000 and the total cost is estimated at $108,000.

2. Boone Waterworks Boat Ramp - The project involves the construction of a single lane concrete boat ramp, crushed stone access road and a 10-car gravel parking lot at the Boone Waterworks Park in Boone County. The Federal cost of the project is estimated at $32,000 and the total cost is estimated at $64,000.

3. Scenic Valley Road Route - The project involves the establishment of a scenic road route along existing State, county and city roads for viewing points of interest along the Des Moines River. Construction would involve the placement of distinctive road signs. The Federal cost of the project is estimated at $145,000 and the total cost is estimated at $290,000.

4. Jester County Park Improvements - The project involves the construction of a campground with a shower/toilet building at Jester County Park in Polk County. The Federal cost of the project is estimated at $135,000 and the total cost is estimated at $270,000.

5. Upper Saylorville Boat Ramp - The project involves the construction of a single-lane concrete boat ramp, crushed stone access road and a gravel parking lot. The Federal cost of the project is estimated at $80,000 and the total cost is estimated at $160,000.

6. Raccoon River Sports Complex - The project involves land acquisition and the construction of a paved access road, softball fields, soccer fields, parking lots, flush toilet, and utilities. The Federal cost of the project is estimated at $1,360,000 and the total cost is estimated at $2,720,000.

7. Greenbelt Trail System-Lutheran Hospital Repair - The project involves the repair and reconstruction of a segment of the city of Des Moines' paved bicycle trail near the Lutheran Hospital. The Federal cost of the project is estimated at $115,000 and the total cost is estimated at $230,000.

8. Greenbelt Trail System-Red Rock (North Shoreline) - The project involves the construction of the trail located on Federal lands along the north shore of Lake Red Rock, Marion County, as described in the approved Corps of Engineers Resources Master Plan, Design Memorandum No. 24b, dated December 1976. The project would be constructed at 100-percent Federal expense. The Federal cost of the project is estimated at $5,350,000 and the total cost is estimated at $5,350,000.

9. Johnston Nursery - The project involves the construction of a 2-acre nursery in the city of Johnston. This environmental enhancement project would be constructed at 75-percent Federal expense and 25-percent non-Federal expense. The Federal cost of the project is estimated at $13,000 and the total cost is estimated at $17,000.

The cost estimate for the Greenbelt project also includes the following two elements:

1. Advisory Committee Coordination - The District will maintain coordination with the Advisory Committee for the overall project. Prior costs for coordination activities (through FY 1988) are estimated at $628,500. Future coordination activities are estimated at $371,500.

2. Bennington Bridge Boat Ramp - The Bennington Bridge Boat Ramp was completed in November 1987. The project was cost-shared with the Iowa Department of Natural Resources at 50-percent Federal ($46,500) / 50-percent non-Federal ($46,500) expense.

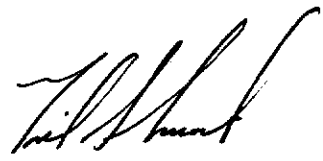
The total Federal cost of the project is estimated at $8,330,000. The total cost of the project is estimated at $10,300,000.

SECTION 8 - RECOMMENDATION

I recommend that the approved Federal construction cost estimate for the Des Moines Recreational River and Greenbelt be increased to $8,330,000 to complete the implementation of the following nine projects. We will complete Engineering and Design on these projects and prepare individual Feature Design Memoranda. Included in the Greenbelt costs are coordination with the Advisory Committee and the Bennington Bridge Boat Ramp, which was completed in November 1987. This segment of the Greenbelt has an estimated total cost of $10,300,000.

Botanical Center Riverfront Park
Boone Waterworks Boat Ramp
Scenic Valley Road Route
Jester County Park Improvements
Upper Saylorville Boat Ramp
Raccoon River Sports Complex
Greenbelt Trail System -
   Lutheran Hospital Repair
Greenbelt Trail System -
   Red Rock (North Shoreline)
Johnston Nursery

I also recommend that additional projects, as recommended by the Advisory Committee, be considered for possible future implementation. Future projects will be identified and submitted as additions to the Des Moines Recreational River and Greenbelt in Annual Addenda.



Neil A. Smart
Colonel, U.S. Army
District Engineer

DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING – P.O. BOX 2004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

CENCR-PD-E

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER
WEBSTER, HAMILTON, BOONE, DALLAS, POLK, WARREN, MARION, JASPER AND MAHASKA COUNTIES, IOWA

SEPTEMBER 1987

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER, IOWA

The lead agency responsible for this project is the U.S. Army Corps of Engineers, Rock Island District, Rock Island, Illinois.

ABSTRACT:

The project was authorized by Public Law 99-88 and subsequent legislation in Public Law 99-662 for the development, operation, and maintenance of a recreation and Greenbelt area on and along the Des Moines River, Iowa, between the point at which the Des Moines River is intersected by United States Highway 20 at Fort Dodge to the point downstream at which relocated State Highway 92 intersects the Des Moines River below the Red Rock Dam. In accordance with Public Law 99-88, the project shall include, but not be limited to: (1) the construction, operation, and maintenance of recreational facilities and streambank stabilization structures; (2) the operation and maintenance of this project (other than any such structure operated and maintained by any person under a permit or agreement with the Secretary) within the area described in the Des Moines Recreational River and Greenbelt Map and on file with the Committee on Public Works and Transportation of the House of Representatives; (3) such tree plantings, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes; and (4) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary.

In accordance with current Corps of Engineers policy, the General Design Memorandum (GDM) will not offer any recommendations for recreation projects in fiscal year 1988. Therefore, project plans have not been evaluated in detail in the Environmental Impact Statement (EIS). As plans are identified in the future for implementation, the Corps of Engineers will initiate additional engineering and environmental studies which address site specific impacts.

If you would like further information on the statement, please contact:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

NOTE: Information, displays, maps, etc., discussed in the main report are incorporated by reference in the EIS.

SUMMARY

MAJOR CONCLUSIONS AND FINDINGS:

The Environmental Imapct Statement is a programmatic document identifying the project area and discussing the potential impacts associated with the types of actions outlined in the GDM.

A total of 121 individual projects were proposed as part of the Greenbelt project. Nineteen of these projects were eliminated from further study. Of the remaining 110 projects, 4 involve development of trails or scenic routes, 21 propose land acquisition and/or environmental enhancement measures, 7 involve streambank stabilization, and 70 involve development or improvement of various aquatic or terrestrial recreation facilities. Site plans, preliminary cost estimates, and general evaluation of potential environmental and social impacts have been developed for each of these projects.

The General Design Memorandum (GDM) does not contain site plans developed in sufficient detail to permit a detailed analysis of environmental, social, or economic impacts. Prior to construction of any Greenbelt projects, a site-specific environmental document will be prepared for public and agency review. Many of the projects considered in the GDM have the potential to benefit natural resources and enhance recreation opportunities within the region. Formulation of site and design alternatives for projects involving development or modification of terrestrial and aquatic areas will attempt to maximize this potential while minimizing the potential for adverse effects resulting from construction, operation, and maintenance of facilities.

The primary focus of the Environmental Impact Statement is the development of a programmatic document assessing existing conditions and resources for the entire Greenbelt, and addressing potential impacts associated with the types of actions outlined in the GDM. Gaps in existing data and future study requirements are also identified in the document. Development of detailed engineering and design plans will require preparation and circulation of site-specific Environmental Assessments or EIS supplements at each stage of implementation.

TABLE EIS-1

Relationship to Environmental Protection Statutes
and Other Environmental Requirements

STATUTE/REQUIREMENT	FULL FEDERAL FUNDING	JOINT FEDERAL/ NON-FEDERAL PARTICIPATION
FEDERAL STATUTES		
Archaeological and Historic Preservation Act (as amended)	Full	Partial
Clean Air Act (as amended)	Full	Partial
Clean Water Act (as amended)	Full	Partial
Coastal Zone Management Act (as amended)	N/A	N/A
Endangered Species Act (as amended)	Full	Full
Estuary Protection Act (as amended)	N/A	N/A
Federal Water Project Recreation Act (as amended)		
Fish & Wildlife Coordination Act (as amended)	Full	Partial
Land & Water Conservation Fund Act (as amended)	Full	Partial
Marine Protection, Research & Sanctuaries Act	N/A	N/A
National Historic Preservation Act (as amended)	Full	Partial
National Environmental Policy Act (as amended)	Full	Partial
River and Harbor Act	N/A	N/A
Watershed Protection and Flood Prevention Act	N/A	N/A
Wild and Scenic Rivers Act (as amended)	N/A	N/A
Farmland Policy Protection Act (as amended)	Full	Partial
EXECUTIVE ORDERS AND MEMORANDA		
Floodplain Management (E.O. 11988)	Full	Partial
Protection of Wetlands (E.O 11990)	Full	Partial
Analysis of Prime & Unique Farmlands	Full	Partial
STATE AND LOCAL POLICIES		
Polk County Planning Objectives	Full	Partial
IDNR Planning Objectives	Full	Partial
LAND-USE PLANS		
REQUIRED FEDERAL ENTITLEMENTS	Full	Partial
Section 404 Permit (Clean Water Act)	Full	Partial

COMPLIANCE CATEGORIES:

a. Full Compliance. Having met all requirements of the statute, E.O., or other environmental requirement for the current stage of planning (either pre or postauthorization).

b. Partial Compliance. Not having met some of the requirements that are normally met in the current stage of planning.

c. Noncompliance. Violation of a requirement of the statute, E.O., or other environmental requirement.

d. Not Applicable. No requirements for the statute, E.O., or other environmental requirement for the current stage of planning.

PROJECT BACKGROUND

The Des Moines Recreational River and Greenbelt was funded and conditionally authorized by Public Law 99-88 as approved on August 15, 1985. The project is for the development, operation, and maintenance of a recreation and greenbelt area on, and along, the Des Moines River from U.S. Highway 20 in Fort Dodge, Iowa, downstream to relocated State Highway 92 in the vicinity of the Red Rock Dam. An Advisory Committee has been established for consultation with the Department of the Army according to H.R. 2577, dated July 29, 1985. Within the Greenbelt boundaries, the Secretary of the Army, acting through the Chief of Engineers, is authorized and directed to proceed with planning, design, engineering, and construction of recreational facilities, streambank stabilization structures, operation and maintenance of existing structures, environmental enhancement for recreational purposes, and the prohibition or limitation of the killing, wounding, or capturing at any time of any wild bird or animal in designated areas.

The Plan for Engineering and Design was prepared to establish the appropriate scope and content of the General Design Memorandum and to describe the role of the Advisory Committee, public involvement, and project administration. Key aspects of the General Design Memorandum are discussed in the Plan for Engineering and Design. Letters of Assurance are included as an appendix and are addressed in the main report to satisfy the local cooperation requirements at this stage of the study. The report was approved by the Office of the Chief of Engineers in February 1986 and distributed to the public in March 1986.

The Corps of Engineers executed a local cooperation agreement with the Iowa Department of Natural Resources in June 1986 for the construction of a 50-percent Federal/50-percent local expense boat ramp and parking lot. The project is located at the Bennington Bridge site near the city of Runnells in extreme northwest Marion County. Construction is scheduled for completion in 1987.

Additional Greenbelt legislation was provided in Section 102 of Public Law 99-500 and Section 604 of Public Law 99-662. Section 102 continues the preparation of the General Design Memorandum and set an October 1987 report completion date.

Section 604 set a town and range description of the boundary as referenced in Committee Print 99-53 and the Joint Explanatory Statement of the Committee on Conference further described the composition of the Advisory Committee.

The General Design Memorandum covers the administration, comprehensive plan, plan for initial development and coordination of the project, and will offer recommendations for Federal participation. The comprehensive plan portion of the report will address the entire Greenbelt. The plan for initial development will be divided into Federal and non-Federal sections. Plans for federally cost-shared projects will be included in the Federal section, while all other development will be listed in the non-Federal portion of the report. Completion of the General Design Memorandum is scheduled for October 1987 in accordance with Public Law 99-500.

SUMMARY OF ENVIRONMENTAL EFFECTS

Noise - Temporary elevations in noise levels during construction in nonurbanized areas are not anticipated to exceed acceptable levels. Construction within urban areas may require implementation of noise abatement procedures if construction is in close proximity to sensitive noise receptors such as hospitals or schools.

Displacement of People - Other than possible relocations due to land acquisition on a willing-seller basis, no displacement of people is anticipated for the proposed projects as outlined at this time.

Aesthetic Values - Several of the identified projects located in the city of Des Moines could result in a noticeable improvement in scenic or other aesthetic values within the downtown area and in parks or recreation areas. Other proposed projects also could have a positive effect on aesthetic values.

Desireable Community Growth - Projects located in rural areas not adjacent to existing communities would have no effect on community growth. Recreation projects located in or near urban areas could have some minor effect on actual or potential community growth.

Community Cohesion - Proposed projects as outlined would not disrupt the integrity of any existing neighborhoods.

Property Values - Several of the identified projects could indirectly increase property values in surrounding areas by providing recreational opportunities which could add to the economic potential of the area or enhance its attractiveness to prospective buyers.

Tax Revenues - Loss of tax revenues could result from implementation of projects involving public acquisition of private lands. There may be some potential for minor increases in tax revenues where project implementation contributes to local economic growth.

Public Facilities - Minimal traffic disruptions could be anticipated to occur during construction activity. Completed recreation projects will enhance local, and in some cases, regional recreational opportunities while alleviating some of the demands on existing facilities.

Public Services - No significant impacts to emergency services (police, ambulance, fire departments, etc.) would be anticipated for any of the projects identified at this time.

Regional Growth - Projects identified in this document would individually have little effect on regional growth. Construction or implementation of a number of these projects could help to promote regional growth by enhancing recreational opportunities and scenic values in the Des Moines River valley and the surrounding region.

Employment/Labor Force - Construction of projects would cause a short-term increase in employment. No permanent changes in local or regional employment opportunities would be anticipated.

Business and Industrial Activity - Business activity would increase during the construction of projects.

Farm Displacement - Some acquisition of farmland may be required for environmental enhancement projects or as right-of-way for trials and other recreation projects. It is not known at this time whether any farmsteads would be displaced by any of the projects.

Man Made Resources - Several projects would involve the rehabilitation and restoration of man-made structures such as bridges and floodwalls. One project would include the removal of several low-head dams from the Des Moines River.

Natural Resources - The proposed projects could result in significant impacts within the Greenbelt study area. Some of these impacts would be beneficial for projects involving protection or enhancement of natural resources or sensitive areas. However, several projects could result in loss of bottomland forest habitat or alter the existing water quality and habitat value of portions of the Des Moines River.

Site-specific analyses based on detailed engineering design plans would be required to assess the full extent of beneficial and adverse impacts.

Cultural Resources - Several projects could result in significant impacts within the Greenbelt study area. Some of these impacts would be beneficial for projects involving protection, interpretation, or enhancement of historic properties. However, several construction projects would result in adverse effects to significant historic properties. Sensitive planning and design will be used to reduce impacts, along with mitigation measures.

Air Quality/Noise - Temporary elevations in emissions from construction machinery would be anticipated for projects involving development or renovation. Construction of projects within the downtown Des Moines area could result in temporary elevations in noise beyond acceptable levels.

Water Quality - Runoff from construction sites in riparian areas could result in temporary localized degradation of water quality. Projects involving work in the channel of the Des Moines River or major tributaries could cause temporary resuspension of sediment or otherwise disrupt aquatic habitat. Projects which increase vegetative cover or stabilize streambanks could result in some improvement in water quality by reducing soil erosion.

FEDERAL STATUTES

Archaeological and Historic Preservation Act - Based on information provided by the Iowa State Historic Preservation Officer (SHPO) and the Office of the State Archaeologist (OSA), together with cultural resources investigations of the Saylorville and Red Rock areas performed under contract for the Rock Island District, a total of 74 known historic properties (71 archaeological, 3 architectural) may be affected by Greenbelt projects. Twenty-two of the archaeological sites are eligible or potentially eligible for listing in the National Register of Historic Places based on previous investigations. Of the remaining properties, 27 of the archaeological sites and the three historic sites would need to be scientifically evaluated for significance if impacts could accrue. The remaining 22 archaeological sites have been determined ineligible for listing in the National Register by the SHPO and the Corps of Engineers based on previous investigations. A summary of potential effects to known historic properties is contained in table EIS-10.

Endangered Species Act (as amended) - None of the projects as outlined at this time are anticipated to have any adverse effect on any federally endangered or threatened species. One project could have some beneficial effect on one federally endangered species, the bald eagle (Haliaeetus leucocephalus), by providing additional nesting and perching sites.

Fish and Wildlife Coordination Act - The Draft Fish and Wildlife Coordination Act Report is included as appendix 1.

National Historic Preservation Act - The SHPO reviewed the Plan for Engineering and Design (PED) in March 1986 and was provided project lists and maps in the fall of 1986.

The SHPO was also afforded the opportunity to review three prototype projects in May 1986 and subsequently concurred with the study recommendations for project clearances. Coordination between the District and the SHPO is continuing through written and verbal correspondence and exchange of information. The SHPO will be given the opportunity to review and comment on the EIS upon its release to the public.

Executive Order 11988 - Floodplain Management - Projects involving construction within floodplain areas would need to be evaluated for compliance with local floodplain zoning regulations.

Farmland Protection Policy Act - Most environmental enhancement, streambank stabilization, or ecreational projects would not involve irreversible conversions of agricultural lands. For projects involving construction or development on farmlands, farmland impact ratings would need to be calculated for each site alternative in accordance with the provisions of the Act.

Executive Order 11990 - Protection of Wetlands - Terrestrial or aquatic recreation projects located in floodplains or riparian areas would need to be evaluated for impacts to wetlands.

PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT

DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER, IOWA

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DES MOINES RECREATIONAL RIVER AND GREENBELT
DES MOINES RIVER, IOWA

SECTION 1 - NEED FOR AND OBJECTIVES OF ACTION

1.1 STUDY AUTHORITY

The Des Moines Recreational River and Greenbelt (hereinafter referred to as the Greenbelt) was authorized on August 15, 1985, by Public Law 99-88, the 1985 Supplemental Appropriations Act. The Conference Report on H.R. 2577, dated July 29, 1985, provides a description of the Greenbelt and directs the establishment of an Advisory Committee for consultation with the Department of the Army. Subsequent Greenbelt legislation was provided in Section 102 of Public Law 99-500, Fiscal Year 1987 Continuing Resolution Act. Additional legislation is contained in Section 604 of Public Law 99-662, the Water Resources Development Act of 1986. Section 604 was further discussed in the Joint Explanatory Statement of the Committee of Conference. Portions of the aforementioned legislation pertaining to the Greenbelt are included in the General Design Memorandum.

1.2 PROJECT PURPOSE

1.2.1 The project is for the development, operation, and maintenance of a recreation and Greenbelt area on, and along the Des Moines River, Iowa, between the point at which the Des Moines River is intersected by United States Highway 20 at Fort Dodge to the point downstream at which relocated State Highway 92 intersects the Des Moines River below the Red Rock dam.

1.2.2 In accordance with Public Law 99-88, the project shall include, but not be limited to:

(1) the construction, operation, and maintenance of recreational facilities and streambank stabilization structures;

(2) the operation and maintenance of all structures constructed before the date of authorization of this project (other than any such structure operated and maintained by any person under a permit or agreement with the Secretary) within the area described in the Des Moines Recreational River and Greenbelt Map and on file with the Committee on Public Works and Transportation of the House of Representatives;

(3) such tree plantings, trails, vegetation, and wildlife protection and development and other activities as will enhance the natural environment for recreational purposes; and

(4) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary.

1.3 PUBLIC CONCERNS - Public meetings were held throughout the Greenbelt in April 1986 and the Corps of Engineers has pursued an active public involvement program. The major public concerns are summarized as follows:

a. The public has expressed a concern over the potential for large land acquisition projects within the Greenbelt corridor. Converting lands to Government ownership would have an adverse impact upon property taxes. The only local sponsor to propose extensive land acquisition has been the Iowa Department of Natural Resources (IDNR). Lands for Greenbelt projects can only be purchased with the consent of the owner in accordance with Public Law 99-88.

b. Sportsmen have raised concerns over the project purpose dealing with the "prohibition and limitation on taking wildlife." The Corps of Engineers controls and manages all lands in the Federal fee title not leased by other interests. Lands outgranted to the State of Iowa for fish and wildlife purposes are managed by the IDNR. The Advisory Committee has recommended that no action be taken to prohibit or limit the taking of wildlife.

c. The public and local government officials have expressed a concern for the need to cost-share construction expenses for Greenbelt projects. In accordance with Public Law 99-662, all recreational development will be cost-shared 50-percent Federal and 50-percent local. Other cost-sharing formulas apply to different project purposes. Upon completion of a project, operation, maintenance, and replacement will be the responsibility of the local sponsor.

1.4 PLANNING OBJECTIVES

1.4.1 In accordance with Public Law 99-88, the overall objective of the project will be to provide central Iowa and the city of Des Moines with environmental protection of scarce river bottom timberlands and greatly enhance opportunities for recreation.

1.4.2 The primary objectives the Greenbelt study were outlined by the Assistant Secretary of the Army (Civil Works) in a letter to Congressman Neal Smith of Iowa dated October 4, 1985. Following approval of the Plan for Engineering and Design in February 1986, the Corps of Engineers proceeded to execute the following instructions:

> The General Design Memorandum will result in a comprehensive plan and a plan for initial development, should it be determined that the total cost of the comprehensive plan exceed resource availability for the near term. A division of responsibility between Federal and non-Federal interests, together with priorities for implementation as you envisioned during our September 25th meeting, also will be developed. In general, it is the Corps' intention during preparation of the General Design Memorandum to address issues such as the following:
>
> > > Identification of boundaries for, and features of, the Recreation and Greenbelt area;
> >
> > > Evaluation of benefits (outputs) and costs;
> >
> > > Responsibility for operation, maintenance, and replacement;
> >
> > > Concerns of state and local officials to be considered in developing the plan to be implemented; and
> >
> > > Assurances of local cooperation from local sponsors.

SECTION 2 - PROJECT ALTERNATIVES

2.1 General

2.1.1 There are 121 individual projects being considered as part of the Greenbelt project. The majority of the projects would be cost-shared between the Corps of Engineers and a local sponsor. Qualifying local sponsors are government entities with taxing authority, such as a city, county, or the State of Iowa. Most of the project proposals are for recreational development, with the remainder being for environmental enhancement and streambank stabilization. The projects proposed by the local sponsors are largely for improvements to existing park areas. Plans eliminated from further study are listed in table EIS-2, and plans considered in detail are listed in table EIS-3.

2.1.2 In accordance with current Corps of Engineers policy, the GDM will not offer any recommendations for project construction in fiscal year 1988. Additionally, the report will not contain draft local cooperation agreements or detailed engineering design required for the preparation of local cooperation agreements.

2.2 PLANS ELIMINATED FROM FURTHER STUDY

2.2.1 There have been 19 plans eliminated from further Federal study and consideration as a cost-shared project. However, these projects may be implemented at 100-percent local expense. Plans were eliminated from further study for a variety of reasons, as listed in table EIS-2.

TABLE EIS-2

Plans Eliminated From Further Study
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Project Purpose	Local Sponsor	Notes
--	Archeological and Historical Studies	Rec.	IDNR	Studies not cost-shared
--	Red Rock Viewing Binoculars	Rec.	IDNR	Facility not cost-shared
--	Centerville Fishing Riffle	Env.	IDNR	Cancelled by sponsor
--	Raptor Inventory	Env.	IDNR	Studies not cost-shared

TABLE EIS-2 (Cont'd)

Project Number	Project Title	Project Purpose	Local Sponsor	Notes
--	Hill Prairie and Woodland Vole Survey	Env.	IDNR	Studies not cost-shared
--	Engineering Studies/ Master Planning-Des Moines River, Downtown Des Moines	Rec.	City of Des Moines	Studies not cost-shared
--	Water Quality Study & Plan	Env.	City of Des Moines	Studies not cost-shared
--	Bridge Restoration Walnut, Locust & Grand Avenues	Rec.	City of Des Moines	Not within limits of authority
--	Terrace Lake	Rec.	City of Des Moines	Cancelled by Sponsor
--	Balustrade Restoration	Rec.	City of Des Moines	Facility not cost-shared
--	Iowa Aquatic Sports Center	Rec.	None	No local sponsor
--	Small Animals for Ledges State Park	Rec.	IDNR	Cancelled by local sponsor
--	Turkeys	Rec.	IDNR	Not within limits of authority 1/
--	Natural History Interpretive Center	Rec.	Polk County	Facility not cost-shared
--	Sandpiper Beach	Rec.	Corps 2/	Proceeding to construction
--	Second Marina (Lakeview)	Rec.	Corps	Proceeding to construction
--	Bennington Bridge Boat Ramp	Rec.	IDNR	Proceeding to construction
--	Visitor Center at Riverside Park	Rec.	City of Des Moines	Facility not cost-shared
107.1	Boone Forks Outpost Development Area	Rec.	IDNR	Facility not cost-shared

1/ - The Iowa Department of Natural Resources has an existing program which involves releasing wild turkeys for species repopulation.

2 - The Corps of Engineers is not a true local sponsor. Projects listed for Corps sponsorship are identified through the approved master plan process, and are constructed at 100-percent Federal expense.

2.3 PLANS CONSIDERED IN DETAIL

2.3.1 A total of 102 plans were considered in detail in the study as listed in table EIS-3. These plans have only been developed in sufficient detail to produce a site plan, preliminary itemized cost estimate, and general environmental and social impacts. Prior to the construction of any Greenbelt projects, a site-specific environmental assessment will be prepared for public and agency review. The GDM does not recommend any projects for fiscal year 1988 construction. Engineering data for each project studied in detail are found in Section 4, Plan for Initial Development, of the GDM. A site plan, itemized cost estimate, and environmental checklist have been developed for each project.

TABLE EIS-3

Plans Considered in Detail
Des Moines Recreational River and Greenbelt

Project Number	Project Title	Project Purpose	Local Sponsor
101.1	Boone Forks Wildlife Management Area	Env.	IDNR
102.1	State Forest Acquisition & Development	Env.	IDNR
103.1	Ledges State Park Improvements	Rec.	IDNR
104.1	Bever Bridge Canoe Access	Rec.	IDNR
105.1	Kalo Boat Ramp	Rec.	IDNR
105.2	Upper River Gateway	Rec.	IDNR
106.1	Dolliver State Park Improvements	Rec.	IDNR
108.1	Carlson Area Boat Ramp	Rec.	IDNR
108.2	Carlson County Recreation Area Improvements	Str.	Webster County
109.1	Don Williams County Park Expansion	Rec.	IDNR

TABLE EIS-3 (Cont'd)

Project Number	Project Title	Project Purpose	Local Sponsor
110.2	Norton's Ford Boat Ramp	Rec.	IDNR
110.3	Lower Fraser Boat Ramp	Rec.	IDNR
110.4	Boone Waterworks Boat Ramp	Rec.	Boone County
112.1	Brushy Creek Bank Stabilization	Str.	IDNR
112.2	Brushy Creek Confluence Staging Area	Rec.	IDNR
114.1	Dayton Mounds	Rec.	Webster County
201.1	Jester County Park Improvements	Rec.	Polk County
202.1	Big Creek State Park Improvements	Rec.	IDNR
203.1	Big Creek Spillway Boat Ramp	Rec.	IDNR
203.2	S&V Bridge Jetty	Rec.	IDNR
203.3	Bob Shetler Picnic Ground	Rec.	N/A
203.4	Walnut Ridge Comfort Station	Rec.	N/A
203.5	Cottonwood Picnic Shelter	Rec.	N/A
203.6	Greenbelt Visitor Center Development-Saylorville Lake	Rec.	N/A
205.1	Beaver Creek Park	Rec.	Polk County
206.1	Upper Saylorville Rest Area	Rec.	IDNR
207.1	Saylorville Refuge Expansion	Env.	IDNR
208.1	Johnston Nursery	Env.	Johnston
301.1	River's Edge Pedestrian Walkway	Rec.	Des Moines
301.2	Downtown Riverfront Plaza	Rec.	Des Moines
301.3	Walnut Street Transit Mall Improvements	Rec.	Des Moines
301.4	Crivaro Park Improvements	Rec.	Des Moines
301.5	Recreational Rowing Marina	Rec.	Des Moines

TABLE EIS-3 (Cont'd)

Project Number	Project Title	Project Purpose	Local Sponsor
302.1	Martin-Marietta Development	Rec.	IDNR
303.1	Walnut Woods State Park Improvements	Rec.	IDNR
304.1	Yellow Banks County Park Improvements	Rec.	Polk County
305.1	Prospect Park Riverbank Stabilization	Str.	Des Moines
306.1	Riverview Park Improvements	Rec.	Des Moines
307.1	West River Drive Riverfront Park Extension	Rec.	Des Moines
308.1	Botanical Center Riverfront Picnic Park	Rec.	Des Moines
309.1	Hubbell Naturalistic Park Improvements	Rec.	Des Moines
310.1	Easter Lake County Park Improvements	Rec	Polk County
311.1	Lighted Outdoor Sports & Athletic Complex	Rec.	Des Moines
312.1	Birdland Marina Improvements	Rec.	Des Moines
313.1	Des Moines Waterworks Park Boat Ramp	Rec.	IDNR
314.1	Boat Traffic: Saylorville Lake to Lake Red Rock	Rec.	Des Moines
314.2	Downtown Marina, Des Moines	Rec.	Des Moines
314.3	Des Moines & Raccoon River Levee Protection	Str.	Des Moines
314.4	Reconstruction of West River Wall	Str.	Des Moines
401.1	Elk Rock State Park Improvements	Rec.	IDNR
402.1	Red Rock 340 Acre Park	Rec.	IDNR
402.3	Wallashuck Camping Loop	Rec.	N/A
402.4	North Overlook Beach	Rec.	N/A
402.5	East Wallashuck Boat Ramp	Rec.	N/A

TABLE EIS-3 (Cont'd)

Project Number	Project Title	Project Purpose	Local Sponsor
402.6	Greenbelt Visitor Center Development-Lake Red Rock	Rec.	N/A
404.1	Runnells City Park Improvements	Rec.	Runnells
404.2	Whitebreast Beach	Rec.	N/A
405.1	Runnells Recreation Area-Howard's Pond Subimpoundment	Rec.	Runnells
406.1	Congregational Church Historic Site & Overlook	Rec.	Runnells
410.1	Runnells Boat Ramp	Rec.	IDNR
413.1	Harvey Boat Ramp	Rec.	IDNR
801.1	Scenic Valley Road Route	Rec.	IDNR
801.2	Kalo Road Bank Stabilization	Str.	Webster County
801.3	Route P73 Bank Stabilization	Str.	Lehigh
801.4	Conservation Easements	Env.	IDNR
801.5	Deception Hollow Bank Stabilization	Str.	IDNR
802.1	Greenbelt Multi-Purpose Trail	Rec.	IDNR
802.2	Brown's Woods Greenbelt Trail	Rec.	Polk County
802.3	Jester Park Greenbelt Trail	Rec.	Polk County
803.1	Des Moines River Fishing Piers	Rec.	IDNR
803.2	Des Moines River Fishing Access	Rec.	IDNR
803.3	Handicapped Fishing Piers	Rec.	Des Moines
803.5	Scott Street Dam Shoreline Fishing Access	Rec.	IDNR
803.4	Prospect Park Fishing Platforms	Rec.	Des Moines
803.6	Red Rock Fishing Piers	Rec.	IDNR
804.1	Forest/Prairie Conservation No. 1	Env.	IDNR

TABLE EIS-3 (Cont'd)

Project Number	Project Title	Project Purpose	Local Sponsor
804.2	Forest/Prairie Conservation No. 2	Env.	IDNR
804.3	Forest/Prairie Conservation No. 3	Env.	IDNR
804.4	Forest/Prairie Conservation No. 4	Env.	IDNR
804.5	Forest/Prairie Conservation No. 5	Env.	IDNR
804.6	Forest/Prairie Conservation No. 6	Env.	IDNR
804.9	Saylorville Prairies	Env.	N/A
804.10	Red Rock Reforestation	Env.	N/A
804.12	Land Acquisition-Joe West Sr. Estate	Env.	IDNR
804.13	SE. Riverfront Land Acquisition	Env.	Des Moines
804.14	Tree Belt Below Red Rock	Env.	IDNR
805.2	Bald Eagle Nest Platform	Env.	IDNR
805.3	Heron Nest Structures-Saylorville Lake	Env.	IDNR
805.4	Heron Nest Structures-Lake Red Rock	Env.	IDNR
805.5	Bird Watching Stations	Rec.	IDNR
806.1	Views/Scenic Easements No. 1	Rec.	Des Moines
806.2	Views/Scenic Easements No. 2	Rec.	Des Moines
806.3	Views/Scenic Easements No. 3	Rec.	Des Moines
806.4	Views/Scenic Easements No. 4	Rec.	Des Moines
806.5	Views/Scenic Easements No. 5	Rec.	Des Moines
806.6	Views/Scenic Easements No. 6	Rec.	Des Moines
806.7	Views/Scenic Easements No. 7	Rec.	Des Moines
806.8	Views/Scenic Easements No. 8	Rec.	Des Moines

2.3.1.1 The No Action Alternative. Failure to implement some or all of the plans considered in detail would result in a continuation of existing conditions in the project area regarding natural resources and recreational opportunities. Natural areas would continue to be threatened by pressure for development in both urban and more rural settings. Increasing demands for recreational facilities would not be met, and existing facilities could subsequently suffer from overuse, thereby diminishing the quality of the recreational experience for many users.

2.3.1.2 100-Percent Federal Sponsorship. There are 12 projects in existing Federal recreation areas or on Federal fee land that are eligible for 100-percent Federal sponsorship. These developments are identified in Recreational Resource Master Plans or other planning documents prepared by the Federal agency. The Federal agency involved in sponsorship (in most cases the Corps of Engineers) would assume the full cost of detailed engineering and design studies, construction, and subsequent operation and maintenance of facilities.

2.3.1.3 Cost-Shared Federal/Non-Federal Participation. Projects not eligible for 100-percent Federal funding but which fall within the Greenbelt boundary and the limits of Corps of Engineers authority may be eligible for Federal/non-Federal cost-sharing. This would involve the establishment of Local Cooperation Agreements (LCA's) with non-Federal entities willing to participate in project cost-sharing with demonstrable ability to satisfy financial conditions and terms of the agreement.

2.4 PLANS REQUIRING FURTHER STUDY

2.4.1 All plans which were considered in detail will require further study. In the future, as plans are recommended for implementation, the Corps of Engineers will initiate additional engineering studies which will include site-specific environmental analyses.

2.4.2 Environmental studies will include the assessment of existing resources and conditions in affected areas, and analysis of potential impacts to natural and cultural resources and to social and economic concerns. At present, little acreage data are available concerning land use and cover types to adequately evaluate the direct, indirect, and cumulative impacts of proposed projects under Greenbelt authority. An inventory of land use and natural resources for the entire study area may be necessary. This inventory would include factors such as forest and farmland acreages, soils, major industrial developments and mineral extracting operations, and natural areas such as prairies and wetlands. While recreation acreage within the Greenbelt is known, most information on other land uses is available only on a county-wide basis. Resource inventories for Saylorville Lake and Lake Red Rock contain more detailed data, but these surveys cover only a portion of the Greenbelt study area. Information obtained through a Greenbelt inventory could be useful in evaluating site-specific and regional impacts.

2.4.3 Projects involving the conversion of previously undeveloped natural areas or agricultural lands could require more detailed site-specific analyses than those projects which would be located in existing urban or recreational developments. Projects involving public acquisition of large amounts of privately owned land, or major recreational developments, could require more extensive analysis of site-specific and region-wide socio-economic impacts.

2.4.4 All projects approved for construction or implementation will be reviewed for impacts to cultural resources. Lands under Federal jurisdiction, or projects involving use of Federal funds or requiring Federal easements, permits, or licenses will need to be surveyed for the presence of archaeological, historical, and architectural properties. Sites identified during these surveys will require evaluation to determine National Register of Historic Places eligibility. The nature and methodology of these studies are described in Appendix C, Cultural Resources. Because so many of the project areas are not located within lands presently under Federal jurisdiction (Saylorville Lake and Lake Red Rock) which are covered by previous surveys, a substantial amount of archaeological compliance work remains to be done.

2.4.5 Land acquisition measures, which represent the largest areas yet to be investigated, would be anticipated to have relatively low impact potential, but would nevertheless require surveys and evaluation. Other measures such as trails also would require extensive work to identify and evaluate properties on project lands. Development of a cultural resources management plan for the entire Greenbelt, similar to and building upon those already developed at Saylorville Lake and Lake Red Rock, may be necessary to ensure compliance with historic preservation laws and to fulfill Federal management responsibilities.

3.1 GENERAL ENVIRONMENT

3.1.1 The Des Moines Recreational River and Greenbelt is located in central Iowa along the Des Moines River Valley from the city of Fort Dodge southward to the State Highway 92 bridge, which crosses the river approxiately 6.5 miles downstream from Red Rock Dam. The Greenbelt boundary encompasses about 362,000 acres (567 square miles) along the Des Moines River corridor and several major tributaries. Approximately 18,000 acres of the total area is covered by water during normal river flow conditions, while the remaining 344,000 acres represents land surface area.

3.1.2 The Des Moines River is the principal natural feature of the Greenbelt. The dominant man-made features within the study area are the Saylorville and Red Rock Dams and their associated reservoirs. The entire reach of the Greenbelt study area has been influenced to a greater or lesser degree by human activity. Least affected by development or other activity is the segment from Ledges State Park near the city of Boone northward to the outskirts of Fort Dodge. This segment includes the Boone River Valley from the confluence northward to Webster City. South of Ledges State Park, the two large Federal reservoirs, other dams and impoundments, transportation networks, small towns, and the Des Moines metropolitan area have extensively modified the character of the river and the surrounding landscape.

3.1.3 The Greenbelt boundary encompasses natural and undeveloped areas, parks and other recreational facilities, agricultural lands, and residential, industrial and urban developments. While no figures on land use acreages within the Greenbelt are currently available, the county land use data shown in table EIS-4 gives some indication of land use and cover types both within the Greenbelt and the surrounding region.

TABLE EIS-4

County Land Use Data
(1978-79)

County	County Total	Land Area	Water Area	State Lands	Federal Lands	Cropland	Pasture and Hay	Woodland	Wildlife	Recreation Lands	Other Lands
Boone	366,720	366,560	160	3,119	6,544	277,842	27,583	26,888	1,835	4,085	21,803
Dallas	382,080	382,000	80	295	2,850	270,160	43,505	21,900	1,800	495	41,290
Hamilton	389,820	389,210	710	0	0	321,623	15,000	6,000	679	835	25,003
Jasper	471,040	470,095	945	2,048	68	329,458	81,482	11,000	9,357	1,471	46,259
Mahaska	366,080	365,598	82	2,520	0	284,528	49,215	15,000	2,000	800	14,454
Marion	364,800	355,560	9,240	280	30,358	189,714	45,639	26,700	19,119	12,795	31,234
Polk	380,160	373,071	7,089	0	9,837	193,078	27,784	22,961	11,436	6,203	101,712
Warren	366,080	365,750	330	1,172	5,616	210,000	80,000	25,000	1,320	2,082	41,732
Webster	459,520	459,470	50	4,918	0	374,800	24,700	16,000	4,897	5,807	33,266

Note: All figures are in acres
Source: U.S. Department of Agriculture, Soil Conservation Service

3.1.4 Climate of the region is subhumid midcontinental, with warm, moist summers and cold, relatively dry winters. About two-thirds of total annual precipitation falls during the months of April through September, when prevailing southerly winds allow warm, moist air masses from the Gulf of Mexico to move northward. During the winter, prevailing northerly winds cause polar continental air masses to move southward through the region, dominating temperature and moisture regimes. Throughout the year, movement and shifting of these two air masses is accompanied by frequently intense storms, resulting in precipitation in the form of rain, sleet, hail, or snow.

3.1.5 Average annual precipitation for the Greenbelt corridor is 32 inches, with average annual snowfall of approximately 32.4 inches. Mean annual temperature for the study area is 49 degrees Fahrenheit, with summer and winter averages of 73 and 22 degrees Fahrenheit, respectively. The normal growing season is approximately 150-165 days. Microclimatic variations include a slight increase in annual precipitation and average temperature along the northwest-to-southeast axis of the Greenbelt study area, and a generally warmer and less moist environment associated with the south-and west-facing slopes of stream corridors.

3.1.6 The study area lies within the Central Lowland physiographic province of North America. In general, this province is characterized by low altitude and slight relief, numerous rivers and lakes, and a thick mantle of glacial deposits. Topography within the study area ranges from nearly flat to steeply sloping land. Two distinct landform regions are represented within the Greenbelt boundary. The northern portion of the study reach, from Fort Dodge southward through the city of Des Moines, passes through the Des Moines Lobe. This region is characterized by level terrain and poor drainage on uplands. The natural lake and marsh system created by these conditions has been largely altered by tiling and draining for agricultural purposes. River systems in the region are relatively young, with many undefined valleys and narrow floodplains. South of Des Moines, the study area lies in the Southern Iowa Drift Plain. This region features a more dissected topography with steeply rolling hills interspersed with lowlands and uplands. The landscape is generally well-drained, with streams forming a dendritic pattern and broad floodplains associated with the larger rivers.

3.1.7 Biologically, the study area lies within the Prairie Peninsula biotic province encompassing all or parts of Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Ohio. Characteristic native vegetation is tallgrass prairie on the uplands and deciduous forest in the bottomlands and on bluff crests and valley walls overlooking the larger streams. Interspersion of cover types within the study area is generally greater than in the surrounding region.

3.2 SIGNIFICANT RESOURCES

3.2.1 NATURAL RESOURCES

3.2.1.1 The Des Moines River

3.2.1.1.1 The Des Moines River is the principal natural element and feature of the Greenbelt. The river flows for about 535 miles from the headwaters in southwestern Minnesota to its confluence with the Mississippi River just south of Keokuk, Iowa. Major tributaries include the East and West Forks; the Boone, Raccoon, Middle, North, and South Rivers; and Lizard, Beaver, Whitebreast, and Cedar Creeks. The Des Moines and its tributaries drain an area about 360 miles long with an average width of 40 miles and totalling some 14,540 square miles in size. The basin covers approximately 26-percent (12,870 square miles) of the land area of Iowa and smaller portions of Minnesota and Missouri. The Greenbelt comprises approximately 4 percent of the Iowa portion of the basin (3.5-percent of basin total). The study area covers the channel and adjacent floodplain, valley slopes, and uplands of the main stem and its major tributaries.

3.2.1.1.3 Upland areas within the northern portion of the study area have immature drainage topography and low runoff rates due to natural storage. Agricultural lands in this region have been extensively channeled and tiled to increase runoff and facilitate cultivation. Both surface and subsurface water are generally abundant throughout the basin. Groundwater is primarily used for municipal and industrial water supply and individual farm water supply. Fish, wildlife, and recreation are the principal uses of surface water within the basin. Restrictive channel conditions, both natural and man-induced, prevent commercial navigation of the Des Moines River and limit boat traffic to small private recreational vessels.

Two prinicpal impoundments are located on the Des Moines River within the Greenbelt boundary. Saylorville Lake is located north of the city of Des Moines at River Mile 213.7. The drainage area above the dam is 5,823 square miles and the reservoir provides flood control, water supply, and recreation benefits to the city and the surrounding area. Lake Red Rock is located in Marion County about 11 miles northeast of Knoxville at River Mile 142.9. Drainage area above this dam is 12,323 square miles, and the reservoir provides flood control and recreation benefits for the basin and surrounding region.

3.2.1.1.4 Smaller impoundments are located at Roberts Creek County Park, Easter Lake County Park, Don William's County Park and Briggs Woods County Park. A reservoir is planned for construction at Brushy Creek State Recreation Area. Other water resource developments in the basin include numerous low-head dams originally built but which are currently inoperative. Storage provided by these dams is relatively insignificant, and they presently function mainly as recreation or fish and wildlife structures. Small dams within the Greenbelt boundary are located at Scott and Center Streets in Des Moines, and near Boone, Fraser and Fort Dodge.

3.2.1.1.5 In a 1983 report on environmental corridors in the Des Moines River Basin, prepared as part of the USDA, Soil Conservation Service/Forest Service, overall basin study, a qualitative rating system was developed to rank individual segments of environmental corridors. Segments were rated on the basis of physical, biological, and human interest factors. Physical factors included flow, velocity, depth, stream structure and pattern, ratio of valley height to width, and bank erosion. Most of the river segments located in the Greenbelt received overall ratings of moderately good to excellent. The upper Des Moines River from Saylorville Dam to Fort Dodge, and the Boone River from the confluence to Webster City received good and excellent ratings, respectively, on physical characteristics.

3.2.1.2 Flora

3.2.1.2.1 Terrestrial vegetative communities include developed lands (urban, suburban, recreational, croplands, upland and bottomland forests, grasslands, old field/savanna communities, and wetlands). Natural terrestrial flora in the Greenbelt study area and the surrounding region is largely relicts of the forests which grew in the river valleys and on uplands protected from fire.

3.2.1.2.2 Prior to white settlement of the region, tall grasses dominated the marsh and bog uplands in the northern reaches of the study area, with narrow bands of deciduous forest populating the more defined drainages. To the south, a more balanced mix of prairie and forest was evidenced, although tallgrass prairies dominated the uplands here as well. Today, agricultural lands are dominant in upland areas.

3.2.1.2.3 Under present conditions, the types, distribution, and use of existing plant communities are influenced by intensive agricultural use and other human activities. The native prairie has virtually succumbed to the expansion of row crop cultivation. Clearing for agricultural purposes also has drastically reduced the state's forest cover. Most surviving forests are located on Federal, state, or local preserves, or on lands unsuited for cultivation. Native prairies are represented by a few small remnants, and restored prairies have been established on Corps of Engineers project lands and in some state and local parks. The Greenbelt boundary contains a comparatively large percentage of the state's existing natural vegetation.

3.2.1.2.4 The three primary forest types found within the Greenbelt are bottomland forest and two upland associations. Bottomland forests are located on alluvial soils bordering streams and rivers. Trees, shrubs, and herbaceous species in this community are generally adapted to moist soil conditions, frequent flooding, and siltation. The mixture of species found in a particular location is indicative of the variability of these conditions. Cottonwood (Populus deltoides) and black willow (Salix nigra) are the pioneer tree species of the central Iowa floodplain. They are tolerant of river disturbance and will quickly populate bare, moist mud and sand deposits.

3.2.1.2.5 Less adapted to flood disturbance but more shade-tolerant are silver maple (Acer saccharinum), American elm (Ulmus americana), hackberry (Celtis occidentalis), and green ash (Fraxinus pennsylvannica var. subintegerrima). These species will thrive under a canopy of cottonwood or willow and prevent regeneration of the mature trees, or they may populate and eventually dominate areas elevated even slightly above levels more frequently subject to flooding. Silver maple has replaced American elm as the dominant bottomland species due to the decimation of the latter by Dutch elm disease. The ground cover of the floodplain forest is also subject to river conditions. Extended periods of flooding during late winter and spring often inhibit the growth of spring blooming perennials and may delay full development of the ground layer until mid-summer. Members of the grass, sedge, mint, nettle, and carrot families are common within the bottomland forest. Wood nettle (Laportia canadensis), stinging nettle (Urtica dioica), poison ivy (Rhus radicans), and herbaceous or woody vines such as grape (Vitis sp.), bur cucumber (Sicyos angulatus), wild cucumber (Echinocytic lobata), common green briar (Smilax hispida), and moonseed (Menispermum canadensis) are abundant in shaded areas.

3.2.1.2.6 Upland forests are dominated by species less tolerant of flooding and moist soil conditions than those found in bottomland forests. The two upland associations found within the Greenbelt study area are the oak-hickory and the maple-basswood associations. The oak-hickory association is found on the drier upland ridges and hilltops and on south- or west-facing slopes in the river basin. The maple-basswood association occurs primarily on mesic or moist north-and east-facing slopes. While not abundant anywhere in the region, this association is more often found in the southern portion of the study area. Intermixing of species is common, and boundaries between the two associations are often indistinct.

3.2.1.2.7 The maple-basswood association is dominated by sugar (Acer saccharinum) or black maple (A. nigrum). Maple seedlings are shade tolerant and will gradually replace other species if undisturbed over an extended period of time. Other common species of this association include American basswood (Tilia americana), red oak (Quercus rubra), slippery elm (Ulmus rubra), and ironwood (Ostrya virginiana).

3.2.1.2.8 The oak-hickory association, unlike the maple-basswood, is not dominated by a single species. The generally thinner canopy coverage allows regeneration of less shade-tolerant species. In addition, greater disturbance by fire and human activity on the sites which favor this association has often prevented the development of a single climax species. Oak species tend to dominate in undisturbed areas. Common species include white oak (Quercus alba), red oak (Q. rubra), bur oak (Q. macrocarpa), and occasionally specimens of black oak (Q. velutina). Hickory species such as shagbark hickory (Carya ovata) and bitternut hickory (C. cordiformis) occur throughout the study area, but are somewhat more common in the southern portion.

3.2.1.2.9 Ground cover of the upland forest varies with canopy cover and moisture conditions. Though no single plant family is dominant, the lily family comprises the largest number of species in mesic stands, and the daisy family contributes the most species in xeric stands. Other plant families that, with the previous two, make up over half the species in the ground layer are the buttercup, sedge, honeysuckle, grass, common fern, and rose (Curtis 1959).

3.2.1.2.10 Within mesic forest areas of the region, spring blooming plants predominate. Among the spring bloomers are ephemerals that grow rapidly in early spring and die back before the leaves of the canopy have fully expanded. Common examples include trout lilies (Erythronium albidum), spring beauty (Claytonia virginica), Dutchman's breeches (Dicentra cucullacia), toothwort (Dentaira laciniata), and false rue anemone (Isopyrum biteratum). Examples of species that bloom in the spring but retain their leaves for all or part of the summer include bloodroot (Sanguinoria canadensis), wild ginger (Asarum canadense), mayapple (Podophyllum pellatum), trilliums (Trillium spp.) and hepatica (Hepatica acutiloba).

3.2.1.2.11 Within the xeric forest with its drier conditions and more open canopy, there is a decrease in spring bloomers and a corresponding increase in plants that bloom in the summer and fall. Shrubs and woody vines also are more abundant in the oak-hickory association and are generally concentrated along the forest edge. Common species include gray dogwood (Cornus recemosa), hazelnut (Corylus americana), smooth sumac (Rhus glabra), gooseberries (Ribes spp.), and blackberries (Rubus spp.). Poison ivy and Virginia creeper (Parthenocisus quinquefolia) are common throughout both mesic and xeric areas.

3.2.1.3 Fauna

3.2.1.3.1 The combination of rivers and streams and adjacent forest in the Greenbelt corridor provides excellent wildlife habitat. Diversity and value are highest where forest land is interspersed with cropland, pasture or other open land. Most species of wildlife remaining within the basin utilize more than one cover type, and the corridor has a high degree of cover type interspersion, particularly in relation to areas outside the corridor. Thus, the highest concentrations of most wildlife species found in central Iowa occur within the Greenbelt corridor.

3.2.1.3.2 Wildlife populations and number of species have changed extensively as a result of habitat changes. Drainage of wetlands and conversion of prairie to cropland in the northern portion of the study area have virtually eliminated waterfowl reproduction in this area, once a part of the 'duck factory' of the north-central United States. Conversely, this change has resulted in some improvement of conditions for pheasant and gray partridge. The southern portion of the project area was largely forested bottomland with tall grass prairie uplands. The bison, elk, and prairie chicken, common in early settlement times, have been replaced by white-tailed deer and bobwhite quail due to forest clearing, grazing, and cultivation.

3.2.1.3.3 Both the IDNR and the Corps of Engineers have active wildlife management programs in the project area. The IDNR has a more extensive program, including State-owned lands as well as Corps of Engineers project lands under lease for wildlife management. The most prominent of these programs is waterfowl management at Lake Red Rock, which has resulted in development of the most important waterfowl stopover in interior Iowa. The Corps of Engineers has extensive forest and prairie management programs on project lands, which include tree and shrub plantings and native prairie reestablishment.

3.2.1.3.4 Terrestrial game species common in the project area are pheasant, gray partridge, bobwhite quail, cottontail rabbit, fox squirrel, fox, waterfowl, white-tailed deer, eastern wild turkey, and raccoon. Other species which provide some hunting include coyote, crow, jack rabbit, muskrat, and ground hog. Common nongame species include mice, voles, shrews, skunks, opossums, some reptiles and amphibians, and various species of raptors and songbirds. During a field reconnaissance conducted from December 15-17 1986, Corps of Engineers and U.S. Fish and Wildlife Service representatives observed 6 species of raptors, 4 species of waterfowl, and 13 nongame species. The list of species is given below:

red-tailed hawk	(Buteo jamaicensis)
rock dove	(Columba livia)
ring-necked pheasant	(Phasianus colchicus)
European starling	(Sturnus vulgaris)
American crow	(Corvus brachyrynchos)
dark-eyed junco	(Junco hyemalis)
American goldfinch	(Carduelis tristic)
rough-legged hawk	(Buteo lagopus)
mallard	(Anas platyrynchos)
blue jay	(Cyanocitta cristata)
white-breasted nuthatch	(Sitta carolinensis)
hairy woodpecker	(Picoides villosus)
red-bellied woodpecker	(Melanerpes carolinus)
barred owl	(Strix varia)
northern cardinal	(Cardinalis cardinalis)
black-capped chickadee	(Parus astricapillus)
ring necked duck	(Aythya collaris)
Canada goose	(Branta canadensis)
giant Canada goose	(Branta canadensis)
American merganser	(Mergus merganser)
northern flicker	(Colaptes auratus)
American kestrel	(Falco sparverius)
American white pelican	(Pelencanus erythrorynchos)

3.2.1.3.5 A complete list of animal species known or anticipated to occur within the Greenbelt is on file in the Rock Island District office.

3.2.1.3.6 Most waterfowl species were observed in the southern portion of the study area, in and around Lake Red Rock. Conversely, most sightings of raptors occurred in the northern portion of the Greenbelt. One species particularly noted in the uplands bordering the forested corridors of the Upper Des Moines and Boone Rivers was the rough-legged hawk (Buteo lagopus). Individuals of both the light phase and the less common dark phase of this species were observed during the field visit. The rough-legged hawk breeds in northern Canada and Alaska and its winter range covers a large part of the continental United States. This species feeds in open areas, possibly utilizing the sheltered wooded ravines of the Greenbelt corridor as a night roost or as cover in harsh weather conditions.

3.2.1.3.7 Wildlife species which were largely extirpated from central Iowa during the last century but have recently been reintroduced include eastern wild turkey (Meleagris gallopavo) and river otter (Lutra canadensis). The wild turkey inhabits forested areas and often feeds in open fields near the forest edge. The river otter is found along the edges of clear, vegetated streams and lakes. The habitat types utilized by both these species are found in some abundance in the project area. Consequently, the potential for their successful reintroduction within the Greenbelt is anticipated to equal or exceed that for the surrounding region.

3.2.1.3.8 The major limiting factors on fisheries within the project area are morphological characteristics (flow, depth, velocity, substrate, sinuosity) and water quality. In general, the fisheries of the Des Moines River Basin are characteristic of large, slow-moving Midwestern rivers. Fisheries are dominated by non-game species such as buffalo, carp, river carpsucker, and drum. However, numbers of species and population proportions of game and non-game fish vary throughout the Greenbelt study reach with changes in physical characteristics and water quality of stream segments. The free-flowing segments of river above, between and downstream of the reservoirs tend to have proportionately larger populations of game fish. Stocking programs for the reservoirs constitute the primary fishery management by the IDNR in the project area, but the abundance and distribution of fish is strongly influenced by pool water level fluctuations. Sedimentation is now, and will continue to be, a major detriment to the aquatic resources of the study area. In addition, littoral habitat and cover is limited in the main body and major coves of the reservoirs. Spawning success has been greatest when high water occurred during the spawning season, increasing the amount of suitable spawning habitat by significantly expanding the littoral zone.

3.2.1.4 Unique Natural Areas

3.2.1.4.1 Areas designated as unique natural areas generally contain unique or relatively undisturbed biological, hydrologic, geologic, or scenic features. These features may include stands of virgin hardwood forest, native prairie remnants, wetlands, or unique geologic surfaces. Some areas may contain habitat for rare, threatened, or endangered plants and animals.

3.2.1.4.2 Within the Greenbelt boundary, four areas have been identified by state or local entities as unique natural areas, all within the upper reaches of the study area. The Des Moines River from the northern half of Boone County to Brushy Creek in Webster County is listed as a natural river area. The Boone River is also listed as a natural river area within the segment from Webster City to its confluence with the Des Moines River. Holst State Forest and the Boone Forks Wildlife Area are located within these two natural areas.

3.2.1.4.3 Woodman's Hollow State Preserve is the only dedicated nature preserve within the Greenbelt boundary. It is located approximately 1-1/4 miles east and southeast of the town of Kalo. This preserve contains unique sandstone bluffs cut by a deep gorge, creating cliff communities especially noted for their rich fern flora. Many rare and endangered species are found within this microclimate. Ledges State Park, also listed as a natural area, is located 4 miles south of the city of Boone. The park is noted for its sandstone (ledges) bluff formations but also contains north-facing slopes and cliff communities rich in ferns, lichens, and mosses. The park contains both remnant and restored prairie and poorly drained vernal ponds.

3.2.2 AIR QUALITY

3.2.2.1 The Division of Environmental Protection of the IDNR monitors air pollutant concentrations in or near many of the state's larger urban areas for comparison with ambient air quality standards established by U.S Environmental Protection Agency (EPA) in accordance with the Clean Air Act of 1970 which were subsequently adopted by the State of Iowa. Two levels of concentration - the primary and secondary standards - are defined for each pollutant anticipated to endanger public health or welfare. The six criteria pollutants monitored in Iowa are: total suspended particulate (TSP) matter, sulfur dioxide, carbon monoxide, nitrogen dioxide, lead, ozone, and hydrocarbons. Primary and secondary concentrations standards are shown in table EIS-5.

3.2.2.2 In areas where monitored air pollutant concentrations are less than the secondary standards, air is considered to be of good quality and should cause no harm. In areas where monitored values are above the secondary standard but less than the primary standard, air is considered to be of moderate quality and may cause deterioration of environmental surroundings. Monitored air pollutant concentrations exceeding primary standards may be hazardous to human health.

TABLE EIS-5

National Primary and Secondary
Ambient Air Quality Standards

Concentrations shown are specified in the following units:
ug/m3 - micrograms per cubic meter
mg/m3 - milligrams per cubic meter
ppm - parts per million

All Values Except Annual Means May Not Be Exceeded More Than Once Per Year. Annual Means Should Never Be Exceeded.

PARTICULATE	Maximum 24-Hour Average	Annual Geometric Mean	
Primary	260 ug/m3	75 ug/m3	
Secondary	150 ug/m3	60 ug/m3 **	
SULFUR DIOXIDE	Maximum 3-Hour Average	Maximum 24-Hour Average	Annual Arithmetic Mean
Primary	No Standard	365 ug/m3 (0.14 ppm)	80 ug/m3 (.03 ppm)
Secondary	1,300 ug/m3	No Standard	
CARBON MONOXIDE	Maximum 1-Hour Average	Maximum 8-Hour Average	
Primary	40 mg/m3 (35 ppm)	10 mg/m3 (9 ppm)	
Secondary	40 mg/m3 (35 ppm)	10 mg/m3 (9 ppm)	
OZONE*	Daily Maximum 1-Hour Value		
Primary	235 ug/m3 (0.12 ppm)		
Secondary	235 ug/m3 (0.12 ppm)		
NITROGEN DIOXIDE	Annual Arithmetic Mean		
Primary	100 ug/m3 (.05 ppm)		
Secondary	150 ug/m3 (.05 ppm)		

TABLE EIS-5 (Cont'd)

LEAD	Maximum Calendar Quarter		
Primary	1.5 ug/m3		
Secondary	1.5 ug/m3		

Notes: * Average number of expected violations during the last 3 years must be less than or equal to one.
** Guideline, not a standard.

Source: 1985 Iowa Air Quality Report, prepared by Iowa Department of Natural Resources, Division of Environmental Protection.

3.2.2.3 The 1985 Iowa Air Quality Report prepared by the IDNR's Environmental Protection Division and published in November 1986 summarizes the results of analyses of samples collected from 86 monitoring sites throughout the state during 1985, as well as trend analyses of pollutant levels and precipitation frequency for the period 1979-1984. Fifteen of the 1985 monitoring sites were located in or near the Greenbelt study area (14 in Polk County, 1 in Webster County). Within the Greenbelt boundary, one area within the city of Des Moines has been designated as a Primary Standard Nonattainment Area for TSP. This area is located on the north side of the Des Moines River Valley between U.S. Highway 69 on the west and SE 30th Street on the east. The rest of the city of Des Moines has been designated as a Secondary Nonattainment Area for TSP. A portion of the Greenbelt study area in the Fort Dodge vicinity on the north side of the Des Moines River Valley is also designated as a Secondary Nonattainment Area for TSP. Other portions of the Greenbelt which are not monitored are generally anticipated to have good to moderate air quality. The report also indicates that decreasing trends in TSP levels statewide during the 1979-1984 period may be due in part to increasing trends in precipitation frequency during the same period.

3.2.3 WATER QUALITY

3.2.1 Surface water quality characteristics of the Des Moines River and its tributaries are generally typical of large rivers with predominantly agricultural watersheds. Water quantity and quality are generally adequate for most forms of recreation and for fish and wildlife. However, as with other basin characteristics, water quality varies within different segments of the Greenbelt study area, and the variability of water quality parameters is a limiting factor affecting fish and wildlife, recreation, and other human uses. Construction and operation of impoundment facilities can have both beneficial and detrimental effects upon aquatic and terrestrial environments depending on the particular sites involved. The Rock Island District has conducted water quality studies on the Des Moines River for the past 20 years, beginning in 1967. Samples were collected at 9 different locations and analyzed for various physical, chemical, and biological parameters.

3.2.3.2 Dissolved oxygen concentration is one of the most important factors in a stream's ability to support a diverse aquatic biota. While average values at the selected stations all exceed the minimum standard set by the State and the U.S. Environmental Protection Agency (5.0 mg/1), several stations have had minimums below acceptable limits. This would tend to limit sport fish populations and lead to an increase in the proportion of rough fish.

3.2.3.3 Suspended solids and turbidity are two closely related water quality parameters which adversely affect fish and the aquatic ecosystem, reduce the aesthetic value of water, and present a danger to swimmers. These two parameters represent the most severe water quality problems throughout the Greenbelt study area. Biochemical oxygen demand (BOD) levels are generally within tolerable limits, although individual stations near feedlots or sewage treatment plants have higher levels. Fecal coliform bacteria is the parameter most often measured to determine a water body's suitability for primary body contact recreation such as swimming. There are many violations of State standards (2,000 organisms/100 ml) in the study area, probably due to feedlot runoff and city sewage. Most violations have been observed immediately downstream of the city of Des Moines' wastewater treatment plant, although during high runoff periods violations of State standards are more widespread. Ammonia nitrogen (the un-ionized portion), an important parameter due to its toxicity to fish, is generally not a problem in the study area. Occasional violations are seen throughout the Greenbelt, especially along the Des Moines River between the city of Des Moines and Lake Red Rock.

3.2.3.4 Water quality conditions vary within the different segments of the Greenbelt. These variations are generally characteristic of the changes in hydrologic conditions across the segments, i.e., the controlled impoundments at Saylorville Lake and Lake Red Rock versus the more or less free-flowing segments upstream and downstream of the reservoirs. Both Saylorville Lake and Lake Red Rock are effective sediment traps due to the decrease in water velocity caused by impoundment. Often as much as 80- to 99-percent of suspended solids are trapped in the lakes.

3.2.3.5 Because much of the suspended matter settles out in the headwaters regions, turbidity is generally lower in the impoundments. Both reservoirs have substantially lowered suspended solids concentrations in the downstream areas. Lower dissolved oxygen concentrations are frequently found near the bottoms of the reservoir as a result of thermal stratification. Such stratification during summer months is a phenomenon typical to Midwestern reservoirs. At these times, the deeper zones of the lakes occasionally experience dissolved oxygen concentrations below the State standard of 4.0 mg/1. With these exceptions, dissolved oxygen concentrations within and below the reservoirs are generally adequate to support aquatic communities.

3.2.3.6 While water quality conditions within and below the two reservoirs are generally well documented as a result of past and current studies, less data are available for the upper portion of the Greenbelt, above the city of Boone. One sampling station is located near Stratford; however, this location is sampled only during periods of high flow, as it represents the upstream limit of the maximum Saylorville Lake flood pool. It is anticipated that water quality in this segment would be comparable to the downstream corridors of the reservoirs. Because the Des Moines River Basin is primarily an agricultural area, non-point sources of pollution far outweigh point sources.

3.2.3.7 The two most productive groundwater sources in terms of quantity and quality are the surficial or alluvial aquifers and the Cambrian-Ordovician aquifer. The surficial aquifers are the most easily accessed, recharged, and drained. In addition, the soil aids in filtering out many pollutants. One exception to this, however, is nitrite and nitrate nitrogen. Inputs from groundwater to streams and other surface water may result in relatively high levels of this contaminant even during winter when most precipitation falls as snow and little runoff occurs. Bedrock aquifers are charged by both lateral and vertical movement at a rate slower than that of the alluvial aquifer. Upper bedrock aquifers such as the Pennsylvanian, Mississippian, and Silurian-Devonian aquifers are generally of poor quality and unsuitable for drinking purposes. In contrast, the Cambrian-Ordovician aquifer, in particular the Jordan sandstone, produces good quality water.

3.2.4 GEOLOGY

3.2.4.1 Bedrock deposits underlying the study area date to the Carboniferous era (280-350 million years ago). Rock formations of the Mississippian and Pennsylvanian systems together comprise the upper bedrock units of much of central and south-central Iowa. Des Moines series rocks of the Pennsylvanian system dominate the exposures in the Greenbelt project area. However, outcrops of Meramec series rocks of the Mississippian System are present a few miles upstream of the Red Rock Dam and also occur as upper bedrock units in Webster and Hamilton Counties. In addition, Jurassic system deposits of gypsum and shales in Webster County represent the only outcrop formations of this period in the state.

3.2.4.2 The uppermost series of the Mississippian system is the Meramec series. This series, in turn, is composed of three formations: the Spergen, St. Louis and Ste. Genevieve. These formations are comprised largely of limestones and dolomites with some shale in the Ste. Genevieve Formation. The Meramec series does not outcrop extensively in Iowa, but it does form the lower walls of the Des Moines River Valley within the Greenbelt boundaries from the State Highway 14 bridge across Lake Red Rock to the downstream limit of the study area.

3.2.4.3 Exposures of this series are primarily of the St. Louis formation. The lower part of this formation is commonly sandstone grading into arenaceous dolomite which is locally cherty and contains a high percentage of gypsum and anhydrite. The upper part of the formation varies from a locally cherty, micritic limestone to a sandy limestone. The St. Louis formation is unconformably overlain by either Pennsylvanian or Quaternary deposits.

3.2.4.4 Above the Mississippian System is the Pennsylvanian System which is comprised largely of sandstones, shales and coal, with limestone also present in some formations. Of primary importance in the Greenbelt area is the lowest series of this system, the Des Moines Series. This series in turn contains two groups, the older Cherokee and the younger Marmaton. Rocks of the Cherokee group form the major valley walls of the Des Moines River in the Lake Red Rock area.

3.2.4.5 The geologic map of Iowa (Hershey 1969) describes this group as "cyclic deposits with carbonaceous shale, clay, siltstone, sandstone, and thick coal beds; minor but persistent limestone beds." Between Dunreath and Harvey, Iowa, are exposures of "Red Rock Sandstone" belonging to the Des Moines Series, most probably a unit of the Cherokee group. This bright red sandstone, exposed in nearly vertical valley walls, rises in excess of 100 feet from the valley floor. The sandstone is underlain by a coal seam averaging 4 feet in thickness which in turn is underlain by approximately 75 feet of shale interbedded with several persistent coal seams.

3.2.4.6 The overlying Marmaton group of the Des Moines Series is described (Hershey 1969) as "alternating shale and limestone, with some sandstone and coal." This group has been divided into 11 formations and 19 members. Whereas shale and sandstone are predominate, limestones are presistent and serve as marker units. Several coal units are present and have been named; however, only the Mystic coal member has significant reserves. Formations of the Marmaton group are not exposed in the valley in the Red Rock area, but small monadnocks are scattered on the high ridges of major interfluves.

3.2.4.7 These bedrock units are overlain by Quaternary system deposits of largely unconsolidated materials, primarily Pleistocene age glacial till and glacially-derived sediments, as well as Holocene alluvium. The sequence of Pleistocene glaciation in the project area is Nebraskan glacial drift overlain by Kansan glacial till, outwash and loess, and capped by Wisconsinan till, outwash and loess.

3.2.4.8 The Illinoian glacial advance is not represented, except perhaps in the extreme northernmost portion of the study area. The portion of the study area located in the Southern Iowa Drift Plain is overlain by Nebraskan and Kansan age deposits. Wisconsin age deposits cover the earlier glacial drift in the portion of the Greenbelt located within the late Wisconsinan-age Des Moines Lobe landform region of north-central Iowa.

3.2.4.9 The Des Moines River flows roughly north-south down the axis of the Des Moines Lobe (Prior 1976). The ice sheet associated with this landform reached its southern limit (the Bemis Moraine) at what is now the city of Des Moines about 14,000 years ago (Ruke 1969; Kemis et al., 1981). By about 13,500 years ago, the ice had retreated to the position of the Altamont Moraine, located just north of Boone in Boone County (Ibid). After the ice had retreated from the Altamont Moraine and before or during its stand at the Algona Moraine, the river incised a now abandoned outwash channel evident as the broad sag between Fourmile Ridge and Capitol Hill in the city of Des Moines. Recent investigations support the theory that the Des Moines River Valley was formed during melting of the Wisconsin ice sheet, and suggest that the valley above Beaver Creek originated as a subglacial channel which became an active outwash channel during the time Des Moines Lobe ice was at the Algona Moraine (Bettis and Hoyer 1986).

3.2.4.10 The present-day Beaver Creek drainage occupies the partially buried pre-Wisconsinan bedrock valley in the Des Moines Area. Between about 12,600 and 11,000 years ago, the Des Moines River was an active glacial drainage, channeling occasionally extreme discharge events which deposited coarse alluvium and incised deeper into till or bedrock. In this 1,600-year period, the Des Moines River downcut approximately 68 meters (223 feet) in northern Boone County and 48 meters (157 feet) in the vicinity of Saylorville Dam. Many of the larger tributaries of the Des Moines River probably developed along subglacial or supraglacial lines during this period. By 11,000 years ago, the Des Moines Valley had incised approximately 3 to 4 meters below the level of the present river.

3.2.4.11 During the Holocene epoch (approximately 11,000 years ago to the present) the Pleistocene glacial deposits throughout the Des Moines Valley and the Greenbelt study area were extensively reworked through weathering, erosion, and redeposition by wind and water. Alluvium derived from glacial material is present along the Des Moines River, its tributaries, and other smaller streams in zones ranging from an eighth of a mile to 2 miles in width. At the beginning of the Holocene, the Des Moines Valley had incised approximately 3 to 4 meters below the level of the present river. Throughout the Holocene the Des Moines River's channel pattern has been meandering, with successive periods of overbank deposition and down cutting of the river and its tributaries, resulting in a complex mosaic of alluvial fans and terraces.

3.2.5 SOILS

3.2.5.1. Soils in the Greenbelt study area were produced by the actions of natural processes upon the underlying parent material over an extended period of time. The most abundant parent materials within the Des Moines River Basin are glacial till, alluvium and loess. Other parent materials which may be present in the study area are eolian (wind-deposited) sand and residuum of shale and sandstone. Factors which act upon or influence the underlying material are the relief or lay of the land; the climate under which the soil material accumulated and existed since accumulation; and the plant and animal life on and in the soil.

3.2.5.2 Soils within the study area are formed under variable climatic and vegetative conditions subsequent to the last glacial advance and retreat. The cool, moderately moist climate which prevailed in the early post-glacial period experienced a gradual warming and drying trend which appears to have reached its peak approximately 8,000 to 4,000 years ago. With this climatic change came a change in vegetative regime, from a boreal forest community with conifers dominating to a mixed-hardwood forest, and finally to a herbaceous prairie community. Studies of the forest-prairie transition area of central Iowa indicate that a late change in postglacial climate (beginning about 3,000 years ago) from relatively dry prairie to more moist conditions has taken place. Despite this change, forested areas generally remained limited to stream corridors and prairie grasses dominated the uplands up to the time of settlement.

3.2.5.3 Soils derived from prairie, mixed prairie-forest, and forest vegetation, and developed in glacial till, loess and alluvium under the influence of a midcontinental subhumid climate are dominant in the Greenbelt study area. General soil associations are described in table EIS-6 and illustrated on figure EIS-1.

TABLE EIS-6

Soil Characteristics in the Study Area
Des Moines Recreational River and Greenbelt

SOIL CHARACTERISTICS	MAP SYMBOL	SERIES	COUNTY
Nearly level to gently sloping poorly drained to well drained loamy and clayey prairie-derived soils on uplands, developed from Wisconsinan till on the Cary Lobe.	B	Webster, Okoboji, Canisteo, Clarion, Nicollet, and Harps soils.	Webster, Hamilton, Boone, Polk, and Dallas Counties.

TABLE EIS-6 (Cont'd)

SOIL CHARACTERISTICS	MAP SYMBOL	SERIES	COUNTY
Nearly level to strongly sloping, somewhat poorly drained loamy and clayey mixed prairie-forest derived soils on uplands, developed from Wisconsinan till on the Cary Lobe.	B	Hayden, Clarion, Marion, Guckeen, Lesueur and Luther soils.	Webster, Hamilton, Boone, Polk, and Dallas Counties.
Gently sloping to very steep, well drained loamy prairie, forest and mixed prairie-forest derived on uplands and valley slopes, developed from Wisconsinan till on the Cary Lobe.	A	Hayden, Lester, and Storden soils.	Webster, Hamilton, Boone, Polk, and Dallas Counties.
Nearly level to moderately sloping, moderately well drained to excessively drained, loamy forest, and mixed prairie-forest derived soils on bottomlands, alluvial fans, benches and footslopes, developed from Wisconsinan till and alluvium on the Cary Lobe.	A	Buckney, Moingona, Wadena, and Sattre soils.	Webster, Hamilton, Boone, Polk, and Dallas Counties.
Nearly level to gently sloping, well drained to excessively well drained, loamy and sandy prairie-derived upland and terrace soils developed from alluvium.	C	Wadena, Talcot, and Ridgeport soils.	Polk County.

TABLE EIS-6 (Cont'd)

SOIL CHARACTERISTICS	MAP SYMBOL	SERIES	COUNTY
Nearly level to very steep, moderately well drained to well drained, loamy prairie derived soil on bottomlands, terraces and valley slopes, developed from Wisconsinan till on the Cary Lobe.	D	Storden and Clarion soils.	Polk, Dallas, and Boone Counties.
Gently sloping to strongly sloping, moderately well drained to well drained loamy and silty forest-derived soils on uplands and valley slopes, developed from loess or pre-Wisconsinan till.	A	Fayette and Lindley soils.	Polk County.
Nearly level to gently sloping, poorly drained to moderately well drained, loamy, silty and clayey prairie-derived soils on bottomlands and some adjacent valley slopes, developed from alluvium.	C	Colo, Zook, Nodaway, Nevin, Ackmore, and Wabash soils.	Polk, Dallas, Warren, Marion, and Mahaska Counties.
Gently sloping to strongly sloping, moderately well drained to well drained loamy and silty prairie-derived soils on uplands, developed from loess, pre-Wisconsin till, or pre-Wisconsin till-derived paleosols.	E	Shelby, Adair, Sharpsburg, Grundy, Haig, Fayette, Downs, Lindley, Arispa, Ladoga, Clinton, and Gara soils.	Polk, Warren, Marion, and Mahaska Counties.

TABLE EIS-6 (Cont'd)

SOIL CHARACTERISTICS	MAP SYMBOL	SERIES	COUNTY
Nearly level to moderately steep, moderately well drained to well drained, loamy, silty and clayey prairie to forest-derived soils, on uplands, developed from loess, pre-Wisconsin till-derived paleosols.	E	Otley, Mahaska, Ladoga, Clinton, Adair, Lindley, Tama, Fayette, and Downs soils.	Polk, Jasper, Marion, and Mahaska Counties.
Gently sloping to very steep, somewhat poorly drained to well drained, loamy and silty forest-derived soils on uplands, developed from loess, pre-Wisconsin till or pre-Wisconsin till-derived paleosols.	F	Lindley, Clinton, Fayette, Downs, Ladoga, Gara, Weller, Keswick, and Armstrong soils.	Polk, Warren, Marion, and Mahaska Counties.

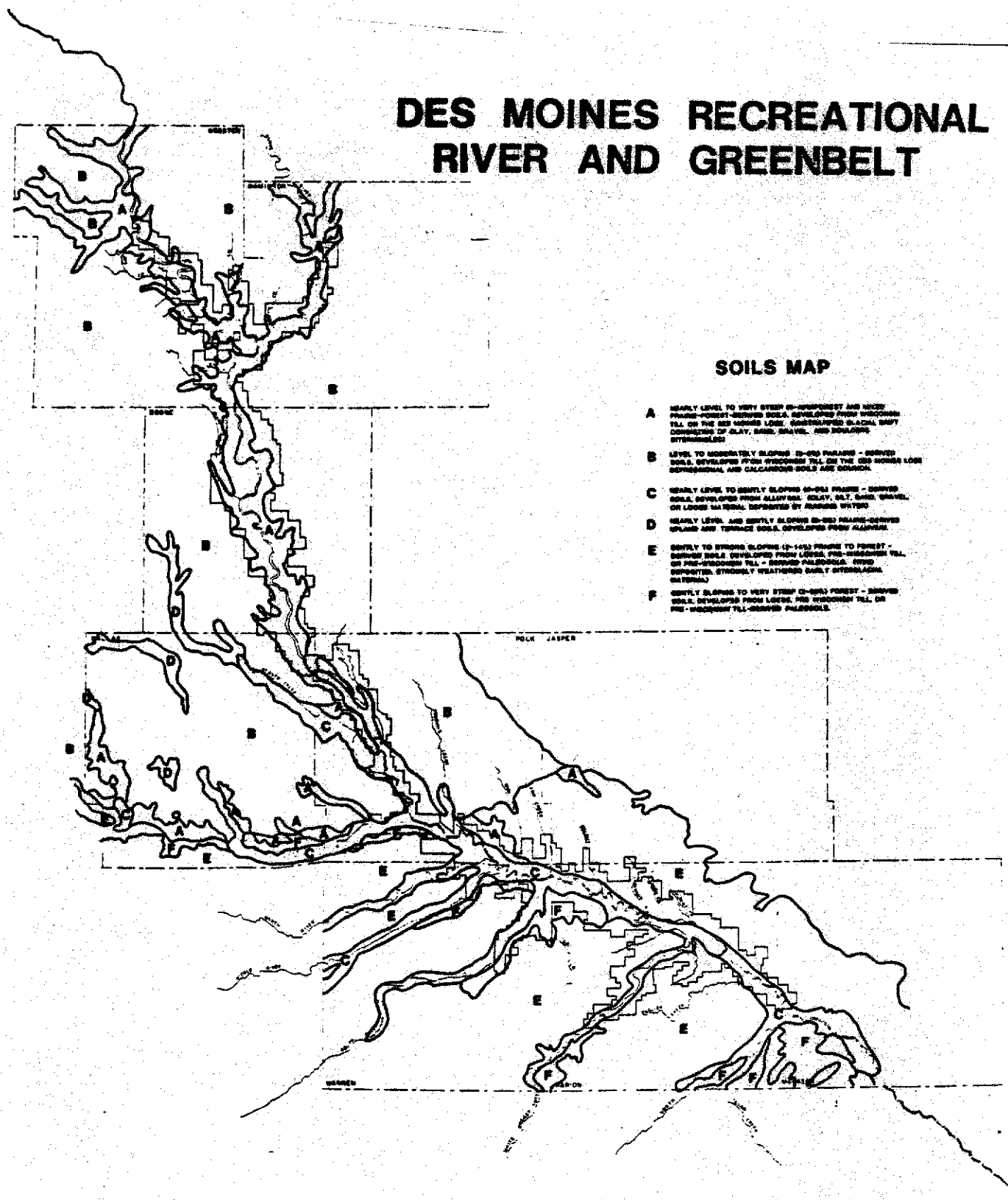

Figure EIS-1. Des Moines Recreational River and Greenbelt Soils Map.

3.2.6 FARMS-AGRICULTURE

3.2.6.1 The nine counties included in the Greenbelt study area, like the rest of the state, are primarily agricultural and have a relatively large percentage of land given over to agricultural uses. Table EIS-7 presents a summary of farmland acreages for each county. Even the most urbanized county, Polk, has over two-thirds of its land area in farmland, though very little of that lies within the Greenbelt boundary. Within the Greenbelt counties, the amount of farmland in crops ranges between 75- and 91-percent of total agricultural acreage.

TABLE EIS-7

Greenbelt Counties
Agricultural Land

COUNTY	TOTAL	FARMLAND ACREAGE		
		% of Co.	% in Cropland	Avg. Farm Size
Boone	342,000	93.2	87.7	274
Dallas	340,000	89.0	85.5	268
Hamilton	363,000	98.3	91.4	283
Jasper	434,000	92.7	83.6	259
Mahaska	342,000	93.4	83.0	254
Marion	308,000	96.7	46.9	237
Polk	258,000	69.8	86.0	228
Warren	325,000	91.0	75.3	231
Webster	422,000	91.9	90.0	298

Source: County and City Data Book 1983, 10th ed. U.S. Department of Commerce, Bureau of the Census. U.S. Government Printing Office, Washington D.C., 1983.

3.2.6.2 No detailed land-use survey of the Greenbelt has yet to be performed, and consequently no accurate figures on agricultural acreage within the Greenbelt boundary are available. However, because many of the existing recreation areas in these counties are part of the Greenbelt project area, it is likely that the percentage of Greenbelt land in agricultural uses is somewhat less than for any given county as a whole. It is estimated that much of the agricultural land in the Greenbelt is uncultivated, either left fallow or in other uses such as pasture or timber production.

3.2.7 RECREATION

3.2.7.1 The Greenbelt contains a unique blend of natural and historic resources and offers a wide range of recreational opportunities. Nearly one-fourth of the land area within the Greenbelt boundary is currently designated for recreational uses, including parks, campgrounds, boat ramps and access areas, marinas, interpretive centers, trails, state forests, refuges, and wildlife management areas. A complete listing of the public and private recreation areas is shown in the main report. These areas offer a variety of settings and experiences, from passive enjoyment of the outdoors to active outdoor sports, and from the primitive wilderness to the highly developed urban environment.

3.2.7.2 The amount of land in recreational uses varies between the Greenbelt counties. A summary of recreation acreage within the Greenbelt boundary for each county is given in table EIS-8. As shown in the table, more than half of the existing Greenbelt recreation land is located primarily in Marion County in the Lake Red Rock area. While the Upper Des Moines River corridor has been rated by the IDNR as excellent in terms of physical, biological, and human interest, it has a comparatively small percentage of the total Greenbelt recreation lands. This may be due in part to the fact that only a minor portion of th Greenbelt within these counties is under Federal ownership. Webster County's State-owned parks and wildlife management area account for its higher percentage of recreation acreage.

TABLE EIS-8

Existing Recreation Land Within
Greenbelt Boundaries

COUNTY	TOTAL GREENBELT ACREAGE	RECREATION ACREAGE	% OF TOTAL
Boone	77,530	11,957	15.4
Dallas	7,200	3,130	43.5
Hamilton	20,813	1,071	5.1
Jasper	1,920	63	3.3
Mahaska	2,304	0	0
Marion	100,928	39,212	38.8
Polk	67,027	22,969	34.2
Warren	27,603	3,900	14.1
Webster	57,683	18,716	32.4
TOTAL	363,053	84,863	23.4

3.2.7.3 Increasing demands upon recreation resources during recent years have accentuated both the need for additional recreational developments in the project area and the need for improvement, rehabilitation, and adaptation of existing areas and facilities. Development and improvement needs includes access (roads, ramps, parking, trails, etc.); basic facilities (water, sanitary, picnic shelters, etc.); and specialized facilities (campgrounds, athletic fields, etc.). These needs have been addressed in the formulation of Greenbelt projects.

3.2.8 ECONOMIC AND SOCIAL ENVIRONMENT

3.2.8.1 The Greenbelt includes portions of 9 counties and encompasses approximately 362,000 acres. It is estimated that 75-percent of the project area population is urban. Urban areas are located along the river throughout the 9-county area, and include the cities of Boone, Des Moines, and Fort Dodge. The combined 1985 population estimate for the Greenbelt counties was 523,800, as shown in table EIS-9.

TABLE EIS-9

Population Trends for the Project Area
(1980-2000)

Area	Population 1980	Population Estimate 1985	Population Projection 2000	Percent Change 1980-1985	Percent Change 1985-2000
City					
Des Moines	191,000	---	---	---	---
Boone	12,600	---	---	---	---
Fort Dodge	29,400	---	---	---	---
County					
Boone	26,200	25,900	25,500	-1.1	-1.5
Dallas	29,500	29,200	28,900	-1.0	-1.0
Hamilton	17,900	17,600	17,200	-1.7	-2.3
Jasper	36,400	35,900	35,100	-1.4	-2.2
Mahaska	22,900	22,500	22,200	-1.7	-1.3
Marion	29,700	30,500	32,500	2.7	6.6
Polk	303,200	309,900	326,900	2.2	5.5
Warren	34,900	35,400	37,800	1.4	6.8
Webster	46,000	44,600	42,900	-3.0	-3.0
9-County Area	546,700	551,500	569,000	0.9	3.2
State of Iowa	2,913,800	2,913,800	2,965,000	-0.3	-2.1

Source: Iowa Development Commission, 1986 Statistical Profile of Iowa.

3.2.8.2 A variety of Greenbelt projects have been submitted for consideration. These projects fall within the following categories:

Trail development
Scenic road route development
Park improvements and renovations
Land acquisition for environmental enhancement
Fishing pier and access construction
Boat ramp construction
Streambank stabilization and jetty construction projects
Boat traffic surveys
Marina development and renovation
Bridge restoration
Levee closure reevaluation
Riverfront plaza development
Visitor center construction
Scenic and conservation easement acquisition
Outdoor sports complex development
Indian mound acquisition
Animal park development
State and city nursery development

3.2.9 CULTURAL RESOURCES

3.2.9.1 The earliest evidence of human utilization of the Des Moines River Valley and the surrounding region dates to approximately 12,500 to 9,500 years ago. By 13,000 years before the present (B.P.) most of the valley within the Greenbelt project area had emerged from beneath glacial ice. But because the valley continued to be subject to massive outwash floods until circa 11,000 B.P., the floodplain and outwash terraces would likely have been unsuitable for habitation. In addition, any evidence would have been destroyed by floods up to the level of high benches. Extensive archaeological survey and testing of the higher benches within the valley disclosed little evidence of habitation or utilization prior to about 8,000 B.P. The floodplain of that period is now deeply buried beneath more recent deposits or lies below the water table, making it inaccessible to ordinary archaeological investigation.

3.2.9.2 From about 8,000 B.C. to the time of the initial European settlement during the first half of the nineteenth century, the Des Moines River Valley was inhabited and exploited by a number of prehistoric Indian groups representing most of the major cultural periods identified by Midwestern archaeologists. These cultural affiliations reflect a gradual change from a primarily nomadic lifestyle dependent upon the movements of large game animals to a more sedentary settlement pattern centered around seasonal exploitation of available plant and animal resources and, later, agriculture. Evidence of prehistoric lifeways and technology is closely tied to, and often obscured by, present geomorphology of the study area.

3.2.9.3 A total of 1,146 known archeological and historical sites are located within the Greenbelt (967 on Federal land and 179 on non-Federal land). As of January 1985, 521 sites have been identified within or adjacent to the Federal fee boundary at Saylorville Lake. All of these are archaeological sites, for all standing historic structures in the project area have been razed. At Lake Red Rock, 318 archaeological and historic sties have been identified within or adjacent to Federal land. It has been estimated that the known sites within the Greenbelt may represent only a small percentage of the actual number, many of which could be deeply buried in landforms on the valley floor or obscured by surface vegetation.

3.2.9.4 As a Federal agency, the Corps of Engineers is required by several historic preservation laws to identify, evaluate, and manage cultural resources under its jurisdiction. Investigations performed under contract with the Rock Island District have involved records and literature searches and field surveys to locate cultural sites; analysis and evaluation of known sites to determine eligibility for listing in the National Register of Historic Places; and the development of management plans for the treatment of cultural resources during project operation. A more detailed discussion of completed and ongoing investigations and the status of the existing resource base is contained in Appendix C, Cultural Resources, in the main report.

3.2.9.5 While much of the land within Saylorville Lake and Lake Red Rock has been covered through surveys by the Corps of Engineers and others, the remainder of the study area has not been extensively investigated. The city of Des Moines conducted a survey of historic sites within city boundaries in 1983. This survey rated some 90 structures as potentially eligible for listing in the National Register. The environmental impact study for the Brushy Creek Recreation Area completed in 1983 identified 62 archaeological sites within the project area. It is likely that future surveys would uncover additional sites within or adjacent to areas which could be affected by the proposed Greenbelt projects.

SECTION 4 - ENVIRONMENTAL EFFECTS

4.1 GENERAL

4.1.1 The three types of projects proposed under the Greenbelt authority are recreation, environmental enhancement, and streambank stabilization. These types of projects are anticipated to have few adverse impacts upon the natural and human environment. Many of the projects would be expected to have beneficial impacts. However, until detailed project plans are formulated, with siting and design alternatives identified, the nature and extent of anticipated impacts may not be fully addressed. As individual projects are proposed for construction and detailed plans are developed, separate environmental assessments will be prepared to address site-specific impacts of these projects. Discussion of potential impacts in this document will be limited to an overview of the general types of impacts which could be expected to result from the projects identified in this study.

4.1.2 Implementation of one or more of the Greenbelt projects identified in the document could have some degree of cumulative impact on environmental, economic, and social concerns. These potential impacts cannot be adequately addressed at this time due to the lack of detailed site information and the fact that no project has been recommended for construction. However, it is reasonable to anticipate that cumulative impacts could be either beneficial or adverse, depending on which project or combination of projects is implemented. Siting and design of projects also could influence the nature and degree of cumulative impacts. Avoidance of duplication or conflicting uses and adoption of environmentally sound alternative plans will help to avoid or alleviate adverse cumulative impacts and maximize beneficial impacts.

4.2 NATURAL RESOURCES

4.2.1 GENERAL

4.2.1.1 Impacts to natural resources from the types of projects identified in this study would include: changes in existing air and water quality, changes in existing drainage patterns, changes in amount and type of vegetation/wildlife habitat, and changes to unique or sensitive natural areas. Potential impacts associated with the various project types are discussed in the following sections.

4.2.2 IMPACTS OF TRAILS

4.2.2.1 Impacts to natural resources from trail projects could result from actual construction of the trail and from expected use following project completion. Preliminary design plans have identified four general locations for trail construction: existing roadways or railroad right-of-ways; urban or developed areas; existing recreation areas; and undeveloped areas. Adverse impacts of trails or developed areas would be anticipated to be minimal, since little, if any, undeveloped land would be converted by construction.

4.2.2.2 Impacts from trail construction in existing recreation areas or along abandoned railroad rights-of-way would be dependent on existing site conditions i.e., the amount of previously undeveloped or undisturbed land to be converted. Construction of trails or trail segments in undeveloped or undisturbed natural areas would result in the loss of some natural vegetation, the amount and type lost depending on trail design and alignment. While trail development in natural areas could result in an increase in 'edge' conditions favorable to some species of wildlife and plants, other species less tolerant of marginal conditions or disturbance could be adversely affected by trail construction and subsequent use. In addition, trail alignments which provide access to previously remote areas could indirectly result in additional stress on these areas both through normal use and through misuse of trail facilities. While no impacts to federally listed threatened and endangered species are anticipated to result from the proposed trail projects, several State-listed plant and animal species could potentially be affected directly or indirectly by trail construction. Site-specific analyses of design and alignment alternatives would be required to fully address environmental effects of trail projects in the Greenbelt study area.

4.2.3 IMPACTS OF PARK DEVELOPMENTS

4.2.3.1 Terrestrial park development measures are expected to have varying potential to affect the natural environment. Developments involving little construction, or those confined to previously developed park areas (mowed grass-landscaped) are anticipated to have minimal impacts to natural resources. Projects which involve clearing or conversion of developed land within park boundaries could represent a significant change in existing development. Structures such as picnic shelters, shower buildings, and vault toilets would by themselves involve little conversion or clearing of land, but developments involving camping area expansion, parking lot or access road construction, or extension of water or electrical utilities could have greater potential for short-term or long-term environmental impacts.

4.2.4 AQUATIC RECREATION PROJECTS. Most aquatic-based recreation projects such as boat ramps, canoe access and fishing access areas have the potential to affect both the aquatic and terrestrial environments at project sites. Adverse impacts to the aquatic environment would, for the most part, be limited to short-term effects associated with project construction.

4.2.5 ENVIRONMENTAL ENHANCEMENT PROJECTS. Environmental enhancement projects would normally be expected to have a long-term beneficial impact on natural resources within, and in some cases beyond, the project area. Acquisition would allow the purchased tracts of land to be protected from development or from further degradation. Enhancement of habitat value through natural succession or through plantings beneficial to wildlife would benefit natural resources and could help to reduce soil erosion in the project area. Construction of nest platforms and roosting structures would directly benefit the bald eagle, a Federally listed endangered species, and the great blue heron, whose numbers in the state have greatly decreased within the last century.

4.2.6 STREAMBANK STABILIZATION. Impacts associated with streambank stabilization measures would vary according to the scope and methods of the individual project. Use of tree plantings and revegetation to stabilize banks could benefit both terrestrial and aquatic habitat by providing additional food and cover. Riprapping could result in short-term degradation of aquatic habitat and water quality through direct loss of habitat and sediment resuspension. However, riprap placement also could have long-term benefits to aquatic habitat by increasing substrate diversity.

4.3 AIR QUALITY

4.3.1 The potential for impacts to air quality from projects considered in this study is anticipated to be primarily short-duration contributions to suspended particulate matter could come from earthmoving activities, movement or deposition of dredged material, and equipment traffic on non-paved roads. This would be of most concern in or near the portions of Fort Dodge and Des Moines designated as primary and secondary nonattainment areas. However, most of these impacts would be temporary, probably occurring over a period of one or two construction seasons, and, consequently, are not anticipated to be significant at this time.

4.4 WATER QUALITY. Any actions which involve either permanent or temporary placement of dredged or fill material in the Des Moines River or in its major tributaries or adjacent wetlands is subject to regulation under Section 404 of the Clean Water Act. Following evaluation of a proposed action for compliance under Section 404(b)(1), State certification under Section 401 must be obtained before issuance of a Section 404 permit.

4.5 FARMS AND AGRICULTURE. No impacts to farms and agriculture would be anticipated for projects located in urban settings or existing recreation areas. Projects which involve land acquisition or development of recreational facilities on agricultural land could result in removal from production or actual conversion of some farmland. In accordance with the provisions of Public Law 99-88, as outlined in the Conference Report on H.R. 2577, land acquisitions or easements would be made with the consent of the owner. Detailed data on agricultural land use percentages are not available. It is likely that much of the land within the Greenbelt boundary which could potentially be affected by identified projects would not be under cultivation, or would have marginal productive value because of steep relief or frequent flooding. Site-specific analyses of projects proposed for construction involving agricultural land would require completion of Farmland Conversion Impact Ratings for each site alternative.

4.6 ECONOMIC AND SOCIAL IMPACTS

4.6.1 COMMUNITY AND REGIONAL GROWTH

4.6.1.1 No significant impacts to community or regional growth would result from the various types of Greenbelt projects submitted for consideration. Most of the Greenbelt is in a rural surrounding with limited residential development. In the city of Des Moines, and in the other urban areas of the Greenbelt, most of the development would occur on existing public lands along the riverfront. It is likely that Greenbelt developments in downtown areas would improve the conditions for commerical development of adjacent property.

4.6.1.2 The total development of all the projects submitted for consideration as an increment to the existing Federal reservoir projects would have the potential to increase regional development. The Des Moines Recreational River and Greenbelt Advisory Committee considers this to be one of the purposes of Greenbelt development.

4.6.2 DISPLACEMENT OF PEOPLE

4.6.2.1 Impacts associated with residential relocations would be minimal. However, some relocations would be necessitated by Greenbelt projects proposed for consideration. These relocations would be associated with land acquisition projects.

4.6.2.2 No acquisition of land would occur without the property owner's consent, and therefore, the effects of these relocations would be minimal. Most of the proposed project development would occur on public lands and no relocations would be required.

4.6.3 COMMUNITY COHESION. Impacts to community cohesion would be positive, as recreational opportunities would improve for the Greenbelt population. The potential Greenbelt development areas are located primarily in rural settings away from residential areas. Urban projects would commonly include such developments as bike trails, boat ramps, park improvements and pedestrian walkways. While bike trails might pass near residential areas, they would have a postitive impact on community cohesion by linking the community and improving accessibility to other areas. It should be noted that no land acquisition would occur without the consent of the property owner.

4.6.4 PROPERTY VALUES AND TAX REVENUES

4.6.4.1 Property owners may notice a fluctuation in the property value of land adjacent to Greenbelt development projects, depending upon the nature of the project. In general, most changes in property values would be positive.

4.6.4.2 Acquisition of private property for Greenbelt development would remove the affected land from the tax roles. This could significantly affect county tax revenues, especially for projects requiring major acquisition. The local sponsor for these projects would have to consider if the loss in tax revenues would be offset by the local project benefits.

4.6.5 PUBLIC FACILITIES AND SERVICES

4.6.5.1 All Greenbelt development would occur on public lands. The projects would positively impact public facilities by improving the quality and increasing the availability of public recreation facilities and wildlife areas in the Greenbelt. In addition, some private land may be acquired for conversion to public areas for either environmental/wildlife management or recreation development. The development of additional recreation facilities would help fulfill a portion of the recreational needs of the general public within the project area.

4.6.5.2 The establishment of a scenic road route would increase traffic rates on the affected roads. This would likely increase maintenance costs for the roadway upkeep, expecially for gravel roads. Designation of scenic road routes would require coordination with county and city engineers to minimize negative impacts.

4.6.6 EMPLOYMENT AND LABOR FORCE

4.6.6.1 Construction of the projects submitted for consideration would impact short-term employment in the project areas. The degree of impact resulting from each project construction would be dependent upon the project scale and the type of the project. The Greenbelt area has a labor pool of large enough size to absorb project needs for even the largest projects without noticeable impact.

4.6.6.1 The expansion or development of park or other facilities might increase the permanent employment opportunities within the project vicinity.

4.6.7 BUSINESS AND INDUSTRIAL DEVELOPMENT. Construction of Greenbelt projects would slightly increase business and industrial activity. However, the slight increase in business activity occurring from the projects would be absorbed into the affected areas without noticeable effect. Changes in land use or increased recreational development in an area could make adjacent land parcels more attractive for residential or commercial development. Long-term effects on business activity would be related to increases in area tourism as well as community and regional growth.

4.6.8 FARM DISPLACEMENT. Acquisition of some farm land may occur as a result of Greenbelt projects. However, no land would be acquired without consent of the property owner.

4.6.9 NOISE LEVELS.

4.6.9.1 Heavy machinery would generate a temporary increase in noise during construction of some types of projects. This increase might disturb users at surrounding recreation sites or residents of nearby dwellings. In urban areas, this increase also may impact schools, hospital facilities, and other public buildings.

4.6.9.2 Long-term impacts to noise would be most noticeable for new development in urban areas rather than an improvement. A minimal increase in noise may be associated with some of the projects proposed for consideration.

4.7 RECREATION

4.7.1 Because of the primary purpose behind the creation of the Greenbelt, most of the projects considered in this study would directly or indirectly benefit recreation resources or enhance recreational opportunities if implemented. Current outdoor recreation opportunity in the Greenbelt includes a continuum of settings and experiences, from passive enjoyment of the outdoors to active outdoor sports, and from more primitive wilderness to the highly developed urban environment. Most identified projects would be compatible with and enhance existing conditions in the Greenbelt.

4.7.2 Projects involving land acquisition or more primitive recreational developments would provide the greatest benefits within the upper reaches of the study area. Rehabilitation and beautification projects would expand urban recreation opportunities in the city of Des Moines. Expansion of current recreation developments and construction of new developments would provide additional recreational opportunities and help to reduce over-use and degradation of existing facilities, particularly in Saylorville Lake and Lake Red Rock.

4.8 CULTURAL RESOURCES

4.8.1 Table EIS-10 presents a summary analysis of effects to known archeological, historical, and architectural properties within the Des Moines Recreational River and Greenbelt project area. A total of 19 projects may affect cultural resources based upon existing information. This number may: (1) increase, as new projects are submitted for consideration; (2) increase, as project-specific surveys result in the identification of additional historic properties; or, (3) decrease, as projects are dropped from consideration or designed to avoid impacts to historic properties.

4.8.2 Impact avoidance through coordinated planning and sensitive design will be most successful for those projects with minimal construction within large areas. It is anticipated that there is a high potential for adjusting land modification, construction, or use requirements in order to avoid impacts to historic properties. Other projects may have little or no effects if low-impact tools, machinery, and methods are utilized. The remaining eight projects will have to be evaluated in terms of direct effects to significant resources, and the desireability of mitigation of adverse effects through data recovery. For these projects, the small tracts of land involved or other special project requirements are so restrictive that avoidance strategies are very difficult to achieve under any "build" alternatives.

TABLE EIS-10

Known Historic Properties and Potential Effects
Des Moines Recreational River and Greenbelt

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
Elk Rock State Park Improvements	401	MA 2	UP	Wheeler 1949, 1959; McKusick and Ries 1962; Roper et al. 1984: 56; Roper and Bastian 1986; Roper and Bastian 1986: 54, 56.			Destroyed	I	NE
		MA 36	O	Gradwohl and Osborn 1976: 29-30.	Surface survey w/20 shovel tests	Shell tempered ceramics, points, flakes; stoneware, iron buckle	4-5 acres	ND	UE
		MA 80	MA MW	Roper et al. 1984: 59; Roper and Bastian 1986: 57.				ND	UE
		MA 137	W	Gradwohl and Osborn 1976: 32; Roper and Bastian 1986: 58.	Surface survey w/16 shovel tests	debitage, grit tempered ceramics, anvil stone, concentration of rocks/charcoal		ND	UE
		MA 157	W	Osborn and Gradwohl, 1976: Letter Report to NCR, p.6; Roper and Bastian 1986: 59.	Surface survey		Destroyed by ca. 1976 park development	I	NE
		MA 158	UP	Osborn and Gradwohl, 1976; Letter report to NCR, p.6; Roper and Bastian 1986: 59.	Surface survey		Destroyed by ca. 1976 park development	I	NE
		MA 159	UP	Osborn and Gradwohl, 1976; Letter report to NCR, p. 6; Roper and Bastian 1986: 59.	Surface survey			ND	UE
		MA 219	W	Roper et al. 1984: 67, Roper and Bastian 1986: 59.				ND	UE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
		MA 270	F	Roper et al. 1986: 93; Roper and Bastian 1986: 60.		Foundation, well, dugout, appliance parts (brick/sand stone); 20th cent.		ND	UE
		MA 444	F	Roper and Bastian 1986: 61; Roper et al. 1986: 126.		Brick and concrete foundation	Severely disturbed	I	NE
		MA 445	F	Roper and Bastian 1986: 62; 1860'S Farmstead.		3 concrete foundations	Heavily damaged	ND	UE
Big Creek State Park	202	PK 129	UP	Benn 1986: 59; Gradwohl and Osborn 1973: 18; 1974: 50.		Past inundation and construction impacts (research 4)		PE	UE
Ledges State Park Improvements	103	BN 5	W	Benn 1986: 106; Ashworth and McKusick 1964; Brown 1966; Gradwohl & Osborn 1973, 1975.		2 mounds ; Lincoln Rhodes Village	Preservation	PE	UE
		BN 6	LW	Benn 1986: 106; Ashworth and McKusick 1964; Brown 1966, Gradwohl & Osborn 1973, 1975, Gradwohl 1975.	Tested 1968		Inundation, plowed, 12 acres, excavated (research 4)	PE	UE
		BN 201	LW	Benn 1986: 129; Ashworth and McKusick 1964; Brown 1966; Benn 1986: 139; Gradwohl and Osborn 1976; Gradwohl, 1975.	Tested 1968		Plowed, eroded, 2-3 acres (research 4)	PE	UE
		BN 263	UP	Benn 1986: 139.			Plowed, 1-2 acre (conserve 3)	PE	UE
Des Moines River Fishing Access	103	BN 143	W UH	Benn 1986: 119; Gradwohl and Osborn 1973, 1976.			Private land, plowed 20-35 acres (conserve 3)	PE	UE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
		BN 176	UP	Benn 1986: 125; Gradwohl and Osborn 1976: 218.			Previous construction impacting 1 acre (conserve 3)	PE	UE
Joe West Sr. Land Acquistion	804	MA 38	UP	McKusick and Ries 1962: 10; Roper and Bastian 1986: 57.				ND	UE
		MA 206	UP	Roper and Bastian 1986: 22, 59.				ND	UE
Lower Fraser Boat Ramp	110	BN 43	LA EW LW	Benn 1986: 112, Ashworth and McKusick 1964; Brown 1966; Gradwohl & Osborn 1973, 1976.			Private land, 5-10 acres, plowed	PE	UE
		BN 210	MW LW	Benn 1986: 130; Gradwohl and Osborn 1976: 254.			Plowed, 4 acres, (conserve 3)	PE	UE
		BN 211	MW	Benn 1986: 130; Gradwohl and Osborn 1976: 255.			Private land, plowed	ND	UE
Saylorville Refuge	207	PK 32	UP H	Benn 1986: 55; Ashworth and McKusick 1964; Brown 1966; Gradwohl & Osborn 1973, 1975: 26.			5 acres (research 4)	PE	UE
Native Grass, Tree and Shrub Plantings (IDNR)	804	PK 400	UP	Benn 1986: 90; Benn and Bettis 1981: 18.	Surface survey	1 flake; possible buried deposit	Plowed, 1 acre, high terrace, no context established (conserve 3)	ND	UE
		PK 401	LA	Benn 1986: 91; Benn and Bettis 1981: 18.	Surface survey	1 flake	Plowed, 1 acre, high terrace (conserve 3)	I	N
		PK 402	A	Benn 1986: 91; Benn and Bettis 1981: 18.	Surface survey	7 flakes from eroded A-B cut, ca. 4,500 BP	Plowed, 1 acre, high terrace, buried site (conserve 3)	PE	UE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
		PK 403	A	Benn 1986: 91; Benn and Bettis 1981: 19.	Surface survey	1 flake, 1 core from eroded A-B cut, ca 4,500 B-P	Plowed, 1 acre, high terrace, buried site (conserve 3)	ND	UE
		PK 406	W	Benn 1986: 91; Benn and Bettis 1981: 20.	Surface survey 1 shovel test	1 flake blank, somewhat buried	Recreation impacts 1 acre, relic intermediate terrace (conserve 3)	ND	UE
		PK 413	LW GD	Benn 1986: 93; Benn and Bettis 1981: 23; Benn and Harris 1983: 72.	Tests (50x50 70 cm)	minature GD vessel; chert flakes; grit tempered sherds; point; 2 pit fea.	3 acres, high terrace diffuse scatter (conserve 4)	E	UE
		PK 414	MA W	Benn 1986: 93; Benn and Bettis 1981: 24; Benn and Harris 1983: 84.	Tested 1982 w/backhoe	Buried soils 9190 & 1830, BP 3/4 grooved axe; barbed point; burned areas	Eroded, recreation impacts 2 acres (research 4)	I	NE
		PK 415	LW	Benn 1986: 93; Benn and Bettis 1981: 24; Benn and Harris 1983: 89.	Tested 1982; 3 shovel tests (x1x110 ans)	Chert cores, tables grit tempered sherds 1 burned area	Eroded, plowed, 1 acre leached (conserve 4)	I	NE
		PK 424		Benn 1986: 94; Benn and Bettis 1981: 27; Benn and Harris 1983: 94.	Tested 1982, (2 units)	Burned features; burned soil 420 BP	Eroded, 2 acres, intermediate and low terrace	I	NE
Oak Hickory Forest	804	DA 137	LW	Benn 1986: 101; Gradwohl and Osborn 1975: 133.			Inundation, plowed, 1 acre (conserve 3)	ND	UE
		PK 137	UP UW	Benn 1986: 60; Gradwohl and Osborn 1973: 19; 1973: 40.	Surface survey		3 acres, inundation plowed, previous construction (research 4)	PE	UE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
		PK 192	LW	Benn 1986: 69; Gradwohl and Osborn 1975: 99.			1-2 acres, private land	ND	UE
Big Creek Park	202	PK 126	A W	Benn 1986: 58; Gradwohl and Osborn 1973: 18; 1974: 46			4 acres, inundation erosion (research 4)	PE	UE
		PK 127	UP	Benn 1986: 58; Gradwohl 1974: 47; Timberlake 1974.	Tested 1973		Previous impacts, inundation, recreation impacts (remove 4)	I	NE
		PK 243	UP	Benn 1986: 78.			3-4 acres previous construction impacts, plowed (research 4)	PE	UE
		PK 258	UP	Benn 1986: 80.			Inundation, 1 acre (research 4)	PE	UE
Elk Rock State Park Shoreline Protection	401	MA 129	W	Roper and Bastian 1986: 48, 58.				ND	UE
		MA 419	T	Roper and Bastian 1986: 49, 54; Roper et al. 1986: 121.	Surface survey		Destroyed/ inundated, silted over, no impact remains; fifield	I	NE
		MA 439	W UH	Roper and Bastian 1986: 50, 61; Roper et al. 1986.	Surface survey	3 concrete foundations; 3 chert flakes	Severe erosion and siltation	ND	UE
		MA 447	LW	Roper and Bastian 1986: 50, 66; Roper et al. 1986: 126.	Surface survey	debitage, ceramics fire cracked rock	100x100M, eroded, artifact transport	ND	UE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
Boat Traffic	314		UH			Center Street Hydropower Dam ca. 1910. Scott/Beauty Dam ca. 19202	Possible removal under consider-ation	ND	AE
Outdoor Sports Complex (Des Moines)	311	PK 418	LA or MW	Benn 1986: 93; Benn and Bettis 1981: 25.		Plowed, 1 acre, 1 side notched point	Conserve 3 deeply buried	ND	UE
		PK 422	UP	Benn 1986: 94; Benn and Bettis 1981: 26.		Plowed, 1 acre, hearth in B horizon	Conserve 3	ND	UE
Congregational Church of Runnells	406							ND	UE
Red Rock 340 Acre Park	402	MA 1	UP	Wheeler 1949, 1959; McKusick and Ries 1962: 5; Roper and Bastian 1986: 16, 65.	Surface survey			ND	UE
		MA 25	UP	Mckusick and Ries 1962: 8; Roper and Bastian 1986: 56.				ND	UE
		MA 101	UP S	Roper et al. 1986: 80.	Tested	Points, flakes, bottle glass, wire	Intensive test produced no material except lag deposit	I	NE
		MA 102	UP	Roper and Bastian 1986: 24,57.				ND	UE
		MA 281	F	Roper and Bastian 1986: 48, 64; Roper et al. 1986: 96.	Surface survey	Fluted brick/tile foundation, asphalt shingles, linoleum, glass, ceramics, wire	Eroded; 20th century	I	NE
		MA 283	UP	Roper and Bastian 1986: 1986: 51, 64; Roper et al. 1986: 97.	Tested	Debitage as lag deposits; no material in tests	Severely eroded; frequent	I	NE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
		MA 284	W H	Roper and Bastian 1986: 48, 64; Roper et al 1986: 97.	Surface survey	Debitage and small sherds as lag deposits	Inundation; lag deposits, severely eroded	I	NE
		MA 285	W	Roper and Bastian 1986: 48, 67; Roper et al 1986: 97.	Surface survey	Lithics and ceramics	Eroded 10x25M	PE	UE
		MA 286	W	Roper and Bastian 1986: 51; 67; Roper et al 1986: 98.	Surface survey	Biofacial tools, cores, debitage		PE	UE
		MA 287	H	Roper and Bastian 1986: 49, 54, 65; Roper et al 1986: 98.	Surface survey	Brick rubble; 1901	Destroyed, bulldozed, eroded	I	NE
		MA 282	S	Roper and Bastian 1986: 48, 60; Roper et al 1986: 97.	Surface survey	Concrete, brick, glass, desk frames; 1901	Extremely eroded beachline	I	NE
		MA 427	W	Roper and Bastian 1986: 49, 66; Roper et al 1986: 123.	Surface survey	2 points, grit-tempered sherds, lithics as lag deposits	Eroded away	I	NE
Yellow Banks Scenic Bluff Addition	304	PK 11	UP	Roper and Bastian 1986: 63; McKusick and Ries 1962: 12.				ND	UE
Jester Park NW. 128th Street Development	201	PK 201	UP	Benn 1986: 71; Gradwohl and Osborn 1973: 24, 1975: 71.		Burial	1 acre	PE	AE
		PK 202		Benn 1986: 71; Gradwohl and Osborn 1973: 24, 1975: 72.		Fossil brachiopods (remove)		I	NE

TABLE EIS-10 (Cont'd)

GREENBELT PROJECT NAME	GREENBELT PROJECT NUMBER	SITE NO.	AGE	REFERENCES	LEVEL OF PREVIOUS STUDIES	KNOWN CULTURAL REMAINS	COMMENTS	NATIONAL REGISTER STATUS	IMPACTS
Sycamore Access	802	PK 400	UP	Benn 1986: 90; Benn and Bettis 1981: 18.	Surface survey	1 flake	Plowed, 1 acre, high terrace, no context established (conserve 3)	ND	UE
		PK 401	LA	Benn 1986: 91; Benn and Bettis 1981: 18.	Surface survey	1 flake	Plowed, 1 acre, high terrace (conserve 3)	I	NE
		PK 402	A	Benn 1986: 91; Benn and Bettis 1981: 18.	Surface survey	7 flakes from eroded A-B cut, ca 4,500 BP	Plowed, 1 acre, high terrace, buried site (conserve 3)	PE	UE
		PK 403	A	Benn 1986: 91; Benn and Bettis 1981: 19.	Surface survey	1 flake, 1 core, from eroded A-B cut, ca 4,500 B-P	Plowed 1 acre, high terrace, buried site (conserve 3)	ND	UE
		PK 414	MA W	Benn 1986: 93; Benn and Bettis 1981: 24; Benn and Harris 1983: 84.	Tested 1982 w/backhoe	Buried soils S190 and 1830, BP 3/4 grooved axe; barbed point; burned areas	Eroded, recreation impacts, 2 acres (research 4)	PE	UE
		PK 415	LW	Benn 1986: 93; Benn and Bettis 1981: 24; Benn and Harris 1983: 89.	Tested 1982; 3 shovel tests (x1x110 ans)	Chert cores, tables, grit tempered sherds; 1 burned area	Eroded, plowed, 1 acre leached (conserve 4)	PE	UE

All site numbers are preceded by 13, the code for the State of Iowa.
Impacts are assessed for effects to National Register properties.

National Register Status

I = Ineligible
ND = Not Determined
PE = Potentially Eligible
E = Eligible

Cultural Affiliation

UP = Uknown Prehistoric
A = Archaic
MA = Middle Archaic
LA = Late Archaic
W = Woodland
EW = Early Woodland
MW = Middle Woodland
LW = Late Woodland
GO = Great Oasis
O = Oneota
S = Schoolhouse
T = Town
F = Farmstead
H = Historic

Impacts

NE = No Effect
NAE = No Adverse Effect
AE = Adverse Effect
UE = Undetermined Effect

4.8.3 A total of 71 archeological sites and three architectural properties (2 dams, 1 church) may be affected by Greenbelt projects (see table EIS-10). Twenty-two of the archaeological sites (of their former locations) have been determined to be ineligible for listing in the National Register of Historic Places based upon previous investigations. In several instances, the sites have been destroyed by erosion or previous construction projects. The Office of the State Archaeologist of Iowa maintains site numbers, site reports, and artifact collections at their office and curation facility at the University of Iowa in Iowa City.

4.8.4 Of the remaining 49 archaeological sites, 22 are eligible or potentially eligible for listing in the National Register of Historic Places (e.g., significant), and 27 have yet to be scientifically evaluated for significance. The significance of the 3 historic-architectural properties, the ca. 1902/1910 dams and the Runnells Congregational Church also must be evaluated for the National Register eligibility if impacts could accrue.

4.8.5 Impacts to the 22 significant or potentially significant historic properties may be avoided through sensitive planning and detailed design. The extent to which avoidance will be successful cannot be determined without final site plans. The potentially endangered sites are listed in table EIS-11.

TABLE EIS-11

Endangered Archeological Sites
Des Moines Recreational River And Greenbelt

Project Name	Project No.	Site No.
Big Creek State Park	202	13PK129
Ledges State Park Improvements	103	13BN5
		13BN6
		13BN201
		13BN263
Des Moines River Fishing Access	803	13BN143
Lower Fraser Boat Ramp	110	13BN43
Saylorville Refuge	207	13BN210
Native Plantings	804	13PK402
		13PK413
Big Creek Shoreline Protection	202	13PK137
		13PK126
		13PK243
Red Rock 340 Acre Park	402	13MA285
Jester Park NW. 128th Street Development	201	13PK201
Sycamore Access	802	13PK402
		13PK414
		13PK415

4.8.6 The 22 archeological sites contain remains which reflect most of the prehistoric periods known for the State of Iowa. The earliest remains (13MA80) date from about 5,000 B.P., while the latest are only about 600 years old (several sites). Although there are only 22 significant or potentially significant archeological sites threatened by Greenbelt projects, 31 components are represented. What this means is that some of the sites (locations) contain remains from more than one prehistoric or historic period. The major cultural periods represented at the 22 sites are listed in table EIS-12.

TABLE EIS-12

Representation of Cultural Periods
Des Moines Recreational River And Greenbelt

CULTURAL PERIOD	DATE	COMPONENTS
Unknown Prehistoric	No Dates	8
Archaic	8,000-800 B.C.	3
Middle Archaic	5,000-3,000 B.C.	1
Late Archaic	3,000-800 B.C.	1
Woodland	800-1,400 B.C.	6
Early Woodland	800-200 B.C.	1
Middle Woodland	200 B.C.-400 A.D.	1
Late Woodland	400-1,400 A.D.	6
Great Oasis	800-1,300 A.D.	1
Historic	1,850-1,910 A.D.	3

4.8.7 Identifications are based upon "diagnostic" artifacts recovered from each component. In many cases, no diagnostic material was found; hence, the identification could not be refined any further than "Unknown Prehistoric" or the very general "Period (Archaic or Woodland)" classifications.

4.8.8 Although Late Woodland components specifically and Woodland Period remains generally are the most abundant, it is very likely that the reason for this is geomorphological. That is, the most recently formed landscape contexts are the ones most likely to remain. Surface surveys and disturbances, like plowing, make it fairly easy to spot prehistoric sites. Chances are good that many more Archaic Period components are present, but deeply buried under later sediments. These older sites are much more difficult to find. In some cases, later Holocene erosional forces may have completely removed earlier Archaic Period contexts. Despite problems with differential rates of preservation and discovery, the Des Moines Recreational River and Greenbelt project contains a wide range of cultural resources and offers unique opportunities for interpretation and preservation-oriented project management practices.

4.8.9 Field surveys conducted in 1976 and 1980 by Brice, Petrides and Associates as part of the Environmental Impact Study for the Brushy Creek State Recreation Area identified 62 prehistoric sites within the park. Eighteen of the sites were selected for intensive testing to determine potential eligibility for the National Register of Historic Places. Of these, six sites were reported to meet the criteria of significance for inclusion in the National Register. Little is known about other areas within the Greenbelt boundary outside of Federal lands. Archeological studies in these areas have been small-scale and few in number. Therefore, the intensive archeological, historical, and geomorphological studies conducted on Federal lands could serve as a representative database for the entire Greenbelt.

SECTION 5 - LIST OF PREPARERS

Name	Experience and Field of Expertise	Role in EIS Preparation
Charlene Carmack	Community Planner - 2 years technical and professional experience preparing environmental documents	EIS Study Team Leader - Biological Impacts
Ron Klump	Botanist - 3 1/2 years technical and professional experience preparing environmental documents	Natural Resources
Larry McLean	Recreation Planning - 19 years of technical and professional experience preparing environmental and recreation resource master plans	Master Planning and Recreational Resources
Charles R. Smith	Archeologist - 7 years university archeologist and 6 years NCR archeologist	Cultural Resources
Patti Risser	Social Science Analyst - 4 years technical and professional experience performing social and ecomonic analysis	Economic and Social Impacts
George Gitter	Community Planner - 4 1/2 years technical and professional experience in water resources studies.	Greenbelt Project Study Manager

6.1 PUBLIC MEETINGS. Following release of the Plan for Engineering and Design in March 1986, six public workshops were held in various locations throughout the Greenbelt. Major public concerns are summarized in Section 1.3-Public Concerns. Concerns expressed during the five public meetings held following release of the draft GDM and PEIS are summarized in the Public Review and Comment Response section of this report.

6.2 AGENCY COORDINATION

6.2.1 AGENCIES CONTACTED

The following agencies were contacted during the preparation of the EIS:

a. U.S. Department of Interior - U.S. Fish and Wildlife Service

b. U.S. Department of Agriculture - Soil Conservation Service

c. U.S. Environmental Protection Agency (U.S. EPA)

d. Iowa Department of Natural Resources (IDNR)

e. Iowa State Historical Department, Division of Historic Preservation (SHPO staff)

6.2.2 SUMMARY OF CONTACTS

Letters of comment received during public review of the GDM and draft PEIS are attached to this report under the heading "Public Review and Comment Response". Corps responses to letters of comment are also contained in this attachment.

6.2.2.1 U.S. Department of Interior - U.S. Fish and Wildlife Service

Close coordination has been maintained with the Ecological Services - Rock Island Field Office of the U.S. Fish and Wildlife Service (U.S. FWS). The Final Fish and Wildlife Coordination Act Report provided to the Rock Island District by the Field Office contained several recommendations for evaluation and implementation of projects. These recommendations are stated below, followed by the Corps of Engineers' responses. A copy of the Coordination Act Report may be found in the Public Review and Comment Response portion of this report.

1. "Scopes of study (should) be developed for the 13 key projects so that as projects are authorized and funded, the necessary environmental studies can be completed in an expeditious manner."

As projects are recommended for detailed design and construction, scopes of study will be developed to insure that environmental concerns are adequately addressed as early as possible.

2. "The planning team (should) support and encourage SCS to accelerate development of conservation plans and watershed projects in the river basin to reduce erosion and sedimentation impacts on the Greenbelt."

This recommendation will be pursued by the Greenbelt Advisory Committee.

3. "The planning team (should) pursue full implementation of 1985 Farm Bill provisions which provide for deed restrictions, conservation easements or acquisition in fee title of FmHA inventory lands to protect or enhance Greenbelt resources."

See above response.

6.2.2.2 U.S. Department of Agriculture - Soil Conservation Service. Representatives of both the State and District offices of the Soil Conservation Service have been consulted regarding the presence of prime and unique farmlands or highly erodible lands within the Greenbelt study area, as well as the applicability of the Farmland Protection Policy Act and the conservation set-aside programs established under the 1985 Farm Bill.

6.2.2.3 U.S. Environmental Protection Agency (U.S. EPA). See the public Review and Comment Response portion of this report.

6.2.2.4 Iowa Department of Natural Resources (IDNR).

IDNR is represented on the Advisory Committee by its Director, appointed to the Committee by the Governor of the State of Iowa as prescribed by Public Law 99-88. Coordination between the IDNR and the Rock Island District has been maintained throughout the Greenbelt study process. The IDNR has been identified as a local sponsor for several of the projects proposed for consideration in the GDM.

6.2.2.5 Iowa State Historical Department, Division Of Historic Preservation (SHPO Staff). Continuous coordination was maintained with the SHPO's Chief Archaeologist, beginning with review of the Plan for Engineering and Design and continuing with review and consultation concerning archaeological studies for prototype projects. The SHPO was consulted during preparation of the EIS for lists of known sites outside of areas covered by previous archaeological studies for Corps of Engineers water resources projects.

6.3 MITIGATION

6.3.1 The extent to which mitigation is justified for a project is heavily dependent on the future condition of a project area should the project not be built. According to Corps of Engineers policy, mitigation is not appropriate if the impacted resource would be lost even if there was no action on the part of the Federal Government. Predicting future conditions are especially difficult where multiple factors (i.e., housing and economic development, topography, availability of agency funding, conservation set-aside programs, etc.) affect the future. Corps of Engineers regulations require that mitigation is not appropriate if it is evident that habitat would be lost through other non-project related future actions. Conversely, mitigation may be appropriate if it is reasonable to assume that the habitat will persist for the foreseeable future if the project is not constructed.

6.3.2 Because the purpose of a number of the projects proposed for consideration is to enhance the natural environment for recreation purposes, few of these projects would be anticipated to have impacts upon the natural environment significant enough to require mitigation. A primary concern in evaluating alternative plans for environmental enhancement or recreational development would be the need to balance the enhancement of recreational opportunity with the preservation and enhancement of scarce natural resources. Detailed evaluation of siting and design alternatives for projects could reduce the need for mitigation if less environmentally damaging alternatives are adopted.

6.4 MITIGATION PLAN

6.4.1 As projects are proposed for construction and alternatives evaluated for engineering, economic and environmental acceptibility, mitigation plans will be developed, as necessary, on a project-specific basis to avoid or compensate for losses of significant resources. Avoidance of impacts would be the foremost goal of this process. Adoption of alternatives which avoid all or nearly all impacts to significant resources would eliminate the need for mitigation. If avoidance is not practical, the next objective would be in-kind replacement of the lost resource.

6.4.2 Because many of the projects proposed for consideration in this document contain several different elements, it may be possible to incorporate in-kind replacement of resources lost through recreational development by implementation of environmental enhancement elements of the same project. In cases where avoidance of impacts is impossible and in-kind mitigation is not a workable option, some form of out-of-kind mitigation may be an acceptable, though least preferable, alternative.

REFERENCES

Benn, David W., and Bettis, E. Arthur III (1985). Archaeology and Landscapes in Saylorville Lake, Iowa. A field trip guidebook for the Association of Iowa Archaeologists Annual Summer Meeting. Sponsored by the U.S. Army Corps of Engineers - Rock Island District; the Iowa Geological Survey.

Iowa Conservation Commission (1981). Iowa Protected Water Areas - General Plan March 1981.

Iowa Conservation Commission (1982). Brushy Creek State Recreation Area Environmental Impact Study. Prepared for the Iowa Conservation Commission by Brice, Petrides and Associates, Inc. September 1982.

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Iowa Conservation Commission (1985). Iowa Forest Resources Plan 1985. Wallace State Office Building, Des Moines, Iowa 50319.

Iowa Department of Natural Resources (1986). 1985 Iowa Air Quality Report. November 1986.

U.S. Army Corps of Engineers (1986). Archaeological Survey and Testing at Lake Red Rock, Iowa: The 1984 and 1985 Seasons, a report prepared for the Rock Island District by Gilbert-Commonwealth Inc. (Dr. Donna C. Roper, Principal Investigator), 209 E. Washington Avenue, Jackson, Michigan, September 1986.

U.S. Department of Agriculture, Soil Conservation Service (1983). Des Moines River Basin Study - Iowa, Minnesota, and Missouri Drainage Report. February 1983.

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--- (1975). Soil Survey of Webster County, Iowa.

INDEX

PUBLIC REVIEW COMMENTS AND RESPONSES

PRESIDENT
Bob Pinneke
Story Co.
Colo, Iowa 50056

CCDA

COUNTY CONSERVATION
DIRECTOR'S ASSOCIATION

VICE-PRESIDENT
Jim Liechty-Madison Co.
SECRETARY-TREASURER
Paul Hagen-Lyon Co.

July 27, 1987

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, IL 61204-2004

Subject: Des Moines Recreational River and Greenbelt Project

Dear Sirs:

Rivers for recreational and cultural use have been neglected as far as national or state park designations. Some counties in Iowa have attempted, with meager budgets, to recognize these resources as valuable additions and to provide through zoning, leases, or fee simple purchases, public access to this heritage. As President of the newly formed County Conservation Directors' Association, I would like to support the Greenbelt concept on the Des Moines River from Highway 92 near Lake Red Rock Dam to U.S. Highway 20 in Fort Dodge. This resource will be greatly enjoyed by ever-increasing numbers of people from a large zone of influence. Such river resources need to be nurtured to protect these fragile areas and developed in others to provide for future public enjoyment. Public involvement will be the key to its success at all levels, and the County Conservation Directors encourage the U.S. Army Corps of Engineers and the Department of Natural Resources to constantly seek input into the process as it develops.

Sincerely,

Robert Pinneke

RRP:jvw

1. Noted.

U.S. Department of Housing and Urban Development
Kansas City Regional Office, Region VII
Professional Building
1103 Grand Avenue
Kansas City, Missouri 64106-2496

July 27, 1987

Colonel Neil A. Smart
District Engineer, U.S. Army Engineer District
ATTENTION: Planning Division, Clock Tower Building
PO Box 2004
Rock Island, IL 61204

Dear Colonel Smart:

Subject: Draft Environmental Impact Statement: Des Moines Recreational River and Greenbelt, Iowa, (June 1987)

This is to acknowledge that the subject draft environmental impact statement has been received by this office. It is being reviewed at the Omaha Field Office by the Environmental Officer, as follows:

Mr. Stan Quy
Environmental Officer
Department of Housing and
Urban Development
210 South 16th Street
Omaha, NE 68102-1622

Telephone: FTS 864-3835

Mr. Quy will review the statement and provide comments, if any, directly to you by September 1, 1987. If you do not receive a reply within this time frame you may assume we have no comments.

Sincerely,

Gary Ultican
Regional Environmental Officer
Community Planning and
Development

2

1. Noted. No further comments were received.

Association of Soil Conservation District Commissioners

STATEMENT OF THE IOWA ASSOCIATION OF SOIL AND WATER CONSERVATION DISTRICT COMMISSIONERS ON THE ESTABLISHMENT OF A DES MOINES RIVER GREEN BELT

We, the Iowa Association of Soil and Water Conservation District Commissioners support the establishment of a riverbottom greenbelt recreational and wildlife area along the Des Moines River--but our support includes complete upland treatment to prevent silt and sedimentation damages to those areas.

It is estimated that more than $30,000,000 in damages result per year in Iowa from off-site damages to reservoirs, lakes and ponds, road right of ways, etc. from siltation deposits from unprotected agricultural lands.

We of the Iowa Association of Soil and Water Conservation District Commissioners not only encourage, but insist that a Greenbelt Plan include safeguards from this type of potential damage. By proper upland treatment the future of the wildlife and fish habitat can be greatly enhanced as well as protect scarce timberland and reduce streambank erosion.

We ask the U.S. Army Corps of Engineers to include complete upland treatment in the plan to establish a greenbelt along the Des Moines river.

Thank you for allowing me the opportunity to come here and share our concerns with you.

Sincerly,

Norman Kading

Norman Kading, Vice President
Iowa Association of Soil and Water
Conservation District Commissioners

August 3, 1987

3

1. Noted.

2. Noted.

3. Plans are included in the Greenbelt General Design Memorandum for reforestation and prairie establishment projects. Future planning and engineering work will include meaures to avoid or minimize increases in erosion and siltation which may result from project construction and operation. However, we are only able to pursue projects on lands in which a Government body has an interest, and have no authority on privately owned property.

4. We do not have the authority to provide upland treatment to non-Federal lands. On Federal lands at Saylorville Lake and Lake Red Rock, we have completed some upland treatment measures including reforestation and prairie restoration. The Department of Agriculture and the Soil Conservation Service may be able to assist in upland treatment programs.

IOWA CHAPTER SIERRA CLUB
STATEMENT FOR PUBLIC MEETING ON DES MOINES RECREATIONAL RIVER AND GREENBELT
Boone, Iowa - August 3, 1987

The Iowa Chapter Sierra Club is an integral part of the National Sierra Club, sharing the objectives of exploring, enjoying and preserving the nation's forests, waters, wildlife and wilderness. We support the wise use of our natural resources, and environmentally-friendly practices in our human endeavors, consistent with prolonging a high quality of life on this planet for ourselves and our children.

In the Des Moines Recreational River and Greenbelt General Design Memorandum, we see an organized approach toward mutually compatible objectives over a large chunk of central Iowa contained within the Des Moines River Basin. We applaud the Advisory Committee and the United States Army Corps of Engineers for progress to date, and look forward to commenting on specific project plans that entail environmental effects.

1. Noted.

Iowa State Historical Department

East 12th and Grand Avenue, Des Moines, Iowa 50319
(515) 281-5111

August 4, 1987

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, IL 61204-2004

RE: DRAFT GENERAL DESIGN MEMORANDUM AND DRAFT PROGRAMMATIC ENVIRONMENTAL IMPACT STATEMENT, DES MOINES RECREATIONAL RIVER AND GREENBELT, DES MOINES RIVER, IOWA.

Dear Col. Smart:

We have reviewed the above referenced document and concur with the overall plan for cultural resources and plans for project coordination with our Office. The extensive prior work already conducted by the COE at Saylorville and Red Rock forms a foundation for cost-effective investigations if additional research is needed in project areas.

As outlined in the draft EIS, several of the proposed projects are likely to result in adverse impacts to cultural resources. However, pre-planning will reduce or avoid many impacts. We look forward to more detailed consultation as individual projects are selected.

Sincerely,

Kay Simpson
Compliance and Archeological Survey

cc: Dudley Hanson, COE

5

1. Noted.

2. Continued coordination will be maintained with the Iowa State Historical Department as projects are developed for construction.

Webster Soil Conservation District

1200½ 3rd Avenue N.W. · Fort Dodge, Iowa 50501 · Phone: 573-4411

August 4, 1987

Des Moines River Greenbelt Committee
Public Hearing - Fort Dodge , Aug. 4, 1987

The IASCDC heartily endorse the concept of a greenbelt along the Des Moines River to protect timberland and enhance opportunities for recreation.

1. Noted.

by Donald Seltz

Donald Seltz

For IASCDC

United States Department of the Interior
BUREAU OF MINES
P. O. BOX 25086
BUILDING 20, DENVER FEDERAL CENTER
DENVER, COLORADO 80225
Intermountain Field Operations Center

August 26, 1987

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Sir:

Subject: General Design Memorandum - Des Moines Recreational River and Greenbelt, Des Moines River, Iowa (with Draft Programmatic Environmental Impact Statement)

Personnel of the Bureau of Mines have reviewed the subject memorandum and draft EIS for impacts to mineral resources and to mineral-related facilities as requested. The documents pertain to a greenbelt and recreation area along the Des Moines River, Iowa.

Mineral resources are not mentioned in the documents. Known mineral resources in the counties crossed by the proposed greenbelt include gypsum, coal, stone, clay, and sand and gravel. A review of our files indicates that several currently active gypsum mines and sand and gravel pits exist in the immediate area of the greenbelt corridor. In addition, several crude oil, natural gas, and petroleum products pipelines pass across the proposed greenbelt. Therefore, we recommend that any future documents pertaining to the proposed project include a list of mineral resources in the area and a discussion of impacts the proposed project would have on them. Also mitigation measures that may be necessary to protect the mine, pits, or relocate the pipelines should be discussed. If no impacts to mineral resources, mineral-producing facilities, or pipelines would occur, then a statement to that effect should be included.

Sincerely yours,

William Cochran, Chief
Intermountain Field Operations Center

7

1. Noted.

2. We have expanded the text to discuss mineral resources. At the present time, the project will have no impacts to mineral resources. Section 3.2.4 of the Environmental Impact Statement contains a description of geological deposits and mineral resources in the study area. Future reports will include a discussion of impacts to mineral resources, mineral-producing facilities and pipelines.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VII
726 MINNESOTA AVENUE
KANSAS CITY, KANSAS 66101

September 1, 1987

Colonel Neil A. Smart, USA
District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

RE: Des Moines Recreational River and Greenbelt, Des Moines River, Iowa

In accordance with our responsibilities under the National Environmental Policy Act (NEPA) and Section 309 of the Clean Air Act, we have reviewed the Draft Programmatic Environmental Impact Statement (DEIS) for the project referenced above and have rated it LO (Lack of Objections). Although we are concerned about the potential adverse impacts that may result from implementation of Project 205-Beaver Creek Park and Project 314-Boat Traffic/Saylorville-Red Rock Lakes, the LO rating results from our understanding that each project will be evaluated for NEPA compliance at a later date.

For future reference, you might note that our specific concern with Project 205 is the proposed conversion of a wetland to a lake, and with Project 314, the dredge and dredge disposal activity.

Thank you for the opportunity to review and comment on this proposed project. Any questions on these comments should be directed to Mr. Mike Bronoski of my staff at FTS 757-2823.

Sincerely yours,

B. Katherine Biggs
Chief, Environmental Review Branch

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1. Noted. We have discussed these projects with the U. S. Fish and Wildlife Service (see their letter dated September 15, 1987).

2. Noted.

Sierra Club Iowa Chapter
THOREAU CENTER, 3500 Kingman Blvd., Des Moines, Iowa 50311—515 277 8868

September 1, 1987

Mr. George Gitter
Department of the Army
Rock Island District, Corps of Engineers
Clock Tower Building - P. O. Box 2004
Rock Island, IL 61204-2004

Dear George:

Attached is the statement of the Sierra Club on the General Design Memorandum for the Greenbelt Project. I will be out of town for the next meeting, so I will see you at the one after.

Yours truly,

Helene F. Mahler

Helene F. Mahler
Legislative Chair
Sierra Club

Attachment

9

1. Noted. Comments are addressed on the following pages.

COMMENTS: General Design Memorandum - Des Moines Recreational River & Greenbelt

FROM: Sierra Club of Iowa, Helene F. Mahler, Representative

We of the Sierra Club understand that each Greenbelt project that is approved must have an Environmental Impact Statement done at the time when plans are finalized, money is available, and cooperative agreements are signed. We will look carefully at each project at that time and consider any mitigation that will have to be done.

1. An environmental document will be prepared for each project. An Environmental Impact Statement will be prepared for major Federal actions which may significantly affect the environment. See Section 6.3 of the Programmatic Environmental Impact Statement for a discussion of mitigation.

However, two of the projects deserve mention here. Project #314 is a plan to make the Des Moines River navigable from Lake Red Rock through downtown Des Moines to Saylorville. We are concerned about bank damage because of increased boat traffic; changing the whole character of the river in downtown Des Moines, and the possible negative impact on acquatic species. Project #205 is a plan to take a 99-acre wetland and turn it into a 40-acre lake (Beaver Creek Park). We want this wetland to be handled in some other way so the present character of the place can be maintained. We essentially agree with the April 14, 1987, letter from the U.S. Fish and Wildlife Service, page 1-8, on these two projects.

2. Noted. We have discussed these projects with the U. S. Fish and Wildlife Service (see their letter dated September 15, 1987).

Our main concern about the Greenbelt project is that there is no standard policy about how far from the recreating public a firearm can be discharged. I spoke to the Iowa Department of Natural Resources (DNR) and the U.S. Army Corps of Engineers (Corps) about this issue, and they told me their guidelines. In the DNR, there is no set rule, policy, law, or regulation about how much space should be allowed between a person camping or hiking and a person hunting or discharging a firearm. In some areas hunters can discharge weapons as close as 50 yds. from people engaged in other recreation. I was told that the distance depended on the intensity of use of the non-hunting facility and the topography of the land. In some areas, there are restrictions on the types of firearms that can be used; so the distance in terms of possible injury is taken into consideration.

3. Noted.

The rule of the Corps regarding the discharge of a firearm "prohibits hunting in a recreation area or in areas designated no hunting by the District Engineer." They have no set number of yards around this 'recreation area,' and the actual extent of the area is not defined. For example, there could be a two-mile square area designated as a campground; but it is not clear how a camper would

4. Areas owned and managed by the Corps of Engineers are closed to hunting when necessary to protect public safety. Designation of buffer zones are made by brochures and boundary signs posted at common access points.

know when the campground ended and the hunting area began. I saw no signs at campgrounds giving this information. The person in charge of the recreational area would decide how much area would be considered a buffer. Like the DNR, this decision would depend on the lay of the land, fences, gullies, roads, etc., in signing for hunting or not hunting.

The Corps has brochures about hunting areas near the lake available at their information centers. I know that the DNR also has brochures indicating hunting areas, but I have not seen one at the Brushy Creek Recreational Area, for example, where hunting, camping,, hiking, etc., all go on at the same time. There is no sign at the entrance of Brushy Creek stating that hunting goes on in that area.

We would like the Corps of Engineers to set a policy to establish the number of yards of buffer land that would surround all recreational facilities inside the Greenbelt. This buffer would exist to protect users of these facilities from hearing firearm noises and having concern about the danger of being injured by firearms, bows/arrows, or animal traps. We would like these buffers to be managed for non-game species and have no taking of animals whatever. We would like these buffers to be about 1,000 yards wide. We do not consider this to be an unreasonable request, as one of the original parts of the law stated: "(5) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary."

In looking at the material in the General Design Memorandum (GDM), we think that we can afford these generous buffers of land around recreational areas. Table 16, page 67, shows that there will be a demand for hunting in 1995 that can be satisfied with 36,628 acres of land. Table 10, page 59, summarizes the recreational facilities that are now available in the Greenbelt area; and at this date, there are 80,704 acres used for hunting. In addition, there are a number of Greenbelt projects proposed by the DNR that will add to this total acreage to be used for hunting. Therefore, we currently have more than enough land to meet the demand by 1995 and will gain more, so we can afford to keep the sound of the discharge of firearms and the threat of injury away from recreational areas in the Greenbelt.

11

5. See above response.

6. The determination of adequate buffer zones considers use of the facility, conditions of the landscape, type of hunting, location of nearby facilities and other factors. A 1,000-yard buffer zone would be inadequate in some areas and excessive in others. An arbitrary distance standard would not meet the needs and conditions of all recreation areas.

7. Acreage figures by type of hunting were not available at the time of the study, and it is not known whether existing acreage meets the projected demand for the various types of hunting. Lands proposed for acquisition could not be considered available for hunting until purchased as part of a Greenbelt project.

20. COMMENT: A suggestion would be that the Corps of Engineers get some advice from bicyclists before building future trails.

RESPONSE: Noted.

21. COMMENT: In the Boone River area, are there any areas set aside for non-game wildlife management?

RESPONSE: At the present time, there are no specific non-game wildlife projects for the Boone River. However, as outlined in the Iowa Department of Natural Resources' Boone River Protected Water Area Management Plan, "timber management aimed at promoting the oak-hickory association and maintaining it in different successional stages in close proximity by small clear cuts will benefit most forest wildlife."

22. COMMENT: I have a hard time understanding how showers and electricity at campsites fit into a wilderness project.

RESPONSE: The overall concept of the Greenbelt is to coordinate existing and future Federal, State and local recreation and environmental enhancement projects. The level of development of a recreation area is determined by the implementing agency based upon projected usership.

23. COMMENT: How can the Greenbelt be called primarily recreation?

RESPONSE: The project was authorized for the development, operation and maintenance of a recreation and greenbelt area along the Des Moines River. Approximately 75-percent of the projects proposed by the Advisory Committee are for recreation.

24. COMMENT: Who will administer fish and game regulations?

RESPONSE: The Iowa Department of Natural Resources will administer fish and game regulations. In a letter dated September 14, 1987, they indicated that they would continue to manage and regulate fish and wildlife resources in the Greenbelt in accordance with their state-wide responsibilities.

25. COMMENT: Is the Conservation Commission trying to get control of taking a count of game animals so that they can advise and decide if it is right to hunt or not?

RESPONSE: The 1986 State Comprehensive Outdoor Recreation Plan notes that continued collection of population data on wildlife species is required by law. This provides the information base for making management and regulation decisions.

Iowa so one knows that the natural area is one for the taking of animals. There should be a brochure of the whole Greenbelt showing where hunting is allowed.

We in the Sierra Club are not against hunting or the taking of animals. We clearly understand that when there are game species and no natural predators, there will be a need to harvest these animals so that habitat and food supplies are not overstressed. However, we believe that people engaged in recreation other than hunting should be able to enjoy their time in the country without the sounds of firearms or concerns of being injured by flying bullets, pellets, or arrows.

13. Noted.

7. COMMENT: The Boone and Scenic Valley Railroad will be aggravated further to the point where we probably will lose a part of our trackage between Des Moines River bridge & the Fraser crossing.

RESPONSE: THe Boone and Scenic Valley Railroad is a privately owned facility and is not eligible for cost-shared projects.

8. COMMENT: The Iowa Chapter of the Sierra Club applauds the Advisory Committee and the Corps of Engineers for progress to date, and we look forward to commenting on specific project plans.

RESPONSE: Noted.

9. COMMENT: I have a hard time believing you are going to have this bike trail going down the river and around somebody's farm.

RESPONSE: Noted.

10. COMMENT: How will this benefit wildlife and the forest with all these trails running through there?

RESPONSE: The purpose of trail construction is to enhance recreational opportunities by providing access to natural and scenic areas, and serve as a connection between the elements of the Greenbelt. Design of trails will include an assessment of potential impacts to natural vegetation and fish and wildlife in order to avoid or minimize adverse impacts. In general, trails have few direct impacts to the value of wildlife habitat.

11. COMMENT: How much land will be left wild and how much is going to be open to public hunting?

RESPONSE: At the present time, there are no large-scale plans to change lands from a wild state, and no restrictions have been imposed under the Greenbelt authority.

12. COMMENT: How much bank stabilization is desired and how is it accomplished?

RESPONSE: There have been relatively few streambank stabilization projects proposed by the Advisory Committee. Banks are typically stabilized using riprap stone.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

September 14, 1987

Colonel Neil A. Smart
Rock Island Corps of Engineers
Clock Tower Bldg., P.O. Box 2004
Rock Island, IL 61204-2004

Dear Colonel Smart:

Iowa Department of Natural Resources staff reviewed the June 1987 Draft General Design Memorandum (GDM) for the Des Moines Recreational River and Greenbelt. We concur with the GDM's content and specifically with your proposed recommendation in Section 7 on page 172. However, following are three points of clarification.

1. Public Law 99-88 states that the Secretary of the Army has the authority to prohibit or limit the killing, wounding, or capturing at any time of any wild bird or animal in areas as directed by the Secretary. The Iowa DNR is the primary agency responsible for managing fish and wildlife resources in Iowa and it will not relinquish that responsibility. In accord with Colonel William C. Burn's September 16, 1985 letter to Douglas Gross, Office of the Governor, I expect your office will coordinate fish and wildlife management plans with the Iowa DNR for those lands under Federal ownership in the same manner as we have for the reservoir project lands at Lake Red Rock and Saylorville Lake. Our cooperative efforts on these two project areas are successful. The Iowa DNR will continue to manage and regulate fish and wildlife resources in the Greenbelt project area per our statewide responsibilities for these resources.

2. State and local entities that participate in cost-sharing land acquisition should hold title on existing land and on all land purchased for purposes of developing the Des Moines Recreational River and Greenbelt.

3. Local cooperation agreements must recognize the logistics involved in cooperating agencies receiving appropriated funds in a timely, coordinated manner for unified fiscal years. This of course will be a factor only if the current policy of the Corps of Engineers requiring cost-sharing remains applicable to the Des Moines Recreational River and Greenbelt.

Thank you for the opportunity to provide comments to you on the Des Moines River Greenbelt GDM.

Sincerely,

LARRY J. WILSON, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145

1. We will continue to coordinate fish and wildlife management with the IDNR.

2. Noted.

3. Noted.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF ECONOMIC DEVELOPMENT
ALLAN T. THOMS, DIRECTOR

September 23, 1987

District Engineer
U.S. Army Engineer District, Rock Island
Attn: Planning Division
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Re: IA880810-043

Dear Sir:

The Iowa State Clearinghouse has performed the required review of the draft General Design Memorandum and Environmental Impact Statement for the Des Moines Greenbelt project in accordance with the Iowa Intergovernmental Review System.

The review:

-- did not generate any comment from those who examined the file.

-- found no serious environmental problems which may result from the project or program.

-- indicated that the proposal conforms to pertinent planning in this area.

-- did not show that the proposal would result in duplicating any existing activity or project.

The Clearinghouse is pleased to recommend that the application be approved for funding. A copy of this letter must be sent to the federal agency as evidence that the review has been performed.

Sincerely,

A. Thomas Wallace
Federal Funds Coordinator

ATW/ml

1. Noted

200 EAST GRAND / DES MOINES, IOWA 50309 / 515-281-3251 / TELEX 478-466

United States Department of the Interior

FISH AND WILDLIFE SERVICE

ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:

COM: (309) 793-5800
FTS: 386-5800

September 15, 1987

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

This constitutes our final Fish and Wildlife Coordination Act Report for your General Design Memorandum (GDM) and Programmatic Environmental Impact Statement (PEIS) on the Des Moines Recreational River and Greenbelt authorized by Public Law 99-88. It has been prepared under the authority of, and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 USC 661 et seq.); the National Environmental Policy Act (NEPA) of 1969, as amended; the Endangered Species Act of 1973, as amended; and in accordance with the Fish and Wildlife Service's Mitigation Policy.

Information for this report was gathered from a literature search, including the Draft Plan for Engineering and Design, various reports on the Des Moines River basin, the Iowa Department of Natural Resources (IDNR), information provided by your staff and site visits. Our draft report was coordinated with the IDNR.

Background

Public Law 99-88, signed in August, 1985, provided for the designation of a 35,000 acre greenbelt area along 139 miles of the Des Moines River between Fort Dodge and State highway 92 below Red Rock Dam. Officially known as the Des Moines Recreational River and Greenbelt (Greenbelt), the project has been expanded to include corridors along the Boone River from Webster City to its confluence with the Des Moines, and the Raccoon River from Interstate 35 to its confluence with the Des Moines. Passage of the Water Resources Development Act of 1986 established the official Greenbelt boundary, which encompasses about 334,000 acres.

The Greenbelt project is to be administered by the Rock Island District, U.S. Army Corps of Engineers (Corps), in conjunction with an advisory committee composed of State, county and municipal members as provided by the enabling legislation. The Greenbelt area includes Corps projects at Saylorville Lake and Lake Red Rock, as well as State Parks, Forests and Recreation areas administered by the IDNR, parks administered by County Conservation Boards (CCB's) and municipalities.

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
230 S. Dearborn Street, Room 3422
CHICAGO, ILLINOIS 60604

ER-87/985

September 16, 1987

Colonel Neil A. Smart
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

The Department of the Interior has reviewed the Draft General Design Memorandum and Draft Programmatic Environmental Impact Statement for the Des Moines Recreational River and Greenbelt, Des Moines River, Iowa. The following consolidated comments are provided for your consideration during future project planning phases.

There are numerous Land and Water Conservation Fund (Conservation Fund) assisted areas within the proposed Greenbelt area. Since the primary purpose of the Greenbelt is to provide open space and recreation, its development generally would serve to enhance any existing recreation opportunities. However, any use of Conservation Fund assisted land for other than public outdoor recreation would constitute a conversion and require compliance with Section 6(f)(3) of the Conservation Fund Act of 1965, as amended. Section 6(f)(3) states: "No property acquired or developed with assistance under this section shall, without the approval of the Secretary (of the Interior), be converted to other than public outdoor recreation uses." The following projects are within the Greenbelt area:

Webster County
19-00458, Sun Kissed Meadows
19-00426, Carlson Recreation Area
19-00574, Carlson Recreation Area
19-00964, Boone Forks Wildlife Management Area

Mahaska County
19-00907, Eveland Access

Marion County
19-00092, Roberts Creek Area
19-00326, Roberts Creek Area

Boone County
19-01049, Ledges State Park

Polk County
19-00878, Yellow Banks Park
19-00581, Des Moines Riverfront Park
19-00412, East Riverside Bikeway

Hamilton County
19-00052, Briggs Woods Park
19-00145, Briggs Woods Park Golfcourse
19-00769, Tunnel Mill Acquisition
19-00964, Boone Forks Wildlife Management Area

1. There are no plans to convert Conservation Fund lands to other uses.

Today, native prairies are represented by a few small remnants, the balance having succumbed to the expansion of intensive row crop agriculture. Restored prairies have been established on Corps project land and IDNR parks.

The primary forest types consist of one bottomland and two upland associations. Bottomland forests are mixed with cottonwood, silver maple, boxelder or willow dominating. More detailed descriptions are available in reports published for various studies on streambank erosion, and the project documents for Red Rock and Saylorville Lakes. Most of these forests have been disturbed by harvest and clearing for agriculture and grazing.

Upland forests consist of oak-hickory associations or maple-basswood communities. Oak-hickory communities are the more common in the river basin, occurring mostly on dry ridges and south or west-facing slopes. Maple-basswood associations occur primarily on mesic north slopes in the basin. The latter type is not abundant, but does occur more frequently in the southern parts of the study area. These forests, like the bottomland associations, have been extensively disturbed by cutting, grazing and agriculture.

C. Wildlife Resources

The combination of rivers, streams and adjacent forest in the Greenbelt Corridor provides excellent wildlife habitat. The diversity and value are highest where the forest land is interspersed with cropland, pastureland or other open areas. Most wildlife species remaining in the basin utilize more than one cover type, and the corridor has a high degree of cover type interspersion, particularly in comparison to areas outside the study area. Thus, the highest concentrations of most wildlife species occur within the Greenbelt corridor, rather than in adjacent habitat.

Wildlife populations and number of species have changed dramatically as habitat changes have occurred. The northern portion of the Greenbelt, once tallgrass prairie interspersed with wetlands, was originally part of the mid-continent "duck factory". Drainage and conversion to cropland have virtually eliminated waterfowl reproduction, while improving conditions for pheasant and gray partridge. The southern portion of the project area was largely forested bottomland with tall grass prairie uplands. The bison, elk and prairie chicken common in early settlement have been replaced by whitetail deer and bobwhite quail as forest clearing, grazing and cultivation altered the habitat.

Game species which are most common are pheasant, gray partridge, bobwhite quail, cottontail rabbit, fox squirrel, fox, waterfowl, whitetail deer, eastern wild turkey, and raccoon. Other species which provide hunting include coyote, crow, jackrabbit, and groundhog.

Populations of eastern wild turkeys in the Greenbelt corridor, as well as elsewhere in Iowa, are the result of reintroduction efforts begun in the 1960's. In the past two years, the IDNR has begun reintroductions of the

loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified or eliminated over time can be compensated by replacement with the same kind of habitat so that the total or net loss is zero.

Resource Category 3 - Habitat is of high to medium value and is relatively abundant in the nation. Goal - no net loss of habitat value while minimizing loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified, eliminated over time or compensated by in-kind replacement can be compensated by replacement with other habitat types so that the total or net loss is zero.

Resource Category 4 - Habitat is of medium to low quality. Goal - minimize loss of habitat value. Guideline - the Service will make recommendations to avoid, minimize, rectify or eliminate losses over time depending on the significance of the potential loss. Such areas are good candidates for mitigation of Resource Category 2 and 3 losses by management or enhancement to increase their habitat value.

B. Assignment of Resource Categories

The habitats at the proposed project sites in the Des Moines Recreational River and Greenbelt vary considerably in their value to fish and wildlife. The general types and qualities of habitats likely to be affected have been described previously in this report. Based on the foregoing discussion of resources, we have placed the habitats of the greenbelt projects into the following resource categories.

Habitat	Resource Category
Mowed tame grass (Parkland)	4
Agricultural field	4
Gravel pit	4
Riverine	3
Lacustrine	3
Bottomland forest	3
Upland forest	3
Restored prairie	3
Emergent wetlands	2

According to our policy, mitigation of project impacts consists of avoiding or minimizing losses, rectifying, reducing or eliminating them over time, and compensating the loss by creating habitat or enhancing similar habitat to replace the lost value. Generally, mitigation should be pursued in that order.

Today, native prairies are represented by a few small remnants, the balance having succumbed to the expansion of intensive row crop agriculture. Restored prairies have been established on Corps project land and IDNR parks.

The primary forest types consist of one bottomland and two upland associations. Bottomland forests are mixed with cottonwood, silver maple, boxelder or willow dominating. More detailed descriptions are available in reports published for various studies on streambank erosion, and the project documents for Red Rock and Saylorville Lakes. Most of these forests have been disturbed by harvest and clearing for agriculture and grazing.

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proposed to be listed, which may be present in the area of a proposed action. Therefore, we are furnishing the following list of species which may be present in the concerned area:

Classification	Common Name	Scientific Name	Habitat
Endangered	Bald Eagle	Haliaeetus leucocephalus	Breeding Wintering
Endangered	Indiana Bat	Myotis sodalis	Caves and Riparian Habitat

There are no currently designated critical habitats in the project area.

In accordance with the Section 7(c) of the ESA, the Federal agency responsible for actions authorized, funded, or carried out in furtherance of a construction project that significantly affects the quality of the human environment is required to conduct a biological assessment. The purpose of the assessment is to identify listed or proposed species likely to be adversely affected by its action and to assist in making a decision as to whether consultation with the FWS should be initiated.

Bald eagles winter along large rivers, feed over open water and roost in wooded ravines some distance away from their feeding areas. The tailwaters at both Saylorville and Red Rock Lakes meet both of these requirements and there are unpublished reports of more winter eagle activity than would be expected from casual migrants. Indiana bats are documented in both Marion and Jasper counties. They are summer residents in riparian habitat utilizing large (>16" dbh) trees with exfoliating bark for nursery colonies. For purposes of assessment, if construction involves tree removal, both species should be considered. For any proposed winter construction, impacts to the bald eagle should be considered.

Analysis of Impacts

There have been 150 individual projects proposed as part of the Greenbelt project. Through the study process, many projects have been eliminated from further study because they were combined with other projects, were cancelled by the sponsor or had no local sponsor, or were funded under other authority. We anticipate this process to be dynamic as additional projects are proposed or modified and others combined or eliminated.

The remaining 102 project proposals recommended for further study are mostly for recreational development, with the remainder for environmental enhancement and streambank stabilization. These projects range from repair, replacement, or expansion of park facilities to construction of boat ramps, from wildlife plantings to large land aquisitions, and from riprapping streambanks to providing buffer strips along streams. The variety of projects and wide range of ecological conditions in the Greenbelt preclude a detailed impact assessment of the project proposals.

environment. These impacts, however, will likely be minor and involve only temporary water quality problems. Riprap or other stabilizing measures in the vicinity of construction will have some benefits in providing habitat diversity.

We anticipate more detrimental impacts to wildlife resources from the development of access roads, trails and parking lots near the river access facilities. The habitat lost in many cases will be bottomland timber or wetland. These facilities should be sited where impacts to forests, wetland, or other wildlife habitats will be least damaging.

Several proposed projects involve the reclamation and development of gravel pits into recreational lakes with associated sports facilities. We do not anticipate adverse impacts from these developments because the gravel pit areas are highly disturbed, and have little habitat suitable for wildlife.

3. Streambank Stabilization

In general, streambank stabilization projects are a mixed bag of adverse impacts and benefits to both fish and wildlife resources. Stabilization of streambanks on an as needed basis may at times increase existing aquatic habitat diversity, but large scale riprapping is discouraged. Preparing the bank for stabilization often involves excavation, reshaping slopes and loss of riparian habitat which adversely affects wildlife. A number of alternatives to standard bank stabilization, such as Palmiter River Restoration Techniques, may have some potential for application at specific sites and should be considered in developing the detailed plans. As long as the proposed features do not involve channel dredging or relocation, we have no objections to bank stabilization. However, we encourage exploration of alternatives to large-scale riprapping proposals.

4. Environmental Enhancement

Proposed enhancement projects range from aquisition of land and developing wildlife observation stations to extensive plantings or redevelopment of forest and prairie. These projects are beneficial to fish and wildlife, and aquisition either in fee title or conservation easements could provide protection to the entire corridor. By definition, these enhancement features should require no mitigation measures.

While we would encourage enhancement projects purely on their own merits, we are aware of the realities of funding these projects. Two recent legislative acts, the Water Resources Development Act of 1986 and the Food Security Act of 1985 (1985 Farm Bill), have provisions which could be highly beneficial in enhancing and protecting the greenbelt. Briefly, Section 906 of the 1986 Water Resources Development Act establishes criteria for cost sharing enhancement projects. Thus, any enhancement projects benefiting endangered species or species listed under international treaties such as the Migratory Bird Treaty may be eligible for 100% Federal funding. Title XIII of the 1985 Farm Bill (Sections 1314 and 1318) provides mechanisms for protecting valuable fish and wildlife resources on Farmers Home Administration (FmHA) inventory lands and FmHA financed lands. Potential actions on surplus lands include title transfer to units of State or local government, or protection

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The remaining 102 project proposals recommended for further study are mostly for recreational development, with the remainder for environmental enhancement and streambank stabilization. These projects range from repair, replacement, or expansion of park facilities to construction of boat ramps, from wildlife plantings to large land aquisitions, and from riprapping streambanks to providing buffer strips along streams. The variety of projects and wide range of ecological conditions in the Greenbelt preclude a detailed impact assessment of the project proposals.

loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified or eliminated over time can be compensated by replacement with the same kind of habitat so that the total or net loss is zero.

Resource Category 3 - Habitat is of high to medium value and is relatively abundant in the nation. Goal - no net loss of habitat value while minimizing loss of in-kind habitat value. Guideline - losses that cannot be otherwise avoided, minimized, rectified, eliminated over time or compensated by in-kind replacement can be compensated by replacement with other habitat types so that the total or net loss is zero.

Resource Category 4 - Habitat is of medium to low quality. Goal - minimize loss of habitat value. Guideline - the Service will make recommendations to avoid, minimize, rectify or eliminate losses over time depending on the significance of the potential loss. Such areas are good candidates for mitigation of Resource Category 2 and 3 losses by management or enhancement to increase their habitat value.

B. Assignment of Resource Categories

The habitats at the proposed project sites in the Des Moines Recreational River and Greenbelt vary considerably in their value to fish and wildlife. The general types and qualities of habitats likely to be affected have been described previously in this report. Based on the foregoing discussion of resources, we have placed the habitats of the greenbelt projects into the following resource categories.

Habitat	Resource Category
Mowed tame grass (Parkland)	4
Agricultural field	4
Gravel pit	4
Riverine	3
Lacustrine	3
Bottomland forest	3
Upland forest	3
Restored prairie	3
Emergent wetlands	2

According to our policy, mitigation of project impacts consists of avoiding or minimizing losses, rectifying, reducing or eliminating them over time, and compensating the loss by creating habitat or enhancing similar habitat to replace the lost value. Generally, mitigation should be pursued in that order.

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
230 S. Dearborn Street, Room 3422
CHICAGO, ILLINOIS 60604

ER-87/985

September 16, 1987

Colonel Neil A. Smart
District Engineer
Rock Island District, Corps of Engineers
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

The Department of the Interior has reviewed the Draft General Design Memorandum and Draft Programmatic Environmental Impact Statement for the Des Moines Recreational River and Greenbelt, Des Moines River, Iowa. The following consolidated comments are provided for your consideration during future project planning phases.

There are numerous Land and Water Conservation Fund (Conservation Fund) assisted areas within the proposed Greenbelt area. Since the primary purpose of the Greenbelt is to provide open space and recreation, its development generally would serve to enhance any existing recreation opportunities. However, any use of Conservation Fund assisted land for other than public outdoor recreation would constitute a conversion and require compliance with Section 6(f)(3) of the Conservation Fund Act of 1965, as amended. Section 6(f)(3) states: "No property acquired or developed with assistance under this section shall, without the approval of the Secretary (of the Interior), be converted to other than public outdoor recreation uses." The following projects are within the Greenbelt area:

Webster County
19-00458, Sun Kissed Meadows
19-00426, Carlson Recreation Area
19-00574, Carlson Recreation Area
19-00964, Boone Forks Wildlife Management Area

Mahaska County
19-00907, Eveland Access

Marion County
19-00092, Roberts Creek Area
19-00326, Roberts Creek Area

Boone County
19-01049, Ledges State Park

Polk County
19-00878, Yellow Banks Park
19-00581, Des Moines Riverfront Park
19-00412, East Riverside Bikeway

Hamilton County
19-00052, Briggs Woods Park
19-00145, Briggs Woods Park Golfcourse
19-00769, Tunnel Mill Acquisition
19-00964, Boone Forks Wildlife Management Area

1. There are no plans to convert Conservation Fund lands to other uses.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
ROCK ISLAND FIELD OFFICE (ES)
1830 Second Avenue, Second Floor
Rock Island, Illinois 61201

IN REPLY REFER TO:

COM: (309) 793-5800
FTS: 386-5800

September 15, 1987

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

This constitutes our final Fish and Wildlife Coordination Act Report for your General Design Memorandum (GDM) and Programmatic Environmental Impact Statement (PEIS) on the Des Moines Recreational River and Greenbelt authorized by Public Law 99-88. It has been prepared under the authority of, and in accordance with provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 USC 661 et seq.); the National Environmental Policy Act (NEPA) of 1969, as amended; the Endangered Species Act of 1973, as amended; and in accordance with the Fish and Wildlife Service's Mitigation Policy.

Information for this report was gathered from a literature search, including the Draft Plan for Engineering and Design, various reports on the Des Moines River basin, the Iowa Department of Natural Resources (IDNR), information provided by your staff and site visits. Our draft report was coordinated with the IDNR.

Background

Public Law 99-88, signed in August, 1985, provided for the designation of a 35,000 acre greenbelt area along 139 miles of the Des Moines River between Fort Dodge and State highway 92 below Red Rock Dam. Officially known as the Des Moines Recreational River and Greenbelt (Greenbelt), the project has been expanded to include corridors along the Boone River from Webster City to its confluence with the Des Moines, and the Raccoon River from Interstate 35 to its confluence with the Des Moines. Passage of the Water Resources Development Act of 1986 established the official Greenbelt boundary, which encompasses about 334,000 acres.

The Greenbelt project is to be administered by the Rock Island District, U.S. Army Corps of Engineers (Corps), in conjunction with an advisory committee composed of State, county and municipal members as provided by the enabling legislation. The Greenbelt area includes Corps projects at Saylorville Lake and Lake Red Rock, as well as State Parks, Forests and Recreation areas administered by the IDNR, parks administered by County Conservation Boards (CCB's) and municipalities.

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF ECONOMIC DEVELOPMENT
ALLAN T. THOMS, DIRECTOR

September 23, 1987

District Engineer
U.S. Army Engineer District, Rock Island
Attn: Planning Division
Clock Tower Building
P.O. Box 2004
Rock Island, Illinois 61204-2004

Re: IA880810-043

Dear Sir:

The Iowa State Clearinghouse has performed the required review of the draft General Design Memorandum and Environmental Impact Statement for the Des Moines Greenbelt project in accordance with the Iowa Intergovernmental Review System.

The review:

-- did not generate any comment from those who examined the file.

-- found no serious environmental problems which may result from the project or program.

-- indicated that the proposal conforms to pertinent planning in this area.

-- did not show that the proposal would result in duplicating any existing activity or project.

The Clearinghouse is pleased to recommend that the application be approved for funding. A copy of this letter must be sent to the federal agency as evidence that the review has been performed.

Sincerely,

A. Thomas Wallace
Federal Funds Coordinator

ATW/ml

1. Noted

200 EAST GRAND / DES MOINES, IOWA 50309 / 515-281-3251 / TELEX 478-466

STATE OF IOWA

TERRY E. BRANSTAD, GOVERNOR

DEPARTMENT OF NATURAL RESOURCES
LARRY J. WILSON, DIRECTOR

September 14, 1987

Colonel Neil A. Smart
Rock Island Corps of Engineers
Clock Tower Bldg., P.O. Box 2004
Rock Island, IL 61204-2004

Dear Colonel Smart:

Iowa Department of Natural Resources staff reviewed the June 1987 Draft General Design Memorandum (GDM) for the Des Moines Recreational River and Greenbelt. We concur with the GDM's content and specifically with your proposed recommendation in Section 7 on page 172. However, following are three points of clarification.

1. Public Law 99-88 states that the Secretary of the Army has the authority to prohibit or limit the killing, wounding, or capturing at any time of any wild bird or animal in areas as directed by the Secretary. The Iowa DNR is the primary agency responsible for managing fish and wildlife resources in Iowa and it will not relinquish that responsibility. In accord with Colonel William C. Burn's September 16, 1985 letter to Douglas Gross, Office of the Governor, I expect your office will coordinate fish and wildlife management plans with the Iowa DNR for those lands under Federal ownership in the same manner as we have for the reservoir project lands at Lake Red Rock and Saylorville Lake. Our cooperative efforts on these two project areas are successful. The Iowa DNR will continue to manage and regulate fish and wildlife resources in the Greenbelt project area per our statewide responsibilities for these resources.

2. State and local entities that participate in cost-sharing land acquisition should hold title on existing land and on all land purchased for purposes of developing the Des Moines Recreational River and Greenbelt.

3. Local cooperation agreements must recognize the logistics involved in cooperating agencies receiving appropriated funds in a timely, coordinated manner for unified fiscal years. This of course will be a factor only if the current policy of the Corps of Engineers requiring cost-sharing remains applicable to the Des Moines Recreational River and Greenbelt.

Thank you for the opportunity to provide comments to you on the Des Moines River Greenbelt GDM.

Sincerely,

LARRY J. WILSON, DIRECTOR
DEPARTMENT OF NATURAL RESOURCES

WALLACE STATE OFFICE BUILDING / DES MOINES, IOWA 50319 / 515-281-5145

1. We will continue to coordinate fish and wildlife management with the IDNR.

2. Noted.

3. Noted.

7. COMMENT: The Boone and Scenic Valley Railroad will be aggravated further to the point where we probably will lose a part of our trackage between Des Moines River bridge & the Fraser crossing.

RESPONSE: THe Boone and Scenic Valley Railroad is a privately owned facility and is not eligible for cost-shared projects.

8. COMMENT: The Iowa Chapter of the Sierra Club applauds the Advisory Committee and the Corps of Engineers for progress to date, and we look forward to commenting on specific project plans.

RESPONSE: Noted.

9. COMMENT: I have a hard time believing you are going to have this bike trail going down the river and around somebody's farm.

RESPONSE: Noted.

10. COMMENT: How will this benefit wildlife and the forest with all these trails running through there?

RESPONSE: The purpose of trail construction is to enhance recreational opportunities by providing access to natural and scenic areas, and serve as a connection between the elements of the Greenbelt. Design of trails will include an assessment of potential impacts to natural vegetation and fish and wildlife in order to avoid or minimize adverse impacts. In general, trails have few direct impacts to the value of wildlife habitat.

11. COMMENT: How much land will be left wild and how much is going to be open to public hunting?

RESPONSE: At the present time, there are no large-scale plans to change lands from a wild state, and no restrictions have been imposed under the Greenbelt authority.

12. COMMENT: How much bank stabilization is desired and how is it accomplished?

RESPONSE: There have been relatively few streambank stabilization projects proposed by the Advisory Committee. Banks are typically stabilized using riprap stone.

Iowa so one knows that the natural area is one for the taking of animals. There should be a brochure of the whole Greenbelt showing where hunting is allowed.

We in the Sierra Club are not against hunting or the taking of animals. We clearly understand that when there are game species and no natural predators, there will be a need to harvest these animals so that habitat and food supplies are not overstressed. However, we believe that people engaged in recreation other than hunting should be able to enjoy their time in the country without the sounds of firearms or concerns of being injured by flying bullets, pellets, or arrows.

13. Noted.

20. COMMENT: A suggestion would be that the Corps of Engineers get some advice from bicyclists before building future trails.

RESPONSE: Noted.

21. COMMENT: In the Boone River area, are there any areas set aside for non-game wildlife management?

RESPONSE: At the present time, there are no specific non-game wildlife projects for the Boone River. However, as outlined in the Iowa Department of Natural Resources' Boone River Protected Water Area Management Plan, "timber management aimed at promoting the oak-hickory association and maintaining it in different successional stages in close proximity by small clear cuts will benefit most forest wildlife."

22. COMMENT: I have a hard time understanding how showers and electricity at campsites fit into a wilderness project.

RESPONSE: The overall concept of the Greenbelt is to coordinate existing and future Federal, State and local recreation and environmental enhancement projects. The level of development of a recreation area is determined by the implementing agency based upon projected usership.

23. COMMENT: How can the Greenbelt be called primarily recreation?

RESPONSE: The project was authorized for the development, operation and maintenance of a recreation and greenbelt area along the Des Moines River. Approximately 75-percent of the projects proposed by the Advisory Committee are for recreation.

24. COMMENT: Who will administer fish and game regulations?

RESPONSE: The Iowa Department of Natural Resources will administer fish and game regulations. In a letter dated September 14, 1987, they indicated that they would continue to manage and regulate fish and wildlife resources in the Greenbelt in accordance with their state-wide responsibilities.

25. COMMENT: Is the Conservation Commission trying to get control of taking a count of game animals so that they can advise and decide if it is right to hunt or not?

RESPONSE: The 1986 State Comprehensive Outdoor Recreation Plan notes that continued collection of population data on wildlife species is required by law. This provides the information base for making management and regulation decisions.

know when the campground ended and the hunting area began. I saw no signs at campgrounds giving this information. The person in charge of the recreational area would decide how much area would be considered a buffer. Like the DNR, this decision would depend on the lay of the land, fences, gullies, roads, etc., in signing for hunting or not hunting.

The Corps has brochures about hunting areas near the lake available at their information centers. I know that the DNR also has brochures indicating hunting areas, but I have not seen one at the Brushy Creek Recreational Area, for example, where hunting, camping,, hiking, etc., all go on at the same time. There is no sign at the entrance of Brushy Creek stating that hunting goes on in that area.

We would like the Corps of Engineers to set a policy to establish the number of yards of buffer land that would surround all recreational facilities inside the Greenbelt. This buffer would exist to protect users of these facilities from hearing firearm noises and having concern about the danger of being injured by firearms, bows/arrows, or animal traps. We would like these buffers to be managed for non-game species and have no taking of animals whatever. We would like these buffers to be about 1,000 yards wide. We do not consider this to be an unreasonable request, as one of the original parts of the law stated: "(5) the prohibition or limitation by the Secretary of the killing, wounding, or capturing at any time of any wild bird or animal in such areas as may be directed by the Secretary."

In looking at the material in the General Design Memorandum (GDM), we think that we can afford these generous buffers of land around recreational areas. Table 16, page 67, shows that there will be a demand for hunting in 1995 that can be satisfied with 36,628 acres of land. Table 10, page 59, summarizes the recreational facilities that are now available in the Greenbelt area; and at this date, there are 80,704 acres used for hunting. In addition, there are a number of Greenbelt projects proposed by the DNR that will add to this total acreage to be used for hunting. Therefore, we currently have more than enough land to meet the demand by 1995 and will gain more, so we can afford to keep the sound of the discharge of firearms and the threat of injury away from recreational areas in the Greenbelt.

11

5. See above response.

6. The determination of adequate buffer zones considers use of the facility, conditions of the landscape, type of hunting, location of nearby facilities and other factors. A 1,000-yard buffer zone would be inadequate in some areas and excessive in others. An arbitrary distance standard would not meet the needs and conditions of all recreation areas.

7. Acreage figures by type of hunting were not available at the time of the study, and it is not known whether existing acreage meets the projected demand for the various types of hunting. Lands proposed for acquisition could not be considered available for hunting until purchased as part of a Greenbelt project.

31. COMMENT: Where is all the money coming from for all the big improvements at Elk Rock State Park?

RESPONSE: Construction of new facilities at Elk Rock State Park would be cost-shared between the State of Iowa and the Corps of Engineers.

32. COMMENT: I don't think enough is being done for the farmers who have suffered with easement acres (at Lake Red Rock) that have been damaged over the years.

RESPONSE: Noted.

33. COMMENT: What about the siltation problem and the raising of the lake (at Lake Red Rock) level? Something needs to be done now.

RESPONES: The Advisory Committee has recommended that the conservation pool at Lake Red Rock be raised from elevation 728 feet NGVD to elevation 736 feet NGVD to accomodate sedimentation.

34. COMMENT: I oppose the Lake Red Rock pool raise.

RESPONSE: Noted.

35. COMMENT: What exactly is enhancement land?

RESPONSE: "Enhancement lands" is a term used to describe all non-governmental lands within the Greenbelt boundary

36. COMMENT: Is there a proposal to have user fees so that the people that take advantage of the projects, in effect, pay for them?

RESPONSE: The managing agency will be responsible for setting a fee schedule for their park facilities. Use fees are customary for certain types of facilities, such as campgrounds.