LINEAR PARK PROJECT

VOLUME NO. 2

LINEAR PARK PROJECT

ST. LOUIS COUNTY DEPARTMENT OF PARKS AND RECREATION
ST. LOUIS COUNTY, MISSOURI

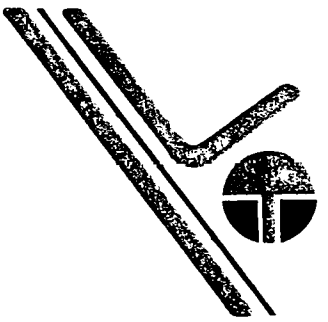
North: Coldwater Creek
Maline Creek

South: Deer Creek
Gravois Creek

VOLUME II: APPENDIX

A. PUBLIC PARTICIPATION AND DEMAND STUDY

B. WILDLIFE HABITAT VEGETATION APPENDIX



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VOLUME II - A

PUBLIC PARTICIPATION AND DEMAND COMPONENTS LINEAR PARK PROJECT

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INTRODUCTION:

The purpose of this report is to provide expanded information and more detailed discussion of the Public Participation and Demand components of the Linear Park Project. Summarized versions of this report have been included with Volume I. This volume has been included as an Appendix.

The Linear Park Project represents a public development by a government agency. The St. Louis County Department of Parks and Recreation must, therefore, be responsive and answerable to the public and the individual citizen. This report deals with the two areas of project planning which are directly involved with this process:

PUBLIC PARTICIPATION

The public participation program was developed as an integral part of the planning process. The primary thrust from inception to plan evaluation has been to bring the public into a direct relationship with the planning process, acting as a constant thread modifying ideas and concepts, establishing goals, and making value judgments.

DEMAND

This is the technical appraisal of recreation needs, based on social and economic factors of the population.

PUBLIC PARTICIPATION

The historical, "elite" decision-making process has led to a great mistrust on the part of the general public to the role of planning. The results of this public attitude has been that many proposals end, unimplemented, "on the shelf".

The policy of government agencies to provide public hearings only after the decisions concerning resource commitment have been made is no longer acceptable to today's more informed citizen. The public today is demanding a new, broader role in the planning and preplanning process.

Public participation is a relatively new concept to planning in St. Louis County. Every attempt to broaden the base of involvement must be considered as venturing into new territory. Old realities of public apathy and mistrust cannot be breached with one project. Consequently, many of the mechanisms established for this project were experimental. They represent only the beginning of real public involvement and should be studied for their successes and failures. Occasional reactions of mistrust and skepticism were encountered, and it is partially with this climate in mind that any public participation program should be evaluated.

PROGRAM OBJECTIVES:

The public participation component of this project has been developed through the entire scope of the program. The primary purposes were threefold:

1. **Definition of Goals**

   The project staff sought a statement of public goals and objectives which could be defined by residents of each of the corridor areas.

2. **Evaluation**

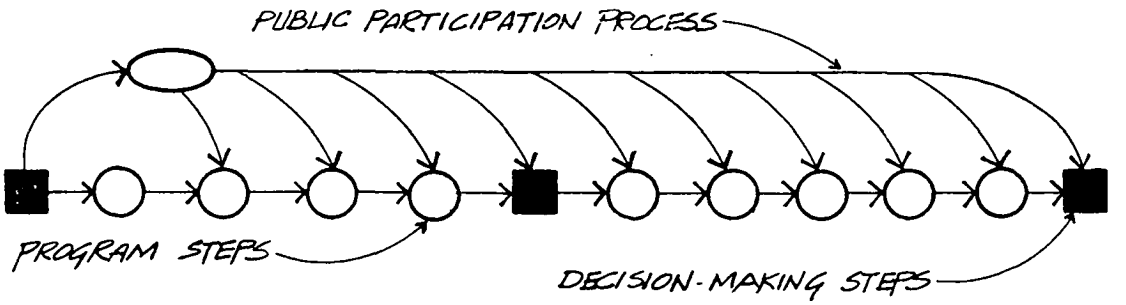
   In carrying out the mandate of the Bond Issue, selection of one creek north and one creek south will be made. Public involvement in the selection and a public understanding of the complex ingredients of the selection, was a vital part of the program.

3. **Decision Making**

   Intelligent decision making implies an informed public capable of unbiased conclusions. This has been a condition sought throughout the program resulting in an information exchange and a sharing of ideas. As much of the decision-making role as possible has been based within the public forum.

In order to carry out such a program, the public participation component needed to be, *first, comprehensive,* fully integrated throughout the program, to include as many viewpoints and ideas as possible, and to cover as broad an area within the corridor as possible. *Secondly,* the program needed to be *focused;* that is, it needed to deal specifically with goals and objectives, question public policy decisions, and establish value judgments.

With this criteria in mind, the public participation program was designated as Phase II of the overall study, with each of the purposes staged throughout the program, and mechanisms provided to allow for the free flow of information.



The specific objectives of Phase II were enumerated as:

1. To increase public understanding of the linear park and open space concept.
2. To convey to the public the fragile nature of the stream environments and the necessity of maintaining them.
3. To solicit public input for the purposes of determining goals and development alternatives.
4. To gain valuable, unpublished information about the creeks from people who live on and use them.
5. To make the design process open and the public's understanding of decision making more beneficial.
6. To avoid rumor and misunderstanding within the public sector.
7. To create a climate which will facilitate linear park and open space implementation.

COMPONENT MECHANISMS

In order to respond to the criteria and provide for the broadest possible base, the following mechanisms were utilized:

1. Linear Park Advisory Committee
2. Public Workshops
3. Inventory Collection
4. Information Questionnaire
5. Public Presentations
6. Evaluation

Before discussing each of these mechanisms in detail, a couple of less formal but definite project techniques should be discussed:

First/Use of Iconic Models: Iconic models are graphic interpretations of symbolic data. The most common form are maps, architects' drawings, graphs, etc. The use of Iconic models offer an important characteristic to the program, their ease of public understanding. Graphic display was given priority over statistical display for all public involvement procedures. Through this process for example, tables of water quality data were simplified into maps indicating stream pollution constituents. Although not as analytical or precise, this technique created a much better public understanding of data sources.

Socond/Project Categories: From the initial stages of the project, five broad categories were used to define and place all information about the project. This technique provided for an ease of public discussion, designation of concerns, and identification of program overlaps. The five project categories exhibited the potential to receive and catagorize all information about the creeks:

1. *Environmental Awareness* — The creek's eco-system and inventory information physical, qualitative, and conceptual collected about the creek.
2. *Recreation* — The concepts of recreational use and demand relative to a Linear Park Development.
3. *Stormwater Control* — The overlapping benefits and focus on problems and potential shared solutions to flooding and erosion problems.
4. *Water Quality* — Aspects of water quality as they impact a park-related project.
5. *Implementation* – The broad range of public policy with regard to project acquisition, development, property rights, and maintenance.

As an aid to assist in the dissemination of information about the creeks, a pamphlet was designed which outlined the broad concepts, background, and historical precedents for Linear Park developments and provided information about each of the creeks divided into these five project categories. The pamphlet proved invaluable throughout the course of the program.

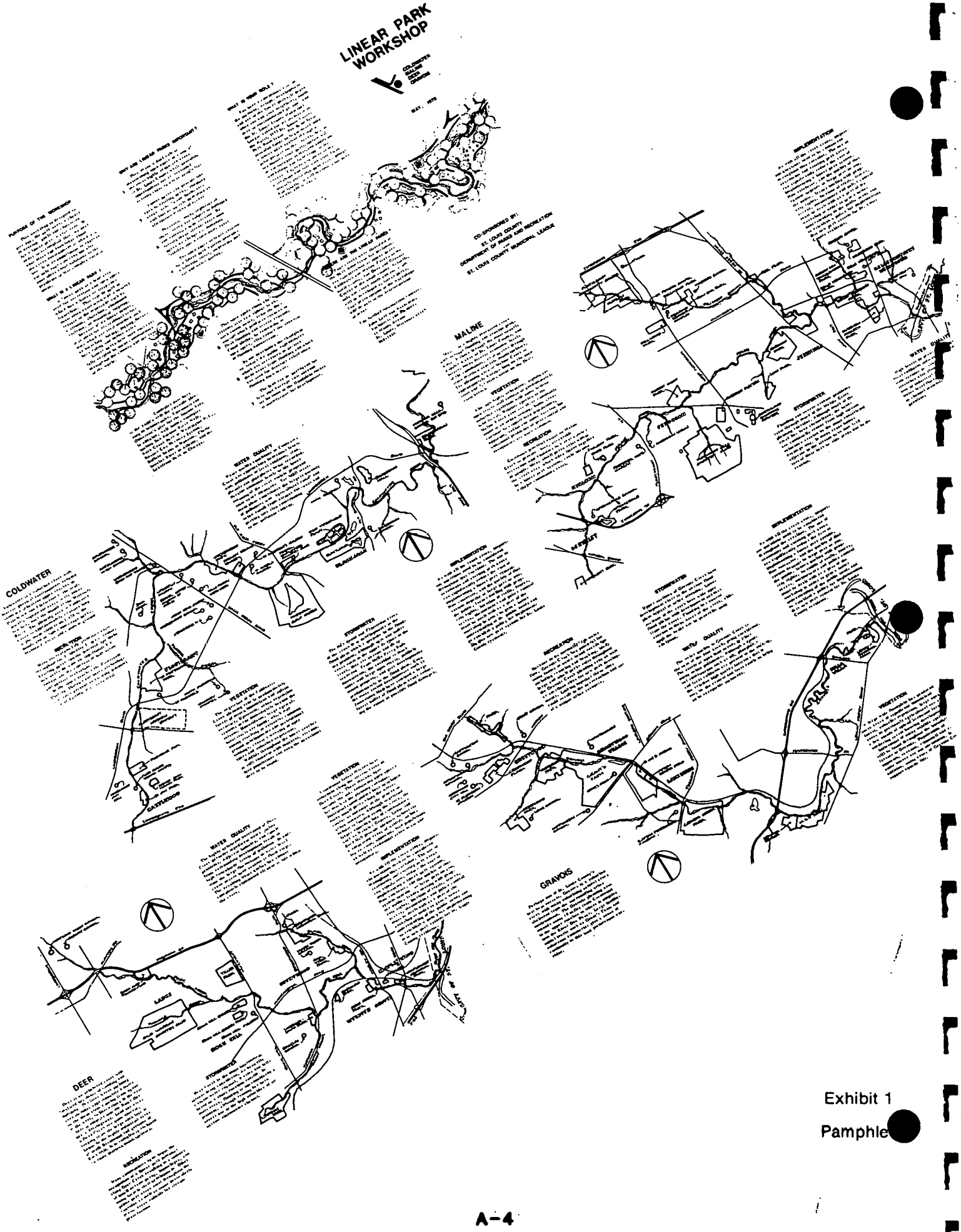


Exhibit 1

Pamphlet

LINEAR PARK ADVISORY COMMITTEE

There are many diverse interests involved in the planning and decision making affecting the four creeks identified under the Linear Park Project. A complex set of overlapping juristictions, a variety of proposed uses, and numerous levels of Federal, State, local, and private interest groups combine to challenge a co-ordinated planning effort.

In order to coalesce the interests associated with the creeks, the formation of a Linear Park Advisory Committee was approved by the Department. The role of the Committee was continuous, providing a mechanism for objective input, and to act as a broadly based decision-making body. The Committee was encouraged to assume this decision-making role, and offer criticism and comment through regular monthly meetings.

Of particular interest has been the role of the St. Louis County Municipal League. The League was an original co-sponsor of the Bond Issue proposal, and their ongoing involvement has been one of the most valuable assets of the project. The League was asked to provide a liaison representative for each of the creeks. This liaison, as well as the League's own staff, created a strong link with the municipalities (36 totally) and their ideas and concepts in developing the program.

The Advisory Committee is composed of twenty individuals representing agencies involved with the creek, as well as private organizations with an interest in the creeks or this specific project. The Advisory Committee includes:

- Marvin Brown
  Missouri Dept. of Conservation
- Kathy Brown
  East-West Gateway Co-ordinating Council
- Armand Brunet,
  Chief of Design and Planning
  St. Louis County Department of Parks & Recreation
- Jack Enger
  Metropolitan Sewer District
- Walter Eschbach
  Environmental Officer
  Dept. of Housing and Urban Development
- Charles Grimm
  Mayor, City of Ferguson
- Lyle Hollenbach
  U.S. Department of Interior
  Heritage Conservation & Recreation Service
- Wesley W. Horner
  Open Space Council
- Kenneth Johnson
  Sierra Club, Florissant
- Jean Magre
  St. Louis County, Department of Planning
- Mr. Roy Mathieson
  U.S. Army Corps of Engineers
- Donald P. Moschenross
  Executive Director
  St. Louis County Municipal League
- Anne Odell
  St. Louis County
  Department of Planning
- Douglas W. Palmer
  Mayor, City of Hazelwood
- Steve Powell
  Missouri Department of Natural Resources
- Roger Pryor
  Coalition for the Environment
- Bruce Sabin, Director
  Parks and Recreation Department
  City of Crestwood
- Jack Sands
  Director of Environmental Services
  City of Webster Groves
- Nicholas J. Varrone
  Division of Site Development
  St. Louis County Department of Public Works
- Mrs. J. Russell Wilson
  League of Women Voters

An indication of the success of the Advisory Committee has been twofold. The Committee has met monthly with excellent attendance. In addition, it has grown since the original formation, with the addition of a representative from the Department of Interior, Heritage Conservation and Recreation Service, in Denver asking to participate, and the representative from the U.S. HUD Office also added.

Secondly, the Committee has assumed its role, and become a dynamic force in the planning process. The Committee regularly provides criticism, suggestions, and modifications in an open and free exchange of ideas. One of the Committee member's own comments is most revealing, "that the Committee will criticize its own criticism".

During the public workshops, approximately sixteen members of the Committee attended each of the four workshops. They conducted the discussion groups, and participated in all program activities.

In order to gain a first-hand feeling for each of the creeks, an Advisory Committee field trip to visit sites on four creeks was arranged by the Department. The field trips were conducted over two days, visiting approximately ten sites on each creek. From 22-24 persons participated in each of the field trips.

The Committee's criticism and interest have been invaluable assets throughout the program, and its continued high level of participation is expected through completion of the project.

PUBLIC WORKSHOPS

Two sets of public workshops were conducted. The first set held in May of 1978 had the following purposes:

1. General overview and dissemination of information to the public.
2. Development of goals and objectives for Linear Park development.
3. Public involvement in the planning process prior to design or plan formation.
4. Collection of information, public comment, and attitudes.

The organization of the first set of workshops included:

- General overview.
  Dissemination of information, map display, informational materials, and a slide/tape presentation dealing with the overall concept and detailed information on each of the four creeks.
- Discussion Groups.
  The attendants were divided into five subgroups or committees, each committee being assigned one or more discussion leaders from the Advisory Committee. Each discussion group dealt with a project category to identify problems and interests, answer questions, and derive goals.
- Overview Discussion and Review.
  The final program segment was devoted to a summarization of each of the subcommittee concepts, and integration of findings into a unified set of goal statements and objectives.

The first stage workshops were designed as preplanning workshops. No plans existed at this time, and specific design concepts were not presented. The workshops drew the following participants:

Coldwater	- 76
Maline	- 33
Deer	- 64
Gravois	- 60

Formats for the discussion groups were developed by the Advisory Committee as a guide to focus questions and stimulate dialogue but were not specifically followed. Instead, the public was encouraged to organize and focus discussion on priorities as they viewed them. The five discussion group topics included:

Outline of Advisory Committee Group Discussion topics for May workshops

ENVIRONMENTAL AWARENESS

I. Existing Environment
   a. Are alterations necessary or desirable?
   b. What opportunities do the existing environment present?

II. What type of environment is desired?
   a. Maintenance and enhancement of "natural" areas?
   b "Developed" Park areas?
   c Blending of development and natural environments?
   d What effect does use of shared easements have on the character of the environment?

III. Wildlife Habitat
   a. What relationship exists to the stream environment?
   b What types of wildlife exist? Can we enhance and protect the existing wildlife? Do we want to?
   c Does potential exist for introduction of new wildlife species? Is this desired? What effect will this have on pest control and other urban issues?

IV. Potential Park related uses of Vegetation and Wildlife Resources
   a. Wildflower Tours
   b. Birdwatching
   c. Nature Centers and natural habitat trails for educational use
   d. Fishing Ponds
   e. Forest Management
   f. Agriculture

RECREATION

I. How can existing recreational opportunities be enhanced or reinforced through Linear Park development?

II. What type of recreational opportunities are desired?
   a. Intensive recreational corridor with active recreational facilities provided internally?
   b. Passive corridor, available for relaxation, walking or biking.
   c. Linkage corridor for connection to recreational nodes, Cultural facilities, parks, etc.

III. Can benefits be developed for use of corridor as transportation to work?

IV. What type of activities are desired?
   a. Picnic grounds
   b. Bike and walking trails
   c. Horseback riding
   d. Water oriented recreation
   e. Playgrounds
   f. Motorbike trails
   f. Boating
   h. Historic Trails
   i. Cross-country skiing
   j. Exercise trails
   k. Field games
   l. Tennis courts

V. How can recreational opportunities be combined with county and municipal park areas?

WATER QUALITY

I. Existing Water Quality of the Streams
   a. Pollution Sources
      1) Dumping
      2) Industrial Waste
      3) Septic Tanks
   b. Sensory Effects
      1) Visual quality
      2) Olfactory quality

II. Effect of Water Quality on the Stream Environment
   a. Will people use the areas? Can they use them for body contact?
   b. Effect on water based recreation.
   c. Effect on aquatic habitat.

III. Does potential exist for improving water quality?
   a. Control of dumping sites.
   b. Filtering effect of greenbelt.
   c. Agency controls
   d. Municipal controls

IV. Can water quality improvement be adequately financed?
   a. Do people want it, will they pay for it?
   b. Federal assistance through 208 and BOR programs?
   c. State, County and Local investment?

STORMWATER CONTROL

I. What is the relationship between stormwater control and Linear Park Development?

II. What type of stormwater system is desired?
- a. Retention basins
- b. Dry reservoirs
- c. Maintenance of flood plain lands
- d. Natural channel
- e. Modified control channels with landscape development
- f. Concrete control channels

III. Can the system work and how can they be combined?
- a. Under what conditions should variations be made to the desired system?
- b. Are people willing to pay the price for adequate storm water control?
- c. Use of MSD easements and tie in to linear park development.

IV. Effects of flooding on Park development?
- a. Flooding conditions effecting trails, particularly at crossings and bridges.
- b. Flooding conditions at low land areas:
  - For possible recreational use
  - For wetland area control
  - Resultant ponding

IMPLEMENTATION

I. Property Acqusition/Easements
- a. Effects on the total project, extent of development, cost.
- b. Shared use of right-of-way easements held by other agencies.
- c. Subdivision Common Ground

II. Property Rights
- a. During acquisition and development stage.
  1) Method of acquisition/easement
  2) Condemnation
  3) Construction access
- b. Criteria for development at residential areas
  1) Connection/access
  2) Bordering trails or creeks
  3) Private recreation developments owned by subdivisions, etc.
- c. Liability/Responsibility
  1) Personal or Injury Liability
  2) Vandalism/Nuisance Conditions
  3) Fences

III. Maintenance/Operation
- a. Responsibility for upkeep, weedcutting, pest control, etc.
- b. Police Control
  1) Entry and exit to park area
  2) Tie in to non-County segments
  3) Control of Motorbikes
  4) Clean-up and dumping control

The development of a set of public goals derived from the public workshops was difficult, some recurring themes certainly were evident, while each creek and, indeed, each discussion group, also responded with their own unique set of objectives. In order to clearly define these areas, they have been separated into overall, recurring themes and into a single goal statement in each category with a set of objectives to achieve that goal:

OVERALL PROJECT GOALS:

- Utilize the Linear Park Project as a means of retaining existing flood plain properties.
- Place a high value on the remaining natural areas; identify and preserve them in their urban setting.
- Use the Linear Park Project as a catalyst to develope solutions to many of the creeks' problems; i.e., erosion, flooding, pollution and dumping.
- Develop the recreational potential of a linear park to maximize the potential for desirable recreational forms such as jogging and bicycling.
- Seek solutions to minimize or eliminate the intrusion of non-compatible uses of trail areas such as motorbikes.
- Develop priroity for passive forms of recreation, utilizing the linkage potential to connect centers of more active recreation.

GOALS SPECIFIC TO EACH CREEK

COLDWATER

ENVIRONMENTAL AWARENESS

GOAL: Preservation of natural areas identified within the corridor.

OBJECTIVES:

- Preservation of the area east of Highway 367 to the Missouri River.
- Limit human intrusion into sensitive areas.
- Preservation of areas where diverse wildlife habitat occurs.
- Value the educational benefits of the diverse physical environment.

RECREATION

GOAL: Maximize the potential for family-based recreation

OBJECTIVES:

- Develop trails with residential access.
- Connections to historic sites and points of interest.
- Provide a mix of paved "bike" trails and walking trails of a nature study character.
- Motorbikes are not compatible with trail useage for other purposes.

STORMWATER

GOAL: Work closely with MSD and municipalities toward stormwater solutions compatible with Linear Park development.

OBJECTIVES:

- Most stormwater problems occur in upper portions of corridor, Taylor and Dunn Road, Foxtree and Elm Grove along Fountain Creek. These areas need immediate stormwater solutions.
- Erosion problems in Florissant and Hazelcrest Apartments should be considered as they impact stream banks.
- Eliminate debris through better control of stream access.
- Natural bank solutions to problems are sought over concrete solutions.

WATER QUALITY

GOALS: Seek an aesthetically pleasing corridor which would support wildlife habitat and allow potential for body contact recreation.

OBJECTIVES:

- Improve effluent quality from the MSD treatment plant.
- Resolve non-point source problems, particularly agricultural sediment and airport surface runoff.
- Many flood plain areas remain undeveloped. Their retention would provide for storm water treatment, filtering of heavy nutrient load, and stormwater retention.
- Implementation of Linear Park would improve the water quality. Do not hold back park due to water quality.

IMPLEMENTATION

GOAL: Protect private residential property.

OBJECTIVES:

- Avoid the taking or use of private residential lots for park use.
- Adopt subdivision regulations which would promote park development.
- Separation or elimination of motor bike use.
- Protect property owners from liability or vandalism.
- Establish a fencing policy.

GOAL: Seek co-operation from municipalities

OBJECTIVES:

- Municipalities can provide security assistance in policing the corridor.
- Municipalities should co-operate in the joint use of public facilities.

MALINE

ENVIRONMENTAL AWARENESS:

GOAL: Maximize the value of the few remaining natural areas.

OBJECTIVES:

- Use the park as a nature study area by adjacent schools. The creek corridor should be retained as open space to protect the remaining wildlife habitat.
- Smaller pockets of heavy vegetation such as areas around Highway 367, near Endicott Park, north of Dellwood Community Center and Forest Avenue should be retained with minimal intrusion.
- Corps of Engineer plans should not be permitted to elimated existing natural areas.

RECREATION:

GOAL: Utilize the Linear Park as a linkage between numerous existing parks, cultural features and commercial areas.

OBJECTIVES:

- Many small parks occur, and the potential for trail-oriented recreation between them is great.
- No major park area exists from Forestwood to Endicott Park. This area is also in need of a swimming pool.
- Utilize the abandoned railroad right of way to expand trail potential and develop loops.
- Separate motor bike and go-cart traffic.
- Use of the Lambert approach area will require some form of noise buffer.

STORMWATER

GOAL: Work with Corps of Engineers toward resolution of stormwater problems compatible with park development.

OBJECTIVES:

- Preference for non-structural stormwater solutions.
- Resolve severe erosion problems before park development.
- Resolve erosion behind Dellwood Community Center and stormwater problems along Suburban Ave. in Kinloch.

WATER QUALITY:

GOAL: Water quality should be conducive to fishable, swimable watercourse.

OBJECTIVES:

- Enforce regulations on debris and dumping in the creek.
- Resolve erosion problems first; this will also aid in sediment control.
- Improve sewer systems and eliminate older septic tanks in Kinloch areas.

IMPLEMENTATION:

GOAL: Improve property values and neighborhood environment.

OBJECTIVES:

- Maline needs this project in order to improve a declining area.
- Many residents willing to donate eroding land if maintained and banks improved.
- Municipalities willing to co-operate in maintenance and security control.
- Retain the only remaining open space.

GOAL: Provide security for bordering residents and uses:

OBJECTIVES:

- Provide bridge crossings and lighting for use of corridor by children.
- Motor bikes incompatible.
- Most residents agreeable to trail development nearby.

DEER

ENVIRONMENTAL AWARENESS:

GOAL: Preserve the few small remaining natural areas within the corridor.

OBJECTIVES:

- Significant ecological areas occur within the corridor and are heavily used, such as wildflowers in Deer Creek Park, bird watching near the Tretolite plant, area adjacent to U.E. right of way upstream.
- Resolve rodent and mosquito problems.
- Construction material and miscellaneous dumping is a threat to the corridor quality.
- Retain few remaining open areas; stop continued industrial expansion.
- Utilize stream corridor as an educational resource for nearby schools.

RECREATION:

GOAL: Use the Linear Park and trail system to minimize the park deficit in this area.

OBJECTIVES:

- Develop better access into small parks scattered throughout corridor.
- Area is heavily used by bicyclists.
- Capitalize potential for bird watching and wildflower tours.
- Design for winter recreation overlap, particularly such activities as cross-country skiing and sledding.
- Tie into recreational activities planned in municipal parks.
- Potential for an urban lake development in Rock Hill Quarry.

STORMWATER:

GOALS: Retain any existing undeveloped flood plain areas.

OBJECTIVES:

- Flooding not generally considered a major problem.
- Preference for non-structural flood-control alternatives, but some structural measures may be necessary.
- Limited remaining floodplain areas may require removal of development in some crucial areas.
- Need for central stormwater control ordinance.

WATER QUALITY

GOALS: Establish an environmentally safe, aesthetically pleasing creek corridor capable of supporting aquatic life.

OBJECTIVES:

- Eliminate dumping along the creek, restrict access, tighten and enforce regulations and restrict adjoining land owners from dumping or self-stabilization programs.
- Develop better municipal co-operation and stormwater control ordinance.
- Initial public education program.

IMPLEMENTATION

GOAL: Develop a safe, aesthetically pleasing corridor which will improve property values.

OBJECTIVES:

- Use old streetcar and railroad right-of-way to bypass industrial areas.
- Deer Creek needs the park development to improve a declining neighborhood and improve property values.
- Much of the creek is not in residential ownership; perhaps provide tax incentive to industry to co-operate in land acquisition.
- Municipalities willing to share some aspects of security and operations but prefer maintenance by St. Louis County similar to highway system.
- Utilize floodplain land in North Webster re-development area.

GRAVOIS

ENVIRONMENTAL/AWARENESS

There was no discussion group participation in this category.

RECREATION

GOAL: Develop new recreational opportunities through Linear Park development.

OJBECTIVES:

- Maximize access to existing park areas in order to capitalize on the few existing recreational opportunities.
- Use trail as a transportation alternative to school or shopping.
- Provide lighting for night use.
- Develop jogging and exercise trails.
- Exclude motorized vehicles.

STORMWATER:

GOAL: Preserve the remaining flood plain areas and initiate solution to flood control problems.

OBJECTIVES:

- Stormwater control should have priority over park development.
- Resolve problems of flash flooding, backwater and constriction at bridge crossings.
- Improve channel maintenance.
- Elimination of meandor loops and constricted channels in lower sections of the creek.

WATER QUALITY

GOAL: Improvement of water quality to sustain body contact water-based recreation.

OBJECTIVES:

- Park should serve as an effective buffer zone, filtering stormwater.
- Monitor dumping and enforce regulations.
- Improve channel maintenance.
- Control stormwater and parking lot runoff.

IMPLEMENTATION:

GOAL: Protect private property and resolve potential conflicts.

OBJECTIVES:

- Resolve security and liability issues along MoPac right-of-way.
- Protect property owners against vandalism; develop fencing policy.
- Resolve flood control issue first.
- Avoid residential purchases along corridor.

Some general comments concerning the workshops are necessary. In all of the workshops, participants found it difficult to accept that there was no plan already developed. Their attitude was one of disbelief that they were being asked to direct the plan development rather than simply commenting on it. One participant on Coldwater, for example, asked three or four times what plans existed. Once convinced that there was, in fact, no plan, his comment was, "Well, let's role up our sleeves and give you one." It was also emphasized in each of the workshops that the purpose was not to air individual gripes. Participants were asked to phrase their comments in a way to identify problems and potential solutions. If someone had an individual complaint, they were asked to state it on the map and to try to rephrase it for the group. This was generally a very successful communication technique. Many times individuals were seen who entered the workshop ready to complain bitterly about MSD or the county maintenance of some particular piece of property who ended up contributing substantially to the discussion.

The major difference among the workshops was the development and verbalization of the concept of need on the two urbanized creeks, Deer and Maline, against the desire to preserve open space on Coldwater and Gravois. This difference in approach was experienced many times, being the singly most dominant response of these four workshops.

A final comment is in order on participation and enthusiasm. Coldwater produced participants from all over St. Louis County. Their primary interest was in the lower sections of the creek. They exhibited a high level of interest and understanding. Maline drew the smallest number of participants, perhaps due to location or weather, but also perhaps due to the apathy of years of waiting for the Corps of Engineers to conclude something on the creek. Deer Creek drew heavily from Webster Groves, Rock Hill, Brentwood, Maplewood, and Shrewsbury. By far this group exhibited the highest level of public interest and knowledge about the creek. The Gravois workshop was of particular interest. Knowledge or understanding about the creek was extremely limited. Their primary concern was only with the immediate back yard area. Most people were quite surprised to see the slides or to realize the attractiveness of this area. Concerns were almost exclusively over stormwater affecting the lower ends of the creek; witness the lack of participation in the environmental awareness discussion group. But during discussions, it was also found that this group of participants was also the most free with regard to access and public use of the corridor trails. When asked how they felt about letting their children use the trail system, their comments were consistently that the kids used them now and that we were only improving it for them.

A second stage of public workshops was held in October of 1978. The second stage workshops had the following purposes:

1. Dissemination of information and project status to the public.
2. Presentation of conceptual plans for the creeks
3. Evaluation of the two creeks north and the two creeks south.

Because of this final purpose, it was felt that a single workshop dealing with the two north creeks, Coldwater and Maline, and the two south creeks, Deer and Gravois, would be the most effective workshop format.

The organization of the second stage workshops included:

PLAN PRESENTATION:

Presentation of overall concept plans for each of the two creeks was made. The presentation involved a 1" =400' map presentation and the breakdown of the program components into:

1. Inventory and suitability
2. Demand
3. Policy, goals, objectives
4. Plan components
5. Purchase/easement/acquisition needs
6. Maintenance objectives

PUBLIC DISCUSSION:

Questions, comments and criticism of the conceptual plans were encouraged. This was done through an open forum. The discussion allowed for more in-depth presentation of the plan and for modification of project components where necessary. In addition to the large display map, each of the workshop participants was also provided with a 1" =1000' Preliminary Concept map and a one-page summary of the preliminary concept plan.

EVALUATION:

An evaluation procedure format sheet was distributed to each workshop participant. The format sheet was in essence the score card for a verbal "test" given under this third phase of the workshop. The evaluation procedure and scoring system is presented in detail further in this report. At this point, it will suffice to understand that the "test" was given in order to assess public value judgements about project evaluations. There were no right or wrong answers, and participants were told that their responses would be analyzed to provide a public workshop recommendation on creek selection based on a scored evaluation.

INVENTORY COLLECTION:

No one knows more about the creeks' immediate environment than the residents who live along them. In order to gain a better base of information, the public was encouraged to provide comments, notes and other information which they felt to be pertinent. Collection methods for this process were designed to make participation as easy as possible. During the workshops, 1"=200' base maps were taped to the floor of each meeting room. Pens were provided, and people were asked to make any notations comments, suggestions, problems, etc., they desired on the maps (These are roughly 10-12 ft. long and 6-8 ft wide.)

A wealth of non-statistical perceptual data was developed through this method. For example, municipal officials identified park sites they were presently negotiating for. Many people identified their own houses relative to the creek. Notes on wildlife spotted or such things as a ten-pound snapping turtle removed from Gravois Creek, locations where children presently play, and land areas used informally as picnic sites were noted as well as natural features such as springs, and problem areas such as flooding of homes.

During the workshop, these maps were referred to often, and additional notes concerning ideas or conceptual schemes were added. The maps were also placed at locations within the corridor for two-three weeks following the workshops in order to give people an opportunity to return with further comments or to tell their neighbors to come in and mark on the map. Although the maps were very successful and people used them extensively during the workshop, it was found that this second location produced very few additional notations.

INFORMATION QUESTIONNAIRES:

In order to establish a better basis of statistical information about the park useage and resident reactions, a Linear Park Questionnaire was prepared and utilized during the first stage workshop. The questionnaire was short, one page, and divided about equally between questions concerning recreational useage, resident reactions to land acquisition, and perceptions about the creek. The questionnaire results were tabulated and the addresses of respondants plotted on the map in order to determine the proximity to the creek and the geographic distribution. The questionnaire was as follows:

LINEAR PARK QUESTIONNAIRE:

Name: _____ Age: _____
Marital status: _____ Number of children: _____
Address: _____
Municipality: _____ Zip code: _____

1. How often do you or your children's leisure or recreation activities take place in a park? other _____
   weekly _____ monthly _____ yearly _____ .
2. What type of parks or private recreation clubs do you use?
   county park _____
   city _____
   subdivision common ground _____ _____
   private club (YMCA, JCCA, etc.) _____

4. What type of recreation activities do you or your children participate in?

organized sports:
baseball _____
basketball _____
football _____
soccer _____
tennis _____
volleyball _____
badminton _____
horseshoes _____

water related:
swimming _____
boating _____
fishing _____
ice skating _____

individual:
bicycling _____
hiking _____
jogging _____
skiing _____
horseback riding _____
motor cycling _____
rock climbing _____
walking _____

passive recreation:
picnicing _____
kite flying _____
bird watching _____
sun bathing _____
wildflower _____
identification _____

5. If there were a trail system near your home, would you participate in the following activities?
   bicycling _____
   jogging _____
   cross-country skiing _____
   horseback riding _____
   walking _____
   bird watching _____
6. Do your or any member of your family have any physical handicap which limits recreation access? _____ If so, what types of recreational opportunities are you/they interested in pursuing? _____
7. Has your home or property been flooded by Coldwater, Maline, Deer or Gravois Creeks? _____
8. What sensory experiences have you had along these creeks?
   Saw attractive natural areas _____
   Saw dumping sites _____
   Smelled unpleasant ordors _____
   Heard wildlife sounds _____
   Heard high levels of urban noise _____
   Heard pleasant natural sounds _____
   Saw rats _____
   Bitten by flies or mosquitoes _____
9. Check one or more of the development alternatives you feel are suitable for your creek area:
   Concrete channelization _____
   Channelization with gabion or natural grass Banks _____
   Levees _____
   Stormwater impoundments _____
   Fully developed urbanization _____
   To bank side _____
   Open space buffer along bank _____
   Parks along bank _____
   Trails along bank _____
   _____
   _____
   _____
   _____
10. If you are a property owner, adjacent to the creek, would you want a linear park bordering your property? _
    Yes, but with a fence separating the park from my property _____
    Yes, if the park were located on the opposite bank _____
    Yes, with other conditions _____
    No _____ reasons _____
11. If you are a property owner, would you be willing to sell part of your property or make other provisions so that a trail could be established along the creek? _____

Please feel free to use the other side of this paper to make any additional comments or questions you might wish to raise.

Results from each of the creeks were tabulated separately, and were supplemented by a random geographic telephone survey and some student samplings made door to door. In total, 163 questionnaires were received with 29 from Coldwater, 13 Maline, 100 Deer, and 26 Gravois. The questionnaires were not intended to provide a complete statistical data base. The original intent had been to use them only within the workshop. They served primarily to check statistical data against other sources, and to obtain a better feel for resident responses on a geographic basis. A rigorous formulation of data was not undertaken.

In general, the sampling on all four creeks was much too small to be meaningful. In addition, the lack of control over geographic distribution led to a somewhat imperfect set of responses. The questionnaires have little real value, except on an individual basis, and no general conclusions were drawn from them.

PUBLIC PRESENTATIONS

Ideally, workshops — 3 or 4 per creek — geographically distributed throughout the corridor, would have provided the best possible method of generating public input. In order to overcome this program deficiency, both the Park Department and the consultant have maintained an open information policy. Presentations requested by any organization, municipality, or subdivision group have been honored. To date, approximately 15 presentations have been completed. Always informational in nature, the presentations were conducted as duplications of the public workshops without the discussion group. The emphasis was placed on gaining information and public response. Presentations included:

City of Dellwood
City of Ladue
City of Crestwood
Mayors and City Councils on Deer Creek
League of Women Voters
North Webster Neighborhood Improvement Assn.
Webster College Biology Students
Municipal League
EWGCC Environmental Task Force
Bellefontaine Neighbors
Foxwoods Subdivisions/Fox Manor

EVALUATION

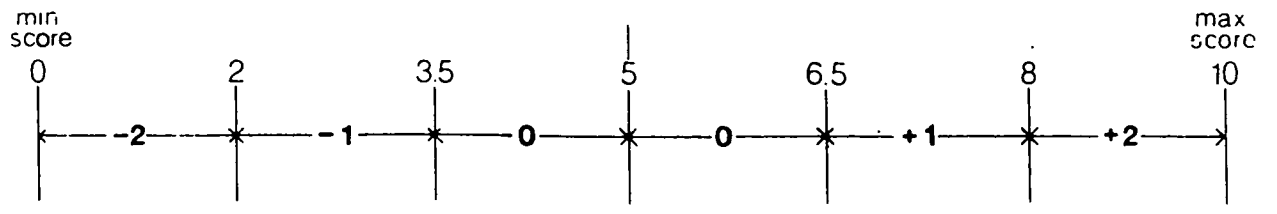
It was recognized early in the program that the planner/designer often works in a vacuum. To overcome this condition, many of the previous public participation mechanisms were established. The planner is also often the determining factor in structuring decisions, imposing his values or judgments on the decision making process. This is a particularly difficult part of the program where the decision making involves a complex set of problems and value judgments. For example, in each case, north and south, the dichotomy between preservation of existing open space and the improvement of a declining community was prevalent. Value decisions on this one issue might well be the total basis for decision making where a strong local bias for the project exists.

The resolution of this issue was largely determined by the Advisory Committee. A quantifiable evaluation procedure was established, taking into account those factors which were felt to bear on the decision making process. But the problem of how to score the value judgments and what items take priority or are weighted more than others, still remained. It was determined that this was the most effective role the public could play in the second stage workshops.

To make this assessment in a public forum, and hopefully to eliminate the strong local sentiment, an "evaluation procedure format" was established. Each of the sets of decision making questions within the evaluation procedure was used to develop a set of responses which determined first, the orientation of the value judgment: i.e., "is a higher or a lower population important"; second, the value that each component played in the overall evaluation. This was scored as a single value from 0 - 10, with 0 being the lowest value, and 10 being the highest value. The "test" and scores from each of the workshops and the consultant's responses are shown below In arriving at a single set of scores, an analysis was made of both the individual creek responses and the joint responses from both creeks north and south.

The second questions were analyzed for a mean determination, standard deviation and variance. Many of the questions had a wide dispersion, but those with a very low variance and a standard deviation of 3 or less, indicated a generally conforming public opinion. These were often the items with the highest score, the vast majority of mean scores being in the middle or average range. This led to development of a weighting system, which responded directly to the scoring levels. Those questions which were indicated as exhibiting a higher priority received "bonus points", and those units with a lower point value had points removed from the final score. The weighting system ranges from a 2-point deduction to a 2-point addition.

WEIGHTING SCALE



EVALUATION PROCEDURE SCORING

Table 1

	WORKSHOP SCORE		CONSULTANT SCORE
	NORTH	SOUTH	
DEMOGRAPHIC			
1 What role does population play in assigning priority to Linear Park development?			
a. Priority to Higher or Lower Population density	Higher	Higher	Higher
b. Ranking 0 - 10	5.4	6.64	7
2 Many of the creeks exhibit age profiles which deviate from normal patterns -- high elderly populations or very young children. Where the conditions occur, should they carry importanee in the evaluation?			
a. Consideration of Age Profiles -- Yes or No	Yes	Yes	Yes
b. Ranking 0 - 10	4.6	6	2
3 Will the % of owner occupied housing affect park usage and need for Linear Park development?			
a. % of owner occupied housing -- Yes or No	Yes	Yes	Yes
b. Priority to higher % owner or transient	Owner	Owner	Transient
c. Ranking 0 - 10	5.3	4.75	4
4 Are income levels important to recreationel use and priority evaluation?			
a. Priority to income levels -- Higher or Lower	Lower	Lower	Lower
b. Rank 0 - 10	5.4	5.4	5
LAND USE			
5 The availability for open space and recreational land is critical to the cost end success of a park project. How should we assess the availability of existing open space land, and assign priority --			
a. Priority to areas with or without open space	With	Without	With
b. Ranking 0-10	7.8	7.5	7.5
c. Priority to areas with or without recreation facilities.	Without	Without	Without
d. Ranking 0-10	5.4	7.5	9
6 What effect on the project should bank ownership have? If a high percentage of residential ownership occurs, should the score go up or dows?			
a. Priority to residential ownership, yes or no	Yes	No	No
b. Priority to vacant ownership, yes or no	Yes	Yes	Yes
c. Priority to public ownership, yes or no	Yes	Yes	Yes
QUALITY OF ENVIRONMENT			
7 Vegetation and landform contribute to the diversity and quality of the environment. Should these areas be retained and what value should they plan in consideration? Rank by priority.	1)Natural 2)Water Related 3)Open field 4)Manicured	1)Natural 2)Water Related 3)Open field 4)Manicured	1)Natural 2)Water Related 3)Open field 4)Manicured
8 The creeks are storm drains for urban runoff. Many of the areas have been channelized or badly eroded. Should preference be given to stable natural banks or to improvement of eroded banks?			
a. Preference to stable or unstable banks.	Stable	Stable	Stable
b. Ranking 0 - 10	6	5.63	6
9 The sensory quality of the rreek corridor is something we all experience, feel, touch, see and smell. Should priority be given to the following sensory characteristics and, if they are important, rank them.			
a. Dumping and debris in channel, yes or no.	Yes	Yes	No
b. Ranking 0 - 10	5.876	6.5	4
c. Smell due to pollution	Yes	Yes	No
d. Ranking 0 - 10	5.625	6.66	5
e. Visual quality of corridor	Yes	Yes	Yes
d. Ranking 0 - 10	6.57	6.37	6.5
10 All the corridors shall sustain some impacts. Should preference be given to those environments capable of sustaining extensive recreation, passive recreation, minimal recreation, or restricted intrusion? Rank by highest priority.	1) Restrictive 2) Minimal Rec. 3) Passive 4) Extensive	Passive Minimal Rec. Restrictive Extensive	Passive Restrictive Minimal Rec. Extensive
11 If trails presently exist, they indicate a level of current use. Should we assign priority to those areas currently in use?			
a. Priority to areas with existing trails.	Yes	Yes	Yes
b. Ranking 0 - 10	5.4	5	7
12 Wildlife habitat areas exist throughout all the corridors. Rank by order of preference the extent of consideration wildlife habitats should play:	1)Ext. Div. 2)Suburban 3)Aquatic 4)Urban 5)Not issue	Exten. Div. Aquatic Suburban Urban Not issue	Exten. Div. Acuatic Suburban Urban Not issue
RECREATIONAL USE			
13 Recreational needs can be measured and quantified. Recreational needs are a measure of our success in planning for use of the corridors. What role/value should the need for addilional recreational area carry? Ranking 0 - 10.	5.4	6.5	7.5
14 In assessing the ability of the corridor to meet recreational needs, what value should be placed upon the corridors meeting the highest percentage of demands?			
a. Rank capability of corridor to meet needs 0-10.	6.5	6.5	5
b. Is land available, positive or negative affect.	Positive	Positive	Positive
c. Ranking of importance 0-10.	6	5.625	3
MANAGEMENT			
16 The acceptance of the concept by municipalities is an important concern. Should priority be given to corridors in which municipalities are willing to cooperate with the Program.			
a. Value ranking 0-10.	5.44	6	6
b. Should priority be given to areas where open door policy is to be in effect? Rank 0 - 10.	Yes	Deer-Yes Gravois-No	Yes
18 The corridors provide recreational use, but also alternative transportation. This transporation mode is best realized by the linkage quality of the corridor. Should priority be assigned to corridors exhibiting secondary use?			
a. Should priority be given to corridor adjacent to or near residential areas or non-residential?	Yes	Yes	Yes
b. Should priority be given to corridors with aeeess to shopping or commercial areas?	Yes	No	Yes
c. Should priority be given to corridors with access to work/employment areas?	Yes	Deer-Yes Gravois-No	Yes
d. Where aceess occurs to special features, should it receive priority? (historic district, farm areas, etc.)	Yes	Yes	Yes
e. What value does the linkage quality receive in the total evaluation? (0 -10).	6.4	5.7	8
17 In the total evaluation, what ranking should the existing water quality play, and should priority be given to the areas with identifiable water quality problems or to areas in which the problems require complex solutions:			
a. Existing water quality ranking 0-10	5.875	5.75	6.5
b. Priority to identifiable or complex?	Identifiable	Identifiable	Identifiable
19 Rank by weight each of the following within the corridors (0 - 10)			
a. Undeveloped flood plain.	5.777	5.55	7
b. Potential reservoir sites	6	5	6
c. Extensive flood damage areas	6.43	5.3	4.5
d. Structural modifications required	5.55	5.4	3
19 Assign a weight of 0 - 10 based on the importance of each of the following questions having to do with cost effectiveness:			
a. Total estimated cost/mile of corridor	5.4	5.1	6
b. Total estimated land acquisition cost	5.4	5	8
c. Total estimated development cost	5.4	5.1	7
d. Potential for shared cost with other agencies such as MSD, etc.	5.55	5.66	e
e. Estimated annual maintenance cost/mile of corridor	5	6.25	7
20 Based on information and an informed judgment, which creek area would you like to see implemented as Pilot Project area?	Split	Deer	

Together with the value decisions from the format sheets, the mean scores, and the weighting system, each creek was scored through the evaluation testing. The results of that scoring are presented below and analyzed in the main body of the report. Together with the last question of the format sheets, this scoring was used to develop the public workshop recommendations.

Two items should be specifically noted:

First, the workshop group is but a small cross-section of the population. Participants represent those individuals interested or concerned enough to devote an evening to the project. It is important for their group to voice an opinion, but it must also be recognized that they do not represent the total group of service area residents. The recommendation derived from this process has been labeled as the Public Workshop Recommendation, and affects only that small group.

Second, no scored quantifiable evaluation is perfect. It represents only the ground work for decision making. Other factors which cannot be taken into account with such a scoring system may also come into play.

The final question of the public workshop format sheets provided for a straw poll of public sentiment on which creek should be selected. The results of that poll were:

North:	Maline 15
	Coldwater 14
South:	Deer 31
	Gravois 15

The actual evaluation procedure, based on the public generated scoring values, resulted in the following tabulations:

North:	Maline 118
	Coldwater 104
South:	Deer 98
	Gravois 128

PUBLIC INTEREST

Public interest in the project can be partially assessed through the level of participation in public workshops and presentations, requests by individuals and organizations or municipalities for further information, and discussion with residents during field investigations.

Although still on a preliminary basis, such an assessment can be characterized as areas of concern expressed, areas of opposition to the project, or areas where opposition can be expected. These have been mapped on Exhibits 2, 3, 4 and 5 and the following summary applies to each creek.

COLDWATER

Public opposition has focused on subdivision common ground and private religious recreation holdings in locations throughout the creek. Most public concerns have been centered on acquisition and security control.

Municipalities of Hazelwood and Blackjack have been very cooperative. No indication has been provided by Florissant of the willingness to participate in the project or concerning non-resident access to municipal parks.

MALINE

Very little opposition has been focused on Maline Creek. Most public concerns expressed have been from individual land owners in only two locations regarding property acquisition and security control.

Strong interest exists in community improvement and the shared solution of flooding and park problems. Municipalities of Ferguson, Kinloch, Bellefontaine Neighbors, Jennings, and Dellwood have all indicated a general interest in participating in the program, although no formal statement has been sought.

DEER

Very strong public interest exists to develop a linear park in Deer Creek. Public opposition occurs only in the upstream sections of Ladue. Some concerns have been expressed regarding security control and acquisition. Municipalities of Webster Groves, Maplewood, Shrewsbury, Brentwood, Rock Hill, and Warson Woods have met and indicated a general interest in participating in the program. Webster Groves has Community Development Funds allocated to share in the cost of a park development on Deer.

GRAVOIS

Very little opposition has been focused on Gravois Creek. Most concerns expressed have been regarding land acquisition.

Solution of flooding and erosion problems is given priority over park development in isolated areas, but a generally open attitude of park access prevails.

Missouri Pacific Railroad has expressed concerns over the security control of their right-of-way.

Few municipalities occur along the corridor, and they have been very cooperative. No definite statement of participation has been sought.

PUBLIC RESPONSE MAP

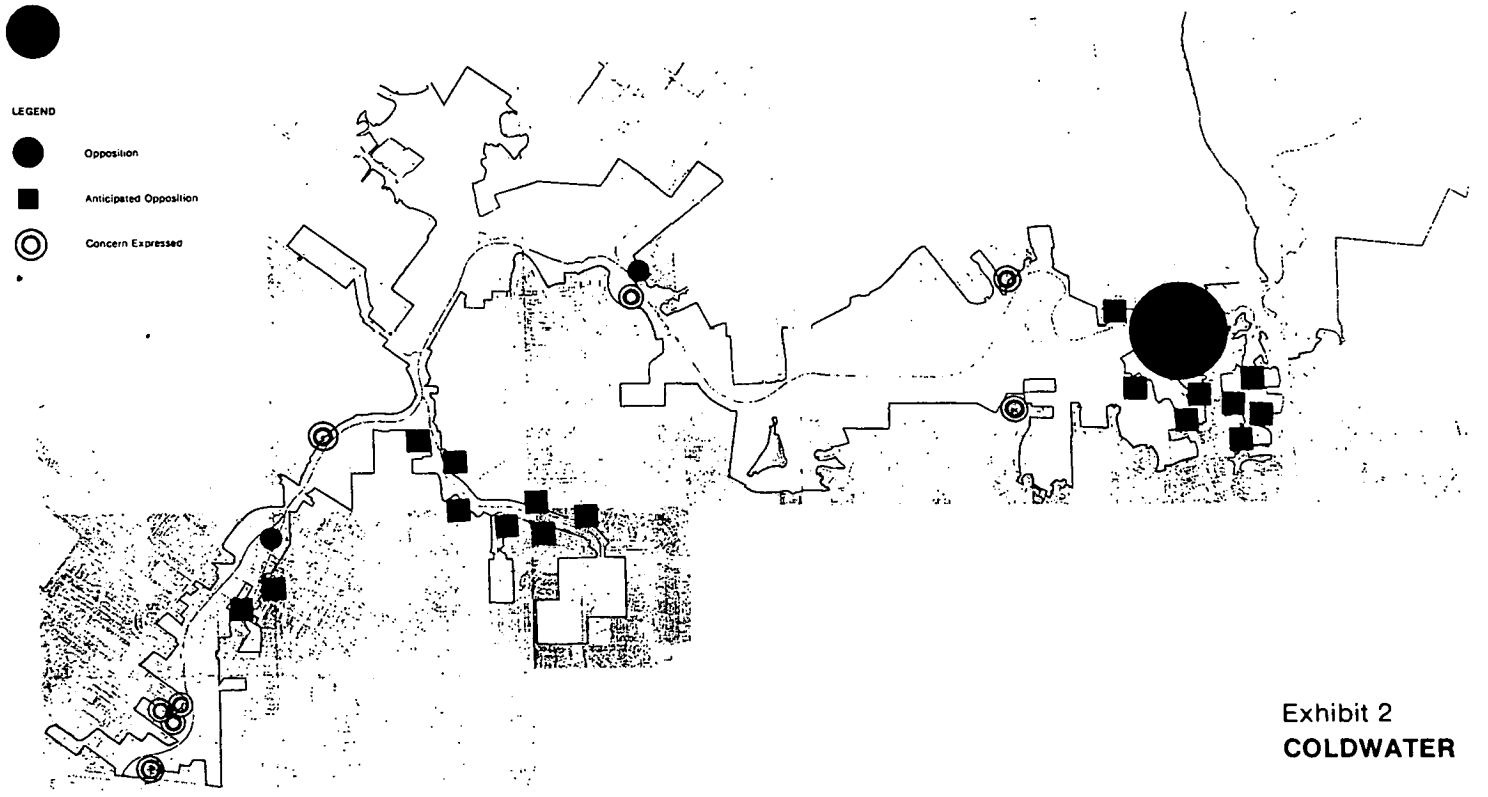


Exhibit 2
COLDWATER

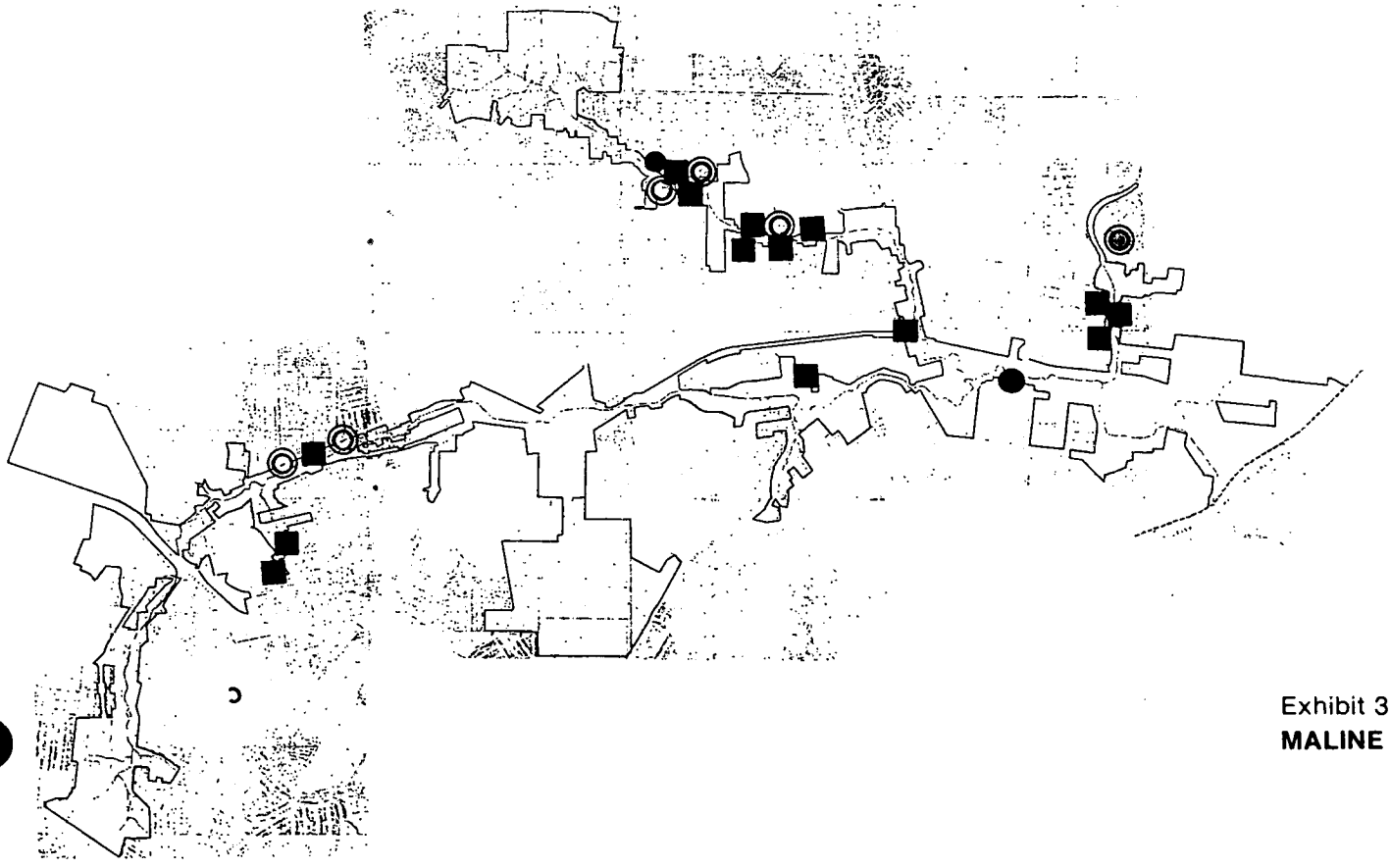


Exhibit 3
MALINE

PUBLIC RESPONSE MAP

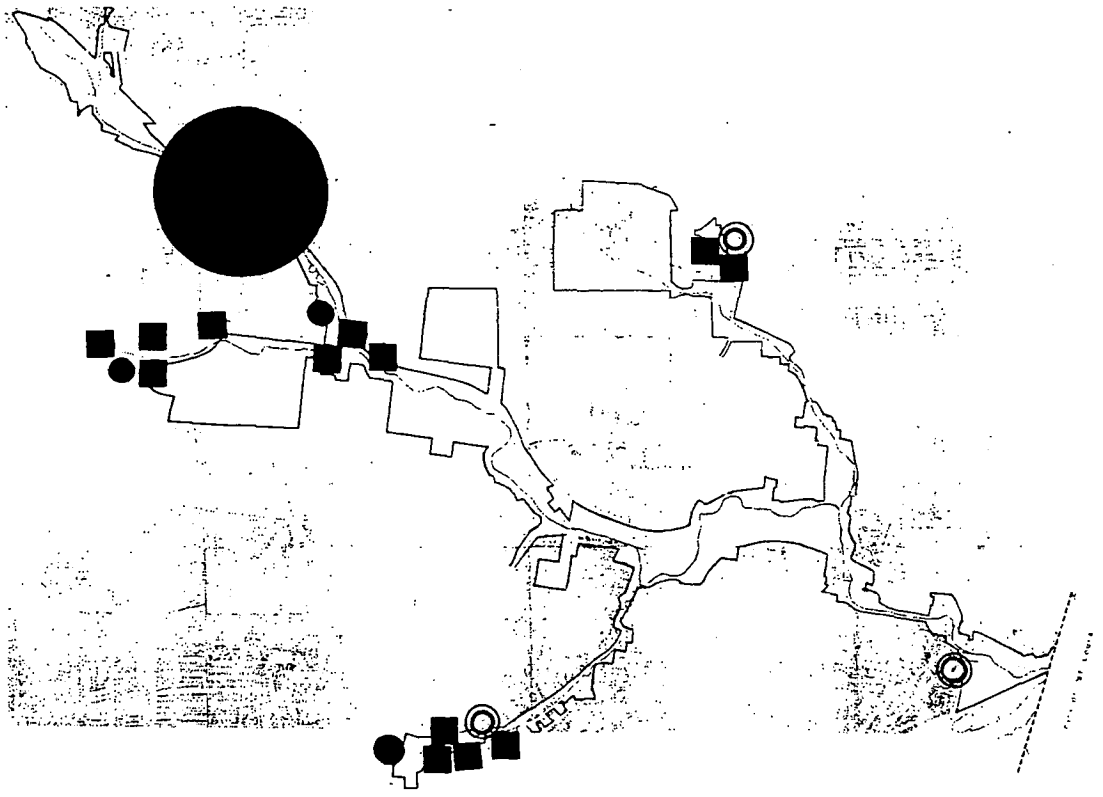


Exhibit 4
DEER

Exhibit 5
GRAVOIS

DEMAND ANALYSIS

INTRODUCTION

The people of St. Louis County, like Americans across the country, are enjoying ever greater amounts of leisure time. Much of this leisure time is increasingly devoted to outdoor recreation activity. Public awareness concerning the importance of physical exercise in maintaining health has led more and more of the population to adopt some sort of physical conditioning program as part of our regular recreation activity, as witnessed by the rapid rise of jogging, bicycling, and even walking. As a result, many of the county's recreation resources and facilities are being used to capacity or in excess of capacity. This overuse accelerates resource deterioration and diminishes the enjoyment of people's outdoor experience. It is, therefore, crucial to evaluate public participation in specific recreation activities in order to determine the need for future recreation facilities and opportunities.

The State of Missouri, in its State Comprehensive Outdoor Recreation Plan (SCOPR) has identified trail-oriented recreation as an integral part, of the total recreation needs within the state. The development of more urban trails has been given a high priority. Looking at the East-West Gateway region alone, the greatest recreational need identified is the development of bicycling opportunities. Fourth and fifth on the list of recreational needs for the region are picnicking and nature walking. Eighth priority is additional warm water fishing opportunity. All four of the recreation activities could be included in a linear park development.

East-West Gateway Coordinating Council, in its recreation facility development plan, "Where to Play", determined that there were 254.5 miles of multi-purpose trails needed in St. Louis County alone. East-West estimates that there are approximately 1 million bicyclists in the St. Louis Metropolitan area.

Presently there are only 66 miles of separated trails. For the most part these trails are discontinuous. They provide no linkage between points of particular interest.

HANDICAPPED

There are approximately 100,000 persons within the St. Louis area who have some type of physical or mental handicap. This population group has had limited opportunity for recreation because design considerations which would allow participation by the handicapped have not been incorporated. Recreation activity is particularly important to the handicapped for its therapeutic as well as recreational value. The Rehabilitation Act of 1973 requires the recipients of Federal funds to make their programs accessible to the handicapped. A 1976 revision of the Missouri Statutes (RSM 8.621) requires that recreational opportunities be developed to all the handicapped's "full enjoyment" of the facilities.

The handicapped population is interested in the same type of recreational activities as the general population. They can be served by the same facilities provided for the general population if they are designed to be barrier free. The most difficult situation the handicapped must overcome is the attitude by the general public that they want or need to be segregated.

METHODOLOGY:

The procedure for determining recreational needs involves the utilization of various types of data. It was necessary to organize this data in a spatial context that would facilitate the comparison of information for evaluation purposes. The spatial unit chosen was the Census Tract. Census tracts were therefore combined into multi-tract groupings which correspond with creek sections. Tracts were included based on their proximity or direct connection to the stream course. In general they represent an area of approximately 1 mile distance from the Creek channel in all directions. This area has been designated the "Service area" of the park development.

By dividing the creeks into sections, recreation need figures of a more localized nature have been developed. This is especially important to the design phase of the project when a more detailed knowledge of local needs becomes paramount.

Demand figures are not intended to provide an exact measure of an activity. They are intended to be a general assessment — a tendency toward human activity. It is important, therefore, that demand calculations be placed in a proper context. They are not major design determinants. They serve instead, to provide a broad indication of need levels, deficiencies or surplus. When combined with land use information they provide a means of establishing recreational goals and the formulation of priorities.

The determination of *"demand"*, that is the total desired recreation units of population, was accomplished by the comparison of two existing forms of activity information.

First: National Parks and Recreation Association Standards which provide a figure of facilities units per population unit; i.e., playgrounds: 1 acres/2,000 pouplation. This figure is multiplied by the projected population (1980) which will be served by the facility.

Second: Utilizes a measurement of recreation activity from the Missouri State Comprehensive Outdoor Recreation Plan (SCORP). A figure for average activity occasions per year, per capita, is provided for each recreation activity considered. This figure was multiplied by the projected population for 1980 which would use the facility. The resulting number is then divided by a standard utilization rate for that particular activity. The standard utilization rate has been adapted from a national standard to more closely reflect conditions in Missouri.

The end result of both these calculations is a measurement of demand based upon total units needed by a specific population group to satisfy their recreation demands.

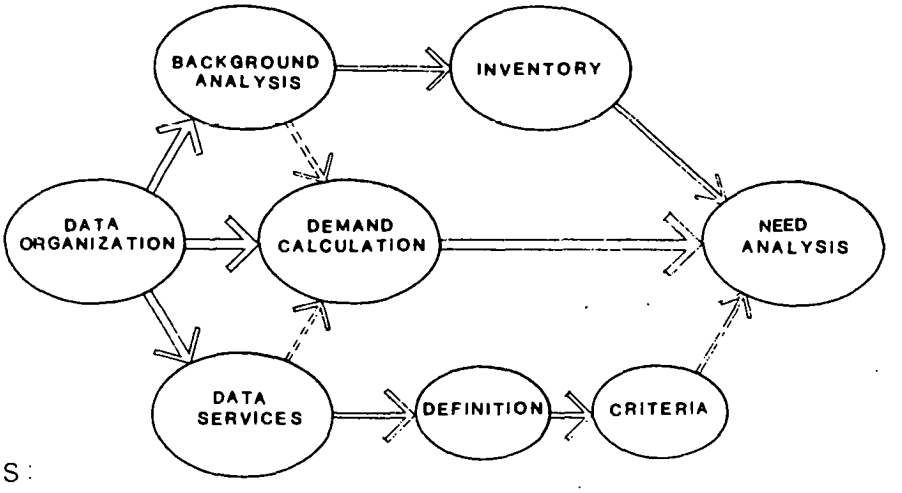
The next step in the demand analysis is to determine the facilities which are already in existence. An inventory was accomplished by utilizing recently published inventories of existing facilities from East-West Gateway Coordinating Council and the St. Louis County Department of Parks and Recreation. Both inventories were based upon questionnaire responses from each municipality in St. Louis County.

Finally, an analysis is made of the "demand" in relation to the supply of existing facilities. This provides a measurement of additional facilities which must be added to satisfy the recreation *"needs"* of the population considered.

This final step represents the total recreational needs derived from the formulation. The Linear Park Project cannot, nor should it attempt to, design for *all* of those recreational needs. The numbers therefore represent only a basis for design and decision making, into which a percentage of recreational needs can be applied.

The methodology is a six step process, which can be summarized as:

1. Spatial organization of data
2. Background Analysis of each Creek
3. Demand Calculations
4. Questionnaire evaluation and comparison with demand figures
5. Inventory of existing recreation facilities
6. Analysis of Data — Determination of need



DEMAND ANALYSIS

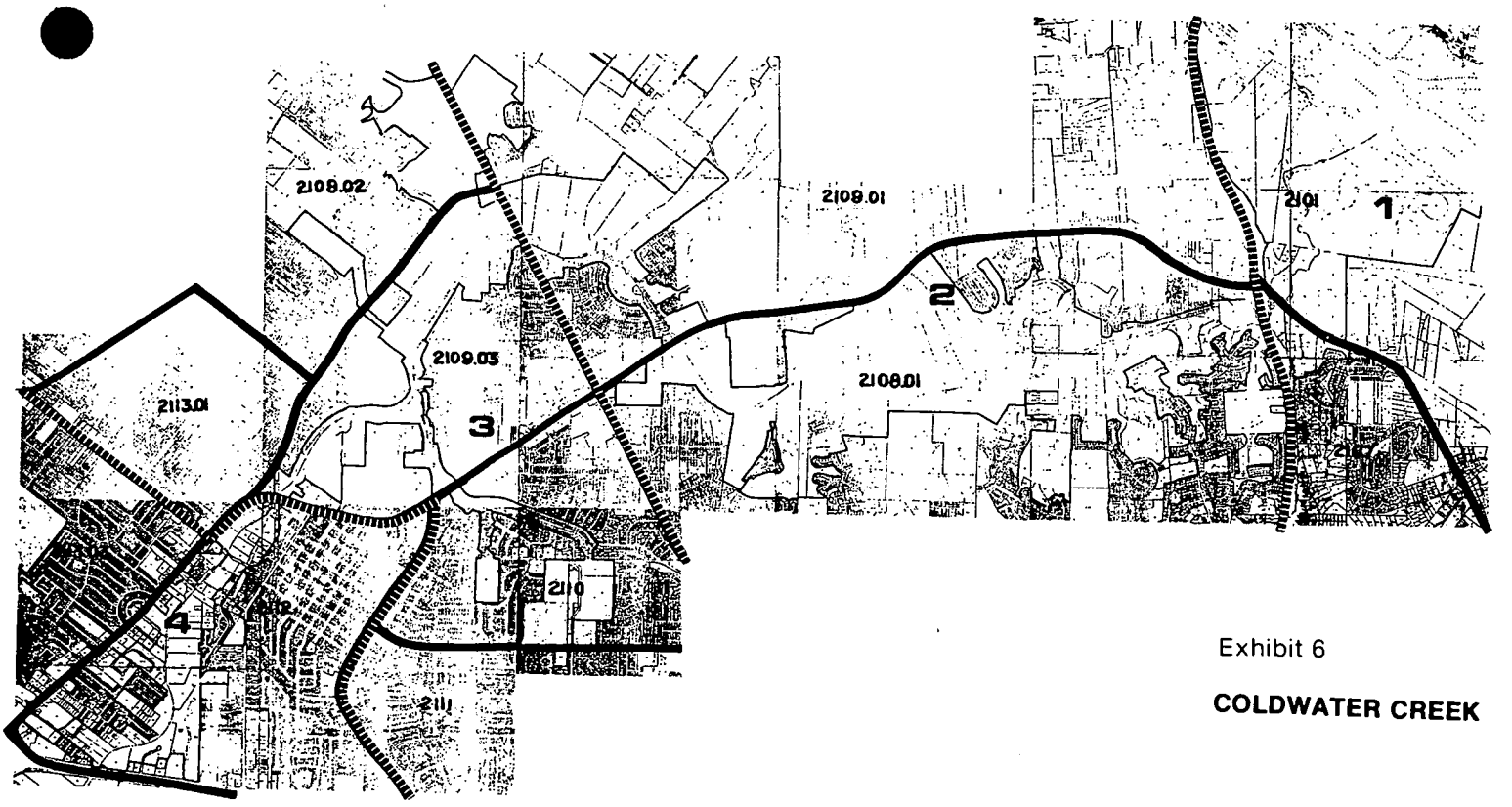


Exhibit 6

COLDWATER CREEK

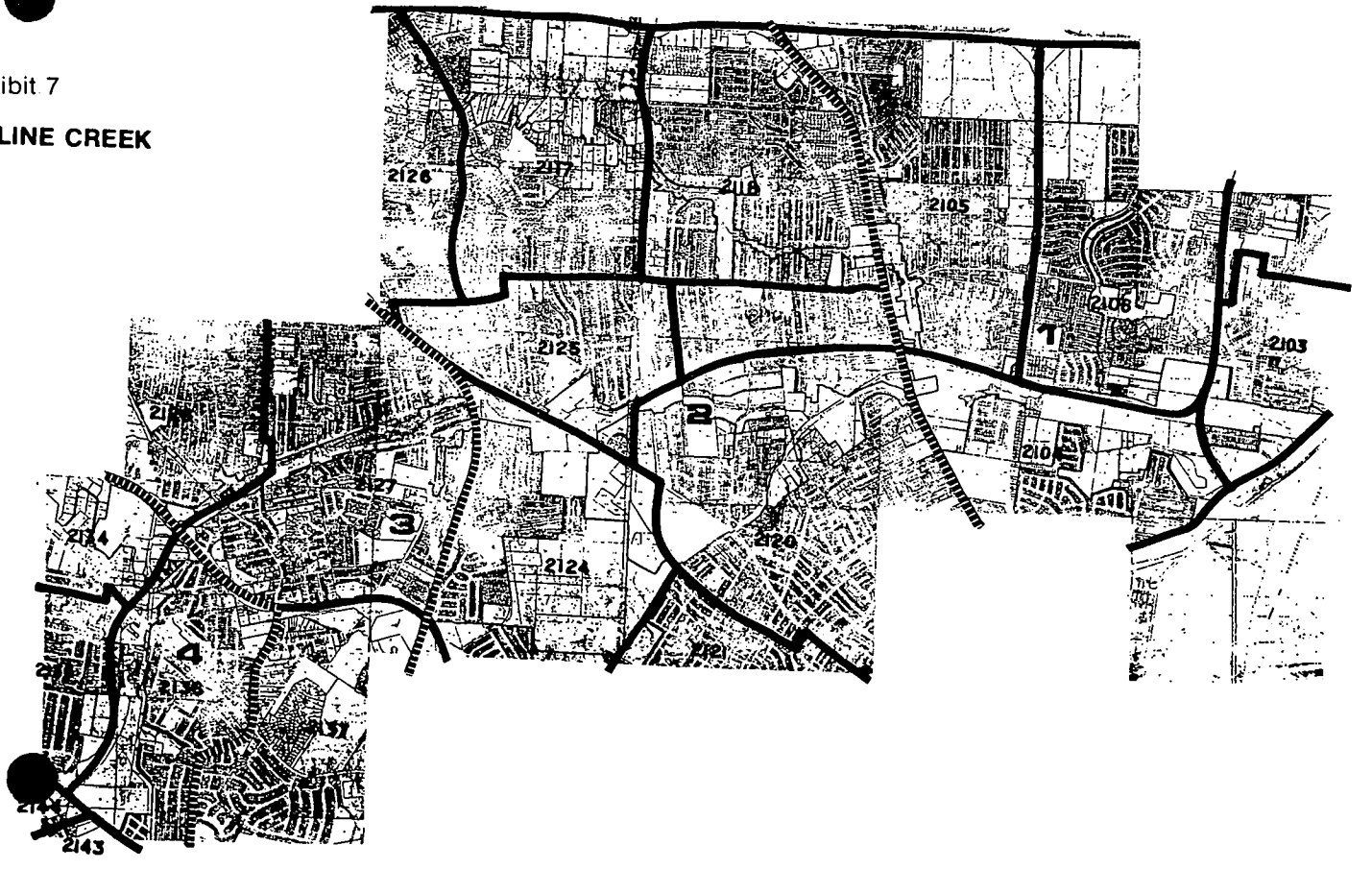


Exhibit 7

MALINE CREEK

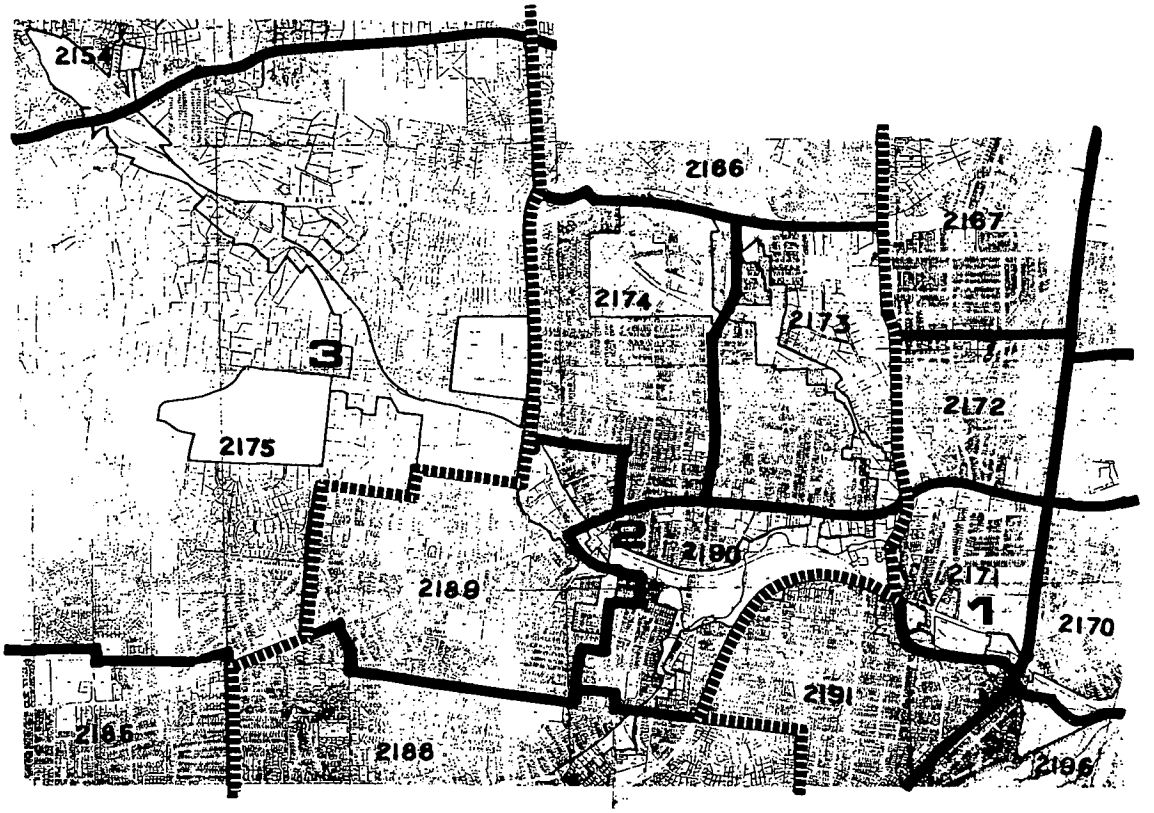


Exhibit 8

DEER CREEK

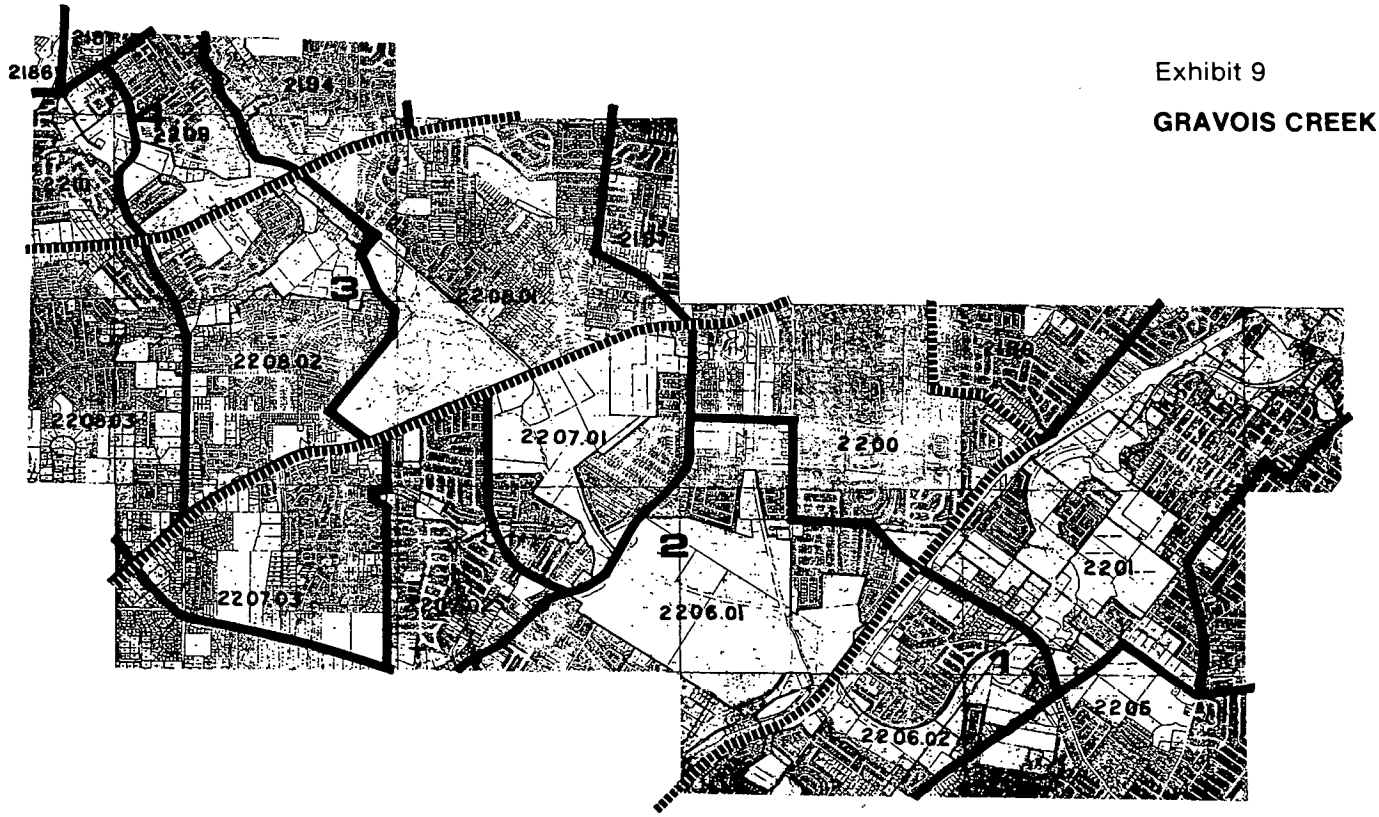


Exhibit 9

GRAVOIS CREEK

AREA BACKGROUND

A background description of each creek is developed in order to provide a profile of socio-economic and land use characteristics. The description is divided into two broad categories: Land Use and Demographics.

The information which follows develops the profile using a statistical data base, graphic characterization of the data, and a descriptive summary.

Table 3 is a total creek summary of Land Use and Demographic material. This is further expanded with detailed statistical data presented for each creek in tables 4, 5, 6 and 7.

Exhibits 10, 11, 12, 13, 14, 15 and 16 provide a graphic representation of information for comparison on all four creek areas.

The final description provides an analysis of the statistical data as a basis for planning considerations.

Table 3 DEMOGRAPHIC/LAND USE SUMMARY TABLE

	Coldwater	Maline	Deer	Gravois
Population:				
0-19 years	44,234	54,549	23,061	37,384
% of Total	45.6	37.6	34.9	38.1
20-59 years	47,468	72,003	32,356	49,613
% of Total	48.9	49.7	49.0	50.5
60 years +	5,342	18,469	10,574	11,228
% of Total	5.5	12.7	16.0	11.4
Total 1970 Population	97,044	145,021	65,991	98,225
Density Pop./Sq. Mi.	1,439	5,753	3,616	4,463
Estimated 1976 Pop. 2.	109,973	131,730	62,660	92,692
Projected 1980 Pop. 3.	111,210	144,740	74,340	111,270
Projected 1985 Pop. 3.	118,540	134,370	79,220	118.050
Income				
Mean 1970 Household Income	12,899	11,110	13,879	12,760
Est. 1976 Mean Household Income	20,637	17,026	22,441	20,449
Housing				
Total Units	26,132	45,171	22,257	30,461
Owner Occupied	21,315	33,843	15,408	24,427
% of Total	81.6	74.9	69.2	80.2
Renter Occupied	8,250	10,394	6,257	5,471
% of Total	16.3	23.0	28.1	18.0
Median Value	20,990	15,153	21,650	21,650
Land Use:				
Residential Acres	7,271	10,013	7,200	6,722
% of Total	16.9	62.1	61.6	42.7
Recreation Acres	3,389	940	693	506
% of Total	7.9	5.8	5.9	3.5
Open Space Acres	34,096	3,927	2,711	5,297
% of Total	79.0	24.3	23.2	37.6
Residential Total Acres	43,146	16,133	11,680	14,086

Table 4 CO[redacted]WATER CREEK

section	census tracts	LAND USE								DEMOGRAPHICS																			
										POPULATION												HOUSING						INCOME	
		Res. Acres	%	Rec. Acres	%	Open Space Acres	%	Total Acres	Ratio Rec. Res.	0 - 19 Years	%	20 - 59 Years	%	60 + Years	%	Total 1970 Pop	Density Pop Sq. Mi.	Est. 1976 Pop	Proj. 1980 Pop	Proj. 1985 Pop	Total Units	Owner Occ.	%	Median Value	Renter Occ.	%	Mean 1970 Income	Est. 1976 Mean Income
1	2101	841	7.6	289	2.6	10,069	90.8	11,089	.343	2,659	46.6	2,571	45.[illegible]	474	8.3	5,704	329	7,501	7,610	8,590	1,396	1,189	85.2	16,700	188	13.5	10,986	20,174
	2107	1,098	44.5	22	0.9	1,146	46.4	2,470	.020	4,210	40.1	5,277	50.3	1,011	9.6	10,498	2,720	13,472	11,600	12,170	3,106	2,331	75.0	21,600	706	22.7	11,863	19,766
	Sub-total	1,939	14.3	311	2.3	11,215	82.7	13,559	.160	6,869	42.4	7,848	48.4	1,485	9.2	16,202	765	20,973	19,210	20,760	4,502	3,520	78.2	19,150	894	19.9	11,425	19,970
2	2109.01	392	4.1	2,547	26.7	8,786	92.3	9,523	6.5	1,562	45.5	1,599	46.6	270	7.9	3,431	230	4,820	6,240	7,690	925	815	88.1	25,700	87	9.4	14,048	23,767
	2108.01	893	27.9	303	9.5	2,124	66.4	3,198	.339	3,951	43.3	4,593	50.3	588	6.4	9,132	1,828	10,066	11,900	13,330	2,553	2,032	79.6	31,100	466	18.3	15,702	27,884
	Sub-total	1,285	10.1	2,850	22.4	10,910	85.8	12,721	2.22	5,513	43.9	6,192	49.3	858	6.8	12,563	632	14,886	18,140	21,020	3,478	2,847	81.9	28,400	553	15.9	14,875	25,826
3	2109.02	209	1.9	80	0.7	10,821	97.6	11,089	.383	4,065	49.8	3,933	48.2	164	2.0	8,162	471	13,148	9,730	10,540	2,059	1,918	93.2	20,800	74	3.6	12,583	17,705
	2109.03	606	52.3	64	5.5	421	36.3	1,159	.106	4,725	48.8	4,660	48.1	294	3.1	9,679	5,345	10,234	10,750	11,380	2,410	2,181	90.5	19,700	208	8.6	13,066	21,888
	2110	759	74.9	30	3.0	64	6.3	1,014	0	5,258	47.9	5,119	46.7	594	5.4	10,971	6,924	11,431	11,580	11,900	2,711	2,468	91.0	22,600	213	7.9	14,671	23,507
	2113.01	617	79.7	7	0.9	95	12.3	774	.011	5,266	49.1	5,095	47.5	374	3.5	10,735	8,876	10,741	11,630	12,080	2,629	2,362	89.8	16,500	238	9.1	11,867	17,724
	Sub-total	2,191	15.6	181	1.3	11,401	81.2	14,036	.083	19,314	48.8	18,807	47.6	1,462	3.6	39,547	1,803	45,554	43,690	45,820	9,809	8,929	91.0	19,900	733	7.5	13,047	20,206
4	2112	751	52.0	29	2.0	345	23.9	1,445	.039	4,760	38.9	6,450	52.7	1,018	8.3	12,228	5,416	13,275	13,240	13,790	4,010	2,623	65.4	16,500	1,211	30.2	11,752	16,689
	2113.03	1,105	79.8	18	1.3	225	16.2	1,385	.016	7,778	47.1	8,171	49.5	555	3.4	16,504	7,626	15,285	16,930	17,150	4,333	3,396	78.4	18,700	859	19.8	12,448	17,266
	Sub-total	1,856	65.6	47	1.2	570	20.1	2,830	.025	12,538	43.6	14,621	50.9	1,573	5.5	28,732	6,498	28,560	30,170	30,940	8,343	6,019	72.1	17,600	2,070	24.8	12,100	16,978
	total	7,271	16.9	3,389	7.9	34,096	79.0	43,146	.466	44,234	45.6	47,468	48.9	5,342	5.5	97,044	1,439	109,973	111,210	118,540	26,132	21,315	81.6	20,990	4,250	16.3	12,899	20,637

Table 5 **MALINE CREEK**

section	census tracts	LAND USE								DEMOGRAPHICS																					
										POPULATION												HOUSING						INCOME			
		Res. Acres	%	Rec. Acres	%	Open Space Acres	%	Total Acres	Ratio Rec. Res.	0 - 19 Years	%	20 - 59 Years	%	60 + Years	%	Total 1970 Pop	Density Pop Sq. Mi.	Est. 1976 Pop	Proj. 1980 Pop	Proj. 1985 Pop	Total Units	Owner Occ.	%	Median Value	Renter Occ.	%	Mean 1970 Income	Est. 1976 Mean Income				
1	2103	204	62.8	0	0	40	12.3	325	0	1,767	37.7	2,342	49.9	584	12.4	4,693	9,242	4,739	4,880	5,060	1,479	1,078	72.9	14,400	367	24.8	10,212	17,789				
	2104	382	49.4	207	26.7	194	25.1	774	.54	1,061	22.0	2,384	49.4	1,381	28.6	4,826	3,990	4,439	5,440	5,760	1,825	1,517	83.1	18,200	290	15.9	11,220	15,867				
	2105	494	55.3	0	0	275	30.8	894	0	4,737	42.2	5,597	49.9	885	7.9	11,219	8,031	9,162	11,670	11,900	3,099	2,788	90.0	18,000	281	9.1	12,896	20,151				
	2106	625	45.5	45	3.2	632	46.0	1,375	.072	3,119	35.5	4,364	49.7	1,296	14.8	8,779	4,086	7,531	9,370	9,680	2,535	2,388	94.2	16,700	128	5.0	12,772	18,940				
	Sub-total	1,705	50.6	252	7.5	1,141	33.9	3,368	.101	10,684	36.2	14,687	49.8	4,146	14.0	29,517	5,609	25,871	31,360	21,690	8,938	7,771	86.3	16,825	1,066	11.9	11,775	18,187				
2	2117	931	86.4	56	5.2	125	11.6	1,078	.06	2,192	41.8	2,533	48.3	516	9.9	5,241	3,112	5,735	5,600	5,780	1,436	1,299	90.5	17,400	119	8.3	13,851	21,892				
	2118	772	70.7	26	2.4	232	21.2	1,092	.034	4,365	44.2	4,811	48.8	690	7.0	9,866	5,782	8,064	10,330	10,570	2,656	2,503	94.2	17,300	136	5.1	12,185	18,391				
	2119	123	74.1	0	0	25	15.1	166	0	1,262	35.5	1,706	48.0	586	16.5	3,554	13,701	3,257	3,700	3,780	1,055	854	80.9	14,800	193	18.3	11,345	17,608				
	2120	933	69.1	73	5.4	196	14.5	1,350	.078	4,766	30.5	8,088	51.7	2,781	17.8	15,635	7,412	14,228	15,900	16,040	5,637	3,485	61.8	15,800	1,982	35.2	10,424	17,293				
	2124	378	43.5	319	36.7	319	36.7	869	.844	1,257	42.1	1,497	50.1	232	7.8	2,986	2,199	3,298	3,060	3,100	846	694	82.0	14,700	134	15.8	11,310	14,887				
	2125	501	77.9	66	10.3	96	14.9	643	.132	2,382	35.5	3,489	52.1	831	12.4	6,702	6,671	5,617	6,930	7,050	2,185	1,519	69.5	17,500	634	29.0	11,779	18,052				
	2126	579	73.5	37	4.7	114	14.5	788	.064	2,487	37.0	3,263	48.6	970	14.4	6,720	5,458	5,868	6,970	7,100	2,064	1,715	83.1	17,400	311	15.1	13,724	20,271				
	Subtotal	A217	70.4	577	9.6	1,107	18.5	5,986	.137	18,711	36.9	25,387	50.1	6,606	13.0	50,704	5,421	46,067	52,490	53,420	15,879	12,069	76.0	16,414	3,509	22.1	12,088	18,342				
3	2127	736	61.3	13	1.1	337	28.1	1,201	.018	4,174	38.2	5,515	50.4	1,245	11.4	10,934	5,827	10,232	11,090	11,170	3,374	2,268	67.2	14,100	1,044	30.9	10,692	17,169				
	2128	311	42.1	15	0	355	48.0	739	.048	3,240	47.8	2,634	38.9	898	13.3	6,772	5,865	6,275	7,010	7,130	1,928	1,145	59.4	8,300	676	35.1	6,701	9,582				
	2129	518	59.1	10	1.1	260	29.7	876	.019	3,209	44.6	3,496	48.6	487	6.8	7,192	5,254	6,603	6,950	6,830	1,982	1,540	77.7	13,600	394	19.9	10,252	15,495				
	Subtotal	1,565	55.6	38	1.3	952	33.8	2,816	.024	10,623	42.7	11,645	46.8	2,630	10.5	24,898	5,659	23,110	25,050	25,130	7,284	4,953	68.0	12,000	2,114	29.0	9,215	14,082				
4	2134	548	50.7	33	3.1	319	29.5	1,081	.060	4,114	39.1	5,422	51.6	975	9.3	10,511	6,223	9,878	9,850	9,520	3,217	2,334	72.6	14,200	817	25.4	11,103	16,510				
	2135	542	78.8	29	4.2	79	11.5	688	.054	2,565	36.0	3,587	50.4	965	13.6	7,117	6,620	6,827	6,520	6,210	2,269	1,797	79.2	14,600	436	19.2	10,374	17,354				
	2136	522	73.5	11	1.5	144	20.3	710	.021	2,849	35.9	4,224	53.2	868	10.9	7,941	7,158	7,159	6,980	6,490	2,647	1,665	62.9	13,400	931	35.2	10,623	15,241				
	2143	423	50.3	0	0	172	20.5	841	0	2,349	36.2	3,136	48.3	1,006	15.5	6,491	4,940	5,508	5,660	5,590	2,134	1,508	70.7	14,300	564	26.4	10,495	15,624				
	2144	491	76.4	0	0	13	2.0	643	0	2,654	33.8	3,915	49.9	1,273	16.3	7,842	7,805	7,510	6,830	6,320	2,803	1,746	62.3	13,200	957	34.1	9,167	15,381				
	Sub total	2,526	63.7	73	1.8	727	18.3	3,963	.028	14,531	36.4	20,284	50.8	5,087	12.8	39,902	6,444	36,682	35,840	34,130	13,070	4,050	69.2	13,940	3,705	28.3	10,347	16,022				
	total	10,013	62.1	940	5.8	3,927	24.3	16,133	.093	54,549	37.6	72,003	49.7	18,469	12.7	145,021	5,753	131,730	144,740	134,370	45,171	33,843	74.9	15,153	10,394	23.0	11,110	17,026				

Table 6 **DEER CREEK**

section	census tracts	LAND USE								DEMOGRAPHICS																			
										POPULATION												HOUSING						INCOME	
		Res. Acres	%	Rec. Acres	%	Open Space Acres	%	Total Acres	Ratio Rec. Res.	0 - 19 Years	%	20 - 59 Years	%	60 + Years	%	Total 1970 Pop	Density Pop Sq. Mi.	Est. 1976 Pop	Proj. 1980 Pop	Proj. 1985 Pop	Total Units	Owner Occ.	%	Median Value	Renter Occ.	%	Meso 1970 Income	Est. 1976 Mean Income
1	2170	158	54.5	0	0	72	24.8	290	0	1,266	29.3	2,249	52.1	799	18.6	4,314	9,523	3,601	4,390	4,430	1,773	671	37.8	12,100	1,043	58.8	7,233	11,202
	2171	85	34.8	31	12.7	105	43.0	244	.365	482	28.1	930	54.3	302	17.6	1,714	4,499	1,863	1,720	1,730	724	300	41.4	13,300	387	53.5	8,688	13,229
	2172	194	68.8	7	2.5	44	15.6	282	.036	1,015	29.6	1,844	53.8	569	16.6	3,428	7,773	3,960	3,790	3,980	1,336	741	55.5	12,500	550	41.2	8,544	12,750
	2191	422	86.5	15	3.1	32	6.6	488	.036	2,153	39.5	2,407	44.2	886	16.3	5,446	7,138	4,699	5,930	6,190	1,696	1,256	74.1	16,600	412	24.3	12,016	19,545
	2196	343	38.7	25	2.8	141	15.9	887	.073	1,696	28.8	3,275	55.5	926	15.7	5,897	4,255	5,533	6,050	6,120	2,106	1,182	56.1	16,900	865	41.1	9,508	17,590
	Sub total	1,202	54.9	78	3.6	394	18.0	2,191	.064	6,612	31.8	10,705	51.5	3,482	16.7	20,799	6,076	19,656	21,880	22,450	7,635	4,150	54.4	14,280	3,257	42.7	9,198	14,863
2	2173	256	47.9	27	5.1	88	16.5	534	.105	1,234	32.8	1,818	48.4	706	18.8	3,758	4,506	3,543	4,070	4,230	1,280	1,027	80.2	16,100	229	17.9	10,272	15,349
	2174	387	72.1	7	1.3	108	20.1	537	.018	2,185	32.5	3,684	54.8	850	12.7	6,719	8,027	5,851	7,170	7,400	2,708	1,051	38.8	22,200	1,488	54.9	10,379	16,345
	2188	674	85.5	7	0.8	67	8.5	788	.010	2,486	36.1	3,198	46.4	1,207	17.5	6,891	5,598	6,677	7,610	7,980	2,192	2,055	93.8	24,600	108	4.9	16,214	24,851
	2189	304	41.1	20	2.7	345	46.7	739	.066	2,772	38.1	3,478	47.8	1,025	14.1	7,275	6,299	6,786	8,020	8,410	2,255	1,882	83.5	16,800	327	14.5	11,075	18,032
	2190	123	28.3	18	4.1	269	61.8	435	.146	548	34.5	778	48.9	264	16.6	1,590	2,339	2,311	1,920	2,090	563	373	66.3	13,600	171	30.4	8,381	13,709
	2192	291	55.2	0	0	99	18.8	527	0	1,352	41.3	1,456	44.5	462	14.2	3,270	3,973	2,894	4,010	4,890	873	626	71.7	24,200	232	26.6	11,430	25,275
	2193	278	70.2	62	15.4	74	18.4	403	.223	1,009	39.1	1,103	42.8	466	18.1	2,578	4,092	2,759	3,120	3,400	845	601	71.1	16,700	212	25.1	11,036	18,757
	Sub total	2,313	58.4	141	3.6	1,050	26.5	3,963	.061	11,586	36.1	15,515	48.4	4,980	15.5	32,081	5,049	30,821	35,920	38,400	10,716	7,615	71.1	19,171	2,767	25.8	11,255	18,903
3	2154	2,018	79.1	158	6.2	171	6.7	2,551	.078	2,240	34.6	3,052	47.1	1,191	18.3	6,483	1,626	5,593	8,020	8,880	2,011	1,824	90.7	50,000+	171	8.5	36,560	54,286
	2175	1,667	56.0	316	10.6	1,096	36.8	2,975	.190	2,623	39.6	3,084	46.5	921	13.9	6,628	1,426	6,590	8,520	9,490	1,895	1,819	96.0	47,500	62	3.3	32,971	53,247
	Sub total	3,685	66.7	474	8.6	1,267	22.9	5,526	.129	4,863	37.1	6,136	46.8	2,112	16.1	13,111	1,518	12,183	16,540	18,370	3,906	3,643	93.3	48,750	233	6.0	34,766	53,767
A-30	total	7,200	61.6	693	5.9	2,711	23.2	11,680	.096	23,061	34.9	32,356	49.0	10,574	16.0	65,991	3,616	62,660	74,340	79,220	22,257	15,408	69.2	21,650	6,257	28.1	13,879	22,441

Table 7 GR[illegible]IS CREEK

section	census tracts	LAND USE								DEMOGRAPHICS																		
										POPULATION												HOUSING						INCOME	
		Res. Acres	%	Ind. Acres	%	Open Space Acres	%	Total Acres	Ratio Res./Ind.	0 - 19 Years	%	20 - 59 Years	%	60 + Years	%	Total 1970 Pop	Density Pop Sq. Mi.	Est. 1976 Pop	Proj. 1980 Pop	Proj. 1985 Pop	Total Units	Owner Occ.	%	Median Value	Renter Occ.	%	Mean 1970 Income	Est. 1976 Mean Income
1	2201	363	27.5	31	3.9	787	59.5	1,322	.085	3,336	31.8	5,460	52.1	1680	16.1	10476	6072	8412	10950	11190	3598	2694	74.9	16700	855	23.8	10387	16843
	2205	896	51.1	7	0.4	615	35.1	1,753	.008	5,558	37.6	7,711	52.2	1513	10.2	14782	5397	12392	15840	16390	4585	3656	79.7	19900	855	18.6	11661	18581
	2206.02	312	32.2	73	7.5	549	56.7	968	.233	2,781	41.5	3,499	52.2	426	6.3	6706	4434	6988	7750	8290	1931	1490	77.2	22500	421	21.8	12103	20707
	Sub total	1,571	38.9	111	2.7	1,951	48.3	4,043	.071	11,675	36.5	16,670	52.2	3619	11.3	31964	5060	27792	34540	35870	10114	7840	77.5	19700	2131	21.1	11384	18710
2	2200	646	74.3	18	2.1	192	22.1	869	.028	3,750	35.7	5,384	51.3	1369	13.0	10503	7735	9064	11050	11330	3403	2866	84.2	17700	498	14.6	11896	18545
	2206.01	332	22.4	117	7.9	855	57.7	1,481	.352	2,299	41.1	2,834	50.7	461	8.2	5594	2417	5356	8780	10430	1669	1320	79.1	19700	313	18.8	11167	17263
	2207.01	163	26.8	15	2.5	286	47.0	608	.092	1,033	35.2	1,575	53.6	329	11.2	2937	3092	4044	4250	4920	968	644	66.5	19900	285	29.4	12279	18992
	2207.02	285	56.8	7	1.4	192	38.2	502	.025	2,185	43.2	2,511	49.7	359	7.1	5055	6445	5240	6630	7450	1381	1297	93.9	20100	69	5.0	13441	21841
	2207.03	313	48.6	7	1.1	176	27.3	644	.022	1,343	43.7	1,519	49.5	209	6.8	3071	3052	3843	5300	6440	843	731	86.7	24900	101	12.0	13351	20960
	Sub total	1,739	42.4	164	4.0	1,521	37.1	4,104	.094	10,610	39.1	13,823	50.9	2727	10.0	27160	4235	27547	36010	40570	8264	6858	83.0	20460	1266	15.3	12427	19520
3	2208.01	549	49.3	4	0.4	509	45.7	1,113	.007	2,292	32.6	3,818	54.3	921	13.1	7031	4043	7115	7970	8450	2524	1511	59.9	27700	952	37.7	14217	23972
	2208.02	386	45.3	76	8.9	370	43.4	852	.196	2,044	38.8	2,751	52.3	470	8.9	5265	3955	5039	5280	5290	1652	1307	79.1	26900	292	17.7	13749	22258
	2208.03	614	55.8	19	1.7	295	26.8	1,100	.031	2,648	41.3	3,178	49.5	592	9.2	6418	3734	6189	6510	6560	1826	1712	93.8	29000	93	5.1	16369	25525
	Sub total	1,549	50.5	99	0.6	1,174	38.3	3,065	.012	6,984	37.3	9,747	52.1	1983	10.6	18714	3908	18343	19760	20300	6002	4530	75.5	27867	1337	22.3	14778	23918
4	2186	336	65.1	3	0.6	77	14.9	516	.008	1,343	41.3	1,477	45.5	428	13.2	3248	4252	3115	3420	3510	1006	700	69.6	16500	269	26.7	10543	17108
	2187	143	38.5	84	22.6	216	58.2	371	.587	571	35.5	689	42.8	349	21.7	1609	2776	1787	1640	1650	411	372	90.5	23400	35	8.5	12483	20968
	2194	773	81.9	22	2.3	121	12.8	944	.028	3,568	36.4	3,148	44.7	1332	18.9	7048	4778	6276	7360	7520	2173	2028	93.3	25300	111	5.1	17793	24562
	2209	327	71.7	4	0.8	26	5.7	456	.012	1,524	41.2	1,851	50.0	328	8.8	3703	5197	3752	3750	3780	1093	1021	93.4	18100	60	5.5	11548	20380
	2210	284	48.4	19	3.2	211	35.9	587	.066	2,109	44.1	2,208	46.2	463	9.7	4779	5210	4080	4790	4850	1398	1078	77.1	18100	262	18.7	11170	18666
	Sub total	1,863	64.8	132	4.6	651	22.7	2,874	.071	8,115	39.8	9,373	46.0	2899	14.2	20387	4540	19010	20960	21310	6081	5199	85.5	20280	737	12.1	12707	20337
	total	6,722	42.7	506	3.3	5,297	37.6	14,086	.075	37,384	38.1	49,613	50.5	11228	11.4	98225	4463	92692	111270	118050	30461	24427	80.2	21650	5471	18.0	12760	20449

LINEAR PARK PROJECT

DEMAND SURVEY

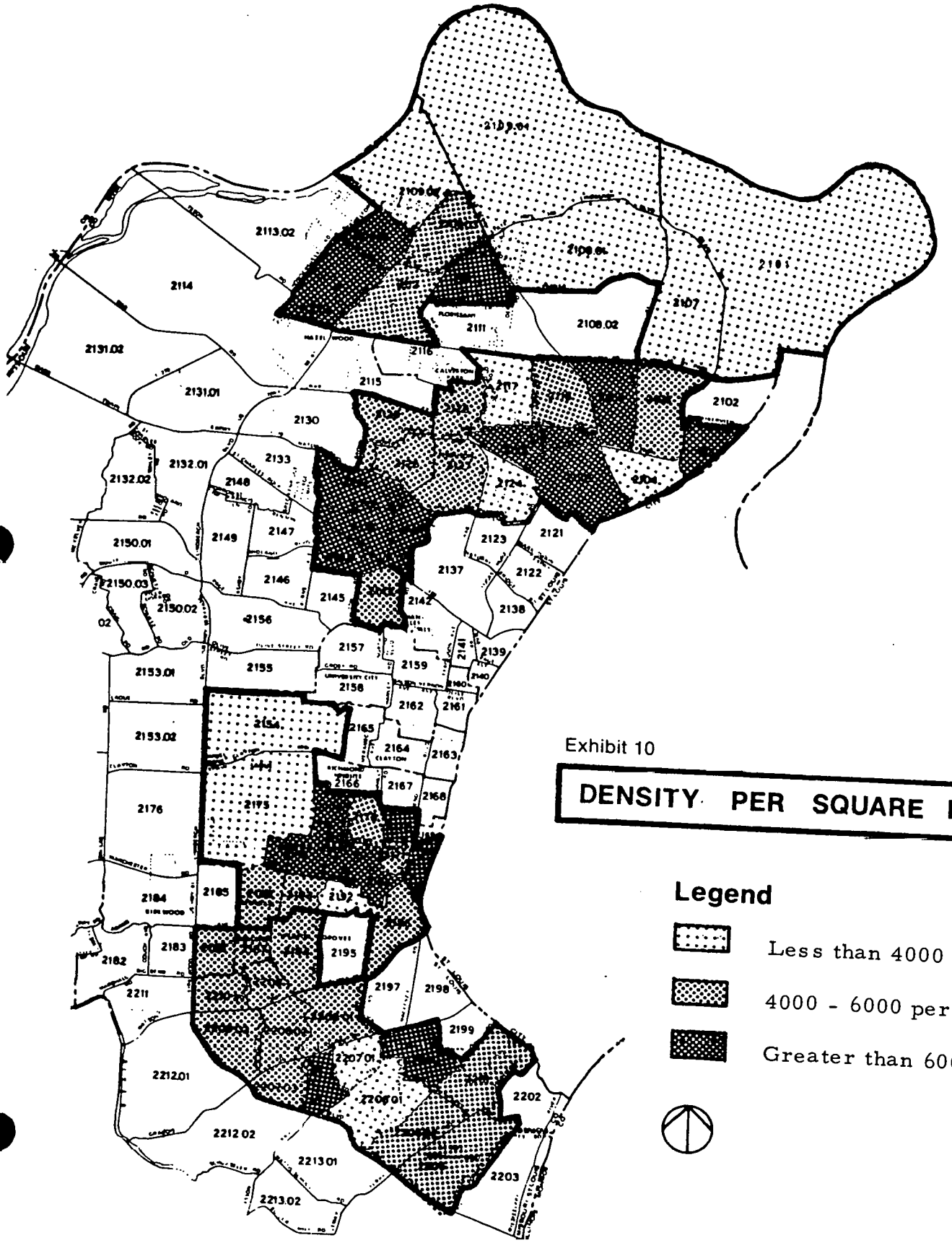


Exhibit 10

DENSITY PER SQUARE MILE

Legend

- Less than 4000 person
- 4000 - 6000 persons
- Greater than 6000 pers

LINEAR PARK PROJECT

DEMAND SURVEY

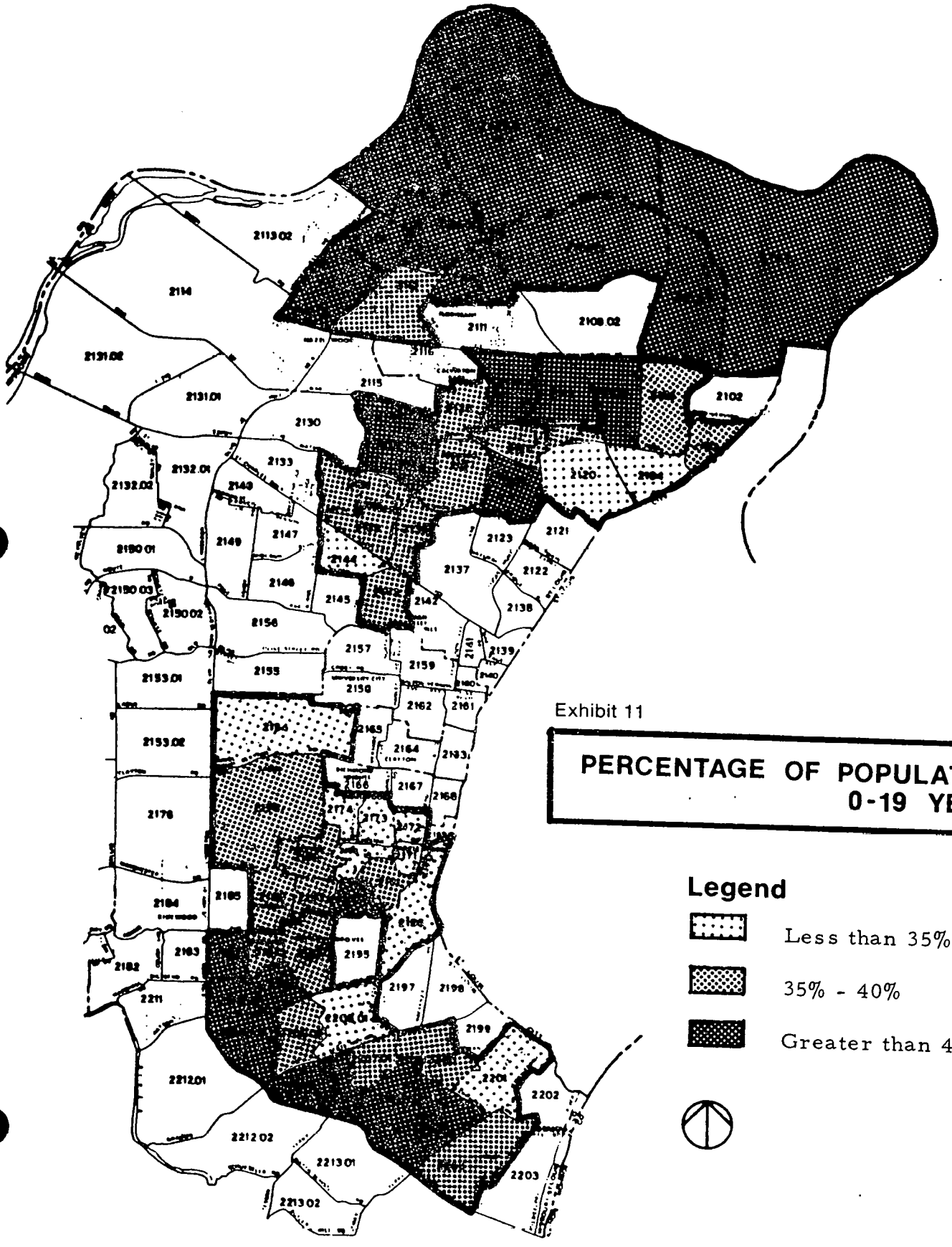


Exhibit 11

PERCENTAGE OF POPULATION 0-19 YEARS

Legend

- Less than 35%
- 35% - 40%
- Greater than 40%

LINEAR PARK PROJECT

DEMAND SURVEY

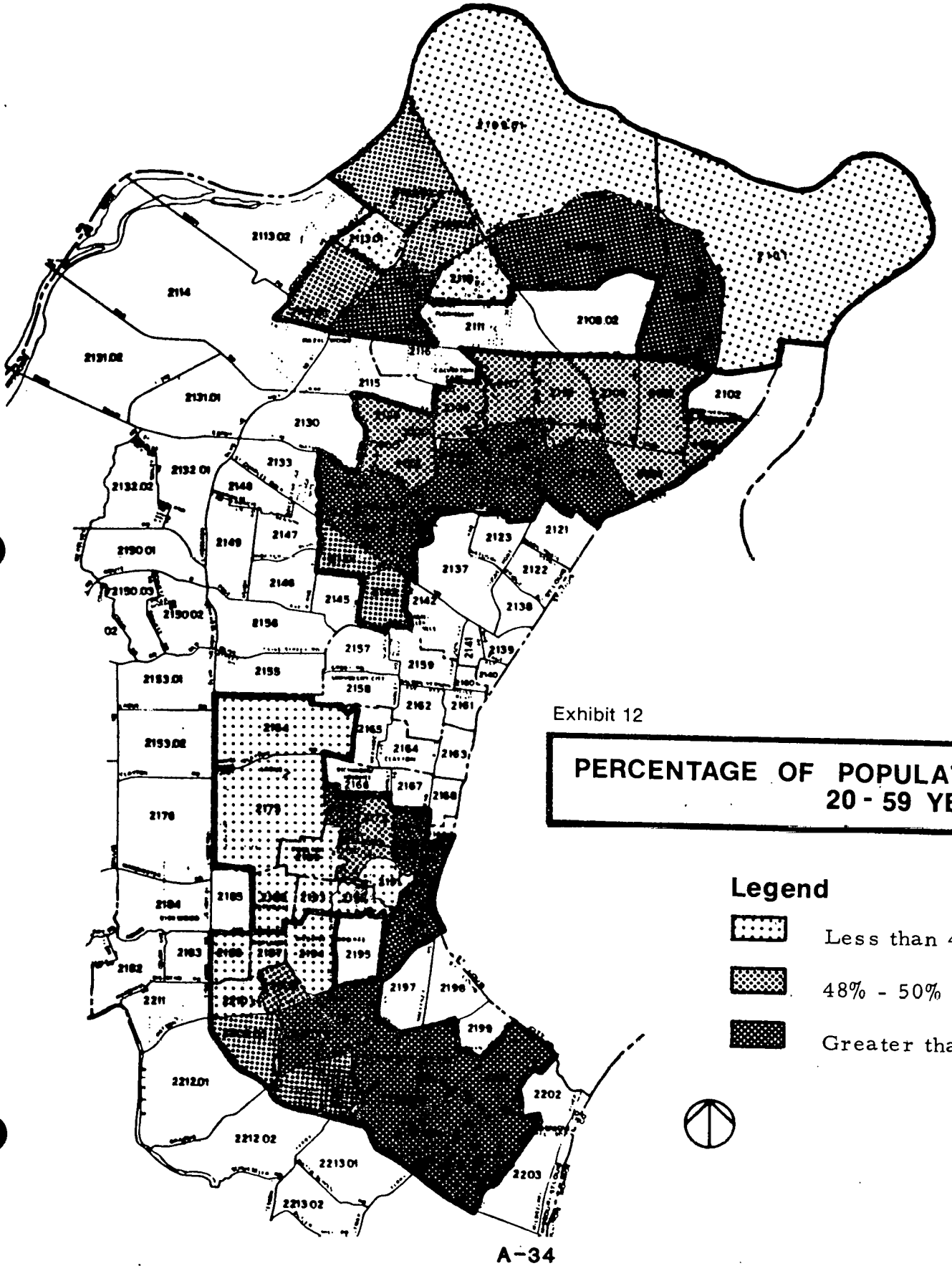


Exhibit 12

PERCENTAGE OF POPULATION 20 - 59 YEARS

Legend

- Less than 48%
- 48% - 50%
- Greater than 50%

LINEAR PARK PROJECT

DEMAND SURVEY

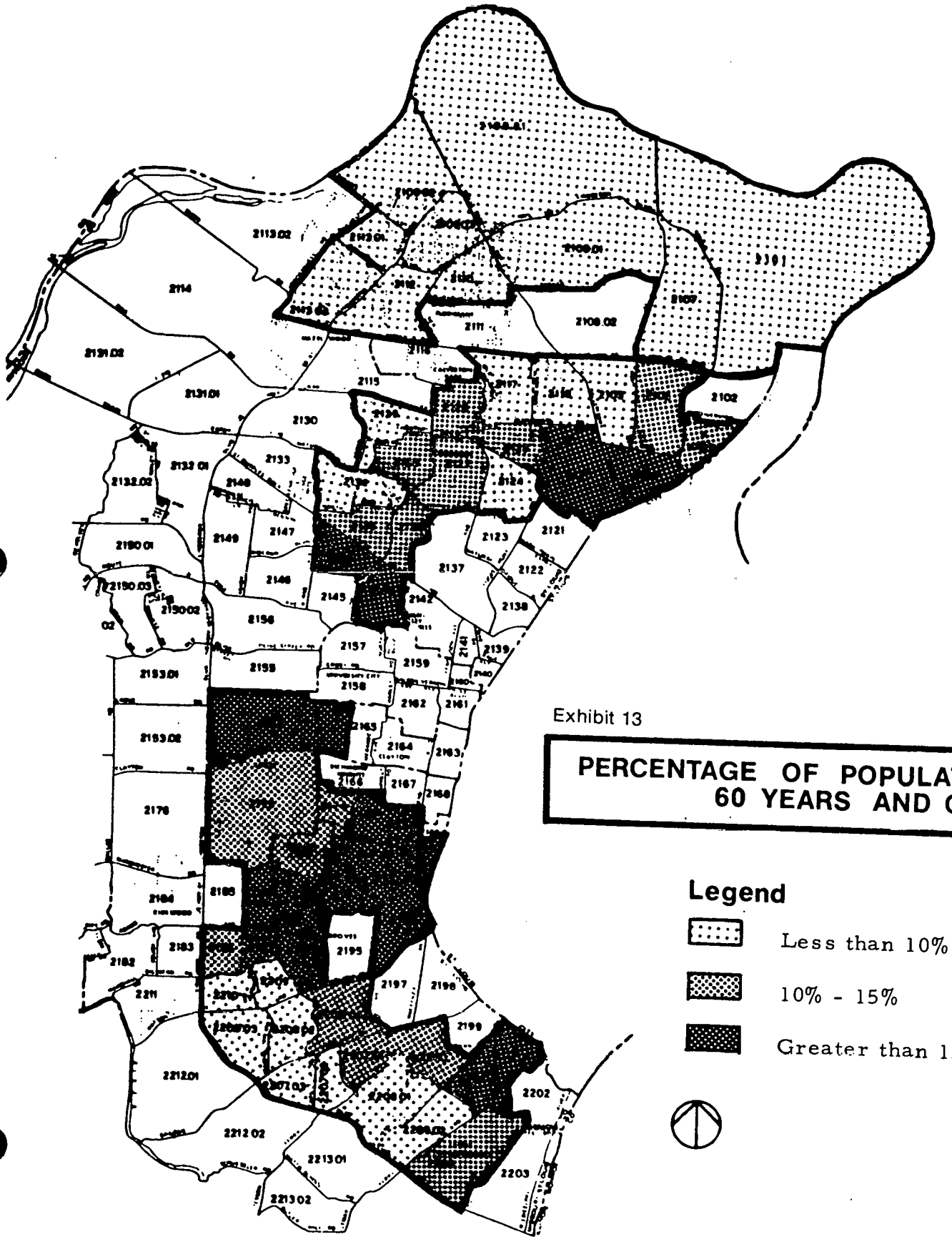


Exhibit 13

PERCENTAGE OF POPULATION 60 YEARS AND OVER

Legend

- Less than 10%
- 10% - 15%
- Greater than 15%

LINEAR PARK PROJECT

DEMAND SURVEY

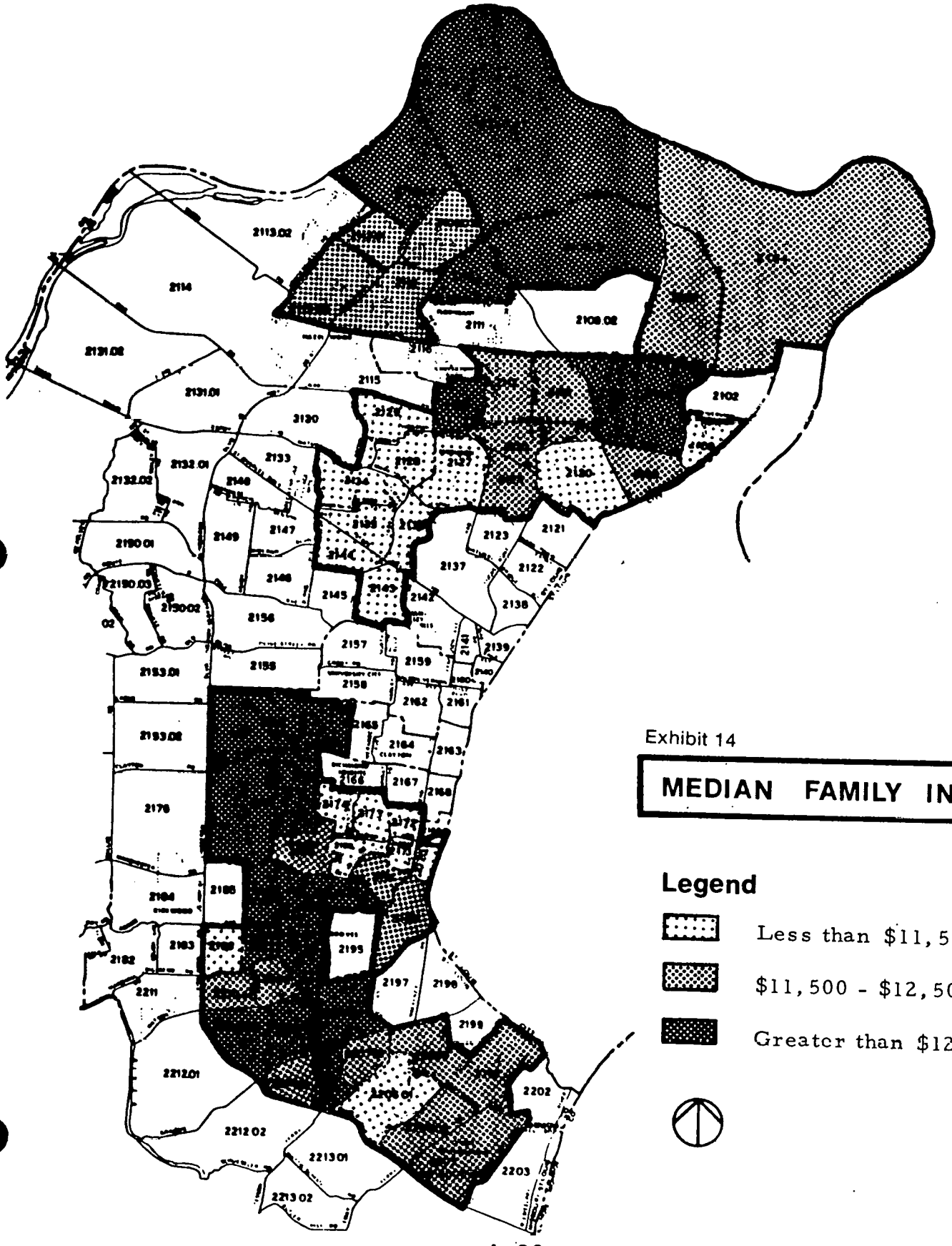


Exhibit 14

MEDIAN FAMILY INCOME

Legend

- Less than $11,500/ year
- $11,500 - $12,500 / year
- Greater than $12,500/ year

LINEAR PARK PROJECT

DEMAND SURVEY

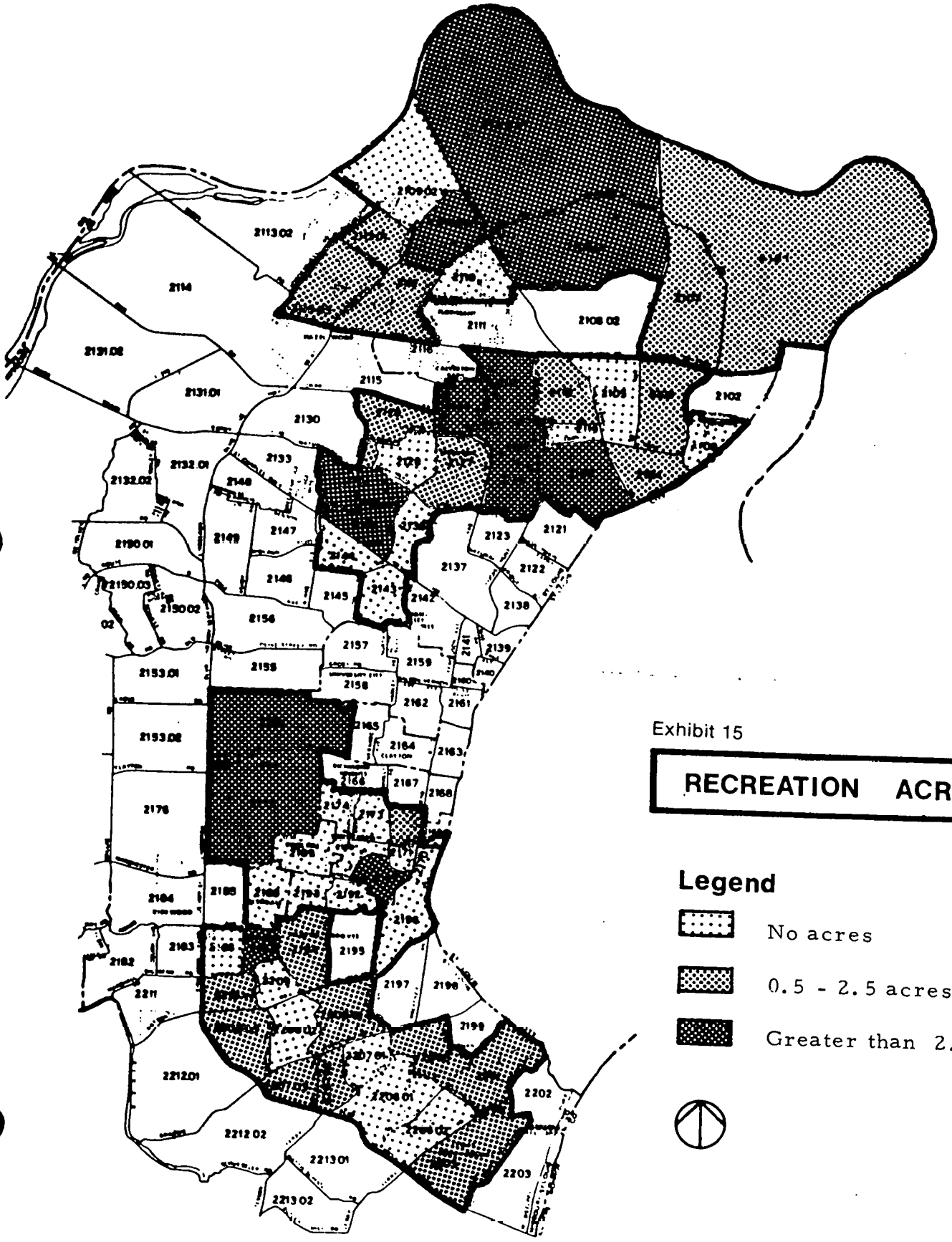


Exhibit 15

RECREATION ACREAGE

Legend

- No acres
- 0.5 - 2.5 acres
- Greater than 2.5 acres

LINEAR PARK PROJECT

DEMAND SURVEY

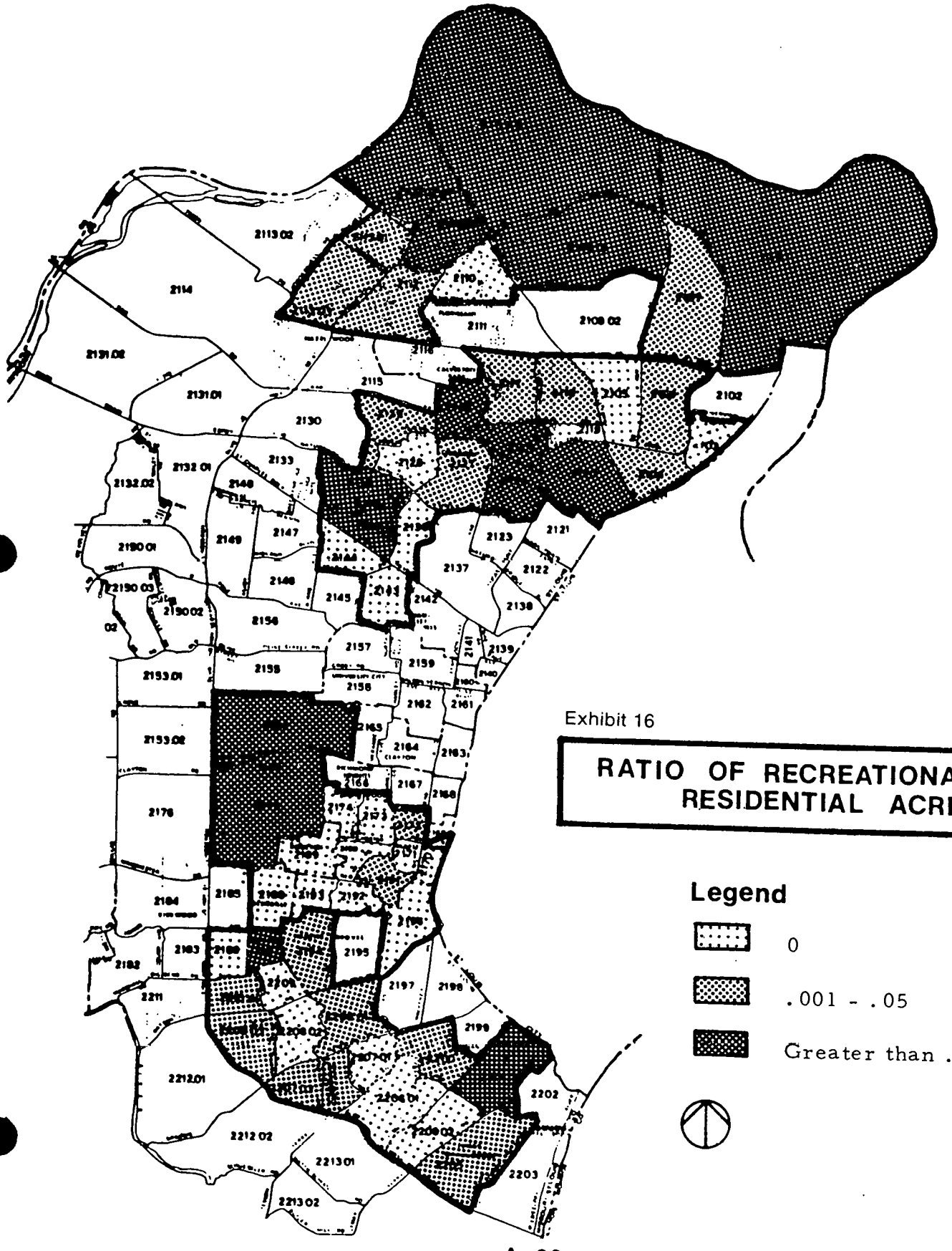


Exhibit 16

RATIO OF RECREATIONAL TO RESIDENTIAL ACREAGE

Legend

- 0
- .001 - .05
- Greater than .05

COLDWATER:

LAND USE:

OPEN SPACE — The area within the Coldwater Creek Corridor is the least developed of the four creek areas. Only section 4 has less than 80% of land in Open Space.

RECREATION — Coldwater has the highest overall percentage of total recreational acreage. Section 4, however, has the second lowest total park acreage within the entire project.

Section 2 has an inordinately high proportion of park acreage (22.4%). This high figure is attributed to the three large County Parks within the section: Champ, Sioux Passage, and Pelican Island with over 2,500 acres alone.

The other three sections have less than 2.5% of their land area devoted to recreation.

RESIDENTIAL — Section 4 is the only area of Coldwater with a significant proportion of residential acreage. All the other sections have less than 16% of area in residential development, while section 4 has 65%. Coldwater has the smallest percentage of total land area — 16.9% in residential use.

TOTAL AREA — Coldwater has the largest total service area acreage of the four creek areas.

DEMOGRAPHICS:

POPULATION — The population of the Coldwater area is the youngest of the four creek areas, with approximately 45% of the population under 20 years of age. Only 5.5% of the population is over 60 years of age. This is 1/3 to 1/2 the proportion of elderly in the other creek areas. The density along this creek area is significantly lower than any of the other creek areas.

HOUSING — The Coldwater area has the highest percentage of owner occupancy. The median value of housing is comparable with both Gravois and Deer.

INCOME — Estimated mean household income of $20,637 is the second highest income level of the four areas.

MALINE:

LAND USE:

OPEN SPACE — There are 3,927 acres of open space in the Maline area, which accounts for 24.3% of the total land area.

RECREATION — Sections 1 and 2 are fairly well endowed with parks and recreation acreage. However, sections 3 and 4 have 1.3% and 1.8% of land area devoted to recreation respectively. Section 3 has the smallest area of land devoted to recreation respectively. Section 3 has the smallest area of land devoted to recreation (38%) of any section within the four creek area.

RESIDENTIAL — Maline, with 10,013 acres of residential area, far surpasses the other three areas. It is also ranked first in the proportion of residential area to total area. The 4,217 acres of residential development within section 2 is the largest total of any section within the four creek park project.

TOTAL AREA — Maline ranks second in terms of total area

DEMOGRAPHICS:

POPULATION — Maline has the largest total population and the highest density. During the previous decade the area has experienced a population decline. Based upon population projections, the area will lose an additional 7% of the 1970 population by 1985.

HOUSING — Median value of housing in the Maline area is the lowest of the four creeks. Approximately 75% of the housing is owner occupied.

INCOME — The average household income along Maline is significantly lower than the other three creeks. Section 3 has the lowest household income of any section within the project area.

DEER:

LAND USE:

OPEN SPACE — The Deer Creek Area has the least acreage and the smallest percentage devoted to open space. Section 1 has less open space than any section within the project.

RECREATION — Sections 1 and 2 each have 3.6% of land area devoted to recreational use. Although Section 3 has 8.6% of its total area utilized for recreation, much of this is devoted to country clubs which are unavailable to the general public. The majority of public park acreage within section 3 is located in Tilles County Park.

RESIDENTIAL — Deer and Maline have a comparable proportion of land devoted to residential use. However, the 7,200 acre total is far less than that of Maline. Section 3 has a high proportion of land utilized for residences — 66.7%. This high proportion of residential land use should not be confused with high density. Many of the homes within this section are on lots of several acres in size. In fact, the density within this section of Deer Creek is the lowest within the project, with the exception of lower Coldwater Creek.

TOTAL AREA — The Deer Creek area is the smallest in terms of total acres.

DEMOGRAPHICS:

POPULATION — This area has the oldest population of the four creeks. Only 35% of the population is under 20 years of age, while 16% are over 60 years. Deer has by far the largest percentage of people over 60 years. The total population within the Deer Creek Area is the smallest of the four creeks.

HOUSING — The Deer Creek area presents an interesting dichotomy in regard to housing. Generally there is a high correlation between the value of housing and the percentage of owner occupancy. This is not the case in the Deer area where we have the highest median value and the lowest percentage of owner occupancy. This phenomenon can be attributed to the lower housing values and lower owner occupancy rates within Sections 1 and 2. The housing values in Section 3 are so high, with owner occupancy rates approaching 100%, that the housing situation for the total creek area is distorted.

INCOME — Overall Deer has the highest average household income. Here again we have the same disparate situation as we had in regard to housing. Section 1 has the second lowest income figure within the project area, while Section 3 has an average household income that is more than twice as high as any other section within the project.

GRAVOIS

LAND USE:

OPEN SPACE — Gravois ranks second in both the percentage and total area of open space. The largest proportions of open space are found closest to the mouth.

RECREATION — The lowest percentage of total area devoted to recreation average is found in the Gravois area. Section 3, with 0.6%, has the lowest proportion of recreational land use within the project area.

RESIDENTIAL — Gravois has the smallest total area utilized for residences, but the percentage of residential area ranks third. The proportion of residential land use increases as we progress from Section 1 to Section 4.

TOTAL AREA — Gravois has the third largest land area of the four creeks.

DEMOGRAPHICS:

POPULATION — Gravois has both the second highest population total (98,225) and the second highest population density (4,463/sq. mi.).

HOUSING — Approximately 80% of the housing is owner occupied, ranking Gravois close to the top in this category. The median value of housing is virtually the same as that of Deer Creek which ranks first. Unlike Deer, there are not the wide disparities of value within sections.

INCOME — The average household income of the Gravois area ranked third.

RECREATION ACTIVITIES CONSIDERED:

An analysis and definition of recreation activities considered is important in establishing the ground work for Demand calculations. The following Activity Definitions and standards have been separated into groups representing trail activities, water oriented recreation types, and passive or miscellaneous recreation:

TRAIL ACTIVITIES:

BICYCLING

DEFINITION — Bicycling done only for pleasure. Bicycling done for transportation purposes, even though enjoyment is derived, is excluded. Motorcycling is not included.

CRITERIA — A primary attribute associated with the linear park system is that trail development would provide alternative transportation routes to work, schools, and shopping. However, this demand analysis deals solely with recreation; therefore, no attempt is made to measure demand for bicycling as an alternative transportation source.

STANDARDS — Participation Rate — 31.40
Activity Occasions — 12,000 A.O./Mi./Yr.
NPRA Standard — .51 Mi./1,000 Pop.

HIKING

DEFINITION — Walking along an improved or established trail. Most frequently goal oriented — walking to a predetermined destination along a prescribed route. May include back packing.

CRITERIA — Paths generally unpaved through natural areas with minimal man-made facilities.

STANDARDS — Participation rate — 0.58
Activity Occasions — 2,310 A.O./Mi./Yr.
NPRA Standard — .26 Mi/1,000 Pop.

NATURE WALKING

DEFINITION — Includes walks for the purpose of observing plants, animals, photographing natural subjects, and the collection of specimens outside urban areas.

CRITERIA — Preservation of habitat with as little manmade intrusion as necessary.

STANDARDS — Participation rate — 3.15
Activity occasions — 17,820 A.O./Mi./Yr.
NPRA Standard — .26 Mi/1,000 Pop.

HORSEBACK RIDING

DEFINITION — Riding horses along trails through natural environments. This activity may be undertaken in conjunction with other activities such as nature observation or camping.

CRITERIA — Trails should be separated from bicycling and motorcycling trails. Trails should be designed and located so that droppings do not pollute streams.

STANDARDS — Participation Rate — 1.79
Activity Occasions — 3,382 AO/Mi./Yr.
NPRA Standards — 16 Mi./1,000 Pop.

JOGGING

DEFINITION — Running for purpose of exercise

CRITERIA — Varied landscape requirements. Gradual turns on steep slopes.

STANDARDS — None.

CROSS COUNTRY SKIING

DEFINITION — Traversing wilderness of varying topography on snow skis.

CRITERIA — Varied landscape requirements. Gradual turns on steep slopes

STANDARDS — Advanced — 6 1/4 miles length
Intermediate — 3 1/8 miles length
Beginning — 1/4 mile length
5,000 skis estimated in metro area

MOTORCYCLING

DEFINITION — Motorized two-wheel vehicles including trail bikes operated off public roadways. This activity may take place on designated tracks or trails or in open spaces or cross country.

CRITERIA — Incompatability of motorized and nonmotorized trail use requires separate trail system. Requires 1/4 mile buffer or 1/8 mile where topographic screening serves to reduce the noise, protecting adjacent property owners.

STANDARDS — Participation Rate — 0.96
Activity Occasions — 12,000 A.O./Mi./yr.

WATER ORIENTED:

CANOE FLOATING

DEFINITION — Non-motorized canoeing activity along free flowing streams. Progress is made either by paddling or just "floating" with the stream current.

CRITERIA — The volume of water during most of the year precludes any canoeing activity. However, structural modifications to some creek areas may make this activity possible.

STANDARDS — Participation Rate — 0.80
Activity Occasions — 1,800 A.O./Mi./Yr.
NPRA Standard — 1 Mi./25-50,000 Pop.

WARM WATER FISHING

DEFINITION — Taking fish for non-commercial purposes. Species include Bass, bluegill, catfish, crappie, and carp.

CRITERIA — Currently the four streams have pollution levels which are unacceptable. Water quality management programs could improve the habitat to acceptable standards

STANDARDS — Participation Rate — 4.33
Activity Occasions — 880 AO/Mi./Yr.

SWIMMING

DEFINITION — Total body immersion in a natural water body. Includes wading and associated activities such as sunbathing.

CRITERIA — As with warm water fishing, the water quality of the streams does not presently permit swimming. Water quality management programs may improve the situation to a point where swimming would be permissible thus relieving over-crowded and insufficient number of swimming pools.

STANDARDS — Participation Rate — 4.61
Activity Occasions — 1,650 AO/ft./Yr.
Calif. Standard — 25 Lin. ft/1,000 Pop.

WINTER SPORTS

CROSS COUNTRY SKIING — Previously mentioned

ICE SKATING

DEFINITION — Sliding over ice on shoes fitted with steel runners. Hockey also included.

CRITERIA — Structural modification could be utilized to supplement and expand pool areas to provide safe natural ice skating areas when temperatures permit.

STANDARDS — Participation Rate — 2.53
Activity Occasions — 2.5 AO/Sq. Ft./Yr.

SLEDDING & TOBOGGANING

DEFINITION — Sliding down a snow covered hill on a sled or toboggan.

CRITERIA — Large open areas free of obstructions — Topographic conditions which provide sufficient velocity, but are not precipitous.

STANDARD — Participation Rate — 1.27

MISCELLANEOUS & PASSIVE RECREATION

PLAYGROUNDS

DEFINITION — Areas provided with swings, slides, teeterboards, and sand boxes, climbing equipment and other such facilities.
CRITERIA — Should be located in safe areas near to picnicking sites and activity areas for older children and adults.
STANDARDS — Activity Occasions — 108,000 AP/A/yr.
DNR — 1/2 A/1,000 Pop.

PICNICKING

DEFINITION — Temporary outdoor eating and drinking activities, set up either soley for the enjoyment of eating outdoors, or also in conjunction with participation in other outdoor recreation activities.
CRITERIA — Unit facility is typically a table and benches, cooking grills, trash disposal containers, and shelters.
STANDARDS — Participation Rate — 5.39
Activity Occasions — 900 AO/Table/Yr.
NPRA — 8 tables/1,000 Pop.

BIRD WATCHING

DEFINITIONS — Observation of aviary and wildlife species and their habitat.
CRITERIA — Assumptions are that observations occur during free circulation through the environment rather than from a fixed point or blind.
STANDARDS — Participation Rate — 11.54

PLAYING OUTDOOR GAMES

DEFINITION — Includes both individual and team play with emphasis on active participation. Excluded are golf, tennis, target, and trap shooting and archery.
CRITERIA — Requires large open field areas.
STANDARDS — Participation Rate — 33.96
Activity Occasions — 12,000 AO/A/Yr.
NPRA — 2A/1,000 Pop

CAMPING

DEFINITION — Living out of doors in a tent, providing food, sleeping and cooking equipment. May also be done in conjunction with backpacking.
CRITERIA — Limited campsite development, potable water, latrines (fireplaces, picnic tables).
STANDARDS — Participation Rate 0.90
Activity Occasions — 360 AO/Site/Yr.
NPRA — 3.1 sites/1,000 Pop.

DEMAND CALCULATIONS

The calculation of demand has been based both on National Parks and Recreation Standards and participation rates for this region provided by the Missouri State Comprehensive Outdoor Recreation Plan. A comparison was made of both demand systems, with the more conservative figures used for each recreation activity. A demand study is intended to provide a guideline for planning park facilities. It is not intended to be a dogmatic final answer as to how recreation areas will be used. In any case, the demand for recreation facilities within these four areas far exceeds the ability of the four linear parks to satisfy that demand. A table of computations is provided for each activity with the following table providing the summary demand figures for each activity. All demand calculations are based upon 1980 population projections.

WATER ORIENTED																	
Fish	2072	mile	95	89	215	149	154	258	123	76	108	177	81	170	177	97	103
Canoe	21	mile	1	1	1	1	1	2	1	1	1	1	1	1	1	1	6
Swim	1131	ac-ft	46	67	110	76	79	132	63	90	55	90	42	87	91	50	53
WINTER ACTIVITIES																	
Skating																	
Skiing	4470	sfx100	195	184	442	305	317	531	254	363	222	364	168	350	364	199	212
Sledding																	
MISCELLANEOUS & PASSIVE																	
Picnic	2646	table	115	109	262	181	188	314	150	215	131	215	99	207	216	118	126
Camp	1102	site	48	45	109	75	78	131	63	90	55	90	41	86	90	49	52
Playgrounds	144	acre	6	6	14	10	10	17	8	12	7	12	6	11	12	7	7
Outdoor Games	884	acre	38	36	87	63	63	105	50	71	43	72	33	69	72	40	42
GENERAL RECREATION																	
Park	4416	acre	192	181	437	302	314	525	251	358	219	359	165	345	360	198	210

DEMAND EVALUATION

Since demand is a function of population, we can see that the creek sections with the highest demand levels correspond with those sections with the highest population totals.

Section 2 of Maline Creek has the highest recreation demand of any of the creek areas. Section 3 of Coldwater Creek ranks second. Sections 4 of Coldwater, 1 and 4 of Maline, 2 of Deer, and 1 and 2 of Gravois share relatively the same demand levels. Section 3 of Deer Creek and section 2 of Coldwater are the areas with the least demand for recreation.

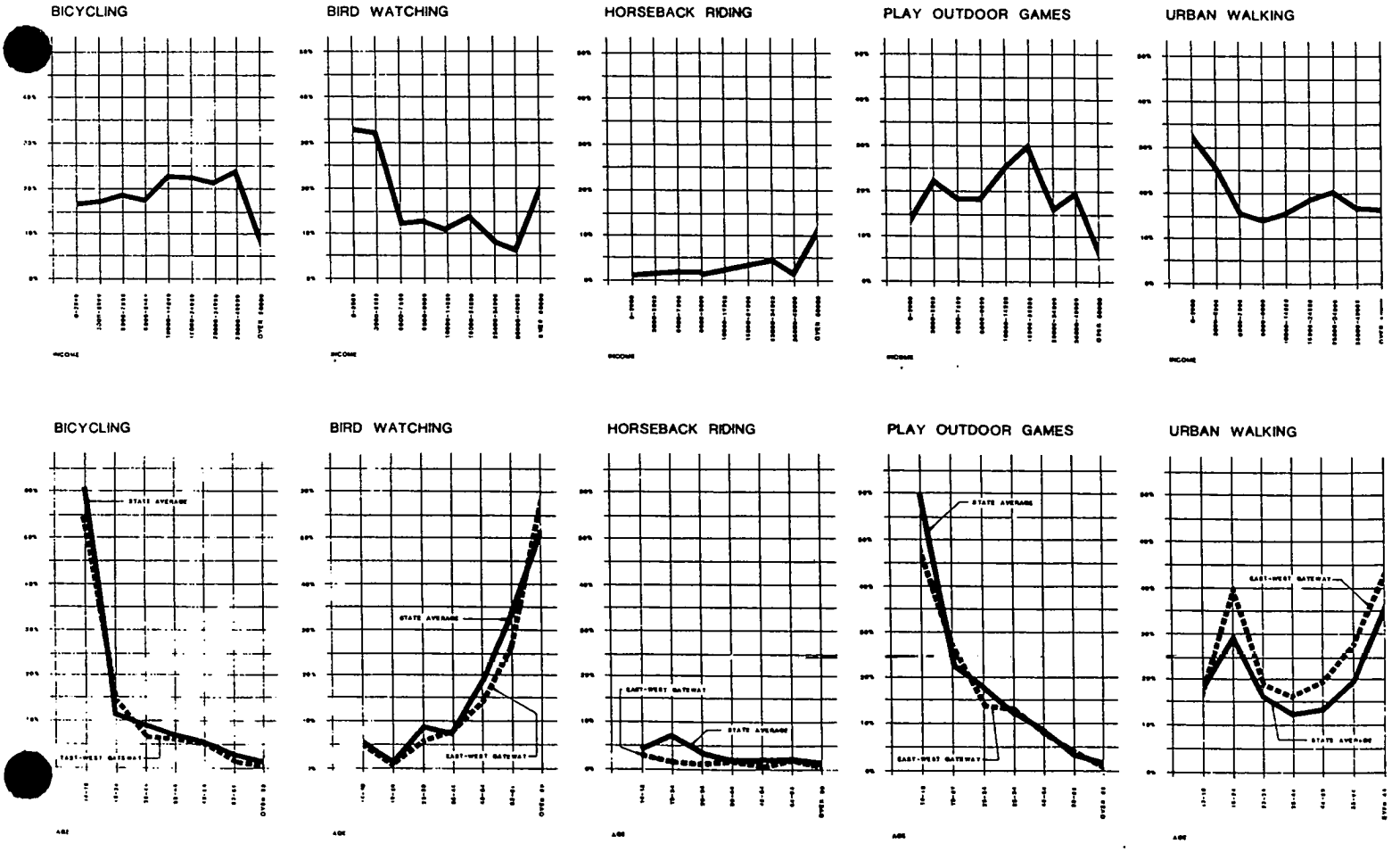
The demand summary table considers each recreation activity separately. There are some trail-oriented activities which can take place on the same trail and in conjunction with other trail activities. General hiking, nature walking, and jogging may tale place either on a paved or natural surface trail. Activities which require specific trail surfaces are horseback riding and cross country skiing, in these cases, a natural surface. Although bicycling does not require a paved surface, it is much preferred by the cyclist. Motorcycling must be separated from other trail-oriented activities. The difference in speed and the noise levels make this both a safety and aesthetic consideration.

Age and income profiles of recreational usage also provide an indication of activity levels which can be weighed against a particular population group. The following graphs provide a comparison of both age and income levels against the Missouri SCORP per capita participation rates.

An analysis of these profiles indicates the general across-the-board average of many forms of recreation regardless of age or income. However, bicycling participation as expected is much higher in the younger age groups, found most heavily concentrated on Coldwater Creek. Urban walking and bird watching both increase drastically with age. Outdoor games are predominantely occurring in the younger age groups.

Urban walking for pleasure is an activity largely dominated by lower income groups, while horseback riding increases dramatically with income.

Exhibit 17

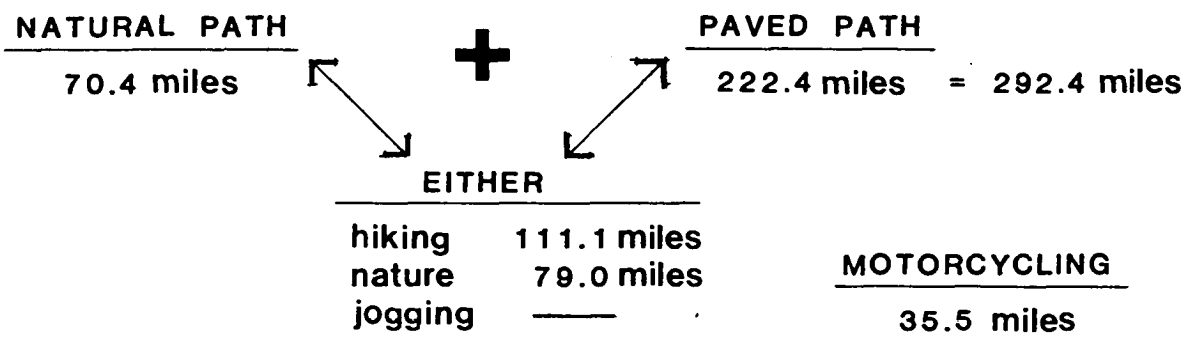


Based upon the summary table, there are 222.4 miles of bike trail required, 111.1 miles of hiking trail, 79 miles of nature trail, 70.4 miles of equestrian trials, and 35.5 miles of motorcycling trails. Demand figures for cross country skiing are underterminable at this time because of the new surge of activity in this area and consequent lack of P.R. s or standards.

Although the number of cross county participants is relatively insignificant today, meteoric rises in popularity are expected in the Midwest in the next four years.

Assuming that all bike trails will be paved, there is a demand for 222.4 miles of paved trail. The 70.4 miles of natural surfaced equestrian trails make a total of 292.4 miles of soft and hard surface trails. The total demand for other trail oriented mileage, nature and hiking, is 190.1. This 190.1 miles of general trail usage can be accommodated within the 292.4 miles of specified trail usage.

TRAIL COMPATABILITY



Due to the fragile nature of some of the areas which would be set aside as nature study areas, it is important that these trails not be designed as multipurpose trails. They should be natural surface trails too small for equestrian use. These and other design considerations would reduce traffic and help to preserve the natural ecosystem.

A check of these demand figures was provided by a questionnaire which was distributed to a random sampling of residents within the four creek areas. As a result of this questionnaire, it was possible to determine the percentage of people participating in various recreation activities. General walking was the most popular activity, with 60.1% participating. This activity was followed by swimming with 58.3%, picnicking with 54.8%, bicycling with 53.6%, and hiking with 42.3% participating.

HANDICAPPED

As mentioned in the introduction, there are approximately 100,000 handicapped people within the St. Louis area. These people have a preference for the same type of recreation activities as the general public. Table 9 provides a preference rating for recreational activities for the handicapped.

The County Parks & Recreation Attitude Awareness and Needs Survey provides additional information regarding recreation demand by the handicapped. Throughout the County, 16.8% of survey respondents indicated that they were interested in participating in programs for the handicapped. The responses were divided into sections of the County. They ranged from 29.2% in South County to 8.2% in West County. The survey also included a series of questions designed to determine the type of general facilities which needed improvement. The response of all people surveyed indicated that 58.8% thought that it was "very important" to improve handicapped facilities; 31% indicated that improvement of handicapped facilities was "somewhat important"; and only 8.2% of the respondents indicated that improving handicapped facilities was "not important".

Although these questionnaire responses do not make up a statistically valid sample, they compare favorably with participation rates for this region, published in the Missouri State Comprehensive Outdoor Recreation Plan, and serve to validate their use in calculating demand for the project.

Table 9

RATING OF RECREATIONAL ACTIVITIES FOR THE HANDICAPPED*

ACTIVITIES LISTED

Swimming	3.7
Group Games	3.4
Crafts	3.4
Picnicking	3.4
Resident Camping	3.3
Singing	3.2
Fishing	3.1
Nature Studies	2.9
Dancing	2.6
Tent Camping	2.6
Softball	2.5
Volleyball	2.4
Hiking	2.4
Archery	2.3
Boating	2.3
Basketball	2.2
Horseback Riding	2.1
Drama	2.1
Horseshoes	2.1
Day Camping	1.8
Tennis	1.5

ACTIVITIES SUPPLIED BY RESPONDENTS

Bus, Train & Car Tours	4.0
Movies	3.8
Bowling	3.0
Scouting	3.0
Football	3.0

*The rating was placed on a 4.0 scale. The groups that responded are: general foundation, muscular handicapped, mentally retarded, blind and deaf.

INVENTORY

Before a need for new facilities can be determined, it is important to weigh what facilities exist in relation to the facilities demanded. This inventory of facilities was based upon existing inventories compiled by the Department of Parks and Recreation and by East-West Gateway Coordinating Council. Available inventories were determined from responses to questionnaires distributed to municipalities throughout the County. Information was recorded by creek section and is available in Table 10.

The most crucial consideration when considering recreation needs is, first of all, the amount of acreage devoted to parks and recreation. Inventory information is based on a 1970 East-West Gateway land use study. It was updated, using the 1978 St. Louis County Department of Parks and Recreation inventory.

The Coldwater Creek Area has 3,389 acres of recreational acreage; Maline area has 860 acres; Deer Creek area has 693 acres; and Gravois area has 506 acres. In two instances, these figures are deceiving. The 3,389 total acres on Coldwater include 2,850 acres in Section 2. Of this total 2,260 acres are Pelican Island, which was recently acquired by the County Park Department. Although this is a huge tract of land, it is undeveloped and relatively inaccessible to most county residents. In addition, the island is inundated periodically during spring floods. The island should more appropriately be considered solely as open space, leaving the Coldwater area with 539 acres of recreation area.

Supporting material for the demand survey was also provided in the St. Louis County Department of Parks and Recreation Attitude Awareness and Needs Survey. Based upon the county survey, over 80% of the respondents indicated that local neighborhood and district parks were the most important to their families. One of the statements in the survey was "more public park land should remain in a natural condition". 58.8% of the respondents indicated that they strongly agreed" with the statement; 35.8% indicated they "somewhat agreed"; 4.4% said they "somewhat disagreed"; and only 1% "strongly disagreed". Another question asked was "What activities would attract you to St. Louis County recreation complexes more often?" The responses indicated that 19.4% were attracted by outdoor educational programs; 12.9% were attracted by nature educational programs; 11.1% by hikes; 15.1% by fishing; and only 4.5% were attracted by bike tours.

Within the Deer Creek Area, private country clubs make up a great majority of the 693 acres. It is not recommended that this acreage be deleted from the total for recreation acreage. But it must be remembered that these areas are not available to the general public.

The four creek areas contain a total of 29 miles of maintained trail. There are 11.6 miles in the Coldwater Area — 9.6 miles of which are in Sioux Passage Park. These trails are used for horseback riding, hiking, and nature study. The Maline area has only 3.1 miles of trail which include 1.8 miles of multi-purpose asphalt trail in Bellefontaine County Park, 3/4 mile wood chip hiking trail in Wilderness Park, and a 1/2 mile asphalt trail around Ramona Lake. Deer has a total of 3 miles of trail maintained by the municipalities of Brentwood, Maplewood, Shrewsbury, and Webster Groves. There are 9.3 miles of trail in the Gravois area, all of which are maintained by the City of Crestwood. Eight miles of trail are located in Whitecliff and Crestwood Parks. They are used for horseback riding and hiking.

Camping and hiking are considered associated recreation activities. For this reason, camping has been included in the demand survey, although camping is not generally considered an urban recreation activity. Currently there are only 12 tent campsites within the project area. Five of these sites are located in Sioux Passage Park in the Coldwater area. There are 7 tent sites in Brentwood Memorial Park in the Deer Area.

Canoeing activity may be a vaiable alternative on some stream segments, especially with some structural modifications. *There are no opportunities for stream canoeing within the project area, at this time.*

Swimming is one of the most popular of recreation activities, yet there is a significant lack of swimming pools in all areas of St. Louis County. The Parks and Recreation Department operates three pools. However, these are all located in the suburban fringe areas outside the project area. There are no natural water bodies utilized for swimming within the project area.

Ice skating is a popular winter sports activity. This interest is reflected in the large number of hockey leagues in the St. Louis area. Much of this interest may be attributed to the presence of a National Hockey League team and a major college hockey team in St. Louis. Recently there have been a number of indoor ice rinks constructed by municipalities. There are two rinks each in the Coldwater and Deer areas. Gravois and Maline have one rink each.

The availability of warm water fishing locations is limited to county and municipal parks. In the Coldwater area, there is fishing in the following park lakes: Spanish Lake, Sioux Passage, Blackjack, and St. Ferdinand. The Maline area has three parks with lakes: January, Wabash, Ramona, and Lake Arrowhead. The only public fishing access in the Deer Creek area is Tilles Park. There is also only one public fishing location along Gravois. This is located at Sappington House.

An inventory of areas appropriate for passive and miscellaneous recreation activities is unavailable due in large part to the informaility of these activities and the lack of facilities provided for them.

Table 10 **EXISTING RECREATION FACILITIES**

	Park Acres	Trails (paved)	Trails (unpaved)	Tent Sites	Playground Acres
COLDWATER					
Section 1	311	2	0	0	1.5
Section 2	2850	0	9.6	5	3.5
Section 3	181	0	0	0	12.3
Section 4	47	0	0	0	4.3
TOTAL	3389 A	2 mi.	9.6 mi.	5	21.6 A
MALINE					
Section 1	172	1.8	.8	0	11.0
Section 2	577	0	0	0	10.5
Section 3	38	.5	0	0	7.5
Section 4	73	0	0	0	4.0
TOTAL	860 A	2.3 mi.	.8mi.	0	33.0A
DEER					
Section 1	78	3	0	0	4.1
Section 2	141	0	2	7	10.2
Section 3	474	0	0	0	5.5
Section 4	693 A	3 mi.	2 mi.	7	19.8A
TOTAL					
GRAVOIS					
Section 1	111	0	0	0	5.3
Section 2	164	0	0	0	3.3
Section 3	99	0	8	0	2.5
Section 4	132	1.3	0	0	3.8
TOTAL	506 A	1.3 mi.	8 mi.	0	14.9A

SOURCE:

East-West Gateway "Where to Play"

County Parks and Recreation "Inventory of Recreational Facilities"

There is only one designated bird sanctuary within the project area. It is located in the Maline Creek area within the City of Bellerive. On Coldwater Creek, the undeveloped common ground of Lake James Manor is used by the subdivision residents as a bird sanctuary. The Tretolite property on the north side of Deer Creek is also used as a bird identification area by the Webster Groves Nature Society.

The information available concerning playground area is inconsistent. Part of the data is available in terms of acres of playground. Other data is available listing only playground sites, with no reference to acreage. Based on acreage figures for parks given on estimates of school playground areas, a total acres figure was determined. Coldwater has approximately 21.5 acres; Maline, 33 acres; Deer, 19.7 acres; and Gravois, 142 acres of playground.

There is no adequate data to inventory number of picnic facilities within the project area. The East-West Gateway inventory does not include any data on picnic facilities. The St. Louis County Parks inventory only indicates if there are picnic facilities within park areas. There is no indication of the number of picnic areas within each park or the number of picnic tables or grills. Consequently, there has been no attempt to measure picnic facilities.

HANDICAPPED INVENTORY:

There are very few recreational facilities for the handicapped in St. Louis County. The Jacob L. Babler outdoor Education Center for the Handicapped provides camping accommodations for 81 persons in Babler State Park. The City of Kirkwood has developed a trail for the blind in Emmenegger Park. Rock Hill has a therapeutic pool and sauna. In addition, Table 11 provides a listing of municipal services for the handicapped. Table 12 provides a list of public and private recreational programs for the handicapped.

Table 11

MUNICIPAL SERVICES FOR THE HANDICAPPED

ST. LOUIS COUNTY	MEETING SPACE FREE USE OR REDUCED RATE	RESERVES FACILITY FOR PROGRAM DIRECTED BY PRIVATE AGENCY	FACILITY DESIGNED FOR EXCLUSIVE USE OF HANDICAPPED	COOPERATIVE SUMMER PROGRAM WITH PRIVATE AGENCY	SOME OR ALL FACILITIES DESIGNED TO ACCOMMODATE HANDICAPPED	SPECIAL PROGRAM OPERATED BY THE MUNICIPALITY
Bellefontaine Neighbors		●				
Berkeley					●	
Brentwood					●	
Crestwood					●	
Country Club Hills	●					
Ferguson		●		●		
Florissant					●	
Hazelwood					●	
Kirkwood			●	●	●	●
Maplewood	●	●				
Rockhill			●		●	●
St. Ann					●	

Table 12

PUBLIC AND PRIVATE RECREATION PROGRAMS FOR THE HANDICAPPED

AGENCY/ORGANIZATION*	CAMP NG	RECREATIONAL PROGRAMS	INFORMATION ON SPECIAL PROGRAMS	SPECIAL EVENTS	GENERAL ACTIVITY DESIGNED FOR HANDICAPPED
Archidocese of St. Louis Department of Special Education	●		●		
Jacob Babler Outdoor Recreation Center for the Handicapped	●				
Catholic Youth Council	●				
Diabetes Association	●				
Easter Seals Society	●	●	●	●	●
Girl Scout Council	●			●	
Bi-State Hemophilia Association	●				
Jewish Employment & Vocational Service			●		
Ranken Jordan Home for Canvalescent Crippled Children		●			
Mount St. Rose Hospital		●			
Multiple Sclerosis Society			●		
Muscular Dystrophy Association of St. Louis	●	●	●		
St. Charles County Association for Retarded Citizens	●	●	●		
St. Louis Association for Retarded Children	●	●	●	●	
St. Louis Board of Education		●			
Sherwood Forest Camping Service	●		●		
Therapeutic Horseback Riding					●
United Cerebral Palsy Association	●				

*Information gathered from the United Way *Directory of Community Services*.

INFORMATION ANALYSIS/DETERMINATION OF NEED

This final section incorporates the material presented previously in order to determine the *need* and priorities for new recreation facilities along each of the four creeks. By comparing the supply of existing facilities with those demanded by the community, this determination of need can be accomplished. Recreation Facility Need Tables present in tabular form measurements of demand, supply, and need.

As a set of sample recreation activities, only those forms for which accurate inventory statistics are available have been developed here. An assessment of need also must take into account those recreation forms for which no inventory or only sketchy information is available. Therefore, the conclusions drawn are predicated on demand calculations, with an interpretation of known existing facilities or general trends towards recreation activities.

Table 13

	COLDWATER			MALINE			DEER			GRAVOIS		
	Demand	Supply	Need	Demand	Supply	Need	Demand	Supply	Need	Demand	Supply	Need
PARK (Acres)												
Section 1	192	311	-119	314	252	62	219	78	141	345	111	234
Section 2	181	2850	-2669	525	577	-52	359	141	218	360	164	196
Section 3	436	181	255	251	38	213	165	474	-309	198	99	99
Section 4	302	47	255	358	73	285	-	-	-	210	132	78
TOTAL	1111	3389	-2278	1448	940	508	743	693	50	1113	506	607
PAVED TRAILS (Miles)												
Section 1	9.8	2	7.8	16.0	1.8	14.2	11.2	3	8.2	17.6	0	17.6
Section 2	9.3	0	9.3	26.8	0	26.8	18.3	0	18.3	18.4	0	18.4
Section 3	22.3	0	22.3	12.8	.5	12.3	8.4	0	8.4	10.1	0	10.1
Section 4	15.4	0	15.4	18.3	0	18.3	-	-	-	10.7	1.3	9.4
TOTAL	56.8	2	54.8	73.9	2.3	71.6	37.9	3	34.9	56.8	1.3	55.5
UNPAVED TRAILS (Miles)												
Section 1	3.0	0	3.0	5	.8	4.2	3.5	0	3.5	5.5	0	5.5
Section 2	2.9	9.6	-6.7	8.4	0	8.4	5.7	2	3.7	5.8	0	5.8
Section 3	6.9	0	6.9	4.0	0	4.0	2.6	0	2.6	3.2	8	-4.8
Section 4	4.8	0	4.8	5.7	0	5.7	-	-	-	3.4	0	3.4
TOTAL	17.6	9.6	8.0	23.1	.8	22.3	11.8	2	9.8	17.9	8	9.9
CAMPING (Tent Sites)												
Section 1	48	0	48	78	0	78	55	0	55	107	0	107
Section 2	45	5	40	131	0	131	90	7	83	112	0	112
Section 3	109	0	109	63	0	63	41	0	41	61	0	61
Section 4	75	0	75	90	0	90	-	-	-	65	0	65
TOTAL	277	5	272	362	0	362	186	7	179	345	0	345
PLAYGROUNDS (Area - Acres)												
Section 1	6.3	1.5	4.8	10.3	11	-.7	7.2	4.1	3.1	11.4	5.3	6.1
Section 2	6.0	3.5	2.5	17.3	10.5	6.8	11.9	10.2	1.7	11.9	3.3	8.6
Section 3	14.4	12.3	2.1	8.3	7.5	.8	5.5	5.5	0	6.5	2.5	4.0
Section 4	10.0	4.3	5.7	11.8	4.0	7.8	-	-	-	6.9	3.8	3.1
TOTAL	36.7	21.6	15.1	47.7	33.0	14.7	24.6	19.8	4.8	36.7	14.9	21.8
MOTORCYCLE TRAILS (Miles:												
Section 1	1.5	0	1.5	2.5	0	2.5	1.8	0	1.8	2.8	0	2.8
Section 2	1.5	0	1.5	4.2	0	4.2	2.9	0	2.9	2.9	0	2.9
Section 3	3.5	0	3.5	2.0	0	2.0	1.3	0	1.3	1.6	0	1.6
Section 4	2.4	0	2.4	2.9	0	2.9	-	-	-	1.7	0	1.7
TOTAL	8.9	0	8.9	11.6	0	11.6	6.0	0	6.0	9.0	0	9.0

Park Acreage

GRAVOIS

This creek exhibits the greatest deficit of park acreage within the project area (607 acres). Two-thirds of the park acreage needed along Gravois is in sections 1 and 2. A portion of the deficit in section 1 will be remedied by the development of the MSD tract east of Interstate 55.

MALINE

The deficit in the Maline area approaches the level of need in Gravois, with 508 acres needed. Maline has the greatest total demand for park acreage; however, Bellefontaine County Park provides more than 1/5 of the total supply of park acreage along the creek. The recreation acreage within section 2 totaled 577 acres, which provides a surplus of 52 acres.

Section 4 has the greatest deficit of any section within the project area.

DEER

The Deer Creek area needs only 50 acres of additional park land. Sections 1 and 2 need 359 acres, but this is offset by a surplus of 309 acres in section 3.

COLDWATER

This is the only creek area with a surplus of recreation land. Pelican Island, Champ, and Sioux Passage Parks, along with other recreation areas in section 2, create a surplus of 2,669 acres. County parks also help to create a surplus of 119 acres in section 1. Sections 3 and 4 each have a deficit of 253 acres, which is the second highest total within the project. These high deficit areas do not offset the surplus of sections 1 and 2, leaving a total surplus of 2,278 acres.

Priorities

1. Section 4 of Maline Creek has the greatest deficit of recreation acreage within the project area. It has the second highest population density.
2. Sections 3 and 4 of Coldwater Creek each have a deficit of 253 acres, the second highest within the four creek areas. Section 4 has both the highest population density and 2nd lowest recreation acreage of the four creeks.
3. Section 1 of Gravois has a deficit of 234 acres. The development of the MSD property with 65 acres would alleviate some of this deficit.
4. Section 3 of Maline is a densely populated section, with the lowest recreation acreage within the project. Although its total recreation land deficit of 213 acres trails section 2 of Deer which has a 218 acre deficit, the corridor in this section of Deer is in a heavily industrialized area.
5. Deer Creek section 2 has both a high density and a large population.
6. Section 2 Gravois also exhibits a high population density and a corresponding high recreational acreage need.

SUMMARY

Overall, the Maline Creek area has the greatest need for future park development. If not for the large number of parks in section 2 which create a surplus of recreation acreage, Maline would easily outdistance the other creeks in total deficit.

Gravois, even though it has only one section with a large recreation land deficit, needs additional park area throughout the length of the corridor. It should rank second of the four creeks within the project.

Third in needed park development should be Coldwater. Although the total area shows a surplus of recreation area, sections 3 and 4 need new park development as badly as any section within the project area.

Recreation development within the Deer Creek area should be limited to sections 1 and 2.

TRAIL DEVELOPMENT

MALINE

This area has the greatest need for trail development within the project area, with 71.6 miles of paved and 22.3 miles of unpaved trail needed. Presently there are only 3.1 miles of maintained trail in the area. The total of 93.9 miles of trails needed exceeds the second largest trails needed figure on Gravois by approximately 1-1/2 times.

GRAVOIS

The total trails needed are 65.4 miles, 55.5 miles of paved trail, and 9.9 miles of unpaved trail. Gravois now has 9.3 miles of trail, only 1.3 miles of which are paved.

COLDWATER

There are 62.8 miles of trail needed along this creek. The need for 34.8 miles of paved trail is very close to the need on Gravois. Eight miles of unpaved trail are also needed. Presently there are 9.6 miles of unpaved trail in section 2, creating a surplus of 6.7 miles. These trails are in Sioux Passage County Park, and provide no link with the creek corridor.

DEER

The Deer Creek area has a need for 44.7 miles of trail, 34.9 miles of which should be paved. Deer has 3 miles of paved trail, which rank its supply first of the four creeks, compared to the others with 2.3, 2, and 1.3.

Priorities

1. Section 2 of Maline has the greatest total trail mileage deficit — 35.2 miles.
2. Section 3 of Coldwater has a total deficit of 29.2 miles.
3. Sections 1 and 2 of Gravois, section 4 of Maline, and section 2 of Deer, each have approximately the same total trail deficits.
   They are as follows:
   Section 2 — Gravois — 24.2 miles
   Section 4 — Maline — 24 miles
   Section 1 — Gravois — 23.1 miles
   Section 2 — Deer — 22 miles
4. Section 4 of Coldwater needs 20.2 miles.

SUMMARY

All the sections assigned a priority presently have no maintained trails within their boundaries. Maline, with the longest total trail deficit, should take priority in regards to trail development. A trail system connecting section 2 with the rest of the creek area would allow people in the other sections to take advantage of the surplus recreation in section 2. The trail deficits within the Coldwater and Gravois areas are so close, it is difficult to assign a priority preference. A trail system connecting section 2 of Coldwater with sections 3 and 4 would relieve some of the pressure for park development in the upper end of Coldwater. However, Gravois offers the opportunity to connect the large institutional and park areas which exist throughout the course of the creek. Deer Creek has the lowest trail deficit, even though section 2 is ranked among the sections with the highest deficits.

Motorcycles Trails

There are no designated motorcycle trail areas within the four creek sections. This does not mean, however, that there are not areas used for off-the-road motorcycling. On Coldwater the open tract southwest of the Lindbergh Boulevard-Highway 367 intersection is heavily utilized by motorcyclists. Maline Creek has two areas: The open field area on Lucas and Hunt Road across from Koeneman Park, and the large undeveloped tract west of Endicott Park. The areas adjacent to the Mo Pac Railroad right-of-way, in section 2 along Gravois, exhibit the heaviest motorcycle usage. The old railroad right of way along Deer Creek, also exhibits heavy usage by motorcyclists.

Priorities

1. Section 2 — Maline
2. Section 3 — Coldwater
3. Section 4 — Maline
   Section 2 — Deer
   Sections 1 and 2 — Gravois
4. Section 1 — Maline
   Section 4 — Coldwater

Tent Camping

There are only two locations within the project area which have facilities for tent camping. Sioux Passage Park in the Coldwater area has five tent sites, and there are seven tent sites in Brentwood Memorial Park within the Deer Creek Area. Maline has the greatest need for tent sites, with 362; followed by Gravois, needing 345; Coldwater needs 272; and Deer, 179.

Priorities

1. Section 2 — Maline
2. Section 2 — Gravois
3. Section 3 — Coldwater
   Section 1 — Gravois
4. Section 4 — Maline
5. Section 2 — Deer
   Section 1 — Maline

SUMMARY

The need for camping sites is approximately the same along Maline and Gravois. Facilities could be provided in large county parks along each creek. A trail connection linking other areas of the corridors with these camping facilities would provide opportunity for back packing within the urban area.

The lack of urban development along lower Coldwater provides ample opportunity for primitive camping experience. Facilities could be developed midpoint along the creek which would be within walking distance of sections 3 and 4. The density of development within both sections 3 and 4 are not conducive to a wilderness camping experience.

Deer Creek offers little opportunity for expanded camping facilities due to the urbanization within the creek corridor.

STATEMENT OF FINDINGS AND PRIORITIES FROM THE DEMAND ANALYSIS

GENERAL RECREATION

- Maline Creek exhibits the highest overall need for future recreational development.
- Gravois ranks second with the most consistent dispersed recreational needs throughout the length of its corridor.
- Coldwater ranks third, with high deficits in sections 3 and 4.
- Deer ranks fourth, with only section 2 showing a high deficit.
- Recreational developments should be limited to Sections 1 and 2.

TRAIL DEVELOPMENT NEEDS

- Trail facilities in general are greatly lacking throughout St. Louis County. In conformance with the Missouri SCORP Plan and EWGCC's needs assessment, a high priority should be placed on development of urban trails for hiking, biking, jogging, and nature walking.
- Maline has the largest total trail deficits. A trail connecting other sections with Section 2 could offset the imbalance.
- Trail deficits on Coldwater and Gravois are nearly equal. Gravois needs are distributed throughout the corridor, while Coldwater's are limited to Sections 3 and 4.
- Deer Creek has the lowest overall trail deficit.
- Motorcycling, although exhibiting a high demand, is not considered compatible with other forms of trail development associated with the Linear Park and should not be considered further.
- Horseback riding, when weighed against demand calculations and age/income profiles, is indicated on Deer Creek Section 3 and Coldwater Sections 1 and 2. Demand levels are also identified throughout the Gravois Creek Corridor.

WATER BASED RECREATION

- Water based recreation within the project area is not considered feasible at this time, although there is a high demand and few facilities are available.
- Gravois exhibits the best potential for water based recreation and high levels of demand. Stream floating and warm water fishing are real possibilities in the forseeable future.
- Swimming pools will continue to provide the most suitable form of water-contact recreation. A pool facility is needed in the Maline corridor Section 3 or 4.

WINTER ACTIVITY RECREATION

- Winter recreation activities are growing in enormous numbers. Cross country skiing and sledding potentials exist on all four corridors as an overlap with summer trail uses.
- Small ponds and holding basins can be additionally used for winter ice skating. This potential currently exists on small lakes in Section 3 and 4 of Maline.

PASSIVE AND MISCELLANEOUS RECREATION NEEDS

- Maline and Gravois exhibit near equal needs for camping facilities developed in conjunction with park sites accessible by biking trails.
- The lower end of Coldwater offers a unique opportunity for a primitive camping experience in an urban setting.
- Gravois exhibits by far the largest need for playground facilities, with Sections 2 and 4 of Maline exhibiting equally high need indicators.

VOLUME II - B

VEGETATION AND WILDLIFE HABITAT REPORT
LINEAR PARK PROJECT

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INTRODUCTION

The purpose of this report is to furnish a generalized inventory of existing wildlife habitat. It is not feasible nor necessary to incorporate a detailed description of every component of the ecosystem. Eight hypothetical habitats have been established, described, and mapped into county planimetric maps for each of the four creek corridors (Coldwater, Maline, Deer, Gravois) in St. Louis County, Missouri.

Selected information from this report is included in the body of the initial report of the Linear Park Project. The importance of vegetation and potential wildlife habitat information in a park project has resulted in the more expanded inventory included herein. Inventory maps identifying habitat groupings have been included with the initial report, and are also included with this volume.

HYPOTHETICAL HABITATS

BOTTOMLAND FOREST

Predominately wooded, seasonally flooded lowlands or floodplains. bordering the streams course; th category may also have islands in the channel, and at the base of bluffs.

AGRICULTURAL

Areas recently tilled for economic interest and small residential plots.

LAKES, PONDS, AND CREEKS

Regardless of origin, this category includes bodies of water — natural and artificial impoundments, water-filled borrow pits, storm-water retention basins, etc.

DEVELOPED LAND

Includes industrial, commercial, urban, and suburban development. Building, roads, parking lots, lawns, etc. occupy a large portion of the surface area. This section may be further broken down into:

Urban — commercial, schools, and industrial
Suburban — residential
Open types — golf courses, cemeteries, treatment plants, athletic fields, quarries, railroad right-of-ways, nursery.

NON-FORESTED

Includes nondeveloped areas such as pastures, open or vacant properties, and abandoned fields, all of which are not currently under cultivation.

UPLAND FOREST

Dominated by trees and other woody vegetation on ridges, hilltops, and crest of hills — upper, middle, and lower sloped included.

WETLAND AREAS

Low-lying land and/or depressions temporarily or permanently submerged at some time during the year. Water levels fluctuate in accordance with those in the main channel, water table, and climatic conditions. These sites can include both non-wooded marshes, wooded swamps, sloughs, shallow or ephemeral bodies of water and poorly drained sites.

SPECIAL OR UNIQUE COMMUNITIES

May include any of the following:

- rocky outcrops/caves/springs/glades
- significant sized wild tracts
- remnants of particular communities possessing uncommon flora or fauna
- in addition to the above, any of the previously listed habitats (UF, BF, Wa, NF), that appear minimally disturbed or representative of samples of the typical ecological systems.

SPECIAL NOTE — One must remember that all these habitats have been disturbed, and mere designation as a special community does not indicate they are pristine natural areas.

When mapped, a developed area was colored over with the predominant vegetation (nonforest, bottomland forest, etc.), and then marked Dev. if the color overlay differed from the habitat type. Ex-Golf course was colored non-forest, but designated Dev-Op.

Refer to Exhibits for mapped units on each of the four corridors.

In addition to the above, the following should be noted:

- Existing setting has been and is currently dominated by human disturbance (littering, hunting, logging, grazing, burning, mining, stream channelizing, urbanization, suburbanization, etc.) Most remaining wild areas are now at some early secondary successional stage. The majority of existing forests harbor relatively young stands of timber with scattered mature trees. Also of primary importance especially in relation to wildlife habitat, are the large numbers of wild dogs and cats. However, some of the larger tracts are surprisingly diverse, and provide the only existing available habitat for wildlife.
- The majority of species found today are opportunistic, and any effort to minimize human distrubances should enhance wildlife values by increasing species diversity.
- Descriptions of the hypothetical habitats, wildlife, and vegetational resources were largely based upon field observations, aerial photos, and literature reviews. (Literature reviews included taxonomic key field guides, environmental impact studies, and a variety of other university contract studies.)

BOTTOMLAND FOREST

Since bottomland forest constitute a large portion of the corridor, they merit special discussion. The species composition of these stands varies considerably throughout the floodplains, depending upon such factors as soil composition, topography, species competition, flooding frequency, and human disturbance. Somewhat distinctive divisions of riparian forest parallel the creeks — willow community, willow-cottonwood, silver maple — cottonwood, and what may be called the older stand, which is extremely variable in species composition.

Dense stands of pole-sized willow *(Salix* spp.) often form narrow bands on sandy substrata along the streambanks. River birch *(Betula nigra)* also occupies most streambanks but only occur at two locations; on Coldwater Creek between Old Jamestown Road and Highway 367 and on Deer Creek just east of Log Cabin Road. Wet forests commonly contain cover like wild grape *(Vitis* spp), trumpet creeper *(Campsis radicans),* poison ivy *(Rhus radicans),* false nettle *(Boehmeria cylindrica),* tall white aster *(Aster simplex),* fog fruit *(Lippia lanceolata),* and several species of smartweeds *(Polygonum* spp.) and grasses *(Gramineae).* Initial dominance of willow generally last 15-20 years on well-drained sites, and 25-30 years on more poorly drained areas. As long as prolonged inundation of the community does not occur, the willow-cottonwood *(Salix-Populus)* community develops.

Herbaceous plants are more abundant in the willow-cottonwood community than in the willow community, and include smartweeds *(Polygonum* spp.), stinging nettle *(Laportea canadensis),* ground ivy *(Glechoma hederacea),* and clearweed *(Pilea pumila).* Abundant woody vines include wild grape *(Vitis* spp.), poison ivy *(Rhus radicane),* and trumpet creeper *(C, radicans).* Since cottonwoods *(P. deltoides)* and willows *(Salix* spp.) both require abundant light for germination, their developing canopy inhibits their reproduction and instead favors shade tolerant silver maple *(Acer saccharinum),* boxelder *(Acer negundo),* black walnut *(Juglans nigra),* sycamore *(Platanus Occidentalis)* and occasionally mulberry *(Morus* spp.).

On better drained sites, silver maple *(A. saccharinum)* may occur in almost pure stands or in association with cottonwoods *(P. deltoides),* whereas sycamore *(P. occidentalis)* may gain dominance on higher, well-drained sandy soils. The silver maple-cottonwood *(Acer-Populus)* community becomes the next dominant type, with maple occupying some 75% of the total tree composition.

The cottonwood *(P. deltoides)* stratum is the tallest and often cottonwood trees of substantial size emerge from the lower substratum of silver maple (A. *saccharinum).* Trees of secondary importance include the green ash *(Fraxinus pennsylvanica),* box elder *(A. negundo),* American elm *(Ulmus americanus),* hackberry (Celtis *occidentalis),* mulberry *(Morus* spp.) and a few old-growth black willow *(Salix nigra.)* Herbaceous growth within these boxelder-cottonwood-silver maple forest is more profuse due to less frequent flooding. Drier localities usually support stands of wild rye *(Elymus villosus).* Beneath these gramnoids in damper, shaded areas, ground ivy *(G. hederacea),* may thrive; propagating itself by producing adventious roots on stems near the ground. Wood nettle *(L canadensis)* may also occur, forming localized or even extensive pure stands. Clearweed *(P. pumila),* jewelweed *(Impatiens capensis),* and species of smartweeds *(Polygonum* spp.) tend to favor wetter lowlying depressions and swales.

Succession beyond the silver maple-cottonwood (Acer-Populus) community is as yet unclear due to continuous human disturbance. It has been suggested that eventually American elm *(U. Americanus),* hackberry *(C. occidentalis),* green ash *(F. pennsylvanica),* boxelder *(A. negundo)* and sycamore *(P. occidentalis)* compose a subclimax community with American elm *(U. americanus)* and hackberry *(C. occidentalis)* as codominants. This is probably no longer the case since older elms are susceptible to the Dutch elm disease. Most remaining older floodplain stands (designated SA) seem to be a mixture of sycamore, elm, hackberry, and occasionally oak *(Quercus* spp.).

Understory vegetation is often well-developed and dominated by dogwood *(Cornus Florida),* pawpaw *(Asimina triloba)* and redbud *(Cercis canadensis).* Wildgrape *(Vitis* spp.), virginia creeper *(Parthenocissus quinquefolia)* and poison ivy *(R. radicans)* may form extensive ground cover and entangle large trees. Wild hydrangea *(Hydrangea arborescens),* coral berry *(Symphoricarpos orbiculatus)* common elderberry *(Sambucus canadensis),* and spice bush *(Lindera benzoin)* are often common in the shrub layer. A rich mesophytic herbaceous growth displays a multitude of ferns *(Cystopteris Fragilis Botrychium virginianum),* and wildflowers *(Dentaria laciniata, Claytonia virginica, Asarum canadense, Uvularia grandiflora, Trillium recurvatum, Sanguinaria canadensis, Viola sororia, Viola pennsylvanica, Dicentra cucullaria, Podophyllum peltatum, Erythronium albidum, Geranium maculatum, Phlox divaricata, Osmorhiza longistylis, Ranunculus septenrionalis, Impatiens capensis, Sanicula gregaria, Phryma leptostachva,* and *Campanula americana)* with species composition changing rapidly from pre-vernal to autumnal blooming periods. A greater diversity of species are found in this community since these sites are more stable and rarely flood. Since the remaining older stands are so few in number and so small in size, they should be vigorously protected from further human intervention.

If community development is proceeding as previously outlined but the process is interrupted by human activity (logging, grazing, burning, etc.), the area undergoes marked changes — secondary succession. Stretches of forested secondary succession occurs commonly along the creek bottoms and some upland areas. However discussion of this special type will be given only in this section.

An array of erect and climbing herbs, woody vines, small trees, and shrubs largely render these areas impenetrable to travel. Plants, such as black raspberry *(Rubus occidentalis)* red raspberry *(Rubus idaeus)*, wild strawberry *(Fragaria virginiana)*, cinquefoil *(Potentilla* spp.), multiflora rose *(Rosa multiflora)*, smooth sumac *(Rhus glabra)*, black cherry *(Prunus serotina)*, mulberry *(Morus alba* and *Morus rubra)*, sassafras (A *Sassafras albidum)*, tree-of-heaven *(Ailanthus altissima)*, giant ragweed *(Ambrosia trifida)*, false nettle *(B. cylindrica)*, grasses (Gramineae), docks *(Rumex* spp.), smartweeds *(Polygonum* spp.) and others succeed in disturbed areas. Japanese hops *(Humulus japonicus)* an introduced species, blankets moist exposed banks of secondary succession and is common throughout all the creek corridors. Japanese honeysuckle *(Lonicera japonica)* also forms extensive sprawling stands in some of the secondary forest locations.

There is a tendency for increased diversity and density of many wildlife species at these numerous interspersions of secondary growth and open areas. In addition to providing cover and food, secondary successional stages may provide for travel routes between adjacent habitats. Such interspersed habitat at community junctions is known as the "edge effect" and is of extreme importance to the support of wildlife communities. White-footed mice *(Peromvscus leucopus)*, eastern cottontail rabbits *(Sylvilagus floridanus)*, and woodchucks *(Marmota monax)* are common edge-dwelling mammals.

On occasion red fox *(Vulpes fulva)*, white-tailed deer *(Odocoileus virginianus)*, and even coyote *(Canis latrans)* utilize these thickets. Two road-killed coyotes were seen near the Highway 367 crossing at Coldwater Creek during the summer of 1978. Common edge dwelling birds may include the ruby-crowned kinglet *(Regulus calendula)*, golden-crowned kinglet *(Regulus satrapa)*, American goldfinch *(Spinus tristis)*, tufted titmouse *(Parus bicolor)*, Carolina wren *(Thryothrous ludovicianus)*, mockingbird *(Mimus polyglottos)*, mourning dove *(Zenaidura macroura)*, yellowthroat *(Geothlypis trichas)*, indigo bunting *(Passerina cyanea)*, bobwhite quail *(Colinus virginianus)*, black-capped chickadee *(Parus atricapillus)*, cardinal *(Cardinalis cardinalis)*, Carolina chickadee *(Parus carolinensis)*, common crow *(Coryus brachyrhynchos)*, red-winged blackbird *(Agelaius phoeniceus)*, dark-eyed junco *(Junco hyemalis)*, wood thrush *(Hylocichla mustelina)*, and the starling *(Sturnus vulgaris)*. Small mouthed salamanders *(Ambystoma tigrinum)* persist in moist situations as does the American toad *(Bufo americanus)*. Eastern yellow-bellied racers *(Columber constrictor)*, black rat snakes *(Elaphe obsoleta)*, eastern garter snakes *(Thamnophis sirtalis)*, and the abundant prairie kingsnake *(Lampropeltis calligaster)* frequent forested edge and brushy areas.

In dicussing wildlife of the remaining bottomland forest communities (willow-community, willow-cottonwood, and silver maple-cottonwood community), the following should be noted:

- As successional changes occur, animals dependent on a particular community must either relocate or in many cases perish.
- Many species exhibit mobility between community types.
- The following are generalizations of typical inhabitants of the various bottomland forest communities.

Small rodents like the white-footed *(P. leucopus)* and house mice *(Mus musculus)*, raptors, and nongame seed-eating birds are ubiquitous. Eastern cottontail rabbits *(S. Floridanus)*, opossums *(Didelphis marsupialis)*, rodents, some carnivores, shore and migratory birds, certain frogs (Ranids), toads *(Bufo* spp.), and aquatic turtles utilize shorelines adjacent to bottomland forest. Young bottomland forest favor deer, carnivores, small insectivorous birds, terrestrial salamanders *(Ambystoma* spp.), turtles, and some snakes; whereas, older stands differ primarily with the addition of cavity-nestling birds and more solitary carnivores.

Few mammals are indigenous to the willow *(Salix* spp.) thickets: white-footed *(P. leucopus)* and house mice *(M. musculus)* forage and may nest in roots and flood-deposited debris. Banks bordering the willow communities provide den sites for beaver *(Castor candensis)*, nutria *(Myocastor coypus)*, muskrat *(Ondatra zibethicus)*, and even woodchuck *(M. monax)* if they are vegetated. Since fluctuating water levels and periodic flooding would wash out dams or lodges, beaver rely heavily upon burrows they construct in the creek banks.

Proximity to water and a sufficient supply of willow *(Salix* spp.) and cottonwood *(P. deltoides)* bark are critical factors in determining the presence or absence of beaver. Opossum *(D. marsupialis)*, striped skunk *(Mephitis mephitis)* and racoon *(Procyon lotor)* frequently forage in the willow forest. At lesser distrubed sties adjacent to water one may encounter the little blue heron *(Florida caerulea)*, green heron *(Butorides virescens)*, and belted kingfisher *(Megaceryle alcyon)*. Common perching birds (Passeriformes) include the cardinal *(C. cardinalis)*, blue jay *(Cyanocitta cristata)*, song sparrow *(Melospiza melodia)*, carolina chickadee *(Parus carolinensis)*, American goldfinch *(S. tristis)*, dark-eyed junco *(J. hyemalis)*, rufous-sided towhee *(Pipillo erythrophthalmus)*, swamp sparrow *(Melospiza georgiana)* and ruby-crowned kinglet *(R. calendula)*. Occasionally a leopard frog *(Rana pipiens)* may

venture into the area or one might find a Woodhouse's or Fowler's toad *(Bufo woodhousei)* beneath debris in moist situations. If the protectively colored arboreal rough-green snake *(Opheodrys aestivus)* still exists along any of the creeks, it should be found amidst the branches of willows overhanging water.

The federally endangered Indiana bat *(Myotis sodalis)* may utilize the stream courses for feeding during the summer.

Since the willow and willow-cottonwood community are nearly identical in faunal species composition, no additional discussion is necessary.

Greater floral diversity and available wildlife niches in the silver maple-cottonwood community lend to additional faunal diversity. Loose tree bark and hollow tree cavities afford habitat for bats, primarily the little brown bat *(Myotis lucifugus)*, silver-haired *(Lasionycteris noctivagans)*, red bat *(Lasiuris cinereus)*, big brown *(Eptesicus Fuscus)*, and the eastern pipistrelle *(Pipistrellus subflavus)*.

Fox *(Sciurus niger)* and gray squirrels *(S. carolinensis)* may construct nests in larger cottonwood cavities or forked branches if sufficient food sources are nearby, while gray squirrels prefer denser forest with more understory than fox squirrels which prefer more open forest. Fallen trees and other debris provide protection and dens for opossum *(D. marsupialis)*, cottontail *(S. Floridans)*, raccoon *(P. lotor)*, and fox *(V. fulva)*. Once again numerous small mammals inhabit the forest floor with deer *(Peromyscus maniculatus)* white-footed *(P. leucopus)*, and house mice *(M. musculus)* quartering in leafy litter, under and in logs, stumps, and burrows. Two species of shrews occur in the project area, these being the short-tailed shrew *(Blarina brevicauda)* and the least shrew *(Cryptotis parya)*; however, the short-tailed shrew prefers dense forest, while the least shrew opts for early secondary succession. Although the eastern mole *(Scalopus aquaticus)* is characteristically associated with open areas, if the soil is not heavily compacted, it is not uncommon for one to see a series of tunnels within the silver maple — cottonwood community.

These forests contain a large number of birds, of which the most commonly encountered are as follows: common crow *(C. brachyrhynchos)*, eastern phoebe *(Sayornis phoebe)*, cardinal *(C. cardinalis)*, prothonotary warbler *(Protonotaria citrea)*, robin *(Turdus migratorius)*, tufted titmouse *(P. bicolor)*, blue jay *(C. cristata)*, eastern wood pewee *(Contopus virens)*, yellowthroat *(G. trichas)*, yellow-billed cuckoo *(Coccyzus americanus)*, great-crested flycatcher *(Myiarchus crinitus)*, Black-capped chickadee *(P. atricapillus)*, Carolina wren *(I. ludovicianus)*, catbird *(Dumetella carolinensis)*, white-breasted nuthatch *(Sitta carolinensis)*, and the yellow-shafted flicker *(Colaptes auratus*.

Small mouthed salamander *(A. texanum)* spotted salamander *(Ambystoma maculatum)* and eastern tiger salamander *(A. tigrinum)* utilize bottomland forested areas to breed in January-February or March where interior ponding of runoff and rainfall has formed temporary standing water. Marbled salamanders *(Ambystoma opacum)*, if they still exist, breed in autumn, in depressions which are to be flooded with rainwater. Fowler's toad *(B. woodhousei)* is commonly found on humid summer evenings and takes refuge beneath boards, logs, etc., in moist vicinities during hot summer days.

The three-toed or eastern box turtle *(Terrapene carolina)* is frequently encountered lumbering in search of food, shade, or cool streams during hot weather. Five-lined skinks *(Eumeces fasciatus)*, and on rare occasion the more arboreal broad-headed skink *(Eumeces laticeps)*, are typical floodplain forest lizards. Black rat *(E. obsoleta)* and eastern garter snakes *(T. sirtalis)* are commonly associated with these bottomland forest. The southern copperhead *(Agkistrodon contortix)* which shows a propensity for wooded lowlands will not be encountered in highly populated reaches, but may rarely occur in more remote areas.

Wildlife species from older stands show similarity in mammalian and avian composition of previous communities, with the exception of the barred owl *(Strix varia)*, pileated woodpecker *(Dryocopus pileatus)*, wood duck *(Aix sponsa)* and red-tailed hawk *(Buteo jamaicensis)*, which are dependent upon mature trees. Downy woodpeckers *(Dendrocopus pubescens)*, red-headed woodpeckers *(Melanerpes erythrocephalus)*, red-bellied woodpeckers *(Centurus carolinus)*, red-eyed vireos *(vireo olivaceus)*, song sparrows *(M. melodia)*, white-throated sparrows *(Zonotrichia albicollis)* dark-eyed juncos *(J. hyemalis)*, and countless warblers seem to thrive better in older stands with increased foliage height diversity and subsequent greater insect biomass. Amphibian and reptile life in older stands is identical to that of the silver maple-cottonwood with an occasional upland forest species.

AGRICULTURAL AREAS

This classification includes fields with major crops, such as corn, soybean, alfalfa, and wheat, truck farms and residential plots. Species of plants of a weedy nature often invade these croplands.

The mammal species utilizing agricultural areas includes deer mice *(P. maniculatus)*, house mice *(M. musculus)*. white-footed mice *(P. leucopus)*, short-tailed shrews *(B. brevicauda)*, norway rats *(Rattus norvegicus)*, cottontails *(S. Floridanus)*, woodchucks *(M. monax)*, and on occasion a white-tailed deer *(O. virginianus)*. Gophers *(Geomys bursarisu)* and the eastern mole *(S. aquaticus)* cause local conflicts with their burrowing behavior.

Cultivated fields have a diversified avian fauna, foraged by the common crow *(C. brachyrhynchos)*, bobwhite quail *(C. virginianus)*, field sparrow *(Spizella pusilla)*, mourning dove *(Z. macroura)*, starling *(S. vulgaris)*, eastern meadowlark *(Sturnella magna)*, red-winged blackbird *(A. phoeniceus)*, and hunted by avian predators, the red-tailed hawk *(B. jamaicensis)*, and sparrow hawk *(Falco sparverius)*.

American toads *(B. americanus)* and western chorus frogs *(Pseudacris triseriata)* are well established with the possibility of small-mouthed *(A. texanum)* and tiger salamanders *(A. tigrinum)* in wetter agricultural localities.

Eastern yellow-bellied racers *(C. constrictor)*, black rat snake *(E. obsoleta)*, prairie kingsnake *(L. calligaster)*, and five-lined skinks *(E. Fasciatus)* thrive in neglected areas near barns, debris piles, etc.

LAKES, PONDS, AND THE CREEKS

This category only describes vertebrates associated with standing and/or flowing bodies of water, with the exception of fish which have been eliminated from discussion.

Bullfrogs *(Rana catesbeiana)*, Blanchard's cricket frog *(Acris crepitans)*, leopard frogs *(Rana pipiens*, complex), and green frogs *(Rana clamitans)* are abundant along the shores of the creeks and other permanent water. Northern Spring peepers *(Hyla crucifer)*, primarily a woodland species, lives near bodies of water, breeding in them in early spring. If the central newt *(Notophthalmus viridescens)* and eastern gray treefrog *(Hyla versicolor-chrysocelis)* still exist along the creek bottoms, they would undoubtedly utilize wooded bodies of water for breeding purposes.

Several aquatic turtles inhabit the shorelines and/or piles of fallen debris in the channel for basking, and were surprisingly abundant along particular sections of the creeks. The Missouri slider *(Pseudemys floridana hoyi)*, slider *(P. concinna hieroglyphica)*, western painted turtle *(Chrysemys picta)*, false map *(Graptemys pseudogeographica)*, Mississippi map *(Graptemys kohni)*, and Red-eared turtle *(Pseudemys scripta)* are well established in sections even though range maps of the sliders indicate a distribution of only southern Missouri.

It would be interesting to study the effects of various pollutants on populations of these highly aquatic turtles. Softshell trutles, probably the western spiny *(Trionyx spinifer)* utilize quiet soft-bottomed stretches of the channel. Stinkpot *(Stemothaerus odoratus)* and common snapping turtles *(Chelydra serpentina)* are bottom dwellers, and are seldom seen except for an occasional snapper which may migrate overland from a drying pond or in order to lay its eggs. When this occurs, area residents are often overwhelmed by the size and ferocity of these reptiles. No Alligator snapping turtles *(Macrochelys temmincki)* are believed to exist or have ever been collected from any of the four creeks; they are an endangered species in Missouri.

The Northern water snake *(Natrix sipedon)* is the most abundant harmless species of water snake, and is commonly confused by lay persons as the poisonous "water moccasin". Such misinterpretation has led to a reduction in many local populations. Graham's water snake *(Natrix grahami)* and the Diamond-backed water snake *(Natrix rhombifera)* may also occur, but their presence has not as yet been established on any of the four creeks.

Beaver *(C. canadensis)*, muskrat *(O. zibethicus)*, and the introduced nutria *(M. coypus)* occupy both standing and flowing water. Belted kingfisher *(Megaceryle alcyon)*, mallards *(Anas platyrhynchos)*, wood ducks *(A. sponsa)*, some shorebirds, green herons *(B. virescens)*, and some migratory species of waterfowl are frequently associated with water.

In April, 1975, an adult River otter *(Lutra canadensis)* was seen swimming downstream in the Missouri River, just below the mouth of Coldwater Creek.

For further information, see the descriptions for birds and mammals under bottomland forest.

DEVELOPED LAND

Urban-suburban type development constitutes the largest percentage of land area in all of the four watersheds. But it does not constitute the greatest portion of land usage in the project corridor; and, therefore, its associated wildlife components are not as important as a study considering the entire watershed.

Residential or suburban development is extremely variable in terms of accessing wildlife habitat, and dependent upon the attitude and land use practices of the landowner. For example, wildlife values vary drastically from one owner's well-manicured lawn to that of another's, planted with a diversity of ornamental and native trees, shrubs, and evergreens, etc. In actuality, some of the exotically planted yards are more productive than existing natural ecosystems, and are possibly functioning as temporary disclimax communities.

Birds representative of subruban yards include the mourning dove *(Z. macroura)*, chimney swift *(Chaetura pelagica)*, black-capped chickadee *(P. atricapillus)*, robin *(T. migratorius)*, mockingbird *(M. polyglottos)*, catbird *(D. carolinensis)*, brown-thrasher *(Toxostoma rufum)*, starling *(S. vulgaris)*, house sparrow *(Passer domesticus)*, European sparrow *(Passer montanus)*, common grackle *(Quiscalus quiscula)*, brown-headed cowbird *(Molothrus ater)*, and cardinal *(C. cardinalis)*.

Common mammals may include house mice *(M. musculus)*, eastern moles *(S. aquaticus)*, squirrel *(Sciurus* spp.), opposums *(D. marsupialis)*, eastern cottontail rabbits *(S. Floridans)*, and raccoons *(P. lotor)*. Reptile and amphibian life is restricted largely because of habitat modification (primarily a lack of cover as a result of maintenance activities, mowing, weeding, etc.) and high mortality factors (road and indiscriminate killings, pestidides, herbicides, and predation of dogs and cats).

Urbanized areas (i.e., commercial or industrial) have the least value as wildlife habitat. Norway rats *(R. norvegicus)*. house mice *(M. musculus)*, pigeons *(Columba livia)*, house sparrows *(P. domesticus)*, starlings *(S. vulgaris)*, chimney swifts *(C. pelagica)*, common nighthawks *(Chordeiles minor)*, robins *(T. migratorius)*, and bluejays *(C. cristata)* are common species. The northern lined snake *(Tropidoclonion lineatum)*, and midland brown or DeKay's snake *(Storeria dekavi)*, if they exist in the corridor, may be found in urban settings.

Open types of development (golf courses, parklands, cemeteries, rights-of-ways, athletic fields, quarries, railroads, etc.) constitute the final category under developed land. Since these habitats are so variable, no generalized discussion will be written of species composition. For example, sections of golf courses may contain upland, bottomland, or even old fields; therefore these habitats will be mapped as predominate over golf courses, parkland, etc. The reader should then refer to the appropriate habitat descriptions for information on species diversity.

NON-FORESTED AREAS

There is a considerable degree of diversity in the vegetation of non-forested areas, simply because these sites all exhibit some varying stage of succession. All types of vegetation (herbaceous, shrub, tree, and vine) are present, with herbaceous growth being most pronounced. Grasses (Graminae), composites (Asteraceae), legumes (Fabaceae), parsleys (umbelliferas), mustards (Brassicaceae), milkweeds (Asclepiadaceae), mourning glories (Convolvulaceae), and to a lesser extent roses (Rosaceae), figworts (Scrophulariaceae) and mints (Labitae), constitute the major plant families. These non-forested areas, if left undisturbed, undergo gradual changes in composition of both plants and animals, with succession following a general trend (annual and biennial weeds — perennial grasses — mixed perennial herbs, shrubs — trees or prairie vegetation). There are no undistrubed prairies remaining along any of the corridors. Much of the remaining non-forested areas, as defined earlier, include pastures, vacant properties, and abandoned fields. Species composition varies considerably from one site to another, in accordance with such factors as size of tract, slope, soil, and exposure, and both previous and current human manipulation.

The occurrence of the cut-leaved teasel *(Dipsacus laciniatus L.)* a member of the family, Dipsacaceae, and *(Gerardia auriculata* Michx.) a Scrophulariaceae, in an old field area north of Tesson Road, in the Gravois creek corridor is noteworthy. This teasel *(P. laciniatus)* is a European introduction that has not as yet been recorded in any of Missouri's botanical writings. The false foxglove *(G. auriculata)* is rare in the state and therefore also of significance.

Older fields provide an excellent breeding and wintering area for birds. Common birds include mourning doves *(Z. macroura)*, catbirds *(D. carolinensis)*, cardinals *(C. cardinalis)*, bobwhite quail *(C. virginianus)*, common crows *(C. brachyrhynchos)*, eastern meadowlarks *(s. magna)*, brown trasher *(T. refum)*, and numerous species of sparrows. Shrews, moles, mice, rabbits, woodchucks, foxes, and an occasional white-tailed deer or even coyote *(C. latrans)*, heavily utilize these abandoned fields.

If water is available, the American toad *(B. americanus)* Woodhouse's toad *(B. woodhousei)*, and the small-mouthed *(A. texanum)* or eastern tiger salamander *(A. tigrinum)* may occur. The Ornate box turtle *(Terrapene ornata)*, eastern yellow-bellied racer *(C. constrictor)*, and prairie kingsnake *(L. calligaster)*, may be locally abundant.

UPLAND FOREST

There are basically five community types of upland forest within the project corridor, as based upon the Missouri Natural Areas classification of 1977.

1. Black oak *(Quercus velutina)* and white oak *(Quercus alba)* on dry slopes and ridges.
2. White oak *(Q. alba)*, shagbark hickory *(Carva ovata)*, northern red oak *(Q. rubra)*, on the deeper soils, but generally the latter two species becoming more important in more protected sites.
3. Northern red oak *(Q. rubra)*, white oak *(Q. alba)*, *sugarmaple (Acer saccharum)*, basswood *(Tilia americana)* in deep ravines and cove sites; generally the latter two species becoming important in more protected sites.
4. River hills, bordering Missouri and Mississippi rivers. A distinctive, cove-like topography from deep loess deposits, affording a variety of sites and soil conditions for a rich spectrum of forest species (restricted to lower Coldwater).
5. White oak *(Q. alba)*, sugar maple *(A. saccharum)* type. limestone slopes and colluvial soils with good drainage.

None of the above upland forest types cover any overwhelming percentage of the remaining corridor.

North-facing upland slopes are always much cooler and moister than the average for the region, while south-facing slopes are much warmer and drier. North and east facing uplands are usually dominated by white oak *(Q. alba)*, shagbark hickory *(C. ovata)*, and sugar maple *(A. saccharum)*; in contrast to white *(Q. alba)*, black *(Q. velutina)*, and chinquapin oak *(Q. muehlenbergii)* dominating dry, south-southwestern exposures. Dominant tree cover at mid-slope includes white *(Q. alba)*, black *(Q. velutina)*, red oak *(Q. rubra)*, and pignut *(C. glabra)*, or shagbark hickory *(C. ovata)*. Lower slopes tend to harbor American elm *(U. americana)*, black walnut *(Juglans nigra)*, bitternut hickory *(Juglans cinerea)*, white oak *(Q. alba)* and even sugar maple *(A. saccharum)*.

Many uplands posess unique flora in the vicinity of limestone outcroppings, with each displaying its own particular flora. North or east facing slopes and ravines, particularly in the vicinity of seepage, intermittent streams, or rocky areas, support pockets of ferns *(Adiantum pedatum, Pellaea atropurpurea, Cystopteris Fragilis, Polystichum acrostichoides)*, mosses, and liverworts. Drier south or west facing slopes may have either dense or sparse native grass and forest cover depending on soil depth. Lichens and other xerophytic bryophytes are present on these exposed limestone bluffs. Unfortunately no true glades exist along any of the creeks.

Pawpaw *(Asimina triloba)*, redbud *(Cercis canadensis)*, and dogwood *(Cornus Florida)* are chief understory components of the vegetation. Virginia creeper *(P. guinguafolia)*, coral berry *(S. orbiculatus)*, poison ivy *(R. radizans)*, may apple *(P. peltatum)*, along with numerous other herbaceous plants and shade-tolerant wildflowers cloak the forest floor.

Amphibians associated with upland and/or slope forest, include the spotted salamander *(A. maculatum)*, eastern gray treefrog *(H. versicolor-chrysoscelis)*, marbled salamander *(A. opacum)*, American toad *(B. americanus)*, and Northern Spring Pepper *(H. crucifer)*. Members of the lungless salamanders (Plethodontidae), especially the long-tailed *(Eurycea longicauda)*, common near springs and seeps, the red-backed salamander *(Plethodon cinereus)*, and slimy salamander *(Plethodon glutinosus)*, more tolerant of drier situations were noticeably absent, but their possible occurance should not be underestimated.

Three-toed box turtles *(T. carolina)*, ground skink *(Lygosoma laterale)*, five-lived skink *(E. Fasciatus)*, and the black rat snake *(E. obsoleta)* are the most commonly encountered reptiles. Six-lined racerunners *(Cnemidophorus sexlineatus)* occur in isolated pockets on dry, rocky, wooded hills.

The eastern gray squirrel *(S. carolinensis)*, raccoon *(P. lotor)*, short-tailed shrew *(B. brevicauda)*, woodland white-footed mouse *(P. leucopus)*, and white-tailed deer *(O. virginianus)* are often upland dwelling mammals.

Resident upland birds include the hairy woodpecker *(Dendrocopos villosus)*, downy woodpecker *(D. pubescens)*, eastern wood pewee *(C. virens)*, blue jay *(C. cristata)*, tufted titmouse *(P. bicolor)*, white-breasted nuthatch *(S. carolinensis)*, carolina wren *(T. ludovicianus)*, indigo bunting *(P. cyanea)*, yellow-billed cuckoo *(C. americanus)*, yellow-shafted flicker *(C. auratus)*, pileated woodpecker *(D. pileatus)*, common crow *(C. brachyrhynchos)*, carolina chickadee *(P. carolinensis)*, black-capped chickadee *(P. atricapillus)*, common grackle *(Q. quiscula)*, brown-headed cowbird *(M. ater)*, yellow-breasted chat *(Icteria virens)*, and numerous warblers and thrushes.

WETLAND AREAS

Two types of wetlands were noted: former channels or sloughs, and marshes. Although some wetland studies include flood-plains as wetlands and even bodies of water, such as lakes and ponds, these areas were not considered wetlands in this report. The number and size of existing wetlands within the corridors are extremely limited.

Former channels or sloughs exist largely as a result of past channel realignment and drainage projects. The majority of these sloughs are shallow depressions, rapidly filling, and usually only water-filled after heavy rainfall. All are bordered by bottomland forest, whose species composition varies considerably depending upon site conditions such as, soil, flooding frequency, and human disturbance. Shallow reaches during dry periods will often become vegetated with jewelweed *(I. capensis),* wood nettle *(L. canadensis),* clearweed *(P. pumila),* and smartweeds *(Polygonum* spp.). Buttonbush *(Cephalanthus occidentalis)* occurs in scattered localities along some of the deeper sloughs.

Wildlife species characteristic of these sloughs are dependent largely upon the degree of wetness a particular stretch of former channel exhibits. Generally speaking, those faunal elements listed under (lakes, ponds, and creeks) inhabit deeper sloughs. The finest remaining example of a deep water slough exists on the south bank of Coldwater Creek, just southeast of Jamestown Mall. This site should be vigorously protected and managed to ensure its value as a wildlife haven. Those sloughs which are otherwise shallow or only temporarily wet represent the finest amphibian breeding sites remaining along the creeks.

Only two inland marshes were identified during the inventory.

A small marshland exists in an area just northeast of Bridgedale Court and southeast of Interstate 70, within the Maline Creek corridor. It appears to be little disturbed, and was dominated by cat-tails *(Typha latifolia),* pockets of very shallow water where surrounded by clumps of grasses, sedges, and rushes. Water hemlock *(Cicuta maculata),* dock *(Rumex* spp.), cottonwood *(P. deltoides),* and willow *(Salix* spp.) occurred as a ring of vegetation surrounding the heart of the wetland.

The only other marsh identified was within the Gravois Creek corridor. This marsh lays in a flat, low lying area northeast of the Old Tesson Ferry Road bridge over Gravois Creek, just south of the Missouri Pacific railroad, and west of the Lakeshire apartment complex. Red-rooted cyperus *(Cyperus erythrorhizos),* cat-tail *(T. latifolia),* arrow-leaf *(Sagittaria latifolia),* water hemlock *(C. maculata),* fog fruit *(L. lanceolata),* and a variety of grasses (Gramineae), sedges (cyperaceae), and smartweeds *(Polygonum* spp.) includes some of the more obvious herbaceous growth. Willow *(salix* spp.) and cottonwood *(P. deltoides)* are the most common trees. Although no standing water was present when the site was visited, mudflats were apparent, indicating some degree of internal wetness. Killdeer *(Charadrius voidferus),* red-winged blackbirds *(A. phoeniceus);* western ribbon snakes *(Thamnophis sauritus proximus),* and the eastern garter snakes *(T. sirtalis)* were observed at this marsh site. Its location admist old fields and bottomland forests have created a unique setting.

rresponds to number on maps, see exhibits)

kberry *bottomland forest* along lower Coldwater directly northeast of the Union

l forest, along lower Coldwater; refer to map for location.
northeast of Union Electric powerlines on west bank; lower Coldwater. Site
wth timber.
to special area #2.
aining slough; on the south bank, southeast of Jamestown Mall.
irectly west of Wild Fox Court. An upper terrace forest with lush moist-loving

meadow completely screened by forest; upstream from Old Jamestown road

v highway 367 between Coldwater and the C.B. & Q railroad.
west of Father Manion Park and cemetary. Abundant wildlife and field
ighly developed area.
ort Bellefontaine Cave, lies below the mouth of Coldwater in a rocky ledge
along the Missouri River. (38°, 41minutes, 38 seconds north latitude; and 90°,
s west longitude)
l soil, site exhibits karst characteristics, on east side of Missouri Hills entrance.

)nds to number on maps, see Exhibits)

ind forest in a wooded valley north of Forest Drive.
the Ferguson maintenance center off Ferguson Road. Scattered wet areas

)ridgedale Court and southeast of Interstate 70.

s to number on maps, see Exhibits)

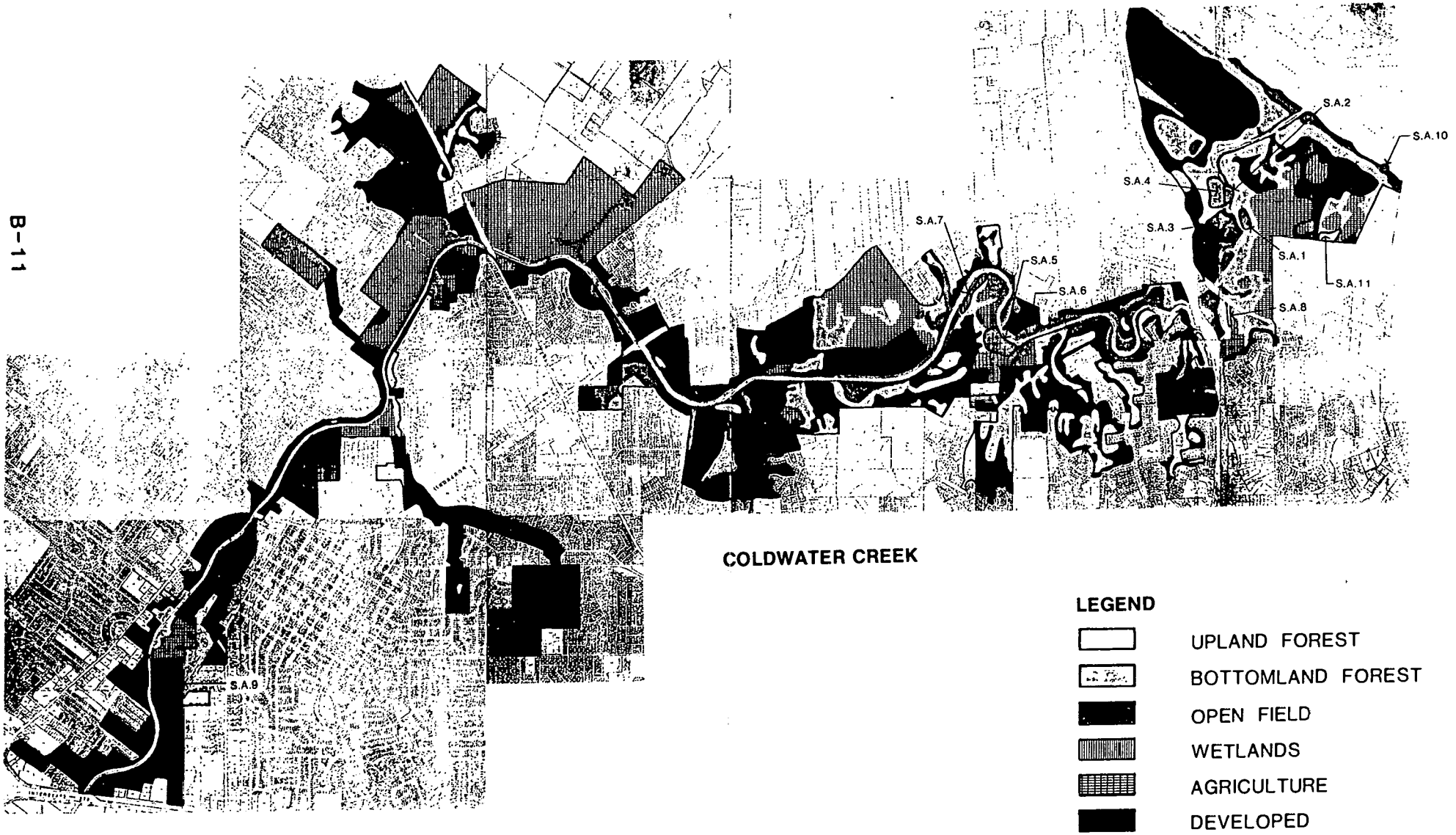
est of Log Cabin Lane on north bank of creek. An even-aged maturing stand of
nbricaria). Site has undoubtedly been disturbed, but this type of species
)lain was nowhere else encountered.
ntwood Memorial Park. Disturbed, but represents the last remaining climax

forest along portions of the south bank between U.S. Highway 40 and Log
)mpares in *some* respects to lower Coldwater.

)nds to number on maps, see Exhibits)

ff Park on north-facing slope
e Road on floodplain between Gravois creek and Missouri Pacific railroad.
f sections laying north of Tesshire Road. *(Dipsacus laciniatus),* occurs at sites
)tains *(Gerardia auriculata).*
je overstory cottonwood, sycamore and boxelder, surrounded by secondary
55 on floodplain between creek and Missouri Pacific railroad.

l wildlife species which occur in the various habitats. The lists are not meant
an that *each* species listed will be observed in a particular habitat site. An
)ame indicates a definite field sighting either during the inventory or during a
)ssions for more detailed information about wildlife species within the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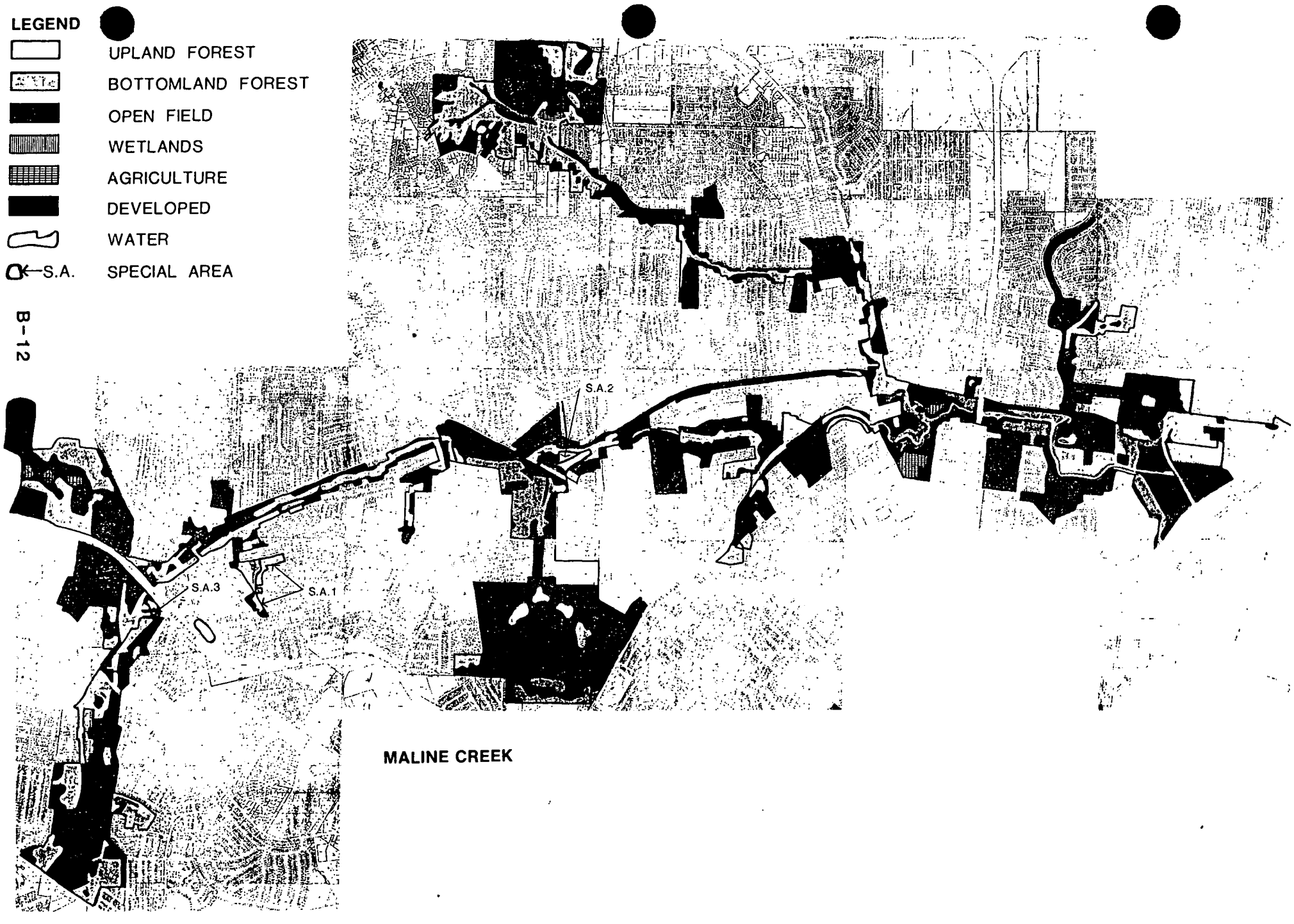
S.A.8
S.A.9
COLDWATER CREEK
LEGEND
UPLAND FOREST
BOTTOMLAND FOREST
OPEN FIELD
WETLANDS
AGRICULTURE
DEVELOPED
WATER
S.A. SPECIAL AREA


LEGEND
UPLAND FOREST
BOTTOMLAND FOREST
OPEN FIELD
WETLANDS
AGRICULTURE
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WATER
S.A. SPECIAL AREA
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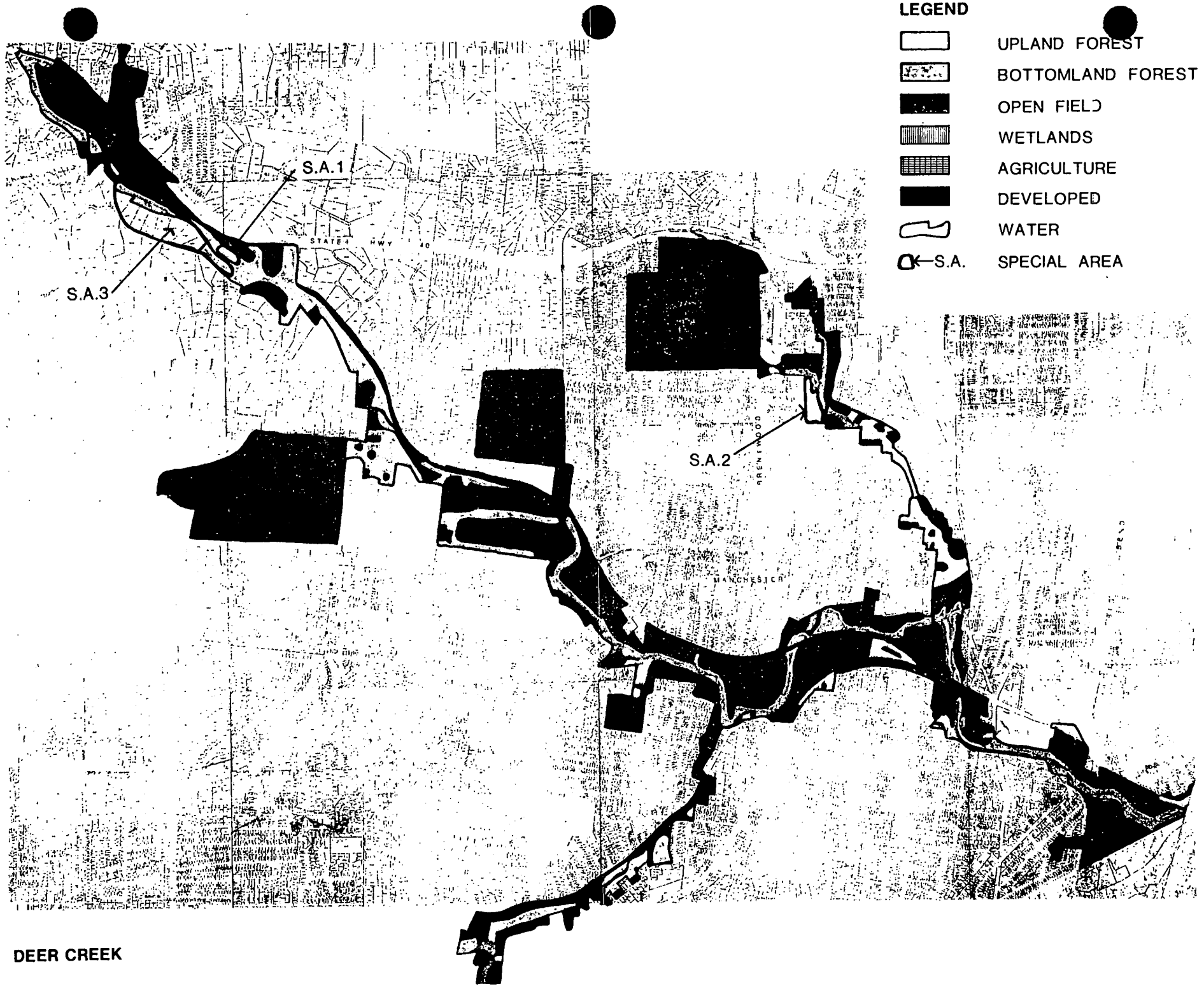
S.A.3
S.A.1
MALINE CREEK


LEGEND
UPLAND FOREST
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WETLANDS
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WATER
S.A. SPECIAL AREA
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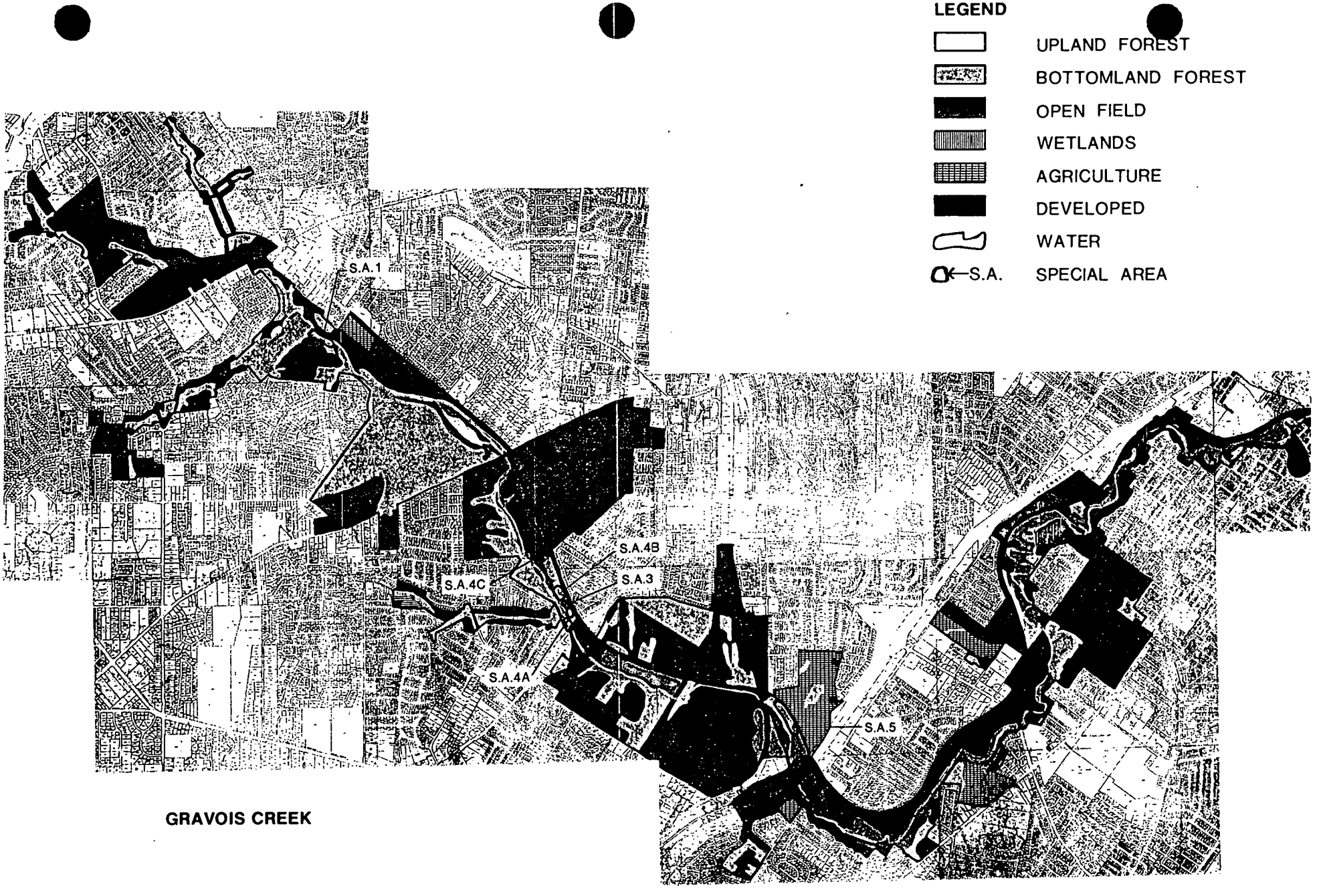
MANCHESTER

DEER CREEK


LEGEND
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WETLANDS
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WATER
S.A. SPECIAL AREA
S.A.1
S.A.4B
S.A.3
S.A.4C
S.A.4A
S.A.5
GRAVOIS CREEK

TYPICAL BOTTOMLAND FOREST WILDLIFE SPECIES

MAMMALS

*White-tailed deer *(Odocoileus virginianus)*
*Striped skunk *(Mephitis mephitis)*
Bats *(Chiroptera – Vespertilionidae)*
Mink *(Mustela vision)*
*White-footed mouse *(Peromysus leucopus)*
House mouse *(Mus musculus)*
*Eastern cottontail rabbit *(Sylvilagus Floridanus)*
*Opposum *(Diadelphis marsupialis)*
*Beaver *(Castor canadensis)*
*Muskrat *(Ondatra zibethicus)*
*Nutria *(Myocaster coypus)*
*Woodchuck *(Marmota monax)*
*Raccoon *(Procyon lutor)*
*Fox squirrel *(Sclurus niger)*
*Gray squirrel *(Sciurus carolinensis)*
*Red fox *(Vulpes fulva)*
*Deer mouse *(Peromyscus maniculatus)*
*Short-tailed shrew *(Blarina brevicauda)*
*Eastern mole *(Scalopus aquaticus)*

AMPHIBIANS

Eastern tiger salamander *(Ambystoma tigrinum)*
*Fowler's or Woodhouses toad *(Bufo woodhousei)*
*Leopard Frog *(Rana pipiens* complex)
Spotted salamander *(Ambystoma maculatum)*
Marbled salmanader *(Ambystoma opacum)*
*Small-mouthed salamander *(Ambystoma texanum)*
Eastern gray tree frog *(Hyla versicolor-chrysoscelis)*

REPITLES

Rough green snake *(Opheodrys aestivus)*
*Eastern garter snake *(Thamnophis sirtalis)*
*Eastern box turtle *(Terrapene carolina)*
*Five-lined skink *(Eumeces fasciatus)*
Broad-headed skink *(Eumeces laticeps)*
Southern Copperhead *(Agkistrodon contortix)*
*Black rat snake *(Elaphe obsoleta)*

BIRDS

American gold finch *(Spinus tristis)*
*Tufted titmouse *(Parus bicolor)*
*Carolina wren *(Thryothorus ludovicianus)*
*Cardinal *(Cardinalis cardinalis)*
*Bluejay *(Cyanocitta cristata)*
Song sparrow *(Melospiza melodia)*
*Carolina chickadee *(Parus carolinensis)*
*Dark-eyed junco *(Junco hyemalis)*
*Rufous-sided towhee *(Pipilio erythrophthalmus)*
Swamp sparrow *(Melospiza georgiana)*
*Common crow *(Corvus brachyrhynchos)*
*Eastern phoebe *(Sayornis phoebe)*
*Prothonotary warbler *(Protonotaria citrea)*
*Robin *(Turdus migratorius)*
*Eastern wood pewee *(Contopus virens)*
*Yellow throat *(Geothlypis trichas)*
Yellow-billed cuckoo *(Coccyzus americanus)*
Great-crested Flycatcher *(Myiarchus crinitus)*
*Black-capped chickadee *(Parus atricapillus)*
Catbird *(Dumetella carolinensis)*
White-breasted nuthatch *(Sitta carolinensis)*
*Yellow-shafted flicker *(Colaptes auratus)*
*Barred owl *(Strix varia)*
*Pileated woodpecker *(Dryocopus pileatus)*
*Wood duck *(Aix sponsa)*
*Red-tailed hawk *(Buteo jamaicensis)*
*Downy woodpecker *(Dendrocopos pubescens)*
*Red headed woodpecker *(Melanerpes erythrocephalus)*
Red-bellied woodpecker *(Centurus carolinus)*
*Red-eyed vireo *(Vireo olivaceus)*
*White-throated sparrow *(Zonotricha albicollis)*
Ruby-crowned Kinglet *(Regulus calendula)*
*Starling *(Sturnus vulgaris)*
*Wood Thrush *(Hylocichla mustelina)*

TYPICAL AGRICULTURAL WILDLIFE SPECIES

MAMMALS

Prarie vole *(Microtus ochrogaster)*
Deer mouse *(Peromyscus maniculatus)*
House mouse *(Mus musculus)*
*Short-tailed shrew *(Blarina brevicauda)*
Norway rats *(Rattus norvegicus)*
*Eastern cottontail rabbits *(Sylvilagus Floridanus)*
*Woodchuck *(Marmota monax)*
*White-tailed deer *(Odocoileus virginianus)*
*Eastern mole *(Scalopus aquaticus)*
Gopher *(Geomys bursarius)*
*Raccoon *(Procyon lotor)*
*Opossum *(Didelphis marsupialis)*
*Coyote *(Canis latrans)*
Long-tailed weasel *(Mustela frenata)*

AMPHIBIANS

*American toad *(Bufo americanus)*
Western chorus frog *(Pseudacris triseriata)*
*Small-mouthed salamander *(Ambystoma texanum)*
Eastern tiger salamander *(Ambystoma tigrinum)*

REPITLES

*Eastern yellow-bellied racer *(Coluber constrictor)*
*Black rat snake *(Elaphe obsoleta)*
*Prarie Kingsnake *(Lampropeltis ealligaster)*
*Five-lined skink *(Eumeces fasciatus)*

BIRDS

*Common crow *(Coryus brachyrhychos)*
*Bobwhite quail *(Colinus virginianus)*
Field sparrow *(Spizella pusilla)*
*Mourning dove *(Zenaidura macroura)*
*Starling *(Sturnus vulgaris)*
*Eastern meadowlark *(Sturnella magna)*
*Red-winged blackbird *(Agelaius phoeniceus)*
*Red-tailed hawk *(Buteo jamaicensis)*
*Sparrow hawk *(Falco sparverius)*

TYPICAL LAKE, POND, AND CREEK WILDLIFE SPECIES

MAMMALS

*Beaver *(Castor canadensis)*
*Muskrat *(Ondatra zibethicus)*
*Nutria *(Myocaster coypus)*
*Raccoon *(Procyon lotor)*
Bats (Chiroptera-Vespertilionidae)

AMPHIBIANS

*Bullfrog *(Rana catesbeiana)*
*Cricket Frog *(Acris crepitans)*
*Leopard Frog *(Rana pipiens* complex)
*Green Frog *(Rana clamitans)*
Northern Spring Peeper *(hyla crucifer)*
Central Newt *(Notophthalmus viridescens)*
Eastern gray tree Frog *(Hyla versicolor-chrysoscelis)*
Mudpuppy *(Necturus maculosus)*
Western Lesser siren *(Siren intermedia)*

REPTILES

*Missouri slider *(Pseudemys floridana hoyi)*
Slider *(Pseudemys concinna hieroglyphica)*
*Western painted turtle *(Chrysemys picta)*
*False map turtle *(Graptemys pseudogeographica)*
*Mississippi map turtle *(Graptemys kohni)*
*Red-eared turtle *(Pseudemys scripta)*
*Western spiny softshell *(Trionyx spinifer)*
Stinkpot turtle *(Sternothaerus odoratus)*
*Common snapping turtle *(Chelydra serpentina)*
*Northern water snake *(Natrix sipedon)*
Graham's water snake *(Natrix grahami)*
Diamond-backed water snake *(Natrix rhombifera)*

BIRDS

*Belted Kingfisher *(Megaceryle alcyon)*
*Mallard *(Anas platyrhynchos)*
*Wood duck *(Aix sponsa)*
*Green heron *(Butorides virescens)*
*Red-winged blackbird *(Agelaius phoeniceus)*
*Blue heron *(Florida caerulea)*

TYPICAL DEVELOPED LAND WILDLIFE SPECIES

MAMMALS

House mouse *(Mus musculus)*
*Eastern mole *(Scalopus aquaticus)*
*Fox squirrel *(Sciurus niger)*
*Eastern gray squirrel *(Sciurus carolinensis)*
*Opossum *(Didelphis marsupialis)*
*Raccoon *(Procyon lutor)*
*Eastern cottontail rabbit *(Sylvilagus floridanus)*
Norway rat *(Rattus norvegicus)*
Black rat *(Rattus rattus)*
*Skunk *(Mephitis mephitis)*

AMPHIBIANS

*American toad *(Bufo americanus)*
Eastern tiger salamander *(Ambystoma tigrinum)*

REPTILES

Northern lined snake *(Tropidoclonion lineatum)*
DeKays snake *(Storeria dekayi)*
*Eastern garter snake *(Thamnophis sirtalis)*

BIRDS

*Mourning dove *(Zenaidura macroura)*
Chimney swift *(Chaetura pelagica)*
*Black-capped chickadee *(Parus atricapillus)*
Catbird *(Dumetella carolinensis)*
Brown trasher *(Toxostoma rufum)*
*Starling *(Stumus vulgaris)*
*Robin *(Turdus migratorius)*
*Mockingbird *(Minus polyglottos)*
House sparrow *(Passer domesticus)*
European sparrow *(Passer montanus)*
Common grackle *(Quiscalus quiscula)*
Brown-headed cowbird *(Molothrus ater)*
*Cardinal *(Cardinalis cardinalis)*
*Pigeon *(Columba livia)*
*Bluejay *(Cyanocitta cristata)*
Song sparrow *(Milospiza melodia)*
*Common nighthawk *(Chordeiles minor)*

TYPICAL NON-FORESTED AREA WILDLIFE SPECIES

MAMMALS

*Short-tailed shrew *(Blarina brevicauda)*
Least shrew *(Cryptotis parva)*
*Eastern mole *(Scalopus aquaticus)*
*White-footed mouse *(Peromyscus leucopus)*
House moust *(Mus musculus)*
*Eastern cottontail rabbit *(Sylvilagus floridanus)*
*Woodchuck *(Marmota monax)*
Deer mouse *(Peromyscus maniculatus)*
*Red Fox *(Vulpes fulva)*
*Coyote *(Canis latrans)*
*White-tailed deer *(Odocoileus virginianus)*
Long-tailed weasel *(Mustela frenata)*

AMPHIBIANS

*American toad *(Bufo americanus)*
*Woodhouses toad *(Bufo woodhousei)*
*Small-mouthed salamander *(Ambystoma texanum)*
Eastern tiger salamander *(Ambystoma tigrinum)*
*Leopard Frog *(Rana pipiens* complex)

REPTILES

*Prairie Kingsnake *(Lampropeltis calligaster)*
*Eastern yellow-bellied racer *(Coluber constrictor)*
Ornate box turtle *(Terrapene ornata)*
*Eastern garter snake *(Thamnophis sirtalis)*

BIRDS

*Mourning dove *(Zenaidura macroura)*
Catbird *(Dumetella carolinensis)*
*Cardinal *(Cardinal cardinalis)*
*Bobwhite quail *(Colinus virginianus)*
*Common crow *(Crovus brachyrhynchos)*
*Eastern meadowlark *(Sturnella magna)*
Brown thrasher *(Toxostoma rufum)*
Field sparrow *(Spizella pusilla)*
Cedar waxwing *(Bombycilla cedrorum)*
*Robin *(Turdus migratorius)*
Bluebird *(Sialia sialis)*

TYPICAL UPLAND FOREST WILDLIFE SPECIES

MAMMALS

Gray fox *(Urocyon cinereoargenteus)*
*Eastern gray squirrel *(Sciurus caroliensis)*
*Short-tailed shrew *(Blarina brevicauda)*
*White-footed mouse *(Peromyscus leucopus)*
*White-tailed deer *(Odocoileus virginianus)*
Bats (Chiroptera-Vespertilionidae)

AMPHIBIANS

Spotted salamander *(Ambystoma maculatum)*
Marbled salamander *(Ambystoma opacum)*
Eastern gray tree frog *(Hyla versicolor-chrysoscelis)*
*American toad *(Bufo americanus)*
Northern Spring Pepper *(Hyla crucifer)*
Long-tailed salamander *(Eurycea longicauda)*
Red-backed salamander *(Plethodon cinereus)*
Slimy salamander *(Plethodon glutinosus)*

REPTILES

*Six-lined racerunner *(Cnemidophorus sexlineatus)*
*Five-lined skink *(Eumeces Fasciatus)*
*Eastern box turtle *(terrapene carolina)*
*Black rat snake *(Elaphe obsoleta)*
DeKay's snake *(storcria deKayi)*
Western worm snake *(Carphophis amoenus)*
Prairie ringneck snake *(Diadophis punctatus)*
Grund skink *(Lygosoma laterale)*

BIRDS

Hairy woodpecker *(Dendrocopus villosus)*
*Downy woodpecker *(Dendrocopus pubescens)*
*Eastern wood pewee *(Contopus virens)*
*Blue jay *(Cyanocitta cristata)*
*Tufted titmouse *(Parus bicolor)*
White-breasted nuthatch *(Sitta carolinensis)*
*Carolina wren *(Thryothorus lodovicianus)*
Yellow-billed cuckoo *(Coccyzus americanus)*
*Yellow-shafted flicker *(Colaptes auratus)*
*Pileated woodpecker *(Dryocopus pileatus)*
*Common crow *(Crovus brachyrhynchos)*
*Carolina chickadee *(Parus carolinensis)*
*Black-capped chickadee *(Parus atricapillus)*
Common grackle *(Quiscalus quisculus)*
Brown-headed cowbird *(Molothrus ater)*
*Cardinal *(Cardinal cardinalis)*
Red-bellied woodpecker *(Centurus carolinus)*
*Wood thrush *(Hylocichla mustelina)*
*Red-headed woodpecker *(Melanerpes erythrocephalus)*

TYPICAL WETLAND AREA WILDLIFE SPECIES

MAMMALS

*Beaver *(Castor canadensis)*
*Muskrat *(Ondatra zebethicus)*
*Nutria *(Myocaster coypus)*
*Raccoon *(Procyon lotor)*

AMPHIBIANS

Spotted salamander *(Ambystoma maculatum)*
Marbled Salamander *(Ambystoma opacum)*
*Small-mouthed salamander *(Ambystoma texanum)*
Eastern tiger salamander *(Ambystoma tigrinum)*
Central newt *(Notophthalmus viridescen)*
Mudpuppy *(Necturus maculosus)*
*American toad *(Bufo americanus)*
*Woodhouses toad *(Bufo woodhousei)*
*Blanchard's cricket frog *(Acris crepitans)*
Northern spring peeper *(Hyla crucifer)*
Eastern gray treefrog *(Hyla versicolor-chrysoscelis)*
Western chorus frog *(Pseudacris triseriata*
*Leopard frog *(Rana pipiens* complex)
*Bullfrog *(Rana catesbeiana)*
*Green frog *(Rana clamitans)*
Western lesser siren *(Siren intermedia)*

REPTILES

*Common snapping turtle *(Chelydra serpentina)*
Stinkpot turtle *(Stemothaerus odoratus)*
*False map turtle *(Graptemys pseudogeographica)*
*Mississippi map turtle *(Graptemys kohni)*
*Red-eared turtle *(Pseudeyms scripta)*
*Western spiny softshell *(Trionyx spinifer)*
*Western painted turtle *(Chrysemys picta)*
*Missouri slider *(Pseudemys floridana hoyi)*
Slider *(Pseudemys concinna hieroglyphica)*
Grahams water snake *(Natrix grahami)*
Diamond-backed water snake *(Natrix rhombifera)*
*Northern water snake *(Natrix sipedon)*
*Eastern garter snake *(Thamnophis sirtalis)*
*Five-lined skink *(Eumeces Fasciatus)*
*Western Ribbon snake *(Thamnophis sauritus proximus)*

BIRDS

*Killdeer *(Charadrius vociferus)*
*Red-winged blackbird *(Agelaius phoeniceus)*
*Belted kingfisher *(Megaceryle alcyon)*
*Mallard *(Anas platyrhynchos)*
*Wood duck *(Aix sponsa)*
*Green heron *(Butorides vivescens)*
*Blue heron *(Florida caerulea)*

GENERAL RECOMMENDATIONS FOR WILDLIFE MANAGEMENT:

1. Utilize principle of interspersion — the edge effect.
2. Protect existing fruit-bearing or mast-producing vegetation, and preserve rare or uncommon species from destruction and heavy recreational usage.
3. Manipulate stages of succession and vegetational zonation in the floodplains to that which is naturally sought by the plant and animal community.
4. Plantings for food and cover should be those naturally occurring in the region.
5. Cutting, thinning, or pruning vegetation during March through April and other times during breeding and young rearing periods, should be strictly controlled.
6. Control wild dogs and cats.
7. Provide protection from uncontrolled fires and grazing.
8. Seek to maintain a maximum of species diversity rather than maximum development of a few species.
9. Be cautious about introducing species, especially non-native flora and fauna.
10. Encourage public involvement and scientific research in development of sound wildlife management practices.

GENERAL SPECIAL AREA RECOMMENDATIONS:

1. Protect and preserve existing special areas outlined during study for present and future generations.
2. Manage for specific uses — either scientific, educational, aesthetic — which is compatible with the primary management goal of each special area, and which will not impair the special qualities of the sites.
   a. Prohibit intrusion of structures, buildings, easements, rights-of-way, etc.
   b. Provide appropriate descriptive material to all interested persons; however, avoid publicity that would induce overusage.
   c. If necessary, clearly mark off special areas to certain usage.
   d. Fire breaks, erosion control, access roads, trails, and other interferences should be *minimal* or not at all, unless the master plan indicates their need.
   e. Ample buffer areas should be established.
   f. Cutting, thinning, removal of dead wood, opening of scenic vistas, or any other manipulation of vegetation, including introduction of species, should be prohibited except as provided in the master plan.
   g. Periodic reports should be submitted to record conflicts, potential hazards, etc. affecting the site.

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Year 00 **ID** 3012

Further Info? ☐

Operating Unit St. Louis Sites **Site** **Area** **MARKS Number** FN:1110-1-8100g

Primary Document Type Site Management **Secondary Document Type** Reference Documents

Subject or Title
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Author/Originator **Company** John Lark & Associate **Date**

Recipient (s) **Company (-ies)** **Version** Final

Original's Location Central Files **Document Format** Paper **Confidential File?** ☐

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Comments

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☐ Madison
☐ Downtown
☐ Iowa

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