

# **A Survey of Attitudes Towards the Mississippi River as a Total Resource in Minnesota**

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## FOREWORD

This Bulletin is published in furtherance of the purposes of the Federal Water Resources Research Act of 1964. The purpose of the Act is to stimulate, sponsor, provide for, and supplement present programs for the conduct of research, investigations, experiments, and the training of scientists in the field of water and resources which affect water. The Act is promoting a more adequate National program of water resources research by furnishing financial assistance to non-Federal research.

The Act provides for establishment of Water Resources Research Centers at Universities throughout the Nation. On September 1, 1964, a Water Resources Research Center was established in the Graduate School as an Interdisciplinary component of the University of Minnesota. The Center has the responsibility for unifying and stimulating University water resources research through the administration of funds covered in the Act and made available by other sources; coordinating University research with water resources programs of local, State and Federal agencies and private organizations throughout the State; and assisting in training additional scientists for work in the field of water resources through research.

This Bulletin is number 55 in a series of publications designed to present information bearing on water resources research in Minnesota and the results of some of the research sponsored by the Center. This Bulletin is concerned with the attitudes of Minnesotans toward the use, maintenance, and development of the Mississippi River in Minnesota including attitudes towards recovery programs for the River resource. The information presented will be essential for planning where understanding public opinion should be an integral part of the planning process.

This Bulletin serves as the Research Project Technical Completion Report for the following Center project:

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Publication Abstract:

A survey of the attitudes of Minnesotans toward the use maintenance and development of the Mississippi River in Minnesota was conducted. Background information on the diverse physical nature of the project Universe (those 23 Minnesota counties which the River flows through or is adjacent to) was collected covering the topics of waterflow, soils, population change, changing riparian land use, and recreational opportunities. Great physical and cultural diversity was found in the project Universe. Attitudes of residents were measured by a 40 item mail questionnaire sent to 5,000 residents of the project Universe; 101 in-depth interviews were also conducted. Respondents provided data on their characteristics, evaluated the desirable and undesirable characteristics of the River, evaluated the role of media in providing them with environmental information, expressed attitudes towards the use of the River, how River pollution should be controlled and financed, and provided data on what aspects of their life styles they were and were not willing to change to improve environmental quality. Secondary students were also surveyed in a separate effort to quantify significant difference of attitudes held by youth and adults. Two significant findings were that Minnesotans do not desire to curtail their uses of energy to improve environmental quality, and the perceived present uses of the River are exactly opposite to the uses the public desires.

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## EDITOR'S NOTE AND ACKNOWLEDGEMENTS

The authors wish to express their appreciation to the many persons, agency personnel and organizations whose cooperation assisted this investigation. Of central significance was the contribution made by the more than one thousand persons who gave of their time to complete and return the mail order questionnaires. Of like value was the contribution made by those persons who were personally interviewed and those high school students and their instructors who provided the youth input to this study by responding to various survey instruments.

At various times the personnel of several agencies were asked for, and willingly gave, information pertinent to the study. Especially helpful were the Minnesota State Planning Agency, officials of several counties, the Minnesota Department of Natural Resources, the Corps of Engineers and the United States Forest Service (especially at the Chippewa National Forest). The cooperation of the state college administration at Bemidji, St. Cloud and Winona is recognized, especially in connection with the public information conferences held on each of the three campuses. The Bemidji State College Center for Environmental Studies provided project coordination and served as the fiscal agent. Professor William C. Walton, Director, Water Resources Research Center, University of Minnesota freely gave of his time and experience at several stages of this project.

Dr. James Ludwig, former Director of the Center for Environmental Studies, Bemidji State College, and Principal Investigator of this research project, contributed principally to the organizational and conceptual framework of the project. His attention to the necessary project record keeping freed the authors from that sometimes time-consuming task. Dr. Ludwig, although not a direct contributor to this article largely assisted in the conceptualization and production of the interview and mail questionnaires (instruments) and did not actually perform either the research or analysis of these data. The cartographic work was largely a contribution of geography students David Ostenso and Hans Christensen of Saint Cloud State College. Basic statistical compilation and analysis was the responsibility of Joel Ward, Bemidji State College.

The efforts of Dr. Eleanor Hanlon, formerly of Saint Cloud State College and Joel Reed, formerly of Bemidji State College who worked in the very early stages of the investigation, proved to be important contributions in the preparation of the final project report. In addition many undergraduate and several graduate students participated in some phase of data collection and analysis.

Finally, it should be recognized that this project is the outgrowth of an immensely larger project conceived by a team of natural and social scientists from the three participating state colleges. The original concept of a multidisciplinary comprehensive survey of the physical and chemical condition of the Mississippi River in the context of the attitudes and perceptions of Minnesotans toward this resource was advanced in the summer of 1969 first by the physical and biological scientists in Bemidji's Center for Environmental Studies. A tri-college team of more than twenty proposal writers convened three times, with help from the State College Board, to produce the proposal for a much larger project than is reported herein. The director of the Center for Environmental Studies was named principal investigator and project director as a matter of convenience. Later, the larger project was deleted in favor of funding only the associated attitudinal study; this left the anomalous situation of a biologist as principal investigator for an attitudinal study. As that biologist I have been privileged to assist five competent and enthusiastic social scientists in the development of this research. Their toleration of my faux pas in their fields of competence, and patience in training me to see and appreciate their problems and needs has been most gratifying, and I think, productive. To all of the above mentioned individuals and organizations I want to extend sincere thanks on behalf of the staff of this project. We present this report to the reader as evidence that fruitful multidisciplinary studies are possible in academic institutions where the patience and wisdom of investigators provide the needed basis for extensive interdisciplinary and intercollege cooperation.

As editor, I hope that the reader recognizes the transitory significance of attitudinal surveys. The volatile nature of public opinion requires that if this study is to be used for its maximum value, it must be made available as soon as possible. As researchers



we would have preferred to wait in order to produce more elegant analyses of these data, but have chosen instead to present this work quickly to provide a clear picture of the present attitudinal profile of Minnesotans toward this river resource.-----

James P. Ludwig  
August 18, 1972

## CHAPTER I

### Introduction

by

Philip L. Tideman

#### 1. The Nature of the Problem

One of the world's major rivers, the Mississippi, originates in Minnesota, receives the discharges of several major tributaries and leaves the state at the Minnesota-Iowa border some 710 miles from its source.

In Minnesota the Mississippi River is many things to many people. It represents low cost water transportation to some, migratory waterfowl habitat to others and even a convenient sewage disposal system to others. The river is variously described as a thing of beauty, a polluted mess, a fisherman's delight (or frustration), a tranquil stream, or a raging torrent. For some Minnesotans the Mississippi is their source for domestic and industrial water supplies and for some its water is diverted for various agricultural purposes. As per capita use of water increases and as population increases the demands placed upon the river are growing. It is logical then that the Mississippi River is the focus of considerable attention and investigation at this time (1). Much of this attention and study is in terms of water quality, the specific requirements of municipalities and industries, and pleasure or recreational potential development. It is clear that these various uses are often in conflict. Planning for rational water development must be based upon a fund of information generated by a variety of research efforts. This study may contribute to that fund of information as it furnishes some knowledge as to how Minnesotans perceive the Mississippi River.

#### 2. The Study

The central purpose of this investigation was to survey attitudes about the river which were expressed through field interviews and questionnaires, both mail order and personally administered.

A more complete description of the study, as earlier identified is as follows:

This project will concentrate specifically on the upper Mississippi River from the Iowa border to its source in northern Minnesota. It is a joint project of natural scientists and social and behavioral scientists at three Minnesota State Colleges--Bemidji, St. Cloud, and

Winona--which are located in the river's valley. Researchers in the various involved disciplines will gather, evaluate, and collate existing data using modern tools, such as the computer, to provide a basic framework concerning the present state of man's attitudes toward and knowledge of one immediate natural resource--the Mississippi River. The proposed project will foster a cooperative inter-institutional, inter-agency, and inter-disciplinary study, providing a sound basis for future planning in such areas as additional scientific study of river ecology if necessary, and possible recovery programs. The project will also work toward much needed public information and education programs. Relevant findings will be disseminated through the news media, workshops, seminars, education programs, and publication in appropriate journals. Base line data will be collected on population, land use, statutes, and ordinances. An attitudinal survey will be conducted which will gather information related to attitudes toward use of the Mississippi River and regulatory anti-pollution programs. Findings will be used to raise the general educational level and promote more positive attitudes toward intelligent use of water resources (2, p. 37).

As conceived, written, proposed and funded the investigation was a joint effort of staff from the three state colleges. Emerging from the initial planning sessions was the social science framework of this study. Although several natural scientists were involved in initial project planning none continued as members of the research team as only the social science phase of the initial proposal was funded. Although the authors represent two social science disciplines, geography and political science, sociologists were also involved in the study at an earlier stage. In addition to faculty members, students from several social science disciplines were also able to participate in the project and thus gain experience in a research effort.

In keeping with the project design, public information conferences were held at each of the three state colleges. In each case the authors participated in the program as well as being involved in the organization of the meetings. There was a further attempt to provide the opportunity for additional topics of regional interest to be included in each program (see Appendix A for programs at each of the three locations.).

Between 300 and 350 persons attended these conferences. Following each conference several types of media carried accounts of the meetings. Television coverage at St. Cloud and Winona carried the river conference to an even wider audience. It appears that dissemination of some of the study's findings has taken place prior to the publication of this final report. From attendance at and interest in these meetings there appears to be substantial interest in each region concerning water resources in general, and the Mississippi River in particular. This interest, the authors believe, can be given direction through further educational efforts with the end result being widespread support for desirable water resource management programs.

### 3. The Method

Of central importance to this study were attitudes of Minnesotans concerning the river. The study universe consisted of the twenty-one Minnesota counties which border on the Mississippi River or through which that river flows with two additional counties, Carver and Scott, added because of their inclusion within the Minneapolis-St. Paul Metropolitan area. For certain purposes it was desirable to subdivide the universe into the four regions identified on Figure 1.1. The Upper Reach included the five counties of Clearwater, Hubbard, Beltrami, Cass and Itasca. The Middle Reach continued downstream with Aitkin, Crow Wing, Morrison, Stearns, Benton, Sherburne and Wright. The seven county Metro Area consisted of Anoka, Ramsey, Hennepin, Washington, Dakota, Scott and Carver. Included as Lower Reach counties were Goodhue, Wabasha, Winona, and Houston. The study universe thus became the twenty-three counties (Figure 1.1), and persons living within these twenty-three counties were those whose attitudes were surveyed. Several groups were sampled:

#### 1) Mail Order Questionnaire

Five thousand randomly selected names from within the twenty-three county study universe were obtained from the Minnesota Motor Vehicle registration lists. Roughly two and one-half million motor vehicles were, in 1970, registered in Minnesota. The Department of Administration computers printed out every 250th

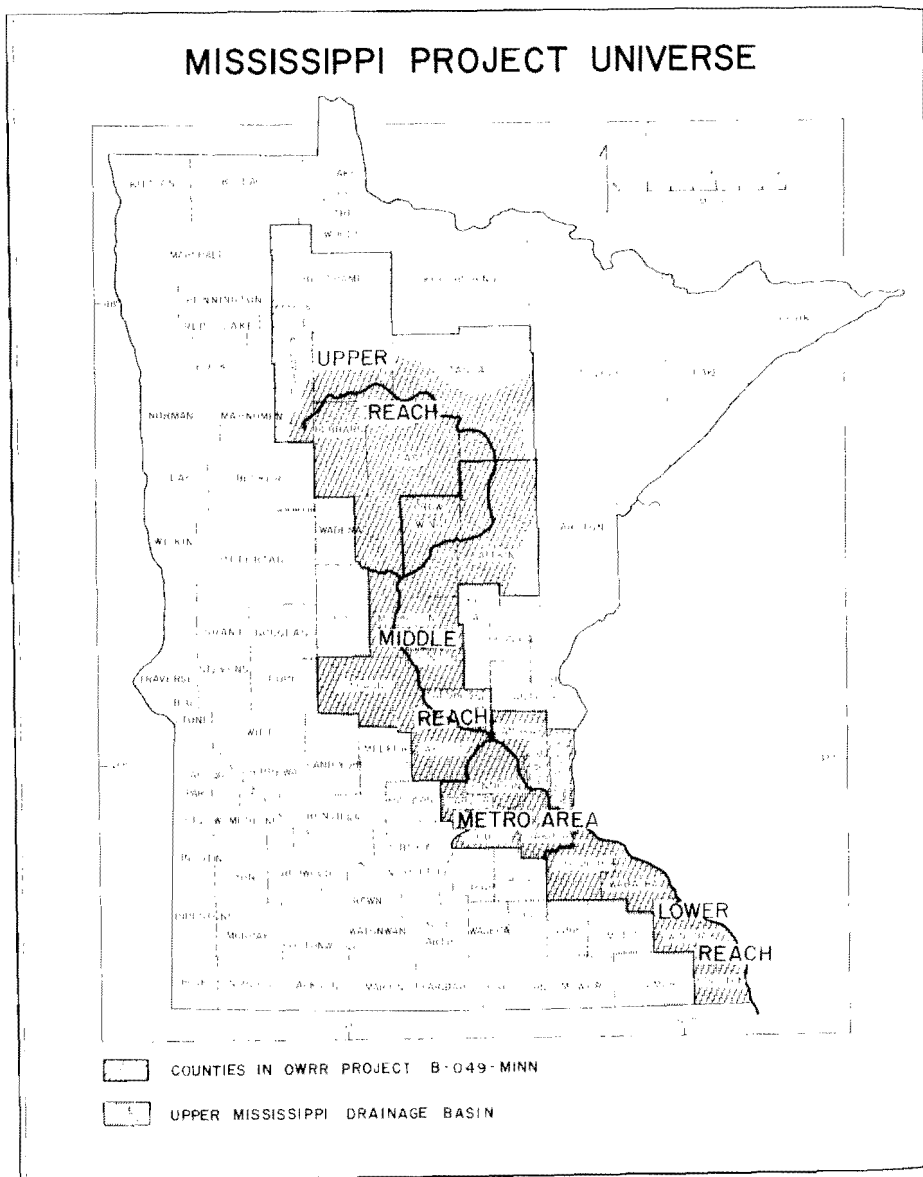


FIGURE 1.1

name from these lists totalling 10,000 names. The computers then eliminated those names from the non-universe counties, leaving a residual list of almost 6200 motor vehicle owners within the twenty-three county study universe. Since the universe population amounts to some 61.3 percent of Minnesota's total, the random sample was of the proper magnitude with all twenty-three counties represented on the mailing list. By visual scanning the list of 6200 names was further reduced by eliminating those motor vehicle owners which were obviously corporate or business entries. Slightly fewer than 5000 mail order questionnaires were mailed in the spring of 1971; 1007 questionnaires were returned. No follow-up attempts were undertaken to increase the rate of questionnaire return. A sample mail order questionnaire is included as Appendix B-1.

#### 2) Personal Interviews

Over 100 personal interviews were conducted during the summer of 1971 by members of the research team. Interviews were held with river-fronting homeowners, recreational users, agriculturalists, and persons representing commercial or municipal interests relating directly to the Mississippi River. Persons interviewed were randomly selected and questioned by the interviewer at a river fronting location.

#### 3) Youth Questionnaires

Close to 200 questionnaires were administered to senior high school classes in eight schools within the universe during late winter 1971. Advance approval was obtained from the proper school administrator as well as from the classroom instructor. In each case the class selected was an unstratified, junior year social studies class with from twenty to thirty students. These questionnaires, in addition to yielding attitudinal information also provided the investigators with a pilot group in terms of questionnaire development. A sample copy of this questionnaire is included as Appendix B-2.

#### 4) Professional Educator/College Class

During the period of development and trial of the instrument the questionnaires were given to two additional groups, 1) a class of 35 public school administrators and, 2) a college class of about 20 students. Although useful for developmental purposes the questionnaires from these two groups were not analyzed.

The design of the project also called for the collection of certain baseline data, largely included in Chapter II. Such data was drawn from census schedules, the Minnesota Land Management Information System and a variety of other sources. An extensive bibliography was developed with the goal being that of assistance to river researchers, present and future. Copies of this bibliography are available at the St. Cloud State College library, and the Bemidji Center for Environmental Studies.

## CHAPTER II

### Backgrounding the Study Universe by Philip L. Tideman

#### 1. Physical Characteristics of the River and its Universe

The study universe consists of twenty-three Minnesota counties (Figure 1.1). That these twenty-three political units do not coincide with the drainage basin of the Upper Mississippi is also apparent (Figure 1.1). To the north the Upper Reach counties generally go beyond the Mississippi watershed while along the western margins, even excluding the Minnesota River drainage, the study counties represent only a portion of the river's drainage area.

The Mississippi rises in southern Clearwater County at an elevation of 1475 feet. From that source the small stream arcs north and eastward to Grand Rapids before turning south and west to the vicinity of Brainerd. Much of this upper course is meandered with numerous oxbow lakes and abandoned channels giving evidence of stream bed shifts across areas of extremely flat, marshy lands, some of which were glacial lake bottoms. An inspection of aerial photographs and topographic maps, or a river inspection trip reveals the significant extent of this type of river and terrain landscape. The generalized vegetation patterns of universe counties is seen in Figure 2.1 with an aspen-birch forest alternating with bog forest types being representative of the northern counties through which the river flows.

From the vicinity of Brainerd in southern Crow Wing county to the Twin City Metro Area the river flows south and southeastward for about 150 miles. For much of this distance the river is entrenched some 30 to 60 feet into the outwash terraces which usually are of light soil and low relief. Meanders can be found but are not common. Near Royalton and Sauk Rapids the granite bedrock is exposed and thus the generally smooth surface of the river is broken by several hundred yards of rapids and turbulent water flow. At several places the river channel is broken by wooded islands. The Crow Wing, Sauk and Crow Rivers, all entering the Mississippi from the west contribute to the increased flow of the master stream over this reach.

## MAJOR FOREST TYPES, 1962

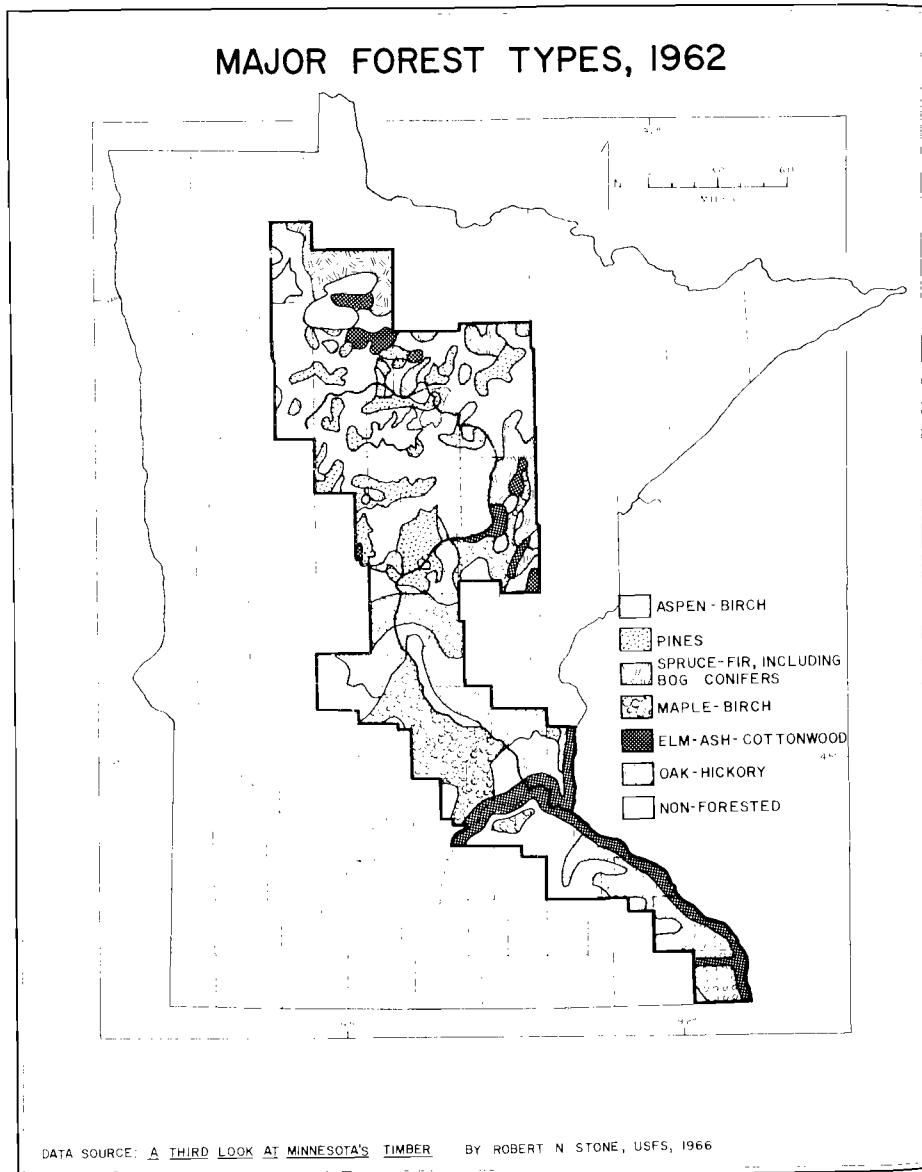


FIGURE 2.1

Along this reach a mixed hardwood forest alternates with open grassland, most of which is cultivated and produces a variety of hay and row crops (Figure 2.1).

In the Metro Area the Mississippi receives the flow of its major state tributary, the Minnesota River, at the historic confluence at Mendota-Fort Snelling. Upstream from this junction the river in the Metro Area is entrenched with only a limited flood plain. Downstream from the mouth of the Minnesota River however, there is a considerable flood plain area. Portions of this low lying plain have been built up as industrial and residential properties which have, on occasion, experienced serious flooding. The Metro Area also marks the head of navigation or northernmost point on the river used by inland water carriers. This use for navigation has been enhanced by numerous river channel projects conceived and built by the Corps of Engineers. A major study is currently being projected for the river corridor in the Metro Area (3). Urban uses of land adjacent to the river vary greatly and include residential, industrial, recreational, and sanitation, among others.

The Lower Reach is greatly different in appearance. Part of this difference is accounted for by the broad valley bounded by bluffs of sedimentary rocks giving the area local relief up to 600 feet. Throughout most of the Lower Reach the river occupies only a portion of the broad deep valley which was scoured by a much larger glacial river (4, pp. 291-303). The exception to this is Lake Pepin, a lake some 25 miles long and up to two miles wide which is backed up by the delta of the Chippewa River. Elsewhere marsh land, backwaters, islands and secondary channels occupy much of the valley bottomland. Differences also stem from the numerous locks, control dams and channel dredging which have been undertaken to facilitate commercial use of the lower river. Including the Metro Area and southward to the Iowa border there are eleven major control works (dam and lock), each of which has created a pool behind the dam and has thus altered the channel and flow of the stream itself (5). As with the Upper Reach of the river, the Lower Reach provides considerable wildlife habitat, especially for migratory waterfowl. The bluffs on either side are hardwood types (Figure 2.1) and include the area designated as the Minnesota Memorial Hardwood State Forest.

The Mississippi River leaves the state at the Iowa line at a pool elevation of 620 feet, some 855 feet lower than at its source. This drop means that well over

one-half the total fall of the master stream occurs within the single headwater state.

The matter of water quality of the Mississippi River has been investigated in a variety of ways, by many persons and at many times. A useful review of Mississippi water quality is available as part of an overall state water study (6, pp. 266-305). Suffice it to say that water quality is variable from place to place and from season to season. Agricultural, industrial and municipal pollution all contribute to lowering of the river's water quality while some land use practices have degraded the associated land quality. The Minnesota Pollution Control Agency's (MPCA) most recent report on municipal wastewater treatment reveals some interesting regional differences (7). These are summarized in Table 2.1.

TABLE 2.1  
MUNICIPAL WASTEWATER TREATMENT

	Percent of Regional Population served by municipal MWT	Percent of Regional Population living in municipalities without MWT	Percent of Regional Population not living in municipalities and not having a central MWT
Upper Reach	37 %	4.5%	58.5%
Middle Reach	46.2	4.9	48.9
Metro Area	91.0	1.7	7.3
Lower Reach	60.2	2.7	37.1

This table, although useful, does not contain complete information about the degree of effectiveness of secondary treatment. Neither does it indicate whether or not plant capacities are adequate for the population and industry served. A more complete study of water quality is now being prepared by the MPCA. When available this study should yield specific and valuable information about stream quality and sources of pollution, not only for

the Mississippi but for all other state rivers.

The records of stream flow reveal the Mississippi to have considerable variation. This variation applies not only to maximum, minimum and average flows at the same station but also to the variations between stations. Table 2.2 represents the stream flow records for five streamgaging stations along the Mississippi (6, p. 143).

TABLE 2.2  
Streamflow Data for Stations on Mississippi River

	Near Libby April 1930 to September 1966	Near Royalton March 1924 to September 1966	Near Anoka June 1931 to September 1966	St. Paul March 1892 to September 1966	Winona June 1928 to September 1966
1	5,060	11,600	19,100	36,800	59,200
2	1,915	4,086	7,053	10,080	24,810
3	16,000	37,700	91,000	171,000	268,000
4	5-17-50	4-16-65	4-17-65	4-16-65	4-19-65
5	83	254	586	632	2,250
6	11-16-36	11-25-36	9-13-34	8-26-34	12-29-33
1-Drainage Area (SQ. Mi.)	4-Date of maximum Cfs/day		5-Minimum Cfs/day		
2-Average Cfs	3-Maximum Cfs/day		6-Date of minimum Cfs/day		

The Libby station, in Aitkin County near Big Sandy Lake shows an average flow of 1915 cfs while the Winona measurement is 24,810 cfs, or thirteen times greater. This large difference is accounted for by the two factors of a greater watershed area and increased runoff at the downstream station. The maximum recorded flow at the St. Paul gaging station which occurred during the heavy spring runoff in 1965 was twenty-seven times that of the minimum flow which was recorded at the same station during the drought of the early 1930s. Sound planning for use of the Mississippi must include recognition of the variable nature of the river's flow.

Climatic patterns of the universe reveal a regional range in average annual precipitation from 22 inches in

the northwest to 32 inches where the river leaves the state. A frostfree season of 100-110 days is experienced in the north with up to 160 frostfree days in the southeast. The seasonal extremes in temperature throughout the universe are those characteristic of a mid-latitude mid-continental location (8, pp. 22-25). Soil fertility levels within the universe are generally rated as fair with some pockets of low fertility soils and, along the western fringe, some soils classed as good (8, pp. 46-47).

In terms of physical characteristics the study universe possesses great diversity. Considerable diversity also characterizes the population patterns.

## 2. Population Patterns

### Population Change

For the state as a whole the 1970 population was 3,805,069, up 11.5 percent over the 1960 census totals. This rate of increase was slightly under the national rate of 13.3 percent for the same period. Table 2.3 compares the state increases with those of the nation for the past three decades.

TABLE 2.3  
Population Change

Decade	United States	Minnesota
1940-1950	+14.5%	+ 6.8%
1950-1960	+18.7	+14.5
1960-1970	+13.3	+11.5

From 1960 to 1970 the twenty-three universe counties increased from 1.94 million to 2.33 million. This increase was at a rate of 20.2 percent or close to double the state increase of 11.5 percent. The universe increase also exceeded that of the nation as a whole. The universe population of 2.33 million constitutes 61.3 percent of the total state population.

Figure 2.2 reveals the patterns of population change for the whole state with the universe counties identified by the heavy boundary lines. The twenty-three universe counties represent about 26 percent of

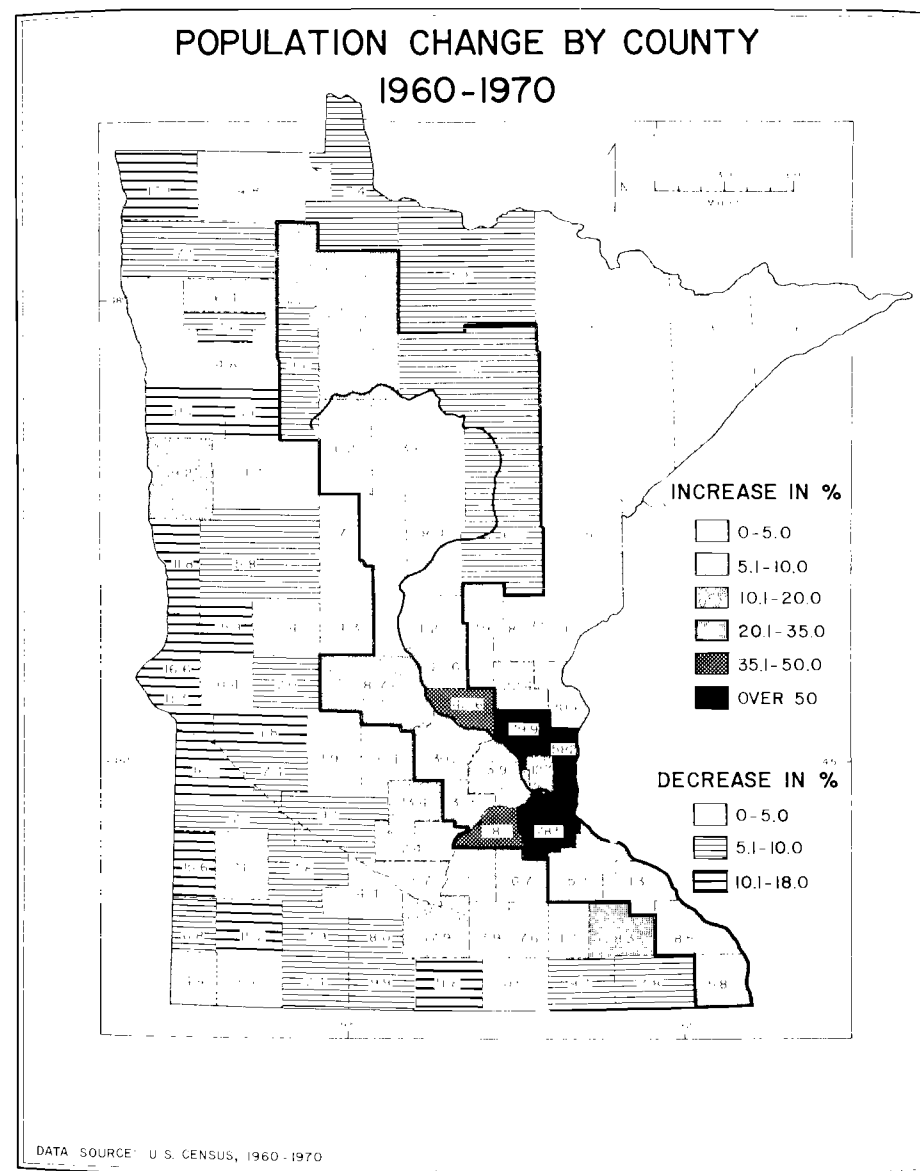


FIGURE 2.2

the 87 Minnesota counties, yet they represent close to one-half of the state's "gaining" counties from 1960-1970. During the 1940's the universe counties accounted for 38 percent of all Minnesota counties which gained in population. During the 1950's they represented 36 percent. It can be said then, that over the past three decades the study universe has consistently included a higher percentage of counties gaining population than their numbers would suggest. Between 1960 and 1970 only three universe counties lost population. Two of these three, Clearwater and Itasca are in the Upper Reach while Aitkin, the third, is the northernmost county of the Middle Reach. Figure 2.2 indicates that counties north and east of the universe and generally those to the west and south are population "losers" while the strip of "gainers" is essentially the study universe. Impressive population gains were registered by counties in or adjacent to the Metro Area. Especially heavy gains were experienced in counties immediately to the north, east and south of the central cities of Minneapolis and St. Paul.

With this pattern of growth in mind it is realistic to assume that a number of the questionnaire respondents have moved into the universe counties from the non-universe counties. Their expressed views therefore may not entirely be drawn from their experiences within the universe where they are now resident.

#### Population Density

The population density patterns within the universe were, in 1970, similar to the state patterns (Figure 2.3). Lowest densities were to be found in the north (under 20 persons per square mile), increasing to a maximum in the Metro Area, then thinning out to the south. As may be expected, the smallest county, Ramsey, which is almost entirely an urban area has the greatest density (3,072 ppsm) found within the universe and within the state. The influence of such outlying cities as Saint Cloud and Winona is reflected in the higher densities for Stearns and Winona counties respectively.

#### Urban-Rural Population Patterns

Figures 2.4 and 2.5 reveal some striking differences which exist within the universe in terms of place of residence. The Upper Reach region not only had the smallest total population but also was most predominantly

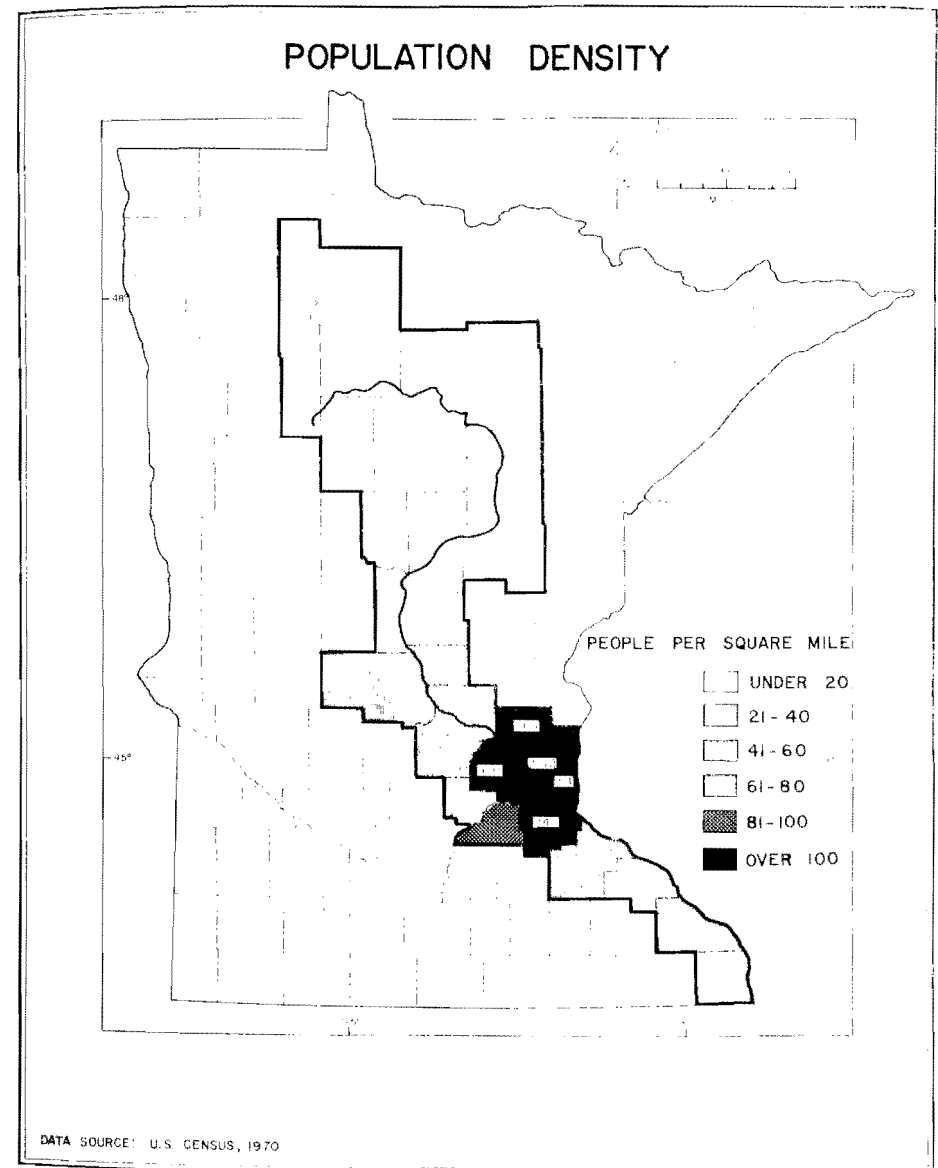


FIGURE 2.3



rural (Figure 2.4). The Metro Area region was overwhelmingly urban as could be anticipated while the Middle and Lower Reach counties were very similar to each other in urbanization. Figure 2.5 is a refinement of Figure 2.4. On a county rather than regional basis it can be observed that a significant difference in place of residence exists within the four regions. Especially striking in this regard is the difference between the "fringe" and "core" counties of the Metropolitan Area. The urban influence of cities such as Bemidji, Brainerd, Saint Cloud and Winona is easily discerned in the graphs of their respective counties. Striking also are county differences in total population.

River City Population Change

Questionnaire respondents were mainly urban residents as the universe population is predominantly urban. There were, in 1970, eight non-Metro cities of 5000 and over along the Mississippi River. Of these eight, four increased in population during the 1960's and four decreased (Figure 2.6). The reasons for this lack of consistency affords a rather interesting topic for future investigation. However, it must be pointed out that city boundaries seldom enclose the urban population. Urban sprawl is a phenomenon which must be taken into account when city populations are considered. It is possible, for example, that although the city of Little Falls experienced a loss in population, as measured by the city's political boundaries, residential sprawl along the river both north and south of the city proper may have added up to an actual area increase which was not reflected in the city census totals.

Figure 2.7 contains city population change for the Metro Area region. Only three cities, Minneapolis, St. Paul and Falcon Heights experienced population loss during the 1960's. Greatest percentage increases were registered by suburban communities whose growth was just starting in 1960. New Hope was the most rapidly growing Metro Area city by this measure.

The population patterns which appear in Figures 2.2 through 2.7 furnish background information which is useful in better understanding the study universe. Questionnaire respondents and persons interviewed and whose attitudes were thus obtained were part of this population. As baseline information these patterns may prove useful for future studies requiring such material.

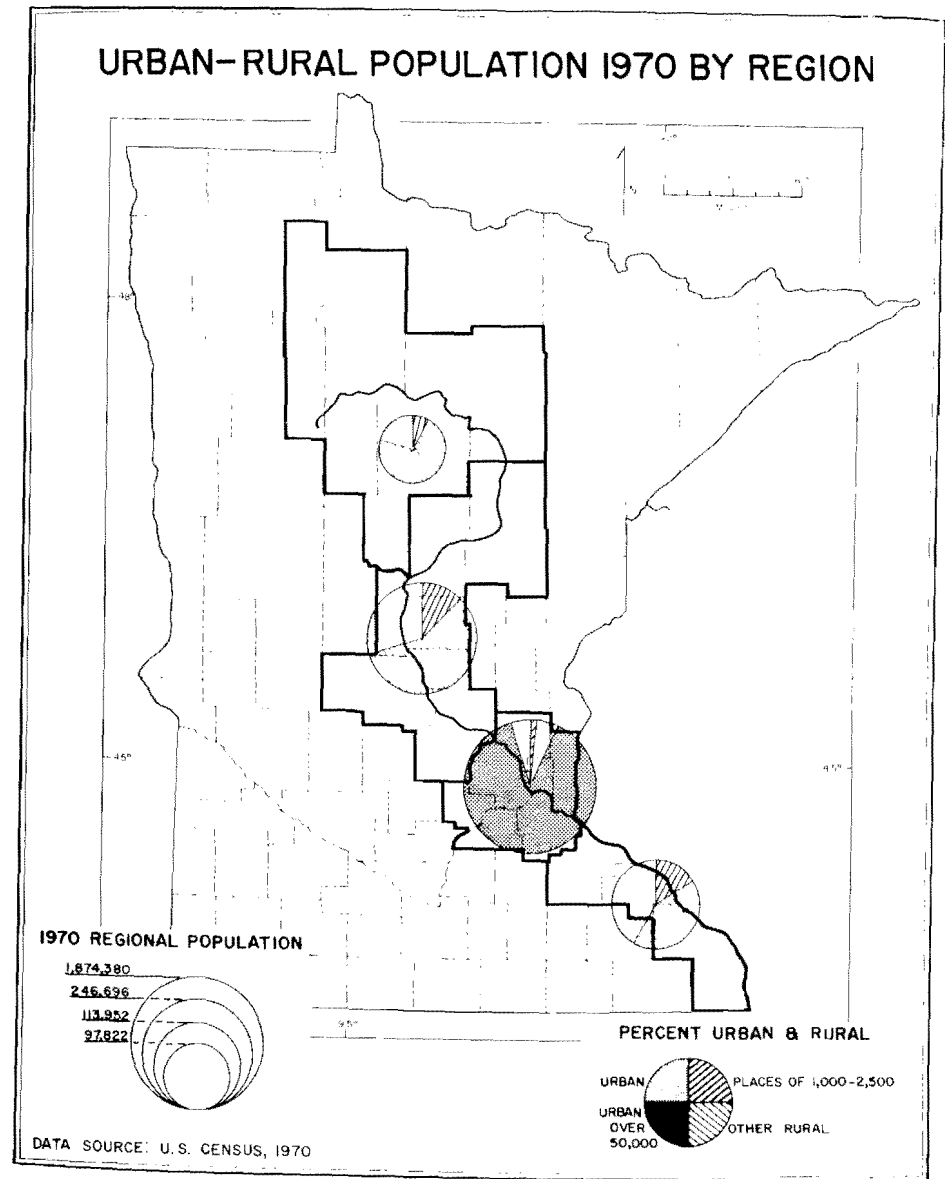


FIGURE 2.4

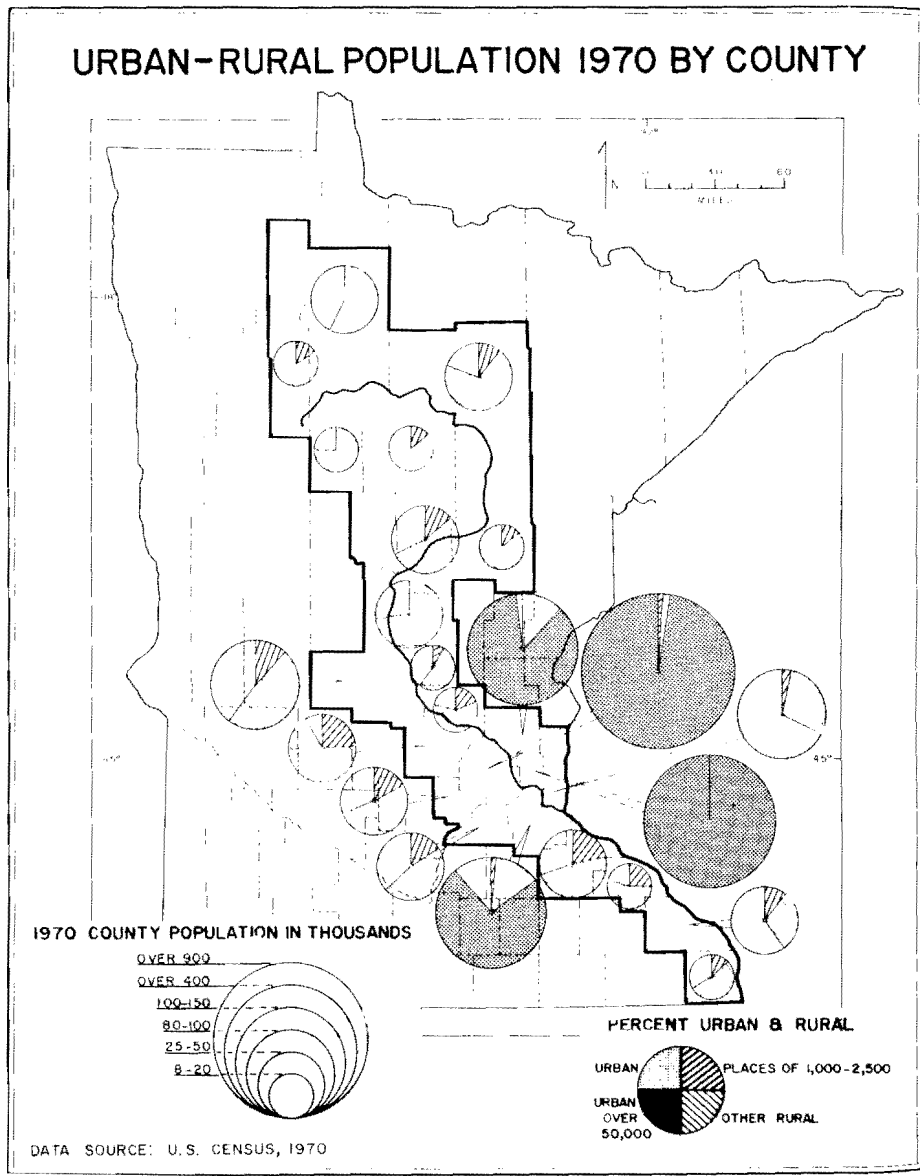


FIGURE 2.5

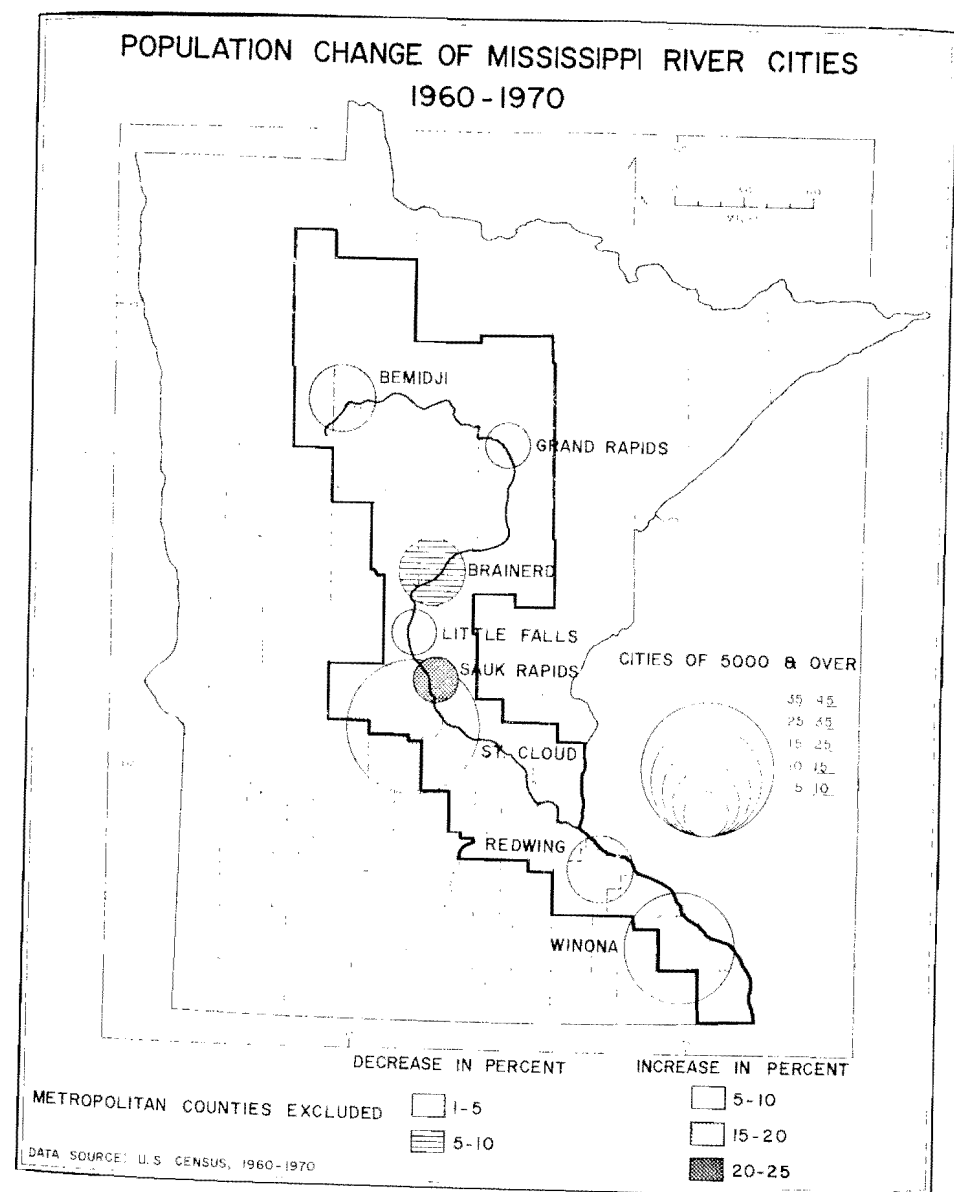


FIGURE 2.6

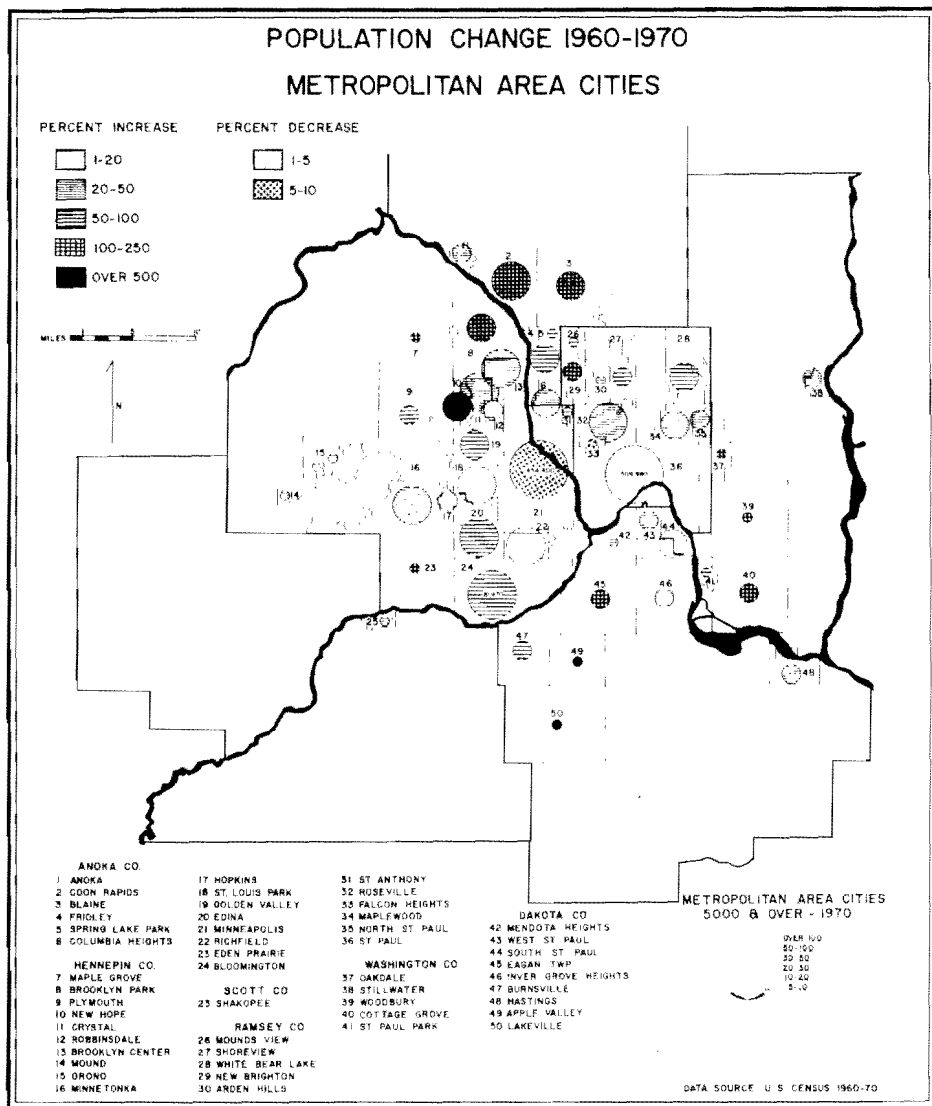


FIGURE 2.7

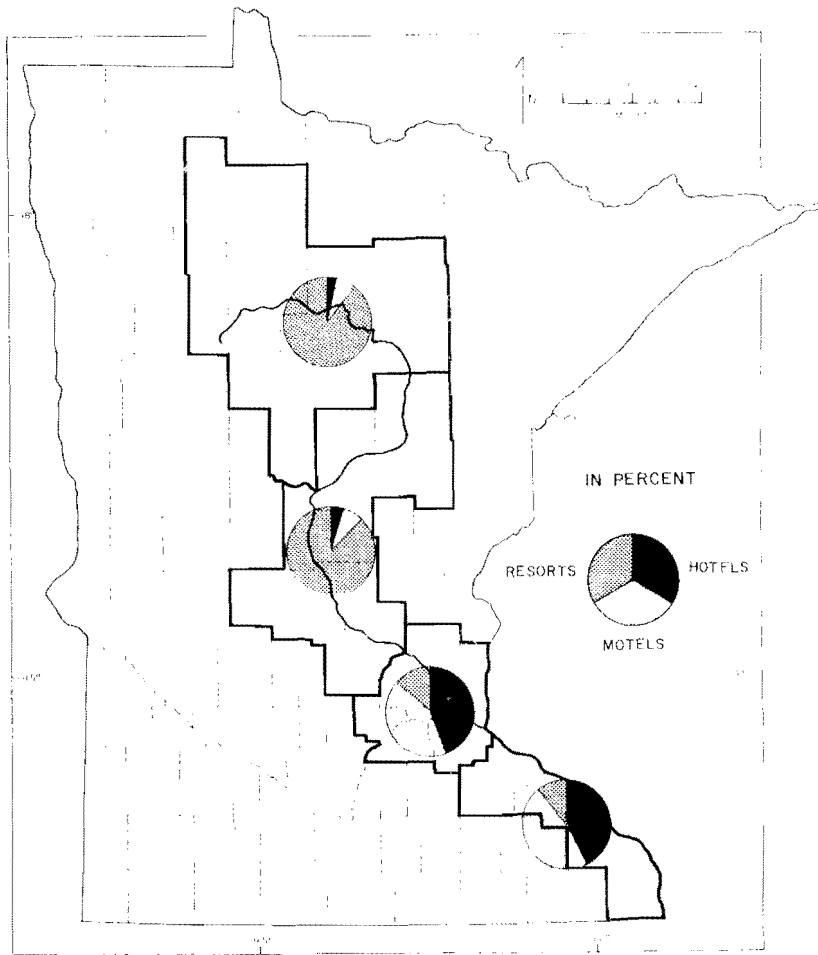
### 3. Recreational Facilities

One aspect of the river universe selected by the investigators was that of recreation. Several questionnaire items were developed which relate to this element. Selected information was derived from a major water resource review and mapped by region (6, p. 79). Figures 2.8 - 2.11 reflect some of the regional differentiation which exists within the study universe. No attempt has been made to apply measures of quality or size, i.e., rooms, number of beds, etc., to the facilities for recreation and tourism. The maps are based upon the number of establishments.

Of interest also is the number and extent of public recreation lands within the universe. A large number of Minnesotans search out and use public lands and public access sites. Figure 2.12 is a cartographic representation of data contained in the Water Resources Coordinating Committee volume (6, p. 195). The size of the circle is roughly proportional to the total land area of the regions. The dark segment of the graph represents the percent of the total land area which is publicly owned, usually federal or state lands. The range here is from about 25 percent publicly owned in the Upper Reach to very small amounts of publicly owned land in both the Metro Area and Lower Reach regions. Some idea of intensity of recreational use of public lands is indicated by the large number of areas in the Metro Area which has the smallest proportion of public recreation land. Numerous, though small, recreation areas account for this seeming disparity. As is frequently the case throughout the United States, public recreation acres are seldom where the demand is greatest. (9, p. 51).

The Minnesota Department of Natural Resources annually publishes lists of Public Water Access Sites (10). Federal, state, county and locally managed sites are included. Figure 2.13 locates these sites. In addition to the several locations on the river proper are two clusters in the Upper Reach. These are lake sites mainly on Cass and Winnebigoishish, two large lakes through which the Mississippi flows. The Middle Reach appears to largely lack access points, a possible item of interest to present to future recreation planners. It is quite possible that not all public access sites appear on the DNR lists. In addition to these public sites are privately owned and operated river resorts

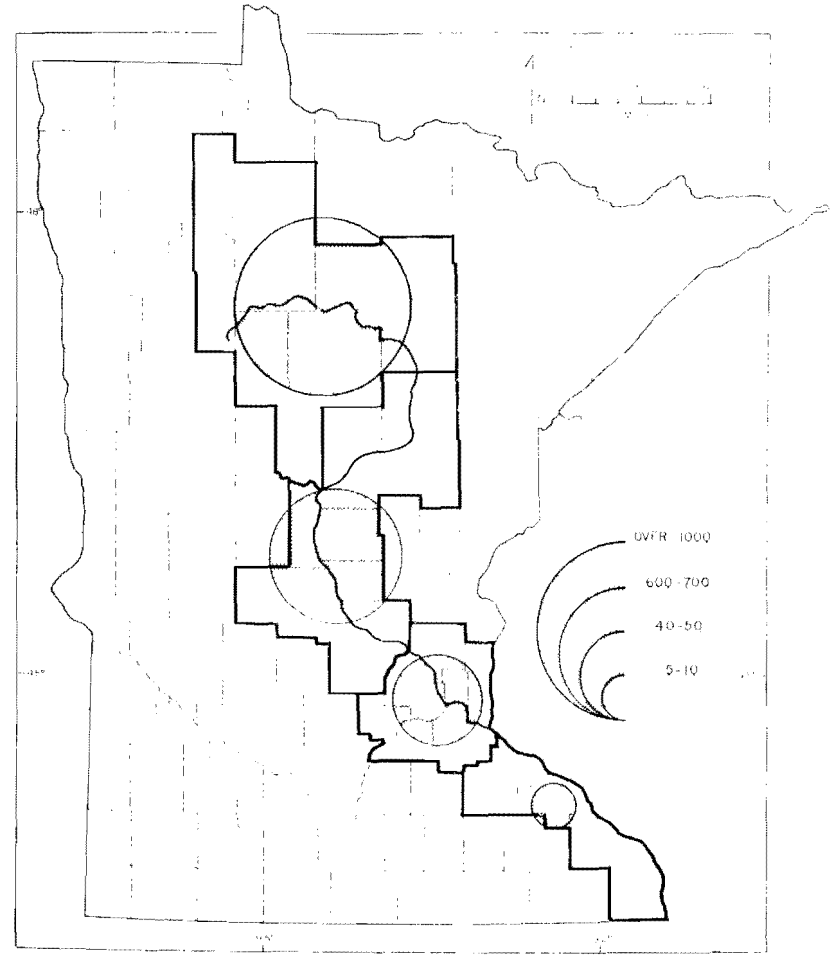
PUBLIC ACCOMODATIONS BY REGION - 1964



DATA SOURCE: TECHNICAL BULLETIN NO. N2  
WATER RESOURCES COORDINATING COMMITTEE

FIGURE 2.8

NUMBER OF RESORTS BY REGION - 1964



DATA SOURCE: TECHNICAL BULLETIN NO. N2  
WATER RESOURCES COORDINATING COMMITTEE

FIGURE 2.9

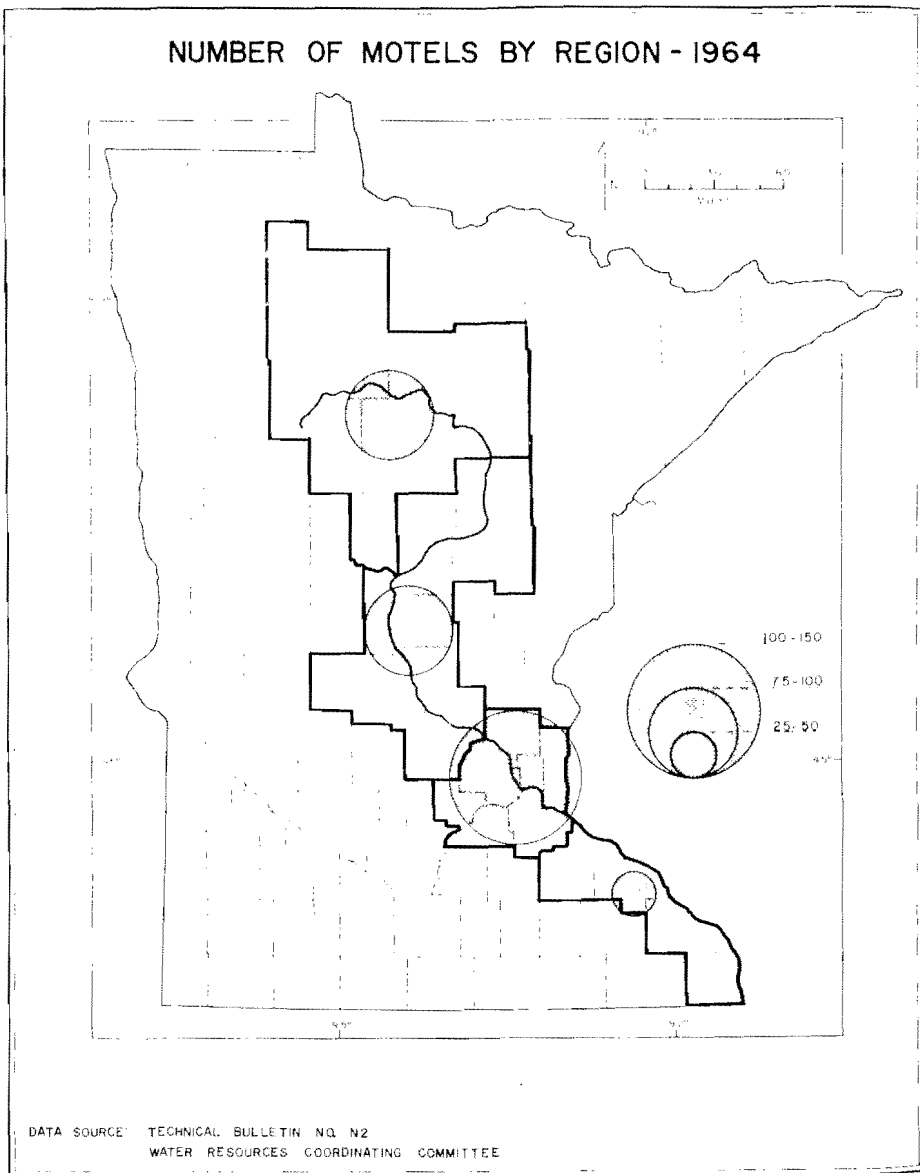


FIGURE 2.10

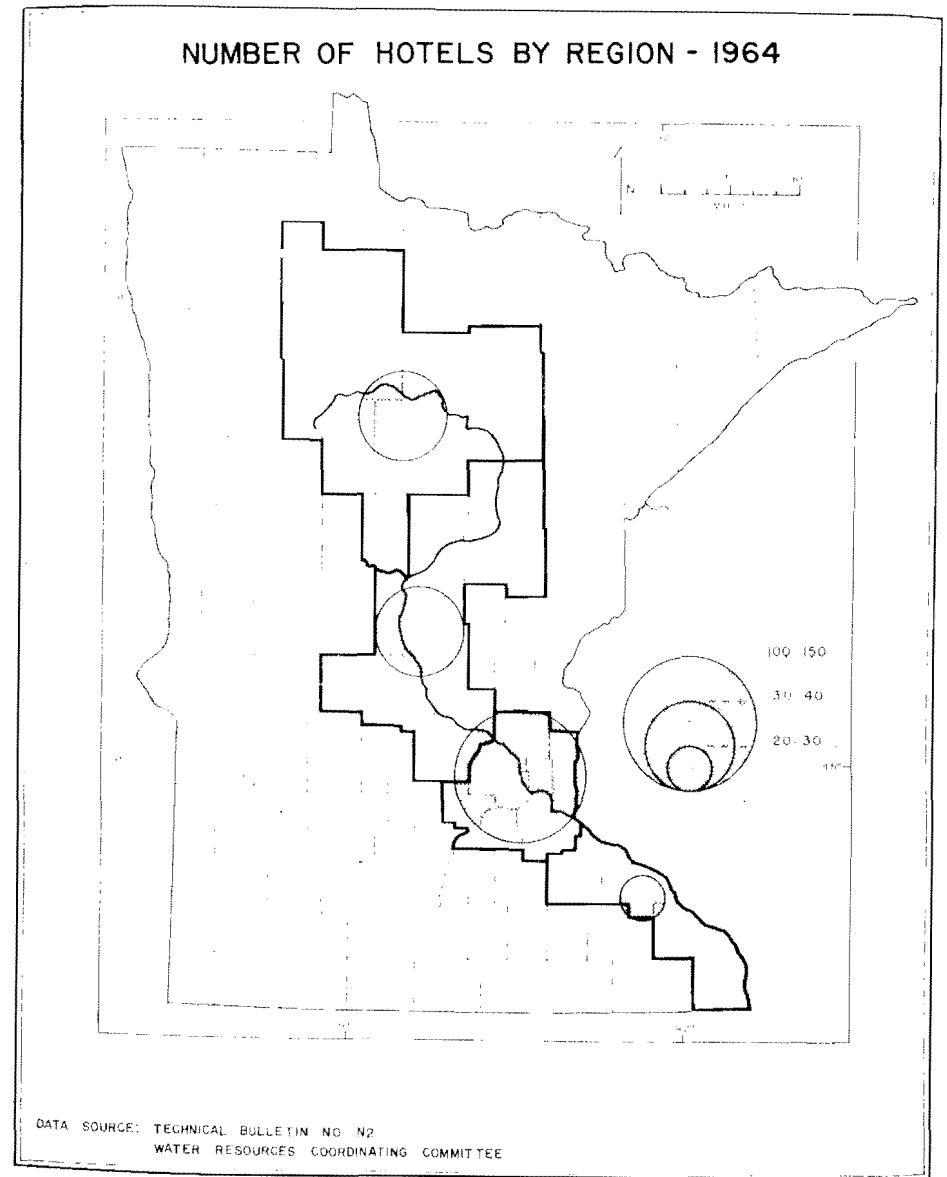


FIGURE 2.11

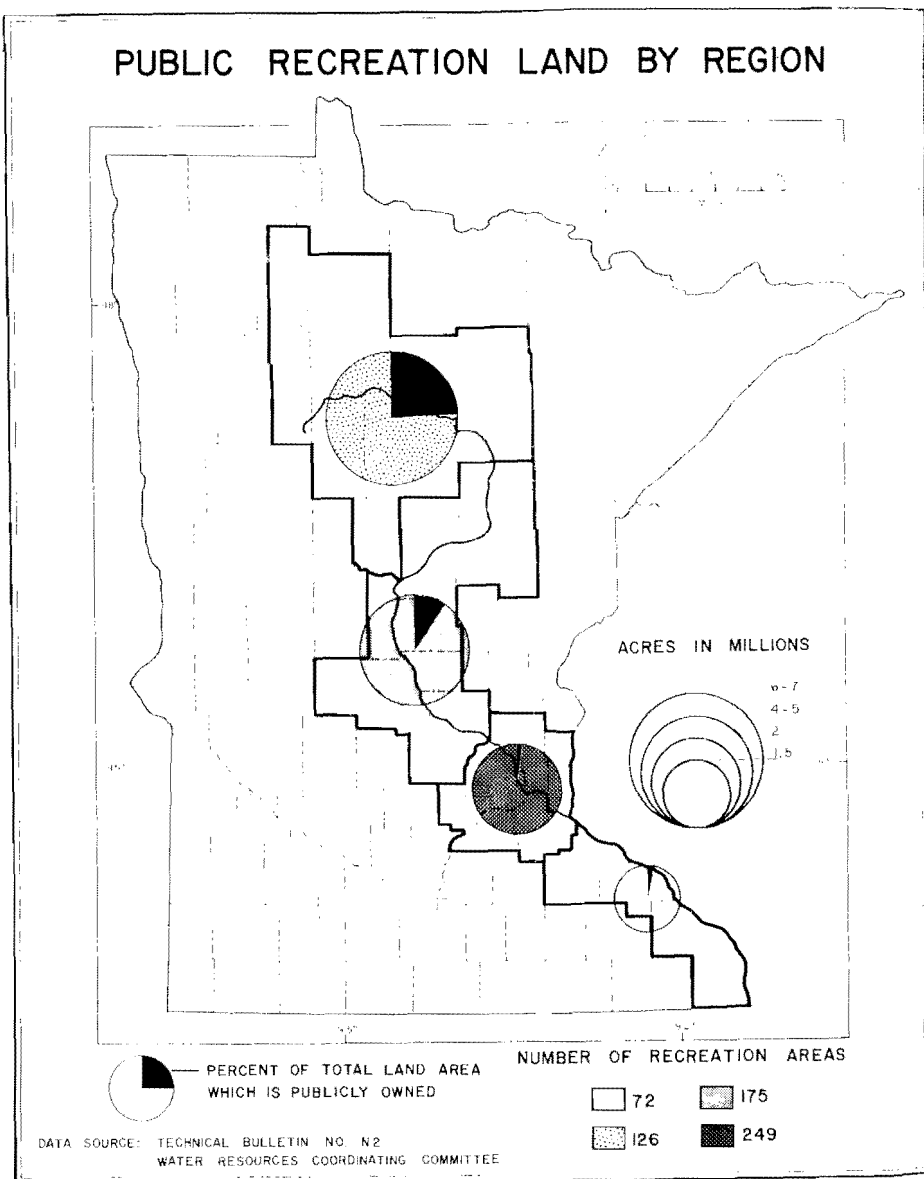


FIGURE 2.12

which provide services and limited access. In terms of recreation, access to water is indeed an important consideration. This importance is stressed in a large scale federal study of outdoor recreation in America (9, pp. 69-72, 173). Attitudes relating to the Mississippi River are thus likely to reflect the perceived impact which various water uses have upon recreational opportunities.

#### 4. Riparian Land Use

Through the cooperation of the staff of the Minnesota Land Management Information Systems (MLMIS), data was obtained for each forty acre parcel along the Mississippi River and the forty acres adjoining the riparian parcel. It is believed that inclusion of more than simply the partial forty acre riparian segment actually fronting the river will give a more accurate picture of the land use along, and close to, the river. It should be recognized that this is a generalized pattern of use based upon forty acre parcels. The criteria for classification of the use types is as follows (11):

- 1) Forested--A forty where the land use is dominated by trees. To be considered forested, a forty must contain a scattering of trees whose crowns cover at least 10% of the land area.
- 2) Cultivated--A forty in which the dominant use consists of land which has been recently tilled or harvested mechanically.
- 3) Pasture and open--A forty of non-forested land not used for any identifiable purpose. Examples are grazing land or abandoned farm land.
- 4) Water--A forty in which the dominant land use is open and permanent water.
- 5) Marsh--A forty in which the dominant land use consists of non-forested, shallow permanently wet vegetated areas.
- 6) Urban residential--A forty containing five or more residential dwellings, and no commercial buildings.

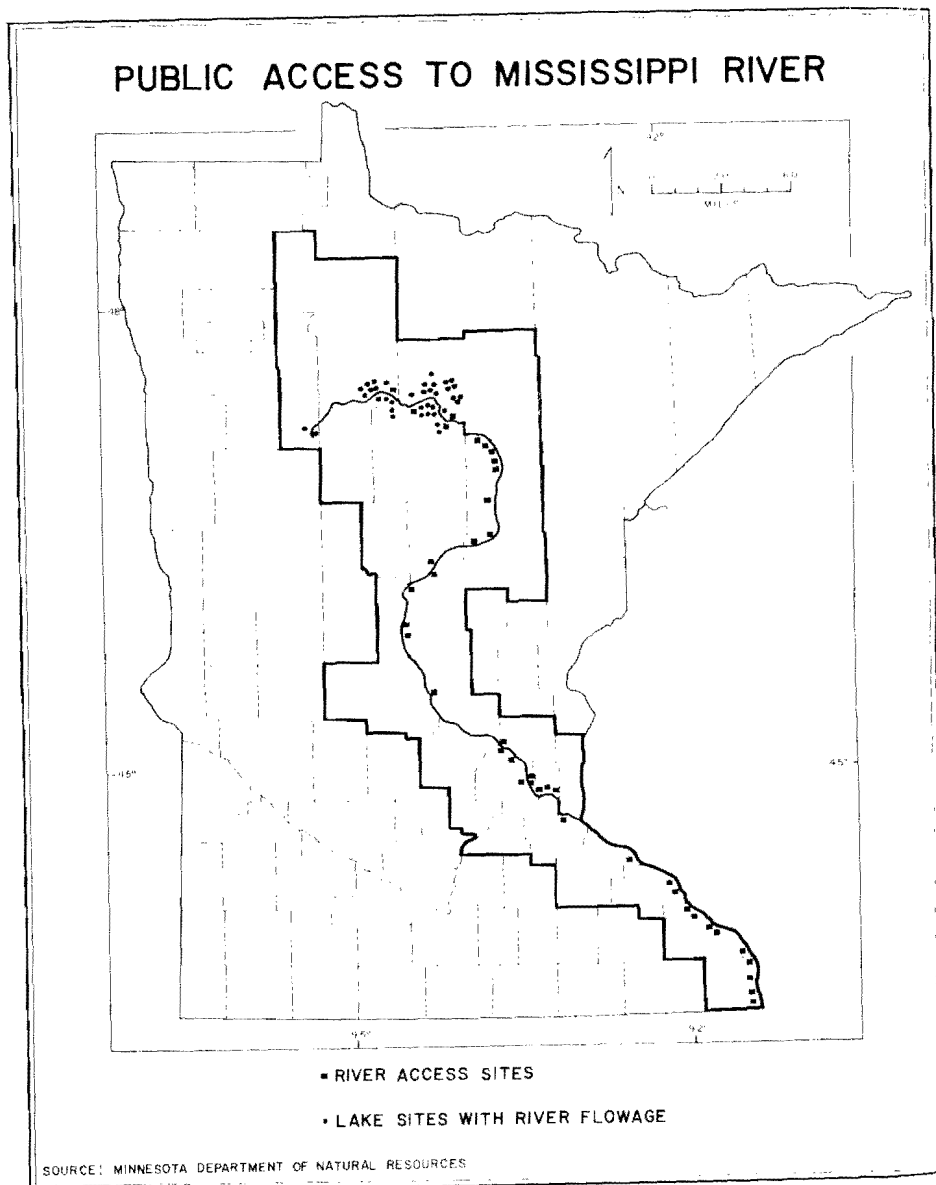


FIGURE 2.13

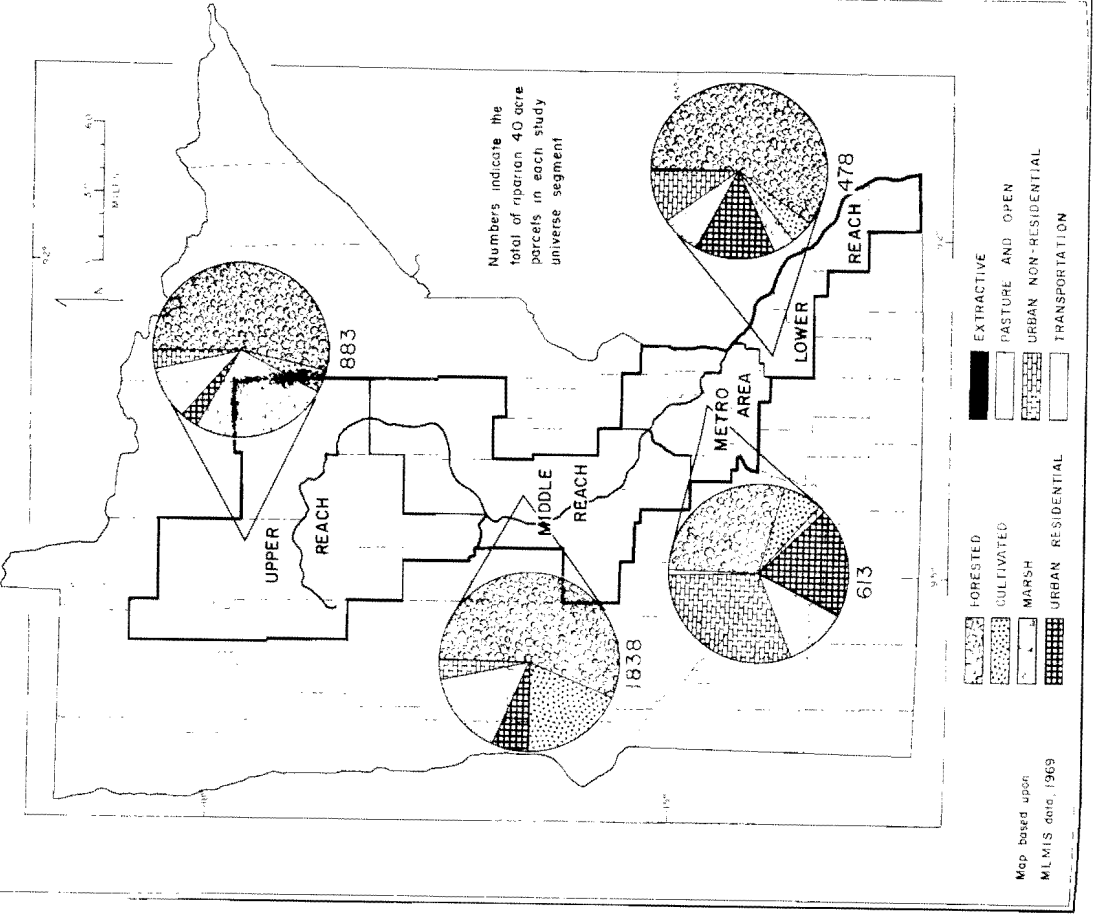
- 7) Urban non-residential or mixed residential--A forty containing at least one commercial, industrial or institutional development and may or may not contain residential development.
- 8) Extractive--A forty in which the dominant land use consists of the extraction of minerals, including ancillary facilities. Examples are mines, tailing piles, gravel pits.
- 9) Transportation--A forty in which the dominant land use consists of facilities for the conveyance of people or materials.

A summary of this riparian and near-riparian land use is contained in Table 2.4 with Figure 2.14 being the cartographic representation of the same information.

The MLMIS is a joint endeavor of the University of Minnesota and the executive and legislative branches of state government to develop a major new comprehensive data system. In the spring of 1972 the major product of this joint work, The State of Minnesota Land Use 1969 Map became available. This state map is at a scale of 1:500,000 and should prove to be a very valuable reference map with great potential utility. The data used for this Mississippi River project was provided by MLMIS in the form of computer printouts for each river township within the study area.

It can be seen that forested river land is the dominant use in all except the Metro Area where it occupies only about one-fourth of the total whereas in each of the other reaches of the study universe forested land accounts for between 55 and 60 percent of the total. In terms of cultivated river lands only the Middle Reach has a significant portion (18.3%) while the others are seven percent or less. Marsh land occupies slightly over one-fourth (27.8%) of the riparian acres in the Upper Reach while the Lower Reach has 3.8 percent. The other two have one percent or less of such land as the river has cut a narrow stream course well below the adjoining terrace land. As is to be expected, Urban Residential use is most extensive in the Metro Area (19.7%) but it is surprisingly high (16.3%) along the Lower Reach. Such land is much less prominent in the Middle and Upper Reaches. The Extractive land use category is almost non-existent at this scale of examination. Pasture and Open land, as with

# RIPARIAN LAND USE BY REGION



Region	Upper Reach	Middle Reach	Metro Area	Lower Reach
Number of 40 acre parcels	883	1838	613	478
Forest	54.4	55.9	28.9	58.9
Cultivated	3.9	18.2	7.0	4.4
Marsh	27.8	0.3	1.0	3.8
Urban Residential	3.4	6.2	19.7	16.3
Extractive	0	0	0.5	0.2
Pasture and Open	9.9	15.2	11.4	7.9
Urban non-residential	3.1	4.0	30.5	10.7
Transportation	0	0.05	1.0	0.4

TABLE 2.4  
Riparian Land Use\*  
Use classification as a percentage of regional totals

\*Forty acre parcels which front on the river and the forty acres which adjoin the riparian land.

FIGURE 2.14



Cultivated land, is greatest along the Middle Reach reflecting the agricultural emphasis of that area as compared to the other three river reaches. Only in the Metro Area does the Urban Non-Residential portion appear to be significant. Here almost one-third of the land is so classified with the others in the 10 percent or less category. Transportation, as with Extractive land use, is of minimal areal significance at this scale. The four sub-regions of the study universe do reveal some substantial differences in land use patterns. Because of current expansion in leisure time activities and resultant governmental programs that lead to control and/or acquisition of forested land it is safe to assume that riparian forested acreages are likely to not change a great deal. Much of this land is already in state and national forests or other public control.

It does seem reasonable to expect a further expansion of urban-residential use of riparian land at the expense of cultivated acreage and pasture and open land now mostly in private ownership. Newly adopted legal restrictions on such change may however, act to slow down this kind of transition.(12). The Middle Reach region has the greatest proportion of its riparian land cultivated as well as pasture and open and thus may well be expected to show the greatest change of this kind in future years.

In a study comparing riparian and near-riparian land use in 1940 with that in 1969 Ostenso (13) found that some significant changes had occurred. These data appear in Table 2.5.

TABLE 2.5  
Riparian and Near-Riparian Land Use Change-1940-1969  
Beltrami and Morrison Counties\*

County	Forested	Culti- vated	Pasture/ Open	Marsh	Urban Resi- dential	Urban Non- Residential
Beltrami	+67%	-53%	+16%	-47%	+15%	+ 2%
100% = 3716 acres changed						
Morrison	+21	-100	+36	--	+32	+11
100% = 5366 acres changed						

\*Preliminary findings based upon aerial photograph interpretation of river-fronting and near river-fronting forty acre parcels.

This preliminary report of the study, based upon aerial photographs, and using forty acre parcels can be summarized as follows. In Beltrami, an Upper Reach county, both cultivated and marsh land categories experienced losses. Two-thirds of these acres went into the forest classification with Pasture/Open land and Urban Residential use gaining almost identical acreages. The Urban non-residential use experienced a slight increase (2%). In the Middle Reach county, Morrison, the total acreage which underwent change in usage was greater than that in Beltrami. Cultivated land accounted for the total converted acreage. Gaining acreage at the expense of cultivated land were Pasture/Open, Urban, Residential, Forest and Urban Non-Residential in that order.

This land use study is currently being refined and is likely to yield more definitive information concerning riparian land use trends in these two universe counties through which the Mississippi River Flows. The preliminary findings however, do suggest riparian land use patterns are dynamic rather than static and that change is neither uniform in type or in magnitude. Studies conducted on a similar scale for the total River would yield additional valuable information for the resource planner and for others concerned with river lands.

#### 5. Farming and Mining

Figures 2.15, 2.16 and 2.17 give additional general background on the study universe. Agriculture and mining activities frequently affect water quality and thus may bear upon the ideas which persons express through questionnaire answers.

#### Background Summary

A variety of physical landscapes combine with a varied human landscape to provide the diversity which characterizes the study universe. From this universe have been extracted the attitudes which several groups hold toward the Mississippi River and the general environment. Such attitudes may be better understood and explained if the patterns of diversity which exist in the region are recognized.

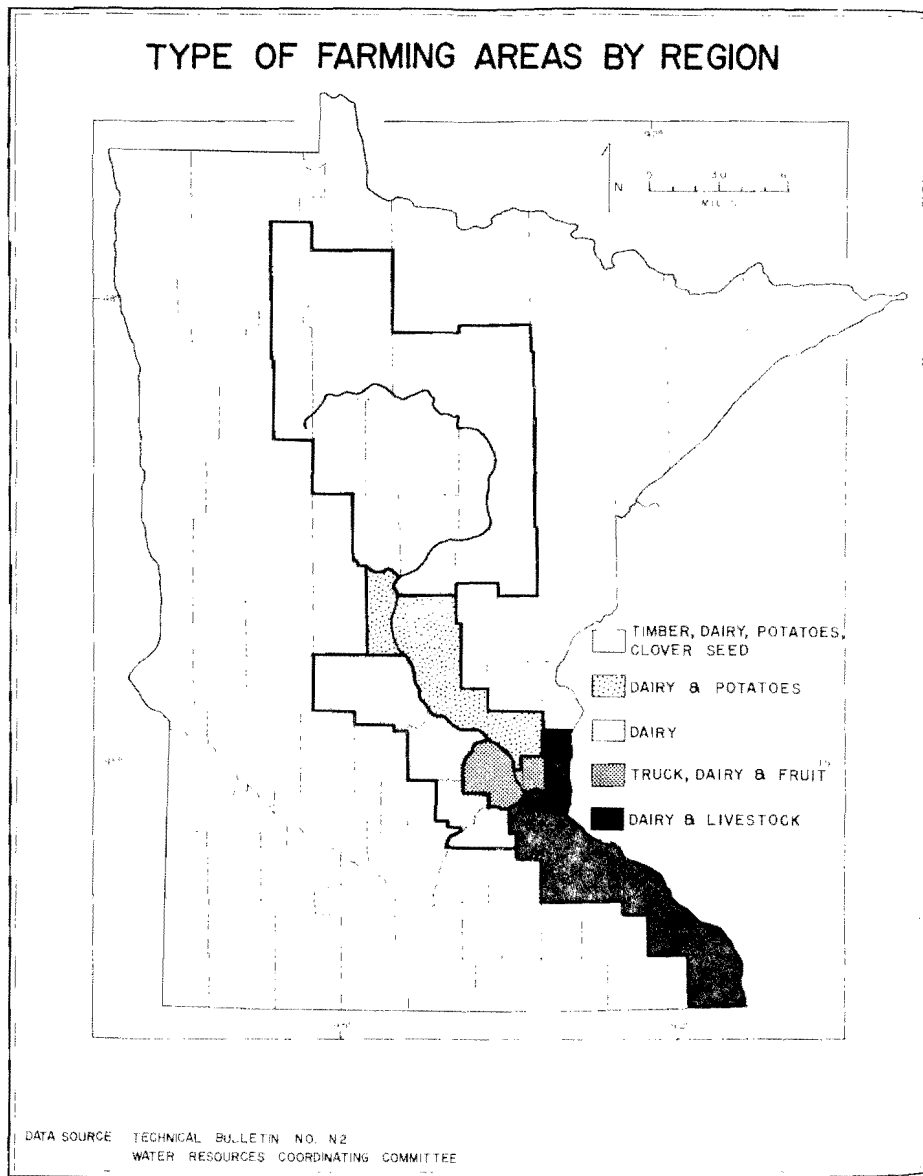


FIGURE 2.15

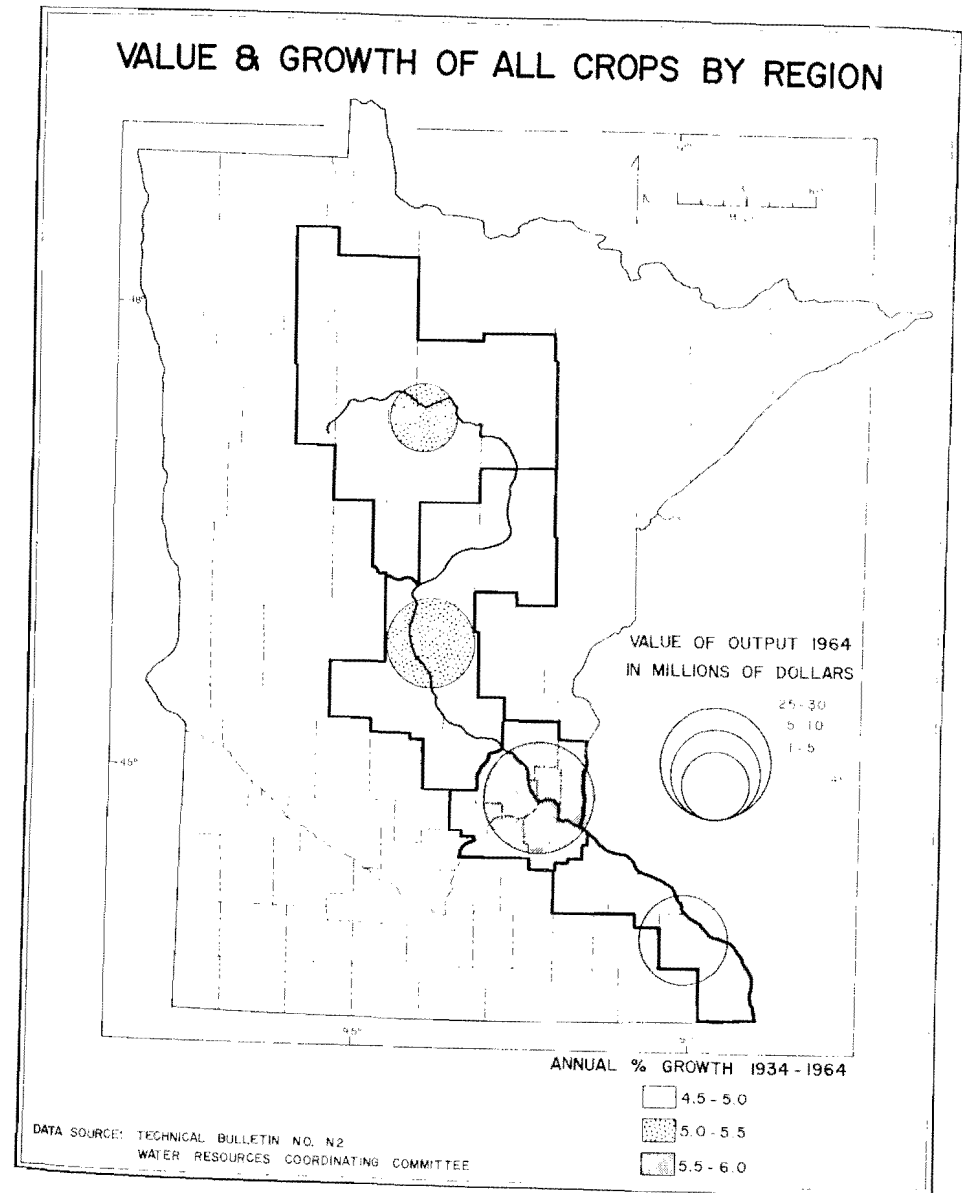


FIGURE 2.16

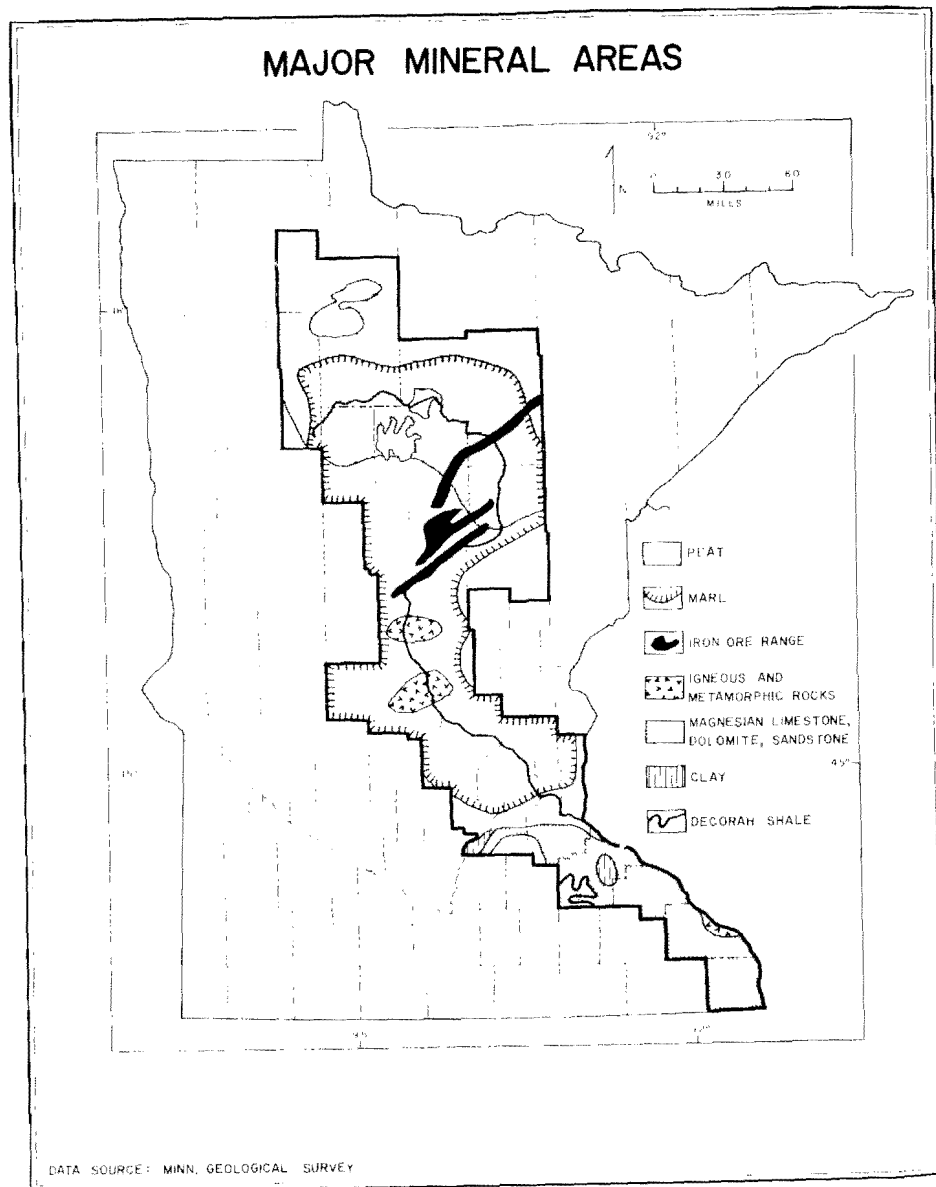


FIGURE 2.17

## CHAPTER III

### Attitudinal Survey of Mississippi River Study Universe by E. James Cecil

#### Methodology

The greatest single source of attitudinal data in this report was gathered by the mail questionnaire. This instrument of forty questions, with several items to each question, was sent to 5,000 respondents. Approximately 20 percent (1007) were returned. The procedure for randomizing the sample was described in Chapter II. While a larger return would have been desirable, other studies indicate that this level of return is not unusual. Mayer and Pratt report the difficulty of gaining response to mail surveys and claim that, "Few published results report response rates exceeding 50 percent; indeed conclusions are frequently based on returns from less than 25 percent of the designated respondents," (1, p. 637). Reasons for this reluctance to respond are somewhat vague, although one reason suggested by Bachrach and Scobel may be applicable in this situation; recipients of the questionnaire may feel "A generalized articulate hostility toward social survey research, which is perceived as an invasion of privacy and a denial of American individualism," (2, pp. 269-271). The length of the survey questionnaire may have intimidated others.

Some selected responses were separated according to out state--the sixteen non-metropolitan counties, and metro, the seven counties. Several significant differences were discovered in comparing these responses. At this particular point of analysis only two differences need be mentioned: 1) the Upper and Middle Reaches, compared to populations, was not as high as the Metro Area and Lower Reach return (See Table 3.2); 2) within the questionnaires returned, the no response incidence was greater among the out state return than in the Metro return. This difference in response level in some cases is perhaps great enough to bias the statistical comparisons, e.g., age, education, self perception of political views and others. Rural reticence to respond to both the questionnaire and items within was discussed by Roehr in a study which analyzed a questionnaire mailed to a sample of 100 urban and 300 rural individuals. He found that significantly more urban

dwellers returned the questionnaire and that they also satisfactorily completed a higher percent of the questions than the rural participant (3, p.301).

The mail questionnaire in its final form was extremely versatile and of great breadth (See Appendix B-1.). This instrument of forty questions and possibly 160 items for the conscientious respondent ranges from attitudes concerning use and quality of the Mississippi River, pollution control and its financing, to general environmental questions as well as some of the standard socio-economic data requests. It included opportunity for open-ended responses, rank ordering, and multiple choice answers.

Since some of the questions were completely open-ended the respondents had the opportunity to give several answers. But, due to a lack of space, not all answers could be coded; in some tables the notation appears that five answers were coded, in others only three were coded. In these latter responses, the N will be more than 100 percent with a corresponding increase in total percentage. In many of the multi-answer tabulations no attempt was made to report the total N or total percentage. In the remaining tables the standard practice of showing total N and percentage is followed.

As a means of ascertaining place of residence, respondents were asked to supply their zip code numbers. This identification is the basis for Tables 3.1, 3.2 and the subsequent supplementary comparative tables designated by the letter "a". Not everyone answered this question and some moved out of the study universe between receiving and completing the questionnaire which accounts for the difference between the 1007 and the 945 used in Tables 3.1 and 3.2.

TABLE 3.1  
Population and Questionnaire Return in the  
Twenty-three Mississippi River Counties

	A. Upper Reach	
	Population 1970	Return N
Beltrami	26,373	8
Clearwater	8,013	2
Hubbard	10,583	2
	(cont.)	

Itasca	35,530	15
Cass	<u>17,323</u>	<u>5</u>
	97,822	32

B. Upper-Middle Reach

Aitkin	11,403	5
Crow Wing	34,826	13
Morrison	26,949	12
Benton	20,841	7
Sherburne	18,344	5
Stearns	95,400	27
Wright	<u>38,933</u>	<u>12</u>
	246,696	81

C. Metro Area

Anoka	154,556	43
Carver	28,310	8
Dakota	139,808	45
Hennepin	960,080	417
Ramsey	476,255	197
Scott	32,403	19
Washington	<u>82,948</u>	<u>30</u>
	1,874,380	759
	(cont.)	
	39	

TABLE 3.1 (cont.)

D. Lower Reach		
	Population 1970	Return N
Goodhue	34,763	24
Wabasha	17,224	19
Winona	44,409	20
Houston	<u>17,556</u>	<u>10</u>
	<u>113,952</u>	<u>73</u>
(23 counties)	2,332,850	945

TABLE 3.2  
Comparison of Questionnaire Return  
to Area Population

	Population %	Return %
Upper Reach	4.2	3.5
Upper-Middle Reach	10.6	8.8
Metro Area	80	80
Lower Reach	<u>4.9</u>	<u>7.9</u>
	99.7	100.1

Table 3.1 is a tabulation of the universe populations and questionnaire return. Predictably the metro return is numerically larger than it is from the other areas. Table 3.2 is a comparison of questionnaire return to population. Returns from the Upper Reach and Metro Area are highly congruent with the Upper Reach having 4.2 percent of the universe population and 3.5 percent of the returns, and the Metro Area with 80 percent of each. The return in the Upper-Middle Reach was somewhat under-represented, 10.6 percent to 8.8 percent. The Lower Reach return over-represented the area by three percent which may be a significant difference. One

reason for what may be an increased awareness of and concern for the River in the Lower Reach is the scarcity of alternate recreational opportunities.

For purposes of analysis and ease of perusal the questionnaire analysis is topically divided into eight sections: 1) Population characteristics; 2) Evaluation of qualities of the Mississippi River; 3) The media and aspects of the Mississippi River; 4) Attitudes toward Mississippi River usage; 5) Sources and degree of River pollution; 6) Pollution control of the river; 7) Financing pollution control; and 8) Environmental quality.

#### Population Characteristics

One of the more difficult aspects related to evaluation of demographic materials is classifying occupations. Duncan's Socioeconomic Index for Occupations, Bureau of the Census, was the coding guide for occupations. However, in spite of this all-inclusive method of classification there is a problem of accurate coding due basically to the vagueness of job descriptions elicited from the survey question. Some respondents answered the question with incomplete or confusing replies, with the result that the coders must evaluate the intent of the respondent and such resultant judgments may be somewhat inaccurate. Backstrom and Hursh indicate in their book that this is a common problem (4, p. 99). With these caveats as a background it can be noted, according to Table 3.3, that approximately 44 percent of the respondents are engaged in status or comparable occupations.

TABLE 3.3  
Occupation

	N	%
No response	61	6
Laborers; wood, cement, etc.	4	-
Semiskilled	26	3
Laborers; metal, glass & agricultural machinery	--	--
Operative	24	2

TABLE 3.3 (cont.)

Craftsmen	18	2
Operators, mechanics	47	5
Managers, buying & selling	49	5
Highly skilled & technical	129	13
Professional, technical	122	12
Status-Professions, etc.	325	32
Retired	22	2
Housewife	78	8
Farmers	11	1
Unemployed	6	1
Students	38	4
Uncodable	22	2
Other	<u>22</u>	<u>2</u>
	1004	100

With such a high percentage of the respondents in status occupations it is not surprising that 61 percent attended college at least briefly. As Table 3.4 indicates, 27 percent were college graduates. In a comparison between the out state and metro respondents (See Table 3.4.) the most significant differences occurred at the levels of some college and college graduate. The metro respondents were clearly better educated, with 29 percent college graduates compared to 21 percent for the out state respondents. However, the out state no response was significantly larger, 14 percent, compared to the metro no response of 1 percent. Moreover both groups seemed to be better educated than the state medians of 12.2 with college experience, considerably better than the rural farm median of 10 percent, the rural non-farm median of 11.5 and close to the urban median of 12.4 (5).

TABLE 3.4  
Level of Education

	N	%	Out State N=247	Metro N=760
No response	37	4	14%	1%
Up to 8th	25	2	4	2
9th to H.S.	44	4	6	4
H.S. graduate	175	17	17	18
Tech-Trade school	113	11	11	11
Some college	235	23	18	25
College graduate	267	27	21	29
Masters	59	6	5	6
Doctorate	28	3	2	3
Advanced degree	<u>24</u>	<u>2</u>	3	2
	1007	99		

TABLE 3.5  
Age

	N	%	Out State N=247	Metro N=760
No response	35	3	13%	1%
Under 20	43	4	4	4
21 - 25	99	10	9	10
26 - 30	137	14	8	15
31 - 40	206	20	15	22
41 - 50	212	21	15	23
51 - 60	172	17	19	16
61 - 70	83	8	13	7
Over 70	21	2	5	1

As might be anticipated from a sample based on auto ownership, the respondents are older than the state population (See Table 3.5.). The median age of the respondents is close to 40 compared to the state median of 26.8. In Table 3.5 significant differences are noted in the categories encompassing the 26 - 50 age groups with the metro group appearing much younger. Reinforcing this is the greater percentage of those from out state in the older brackets; 51 through 70. The difference in median ages between out state and metro respondents is greater than between somewhat similar U. S. census populations. Median age of Minnesota urban residents is 26.3 and for rural it is 28.1. While the out state respondents were not all rural nor were the metro residents all urban, it was perhaps significant that the median age for out state was slightly under 40 and for the metro respondents it was between 34 and 35.

TABLE 3.6  
Sex

	N	%
No response	35	3
Male	693	69
Female	273	27
	1001	99

TABLE 3.7  
Place of Residence

	N	%
No response	36	4
In town	775	75
Farm	54	5
Rural non-farm	138	14
	1003	98

TABLE 3.8  
Employed, Unemployed or Retired

	N	%
No response	51	5
Employed	795	79
Unemployed	102	10
Retired	58	6
	1006	100

Male respondents predominated about 2.5 to 1 (See Table 3.6.) and 75 percent of the respondents lived in town with rural non-farm accounting for 14 percent and rural inhabitants accounting for 5 percent. (See Table 3.7.). Most of the respondents, 79 percent, were employed, with 10 percent unemployed and 6 percent retired. (Table 3.8).

TABLE 3.9  
Self Perception of Political Views

	N	%	Out State N=247	Metro N=750
No response	45	4	14%	1%
Very liberal	49	5	4	5
Liberal	229	23	19	24
Moderate	459	46	45	46
Conservative	219	22	18	23

Upon examination of the item concerning self perception of political views, in Table 3.9, one can conclude that almost half of all respondents, 46 percent, perceived themselves as moderates. This was equally true for out state and metro with 45 percent and 46 percent respectively. The metro group was significantly more liberal, 24 percent, but also more conservative, 24 percent. An analysis of the 14 percent out staters who did not respond might sharpen some differences.

TABLE 3.10  
Religion

	N	%
No response	49	5
Catholic	290	29
Jewish	14	1
Protestant	592	59
Specify other	<u>62</u>	<u>6</u>
	1007	100

As shown in Table 3.10, over half, 59 percent, of the respondents are Protestants and 29 percent are Catholic. The balance of respondents was divided into religious preferences too small to be significant.

TABLE 3.11  
Boat Ownership

	N	%	Out State N=247	Metro N=760
No response or no boats	555	55	53%	56%
One boat	278	28	28	27
Two boats	109	11	11	11
Three boats	36	4	3	4
Four boats	20	2	3	2
More than four	<u>9</u>	<u>1</u>	1	1
	1007	101		

Boat ownership (See Table 3.11.) may be a criteria of income, proximity, and interest in certain kinds of outdoor recreation. Presumably less than one-half, 45 percent, owned one or more boats. There was no significant difference between out state and metro boat ownership.

Among boat owners, the outboard was the most popular, 14 percent, closely followed by canoes, or rowboats, 10 percent, Table 3.12. The most consistent return in the two tables, 3.11 and 3.12, is 11 percent who owned two boats.

TABLE 3.12  
Types of Boats Owned

	N	%
No response	551	55
Canoe or rowboat	102	10
Sailboat	14	1
Pontoon boat	6	1
Outboard	137	14
Inboard or inboard/outboard	13	1
Two or more powered craft	34	3
Two or more non-powered craft	31	3
Two or more	106	11
Other	<u>13</u>	<u>1</u>
	1007	100

TABLE 3.13  
Frequency of and Types of Mississippi River Frontage Ownership

	N	%
No response	966	96
Permanent residence	25	2
Summer cottage	7	1
Farm land	2	-



TABLE 3.13 (cont.)

Resort or motel or hotel	1	-
Marina or boat rental	1	-
Other industrial, commercial	5	-
	1007	99

Apparently Mississippi River frontage ownership is not desirable or possible since only 3 percent of the respondents were in this category (See Table 3.13).

TABLE 3.14  
Participation in Any Kind of Survey  
Within Past Three Years  
(Does not include U.S. census)

	N	%
No response	80	8
No	613	61
Once or twice	217	22
3 to 4 times	63	6
More than 4	33	3
	1006	100

As shown in Table 3.14, more than half, 61 percent, have not participated in a survey within the past three years; 31 percent had participated in one or more surveys during this period.

A question in the survey which invited comment on the questionnaire elicited low response (See Table 3.15) with 55 percent not responding. Most of the remaining responses were generally friendly but badly fragmented; the second largest response was 9 percent indicating "good luck".

Interest in environmental literature may be relatively high among these respondents. Turning to Table 3.16 it is significant that 49 percent read one or more books concerning environment. Silent Spring with 31 percent was the most read followed by Population Bomb

with 26 percent and Environmental Handbook, 11 percent.

TABLE 3.15  
Comments or Questions Relative to Questionnaire  
(Three responses are coded.)

	N	%
No response	554	55
Want to know results	47	4
Good luck	94	9
Stronger laws, enforcement & planning	54	5
Questionnaire complaints	33	3
Questionnaire compliments	14	1
Questionnaire neutral comments	24	3
Fine polluters and make them clean up	12	1
Environment and pollution big problem	18	2
Must clean up now	57	5
Economical, financial reasons	9	-
Need better facilities	12	1
How can we help	28	3
Industries & cities dangerous	11	1
Population is a problem	7	1
Control water traffic & snowmobiles	7	1

TABLE 3.15 (cont.)

Political response	11	1
Non-polluting products	1	-
Properly develop	5	-
Uncodable, unreadable	11	1
Other	<u>153</u>	<u>15</u>
	3014	295

TABLE 3.16  
Readership of Environmental Books

	No Response		Yes	
	N	%	N	%
Have you read any of the following books	513	51	493	49
<u>Silent Spring</u>	697	69	310	31
<u>Population Bomb</u>	742	74	265	26
<u>Ecotactics</u>	989	98	12	2
<u>SST</u>	948	94	59	6
<u>Environmental Handbook</u>	895	89	112	11
<u>Resources and Man</u>	934	93	73	7
<u>Similar books</u>	882	88	125	12

From these data analyses it appears that the typical respondent is male, older than the state median age, better educated, Protestant, tends to be a political moderate, owns less than one boat, and has read part of an environmental handbook. He lives in town in the seven county area, and he is employed in an occupation which has higher status than average.

This description of the respondent suggests that the return is biased. The bias is predictable and similar to that found by other social scientists.

According to Goode and Hatt, in a discussion of who returns the mail questionnaire, "The direction of this bias is toward those who have knowledge of the subject matter, those who have interest in the subject matter, those who are higher in socio-economic status and those who have had more education," (6, pp.172-173).

#### Evaluation of Qualities of the Mississippi River

A major objective of the survey was to determine the attitudes of the study universe toward the Mississippi River. Questions relating to this basic objective asked the respondent to list desirable and undesirable qualities of the Mississippi River. Data in Table 3.17 tabulates the desirable qualities of the River. Beauty, scenery heads the list with 43 percent followed by recreational, 33 percent. These are followed by fishing, boating, transportation and wildlife. If various kinds of recreation are consolidated, recreational uses were clearly dominant with transportation considered the most important of the more utilitarian usages. As indicated in Table 3.17, attitudes of out state and metro respondents were not significantly different in most items. The only major difference concerns boating with the out staters leading the metroites 44 - 25 percent, respectively. It also appears that beauty was somewhat more important to those in the metro area than to out staters.

TABLE 3.17  
Desirable Qualities of Mississippi River

	Total		Out State	Metro
	N	%	N=247	N=760
No response	63	6	11%	5%
Negative response	27	3	2	3
Beauty; scenery	444	43	40	46
Boating; sailing	303	31	44	25
Fishing	305	32	33	29
Transportation	172	17	19	17
Recreation	318	33	33	31
Clean	51	5	4	5

TABLE 3.17 (cont.)

Historic	148	14	11	16
Swimming	89	7	12	8
Wildlife	175	17	21	17
Water supply	81	7	7	9
Economic	66	6	6	7
Picnics	27	3	2	3
Power source	45	4	5	5
Relaxing	43	4	2	5
Riverboats	31	4	1	4
Banks	38	4	2	4
Other	106	11	10	11

TABLE 3.18  
Undesirable Qualities of Mississippi River

	N	%	Out State	Metro
No response	63	6	11%	5%
Pollution	451	44	42	46
Sewage	229	22	21	24
Dirty, oil, smell	327	32	23	35
Garbage, debris, junk on banks	172	16	11	19
Industrial-heated water, commercial use, barges, dams	245	25	19	26
Flooding	95	9	10	10

52

TABLE 3.18 (cont.)

Bad fish, poor fishing	62	6	7	6
TC area, congestion, bad shoreline	70	8	3	8
Hazardous	44	4	3	4
Plants, algae	25	3	4	2
Bad recreation opportunities	55	6	2	6
Pollution & congestion by commercial users	29	2	3	3
None or nearly nothing	6	-	1	1
Other	113	11	11	6

\*Up to five responses were coded from each questionnaire.

Table 3.18 indicates that pollution is the most undesirable quality of the River. This is quite apparent in both tables and is reinforced by the listing of such items as sewage, dirty, garbage and industrial waste. Significant differences occur in items which are perceived by metro dwellers as more serious. To this latter group the items dirty, oil, smell, garbage and debris, industrial, congestion, and bad shoreline are more serious problems than to the out staters.

TABLE 3.19  
Choice of Body of Water for Leisure Time

	N	%	Out State N=247	Metro N=760
No response	41	4	6%	3%
Mississippi River	129	13	24	9
Other unspecified	175	17	18	17
Other lake	449	45	41	46
Any other	138	14	6	16
None	2	-	-	--
Other lakes & rivers	22	2	2	2

53

Questions closely related to attitudes toward the river were probed by asking respondents to choose what kind of a body of water they preferred, reasons for the preference and whether any of their leisure time was spent along the river. Respondents (See Table 3.19.) preferred lakes to the Mississippi River or any other river by a wide margin, with 45 percent preferring lakes, 13 percent the Mississippi, and 14 percent other rivers. Out staters, while choosing lakes by 41 percent, indicate the Mississippi as second choice, 24 percent, and unspecified other, 18 percent. Three choices stand out for the metroites; only 9 percent chose the Mississippi, 48 percent preferred other lakes, and 16 percent preferred other rivers. Hindsight acquired during the coding process suggests that perhaps one of the most attractive of the "other rivers" to the metro resident is the St. Croix.

TABLE 3.20  
Reasons for Choice of Body of Water Other Than Mississippi River for Leisure Time\*

	Total		Out State N=247	Metro N=760
	N	%		
No response	80	8	13%	6%
Quiet, secluded	157	16	11	17
Better fish & fishing	120	11	13	12
Better recreation facilities	150	14	13	15
Mississippi River polluted	67	6	4	8
No reason	55	5	8	5
Less pollution	470	48	37	50
More beauty	94	9	7	10
Proximity or convenience	91	9	14	7
Mississippi River unsafe	106	10	9	11
Other	100	11	9	10

Table 3.20 pursues choices of bodies of water for recreation by asking reasons for the preference. Patterns similar to those developed in Tables 3.17, 3.18 and 3.19 are reinforced by data in Table 3.20. Forty-eight percent gave river pollution as a reason for choosing some other body of water as a place to spend leisure time. Significant differences between out staters and metroites are apparent in three items; out staters perceived the River as being less polluted, metroites believed the River to be less quiet than out staters, and other bodies of water were more convenient to out staters.

TABLE 3.21  
Leisure Time On or Along Mississippi River During Past Year

	N	%	Out State Metro	
			N=247	N=760
No response	10	1	2%	1%
Yes	471	47	56	44
No	526	52	43	55
	1007	100		

It was therefore no surprise to find in Table 3.21 that 47 percent, less than half, of the respondents spent some leisure time on or along the Mississippi River during the past year. Significantly more out staters, 56 percent, than metro residents, 44 percent, spent some leisure time along the River.

TABLE 3.22  
Leisure Time Activities On or Along Mississippi River During the Past Year

	NR	Once or Twice		Several Times		Fairly Often		Quite Often		Confusing Response	
		N	%	N	%	N	%	N	%		
Fishing	807	80	92	9	64	6	20	2	22	2	0
Boating	761	76	121	12	56	6	38	4	30	3	1

TABLE 3.22 (cont.)

Water skiing	931 92	37 4	18 2	12 1	8 1	1 0
Camping or picnics	749 74	127 13	77 8	31 3	22 2	1 0
Other	841 84	6 1	22 2	30 3	8 1	48 5

TABLE 3.23  
Reasons for Non-Use of Mississippi River  
Within Past Year  
(Up to three responses were coded.)

	N	%
#5 NR - Yes	2063	205
#5 NR - No	36	4
Access, knowledge, proximity	190	19
Mississippi River dirty, polluted, other cleaner	266	26
No interest, don't care	53	5
Busy, no boat	153	15
Dangerous	27	13
Prefer other, less crowded	120	12
	2984	296

Kinds of activities along and frequency of activity along the Mississippi River are analyzed in Table 3.22. Camping or picnics were the most popular with boating and fishing second and third; however, few of the respondents engaged in these activities along the river and with low frequency. Supplementary to Table 3.22 is data in Table 3.23 which lists reasons for non-use of the Mississippi. Again pollution leads the list with a cumulative 26 percent followed by access with 19 percent. These objections correspond with previous attitudes toward river quality.

Media and Aspects of the Mississippi River

Publics acquire information from a variety of experiences. Some read about certain aspects of the River others may depend on other sources for the knowledge which helps shape their attitudes. These two questions, analyzed in Tables 3.24 and 3.25, ask which aspects of the River are the best known and for the sources of the respondent's information. Seventy-nine percent recalled pollution as an important aspect. It was closely followed by atomic power plants with 76 percent, and sewage treatment or disposal at 76 percent. Those items best remembered may be those which were perceived as most threatening. Newspapers were the most popular source of information by a wide margin; 87 percent of the respondents acquired information from the newspapers and 69 percent from television. Radio was third with 54 percent and magazine readership was behind family and friends. Respondents seemed to recall negative or threatening aspects with greater frequency than those which are positive. Major sources of information were newspapers and television in that order.

TABLE 3.24  
Degree of Popularization of Certain Aspects of  
the Mississippi River  
(Check as many as you wish.)

	No Response		Yes	
	N	%	N	%
Recreational opportunities	527	52	480	48
Reservoir or dam building	803	80	204	20
Flooding of flood control	457	45	550	55
Industrial development	518	51	489	49
Pollution levels or control	210	21	797	79
Mjolsness Construction lawsuit	990	98	17	2
Twelve-foot channel project	864	86	143	14
Sewage treatment or disposal	269	27	738	73

TABLE 3.24 (cont.)

Atomic power plants	244	24	763	76
Wild rice cultivation	849	84	158	16

TABLE 3.25  
Sources of Information

	No Response		Yes	
	N	%	N	%
	Newspapers	127	13	880
Magazines	784	78	223	22
TV	314	31	693	69
Radio	467	46	540	54
Family or friends	658	65	349	35
Other, specify	900	89	11	1

Attitudes Toward Mississippi River Usage

As the forgoing topical analyses of the survey have indicated, the respondents had some positive attitudes concerning River quality or attributes and its desirability as a recreation resource. And unweighted responses indicated that much of their information was supplied by newspapers and television.

In view of these evaluations it may be important to ascertain their attitudes toward river use. These next three tables, 3.26, 3.26a and 3.27 attempt to differentiate between the "ought" and the "is"; what the most important usages of the River should be compared to respondents perceptions of how it is actually used. Analysis of Tables 3.26 and 3.27 gave the highest priority to fish and wildlife habitat, 48 percent, with public water as a second choice, 36 percent. Lowest priority was assigned to waste disposal. However, respondents apparently believed that in actual practice almost the reverse was true. Waste disposal ranked first in usage with 37 percent; industrial and commercial uses were second with 32 percent. Public water supply was fourth

TABLE 3.26  
Uses of Mississippi River  
(1=most; 6=least; 0=no response)

	Fish and Wildlife Habitat		Transportation		Public Water Supply	
	Should Be	Actual Use	Should Be	Actual Use	Should Be	Actual Use
	N %	N %	N %	N %	N %	N %
0	22 2	52 5	33 3	42 4	31 3	45 4
1	481 48	40 4	87 9	98 10	365 36	172 17
2	265 26	22 2	142 14	129 13	198 20	123 12
3	109 11	52 5	255 25	251 25	195 19	232 23
4	76 8	112 11	369 37	290 29	148 15	234 23
5	41 4	251 25	87 9	95 9	51 5	89 9
6	13 1	477 47	34 3	102 10	19 2	112 11

	Water Sports & Recreation		Waste Disposal		Industrial & Commercial Uses	
	Should Be	Actual Use	Should Be	Actual Use	Should Be	Actual Use
	N %	N %	N %	N %	N %	N %
0	29 3	47 5	71 7	36 4	53 5	37 4
1	85 8	30 3	10 1	374 37	34 3	325 32
2	279 28	35 3	27 3	338 34	53 5	308 31
3	296 29	83 8	32 3	138 14	72 7	204 20
4	200 20	167 17	39 4	62 6	113 11	76 8
5	79 8	438 43	125 12	24 2	542 54	40 4
6	39 4	207 21	703 70	35 3	140 14	17 2

TABLE 3.26a  
 Uses of Mississippi River  
 (1=most; 6=least; 0=no response)

	Fish and Wildlife Habitat						Transportation					
	Should Be			Actual Use			Should Be			Actual Use		
	Out State	Metro	All	Out State	Metro	All	Out State	Metro	All	Out State	Metro	All
0	3%	2%	2%	7%	5%	5%	7%	2%	3%	8%	3%	4%
1	55	45	48	9	2	4	11	8	9	10	10	10
2	26	26	26	6	1	2	13	15	14	12	13	13
3	7	12	11	9	4	5	25	25	25	19	27	25
4	5	8	8	13	11	11	32	38	37	26	30	29
5	2	5	4	17	28	25	10	8	9	10	9	9
6	2	1	1	40	50	47	2	4	3	17	8	10

Out State N=247; Metro N=760; All N=1007

TABLE 3.26a (cont.)

	Public Water Supply						Water Sports and Recreation					
	Should Be			Actual Use			Should Be			Actual Use		
	Out State	Metro	All	Out State	Metro	All	Out State	Metro	All	Out State	Metro	All
0	6%	2%	3%	7%	4%	4%	6%	2%	3%	7%	4%	5%
1	30	38	36	16	18	17	9	8	8	7	2	3
2	20	20	20	10	13	12	28	28	28	6	3	3
3	21	19	19	23	23	23	32	28	29	13	7	8
4	15	15	15	19	25	23	18	20	20	19	16	17
5	7	5	5	11	8	9	4	9	8	37	46	43
6	2	2	2	14	10	11	2	4	4	11	24	21

TABLE 3.26a (cont.)

	Waste Disposal			Industrial and Commercial Use									
	Should Be	Actual Use	Should Be	Should Be	Actual Use	Actual Use							
	Out	Out	Out	Out	Out	Out							
	State	Metro	All	State	Metro	All							
0	13%	5%	7%	7%	3%	4%	10%	4%	5%	5%	7%	3%	4%
1	0	1	1	39	37	37	4	3	3	25	35	32	32
2	1	3	3	27	36	34	5	5	5	31	31	31	31
3	1	4	3	11	15	14	6	8	7	17	21	20	20
4	6	3	4	7	6	6	11	11	11	7	8	8	8
5	13	12	12	5	2	2	51	55	54	10	2	4	4
6	66	71	70	6	3	3	13	14	14	3	1	2	2

TABLE 3.27  
Perceived Uses of the Mississippi River  
(1=most; 6=least)

Rank Order	Should Be	Actual Use
1	Fish & wildlife habitat	Waste disposal
2	Public water supply	Industrial & commercial uses
3	Water sports & recreation	Transportation
4	Transportation	Public water
5	Industrial & commercial	Water sports & recreation
6	Waste disposal	Fish & wildlife habitat

with 23 percent and fish and wildlife habitat was last with 47 percent.

Upon further comparison of these data in Table 3.26a, the rank order with one exception holds true for both out state and metro residents. The exception by a very slight margin was the placement of public water in the actual usage column by metro respondents; transportation was third and public water supply was fourth. Metroites generally seemed more aware or sensitive to waste disposal, industrial and commercial use and transportation. Out stateres were more concerned with water sports and fish and wildlife habitat; however, most differences were of degree rather than rank. The no response for the out stateres, while about twice that of the metro dwellers, was probably not great enough to be significant.

Sources and Level of River Pollution

In the previous topic respondents perceived major uses of the River to be more oriented toward industrial use and waste disposal. It is also important to ascertain perceptions concerning the level of River pollution and to identify the pollutants.



TABLE 3.28  
Comparative Degree of Pollution Level of the Mississippi River

	No Response		None		Low		Medium		High		Don't Know		Total	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
	Itasca to Grand Rapids	30	3	100	10	546	54	94	9	19	2	216	21	1005
Grand Rapids to Anoka	28	3	3	--	151	15	534	53	108	11	177	18	1001	99
Anoka to Red Wing	25	2	--	--	11	1	139	14	717	71	112	11	1004	99
Red Wing to Iowa border	29	3	2	--	26	3	169	17	538	53	240	24	1004	100

TABLE 3.28a  
Comparative Degree of Pollution Level of the Mississippi River

	No Response			None			Low		
	Out	Metro	All	Out	Metro	All	Out	Metro	All
	Itasca to Grand Rapids	7%	2%	3%	8%	11%	10%	46%	57%
Grand Rapids to Anoka	7	2	3	-	--	--	9	17	15
Anoka to Red Wing	6	1	2	-	--	--	--	1	1
Red Wing to Iowa border	5	2	3	1	--	--	4	2	3
	Medium			High			Don't Know		
	Out	Metro	All	Out	Metro	All	Out	Metro	All
	Itasca to Grand Rapids	14%	8%	9%	3%	1%	2%	21%	22%
Grand Rapids to Anoka	47	55	53	19	8	11	17	18	18
Anoka to Red Wing	13	14	14	59	75	71	20	8	11
Red Wing to Iowa border	15	17	17	47	56	53	26	23	24

Tables 3.28 and 3.28a concern degree of pollution along the River by stretch. Fifty-four percent of the respondents believed that the least polluted stretch of the River was from the source in Itasca Park to Grand Rapids, while 71 percent believed the most highly polluted stretch was from Anoka to Red Wing. There may be a tendency for the residents of an area to believe that stretches farther away are less polluted, e.g. residents of the metro area may see their stretch as more polluted than residents of other areas. Out staters apparently saw the Itasca-Grand Rapids area somewhat more polluted than the metro dwellers did. Those respondents who "do not know" comprised a fairly consistent proportion of about 20 percent except for the metro dwellers; when they assessed the pollution level of their own area the "do not know" response dropped to 8 percent. Regardless of the indicated lack of knowledge and its effect on the table, the most polluted area of the River was judged to be where most of the people lived and where most of the industry was concentrated.

TABLE 3.29  
Major Sources of Pollution of Rivers  
and Streams in Your Area

	Sewage Disposal & Heated Water		Industrial Wastes & Recreation Use		Agricultural Chemicals & Dumping or Littering		
	N	%	N	%	N	%	
No response	0	65	6	61	6	135	13
Top item only	1	803	80	887	88	390	39
Second item only	2	28	3	26	3	408	41
Both items	3	109	11	33	3	74	7
		1005	100	1007	100	1007	100

TABLE 3.29a  
Major Sources of Pollution of Rivers  
and Streams in Your Area

	Out State		
	Metro	All	
Sewage disposal	81%	80%	80%
Heated water	2	3	3
Industrial wastes	81	91	88
Recreation usages	4	2	3
Agricultural chemicals	33	41	39
Dumping or littering	42	40	41

Multi-answer tables 3.29 and 3.29a support the previous data in showing that 88 percent of all the respondents judged industrial wastes to be a major pollutant. Sewage disposal was second with 80 percent. Neither recreation usages nor heated water was considered a major problem. This latter perception of heated water by only 3 percent is interesting in view of recent statewide publicity concerning thermal pollution. There was a high degree of unanimity among respondents from all areas in these two tables except for the consideration of agricultural chemicals; only 33 percent of the out staters thought these were pollutants but 41 percent of the metro dwellers did. This difference may be due to the rural residents who did not believe fertilizers, sprays and other chemicals to be dangerous as did their metro counterparts.

Data from the Minnesota Poll conducted in 1969 and 1970 was helpful in comparing attitudes relative to two of these areas; heated water and agricultural pollution. A question asked in the Minnesota Poll of 1969 concerned the return of water to the River which had been used to cool the Monticello atomic energy power plant. Based on all adults in the sample, 58 percent believed that the return of the heated water would have a harmful effect, which seemed to indicate a greater concern than the River survey (7). This response was somewhat difficult to compare to data in the previous tables because the Minnesota Poll question made no attempt to compare kinds of pollution. Perhaps

a more meaningful comparison can be made between the River survey response concerning the danger of agricultural chemicals and a broader question in a 1970 Minnesota Poll which included pollution from feedlots as well as various kinds of agricultural chemicals. In the River survey 39 percent judged agricultural chemicals to be a major pollutant compared to 29 percent of all adults in the Minnesota Poll who believed that this kind of pollution was very serious. Again as in the River survey there was a decline in the perception of agricultural chemicals as a pollutant by the rural areas; in the Minnesota Poll 19 percent in these areas believed these chemicals were a very serious pollutant while in the River survey the decline was from 41 percent in the metro area to 33 percent among the out staters (8). Admittedly the out staters can not be accurately compared to the Minnesota Poll's rural area but their value systems may be more similar than they are to the all adults. Analysis of the data in this topic indicated that there was a basic agreement on perception of the major pollutants--industrial wastes, sewage disposal, and again agricultural chemicals. There was also agreement that the most populated stretch of the River was the most polluted. Differences of degree seemed to occur according to proximity; residents in one river stretch perceived their part of the river to be more polluted than did non-residents of that area. Furthermore respondents tended to perceive their own activities as being less harmful than did others, e.g. different populations and their attitudes toward agricultural chemicals.

#### Pollution Control of the River

Attitudes toward degree of River pollution and its major causes, as discussed in the last topic, were reasonably simple to determine and important to the decision makers was the respondent's knowledge and choice of which agency and level of government should be charged with enforcement.

Tables 3.30 through 3.33 attempt to identify these preferences as well as more specific weighting of pollutants. Table 3.30 indicates that 83 percent of the respondents were willing to report water pollution problems. The consensus was not nearly as high in Table 3.31. Here the respondents were asked to participate in a multi-answer, open-ended question of which two

with the highest frequency were coded. Forty-one percent chose the Pollution Control Agency (PCA). Lagging far behind was conservation with 8 percent and local, county, regional governments at 7 percent. Other choices were in the 1-3 percent range and may indicate some confusion concerning names of enforcement agencies.

TABLE 3.30  
Willingness to Report Water  
Pollution Problems

	N	%
No response	41	4
Yes	840	83
No	101	10
Confused response	20	2
	1002	99

TABLE 3.31  
Who Would You Report It To  
(Two answers were coded.)

	N	%
No response	161	16
Don't know	92	9
PCA or similar	418	41
Conservation	78	8
Corps of Engineers	12	1
Dept. of Health, similar	37	3
Senator and/or Congress	15	1
Law enforcement agency	24	2
Local, county, regional governments or agencies	71	7

TABLE 3.31 (cont.)

Would find out	20	2
Game, Fish and Wildlife Dept.	18	2
City water department	4	-
Action line, etc.	15	1
Uncodable	18	2
Other	96	10

TABLE 3.32  
Responsibility for Controlling Pollution  
of the Mississippi River  
(Check as many as you wish.)

	No Response		Yes Response		Total	
	N	%	N	%	N	%
Federal government	515	51	492	49	1007	100
Regional agencies (like TVA)	784	78	223	22	1007	100
State governments	496	49	511	51	1007	100
County & local governments	654	65	353	35	1007	100
Each of these looking after its own needs	945	94	62	6	1007	100
All of these working together	344	34	662	66	1006	100
Other	877	87	4	--	891	87

Further analyses of the more basic question concerning responsibility for pollution control of the River is attempted in Tables 3.32 and 3.32a. Sixty-six percent of the respondents chose, in a multi-answer question, all levels of governments working together, which seems to indicate some appreciation of a need for cooperation

TABLE 3.32a  
Responsibility for Controlling Pollution  
of the Mississippi River

	No Response			Yes Response		
	Out State	Metro	All	Out State	Metro	All
Federal government	57%	49%	51%	43%	51%	49%
Regional agencies (like TVA)	82	77	78	18	23	22
State governments	52	48	49	48	52	51
County and local governments	66	64	65	34	35	35
Each of these looking after its own needs	96	93	94	5	7	6
All of these working together	36	34	34	64	66	66
Other*	91	86	87	6	10	--

\*Other is so fragmented it is not reported.

between governmental levels in these enforcement efforts. The second choice was state governments with 51 percent followed very closely by federal government with 49 percent. The slight difference in these latter choices seemed to indicate an ambivalence as to which should have the control. Perhaps more significant was the fourth choice of the local and county governments with 35 percent. This choice did not seem to support those who advocated local control and enforcement. Table 3.32a again indicated no difference of rank but some of degree. Metro dwellers showed a marked preference for federal control compared to the out staters, the metro preference for state control was greater but closer to the out staters and about the same for local and county governments. Considering the well-publicized rural opposition to regionalism during 1971 and 1972, one might expect greater support from the out staters for local and county control and considerably less than was indicated for state and federal.

TABLE 3.33  
How Certain Things Affect the Mississippi River

	0	1	2	3	4	5	6	7	8	9	Total
	N	N	N	N	N	N	N	N	N	N	N
	%	%	%	%	%	%	%	%	%	%	%
DDT & pesticides	21 2	102 10	142 14	22 2	3 -	16 2	189 19	505 50	3 -	4 -	1007 99
Commercial fertilizers	19 2	95 9	217 22	41 4	4 -	12 1	178 18	437 43	2 -	2 -	1007 99
72 Land fill projects	45 4	289 29	245 24	27 3	13 1	68 7	195 19	116 12	5 -	4 -	1007 99
Channel dredging	55 5	419 42	190 19	15 1	13 1	84 8	138 14	85 8	5 -	3 -	1007 98
Field & marsh drainage	40 4	276 27	200 20	39 4	10 1	53 5	133 13	243 24	5 -	9 1	1007 99
Heated water	39 4	202 20	202 20	27 3	15 1	56 6	216 21	241 24	3 -	6 1	1007 100

TABLE 3.33 (cont.)

Motor boat exhaust	46 5	359 36	246 24	31 3	7 1	67 7	153 15	92 9	3 -	3 -	1007 100
Atomic power plants	35 3	167 17	156 15	40 4	19 2	86 9	196 19	297 29	5 -	6 -	1007 99
Secondary sewage	20 2	23 2	123 12	32 3	9 1	27 3	252 25	514 51	2 -	5 -	1007 99
73 Spilled oils	19 2	11 1	42 4	46 5	7 1	14 1	86 9	778 77	2 -	2 -	1007 100
Dumping and littering	13 1	19 2	78 8	25 2	5 -	25 2	211 21	627 62	2 -	2 -	1007 98

CODE: 0 = no response  
1 = little effect  
2 = somewhat harmful  
3 = quite harmful  
4 = restricted or controlled  
5 = restricted, little effect  
6 = restricted, somewhat harmful  
7 = restricted, quite harmful  
8 = ambiguous  
9 = confusing response

Data in Table 3.33 reflects an effort to discover what specific pollutants were dangerous enough to be controlled. This multi-answer question measures degree of pollution from little effect to restricted, quite harmful. The most harmful pollutant was judged by 77 percent to be spilled oil. The second choice, 62 percent, was dumping and littering. DDT and pesticides and secondary treated sewage were 51 and 50 percent, respectively. Fifth choice, at 43 percent, was commercial fertilizers. The least threatening was channel dredging. Heated water, at 24 percent in this context, did not correspond to the 3 percent who believed it to be a major pollutant in Table 3.29a. There was also a difference in emphasis on DDT and commercial fertilizers, agricultural chemicals, between this table and the 39 percent in Table 3.29. Part of this variance may be attributed to the somewhat different composition of the questions. Most dangerous pollutants, e.g. those which should be restricted, are those which have been identified in previous topics and these choices may reflect the weight of the metro responses. Analyses of the preceding data seemed to reflect an uncertainty and possible lack of knowledge of which agencies and levels of government should control pollution.

#### Financing Pollution Control

Of major importance to any policy decisions is the method of financing the program. While it may be difficult to discuss means of payment without knowledge of amounts involved, it is important to gain some insights concerning this issue even if these choices were based on admittedly limited information. The next four tables attempt to ascertain attitudinal preferences concerning national priorities and means of payment for pollution control.

TABLE 3.34  
Preference of Options in Payment for Pollution Control

	No		Yes		Total	
	Response		Response			
	N	%	N	%	N	%
Special use fees for industry & business	126	13	877	87	1003	100

TABLE 3.34 (cont.)

Special use fees for individuals who use water	529	53	476	47	1005	100
Redistribution of funds from other agencies & programs	597	59	408	41	1005	100
Other (please specify)*	870	86	135	14	1005	100

\*Specified other is so fragmented it is not itemized.

TABLE 3.34a  
Preference of Options in Payment for Pollution Control

	No			Yes		
	Response			Response		
	Out	State	All	Out	State	All
Special fees for industry & business	14%	12%	13%	85%	88%	87%
Special use fees for individuals who use water	59	51	53	41	49	47
Redistribution of funds from other agencies & programs	57	60	59	43	40	41
Other (please specify)*	88	86	86	12	13	14

\*Specified other is so fragmented it is not itemized.

Both out state and metro respondents were in close agreement on the most preferred approach to payment for pollution control. As indicated in Tables 3.34 and 3.34a between 85 and 88 percent chose special use fees for industry and business. Special use fees for individuals who use water varied from 41 percent for out staters to 49 percent for metro residents. Redistribution of funds from other agencies and programs was third with 41 percent.

In the next two Tables, 3.35 and 3.35a, data was analyzed which relates to priority of pollution control in comparison to certain federal programs. For 77

percent pollution control would have priority over foreign wars, for 66 percent over foreign aid and for 54 percent over defense spending. Space programs were marginal with 47 percent or less than half of the respondents favoring pollution control. Programs which were clearly deemed more important than pollution control included education with a mere 5 percent, health programs 8 percent, urban renewal with 13 percent, and even a sometime controversial program like welfare had priority over pollution control in these data.

A comparison between the out state and metro respondents in Table 3.35a offers no dramatic differences. The greatest percentage difference was in the perceived value of commerce programs with only 24 percent out staters and 17 percent metroites believing these programs were more important than pollution control.

TABLE 3.35  
Redistribution of Federal Funds to  
Increase Pollution Control  
(Check as many as you wish.)

	No Response		Yes Response		Total	
	N	%	N	%	N	%
Foreign aid	341	34	665	66	1006	100
Welfare programs	664	66	343	34	1007	100
Defense spending	466	46	539	54	1005	100
Education programs	954	95	52	5	1006	100
Space programs	529	53	478	47	1007	100
Urban renewal	873	87	134	13	1007	100
Highway building	831	83	175	17	1006	100
Agricultural supports	740	73	267	27	1007	100
Health programs	926	92	81	8	1007	100
Foreign wars	226	22	780	77	1006	99
Commerce programs	818	81	189	19	1007	100
Other	961	95	46	5	1007	100

TABLE 3.35a  
Redistribution of Federal Funds to  
Increase Pollution Control

	No Response			Yes Response		
	Out State	Metro	All	Out State	Metro	All
Foreign aid	31%	35%	34%	69%	65%	66%
Welfare programs	65	66	66	34	34	34
Defense spending	51	45	46	49	55	54
Education programs	93	95	95	7	5	5
Space programs	49	54	53	51	46	47
Urban renewal	84	88	87	16	12	13
Highway building	86	81	83	14	19	17
Agricultural supports	73	74	73	27	26	27
Health programs	92	92	92	8	8	8
Foreign wars	27	21	22	73	79	77
Commerce programs	76	83	81	24	17	19
Other	96	95	95	1	3	5

Defense spending, highway building and foreign wars were slightly more acceptable to the out staters, whereas the metroites were not quite as negative to foreign aid, space programs and urban renewal.

On the basis of the questions asked respondents generally preferred to pay for pollution control with use fees and a reordering of federal spending. Pollution control would have a clear priority over foreign wars and foreign aid and slightly over defense spending. Education, health, and urban renewal were leaders among the programs which were considered more valuable than pollution control.

Environmental Quality

Previous survey data analyses have been more or less concerned with River usage, water quality and pollution. This topic is more general and discusses the "environment."

TABLE 3.36  
Rank of Types of Environmental Pollution  
(1=most harmful; 7=least harmful)

		No Response		1		2		3	
		N %		N %		N %		N %	
Excessive noise	1	360	36	30	3	13	1	60	6
Pesticide pollution	2	338	34	85	8	66	7	168	17
Destruction of beauty	3	345	34	75	7	41	4	88	9
Water pollution	4	314	31	268	27	283	28	89	9
Land erosion	5	384	38	21	2	18	2	72	7
Urban congestion	6	356	35	57	6	51	5	81	8
Air pollution	7	333	33	287	29	187	19	93	9
Equally harmful	8	641	64	4	-	357	35	-	-

TABLE 3.36 (cont.)

	4		5		6		7		Total	
	N	%	N	%	N	%	N	%	N	%
Excessive noise	89	9	115	11	126	13	207	21	1000	100
Pesticide pollution	129	13	94	9	78	8	40	4	998	100

TABLE 3.36 (cont.)

Destruction of beauty	121	12	103	10	103	10	123	12	999	98
Water pollution	23	2	12	1	6	1	2	-	997	99
Land erosion	116	12	136	14	154	15	100	10	1001	100
Urban congestion	100	10	127	13	118	12	109	11	999	100
Air pollution	45	4	29	3	15	1	10	1	999	99
Equally harmful	2	-	1	-	-	-	-	-	1001	99

The first question concerned attitudes toward harmfulness of environmental pollution. Respondents were asked to rank types of environmental pollution, Tables 3.36 and 3.36a. Air pollution, 29 percent, was considered slightly more harmful than water pollution at 27 percent. Pesticide pollution was third, 17 percent, and land erosion and destruction of natural beauty were tied for fourth with 12 percent. As shown in Table 3.36a, to out staters water pollution was more harmful than air pollution which was second. While pesticide pollution was judged third by both groups, the out staters indicated a somewhat lower response. The out stater's greater concern for land erosion was reflected in their fourth and fifth choices.

Relevant data concerning air and water pollution have also been gathered by national polls. An Opinion Research Corporation survey of 1968 reported that 27 percent of the population perceived the water pollution problem to be very serious. The other two answers were somewhat serious, 31 percent, and not serious or no opinion, 42 percent. A similar question concerning air pollution was also asked, 25 percent said it was very serious, 30 percent somewhat serious and 45 percent as not serious or no opinion (9, p.79). In spite of the differences between the River survey and the national poll questions it is significant that the results on these two aspects of pollution were this comparable.





TABLE 3.37  
How Should Environmental Quality Problems Be Handled  
(Check one)

	Total		Out State Metro	
	N	%	%	%
No response	19	2	4	1
No need - eventually take care of themselves	-	-	-	-
Each problem solved as it develops	68	7	10	6
Each problem handled separately	155	15	16	15
Long range planning for comprehensive problem solving	755	75	69	77

The response to a question asking how environmental quality problems should be handled was examined in Table 3.37. The overwhelming preference was for long range planning, 75 percent. Out state respondents however favored this solution somewhat less, 69 percent, and were slightly more in favor of handling each problem separately.

TABLE 3.38  
Pollution Toleration  
(Check one)

	Total		Out State Metro	
	N	%	N=247	N=760
No response	17	2	3%	1%
Little need for pollution control - problems solve themselves	-	-	-	-
Moderate pollution is price we pay for progress; tolerable as long as environment is safe for people	29	3	3	3

TABLE 3.38 (cont.)

Slight pollution is tolerable so long as environment is safe for wildlife as well as people	450	45	42	46
Environment should be kept as clean as possible; even slight pollution is not tolerable	504	50	50	50

As shown in Table 3.38 pollution toleration was low. Fifty percent believed that even slight pollution was intolerable, 45 percent indicated acceptance of slight pollution so long as environment was safe for wildlife as well as people. Differences between metro and out state respondents were small.

TABLE 3.39  
Measurement of Degree of Environmental Crisis  
(Check one)

	Total		Out State Metro	
	N	%	N=247	N=760
No response	22	2	4%	2%
No crisis; crisis only in people's minds	6	1	1	1
Are some isolated problems; no crisis	18	2	2	2
A few major problems; no crisis	102	10	9	11
There is a possible crisis; is a long way off	34	3	4	3
There is a minor crisis with few immediate dangers	162	16	17	16
There is a major crisis with clear and present dangers to the entire human species	658	65	63	66
	1002	99		

Similarly in a question which measured perception of degree of environmental crisis as presented in Table 3.39 there was high agreement that there is a major crisis with clear and present dangers to the entire human species. Sixty-five percent made this choice with only 16 percent indicating that there is a minor crisis with few immediate dangers. Again the metro and out state respondents opted for the same positions.

TABLE 3.40  
Potential Adoption of Environmental Control Practices

	No Response		Yes		No		Total	
	N	%	N	%	N	%	N	%
	Use soap instead of detergent	26	3	924	92	56	6	1006
Use fewer electrical appliances	80	8	494	49	431	43	1005	100
Reduce the use of pesticides	42	4	893	89	72	7	1007	100
Use only returnable bottles & cans	30	3	909	90	67	7	1006	100
Sorting garbage & not burning paper & plastics	49	5	868	86	87	9	1004	100
Payment of extra fees for excessive water use	64	6	707	70	229	23	1000	99
Driving a less powerful car	50	5	803	80	152	15	1005	100
Cease using colored toilet paper & paper towels	42	4	887	88	77	8	1006	100
Using fewer pre-packaged goods & foods	55	5	759	75	191	19	1005	99

TABLE 3.40 (cont.)

Stricter usage zoning regulations	83	8	823	82	98	10	1004	100
Gasoline rationing	95	9	295	29	608	60	998	98

TABLE 3.40a  
Potential Adoption of Environmental Control Practices

	Out State			Metro			All		
	NR	Yes	No	NR	Yes	No	NR	Yes	No
	Use soap instead of detergent	5%	87%	7%	2%	93%	5%	3%	92%
Use fewer electrical appliances	15	43	42	6	51	43	8	49	43
Reduce the use of pesticides	5	87	8	4	89	7	4	89	7
Use only returnable bottles and cans	6	87	7	2	91	6	3	90	7
Sorting garbage and not burning paper and plastics	8	77	15	4	89	7	5	86	9
Payment of extra fees for excessive water use	10	65	25	5	72	22	6	70	23
Driving a less powerful car	9	74	17	4	82	14	5	80	15
Cease using colored toilet paper and paper towels	7	82	11	3	90	7	4	88	8
Using fewer pre-packaged goods and foods	9	74	18	5	76	19	5	75	19

TABLE 3.40a (cont.)

Stricter usage zoning regulations	13	74	13	7	84	9	8	82	10
Gasoline rationing	15	28	58	8	30	61	9	29	60

Perhaps one of the most interesting questions to be examined asks the respondents if they would be willing to make changes which would have an impact on their life style. Tables 3.40 and 3.40a present data based on yes or no answers to this question. By large margins respondents favored making all but two of the suggested changes. Using soaps instead of detergents led with 92 percent. The lowest positive response was 70 percent for the payment of fees for excessive water use. The decision regarding less use of electrical appliances was somewhat ambivalent with 49 percent favoring it, 43 percent opposing and 8 percent no response. Gasoline rationing was not acceptable as 60 percent were opposed to it, but at the same time 80 percent favored less powerful cars. Both of the objectionable alternatives deal with fuels or energy uses which are considered to be major pollutant sources by pollution control experts.

A survey conducted by the Minnesota Poll, using somewhat similar questions but with different phrasing, asked what should be done to conserve power because of a lack of fuel. Respondents apparently were not directly asked whether they would use less electricity; the questions seemed to be more related to the conservation of fuel. About 30 percent suggested reducing the use of fuels; 20 percent recommended development of alternative fuels such as atomic or solar energy; and about 20 percent advised the use of traditional fuels such as wood.

A supplementary question asked adult respondents whether they would be willing to cut down on the use of electricity, gasoline, oil and natural gas. The response to this question was more clear cut; 59 percent said they would, 25 percent said no and 18 percent had no opinion or gave other answers (10).

These Minnesota Poll respondents indicated a greater willingness to reduce their use of electricity and gasoline than did the respondents in this attitudinal survey. This difference may be due to a more representative sample in the Minnesota group and perhaps to the phrasing of the questions. The specificity of the survey question regarding electrical appliances may have

elicited a more negative response than to the Poll question which was more comprehensive. The term gasoline rationing in the survey may have a bad connotation for people who have either experienced or know about rationing.

Summary

Compared to the universe population, the survey data returns appeared to be from respondents who were older, better educated, more knowledgeable, tended to be engaged in higher status occupations, and reflected the urban population dominance.

Analyses of the data indicated a great concern for the water quality and usage of the Mississippi River. The River was perceived as polluted, some areas more than others, and if given a choice the respondents preferred lakes for recreation.

While there was agreement that there should be pollution control, ambivalence and lack of knowledge did not clearly indicate who should do it. A fee system and the reordering of national priorities seemed to be the most desirable methods of financing pollution control.

Environmental data analysis suggested that the desired goal should be an environment which is not harmful to man or wildlife. Major environmental problems were perceived as air and water pollution. The environmental crisis was believed to be immediate and it was felt that the problem should be attacked now.

The respondents seemed to be willing to modify their life styles to some extent. However, reduction in gasoline and electric power usage did not have the same appeal that giving up colored toilet paper did. Differences between out state and metro respondents were primarily of degree rather than rank.

Awareness, concern and action may be the substance of the data analysis. However because of a lack of firm data concerning reactions to costs in terms of money, life style and regulation it is difficult to determine the degree of support which would be forthcoming if large scale environmental control programs were proposed.

## CHAPTER IV

### Personal Interviews with Agriculturalists, Resort Owners, Recreational Users, and Home Owners Along the Mississippi River

by  
Norman Baron

#### Introduction

Personal interviews were conducted in order to acquire a randomized sample of opinion toward the Mississippi River. A limited number of interviews (101) were dictated by the expanse of the universe, length of the questionnaire, and the time available. In the Middle Reach of the Mississippi River much land use adjacent to the river is agricultural. Agri-businessmen along the river were selected and interviewed to obtain the agriculturalist's view of the Mississippi River. Seventeen respondents participated in the survey from the agricultural community upstream from Anoka, Minnesota. Nine resort owners were randomly selected from the vacation land adjacent to the Mississippi River in the Bemidji area. Resort proprietors were queried on water quality and its effect on their operations. The remaining 74 interviews were directed toward recreational users and home owners; nineteen of these were interviewed north of Anoka and 55 south of that city. Approximately fifty percent of the respondents between Anoka and the Iowa state line were recreationalists and the other half home owners.

The questionnaire schedule consisted of six parts; 1) general opinions of the Mississippi River; 2) what the river should be used for; 3) sources of pollution; 4) areas of control for the Minnesota Pollution Control Agency; 5) personal environmental protection; and 6) how the government should control the environment. Each of the preceding groups will be discussed in the following order: 1) the attitudes of the total study area; and 2) the more detailed characteristics of the southern segment of the Mississippi River, the resort owners, and the agriculturalists.

#### Methodology

The selection of the participants in the study area was on a random basis. Resort owners and agriculturalists

were interviewed at their place of business. Users of the river were found at recreational sites located along the Mississippi River, while home owners were selected by considering geographic area and population density. Recreational facilities were visited and Minnesota residents were arbitrarily chosen for interviews. User participants were in the Twin Cities, Hastings, Lake City, Wabasha, and Winona. Bemidji, Crow Wing State Parks, Tamarack Point and Norway Beach sites were used on the Upper Mississippi River. City parks were selected in the Twin Cities and Hastings area, while the fishing float and the campgrounds were selected in addition to several sand bars and public beaches in the Winona area.

There was a notable lack of public recreation sites between Minneapolis and Anoka, with much privately owned river frontage. South of Winona, U. S. Highway 61 and the Milwaukee Road right-of-way limits available river frontage as far south as La Crescent. Between La Crescent and the Iowa border, State Highway 26 is a sparsely traveled and populated road; much of the area is swampy backwater.

Home owners were selected systematically to get representation of the study area from Anoka to the Iowa border. The interviewing schedule was arranged to acquire representation from every notable urban cluster in the study area. The distribution of population and equitable representation by population was also calculated. Population numbers by townships and municipalities were gleaned from the 1970 United States Census for Minnesota. Forty percent of the homeowners interviewed were from the Minneapolis-St. Paul area with the remaining sixty percent from other communities along the Mississippi River; this provided a representative sample. Home owners were randomly selected and interviewed in their homes.

Home owner, recreationalist, and agriculturalist represent a wide range of social and cultural strata in the study area. The combined religious philosophy, education, family characteristics, and attitudes toward the Mississippi River of the respondents will be noted as a cultural profile. The cultural profile of home owners and recreation users is Table 4.1, while the agricultural profile is Table 4.2.

#### Cultural Profile

Home owners and recreationalists were from a wide range of primary, secondary, and tertiary occupations

and others were not gainfully employed. The latter included the housewives, retired people, students and actual unemployed. Respondents were primarily Protestant, with a substantial representation of Roman Catholics. Educational achievement ranged from elementary to doctorate. The largest group attained one or more years college education, with 26 receiving a baccalaureate degree. Of the 30 people who had attended high school only 25 received a diploma. Thirteen participants had an elementary education, and only one did not complete the eighth grade. Family size ranged from one to a dozen, 47 percent being from households of four and five persons. Six families resided on Mississippi River frontage, while three owned river-side property.

Most respondents, 64 of 74, use the Mississippi River for leisure time. However, 49 people use the river less than two weeks annually or not at all. Primary recreation uses were listed as fishing (38), camping (18), and swimming (16) with numerous other activities cited.

An excess of 80 percent of the respondents, 59, had read books or magazine articles on the environment. A slightly larger number, 61, noted similar programs on television. Forty-three of 60 persons indicated interest in more public information and educational programs on the environment.

More than half the agricultural respondents considered themselves in agri-business. Agri-business was defined as those earning half or more of their annual income in agricultural activities. The remaining participants received most annual income from non-agricultural pursuits, but received financial returns from commercial crops or pastoralism. Farm size ranged from 30 to 500 acres, the average being 194.6. All except two farms utilize land along the Mississippi River. Approximately half the farms use the river directly at some time for stock watering or irrigation. Commercial fertilizers and manuring were used in at least 60 percent of the farms, while herbicides and pesticides were used to a lesser degree on 45 percent of the farms. Family size ranged from two to nine, averaging 4.8 per family. Two-thirds of the participants listed themselves as Protestant with an achievement level of high school. Most participants had read books or magazine articles on the environment, and witnessed programs on television. Eleven of 17 persons indicated interest in more public information and educational programs on the environment.

TABLE 4.1  
HOME OWNER AND RECREATIONALIST CULTURAL PROFILE

Religion	
Protestant	38
Catholic	22
Others	13

Education	
College	
Ph.D.	1
Masters	6
Baccalaureate	25
Others	9
High School	
Diploma	25
Others	5
Elementary	
8th grade	12
Others	1

Family Size	Number of Households
1	1
2	11
3	10
4	15
5	16
6	7
7	3
8	3
9-12	1

Leisure Time Spent at the Mississippi River	
None	10
15 days or less	39
16 to 60 days	16
More than 60 days	9

TABLE 4.1(continued)  
Activity Use at the Mississippi River

Use	Number
Fishing	38
Camping	18
Swimming	16
Sightsee	11
Boating	11
Picnics	9
Hunting	9
Canoeing	4
Snowmobiles	3
Hiking	3
Recreation	3

Environmental Education

Question	Yes	No
Read books or magazine articles on the environment?	59	11
Attended programs, movies, viewed television programs on environment	61	8
Indicate interest in more public information on the environment	42	24

TABLE 4.2  
Agriculturalist Cultural Profile

Annual Income	
Agri-business	10
Rural Non-farm	7

Farm Size in Acres	
Range	30 - 500
Average	194.6

TABLE 4.2(continued)  
Agricultural Use of the Mississippi

Irrigation	3
Water stock	4

Fertilizer Use and Control

	Yes	No
Commercial Manure	14	4
Pesticides	16	6
Herbicides	5	11
	7	10

Sociological Data

Religion	Family Size	Education
Protestant 9	Range 2 to 9	College 2
Catholic 6	Average 4.6	High School 10
Other 2		Elementary 5

The Mississippi River Means to Me

TABLE 4.2 (Continued)  
Environmental Interest

Question	Yes	No
Have you read any books or magazine articles on the environment or environment problems?	14	3
Have you attended any programs, viewed television programs or seen movies on environment problems?	11	6
Would you be interested in any special education programs on environment problems?	11	6

TABLE 4.3  
The Mississippi River Means to Me\*

Use	Lower Reach	Upper Reach	Total
Recreation	18	9	27
Historic	10	5	15
Home	12	0	12
Pollution	5	5	10
Beauty	4	3	7
Miscellaneous	5	0	5

A variety of answers were given for what the Mississippi River meant to the home owner and the recreationist. The most frequent answer was recreation; 27 of 74 respondents noted the River meant a place to spend leisure time (Table 4.3). Recreation was defined as vacationing and sports activities. A second significant group viewed the Mississippi River from a historic viewpoint. The historic and geographic grandeur of the Father of Waters and the source of the Mississippi River were common references to the waterway. Notably the historic attitude toward the river was found primarily from the segment of the Mississippi between Anoka and the Iowa border which will be referred to as the Lower Reach of the river. A dozen persons, all from the Lower Reach, viewed the river as their home in some form. Many responded that they, "lived near the river," "it was part of [their] life," or they "were born and raised along the river." Most significant among this group were the home owners. The recreational users that thought of the river in terms of their home or some part of their life, had been raised near the river and had moved away for probable economic advantage.

A significant number of respondents regarded the River in terms of pollution (Table 4.3). Pollution referred to all types of man-made forms, e.g. water, dumping, pesticides, etc. In the Lower Reach pollution was often noted by both home owners and recreationalists. In general, the pollution views were predominant in the section of the river upstream from Lake City; e.g., it was pointed out that the Hastings City marina was the second choice of boat owners; they preferred to leave their craft at the marina on the St. Croix River. A city official from Hastings also pointed out that residents take their pleasure craft up the St. Croix River rather than on the Mississippi River. A small group, classed miscellaneous, listed various other meanings varying from physical characteristics of the Mississippi to no opinion.

The Mississippi River's Most Desirable Quality

Forty-eight of 91 respondents indicated recreation as the primary quality of the Mississippi River (Table 4.4). South of Anoka both home owners and recreation users regarded recreation as the most desirable quality. Participating agriculturalists generally viewed recreation



as the most desired quality of the Mississippi River.

The natural beauty of the river as a quality ranked second to recreation. Respondents in the previous question, what does the Mississippi River mean to you, did not consider beauty in the context of the question. However, the Lower Reach group primarily viewed scenic beauty as a desirable quality. Several agri-businessmen selected other choices reflecting the agricultural viewpoint, i.e. a source of water and irrigation.

TABLE 4.4  
The Mississippi River's Most Desirable Qualities

Use	Lower Reach	Upper Reach	Agri-cultural	Total
Recreation	26	11	11	48
Beauty	17	4	5	26
Transportation	7	5	0	12
Miscellaneous	2	3	4	9

Appendix C for complete data on the Lower Reach only

The Mississippi River's Least Desirable Qualities

The people interviewed viewed pollution as a deterrent. Sixty of 91 respondents cited pollution as making the river least desirable (Table 4.5). Most outspoken were persons disgusted that the river was being used for sewage disposal and as a depository for trash, especially metal beverage containers. The numerous miscellaneous reasons given for poor quality of the river were strong opinions based on individual experiences. The boat owner who had to wait for a commercial barge to pass through a lock before he could do so, and the fisherman that does not own a boat and must rent one or view a number of boathouses that have access to the river that he cannot acquire cited these as undesirable qualities. A notable number of agriculturalists, seven of seventeen, had no response to this question. Surprisingly few people viewed the flood hazard as undesirable (Table 4.5). The majority with the latter view were from the Upper Reach of the River.

TABLE 4.5  
The Mississippi River's Least Desirable Qualities

Use	Lower Reach	Upper Reach	Agri-cultural	Total
Pollution	44	10	6	60
Miscellaneous	7	4	5	16
No Response	0	0	7	7
Floods	2	4	0	6

Appendix C for complete data on the Lower Reach only

The Order of Importance Should Be

The procedure for determining what use should be made of the Mississippi River consisted of two parts. A card with the following six general uses of the Mississippi River was presented to all persons interviewed: 1) fish and wildlife, 2) water sports, 3) water supply, 4) sewage and waste, 5) commercial transportation and 6) industry and manufacturing. Each person was asked to look at the card and list what they felt the order of importance for these should be, and what uses of the Mississippi River should be greatly restricted. The primary use of the Mississippi River should be for fish and wildlife (Table 4.6). Numerically the population of the study felt that fish and wildlife deserve major consideration. However, there are regional differences. In the Upper Reach, primary support for fish and wildlife was much less than in the Lower Reach. North of Anoka, 17 of 36 (48%) respondents selected fish and wildlife as their first choice, while in the Lower Reach, 33 of 55 participants (60%) indicate fish and wildlife as the primary consideration.

The use of water supply also ranked high as a primary consideration (Table 4.6). Interviewees in the Lower Reach of the Mississippi River viewed water supply as a primary use but not to the extent as those upstream from Anoka. Eight home owners as opposed to three recreationalists viewed the lower river for water supply. The home owner certainly may consider the river from more aspects than the recreationalist, as many factors beside recreation directly affect home owners in the communities along the river.

TABLE 4.6  
The Order of Importance for These Should Be

Uses	1st		2nd		3rd		4th		5th		6th	
	U	L	U	L	U	L	U	L	U	L	U	L
	T		T		T		T		T		T	
Fish and Wildlife	17	33	11	14	3	7	3	3	0	0	0	0
	50	50	25	25	10	10	6	6	0	0	0	0
Water Sports	7	1	18	18	8	10	3	13	0	8	0	2
	8	8	36	36	18	18	16	16	8	8	2	2
Water Supply	9	11	2	13	15	23	5	6	3	2	1	0
	20	20	15	15	38	38	11	11	5	5	1	1
Sewage and Waste	0	1	0	0	0	0	4	3	3	1	28	52
	1	1	0	0	0	0	7	7	4	4	80	80
Commercial Transportation	0	8	3	9	6	12	15	22	8	5	2	0
	8	8	12	12	18	18	37	37	13	13	2	2
Industry and Manufacturing	1	1	2	1	3	3	4	9	20	39	3	2
	2	2	3	3	6	6	13	13	59	59	5	5

Code: U=Upper Reach\*; L=Lower Reach; T=Total;

\*Recreation users and agriculturalists

Appendix C for complete data on Lower Reach only

Secondary consideration of river usage is not as clearly defined as the primary usages (Table 4.6). Water sports often ranked as first order second choice, ahead of fish and wildlife. However, recreationalists in the Upper Reach of the river tend to favor fish and wildlife over water sports seven to five respectively. Upper Reach agriculturalists preferred water sports, as selected by eighteen persons and fish and wildlife by only four. The recreational user was primarily responsible for fish and wildlife as a second choice, but the home owners tended to list this at a lower order. Water supply, another significant selection, was primarily the choice of respondents in the Lower Reach of the river. Home owners ranked water supply as primary or secondary use; this is a concern of communities along the river.

Third most important usage of the river was overwhelmingly relegated to water supply (Table 4.6) for all respondents. Although commercial transportation and water sports was greatly outranked by water supply, some interesting views appear. The recreation user ranked water supply high among his considerations after recreational activities in the Lower Reach. Interviews and observations indicate that the recreationalist was often more aware of the commercial transportation on the river than the home owner. The recreational user sees barges ply the waters and may be directly affected by the barge traffic, e.g. water skiing. Either home owners interviewed do not necessarily live adjacent to the river to witness this barge traffic, or it is such an integral part of their lives that it passes unnoticed. Notably, it was the recreationalist who listed commercial transportation as third in usage. The home owner has daily access to water sports whether his viewpoint was favorable or unfavorable, and had a strong tendency to assign this to third choice. The recreationalist, who did not have as frequent access, tended to relegate it to a higher degree of importance.

Fourth order usage was notably assigned to commercial transportation by 37 of 91 respondents (Table 4.6). In the Lower Reach of the river home owners strongly urged commercial transportation usage in this ranking as do a good representation of recreationalists. Many home owners interviewed recognize the value of commercial transportation to their communities and the river. The low ranking of commercial transportation by home owners may be the result of actual and assumed misuse of the Mississippi River by commercial barges, which was noted by respondents. Most important fifth choice of

river usage was rated as industry and manufacturing, represented by 59 of 91 persons (Table 4.6). In the Lower Reach respondents noted mistrust of industry and manufacturing based on actual and hearsay information. An exception was the agriculturalist, who selected commercial transportation as his primary fifth choice, industry and manufacturing being secondary fifth choice. The least important use of the river was overwhelmingly judged by respondents to be for sewage and waste, 80 of 91 interviewees judged this to be the least important use. This view supported equally in the upper and lower reach of the river and by home owners, recreationalists, and agriculturalists.

Which Uses of the Mississippi Do You Feel Should Be Greatly Restricted

Eighty-one of 91 respondents felt sewage and waste should be greatly restricted from the river (Table 4.7); the secondary most often mentioned for restriction was industry and manufacturing.

TABLE 4.7  
Which Uses of the Mississippi River Do You Feel Should Be Greatly Restricted

Uses	Lower Reach	Upper Reach	Total
Sewage and waste	50	31	81
Industry and manufacturing	26	17	43
Commercial Transportation	5	6	11
Water Supply	2	2	4
Water Sports	1	0	1

Appendix C for complete data on the Lower Reach only

Sources of Water Quality Problems

Section three of the questionnaire examined the causes of pollution and consisted of three parts: 1) opinions were sought as to causes of water pollution, 2) which types of pollution have the greatest affect on

the Mississippi River, and 3) which forms of pollution have the greatest affect in your area. A list of the following was presented to respondents: 1) pesticide, 2) fertilizer, 3) land fill, 4) dredging, 5) drainage, 6) exhaust, 7) atomic power, 8) sewage, 9) oil spillage, 10) dumping, 11) heated water, and 12) heavy recreation. The interviewee was asked to judge how each of these items on the list affects the quality of the Mississippi River at the present.

Opinions on what affects the quality of the river varied greatly. Many people admitted little knowledge of the items included on the list. Educated guesses were made by respondents in many instances. Answers and statements about items on the list were brief, i.e. bad problem, a problem, or should be corrected. Their indecision may have been related to recent conflicting articles and news reports. Very few people had strong opinions supported by factual information or hearsay. In general, public utilities' information (public relations efforts) was viewed with some mistrust. Choices as to the three problems affecting water quality of the Mississippi River were often hastily selected and in some instances their choices contradicted statements made in this and other sections of the questionnaire.

The primary source of water pollution of the Mississippi River, according to respondents, was sewage. Sewage as a choice far outranked any other answer as the chief cause of water pollution, and was cited more than any other choice from the list (Table 4.8). This choice was consistent with other elements of the interviews. Although data from resort owners is not included in Table 4.8, all proprietors of tourist facilities noted pollution of the river in their respective areas. Nine resort owners faced serious problems from algae and water discoloration which affects their clientele's use of water recreation. Commercial resorts were very concerned over the future of their industry if water quality did not improve. All resort owners near Bemidji cited the City of Bemidji sewage disposal policies as the cause of their pollution problem.

The second priority was given to oil spillage. In the Lower Reach of the river recreation users principally pointed to oil spillage as a problem. Home owners seemed less concerned with the problem of oil spills. Perhaps recreationalists are more conscious of oil spillage as it directly affects their activities on the river. Third order cause of river pollution was seen

as dumping. Dumping as third order choice far out-ranked any other type of pollution on the river.

People were asked to choose from the previous list the three items which most affected water quality in their area. In most instances people interviewed were from the area in which the interview was conducted. Persons tended to select the same three items for their local area of water pollutants as they did for the whole Mississippi River. The cases where other choices were made are too few to evaluate.

TABLE 4.8  
Sources of Water Quality Problems

Use	Response	Use	Response
Sewage	64	Drainage	11
Oil spillage	56	Atomic power	10
Dumping	51	Heated water	7
Fertilizer	26	Heavy recreation	7
Pesticides	25	Exhaust	6
Land fill	15	Dredging	4

Appendix C for complete data on the Lower Reach

Areas of control for the Minnesota Pollution Control Agency involve several questions: 1) judgment of a selected list of problems; 2) which selected problems are of greatest concern in the state; 3) what problems should the Minnesota State Pollution Control Agency be concerned with; and 4) what problems are not a concern of the Minnesota Pollution Control Agency.

#### Problems Which Need the Most Immediate Attention

Respondents were given a list of problems which are and may be potential problems in Minnesota. Each person was asked to judge the seriousness of these problems to this state, and in which order they should be solved. As in the previous section answers were varied with a tendency to reflect local conditions. Few people were acquainted with the geography of Minnesota, and many admitted some of their choices were

educated guesses. Basis for opinions seemed to reflect casual observation, hearsay, or the news media.

Rank order for solving problems primarily centered around water pollution (Table 4.9). Forty-two of 91 people interviewed listed water pollution control as the prime problem to be solved. Water control was of slightly greater concern to home owners than recreation users in the Lower Reach. Water (21) and air pollution (20) were nearly equally ranked as second order selections. Participants in the Upper Reach noted air pollution over water, and vice versa in the Lower Reach. There was some indication that the people in the metropolitan area of the Twin Cities viewed air pollution as a major problem, and looked upon the river secondarily. Air pollution (20), pesticides (20) and land erosion (13) were closely ranked as the top problems in the third order. In the Lower Reach of the river home owners and recreationalists viewed air pollution and pesticide control comparably. However, land erosion was noted as more serious by home owners than recreation users. Lower Reach respondents also indicated land erosion a serious third order choice.

Noise levels (23), destruction of natural beauty (19), erosion (17), and pesticides (16) are chief concerns as fourth order selections. Destruction of natural beauty and land erosion were ranked primarily in the Lower Reach, while those in the Upper Reach strongly selected noise levels. The outstanding comment in regard to natural beauty of Minnesota was that the highway department and public utility companies indiscriminately destroy the state's natural beauty. Land erosion remained higher priority to home owners than to recreationalists in the Lower Reach, while recreation users tended to select destruction of natural beauty.

Fifth order considerations were numerous with little consensus for any issue. The six closely ranked problems for solution were land erosion (18), noise levels (13), overpopulation (13), and pesticides (12). In the lower part of the river, land erosion had been more of a concern to the home owner than the recreation users from the first through the fourth order; the recreationist viewed this problem as fifth order priority. Pesticide control was also selected as a fifth order problem for solution by recreationalists.

The outstanding sixth order problem was overpopulation. Downstream from Anoka both home owners and recreationalists ranked this problem primarily as sixth

TABLE 4.9  
Problems Which Need the Most Immediate Attention in Minnesota

Problems	1st			2nd			3rd			4th			5th			6th			7th		
	U*	L	T	U*	L	T	U*	L	T	U*	L	T	U*	L	T	U*	L	T	U*	L	T
Land erosion	1	4	5	2	3	5	3	11	14	4	13	17	6	12	18	5	6	11	10	8	18
Pesticide pollution	2	3	5	3	9	12	9	11	20	5	11	16	4	8	12	4	6	10	2	3	5
Air pollution	8	12	20	12	8	20	5	15	20	4	2	6	4	7	11	0	5	5	0	2	2
Overpopulation	3	2	5	3	2	5	2	3	5	1	4	5	4	9	13	11	18	29	8	15	23
Noise level	1	1	2	1	5	6	2	6	8	12	11	23	4	9	13	4	11	15	7	11	18
Water pollution	13	29	42	7	14	21	7	2	9	3	2	5	1	6	7	1	0	1	0	0	0
Destroy Natural Beauty	15	4	19	4	11	15	4	2	6	5	14	19	4	6	10	8	6	14	3	8	11

Code: U=Upper Reach; L=Lower Reach; T=Total

\*Recreation users and agriculturalists

Appendix C for complete data on Lower Reach only

order with recreation users indicating overpopulation a more serious problem than the home owners. Also of high priority in this rank order was noise level and destruction of natural beauty. The seventh order problem was overpopulation. Overpopulation as last ranked is selected more frequently by home owners than recreationalists in the Lower Reach. A second highly ranked seventh order problem is noise level. Examination of the list reveals some insight into the seriousness of each problem to the sample population (Table 4.9).

The most serious problem was perceived to be water pollution. Overwhelmingly residents have chosen this as the primary and secondary problem of concern in the state of Minnesota. Water pollution is most outstandingly ranked as a primary or secondary problem needing attention in the state. Air pollution as a problem was ranked high by the people of the state. The rank order of the first, second, and third was predominant. Pesticide pollution ranks, in order, second, third and fourth for control in Minnesota. In general, Minnesota residents view pesticides as a major problem, but not the primary problem needing attention.

Noise level is ranked low as a state problem. Noise level, being ranked high in the last four rankings, appears to be of greater concern than overpopulation. Overpopulation, like noise level, was considered a problem of low priority in Minnesota. Respondents ranked overpopulation primarily as the sixth and seventh order problem needing resolution. Destruction of natural beauty was viewed with mixed emotion. Some respondents tended to rank the issue first and second order, while another group notably ranked destruction of natural beauty fourth through seventh. Land erosion is not considered to be an overall state problem. Third and last order ranking is where the majority of people have classified the solution for land erosion. Only ten of those interviewed selected land erosion a primary or secondary problem in the state for resolve.

The State Pollution Control Agency Should be Concerned With

The Minnesota Pollution Control Agency and opinions concerning their jurisdiction are examined under the question the State Pollution Control Agency should be concerned with? Participants were given a selected list of problems: 1) land erosion, 2) pesticide pollution, 3) air pollution, 4) overpopulation, 5) noise levels, and 6) destruction of natural beauty. Each respondent

was asked to approve the entire list, or select those problems which they thought relevant to the State Pollution Control Agency. This question was not part of the agricultural schedule.

Slightly less than half the participants, approximately 45 percent, felt that the Minnesota Pollution Control Agency should be concerned with the entire list of problems (Table 4.10). However, in the Lower Reach of the river a majority of the sample, 33 of 74 persons, thought all problems should be under some form of control of a single agency. Others selected problems for jurisdiction by the State Pollution Control Agency, rather than accept the entire list. Control of water (65), and air (62) by the State Agency received primary and secondary support, especially in the Lower Reach where 53 and 50 of 55 respondents, respectively, supported water and air pollution control. The third, fourth, and fifth choices were pesticides, destruction of natural beauty, and noise levels.

TABLE 4.10  
The State Pollution Control Agency  
Should be Concerned With\*

Problems	Response	Problems	Response
All problems listed	33	Destroy natural beauty	53
Water pollution	65	Land erosion	47
Air pollution	62	Noise level	49
Pesticide pollution	56	Overpopulation	31

Appendix C for data on the Lower Reach only

\*Agriculturalists not included

Land erosion and overpopulation were ranked sixth and seventh. Only 30 of 74 persons considered population a problem in Minnesota; all 30 were from the Lower Reach of the river. Home owners were slightly more in favor of state control of population than recreationalists. Many people who thought that the State Pollution Control Agency should be in control of all things

qualified their answers. The question was raised concerning the degree of state control over problems. Other people suggested that the Pollution Control Agency ought to be an overseer of other agencies better suited to handle specific problems, e.g. land erosion controlled by the Conservation Department.

Personal environment protection explored individual effort toward environmental protection. The following list of items was given to participants: 1) soap detergents, 2) electric appliances, 3) pesticides, 4) throw-aways, 5) garbage sorting, 6) special fees, 7) less powerful autos, 8) colored toilet paper, 9) pre-packaged goods, 10) gasoline rationing, 11) family size regulation, and 12) power tools. Respondents were asked to indicate any voluntary change for environmental improvement. Secondly, respondents were asked to indicate items on the list that should be controlled by law.

We Would Be Willing to Change and What Should be Regulated by Law

Most participants were willing to sort garbage, have fewer throw-aways, to change soap and detergents, and to use less pre-packaged goods (Table 4.11). Garbage sorting consists of placing garbage, paper, bottles and cans or some similar combination into separate containers. Many people along the river are already required to sort garbage for selective city sanitation collection. The cities of Minneapolis and St. Paul, during the summer of 1971, inaugurated total garbage and rubbish collection; until then, residents had to sort their garbage. Numerous respondents noted that the frequency of collection remains the same. Un-sightly rubbish heaps have appeared in some areas and rat invasions were reported in new neighborhoods.

A high priority was given to less use of throw-away containers. Many people stated they would be willing to use less throw-aways and would like fewer non-returnable bottles and beverage containers. Numerous complaints were given over the volume of disposable beverage containers along the river. Soap and detergents were secondary for change from the present pattern use. Many noted that they had already changed soaps and detergents, especially females. As the housewife is more directly affected by use of soap in dishwashing and laundry, she may be in a better position to judge the value of soap and detergents in her daily use than

TABLE 4.11  
We Would Be Willing to Change, and What Should Be Regulated by Law

Uses	U	L	T	U*	L*	T*	Uses	U	L	T	U*	L*	T*
Soap/detergent	19	32	51	9	17	26	Colored Toilet paper	17	13	30	6	5	11
Electric appliances	9	14	23	0	6	6	Pre-packaged goods	22	25	47	12	9	21
Pesticides	14	20	34	29	20	49	Gasoline rationing	3	16	19	3	13	16
Throw-aways	23	29	52	25	17	42	Family size regulation	15	15	30	5	7	12
Special fees	10	16	26	15	13	28	Power tools	2	12	22	0	5	5
Less powerful autos	14	25	39	30	12	42	Sort garbage	32	20	52	7	14	21

Code: U=Upper Reach; L=Lower Reach; T=Total

\*What should be regulated by law

Appendix C for complete data on Lower Reach only

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the male. Pre-packaged goods ranked third among respondents. Many people felt that there should be less pre-packaging or a different, more decomposable type package. Males more readily stated that they would use less pre-packaged goods than females. Perhaps the housewife may do most of the shopping so favors pre-packaged items for various reasons. Less powerful automobiles and pesticides were fourth and fifth ranked items they would be willing to change. Males slightly more than females favored reduced power of autos. Sixth ranked was less use of colored toilet paper. A surprising number of persons had read or seen conflicting reports about the effects of colored toilet paper. Most agreed that they could use uncolored paper. Family size control was equally ranked with the latter. People responding to some family size control did not understand how it could be universally accomplished, but realized it as a necessity. Females more than males voiced an opinion for family size control.

Ranked at the bottom of the list of priorities for reduced use were special fees, electrical appliances, power tools, and finally gasoline rationing (Table 4.11). Very few people were in favor of curtailing any of these items. Those who responded for less use of appliances, power tools and gasoline rationing did so with qualifying statements. Some stated that if it were necessary, they would reduce the use of some electrical appliances, e.g. hedge trimmers and unessential conveniences. Several suggested more use of natural gas as a possibility, e.g. gas refrigerators and air conditioners. Very few were in favor of less power tools. Many stated this as a minor use of electricity.

Government control of items on the list was frequently viewed from this standpoint; if items and uses were controlled by law, everyone would have to change and under these conditions they would be willing to change their way of life. The agriculturalists were not in favor of laws regulating the environment. All items from the selected list, except pesticides, received less than 30 percent support in the agricultural community. Pesticides were the only item the agriculturalist supported to any degree, by eight of seventeen persons. Primary ranking for government control was pesticides, although voluntary control ranked low (Table 4.11). Various people noted that if proper pesticides were government controlled, there would be a minimal problem with their usage. Less powerful automobiles ranked second for some type of legal control.

Although few people were personally in favor of less powerful autos, they stated that government control was needed for effectiveness. Equally ranked with the latter was control of throw-away containers. This opinion was voiced equally in the Upper and Lower Reaches of the river. Government controls of soap and detergents ranked third, and was ranked high in this order by males rather than females. It appears to indicate that males are aware of the problems brought about by soap and detergents, but females are the prime users.

The use of special fees is ranked fourth. Many noted that these are in effect for such things as garbage collection. People did not generally favor the use of special fees. Those responding favorably noted that if special fees were to be assessed, there should be a law governing types and rate.

The remaining items; garbage sorting, pre-packaged goods, gasoline rationing, colored toilet paper, family size regulation, electrical appliances and power tools were ranked respectively at the bottom of the list by comparably few people ranking each item (Table 4.11). Respondents generally were not in favor of laws regulating family size, garbage sorting, gasoline rationing, electrical appliances and power tools.

The last section of the questionnaire considered legal means of controlling the environment. Respondents were asked what level of government controls they would prefer, if government control of the environment becomes a reality. If government control of the environment becomes a reality, which level of government should have the greatest responsibility: local, state or federal?

TABLE 4.12  
If Government Control of the Environment Becomes  
A Reality, Which Level of Government Should  
Have the Greatest Responsibility:  
Local, State or Federal?

	Federal	State	Local	Others
All respondents	44	27	20	4
Agriculturalists	4	9	4	0

See Appendix C for complete data on the Lower Reach only.

The majority of people interviewed stated that if government regulations were forthcoming, federal laws would be needed (Table 4.12). Reasons for choosing federal authority were that many items required federal control to be effective, especially where state borders are involved, i.e. Wisconsin and Minnesota. Others noted that federal regulations are more effective as local and state levels cannot, or will not, effectively act as enforcement agencies. Secondly, one group thought state authority would be the most effective type of control. State authorities are aware of their problems and many are state confined. A smaller group that rated state authority as a preference, rated local law as the most effective method of control. Those favoring local law noted that many of the problems are of a local nature and the state has little knowledge of the problems. Others noted that state and federal laws create more bureaucracy but do little to solve local problems. It was stated that state and federal governments were most concerned with problems of magnitude and were not interested in wholly local problems.

Government control of the environment, if necessary, is viewed as a function of state authority in the agricultural community. The agriculturalist strongly indicated that the state is aware of his problems and is within reach of public response. Local law enforcement received wide support for the same reasons. Federal authority was viewed important by only four of eighteen people (Table 4.12). The few participants which selected federal law as most important indicated that federal laws would be more uniform and have the most far-reaching effect.

#### Summary

The Mississippi River connotes a variety of meaning to people, most outstanding is recreation. Although few participants spent more than two weeks annually at the Mississippi River, recreation and associated scenic beauty of the Mississippi Valley were judged outstanding qualities by respondents. The least desirable quality of the river was noted as pollution. Participants highly rank fish, wildlife, and water sports as what they think the river's primary function should be. Industry and manufacturing, and sewage and waste were regarded as uses to be restricted from the Mississippi River. The chief source of water quality problems, according to participants, was relegated to sewage, oil spillage and



by  
Philip Tideman

dumping. Similarly, water pollution is deemed the problem needing the most immediate attention in Minnesota. Two other major areas for pollution control, air and pesticides, were cited as needing resolution.

The Minnesota Pollution Control Agency was considered functionally responsible for all types of pollution control in the state by numerous people. However, many people suggested only water, air pollution, and destruction of natural beauty for state agency control. If government control of the environment becomes a reality, federal and state authority were considered more effective than local law by participants.

Individuals stated that they would be willing to protect the environment by voluntarily sorting garbage, using returnable containers, and changing brands of soaps and detergents. Reduced use of electric appliances, power tools, and gasoline rationings were items respondents personally did not want to change. Participants selected pesticides, less powerful autos, and throw-away containers for regulation by laws. Legal authority over these were considered the only effective type of control.

People are interested and curious about the environment. Many persons have read or witnessed television programs on pollution problems (Tables 4.1 and 4.2). The public utilities and industry have, rightly or wrongly, become the major causes of pollution according to respondents. It appears people are ready for more public information concerning the environment. Secondly some type of environmental legislation may be acceptable and/or desired; the problem of disposable beverage containers in and along the Mississippi River has been a noted concern in the study area. Individuals selected throw-away containers as something they could do without, and indicated some sort of legal control as necessary (Tables 4.1 and 4.2).

In an effort to sample the attitudes of a population younger than that of the mail-order questionnaire, and also to assist the project investigators in the development and trial of the instrument, several high schools within the universe were contacted. As a result of these contacts student questionnaires were administered in April, 1971 to eleventh grade social studies classes in eight locations (Figure 5.1). In none of the eight classes was ability grouping a factor, hence student randomness of the 195 respondents was more likely obtained.

To assist with the development of the questionnaire two other educational groups responded to questionnaires. A group of school administrators were questioned at St. Cloud State College while a college-age environment class at Bemidji State College received the questionnaire. Although the response of these additional groups was of value in development of the instrument, neither is included in the response analysis.

The high school student questionnaire was made up of three parts. The first of these contained questions relating to environmental education. The second section contained questions relating to attitudes held concerning the Mississippi River, many of which were similar to those of the mail order questionnaire. The third portion, like that of the mail order questionnaire contained questions designed to furnish a profile of the students in terms of place of residence and socio-economic factors. A copy of the student questionnaire is included for reference as Appendix B.

#### Student Profile

The general profile of the student respondents would include the following:

1. Over one-half (53.3%) were town dwellers with another 14.3 percent suburban. Farm youth constituted 18.4 percent of the respondents.
2. Over 40 percent (43.3%) had some kind of part-time job.
3. Political moderates (43.0%) predominated with the balance being more heavily weighted toward

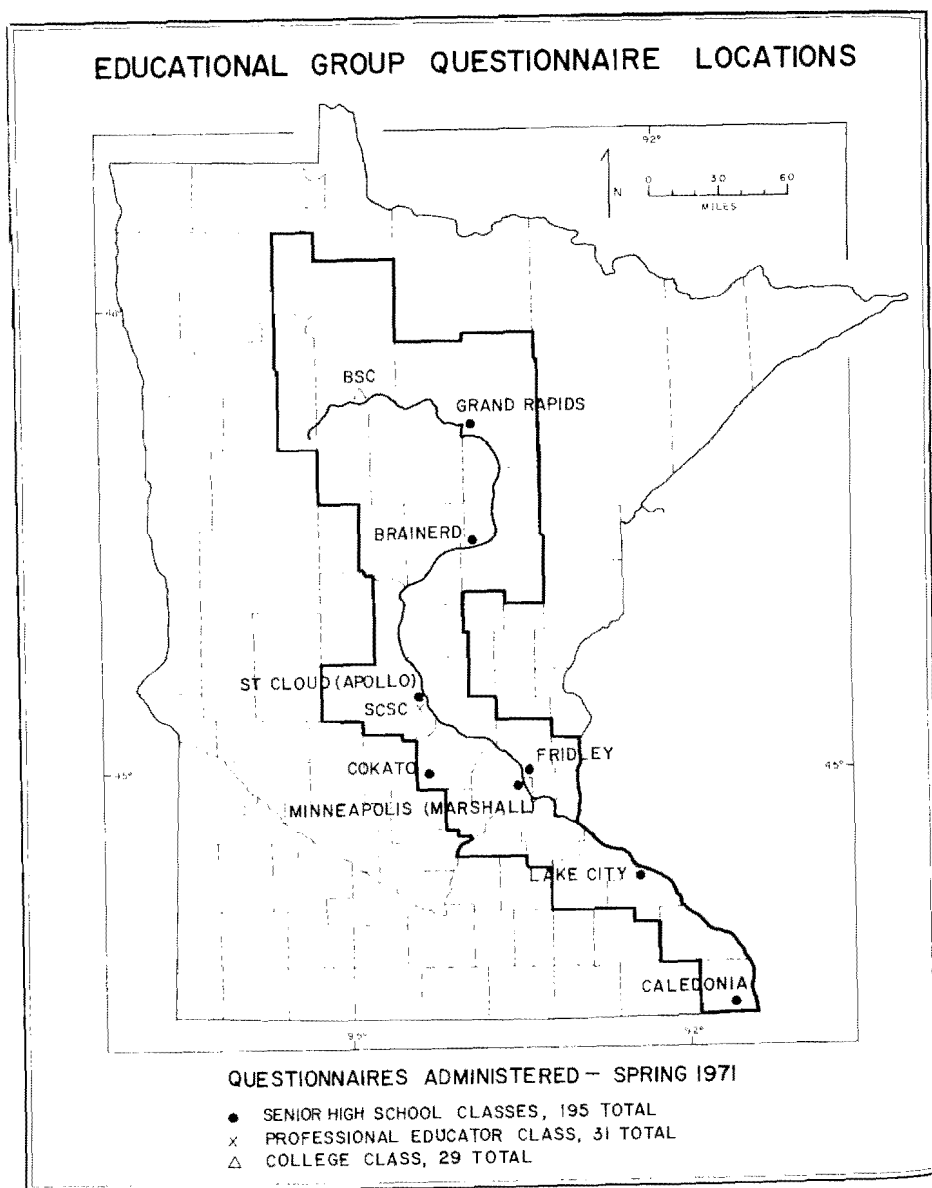


FIGURE 5.1

liberal views than toward conservative views.

4. Slightly over one-half did not own boats; canoe and rowboat/outboard ownership was most common among those having boats.
5. Only 13 of the students came from families owning Mississippi River frontage and of these nine had a river-fronting residence.

#### Environmental Education

Almost 55 percent of the students recognized their school as having an environmental studies program while about one-fourth said they had none with the balance not knowing. About two-thirds of the students indicated that environmental issues were dealt with in classes, mostly in history, biology, chemistry and environmental classes per se. Over 92 percent indicated interest in taking courses dealing with environmental issues, a rate of response which should be of interest to public school curriculum planners.

Table 5.1 indicates the responses to the question: "Which environmental topics would you be interested in learning about? Check as many as you wish."

TABLE 5.1  
Environmental Interests

	N	%	Rank
NR	2	1	
Water quality	119	61	2
Food production	73	37	9
Environmental ethics	51	26	12
Human ecology	82	42	8
Man's effect on weather	93	48	5
Pesticides	68	35	10
Environmental aesthetics	39	20	14

Air quality	117	60	3
Urban problems	96	49	4
Birth control	121	62	1
Environmental pollution	44	23	13
E. e. weapon tech.	60	31	11
Resource development	83	43	7
Industrial living habits	83	43	7

Apparent from the above table is student interest in birth control, water quality, air quality, urban problems and man's effect upon weather, in that rank order. Other topics on the list stimulated lesser degrees of interest. Students evidenced interest in having environmental education programs commence in the elementary grades rather than later in the school sequence. They recognized that it is desirable to educate people so as to make them aware of problems and to then suggest courses of action. About half (50.2%) said the need for environmental education was urgent while 37 percent more said such an educational effort was critically needed. About 94 percent of the students were in their junior or eleventh year, thus being born in 1953 or 1954 which meant that their attitudes have been greatly influenced by the decade of the 1960's.

In terms of the occupation of the student's father the pattern was somewhat similar in ranking to the mail order respondents with the notable exception being that 14.5 percent of the students were from farm families while only 1 percent of mail order respondents were farmers. Although the status professions category was of highest ranking, its 20.5 percent was well below that of the 32 percent of mail order respondents who classed themselves in that category.

#### Mississippi River Attitudes

Rather than a complete, tabular analysis of each item primary attention will focus upon comparison of

responses between the student and mail order groups. Some minor differences in questionnaire terminology can be observed by comparing appendix B-1 with appendix B-2.

[Student Survey Questionnaire Items 1-2]

Various forms of recreational along with scenic beauty were identified as desirable river qualities by the students while various forms of pollution were singled out as undesirable aspects of the river. Student attitudes were therefore much the same as those expressed by adults among the mail order respondents.

[Item 3]

Slightly over one-fourth (26.5%) of the students looked to the Mississippi River to provide leisure time opportunities while only about half that percentage (13%) of the mail order respondents focused upon the Mississippi. A geographic breakdown of this response as contained in Table 5.2 is an interesting reflection of attitudes and alternatives.

TABLE 5.2  
Percent of High School Respondents Using the  
Mississippi River for Leisure Time

School	N	%
Lake City	14	64
Caledonia	7	32
Mpls. Marshall U.	6	30
St. Cloud Apollo	7	29
Cokato	8	27
Brainerd	5	22
Fridley	3	12
Grand Rapids	1	5

From this table the significance of the river for leisure time at the river town of Lake City and the inland town of Caledonia, both in Lower Reach counties, is apparent. Also of interest is the fact that only one out of twenty Grand Rapids students (5%) looked to the river for leisure-time activities while 27 percent of the students at Cokato did so in spite of the fact that the former city is sited on the Mississippi while the latter is some 30 miles from the nearest river point.

[Items 5-6]

About two-thirds of all student respondents had engaged in some leisure time activity on or along the Mississippi River during the past year with camping/picnicking and boating being the major attractions, followed by swimming, water skiing and fishing. Again, considerable regional variation in ranking is evident.

[Items 8-9]

In response to a question related to present news about the Mississippi the most frequent responses were those about pollution levels and controls of sewage treatment, flooding and atomic power plants. Of much lesser frequency were such news items as those involving industrial development, recreation, dams, wild rice, and the twelve-foot channel controversy. Newspapers and television were the sources for most of these news items.

[Items 10-11-12]

Student views as to what the river should be and what its actual use is were almost identical with those of the mail order population, i.e., that what "ought to be" is almost an exact opposite of what "is". Student impressions of river quality for the several river reaches are contained in Table 5.3.

TABLE 5.3  
Student Impressions of River Quality

	Itasca to Grand Rapids		Grand Rapids to Anoka		Anoka to Red Wing		Red Wing to Iowa Border	
	N	%	N	%	N	%	N	%
NR	0	0	1	1	2	1	1	1
Not polluted	36	19	1	1	0	0	1	1
Slightly polluted	112	59	64	33	17	9	24	13
Moder- ately polluted	36	19	100	52	95	50	66	35
Highly polluted	<u>6</u>	<u>3</u>	<u>26</u>	<u>14</u>	<u>77</u>	<u>40</u>	<u>99</u>	<u>52</u>
	190	100	192	100	191	100	191	100

A comparison of Table 5.3 with the mail order group shows that the two groups share rather similar impressions of river quality. Over half in each group indicated the Upper Reach of the river to be only slightly polluted with a similar proportion considering the Middle Reach to be moderately polluted. The students viewed the river quality in the Metro Area to be somewhat better than the mail order respondents as 40.3 percent of students considered pollution levels to be high for that reach while 71 percent of the mail order group considered it to be highly polluted. Their opinions of the Lower Reach were quite similar.

[Item 13]

Students felt that sewage disposal, dumping/littering and industrial waste represent the major sources of pollution with agricultural chemicals, heated water and recreational use as being substantially less of a pollution problem. This pattern of response was quite

similar to that of the mail order questionnaire respondents except that a larger percentage (86.6%) of students evidenced concern about dumping and littering than did the mail order respondents (41%).

[Items 14-15]

Four out of five students would report an incident of water pollution but fully one-fourth said they did not know to whom such reporting would be made. City officials, the PCA and the Conservation Department (DNR) each were recognized by 12-15 percent of the students as proper agencies to which a report is made with the rest of the student respondents selecting a variety of other agencies and/or persons. It is quite obvious that many students do not have adequate information as to whom river pollution should be reported, an uncertainty shared by one-fourth of the mail order respondents.

[Items 16-17]

Students would overwhelmingly restrict the use of the river for such purposes as garbage dumping/litter, oil spills, secondary treated sewage and DDT/pesticides. Few thought restrictions should be placed upon the channel dredging, land fill projects and motor boat exhaust. Student and mail order respondent views were very similar in these questionnaire items.

[Items 18-19]

Student attitudes matched those of the mail order population in suggesting that state, federal and local governments all have a major role to play in controlling river pollution. Methods of payment for pollution control were ranked much the same with the exception that fewer students felt that special use fees for individuals should bear a heavier share of the cost than fund redistribution. In each group over 80 percent would favor special use fees for industry and business.

[Item 20]

Table 5.4 compares student and mail order responses to the question regarding redistribution of federal funds in order to increase pollution control. It is of

TABLE 5.4  
Redistribution of Federal Funds to  
Increase Pollution Control

Source of funding	Student		Mail Order	
	%	Rank	%	Rank
Space Programs	62	1	47	4
Foreign wars	59	2	77	1
Defense spending	45	3	54	3
Foreign aid	39	4	66	2
Highway construction	28	5	17	8
Welfare programs	22	6	34	5
Commerce programs	17	7	19	7
Agricultural supports	8	8	27	6
Health programs	6	9	8	10
Urban renewal	5	10	13	9
Education programs	2	11	5	11
Miscellaneous	5	--	5	--

considerable interest that youth are apparently much more willing to give dollars from space programs to pollution control than are their elders. They are less willing to cut foreign aid than the mail order respondents. Both groups apparently value health, urban renewal and education programs ahead of pollution control. A much larger percentage of mail order respondents would take from agricultural support payments, reflecting perhaps, the fact that the student group contained more farm respondents. Mail order attitudes were less generous toward welfare programs than were those of the students but were more generous towards highway construction than were their youthful counterparts.

[Item 21]

Air and water pollution are dominant environmental concerns of both groups with noise and land erosion of least concern of the seven categories.

[Items 22-23-24]

Both groups saw long range planning as the best way of handling environmental quality problems. Both groups think alike in that a clean or only slightly polluted environment is desirable. They also are similar in their concern that a major environmental crisis is now present.

[Item 25]

Table 5.5 compares student and mail order respondents in regards to personal environmental control practices.

TABLE 5.5  
Personal Environmental Action

	Students %	Mail Order %
Use soap, not detergent	89	92
Use fewer electrical appliances	59	49
Reduce use of pesticides	89	89
Use fewer throw-away containers	99	90
Sort garbage-not burn paper and plastic	86	86
Pay special fee for excessive water use	45	70
Drive a less powerful car	77	80
Cease using colored toilet paper	93	88
Use fewer pre-packaged goods	80	75

TABLE 5.5 (cont.)

Have stricter zoning regulations	72	82
<u>Have gasoline rationing</u>	<u>34</u>	<u>29</u>

Neither group (Table 5.5) appeared to be willing to impose gasoline rationing in order to improve the environment. Neither group was overly enthusiastic about reducing electrical consumption. Students again appeared reluctant to employ special water user fees, an attitude not shared by the mail order group. Both groups indicated willingness to adopt other measures in order to improve environmental quality.

Student Summary

With the relatively few exceptions as noted in the foregoing section of this chapter it can be seen that, in most cases, the attitudes of the sixteen and seventeen year-old high school students were similar to those held by the older and larger group of mail order respondents. The apparent high interest levels shown in this Mississippi River survey questionnaire by the high school students indicates a laudable concern about the environment in which they live.

## CHAPTER VI

### Summary

In the United States natural resource management programs seldom are established by edict. Rather, they come about as a result of action by various representative and administrative groups. Further, the resultant programs often are less than comprehensive as they develop from compromises arrived at by diverse and often competing interest groups. This being so, the citizenry has an impact, for better or for worse, upon these plans and programs. Not only does the public have the opportunity to react to proposed resource management programs but it also may initiate such programs through individual and collective influence upon elected public officials. The attitudes held and opinions expressed by the general public indicate the degree of support for, or opposition to, possible resource management measures.

Attitudes are shaped by many factors. The physical and cultural milieu of the study universe population plays an important part in the determination of attitudes. The diversity which characterizes this study universe in terms of physical setting, population distribution, population changes, land usage and recreational facilities, may be reflected in respondent attitudes. Background information contained in this study may also serve as baseline data for subsequent studies relating to the Mississippi River universe. Attitudes, whatever their origins, represent the focus of this study.

#### Attitudinal Review

This study was conceived and executed because information about attitudes is important to water resource planning and development. Analysis of this survey reveals the levels of understanding and concern for environmental problems, especially those related to the Mississippi River. Through the recognition of respondent attitudes the resource planner, manager, legislator, public official and the educator may be better able to predict the degree of public support for, or opposition to, rational water resource programs and management. In spite of the problems which are inherent in any survey effort of this type, significant and relevant attitudinal data were obtained.

Within the context of the study some of the more significant items of concern are associated with river use, water quality and environmental controls. While all items are important the following represent some of the more salient expressions of opinion.

- 1) There is recognition of multiple benefits to be derived from the Mississippi River;
- 2) there is a very serious concern about the diminution of Mississippi water quality;
- 3) there are several sources of water quality degradation;
- 4) the Mississippi is a river with varying degrees of water quality, depending upon geographic location;
- 5) uncertainty exists as to whom water quality problems should be reported;
- 6) there is a lack of consensus relative to which level of government would be most effective as a pollution control law enforcement agency;
- 7) there should be a re-ordering of national priorities in order that additional funds be allocated to programs facilitating pollution control;
- 8) there is the recognition of need for comprehensive long range planning;
- 9) there is a willingness to adopt certain changes in personal consumer practices to help improve environmental quality, but there are also certain changes which would not be so readily accepted if adopted at all.

## Recommendations

### A. Future Studies and Research

1. Additional research must be conducted to ascertain the costs which are necessary to achieve an improved environment. Some of these costs may be in the form of higher taxes and consumer use fees, either direct or indirect. An additional cost of the commitment to environmental improvement may be that of re-adjustment to and retraining for new occupations.
2. One of the most important personal costs and yet difficult to determine is the impact of environmental improvement upon individual life styles. Whereas the public may accept minor inconveniences it has not yet been ascertained what degree these inconveniences and concomitant hardships would be tolerated without vigorous public reaction.
3. The level of tolerance for environmental planning is imperfectly known. Yet these tolerance levels may be extremely important to know when decision-makers must come to grips with comprehensive long-range plans and projections.

To be of value the findings of such research efforts must be broadly disseminated.

### B. Programs for Action

1. Public information programs should be conducted with the general objectives being that of increasing public awareness of environmental issues. These programs should employ a variety of formats and utilize diverse media. Such programs must receive full support from the appropriate federal, state and local agencies.
2. Educational institutions can and should expand their environmental programs to include not only appropriate formal academic offerings but also to provide non-credit programs as a public service in order to better inform a larger segment of society concerning water and other natural

resource problems, needs and developments. Extension courses could be a focus for such a statewide effort by higher education.



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APPENDIX A

Public Information Conferences

1. Bemidji State College

Program for the 1972

MISSISSIPPI RIVER HEADWATERS RESEARCH CONFERENCE

April 10, 1972  
9 AM to 4:30 PM  
Classroom Auditorium  
Bemidji State College

PROGRAM OF EVENTS

- 8:30 - 9:00 Registration, Hallway Entrance to Classroom Auditorium
- 9:00 Welcome and Introductions --  
James P. Ludwig, Director  
The Center for Environmental Studies
- 9:05 - 9:40 New and Revised Federal Programs and Laws Influencing Water Quality Management in Minnesota -- The Honorable Robert Bergland  
U. S. Congressman 7th District  
Minnesota
- 9:40 -10:20 Comprehensive Planning Efforts for the Mississippi River Basin --  
William C. Walton, Director  
The Minnesota Office of Water Resources Research
- 10:20 -10:40 COFFEE BREAK
- 10:40 - 2:00 Reports relating to OWRR Project B-049
- 10:40 -10:55 Strategy of the Project and Organization of the Research Staff --  
James P. Ludwig, Principal Investigator  
Director, Center for Environmental Studies

10:55 - 11:20 The Study Universe --  
 Dr. Philip Tideman, Chairman  
 Department of Geography, SCSC

11:20 - 11:55 Attitudinal Survey of all Minnesotans  
 towards the Mississippi River as a multiple-  
 use Resource --  
 E. James Cecil, Assistant  
 Professor of Political Science,  
 BSC

11:55 LUNCHEON BREAK. Lunch for Speakers and  
 Invited Guests in The Viking  
 Room of Student Union

1:00 - 1:20 Results of Interviews of Minnesotans  
 towards the Use and Development of the  
 Mississippi River --  
 Norman Baron, Associate  
 Professor of Geography, WSC

1:20 - 1:40 A Comparison of River-Fronting Land Use  
 along the Mississippi River in 1940 and  
 1970 in Beltrami and Morrison Counties  
 of Minnesota --  
 Mr. David Ostenso

1:40 - 2:00 Open Session for Questions directed to the  
 Research Staff of OWRR Project B-049.

2:00 - 2:30 Activities and Responsibilities of the State  
 Planning Agency Relating to Use of the  
 Mississippi River --  
 Joseph Sizer, Director  
 Environmental Section of the  
 Minnesota State Planning Agency

2:30 - 2:45 COFFEE BREAK

2:45 - 3:15 The Ecological Problems Associated with  
 Power Plant Siting and Heated Effluents --  
 A. Joseph Hopwood, SCSC  
 Professor of Biology

3:15 - 3:45 Preliminary Report on the Effects of the  
 Culture of Wild Rice on Water Quality --  
 Kenneth R. Lundberg and  
 Pat Trihey,  
 Associate Professor of Chemistry  
 and Assistant Professor of  
 Biology respectively - BSC

3:45 - 4:15 The Impact of Snowmobiles on Northern  
 Minnesota Vegetation --  
 Wallace J. Wanek,  
 Associate Professor of Biology  
 BSC

4:15 - 4:30 Concluding Remarks and Conference Adjournment  
 James P. Ludwig

2. St. Cloud State College

Public Information Seminar

MINNESOTANS LOOK AT A NATURAL RESOURCE:  
 THE MISSISSIPPI RIVER

Saint Cloud State College  
 Tuesday, April 11  
 1 - 8 PM

Centennial Hall  
 Room 100

SEMINAR PROGRAM

1:00 "The Role of Federal and State Planning  
 for the Upper Mississippi River"

William C. Walton - Director  
 Water Resources Research Center  
 The Graduate School  
 University of Minnesota

1:30 Reports on a joint research effort.

"A Survey of Attitudes towards the Mississippi  
 River as a Total Resource in Minnesota"

Introduction to the Project  
 James Ludwig - Biologist  
 Bemidji State College

Backgrounding the Study Universe  
 Philip Tideman - Geographer  
 St. Cloud State College

Thirty Years of Change in Riparian Land Use in  
 Morrison County  
 David Ostenso - Geography  
 Graduate Student  
 St. Cloud State College

Attitudes Towards the River  
James Cecil - Political Scientist  
Bemidji State College

Attitudes of Special Interest Groups  
Norman Baron - Geographer  
Winona State College

COFFEE BREAK -- Hosts: Geography Club, SCSC

3:00 "An Industrial Use of the River:  
The NSP Monticello Plant"

Alfred Hopwood - Biologist  
St. Cloud State College

3:30 "Agricultural Practices and Surface Waters"

Orville Berry - Area Conservationist  
Soil Conservation Service  
U. S. Department of Agriculture

4:00 "A City Uses the River"

John Miller - Chief Planner  
City of St. Cloud and the Metropolitan  
Planning Commission

The above three topics have been selected as they are  
of special importance along the Middle Reach of the  
Mississippi River here in Central Minnesota.

5:30 Dinner (At modest cost)  
Atwood College Center  
St. Cloud State College

7:00 Seminar Featured Speaker

"Minnesota State Water Policy and the Minnesota  
Water Permit System"

Gene Hollenstein  
Chief Hydrologist  
Division of Minerals and Waters  
Department of Natural Resources  
State of Minnesota

### 3. Winona State College

Public Information Seminar

MISSISSIPPI RIVER RESEARCH CONFERENCE

Winona State College  
Thursday, April 13  
9 AM - 3 PM

Kryzsko Commons  
Rooms F and G

#### PROGRAM

9:00 Reports on a Joint Research Effort

"Strategy of the Tri-College Study of the  
Mississippi River and Organization of the  
Research Staff"

James P. Ludwig - Director  
Center for Environmental Studies  
Bemidji State College

9:30 "The Mississippi in Minnesota: An Overview"

Philip Tideman - Geographer  
St. Cloud State College

10:00 "Selected Results of the General Attitudinal  
Survey"

E. James Cecil - Political Scientist  
Bemidji State College

10:45 COFFEE BREAK

11:00 "Attitudes of Minnesota Residents Toward the  
Mississippi River"

Norman Baron - Geographer  
Winona State College

12:00 LUNCHEON FOR PARTICIPANTS

1:00 "Thirty Years of Change in Riparian Land Use"

David Ostenso - Geography Graduate Student  
St. Cloud State College

1:20 "The Metropolitan Sewer Board's Water Quality  
Monitoring Program"

Russell Susag - Manager of Quality Control  
Metropolitan Sewer Board

2:00 "Pre-operational Studies are a Necessity"

Edward Miller - Research Associate  
NSP Prairie Island Nuclear Site  
St. Mary's College

DIVISION OF SCIENCE & MATHEMATICS

218-755-2920

APPENDIX B-1

Facsimile Cover Letter

Dear fellow Minnesotan,

The Center for Environmental Studies has been commissioned by the Office of Water Resources Research to do a survey of attitudes toward the Mississippi River. We are interested in what Minnesotans think about the river and how they feel it should be used. The only way we know to find out what people are thinking is to ask them, and that is what this questionnaire is about.

Your name has been chosen as part of a representative sample of the people living in the Mississippi River area, and we would appreciate your filling out this short form and returning it to us. No postage is needed. After you have filled in the form, simply fold it so our return address is on the outside and drop it in the mail.

Please note that we do not ask for your name. The information you give is strictly confidential and cannot be traced to you. Consequently, you should give us your frank answer to the questions asked. Please answer all of the questions.

Thank you very much for your kind cooperation. If you have any questions about this survey please feel free to get in touch with us.

Sincerely,

Joel B. Reed  
Assistant Professor of Sociology

JBR:ga

Encl.

MAIL QUESTIONNAIRE

The following questions have to do with your attitudes toward the Mississippi River and water quality. We need to know your attitudes toward the River and how you feel it should be used. Please base your answer to each question on how you actually feel about the subject.

1. When you think about the Mississippi River, what desirable things come to mind? List as many as you wish.

2. What undesirable things come to mind? List as many things as you wish.

3. If you had a choice of spending some leisure time on or along the Mississippi or any other body of water in Minnesota, which would you choose?  
 Mississippi  Other(please specify)

4. Why would you choose one over the other?

5. Have you spent any leisure time on or along the Mississippi River during the past year?  Yes  No

6. If your answer to the last question was "Yes", what kinds of activities did you do? Please check how often you did each one.

	once or twice	several times	fairly often	quite often
fishing.....	_____	_____	_____	_____
boating.....	_____	_____	_____	_____
swimming.....	_____	_____	_____	_____
water skiing.....	_____	_____	_____	_____
camping or picnics.....	_____	_____	_____	_____
other (specify).....	_____	_____	_____	_____

7. If your answer to Question 5 was "No", or if you used the river only once or twice, what kept you from using the area more often.

8. Have you recently read or heard about any of the following aspects of the Mississippi River? Check as many as you wish.

- recreational opportunities  Mjolsnes Construction lawsuit
- reservoir or dam building  twelve-foot channel project
- flooding or flood control  sewage treatment or disposal
- industrial development  atomic power plants
- pollution levels or control  wild rice cultivation

9. Where did you hear about these? Check as many as you wish.

- Newspapers  Magazines  TV  Radio  Family or friends
- Other (please specify) \_\_\_\_\_

10. Minnesotans use the Mississippi River for many different purposes. Please rate the following uses according to what you feel should be the most important use, the second most important use, etc. (1 = most important; 6 = least important)

- fish and wildlife habitat  water sports and recreation
- transportation  waste disposal
- public water supply  industrial and commercial use

11. What would you judge is the actual use right now? Rate this in the same manner. (1 = greatest use; 6 = least use)

- fish and wildlife habitat  water sports and recreation
- transportation  waste disposal
- public water supply  industrial and commercial use

12. How polluted would you judge the Mississippi is now in these stretches of river? Check one for each stretch of river.

From:	Pollution level:				DON'T KNOW
	NONE	LOW	MED.	HIGH	
Itasca to Grand Rapids	_____	_____	_____	_____	_____
Grand Rapids to Anoka	_____	_____	_____	_____	_____
Anoka to Red Wing	_____	_____	_____	_____	_____
Red Wing to Iowa Border	_____	_____	_____	_____	_____

13. Which three (3) of these would you say are the worst sources of pollution of the rivers and streams in your area? Check three.

- sewage disposal  industrial wastes  agricultural chemicals
- heated water  recreation usages  dumping or littering

14. If you found out about a water pollution problem, would you report it?  Yes  No

15. Who would you report it to?

16. Who should be responsible for controlling pollution of the Mississippi River? Check as many as you wish.

- Federal government
- Regional agencies (like TVA)
- State Governments
- County and local governments
- Each of these looking after its own needs
- All of these working together
- Other (please specify) \_\_\_\_\_

17. There is disagreement about how certain things affect the river. How do you feel the following things affect the Mississippi River at present? Check only one for each item.

	little effect	somewhat harmful	quite harmful
a. DDT and pesticides.....	_____	_____	_____
b. commercial fertilizers....	_____	_____	_____
c. land fill projects.....	_____	_____	_____
d. channel dredging.....	_____	_____	_____
e. field and marsh drainage..	_____	_____	_____
f. heated water.....	_____	_____	_____
g. motorboat exhaust.....	_____	_____	_____
h. atomic power plants.....	_____	_____	_____
i. secondary treated sewage..	_____	_____	_____
j. spilled oils.....	_____	_____	_____
k. dumping and littering.....	_____	_____	_____

18. Which of the above things in Question 17 do you feel should be restricted or highly controlled along the Mississippi River? Check as many as you wish.

- a.  b.  c.  d.  e.  f.  g.  h.  i.
- j.  k.

19. There are a number of ways pollution control can be paid for. Which of the following options would you prefer? Check as many as you wish.

- special use fees for industries and businesses which use the water
- special use fees for individuals who use the waters
- redistribution of funds from other agencies and programs
- other (please specify) \_\_\_\_\_

20. Assuming Federal spending would be redistributed to increase pollution control funds, from which programs should funds be taken? Check as many as you wish.

- foreign aid
- welfare programs
- defense spending
- education programs
- other (specify) \_\_\_\_\_
- space programs
- urban renewal
- highway building
- agricultural supports
- health programs
- foreign wars
- commerce
- programs

In the following questions the emphasis is more on general environmental quality than on water resources. Answer each question as completely as possible.

21. Please rate the following types of environmental pollution according to what you feel is the most harmful, the second most harmful, etc. (1 = most harmful; 7 = least harmful)

- excessive noise
- water pollution
- urban congestion
- pesticide pollution
- land erosion
- air pollution of foods
- destruction of natural beauty

check here if you feel all the above are equally harmful

22. How should environmental quality problems be handled? Check only one choice.

- there is no need to handle them, they eventually take care of themselves
- each problem should be dealt with as it comes up

each general type of problem should be handled separately

there should be long-range planning for all problems taken together

23. There is disagreement on how far pollution control should be carried. Which of these statements comes closest to your feelings about this? Check only one choice.

- there is little need for pollution control, given time
- most of the problems solve themselves
- moderate pollution is the price we pay for progress and is tolerable so long as the environment is safe for people
- slight pollution is tolerable so long as the environment is safe for wildlife as well as people
- the environment should be kept as clean as humanly possible; even slight pollution is not tolerable

24. There is some question whether there really is an environmental crisis. How do you feel about this? Check only one.

- there is no crisis, a crisis exists only in some people's minds  
 there are a few isolated problems, but no crisis  
 there are a few major problems, but these are not a crisis  
 there is a possible crisis, but this is a long way off  
 there is a minor crisis with only a few immediate dangers  
 there is a major crisis with clear and present dangers to the entire human species

25. Environmental pollution can be partly controlled by changing some of the things we do. Would you be willing to change in any of the following ways?

Yes No

- a. use soap instead of detergent  
 b. use fewer electrical appliances  
 c. reduce the use of pesticides  
 d. use only returnable bottles and cans  
 e. sorting garbage and not burning paper and plastics  
 f. paying special fees for excessive water use  
 g. driving a less powerful car  
 h. cease using colored toilet paper and paper towels  
 i. using fewer pre-packaged goods and foods  
 j. stricter usage zoning regulations  
 k. gasoline rationing

26. Have you read any of the following books? Check all that you have.

- "Silent Spring"  "Ecotactics"  "Environmental Handbook"  
 "Population Bomb"  "S.S.T."  "Resources and Man"  
 Similar book(s) (please specify)

In order to interpret the results of our survey we need to know something about the background of each person who receives the questionnaire. Please complete all of the following questions.

27. Write in the ZIP code of your town. \_\_\_\_\_

28. Do you live  in town  on a farm  in the country but not on a farm?

29. Please check one.  Male  Female

30. Which of the following is your age group?  
 under 20  26 to 30  41 to 50  61 to 70  
 21 to 25  31 to 40  51 to 60  over 70

31. Which of the following best describes your education?  
 up to eighth grade  technical/trade school  
 ninth grade through  some college  
 partial high school  college graduate  
 high school graduate  advanced degree(specify) \_\_\_\_\_

32. Are you currently  employed  unemployed  retired?

33. What do you usually do for a living? Please be specific about what type of work you do. \_\_\_\_\_

34. How would you describe your political views?  
 very liberal  liberal  moderate  conservative

35. What is your religious background?  
 Catholic  Jewish  Protestant  Specify other \_\_\_\_\_

36. If you are a boat owner, how many boats do you own? \_\_\_\_\_

37. Please check which types of boats.  
 canoe or rowboat  outboard motorboat  
 sailboat  inboard or inboard-outboard  
 pontoon boat  other (please specify)

38. If you own any Mississippi River frontage, please check what type(s) of frontage you own. Check all that apply.  
 permanent residence  resort or motel or hotel  
 summer cottage, etc.  marina or boat rental  
 farm land  other commercial/industrial  
 other (please specify)

39. Have you participated in a survey in the past three years? Do not count U. S. Census.  
 no  once or twice  3 to 4 times  more than 4 times

40. Do you have any comments or suggestions to offer us?



APPENDIX B-2

Youth Questionnaire on Environmental Education

The Center for Environmental Studies has been commissioned by the Office of Water Resources Research to do a general survey of attitudes toward the Mississippi River. Part of our project is to survey attitudes of students toward the Mississippi River and water resources. We also need to know how students feel about environmental education and what they believe should be included in classes on environment and ecology. You can help by filling out the questionnaire and returning it to your teacher. Please note that we do not ask for your name. The information you give us is strictly confidential and personal information about you cannot be released. Consequently, you should give us your frank answers to the questions we have asked.

Thank you very much for your cooperation.

1. Do you currently have an environmental studies program at your school?  Yes  No  Don't Know

2. Do any of your classes deal with environmental issues?  Yes  No  Don't Know

3. If your answer to the last question was "yes", what classes were these?

4. Would you be interested in courses which deal specifically with environmental issues?  Yes  No

5. If your answer to the last question was "no", please write your reasons on the back of this sheet and skip to question 10.

6. There are many topics which could be covered in a class in environmental studies. Which of the following topics would you be interested in learning about? Check as many as you wish.

- |   |  |
|---|--|
| <input type="checkbox"/> water quality                        | <input type="checkbox"/> air quality                                 |
| <input type="checkbox"/> food production                      | <input type="checkbox"/> urban problems                              |
| <input type="checkbox"/> environmental ethics                 | <input type="checkbox"/> birth control                               |
| <input type="checkbox"/> general human ecology                | <input type="checkbox"/> environmental politics                      |
| <input type="checkbox"/> man's effects on weather and climate | <input type="checkbox"/> environmental effects of weapons technology |
| <input type="checkbox"/> pesticides                           | <input type="checkbox"/> resource depletion                          |
| <input type="checkbox"/> environmental aesthetics             | <input type="checkbox"/> individual living habits                    |

7. What do you believe the goals of an environmental education program should be?

8. At what age do you believe environmental education should be started? \_\_\_\_\_

9. How much of a need do you feel there is for environmental education?  Very little need  Some need  
 An urgent need  A critical need

10. What year of school are you in? \_\_\_\_\_

11. What year were you born in? \_\_\_\_\_

12. What does your father or guardian usually do for a living?  
\_\_\_\_\_

APPENDIX B-3

Youth Questionnaire on the Mississippi River Survey

The Center for Environmental Studies has been commissioned by the Office of Water Resources Research to do a survey of attitudes toward the Mississippi River. We are interested in what Minnesotans think about the river and how they feel it should be used. The only way we know to find out what people are thinking is to ask them, and that is what this questionnaire is about.

Your name has been chosen as part of a representative sample of the people living in the area, and we would appreciate your filling out this form and returning it to us. No postage is necessary. Please note that we do not ask for your name. The information you give is strictly confidential and cannot be traced to you. Consequently, you should give us your frank answer to the questions asked. Please answer all of the questions.

Thank you for your kind cooperation. If you have any questions about this survey, please call or write.

The following questions have to do with your attitudes toward the Mississippi River and water quality. We need to know your attitudes toward the river and how you feel it should be used. Please base your answer to each question on how you actually feel about the subject.

1. When you think about the Mississippi River, what desirable things come to mind? List as many things as you wish.

2. What undesirable things come to mind? List as many things as you wish.

3. If you had a choice of spending some leisure time on or along the Mississippi or any other body of water in Minnesota, which would you choose?  
 \_\_\_ Mississippi River \_\_\_ Other (please specify) \_\_\_\_\_

4. Why would you choose one over the other?

5. Have you spent any leisure time on or along the Mississippi River in the past year? \_\_\_ Yes \_\_\_ No

6. If your answer to the last question was "yes", what kinds of activities did you do? Please check how often you did each thing.

	once or twice	several times	fairly often	quite often
a. fishing.....	_____	_____	_____	_____
b. boating.....	_____	_____	_____	_____
c. swimming.....	_____	_____	_____	_____
d. water skiing.....	_____	_____	_____	_____
e. camping or picnics.....	_____	_____	_____	_____
f. specify others.....	_____	_____	_____	_____
g. ....	_____	_____	_____	_____

7. If your answer to Question 5 was "no", or if you used the Mississippi only once or twice, what kept you from using the river area?

8. Have you recently read or heard anything about these aspects of the Mississippi River? Check as many as you wish.

- recreational opportunities
- Mjolanes Construction lawsuit
- reservoir or dam building
- twelve-foot channel project
- flooding or flood control
- sewage treatment and disposal
- pollution levels or controls
- atomic power plants
- industrial development
- wild rice cultivation

9. Where did you hear about these? Check as many as you wish.

- Newspapers
- Television
- Radio
- Family or friends
- Magazines
- Other sources (Please specify) \_\_\_\_\_

10. Minnesotans use the Mississippi River for many different purposes. Please rate the uses below according to what you believe should be the most important use, the second most important use, etc. (1 = most important; 6 = least important)

- fish and wildlife habitat
- water sports and recreation
- transportation
- waste disposal
- public water supply
- industrial and commercial uses

11. What would you judge is the actual use right now? Rate this in a similar manner. (1 = greatest use; 6 = least use)

- fish and wildlife habitat
- water sports and recreation
- transportation
- waste disposal
- public water supply
- industrial and commercial uses

12. How polluted would you judge the Mississippi is in these stretches of river? Check one choice for each stretch.

From - To	not polluted	slightly polluted	moderately polluted	highly polluted
Itasca to Grand Rapids.....	_____	_____	_____	_____
Grand Rapids to Anoka.....	_____	_____	_____	_____
Anoka to Red Wing	_____	_____	_____	_____
Red Wing to Iowa border.....	_____	_____	_____	_____

13. Which three (3) of these would you say are the worst sources of pollution of rivers and streams in the area where you live? Check only three choices.

- sewage disposal
- industrial wastes
- agricultural
- heated water
- chemicals
- recreational use
- dumping and littering
- other (specify) \_\_\_\_\_

14. If you found out about a water pollution problem would you report it?  Yes  No

15. Who would you report it to? \_\_\_\_\_

16. There is disagreement about how certain things affect the river. How do you feel the following things affect the Mississippi River right now? Check one for each thing.

	has little effect	some what harmful	quite harmful	do not know
a. DDT and pesticides...	_____	_____	_____	_____
b. commercial fertilizers	_____	_____	_____	_____
c. land fill projects...	_____	_____	_____	_____
d. channel dredging....	_____	_____	_____	_____
e. field drainage and marsh drainage.....	_____	_____	_____	_____
f. heated water.....	_____	_____	_____	_____
g. Motorboat exhaust...	_____	_____	_____	_____
h. atomic power plants..	_____	_____	_____	_____
i. secondary treated sewage.....	_____	_____	_____	_____
j. spilled oils.....	_____	_____	_____	_____
k. garbage dumping and littering.....	_____	_____	_____	_____

17. Which of the above things (in question 16) do you believe should be restricted or highly controlled along the Mississippi River? Check as many as you wish.

- a.  b.  c.  d.  e.  f.  g.  h.  i.

j.  k.  none of these should be restricted or highly controlled

18. Who should be responsible for controlling pollution of the Mississippi River? Check as many as you wish.
- Federal government       County and local governments  
 Regional agencies (like TVA)  
 State governments       Each of these looking after its own needs  
 All of these working together
19. There are a number of ways pollution control can be paid for. Which of the following options would you prefer? Check as many as you wish.
- special use fees for industries or businesses that use the river  
 special use fees for individuals who use the river  
 redistribution of funds from other agencies and programs  
 other (please specify) \_\_\_\_\_
20. Assuming Federal spending would be redistributed to increase water pollution control funds, which programs should funds be taken from? Check as many as you wish.
- foreign aid       space programs       health programs  
 welfare programs       urban renewal       foreign wars  
 defense spending       highway construction       commerce programs  
 education programs       agricultural supports       other: \_\_\_\_\_
- spending should not be cut back in any of these areas
- In the following questions the emphasis is more on general environmental quality than on water resources. Answer each question as completely as possible.
21. Please rate the following types of environmental pollution according to what you feel is the most harmful, the second most harmful, etc. (1 = most harmful; 7 = least harmful)
- |   |  |
|---|--|
| <input type="checkbox"/> excessive noise  | <input type="checkbox"/> water pollution               |
| <input type="checkbox"/> urban congestion | <input type="checkbox"/> pesticide pollution           |
| <input type="checkbox"/> land erosion     | <input type="checkbox"/> of food                       |
| <input type="checkbox"/> air pollution    | <input type="checkbox"/> destruction of natural beauty |
22. How should environmental pollution problems be handled? Check only one.
- there is no need to handle them, they eventually take care of themselves  
 each individual problem should be dealt with as it comes up  
 each general type of problem should be planned for separately  
 there should be long-range planning for all problems taken together

23. There is disagreement on how far pollution control should be carried. Which of these statements comes closest to your feelings about this? Check only one.
- there is little need for pollution control, given time most problems solve themselves  
 moderate pollution is the price we pay for progress and is tolerable so long as the environment is safe for people  
 slight pollution is tolerable so long as the environment is safe for wildlife as well as for people  
 the environment should be kept as clean as humanly possible; even slight pollution is not tolerable
24. There is also some question whether there really is an environmental crisis. How do you feel about this? Check only one.
- there is no crisis, a crisis exists only in the minds of some people  
 there are a few isolated problems but no real crisis  
 there are a few major problems but these are not really a crisis  
 there is a possible crisis, but this is a long way off  
 there is a minor crisis with only a few immediate dangers  
 there is a major crisis with clear and present dangers to the human race
25. Environmental pollution can be partly controlled by changing some of the things we do. Would you be willing to change in any of the following ways?
- |                              |                             |   |
|------------------------------|-----------------------------|---|
| <input type="checkbox"/> Yes | <input type="checkbox"/> No | a. use soap instead of detergent                      |
| <input type="checkbox"/>     | <input type="checkbox"/>    | b. use fewer electrical appliances                    |
| <input type="checkbox"/>     | <input type="checkbox"/>    | c. reduce use of pesticides                           |
| <input type="checkbox"/>     | <input type="checkbox"/>    | d. using fewer throw-away bottles                     |
| <input type="checkbox"/>     | <input type="checkbox"/>    | e. sorting garbage and not burning paper and plastics |
| <input type="checkbox"/>     | <input type="checkbox"/>    | f. paying special fees for excessive water use        |
| <input type="checkbox"/>     | <input type="checkbox"/>    | g. driving a less powerful car                        |
| <input type="checkbox"/>     | <input type="checkbox"/>    | h. cease using colored toilet paper                   |
| <input type="checkbox"/>     | <input type="checkbox"/>    | i. using fewer pre-packaged goods                     |
| <input type="checkbox"/>     | <input type="checkbox"/>    | j. stricter zoning regulations                        |
| <input type="checkbox"/>     | <input type="checkbox"/>    | k. gasoline rationing                                 |
26. Have you read any of the following books? Check all that apply.  "Silent Spring"       "Ecotactics"       "S.S.T."  
 "The Environmental Handbook"       "Resources and Man"  
 "The Population Bomb"       similar book(s) (please specify)

In order to interpret the results of our survey we need to know something about the background of each person who receives the questionnaire. Please complete all of the following questions.

27. Write in the name of your town or its ZIP code. \_\_\_\_\_

28. Do you live \_\_\_ in town; \_\_\_ in a suburb; \_\_\_ on a farm; \_\_\_ in the country but not on a farm

29. Please check one. \_\_\_ Male \_\_\_ Female

30. Which is your age group?  
\_\_\_ under 20 \_\_\_ 26 to 30 \_\_\_ 41 to 50 \_\_\_ 61 to 70  
\_\_\_ 21 to 25 \_\_\_ 31 to 40 \_\_\_ 51 to 60 \_\_\_ over 70

31. Which category best describes your education?  
\_\_\_ up to eighth grade \_\_\_ technical or trade school  
\_\_\_ eighth grade through \_\_\_ some college  
\_\_\_ high school  
\_\_\_ college graduate \_\_\_ graduate degree

32. Are you \_\_\_ currently employed; \_\_\_ unemployed; \_\_\_ retired.

33. What do you usually do for a living? Please be specific about what your job is. \_\_\_\_\_

34. How would you describe your political views? Check only one. \_\_\_ very liberal \_\_\_ liberal \_\_\_ moderate \_\_\_ conservative \_\_\_ very conservative

35. What is your religious background?  
\_\_\_ Catholic \_\_\_ Jewish \_\_\_ Protestant \_\_\_ other (specify) \_\_\_\_\_

36. How many boats do you own? \_\_\_\_\_

37. Please check which types of boats, if you own any boats.  
\_\_\_ canoe or rowboat \_\_\_ outboard motorboat \_\_\_ sailboat  
\_\_\_ inboard-outboard \_\_\_ pontoon boat or houseboat  
\_\_\_ or inboard  
\_\_\_ specify other \_\_\_\_\_

38. If you own any Mississippi River frontage, what type is it? Check all that apply.  
\_\_\_ permanent residence \_\_\_ resort or motel \_\_\_ other (please specify)  
\_\_\_ summer cottage, etc. \_\_\_ marina or boat \_\_\_ rental  
\_\_\_ farm land \_\_\_ other commercial or industrial

39. Have you participated in a survey in the past three years? Do not count Census.  
\_\_\_ no \_\_\_ once or twice \_\_\_ three or four times  
\_\_\_ more than four times

40. Do you have any comments or suggestions to offer us?

APPENDIX C

Lower Reach Interview Data  
Recreational Users and Home Owners  
Along the Mississippi River From  
Anoka to Iowa

Table 1

THE MISSISSIPPI RIVER MEANS TO ME

Code	Recreation	Home	Historical	Beauty	Pollution	No Response
a)	13	3	3	2	3	4
b)	5	9	7	2	2	1
c)	18	12	10	4	5	5

Code: a) Recreational Users; b) Home Owners; c) Total

Table 2

THE MISSISSIPPI RIVER'S MOST DESIRABLE QUALITIES

Code	Recreation	Beauty	Transportation	Miscellaneous
a)	16	7	5	0
b)	10	10	2	2
c)	26	17	7	2

Code: a) Recreational Users b) Home Owners c) Total

Table 3

THE LEAST DESIRABLE QUALITY OF THE MISSISSIPPI RIVER

	Pollution	Floods	Miscellaneous
Recreational User	21	1	5*
Home Owner	23	1	2
Total	44	2	7

\* Problem of transportation of pleasure boats through locks in competition with barges; no boats for rent in the Winona area; disagree with the Corp. of Engineers over water level controls; uncontrolled land use, especially boat houses

Table 4

THE ORDER OF IMPORTANCE FOR THESE SHOULD BE

Uses	Code	1st	2nd	3rd	4th	5th	6th
Fish and Wildlife	a)	21	5	3	0	0	0
	b)	12	9	4	3	0	0
	c)	33	14	7	3	0	0
Water Sports	a)	1	11	2	10	3	1
	b)	0	7	8	3	5	1
	c)	1	18	10	13	8	2
Water Supply	a)	3	6	14	5	2	0
	b)	8	7	9	1	0	0
	c)	11	13	23	6	2	0
Sewage & Waste	a)	0	0	0	2	1	26
	b)	1	0	0	1	0	25
	c)	1	0	0	3	1	51
Commercial Transportation	a)	3	7	8	8	3	0
	b)	5	2	4	14	2	0
	c)	8	9	12	22	5	0
Industry and Manufacturing	a)	1	0	1	5	20	2
	b)	0	1	2	4	19	0
	c)	1	1	3	9	39	2

Code: a) Recreational User; b) Home Owner; c) Total

Table 5  
WHICH USES OF THE MISSISSIPPI  
DO YOU FEEL SHOULD BE GREATLY RESTRICTED

Uses	1st	2nd
Sewage and Waste	50	0
Water Sports	0	1
Industrial and Manufacturing	2	24
Commercial Transportation	1	4
Water Supply	$\frac{1}{54}$	$\frac{1}{30}$

Table 6  
SOURCES OF WATER QUALITY PROBLEMS

Cause	Code	1st	2nd	3rd	Cause	Code	1st	2nd	3rd
Pesticides	a)	5	1	1	Exhaust	a)	0	1	0
	b)	2	2	3		b)	0	0	0
	c)	$\frac{7}{3}$	$\frac{3}{4}$			c)	$\frac{0}{1}$	$\frac{1}{0}$	$\frac{0}{0}$
Fertilizer	a)	3	1	2	Atomic Power	a)	2	1	2
	b)	3	0	6		b)	0	0	1
	c)	$\frac{6}{1}$	$\frac{1}{8}$			c)	$\frac{2}{1}$	$\frac{1}{3}$	$\frac{2}{3}$
Land Fill	a)	0	0	0	Sewage	a)	16	6	1
	b)	0	1	1		b)	$\frac{19}{3}$	$\frac{3}{0}$	$\frac{0}{1}$
	c)	$\frac{0}{1}$	$\frac{1}{1}$			c)	$\frac{35}{9}$	$\frac{9}{1}$	$\frac{1}{1}$
Drainage	a)	1	0	2	Heated Water	a)	0	0	1
	b)	$\frac{1}{2}$	$\frac{1}{1}$	0		b)	0	0	3
	c)	$\frac{2}{1}$	$\frac{1}{2}$			c)	$\frac{0}{0}$	$\frac{0}{4}$	$\frac{4}{4}$
Dredging	a)	1	0	1	Dumping	a)	1	2	10
	b)	0	0	1		b)	0	13	5
	c)	$\frac{1}{0}$	$\frac{0}{2}$			c)	$\frac{1}{15}$	$\frac{15}{15}$	$\frac{15}{15}$
Oil	a)	2	15	2	Heavy Rec.*	a)	0	0	2
	b)	6	$\frac{11}{4}$	2		b)	0	1	2
	c)	$\frac{8}{26}$	$\frac{2}{4}$			c)	$\frac{0}{1}$	$\frac{1}{4}$	$\frac{2}{4}$

\* Recreation; Code: a) Recreational User; b) Home Owner c) Total

Table 7

PROBLEMS WHICH NEED THE MOST IMMEDIATE ATTENTION  
IN MINNESOTA

Problem	Code	1st	2nd	3rd	4th	5th	6th	7th
Land Erosion	a)	2	1	7	9	4	4	7
	b)	0	0	4	4	8	2	1
	c)	2	1	11	13	12	6	8
Pesticide Pollution	a)	2	4	5	7	3	5	1
	b)	1	5	7	5	5	1	2
	c)	3	9	12	12	8	6	3
Overpopulation	a)	0	1	0	1	4	7	9
	b)	2	1	3	3	5	11	6
	c)	2	2	3	4	9	18	15
Noise Level	a)	1	3	3	6	5	6	4
	b)	0	2	3	5	4	5	7
	c)	1	5	6	11	9	11	11
Water Pollution	a)	16	11	2	2	5	0	0
	b)	13	3	0	0	1	0	0
	c)	29	14	2	2	6	0	0
Destroy Natural Beauty	a)	2	3	1	2	0	4	5
	b)	2	8	4	12	6	2	3
	c)	4	11	5	14	6	6	8

Code: a) Home Owner; b) Recreational User; c) Total

Table 8

THE STATE POLLUTION CONTROL AGENCY SHOULD BE CONCERNED WITH

Problems	Respondents	Number
All Problems Listed	Home Owners	17
	Recreational User	12
	Total	29
Land Erosion	Home Owners	21
	Recreational User	19
	Total	40
Pesticides	Home Owners	25
	Recreational User	24
	Total	49
Air Pollution	Home Owners	26
	Recreational User	24
	Total	50
Overpopulation	Home Owners	17
	Recreational User	13
	Total	30
Noise Level	Home Owners	22
	Recreational User	20
	Total	42
Water Pollution	Home Owners	26
	Recreational User	27
	Total	53
Destroy Natural Beauty	Home Owners	24
	Recreational User	22
	Total	46



Table 9

WOULD BE WILLING TO CHANGE &amp; SHOULD BE REGULATED BY LAW

Uses	A	B	Uses	A	B
Soaps/Detergents	19	22	Less Powerful Autos	14	30
Electric Appliances	9	0	Colored Toilet Paper	17	6
Pesticides	14	29	Pre-packaged Goods	22	12
Throw-aways	23	25	Gasoline Rationing	3	3
Garbage Sorting	32	7	Family Size Regulation	15	5
Special Fees	10	15	Power Tools	4	0

A- Would be willing to change; B-Should be regulated by law

Table 10

IF GOVERNMENT CONTROL OF THE ENVIRONMENT  
BECOMES A REALITY, WHICH LEVEL OF GOVERNMENT SHOULD HAVE  
GREATEST RESPONSIBILITY, LOCAL  
STATE, OR FEDERAL?

Respondents	Local	State	Federal	Others
Recreational Users and Home Owners	12	14	31	4