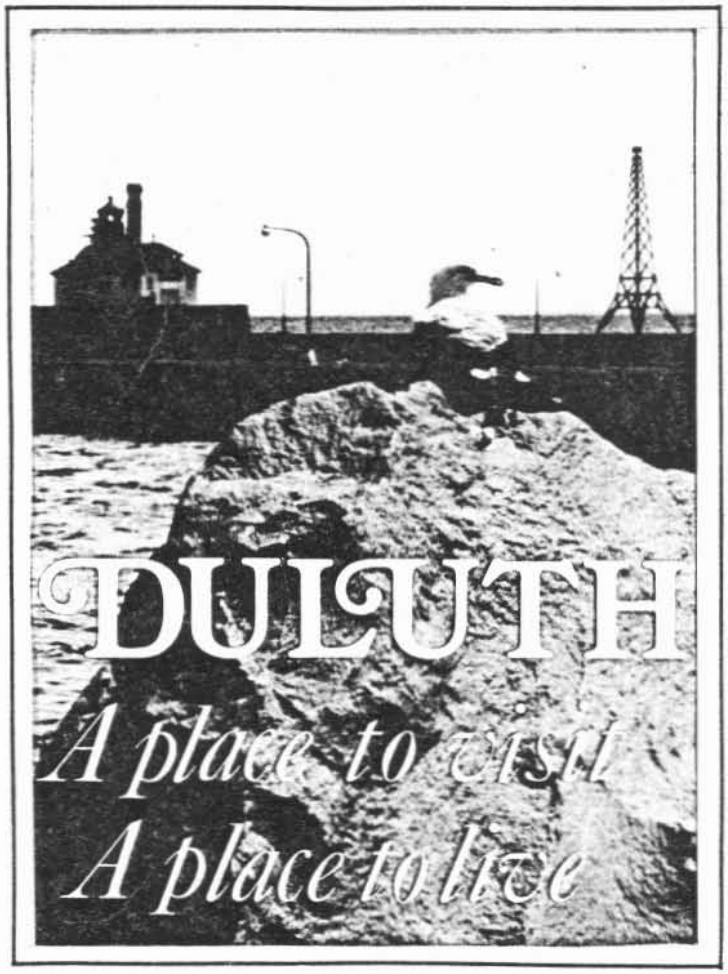

RECREATION & TOURISM STUDIES

Conducted during the summer of 1978

Prepared by
The Community
Development Laboratory

DULUTH - A PLACE TO VISIT
- A PLACE TO LIVE

A Summary Report
of
A Series of Recreation and
Tourism Studies Conducted During
The Summer of 1978

By The
Community Development Laboratory
Lake Superior Basin Studies Center
University of Minnesota, Duluth
Duluth, Minnesota

January 1979

PREFACE

This summary report is a compiliation of a series of research projects supported in part by the Comprehensive Employment Training Act (CETA) program of the City of Duluth. Members of the study team (Appendix B) conducted, compiled, analyzed, and reported the results of four research projects. Dr. Thomas J. Wood, Director of the Lake Superior Basin Studies Center, provided the primary guidance for the Study team along with the help of faculty from several academic and service departments at the University of Minnesota, Duluth. Technical Reports developed separately from this summary report include:

Project 1. Recreational Traffic Monitor, Thompson Hill, Duluth, MN (A. Norton)

Project 2. Visitation Survey of Duluth's Recreation Attractions, (J. Larson)

Project 3. Urban Campground Survey, Duluth, Minnesota (R. Kropf)

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Introduction

The City of Duluth, located at the western tip of Lake Superior, is a beautiful coastal city, characterized by high bluffs overlooking the St. Louis River and its harbor estuary. With numerous cascading creeks and the panorama of Lake Superior stretched out to the east, Duluth is truly a city that has visibly integrated with nature's water courses. Although the city has abused its water resources in the past, efforts by various organizations and public agencies have and are creating a dynamic city in which to live and to visit by cleaning up its air and water and protecting and developing its natural and cultural resources. The combination of an extensive park system along the St. Louis River and the city drainage system, the largest seaport in the Midwest, convention facilities, cultural and retail opportunities, and recreational opportunities provide a setting that has yet to reach its full potential as a major tourist center.

Early in 1977, varied interests in the city independently stated a dire need to know more about Duluth's visitors and their activities, the viewpoints of its own citizens, and the relative impacts of a developing recreation/tourism complex in northern Minnesota. Recognizing the importance of developing a good data base from which planners and business interests can draw upon for future decision making, the Community Development Laboratory was established in 1978 utilizing a grant from Title VI of the Comprehensive Employment Training Act. The Laboratory, one

of four within the Lake Superior Basin Studies Center (see Appendix A), conducted a series of studies during the summer of 1978 to develop a data base for Duluth.

The following pages provide in some detail background for the studies, a description of how the subject areas were selected for study, and brief summaries of each of the studies conducted. Due to the input of several authors (Appendix B) and research techniques utilized, style of presentation varies considerably.

RESEARCH PROGRAM

In January 1978, the research team was assembled and began an indoctrination in regional recreation and tourism design principles. The basic handbook of the team was Vacationscape, authored by Dr. Clare A. Gunn. Since the team's backgrounds were varied, a period of leveling-off or understanding the needs of a recreation and tourism region and the specific needs of the City of Duluth consumed a sizeable portion of the one year effort. This leveling-off aspect was extremely important in reaching the desired goals of the research program and consisted of two basic concurrent activities: (1) Development of a Plan of Study and (2) Assessment of Data Needs.

Plan of Study

The "Plan of Study" (POS) was essentially a process that led to a written document describing the area's attributes, resources, and needs. Each team member was assigned specific tasks designed to provide an analysis of how Duluth has reached its current position as a city to live and as a city to visit. The approach was essentially an historic overview ranging from geology, to people, to the economy. The historic overview was intentionally designed to be wide-ranging in order to provide clues as to what residents and visitors might want to know, see, or do while they experience and enjoy what Duluth has to offer. This was somewhat of a nebulous objective to accomplish and proved to be frustrating to the research team. However, the process of synthesizing their accumulated knowledge into a written document provided the catalyst to develop the research projects identified in the concurrent "Assessment of Data Needs."

The "POS" also set forth the goals and the timetable for the remaining months in the program. The following list outlines the activities that guided the research team to its conclusion in December 1978.

1) Conduct research studies that address problems of concern.

2) Identify views and desires of local groups and individuals concerning recreation and tourism in the study area.

3) Evaluate waterfront recreation developments in similar metropolitan areas outside the study area.

4) Evaluate the recreation and tourism potential along the St. Louis River and Harbor.

5) Develop an awareness of the existing recreational opportunities along the river and harbor.

6) Coordinate these studies and efforts with other groups concerned with the harbor-metropolitan area.

7) Work toward the local use of recreational development and compatibility of local and incoming recreational uses.

8) Develop expertise and act as a resource group to aid planners.

9) Use the findings to undertake and stimulate actions that are compatible to the project goals and diversified usages and interests.

Assessment of Data Needs

One of the overriding concerns of the research program was to provide data to community leaders and planners that would aid them in decision-making. In order to accomplish this objective, a series of meetings and informal discussions were held with representatives from several interested groups and agencies involved in either recreation and tourism development, management, or promotion. These city and regional planners, park managers, and information specialists articulated the kinds and types of

information that they would like to have. The expressed data needs were much beyond the resources, time, and capability that the research team had available.

By examining their own abilities and continuing discussion with the community leaders, a series of research projects was designed to answer some of the needs articulated. These projects were then incorporated into the "Plan of Study."

Research Projects

Typical of the assessment process, many research projects were advocated in the early stages of the research program, and some preliminary work was initiated on such items as (1) boating on the river, (2) bottom core sampling in the river, (3) commercial outfitting and suppliers on the river, (4) urban nature centers, (5) environmental education curriculum, (6) industrial tours, and (7) a three-year calendar of events. None of these subject areas were pursued for a variety of reasons. This does not mean to say, they were not worthy of pursuit, but only that they were not suitable for the study team at this moment of time.

Four specific research projects were initiated and completed by the research team addressing: (1) recreation traffic, (2) Duluth attractions, (3) Duluth area campgrounds, and (4) Duluth resident viewpoints toward recreation and tourism. A summary of each of these projects is found in this report.

Information/Education Activities

In addition to the four research projects, the research team produced a slide/tape media program to present the purpose of the research program and to describe the Duluth setting from historical, present, and future

perspectives. Several programs with taped narrative, display boards, photographs, and maps experienced public exposure in Miller Hill Mall during Environmental Awareness Days in Duluth, the Arena-Auditorium during Duluth Days, and the 1978 Minnesota State Fair. Two public meetings were held on the University of Minnesota Duluth campus by the research team where results of the research projects were presented.

DESCRIPTION OF THE STUDY AREA

During the "Plan of Study" preparation, the research team began to identify what makes Duluth and the Duluth area unique. In a capsular form, excerpts from the "Plan of Study" are provided below to highlight the area's uniqueness--that which a coordinated recreation and tourism program can capitalize upon.

Study Area Boundaries

This research program was primarily concerned with the St. Louis River, harbor and estuary, and the City of Duluth. The study area began at the eastern boundary of Jay Cook State Park and continued downriver to Lake Superior. It included areas such as Mud Lake, Spirit Lake, and Pokegama, Kimballs, St. Louis, Superior, and Allouez Bays. Although all of the Duluth-Superior metropolitan area was included in the study area, particular emphasis was placed on the area from downtown Duluth westward.

Physical Characteristics

As the largest tributary of Lake Superior, the St. Louis River and its surrounding landforms are characterized by a unique geological formation and a wide diversity of plants and animals. Outstanding characteristics are delineated below.

Geology. About 2 billion years ago, the area which now forms the St. Louis river bed was covered by an inland sea. Iron-rich lake sediments formed extensive deposits of taconite which now play such an important role in the mining of this region.

The formation of this iron-rich rock was followed by a period of deposition of silt and mud. These resulting structures have been named the

Thompson Formation, examples of which can be seen at Jay Cooke State Park.

Underlying Duluth itself are rocks from the Upper Precambrian period (about 1.1 billion years ago). A large rift developed in this period, accompanied by volcanic action with its attendant lava flows. Accumulation of this rock material caused a sinking of the earth's crust. This was probably the first step in the formation of the Lake Superior Basin.

Near the end of the Precambrian Era, the Fond du Lac Formation was formed of flat beds of sandstone and siltstone. Overlying this formation in the harbor area is a layer of unconsolidated clays and silts which were deposited at the bottom of Glacial Lake Duluth (a mere few thousand years ago). In its early period, Glacial Lake Duluth drained westward into the Mississippi River. However, when the water level dropped some 550 feet, the outflow shifted east to its present location. The most recent ice age (2-3 million years ago) was characterized by glaciers which advanced and retreated many times, giving us our present land forms through glacial activity. As the glacial ice receded about 11,000 years ago, it left the area looking much like the Arctic tundra of today. Further warming and cooling periods brought the forests, the peat bogs, and the other vegetation seen today.

Climate. Regional climate is typified by the mild summers and cold winters of inland northern latitudes. Mid-continental high and low pressure systems passing over the area are a major influencing factor, often causing rapid and extreme weather changes. Four distinct seasons are present, with winter receiving attention on a national scale due to northern Minnesota often being the coldest area in the nation.

Temperatures in the study area are generally warmer in winter and cooler in summer on account of the moderating influence of Lake Superior.

The range includes a January average of 9°F. and a July average of 65°F., with a record low of - 41°F. and a record high of 106°F. The average annual air temperature is 39°F. which correlates to the average Lake Superior temperature of 40°F.

Prevailing winds are from the east (off the lake) during May, June, and August, and from the west and northwest during July and September through April. Average windspeed is 11.7 miles per hour.

Annual precipitation averages 28 inches per year, half of that coming during the summer months. Normal snowfall is about 75 inches in the Duluth-Superior area, covering the ground at least one inch deep for approximately 140 days per year. Frost often penetrates to a depth of 6 feet from October until May.

Ice usually begins to form in the harbor in mid-November and attains its greatest thickness by the end of February, with the bay area freezing over in mid-January. Break-up and melting usually occur in mid-April.

Hydrology. The St. Louis River originates in Seven Beaver Lake in northern St. Louis County. Traveling 160 miles before reaching Lake Superior, the river drains an area of 3,647 miles and has an average flow of 2,000 cubic feet per second. Some of this flowing energy is captured by the network of resevoirs and hydroelectric stations which follow the river's course.

The upper river is a slow-moving body of water, flowing through peatlands and silty deposits from Glacial Lake Upham. Percolation through partially decomposed peat gives the water its tea colored appearance.

At Cloquet, the current quickens as the river drops nearly 800 feet within a ten-mile stretch while flowing through rocky gorges. Further downstream at Fond du Lac, the river widens to form an almost ideal harbor.

Within the harbor area, a seiche effect is noted. Similar to oceanic tides, the seiche causes short-term ebb and flow. The seiche is not controlled by gravitational pull but is brought about by wind and by changes in barometric pressure. A seiche can change lake levels up to twelve inches.

Water Quality. The lower St. Louis River, harbor and estuary, is presently a polluted water system. A combination of industrial developments, reduction of flow due to impoundments, thermal pollution at impoundments, inadequately treated sewage from both Duluth and Superior, non-point source discharges, red clay erosion, and fallout from air pollution all add to the degradation of the water quality. Additionally, bottom sediments are believed to contain harmful concentrations of heavy metals, polychlorinated biphenyls (PCB's) and other toxic compounds. Dredging and motor boat usage disturb these sediments and could prove to be a continuing problem.

Flora and Fauna Resource. The study area is composed of discontinous vegetational communities which provide a wide array of habitats for fish, wildlife, and man. Shrublands, grassy meadows, weedy fields, industrial and residential areas, aquatic environments, mud flats, flood plains, decidous and coniferous forests, and marshes and bogs are all found within the study area. These habitat variations have been found to be supportive to numerous mammals, at least 276 identified and recorded species of birds, and at least 36 species of fish (both native stock and recruitment). Recently, the Lake Superior Basin Studies Center and the Department of Biology conducted a series of studies in the St. Louis River and estuary. These studies are in considerable detail and need not be repeated here.

Cultural Characteristics

History. Shortly after the last glacier, nomadic people roamed the Tundra-like area. As the climate warmed, the vegetation changed and small camps of prehistoric Indians arrived and occupied the territory between

5,000 B.C. and 1,000 B.C.

About 3,000 years ago, the "Woodland Cultures" inhabited the land. Dependence on the abundant wild rice led to the establishment of permanent villages, an increased population, and the development of a culture which made pottery and constructed burial mounds.

By the time the French explorers arrived (early 1660's), the Dakota Indians (Sioux) ruled the area. They in turn were driven out by the Ojibwa, who had first arrived here in 1679 with Siur du Lhut. By 1776, the Dakotas were all but gone from the area.

The fur trade was the major activity of the early white immigrants from the earliest explorations until the middle 1800's when copper mining commenced in northern Michigan. In 1854, the LaPointe treaty was signed, which moved the Ojibwa to a reservation west of Cloquet and opened the rest of the area to prospectors, lumbermen, and land speculators. Following the treaty, Fond du Lac was platted into a village, and eleven other small townsites were found along the St. Louis bay. Superior, having been founded in 1853, had a population of nearly 500, which tripled to over 1,500 in four years.

Several sawmills were soon operating along the shores of the St. Louis River. The Civil War slowed area growth for about a decade, but in 1866, Jay Cooke picked Duluth as the terminus for his railroad. The initial boom growth halted abruptly in 1873 with Cooke's financial failure and resulted in a population drop from 6,000 to 1,300. The subsequent depression lasted until lumbermen came in the early 1880's bringing 30 years of prosperity with them. During this boom, railways, lumber, and grain storage facilities were developed as the city of Duluth grew to 50,000 people.

The future of the Twin Ports was secured when iron-ore was discovered on the Mesabi Range. The promise of jobs lured thousands of European immigrants to the mines and the port cities. By the early 1920's both Duluth and Superior were bustling towns. The Great Depression of 1929 slackened the market for steel and slowed port activity, but the economy recovered as America entered World War II.

Demand for steel skyrocketed, ship building peaked, and other local industries were busy with war production. Peacetime arrived with the realization that high grade ore was rapidly depleting. As an industrial center, Duluth-Superior has experienced a steady decline. However, area fortunes are changing as it becomes a service, retail, medical, educational, and recreational center for the surrounding regions.

Population. In 1865, most of Duluth's foreign-born residents were from northern and western Europe. Substantial numbers of southern and eastern groups, as well as Native Americans, Afro-Americans, Asiatics, the Jewish community, and others, maintain a strong interest in the preservation of their diverse cultures.

According to the 1970 census data, 13,430 of 100,578 Duluth residents were 65 years or older; that number has since increased. Duluth's senior segment is proportionally larger than most cities. If Duluth becomes a major medical center, the senior citizen population may become even greater.

The census data from 1970 put Superior's population at just over 32,000. When we add the outlying area, the population for the Duluth-Superior metropolitan area totals nearly 150,000.

Industry and Economy. In the early lumber days, logs of white and red pine were floated down the St. Louis River to Rice's Point, where thirteen mills operated full-time. Brownstone and slate quarries provided materials for homes. Fish were abundant. Four cigar factories and four breweries operated at one time.

By the turn of the century, the steel industry had become a major local industry. The U. S. Steel Company built a plant and factory town at Morgan Park in 1915. Despite its remote location from sister plants in the east, the plant had a major influence on the community until it closed in 1972. Iron-ore shipments continue to pass through the port, making it the largest iron-ore shipment port in the world.

Shipping is still the most exciting and attractive of Duluth's industries. As shipments of wood declined, iron-ore and grain took up the slack. The port is the site of bustling activity nine months of the year, contributing nearly 130 million dollars annually to Minnesota's economy.

Duluth is becoming a major service center for the region. As a professional administration center, it is opting for a new government complex. Medical services, retail trade, transportation, public utilities, construction, and wholesale trade are some of the dominant service industries.

Transportation. Duluth-Superior metropolitan area is a major transportation center due to both its geographic location and its large population.

Harbor activities generate enormous amounts of interstate truck, railway, and freight travel. Duluth International Airport has seventeen daily incoming flights, while Amtrak services the rail passenger.

Busses are responsible for about 16,000 incoming passengers per month

during the slower winter months. Three major U.S. highways serve the area, and four state highways converge here.

Recreational boat travel, presently not a major activity, is expected to increase in the future.

Land Use. Development patterns along the St. Louis River in the study area exhibit great diversity, covering the spectrum from semi-wild stretches to the heavily industrialized harbor.

The bay-mouth sandbar, formed by Minnesota and Wisconsin Points, separates the harbor from Lake Superior. Minnesota Point has residential development along most of its length, while Wisconsin Point remains undeveloped.

Several islands lie within the study area. Some are natural, others are man-made from dredged material. Except for Barkers Island, they remain in their undeveloped states.

Recreation Facilities and Opportunities. Not all recreational activities occur at specific sites but can take place on any suitable site, e.g., cross-country skiing or hiking. Nearly all activities are seasonal in nature.

Water Surface and Shoreline. The river and harbor offer many recreational opportunities. During the summer, boating of all kinds takes place. Canoeing, sailing, small power boating, touring boats, and larger power boating all occur in the study area. The Duluth Rowing Club uses the harbor for sculling.

Due to poor water quality, fishing, swimming, and water skiing are rare activities now; that should change as the new sewage treatment plant cleans the water. In fall, waterfowl hunting occurs on the Wisconsin side.

The winter sports of snowshoeing, skiing, snowmobiling, and ice fishing

are very popular in the study area. Recently, ice auto racing has gained a following with races off Minnesota Point.

Shorelines within the area display a great deal of contrast, adding to the scenic beauty of the area. From extensive industrial and shipping areas to near wilderness conditions, the waterfront includes wetlands and islands which provide sanctuaries for birds, wildlife, and unique vegetative communities. Each change of season brings with it new perspectives for viewing the river and harbor.

Waterfront Facilities. Both Duluth and Superior provide boat access; however, only one of the eight Duluth accesses is well developed with a ramp, parking space, and signing. As water quality improves, there is likely to be a demand for more or improved launching areas, not to mention marinas.

Waterfront areas for sightseeing, boating, picnicking, hiking, cross-country skiing, snowmobiling, nature study, swimming (lakeside of Minnesota Point), family games, art fairs, and other events appear to be available but under utilized; The Lake Superior Marine Museum at Canal Park and the Aerial Lift Bridge are cited as one of Minnesota's top attractions. The Arena-Auditorium, Indian Point Campground, and Chambers Grove Park, to name a few, facilitate contact with the water.

On the drawing boards are Bayfront Park and Harbor Mall Shopping Plaza, plus a waterfront trail (tour train, biking and hiking) to run from the Riverside area to the foot of Commonwealth Avenue.

Duluth-Superior Metropolitan Area. The City of Duluth is fortunate to have open space amounting to about 27 percent of its total area. Parks with open spaces take up about 1,000 acres and provide opportunities for many activities.

Steep wooded hillsides and ravines with cascading streams are some of the

unusual features of Duluth. Most of these streamside areas contain parks and are in a relatively undisturbed, primitive state.

Facilities for winter sports are well developed with cross-country trails, ski jumps, alpine hills, and snowmobile trails. Other outdoor attractions include: Skyline Parkway, Enger Tower, Lief Erikson Park, Duluth Zoo, Spirit Mountain, and Thompson Hill Visitors Center.

The City of Superior has about 5,100 acres of open space land, which is about 60% of its total land. The nation's largest (4,500 acres) municipal forest belongs to Superior and lies along the St. Louis River between Billings Park and Oliver. Jay Cooke State Park with its 11,300 acres demands special mention. Here the St. Louis River runs through narrow gorges and is full of rapids. Twenty-six miles of hiking and cross-country skiing trails, twelve miles of snowmobile trails, picnic areas, a campground (94 sites), and a foot bridge all combine to make the park especially attractive to recreationists.

Regional Attractions. Northeastern Minnesota has a vast array of recreational experiences available, ranging from highly developed and luxury type accomodations to day-use areas for casual visitors to wilderness-type settings.

The North Shore, upper St. Louis River watershed, Iron Range Interpretative Center, Tower-Soudan State Park, Superior National Forest, Gunflint Trail, Boundary Waters Canoe Area, and Voyageurs National Park are some of the regional attractions on the Minnesota side.

Wisconsin boasts the Apostle Island National Seashore, a large lake resort region, the Chequamagon and Nicollet National Forests, Mt. Telemark Ski Area, and several major state parks.

In addition, the upper peninsula of Michigan and Canada must be included in the regional picture when we are looking at recreation and tourism from this area's standpoint.

RESEARCH PROJECT I. Summary of

Recreational Traffic Monitor, Thompson Hill, Duluth, MN
(A. Norton)

Purpose and Method

Since August, 1977, the Lake Superior Basin Studies Center has been conducting a study of recreational traffic in the Duluth area.

The study was initiated for two major reasons. The first was to determine if an easily conducted, standardized count of traffic can adequately describe patterns of recreational movement in and out of the Duluth area. The relative popularity of different activities can perhaps be determined by counting the boats, bicycles, skis, etc., being transported on the highways. Periods of high and low recreational activity can be identified. The second reason involves factors which influence recreational activity. By collecting information on such things as weather conditions, gasoline prices, and holidays, we could determine, at least roughly, their effects on recreational activity.

The method of data collection was as follows: each Friday afternoon between one and five o'clock, recreational traffic was recorded from a viewing station overlooking Interstate 35 about one mile south of the Duluth city limits (at Hall Equipment Company). Friday afternoon was selected, because it is the start of a weekend and a time of heavy recreational traffic flow. Hourly tallies were made of both numbers and types of recreational vehicles (e.g., motorhomes, camping vans) traveling north and south. Sedans, pickups, and other vehicle types were counted only if they were carrying or pulling recreational equipment. All recreational items that were being

transported were also counted (e.g. bicycles, skis, boats, camping trailers).

For each weekend period, weather forecasts (Duluth and Twin Cities area), snow cover, holidays, special events, and hunting and fishing season dates were obtained.

In addition, records of traffic totals were kept for the following: Amtrak Friday-Saturday morning passenger totals; Minnesota Department of Transportation total traffic counts, hourly and weekly, hotel-motel occupancy rates; and Thompson Hill Visitor Information Center inquiries. These were then compared with the counts of recreational traffic obtained in this study.

Results of the first year's data were compiled using the statistical and plotting facilities of the UMD computer center.

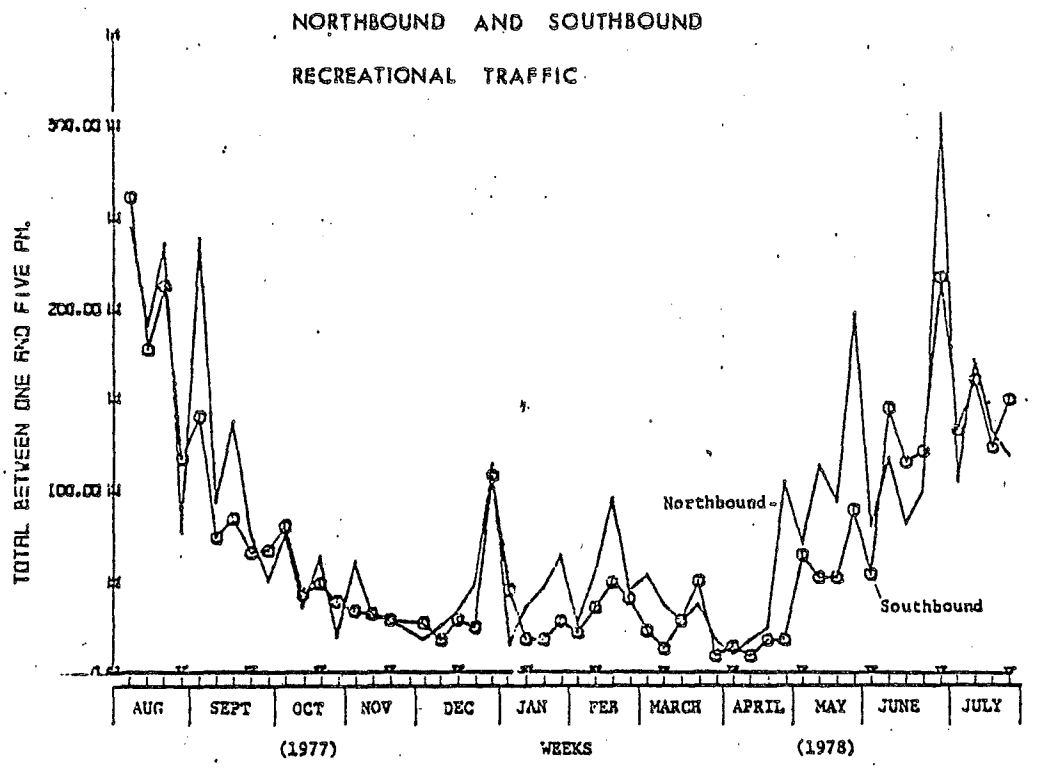
Recreational Traffic Patterns

In a graph of northbound versus southbound total recreational traffic, a definite trend exists between highs in the summer and lows in the fall and spring. A smaller, but noticeable peak occurs in mid-winter (Figure 1).

Northbound traffic was greater than or equal to southbound traffic every month of the year on Fridays with the largest discrepencies occurring from January through June. It is likely that the reverse situation happened at the end of each weekend.

Variations from the overall trend can be seen for several of the weeks. Holidays coincided with several of the largest peaks: Labor Day weekend, President's Day weekend, Easter, Memorial Day, and the 4th of July. Christmas, however, did not show any increase. Interestingly, but perhaps not significantly, recreational traffic on those Fridays following four of the major

Figure 1



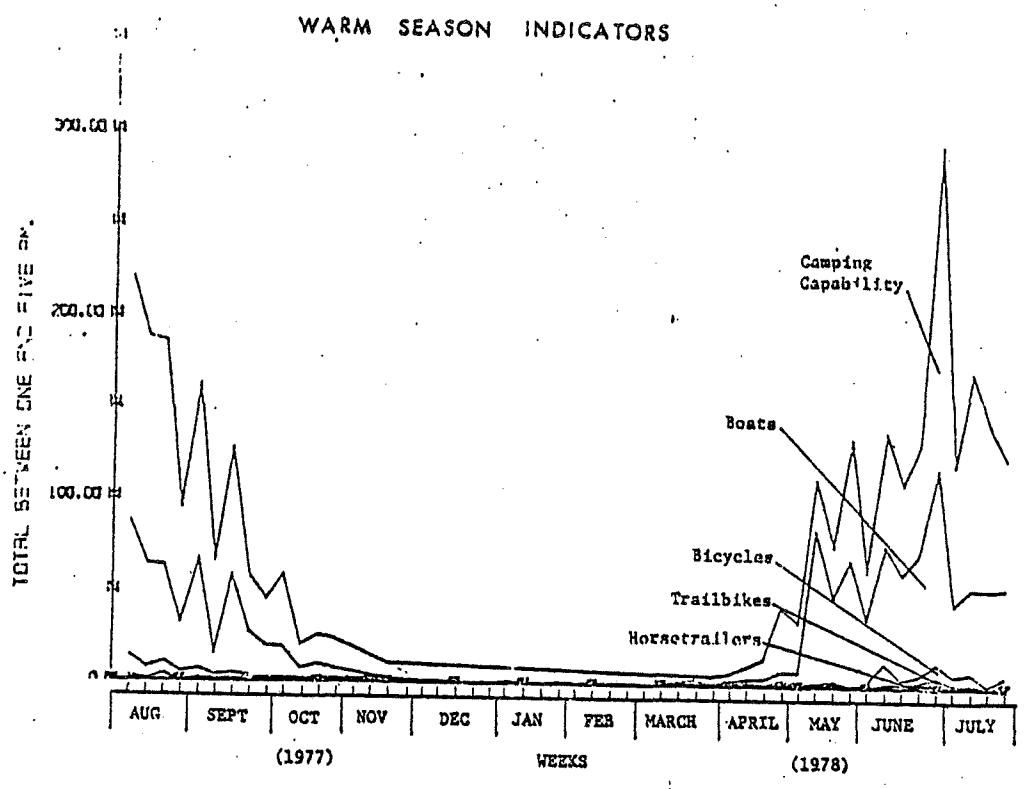
holidays (Labor Day, New Years, Memorial Day, and the 4th of July) was lower than normal.

Major openers of hunting and fishing caused a rise in traffic, as did deer season (November 4), regular fishing season (May 12), and the first weekend of the smelt run (April 28).

All recreational items were split into one of two categories: warm season and cold season indicators. These were then graphed after averaging north and southbound traffic to give a single line and reduce variations in the graph.

Camping equipment-trailers, pickup cabovers, and car-top carriers made up almost 60% of the total number of warm season indicators (Figure 2). Boats of all types contributed another 36%. Bicycles accounted for only 1%.

Figure 2



Camping capability extended later into the fall and began earlier in the spring than the other categories.

The cold season indicators (Figure 3) show total number of snowskis, snowmobiles, and camping capability. A low level of camping activity was maintained throughout the winter. Skis and snowmobiles follow the same general pattern, with skis showing a peak on the Friday before New Year's Eve while snowmobiles peaked on President's Day weekend. Lesser peaks occurred on the weekends of January 27 and Easter.

By combining the warm and cold season indicators into one graph, a picture of several general periods of recreational activity was developed (Figure 4). The beginning and end of both seasons was determined as falling during the week in which totals of one indicator surpassed totals of the other. In this way,

Figure 3

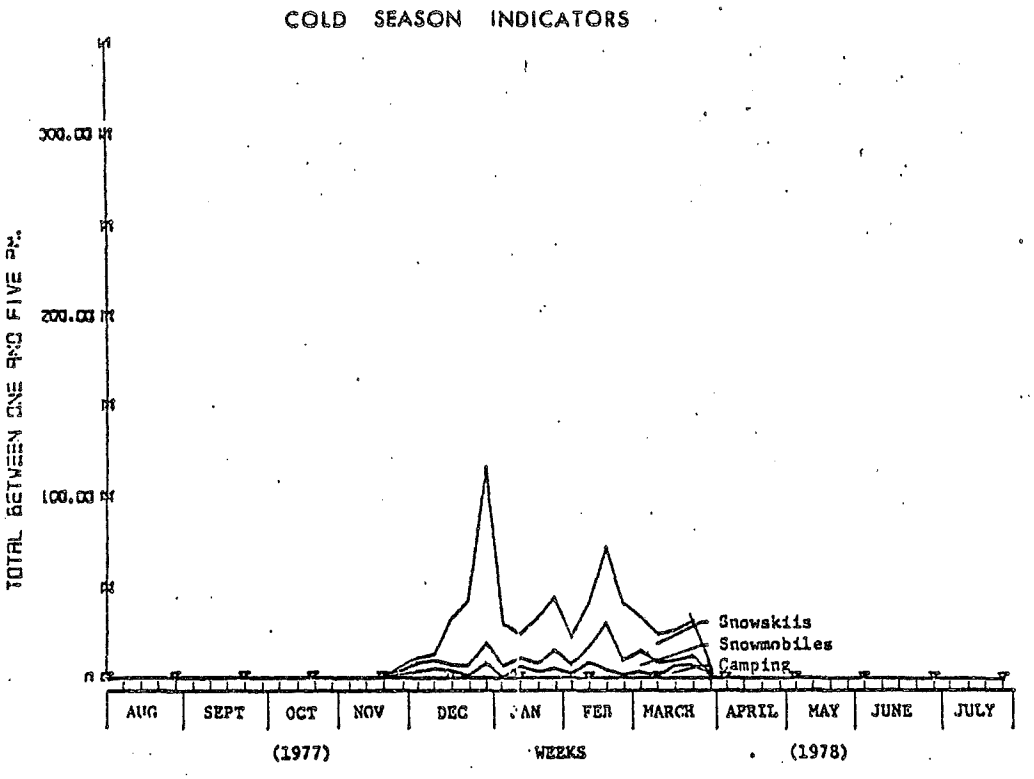
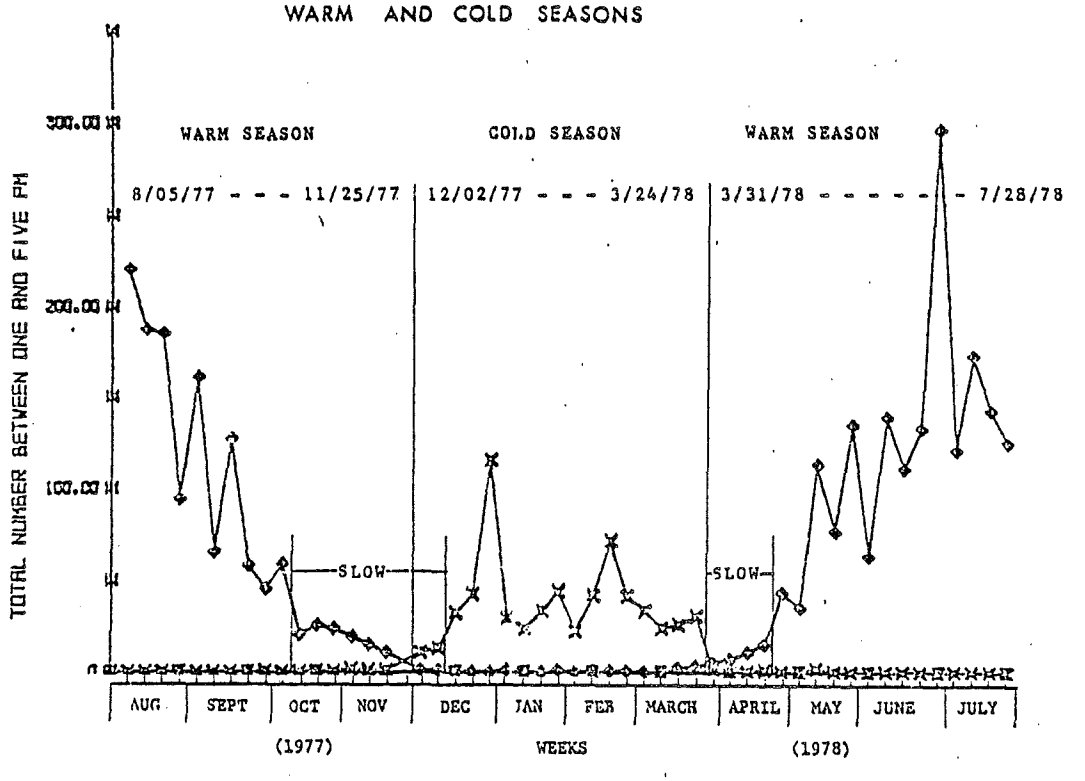


Figure 4



the "cold season" was determined as starting December 2, 1977, and ending after the weekend of March 24, 1978, nearly a third of the year.

Two periods of very low activity are evident in late fall and early spring (October 14-December 13, 1977, and March 31-April 28, 1978). The spring period of four weeks is shorter but even lower in activity than the nine week fall lows. The two periods are marked by times of uncertain weather fluctuating around the freezing point--not good conditions for most active recreation!

Factors Influencing Recreational Traffic

The second part of the survey involved determining the effects of factors on activity levels. As previously mentioned, holidays had a noticeable effect on many occasions. Special events in or near the Duluth area were monitored--with mixed results. Three special events coincided with increases in activity: The Duluth Folk Festival, University of Minnesota graduation, and the fall foliage season. Frequently, special events were not accompanied by a rise in recreational activity. This could be due to the fact that most special events involve passive recreation and are not detected by the traffic counts.

Gasoline prices fluctuated little throughout the year; therefore, no effect on recreational traffic could be computed. During subsequent years, however, this situation could change.

Hunting seasons probably caused increases during the three major opening weekends. Such openers as waterfowl (October 14), small game (September 9), steelhead fishing (April 7), and Wisconsin-Minnesota boundary waters fishing (May 5) did not produce any observable increases.

Weather predictions were divided thusly: (1) average temperatures and (2) road, wind, and precipitation conditions. Temperatures, in a general sence, corresponded positively with the yearly and seasonal trends in

activity. As temperatures decreased, so did warm season indicators and total recreational traffic.

The weather factors of wind and precipitation varied randomly through the year and seemed to have no positive correlation with traffic levels. The three weekends of severe road conditions did reduce traffic volume: heavy fog on August 26, heavy rains which caused road and bridge washouts in NE Minnesota on September 23, and icy roads (travel advisory) on January 6.

Although one year's data is not statistically valid for analysis, it does suggest that temperatures have some positive effect on active recreational traffic. Holidays, opening days of hunting and fishing seasons, and road conditions also have some positive effect on active recreational traffic. Aside from temperatures, other weather factors seem to have very little effect, and special events actually caused a decrease in active recreational traffic patterns.

Conculsions

Should the trends of the first year's data be observable in succeeding years, this system of monitoring recreational traffic will be useful as an indicator of levels and types of recreational activity.

For those interested in the tourism business of planning, data on numbers of skis or snowmobiles, boat sizes, and types of recreational vehicles, and the increases or decreases in these, could be helpful.

The reader must be advised that this index does not represent all recreational or tourist traffic. Obviously, much recreationally-oriented traffic passes through Duluth without being recognized as such. Expansion of the data to gain a picture of total recreational travel should not be difficult. A reliable estimate could be made if the following information were obtained: (1) percentage of total (weekly) identifiable recreational

traffic that passes the counting station on Fridays between one and five p.m., and (2) percentage of total (weekly) recreational travel that is obtained by the monitoring method described in this paper.

Such information may be available from various traffic data already collected, such as the Department of Transportation origination-destination surveys and various Minnesota Department of Natural Resources recreation studies. Given time and access to properly evaluate the data, accurate figures could be obtained for expansion of our four hour counts. Calculation of total recreational activity in the Duluth area would then be possible.

Evaluating changes in recreational traffic through the years may prove to be a valuable use of the traffic monitor. For instance, if gasoline prices rise steeply, or its availability becomes greatly restricted, then resulting changes in levels or types of recreational traffic should be noticeable.

This model of recreational traffic flow has promise, but succeeding years of data are required to test its accuracy as an evaluator of factors influencing recreation. Similar monitors could be set up in other parts of the country, and controlling factors on recreation in such areas as Florida, New England, or Texas could be determined.

Baseline data from this monitor can be used to document changes in recreation which may occur as Americans alter their leisure time pursuits and as new kinds of recreational equipment are developed.

RESEARCH PROJECT II. Visitation Survey
of Duluth Recreation Attractions
(J. Larson)

Purpose and Method

The main intent of the visitation survey was to establish the routes used by visitors to Duluth recreation attractions, inasmuch as these linkages could provide invaluable information with regards to recreation and tourism planning and development. The realm of the survey included the incidental areas of developing a visitor profile and gathering visitor opinions and suggestions as to potential recreation activities.

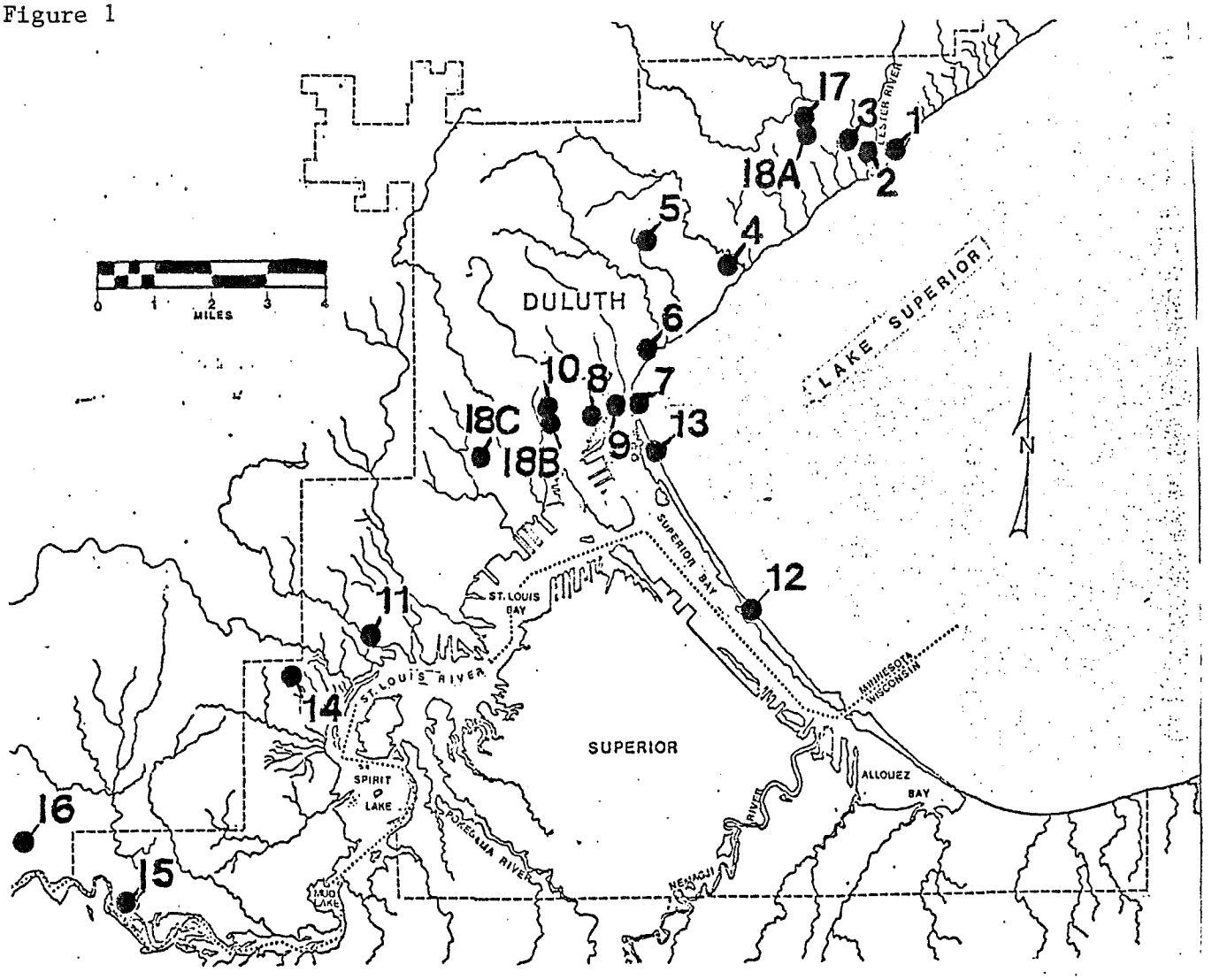
For this survey, an interview schedule was used at eighteen recreation sites in the area. The sites were chosen as generally representative of a cross section of summer recreational opportunities. All sites were outdoors except Tweed Gallery at the University of Minnesota, Duluth, and the St. Louis County Heritage and Arts Museum (The Depot). The attraction sites tended to occur in clusters centering in East Duluth, Downtown, West Duluth, and the Fond du Lac area. Four locations along Skyline Parkway, including Enger Tower, were used as interview sites (Figure 1.).

Interviews were conducted from May 24 - October 4, 1978. Ten sampling periods included both weekdays and weekends. Time spent at each site ranged from one-half to four hours depending on the usage anticipated at the different places (see Figure I for interviewing time allotted to each attraction). A total of 250 hours of on-site time was logged.

Of the 800 responses obtained, 53% were from visitors and 47% were classified as residents. Residents for this survey were defined as those interviewed who resided within 35 miles of downtown Duluth (sample inclusions are Two Harbors, Carlton, Cloquet, Esko, Hermantown, and Superior, Wisconsin).

Resident interviews required about five minutes to complete, while visitor

Figure 1



INTERVIEWING LOCATIONS
(TIME SPENT AT EACH LOCATION FOR A SAMPLE PERIOD)

1. BRIGHTON BEACH (KITCHI GAMMI PARK) (1/2 HR)
2. LESTER RIVER PARK (1/2 HR.)
3. SEVEN-BRIDGES ROAD (1/2 HR.)
4. CONGDON CREEK TRAIL (1/2 HR.)
5. TWEED GALLERY-UMD (1 HR.)
6. LEIF ERIKSON PARK (1/2 HR.)
7. CANAL PARK AND MARINE MUSEUM (4 HR.)
8. DEPOT (ST. LOUIS COUNTY HERITAGE AND ARTS CENTER) (2 HR.)
9. TOUR BOATS (DULUTH-SUPERIOR EXCURSIONS) (4 HR.)
10. ENGER MEMORIAL TOWER (1/2 HR.)
11. DULUTH ZOO (3 HR.)
12. PARK POINT RECREATION AREA (1 HR.)
13. FRANKLIN BEACH (1/2 HR.)
14. SPIRIT MOUNTAIN RECREATION AREA (1 HR.)
15. CHAMBERS GROVE PARK (1/2 HR.)
16. JAY COOKE STATE PARK (3 HR.)
17. HAWK RIDGE NATURE RESERVE (1/2 HR.)
18. SKYLINE PARKWAY (3 LOCATIONS)
    - A. HAWK RIDGE OVERLOOK (1/2 HR.)
    - B. ENGER TOWER OVERLOOK (1/2 HR.)
    - C. BREWER PARK OVERLOOK (1/2 HR.)

interviews often needed up to fifteen minutes. Prospective interviews were chosen by random encounter (refusal rate of about three (percent), with a spokesperson for each group selected at the onset of the interview.

Survey Results

Linkage Patterns. The linkage pattern analysis was extremely complex. Those interviewed were asked to indicate places they had been or were planning to visit (from a list of 48 attractions) and their shopping habits. A detailed computer analysis of the 3,000 possible route combinations was performed, results of which are included in the separate report. Briefly, the linkages were separated into the two categories of within-cluster linkages and between-cluster linkages. The downtown area of Duluth had the largest number of within-cluster linkages, with visitors going to several attractions within one general area such as the tour boats, Canal Park, Depot, Downtown Shopping, Arena-Auditorium, and so on. East Duluth had the second highest number of within-cluster linkages which involved people going to such attractions as Tweed Gallery at UMD, Seven Bridges Road, Brighton Beach, Lester River Park, and others. The third largest linkage cluster occurred in West Duluth and involved visitation to Spirit Mountain Recreation Area, Duluth Zoo, and Thompson Hill Information Center.

The largest between-cluster linkages were, in order of occurrence, (1) East End to or from Downtown Duluth, (2) West End to or from Downtown Duluth, (3) Skyline Parkway to or from Downtown Duluth, (4) Park Point Recreation Area to or from Downtown Duluth, and (5) Skyline Parkway to and from West End.

Residents surveyed visited attractions in the following order: (1) Skyline Parkway, (2) Canal Park and Marine Museum, (3) Park Point Recreation Area, (4) Jay Cooke State Park, and (5) the Duluth Zoo. Resident shopping patterns favored the Miller Hill Mall slightly over the downtown area.

Attractions most used by visitors in descending order, are Canal Park and Marine Museum, Skyline Parkway, North Shore Scenic Drive, the tour boats (Duluth-Superior Excursions), the Depot, Jay Cooke State Park, Spirit Mountain Recreation Area, and the Duluth Zoo. Both Jay Cooke State Park and the North Shore Scenic Drive are along major routes in Duluth and receive a large number of visitors. The visitors tend to shop downtown considerably more than the Miller Hill Mall area.

First places to be visited include: Canal Park and Marine Museum, Jay Cooke State Park, North Shore Scenic Drive, Thompson Hill Information Center, Skyline Parkway, Spirit Mountain Recreation Area, the Depot, and the tour boats.

Visitor Profile. Visitors from 30 states, Canada, and 9 other foreign countries are represented in this survey. Minnesotans constituted about 60% of the total. Overall, 11% came from a day-use zone within the state, which is defined as all the land within a 100 mile radius of a given locale. Using Duluth as the center, the Iron Range communities are included in the day-use zone. The Twin Cities-Metropolitan area accounted for 30% of the total visitation, and the remaining 19% came from other parts of Minnesota outside the day-use zone.

Wisconsin provided about 10% of the total-visitation, with just over 3% coming from a day-use zone with Superior, Wisconsin, as the center. Actual Superior residents were classified as residents in the survey and are therefore not reflected in the visitor tally. Outside the day-use zone, Wisconsin visitors provided over 6 % of the total, while North Dakota (3.1%), Iowa (2.6%), California (2.4%), and Illinois (2.2%) led the list of other states. All states, excluding Minnesota and Wisconsin, contributed 24.5% to Duluth's visitation.

Canadians accounted for about 3% of the visitation, which is a lower figure than other surveys have reported. Reasons for this low figure may have been caused by the recent devaluation of their currency, resulting in either reduced visitation or shopping rather than visiting attractions. Other foreign visitation amounted to about 2% of the total.

Transportation to and from the Duluth area was accomplished by private vehicle in 87% of the cases. Motor homes constituted about 3%, Amtrak about 3%, buslines about 4%, and airlines about 2%, while other forms (bikes, motorcycles) were negligible.

One survey question dealt with the purpose of the visit and educed the following responses most often: sightseeing and recreation, visiting friends and relatives, and vacationing. Reasons such as business, shopping, conventions, or medical were less frequent responses.

Of all visitors to the area, 68% stayed overnight(s) and used motels or hotels 35% of the time. Campgrounds and private residences each accommodated about 15%. Another 4% stayed at cabins or motels outside the city limits, slept in cars, or stayed at hostels (Table 1). The remaining 32% of the total visitors surveyed were in the day-use category.

Table 1. Visitor Accommodation Usage.

Accommodation Type	Total % of Visitor Groups	Total % of Nights Stayed
Campgrounds	19.1% (14.6%)*	21.6%
Duluth Area	17.3%	18.8%
Others (Wisconsin, Northshore, Two Harbors)	1.8%	2.8%
Hotels/Motels	52.7% (34.9%)*	38.7%
Includes:		
Superior, Wisconsin	2.8%	1.3%
East Duluth	8.8%	5.5%
Downtown Duluth	21.9%	16.5%
West Duluth	4.2%	2.3%
Motels/Cabins	6.0%	4.2%
Northshore, Two Harbors		
Hostels	1.8%	3.2%
Overnight Parking	1.4%	0.9%
Private Residences	18.7% (14.6%)*	30.1%
Total For All Overnight Accommodations	100%	100%

* = % of Total Visitation

Total visitor expenditures in Duluth and on the overall trip are shown in Table 2. These are averages for all parties interviewed. Lodging averages are low in that day-use (32%) and private accommodation (15%) figures were included. A more detailed analysis was performed on visitor expenditure breakdown, part of which is included in Table 3. The spending patterns of visitors were analyzed by 1) type of accommodations and 2) attractions visited. Of the six attraction sites used for comparison, the zoo and the tour boats appear to draw the biggest spenders. Both of these sites are fee as opposed to "free" and may attract people willing to pay for entertainment. The smallest daily expenditures per group were noted at Jay Cooke State Park where many groups were either in the day-use category or were camping in the park and spending very little time and money in Duluth.

More in-depth visitor profile information can be found in the Visitation Survey Technical Report.

Resident and Visitor Opinions. The survey format was designed to include resident and visitor comments on actual and potential Duluth recreation attractions. Residents surveyed often expressed concern about their own neighborhoods; they would like to see revitalization of local parks for example. Visitors frequently mentioned needed improvements along Skyline Parkway such as repaving, trimming or removing trees for better vistas, creating more overlook areas, and providing more picnic areas. Existing problems encompassed litter and vandalism. Those interviewed did not favor extensive commercial developments which could detract from the character of the city. Waterfront developments, such as swimming beaches, camping areas, parks and picnic areas, boat access, and hiking/biking trails, were favored as potential recreation as the water quality improves due to the operation of the W.L.S.S.D. facility. Hotels or condominiums were considered negative developments which

Table 2. Average Visitor Expenditures (Totals).

Within Duluth Area

Type of Expenditures	Dollar Amount	% Of The Visitor Dollar
Lodging	$13.47	19%
Transportation	9.60	14%
Food and Beverage	24.09	34%
Retail Purchases	14.73	21%
Recreation and Entertainment	8.16	12%
Total	$70.05	100%

Average number of days visitor stayed in the Duluth area = 2.4 days

On Overall Trip

Type of Expenditures	Dollar Amount	% of the Visitor Dollor
Lodging	$13.47	26%
Transportation	9.45	18%
Food and Beverage	17.46	34%
Retail Purchases	7.22	14%
Recreation and Entertainment	4.29	8%
Total	$51.82	100%

Average number of days visitor was on the total trip = 6.6 days

Average number of persons in a visitor party = 3.1

Table 3. Average Visitor Expenditures (Totals by Attraction and by Accommodation).

Attraction	Total Daily Expenditures
Duluth Zoo	$83.89
Jay Cooke State Park	31.11
Canal Park And Marine Museum	74.71
Depot	50.24
Tour Boats (Duluth-Superior Excursions)	96.09
Skyline Parkway	60.45

Accommodation	Total Daily Expenditures
Hotels/Motels	$91.26
Area Campgrounds	26.81
Private Residence	24.40
Day-User	97.96

would result in over-commercialization of the area. A complete listing of resident and visitor opinions can be found in Appendix I of the Visitation Survey Technical Report.

Conclusions

A major portion of this survey was designed to provide information on the linkage patterns of visitation to Duluth recreation attractions. The complete analysis is provided in the technical document, along with a more detailed description and analysis of the additional survey information.

Duluth has the potential for providing more recreation opportunities which could result in increased visitation. The St. Louis River and the harbor area, as well as other scenic or unique locations within or near the city, could offer many possibilities for expansion of the Duluth tourism base. Emphasis should be placed on the avoidance of over-commercialization which could feasibly detract from overall tourism.

RESEARCH PROJECT III.
Urban Campground Survey
(R. Kropf)

Purpose and Method

A network of state, city, and private campgrounds serve visitor needs both within the Duluth city limits and in the adjacent urban fringe. The basic goal of this study was to characterize who these visitors were, how long they stayed, what they did, and how much they spent. The study was also designed to determine the urban campground user needs as they pertain to their visit to Duluth and to determine how their awareness (or lack thereof) of existing recreational opportunities affected their visit.

Following an assessment of community interests, a questionnaire was designed to generate desired information. Six campgrounds were included in the survey program because of their proximity to the Duluth trade area. Of these six campgrounds, one was state-owned and managed, two were municipal-owned and managed by two separate city departments or elements, and three were privately owned and managed. Ten survey periods were conducted. One weekday and one weekend were randomly selected for each month in each campground from May through September. A drop-type method for questionnaire return was utilized. Each camping party during the selected survey period was given a questionnaire by study team members to be filled out at their convenience and returned to the campground office upon departure. There were 1,437 questionnaires handed out with 613 being returned, resulting in a return rate of 42.6%. On occasion, questionnaires were returned by mail at the respondent's own cost. While data from individual campgrounds was given to the campground owners, results presented here display only

aggregate data in averages and percentages.

Survey Results

Characterization of Camper Party. Respondents to the questionnaire reported that their average camping party consisted of 3.03 people, 52 percent of which were male. Fully 80 percent of the camping parties were families rather than individuals or groups of friends. Slightly over one-third of the campers were 18 years or under, nearly half were between 29 and 64 years old, and only a small percentage were over 65 years of age (5 percent). One-third of the party leaders stated that their income levels exceeded $20,000 per year.

Travel Patterns. Nearly 50 percent of the campers surveyed indicated they were from Minnesota; of these, 26 percent were from the Minneapolis-St. Paul area. Canada accounted for another 13 percent with the remaining visitors out-of-state. Michigan, Wisconsin, and Iowa were leading out-of-state residences.

The primary destination of these campers was varied, however; 44 percent indicated Duluth was their primary destination, and the other 56 percent indicated Duluth was an intermediate stop on their way to other Minnesota locations, Canada, or elsewhere.

These visitors were on vacation trips lasting over one to two weeks (55 percent). However, there was a high incidence of two and three day trips (32 percent). They spent about two days in Duluth on the average.

Camping Style. Fully seventy percent of these campers indicated that camping was primarily the means by which many other activities can be engaged and not an end to itself. Most utilized trailers and motorhomes requiring full service. Only a few (13 percent) carried a boat with them, and the majority of the boats (59 percent) were canoes.

Campground Management and Design Preference. Many campers expressed no preference (36 percent) for campground ownership, and the rest were split between state, federal, and private ownership preference. However, most (88 percent) did prefer campgrounds with an attendant on duty. A high degree of satisfaction with courtesy, general service, and facilities was expressed by these visitors to Duluth area campgrounds, and they indicated that they planned to visit again in the future.

Decision-Making and Area Knowledge Base. While most made their decision to visit the area at least a month in advance, nearly 20 percent made their decision less than five days prior to their trip. Forty-three percent read about their campground prior to coming, and many learned about the campground through friends (25 percent). Only 30 percent of the visitors expected to find all their recreation and entertainment within the campground. The majority were going to other Duluth attractions or intended to search out their activities in the area.

In terms of previous knowledge base, the Spirit Mountain complex received the single greatest recognition as a place they knew about previously, followed by the Canal Park Museum, Skyline Parkway, Jay Cooke State Park, and the Northshore Drive.

Return visits by these campers amounted to 25 to 30 percent over the past three years. Future plans for these campers had Duluth in them by over 60 percent of the surveyed groups.

Conclusions

A greater amount of detail can be found in the Technical Report relating to preferences, expenditure data, and recreation participation data. However, it is evident that campers utilizing area campgrounds represent

a major segment of the tourist industry and should be incorporated in area and regional promotional plans and activities. Inflation and fuel availability are two major concerns that campground owners must respond to in future development and management programs.

RESEARCH PROJECT IV.
Resident Viewpoint Survey
(D. Hanninen)

Purpose and Method

The resident viewpoint survey was conducted in an effort to find out how the people living along the St. Louis River and Harbor felt about four major issues. These were:

1. Using the river for recreational purposes,
2. Developing the area for further recreational usage,
3. Having a greater number of tourists in the area, and
4. Direct and indirect effects of increased tourism.

In addition to questions relating to these four issues, the survey contained some general questions about recreation in the larger Duluth area. Demographic data was also obtained.

Finding out how the population most likely to be affected by any changes may feel about those changes is considered vital by planners. Resident opinions are supposed to have weight when changes are contemplated.

Therefore, we set about trying to ascertain those opinions from people who live on or near the river which is already changing due to the operation of the Western Lake Superior Sanitary District plant situated in the harbor area.

The Resident Viewpoint Survey was conducted on a house-to-house basis using seven U.S. census tracts, starting at 21st Avenue West and continuing westward through Fond du Lac which is the city limits and also the outer boundary of our study area.

Streets within each tract were randomly selected; every third house on a given street was surveyed. The survey period covered three weeks beginning in late September and continuing into early October, 1978.

The census data was from 1970 (latest available), and three percent of each tract was surveyed resulting in a total of 326 returns overall.

The survey instrument was a multiple choice (strongly agree, agree, medium, disagree, strongly disagree) questionnaire to be filled out by the resident as the interviewers waited for the form. In a few cases, the interviewers had to ask the questions and record the respondent's answers.

Survey Results

A number of questions were designed to learn who now uses the river for recreational purposes and how they use it. An overwhelming number of respondents do not use or go down to the water at all. A small group said they used it for fishing, boating, hunting, picnicking, and hiking, with an even smaller number (approximately six) who said they are on or near the water daily.

Considering the present quality of the water, it is easy to understand why so few people presently use it; however, we received many remarks from older respondents who can remember when they swam in the river as children.

Establishing feelings about more recreational development was the second objective. The questions regarding this were contingent upon a vast improvement in water quality and were so stated.

Almost one half of the interviewees thought the river was suitable (if cleaned up) for recreational development, while three out of four found the area to be very scenic.

Although we received affirmative answers to the above, there were many unsolicited remarks which indicated that the residents were fearful of "over" development; they would like to see things they could use, but they do not care to see others coming into "their" neighborhoods to use them. The words over-used and over-commercialized were often heard. Those reactions answered our third concern. Although the item did not differentiate between Duluthians in

general and tourists, the interviewers felt that neither group would be very welcome, as based on remarks of residents.

Having their opinions taken into account was of great importance to many (82%). Citizen input rates very high among citizens.

The final objective dealt with direct and indirect effects of increased tourism in the area. Just over one-fourth felt that increased tourism would accentuate or create problems in the river area. An equal number felt that it would not be a problem. Another fourth had no opinion, while the remainder marked "medium" to mean they held no strong opinions either way. The above item never specified what "problems" might occur if tourism increased nor did it state what level of "increase" might take place.

Another survey question asked residents whether they felt that possible disadvantages of increased tourism would be offset by economic gains. Responses divided into three main groups on this: one-third thought they would balance, a fourth had no strong feelings, and about two-thirds had no opinion.

The general questions concerning Duluth's recreation attractions received mostly positive responses. About 80% said the Arena-Auditorium and the Zoo are assets to the community. The percentage fell to 65 percent where Spirit Mountain was concerned. Despite the fact that many residents were unfamiliar with the proposed Western Waterfront Trail, about 62% favored the idea when a short description of the Trail was read to them.

People thought enough activities were available for children, adults, and senior citizens, but not enough for teenagers.

One question asked interviewees why they had decided to live where they do. Our motive was to see if the river was a major determinant. It definitely was <u>not</u> the reason people chose the area. The top three answers

were: 1) work, 2) economic (affordable), and 3) a strong emotional attachment to the western part of Duluth. Schools and closeness to family were heard less often, and proximity to the river was mentioned only five times.

Conclusions

The Resident Viewpoint set out to determine the public's thoughts and feelings about recreation and tourism both along the river and in Duluth in general. While the sample population was narrowly confined to a strip along the river, it would seem fair to say that we obtained a reasonable picture of the sample group's opinions.

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APPENDIX A

Organization and Purpose of Lake Superior Basin Studies Center

The Lake Superior Basin Studies Center consists of an interdisciplinary team of scientists, educators, planners, and technicians engaged in efforts to meet the three-fold charge of research, education, and public service of the Minnesota State Legislature to the University of Minnesota, Duluth.

The basic purpose of the Center is to initiate, interpret, and support research, education, and public service in the physical, geographical, sociological, economic, and governmental aspects of the Lake Superior basin. The functions of the Center include cooperation with existing agencies, coordination of research and information in a wide variety of fields, and sponsorship of research and training projects that promise to be of value to the people of this area. As a consequence of such programs, the Center makes available to the public, in both technical and non-technical forms, the results of its activities with the premise that an informed public can better direct its future with more complete information.

More specifically, the Center maintains the following objectives:

1. To document baseline conditions and record case histories of man's involvement with his environment in the Lake Superior basin. This includes studies of the characteristics and processes of water and related land resources, and evaluation of the impacts of human actions on natural and social systems.
2. To generate an awareness of the problems and opportunities confronting the region through cooperative programs with other groups, sponsorship of educational programs, conferences, and dissemination of information to the general public.

3. To provide educational opportunities through the involvement of students in sponsored projects and activities, enabling them to gain valuable experience in their technical fields while off-setting college expenses.

The purpose of the Community Development Laboratory is to initiate, integrate, and support research, education, and public service programs in the community as they relate to the Lake Superior basin. This laboratory support unit emphasizes studies of economic development, social well-being, and cultural resources in the Lake Superior basin area.

The technical advisor of the project was Dr. Thomas J. Wood. He brought together a study team with educational background and experience in business administration, history, commercial photography, psychology, geology, fisheries, boating, water quality, commercial and public recreation, forestry, and wildlife. A project supervisor coordinated the group's effort toward establishing an awareness and a concept for recreation and tourism potential in the study area.

Other elements of the Lake Superior Basin Studies Center include a Limnological Laboratory, an Environmental Services Laboratory, an Analytical Laboratory, and the Lake Superior Reference Library.

APPENDIX B

Community Development Laboratory Staff Participating in Program. The staff of the Community Development Laboratory of the Lake Superior Basin Studies Center is directed by Dr. Thomas J. Wood.

Jeffery Crosby - Has education and experience in fisheries and limnology. Crosby was responsible for information pertaining to commercial and recreational fishing, wildlife, boating, and water quality.

Pat Hanninen - Has an educational background in psychology. She evaluated recreation-tourism needs and interests of all age groups, all socio-economic groups, all ethnic backgrounds, and varied capabilities. She conducted the Resident Attitude Survey.

William Kosiak - Has an educational background in history and experience in commercial photography. His responsibilities were to study the historical aspects of the area in relation to industry and tourism. Kosiak produced the multi-media presentation.

Ronald Kropf - Has experience as a commercial outfitter. He inventoried present commercial recreation activities pertaining to the river basin and looked at potential commercial recreation for the future. He conducted the Urban Campground Users Survey.

James Larson - Has an educational background in recreation and experience in forestry. An inventory of publicly-owned recreation facilities, their use and scenic amenities were his responsibility. The linkage Survey of Visitors to Duluth Recreation attractions was conducted by Larson.

Arthur Norton - Has an educational and professional background in geology. His responsibilities were to gather information on geology, land use, and transportation patterns as related to the river basin. Norton conducted the Recreational Traffic Monitor, completed its first full year, and analyzed and computerized the data. The monitor is on-going.

Thomas Pavlowich - Has an educational background in business administration and was responsible for studying and promoting tourism in relation to the harbor industries. He served as bookkeeper and financial manager of the project.

Roberta Shank - Was the project's clerk-typist. She handled all secretarial duties involving the Community Development Laboratory.

Cynthia Ward - Has a sociology degree and has worked in education and as a paralegal. She is editor of reports and narrator of the slide-tape production.