RECREATIONAL DEVELOPMENT WITHIN THE TRI-COUNTY REGION

A Comprehensive Problem Report
for the Degree of M. L. A.
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DANIEL W. DONELIN

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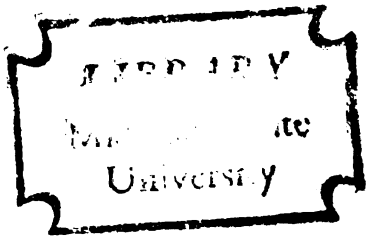

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ABSTRACT

RECREATIONAL DEVELOPMENT WITHIN THE TRI-COUNTY REGION

by Daniel William Donelin

Recreational Development Within the Tri-County Region of Clinton, Eaton, and Ingham Counties examines the existing open space within this Region, and the recreational needs of its inhabitants.

In carrying out research in a regionally oriented manner, needs for the Tri-County Region were determined by examining some of the social and economic factors influencing recreational demands of the Region: such as, regional location, place of residence, vocation, education, and age. This information was compared to the results of a nationwide survey conducted by the Outdoor Recreation Resources Review Commission. The development of an open space plan is proposed (1) to act as a basis for the regional development of recreational land; and (2) to correct deficiencies in the quantity of available recreation areas. The corridor system was chosen, following the drainage patterns of the Region. This plan was chosen to form the nucleus for open space development, yet could include other open space plans. The corridor system restricts intensive development making these areas ideal for recreation.

Water is a major part of the corridor system. Watershed areas are examined and proposed as nodes of quality recreational land within the open space plan. Due to the lack of usable water facilities in the Region, watershed impoundment areas were studied for their possible water bodies. Open space goals were developed to provide purposeful reasons to include the impoundments as part of the open space plan. General and specific criteria were used to facilitate the future selection of impoundment sites and other recreational areas.

Basic interests of the residents of the Tri-County Region were determined. Among the more popular were camping, swimming, boating, fishing, golfing, picnicking, and sightseeing. A study was then made as to the quantity of land needed by 1980 using the Outdoor Recreation Resources Review Commission's means of land classification, pertaining to the Tri-County Region, namely: Class 1: High-density Recreation Areas; Class 2: General Outdoor Recreation Areas; and Class 3: Natural Environment Areas. Of the three, Class 2 areas were shown to contain most of the activities desired for participation in the Region, yet had the greatest deficiency, requiring the existing 485 acres of land to increase to 6652.5 acres by 1980. Major activities were also studied, based on various standards, and showed deficiencies.

A particular site was chosen in order to test the criteria

and to develop a plan of a Class 2 type recreational area providing activities both needed and desired by the Region. Each site will dictate its own standards due to regional context, historical significance, topography, vegetation, and soil conditions. A perceptual study of these design considerations, including all the extrinsic and intrinsic values of the particular site, enables the site to be developed to its maximum potential. Spacial requirement standards for the activities to be provided were studied and used as a guide in the development of the Master Plan. A functional diagram of activity relationships was used to show linkages,both positive and negative, in order to strengthen the design conclusions.

From these design considerations, evolved the Master Plan for the development of Columbia Creek Recreational Area, having the following major provisions: an information center, swimming, fishing, canoeing, picnicking, camping both for day and overnight purposes, nature center and hiking trails, educational farm, and a nine-hole golf course.

RECREATIONAL DEVELOPMENT

WITHIN THE TRI-COUNTY REGION

By

Daniel William Donelin

A COMPREHENSIVE PROBLEM REPORT

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Introduction

> Decade by decade, the expanding population has achieved more leisure time, more money to spend, and better travel facilities; and it has sought more and better opportunities to enjoy the outdoors. But the public has also demanded more of other things. In the years following World War II, this process greatly accelerated as an eager nation, released from wartime restrictions, needed millions of new acres for subdivisions, industrial sites, highways, schools, and airports. The resources for outdoor recreation - shoreline, green acres, open space, and unpolluted waters - dimenished in the face of demands for more of everything else. [1]

This quote from the Outdoor Recreation Resources Review Commission's (ORRRC) report to the President indicates the importance of evaluating those areas remaining which have recreational potential. A complete and comprehensive inventory of potential open space areas especially those within easy reach of our expanding urban populations is needed. Michigan's population is expected to increase from 8.0 million in 1962-1963 to 10.2 million by 1980. The shift in population is away from rural to the urban and suburban areas, thus increasing urban sprawl. People will be more affluent, they will have more leisure time with the average work week being reduced to four days. Employees will likely have another week of paid vacation and more will retire at earlier ages. This extra leisure time is due to the automation of today's society, which allows one to accomplish production goals with

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[1] Outdoor Recreation Resources Review Commission; Outdoor Recreation for America; January 1962; P. 1.

the minimum of both labor and time. A sample of the expectations of the leading authorities on the future of leisure in the United States is shown in Table I.

TABLE I

United States Leisure Projections

Item	Unit	Clawson 1956	Clawson 1980	ORRRC 1960	ORRRC 1976
Leisure					
Avg. work week	Hrs/Employee	40	32	38.5	35.4
Discrety. leisure...	Hrs/Week	30	38	N.A.	N.A.
Paid vacation	Wks/Employee	1.	2.5	2.0	2.8
Paid holidays	Days/Employee	N.A.	N.A.	6.3	8.5

Source: Research Report 42: Natural Resources:Milstein, David N.;"Michigan's Outdoor Recreation and Tourism" Project '80 - Rural Michigan Now and In 1980; Dept. of Resource Development, Michigan State University, 1964; P. 15.

But what are people doing with their newly created leisure time? The attendance figures showing the recreation visits to federal properties gives some indication as to the expected future trends with leisure time.

TABLE II

Estimated Recreation Visits to Selected Federal Properties

United States Agency	1950	1960
National Park Service	32,780,000	72,288,000
U. S. Forest Service	27,368,000	92,595,000
Bureau of Reclamation	6,594,000	24,300,000
Corps of Engineers	16,000,000	106,000,000
T.V.A.	16,645,000	42,349,000

Source: Research Report 42: Natural Resources: Milstein, David N.; "Michigan's Outdoor Recreation and Tourism" Project '80 - Rural Michigan Now and In 1980; Dept. of Resource Development, Michigan State University, 1964; P. 6.

Recreation provides a balance between one's work and home environments. Eight hours are spent at work, eight hours of sleep, and leaving one-third of the day to divide between eating, bathing, shopping, and recreation. Recreation gives one the opportunity to exercise muscles, develop imagination, or to experience such feelings as achievement, dominance, and self-expression.

> Recreation is a vital need in today's world. It is perhaps the greatest opportunity for self-expression, for doing what one really wants to do, not what one is forced to do, to earn a living. The very phenomena which have brought leisure and income have also brought serious tensions for every day life - both working and living place hurriedly, under crowded and often noisy conditions. Recreation under conditions of one's choosing is necessary to relieve these tensions. For many the physical activity of outdoor recreation is vital in building and maintaining physical fitness and in discharging nervous energy.[2]

Man is finding it more and more difficult to find areas that can provide him with the type of land and water resources needed to accomodate recreational activities. The increasing penetration of the automobile into the countryside and the disappearance of the wilderness areas that are being devoured by urban expansion are adding to these difficulties. Only a small minority can afford to travel the distances necessary to participate in recreational experiences. Cities have sprawled to such an extent that in some cases it requires hours of driving to leave the urban area and its neighbor, suburbia. Once past the suburbs, one is still met with the

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barrier of property ownership which forces trespassing or retreat to the heavily used and more likely over-used recreational areas.

Ecology is the science of the togetherness of living things and their environment.[3]

> Although man is now the dominant species on the earth, his very survival depends upon the intricately complex ecological balance among all plants and animals within their respective geologic and climatic environments. When the population was small and the resources of the American continent appeared to be virtually unlimited, one tolerated a degree of resource exploitation that can no longer be sustained. It is now firm national policy that the soils, water supplies, and the plant and animal life of the country be protected, lest the ecological balance be further upset and the nation's welfare be thereby endangered.[4]

In order to protect these resources yet allow for the growth of one's society requires wise usage of the land. One of the landscape architect's roles that will become more demanding in the future will be to suggest and develop areas possessing unique recreational potential. He must be trained in the recognition of and in the method of planning for wise usage of the recreational resources. It will require an understanding of man involved in a symbiotic relationship with other animals in which each depends on the other and upon their natural environment for their needs.

In suggesting recreational areas he will be required to determine the region's needs and evaluate how adequate the ex-

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[3]Chermayeff and Alexander; Community and Privacy;P.45.

[4]Webber, Melvin M.;"Relations Between the Social-Physical Environment of Outdoor Recreation and Mental-Physical Health"; P. 248.

isting facilities are in fulfilling their purpose. After determining the needs, the amounts and quality of lands must be identified in relation to such things as accessibility, land usage, size of site, and site requirements. Finally, the design of such areas must be prepared in such a manner so as to assure the proper execution in fulfilling the recreational desires of the people.

The need for such recreational lands has been emphasized by Joseph Wood Krutch, as he wrote in Life magazine:

> We need some contact with the thing we sprang from. We need Nature at least as a part of the context of our lives. Without Nature,....., we are compelled to renounce an important part of our heritage.
> On some summer vacation or some country weekend we realize that what we are experiencing is more than merely a relief from the pressures of city life; that we have not merely escaped from something but also into something; that we have joined the greatest of all communities, which is not that of men alone but of everything which shares with us the great adventure of being alive.[5]

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[5]State of Wisconsin, Dept. of Resource Development; A Plan for Wisconsin; P. 70.

THE DEMAND FOR RECREATION

Need for Recreational Activity

W. G. Carnes, Head of the Department of Landscape Architecture at the University of Illinois, in "A Study of Recreation and Open Space in Illinois" defines recreation as many things. It is the

> refreshment of strength and spirits and satisfying diversion in the outdoors ... in many different ways ... through the contemplation of inspiring natural scenery; through insight into the geological and biological forces of nature; through visiting sites and seeing structures and objects associated with significant events in history and with cultures of prehistoric peoples; through activities such as picnicking, boating, skiing, and other outdoor sports; and through enjoyable community activities.[6]

Recreation is many different things to many different people. Yet what can be said with some certainty is that Americans enjoy the out-of-doors. The crowding of our parks, beaches, picnic sites, campgrounds, and other facilities is proof that recreation is an integral part in the lives of most Americans.

Recreation has not always been looked upon with favor in the United States. The colonialist felt that recreation was a wasteful use of time and energy. There was plenty of work to do if exercise was needed. Work in those days was vigorous and diversified; and there was not the need for recreation as there is today. Leisure was of little concern to the family

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[6]Lewis, Philip H.,Jr.;"A Study of Recreation and Open Space in Illinois"; Division of Landscape Architecture and the Bureau of Community Planning, University of Illinois, P. 9.

that worked their fields until after dark to assure themselves of food.

A great change has taken place since those embryotic days of our nation. The growth of our population, our cities, our economic gains, and other factors have changed the nature of the American Society, and magnified the importance of recreation in supplementing our leisure time.

Since World War II, the work week has been shortened, incomes increased, automobile ownership almost necessitated, and our communication systems expanded, all increasing our leisure time. These facotrs indicate demands for recreation are many, yet the greatest of these factors must surely be our wealth.

> Medium U.S. family income has approximately doubled since 1950, from $3,320 in 1950 to $6,570 in 1964. After adjustment in terms of 1957-1959 dollars, these incomes become $3,960 and $6,080 - an increase in purchasing power of 54%. Present trends show purchasing power per capita to about double each generation.
> Not only is the dollar volume expended for recreation growing rapidly, but it is increasing as a proportion of the personal consumption expenditures.
> Approximately sixty billion dollars were spent in the United States for recreation-tourism in 1964. A statistical series maintained by the United States Department of Commerce estimated total spending for selected recreational items at eleven point three billion dollars in 1950; this was 5.8 percent of the United States personal consumption expenditures. By 1964 it had increased to twenty-four and one-half billion dollars and 6.2 percent of the personal consumption expenditures.[7]

In most areas of the country the need for recreation has be-

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[7]Blank, Gunn, and Johnson, Johnson, and Roy,Inc.; "Guidelines for Tourism-Recreation in Michigan's Upper Peninsula"; November 1966; P. 18.

come a demand. The degree of industrialization and specialization of our society produces, according to the authors of The Theory of Play and Recreation, a monotony of repetition, a lack of opportunity for expression and sociability, and a strain from the quick tempo of today's industry.[8]

> Recreation is a fundamental and universal need. There is a striking similarity in the forms of recreation that man has used throughout history as an outlet for self- expression and personal development. Though this expression takes on a variety of forms, recreation is a common heritage among all people.[9]

It is especially important to provide recreation in or within easy access of our metropolitan areas where, according to the ORRRC, more than two-thirds of our nation now lives. In 1900 there were only 30% of the population living in urban areas, today there is 70%. This influx to our centers has produced higher and still rising standards of living, which in turn has resulted in a movement to the suburbs by the people in search of greater space and better living and working conditions. This movement to the suburbs has caused massive new problems. What had been at one time open space surrounding the city has been replaced with extensive suburbs which consume more and more of our hinterland for development. Thus the metropolitan areas are engulfing the small communities and our open country, running one into the other. These large concentrations of people are generating great demands on both

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[8]Sapora and Mitchell; The Theory of Play and Recreation; Page 208.

[9]Edsall and Hewitt;"Recreation and Open Space"; P.3.

non-recreational and recreational land usage.

> There is an unmistakeable note of urgency in the quiet crisis of American cities. We must act decisively - and soon - if we are to assert the people's right to clean air and water, to open space, to well designed urban areas, and to mental and physical health.[10]

We must place a higher premium on the correct-usage of our land to insure its proper usage not only for recreation but for industry, farming, and housing as well.

One of the greatest challenges facing planners in the future will be an attempt to define recreational needs and to provide recreation near areas of population concentration. Too often the case has been that land and water resources are available in areas of low population density and conversely the least amount of recreational facilities where the population is at its greates density.

The ORRRC has outlined a number of pertinent facts of recreation demand and supply:

1. Demand for outdoor recreation is growing and the demand for the future is becoming greater.
2. The type of recreation people desire in most cases is relatively easy to supply. This includes a path to walk along, a picnic area, and an attractive drive.
3. People want these things where they live, and the trend in living is in the metropolitan areas.
4. We have been failing to use land effectively. The physical supply of land and water for recreation is plentiful; yet due to the ownership, management, or location it is unavailable. [11]

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[10]Udall, Stewart L.; The Quiet Crisis; P. 184.

[11]ORRRC; "Outdoor Recreation for America"; January 1962; page 81.

Basis for Selection of Tri-County Region

The reasons for selecting the Tri-County as a study area for the evaluation of recreational facilities and the development of a recreational area were many. Some of the more significant reasons were the availability of information to facilitate the study: such as, a recent recreational inventory of the Region; recent USGS topographic mapping and up-to-date soil information provided by Dr. Whiteside, professor in the Soil Science Department of Michigan State University.
Another major reason for studying the Tri-County Region was the lack of recreational facilities within the Region brought to light and emphasized in interviews with Mr. W.C. Roman, executive director of the Tri-County Regional Planning Commission; Mr. James Wicks, landscape architect with the Recreational Resource Planning Division of the state of Michigan; and Mr. Allen Amsterburg, engineer in the U.S. Department of Agriculture studying water resources and watershed development in the Grand River Basin.

FACTORS INFLUENCING RECREATIONAL DEMANDS

Many factors have been shown which influence recreational demands for a region. In order to plan effectively for the future some inclination as to the demands of the people must be made prior to design. For example, it would be impractical to construct bicycle paths if only 1% of the residents knew how or cared to ride a bicycle. This is not to say that the 1% should be denied. Yet in all probability it would be better

to provide a type of facility that could be used by a greater percentage of the people. Thus it becomes necessary in providing recreational facilities for an area, to be concerned with details that provide information of the future needs of the Region. There are many factors that should be studied that reflect recreational trends of a region. Some of these recreational determinants used by the ORRRC in its report to the President in 1960 were:

1. Regional location
2. Place of residence
3. Vocation (Income, Vacation)
4. Education
5. Age

These factors when studied expressed some ideas as to the recreational trends and needs of our nation. For example, there are definite differences in recreational participation between young and old. The young are involved more in strenuous activities, while the latter are more interested in passive activities such as car-riding. The results of this research can be seen in Table III on page 12. Some caution must be assumed in the use of such information since only 3647 persons were interviewed to obtain the result of the survey. Can 3647 persons determine the primary recreational attitudes for a country of eighteen million people? Probably not. Yet the information can be used as an outline in examining a region to determine its recreational needs.

TABLE III

PERCENT OF PERSONS 12 YEARS AND OLDER
PARTICIPATING IN VARIOUS OUTDOOR RECREATIONAL ACTIVITIES

	United States		North Central	
	Percent	Rank	Percent	Rank
Picnics	53	1	58	1
Driving for Pleasure	52	2	58	1
Swimming	45	3	42	3
Sightseeing	42	4	47	2
Walking for Pleasure	33	5	29	6
Playing Outdoor Games	30	6	35	4
Fishing	29	7	33	5
Attending Outdoor Sports Events	24	8	28	7
Other Boating	22	9	27	8
Nature Walks	14	10	15	9
Bicycling	9	11	10	10
Attending Outdoor Concerts	9	11	11	9
Camping	8	12	7	11
Hiking	6	13	5	13
Horseback Riding	6	13	5	14
Hunting	3	15	2	16
Canoeing	2	16	3	15
Sailing	2	16	2	16

Source: U.S. Outdoor Recreation Resources Review Commission; Study Report 19, National Recreation Survey, Washington: U.S. Government Printing Office, 1962; P. 120 Table 1.01.

Outdoor Recreation Demand; Volume 1: Methods and Models; Technical Report No. 6, June 1966; Milstein and Reid; Page 5.6.

Regional Location

Effects of climate, resource availability, population demand, cultural background of the people, and other factors all form attitudes toward recreational activities.

Physical Setting: The Tri-County Region is made up of Ingham, Eaton, and Clinton Counties as shown in Figure I on page 14. Together they comprise over 1500 square miles with a population of approximately 339,900 in 1965 and an estimated population in 1980 of 489,200.[12] The highest concentration of people is found in the City of Lansing which has a population of over 65,000. The region is expanding rapidly due to the influence of the state capitol complex with its offices, and employees; manufacturing oriented toward the motor vehicle industry; and Michigan State University.

The Tri-County is located in the South Central portion of the state and bisected by National Interstate Highway 96 and U.S. Highway 27. Large urban areas surrounding this region are: Detroit - approximately 75 miles to the S.E. of Lansing

Flint - approximately 30 miles to the N.E. of Lansing

Jackson - approximately 30 miles to the S. of Lansing

Kalamazoo - approximately 65 miles to the S.W. of Lansing

Grand Rapids - approximately 55 miles to the N.W. of Lansing.

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[12] Tri-County Regional Planning Commission; Population Data compiled April 1966.

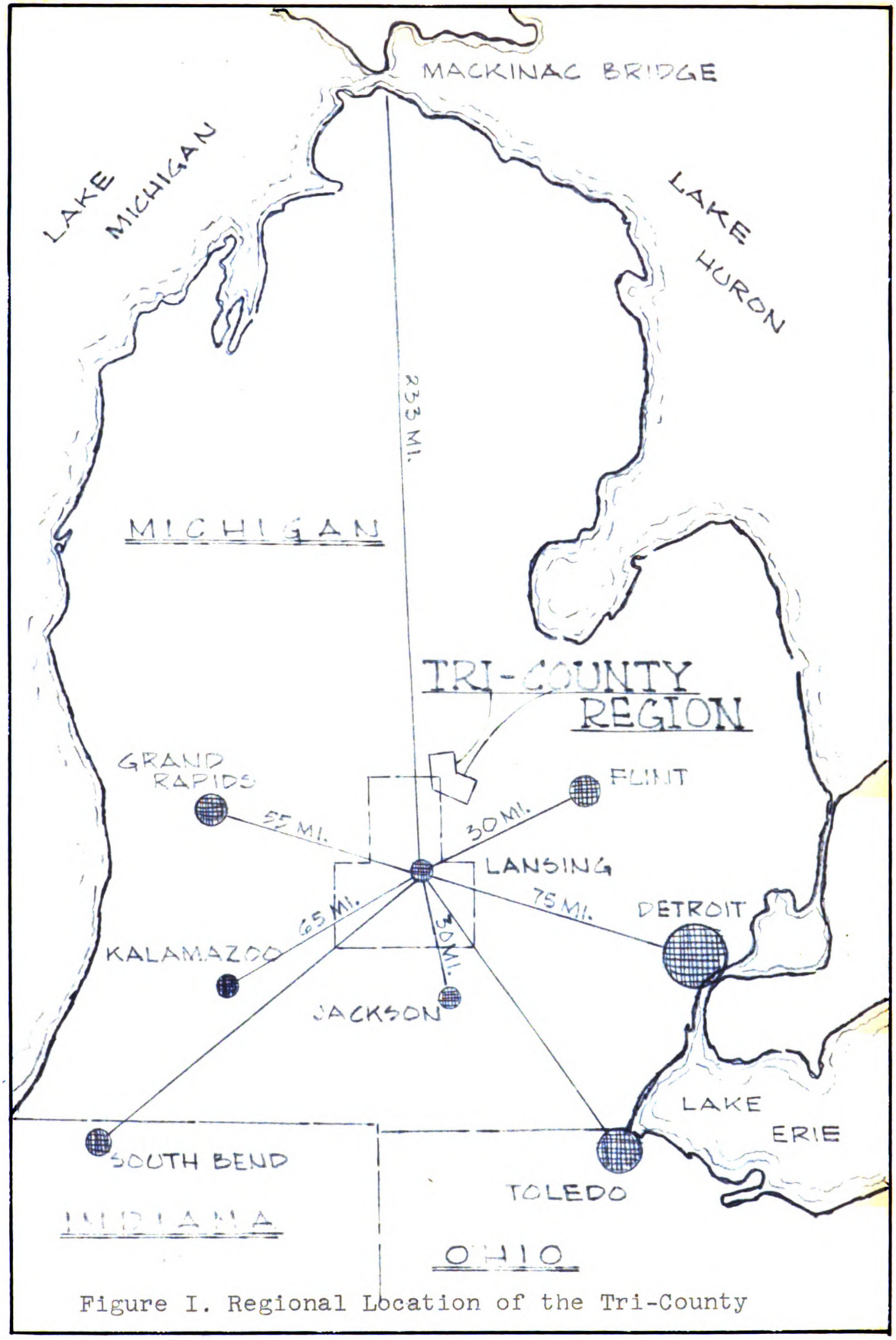

Figure I. Regional Location of the Tri-County

Physiography: The Tri-County Region has been formed through two major events in geologic history. During the Paleozoic Era (200-300 million years ago) which resulted in the lower peninsula of Michigan becoming a great structural basin creating several hundred feet of sedimentary layers consisting of limestone, sandstone, and shale. The second series of events took place about one million years ago during the Pleistocene Period. It consisted of four glaciers, the last of which, Saginaw Lake of the Wisconsin Glacier having the greatest effect. Water from the melting glaciers became rivers, eroding glacial drainage channels forming valleys; depressions left by the glaciers formed the lakes and concentrated deposits of sand and gravels.

Topography: Very few areas within the Region have slopes of more than 10 percent. In fact 80% to 90% of the Tri-County area have less than a 5 percent slope. The highest point of elevation is 1052 feet above sea level, located in Leslie Township, and the lowest elevation is 640 feet above sea level, located in Clinton County. Local relief is restricted to those areas having particular glacial features such as eskers, moraines, and kames. Relief can also be found along river banks and in areas where man has excavated for minerals or has stockpiled materials - soil or waste material.[13]

Soils: Seventy-five percent of the Tri-County Region is in a medium high fertility range. This along with a moderate

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[13]Tri-County Regional Planning Commission; "Physical Development Factors"; Pages 5-6.

climate and rainfall were responsible for the high productivity of the loamy soils. Many of the more productive regions within the area are being engulfed or isolated by the expanding urban development. How serious this is, is unknown. With expanding technology in farming and with a greater knowledge of soil productivity, the farmer is increasing his output and is unable to forecast his future needs with any degree of accuracy.[14]

Historical Development: The first permanent farm settlements in Clinton, Ingham, and Eaton Counties were established in the early 1800's, predominantly by farmers who migrated from the state of New York, and later farmers from Pennsylvania, Ohio, and the New England states.

A flourishing fur trade was established by the first settlers, and the word of low-land prices brought a rapid and steady growth in population. Later settlers farmed small clearings in the densely forested area on a subsistence basis. The increase in land farmed was rapid up to the early 1900's as the virgin forests were cut to make way for agriculture.

The first settlers were intent upon farming; and the forest cover was considered a hindrance. The land was cleared of the trees and much of the lumber wasted. Lumber that was milled, soon exhausted the pine supply by 1925.

On January 26, 1837, Michigan was admitted to the Union as

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[14]Tri-County Regional Planning Commission; "Physical Development Factors"; Page 10.

the 26th state. In 1847 the state capitol was located in Lansing, and by 1863 it was a bustling urbanized center. Since then the Tri-County and especially the Lansing area has experienced rapid growth both in industry and population.

Climatological Data: The climate of the Tri-County Region alternates between continental and semi-marine. When there is little or no wind, the weather becomes continental in character, which means pronounced fluctuation in temperature. This results in temperature extremes, being hot in the summer months and severe in the winter months. A semi-marine climate will develop if a strong wind comes in from across the Lakes. This results in milder winters and cooler springs. The average length of the growing season is 154 days. Precipitation is distributed fairly well throughout the year. The wettest months of the year are May and June. Snowfall for the Region is 45.2 inches, light compared to the average snowfall of 115-130 inches along the northside of the Upper Peninsula. The average number of days with appreciable rain throughout the year is 137, or a little more than one day in three. There are almost twice as many cloudy days as clear days throughout the year. Much cloudiness prevails during the winter season, but sunshine is abundant during the summer months. Similarly, relative humidity remains rather high during the winter, but is only moderate in summer.
Tornadoes sometimes occur in this area, but their frequency is less than in states farther to the south and west. Destructive thunder and wind storms are not uncommon. Flooding

of streams and rivers in the Upper Grand Basin occurs in about one year out of three, with floods causing considerable damage in about one year out of ten.[15]

Place of Residence

The degree of urbanization varies across the United States and appears to be an important determinant of outdoor recreation. The trend seems to be toward..."urbanization, decreases in farmland and scatterization of residential and other urban land uses over the rural landscape...".[16] According to the Department of Conservation 87% of the people live in the southern third of the state.

Of the 298,949 people residing in the Tri-County Region, 47.6 percent are considered urban and another 34.7 percent are rural non-farm according to the Bureau of Census.[17] In planning outdoor recreation for the Tri-County, the major emphasis must be on serving an expanding population which is concentrated in relatively small areas within the Region. Figure II on page 19 shows schematically the growth that has occured in the urban areas of Clinton, Eaton, and Ingham Counties between 1920 and 1960.

The ORRRC has found a number of activities that are more

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[15]U.S. Dept. of Commerce; "Local Climatological Data"; Lansing, Michigan; Annual Summary With Comparative Data, 1966.

[16]Dept. of Conservation;"Michigan's Recreation Future"; September 1966' Page 5.

[17]U.S. Dept. of Commerce;Bureau of Census; 1960 Census, Michigan; 24-A Number of Inhabitants; P. 24-16.

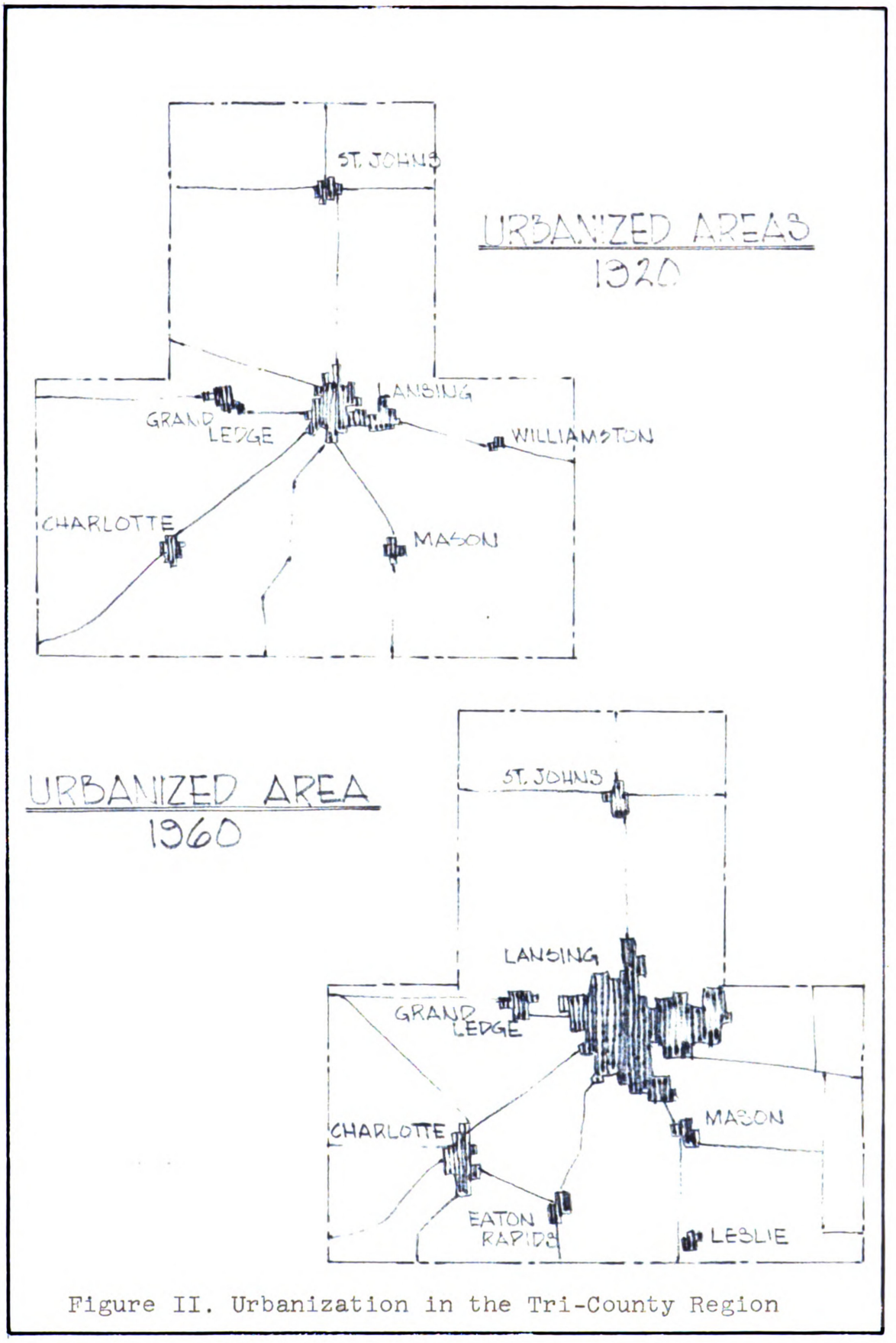

Figure II. Urbanization in the Tri-County Region

actively engaged in by the urbanites such as driving for pleasure, picnicking, and particularly swimming. Whereas the outlying areas participate more in those activities that require roughing it - camping, fishing, and hunting being a number of their favorites. Since the Tri-County Region has both high percentages living in urban and suburban areas, the Table IV on page 21, compiled from ORRRC information shows the activities participated in by these groups at least once during the year.

Vocation

One's occupation (Table V, page 22) is shown to relate to the degree of one's participation in recreational activities. Professional, technical, and kindred workers, according to the ORRRC, have 36.7 activity days per person; managers, officials, and proprietors having 24.4; clerical and sales workers 32.8 activity days. This white collar group represents 48 percent or 53,115 of the Tri-County workers. The white collar group is among the highest paid and has the greatest amount of paid vacation. This group has an average of 31.3 activity days per year whereas the total average days for employed persons in the United States was given at 28.2 activity days per year.

The blue collar workers are the second largest group of workers within the Tri-County with 36 percent of the labor force or 39,297 workers. These include craftsmen, foremen, and kindred workers with 30.0 activity days per year and operators and laborers with 27.0 average activity days per year.

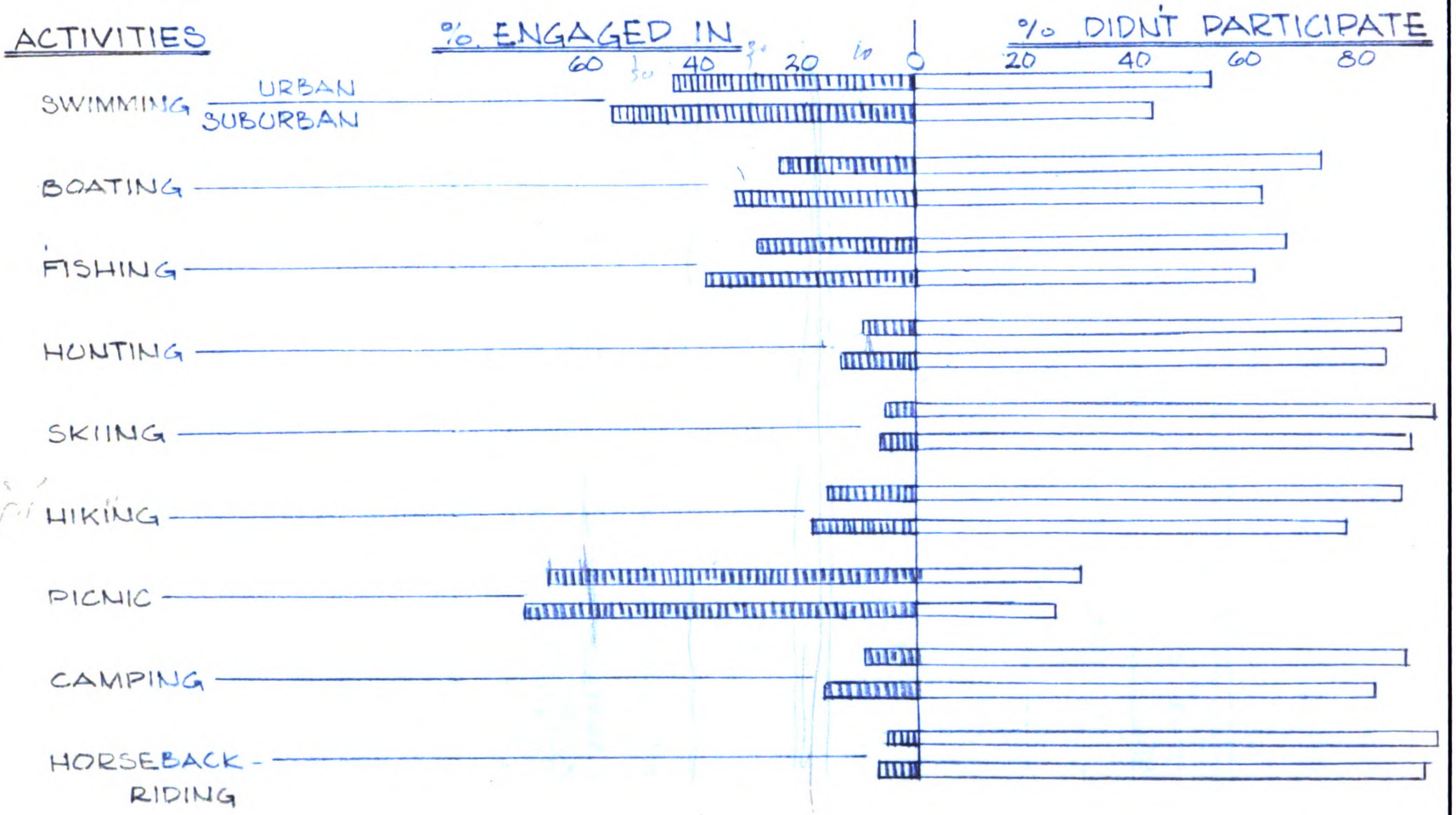

Figure IV. Urban and Suburban Activity Participation Percentages

TABLE V

RELATIONSHIP OF VOCATION TO
ACTIVITY PARTICIPATION

Tri-County Workers	Number	Percent	Activity Days per year
WHITE COLLAR WORKER Professional, Technical and kindred workers; managers, officials, and proprietors; Sales workers and clerical workers.	53,115	48%	31.3
BLUE COLLAR WORKER Craftsmen, foremen, and kindred workers; operators, laborers, and kindred workers.	39,297	36%	28.5
SERVICE WORKERS	13,038	4%	

Source: Tri-County Regional Planning Commission.

A Report to the President and to the Congress by the Outdoor Recreation Resources Review Commission; Outdoor Recreation for America; January 1962; Page 41, Table on Occupation.

If a person has a short or no vacation, he tends to be a low participator. The ORRRC studies have shown that as one's vacation increases so does his leisure activity. The average number of hours worked per week in 1850 were 70, while in 1960 it had dropped to 40. The eight hour day, five day week is almost standard. This along with the many time and labor saving devices now used in both our homes and at our jobs has had a great effect in the rise of outdoor recreation.

> The future prospect is for shorter working days and weeks, and for longer and more widespread paid vacations. A reasonable estimate for the year 2000 may well be an average work week of about 28 hours.[18]

Income: Income has an effect on participation. The ORRRC report shows a tendency for participation in recreational activities to rise from the lower incomes of index $3,000 to the $7,500 - $10,000 income groups for all activities except hunting, horseback riding, and fishing. The other activities surveyed - swimming, boating, skiing, hiking, nature and bird walks, picnics, camping, and automobile riding - all showed some change and increased participation as incomes rose. Some activities such as boating and skiing require a good deal of both time and expense, and it becomes evident that these sports are for those in the higher income bracket. Those activities that require little or no expense such as hiking and picnicking are participated in more frequently by those in lower income brackets. According to the Tri-County

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[18]Clawson, Marion; Land and Water for Recreation - Opportunities, Problems, and Policies; Rand McNally and Co., Chicago, 1963; Page 5.

Outdoor Recreation Inventory published in 1962, the average income per family has increased sharply within the area. From 1950 through 1958, it rose from $4,820 to $6,340.[19]

Education

Education has shown itself to be an influencing factor in activity participation; those having higher educational backgrounds being the more active participants. The one exception is that high school graduates are more active than college graduates. The ORRRC report is somewhat difficult to interpret since the lower educated groups tend to be older and not able to participate in physical activities. In the Tri-County Region, Ingham County has one of the highest number of median years of school completed by a person 25 or over in 1960. This average for Ingham County is 12.2 years, while Clinton and Eaton Counties have 10 and 11 years, respectively.

Age

Age has the greatest effect on recreation of any of the other variables. The older people become, the less active they become in outdoor activities. It is a progressive relationship, each age group participates less than the next youngest age group. The decline is most evident in those activites that require the greatest expenditure of energy such as camping, horseback riding, and skiing. Picnicking, pleasure driving, hiking, and fishing are actively partici-

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[19]Tri-County Regional Planning Commission; "Outdoor Recreation - An Inventory"; January 1962; P. 2.

pated in until the age of 40 and 50's. The relationship of age to participation in specific activities can be associated with physical abilities, and advancing age is one of the greatest barriers to outdoor recreational activity. Under age 25, participation in all activities is high. As one becomes older, activities taper off. Participation for the residents of Tri-County Region would certainly include swimming, boating, canoeing, driving, picnicking, and fishing as indicated in Table VI on page 26.

SUMMARY

Factors Creating Recreational Demands

The Tri-County Region is expecting an increase in population to 443,558 by 1980. This increase will continue to add to the urban and suburban areas. Predictions set forth by the Michigan Department of Conservation forecast that by 1980 there will be one-third less land in farms, and half again as much urban and suburban land. These groups have some recreational similarities, such as, swimming, boating and canoeing, fishing, driving and sightseeing, and picnicking.

Leisure time is increasing, the trends are for people to start work later in life and to retire earlier.

> A study, sponsored by the Senate Select Committees on National Water Resources, projects that leisure time will rise to nearly 75 hours per week in 1970 and 85 hours per week in the year 2000. This compares to about 72 hours per week in 1959.[20]

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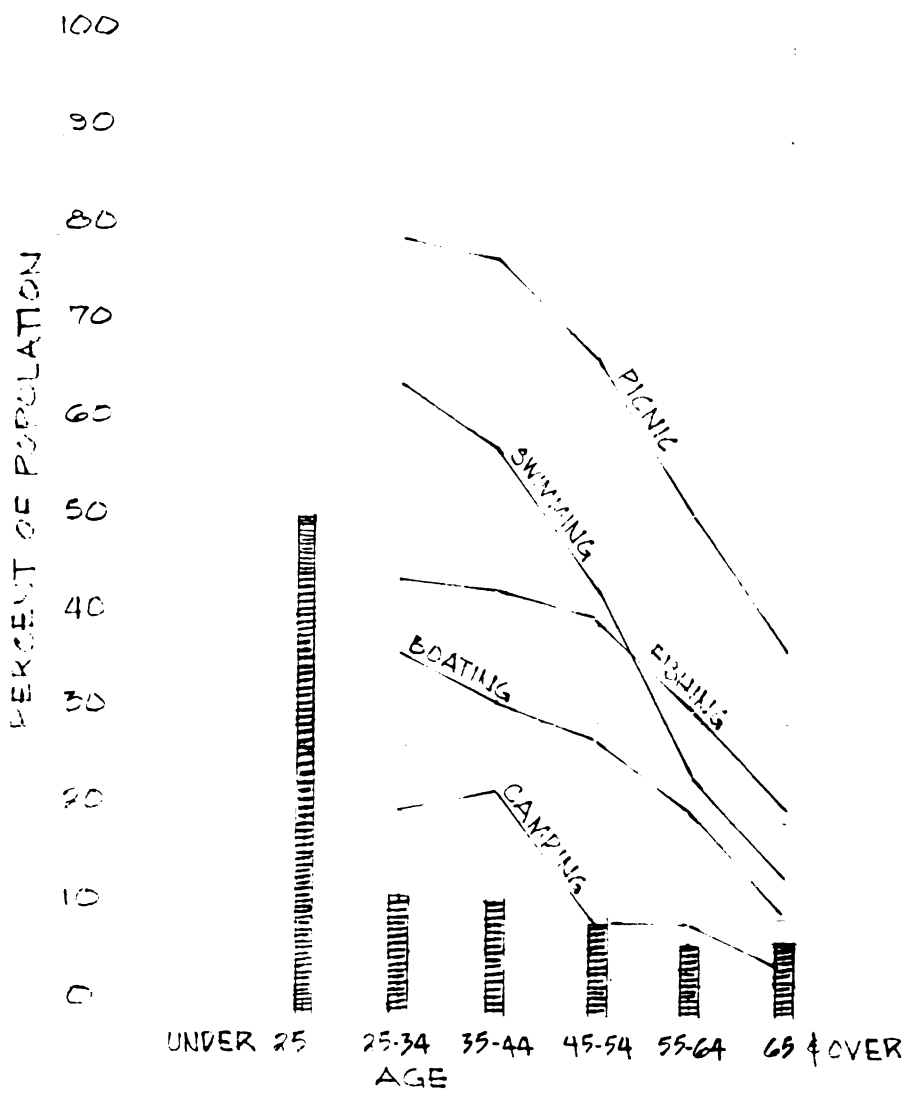
100
90
80
70
60
50
40
30
20
10
0
PERCENT OF POPULATION
PICNIC
SWIMMING
BOATING
FISHING
CAMPING
UNDER 25
25-34
35-44
45-54
55-64
65 & OVER
AGE
% OF AGE DISTRIBUTION IN TRI-COUNTY REGION
RELATIONSHIP BETWEEN AGE AND PARTICIPATION IN ACTIVITIES

FIGURE VI.

The Tri-County Region has 48 percent white collar workers who have an average of 31.3 activity days per year. Compared to the national average of 28.2 activity days per year, this group has the greatest opportunity for leisure.

Only 14 percent of the families within the Tri-County Region earn less than $3,000 and the median income for the Region is $6,340 as shown in Table VII. Table VII shows the relationship between the national average per person of activity days per year to the percentage of families making a certain income. Again as shown with vocations, a relatively high number of activity days are evidenced within the Tri-County Region.

TABLE VII

ACTIVITY DAYS BASED ON INCOME

Income Data	National activity Days/Person	Tri-County % Families	Tri-County No.People
Less than $3,000	18.5 days	14%	10,549
$3,000 - 4,499	33.5	19	13,520
$4,500 - 5,999	33.3	15	11,021
$6,000 - 7,999	40.5	22	16,108
$8,000 - 9,999	42.4	14	10,078
$10,000 - 14,999	44.2	12	8,746
$15,000 and over	49.7	3	2,406

Source: Outdoor Recreation Resources Review Commission; "Outdoor Recreation for America"; January 1962; P. 96.

Tri-County Regional Planning Commission; Population Data and Incme Data Compiled April 1966.

The forecast for 1980 places this at over $10,000 for the median income for the Tri-County Region. This expected higher income will allow families to spend more of their time

and money for recreational purposes.

Education has increased from a state-wide average of 8.8 years of schooling in 1940 to approximately 11 year average for the Tri-County Region. Thus students have more opportunity to receive training and education through school programs.

The median age for the Tri-County Region is between 26-28 years and is relatively an active age. These factors are combining to assure a great demand for recreation. People desire to undertake such day use activities as swimming, picnicking, fishing, camping, etc. It is, therefore, with some degree of accuracy that we can assume the ORRRC's ranking for the North Central states as shown in Table III on page 12.

Deterrents to Desired Recreational Participation

There are three major deterrents to desired recreational participation - lack of time, lack of money, and a lack of facilities. The lack of time is the greatest deterrent to desired recreational participation. Yet with the increased affluence, shorter working hours, spread of automobile ownership, and the decreasing physical effort required on the job, recreation is supplementing much of one's increasing leisure time. Lack of money, also a deterrent, seems to be a minor one within the Tri-County Region where the median income is over $6,000 and expected to reach $10,000 by 1980. However, even picnicking, swimming, sightseeing, and relaxation are activities that can be participated in with relatively little expense. Finally, the third deterrent appears to be lack of facilities, which will be examined in greater detail in Chapter III.

CHAPTER II

JUSTIFICATION OF SITE SELECTION

Expansion Patterns for Metropolitan Areas

In order to propose a site or sites suitable to supplement the recreational needs of the Tri-County Region, an overall plan is developed to ensure that the open spaces have some relationship to the population and that the spaces are organized to provide a continuous flow between them.

The expansion of the Tri-County Region has been examined by the Battelle Memorial Institute in their study of "Alternative Long Range Water Use Plans" for the Tri-County Region. From this study "regional economists have noted that most metropolitan areas grow according to one of three general patterns."[1]

1. Planned Sprawl
2. Satellite Cities
3. Corridor Pattern

Planned Sprawl: The "Planned Sprawl" postulates that the greatest economic and population growth would take place in a ten township county area surrounding Lansing, with relatively little growth in the surrounding area.

Satellite Cities postulate that any further economic and population growth is to take place in communities surrounding Lansing and that the present urban core would remain, with little if any growth.

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[1]Battelle Memorial Institute; A Summary of "Alternative Long Range Water Use Plans"; P. 6.

Corridor Pattern: This "Corridor Pattern" plan fosters growth in the future to be along major transportation routes connecting our major urban areas.

It is impossible to predict accurately just where people will locate or where industry will build. The Tri-County Regional Planning Commission does expect 50 square miles of additional urbanization by 1985. The formulation of a plan for open space development which would provide recreational lands regardless of which pattern develops would be desirable.

Open Space System

Land Values: To develop recreational lands near populated areas requires wise scrutinization of soil types and the evaluation of land values. Those soils which possess a structure favorable to building or the fertility need for farming may be poor choices for recreational land. It is difficult to propose lands for recreation that are desirable for building in urban expansion and industry or needed for farming,, since recreation land removes money from the tax roles whereas building and farming increase the tax values of land.

Environmental Corridor System: Thus it would be desirable to develop a type of open space plan on those lands that are not suited or needed for urban expansion and farming; and that could bring together the already existing major open space areas. This suggests a system based on land surfaces that are only encourageable to recreational uses. Such an open space pattern is the environmental corridor system. It

is based on such natural elements as steep topography, a low-land surface that may either be water, swamp land, or an area subject to flooding. Phil Lewis, in "Recreation and Open Space in Illinois", found of the corridor plan "...that the quality resource which is necessary for recreation, tourism, and open space does lie within this unique linear pattern."[2]

> In landscape resource ananysis at the University of Wisconsin, land forms have been shown to be a sound indicator of quality recreation resources. Working with slope and water combinations, Lewis was able to block out corridors and nodes of quality. More than 80% of 200 identifiable resources such as key wildlife habitat, waterfalls, and historic sites fell within the corridors and nodes.[3]

These lands, due to their bottom land locations, steep topography, and water surfaces are undesirable for building, farming, or any intensive development, making them ideal for recreational usage. Rims along the corridor provide stable areas for road construction and are valuable for their viewing potential. The steep slopes provide the interesting topography lacking in the Tri-County Region, and are ideal for hiking and exploring. The surface areas (water, wet-lands, and flood plains) along the bottom lands add contrast and provide a close contact with nature. The elevation as shown in Figure III on page 32 shows such a corridor. The corridor is limited in width by the natural terrain or existing devel-

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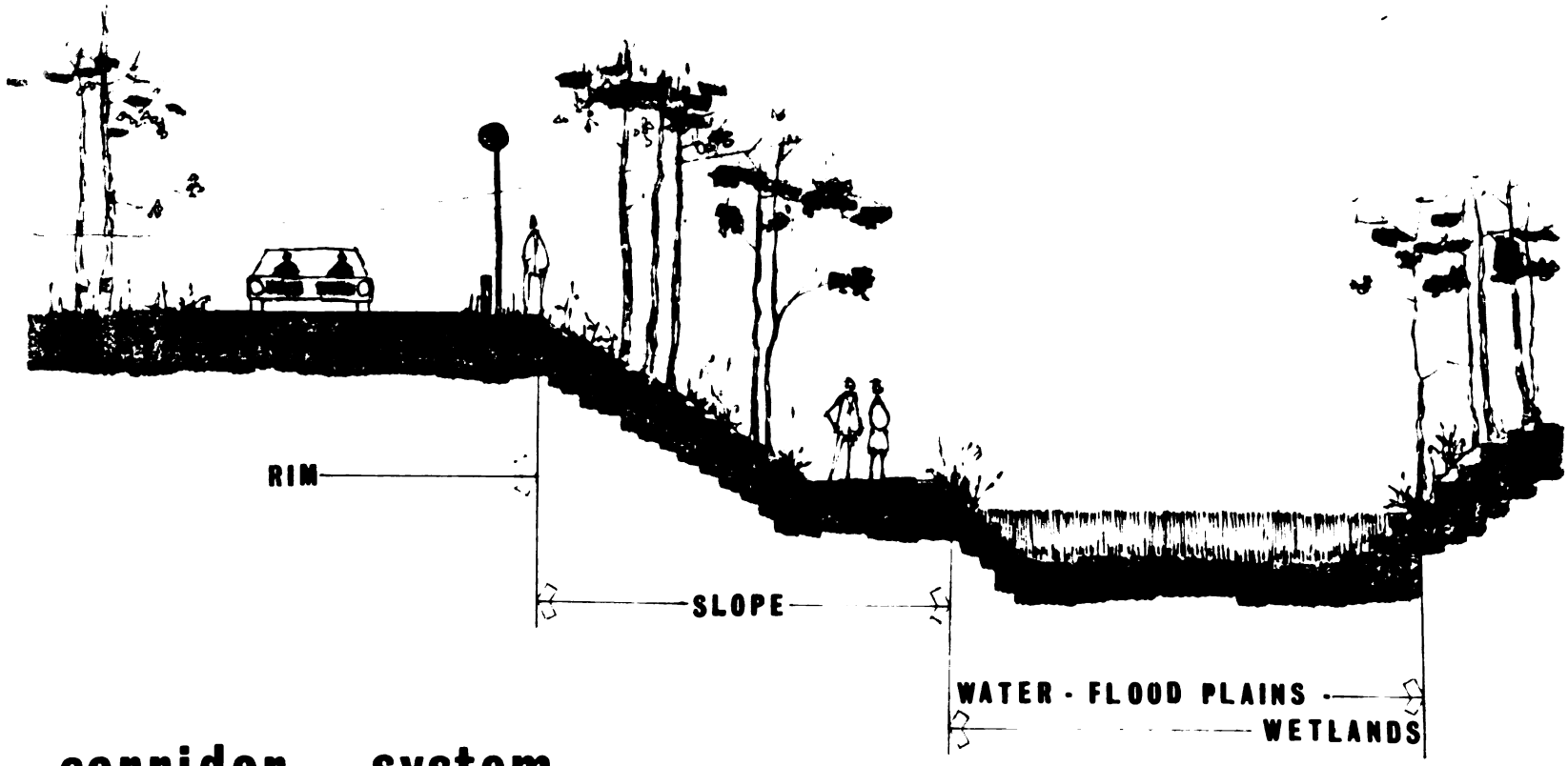
[2]Lewis, P.H.,Jr.; "Recreation and Open Space in Illinois"; Page 63.

[3]Hart and Graham; "How to Rate and Rank a Landscape"; Landscape Architecture Quarterly; January 1967; Page 122.



corridor system -

MAJOR PHYSIOGRAPHIC ELEMENTS

Figure III.

opments along it and in length only by one's imagination, since it may go from the largest river to the smallest tributary feeding that river. Historic areas should be developed along the corridors to provide interest for the tourist and pride in Michigan's past heritage. Along many of Michigan's streams, rivers, and lakes can be found artifacts of the Indians, trappers, and early settlers. They located here due to the abundance of wildlife and because water was the major means of transportation. Thus, water patterns - rivers and streams, flood plains and wet-lands, and steep topography over 10 percent slope - are lands which are the least productive, provide the best scenery, have potential for recreational development, and are the least expensive to obtain. Most of Michigan's cities are located close to water, also because the water was needed for transportation. In fact, no point in Michigan is more than six miles from a lake or stream.[4] It is no mystery why the Indians named this land Michigan - meaning "Great Water".

Thus by developing a corridor system, one could link Michigan's cities together with linear belts of recreational lands. The environmental corridors can become a basic resource unit for recreational planning including within it both intrinsic and extrinsic values of the landscape.

The inventory and mapping of environmental corridors encourages planning for the total environmental develop-

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[4]Michigan Department of Commerce; Travel Brochure;

> ment, rather than for piecemeal and perhaps haphazard development of a picnic table here and an observation point there.[5]

Water Resources and Watershed Areas: The United States Department of Agriculture has published a review draft of a Grand River Basin study.

> This report presents a plan for the future development of agriculture water and related land resources and the potential for solving other water problems and meeting projected needs through programs and projects in the Grand River Basin. This basin, located in lower Michigan, consists of approximately 5,560 square miles or 9.8% of the state. The Grand River outlets into Lake Michigan as a port of the Great Lakes and the St. Lawrence Drainage Basin.[6]

One of the major objectives of this study was to identify watershed areas, locate potential dam sites, and evaluate their potential for flood prevention and possibilities for water storage that might be usable for recreation. The corridor system, following the drainage pattern and the relation of watershed impoundment sites within the open space plan is shown in Figure IV on page 35. A list of watershed impoundment areas by county of the Tri-County Region is given in Table VIII on page 36.

A watershed as defined by Webster's New World Dictionary is the area drained by a river or river system. In order to lo-

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[5]Dept. of Resource Development, State of Wisconsin; "Recreation in Wisconsin"; Page 177.

[6]U.S. Dept. of Agriculture; Comprehensive Water Resources Study, Grand River Basin, Michigan - Appendix M - Agriculture, Review Draft; April 1967; P. 1.

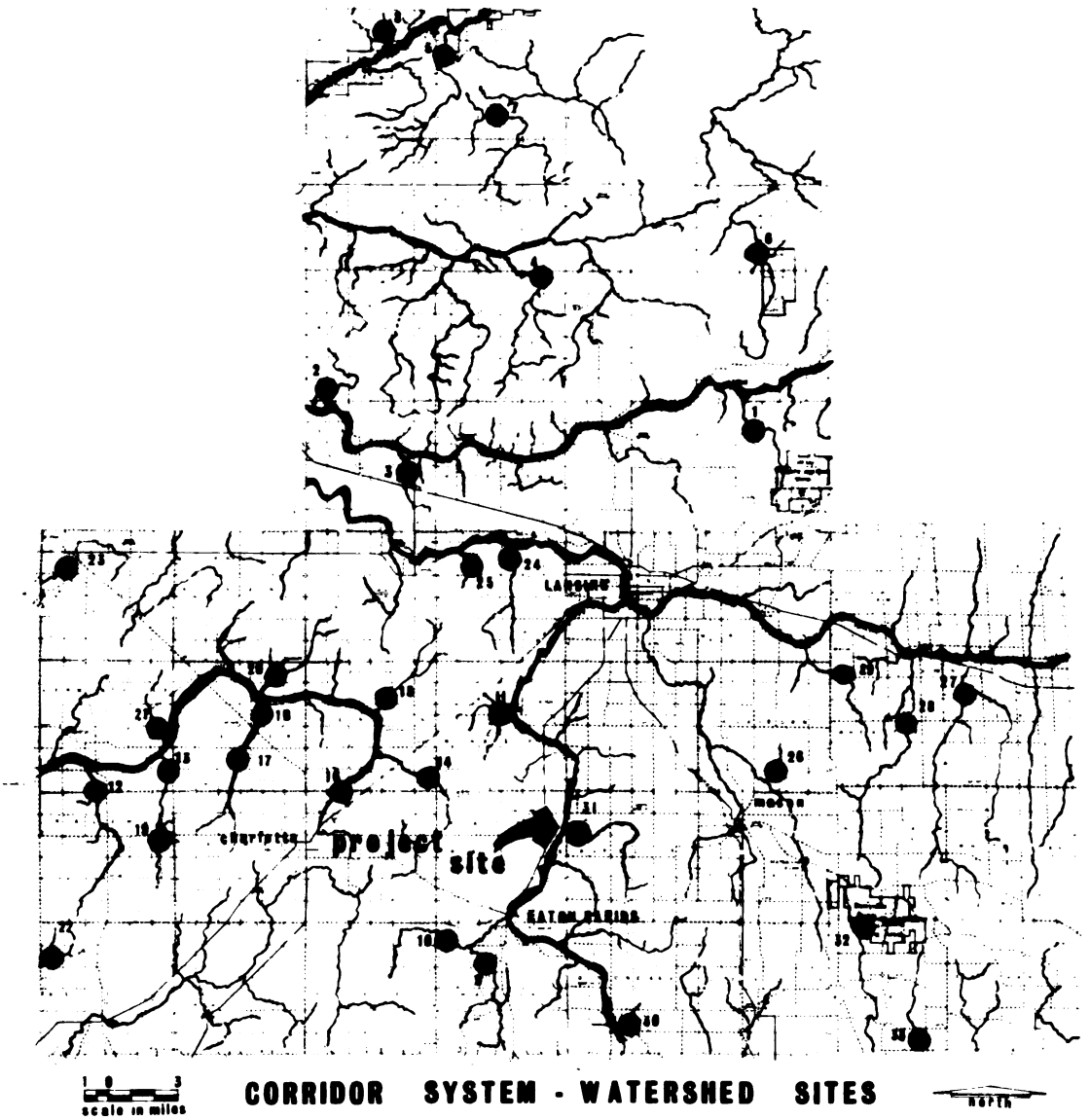
project site
CORRIDOR SYSTEM - WATERSHED SITES
scale in miles
north

Figure IV.

TABLE VIII

DATA FOR POTENTIAL RESERVOIR SITES

County	River	Map Number	Drainage Area, Square Miles	Drainage Area, Acres
Clinton				
	Lookingglass River Sub-Basin			
		1	3.7	2,390
		2	5.5	3,550
		3	9.8	6,326
	Stony Creek Sub-Basin			
		4	20.1	12,873
	Maple River Sub-Basin			
		5	82.8	53,000
		6	11.1	7,135
		7	5.3	3,421
		8	10.0	6,400
Eaton				
	Upper Grand River Sub-Basin			
		9	3.1	2,000
		10	3.7	2,370
		11	4.0	2,540
	Thornapple River Sub-Basin			
		12	13.0	8,320
		13	24.0	15,360
		14	15.6	9,973
		15	71.7	45,930
		16	3.4	2,170
		17	23.5	15,056
		18	28.8	18,400
		19	11.2	7,208
		20	9.1	5,842
		21	6.8	4,360
		22	4.5	2,930
		23	3.8	2,451
	Middle Grand River Sub-Basin			
		24	10.9	6,945
		25	6.8	4,350
Ingham				
	Red Cedar River Sub-Basin			
		26	32.0	20,480
		27	32.5	20,796
		28	26.7	17,051
		29	21.9	13,974

TABLE VIII (continued)

County	River	Map Number	Drainage Area Square Miles	Acres
Ingham(con't.)				
	Upper Grand River Sub-Basin			
		30	3.2	2,050
		31	14.8	9,477
	Portage River Sub-Basin			
		32	8.2	5,200
		33	18.2	11,330

Source: U.S. Department of Agriculture, Economic Research Service, Forest Service, Soil Conservation Service; Comprehensive Water Resources Study, Grand River Basin, Michigan - Appendix M - Agriculture, Review Draft; April 1967; Pages 129-131.

cate its boundaries requires the defining of all those areas that are contributing drainage water to it. A ridge or a stretch of high land usually divides those areas drained by different rivers or river systems.

> The strategic importance of water resources as a man-nature problem now and as a critical factor in future development raises to new prominence the watershed region. A watershed is the land area unified by a surface drainage system. It is well known that in the arid western sections of the United States, the availability of water determines land values and land use. There is now an awakening realization that the once adequate water resources of the eastern states are in many areas no longer adequate, without further development, to meet the needs of the future. Solutions to present problems and development of additional water resources require that the watershed be studied as an entity susceptible to coordinated design along with the overlying socio-economic regions in a unified framework.
>
> A significant legal, economic, and biological community of interest is created through the unifying character of surface water. It is the same run-off water that passes each section of the watershed and any changes in quantity or quality are the result of the use patterns and regulation throughout the watershed.
>
> In this framework, land and water emerge as closely related resources. Most human activities involve the use of both land and water resources with varying effects. Water resources and land resources can no longer be meaningfully analyzed or developed in isolation from each other. Because water resources are more limited than land resources, watershed factors and water use decisions will play a leading role in determining future environmental health conditions and the most feasible settlement patterns.[7]

Earlier civilizations realized the value of their water re-

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[7]Farness, Sanford S.; "Man-Environment Problems in an Urban Age and the Role of Universities"; (unpublished paper, School of Urban Planning and Landscape Architecture, Michigan State University, 1963) Page 11.

sources.Dams, although primitive in construction, were used to impound water for periods in the year when there would be no water. People learned to dig ditches in order to supply dry inland areas with water for crops. Water was an important means of transportation both for people and goods, and was essential in sustaining life by providing drinking water and food.

As the nation developed, new and faster means of transportation became available. Water was still important especially with industry and water began to transport the waste products, polluting the rivers. Farmers began clearing their lands carelessly, allowing water to runoff faster and in greater quantities. Cover crops, woodlands, and contour farming are all necessary in order to lessen runoff.

The river channels became wider as the rivers were swollen by the additional runoff and finally the inevitable floods came, destroying lives and property. This often becomes the incentive for action. Both the Corps of Engineers and Department of Agriculture are developing watershed areas to prevent flooding. The Corps of Engineers is responsible for the construction of large dams, building of levees, and the improving of stream channels downstream. The Department of Agriculture is concerned more with the prevention of flooding in the upstream tributaries.

Conservationists have urged that small, rather than large, watersheds be considered in watershed manage-

> ment. They believe that, first, important work must be done in the headwaters of streams in order to make the construction of reservoirs downstream as effective as possible in water resource management.[8]

Mr. Allen Amsterburg, an engineer with the U.S. Department of Agriculture in East Lansing studying the Grand River Basin, believes that a large percentage of all agricultural flood damage occurs on the watersheds of the smaller tributaries rather than along the banks of the big stream. The typical flood has already done most of its damage before it reaches a downstream city.

The watershed contains much more than a drainage area. It includes the soil, forest, grass, crops, wildlife, and in some cases it includes cities, towns, and people. What happens in the smaller watersheds upstream has a great effect on the water downstream. If water is allowed to runoff uncontrolled upstream, it may cause downstream flooding. Soil runoff upstream means muddy water in the rivers, which is undesirable both for fish and recreation purposes. Wildlife need water, food, and cover to survive. With careful planning one can assure the continuence of existing wildlife or provide a more desirable habitat for them, through correct conservation methods.

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[8]The Report of the President's Water Resources Policy Commission; "A Water Policy for the American People"; Washington, D.C.: 1950; Page 125.

Open Space Goals: These watershed areas would be incorporated into the previously discussed Corridor System. Since these watershed impoundments are scattered throughout the Region, their development as recreational nodes in the corridor system should provide adequate open space, including quality recreational water.

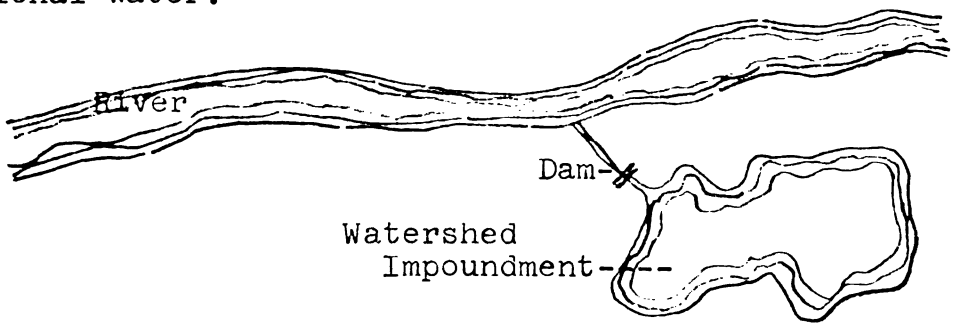

FIGURE V. Typical recreational node in relation to corridor open space plan.

In addition to providing areas of recreation, this open space plan, by developing and including watershed impoundments, would have as some of its goals:

1. Help prevent flood danger.
2. Conserve forest lands and wildlife.
3. Protect existing and future water supply reservoir sites.
4. Help reduce soil erosion and silting of reservoirs.
5. Preserve needed drainage ways.
6. Provide breaks in the urban sprawl taking place in our metropolitan areas.
7. Promote community identity, character, pride, and values such as preservation of historical sites.[9]

Problems in Recreational Usage of Watershed Areas: If these watershed areas designated primarily for flood prevention

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[9]Bowdy, W.W.; The Review of an Approach Determining Land Suitability for Regional Recreation and Open Space; Thesis for degree of M.U.P., Michigan State University, 1964; Page 53.

could be used for multiple purposes, this would increase their value. This has been suggested in the recreational development of such sites. Recreational usage of watershed areas conflicts to some degree with flood prevention.

Reservoir Fluctuation: For flood control the impoundment site requires an area with sufficient surface to receive water from the melting snows during the early spring and to store water from heavy rainstorms during the summer.

This requires the individual study of each watershed area. It is possible to assign a number of watershed areas primarily as recreation impoundments and designate other impoundments for flood prevention. It is also possible to design with the increase flood water in mind: by providing a dam and impoundment site large enough to hold the additional water and release it during the dry summers to supplement the flow of the river at its low period. Facilities must be situated above the expected flood design stage.

Peripheral Development of the watershed impoundment site must be carefully controlled to protect against indiscriminate development along the water which may cause pollution and erosion problems.

> There are many examples.....of reservoir sites being abandoned or altered because of the creation and expansion of intensive land uses within the reservoir area.[10]

This requires control over the immediate area surrounding

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[10]Olson, George T.; "Preservation of Reservoir Sites"; P.6.

the impoundment area but also those areas upstream that could contribute pollutents or excessive sediments to contributing streams.

Summarization

Three types of urban expansion for the region were examined and an open space plan, "the corridor system", proposed. The basis of accepting such a plan was the need for water-oriented recreational lands that didnot conflict with urbanization nor the use of good farm land. The corridor system could provide the much needed water resource for this region. In addition it would be developed along lands that would require extensive development if they were to be used for urbanization or farming due to fluctuations in water levels. The plan would act as a nucleus for an open space plan that would not rule inland lands that have recreational potential out.

Watershed areas within the Region proposed for flood control by the Department of Agriculture should be evaluated for their recreational usage.

> Recreation opportunity, both present and potential, should be considered throughout the planning of water resource programs and be evaluated fully in all decisions to construct water resource projects. In densely populated areas and in regions where natural water recreation opportunities are limited, recreation use may be a controlling factor in water resources programs.[11]

Major water impoundments so located that they have high

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[11]The Report of the President's Water Resources Policy Commission; "A Water Policy for the American People"; Washington, D.C.; 1950; Page 256.

> recreation values should be constructed and operated to insure full realization of their recreation values compatible with other beneficial water uses.[12]

Both these recommendations made to the President in 1950 in "A Water Policy for the American People" indicates both the desirability and the need for the development of the watershed areas and their possible function as multi-purpose use areas. These areas could be designed as nodes of activities along the waterways of the corridor system.

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[12]The Report of the President's Water Resources Policy Commission; "A Water Policy for the American People"; Washington, D.C.; 1950; Page 257.

CHAPTER III

DETERMINATION OF TRI-COUNTY REGION DEFICIENCIES

The summary of findings from the "Outdoor Recreation Inventory" published in 1962 by the Tri-County Regional Planning Commission pointed out a number of short comings in the Region's existing recreational facilities. The most outstanding of these deficiencies were:

1. Lack of good recreational water areas; and
2. Lack of large regional park areas.

Classification System for Recreational Land Evaluation

In order to examine the recreational land available to the public within the Tri-County Region, the system recommended by the ORRRC for classifying recreational resources shall be used. It will provide us with a means of evaluating the quantity of recreational land within the Region and discover any limitations within the Tri-County Region in the facilities provided. The areas included are:

Class 1 High-density Recreation Areas
Class 2 General Outdoor Recreation Areas
Class 3 Natural Environment Areas
Class 4 Unique Natural Areas
Class 5 Primitive Areas
Class 6 Historic and Cultural Sites

Of these only three pertain to the Tri-County Region, Class 1 High-density Recreation Areas; Class 2 General Outdoor Recreation Areas; and Class 3 Natural Environment Areas.

Definition of type of classification: Class 1- High-density Recreation Areas: Activities include intense day usage - kinds such as picnicking, pool areas, sport fields, and golf

courses - and have interior roads and sanitary facilities. Location - these areas are located within or near our urban areas and are usually easily accessible to the public. Land requirements - topography and soil that are adaptable to intensive land usage.

Class 2 - General Outdoor Recreation Areas: Activities provided are facilities to sustain a large and varied amount of activity - camping, picnicking, fishing, water sports, nature walks, artificial lakes, beaches, etc. These areas may also have nodes of Class 1 areas such as golf and intensive game areas. Facilities are segregated to maximize use of the entire area. Location - these areas are usually found within a 40 mile radius from our metropolitan areas. Land requirements - varied topography; interesting flora and fauna in a natural or man-made setting; adaptable to a wider range of recreational opportunities than Class 1. Future needs for outdoor recreation, particularly in the growing metropolitan areas, will create pressures for more general (Class 2) and high-density (Classl) recreation areas.

Class 3 - Natural Environmental Areas - Activities - the primary recreation management objective is to provide recreational usage of the area in conjunction with other resources. This type of an area possesses a natural environment that encourages sightseeing, nature study, camping, and boating. Access roads should be provided along the periphery of the site and the major emphasis placed on man's closeness to

nature. Man-made facilities should be limited. Areas such as this serve vacationers as well as intensive day and weekend usage. Location - this type area is within an 80 mile radius of our metropolitan areas and should encourage users to make use of the area in its natural environment. Land requirements - should possess interesting and varied topography, lakes, streams, flora and fauna in a natural setting.

Classes 4, 5, and 6 - Unique natural areas; Primitive areas; and Historic and Cultural sites - For the purpose of this evaluation, these classes shall be eliminated due to the absence of any unique natural or primitive areas. The Capitol area and Michigan State University provide the only historic and cultural sites of any value.

Table IX on page 52 shows the breakdown in acreage of the existing recreational facilities within the Tri-County Region according to the descriptions given of Classes 1, 2, and 3. To evaluate the meaning of the chart, a standard for desired acreage must be determined to assure adequate facilities in the future.

> Each recreation agency...should establish its own standards, in accordance with what the people consider adequate and are willing and able to pay for..."[1]

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[1]California Committee on Planning for Recreation, Park Areas, and Facilities, 1956; "Guide for Planning Recreation Parks in California; Page 34.

Determination of Amount of Needed Recreational Land

For many years the National Recreation Association recommended a ratio of 10 acres of park land per 1,000 persons. The New York Regional Planning Association has recommended a standard of 12 acres per 1,000 persons. According to the Southeastern Pennsylvania Regional Planning Commission

> these standards have been acceptable in the past, but the parks now being discussed are for the future, so it would be preferable to establish a goal of 15 acres of regional park and recreation land per 1,000 population, in view of the continuing increase in leisure time, in growing accessibility to outlying parks, and in the expansion of built-up land.[2]

Determination of Type of Needed Recreational Land

If we accept both the 15 acres per 1000 population figure and the predicted population for the Tri-County Region by 1980 as 443,558 persons, the recreational land need by 1980 will be 6652.5 acres. As shown in Table IX, the Class 3 area would appear to take care of these needs. Yet these Class 3 areas consist mainly of Maple River and Dansville State Game Areas and Rose Lake Wildlife Experimental Station which are administered by the Conservation Department for the state of Michigan, Their main purpose is hunting. The Tri-County is fortunate to have these lands within its boundaries, yet hunting is not the greatest recreational need for this Region. Intensive use of these areas by people would destroy the ecological relationship between plant and animals.

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[2]Southeastern Pennsylvania Regional Planning Commission; 1956; A Regional Recreation Policy and Program; Pages 11-12.

Class 2 areas must be greatly increased by 1980. Much of the existing Class 2 areas within the Tri-County Region have not yet been developed, such as Grand Woods Park and Priggoris Park, both owned by the city of Lansing. Sleepy Hollow State Park is being developed to the Northeast of Lansing, within Clinton County. This will only provide an additional 2000 acres of Class 2 area. There is existing an available recreational source in nearby counties. People looking for outdoor recreation are not interested in political boundaries and with increasing mobility will be attracted to those areas that best satisfy their needs. This is evident in that the most visited State Forest Campgrounds by persons from Eaton, Ingham, and Clinton Counties was the county of Roscommon where water activities are available.[3] The top six destinations for State Park Day users from Ingham County in 1964 were: (1) Waterloo; (2) Holland; (3) Yankee Springs; (4) Grand Haven; (5) D.H. Day; and (6) Higgins Lake[4] The locations of these camper destinations are shown in Figure VI on page 50. It is evident that the people of the Tri-County Region are seeking recreation outside their own area.

This available source of recreational facilities does not fulfill the needs of the Region. Not everyone has the time,

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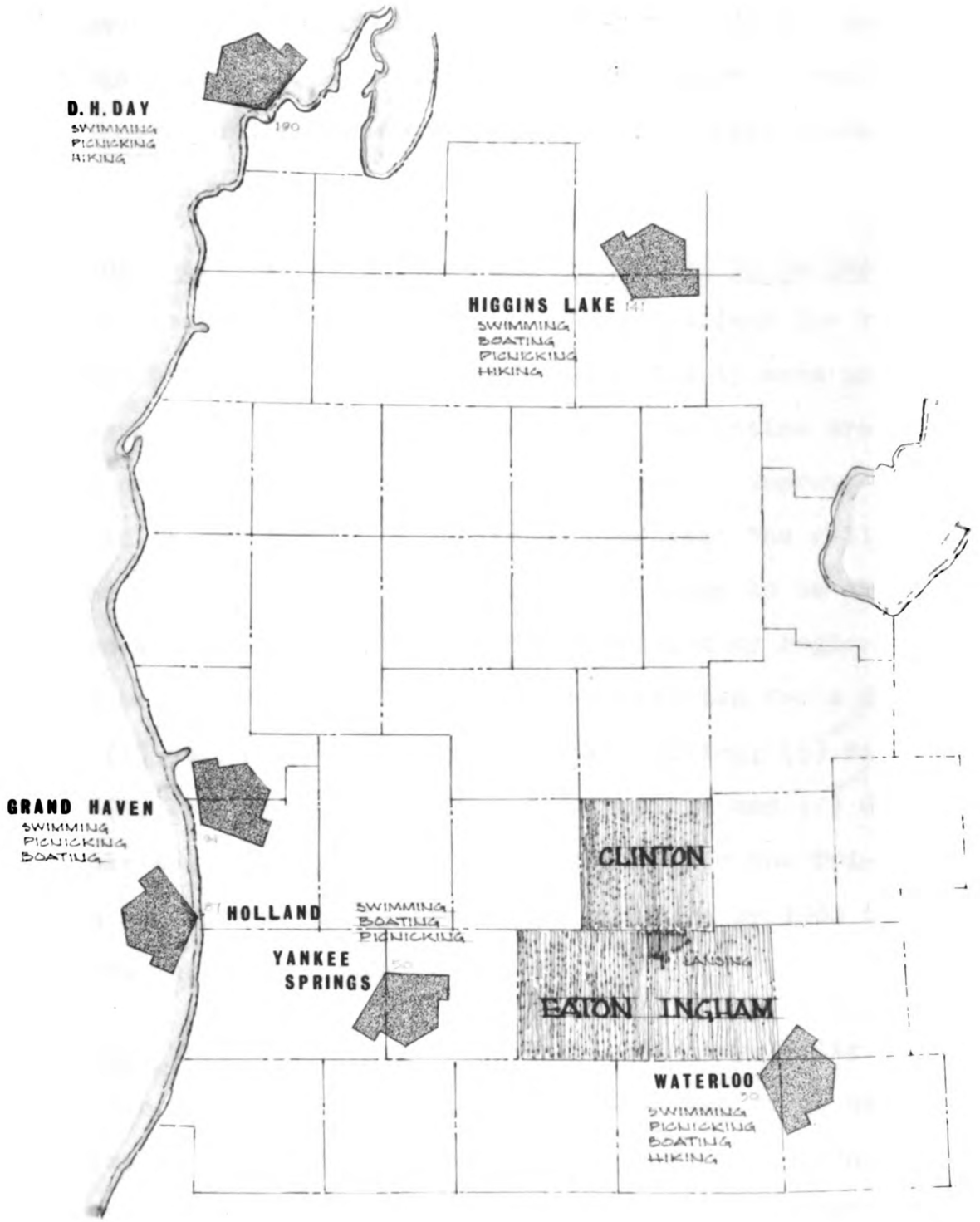
[3]Milstein and Reid; Michigan Outdoor Recreation Demand Study: Volume II Activities Reports; Table 7.16, P. 7.35.

[4]Ibid.; Table 8.17; Page 8.59.



destinations of campers
FROM THE TRI-COUNTY REGION

Figure VI.

money, nor means of transportation to allow long trips. It thus becomes the responsibility of the governmental bodies of the Region to provide or encourage development of recreational opportunities close to home to facilitate access to them.

Major Recreational Activities and Facilities to be Improved

Class 2 areas have been shown to be insufficient for the Region and that people are leaving the Tri-County area in search of adequate recreation facilities. What facilities are needed and could be included in a Class 2 area to improve conditions in Eaton, Ingham, and Clinton Counties? The following are the major activities that have been shown to be the most desired and used by residents of the Tri-County Region and should be included in any design consideration for a Class 2 area: (1) Swimming; (2) Sightseeing and hiking; (3) Picnicking; (4) Boating; (5) Fishing; (6) Camping; and (7) Golf. A comparison as to existing activities within the Tri-County Region and what would be considered adequate by 1980 is shown in Table X on page 52.

Swimming: This activity is ranked third in popularity by the ORRRC for the North Central states and ranked first by the Department of Conservation based on a study by Central Michigan University. People camping at state forest campgrounds from the Tri-County Region chose areas having swimming facilities. The Region has only two public beaches found at Lake Lansing and Community Park, having a combined lehgth of shore-

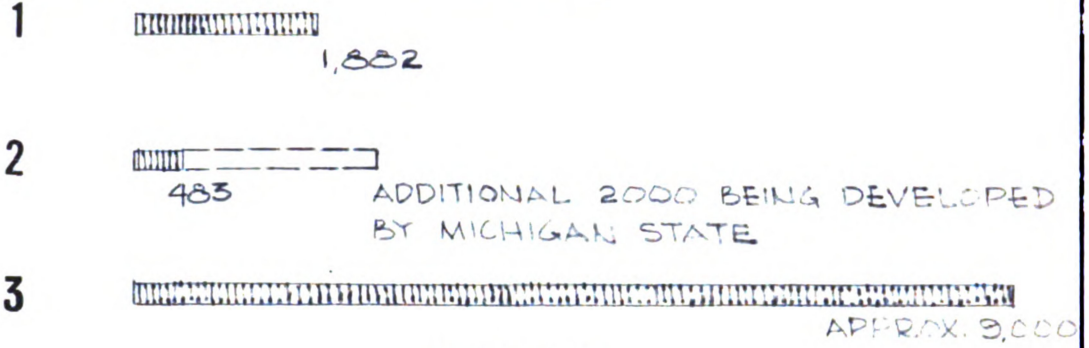


FIGURE IX

Existing Recreational Land Classification Comparison

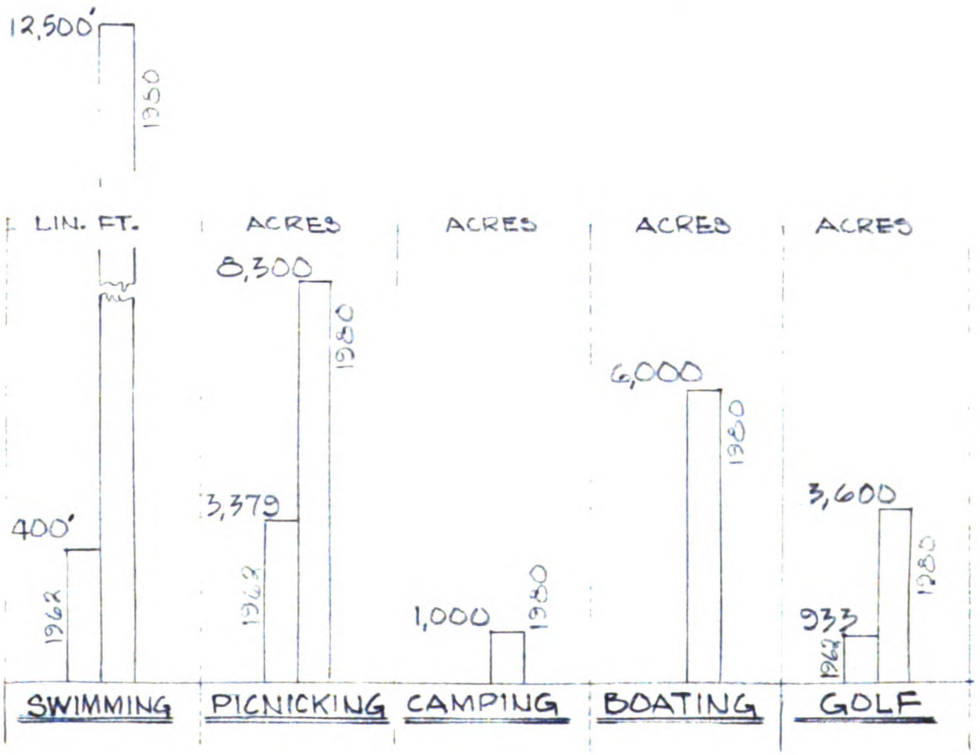


FIGURE X

Regional Examples of Quantitative Needs by 1980 for the Tri-County Region

Table IX. Existing Recreational Lands of the Tri-County Region

Source: Tri-County Regional Planning Commission; "Outdoor Recreation - An Inventory"; January 1962.

Table X. Comparison of Recreational Lands in 1962 and 1980.

Source: Tri-County Regional Planning Commission; "Outdoor Recreation - An Inventory"; January 1962.

Candeub, Cabot and Associates; Preliminary Development Plan for Mauch Chunk Creek Watershed Area; Carbon co., Pa.; (for picnicking standard)

California Public Outdoor Recreation Plan Committee; California Public Outdoor Recreation Plan, Part1, 1960; (for swimming standard)

Onondaga County Dept. of Planning, and N.Y. State Dept. of Commerce; Recreation and Open Space in the Onondaga - Syracuse Metropolitan Area; March 1962; (for boating standard)

New Mexico State Planning Office; New Mexico Comprehensive Plan for Outdoor Recreation; August 1965;(for camping standard)

Sacramento County Planning Commission; A Report on the Park and Recreation Space needs of the Sacramento Metropolitan Area; July 1960; (for golf standard)

line of 400 feet, and four public pools - one at Williamston City, one at St. Johns City, and two within Lansing. Private membership clubs provide eight additional areas for swimming. Low water quality is one of the major reasons for failing to crowd our existing beaches. Numerous studies indicate water is a key attraction to most areas and even more so if people can participate in water-oriented activities, such as boating and swimming. It can be said that no matter how adequate recreational areas are, residents and tourists will be attracted to them less if they are without swimming facilities. People are interested in spending their vacation and weekends where there is water and the opportunity to swim.

Sightseeing: is ranked second by the ORRRC and participated in by 74.7 percent of the tourists visiting Michigan during the summer of 1964. Within the counties of Eaton, Clinton, and Ingham the residents and tourists can investigate the Capitol Complex, Michigan State University, Fenner Arboretum Park, and Potter Park Zoo.

The greatest sightseeing potential within the area is the farmbelt area which supplies the large Metropolitan markets of Detroit and Lansing and others in the area. The farmbelt now provides easy access to the urban dweller. It is doubtful with urban and suburban growth that this closeness will remain.

Tourism is mentioned due to the great amount of income it adds to Michigan's economy. It contributed 400 million dollars in 1950 and according to the Michigan Department of Conserva-

tion, it will increase to over one billion dollars in 1967. More facilities should be developed to encourage tourism within the Tri-County Region. Sightseeing was also ranked second in primary purposes of visits to Michigan National Forests with 1.265,800 participants.[5]

Picnicking is usually an accompaniment to other activities, such as hiking, fishing, sightseeing, etc. There are over 1500 picnic units provided in 51 developed picnic areas within the Tri-County Region. The size of the picnic sites range in area from one-quarter of an acre to over 90 acres, and the number of picnic units at these sites range from 2 to 150. Picnicking ranked high in the number of visits to Michigan National Forests totaling 188,300, and was ranked number one for the North Central states by the ORRRC. Yet many of the areas within the Tri-County are poorly designed, lacking shade, toilet facilities, adequate parking, and are over used with inadequate management.

Boating: The popularity of boating has increased steadily in the period 1958-1962.

> In the Tri-County Region, boat registrations have increased from 10,900 in 1958 to 18,262 in 1962.[6]

Many problems are confronting the boating enthusiasts. There

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[5]Milstein and Reid; Michigan Outdoor Recreation Demand Study: Volume II Activities Reports; Michigan Dept. of Conservation, Tech.Report No.6, June 1966; Page 7.84.

[6]Tri-County Regional Planning Commission; "Outdoor Recreation - An Inventory"; January 1962; Page 20.

is a need for more launching facilities. Few lakes within the Tri-County Region are large enough to accomodate boating activities. Pollution, siltation, weed growth and over use of lakes are affecting the attractiveness of boating resources. Excessive boating reduces the value of lakes for fishing and other activities and even discourages the boater.

Fishing is the primary purpose of visitors to the Michigan National Forest. It is listed by the Conservation Department as being participated in by 52 percent of 6,872 vacationing tourists surveyed. Fishing is considered to be the second most popular use of water. Yet the Tri-County Region between 1955 and 1960 had a decrease of almost fifteen percent in the number of resident fishing licenses sold. One of the chief reasons for this decrease is believed to be the lack of good water quality. Pollution, especially in urbanized areas, is reducing the fish habitat and creating pressures on remaining waters.

Water Problems of the Grand River Basin: Surface water resources within the Tri-County are considered to be of generally poor quality. There exist six major rivers - Grand River, Looking Glass River, Maple River, Thornapple River, and Battle Creek River - which provide 760 miles of waterways through the three counties. There are also 628 water bodies in the Tri-County Region containing 4360 acres of surface water. They range in size from small ponds less than an acre to the largest lake, Lake Lansing with a surface area of

453 acres.[7]

C.J.D. Brown of the Institute of Fisheries Research, Michigan Department of Conservation, has evaluated existing lakes and ponds of Michigan. His research shows that five inland counties have less than 1000 acres of lakes each. Ingham, Clinton, and Eaton Counties are three of the five counties, and together they contain only 113 natural or artificial lakes.

The Tri-County "Natural Resource Problem Study" focuses on a number of reasons as to the undesirability of lake development. Among them are listed:

1. The smallness of lakes.
2. Limited access to the lakes due to the many residential developments around them.
3. Excessive land values.
4. Poor water quality.

The reasons for the poor water quality are (1) poor water circulation; (2) feed streams that often drain poor soils; (3) shallow irregular bottoms; (4) high water temperatures and obnoxious vegetation characteristics of the summer period; and (5) waste dumped into many lakes.

The rivers and streams of the region also have many problems. The rivers rarely exceed a width of 40 yards, are shallow in depth and either contain a high degree of suspended materials or are contaminated with sewage or industrial waste.

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[7]Tri-County Regional Planning Commission; "Tri-County Regional Transportation Study": Natural Resource Problems;P.51.

Camping within the Tri-County Region is unavailable to the tourist and difficult for the residents to find. Most of the existing camping areas are used as day camps for children. There are four municipally owned yet undeveloped camping areas, six privately owned by such groups as the Boy Scouts and the YMCA, and an area at the Rose Lake Wildlife Experimental Station.

People within a thirteen county region according to the Michigan Department of Conservation represented 19% of the state forest campers and were the third highest in the state in visits to state forests.[8] This thirteen county region, of which Eaton, Ingham, and Clinton Counties are a part, is the only region to be without a state forest, thus requiring travel outside its regions.

Large campgrounds with swimming facilities were definitely preferred by the state forest campers in this region, even though they had to travel past many smaller campgrounds on their way.[9] According to the Central Michigan University study, 54% of all tourists participated in camping activities.

Golf: As has been stated previously that within Class 2 areas, nodes of Class 1 activities may be developed. Such a node of activity is considered to be a golf course.

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[8]Milstein and Reid; Michigan Outdoor Recreation Demand Study: Volume II Activities Reports; Michigan Dept. of Conservation; Tech.Report No.6, June 1966; Page 7.33.

[9]Ibid.; Page 7.34.

> Popular interest in golf has been steadily mounting throughout the country in the past several years. It is now a form of recreation enjoyed by three million persons in the nation.[10]

The Tri-County Region has nine 9-hole courses open to the public, of which six are 70 acres or less. There are only two 18-hole golf courses open to the general public.

Site Selection Criteria

In order to provide areas of recreation for the Tri-County Region, general criteria were used to facilitate the selection of those areas most desirable for recreational development.

General Characteristics: The following criteria were used in Southeastern Pennsylvania in order to facilitate their selection of such areas:

1. A site should possess conspicuous scenic value typical of the region and adequate recreation resources. Because of their greater social value, unusual recreation resources may compensate for the absence of outstanding scenic beauty.
2. A site should be characterized by scenic and recreational resources of kinds which are unlikely to be preserved and developed for the enjoyment by the public of this and future generations under private ownership and which are sufficiently distinctive to attract and interest the people of the region.
3. Sites should be sufficient in number, extent, and variety of character to meet the present and future demands of the people and which are not ordinarily supplied.
4. Sites should be so distributed geographically as to serve the people of the region adequately and with a minimum of required travel time.

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[10]Tri-County Regional Planning Commission; "Outdoor Recreation - An Inventory"; Page 8.

5. A site, if at all possible, should provide a water feature for scenic value and for a recreation resource.[11]

These criteria are both general and somewhat vague. Yet, purposely so, in order that no site might be overlooked in the investigation of areas for recreational lands.

Specific Characteristics: A more detailed and specific outline of criteria was used by the Cumberland County Planning Board of Bridgeton County, New Jersey, to investigate particular areas that were thought to have recreational lands. The criteria used in their analyses were:

1. Need
2. Topography and soil
3. Financing of land acquisition
4. Highway access on existing highway system
5. Ease of land assembledge
6. Size of area for parks and possibility of future expansion
7. Relation to population centers of the area to be served
8. Availability of water for recreation use
9. Scenic attraction of the site
10. General character of the surrounding area
11. Compatibility of park use with municipal plans [12]

This criteria is proposed specifically as a basis for evaluating the watershed impoundment sites as to their recreational potential. The impoundment sites have been recognized and studied by the Department of Agriculture for their flood water retention in preventing floods. These water bodies may

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[11]Southeastern Penn. Regional Planning Commission; A Regional Recreation Policy and Program; 1956; pp. 13-15.

[12]Cumberland County Planning Board; Cumberland County, New Jersey; Published 1966; Page 72.

provide excellent quality recreational uses.

Need: Needs concerning quantity can be measured in a number of ways. Three methods described in the "Recreation and Open Space in Illinois" report are: (1) Current Practice; (2) User-Density, User-Preference; and (3) Share of National Total.

The"Current Practice"method requires the study of recreational open space plans of other areas as to the amount of land in acres per 1000 population they are providing for open space. Evaluation is needed as to the adequacy of these plans in fulfilling their goals and selecting the better one or combining to meet the area's goals.

"User-Density, User-Preference" method entails identifying, by survey, the quantity of people who would participate in a particular activity on a particular day. Then density standards can be determined to handle the expected participation for each activity. This method is considered to be the most accurate in evaluating present need, yet is the most expensive and time consuming.

"Share of the National Total" method assumes the national average of open space per 1000 population will be acceptable for the area being studied. This requires evaluation as to the growth of the area being studied and how well its development is in comparison to the nation's.[13]

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[13]Lewis, Jr., Philip H.; "Recreation and Open Space in Illinois"; Page 107.

In order to determine the activities needed by the people of the Region, their age, income, distribution, education, and regional location were studied; and then compared to a national study done by the ORRRC. Certain trends were evidenced: such as high participation in picnicking, swimming, and boating; etc. and determination of the generalized activities for the Region were made.

By comparing standards, used on a national basis by planning agencies, the major activities were studied as to their quantity to supply the population of 500,000 by 1980. To insure the location of these activities to be within easy access of the population, the Class 2 area was defined as a general outdoor recreation area usually found within a 40 mile radius from our metropolitan areas. This enables determination of shortages in Class 2 open space areas and those activities involved.

Finally, by again comparing standards throughout the country, desirable spacial requirements for the site design of such Class 2 areas were selected.

Topography: The form of the earth surface can foster the types of activities pursued if changes in the terrain are not desirable nor possible. Those areas possessing level or gently rolling terrain are suitable for active sports such as camping or picnicking; whereas those lands that have a rough terrain or steep slopes are attractive to hikers. Much can be done with those sites possessing various types of terrain,

especially if the need for activities is varied.

The Tri-County Region as has been mentioned in the preceeding chapter is limited in topographic variations, thus any area that possesses a slope greater than 10 percent (10 feet in 100 feet) and is in conjunction with a possible water surface should be evaluated for its recreational potential. It would be difficult to build or farm on such areas to any degree and due to the flattness of the Region, these lands would not be competition for such purposes. The streams within the Region, besides providing the contrasting element of water, also cause local relief due to the erosion of the channel bed. The relief and water surface form the backbone of the environmental corridors discussed in the previous chapter.

Soil: Inventories of existing soil conditions can provide basic information to the planner. The primary benefit of generalized soil information is the ability to identify those areas having poorly drained and unstable soils, thus limiting intensive development.

Optimum supporting soils for building foundations are those having high percentage of sand or gravel. This is true of most building construction such as roads. Soils will vary in their ability to provide food and maintain a proper balance of air and water for good plant growth. If a wildlife habitat is to be encouraged, development of a soil that will support food producing plants is necessitated.

Soil types will also determine carrying capacities for cer-

tain activities:

> Vegetation growing in rich ground with evenly maintained moisture is far less sensitive to moderate use than are plants which are barely able to support themselves in poor, gravelly soil.[14]

The ability of the soil to support plant growth will also lessen the expense of soil cultivation. Drainage of the soil can effect carrying capacity in that poor drainage limits activity within the particular area. This is detrimental especially in such activities as golf courses or picnic grounds.

Vegetation: At one time the Region had an abundant supply of forest cover. As farming became the major industry and then later with urban expansion, most of the timber land was cleared. Those existing woodlands yet remaining, besides adding landscape attractiveness to the countryside, provide relief from the hot summer temperatures and the cold winter winds and facilitate soil stabilization from erosion.

> The biotic character of a recreation site, when considered with terrain, may add great value for all types of recreational experiences. Hiking, including nature walks, is the outdoor activity that benefits directly. Nature study is enhanced if a wide variety of biotic types are available, or if one or two atypical types are abundant.[15]

Vegetation can also act as a space definer, a wind break, visual screen, or a physical barrier. If animal life is desired, analysis of food supporting plants will be beneficial

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[14]Meinecke,E.P.; Camp Planning and Camp Reconstruction; California Region, 1934; Page 7.

[15]Milstein and Reid; Outdoor Recreation Demand Study Volume II Activities Reports; Michigan Dept. of Conservation, Tech. Report No. 6, June 1966; Page 5.30.

to sustain their existence.

Approximate Cost of Land per Acre: It is difficult to place a price on our environment especially in evaluating our future recreational needs. Lands possessing high recreational value need not necessarily be the most expensive. As we have discussed with the corridor plan, those low lands subject to flooding and a hazzard to intensive development in terms of property damage and loss of life, can contribute at a reasonable price to the region's recreational needs. An effort should be made to obtain other desirable recreational lands not in the low-lying areas if they possess outstanding recreational characteristics or low-lying areas are non-existent.

Highway Access on Existing Highway System:

> It is interesting to note the impact of highways on campgrounds used. Those camping from counties with relatively easy access to interstate highways ordinarily used them in traveling to the nearest large campground.[16]

As with any area that is to supply large groups of people, ease of access to and from the site is desirable for the efficient movement of people. Activities should also be of easy access to those traveling through the area.

A study done by Central Michigan University in 1964 indicates that of those tourists vacationing in Michigan 77.1% partici-

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[16]Milstein and Reid; State Resource Planning Program; Michigan Department of Commerce; Michigan Outdoor Recreation Demand Study: Volume II Activities; Michigan Department of Conservation; Technical Report Number 6, June 1966; Page 7.34.

pated in swimming; 54.2% participated in camping; and 52.0% participated in fishing.[17]

> Our capability to travel is growing twice as fast as our population. From 1949 to 1965, passenger car mileage jumped 74%, while population increased 32%. Mileage is expected to double by 1980. Better roads and cars mean more and longer trips to seek recreation.[18]

Ease of Land Assembledge: Areas should be investigated for ownership. Usually land close to urban areas is not only expensive, but to acquire any sizable land area requires the dealing with a great many property owners. Further out from the populated urban areas, land parcels become larger and owners fewer, thus costs and dealings are reduced. Methods of land acquisition include outright purchase of fee; public lease of land; easements; eminent domain; condemnation; tax foreclosure and private donations.

Public acquisition of land has its disadvantages in that costs are excessive, and there is a loss of land from the public tax roles. The Federal Government is stimulating open space acquisition of land with such programs as (1) Federal Housing Act of 1961 - Department of Housing and Urban Development to make grants to state and local authorities of 50% for the purchasing and development of land within urban areas; (2) Food and Agriculture Act of 1965 - Department of Agriculture provides grants to state and local governments desiring

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[17]Michigan Dept. of Conservation; "Michigan's Recreation Future"; September 1966; Page 13.

[18]Ibid.; Page 6.

to purchase cropland for public recreation. Grants cannot exceed what would originally have been paid the farmer had the land been in an agricultural diversion program; (3) communities carrying on Small Watershed Projects, under Congressional Act 566, 1954, are provided extensive aid by the government. Reasons necessary for development in order to be eligible for such aid vary a great deal. Flood control and prevention, fish and wildlife habitat improvement, recreational development, or municipal and industrial water needs are some of the reasons. The size of the project is limited to 25,000 acres; and (4) Land and Water Conservation Act of 1965 authorizes the Bureau of Outdoor Recreation to provide Federal Assistance to state governments. The state may then distribute the funds to the local units of government.

Local government can either through bond issues or general revenues stimulate open space land acquisition.

> County governments are increasingly involved in acquiring parks and recreation space. Since the county governments have the largest tax base of any unit of local government, and have broad powers and responsibilities, they are able to act to secure significant open space sites.[19]

Water usage and county planning should be closely related. Rapid urbanization and industrial water requirements are over-loading streams.with pollutents. Availability of water sources will certainly effect future development within an area. It is with some urgency that coordinated and workable

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[19]Southwestern Penn. Regional Planning Commission; "A Regional Planning Study: Regional Open Space"; 1966; P.234.

programs be instituted by our local, county, state, and federal governments to protect and develop existing and potential water resources.

Size of Area for Parks and Possibility for Future Expansion: To quote from the National Park Service Publication of October 1959, "Guidelines for Determination of Needs":

> On the basis of population, it should be possible to determine the minimum amount of land and facilities required for physical activities. But it is impossible to set a figure on the amount of land that should be set aside for educational, spiritual, and esthetic values. From the esthetic point of view, the limit of an area is the horizon... [20]

There is no absolute standard that can be given as to the amount of acreage or physical characteristics a Class 2 area as defined earlier should possess. In order to differentiate classes, a suggested minimum of 100 acres for Class 2 areas was proposed by the ORRRC. The extent of such a Class 2 area should be determined by the area proposed for development: the size of the water body, the activities desired and the expected population demand upon the area. Future expansion of an area need not necessarily take place. Yet the surrounding areas should be examined in order to assure adequate spacial expansion.

Relation to Population Centers of the Area to be Served: The distance a person will travel to a particular area will depend on a number of criteria. The type of roads that exist

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[20]National Park Service; "Guidelines for Determination of Needs"; October 1959.

usually influence the traveler: the person will travel further on a four-lane highway than on a two-lane country road. What type of landscape he will pass through on his route to the park and the type of facilities and activities that are available at the site will determine the distances people will travel.

> In the Tri-County Region, automobile registrations increased 31% from 84,000 in 1950 to 110,000 in 1960. The number of registered vehicles per 1000 persons in the Region is 20.25% above the ratio for the United States.."[21]

This along with 5,000 miles of streets and highways within the Tri-County Region would allow all areas having recreational potential to be given consideration, since access and distance to them would not be considerable.

Availability of Water for Recreational Use: This is an especially important criteria for the Tri-County Region due to the limited amount of water existing in the area and its lack of quality. Since water is generally considered as a focal point for recreation and these sites are so few within the Tri-County, the presence of running streams and landforms conducive to water impoundments should be important locational criteria. Water impoundment sites have already been located as to their desirability for flood control. Now they must be evaluated as to water oriented recreation potential. This importance is emphasized by the ORRRC report to the President in 1962 which said that:

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[21]Tri-County Regional Planning Commission; "Transportation - An Inventory"; January 1962; Page 25.

> nearly one-half of our population prefers water based recreation to all other forms: roughly one-third of all Americans fish for sport; boating is among our most popular outdoor pastimes; ...; swimming, already high on the list of outdoor activities, promises to top all others before many years have passed.[22]

The evaluation of a water body for recreational usage should include size of the impoundment area and its adequacy which has a spacial effect on bathers needs, and the size has an effect on the water temperature.

> A very large body of water, if of sufficient depth, can be a very cold one. ..... Swimming is not a popular activity if the water temperature is below 68 degrees Farenheit and temperatures above this are preferred. Size is also important as to the activities that can take place on the water surface. Boating, fishing, and bathing are not activities that are conducive to one another.[23]

> The shape of an impoundment site will determine boating activities. Sail boating requires a relatively large open space and a water surface unprotected from winds. Motor boating and water skiing are difficult to execute on narrow water bodies such as rivers, whereas a large rounded one facilitates boating activities.

> Water quality and its maintenance should be enforced to prevent pollution and ensure that no limitations be imposed on those seeking water recreational activities.[24]

Scenic Attraction of the Site: Since people do not perceive the landscape in the same manner it is difficult to analyze the desirability of a site that will ensure attractiveness

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[22]U.S. Dept. of Agriculture; The Yearbook of Agriculture, 1963: A Place to Live; Washington D.C.; Page 356.

[23]Milstein and Reid; Michigan Outdoor Recreation Demand Study: Volume II Activities Reports; Michigan Dept. of Conservation; Technical Report No. 6, June 1966; Page 5.33.

[24]Ibid.; Page 5.34.

to all.

> The National Advisory Council on Regional Recreation Planning in 'A User-Resource Recreation Planning Method' suggests six types of values that may be used individually or in combination to measure the outdoor recreational experiences. These are: physical, emotional, aesthetic, educational, social, and intellectual experiences.[25]

The physical experiences are the easiest to measure for it requires active participation by the person as in swimming or horseback riding. The other values are more difficult to measure since, as in the case of an intellectual experience, it may be participated in unknowingly.

Some positive measures may be taken to areas, to improve the site's attractiveness. Variations in topography and in plant life, various types of spacial experiences from open to enclosed, from confined to free, and differences in textural variation from fine to coarse, all contribute to the perceptual experiences of the visitor.

To provide scenic attractiveness, general park design factors suggesting spacial standards are used, in order to provide adequate activities and facilities.

General Character of the Surrounding Area: This entails a policy of using lands for recreation that does not conflict with one's ideas as to what the out-of-doors should provide.

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[25]Milstein and Reid; Michigan Outdoor Recreation Demand Study; Volume I Methods and Models; Michigan Dept. of Conservation; Technical Report No. 6, June 1966; Page 5.21.

Such conflicts would arise if the odors of industry, excessive noise, or the unsightlyness of junkyards were a part of the recreation scene. This in conjunction with the final site selection criteria, Compatibility of Park Use with Municipal Plans, will ensure against such conflicts as the above mentioned. Land use planning will facilitate area selection of recreation sites by generalizing those areas desirable for urban expansion and industrial locations based upon soil desirability and land values.

Summary

The Tri-County was shown to possess three major recreational areas, Class 1 High-density Recreation Areas; Class 2 General Outdoor Recreation Areas; and Class 3 Natural Environmental Areas. Of these, Class 2 areas were selected for further study.

The deficiencies in the quantities of recreational lands were studied. The results indicated that a total of 6652.5 acres of Class 2 recreational land would be necessary in order to provide the 500,000 persons expected to be living in the Tri-County Region by 1980 with adequate recreational facilities. Certain recreational activities that have been shown to be desirable for participation by the residents of the Tri-County Region and are desired within Class 2 areas are swimming, picnicking, sightseeing and hiking, boating, fishing, camping, and golf. These were quantitatively studied and deficiencies noted. The results assured the need of a Class 2 area and the facilities the area should provide.

Site selection criteria were outlined to provide a means of land evaluation and selection. General criteria were designed to allow all areas having any possible recreational potential to be evaluated. More specific criteria were proposed in studying particular sites thought to be quality recreational areas. Due to the lack of water quality and quantity of the Region, this criteria was to be used on a watershed impoundment site in developing a corridor node.

CHAPTER IV

ANALYSIS OF THE SITE

THE SITE: Regional Context

The site is entirely within the Grand River Basin and shall be known as the Columbia Creek Watershed Area. Columbia Creek drains an area of approximately 14.8 square miles or 9,477 acres. Columbia Creek Watershed Area, shown in the Regional Context Map of Figure VII on page 75 is in the southern part of the Tri-County Region. The site is located approximately 13½ miles from Lansing, Michigan, and 3.4 miles from Eaton Rapids, Michigan. Columbia Creek Recreational Area, to be developed, is divided by the Ingham and Eaton County line.

The area within Eaton County is located in Eaton Rapids Township, designated as the eastern portion of T.2N-R.3W Sections 12 and 13. The area within Ingham County is located in the western part of Aurelius Township and designated as T.2N-R.2W Sections 7 and 18.

The northern boundary of the site is Columbia Highway, a two-lane asphalt paved roadway. To the south is Bunker Road which is only partially paved. The eastern boundary is Gale Road, also a two-lane paved asphalt road. The western boundary to the proposed Recreational Area is the Grand River into which Columbia Creek empties.

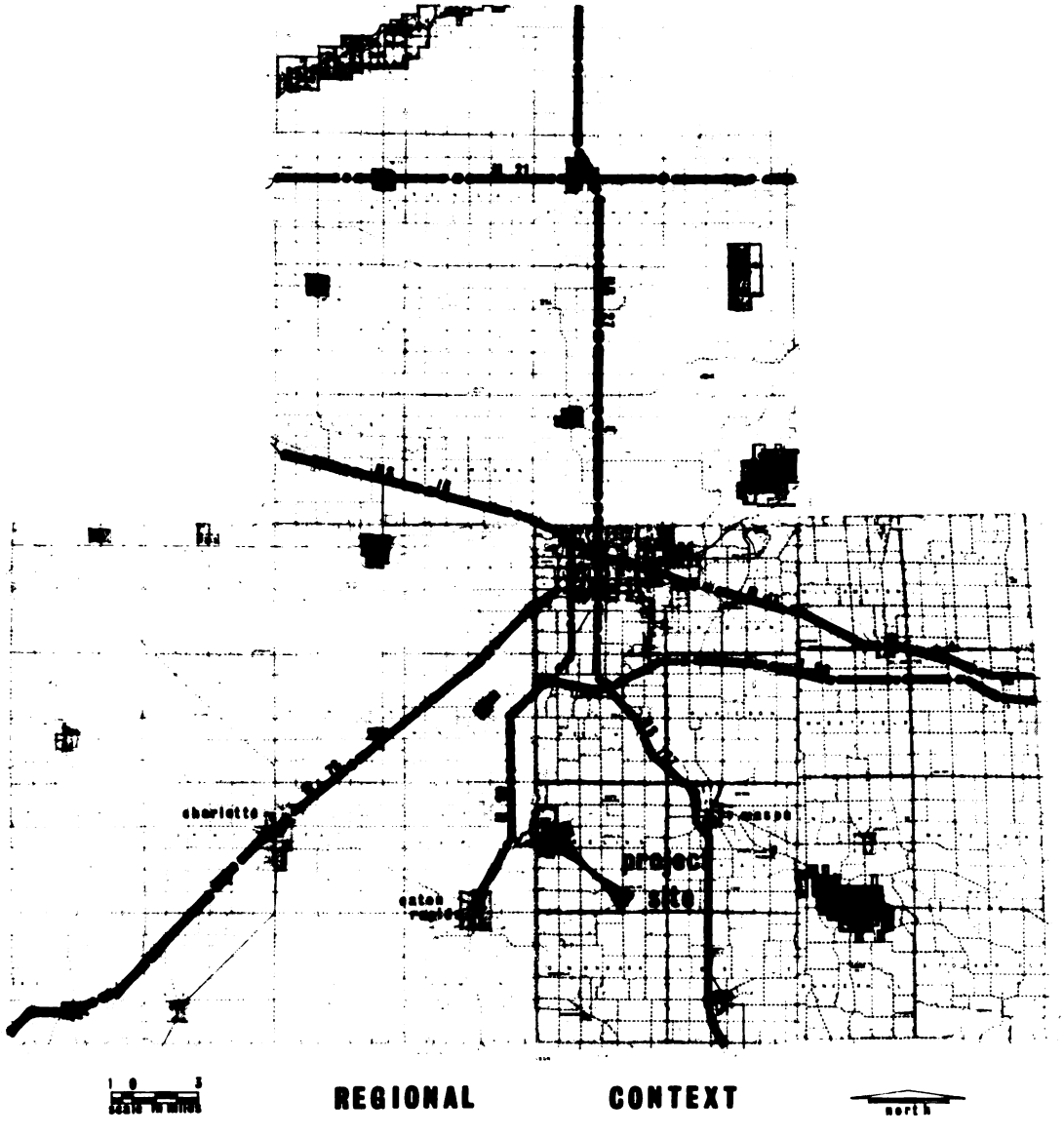

Figure VII.

The proposed Columbia Creek Recreational Area will cover approximately 1700 acres, which is 2.65 square miles. The boundaries of the site as described were selected so that the Grand River would become a physical boundary to the West, with an additional proposed scenic easement of 300 feet along the west bank of the Grand River. To the North, Columbia Highway, the major access route to the area with heavy traffic expected, was chosen as the park's boundary. To the east Gale Road becomes the boundary, since the land further to the east is relatively flat and uninteresting. For the same reason, Bunker Road becomes the southern boundary. Interesting topography, vegetation, a water body formed through impoundment by damming Columbia Creek, wetlands, and the river are all included within the site. Future expansion does exist in all directions since the area is surrounded by farmland. Yet it is believed that more than one area should be developed as suggested earlier of the open space plan in the Corridor System, thereby increasing the value of the Corridor Plan.

Lansing, located 13 miles to the north of the site has a population of 139,600. Eaton Rapids, 3.4 miles south of the site has 4,270; Mason is approximately 6.5 miles east and has 5,020 people; and the city of Charlotte, 12 miles to the west, has 7,900 people. Each will contribute users to the site. It would be unrealistic to propose this site as the panacea to the recreational needs of over 150,000 urban residents, not including the rural populus in these areas.

This watershed area, Columbia Creek, is but one of thirty-three possible sites throughout the Tri-County Region as shown earlier in Figure IV on page 35. Other sites would be developed as their need arose, and in relation to the expanding population. The size and extent of their development would also be based upon the Region's needs and the quality of the land in the watershed.

Historical Significance - Present Land Usage:

The dominant usage of the land today is agriculture, both within and surrounding the planning area. There is some residential development, and this can be expected to increase. The Tri-County Region estimates that some 225,000 dwelling units will be needed to house regional residents by the year 2000. An additional 62 square miles of land will be consumed by residential development within the next thirty-five years.[1] Presently, the land is zoned agricultural, and there are no known municipal plans that are being developed that would change this.

The land as seen from the rural roads that surround the site presents a pastoral scene. Corn stalks, pumpkins, sheep, dairy cows (Holstein), the sound of barking dogs, the old barns, horses, and deciduous tree rows defining the farm fields identify the type of area that is being engulfed by urban sprawl. Sand pits are located on the site, owned by

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[1]"Metropolitan Growth Predicted for Area"; State Journal; Sunday, October 8, 1967, Section D, Page 7.

Ingham County, another by Aurelius Township, and a third by Eaton County Road Commission.

A cemetery exists at the corner of Bunker Road and Waverly Road. It contains recent burials, yet many of the markers indicate a very early history of the area. Marillee Norton, who died August 26, 1829, at the age of 26, was the first burial in the cemetery, although many stones were illegibile due to weathering. There also exists a small park of Aurelius Township along Curtice Road, which has a pavilion and picnic facilities.

Vehicular Circulation: M-99 connecting Lansing with Eaton Rapids is a major highway by-passing the site. This is a two-lane road along which traffic moves at 60 miles per hour. There is limited passing allowed due to the under design of vertical and horizontal curves, limiting viewing distances. Columbia Highway connects with U.S. Highway 127, which is only 6 miles to the east.

All the roads surrounding the site are paved in asphalt except that portion of Bunker Road which is in Eaton Rapids Township. Two roads penetrate the site, Curtice Road and Waverly Road. Curtice Road is paved one-half its distance from Gale Road, and gravel the remainder of the way to Waverly Road. Waverly Road is entirely gravel. The width of these roads is approximately twenty feet.

With the expected increase in use and number of automobiles

in the future, it will be necessary to increase the width of M-99. From Highway M-99, by way of Bunker Road, a narrow steel trestle bridge must be crossed in order to enter the site. This bridge is inadequate for two-way automobile traffic. It is suggested that the bridge be used for one-way traffic, or be retained as a pedestrian access to the site.

Land Ownership: Ingham County, Aurelius Township, Sections 7 and 18 have twenty-one property owners. The smallest land division is ten acres, the largest being 120 acres. Within this section, Ingham County owns 40 acres, Aurelius Township owns 40 acres and Eaton County Road Commission owns 9.4 acres. The average land owner has approximately 65 acres.

Eaton County, Eaton Rapids Township, Sections 12 and 13 have eleven property owners. The smallest land holding is 22 acres; the largest is 137.5 acres. A cemetery consisting of 50 acres is located in Section 13, owned by Eaton Rapids Township. The land holders own on the average approximately 47 acres each.

Perceptual Study: In order to assure the full recreational utilization of the site, a perceptual study of both intrinsic and extrinsic values was conducted. The intrinsic values include such elements as water features, topographic characteristics such as steep land over 10 percent slope, flat land under one percent, high points from which views are possible, forest cover, wet lands, and other features of the site that possess dominant natural attractions, readily perceived by

one's eye.

> Contrast and variety are the most widely valued perceptual attributes of environmental patterns. Contrasts in high points and between land and water features, and variety in slopes and ridges are among the scenic resources which enhance the setting for recreation.[2]

Extrinsic values are man-made elements altering the natural values of the landscape such as roads, buildings, land usage, utility lines, bridges, mining, and cemeteries. The placement by man of objects or the altering of the existing landscape has an effect, no matter how small on the environment.

Both of these values, natural or man-made, have visual significance on the impact of the design, and have been indicated on the Site Analysis - Perceptual Study, Figure VIII on page 81. The analysis was made from USGS topographic maps at a scale of one inch equals two thousand feet, aerial photographs, and on-site inspection.

Investigation of the Site:

The site is basicly agriculturally oriented, yet there is evidence of the land possibly becoming residential with urban expansion. The area has some residential development already, and commercial areas are springing up along Highway M-99.

Topography: The planning area has approximately 100 feet

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[2]Maryland-National Capital Park and Planning Commission; "Preliminary Master Plan for Rock Creek Planning Area"; September 1966; Silver Spring and Riverdale, Maryland;P.76.

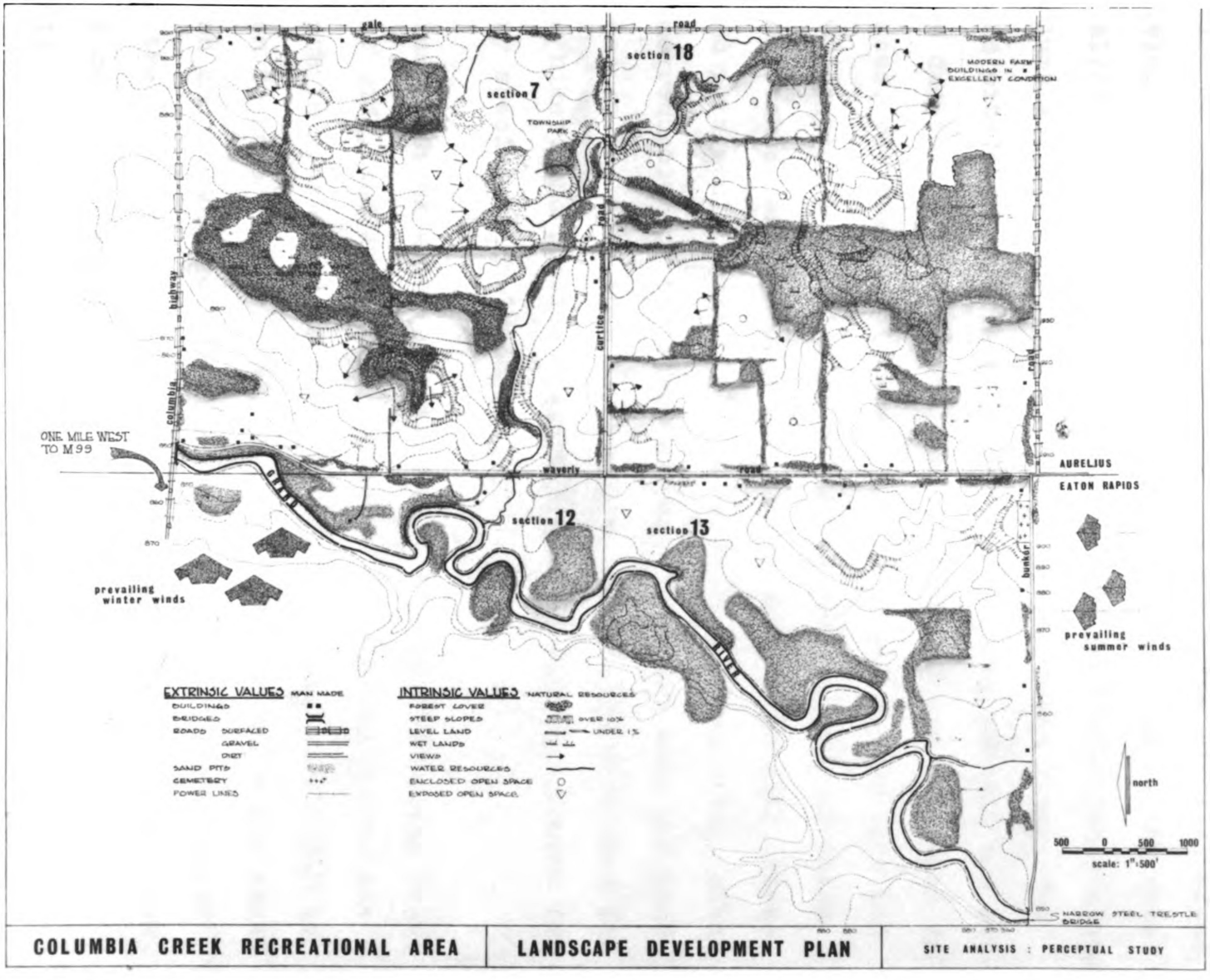
section 18
section 7
section 12
section 13
MODERN FARM BUILDINGS IN EXCELLENT CONDITION
TOWNSHIP PARK
ONE MILE WEST TO M99
AURELIUS
EATON RAPIDS
prevailing winter winds
prevailing summer winds
EXTRINSIC VALUES MAN MADE
BUILDINGS
BRIDGES
ROADS SURFACED
GRAVEL
DIRT
SAND PITS
CEMETERY
POWER LINES
INTRINSIC VALUES NATURAL RESOURCES
FOREST COVER
STEEP SLOPES OVER 10%
LEVEL LAND UNDER 1%
WET LANDS
VIEWS
WATER RESOURCES
ENCLOSED OPEN SPACE
EXPOSED OPEN SPACE
north
500 0 500 1000
scale: 1"=500'
NARROW STEEL TRESTLE BRIDGE
COLUMBIA CREEK RECREATIONAL AREA
LANDSCAPE DEVELOPMENT PLAN
SITE ANALYSIS : PERCEPTUAL STUDY

Figure VIII.

difference in elevation.The river bank has the lowest elevation of 850 feet above sea level, while the highest point in the area is in the southeast corner of the site with an elevation of 950. The land is generally a rolling terrain. Areas having greater than 10 percent slopes are shown in the site analysis on page 81. Steeper slopes are generally found along Columbia Creek and along the banks of the Grand River. The sand pits have some very steep slopes, fifty percent and better due to the excavations. The mined areas are hazardous in places, yet they add interesting topography to the site and provide excellent building sands for construction of roads and beaches, and add contrast to the dark brown soil. These sand pits would certainly be a favorite for exploring, after some reduction of the steep slopes. There are some wet land areas on the site that may provide interesting surprises for the hiker, and provide desirable shelter and environment for many species of fowl and fauna.

Columbia Creek which bisects the site is approximately 8-10 feet wide, and at points narrows to 2-3 feet in width. Its depth in most areas is about 2-3 feet and the bottom can be seen to have a sandy base. Water movement is swift and small fish and tadpoles can be seen darting about. In some areas on the site, water can be heard running in the nearby creek, yet due to thick undergrowth of deciduous plants, one must follow the sound until access is permitted by an opening in the vegetation.

There are a number of areas that are low and soft underfoot. These areas are easily recognizable by the appearance of sedge (Carex filiformis) a wire grass. The Grand River meanders slowly past the site and the water is visually clean. Sand can be seen at its bottom which is only 4-5 feet in depth. Soft mud flats along the river's banks indicate that there are frequent changes in the water's elevation. Old canoes and small rafts built from wood and large barrels lashed together with cord are secretly hidden by the river's "explorers". As one moves along on the river, the banks are too high to see beyond and the meandering of the river provides an enclosed space. One wonders what lies ahead around the next turn. The trees along the banks are deciduous and in some areas very dense. They provide a means of judging one's speed which is not very fast. It is just as well, for an old oak lies three-quarters of the way across the river, and careful navigation must be used to avoid hitting it or its submerged branches lying close to the surface of the water.

Vegetation: The forest cover consists almost entirely of deciduous material with small quantities of pine scattered throughout. Of the approximately 1740 acres on the site, 450 acres or over one-fourth of the site is in tree masses, not including the tree rows defining the fields. At one time the entire site was covered with trees in a maple, oak, hickory, and elm association. There exists very little erosion on the site, due mainly to the vegetation cover and farm practices. Soil characteristics concerning plant development will be

examined in connection with individual soil series types.

Climatological Data: The average number of days with appreciable rain throughout the year is 137, or a little more than one day in three. There are almost twice as many cloudy days as clear days throughout the year. Much cloudiness prevails during the winter season, but sunshine is abundant during the summer months. Similarly, relative humidity remains rather high during the winter, but is only moderate in summer.[3] The normals, means, and extremes of specific climatological information for this Region are given in the Table XI on page 85.

Soil Study: Effects on Vegetation: Soil classifications of the area have been studied in order to predict the behavior of the soil in their different uses. The engineer and builder examine the soil for support, the farmer for its nutrients, the forester for identification of soil and plant relationships for optimum production.

Soils vary in their ability to supply water, air, and nutrients to the plants for growth. Some soils might supply plenty of air to the plant's roots, as a gravelly soil does, yet food nutrients are leached from the soil so quickly with the passage of water downward, that plant subsistance is difficult. Some plants require more water, others more nutrients, and others more air. Plant root systems are different

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[3]U.S. Department of Commerce; "Local Climatological Data"; Lansing, Michigan; Annual Summary with Comparative Data, 1966. Page 1.

TABLE XI

NORMALS, MEANS, AND EXTREMES
OF
LOCAL CLIMATOLOGICAL DATA

Month	TEMP. Normal Monthly	Precipitation Normal Total	Precipitation Snow, Sleet Mean-Total	Wind Prevailing Direct.	Mean No. of Days Sunrise to Sunset Cl.	P.C.	Clo.	T.S.	H.F.
Jan	24.3	1.96	9.4	SSW	4	6	21	*	3
Feb	24.2	1.95	9.6	W	4	6	18	*	2
Mar	32.4	2.40	6.9	W	5	7	19	1	2
Apr	45.7	2.87	3.4	W	5	8	17	3	1
May	57.1	3.73	T	S	8	10	13	4	1
Jun	67.4	3.34	0.0	S	9	11	10	7	2
Jul	71.7	2.58	0.0	S	10	12	9	5	1
Aug	70.2	3.05	0.0	S	10	11	10	6	3
Sep	62.0	2.60	T	S	10	9	11	4	2
Oct	51.3	2.50	0.1	S	10	10	11	2	3
Nov	37.9	2.21	5.9	S	5	6	19	2	2
Dec	27.5	1.99	9.9	SSW	4	7	20	*	2

Symbol Key: Cl. - Clear
P.C.- Partly Cloudy
Clo.- Cloudy
T.S.- Thunderstorms
H.F.- Heavy fog
* - Less than .5
T - Trace

Source: U.S. Department of Commerce; Environmental Science Services Administration, Environmental Data Service; "Local Climatological Data", Lansing, Michigan; Annual Summary with Comparative Data, 1966.

in that some are tap root and extend into the ground a great distance, such as oak, while maples for example have a very fibrous root system. Also effecting plant soil relationships is the topography. Plants on the uplands need special qualities such as survival against wind exposure and usually drier conditions; whereas plants in low-lying areas are exposed to excessive wettness and frost pockets.

> There is a great diversity in soils, from coarse sands to fine clays,from wet to dry, from level to steep topography, from low to high organic matter content, from thin to thick coverings over bedrock, from high to low content of plant nutrients. Man has learned through years of experience that certain soils will react differently than others.[4]

There are approximately twenty-three soil series having approximately six types on this site. In evaluating them, identification of their suitability or limitations in their ability to support certain types of activities will facilitate and strengthen the design decisions.

Effects on Land Usage: Camp sites, picnic areas, and golf fairways are usually subject to heavy foot and vehicular traffic. The most desirable soils are those that have nearly level to gently sloping topography, good drainage, freedom from flooding during use period, a texture and consistence that provide a firm surface when wet and the ability to support good vegetative cover. Intensive play areas need similar

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[4]Dept. of City Planning and Landscape Architecture; Regional Landscape Planning; Univ. of Illinois; Page 43.

requirements, yet the ground slope should be restricted depending on the activity. Figure IX on page 88 shows the areas having soil types acceptable for these uses.

Vegetation supporting soils are used to determine areas that would be acceptable for lawn areas or for ornamental tree planting.

Building Soils as shown in Figure X on page 89 are those soils that will support roads and buildings. Buildings evaluated are those that have suitable soils for seasonal and year round cottages, washrooms and bath-houses, picnic shelters, and service buildings.

Paths and trails used for the movement of both people and animals as in cross-country hiking and bridle paths are assumed to be used as they occur in nature and that there will be little if any disturbance of the soil. Consideration should be given to placement of paths and trails on sloping relief to reduce the erosion hazard.

Soils possessing high water tables shown in Figure XI on page 90, as could be expected, would be considered poor building sites. Any usage of areas possessing such soils would be restricted to dry seasons of the year. The siting of septic tanks over such soils would be dangerous.

Soil Types

Perhaps the most useful grouping of the soils in this area

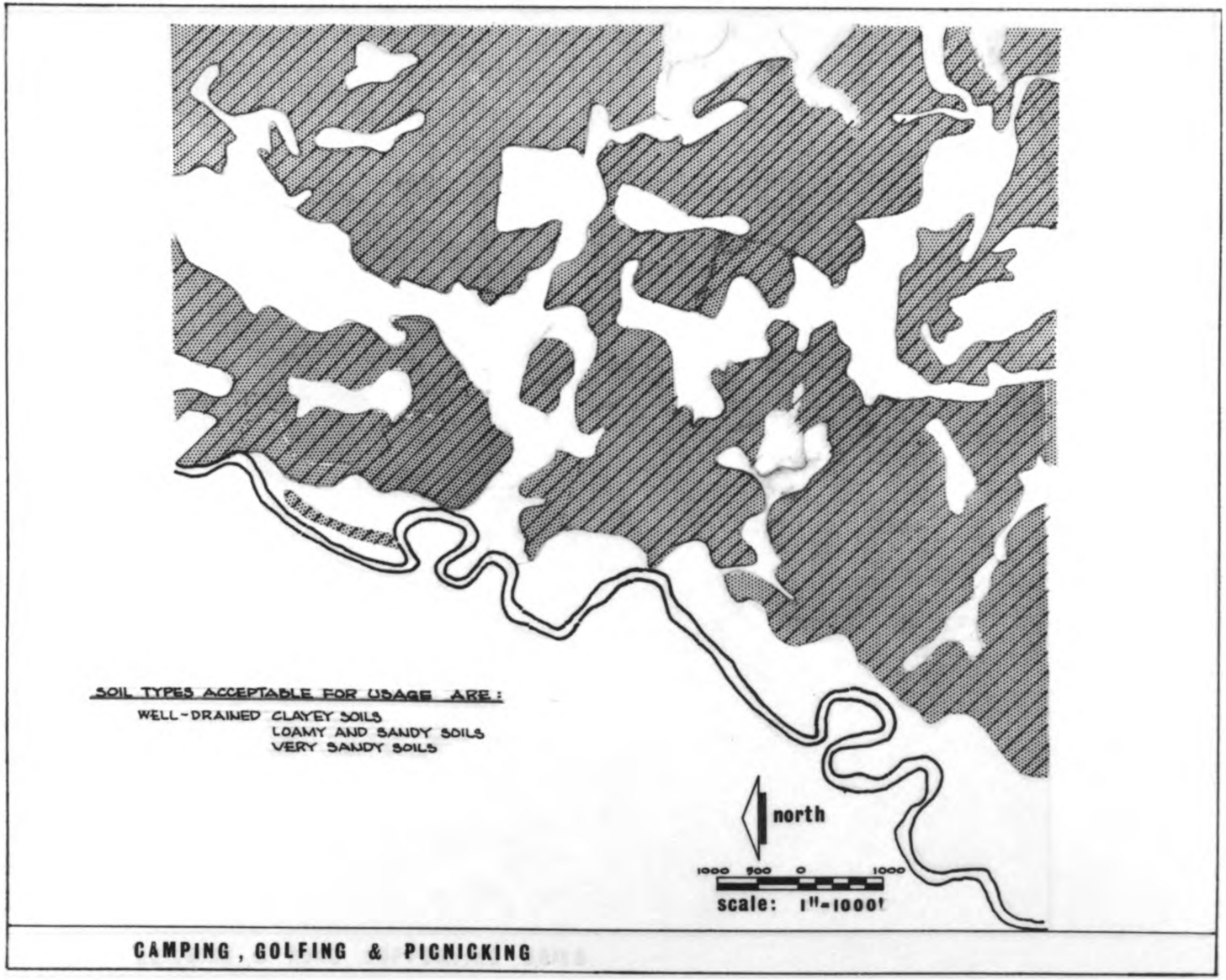

SOIL TYPES ACCEPTABLE FOR USAGE ARE:
WELL-DRAINED CLAYEY SOILS
LOAMY AND SANDY SOILS
VERY SANDY SOILS
north
1000 500 0 1000
scale: 1"=1000'
CAMPING, GOLFING & PICNICKING

Figure IX.

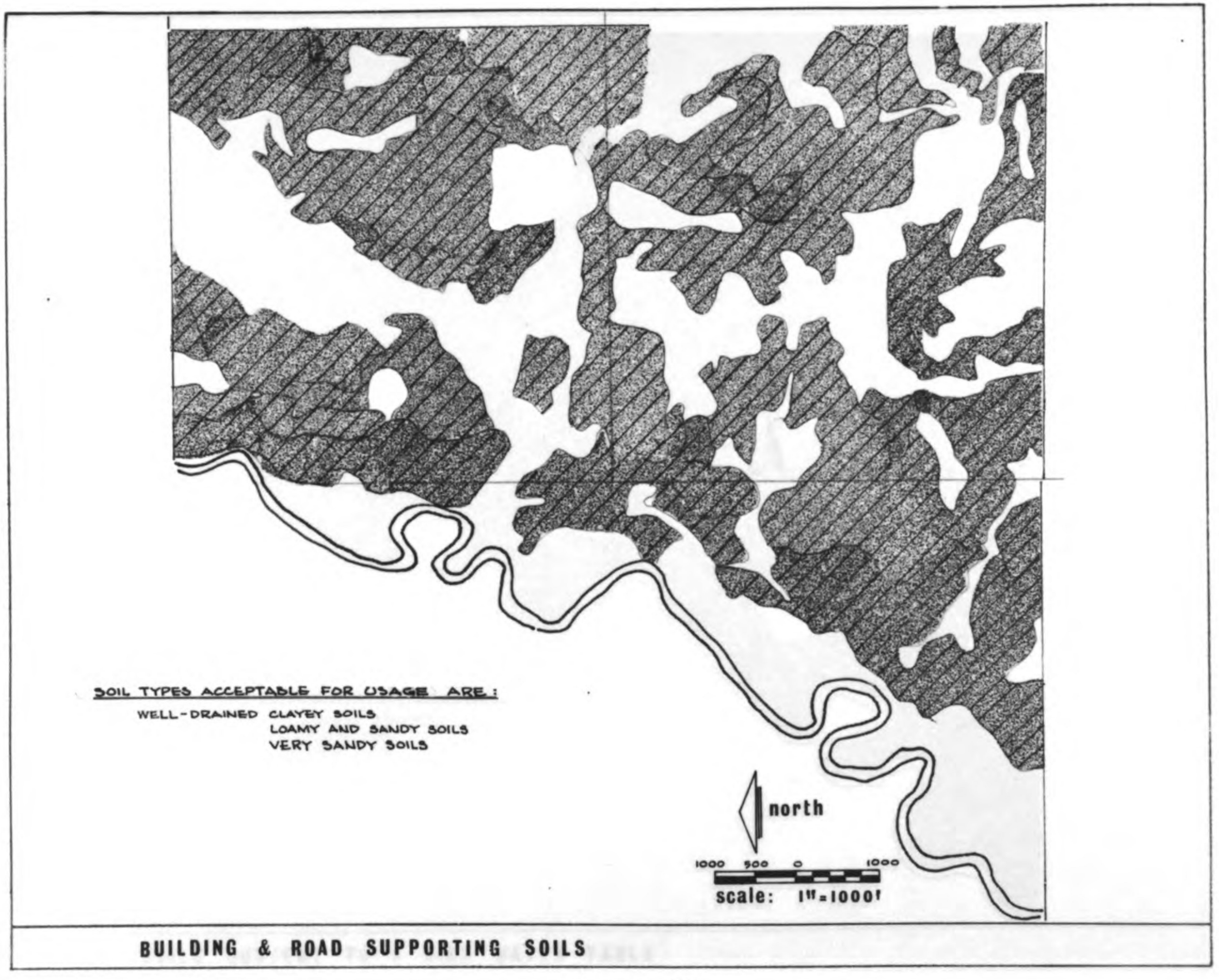
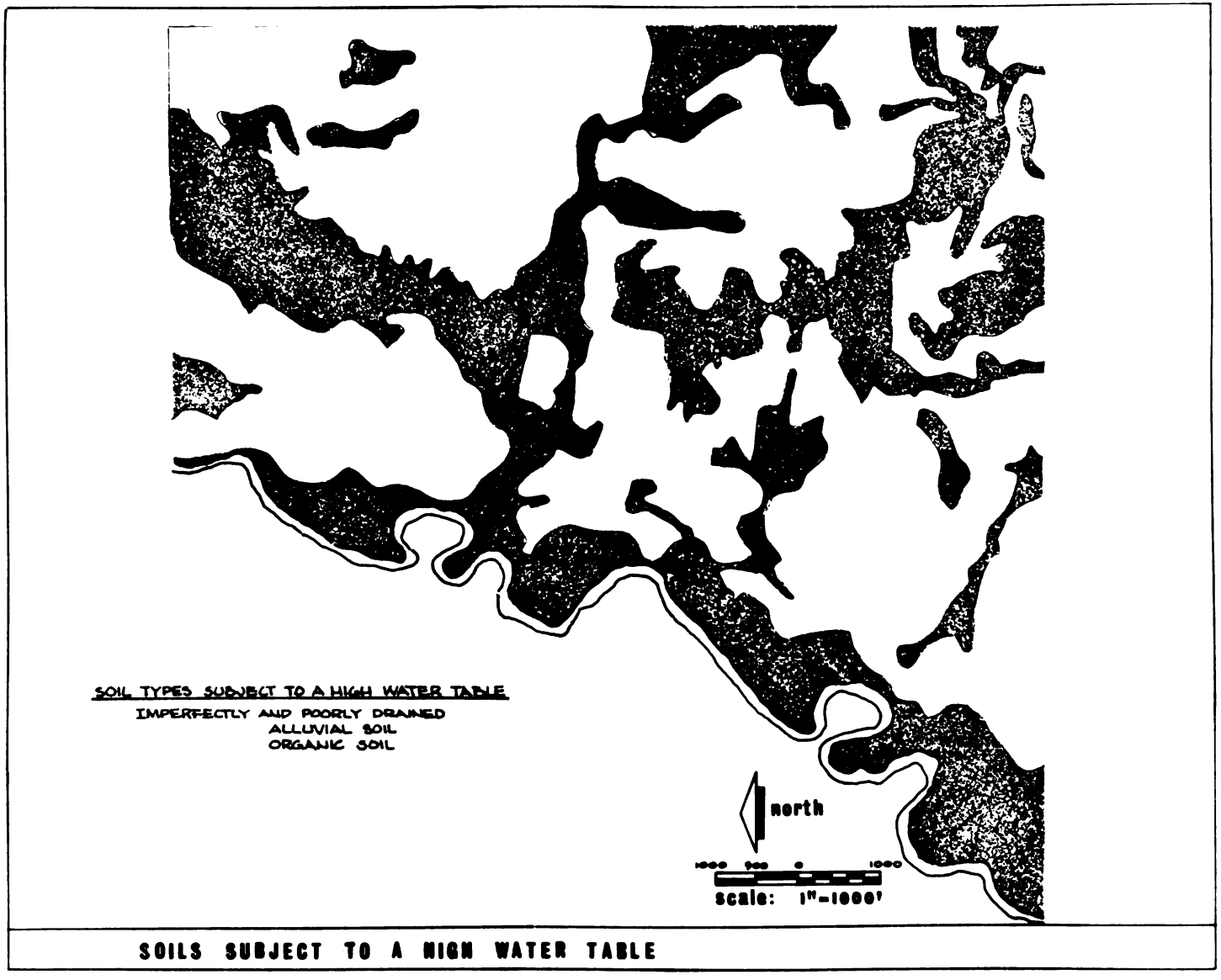

SOIL TYPES ACCEPTABLE FOR USAGE ARE:
WELL-DRAINED CLAYEY SOILS
LOAMY AND SANDY SOILS
VERY SANDY SOILS
north
1000 500 0 1000
scale: 1"=1000'
BUILDING & ROAD SUPPORTING SOILS

Figure X.



SOILS SUBJECT TO A HIGH WATER TABLE

Figure XI.

is on the basis of texture of parent materials and natural drainage, or water content. The individual soil types may be grouped as follows:

1. Well-drained clayey soils;
2. Imperfectly and poorly drained clayey soils;
3. Well-drained loamy and sandy soils;
4. Well-drained very sandy soils;
5. Alluvial soils; and
6. Organic soils.

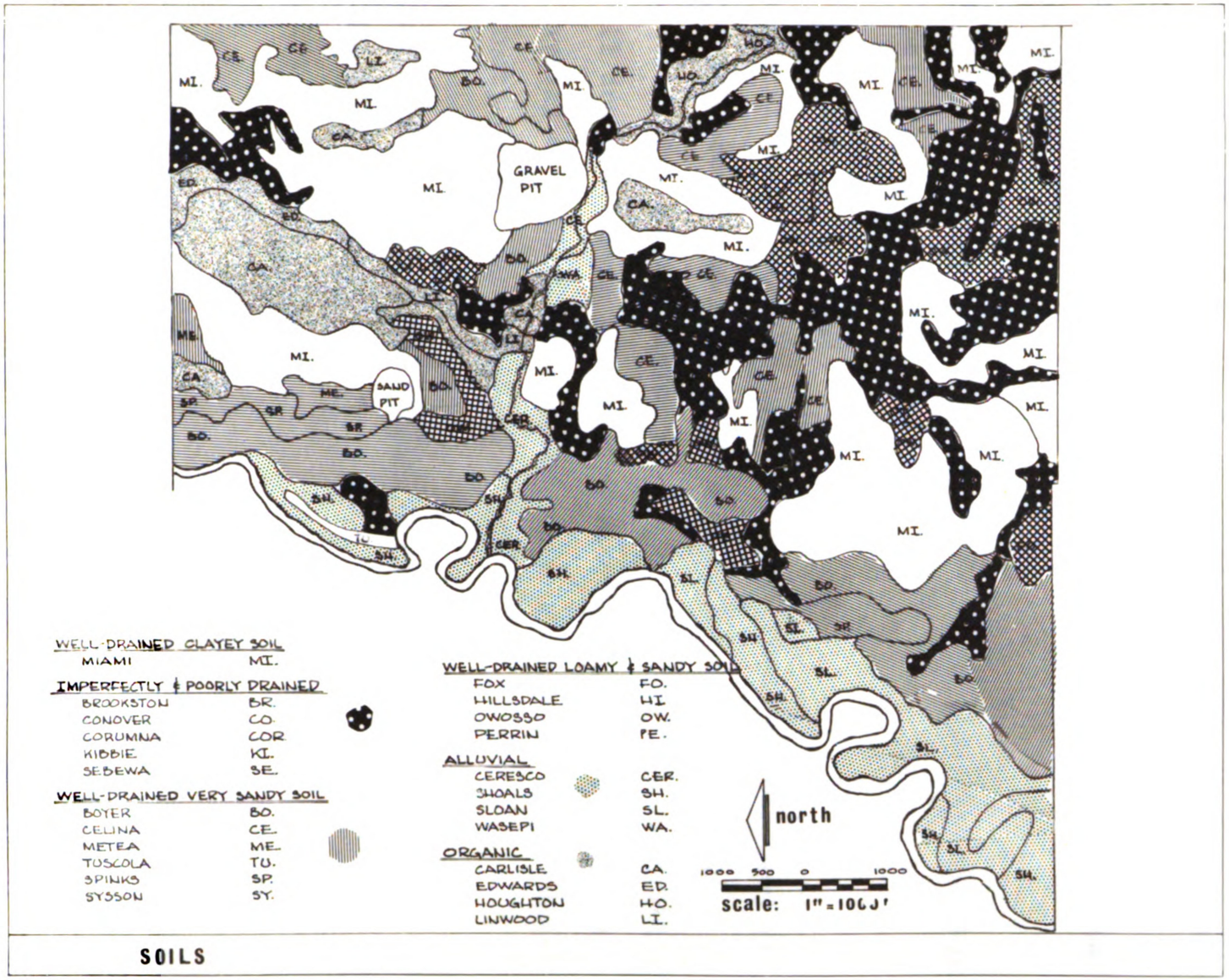
Each soil series is then listed as to its appropriate type. The soil series indicates soils having the same genetic horizons and developed from a particular type of parent material. Figure XII shows the location of the various soil types on the site.

Well-drained Clayey Soils: Series: Miami (Mi).
For soils of this type, the designation implies high moisture holding capacity with fair to high natural fertility and productivity. The plow soil consists of a grayish-brown yellow fine-granular loam. Usually found on nearly level to strongly sloping areas. Vegetation - deciduous forest, chiefly oaks, sugar maple, beech, and hickory.

Imperfectly and Poorly Drained Clayey Soils: Series included in this type are:

Brookston	(Br)
Sebewa	(Se)
Kibbie	(Ki)
Conover	(CO)
Corumna	(Cor)

These are somewhat poorly drained soils on nearly level to gently sloping land. The water table fluctuates between 2 and 10 feet from the surface. Areas are subject to ponding. Soils are generally classified by their dark grey or nearly



SOILS

Figure XII.

black surface which is rich in organic matter. Drainage problems do exist and contribute to the decreased value of the land for farming purposes. These soils provide an excellent source for the development of a plant cover and a food supply for wildlife. Lowland vegetation - deciduous forest, sugar and red maple, beech, elm, ash, hickory, basswood, and swamp white oak.

Well-drained Loamy and Sandy Soils: Series included in this type:

Perrin	(Pe)
Hillsdale	(Hi)
Owosso	(Ow)
Fox	(Fo)

Soils of this group are light-colored, usually described as grayish-brown, and have a low content of organic matter. Erosion is a major problem although the soils are moderately well drained. Where problems of erosion exist, the land is gravelly or cobbly. Vegetation - oaks, hickory, sugar maple, walnut, beech, and basswood.

Well-drained Very Sandy Soils: Series included in this type are:

Spinks	(Sp)
Boyer	(Bo)
Celina	(Ce)
Tuscola	(Tu)
Sisson	(Si)
Metea	(Me)

The characteristics of soils in this type are: loosely coherent, low in humus, light colored, low in moisture-holding capacity and low in natural fertility. Vegetation - deciduous forest, sugar maple, oaks, beech, elm, and basswood.

Alluvial Soils: Series included in this type are: Shoals (Sh), Sloan (Sl), Ceresco (Ce), Wasepi (Wa)

These are soils of the bottom lands, or those consisting of recent alluvium, lying in the flood plains of streams. These lands are subject to flooding with the water table fluctuating between 2 and 10 feet from the surface. Soil is mottled with rust brown or yellowish brown, indicating poor sub-surface drainage with poor aeration and oxidation. Vegetation - elm, ash, sycamore, soft maple, swamp white oak, hickory, cottonwood, and willow.

Organic Soils: Series included in this type are: Carlisle (Ca), Edwards (Ed), Linwood (Li), Houghton (Ho)

These are very poorly drained soils with 12 to 42 inches of muck and peat. Organic material derived from woody plants mixed with fibrous material. The land is nearly level with depressional areas subject to water ponding. The water table is at or near the surface unless drained. Soil is characterized by a dark brown or black surface material. Vegetation - mixed hardwood and conifers, ash, elm, white birch, white cedar, balsam fir, tamarack, cherry, aspen; shrubs - willow, dogwood, and alder; marsh grass, sedges, reeds, and cattails.

Degree of Limitations for Various Uses: The evaluation of the soils, expressed in terms of degree of limitation, are predictions of the behavior of soils under defined conditions. Four degrees of limitations are used in the Table XII showing

the various soil limitations on page 96:

1. Slight - relatively free of limitations or limitations are easily overcome.
2. Moderate - limitations need to be recognized, but can be overcome with good management and careful design.
3. Severe - limitations are severe enough to make use questionable.
4. Very Severe - extreme measures are needed to overcome the limitations and usage generally is unsound or not practical.

TABLE XII

SOIL LIMITATIONS

Soil Series	Bldgs.	Camp sites, Picnic areas, Golf	Intensive Play	Paths	Rds.	Lawns and Shrubs
Well-drained Clayey Soils						
Miami	1	1-2	2	1	2	1
Imperfectly & Poorly Drained Soils						
Brookston	3	3	3	3	3	2
Sebewa	3	3	3	3	3	2
Kibbie	3	3	3	3	3	2
Conover	3	3	3	3	3	2
Corumna	3	3	3	3	3	2
Well-drained Loamy & Sandy Soils						
Perrin	1	1	1	1	1	2
Hillsdale	1	1	1	1	1	1
Owosso	1	1-2	2	1	2	1
Fox	1	1	1	1	1	1
Well-drained Very Sandy Soils						
Boyer	1	1	1	1	1	2
Tuscola	1	1	1	1	2	1
Metea	2	2	2	2	2	2
Spinks	1	1	1	1	1	2
Celina	1	1-2	2	1	2	1
Sisson	1	1	1	1	2	1
Alluvial Soils						
Shoals	3	3	3	3	3	2
Sloan	3	3	3	3	3	2
Ceresco	3	3	3	3	3	2
Wasepi	2	2	2	1-2	2	2
Organic Soils						
Carlisle	4	4-3	4	3	4	3
Linwood	4	4-3	4	3	4	3
Houghton	4	4-3	4	3	4	3
Edwards	4	4-3	4	3	4	3

Key: 1. Slight
2. Moderate
3. Severe
4. Very severe

Source: U.S. Department of Agriculture, Soil Conservation Service in Cooperation with Michigan Agricultural Experiment Station; National Cooperative Soil Survey, August 1965.

Program for Site Development

The ORRRC recommends that a Class 2 area should be managed to provide a wide range of outdoor opportunities in a relatively natural setting and that the facilities and services be dispersed to maximize the use of the entire area. The design of a recreational area is not one based solely on physical space. There are other experiences associated with recreation such as the emotional, aesthetic, educational, social, and intellectual experiences, that are effected by spacial allotment.

> Much of the art and science of land planning is revealed to the planner when he first realized that he is dealing not with areas, but with volumes or spaces. ..... A well designed area is a series of well organized volumes, each volume skillfully devised to provide the most useful and pleasant space for its specific function.[5]

Dr. Hall, in his book, The Silent Language, indicates that spacial requirements of people and their cultures are many and varied, with each of us having highly developed spacial zones. These spacial areas or zones allow one to use discriptive words as crowded or empty, and thus, communicate one's feelings. Yet each person has their own idea of what crowded is, or when their feeling of space is being infringed upon. It is more evident in animals. A bird will take to flight and the dog will bark when their spacial requirements are encroached upon. This occurs among humans, usually unknowingly. When designing, it is necessary to consider the spacial re-

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[5]Simonds, J.O.; Landscape Architecture; F.W. Dodge Corporation, New York; 1961; Page 79.

quirements of the people, and ensure that the spacial zones are not violated. Through experimentation and user surveys, standards have been developed to provide adequate space for different recreational activities. Identification of those activities that are generally classified with Class 2 areas, and especially those that have been shown to be lacking in the Tri-County Region, have been made. The requirements for these activities as to their desired spacial standards will, along with their functional relationships be examined.

Standards for Activities

Picnic Areas: According to the Cleveland Regional Planning Commission, the best location for picnic sites is bottomland, preferably in the flood plains in a wooded place. This does not eliminate other areas having soils that can withstand a heavy carrying capacity. Layout and design of such facilities should be such that picnic units could be shifted to new sites within the same area when detrimental effects to the soil and vegetation are observed.

It has been the author's experience that people choose to drive as close as possible to their picnic site to lessen the distance picnic baskets and coolers must be carried. After eating, the picnickers are willing to leave their car and walk.

Activity areas should be provided near picnic sites such as softball fields, or the area could be less developed, and an open field serve the same needs. Fishing and nature trails

are also activities engaged in by picnickers. Swimmers will picnic and sites should be provided close to the water.

Spacial Requirement Standards:

National Park Service: 10 to 15 picnic sites an acre. Minimum size of 90 to 120 picnic sites an area. Each table accomodates 6 to 8 people; 2 to 3 tables per fireplace.[6]

Forest Service: Units should be spaced 100 feet apart for privacy and to prevent overuse of site. A unit consists of 1 stove and 1 table.[7]

National Recreation and Park Association: An average of 10.5 tables per acre with 1 charcoal grill per 5.1 tables. Saturation rate is an overall maximum average of 220.1 picnickers a day per acre of land.[8]

Nature Trails: Trails should be located to offer hikers or riders as many interesting vistas or views as possible. Interpretive signs should be used. Trails should be planned with numerous access points and inter-connection links. It should be noted that these statements are general and that each area due to different landscapes must be evaluated to insure that the trails take full advantage of the site. The opportunity for the designer to provide visual interest and variety by alternating spaces and views should not be overlooked. Standards by the Bureau of Land management-average suggest grades for trails not to exceed 8 percent.

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[6]U.S.Dept. of the Interior; National Park Service Handbook; "Special Park Uses", Washington,D.C.,April 1961;Pp.1-5.

[7]U.S.Dept. of Agriculture, Forest Service; Forest Service Handbook;"Title 2300-Recreation Management"; P. 76.

[8]National Recreation and Park Association; Management Aids Bulletin No. 4; Outdoor Theaters; M.Foss Narum; Washington, D.C.; May 25, 1961; Pages 8-22.

Nature trails have strong functional relationships to the camper and picnicker, and usually originate from a Nature Center. The Nature Center could provide an ecological history of the area, plant and animal life to be studied, and information as to path directions, destinations, and what can be seen along the way.

Spacial Requirement Standards:

California Public Outdoor Recreation Plan: Well defined and maintained tread up to 10 feet wide, grades not to exceed 5% average with a maximum of 15%. Minimum parking for 25 autos at any access point. On short, scenic, well known trails this might be extended to 100 auto parking spaces.[9]

Bureau of Land Management: Trails should be located to offer hikers or riders as many interesting vistas or views as possible. Interpretive signs should be used. On extended trails, rest stops should be about every 3-5 miles and overnight stops, about every 10-20 miles. In heavily used areas, overnight stops may be equipped with tables, fireplaces, and pit toilets. The trail should be planned with numerous access points and interconnecting links. Average sustained grades of trails ahould not exceed 8%; sections of 4% or less, at least 500 feet in length, should be used every mile if practical. At the beginning of an ascent, "pick up" the grade slowly at a rate of 1% per 100 feet of trail.

Width of trails vary, depending upon use as shown below:

(a) hiking trails will be narrow as possible to permit single file use, with widened areas every 200-500 yards where terrain permits.
(b) riding trails where no pack stock is used can be a little wider than a hiking trail with more frequent passing areas.
(c) a pack trail needs 8 feet of clearing although the tread will be considerably narrower.
(d) an interpretive foot path will be about 4 feet wide for medium use and 6-8 feet wide for very heavy use.
(e) multiple use trails will be designed for widest expected use.[10]

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[9]California Public Outdoor Recreation Plan Committee; California Public Outdoor Recreation Plan, Part II; 1960; P.85.

[10]Bureau of Land Management, U.S. Dept. of the Interior; Recreation Development Handbook; Washington, D.C.

Comprehensive Plan for Wisconsin: 50 people per mile of trail. Trails are 1 to 2 miles long. With a turnover rate of 8, there are 400 people per mile of trail per day.[11]

Golf: Since the golf course is not a family activity and does not encourage spontaneity in other activities, it need not be closely related to other areas of activity such as the swimming area to the picnic area. in fact it is best to isolate the course to stop interference of the game by non-players. The course should be laid out so as to provide a considerable distance between the fairways, to act as a planting area, thus giving each hole its own identity. Traps and rough areas should not be eliminated to speed up play. They are very important in the development of the golfer's skill, requiring accuracy on every shot.

Grounds care is very important if the course is to remain in a playing condition. Due to this well-kept appearance, the golf course gives a pictoral view of the landscape. The use and combination of evergreens and deciduous plants heigthen the visual interest.

Some of the amenitiesthat should be provided for the golfer are a club house, parking, and a practice green. The size of the club house will depend on its purpose. It should contain food service, act as a starter house, provide locker space for changing and rest rooms. Parking is necessary and a vehicu-

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[11]Wisconsin Conservation Department; A Comprehensive Plan for Wisconsin, Outdoor Recreation; Pp. G-7,G-8.

lar approach up to the club house is desirable to allow golfers to drop off their equipment. A practice green is used to provide a waiting area for the golfer, give him some idea as to the condition and speed of the playing greens, and allows him to loosen up.

Spacial Requirement Standards:

Sacramento County Planning Commission - 9 hole golf course facility - One 9 hole course for each 25,000 people. Each golf course has 75 acres that include:
(a) fairways, roughs, greens, and tees, 43 acres.
(b) club house, .25 acre.
(c) parking area and service roads, 1.75 acres.
(d) natural area, 20 acres.
(e) landscape area, 10 acres.
For one 18 hole course, double each of the above requirements.[12]

National Golf Foundation - 9 hole golf course facility - An 80 acre golf course located in a gently rolling area with some trees is preferable. Minimum of 50 acres.
18 hole golf course facility - 160 acres for a good course. Minimum of 110 acres.[13]

Camping: As camping has been examined earlier, under the Region's needs, there were no facilities provided for overnight camping. In designing these areas, it would be necessary to provide for the different types of campers: some using tents, others having trailers or truck campers. Camping could be participated in by Michigan residents as well as out of staters, depending on the closeness of a highway to the campground. The campers could be expected to stay for at least

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[12]Sacramento County Planning Commission; A Report on the Park and Recreation Space Needs of the Sacramento Metropolitan Area; Sacramento, California; July 1960.

[13]National Golf Foundation,Inc.; Planning and Building the Golf Course; Roy Holland, Editor; Chicago, Illinois;P.3.

one night and probably longer. Mr. Wicks, with the Michigan Department of Recreation, Resource Planning Division, said that campers like to take their equipment and camp overnight previous to long trips to make sure of their supplies. This is one type of camping area then to be developed, short-term, along with longer camper stays. Facilities that should be provided are those found to be important by the Gilbert Study for the ORRRC.[14] Interviews with campers indicated that water, toilet facilities, garbage facilities, tables, and preserving the area in a natural state, with no excessive crowding were the most important. The design of camping areas should be simple with the realization that people are attempting to experience the outdoors rather than duplicate their residential surroundings.

Spacial Requirement Standards:

Soil Conservation Service - Camp sites facility - 3000 sq.ft. per unit. A unit includes tent space, vehicle parking space, and use area for cooking, eating, wood storage, trash disposal, etc. 14 units an acre or 56 people an acre. Camp sites average 4 persons each. Dimension of tent space is 16x16 feet or 12x18 feet. Privacy size is 4000 to 8000 sq.ft. a unit; 5-11 units an acre or 20-44 people an acre.[15]

National Park Service - camp sites facility - One campground should provide a minimum of 90 to 120 camp sites on 12 to 30 acres, with 4 to 7 camp sites per acre. Each camp site should contain a parking space, a tent

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[14]U.S. Outdoor Recreation Resources Review Commission; As Evidenced By User Satisfactin; Study Report 5; Page 121.

[15]Soil Conservation Service, U.S.Dept. of Agriculture; Recreation Memorandum -3, Supplement 3; Washington, D.C.; April 23, 1964; Pages 1-2.

area, a table and bench combination, and a camp stove.[16]

Bureau of Land Management: High density campground facility - The high density campground is provided where use is expected to be continuous and intensive over normal visitor season, and where primary activity sought is not camping. If primary purpose is for lodging on a scenic trip, or a stop on a fishing tour, the campground may be more intensely developed.
The units have table, fireplace, and tent area. Density of campground is average to high. Garbage facilities and comfort stations are provided. Electricity and water stations may be provided at comfort stations. Spacing is about 95 feet to 105 feet along centerline.[17]

Campers should be functionally related to the nature trails (hiking), boating facilities, swimming areas, and fishing due to their popularity with campers as shown in Table XIII on page 105.

Day Camping:,as defined in the Regional Recreation Lands Plan by the Huron-Clinton Metropolitan Authority,is organized day-long outdoor recreation for children between the ages of 6 and 14. Basic physical requirements include sufficient acreage with interesting topography and vegetation to supply visual variety and develop inquisitiveness. The day-camping program is oriented to the out-of-doors with crafts and nature-lore being of special interest. Supervision is very important and the consolidation of those facilities requiring such is important. Bathing areas, shelters, playfields, fresh water, toilet facilities, and nature trails are all functionally

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[16]U.S.Dept. of the Interior; National Park Service Handbook; "Special Park Uses: Campground Planning"; Pp.1-5.

[17]Bureau of Land Management, U.S.Dept. of the Interior; Recreation Development Handbook; Washington, D.C.

TABLE XIII

COMPARISON OF PARTICIPATION IN OTHER OUTDOOR ACTIVITIES BY CAMPERS AND NONCAMPERS

Activity	Percent Participation Among Those Who Went Camping				
	Often (col.1)	1-4 Times (col.2)	Total (col.1&2)	Not at all	TOTAL
Outdoor Swimming or Going to a Beach					
Campers	43	25	68	31	100
Noncampers	25	20		54	100
Boating and Canoeing					
Campers	31	26	57	42	100
Noncampers	9	15		75	100
Fishing					
Campers	46	28	74	25	100
Noncampers	17	17		62	100
Hiking					
Campers	22	25	47	51	100
Noncampers	5	9		84	100
Horseback Riding					
Campers	8	8	16	83	100
Noncampers	2	3		94	100

Source: U.S. Outdoor Recreation Resources Review Commission, Study Report 20, Participation in Outdoor Recreation: Factors Affecting Demand Among American Adults; Washington: U.S. Government Printing Office, 1962; Page 68.

related to the day camp area.

Spacial Requirement Standards:

California Public Outdoor Recreation Plan: group camping facility - 5 acres for 50 persons for short periods of time. The 5 acres include sanitary, water and basic cooking facilities, open space for bedding or tents, and spaces for 25 automobiles.
Organizational camping facility - 5 acres for 100 persons. The 5 acres include developed permanent facilities and structures for eating and sleeping. Parking space for minimum of 50 cars.[18]

Swimming: The slope of the beach above water should not be greater than 2 percent for control and erosion. The beach should extend well into the lake at a desirable grade so as to effectively dissipate wave action. The slope below water level should be within a 3 to 10 percent grade and extend far enough to allow sufficient depth forswimming. The sand beach should extend at least to the six foot contour of the lake bottom. The depth of the sand fill should be at least a foot deep.

The design of the beach should require a minimum of maintenance, including ample room for complimentary facilities such as day use areas, sanitary and bath house facilities, as well as room for auto parking. The complementary facility areas should be provided with adequate space to handle the uses that are encouraged. The beach development should be easily accessible from the parking facilities and other use facilities should be well placed to serve the public's needs.

[18]California Public Outdoor Recreation Plan Committee; California Public Outdoor Recreation Plan, Part II; Sacramento, California; 1960; Page 84.

The lake bottom may be undesirable for recreational use owing to the presence of undesirable sediments or peat. This factor alone is one of the most frequent obstacles to overcome in beach development in the northern portion of the United States. It is generally thought that, where feasible, the unstable foundation material should be removed and replaced with a desirable sand fill. This eliminates many of the problems that result from sand mixing with foundation materials. Though this is the most desirable method of construction, it is often not economically practical to remove the great quantities of unstable material that may be present. It is possible in some cases to have enough support from the existing shoreline material to establish a beach by placing an even layer of sand over the existing sediments.[19]

Swimming is a major activity and is functionally related to campers and picnickers. It must be remembered that water available for swimming will be a popular attraction to the site.

Spacial Requirement Standards:

California Public Outdoor Recreation Plan and Huron-Clinton Metropolitan Authority: One effective front foot of shoreline is defined as comprising one lineal foot of beach with a 100-foot wide band of water suitable for swimming. It has a 200-foot strip of beach for sun-bathing and play, and a 100-foot wide buffer zone for utilities and picnicking. Where all attendance is by automobile, an additional 265-foot strip is needed for parking. Ten effective front feet will provide space for 20 persons at any time

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[19]Truncer, James J.;"A Brief Look at Artificial Public Beach Development in Michigan"; 1961; Resource Development Department; Michigan State University; Pages 5-6.

and provide space to park 5 cars.[20]

Boating: Although motor boating and water skiing are popular activities, they can reduce the value of the watershed area for other uses, such as fishing, swimming, and canoeing.

Spacial Requirement Standards:

Comprehensive Plan for Wisconsin: water skiing facility - One person per 13.3 acres of water. Estimate 3 persons per boat, 20 acres per boat may be adequate, but 40 acres per boat is more desirable. Boating facility - One person per 8 acres of water surface. Estimating 2.5 persons per boat, or 20 acres per boat. Small lakes with restricted motor sizes could support more than one boat per 20 acres.[21]

Louisiana Parks and Recreation Commission: Motor boat area facility - It takes 20 acres of water to support one power boat. 13 boats in the water would require 260 surface acres of open water to support a ramp. With 2.5 persons per boat, an optimum day with 40 launchings would produce 100 user days per ramp or 100 user days per acre of land and .385 user days per acre of water. This amounts to .01 acre of land and 2.6 acres of water per user day. Water skiing area facility - One ski boat requires 40 acres of water, therefore, 13 ski boats would require 520 acres of water to support one ski boat ramp. With an average of three persons per ski boat, a ramp would produce 120 activity days during an optimum day use, or 120 user days per acre of land and .23 user days per acre of water. This amounts to .0083 acres of land and 4.33 acres of water per user day.[22]

Boating and water skiing willnot be a part of the development program for the main water body will be but approximately 120 acres. Canoeing will be provided for, with rental available. Canoeing is functionally related to campers and picnickers.

[20]California Public Outdoor Recreation Plan Committee; California Public Outdoor Recreation Plan, Part II; Pp.48,84.

[21]Wisconsin Conservation Dept.; Comprehensive Plan for Wisconsin, Outdoor Recreation; 1966; Pp. G-10,G-11.

[22]Louisiana Parks and Recreation Commission; Louisiana Statewide Comprehensive Outdoor Recreation Plan, Supplement I; August 10, 1966; P. 3.0.15.

Fishing: Fishing is certainly associated and a desired activity within Class 2 areas, and would help improve the fishing opportunities within the Region. The impoundment site could be stocked, thus providing an excellent fishing opportunity for fishermen. Care should be exercised as to the location of fishing sites. Overuse along the banks of the impoundment site can create serious erosion problems.

Winter Sports: Water has a multiple season usage, for in the winter, it provides a slick frozen surface for ice-skating and ice-fishing. Hills covered with snow can become ski hills or sliding hills for sleigh rides. This particular site does not have the topography for skiing. Winter activities would be limited to ice skating and some sleigh riding.

Spacial Requirement Standards:

Clare A. Gunn - Winter Sports Site Facilities - Areas with less than 60 inches of snowfall per year depend upon artificially prepared snow. A good winter sports site includes over 80 acres of both hilly and reasonably level land.
Skiing and toboganing areas - These activities require elevation differences of over 100 feet and slopes from 10 to 60 percent or over. Nearly level but well drained land is needed for building sites, parking areas, drives, and skating rinks.[23]

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[23]Gunn, Clare A.; "Location and Site Selection Factors for Winter Sports Areas in Michigan"; Quarterly Bulletin: Vol. 40, No. 4. Michigan Agricultural Experiment Station; Michigan State University; May 1958; Pp. 743-746.

Outdoor Games: Outdoor games are related to beach areas, picnickers, and campers. The areas should provide free play or softball facilities, and should not add greatly to the park's maintenance problems. It is suggested by the Huron-Clinton Metropolitan Authority that an acre of game area be provided for every 2 acres developed for picnicking and beach development.[24]

Hunting: Due to the closeness of the Dansville State Game Area and that 60 percent of the private owners in the Region allow hunters access to their land, hunting has not been provided for. Also, since a nature center and trails are being developed, a natural animal environment is desired.

Horseback Riding: It is difficult to estimate the Region's needs for this activity, and due to the maintenance and cost involved (usually three dollars per hour) this facility has not been provided.

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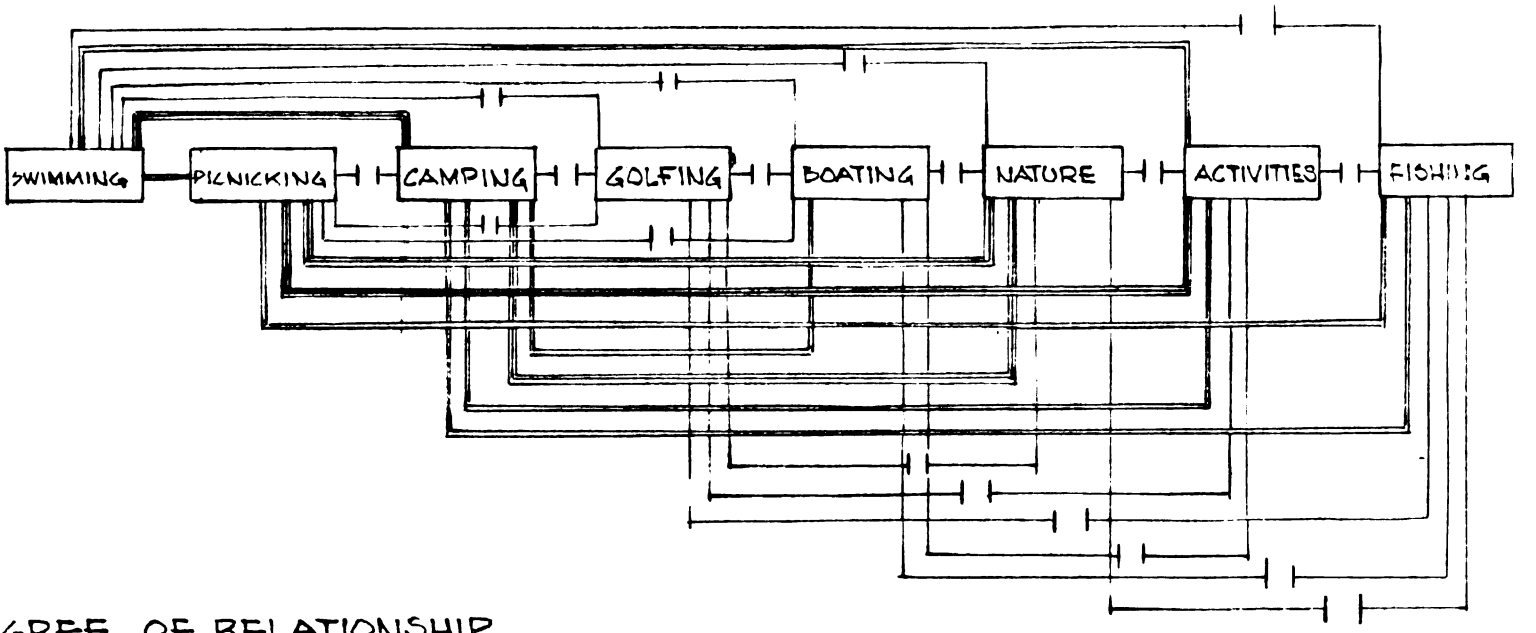
[24]The Huron-Clinton Metropolitan Authority; The Eleventh Biennial Report as of December 31, 1963.



DEGREE OF RELATIONSHIP

STRONG

WEAK

NONE

Summarization

The site has been selected from the thirty-three possible watershed impoundments within the Tri-County Region as proposed by the Department of Agriculture. Its selection was based on the nearness to populated areas, recent topographic USGS maps, topographic relief and vegetative cover, in addition to the suggestions of both Mr. Wicks, landscape architect with the State Recreational Resource Planning Division, and Mr. Amsterburg, engineer with the United States Department of Agriculture, as to the possible desirability of Columbia Creek as an impoundment site for recreational development.

Site selection criteria was used to evaluate the area as to its recreational potential. Both the perceptual study and the soil studies have been made of the site in order to discover areas possessing satisfactory conditions in the development of a recreational plan. Defining those soils and perceptual qualities of the landscape having limited recreational values, facilitates the utilization of the land to its maximum potential.

The spacial requirements are used as a guide in the development of the site plan. Standards are variable. There could be as many different standards as there are designers or recreational sites. There are different recreational experiences and people have varied spacial requirements, therefore, in the development of the site plan,

we are dealing with the total organization of space, a space which is loose, continuous and dynamic in nature. This space is formed with buildings, earth, rock, water, plants and light. The criteria for visual success are first, that this space be imageable, i.e. well structured and vivid in form, endowed with a pervading sense of place. Second, it must be conceived as a sequential experience, rhythmically organized, with contrast and variety, yet with strong continuity. Third, it must be meaningful: highly expressive of the nature, function, and value of the place and the uses that occupy it.[25]

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[25]Lynch, Kevin; Site Planning; The M.I.T. Press; Cambridge, Mass.; 1962; Page 87.

CHAPTER V

DEVELOPMENT OF THE COLUMBIA CREEK RECREATIONAL AREA

The park site, Columbia Creek Recreational Area, as shown in the Master Plan of Figure XIII on page 114, has been designed to be developed primarily for the potential water resource available that would occur from damming Columbia Creek. As has been mentioned earlier it is only one of thirty-three watershed sites throughout the Tri-County Region. Each of those should be investigated for their water impoundment value.

Provisions of the Master Plan

Facilities that have been provided on the site are:

- Information Center
- Swimming area and Pavilion
- Fishing
- Canoeing
- Camping
- Picnicking
- Nature Center
- Nature Trails
- Educational Farm
- Golf Course (9-hole)
- Maintenance area

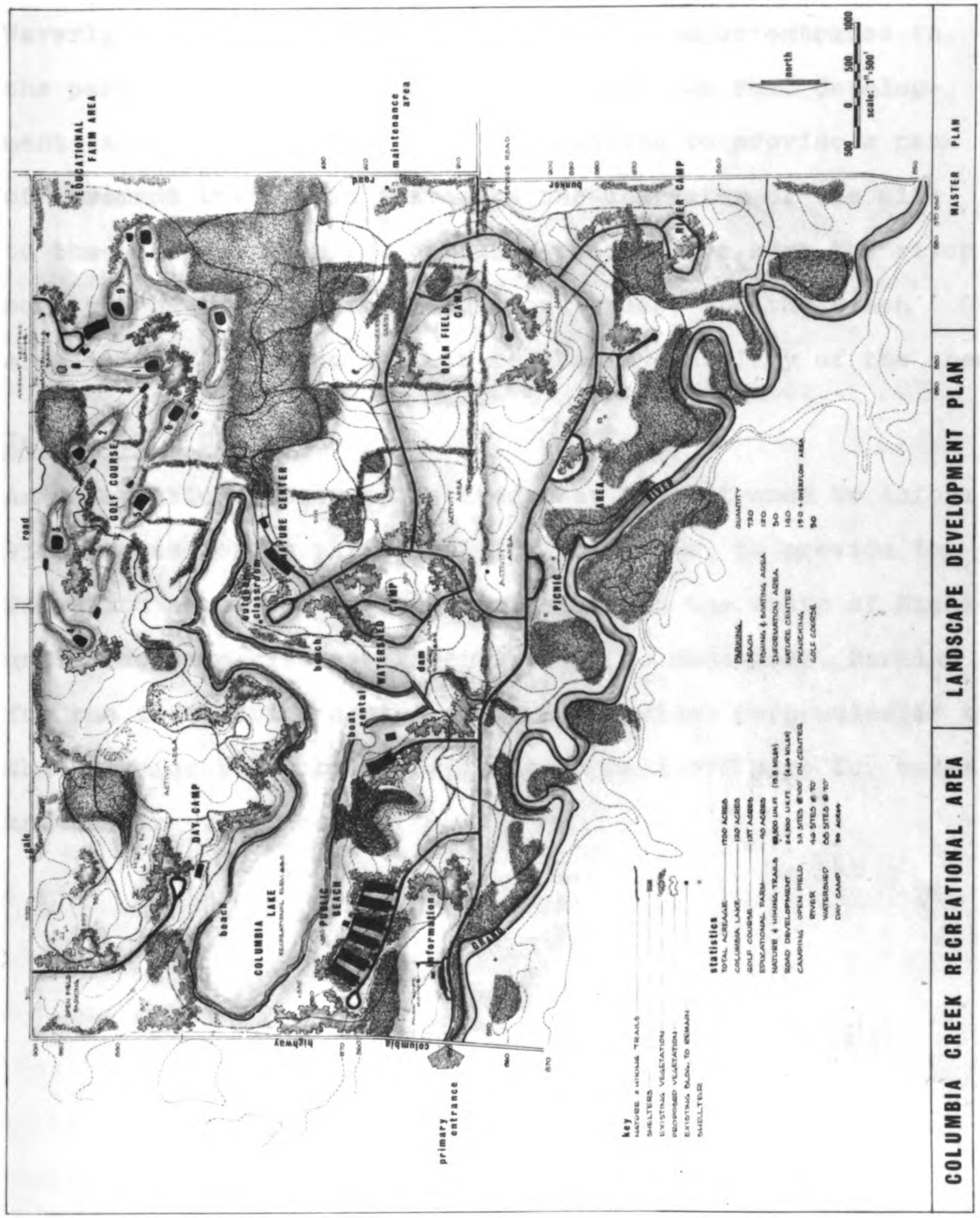

COLUMBIA CREEK RECREATIONAL AREA
LANDSCAPE DEVELOPMENT PLAN
MASTER PLAN
EDUCATIONAL FARM AREA
maintenance area
GOLF COURSE
DAY CAMP
COLUMBIA LAKE
PUBLIC BEACH
WATERSHED CAMP
OPEN FIELD CAMP
RIVER CAMP
PICNIC AREA
RIVER
primary entrance
Columbia
Highway
Information
boat rental
dam
beach
bunker
road
north
scale: 1"=500'
statistics
key

Figure XIII.

Approach and Entrance to the Site:

Users can be expected to approach the site along Columbia Highway, the major access route from M-99 and U.S. 27. Waverly Road has been designed to be the major entrance to the park due to the adequacy of the soil for road development; and it was the designer's intention to provide a path of movement that would introduce the character of the site to the visitor. From the entrance road can be seen the river, some old barns, stands of deciduous trees, and the beach area. All of these contribute to the imageability of the area.

Information Center:

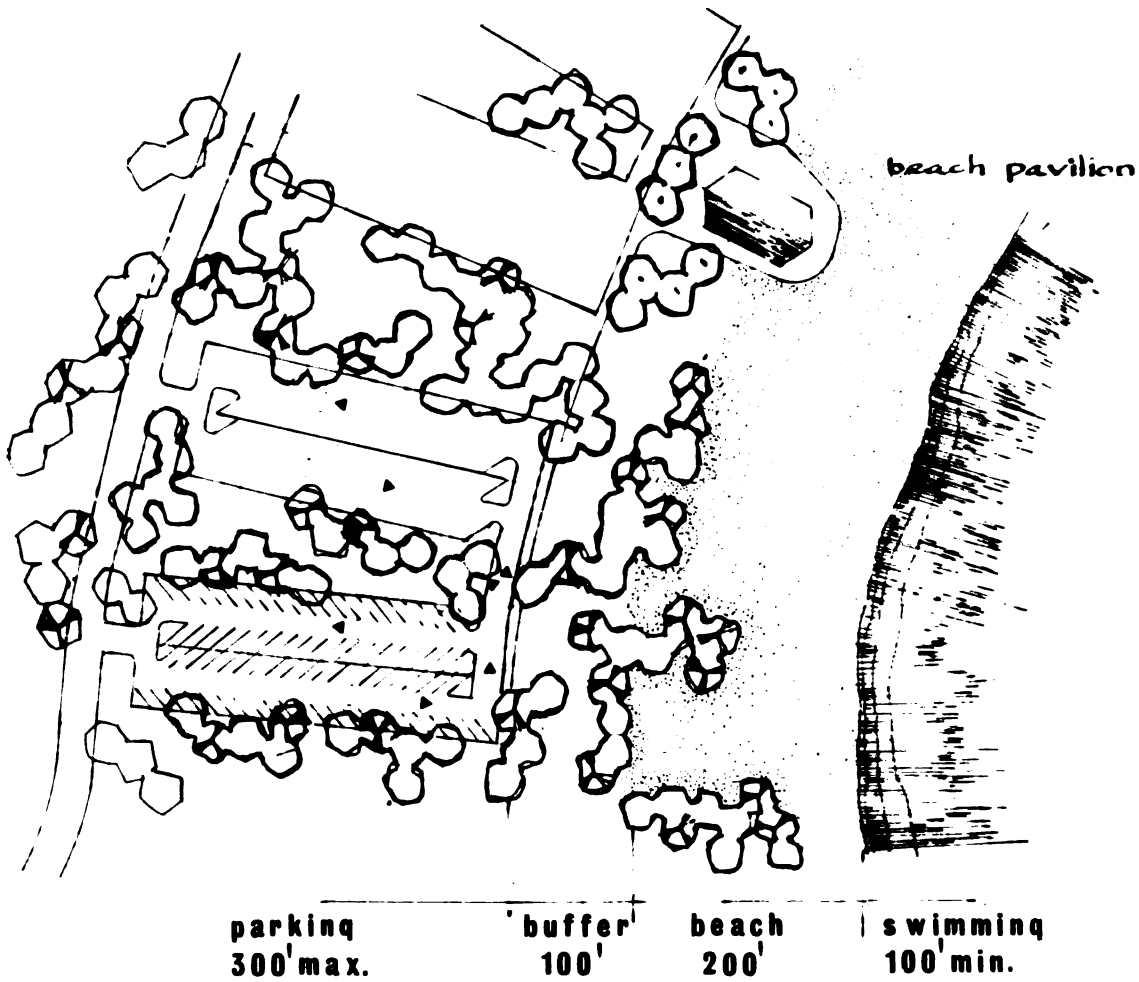
An information center is located near the entrance to inform visitors as to the parks activity locations, to provide information about the surrounding area, and the state of Michigan. Also camp site assignments would be made here. Parking for the information center would be provided perpendicular to the curb for automobile stalls and a pull-off area for buses and camping vehicles.

Swimming:

The entrance road to the beach area is located one-half of a mile from Columbia Highway south on Waverly Road. The road is far removed from the park entrance and the information area, to reduce vehicular congestion. Due to the extreme shortage of quality water in the Tri-County Region, the swimming facilities can expect heavy usage.

Parking for 500 automobiles is provided for the beach area, allowing the maximum daily usage, according to spacial details mentioned in Chapter IV, to be 2,000 persons. A Pavilion has been provided to accomodate food preparations, changing facilities, and outdoor eating areas. The beach road terminates in a cul-de-sac facilitating vehicular maneuverability. Parking lots have been designed to provide the most efficient movement of people and automobiles, provide additional picnicking areas for the swimmers, and to break up the large asphalt parking lots. Each lot has provision for approximately 83 automobiles.

For the public beach, Figure XIV shows the development zones that have been established to assure sufficient space between activities. These zones are (1) developed swimming area not less than 100 feet; (2) beach 200 feet in depth, with a sand surface; (3) buffer zone 100 feet in depth provided for picnickers. This area is to be in grass with shade trees. Picnic areas will extend out into the buffer area between parking areas. (4) Parking to be developed within 300 feet of the



PUBLIC BEACH DEVELOPMENT ZONES

scale: 1" = 100'

buffer zone.

The beach is approximately 1000 feet in length and will need intensive development due to the existing woods and the muck soil that exists. Fortunately these problems can be taken care of before the dam is constructed and the land flooded. Sand pits located next to the beach area will reduce the cost and time involved in the development of the beach.

Open space areas are provided adjacent to the parking and beach area for activities and picnicking. A pavilion is provided to assure the swimmer the necessary amenities with a minimum of park maintenance. Restrooms with changing facilities are included within the pavilion. Concession machines serve pop and snacks. Elaborate service facilities have not been provided to reduce commercialization and encourage picnicking.

Water Elevation of Impoundment: The water body has been designed with a recreational level of 880 feet above sea level providing a 10 foot depth of water. In evaluating the flood prevention elevation of the Columbia Creek Watershed Area, Mr. Amsterburg, a civil engineer with the Department of Agriculture, used the Manning formula with a 25 year storm design criteria. It was determined that it would be doubtful if the impoundment area would receive more than three feet of additional water from melting snows or summer rains. Yet an an additional two feet was added to the height of the dam and

to the building of levees along the northern edge of the lake. The flood elevation provided for then is 885 feet above sea level. Buildings, roads, and other intensive development must be above this elevation.

The woodlot in the impoundment area would be destroyed. This is a controversial conflict of interest. In providing one element of recreation, water, another element is destroyed, trees. In planning for recreation, according to Mr. James Wicks, landscape architect with the Recreational Resource Planning Division of the State of Michigan, water, due to the Region's needs, is more desirable than the existing tree cover. Trees can be planted, yet only a few areas can impound water. It is more desirable to have the water area as opposed to the tree cover, especially in this instance with so many of the trees being elms, and already affected with the Dutch Elm Disease.

Fishing

Fishing is allowed along the banks of both the river and the impoundment area, at places provided with fishing docks. These are provided particularly near picnic areas and camping sites.

Parking is provided for watershed fishing in the boat rental area. The impoundment's stocking of fish is to include some or all of the following game fish: large mouth bass, Pan fish, black crappie, white crappie, blue gill, and wall-eyed pike. Also provided is the gizzard shad as a feeding fish.

Canoeing

Canoes can be rented to be used in the impoundment area for the enjoyment of rowing and exploring the water body. A shelter has been provided for the storage of the canoes during the winter season, and in order to make repairs on them. Toilet facilities and concession machines are to be included within the shelter.

Camping Facilities

Two types of campers are expected to use the park. They are day campers and overnight campers. Day campers will include groups from such organizations as the Boy Scouts, YMCA, and other private associations. The entrance road focuses on a large grouping of deciduous trees from which the road turns toward the campground offering a surprise view of the impoundment area, Columbia Lake. The road brings the campers to a drop-off point near the shelter in order to facilitate transportation of the campers and to provide service for the area. Open field parking has been provided near the entrance to the Columbia Creek Day Camp at Gale Road, thus allowing the interesting land nearer the camp to be used for camp activities. A swimming area has been developed with a length of 200 feet and depth of 5 feet, less than the public beach for supervision and safety. A shelter is located near the beach area in order to provide changing facilities for swimmers. The shelter will also be used as an eating area and used in the instruction of hand-crafts. It will include toilet and drinking facilities. Wet lands, woodlands, nature trails, an outdoor classroom, and open space areas providing for ball games and archery are additional amenities within easy access to the day-campers.

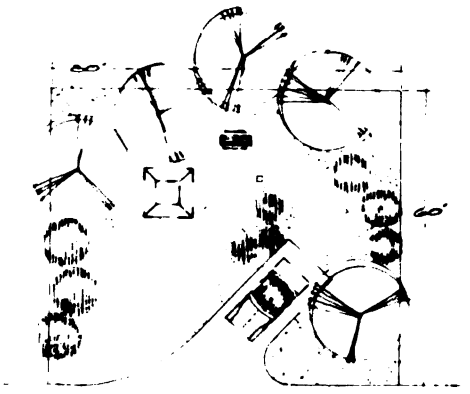
The second type of camping is overnight camping and three divisions are provided: River Camping, Watershed Camping Area, and Open Field Camping.

River camping has been designed basicly for those interested in river canoeing, either as a starting point for a canoe trip or as an overnight stopping point. Electricity, garbage, toilet, and water facilities are provided in a central area for the camper's usage. The camp sites are more of a wilderness type area, restricting development of the area and requiring concealment of the camp facilities to some degree. A canoe landing constructed of wood, parallels the river bank.

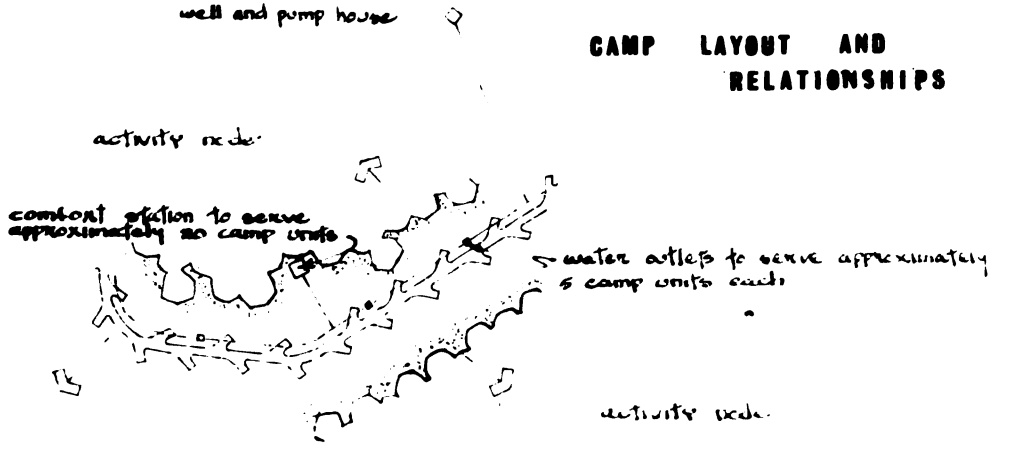
The watershed camping area will probably receive the greatest amount of usage due to the closeness of the camp to the beach area. These campers will have more sophisticated equipment than those along the river. Trailer and truck campers will mix with those campers having tents. Toilet and water facilities, and garbage disposal is to be provided.

Open field camping provides the third overnight division of camping. This camping area does not have water for recreational activities. Yet it is situated between the impoundment water, Columbia Lake, and Grand River, allowing easy access to both. Also the nature trails and activity areas are close by. Again, drinking water, toilet facilities, and garbage disposal areas are located centrally.

Typical camp unit layout and design considerations are shown in Figure XIV on page 122.

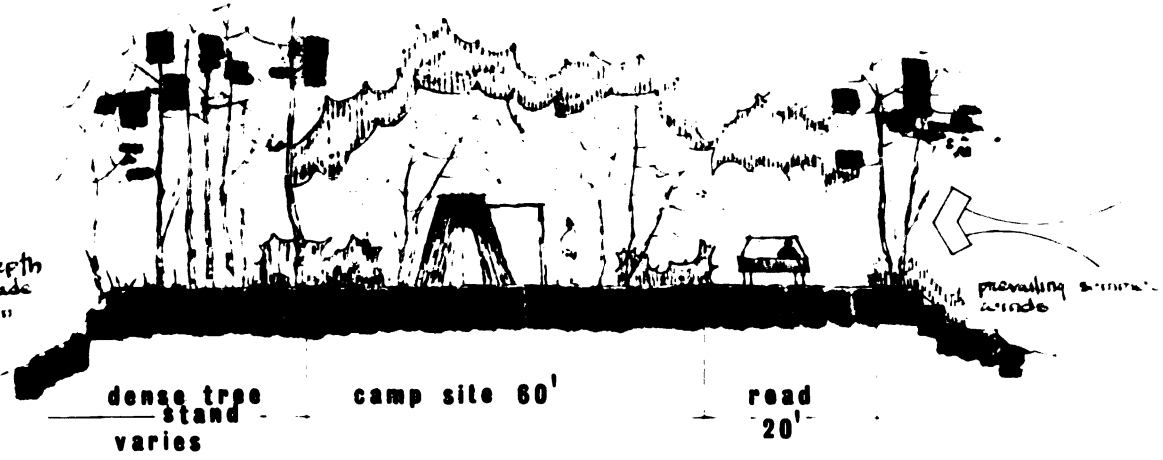


CAMP UNIT PLAN
scale: 1" : 20'



road width reduced in camping areas to serve as a means to slow vehicular traffic allowing safer pedestrian circulation.

camping units are approximately 60' in depth and 60' wide. plant cover is limited to shade trees which will provide relief from the sun and give some degree of enclosure to each unit. the majority of the camp site is to remain open for camping activities. [illegible] stand acts as a buffer between camp sites.



ZONES OF TYPICAL CAMP LAYOUT

LAYOUT AND DESIGN OF CAMP SITES

Figure XIV.

Picnic Areas

The picnicking areas are located along the river in the flood plain. Here, shade is provided by the trees along the river's bank and picnickers can engage in fishing, watch the canoers pass, or take part in activities in the planned open space surrounding the area. Picnic areas are clustered in small groups with a buffer zone of open space between groups. Parking for picnicking along the river area is designed as pull-off areas to facilitate traffic circulation. Picnic tables and benches are placed to the outside edge of the site so that they may be easily reached from the parking areas. Picnic areas are also provided in conjunction with the swimming areas and near the nature center. Small shelters have been located in the picnic areas to provide protection against inclement weather, rest rooms, and drinking water. Nature trails pass by the picnic areas and it is planned that they will receive heavy usage from the picnickers.

Nature Science Center

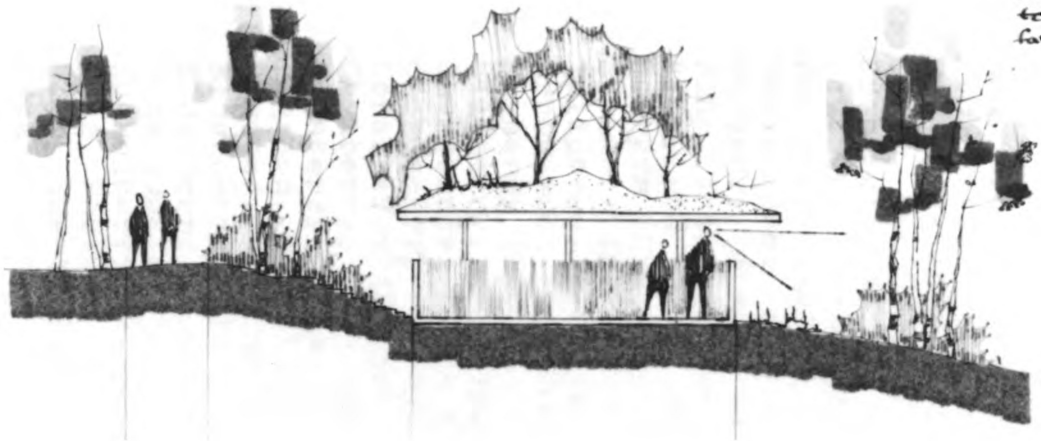
The Nature Science Center building is located overlooking a portion of the impoundment area in the center of the site. All trails begin at the Nature Center, although it is possible to enter the trails at other points. The science center provides an educational experience for both children and adults. Displays of animal and insect life that exist on the site presently or did exist in the past can be seen. Public programs, including movies, lectures, and frog hunts are to be sponsored by the center. A lending library for schools is also one of the science center functions, loaning both books and small animals. A gathering place near the center is the outdoor classroom to be used for large group lectures and instruction. The classroom provides a close contact with nature and facilitates the educational experience. Trail information guides, restrooms, and a small picnic area can also be found at the science center.

Nature Trails

The nature trails encircle the entire park. They are to be well marked and an information guide on each major trail can be gotten at the Nature Center. The trails are designed to enable complete exploration of the site and to enjoy the interesting intrinsic and extrinsic features of the park.

Different surface materials for the trails are used in fitting them to the landscape and to lessen maintenance. Asphalt surfacing materials are used near buildings or other facilities having heavy foot traffic. In the open fields, grass is to be used, wood chips in wooded areas, and along the river and in areas having muck soil subject to a high water table, narrow wood decks on cencrete foundations are used to penetrate the wet land areas. The trails pass old scenic barns, a pioneer's cabin, a small Indian camp, and a modern farm providing a history of the area and encouraging the inquisitiveness of children as well as the adults.

The Indian camp and the trapper's cabin can be seen from the main road in order to heighten visual perception of the road and to allow supervision of these attractions by park officials. These areas are accessible by trails only. Trails are many, thus allowing one to choose a different trail for the returning hike from any location. A number of concealed wildlife observatory shelters are located off the trails in order to observe and study the wildlife habitat. Design considerations for hiking paths are illustrated graphically in Figure XV.

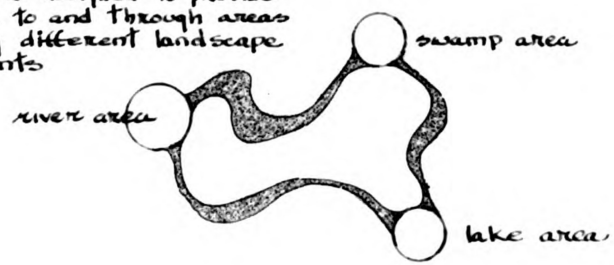


PATHS provide a unifying element for the site, linking together favorable nodes of activities.

activity nodes not functionally related can be segregated by not providing paths between them.

path | buffer | wildlife observation | animal habitat

PATHS are designed to provide a passage to and through areas possessing different landscape environments.



PATHS introduce to the hiker the interesting and unique within each landscape environment. they are designed to allow viewing of the areas through a variety of speeds.

CONSIDERATIONS FOR hiking paths

Figure XV.

Vegetation throughout the Site: Proposed vegetation has been planned to provide:

1. shade in both picnic and camping areas;
2. definition of spaces, a visual screen and a physical barrier;
3. protection against erosion;
4. food and cover for wildlife;
5. an increase in the overall aesthetic appeal of the site; and
6. a wind break.

Listed below are some plants conducive to the development and support of wildlife habitat:

Trees:
- Ash, Mountain (Sorbus americana)
- Ash, White (Fraxinus americana)
- Birch, Yellow (Betula lutea)
- Cedar, Red (Juniperus virginiana)
- Crabapple (Malus, many species)
- Hawthorn (Crataegus, many species)
- Hemlock, Canadian (Tsuga canadensis)
- Maple (Acer, many species)
- Mulberry (Morus, several species)
- Pine, White (Pinus stobus)
- Pine, Red (Pinus resinosa)
- Sourgum (Nyssa sylvatica)
- Sycamore (Platinus occidentalis)
- Tuliptree (Liriodendron tulipfera)

Shrubs:
- Arrow-wood (Viburnum dentatum)
- Bayberry (Myrica pennsylvanica)
- Blueberry, High Bush (Vaccinium corymbosum)
- Chokeberry, Black (Aronia melanocarpa)
- Chokeberry, Red (Aronia arbutifolia)
- Coralberry (Symphoricarpus orbiculatus)
- Cranberry, European (Viburnum opulus)
- Cranberry, Highbush (Viburnum trilobum)
- Dogwood, Gray (Cornus racemosa)
- Dogwood, Red Osier (Cornus stolonifera)
- Elderberry, Black (Sambucus canadensis)
- Elderberry, Red (Sambucus pubens)
- Honeysuckle, Tatarian (Lonicera tatarica)
- Huckelberry, Black (Gaylussacia baccata)
- Rose, Pasture (Rosa carolina)
- Rose, Sweetbriar (Rosa eglanteria)
- Sumac, Smooth (Rhus glabra)
- Sumac, Fragrant (Rhus aromatica)[1]
- Withe-rod (Viburnum cassinoides)

[1]Szabo, Bert; "Attracting Birds to our Homes";Woodland Trails; Akron Metropolitan Park District; Vol.6,No.2; Feb.1966.

Educational Farm

The educational farm would produce small and variable quantities of farm crops as did the first settlers that came here from New York, Pennsylvania, and Ohio. Corn, oats, hay, and potatoes and possibly some truck crops (lettuce, onions, or tomatoes) would be grown. A small number of animals would be displayed in their farm environment also. Pigs, cows, chickens, and horses are certainly all apart of farm life. The farm selected exists in the southeast corner of the proposed park area. It was chosen due to the seemingly operational efficiency by the owner of the farm, its cleanliness, and due to the existing silo, barn, and equipment present on the farm, reducing development cost. It would be advantageous to purchase the farm from its owner and retain him at an annual wage to help in the development and management of the same.

Vehicular access to the farm and open field parking are provided for visitors arriving by car or bus, such as 4-H or FFA groups coming to examine and learn farm practices.

Trails from other areas within the park lead to the farm. Restrooms and picnic facilities are also provided in this area.

Golf Course

The Columbia Creek Golf Course is located in the southeast section of the site. Since it is segregated from the other areas as to activity participation, its own entrance and parking area have been developed. Approximately 40 parking spaces have been provided. The clubhouse is limited in size, providing food and drink machines, locker space, caddie cart rental and storage, sitting facilities, and restrooms. The clubhouse overlooks the course and many of the holes can be seen from there. The location of the clubhouse on high ground gives the starter sufficient sight coverage of the first hole so as to control the golfers starting times from this point. The third and fifth holes have water hazzards and the golfer must traverse Columbia Creek by foot-bridge. The existing woods and topography have been used to make the course more challenging.

The 9-hole course provides a difficult 36 par round of golf.

Table XIV. Golf Course Yardage

HOLE	MEN	WOMEN	PAR
1	300	300	4
2	370	300	4
3	300	300	3
4	375	300	4
5	470	400	5
6	375	300	4
7	400	300	5
8	375	350	4
9	250	250	3
TOTAL	3215	2800	36

A 9-hole course was chosen over an 18-hole course due to the limited amount of land available, and in order to lessen the maintenance costs.

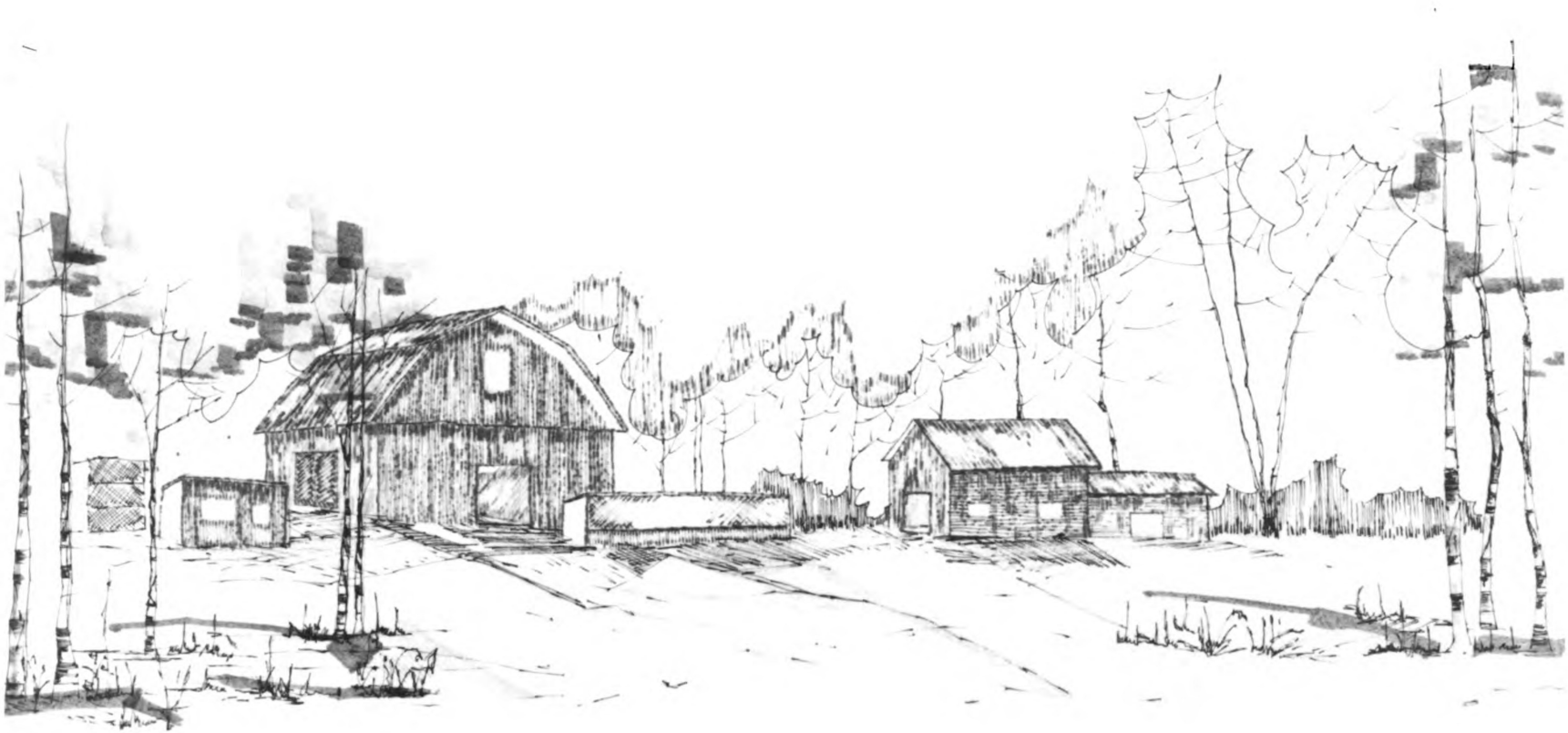
Maintenance Area

Many of the farms in the park area have barns that could be used as storage facilities for maintenance equipment. These barns would add greatly in preserving the existing character of the area and contribute to the extrinsive perceptual qualities of the land. Figure XVI on page 131 shows a cluster of existing barns located along Waverly Road.

Equipment needed specifically for the golf course maintenance such as special green mowers, fairway mowers, water hoses, rakes, and fertilizer all would be better stored close to the golf course. Storage of picnic tables and benches close to the area of usage would be desirable.

A maintenance area is required for major jobs such as equipment repair, paint shop, road repair, construction crews, and tree maintenance. Groups with daily schedule changes would be located here to facilitate park organization in assigning work loads. The Park Superintendent, his assistant, the naturalist of the Nature Center, and the construction head would all meet here as often as deemed necessary to present progress reports as to the time being spent on projects and future projects to be executed are announced and planned.

Due to busyness, and the activities around the maintenance buildings, this area is set off by itself with adequate access both to the site and also to the road system around the site.



CHARACTER SKETCH -

buildings retained for maintenance purposes.

Figure XVI.

The Park Superintendent has been supplied with living quarters on the site, as has the green's keeper. Their quarters are modest and are set back from activity areas to provide privacy for their families, yet they are within easy reach to answer any emergencies. Houses that exist on the site have been used for this purpose.

CONCLUSIONS AND RECOMMENDATIONS

Recreational Development Within the Tri-County Region of Clinton, Eaton, and Ingham Counties examines the existing open space within this Region, and the recreational needs of its inhabitants.

In carrying out research in a regionally oriented manner, needs for the Tri-County Region were determined by examining some of the social and economic factors influencing recreational demands of the Region: such as, regional location, place of residence, vocation, education, and age. This information was compared to the results of a nationwide survey conducted by the Outdoor Recreation Resources Review Commission. This enabled the general selection of activities that would be participated in by a large segment of the population. It is suggested that a more detailed study of the recreational activities of the Tri-County residents be undertaken. A user preference study which would determine more accurately the inhabitants' needs and facilitate the formulation of density standards is recommended.

An open space plan is proposed in order to provide a recreational land development policy for the planning of the Region's total environment. Too often it has been the case that individual tracts of land are designated as open space without consideration for their future integration with the ever changing environment. The Corridor System, following the drainage patterns, is suggested to form the nucleus for open

space development within the Region. It was selected for the following reasons:

1. the obvious lack of recreational water within the Region;
2. the desirability of the Region's residents toward water oriented activities;
3. the inexpensiveness of bottom lands due to their undesirability for permanent development;
4. the closeness of water to our urban populations;
5. the interesting topography which the corridor possesses;
6. the wooded shoreline which is usually provided;
7. lands needed for urban expansion or farming would not be interfered with;
8. a greater interest in the development and protection of the Region's waterways would be created; and
9. a unifying recreational element, water, would be provided within the Tri-County Region that would extend into the other counties of Michigan.

It is suggested that further open space plans be studied as to their effect and cost to the Region. An example of such a study area would be the use of farm land in providing open space between the existing urban areas and their further expansion.

The lack of quality water usable for recreation within the Tri-County has created a major deterrent to recreational participation by the residents. Water, being a basic element of the corridor open space plan, would help eliminate this problem.

Watershed areas are proposed as nodes of recreational land along the corridor system providing a quality water surface. Columbia Creek Watershed impoundment area has been designed as an example of such a node. It is but one of thirty-three such areas located within the Tri-County Region. It is

suggested that each area be evaluated according to the specific criteria used in the studying of Columbia Creek.

Basic interests of the residents of the Tri-County Region were determined. Among the more popular were camping, swimming, boating, fishing, golfing, picnicking, and sightseeing. A study was then made as to the quantity of land needed by 1980 using the Outdoor Recreation Resources Review Commission's means of land classification, pertaining to the Tri-County Region, namely: Class 1: High-density Recreation Areas; Class 2: General Outdoor Recreation Areas; and Class 3: Natural Environment Areas. Of the three, Class 2 areas were shown to contain most of the activities desired for participation in the Region, yet had the greatest deficiency, requiring the existing 485 acres of land to increase to 6652.5 acres by 1980.

Information giving the strengths and limitations of soil types for the Tri-County Region is available through the Department of Agriculture at Michigan State University. This information, due to its detail, can be used to validate design considerations, and to lessen land improvement costs. It is recommended that the future expansion and development of the Region rely heavily on the usage of this soil information.

It was discovered that many agencies are involved in the development of recreational plans for the Tri-County Region, some agencies seemingly unknowing of the others plans. It is

suggested that a closer correlation be formed between Federal, State, Regional, Township, and City governments in recreational planning to provide an exchange of ideas and information.

Although there were no new ways used to evaluate the regional landscape character as to its desirability for recreational usage, the author has shown in the Recreational Development Within the Tri-County Region the possibility for a program of recreational development to fulfill man's needs in the future in this Region.

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