ARTIFICIAL PONDS IN MICHIGAN

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ABSTRACT

ARTIFICIAL PONDS IN MICHIGAN

By

Ralph Edward Christensen

One of the outlets for our increasing amount of leisure time is a growing recreational pressure on accessible surface waters. Extensive pond building in Michigan appears to be a response to this pressure and need. Dr. C. R. Humphrys, Michigan State University, made a survey and inventory of these ponds in 1961. Since that time, pond construction in Michigan increased 400 per cent, to over 15,000 ponds.

This thesis attempts to outline the extent of this building boom and its distribution. The bulk of the construction is seen as a response to the ASCS cost-sharing program, which made irrigation and stock-watering ponds eligible for aid in 1954 and expanded to include wildlife ponds in 1962. Extensive use is made of available ASCS, SCS, and SCD reports to show both total numbers of ponds aided by them and their distribution around the state.

Soil Conservation District Directors were contacted and provided information on recent construction within their areas, together with names of pond owners.

Pond owners were contacted through use of a questionnaire. Their responses provided some basic information on intensity of use, kinds of uses, and information relating to management problems.

The responses indicated that these small water areas (averaging one acre each) were capable of sustaining intense recreational pressure. It appears that they are readily accepted as a substitute for larger public areas, and that they are capable of supporting many different water-based recreational uses.

Additional research shows an absence of state or local regulations which would act to slow the construction buildup. A review of Michigan case law indicates that little added liability would accrue to a pond owner.

The areas treated in this thesis indicate that artificial ponds are successfully filling a recreational need and that substantially few problems of regulation or liability exist at the present time which would inhibit the present rate of construction.

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By

Ralph Edward Christensen

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INTRODUCTION

The dedicated fisherman may sometimes be heard to justify his business with the tongue-in-cheek observation that surely the Good Lord meant for us all to devote more time to fishing than to other pursuits, since He gave us so much more water than land.

We may not choose, at least at this point in time, to accept this observation in its entirety, but I believe we can safely accept the fact that, increasingly in our world, leisure is becoming a central fact of human life--and one of the outlets for this leisure time is a growing recreational pressure on accessible surface waters. The ORRRC Report No. 26, "Prospective Demand for Outdoor Recreation" (1962), predicts that water-dependent recreational activities in the United States will increase 220 to 270 per cent by the year 2000. The increase will occur because of population growth, a shorter work week, rising incomes, lower retirement ages, and an increase in the mobility of the population.

Michigan is experiencing and certainly will continue to experience these demands and pressures on her water resource. The state is currently in the midst of

Figure 1.--Artificial pond dredged from low swampy area, water supplied by several springs.

a ten-year, $150 million program for land acquisition and development--this in spite of the fact that Michigan is much more amply endowed with water resources than most states. In addition to thousands of square miles of Lakes Superior, Michigan, Huron, and Erie within her borders, Michigan also has almost 800,000 acres of inland lakes,[1] nearly one-tenth acre for each of her citizens. The problem, of course, is that the distribution of water and people do not coincide. Much of the Great Lakes water area is a long distance from the population centers. Southeastern Michigan, with over one-half of the state's population, has only one-fifteenth of the inland lake area within its boundaries[2] and only 1.7 per cent of the public recreational land in the state.[3] This distribution problem creates problems of access and conflicts between competing user groups. To combat these problems, the state attempts to provide needed access and develop intensive recreational use areas.

A distinctly different response to recreational need, however, may be seen when we examine Michigan's artificial ponds. Relatively little has been written

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[1]"Michigan Water and Related Resource Data, Michigan Water Resources Commission, November, 1969. Hereafter cited as "Michigan Water."

[2]"Michigan Water."

[3]"The Water Resources of Southeastern Michigan," Michigan Water Resources Commission, February, 1968.

regarding their distribution and use within the state. It has been ten years since Dr. C. R. Humphrys catalogued the then existing ponds within the state and indicated that these small artificial bodies of water "represent an area or volume of water that is used more intensively and completely than most of the natural surface waters of the state."[4] In a rather meticulous fashion, he created a dot map of the state pinpointing the location of 3,793 ponds (under ten acres each) which he found to exist up to 1962. He made some general observations regarding use, water supply, and construction trends obtained from a sample questionnaire to pond owners. He concluded that Michigan had recently passed through a cycle of intense construction activity with respect to ponds and, that barring a renewed cost-sharing program by the ASCS, the rate of construction would likely be low for a few years.

Well, what has happened? During the period 1961-1971 construction of artificial ponds increased nearly 400 per cent. Some of the reasons for this rather spectacular spurt are readily evident, others may be guessed at. This thesis will attempt to outline the extent of the buildup. Where did it happen and why? How intensively can these waters be used? Are there problems

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[4]C. R. Humphrys, "Michigan's Artificial Ponds," Agricultural Experiment Station (East Lansing: Michigan State University, November, 1961), p. 3. Hereafter cited as "Michigan Ponds."

of management, liability, and/or laws and regulations which might act against a continued buildup? These are questions which this thesis will attempt to answer.

CHAPTER I

POND CONSTRUCTION

Several different types of definitions might be applicable to ponds but for purposes of this study we will be dealing with artificially created bodies of water of ten acres or less. Reclaimed gravel pits and borrow pits will not be included.

We will also not deal to any extent with the mechanics of construction--ponds may be dug, blasted, or created by placing levees and dams--technical help on design and construction of ponds is available from several agencies, most notably the Soil Conservation Service. A pond can be constructed in just a few days and this single factor probably accounts for much of the increasing popularity of ponds as recreation centers.

Prior to 1954, any pond constructed in Michigan was completed primarily under private initiative. Several agencies offered varying amounts of technical assistance to aid landowners but no financial assistance was available. Dr. Humphrys' study indicates that in all the years preceding 1954, 550-650 ponds were built. No doubt a

number of these ponds were created for recreational purposes but most were created to provide water for irrigation, stock, and fire protection.

In 1954, several ponds were cost-shared by the United States Agricultural Stabilization and Conservation Service (ASCS) in Michigan. Briefly, the ASCS works through Soil Conservation Districts (SCD) which are organized to adopt programs for the discontinuance of land use practices contributing to soil wastage and soil erosion, and the adoption and carrying out of soil conserving land use practices. Members of the SCDs, called cooperators, are encouraged to develop basic farm plans and install needed practices--they are eligible to join if they own five acres or more. They are governed by a board of directors elected by landowners in the community. The ASCS provides financial assistance for performing certain on-land conservation practices through its Agricultural Conservation Program. A landowner cooperates by requesting cost-sharing (usually 50%) on practices he expects to carry out on his farm. He is notified by his local ASC committee as to the extent approved. After the practice is completed he reports to the committee office and receives a payment to match his share of the cost of the practice.

The Soil Conservation Service gives technical assistance to SCDs and through them to landowners and

operators. It gives technical help to farmers who are applying for permanent conservation measures with cost-sharing aid from the ASCS and certifies to the technical accuracy of the measures. The SCS is the primary source of technical assistance for pond construction in Michigan.

After cost-sharing several ponds in 1954 and about twenty in 1955, the program, probably spurred on by the Michigan dry years of 1954 and 1955, exploded to share in the creation of 2,400 new ponds through 1961.[5] In order to qualify for cost-sharing these new ponds were primarily intended to be used for irrigation and livestock water.

After tremendous construction years in 1957, 1958, and 1959, the pace began to slow. It is probable that many of the people who needed ponds had already constructed them. The availability of federal cost-sharing funds for ponds versus other needs within the SCDs no doubt also contributed to the slowdown. It is difficult to assess the growth of entirely private construction during this period also.

The Wildlife Pond

1962 began the era of the wildlife pond. It is probable that changes in administration personnel and the influence of wildlife people prompted this significant addition to the ASCS cost-sharing program. Shallow water

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[5]Figures obtained from ACP annual reports for Michigan. A breakdown by years 1954-1969 is given in Appendix A.

areas and deeper ponds were now qualified under cost-sharing procedures as wildlife ponds. Under the impetus of this new program, over 1,000 ponds were constructed during the next two years alone, with 930 wildlife ponds constructed during the single year 1966. It became evident that people wanted these ponds but had been reluctant to undertake the entire project by themselves.

During this same period, construction of cost-shared irrigation and livestock water ponds generally continued to decrease--from 320 ponds in 1961 to 127 in 1969. Again, it is probable that the gap between those who actually had a need for this type of pond, and those who already had constructed one, was being narrowed. Some of those who constructed wildlife ponds may also have intended them to serve as sources of irrigation and stock water.

Present Numbers and Distribution

Two major problems were identified while attempting to compile accurate figures of total ponds on-land at present. The largest of these lies in estimating private construction--construction not subsidized by cost-sharing or aided by SCS technical help. No records of any type are available to aid in solving this problem. Dr. Humphrys' pond study in 1961 probably found most of these ponds through extensive help by field personnel but the total number of ponds involved was only about one-fourth

the size of the present total. The idea that field personnel could be used to "count ponds" was discarded in this case because of the questionable value of the data which could be obtained versus the amount of labor which would have to be utilized to obtain it. (Assuming also, of course, that field personnel in various offices could be prevailed upon to undertake the project.)

The other problem lies in projecting county pond totals from ASCS and SCS records. Local offices do not keep records of these practices for more than three years, if that. Records can be obtained from yearbooks giving annual state totals but further breakdowns are difficult to obtain. The method and types of data recorded varies from year to year, i.e., some years the number of ponds created is recorded, other years only the acreage created is recorded, and in some cases only the acreage served is given. Another complicating factor is the fact that the federal agencies involved in these programs deal with fiscal years rather than calendar years thus making yearly totals difficult to compile.

After a lengthy examination of the sources of data available a decision was reached to forego any hope of a precise breakdown of pond numbers by county. Instead, several sources were used to project a rough working estimate of ponds by county in order to continue the study.

Dr. Humphrys' 1961 study and 1962 additions were used as a base (Appendix B). ASCS records were utilized

to obtain state totals (Appendix A) for all years back through 1954. Current ASCS records provided a breakdown by county for years 1966-1969. Figures were obtained showing on-land practice totals by county by SCS to FY 1969.[6] In addition, copies of SCD annual reports, published in local newspapers and listing yearly accomplishments of the district, were used to obtain yearly totals of ponds created from 1964 through the present.

Although inaccuracies remained, county totals were projected for the state using the data described. The resulting working map is included (Figure 2). Of course, these results did not include privately constructed and financed ponds created since 1961. Also additional ponds created during part of 1969 and 1970 were not included because statistics were not yet available.

In order to obtain a fairly accurate count for 1969 and 1970 a cover letter and accompanying form signed by Dr. Eckhart Dersch, Michigan State University, Cooperative Extension Service, was sent to all eighty-four of Michigan's SCD directors (Appendix C).

The directors were asked to list the number of ponds constructed within their district during 1969 and 1970 with assistance from SCDs, SCS, and/or ASCS, and to include separate figures for ponds they knew to be

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[6]These and other figures were combined on master sheets to summarize various estimates.

Figure 2.--Rough working estimate of pond numbers.

constructed without any assistance. In this manner we planned to gain a rough index of private construction.

In addition, we assumed that the directors would be in a position to know whether or not there were any county or township regulations in their districts affecting pond construction. They were asked to provide offices which could be contacted for further information regarding these regulations.

Finally, with the intention of creating and basing a questionnaire study on their replies, the directors were asked to furnish names and addresses of twenty pond owners from their area who had constructed ponds during the years 1965, 1966, 1967, and 1968.

Returns from Directors

Of eighty-four letters sent, seventy-five replies were received. The replies indicated that 815 ponds were constructed in 1969 with either SCD, SCS, and/or ASCS assistance and an additional 137 ponds of private construction. The private "no help" ponds represent 14.4 per cent of the total for the year but this figure is inaccurately low. An additional nine questionnaires did not venture an opinion on construction of these ponds, making eighteen in all. It is also probable that "no help" ponds may more easily be overlooked in any type of counting procedure. It appears that 20 per cent private construction may be a realistic approximation for 1969.

Totals for 1970 are lower--an undetermined number of ponds undoubtedly had not yet begun or completed construction at the time the questionnaire was sent--hence they may not have been included in district totals. A total of 575 ponds were reported from seventy-four districts, with eighty-three "no help" ponds--only 12.6 per cent of the total. However, ten additional questionnaires did not report on these ponds, so again it seems likely that the volume of "no help" construction may be some 15-20 per cent.

Dr. Humphrys, working with a slightly different situation, obtained results which show a possibly higher than 20 per cent rate of "no help" construction.[7] Those results appear to be the result of a large number of ponds built prior to 1955. Although SCS technical assistance was available, the large ASCS cost-sharing program was not initiated in Michigan until 1954.

Using the working estimate of ponds previously obtained, plus totals for 1969 and 1970 modified by returns from the SCD directors, the total number of artificial ponds in Michigan approximates 13,000 through 1970. This figure neglects, except for those included in Humphrys' 1961 study, most of the "no help" ponds. By including a 15-20 per cent figure for these ponds, based on some 9,000 constructed with help since 1961, we arrive

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[7] "Michigan Ponds," Figure 7, p. 14.

at a total of 14,400-15,100 ponds in Michigan through 1970. Since the 13,000 figure can be verified, the 14,400 figure must be regarded as conservative.

CHAPTER II

THE POND QUESTIONNAIRE

Early research into the subject of artificial ponds indicated several areas (covered in later chapters) in which it would be helpful to tabulate responses from the pond owners themselves. Travel distances and time involved ruled out personal contacts and left some type of questionnaire as the only real alternative. The problem became one of obtaining a valid list of pond owners from somewhere from which a number of questionnaire candidates could be drawn.

The approach settled upon--that of asking for the information from district directors--while having several disadvantages, appeared the best alternative. The directors were asked for twenty owners from each district, and insofar as possible, to list those owners who had constructed ponds during the years 1965, 1966, 1967, and 1968.

A potentially serious shortcoming of this procedure lay in obtaining a relatively unbiased listing from districts containing very large numbers of ponds.

It would probably be difficult to recall just who built when in these areas. We expected those who had problems with listing owners to contact SCS or ACP field personnel for help. It is apparent that many did, in fact, use this method of obtaining the requested information. It may also have been possible for some listings to be biased in favor of "successful" ponds. In some ways, however, this would not likely be a major problem since prior studies indicated that well over 90 per cent of the ponds constructed are successful anyway.

The directors, through their contacts with field personnel, were one of the few available sources of the information needed. It was felt that response from them would be nearly complete and relatively prompt. Keeping the list of owners requested to only twenty was done to help encourage a prompt reply. The request for ponds constructed primarily during four years was made for several reasons. Initially, it was intended to provide a list of ponds which had been in use long enough for their owners to be able to evaluate them. Another reason was that a fairly recent group of ponds was desired to attempt comparisons with the 1961 Humphrys' study. The year restriction was intended to partially offset a bias in listing owners. Many districts probably did not build many more than twenty ponds during the years requested so their ability to select would necessarily be limited.

A total of 1,441 usable names and addresses were obtained from the returns.

One of the primary objectives of a questionnaire was to attempt to discover the intensity of use on the ponds. This problem was felt to be the controlling one regarding a sample size. It appeared that the only attempt at use intensity to date was a survey and paper by Carl Stamm.[8] No type of variance data was available other than from his study which indicates that 800 visitor days was approximately the top level of use. Assuming most measures of use would fall somewhere between 0-1,000, then sample size would be determined by the size of the variation desired, i.e., coming within 20 would require a sample of 225, within 50 only 36. After taking into account the problem of certifying a valid sample to begin with, that of respondents interpreting the question on a questionnaire, and the fact that very few people would be likely to have any type of records of their own use, the idea of producing a representative use figure to cover all ponds was tabled. A sample was created, however, to investigate this problem for informational purposes.

A sample was created by taking the list of twenty owners from each district, using twenty as a maximum from

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[8]Carl R. Stamm, "Pond Construction and Use in Genesee County," Student Waters Publications, Michigan State University, 1970. Hereafter cited as "Use in Genesee County."

districts with the greatest number of ponds, and prorating down to two for districts with very low numbers of ponds on-land. Because this had to be accomplished before final county approximations were completed, the number of questionnaires sent to a county may have been slightly off the average which was one to thirty ponds.

Before the lists were returned by the directors then, a sample had been determined of approximately 450. Because nine lists were never received and several others arrived too late to be included in the project, the actual number of questionnaires mailed was reduced to 378. At the time of this writing a total of 280 or slightly more than 74 per cent have been returned. Figure 3 shows distribution of the questionnaire. A copy of the questionnaire and cover letter may be found in Appendix D.

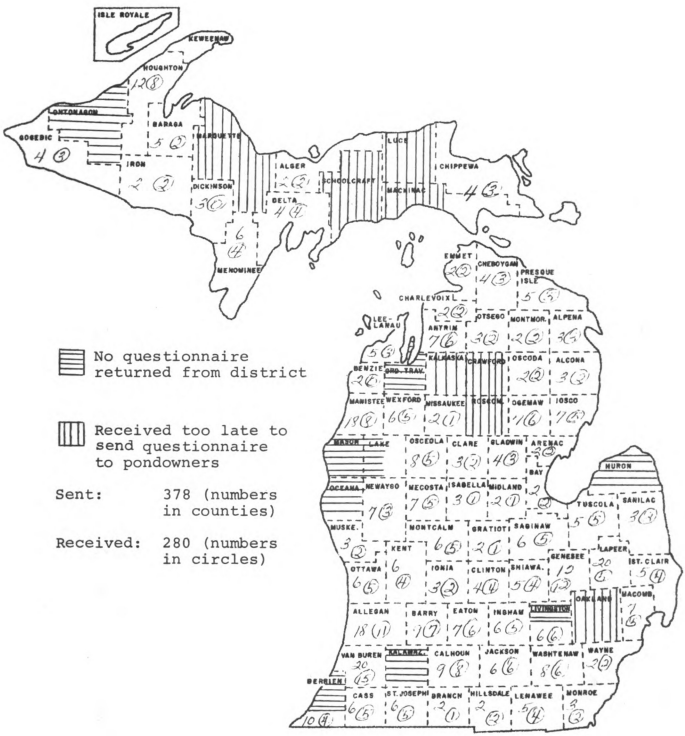

Figure 3.--Distribution of questionnaires to pondowners.

CHAPTER III

SIZE AND COST

Twenty-four of the 280 returns failed to note the year their pond was constructed. The remainder followed fairly closely the pattern requested of the district directors. The years 1965-1968 accounted for 159 or 62 per cent of the returns and the remaining 1960-1970 years brought the total to 92 per cent. This particular distribution was desired to check possible changes in use, size, etc., against data secured in Humphrys' 1961 study.

Humphrys determined the size of 3,362 ponds to average 0.82 acres each.[9] In January 1962 he averaged 3,424 to increase the average to 0.85 acres.[10] Also after checking ACP records he found the average unit cost of 896 ponds to be $406.[11]

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[9]"Michigan Ponds," p. 5.

[10]C. R. Humphrys, "Water Bulletin No. 12--Pre Inventory of Michigan's Artificial Surface Water," Michigan State University, 1962, p. 9. Hereafter cited as "Bulletin No. 12."

[11]"Michigan Ponds," p. 6.

Stamm,[12] dealing primarily with ponds constructed in Genesee County from 1962-1967, had a sample with a distribution as shown below and indicated that the average cost would be around $1,300 per unit, with substantially higher costs at the present time.

Pond Size	Number of Ponds
0.25 or less	2
0.25 to 0.49	45
0.50 to 1.0	45
1.0 to 5.0	6
over 5.0	2

In this study, although 128 of the ponds reporting were .5 acre or less, the results show 260 ponds reporting 275.49 acres for a per pond average of 1.06 acres. Taking into account the addition of thousands of shallow water pond acres in new wildlife ponds, the present per pond average in Michigan has probably risen from Humphrys' 0.85 figure to approximately one acre each.

Only 243 reported both an acreage figure and an estimated cost. These ponds reported 235.03 acres at an average cost of $1,900 per pond. There is no doubt that construction costs are still rising but it appears that the cost of an acre of private water remains a bargain when compared to the rising cost of vanishing footage on natural lakes and streams.

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[12]"Use in Genesee County," pp. L8, L9.

If the investment figures are relevant, small wonder that 233 or over 85 per cent felt that their pond raised the value of their property. Some returns made a point of stressing that their taxes were raised because of it. About 14 per cent felt that their property value had not increased. In spite of the costs, an overwhelming 99 per cent felt that their pond was a worthwhile investment. It is possible that the survey is biased in favor of successful ponds but both Humphrys[13] and Stamm[14] indicate about 95 per cent success is normally attained.

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[13] "Michigan Ponds," p. 15.

[14] "Use in Genesee County," p. L11.

CHAPTER IV

GROUP USE AND INTENSITY OF USE

From a total of 269 respondents to the question of whether or not various groups had used their ponds, 102 or 38 per cent replied yes. Groups included Boy and Girl Scouts, mentally retarded, various kinds of school classes, church groups, family reunions, 4-H, and various conservation organizations. Other uses included a pond used for coon-dog trials and another which was used for baptismal services. Even though the ponds average only about one acre of water each, it is evident that they can provide the atmosphere and recreational setting desired for group use.

In Stamm's survey only 19 per cent reported group use as compared to 38 per cent in this survey. It is probable that the true average is somewhere between the two. The question on the present survey was phrased to read "have any groups ever used, etc." No doubt group use was noted even though it may not have occurred in the preceding year.

The question pertaining to intensity of use recorded many different variations of answers. It became rather obvious that either the question as stated was difficult to interpret, or many respondents felt that it was too troublesome to bother with. Forty-four respondents did not answer the question and forty-seven more answers were unusable, primarily because they supplied no numerical data or their ponds had only recently been completed. Intensity of use, of course, is a rather relative determination. Pond owners were asked to tabulate the number of visitor-days their pond was used during the preceding year by their families, friends and neighbors, groups, and paid guests. These four categories were listed on the questionnaire primarily to insure that one or more of them were not left out of their tabulations.

In his Genesee County study, Stamm obtained the following results:[15]

Number of Visits (Family, Friends, Neighbors, and Guests)	Number Ponds (100)	
0-49	3	3%
50-199	38	38%
200-399	34	34%
400-799	23	23%
800+	2	2%

If the present survey used the same breakdown, the results would be:

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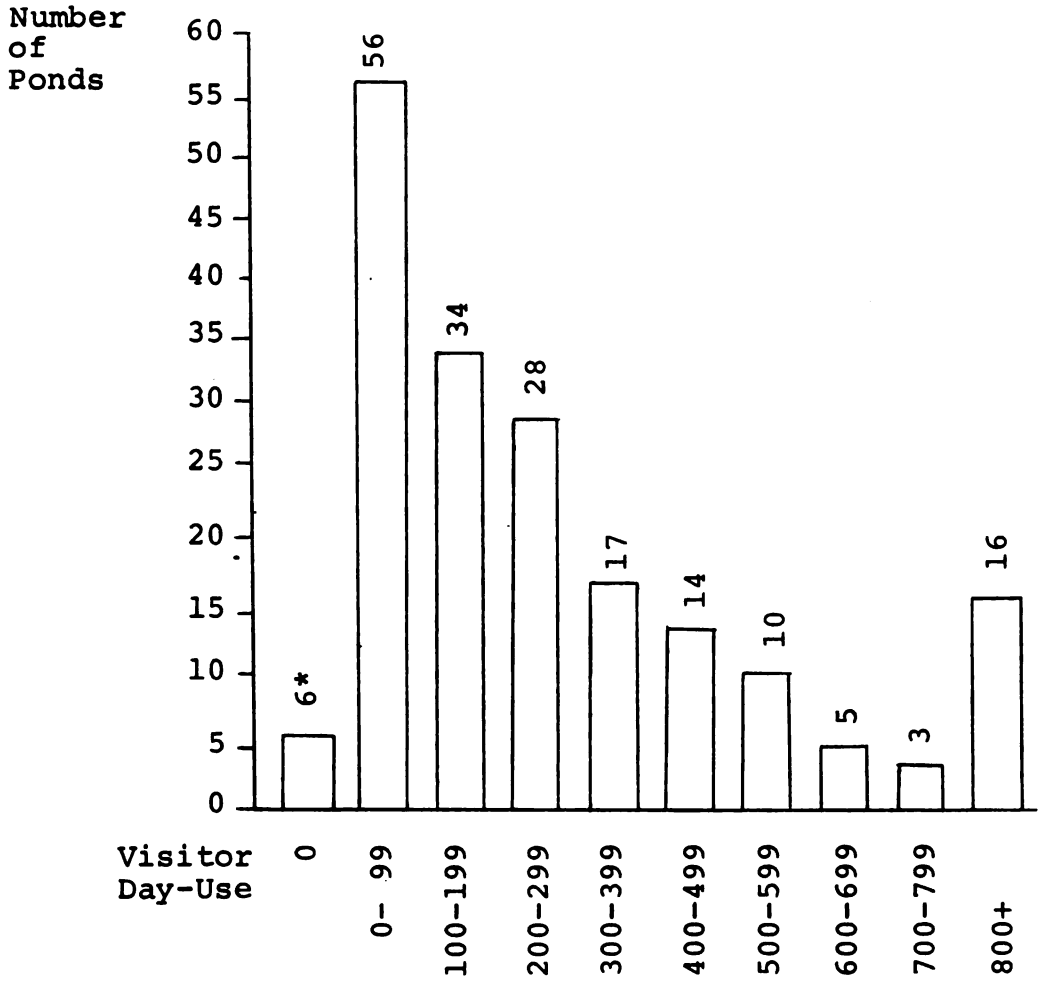
[15]"Use in Genesee County," p. L9.

Visits (Family, Friends, Neighbors, and Guests)	Number Ponds (189)	
0-49	32	17%
50-199	64	34%
200-399	45	23.5%
400-799	32	17%
800+	16	8.5%

A more precise breakdown yields the results shown in Figure 4. Using Stamm's distribution we find a larger percentage in the 0-49 category and also a large number in the 0-99 category in Figure 4. Many ponds in this particular category probably belong in a higher ranking--in some cases they indicated use by groups or neighbors but did not include numerical estimates.

There appears to be no correlation between the potential for intense use and the size of the pond as long as 0.25 acre is used as a lower limit. In fact, three ponds smaller than 0.5 acre each topped the 800+ mark in visitor-days reported.

Sixteen ponds reported use in excess of 800 visitor-days, with twelve of them well over the 1,000 mark. Some of these were subjected to primarily private use but others reported varying numbers of paid guests. Of particular note were two ponds constructed for commercial recreation. One of 3.5 acres had approximately 7,000 paid guests, while a 7.8 acre enterprise reported 16,000 paid guests in addition to other family use.



*Includes four stock water and irrigation ponds, and two only recently completed (of 189 ponds responding).

Figure 4.--Distribution of intensity of use.

In addition to the two commercial recreation ponds, forty-four others (17%) reported additional income as a result of their pond. Most of these (24) gained added income from irrigation and (11) from fee fishing.

In light of the intensive use to which these ponds may be subjected and the growing statewide pressure for accessible recreational areas, it is likely that pond construction for income purposes will certainly increase --perhaps dramatically.

The entire response to the question on intensity of use has raised far more questions than it can safely answer. Respondents were asked to consider all uses in the same light and list a total use figure. It is apparent that this approach neglects other areas--what factors influence intensity of use? Certainly the type of owner, pond design, location, etc.--and what about our units of expression; how can we reasonably compare the returns from passively enjoying the natural pond setting versus the returns and effects on the pond environment from an active use such as swimming?

CHAPTER V

USE OF OTHER RECREATIONAL AREAS

Before the survey was started it was thought likely that if the ponds were, in fact, subjected to intense recreational pressure, the need of the pond owners for other recreational areas should decrease. Accordingly, a question was included in the survey asking, first, whether or not the pond owner or his family had used parks and other recreational areas prior to constructing his pond. And secondly, if they now used these areas about the same as before, more, or less than before.

To the first question, 195, or nearly 73 per cent of those responding to the question replied that they had used other public areas to some degree. And of those who had used these areas, 126, or nearly 65 per cent replied that they now used these areas to a lesser degree or not at all. Only two responded that they had since utilized public recreational areas to a greater degree.

No Answer	No	Yes--Used Other Areas
12	73	195

Presently Use These Areas:

More	Same	Less
2	67	126--64.6%

No questions were asked regarding the use of public recreational areas by friends and neighbors since it no doubt would have been difficult for the owner to obtain this type of information. In view of the heavy visitor-day use reported from many ponds by friends and neighbors, however (in many cases it exceeds family use), there is ample reason to suspect that the dependence and use of other public recreational areas by these people is also reduced by construction of a nearby pond.

CHAPTER VI

USES OF PONDS

A question was included on uses of ponds to attempt to determine whether or not any significant shift had occurred between Humphrys' 1961 data and that taken essentially from the mid and later 1960s. Because of the addition of wildlife ponds to the ASCS cost-sharing program and the increased interest in recreational ponds evident during the late 1960s, a shift was expected to develop towards more purely recreational pursuits.

For purposes of comparison a graph of the questionnaire results overlays a graph of the 1961 study (Figure 6). As it turned out, the number of returns from the two studies was almost identical--the results were not.

The returns provide evidence that the expected shift into primarily recreational uses has, in fact, occurred. The use of all of the traditional recreational forms--fishing, swimming, picnicking, and boating--increased by substantial margins over 1961 data. Improving wildlife habitat and the scenic value or aesthetic value registered impressive gains also and were the second and

Figure 5.--Uses of Ponds. [Upper pond an example of small family pond used primarily for swimming. Lower, new pond will fill to a maximum depth of 11 feet, occupy one-third acre, be used for swimming, fishing, land improvement.]

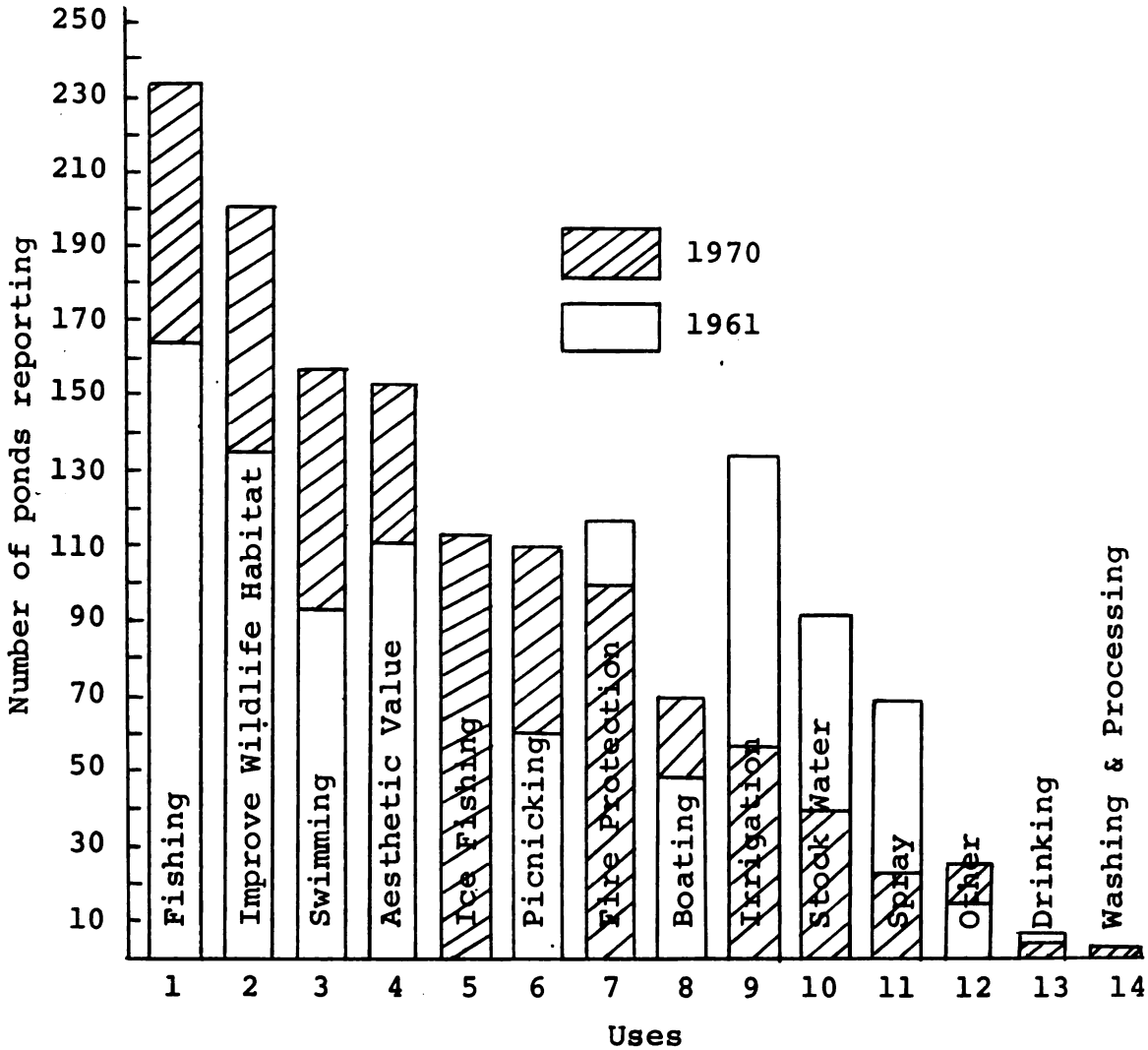


Figure 6.--Uses of ponds. [1961 (footnote 16) --278 returns; 1970--277 returns, "ice fishing" added category.]

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[16]"Michigan Ponds," p. 13.

fourth most frequently mentioned uses. All of the economically related uses--irrigation, fire protection, stock water, spray and drinking water--decreased in relative importance.

The present survey also included a separate category for ice fishing which 40 per cent of those responding also checked. In the Other category twelve also noted that their ponds were used for ice skating. These responses indicate that ponds have benefits which could be utilized year-round.

Only seventeen owners indicated that their ponds were single-purpose--primarily irrigation. This again reflects a move towards more intensive use. Humphrys' data showed forty-six such ponds. His data on 278 returns showed a total of 1,038 uses checked. Discounting the question of ice fishing, the present survey on 277 returns showed 1,166 uses checked--a trend toward recognizing more of the benefits of pond ownership.

	1961 Results[17]	1970 Results
Questionnaires	278	277
Uses	1,038	1,166

[17] "Michigan Ponds," p. 13.

CHAPTER VII

MANAGEMENT PROBLEMS

Increased cost-sharing programs, availability of technical help, ease of construction, and an accelerating interest in recreational pursuits have contributed to producing a boom in pond construction during the past decade. It is difficult, given present conditions, to predict a slowdown in this area--if anything, indications are that landowners will continue to build at an accelerated pace. A series of disadvantages which may act to affect this pace to some degree may be lumped under the heading of management problems.

There presently is no absence of written material on various aspects of pond management--which probably should give the casual observer a hint regarding the ease of managing ponds. In spite of this many owners find it difficult to obtain the results they seek.

For informational purposes owners were asked to note whether they had experienced problems with weeds, algae, fish diseases, poaching, or others. Over 85 per cent (188) of those responding to this question indicated

that they had experienced one or more of these problems. Algae and weeds headed the list. Poaching was included as a management problem but will be covered under another chapter.

Winter-kill of fish is a problem with some of the 87 per cent of owners who indicated that they had stocked fish in their ponds. Slightly over 16 per cent (38) of those responding to a question on winter-kill indicated that they had experienced it to some degree. Winter-kill can occur through stocking ponds of insufficient depth to support fish year-round. It could happen on those shallow-water wildlife ponds which had been stocked with fish. Ball[18] indicates that fertilization can result in algal and weed growths which promote severe winter-kill conditions. Humphrys indicated finding 15 per cent winter-kill in his 1961 study.

Although management problems of various types and degrees of seriousness exist on most ponds, it is apparent that their prevalence has not slowed the rate of construction. It is evident, however, that in this area alone, there is a world of room for more technical aid and education by assisting agencies to would-be pond owners.

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[18]Robert C. Ball, "Fertilization of Lakes--Good or Bad?," Michigan Conservation (September, 1948), 7-14.

CHAPTER VIII

ARTIFICIAL PONDS AND LIABILITY

During the last decade, pond construction by private landowners has increased the number of artificial ponds in Michigan approximately 400 per cent to about 15,000. The bulk of this increase has occurred in the southern half of the lower peninsula along with the increase in Michigan's population. We need not wonder at this point about the reasons for this growth--the fact remains, ponds and people have together experienced a tremendous growth in southern Michigan.

> An unsupervised two-year-old boy pushed his favorite toy into a private pond and drowned trying to retrieve it.[19]
>
> Accidents of a similar nature accounted for 10 per cent of Michigan's 261 non-boating water fatalities in 1969.

We must wonder, I think, whether the construction of a pond also creates something which is not of benefit

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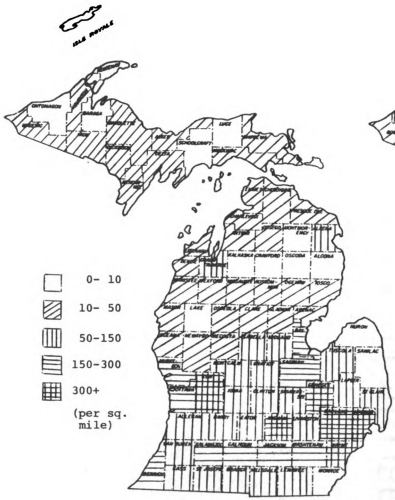
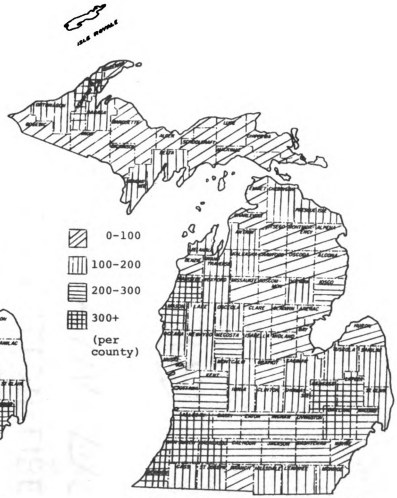
[19]Excerpt from water accident in 1969. Printed in "Water Accidents in Michigan--1969," Michigan Department of State Police.



Population Density by County, 1960
"Michigan Chart Book," p. 3.



Pond Distribution by County, 1970

Figure 7.--Population and pond density.

Figure 8.--The difference in access. [Upper: pond is fenced, posted, relatively inaccessible. Lower: newly constructed, not fenced or posted, and lying immediately adjacent to a county truck highway.]

to the owner--namely, does creation of a pond in a heavily or semi-populated area also subject the owner to the possibility of liability? More specifically, is a pond a special type of hazard, especially as regards children? Must a pond be fenced and guarded? and how much protection is enough?

To attempt to speak to these questions, a review of Michigan case law relating to this problem seems appropriate.

> [In the survey question regarding management problems, slightly over 30 per cent (67) of those responding indicated that poaching was a problem --some said their most serious problem.]
> [In a separate question regarding trespass, 37.8 per cent (102) of those responding indicated that they had experienced trespass to their ponds, at least sixty knew that children were involved.]

Rule of 339 Restatement of Torts says:

> A possessor of land is subject to liability for bodily harm to young children trespassing thereon caused by a structure or other artificial condition which he maintains upon the land if (a) the place where the condition is maintained is one upon which the possessor knows or should know that such children are likely to trespass, and (b) the condition is one of which the possessor knows or should know and which he realizes or should realize as involving an unreasonable risk of death or serious bodily harm to such children, and (c) the children because of their youth do not discover the condition or realize the risk involved in intermeddling with it or in coming within the area made dangerous by it, and (d) the utility to the possessor of maintaining the condition is slight as compared to the risk to young children involved therein.

This is essentially a restatement of principles of case law relating to the doctrine of "attractive nuisance."

The attractive nuisance doctrine is based on the theory that one who maintains upon his premises a condition, instrumentality, machine, or other agency which is dangerous to children of tender years by reason of their inability to appreciate the peril therein, and which reasonably might be expected to attract children of tender years to the premises, is under a duty to exercise reasonable care to protect them against the dangers of the attraction (8ALR 2d 1262).

In many jurisdictions, ponds have been held to create this "attraction" and landowners have been held responsible for drownings occurring therein. Courts generally deny application of this doctrine where the child was of normal intelligence and over eight years old, although decisions wherein the child is from seven to fourteen vary with his maturity.

Recovery for the drowning of a child has most often been sought under the attractive nuisance doctrine, since the child is in most instances a trespasser on the premises and some such theory is necessary to make the landowner liable at all. (Generally speaking, a landowner is not liable for accidents occurring to trespassers through ordinary negligence--he would be exempt from liability unless he purposefully caused the accident. Children are sometimes exempted from this trespassing category because they are thought to be too immature to grasp some potentially dangerous situations.) Florida and South

Carolina are among the states which uphold liability on this theory when ponds are involved.

Many states, which recognize the attractive nuisance doctrine under other circumstances, however, will not allow it to be applied to permit recovery for the drowning of a child. Wisconsin is among these states. In Emond v. Kimberly-Clark Company (1914), 159 Wis. 83, the opinion said in part,

> The world cannot be made danger-proof--especially to children. To require all natural or artificial streams or ponds so located as to endanger the safety of children to be fenced or guarded would in the ordinary settled community practically include all streams and ponds--be they in public parks or upon private soil--for children are self-constituted licensees if not trespassers everywhere. And to construct a boy-proof fence at a reasonable cost would tax the inventive genius of an Edison.

> [In the present pond survey, owners were asked if their ponds were fenced and/or posted. They responded: 27.7 per cent (74) fenced and 44.9 per cent (120) posted.]
>
> [When correlated with the ponds (102) known to have been trespassed upon, we find that twenty-nine (28.4%) are fenced and 71.6 per cent (73) were posted. This significant deviation in posted ponds trespassed upon versus posted ponds in general presents an interesting question--are signs an added attraction or are they prompted because of prior trespassing?]

In these states and others the doctrine is generally denied applicability unless some other hidden inherent danger was also present.

In Powers v. Harlow (1884), 53 Mich, 507, Justice Cooley stated:

> Children, wherever they go, must be expected to act upon childish instincts and impulses; and others who are chargeable with a duty of care and caution towards them must calculate upon this and take precautions accordingly. If they leave exposed to the observation of children anything which would be tempting to them, and which they in their immature judgment might naturally suppose they were at liberty to handle or play with, they should expect that liberty to be taken.

Michigan might thus be said to recognize the attractive nuisance doctrine but when its application is an issue Michigan courts have been conservative in its use. Recovery for the drowning of a trespassing child is rather consistently refused by Michigan courts.

Many reasons are given for refusal to apply the doctrine--they include the primary duty of parents in the matter, the absence of any unusual features about the hazard, and the improbability of a fatal accident occurring. Other jurisdictions may recognize the absence of any hidden peril, and the lack of any invitation express or implied.

The artificial character of the hazard (pond) may be an important factor in imposing liability in some jurisdictions, but the weight of authority is to the effect that such artificiality has no bearing on liability or nonliability. In Harper v. Topeka (1914), 92 Kan 11, it was held that since the pond described in the petition was a reproduction of a natural pond, it could not constitute an attractive nuisance. And in Von Almen v. Louisville (1918), 180 Ky. 441, it was said that an ordinary

artificial pond is not an attractive nuisance, although attractive to children, and even though they may be expected to wade or fall into it, just as they will into natural ponds, rivers, and lakes in spite of admonitions and barriers.

Pools and ponds on private property which are maintained for legitimate purposes, are not held to constitute attractive nuisances, since the condition is not in itself dangerous, but only made so because of use by trespassing children. (In Peninsular Trust Co. v. Grand Rapids (1902), 131 Mich. 571, a child crawled through a hole in a fence and drowned in a city water reservoir. And in Graves v. Dachille (1950), 328 Mich. 69, a six and one-half-year-old boy drowned in a temporary pond created to collect drainage water.)

Hargreaves v. Deacon (1872), 25 Mich. 1, expressed a disinclination on the part of the courts to shift the duty of caring for such children from their parents to the owners of such hazards:

> There is some danger in dealing with these questions, of confounding legal obligations, with those sentiments which are independent of the law, and rest merely on grounds of feeling, or moral considerations. We feel, usually, more indignation at wrongs done to children than at wrongs done to others. But the law has not usually given them civil remedies on any such basis. Nor does it usually, if ever, impose any duties on strangers towards them resting entirely on the fact that they are children. Those who have any special dealings with them, as parents, teachers, and employers, incur obligations appropriate to their relations, and differing from those incurred towards others

> in proportion to the necessity of care and protection, and the risk of injury. But those who have no such relations with them are not liable for negligence in carrying on their own business, beyond what would be their liability to others as well as children, who are equally free from blame.

Ordinarily, the location, accessability, or nonaccessability of the hazard has been given little relevance in states not applying the doctrine to ordinary water hazards. The Hargreaves case also implied, however, that the inaccessability of the accident location negatived liability.

In Charlevoix v. Gogebic & M. River R. Co. (1892), 91 Mich. 59, the improbability of a fatal accident occurring was cited in denying recovery. And Barnhart v. Chicago, M. & St. P.R. Co. (1916), 89 Wash. 304, stated:

> That a pond of water is attractive to boys for the purposes of play, swimming, and fishing, no one will deny. But its being an attractive agency is not sufficient to subject the owner to liability. It must be an agency such as is likely to, or will probably result in, injury to those attracted to it. That many boys every year lose their lives by drowning is a matter of common knowledge. But the number of deaths in comparison to the total number of boys that visit ponds, lakes, or streams for purposes of play, swimming, and fishing, is comparatively small. It would be extending the doctrine too far to hold that a pond of water is an attractive nuisance.

In Ryan v. Towar (1901), 128 Mich. 463, the courts, in again holding that children were trespassers and the defendant not liable for injuries suffered by them, said:

> Does the new rule go still further, and make it necessary for a man to fence his gravel-pit or quarry? And, if so, will an ordinary fence do, in view of the known propensity and ability of boys to climb fences? Can a man nowadays safely own a small lake or fish-pond? . . . The term "attractive nuisance," as applied, is a new one on the books, and the plausible application

> of the well-known principle that one must so occupy his own as not to do harm to the rights of others should not be construed to so restrict the use of private lands as to make it necessary to guard and protect trespassers.
>
> Why should the duty of incessant watchfulness and care of one's own property extend to children, upon whose parents both nature and the law impose the duty of care and watchfulness?

A more recent case is Heider v. Michigan Sugar Co. (1965), 375 Mich. 490. Plaintiff's twelve and one-half- and eight-year-old sons drowned while trespassing on defendant company's 27.1 acre pond in the center of a 200-acre tract of land in mid-afternoon in subzero weather where a waste pipe prevented freezing in one part of the pond. In this case, "reasonable forseeability" was not established--that the owner knew, or had reason to know, that infant children would be trapping, playing, or trespassing upon the property. This is a necessary prerequisite to imposition of liability for injuries or death to trespassing children.

Michigan Public Act No. 201 of 1953 was also introduced as absolutely barring recovery in this case. The boys had come upon the land to trap, and P.A. No. 201 provides:

> No cause of action shall arise for injuries to any person who is on the lands of another without paying to such other a valuable consideration for the purpose of fishing, hunting, or trapping, with or without permission, against the owner, tenant, or lessee of said premises unless the injuries were caused by the gross negligence or willful and wanton misconduct of the owner, tenant, or lessee.

Upon its appearing that the relationship of defendant to the drowned child was such that a duty of care was owing on former's part to the latter, however, liability may be affirmed. In Peklenk v. Isle Royale Copper C. (1912), 170 Mich. 299, later 187 Mich. 644, defendant mining corporation left a partially concealed and overgrown pit uncovered and unguarded about 200 feet from a highway and one-quarter mile from houses it rented. A son of one of the tenants drowned there. The court held that the question of negligence was one for the jury and later affirmed judgment for the plaintiff against the company. And again in Parsons v. Powder C. (1917), 198 Mich. 409, the court held that the question of negligence was a proper one for the jury where a seven-year-old boy drowned while skating on a navigable river over ice made unsafe by a discharge of warm water by the company.

The fact that children are sometimes drowned in water in which they are tempted to play does not impose upon the landowner the duty to see that his pond is fenced or drained away; that the children who are drowned while playing in the water are, after all, but a small percentage of those who are tempted to play in it; that accidents of this kind while always possible, are not so likely to happen that there should be a duty to guard against them (8ALR 2d 1261).

This is the line of defense, generally, against applying the attractive nuisance doctrine. The Heider case tempered this with "reasonable forseeability." In the Peklenk case, and in the Parsons case, liability was predicated on the theory that conditions were such that it was the landowner's duty to anticipate the presence of children. And the Peninsular v. Grand Rapids case held that no recovery was possible if reasonable precautions had been taken.

The problem of liability can affect over 15,000 landowners in different ways. Generalizations are dangerous, especially in law, but a few generalizations seem in order here.

It seems apparent that little liability exists for the average pondowner under the attractive nuisance doctrine in Michigan. There should be even less if the pond lies well away from public thoroughfares. There is some doubt regarding liability where the pond is easily accessible to trespassers and the owner takes no precautions to prevent unauthorized access. It seems well settled that if the landowner takes ordinary, reasonable precautions to prevent access, his "duty of anticipation" will have been fulfilled.

Of course, if there is, however, some actual express or implied invitation from the owner to others to boat, swim, play, etc., then he must insure that all

possible precautions and due care are taken to avoid any unsafe conditions.

CHAPTER IX

RULES AND REGULATIONS

Stamm, in his report on Genesee County ponds, indicated that new laws regulating flood plains, stream water use, and alterations to water courses might restrict construction in some areas. He also mentioned the fact that several Genesee County townships required building permits before allowing construction.

If the trend towards restrictions statewide and at various local levels was prevalent, it would be an important factor to consider toward the future of pond construction. Accordingly, the district directors were asked, in the initial mailing, to provide addresses of those county and township offices involved with particular local restrictions. It was believed that the directors might be in a good position locally to supply this type of information.

Most replied that no such regulations (with the exception of state laws) were at present in effect within their districts. Ten gave various answers and possible

contacts for more information. Most of these were then contacted with a follow-up letter.

Genesee County townships by and large require a building permit of some sort. Benzie County has a law which allows county commissioners to require a permit to install dams over two feet high. Adrian Township, Lenawee County, could affect construction by requiring a conditional use permit after a hearing to protect the neighborhood. Bedford Township, Monroe County, was found to have an ordinance covering quarry operations, but not directly relating to ponds. Lake County was contacted and indicated no county or township regulations. Presque Isle had regulations affecting only impoundments; and Wexford County indicated that nothing in their zoning ordinance covered ponds except where they were created by damming streams.

The results of this survey indicate that substantially few regulations exist at the county or township level at the present time which by themselves might inhibit future pond construction.

Pond construction on or near existing navigable waterways and bodies of water is affected somewhat by state regulations. State law requires permits under Sec. 1. of Act 184, Public Acts of 1963, for constructing dams on any stream or river impounding more than five (5)

acres. Under Sec. 18., Act. 291, Public Acts of 1965, permits are also required to construct a pond connecting to, or located within 500 feet of the ordinary high water mark of an existing navigable stream, lake, or other body of navigable water.

The Water Resources Commission approved about fifteen dams during 1970 and only about sixty the last five years. Many impoundments can escape regulation merely by creating impoundments upon non-navigable feeder streams or of less than five acres in size. As a result of this situation, the state senate began hearings in April of 1970 on a bill which would amend the present Lakes and Streams Act, to require permits for any impoundment over five acres.

Taken together, state and local regulations at present appear to have negligible effect upon pond construction. (It must be noted here that the bulk of pond construction occurs by digging. Certain areas, i.e., parts of the Upper Peninsula, which rely more heavily on impoundments to create ponds are subject to more controls which make construction more time consuming and more expensive. Recent amendments and a pending revision of the Inland Lakes and Streams Act will undoubtedly inhibit this type of construction in the future.)

CHAPTER X

AESTHETICS

Aldo Leopold, in an essay entitled "Conservation Esthetic," lamented:

> The disquieting thing in the modern picture is the trophy-hunter who never grows up, in whom the capacity for isolation, perception, and husbandry is undeveloped, or perhaps lost. He is the motorized ant who swarms the continents before learning to see his own back yard, who consumes but never creates outdoor satisfactions.

And Paul Errington, in his Of Men and Marshes reflected upon: " . . . the incongruities of wasting what we have at home and then expecting to go somewhere else for the enjoyment of hunting, fishing, and outdoor beauty."

There are, of course, values which cannot be placed on a sliding-scale of visitor-days, and returns which have other than economic value. The tourist dreams--and the farmer has been building part of his dream in the back-yard or his north forty. We cannot deny certain unmeasurable satisfactions in other recreational pursuits, in natural lakes, and public parks--but what joy there must be to a man to watch a swallow celebrate sundown over his pond by chasing mosquitos, to see his boy entranced by a

silvery swirl of bubbles trailed after a muskrat under ice?

John Steinbeck, in his book America and Americans writes,

> Unless some valuable direction can be devised and trained for in America, leisure may well be our new disease, dangerous and incurable.
> And year after year, thousands of families, having accumulated a nest egg through hard, monotonous, boring work, go back to the country and try with puzzled failure to re-create a self-sufficient island against the creeping, groping, assembly-line conformity which troubles and fascinates them at the same time.
> We have the things and we have not had time to develop a way of thinking about them. . . . We have found no generally fulfilling method for employing our leisure.

Is the pond boom a move both toward finding a "fulfilling method for employing our leisure" and a recognition of aesthetic values? Admittedly we may have to adopt a wait-and-see attitude. The survey recently completed indicated that 55 per cent of the respondents recognized aesthetic values connected with their pond compared to only 40 per cent in 1961. It would be encouraging to believe that our society has progressed far enough up the material ladder to allow some of us to dream of aesthetics.

It is perhaps only in our ability to appreciate and need the intangible beauty of an early morning mist over a pond or the raucous rattle of a kingfisher that we can demonstrate a higher calling than other animal groups. Thoreau, in Walden, said,

> There were times when I could not afford to sacrifice the bloom of the present moment to any work, whether of the head or hands. . . . I grew in those seasons like corn in the night, and they were far better than any work of the hands would have been. They were not time subtracted from my life, but so much over and above my usual allowance.

Errington in Of Men and Marshes, also felt,

> Wilderness and related values may not offset all of the worries and frustrations to which civilized man is subject, but they help. I would say that cherishing them can be among the experiences redeeming human life from futilities and conceits. The receptive person can thus better see himself, his life, and his problems within a framework of universal order, of permanent physical realities, of evolutionary trends, and of the great phenomena of Life.

Leopold believed that the race is benefited by any incentive to get out into the open--the pond boom provides that benefit and also helps attack the problem of shrinking recreational opportunities. Peace and a place to go --together, and in one's own backyard.

CHAPTER XI

SUMMARY AND CONCLUSIONS

Artificial pond construction at present is a dynamic, rapidly growing enterprise. While Michigan agencies attempt to plan, develop, and provide recreational opportunities for its citizens, thousands of these same citizens have decided to provide their own. It is apparent that for many reasons a large segment of our mobile population has decided that they can maximize their benefits by staying at home. They have decided to provide their own private swimming, fishing, and congestion-free areas. The rate of construction and use of these areas attests to the popularity of this approach.

The questionnaire survey was an attempt to gather information in an area in which virtually none exists. Several obvious results command more attention--Why was the response to the questionnaire so high? Initial response (upon which most of the other data results are based) was over 74 per cent but returns continue to trickle in--at the time of this writing total response is approximately 80 per cent. Although attempts were

made to encourage a high return, (return envelope, one-page questionnaire) it is likely that other factors were involved. It is evident that many respondents wanted to explain the benefits (and some of the problems) they felt they received from being a pond owner. Comments included "best investment I ever made," to several such as "we live on it all year." Obviously there are some very worthwhile benefits involved. It is also difficult to imagine any other field of investment within which 95-99 per cent of the investors remain satisfied.

Although the percentage of purely privately constructed ponds may be slowly increasing, it is evident that construction of a large majority of ponds is still influenced by amounts of cost-sharing help available to landowners, both in local districts and statewide. The mid 1950s and 1960s building spurts are ample proof of the effect of the cost-sharing incentive plan. Keeping this factor in mind, and then taking into account the response from the pond owners regarding lessened dependence on previously used public recreational areas, we may see the germ of an interesting idea begin to form--can construction of small ponds on a more massive statewide scale be contemplated as a viable alternative by the state to developing high-intensity use areas in parks? Could this be a useful concept toward diffusing recreational pressures? Certainly this small study does not

provide enough data to carry the thought very far but several factors are worth noting in its favor:

1. Very small ponds (under one acre) are capable of sustaining relatively intense use.
2. Construction is simple, fast, probably over 95 per cent successful.
3. Users appear to derive satisfactory recreational returns--benefits.

The areas developed for the pressures of the southeastern Michigan population can never be eliminated but something is missing from a concept which strives only to provide better ways of packing more people into the same area--perhaps ponds could help share the load.

It appears likely, after receiving the use figures from several ponds built for commercial recreation, that the private sector might find it advantageous to convert or build more ponds to satisfy this demand. This might be an entirely new field to explore.

Dr. Humphrys was quite prophetic in 1961 regarding the influence of a renewed cost-sharing program by ASCS. The program resulted in a tremendous outpouring of private and matching public funds. The creation and success of those ponds has undoubtedly influenced the growing number of ponds built without this extra help. Many people have discovered that they do not have to spend all year

waiting for a vacation--they can build part of it in their backyard. They can introduce their families to a world of life without a park sticker for admission, and they can reserve a tiny bit of country for (times)

> At times, one of man's greater needs is freedom from himself . . . in needing, on occasion, freedom from man to escape being psychologically overwhelmed by Man as a mass phenomenon (Errington, Of Men and Marshes).

The artificial pond is a natural recreation center. Ponds may become more and more popular as a means of obtaining needed recreation while avoiding the recreational crush.

Might different approaches to securing data have worked as well or better than the ones chosen? I have listed some of the problems concerned with intensity of use following Chapter IV. The short questionnaire approach to this question evidently confused many people. A personal interview would undoubtedly be far superior for this purpose but the added problems of time and cost would have to be considered. Perhaps a questionnaire explaining and dealing entirely with this single question could obtain better results.

Further studies would also have to reconsider methods of obtaining names and addresses of pond owners for sampling purposes. I believe the system I used was fairly workable in this instance but soon the sheer bulk

of pond numbers will no doubt make the validity of a sample size more critical. Perhaps SCS and/or ASCS field personnel may again be the best primary source of information in the future.

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APPENDICES

APPENDIX A

ACP ANNUAL POND CONSTRUCTION IN MICHIGAN, 1954-1969

APPENDIX A

ACP ANNUAL POND CONSTRUCTION IN MICHIGAN, 1954-1969

1954	First ponds cost-shared				Irrigation		Stock	
					C-14	3 new		
1955					C-14	21		
1956					C-14	146	B-7	1
1957					C-14	490	B-7	240
1958					C-14	296	B-7	263
1959					C-14	200	B-7	145
1960					C-14	158	B-7	116
1961					C-14	172	B-7	148
1962	Wildlife ponds added							
		(acres)		(no.)				
	G-2	139	G-3	409	C-14	131	B-7	85
1963	G-2	180	G-3	524	C-14	195	B-7	98
1964	G-2	313	G-3	493	C-14	264	B-7	148
1965	G-2	101	G-3	490	C-14	235	B-7	83
		(no.)						
1966	G-2	165	G-3	765	C-14	96	B-7	86
1967	G-2	185	G-3	632	Combined		B-7	212

1968	G-2	87	G-3	563		B-7	137
1969	G-2	129	G-3	327		B-7	127

(Figures compiled from Federal Annual ACP reports.)

APPENDIX B

1961 BASE POND TOTALS

APPENDIX B

1961 BASE POND TOTALS

		1961	1962			1961	1962
1.	Alcona	39	39	37.	Isabella	36	36
2.	Alger	6	6	38.	Jackson	65	65
3.	Allegan	118	118	39.	Kalamazoo	62	62
4.	Alpena	19	19	40.	Kalkaska	20	20
5.	Antrim	35	35	41.	Kent	77	81
6.	Arenac	20	20	42.	Keweenaw	6	6
7.	Baraga	46	46	43.	Lake	12	12
8.	Barry	62	64	44.	Lapeer	175	178
9.	Bay	4	6	45.	Leelanau	59	59
10.	Benzie	15	16	46.	Lenawee	32	32
11.	Berrien	371	371	47.	Livingston	91	89
12.	Branch	3	3	48.	Luce	3	3
13.	Calhoun	40	40	49.	Mackinac	9	9
14.	Cass	59	59	50.	Macomb	73	75
15.	Charlevoix	19	19	51.	Manistee	128	128
16.	Cheboygan	30	30	52.	Marquette	10	10
17.	Chippewa	15	15	53.	Mason	79	79
18.	Clare	22	22	54.	Mecosta	54	54
19.	Clinton	17	17	55.	Menominee	16	16
20.	Crawford	19	19	56.	Midland	3	3
21.	Delta	8	8	57.	Missaukee	0	0
22.	Dickinson	27	27	58.	Monroe	12	36
23.	Eaton	65	65	59.	Montcalm	39	39
24.	Emmett	18	18	60.	Montmorency	8	8
25.	Genesee	45	46	61.	Muskegon	25	25
26.	Gladwin	27	27	62.	Newaygo	59	59
27.	Gogebic	4	4	63.	Oakland	162	170
28.	Grand Traverse	44	44	64.	Oceana	79	79
29.	Gratiot	18	18	65.	Ogemaw	51	51
30.	Hillsdale	27	29	66.	Ontonagon	36	36
31.	Houghton	116	116	67.	Osceola	65	65
32.	Huron	7	7	68.	Oscoda	21	21
33.	Ingham	53	53	69.	Otsego	36	36
34.	Ionia	7	7	70.	Ottawa	56	56
35.	Iosco	20	22	71.	Presque Isle	41	41
36.	Iron	6	12	72.	Roscommon	2	2

		1961	1962
73.	Saginaw	19	20
74.	Sanilac	24	27
75.	Schoolcraft	8	8
76.	Shiawassee	38	38
77.	St. Clair	44	47
78.	St. Joseph	56	56
79.	Tuscola	14	14
80.	Van Buren	233	233
81.	Washtenaw	115	115
82.	Wayne	51	51
83.	Wexford	38	38
	Totals	3,793	3,861

Note: 1961 statistics from "Michigan Ponds," pp. 4 and 5.

1962 statistics from "Bulletin No. 12," p. 9.

APPENDIX C

COVER LETTER AND QUESTIONNAIRE TO SOIL CONSERVATION DISTRICT DIRECTORS

COOPERATIVE EXTENSION SERVICE

MICHIGAN STATE UNIVERSITY • EAST LANSING • MICHIGAN 48823

AND U.S. DEPARTMENT OF AGRICULTURE COOPERATING

Department of
Resource Development
Natural Resources Building

August 1, 1970

Dear Sir:

During the past ten years, the number of artificial ponds in Michigan has increased approximately 400%. This increase varies from county to county but little else is known about such related factors as the value and intensity of use of these small bodies of water.

The Department of Resource Development at Michigan State University is attempting to inventory certain of these facts relative to artificial ponds. We believe this study may provide valuable information for all who will be concerned with constructing these ponds.

Your assistance in helping us pursue certain areas of this study is needed and will be greatly appreciated. A form for your answers to several questions and a stamped return envelope have been provided.

At the end of the form we ask for the names and addresses of 20 pond owners from your counties. We intend to contact most of these owners with a questionnaire or a short, personal interview. The results of these interviews will be utilized in statistical form only - we will not publish, or make available to other individuals or agencies, these names and addresses.

Thank you for your assistance.

Very truly yours,

COOPERATIVE EXTENSION SERVICE

Eckhart Dersch

Eckhart Dersch
Extension Specialist in
Soil and Water Conservation

ARTIFICIAL PONDS (under 10 acres)

	County(ies)	Number	(Total Acreage If Available) Acreage
1. Ponds constructed 1969 with assistance from SCD, SCS and/or ASCS			
2. Ponds constructed 1970 with assistance from SCD, SCS and/or ASCS			
3. Ponds constructed 1969 without assistance; if you know of any			
4. Ponds constructed 1970 without assistance; if you know of any			

5. Are you aware of any county or township regulations in your district governing pond construction? (zoning, permits, etc.?) yes _____ no _____

   If yes, can you list the county or township offices which we can contact for further information?

6. We would like the names and addresses of 20 owners from around your district selected from among those who built their ponds during the years 1965, 1966, 1967 and 1968. Include names of those who built prior to 1965 if needed.

NAME AND ADDRESS Note: Original questionnaire listed 20 spaces

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____

APPENDIX D

COVER LETTER AND QUESTIONNAIRE

TO POND OWNERS

MICHIGAN STATE UNIVERSITY East Lansing, Michigan 48823

DEPARTMENT OF RESOURCE DEVELOPMENT . NATURAL RESOURCES BUILDING

August 27, 1970

Dear Sir:

Re: ARTIFICIAL POND SURVEY

During the past ten years, the number of artificial ponds in Michigan has increased approximately 400% to over 15,000 ponds. This increase varies from county to county but little else is known about such related factors as the value and intensity of use of these small bodies of water.

The Department of Resource Development at Michigan State University is attempting to inventory certain of these facts relative to artificial ponds. We believe this study may provide valuable information for individuals and agencies concerned with constructing these ponds in the future.

We have selected a number of individuals from among those who have constructed ponds in Michigan. You are one of _____ persons picked from those who have built ponds in _____ county. Your assistance in helping us develop certain areas of this study is needed and will be greatly appreciated.

We hope you will take the time to list your answers to the questions on the form provided and return it to us in the stamped return envelope.

Thank you for your assistance.

Very truly yours,

Ralph Christensen

Ralph Christensen
Graduate Student
Department of Resource Development

RC:ph

MICHIGAN STATE UNIVERSITY - EAST LANSING

POND OWNER QUESTIONNAIRE

County _____ Year Constructed _____ Size of Pond _____ acres

A. Primary purpose pond was intended for? _____

B. What do you use the pond for? (Check as many items as necessary)

1. _____ Irrigation
2. _____ Stock water
3. _____ Spray water
4. _____ Boating
5. _____ Fishing
6. _____ Picnicking
7. _____ Swimming
8. _____ Drinking water
9. _____ Fire protection
10. _____ Ice fishing
11. _____ Aesthetic (Improve scenic value of land)
12. _____ Washing or processing
13. _____ Improve wildlife habitat
14. _____ Other _____

C. Have any groups (youth, church, fraternal, etc.) ever used your pond?

YES _____ NO _____ If yes, what type? _____

D. Intensity of Use - the number of visitor-days your pond is used during the year. A visitor-day is one visit (swimming, picnicking, fishing, etc.) made to the pond during the day for any length of time. A total for the year is arrived at by adding up all the people who have used the pond during each day and then adding up all those daily totals.

List your best estimate including all uses for an entire year.

_____ Family _____ Groups

_____ Friends & Neighbors _____ Paid Guests

E. Did you and your family use other public recreational areas, county or state parks, etc., before you built your pond? YES _____ NO _____

Do you now use any of these public recreational areas: (check one)

More Frequently? _____ Less Frequently? _____ About the Same? _____

F. Approximate cost of pond? _____

G. Was your pond a worthwhile investment? YES _____ NO _____

H. Any additional family income resulting from pond? YES ____ NO ____ (Amount not requested.)

If yes, was it from ---------- fee fishing _____
irrigation _____
commercial recreation _____
other _____

I. Did pond raise the value of your property? YES _____ NO _____

J. Management Problems (Check any which apply)

Was pond stocked with fish? YES ____ NO ____
Ever had winter kill? YES ____ NO ____

none _____ poaching _____
pond weeds _____ algae _____
fish diseases _____ other? _____

K. Have you ever had any problems with uncontrolled access (trespassing) connected with your pond?
YES ____ NO ____ (by children?) YES ____ NO ____
Do you expect this problem in the future? YES ____ NO ____
Is your pond presently fenced? YES ____ NO ____ Signs posted? YES ____ NO ____