FACTORS AFFECTING COTTAGE SITE DESIRABILITY

FACTORS AFFECTING COTTAGE SITE DESIRABILITY

by

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SCOPE AND CONTENTS:

     Factors affecting cottage site desirability are investigated two
ways. A step-wise compilation of the regression model is used to
rank the cottage site desirability variables, and determine the pro-
portion of variation that the variables contribute in explaining
cottage land values. The simple regression and correlation tech-
nique is used to determine the existence of possible relationships
between distance measures, and measures of both cottage land values
and cottage road values.

ACKNOWLEDGEMENTS

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CHAPTER I

Introduction

Cottaging in Southern Ontario has recently boomed in popularity. Little is known about what makes cottage sites desirable other than the universal popularity of the presence of some type of water body. Research on the question of which factor cottagers find desirable in cottage sites is limited.

The purpose of this study is to improve our understanding of the relative desirability of certain summer cottage site characteristics. The study was undertaken in a cottage area on the Severn River in which 221 cottage sites were examined.

In the first part of the study, eighteen variables are measured and tested. The seven variables found to be most important in affecting cottage site desirability in their rank order of importance are: degrees of view, distance from a low order centre, slope of the land, assessed structure value, shoreline footage, length of sandy shoreline, and distance from a car-park area. The principal measure of cottage site desirability employed is land value.

In the second part of the study, with the data gathered, it is found that no statistically significant relationships exist between cottage land values and distance away from either the low order

centre[1] or car-park areas for both single and double[2] access sites.
Also, since ninety percent of the cottagers are satisfied with their
present cottage location, it indicates that no ideal distance away
from the low order centre exists. Finally, the value of a road to the
cottage is found. Double access cottagers consider a road increases
the value of their site by $14.40 per foot frontage, and single access
cottagers estimate that if they had a road it would increase their
site value by $11.80 per foot frontage.

In order to test cottage site desirability factors, land value
estimates were collected from cottage owners and real estate agents.
Initially real estate sales and assessment values were to be collec-
ted, but these data are not applicable for this study. Regardless
of the limitations of the study, the results do provide an improved
understanding of the variables which cottagers feel are important in
affecting the value and desirability of their cottage site. It is
also found that road access is of considerable value to a cottage
site even though all cottagers may not want it.

The Problem

Within the past 15 to 20 years, cottaging in Southern Ontario and
other parts of North America has boomed in popularity. What was once

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[1]In most cottage areas, a low order centre consists of one or two
gasoline outlets (auto and marine), one or two general stores, and
possibly a restaurant, post-office, marina, and areas for parking
cars.

[2]Single access cottagers can only get to their cottage by boat
while double access cottagers can get to their cottage by both car
and boat.

an isolated lake or river has, is, or might in the near future, be developed for the purpose of cottage recreation.

Different cottage sites, and different cottage areas offer many varying services, conveniences and attractions. Some of these may appeal to one cottager but not necessarily to another. This apparent confusion and contradiction creates a problem. What are the factors that make cottage sites desirable to the cottager?

It is well known that the single most desirable characteristic for recreational land anywhere is the presence of water.[3] The form and shape of the water body does not appear to be a factor in the selection of cottage sites. Some cottagers may only want a small creek in which to fish while others want a body of water large enough for swimming, boating, and cruising. In Ontario, most cottage sites have some type of private water frontage, but for those that do not, it is generally found that the cottages are clustered around a public beach.[4]

Research on cottage site desirability is limited. There have been studies concerned with accessibility to cottage areas[5] and

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[3] E. J. L. David, "The Exploding Demand for Recreational Property", *Land Economics*. May 1968, p. 206.

[4] The Wasaga Beach area of Georgian Bay is a prime example of this type of cottage area. Rather than cottages extending parallel to the shoreline, they extend away from the shoreline similar to an urban residential neighbourhood.

[5] R. I. Wolfe, "Parameters of Recreational Travel in Ontario - A Progress Report", Department of Highways of Ontario, Report #RB 111, March, 1966.

with methods of evaluating factors that might contribute to making recreational areas potentially valuable.[6] Most recreational studies have to do with leisure time activities other than cottaging, for example, camping or playground activities.

Because little research has been conducted on cottage site desirability, few facts are known about this topic. The purpose of this thesis is to determine some of the factors that cottagers consider important and desirable in cottage sites.

This field of research is highly subjective because of the wide variation in types of cottage areas, cottage sites, and type of cottagers. By being objective in this study, it is hoped that the results of this thesis will be useful as a springboard to further research as well as being useful to governmental agencies, and to individuals such as planners, assessors, developers and real estate agents. It may give these people a greater understanding of the cottagers' desires and through this they may be better able to serve the public.

Nature of the Study

This study is divided into two parts because of the differences in problems examined, methods used, and scale of study. The purpose of Part I is to determine both the physical and man-made factors that are considered important in affecting the desirability and value

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[6] E. B. Wennergaren, "Valuing Non-Market Priced Recreational Resources", *Land Economics*, 1964.

of cottage sites. Factors such as view, cottage density, shoreline frontage plus others are examined to discover if they are important to the value and desirability of cottage sites. Part II is a detailed investigation into the road access factor which is one of the site desirability factors. This investigation is carried out by testing three hypotheses and by obtaining answers to some exploratory questions. Parts I and II are explained in detail in the remainder of this chapter.

In the first part of Chapter II, the study area is described. In the latter part of Chapter II the site desirability factors and independent variables are described with reference to the study area, and the methods of measuring and collecting the data for each. In Chapter III, the dependent variable data sources and the methods of calculating each dependent variable are explained. In Chapter IV the pretest, the questionnaire, the sampling procedure, and the sampling results are described. Chapter V is broken into two parts. In Part I, the results and interpretation of the variable analysis is given, with special emphasis on the seven variables found to be important in affecting the desirability of cottage sites. In Part II of Chapter V, the results and interpretation of the road access factor testing are set forth. Finally, in Chapter VI, the summary and conclusions of the study are given. It is also shown in this chapter how a different research approach would be undertaken if this study were to be repeated.

PART I: Site Desirability Factors.

In many cottage areas, unlike urban areas, site characteristics such as slope, width of lot, and access can vary greatly among neighbouring lots. It is not unknown to have neighbouring cottage sites almost

completely different from each other. For example, one cottage may be located near a swamp while the neighbouring cottage may be on an island or perhaps fifty to sixty feet above the water surface. Each cottage site has its own unique set of characteristics which are likely quite different in comparison to neighbouring lots. With a wide range of differing characteristics or factors possible in a site, a problem exists in finding those factors that cottagers consider to be important in contributing to the value of cottage property. What are some of the physical and man-made factors that cottagers find desirable in cottage sites?

From the literature, the factors (other than the presence of water) found to be important in affecting the value and desirability of cottage sites are few. Wolfe found that a commanding view and an illusion of solitude are valuable site factors.[7] It has been claimed that road access to the cottage site is of significant value to the cottage site.[8] Finally, in a small scale study which is similar to Part I of this study, it was found that the slope of the land and the type of shoreline are significant factors in affecting site desirability.[9]

Because of the incompleteness of the research on this topic, it is important to test additional factors considered important in contributing to the value and desirability of cottage sites.

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[7] R. I. Wolfe. *Recreational Land Use in Ontario*. Ph.D. Thesis, University of Toronto, 1959, p. 445.

[8] Canada Land Inventory, A.R.D.A., Canada Department of Forestry and Rural Development. *Land Capability Classification for Outdoor Recreation*, Ottawa, June 1967, p. 65.

[9] F. M. Helleiner, "A Technique for Estimating Physical Variables as Parameters of Cottage Desirability", University of Western Ontario, February 1968, p. 6.

Research Approach

Part I of this study is strictly explorative, the purpose being to identify the important factors (variables) that contribute to the value and desirability of a cottage site. It is not the purpose of this thesis to develop a predictive model, nor is the explanation of cause being sought.

The site desirability variables (independent variables) are measured for each cottage site. Analysis is carried out with land values as the dependent variables. The methods of analysis are both simple correlation, and step-wise multiple regression. Since land value is a measure of site desirability, the independent variables that prove statistically significant can be considered important in affecting cottage site desirability.

Independent Variables. The independent variables are the measures of the various site desirability factors. These are selected from the literature and the researcher's knowledge of the study area.

The independent variables are sub-divided into three categories: site variables, for example view and slope; local variables, for example cottage density and distance to low order centre; and human variables, for example shoreline frontage and distance from home. In total there are eighteen independent variables measured and analyzed in order to test twelve site desirability factors.

The data for these variables are gathered from the examination of the characteristics of each cottage site and from the Matchedash Township assessment roll. In Chapter II each of the site desirability factors and independent variables is discussed and explained in detail.

Dependent Variables. In order to isolate the important indepen-
dent variables, land value[10] is selected as the dependent variable. It
is considered that the use of land value as the dependent variable is
a good measure of the value that an owner attaches to his site.

The analysis employs three measures of land value. One is calcu-
lated by combining real estate agents' estimates and cottage owners'
estimates. The two others are computed using both cottage owners'
estimates of land value.

In Chapter III, an explanation of the dependent variable and the
problems encountered with this variable is provided in detail.

Methods of Data Analysis. The variables must be analyzed in such
a way that from the results it is possible to determine the variables
that appear important in affecting and contributing to cottage site
desirability, their rank order of importance, and their negative or
positive effect on land values.

Helleiner attempts to estimate the importance of eleven physical
site desirability variables.[11] He uses both simple correlation and
multiple regression and from his analysis he is able to determine two
significant variables that contribute to cottage site desirability.

Both of the above methods of analysis are used in this study.
Simple correlation determines the significance and strength of the
relationship between two variables. Multiple regression determines the

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[10]Land value is expressed as a value per foot frontage.

[11]F. M. Helleiner, *op. cit.*, pp. 2-9.

existence of a linear relationship and degree of significance between one variable and a number of other variables.

A step-wise multiple regression analysis is used.[12] This solution gives, in descending order, the variables which contribute most to the variation in the dependent variable. One variable is added to the equation at a time beginning with the variable exhibiting the highest zero-order correlation value. Then the partial correlations between the dependent variable and each of the remaining independent variables are computed. At the next step, the variable having the highest partial correlation coefficient is added to the computation. The step-wise procedure continues until all the specified independent variables are included, or the computation may be terminated when the addition of further variables provides no further explanation to the estimating equation.

PART II: Road Access Factor

A federal government report states accessibility to a cottage by road is considered significant to the acquisition and value of cottage sites.[13]

Within some cottage areas there are sections in which cottagers are able to drive a car to their cottage (double access) while other cottagers can only get to their cottage by boat (single access).

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[12]A. Ralston and H. S. Wilf. *Mathematical Models for Digital Computers*. New York, 1960, Ch. 17.

[13]Canada Land Inventory, A.R.D.A., *op. cit.*, p. 65.

Because of the different accessibility patterns, a difference between the two types of cottage sites might exist in terms of value and desirability. Is a double access site of greater value than a single access site?

Through the personal experience of the researcher, it is believed that some cottagers do not want road access to their site. Other cottagers would not have a cottage unless they could drive their car directly to it.

This situation raises certain questions. What is the value of a road to a cottage site? What effect does the distance to a low order centre and car-park area have on land and road values? Is there an ideal distance that cottagers would prefer to be away from a low order centre? Would a road or lack of road access affect the cottagers' preference for an ideal distance?

Research Approach

The basic data sources are cottage owners' responses to the questionnaire. The distance values are determined from a large scale map of the study area. The methods of data anlysis are linear regression and correlation analysis, and averaging. Regression is used because the results demonstrate the relationship between two variables (value and distance). Correlation measures the strength of the relationship.

Hypotheses

Each of the three hypotheses is based on the assumption that road

accessibility to the cottage site is considered significant to the value of a cottage site.[14] It is also assumed that the road value will vary depending upon a change in distance away from both a car-park area and from a low order centre.

Hypothesis #1. Low Order Distance. Empirical research carried out on land values in urban areas reveals that land values vary inversely with distance away from shopping areas. In a cottage area, low order centres provide similar, although limited, functions as those in urban shopping areas. Perhaps in a cottage area, a similar land value-distance relationship exists as found in urban areas. For this reason, it is hypothesized that there is an inverse relationship between land values and the distance the site is away from a low order centre.

Hypothesis #2. Car-Park Distance. For cottage areas with single access, distance away from the low order centre may not in itself be enough to explain the variation in land values. Single access cottagers might also be aware of the distance their cottage site is away from a car-park area.[15] It is obvious that the farther a cottager has to travel from the car-park area to his cottage, the more transport costs he encounters and perhaps this is reflected in land values. For this reason it is hypothesized that in a single access area, there is an inverse relationship between land values and the distance the site is away from the car-park area.

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[14]*Ibid.*, p. 65.

[15]In some cases, the car-park area is located at the low order centre.

Hypothesis #3. Ideal Distance. This hypothesis is included largely to satisfy the personal curiosity of the researcher. The hypothesis is simply that there is an ideal distance that cottagers would prefer to be away from a low order centre. The rationale for making the hypothesis is that most cottagers travel to the low order centre by boat. Because boat travel is relatively expensive, yet pleasurable, it is anticipated that an ideal distance would reflect a balance amongst the cost of the trip, the convenience of the distance, and the enjoyment of the ride.

Road Value Investigation. A government study has shown that road access to a cottage site has an important influence on the value of that site.[16] In order to further examine this finding within this study area, an exploratory study is undertaken as follows.

Cottagers with single access are asked to estimate the value of their land as if it had a road, while double access cottagers are asked to estimate the value of their land as if it did not have a road. With these data, a mean road value is determined for both single and double access sites.

In addition, estimates of land values, both with and without a road, are analyzed by simple regression with low order centre distance and car-park area distances as independent variables. The results for single access are compared to the results for double access to see if the two types of cottagers do in fact differ in their basic evaluation

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[16]A.R.D.A., *op. cit.*, p. 65.

and need of a road.

In the chapters that follow, the independent variables are discussed in Chapter II and the dependent variables in Chapter III. In Chapter IV the questionnaire and the sampling procedure is explained. The results and interpretation of both the site desirability variable analysis and the road access factor analysis are in Chapter V. The summary and conclusions of the study are in Chapter VI.

CHAPTER II

STUDY AREA AND INDEPENDENT VARIABLES

Introduction

The purpose of this chapter is two-fold. First it is necessary to
have an understanding of the area in which the study is conducted. By
understanding the make-up of the study area, the discussion of the site
desirability factors and variables are more relevant. For this reason,
a brief discussion of the study area is included in the first part of
this chapter. The second and more important purpose of this chapter
is the discussion of the site desirability factors and variables; why
they are included, how they relate to the study area, and how they are
measured.

Study Area Rationale

There are a number of different types and varieties of cottage
areas within southern Ontario. To mention only a few, there are:
sandy beach areas, large and/or small land-locked lake areas, wilder-
ness areas, privately developed areas, and Canadian Shield areas.

If the total area of cottaging in southern Ontario is taken as a
sample area, then this study would be an enormously large undertaking
not only because of the size of the area but more importantly because
of the variation and diversity within the region. If the study area is

small enough to have only one major type of physical topography, then the differences within the area are more easily studied because the number of differences are already limited. Also, if the study area is of one type, then the area will attract cottagers that prefer that particular type of area. If the cottagers like the area, then they will likely have similar ideas about the type of factors found desirable in cottage sites with that particular topography.

It is therefore important that the study area chosen has basically the same physical characteristics throughout. This is shown to be the case for this study area in the discussion of the homogeneous factors that follows.

Area Selected for Study

The area in which the data for this study are collected is that strip of land bordering on the Severn River within the township of Matchedash, and a three mile section on the north shore of the river within the township of Wood (Map 2.1). The land along this stretch of river is utilized primarily for cottage recreational purposes, but it is also interspersed with a few boatels, restaurants, marinas and stores.

The first cottages to be built in the area were constructed in the early 1900's before and during the period that the Severn River was damned and canalized. Through canalization, the Federal Government created the last leg of the 240 mile Trent-Severn Waterway which is a navigable link for pleasure craft between Lake Ontario and Georgian Bay. Cottaging developed along the entire river length in the early period,

MAP 2·1
STUDY AREA- TOWNSHIP OF MATCHEDASH

GRAVENHURST

Six Mile Lake

SEVERN FALLS

Gloucester Pool

Sparrow Lake

Georgian Bay

(103)

PT. SEVERN

MATCHEDASH TOWNSHIP LINE

PT. STANTON

MIDLAND

(12)

COLDWATER

(11)

(12)

Lake Couchiching

0 —— 5 miles

(400)
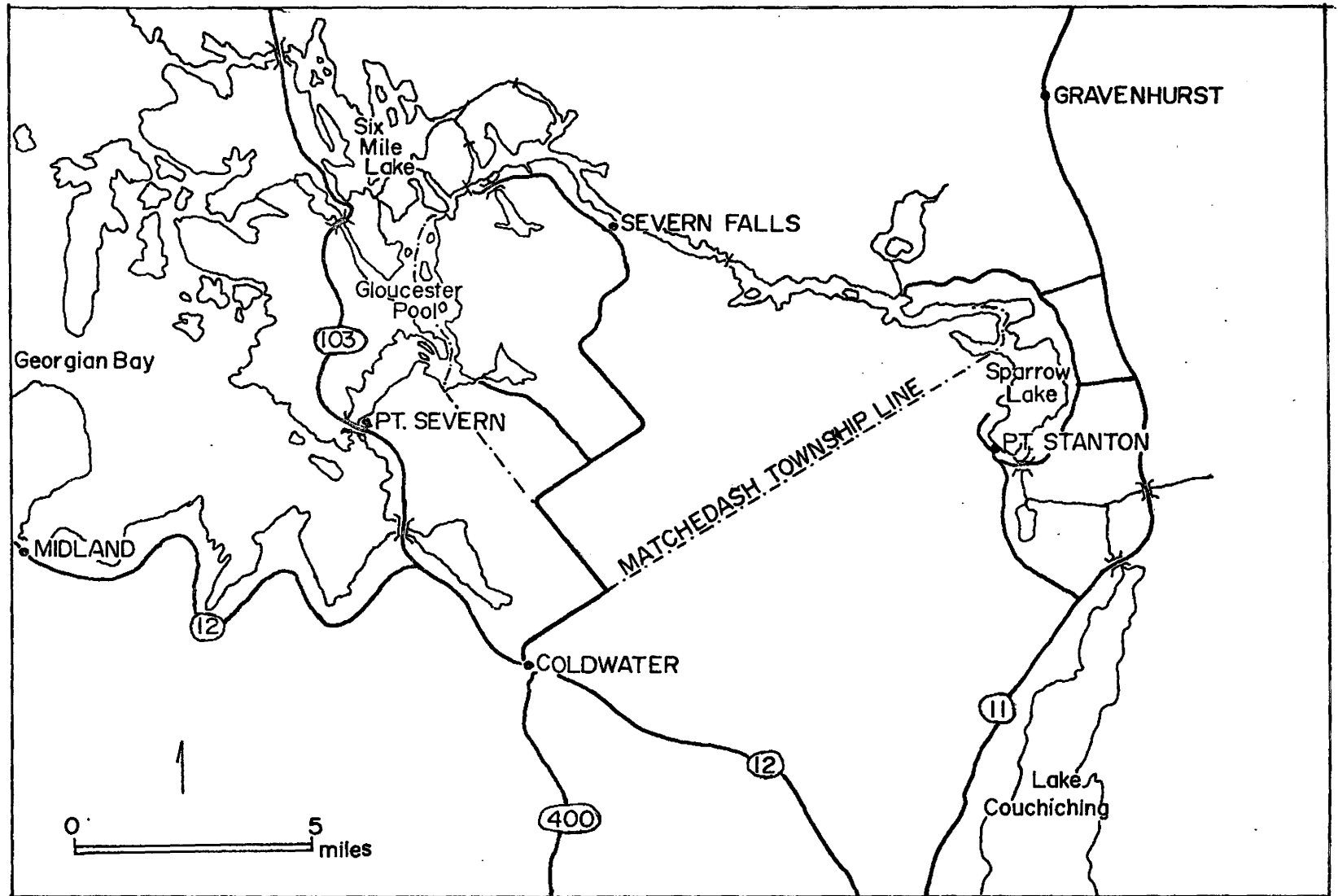
despite the fact that the railway[1] was the only means of access. It
was not until the late 1930's that township roads were extended to a
couple of location points on the river, thus giving easier access and
stimulating further cottage growth.

The Crown was the original owner and realtor of this waterfront
land in the early development period. The selling price of the land at
the turn of the century was $2.50 per acre. By 1914, the price had
increased to $5.00 an acre, which in one known case figured out to be
5¢ per front footage of shoreline. This seems ridiculously cheap at
today's prices, but even in 1955, the local real estate agent was having
trouble selling property at $1.00 per front footage. This same land
today is valued at thirty to forty times the 1955 selling price.[2] There
is no longer any river frontage that is still held by the Crown in this
area and this has been the case since about the early 1950's.

Homogeneous Factors

Within the study area, there are several factors which could be
important in affecting land values, but because they are homogeneous
throughout the area, they will not be included in this study. The fac-
tors and reasons for not including them in this study are as follows:

1. Wolfe suggests that water clarity is a significant factor in

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[1] Both Canadian National and Canadian Pacific Railways ran daily
passenger service to the area.

[2] Conversation with Mrs. P. D. Beckstead, June 1969.

determining land values within different cottage areas.[3] This factor is not relevant to this study (even though some cottagers may prefer clearer or purer water), because the water throughout this area is of the same source, that being Lakes Simcoe and Couchiching.

2. The study area is situated on a controlled level motor boat waterway. The Trent-Severn Waterway offers the cottager the options of extended boat trips, and cruising away from his cottage. As stated above, this encompasses the entire river length. Therefore, this factor is held constant. It would be interesting to try to determine the value of the waterway as it affects land values, but to do this it would be necessary to compare the Trent-Severn area to other waterfront cottage areas that are land-locked.

3. The soil types, vegetation, bedrock, and overall topography are similar throughout this portion of the township; that being typically Canadian Shield. It would be an interesting study to compare Canadian Shield land values with those in other areas, but again this is not the purpose of this study.

4. This area of southern Ontario is one of the closest and most accessible Canadian Shield areas to Toronto. To measure the importance of this factor, it would be necessary to compare land values in other cottage areas of similar distance from Toronto with both similar and dissimilar characteristics.

5. The distance from Toronto plays an important part in determining cottage land values. Because the Toronto area is the major source

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[3]R. I. Wolfe, *op. cit.*, p. 445.

for cottagers in southern Ontario, and also because highways 400, 27, 11, 48, and 401 radiate[4] from Toronto (Map 2.2) the chances are good that even if a cottager does not live in Toronto, he might well have to pass through the city on his route. The average distance from highways 400 and 401 (in Metro Toronto) to the study area is 80-85 miles. Possibly to the remotest portion of the study area the maximum distance would be 95 miles. The study area is split in half with respect to routes taken to and from the cottage area. Because of the lock at Swift Rapids, those cottagers east of this point must travel highways 400 and 11 before turning off to the cottage in the vicinity of Sparrow Lake. The cottagers west of Swift Rapids travel highway 400 and the 400 extension to Coldwater, then either follow township roads to the cottage area, or highways 12 and 103 to the Port Severn and area marine facilities. As indicated, variation in distance from Toronto to the study area is minimal, therefore the factor of distance away from Toronto is relatively constant.

6. The cottage sites within the study area are all located on the waterfront; therefore, the influence of proximity to water or water frontage as a major factor in affecting land values is held constant.

7. In most cases, the land directly behind cottage lots is still owned by the Crown. This is important (and yet a constant), because

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[4]Highways 27, 400, 11 and 48 radiate in a north-south direction, and act as the main routes taken to the Georgian Bay, Muskoka, and Simcoe cottage areas. Highway 401 is the major east-west traffic artery that links all four of the above in the Metro Toronto area. Highway 401 functions as a funnel to cars using other highways on Fridays and disperses the traffic on Sundays during the summer months.

MAP 2·2
ACCESSIBILITY TO STUDY AREA.
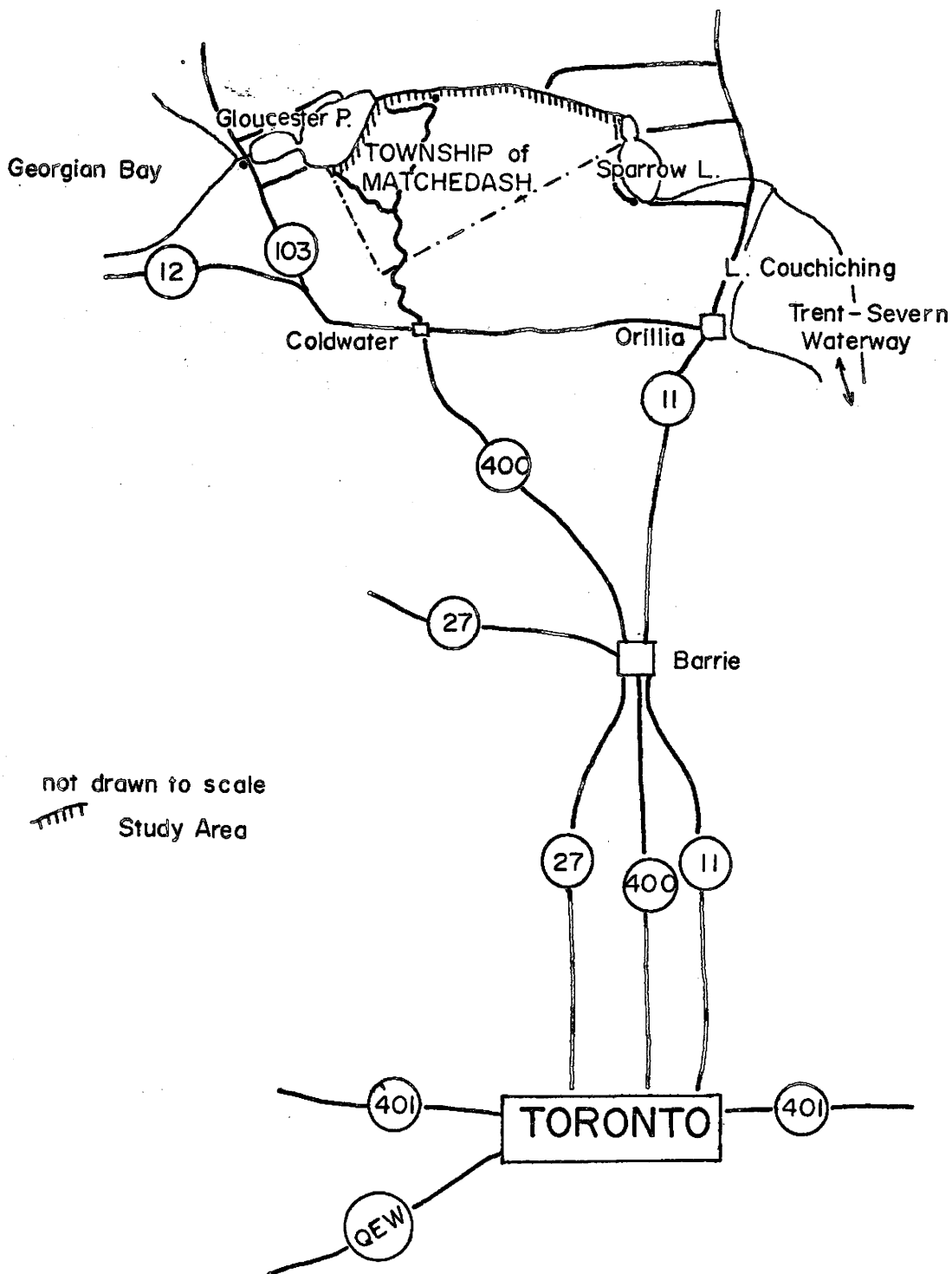
with this land still being in public ownership, it gives the cottager
freer access to his site, and restricts further cottage development.
This might not be the case if the land were owned privately.

Site Desirability Factors

Factors that are not homogeneous throughout the study area are con-
sidered under three categories: (a) site factors, (b) local factors,
and (c) human factors. The site factors that are considered to have the
greatest influence on affecting the desirability and value of individual
cottage sites are: view, slope, shoreline type, water body size, island
(or mainland) and aspect. These factors can change drastically between
one cottage site and the next, and are not influenced by neighbouring
conditions. The local factors considered are: cottage density, low
order distance, and car-park distance. The changes in local factors
from one site to the next are gradual and dependent on man's influence
of change. The human factors are: shoreline footage, value of struc-
ture(s), and distance from home. They have a completely different conno-
tation than either site or local factors. These factors are included
in this study because they may be partially responsible for contributing
to the total value that a cottager attaches to his site, and therefore,
affecting the cottager's estimates of land value.

By measuring these twelve site desirability factors within the con-
text of this study area, it is hoped that a high fraction of variability
will be accounted for, thus indicating that these factors are important
in contributing to land values. The reasons for choosing the twelve

factors and the methods of measuring them are discussed in the remainder of this chapter.

Site Factors and Variables

View. Wolfe notes that most cottagers prefer a "commanding view"[5] and perhaps the greater the view, the greater the value of the site.

The method used to measure view requires the observer to position himself in front of the cottage. It was decided that it would be best to measure cottage view from the ground level rather than from a porch or veranda of the cottage. Because only a limited number of cottages have verandas, it would be a matter of consistency to measure the view for all cottages from the ground in front of each cottage.

This variable measures the maximum angle of vision of river water expressed in degrees. In all cases, a small island with one or two cottages is recorded as having a view of 360 degrees.

Slope. If the water's edge is steep (cliffs), it would appear likely that the land would be less valuable than if the land was gently sloping at about 10 to 15 degrees away from the shoreline. It is expected that this variable will exhibit a negative effect. The steeper the slope, the less desirable.

Slope is measured from the same point in front of the cottage as that of view. It is simply the angle measured in degrees from the cottage to the closest point of water on the river's edge.

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[5] R. I. Wolfe, op. cit., p. 445.

<u>Shoreline Type</u>. Rocky shore and shore bottom is the norm in this
area. It may be found that a sandy shore or bottom, where it occurs,
will increase values (positive effect), whereas a weedy or marshy area
may make a site almost valueless (negative effect).

To a certain extent, this variable is a subjective measurement.
Considering the shoreline of a cottage to be rocky, sandy, weedy or any
combination of the three, the values given for each of the three varia-
bles have to total 100%. Being unable to ascertain property lines, it
is impossible to estimate exactly what percentages are accounted for
by each of the above three variables per site. If the property lines
could be detected between each site, as is the case in many other
cottage areas, this factor could be objectively measured by pacing off
the actual footage for each variable. The measurement of this factor
can be justified in that each site is measured by the same individual,
therefore, if error existed, perhaps the error is consistent throughout
the study area.[6]

In order to combine shoreline type from three variables into one
variable, the three percentage values are given different weightings.
Taking the opinion that a weedy shoreline has a negative effect on land
values, this variable is weighted as zero. Rocky shoreline, being the
norm is weighted as one, but since a sandy shoreline should have a posi-
tive effect, this variable is weighted as two. Here is an example of

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[6]On several occasions, after having taken this measurement, the
cottager was asked to estimate the percentages of the shoreline types
for his cottage site. In all cases, the comparison of the two estim-
ates were extremely close.

the mechanics of four sites to show the computed shoreline value for each.

TABLE 2.1

SHORELINE VARIABLE CALCULATION

	A	B	C	D
Rocky - % x 1	60 = 60	100 = 100	10 = 10	50 = 50
Sandy - % x 2	20 = 40	0 = 0	10 = 20	50 = 100
Weedy - % x 0	20 = 0	0 = 0	80 = 0	0 = 0
Computed Shore-Line Value	100	100	30	150

Three additional variables to test the factor "shoreline type" are made by obtaining the measure of property widths for each cottage lot from the Simcoe County Regional Assessment Office. With these data, two variables are calculated by using the percentage figures of shoreline type. One is calculated as the frontage (in feet) of rocky shoreline per site, and the other as the frontage (in feet) of sandy shoreline per site.

Finally, the nominal scale of measurement[7] (or dummy variable) is used to indicate if a site has any amount of sandy shoreline. The symbol 1 indicates the presence and the symbol 0 indicates the absence of sand

[7] M. H. Yeates *An Introduction to Quantitative Analysis in Economic Geography*. McGraw-Hill Book Company, Toronto, 1968, p. 1.

when this question is asked about each site, "Does this site have any portion of its shoreline sand?".

Water Body Size. The size of the water body in front of a cottage site dictates the distance away from the shore that boat traffic has to pass. It is felt that this is important in this study area because of the varying widths[8] of the river and because boat traffic is increasing each year on the waterway. In wide sections of the river, the problems of noise, waves, and the number of boats is not a serious problem, but in narrow sections, the concentration of noise, waves and congestion does appear to be a detriment to cottage enjoyment and desirability.

A large scale map and a divider is the equipment needed to measure this variable. The variable, which is represented as a distance in feet, is measured from the water's edge in front of each cottage to the nearest point of land on the far shore, or point of restricting width.[9] The values measured for the distance vary from 100 feet to over 2000 feet. It is considered that a distance greater than 2000 feet would have little effect on the results, therefore, 2000 feet is used as the maximum value for this variable.[10]

Aspect. Aspect or direction of face of a cottage may have an influence on land values. It is difficult to predict how this factor will

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[8] In some areas, the river is less than 150 feet wide, while in others, the width is greater than half a mile.

[9] The restricting width could refer to a buoy (channel market) or a small island.

[10] Only seven cottage sites would have had a distance greater than 2000 feet.

affect land values. It appears possible that an eastern and northern face would have a negative effect on site values, whereas a western or southern face should have a positive effect. This is because the southern or western facing cottage site receives more sunlight throughout the day.

It is relatively simple to measure the variable. By standing in front of the cottage (the same location from which the view and slope are measured), a compass is used to indicate which of the four directions the front of the cottage faces.

To include aspect as part of the computer analysis, this one factor is made into four variables. The variables represent four possible directions of face: north, south, east and west. In the analysis, dummy variables are used to represent each of the above directions, therefore, if a cottage is facing north, the symbol 1 is recorded for north, and the symbol 0 is recorded for the other three variables.

Island or Mainland. The illusion of solitude[11] is one of the site desirability factors cited by Wolfe. An island location is one example of a site with solitude and privacy because generally the only way to reach it is by boat. Among cottagers, an island site is usually considered the ultimate in privacy and prestige, therefore, an island site should be more desirable than a mainland site.

In order to measure if a cottage site is located on either an island or on the mainland, a dummy variable is used. The symbol 1 indicates that the cottage is located on an island, and the symbol 0 indicates that

[11]R. I. Wolfe, *op. cit.*, p. 445.

the cottage is located on the mainland.

At one point, it was considered that the island variable would be tested through the variables view, and density, but later it was realized that this would not distinguish a unique island variable. For example, with small islands, view is measured as 360 degrees, and density is measured as 1, but this only affects the outcome of these variables and does not distinguish any value for an island. By using the dummy variable to distinguish island sites from mainland sites, a differentiation is made between the two property types.

Summary of Site Factors and Variables

Within the study area, there are a wide range of combinations among the six site factors. It appears likely that shoreline type will have the least amount of variation since the area has predominantly a rocky shoreline. Alternatively, view will have the most extreme variation because some cottages are secluded in bays with virtually no view while some island sites have a water view of 360 degrees.

Local Factors and Variables

Cottage Density. Cottage density within the area varies a great deal. Within the study area, there are sections of the river where the density is as low as one cottage per 1/4 mile, while in other sections, the density is as high as 16 cottages per 1/4 mile length. It is found that in "high density" areas, the sites: (1) are generally serviced by a road, (2) are easily accessible to low order functions, (3) have been settled for a longer than average number of years, and/or (4) are more

than likely to have more than one cottage on each site. In "low density" areas, the sites: (1) are generally accessible only by boat, and/or (2) are located a considerable distance from low order functions.

The information required to measure density is taken from a map of the study area showing the location of each cottage.[12] Density is measured as "x" number of cottages within a 1/4 river-mile length. Each cottage site to be measured is centred in the middle of the 1/4 river-mile length (measured by using a divider), then all the cottages within this unit are counted, including the sample cottage.

For this variable, the range of values varies from one to sixteen cottages (per 1/4 river-mile length). In the case of a small island, with only one cottage, or an island with more than one cottage, but owned by one individual, the density value is recorded as one.

Low Order Distance. The distance from low order centres to cottage sites may also have an influence on land values. There are three important low order centres that service the study area. Two of these are located outside the study area; Port Stanton at the southern end of Sparrow Lake, and Port Severn at the southern end of Little Lake (off Gloucester Pool). The third centre, Severn Falls, is located about half way between the Swift Rapids Lock and the Big Chute Marine Railway.

It may be found that the distance away from the low order centre is not important, but that possibly the time or cost in travelling is more important. The size, type, power and speed of a boat would then

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[12] The plotting of cottages is explained in Chapter IV.

be important in influencing one's estimate of land values. A cottager

with a fast boat may not consider time or distance an important factor

in influencing site values, whereas another cottager with a slow boat

might consider distance very important in his assessment of site values.

The distance between cottage and low order centre is further influ-

enced by the factor of single and double accessibility. Within the

total 23 "river miles"[13] of the study area, there is a six mile section

in which cottages are serviced by roads, thus supplying them with

double accessibility. Cottages in the remaining seventeen river miles

of the study area have only single accessibility; therefore these

cottages are virtually inaccessible except by boat. It may be found

that in double access areas, the distance factor may have little effect

on site values, whereas in single access areas, there may be a strong

inverse relationship between distance and land values.

This variable is measured in miles (to the nearest tenth) from a

cottage site to the nearest low order centre. The distances measured,

(from a map) are the most direct route that could be taken by a motor-

boat from the cottage to the low order centre. Values for variable

range from a tenth of a mile to ten miles.

Car-Park Distance. The third local factor that may have

an influence on land values is the distance from the point where a

cottager parks his car to his cottage site. In the case where a cottager

can drive his car to the cottage, as in the six mile section mentioned

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[13]River miles are measured as statute miles through the river
channel. The actual shoreline distance is almost double the river
mile distance.

in low order distances, the distance measured from the car-park is 0.01 miles. Cottagers in the remaining seventeen river-mile section, must get to and from their cottages by boat, with the distance varying from a few hundred feet to as much as four or five miles.

Several years ago, the advantages of single access outweighted the advantages of double access. A cottager with only single access used to consider himself a type of pioneer and preferred the privacy while enjoying the hardships that went along with single access. There are many people that own cottages in the area that still prefer the hardships of single access, but the new breed of younger cottager coming into the area prefers the convenience of double access, and in most cases, would not own a cottage unless it were serviced by a road.

Up until the mid 1950's, a road to a cottage was rarely considered, because there was no problem of parking a car or mooring a boat in the car-park area. Since then, however, the number of cottagers has increased, thus causing an increase in the number of boats and cars that have to be parked. Today, the crowding in car-park areas, and around government docks, caused by the shortage of parking spaces for both cars and boats, has created an unsafe environment.

Unlike fifteen years ago, when these services were free, the cost to park one's car and moor a boat for the season has become fairly high.[14] A cottager with single access can expect to incur this expense for many years to come unless he is able to make other arrangements.

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[14]The cost to park a boat and car at privately owned marinas for a season ranges from $45 to over $100, depending on the type and location of dockage facilities and parking areas.

It may be argued that a cottager with double access also has considerable yearly expense in order to build and maintain his road. In one case, it was found that a cottager had to pay $50.00 initial fee to join a "road association", and since then, his yearly maintenance bill has only been $5.00. The expenses incurred by this cottager are lower than those incurred by the average single access cottager. It is a fact that after the initial expenses of constructing a road, which is usually shared by a number of cottagers, the yearly cost of maintaining a road is minimal.

There are other problems associated with single access cottages; each cottager must own a boat. If he leaves his boat at a marina during the week,[15] there is the possibility of theft and damage to it. If for some reason, he prefers not to leave his boat at the marina, then he must rely on a water taxi for transport.[16]

It appears that cottagers with single access not only have seasonal expenses to be concerned with, but they also have more inconvenience to overcome. These cottagers must transport everything by boat to their cottage site. This includes not only the materials required to build the cottage in the first place, but also the furnishing, clothing, food, and other necessary items.

Other problems that affect single access cottagers are: (1) weather conditions, (2) time of arrival or departure from cottage (day or

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[15] This is assuming that most cottagers usually use their cottage on weekends.

[16] The cost of hiring a water taxi for a one-way trip to or from one's cottage could vary from $2 to $10 depending on the water taxi operator, the length of the trip, the number of passengers and even the time of day or night and the weather.

night), (3) "bulk breaking" more than once, (4) meeting visitors and weekend guests, (5) size and capacity of boat and (6) maintenance of boat. Taking into consideration all of the above mentioned problems, it would appear likely that land values in single access cottage areas should not be as high as land values in double access cottage areas.

This variable is measured by using the same method used with low order distance. For this variable, the distance is measured from a cottage site to the location in which a cottager usually parks his car.

Map 2.3, indicates the twelve car-park areas used by cottagers with single access, within the study area. The value measures for single access cottage sites range from 0.1 to 3.5 miles. Cottages with double access, in most cases, are measured as having a distance of 0.01 miles from car-park to cottage. For the remaining few cases in which double access cottage sites are not measured as 0.01, the value of measurement varies as high as 0.2 miles. The reason for this is that these cottagers have not completed a road directly to their site, and yet are not using a car-park area.

Summary of Local Factors

These are the factors that can change most easily and perhaps have the greatest affect on cottage site value. If a new car-park area is built, this may make a number of cottage sites more convenient and cause the land values to change. Or a cottage area is subdivided causing a change in the density and privacy of the area. These changes should have an influence on cottage site desirability. This should reflect in the value of the cottage site.

MAP 2·3

ACCESSIBILITY POINTS FOR STUDY AREA.

LANDING

SEVERN FALLS

MORRISON LANDING

LANDING

WHITE'S FALLS

Gloucester Pool

NICKELSON'S
MARINA

GRANDVIEW LODGE

Little L.

NARROWS
MARINA

Maclean L.

Sparrow Lake

PT. SEVERN

PT. STANTON

103

to Coldwater
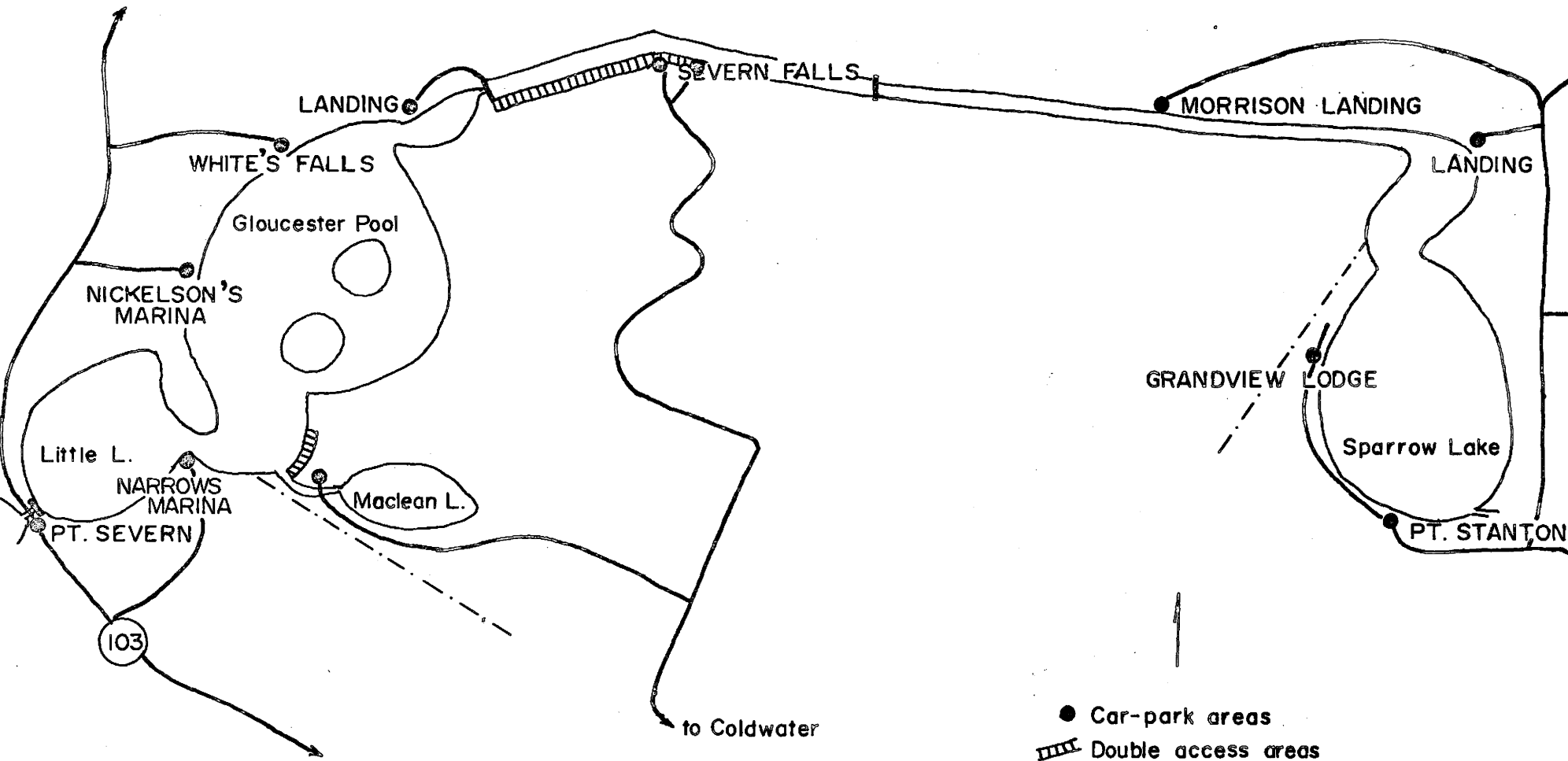
● Car-park areas

⊞ Double access areas

not drawn to scale

Human Factors and Variables

Introduction. It appears likely that factors other than the site and local factors may have an influence on the value that a cottager attaches to his site. The human factors do not affect the land value of the site, but they may affect the cottagers' estimations of land values. For this reason, it is considered important to include these factors to see if they are influential in affecting land values as estimated by the cottage owners.

The data required for the following three factors were made available by the Simcoe County Regional Assessment Office from the assessment roll of Matchedash Township. The collection of information on shoreline frontage, assessed structure(s) value and home address was made for each of the sampled cottage sites.

Shoreline Footage. Through conversations with real estate agents, it was emphasized that it is much easier to sell a lot (cottage or no cottage) of about 100 feet in width, than a lot of 300 feet or more. The agents explained that a cottager would be willing to pay $4,000 for a hundred foot lot, but not $12,000 for a similar lot three times as wide. Applying this reasoning to the cottagers' point of view, perhaps a cottager with a 100 foot lot considers his lot to be worth $4,000, thus giving the lot (to him) a value of $40 per front footage. It does not necessarily follow that a cottager with a 500 or 1,000 foot lot also values his land at $40 per front footage. The cottager with a large lot might realize that few, if anyone, would be willing to pay $40,000 for a site with 1,000 feet of frontage.

The purpose of including this factor in the analysis is to deter-

mine if a significant relationship exists between the shoreline front-
ages and the estimated values given by cottage owners.

The measure of this variable is made in feet for the actual shore-
line frontage of each sampled cottage site as recorded on the assessment
roll. In the cases of islands, the assessed value[17] of the island is
used.

Value of Structure. The amount of money, time, and energy that a
cottager puts into improving the total site (land and cottage) should
be reflected in the value he attaches to it. The cottage value might
be a factor responsible for influencing the estimated land values given
by the cottager. Even though the estimate requested was for land only,
it is likely that a cottager would have difficulty being totally objec-
tive. Subsonsciously, the cottage value might affect the estimates of
land value given by the cottagers. For this reason, a measure of
cottage value is included as a variable.

The most attainable and objective measures of structure value that
could be used for each cottage within this study area are the assessed
values. As will be explained in the next chapter, the structure's(s')
value is considered reasonably accurate; therefore, this value is used
to represent a relative value for each site's structure(s). The range
of values received for this factor vary from $160 to $1790 per site.

Distance From Home. As discussed previously in this chapter, the

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[17]The assessed value is a value calculated from the area (acres)
of each island.

distance from Toronto to the study area is considered to be a constant in affecting land values. If all the cottagers are Toronto residents, then the factor of distance from home to cottage would not be consider-ed. However, the distance a cottager must travel to reach his cottage may, as with the other human factors, subconsciously affect the value he attaches to it. It is unlikely that the distance from home to cottage will in any way affect the value of the cottage site, but it is possible that it might affect the land value estimates given by the cottagers.

The home address for each cottage site owner is recorded off the assessment roll. By using an official Department of Highways of Ontario (1968) road map, the addresses of the cottagers are converted into a measurement in miles, for the distance taken as the most direct route from the home to the cottage site. The range of values for this factor varies from 0 miles to 500 miles. The 500 mile distance, which is used as the maximum value for this variable, was exceeded by only two cottagers, one of whom lives in Florida. For the individuals who use their cottages as a permanent year-round home, and do not "commute" to the study area, the distance value is given as zero miles.

A brief summary of the type of data collected for each of the above variables is found in Appendix V.

Summary

The study area has been discussed with the purpose of justifying the selection of the factors to be tested in this thesis. It is shown that a number of possible factors, such as water clarity, topography and

the distance from Toronto are not studied because they are basically

similar throughout the study area. The factors that are studied in

this thesis, the site desirability factors, are broken down into three

sub-groups; site factors, local factors, and human factors. Within

each sub-group, the individual factors are discussed as to how they

relate to the study area, and how the data necessary to test each

factor are obtained.

CHAPTER III

THE DEPENDENT VARIABLE

Discourse on the Problem of Selecting a Dependent Variable

Helleiner uses date of acquisition of crown land sales as his
dependent variable[1] in his analysis. His research was conducted in an
area in which he has the exact dates when each site was sold through
crown land sales. He assumes that the lots with the most site desira-
bility factors would be acquired first. In order to determine the
significant factors affecting and contributing to cottage site desira-
bility, Helleiner measures the physical site characteristics of the
sites for which he has date of acquisition data and then he computes
simple correlation and multiple regression analysis with his data.

It is not possible to use date of acquisition of crown land sales
as the dependent variable in this study for the following reasons:

1. In most cottage areas, crown land was put up for sale in small
portions at varying times over several decades with no systematic
selling pattern.

2. In some cases crown land was granted to individuals by the
federal government in lieu of payment for services rendered to the
government.

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[1] F. M. Helleiner, *op. cit*, p. 4.

3.   The buyer did not always have a selection of lots from which to choose but rather took what was available at the asking price. Perhaps for this reason it was price and size of lot that determined his preference rather than other characteristics.

4.   Date of acquisition data are not readily available from federal agencies.

5.   The date of acquisition method can not be applied universally to studies in any cottage area.

Consider the following hypothetical situations. If a prospective cottage buyer is looking at a cottage area before any cottage lots are sold, and if all lots in the area are priced the same, then the lot he selects, under normal circumstances, should have the most factors he finds desirable in a cottage site.[2] At this point, if it is possible to find such a case, it would be relatively easy to find out from the individual why he selected that particular site, and what factors he finds most desirable in the property. But what about the fifth, sixth, or tenth individual to buy a lot in the area? Perhaps the site he really likes is already sold. In this case, if he decides to buy, he will have to buy a site that has more attributes and appeal than any among the remaining lots.

Another example is that of an individual who wants to buy a cottage at a time when only three or four cottages are for sale in the area. Once again this individual must select the property he likes best, based

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[2]It is not necessarily true that another individual in the same situation would make the same choice.

on the available selection. In this case, he not only considers site

characteristics, but also the type and quality of the cottage, and most

certainly price.

Any assumption that each cottager considers his site

to have the best site desirability factors is shown to be invalid based

on the previous discussion. There must be some factors that cottagers

like about their site but it is unlikely that each site is perfect for

the cottager.

As cottages become more familiar with a cottage area it appears

logical that they would become more aware of the type of factors that

increase and/or decrease the value and desirability of cottage sites.

Through this added insight the cottager should be able to evaluate his

site in terms of neighbouring sites. The problem that exists, there-

fore, is to find from the cottager some measure of site desirability

in order to determine the factors that cottagers value in cottage sites.

One way of doing this is to have each cottager speculate on the value

of his site, and the value of neighbouring sites around his cottage.

In this way a comparative or relative land value is obtained from the

cottager. For example, if a cottager estimates the value of the sites

around him at twenty-five dollars per foot frontage and values his site

at thirty dollars per foot frontage, then it is reasonable to suppose

that there are some conditions or factors about his site that he consi-

ders more valuable and desirable than neighbouring sites.

The dependent variables[3] used in the analysis are all calculated

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[3]In the analysis, there are three dependent variables, all measures
of land values, but calculated differently.

measures of land values. Market land value is the definition of land value that is used throughout this study because the cottagers and real estate agents are asked to give estimates of the market value of land. The legal definition of market value (or market price) in Canada is defined as the price fixed by buyers and sellers in the open market in the usual ordinary course of lawful trade and competition.[4]

In addition to the cottagers' land estimates, recent real estate sales, tax assessment values, and real estate agents' estimates are investigated in order to determine a realistic land value for each site. Recent real estate sales, and tax assessment values are two sources that should yield objective measures of land value. Real estate agents are perhaps less objective but through training and experience, the agents should be able to offer relatively accurate estimates as to the market value of land in the areas in which they work. Finally, cottage owners' estimates would be the least objective, but most important for it determines the comparative value of each site.

David[5], in his research on cottage land values, compares the changes in cottage values on several lakes in Wisconsin. As his basic data source he uses tax assessment values converted to market value by means of a multiplier. He also interviews cottagers to find out their estimates of the market value of their property. His results show that, on the average, cottage owners estimate their property value slightly higher

[4]J. I. Stewart *Real Estate Appraisal in a Nutshell.* University of Toronto Press, 1967, p. 38.

[5]E. J. L. David, *op. cit.*, pp. 207-209.

than the assessed value. But he concludes that an individual owner's estimate for a particular property is not a good estimate of market value. This points out one problem that is anticipated in this study.

A further problem arises because the cottagers are asked to estimate only a value for land. Since the cottager is not able to estimate a total property value accurately, then the difficulty of separating and estimating only land value from the total value might involve additional estimating problems.

Realizing the above problems, the other data sources are vital in being able to determine an objective dependent variable for each site. It is anticipated that cottage owners are able to supply the relative site value for their own property. The other data sources would be used to calculate realistic land values for each cottage site within the study area.

Data Sources

To this point in this chapter, the rationale and reasoning behind selecting land values as the dependent variable has been explained. In the next section, the four land value data sources are each explained in detail. It is shown how assessment values and recent land sales turn out to be totally useless. Because of this, the land value for each site has to be calculated by using the two subjective measures: real estate agents' estimates, and cottage owners' estimates.

Assessment Value. It was anticipated that the assessment value would be an objective evaluation of both site and situation characteristics of each cottage lot. After spending time working with the

assessor in the study area, it was found that this method of evaluation would not yield the results required. The assessor had valued most of the river property at a fixed value of $1.50 per foot frontage of shoreline.

The actual assessment value was not important, because it was felt that this could be adjusted by multiplying it by a market index value[6] that would yield a realistic value between sites in the same areas. But even if an index multiplier was used on the assessed value, the figure would be a constant value throughout, and contribute nothing. No factor other than the cottage site's proximity to water was taken into account by the assessor. Put another way, all river front lots, (which included all the cottage sites sampled in the study area), are valued equally on the foot frontage basis.

Recent Real Estate Sales. These data, it was hoped, would give a strong footing in understanding the actual market values of the land within the study area. The definition implies that market value is only applicable when a willing seller sells and a willing buyer buys, with neither being under abnormal pressure.[7] It would be very difficult to determine if in actual fact either the buyer or the seller was under pressure; therefore, it was considered that all sales within the study area are representative of market value.

Data for this were made available by the Simcoe County Regional Assessment Office, Orillia, Ontario. A list was made of all recent

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[6]E. J. L. David, *op. cit.*, pp. 207-209.

[7]American Institute of Real Estate Appraisers, *Appraisers Hand-Book*. Chicago, 1954, p. 163.

cottage property sales, that had been transacted in the study area dur-
ing 1968 and up until the end of August, 1969. Since the sales are
recorded as one value[8] it was then necessary to use the assessment roll
to try to determine the land value for each site. On the assessment
roll each property has an assessed land value and assessed structure(s)
value. If there is more than one structure on a site, each structure
is valued separately, then totalled. In the case of large structures,
such as a cottage, the value is calculated by the volume, construction
and condition of the cottage.[9]

The total value of the structures are then multiplied by an index[10],
which is to represent the current market replacement value, (or in other
words, an index that would convert the assessed value into a realistic
market value).

The structure value derived from the above calculation (in the case
of each recent sale) is subtracted from the total sale price of the
property. This simple process yields the total land value of the site.

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[8] The sales are not broken down into a value for land, and also a
value for structures.

[9] Cottages are valued from 10¢ to 14¢ a cubic foot depending upon
the type of construction. This total figure is then altered by the
obsolescence factor, depending upon the stage of completion, or the age
of the cottage. The maximum obsolescence allowed for cottages in this
area is 25%. Other structures such as sheds, cabins, and boat-houses
are subjectively assessed as a unit value.

[10] A senior assessor in the Simcoe County Assessment Department
indicated that the assessed values of cottage property in the township
of Matchedash are about 10% of market value. If 10% is an accurate
figure, the index multiplier used to equate assessed values to market
values is 10.0.

The total land value figure is then converted into a value per foot

frontage by using the shoreline frontage of the site, which is also

recorded on the assessment roll.

In theory, this method of using assessed land values appears

realistic and easy to handle, but in practise, it proves to be unsatis-

factory. As an example, Table 3.1 shows the calculation for four

cottage sites that were recently sold and are all located reasonably

close to each other.[11]

TABLE 3.1

LAND VALUES FROM RECENT PROPERTY SALES

Example	A	B	C	D
Concession No.	6	6	6	7
Part Lot No.	27	27	27	23
Selling Price	$18,500	$12,000	$5,000	$6,800
Assessed Structure Value	665	725	185	815
Market Structure Value (x 10.0)	$6,650	$7,250	$1,850	$8,150
Shoreline Frontage	100'	100'	761'	129'
Value per Foot Frontage	$98.50	$47.50	$4.25	-$10.48

SOURCE: *Matchedash Township Assessment Roll.* Simcoe County
Regional Assessment Office, Orillia, Ontario, 1969.

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[11]These cottages are within a distance of less than two miles of
each other; all four are serviced by roads, and all four are in the
same division of the river.

The final calculation in Table 3.1 (value per foot frontage)
should be relatively close in value for all four cottage sites, but
because there is such a wide range of different values, it is obvious
that his method is unsatisfactory. Even if the index multiplier used
in the calculation is erroneous, there still exists the problem of a
wide variation in land values. This can not be corrected by changing
the index multiplier.

In the case of recent land sales (land only) that were transacted
in the area, the market land value appears to be much more realistic.
For example, Table 3.2 shows the figures of four lots[12] within the
study area that had been sold recently.

TABLE 3.2

LAND VALUES FROM RECENT LAND SALES

Example	A	B	C	D
Concession No.	1	1	13	13
Part Lot No.	21	21	6	6
Selling Price	$3,000	$3,000	$2,400	$2,200
Shoreline Frontage	130'	120'	115'	108'
Value Per Foot Frontage	$23.00	$25.00	$21.00	$20.50

SOURCE: *Matchedash Township Assessment Roll.* Simcoe
County Regional Assessment Office, Orillia,
Ontario, 1969.

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[12]The first two examples, A and B, are sites located at the southern end of Gloucester Pool, whereas examples C and D are sites located about 18 miles up river from A and B.

The values derived from this type of sale must be an accurate measure of market land values. Unfortunately, there are a total of only nineteen such sales, and most of these are grouped in the two areas from which the above examples are taken.

It is found in further investigation that there is a value difference between uncleared land and cleared land, or unimproved and improved land. The fact that a dock has been built, and a few trees cut down, and a portion of the lot cleared, would usually have an increasing effect on land values. Because of this, it would be inconsistent to compare the value of unimproved and improved sites. The data collected for this study are taken exclusively from improved sites.[13] Even though the variation of improvement between sites can be great, it is argued that all sites observed in the data collection are homogeneous, in that some improvements had been made. For these reasons, it is not reasonable to use recent land sales as a measure of cottage site land values in determining the dependent variable.

Real Estate Agents. Three real estate agents[14] are each asked to give estimates of land values within each of three different areas along the river. Because there is no overlapping of areas, it is not possible to compare the estimate of one agent against the estimate of another. The lack of comparison between the three data sources may appear to be

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[13]All sites had at least one cottage and a dock.

[14]Mr. A. Flynn is virtually the only real estate agent that has been able to sell property in the area between Sparrow Lake and the Swift Rapids Lock. Mrs. P. D. Beckstead has been selling real estate in the Severn Falls area since 1941, with very little competition. Mr. J. Nolan, an agent for Mrs. Beckstead, confines his selling activities to the Gloucester Pool area.
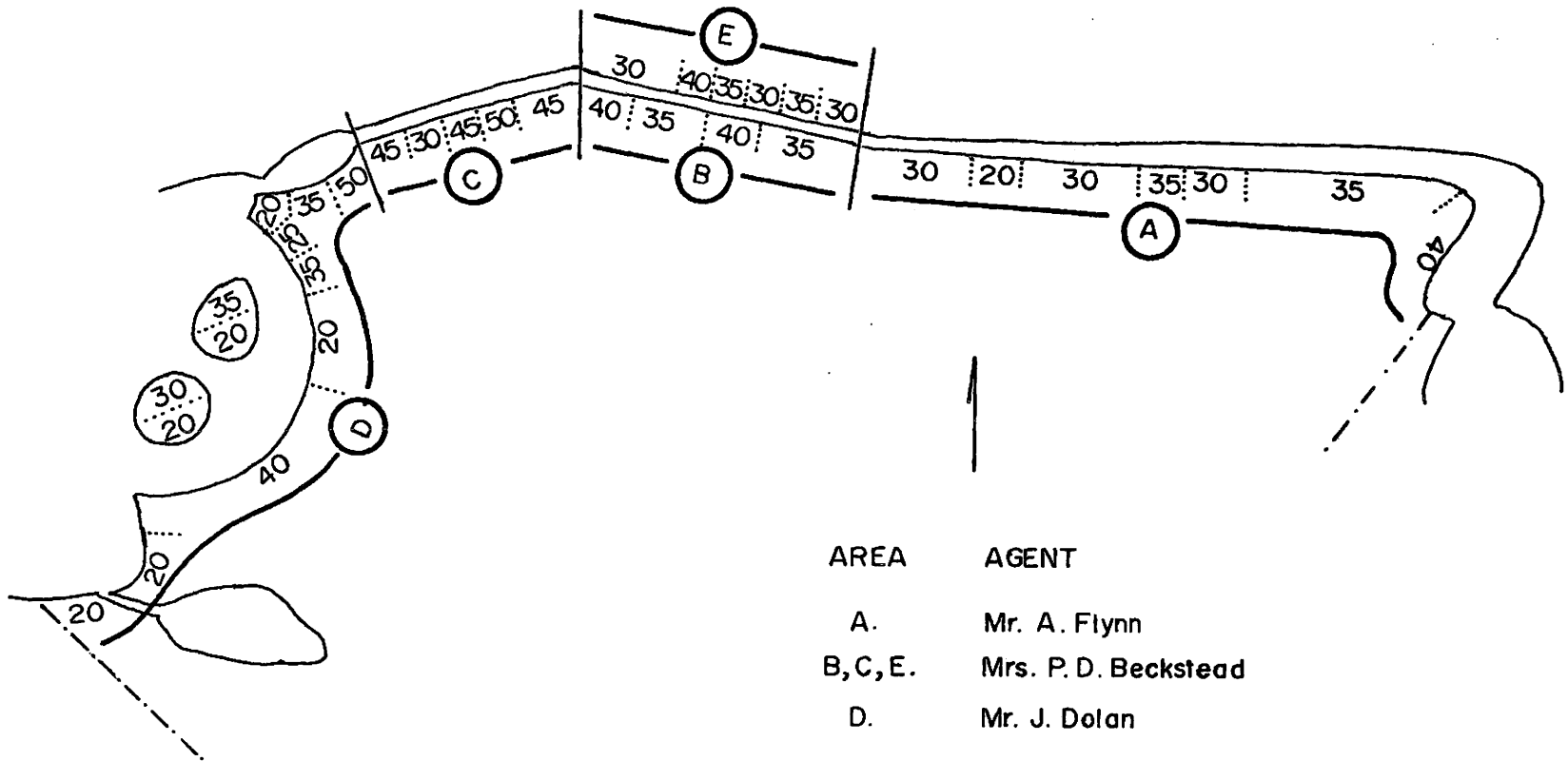
a weakness of this study. It was considered at one point, to seek the estimates of other real estate agents within the study area. Upon trying to locate other real estate agents, none met with the qualities of experience and lack of bias of the above three. As an example, two real estate agents in Gloucester Pool were selling property that was either owned by themselves or their family. Data supplied by these agents would be very biased towards their own property with no first hand knowledge of other property. The three real estate agents consulted are virtually the only agents that know the area well, have years of experience, and have been selling in the area for a reasonable length of time.

The method used to obtain the land value estimates from the real estate agents is as follows. After the summer season, each agent was contacted separately at his or her home. A map of the area was placed before them and they were then asked to estimate what they would consider a fair assessment of the market value of the cottage land along the river. Some problems did arise by using this method. Firstly, within some sections of the river, no property has been sold for years, so that the estimate is an educated guess rather than a real evaluation. Secondly, the problem of unimproved and improved land causes difficulty in giving an accurate assessment, and thirdly, the future potential uses of the land has an effect on influencing their land value estimates.

The estimates given by the real estate agents are shown on Map 3.1.

Cottage Owners. To secure the information required for this data

MAP 3·1
REAL ESTATE AGENTS' LAND VALUE ESTIMATES.

E

30 40 35 30 35 30

45 30 45 50 45 40 35 40 35

20 35 50 B

C

30 20 30 35 30 35

20
35
20

35
20

40

30
20

A

40

D

20

20

20

AREA   AGENT

A.   Mr. A. Flynn

B, C, E.   Mrs. P. D. Beckstead

D.   Mr. J. Dolan

Values per foot frontage for a 100' cottage site.

not drawn to scale

source, the interviewing of cottage owners in the study area was required. The assumption was made, before any field research was started, that most, if not all, cottage owners have a reasonably good knowledge of land values generally and more specifically, an accurate estimate of the value of their own land. It was quickly realized that the exact opposite is the case. Very few cottagers have any idea of land values and the estimates made in most cases are pure guesses. It appears that perhaps this could be a problem, but if the total sample is unaware of the true market value of land, then the sample is homogeneous in this respect.

Two questions were asked and phrased in such a manner that the response the cottager gave would have to be his best estimate of the market value of the land. The first question is: "Within this section of the river, what would you estimate the value (market value) of land to be per foot frontage of shoreline?". The second question is: "What would you estimate the value (market value) of land to be per foot frontage of your particular cottage site?". Both of these questions are answered as a value per foot frontage, which is in keeping with the form of other land value estimates.

Question One asks the cottager to give an estimate of land value in the general area of his cottage site. It was found that the word "section" had to be explained a number of times, so this was done by indicating that the section referred to the area about 1/4 mile each side of his particular cottage site. In a good number of cases, the owners could not make a distinction between Question One and Two, but generally those people who owned cottages with above or below average

characteristics, compared to neighbouring sites, interpreted the difference between the two questions.

By subtracting the answer of the first question from the answer of the second question, the resultant figure (added site value) is used to indicate how much a cottager values his site, relative to the land around him. If the added site value is high, it should indicate that there is some attribute about the site that the owner values and feels that other cottage sites, in the section, do not have. If the value is negative, it indicates that the site is below par, relative to surrounding sites.

Methods of Calculation of Dependent Variables

The original method considered in calculating a value for land included all four of the above mentioned data sources. As already stated, assessment values and recent sale values (the two objective sources) are not operable. Therefore, only the real estate agents' estimates and the cottage owners' estimates (the two subjective sources) can be used.

Because of the subjective nature of the data sources, it was decided to try more than one method of deriving a land value. All the dependent variables used in the analysis are measures of land values but calculated differently.

The study area is divided into 1/4 river-mile sections,[15] not only

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[15]This is explained in more detail in the next chapter.

for the convenience of sampling, but also for the convenience of data analysis. All the cottagers samples that are located within a 1/4 river-mile section are considered as one unit. The land value answers given by the cottagers (within a unit) are averaged together to yield a figure that is called the "cottagers' average estimate (1/4 mile)".

Dependent Variable 1.

The first dependent variable is calculated by averaging real estate agents' estimate (1/4 mile) with the cottagers' averaged estimate (1/4 mile) for each individual 1/4 mile unit. The added site value is added, which gives a final value, called "total site value". An example of the mechanics of this procedure is found in Table 3.3.

TABLE 3.3

DEPENDENT VARIABLE 1. COMPUTATION

Real Estate Agents' estimate (1/4 mile)	=	$30.00	
Cottagers' Averaged Estimates (1/4 mile)	=	$40.00	
Averaged Estimates	=	$35.00	$35.00
Question #1 (Section Value)	=	$35.00	
Question #2 (Site Value)	=	$45.00	
Added Site Value	=	+$10.00	$10.00
Total Site Value	=		$45.00

Dependent Variable 2

The second dependent variable is simply the cottagers' answers to question #2: "What would you estimate the value (market value) of land to be per foot frontage of your particular cottage site?".

Dependent Variable 3

The third dependent variable is calculated by adding the cottagers' averaged estimate (1/4 mile) to the added site value. Dependent variable 3 is almost the same as dependent variable number 1 except the real estate agents' estimates are excluded.

Summary

In this chapter, the rationale for selecting land value as the dependent variable is discussed. The four land value data sources (assessment value, recent real estate sales, real estate agents' estimates, and cottage owners' estimates) are outlined in detail. Finally, it is shown how the three dependent variables are calculated using only the real estate agents' and cottage owners' estimates of land values.

CHAPTER IV

SAMPLING OF COTTAGE OWNERS

The Pretest

The pretest was conducted during one week in the early part of the 1969 summer season. It was carried out on two cottage areas in the vicinity of Severn Falls. Neither cottage area is included as part of the study area. The two areas were chosen because they each have different accessibility patterns,[1] are reasonably close to each other, and are both centred on Severn Falls as the accessibility route in and out of the area.

The pretest was conducted in order to find out three facts about the questionnaire; how cottagers would receive the questionnaire, how the questions would be answered, and how much time would be required for each cottager to fill it in.

Of the total number of cottagers sampled, only one refused to answer. All the other cottagers that were asked, answered the questions, but in a few cases it required some encouragement for them to do so.

The answers given by the cottagers were in the form that was asked, thus indicating that the questions were generally well understood, and the cottage owners had either an idea of the answers, or were willing

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[1]The Tea Lake area has double access, whereas the "North Shore" area (Wood's Bay) has single access to cottage sites.

to take a guess.

The time required to complete the questionnaire varied greatly from a few minutes to over an hour. It was found that cottagers were willing to sit down and talk about the study, thus adding considerably more time to the interviewing process.

Sample Method. The sampling method followed in the pilot study was not important, because the interviewer only stopped at cottage sites where it appeared the owner was there. It is important to note that a motor-boat was required to travel from one cottage to another; therefore, a limitation was put on the number of sites sampled, because no site was sampled which, by appearances, might have caused damage to either the boat or the motor of the interviewer.[2]

During the administering of the pilot questionnaire, an introduction to the cottage owner was devised. This included a procedure of introducing the interviewer, of introducing the questionnaire, and of stating a general purpose of the research. It was found that if the interviewer introduced himself as a fellow cottager from the same area, (which was the case), then the cottage owner was generally co-operative in answering the questions, and interested in the purpose of the study.

Pretest Results. The answers given by the cottagers in the pilot study were not analysed, other than to observe how a cottager answered each question. The questionnaire for the pilot (see Appendix I) was structured such that the two most important questions (land values) were

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[2]Sites with no dock and sites located in areas with visible and/or submerged rocks, stumps and weeds were not sampled.

numbers 1. and 2. It was found that these questions were the most diffi-

cult for the cottager to answer, and the most offensive, if he had any

objection to the questionnaire. Similarly, it was found that the word-

ing in a few ,questions was not perfectly clear. Changes were made for

the final questionnaire in both the order and the wording of the questions,

so as to overcome these problems.

Questionnaire

Two questionnaires are used in the study area. (Appendix II and

III). The short questionnaire is used in Divisions A and D, while the

long questionnaire is used in Divisions B, C, and E. (The divisions are

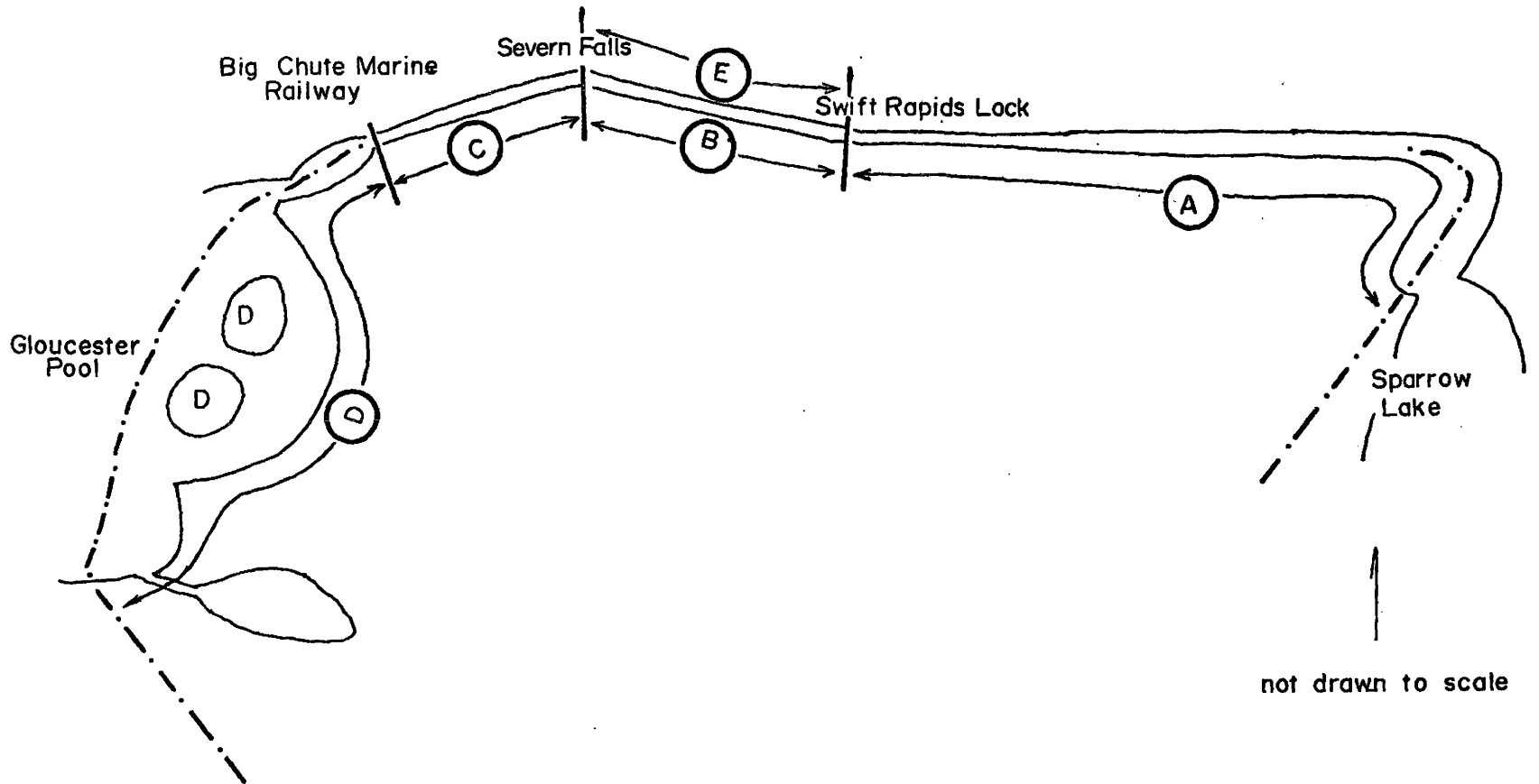explained in detail on page 59 and shown on Map 4.1.)

While the short questionnaire has only two questions, both asking

for land value estimates, the long questionnaire includes the same two

questions in addition to four[3] others. The additional four questions

in the long questionnaire are used in the road access testing. The road

access testing is conducted in the part of the study area that is centred

on Severn Falls, thus the reason for the exclusive use of the long quest-

ionnaire only in Divisions B, C, and E.

The two questions[4] used to determine the cottage owners' estimates

of site and local land values have already been explained in detail with

the discussion of the dependent variable on pages 50 to 51 in the previous

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[3] Questions 2 and 3 of the questionnaire are not used in the analysis.

[4] The two questions are numbers 4 and 5 of the long questionnaire,
and number 1 and 2 of the short questionnaire.

MAP 4·1
DIVISIONS OF STUDY AREA.

Big Chute Marine Railway

Severn Falls

Swift Rapids Lock

Gloucester Pool

Sparrow Lake

E

B

C

D

D

D

A

not drawn to scale

chapter. It will now be explained why the other questions in the long

questionnaire are used.

> QUESTION 1. "If your cottage site with all its advantages
> and disadvantages could be moved anywhere along this side of
> the river, what distance would you like to be away from
> Severn Falls?".

This question is included to try to determine if there is an ideal

distance that cottagers would prefer to be away from a low order centre.

The answers to this question provide the data necessary to test hypo-

thesis #3, ideal distance, which is discussed in Chapter I. The data

received for cottages with single access and cottages with double access

is considered separately in order to determine if there is a difference

in preference between the two groups.

> QUESTION 6(a). "If you and the other cottagers along this
> section of the river had no road to your cottages, thus
> having to park your car at Severn Falls, what would you esti-
> mate the market value of your land would be within this sec-
> tion of the river?".

> QUESTION 6(b). "If you and the other cottagers along this
> section of the river had a road and were able to drive a car
> to your cottage site, what would you estimate the market va-
> lue of your land would be within this section of the river?".

These are both hypothetical questions with 6(a) directed to double

access cottagers, and 6(b) directed to cottagers with single access.

The purpose of these questions is to attempt to determine what

value a road has to a cottage site, and whether the presence or absence

of a road has an effect on the land value of a cottage site. It also seems to follow that the value of a road will vary as the distance away from the low order centre increases.

The answer to question 6, subtracted from the answer to question 4,[5] is designed to yield a value which represents to the cottager, the extra value of having or not having access by road.

Pre-Sampling Procedure

The study area is divided into four natural divisions (see Map 4.1). Division A extends from the most easterly extreme of the township to the Swift Rapids Lock. Division B is from the Swift Rapids Lock to Severn Falls, and Division C from Severn Falls to the Big Chute Marine Railway. Division D extends from the Big Chute Marine Railway, through Gloucester Pool to the western boundary of the township.

A fifth division, E, outside the study area is also included in the sampling. The data received from this area are not included in the total sample analysis, but are used in preliminary analysis and in the Part II study. Division E is included because Division B has only 24 cottages, and of these a low rate of return was expected. The characteristics of Divisions B and E are very similar except for aspect and accessibility. The aspect of Division E is mainly a southerly face, whereas the aspect of Division B is mainly northerly. In terms of accessibility, all cottagers in Division E have single access, but in Division B, 16 cotta-ges have single access, while the other 8 cottages have double access.

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[5] Question 4 asks the cottager to estimate the value of land in the general area of his cottage.

The next step is to divide the five divisions into 1/4 river-mile lengths. This is done in order to work out land value averages, and also to code each cottage. A divider is used to measure the 1/4 river-mile lengths onto a map, along the charted navigation route. At each 1/4 mile point, a line is projected at right angles from the navigation route to the shoreline. This method, therefore, subdivides the divisions into 1/4 river-mile sections with each having almost equal river frontage, but unequal shoreline frontage. Each of these sections within a division is numbered, commencing from one of the ends.[6]

Finally, all the cottages within the study area are plotted on a map and then coded. Within each section, the cottages are numbered, (see Map 4.2), thus completing the coding system, and enabling the interviewer to code each questionnaire and data sheet, to correspond to the appropriate cottage site.

Sampling of Study Area

From knowledge of the study area, it is known that most cottagers do not frequent their cottages every week or weekend during the summer. Perhaps during a complete summer week, a total of between 50 to 75 percent of the cottages in an area may be occupied. There are 387 cottage owners[7] in the sample area and if 50% of these are at their cottages during the sample time period, the possible sample size is reduced to

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[6] It was usually numbered starting at the end at which the first sampling was conducted.

[7] There are more than 387 cottages in the study area, but in some cases one individual ownes more than one cottage.

MAP 4·2
COTTAGE CODING SYSTEM

A12 A13 A14 A15 A16

CODE FOR
THIS COTTAGE
A13-3
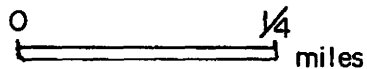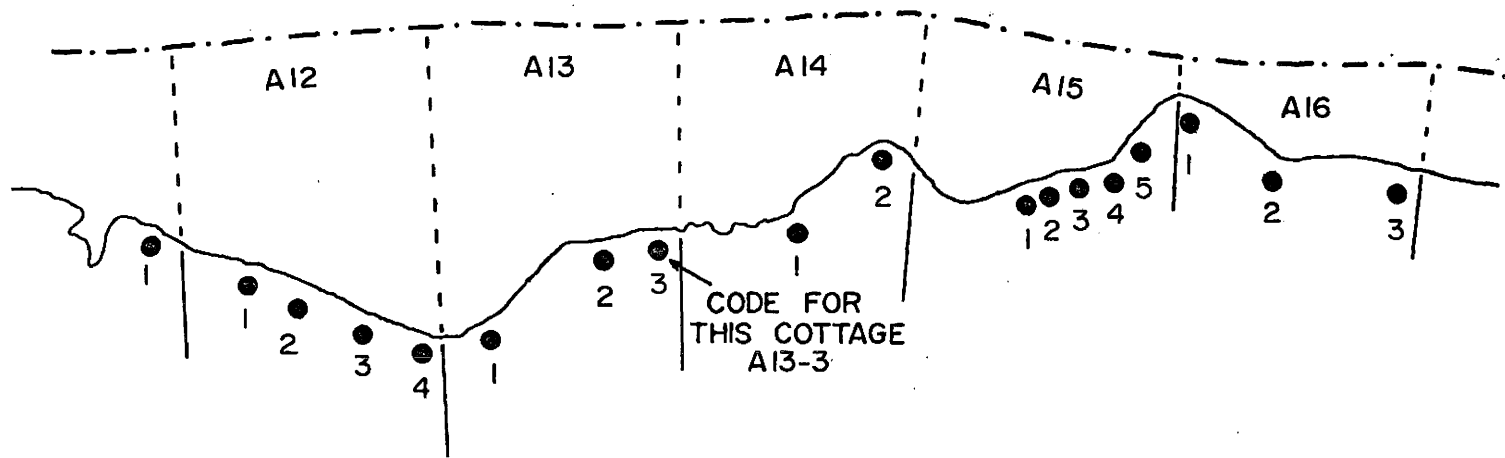
PART OF DIVISION A
1/4 RIVER–MILE SECTIONS ARE NUMBERED

COTTAGES NUMBERED WITHIN EACH SECTION

0   1/4
miles

61.

less than 200 cottage owners. Realizing the above problem, and with the

desirability to have as large a sample as possible, it was decided to

attempt a 100% sample coverage in the study area. This means that a

sample method is not important in this study because every cottage site

would be visited in the hope of contacting the owner.

The sampling of each cottage site required the completion of the

questionnaire and the measurement of the site desirability factors.[8]

In order that the interviewing process could be completed on the weekends

when the greatest number of cottages would be there, the site desirability

factors were measured during the week. By completing the site desirabi-

lity factors during the week, this not only reduces the time spent at

each cottage during the weekend, but also contributes to a more objective

appraisal of each site's characteristics.[9]

There are three restrictions imposed in this sampling procedure.

As stated in the pretest, no cottage is sampled if it would involve

possible damage to the interviewer's boat or motor. This, in fact,

only hinders the interviewing of five to ten cottage owners.

A second restriction is that of not interviewing any cottage owner

who is in the process of selling his cottage. The reasoning behind this

decision is that these individuals may have had professional advice in

assessing their site, therefore, biasing the sample. Also since all the

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[8]The measured variables are displayed in histogram form in
Appendix VII.

[9]By gathering these data for the entire division within two or
three days, the subjective measurements would likely have had less
variation than if this process has been completed over the full week.

other cottagers in the sample are not interested in selling (or at least have not made their intentions public), the inclusion of those willing to sell will not retain the homogeneity of the sample. The exclusion of cottagers in the process of selling their cottages reduces the sample by another 20.

The third restriction imposed is to interview the male cottage owner whenever possible. The feeling is that he probably has a greater understanding of his cottage value than anyone else in the family.

In most cases, the interviewer has to return to each cottage site twice. It is found that in some cases, to obtain a completed questionnaire, the interviewer has to make four or five trips to individual cottage sites. To try to overcome the problem of returning too many times to any one site,[10] two courses of action are followed. In some cases, cottagers are asked to return the questionnaire by mail, while in other cases, a questionnaire is left with a member of the family for the owner to complete, and then picked up a day or two later. Of the twelve cottagers that are asked to return the questionnaire by mail, only four did so. The drop and pick up method appears more successful, but with this method and the mailing method, the cottagers have the questionnaire for a considerable length of time, and this may have influenced their answers.

Sampling Results

Eighteen cottagers refused to answer the questionnaire. This, in

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[10] The problem of returning too many times to one site is not only time consuming but also expensive in terms of travel costs.

addition to the eight that did not mail the completed questionnaire[11]

made the non-return rate only 11%. Of the eighteen that refused to

answer the questionnaire, some of these stated that they had absolutely

no idea of land values, therefore, rather than embarrass themselves,

they refused to answer. A few cottagers could not be bothered, while

three or four others indicated it was a personal matter and no one's

business but their own.

From a total possible sample of 387 cottage owners, questionnaires

were completed by 221, refusals from 26, leaving 140 cottagers that were

not sampled. No figures are kept on how many of the 140 were not avail-

able for questionning, or how many cottages were being rented, being

used by friends or relatives of the owner, or were vacant. Because 20

cottages in the area were for sale, the total possible number of cottage

owners was reduced by this amount. Table 4.1 indicates the breakdown

of the sampling results of the study area as a total and by divisions.

Conclusion

The sampling procedure for this study became a very hectic weekend

exercise in order that a sufficient sample size would be acquired.

Cottagers in most cases were co-operative and curious, because of this

it became necessary to explain the purpose and nature of the study to

many of them. The interest shown by the cottagers, therefore, added

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[11]It is probably not safe to assume that all of the eight actually refused to answer the questionnaire, because it was unlikely that the owners in perhaps half of these cases even received the questionnaire. The questionnaires were given to friends, relatives or family of the owner.

TABLE 4.1

SAMPLING RESULTS

	DIVISIONS					Total Sample
	A	B	C	D	E	
Total cottage owners in sample area	97	24	86	135	45	387
Cottages for sale	6	4	3	5	2	20
Total cottage owners eligible for interview	91	20	83	130	43	367
Total returns	54	8	48	79	32	221
Refusals	7	2	5	2	2	18
Not returned by mail	3	1	1	2	1	8
Percentage of return from eligible cottage owners	59	40	58	61	74	60
Percentage of return from cottage owners contacted	84	73	89	95	91	89

considerably to the time required for each interview. If time is a factor for acquiring data for another study in a cottage area, it is suggested that perhaps another sampling method should be used.

CHAPTER V

RESULTS AND INTERPRETATION OF ANALYSIS

This chapter is in two parts. In part one, the results and inter-
pretation of the variables used to measure the site desirability factors
are discussed. In the second part of the chapter, the results of road
access factor testing are explained and interpreted.

PART I: Site Desirability Variable Analysis

In this part of the research, the major objectives are to determine
the significant variables which relate to cottage site desirability,
the amount of variation that the variables contribute in explaining
land values, and the order of importance of the site desirability
variables.

Significant Variables: Multiple Variable Explanation. The
complexity of cottage land values cannot satisfactorily be explained
by isolating a single independent variable and a single dependent varia-
ble as is found in simple correlation. Step-wise multiple regression
is used to generate a linear model which includes all the independent
variables in combination with the dependent variables.

Fitting the general linear regression model to the entire sample
population, the resulting equation for the variables that are statisti-

cally significant at the .05 level with dependent variable[1] Y_1 is:

$$Y_1 = 23.108 + 0.083X_1 - 4.734X_{17} - 0.796X_6 + 0.008X_{16}$$

The four variables represented in this equation are: (X_1) angle of view, (X_{17}) assessed value, (X_6) low order distance, and (X_{16}) island location. The multiple regression coefficient of variation (R^2) of these variables is 0.26 as compared to 0.35 for all eighteen variables analyzed.

Fitting the same model to dependent variable[2] Y_2, the multiple regression coefficient of variation, for the eighteen variables is 0.19. For the significant variables, view, low order distance, and south facing, the R^2 value becomes 0.10.

Using dependent variable[3] Y_3, view, low order distance, and length of sandy shoreline, are the statistically significant variables. These variables have an R^2 value of 0.14 as compared to a value of 0.27 for all eighteen variables.

Following the above analysis (for the total study area) the total sample is broken down into three smaller sub-areas[4] for further analysis. The sub-areas are in themselves relatively homogeneous geographic regions

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[1]Dependent variable Y_1 is calculated using both real estate agents' estimates and cottage owners' estimates.

[2]Dependent variable Y_2 is simply the cottage owners' estimates of his site value.

[3]Dependent variable Y_3 is calculated using the cottage owners' estimates of site and section land values.

[4]The sub-areas are Divisions A, B and C, and D.

but distinguishable from one another by different factors (for example, access and water body size). By testing the variables at the sub-area level, some variables not found to be significant in the total study area analysis are found significant in the smaller sub-area analysis. The results of this analysis in addition to the total study area results are summarized in Table 5.1.

In the sub-area results, Division A, has more statistically signi-ficant variables and higher R^2 values than either of the other sub-areas. The variables view (X_1), slope (X_2), low order distance (X_6), car-park distance (X_7), north facing (X_8), and length of sandy shore-line (X_{15}), all prove significant with at least two dependent variables. Dependent variable Y_1 has the highest R^2 value of 0.67 whereas depen-dent variable Y_2 has the lowest R^2 value of 0.46 in this sub-area. The lowest of these values is still higher than any other value in either the total study sample or the other two sub-area results.

In Division D, view (X_1) appears as a significant site desirability variable, ranking first with all three dependent variables, with assessed value (X_{17}) and shoreline footage (X_8) as the other significant variables. The R^2 values are all relatively close to each other, averaging 0.38 for all eighteen variables, and 0.28 for the significant variables.

The results show that in Divisions B and C, the variables view (X_1), slope (X_2), car-park distance (X_7), shoreline footage (X_8) and sandy shoreline (X_{13}) prove significant whereas in other sub-areas, they are each significant with only one dependent variable. The R^2 values are generally very low for this sub-area.

TABLE 5.1

RESULTS OF MULTIPLE VARIABLE EXPLANATION

Sample Area	n	Dependent Variables	Significant Independent Variables in Order of Importance in Contributing to Land Values	R^2 Using All Independent Variables	R^2 Using Only the Significant Independent Variables
Total Sample Area - Divisions A, B, C, and D	187	Y_1	X_1, X_{17}, X_6, X_{16}	0.35	0.26
		Y_2	X_1, X_6, X_{11}	0.19	0.10
		Y_3	X_1, X_6, X_{15}	0.27	0.14
Swift Rapids to Big Chute Divisions B and C	55	Y_1	X_2	0.17	0.09
		Y_2	X_{13}, X_1, X_8	0.39	0.09
		Y_3	X_7	0.23	0.08
Big Chute and Gloucester Pool Area Division D	79	Y_1	X_1, X_{17}	0.42	0.32
		Y_2	X_1, X_{17}, X_8	0.34	0.28
		Y_3	X_1	0.38	0.25
Sparrow Lake to Swift Rapids Division A	53	Y_1	$X_{15}, X_1, X_8, X_6, X_2, X_7$	0.67	0.62
		Y_2	X_2, X_6, X_7	0.46	0.29
		Y_3	$X_{15}, X_1, X_8, X_7, X_2$	0.62	0.48

VARIABLES:

X_1 - View

X_2 - Slope

X_6 - Low Order Distance

X_7 - Car-Park Distance

X_8 - Shoreline Footage

X_{11} - South Facing

X_{13} - Sandy Shoreline

X_{15} - Length of Sandy Shoreline

X_{16} - Island

X_{17} - Assessed Value

Y_1 - Land Value

Y_2 - Land Value

Y_3 - Land Value

It appears that of the selected variables used for testing, Division A is the only area in which the variables are readily applicable. Because of the low R^2 values in the other divisions, it is apparent that there must be other factors that are more important in contributing to cottage site desirability than the ones selected, or else desirability is measured poorly.

From both the total study area analyses and the sub-area analyses, the variables found to be important in affecting cottage site desirability and value are: view (X_1), low order distance (X_6), slope of the land (X_2), assessed value (X_{17}), shoreline footage (X_8), length of sandy shoreline (X_{15}), and car-park distance (X_7). These variables are considered important because they prove significant three or more times in the results. The seven important variables are discussed separately in detail starting on page 72. The remaining eleven variables[5] are not found to be significant and for this reason it is considered unnecessary to include them in this discussion.

Rank Order of the Variables. The step-wise multiple regression technique automatically ranks the variables in the order of each variable's contribution in explaining its affects on cottage land value. Having three dependent variables means that three different rankings of the independent variables are produced. Because each dependent variable is a measure of land value, it is possible to combine the three

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[5]The variables that are not considered important are: shoreline type (X_3), water area (X_4), density (X_5), north facing (X_9), west facing (X_{10}), south facing (X_{11}), east facing (X_{12}), sandy shoreline (X_{13}), length of rocky shoreline (X_{14}), island (X_{16}), and distance home (X_{18}).

TABLE 5.2

RANK ORDER OF VARIABLES

Variable Number	Ranking with Dependent Variable			Total of Rankings	Rank Value	Rank Order	Variable Name
	Y_1	Y_2	Y_3				
1	1	1	1	3	1.0	1*	View
6	2	2	2	6	2.0	2*	Low order distance
2	5	5	3	13	4.3	3*	Slope
17	3	4	6	13	4.3	3*	Assessed structure value
3	6	8	4	18	6.0	5	Shoreline
8	5	9	5	19	6.3	6*	Shoreline footage
16	4	7	12	23	7.8	7	Island
15	11	11	8	30	10.0	8*	Length of sandy shoreline
11	16	3	11	30	10.0	8	South facing
14	12	12	7	31	10.3	10	Length of rocky shoreline
7	7	15	13	35	11.7	11*	Car-park distance
12	17	10	9	36	12.0	12	East facing
13	14	13	10	37	12.3	13	Sandy shoreline
4	10	14	14	38	12.7	14	Water body size
18	9	16	15	40	13.3	15	Distance home
10	18	6	10	41	13.7	16	West facing
5	13	17	16	46	15.3	17	Density
9	15	18	18	51	17.0	18	North facing

*Important variables (significant three or more times).

SOURCE: Step-Wise Multiple Regression Analysis.

rankings in order to produce one ranking. The method used to combine the three rankings is to compute a simple average. The results of the average ranking procedure are displayed in Table 5.2.

Results and Interpretation of the Important Site Desirability Variables.

Variable X_1, View. This variable has the highest level of significance of any of the eighteen variables. It proves significant with all three dependent variables in the total sample analysis and with six of the nine dependent variables in the three sub-area analyses. In Division D, view is significant with all three dependent variables and ranks first in importance in this division. In Division A, view is significant with dependent variables Y_1 and Y_3, whereas in Divisions B and C view is only significant with Y_2.

View ranks number one in importance. By ranking first, it appears that view is the most important factor in contributing to the value and desirability of a cottage site. In other words, a good view is more valuable than being close to a low order centre, having a gently sloped site, or having an area of sandy beach.

From both the simple correlation and step-wise multiple regression analysis, view exhibits a positive relationship to land values. Since view is measured in degrees of an angle, it may be concluded that the greater the angle of vision, the greater the site value.

It is interesting to note that the variable is highly significant by ranking first with all three dependent variables in Division D. On the contrary, view shows very little significance in Divisions B and C.

This irregularity might be explained by the fact that in Divisions B and C (those centred on Severn Falls), the river is relatively narrow with only a few sites having an extraordinary view. On the other hand, in Division D (Gloucester Pool), there are numerous sites with exceptional view because the river widens and the shoreline becomes irregular.

In the past, cottagers have generally tried to take full advantage of the view possibilities available per site, but the trend may be reversing today. As Wolfe states, cottagers prefer a commanding view and an illusion of solitude.[6] This is very difficult to achieve on one site, except in the case of small islands. In areas that are crowded (Divisions B and C), cottagers may become more aware of the need for privacy, seclusion, or solitude. It is difficult to have a good view and also maintain privacy as in a high density area. Perhaps in the future, if not already, in areas where cottagers are crowded together, view may become a liability rather than an asset.

Variable X_6, Low Order Distance. Low order distance ranks second in importance as a site desirability factor. Like view, it is significant with all three dependent variables in the total sample analysis. It is also significant with dependent variables Y_1 and Y_2 in Division A.

This variable has a negative affect on land values. This implies that the closer the cottage is to the low order centre, the greater the value of the site, and as distance away increases, the value of the site decreases.

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[6]R. I. Wolfe, *op. cit.*, p. 445.

Low order distance is one of the three local factors selected.
These are defined as factors that can be relatively easily altered by
man. In this case, the distance will change if a new low order centre
develops closer to one's cottage. Distances for this variable are
measured from the nearest of the three largest low order centres.[7]
These are the three traditional retail centres that have been used by
cottagers for the last twenty-five to fifty years. If the purpose of
the low order centre is to provide the basic shopping needs for the
cottager, then perhaps it was incorrect to select only the three largest
centres. There are a number of smaller retail centres either within or
close to the study area that could satisfy some of the cottagers'
shopping needs. The distance to the smaller centres may be more import-
ant now than to the larger centres. If during the interviewing, the
cottagers were asked where they shopped locally, a variable that mea-
sures distance away from the retail centre could be included in the
analysis. This is not to say that the variable selected is invalid.
Low order distance is the distance a cottager must travel by water to
be supplied with a number and variety of retail functions. Cottagers
must still consider the distance to these low order centres important
for this variable to be so highly significant in the total sample
analysis.

Variable X_2, Slope. This variable ranks third, as does assessed
structure value (X_{17}). Slope proves significant with all three depend-
ent variables in Division A and in Divisions B and C, it is the only

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[7]The low order centres are: Port Stanton, Severn Falls, and
Port Severn.

significant variable with dependent variable Y_1. This variable is not significant with any of the dependent variables in the total sample analysis.

Slope exhibits a negative effect on land values. The steeper the slope away from the hypothetically ideal[8] slope, the less attractive the site becomes.

In Division A, there are several cottages that are built on steeply sloped sites; more than in any other division. The awareness of the cottager of this condition could explain why this variable proves significant in Division A to such a high degree. In the other divisions there are a few areas with "cliff-like" conditions but it is unusual to have cottages built in these areas.

A cottager in Division A stated that he built his cottage on a steeply sloped site because conditions were better up high; fewer bugs, less noise, better view. He didn't find any problem in getting to or from his cottage twenty or thirty years ago, but now because of his age, the previously considered advantages are less desirable than ease of access. The fact that the cottage is located on a steep slope will likely be the reason that this one particular cottager will be forced to sell his cottage.

A steep sloped site creates another problem. It is difficult enough building cottages on the rocky uneven terrain of the Canadian Shield. It is even more difficult to find a suitable site for a cottage

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[8]It is not possible to determine an ideal slope from the data. A site with a slight slope is not ideal because the land could be swampy, or flooded during high water. At some point where the above conditions aren't found, an ideal slope may exist.

on steeply sloping land. For these reasons, it is understandable why
the slope variable exhibits a negative relationship with land values.

Variable X_{17}, Assessed Structure Value. The ranking of this varia-
ble is third; the same as slope. In the sub-area analysis, assessed
structure value is significant in Division D with dependent variables
Y_1 and Y_2, and significant in the total sample analysis with dependent
variable Y_1. This variable is not found significant in either of the
other sub-area analyses.

This variable has a positive affect on land values. As the value
of the structures on the cottage site increase, so (it appears) should
the value of land also increase.

Assessed structure value is one of the three human factors. It is
included in the analysis because it was considered that it may have an
affect on the cottage owners' estimates of land value, or in other words,
it could influence how a cottager values his site. A cottager who has
spend a considerable amount of time and money in improving his cottage
will likely also improve his site conditions. For example, he may make
a sandy beach, cut down some trees to improve his view, or build some
steps to make cottage access easier. It could still be safe to assume
that a cottager with a high assessed structure value may (as yet) have
made no improvements to his site. Regardless, when the cottager was
asked to estimate the value of his land, he may have had difficulty in
trying to separate the amount[9] spent on the cottage and the amount

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[9]Amount, in this case, can refer to money, time, and effort.

spent on his land. For this reason, he overestimates the land value, thus accounting for the positive relationship of this variable.

Variable X_8, Shoreline Footage. This variable ranks sixth in the order of importance. The fifth ranking variable, shoreline type (X_3) is not one of the important variables. In Division A, shoreline footage is significant with dependent variables, Y_1 and Y_3, and in Divisions D, and B and C, it is significant with dependent variable Y_2. This variable, like slope, does not prove significant with any dependent variable in the total sample analysis.

Shoreline footage exhibits a positive effect on land values by simple correlation, and a negative effect by multiple regression analysis. This is the only one of the seven important variables in which a difference in sign exists between the two methods of analysis. It was expected (as explained in Chapter II) that the length of footage of shoreline would have a negative effect on land values. In other words, the larger the lot, the less the cottager would value his site on a foot frontage basis. For example, a cottager with a 100 foot lot could visualize a value of 40 or 50 dollars per foot frontage. But a cottager with 1000 feet of equal shoreline may estimate a value of 20 dollars per foot frontage because he can't imagine anyone willing to pay 40,000 dollars for his site if it were valued at 40 dollars per foot frontage.

The positive relationship as determined from simple correlation could be accounted for by any one of a number of possible explanations. A wider lot offers the cottager more privacy. More frontage is valuable in terms of future use. It is common now that one site may have a second cottage for the married children and their families to use. If

the lot is wide enough, then this is possible. A large lot gives greater choice of cottage and dock locations. The cottager is less narrowed in choice possibilities. A large lot also gives more usable land; possibly for play areas, a septic system, a parking lot, and others.

Variable X_{15}, Length of Sandy Shoreline. This variable ranks eighth in order of importance. All together there are four variables used to measure the shoreline factors. The shoreline type variable (X_3) ranks fifth, length of sandy shoreline ranks eighth, length of rocky shore-line (X_{14}) ranks tenth and the dummy variable sandy shoreline (X_{13}), ranks thirteenth. It appears that the type of shoreline based on the rankings is relatively important as a site desirability factor.

In Division A, length of sandy shoreline is significant with de-pendent variables Y_1 and Y_3 but is not significant in any other sub-area analysis. In the total sample analysis, it is significant with dependent variable Y_3. The length of sandy shoreline variable has a positive relationship with land values. This implies that as the length of sandy shoreline increases, the value of the cottage site should also increase.

It appears somewhat peculiar that this variable is not more highly significant. This is generally one factor that a great number of cottagers consider to be an extremely important characteristics for a cottage area. As stated in the discussion in Chapter II, this study area has a predominantly rocky shoreline. Upon investigation, it is found that within Division A, there is an extended area of about 1-1/2 to 2 miles in length where the shoreline is mainly sand. For the rest of the study area, there are isolated and scattered pockets of sandy

shoreline. Most of these would have been cleared of stones to expose the sand, or sand was brought in. The high degree of significance[10] of this variable in Division A could be explained by the fact that the cottagers in this area are well aware of the advantages that a lengthy stretch of sandy shoreline offers to them.

Variable X_7, Car-Park Distance. This is the least desirable of the seven important variables in terms of ranking since it ranks eleventh. Car-park distance is significant with all three dependent variables in Division A, with dependent variable Y_3 in Divisions B and C, but it is not significant in the total sample analysis.

It is interesting to note why car-park distance is so highly significant in Division A. Division A is the only sub-area in which all cottagers must get to their cottage by boat. In addition, there are only two or three areas within this division at which cars can be parked. This means that a number of cottagers have to travel two to three miles in order to reach their cottages. Even though some cottagers in this division explained that they liked reaching their cottage by boat, it does show that they are conscious of accessibility and consider the distance they have to travel an important factor. In the other sub-areas, distances are considerably less because the car-parking areas are more numerous, and some cottage sites have road access, therefore distance is not a problem and not considered important.

Car-park distance exhibits a negative effect on land values. As

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[10]This variable ranks first in importance with both dependent variables for which it is significant.

with low order distance, the value of a site is greater when the distance the cottage owner has to travel in order to reach his car is small. As the distance to his car-park area increases, the site value should decrease.

Summary of Part I

From the variable analysis the results show that the selected variables account for a high of 67 percent explanation of site desirability within one of the sub-areas and a low of 17 percent in another. Even though the selected variables are adequate in explaining cottage site desirability in some areas of the study area. Other important site desirability variables may have been overlooked and/or site desirability was poorly measured. In addition, seven important site desirability variables are found. They are ranked in the order of importance, and their positive and/or negative relationship to land values is determined. The results of this in rank order are as follows: view (+), low order distance (-), slope (-), assessed structure value(+), shoreline footage (+), length of sandy shoreline (+), and car-park distance (-). View, which ranks first in importance, is the most statistically significant and the only variable that is applicable,to some degree, in all levels of analysis. All of the above variables are considered to be important because they are significant three or more times in the analysis.

Part II: Road Access Factor Testing

Introduction

In Chapter I, three hypotheses are presented for consideration. All

the hypotheses are concerned with some aspect of distance to or from the

cottage within the cottage area. In addition, the problem of determining

the value of road access to the cottage site is investigated.

The data to test these hypotheses and the road access investigation

are gathered from the answers to the questionnaire, which was circulated

in Divisions B, C, and E.[11] All the cottage sites in Division C and six

sampled sites in Division B, have double accessibility whereas all others

have single access. The comparison of single access sites to double

access sites is made in an attempt to test the following:

Hypothesis #1:
Low order distance: there is an inverse relationship between
land values and the distance the site is away from the low
order centre.

Hypothesis #2:
Car-park distance: in single access areas there is an in-
verse relationship between land values and distance the
site is away from the car-park area.

Hypothesis #3:
Ideal distance: there is an ideal distance that cottage
owners would prefer to be away from a low order centre.

Road value investigation: to discover the effect of a
road on estimated land values and the value of a road
to the cottager.

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[11]The divisions centred on Severn Falls.

Hypothesis #1. Low Order Distance.

"There is an inverse relationship between land values and the distance the site is away from a low order centre."

Based on the above hypothesis, it would be expected that the closer the cottage site is to the low order centre, the higher the land value. As the distance increases away from the low order centre, the land values should decrease.

The null hypothesis states that there is no relationships between land values and distance away from the low order centre. If distance away from the low order centre increases, it will have no affect on the value of the land of cottage site.

Test. To test this hypothesis, the cottagers' estimated section land value[12] is compared to the actual distance that the cottage site is away from Severn Falls.[13] The data for both single and double accessibility sites are analyzed separately using the linear regression and correlation techniques with land values as the dependent variable and distance as the independent variable. Graphs 5.1 and 5.2 show the results of the analysis.

Results. The hypothesis states that land values should be decreasing as the distance away from the low order centre increases. It is visually clear from the graphs that the line for double accessibility shows this relationship to be true, but the opposite is the situation for single accessibility. It is also clear from the analysis that
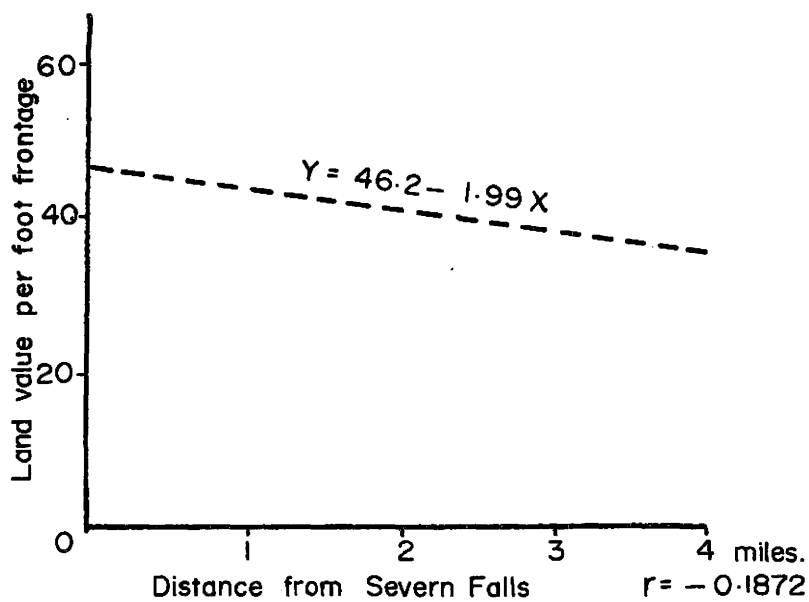
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[12]The "section land value" is the answer to question 4 on the long questionnaire.

[13]Severn Falls is the low order centre used in testing this hypothesis.

GRAPH 5·1
LOW ORDER DISTANCE – SINGLE ACCESS

$Y = 25.5 + 2.6X$

Land value per foot frontage

Distance from Severn Falls

$r = 0.1712$
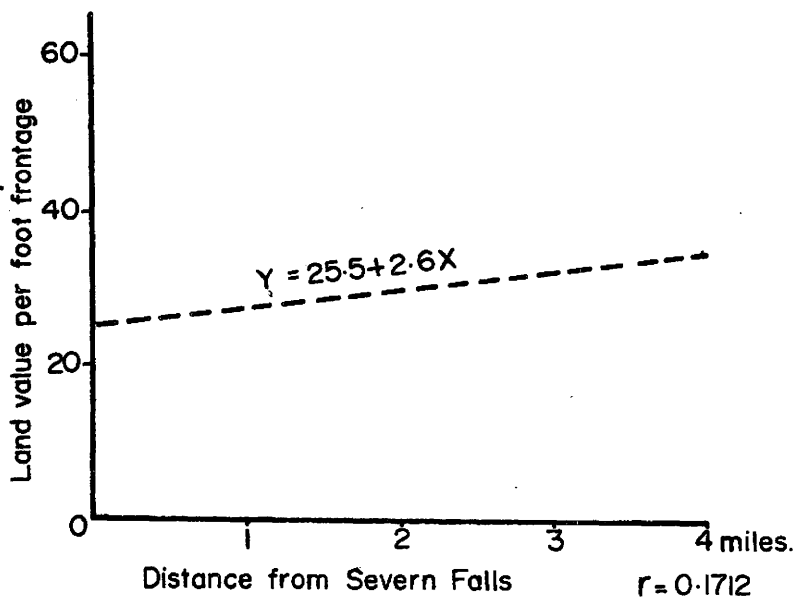
GRAPH 5·2
LOW ORDER DISTANCE – DOUBLE ACCESS

$Y = 46.2 - 1.99X$

Land value per foot frontage

Distance from Severn Falls

$r = -0.1872$

neither relationship is significant at the .05 level. Because the results are not shown to be significant, the null hypothesis is accepted. This indicates that no relationship is found between the distance a cottage site is away from a low order centre, and the value of the land of that site.

Interpretation. From the results it appears that distance away from the low order centre is not a significant factor in affecting cottage land values. This is contradictory to the results given in Part I. On Table 5.1 it shows that this variable proves significant in both the total sample and in Division A, but is not significant in Divisions B and C. If this hypothesis testing was conducted in Division A, perhaps the null hypothesis would be rejected and the hypothesis accepted.

Hypothesis #2. Car-Park Distance.

"In single access areas, there is an inverse relationship between land values and distance the site is away from a car-park area."

This means that cottage sites that are close to a car-park area should be more valuable than sites farther away. The reasoning is that the closer the cottager is to the parking area, the more convenient the site would be and this should reflect in increasing the value of the site.

The null hypothesis states that there is no relationship between land values and the distance away from the low order centre for single access sites.

Test. Seventy percent of the single access cottagers park their
cars at Severn Falls while the remainder park in an area 0.3 miles up
river. In the event that all single access cottagers parked at Severn
Falls, then the results for hypothesis #1 and #2 would be the same.
However, because of the distance difference for some cottagers, the
additional testing is possible. The testing is performed using the
linear regression and correlation technique with land values as the
dependent variable and distance away from the car-park areas the inde-
pendent variable. Graph 5.3 shows the results of the analysis.

GRAPH 5.3

CAR - PARK DISTANCE - SINGLE ACCESS.

$Y = 25.6 + 2.7 X$

Car-park distance   r = 0.2077
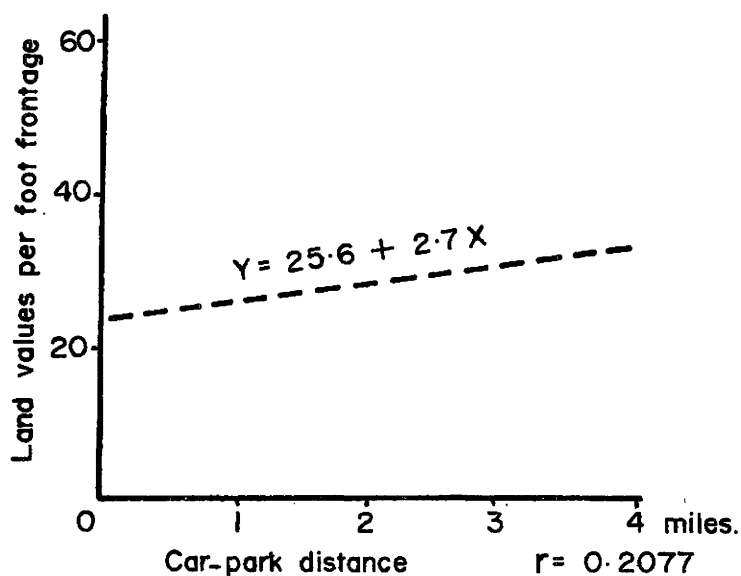
Results. The hypothesis states that land values should decrease
in value with an increase in distance away from the car-park area. The
line on this graph shows an increase in land values with an increase
in distance. This contradicts the hypothesis. In addition, the r value
is not large enough to conclude that the relationship is significant.

Because of the results shown, the null hypothesis is accepted which states that there is no relationship between land values and the distance the cottage site is away from the car-park area.

Interpretation. A comparison of graph 5.1 and 5.3 shows that there is virtually no difference between the two. The critical value of r in graph 5.3 is of greater value, but still not significant. From this it appears that car-park distance is not a significant factor in affecting land values. This result is contrary to that found in Part I. In Part I, this variable exhibits an inverse relationship, is significant four times which categorizes it as an important variable, and is significant three of the four times in Division A. Where this hypothesis is not accepted based on the data gathered in Divisions B, C, and E, it most likely would be accepted if tested in Division A.

Hypothesis #3.   Ideal Distance.

"There is an ideal distance that cottage owners would prefer to be away from a low order centre."

From this hypothesis it should be found that cottagers would disregard the actual distance their cottage site is away from the low order centre, and state an ideal or most preferable distance that they would like to be away from a low order centre.

The null hypothesis states that there is no ideal distance that cottagers would prefer to be away from the low order centre. In other words, the cottagers either consider that there is not an ideal distance to be away from a low order centre, or they consider their present cottage site to be the ideal distance.

Test. Subsequent to the collection of the questionnaire data, the actual distance from each cottage to the only low order centre in the area (Severn Falls) was measured. The actual distance is compared to the preferred (or ideal distance) which is the answer given to question #1[14] on the questionnaire.

The data are separated into two groups: those cottagers that preferred a change of distance, and those who considered that their present distance away from Severn Falls is the ideal distance. In this analysis, the latter group is not included. The purpose of this section of the study is to examine the relationship between the actual distance, and the preferred distance change. Therefore, only the data from cottagers who are unsatisfied about their actual distance are used in the calculation.

Results. By using the data from only those cottagers that indicated they would prefer a distance change, the results are as follows:

TABLE 5.3

IDEAL DISTANCE

Distance from Severn Falls	SINGLE ACCESS		DOUBLE ACCESS	
	ACTUAL	PREFERRED	ACTUAL	PREFERRED
	1.5 mi.	2.8 mi.	2.7 mi.	2.0 mi.

The following tables shows the percentage of cottagers that actually considered a change in distance to be preferable.

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[14]Question #1. If your cottage site with all its advantages and disadvantages could be moved anywhere along this side of the river, what distance would you like to be away from Severn Falls?

TABLE 5.4

PERCENTAGE PREFERRING A DISTANCE CHANGE

	SINGLE ACCESS		DOUBLE ACCESS	
Percentage of Cottagers Who Preferred a Distance Change	n = 36	11%	n = 47	9%

It is strikingly noticeable that few cottagers would prefer to change their actual distance from Severn Falls. In fact, for single and double accessibility, only four cottagers in each group stated they would prefer a change in distance. From the testing of this hypothesis, it is found that the null hypothesis must be accepted because only 10 percent of the cottagers considered a distance other than their actual distance away from the low order centre to be more ideal.

Interpretation. Ninety percent of the cottagers like the distance they are away from Severn Falls and do not want a change. This finding may be explained by any of the following reasons. (1) A cottager does not consider the distance away from Severn Falls to be important. (2) A cottager knows no difference because he has always been this same distance away since living in the cottage area, thus he would not know if it were better or worse to be closer or farther. (3) He has improved his means of travel through a better road or better boat and thereby may have overcome a distance problem that might have existed at one time. (4) A cottager gets used to his site and is able to adapt to the distance away from the low order centre. (5) The cottager may genuinely like the distance he is away and find no inconvenience because of the distance.

From the few cottagers who do feel a change would be more ideal, the results show that double access cottagers want to be closer and single access cottagers want to be farther away. This might reflect the attitudes that double access cottagers like convenience and single access cottagers like privacy. As one single access cottager stated, "it is great having a cottage a couple of miles from Severn Falls. Your friends, neighbours and relatives from home are not able to drop in on you; they have to be invited".

Road Access Factor Testing

No hypotheses are presented for consideration with this problem. The data are used to find out two things about a road; the affect of a road on the estimated land values, and the value of a road to the cottager. The cottagers are asked one of two hypothetical questions[15] to find out how they value a road to their cottage site. The cottagers who do not have a road to their site are asked to value their land as if it did have a road[15b]. Conversely, the cottagers who do have a road are asked to value their land as if there was no road to their cottage site[15a].

The Affect of a Road on the Estimated Land Values. The land values for single and double accessibility sites are again compared separately.

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[15] (a) Question 6(a). If you and other cottagers along this section of the river had no road to your cottage, thus having to park your car at Severn Falls, what would you estimate the market value of your land to be, within this section of the river?

(b) Question 6(b). If you and other cottagers along this section of the river had a road and were able to drive a car to your cottage site, what would you estimate the market value of your land to be within this section of the river?

The data used to study this problem are the cottagers' estimates of land value for both having a road and not having a road[16] to their cottage sites. Linear regression and correlation analyses are performed on the data with land values as the dependent variable and distance away from Severn Falls as the independent variable.

Results. On Graph 5.4, single accessibility, line

$$Y = 25.5 + 2.6X$$

shows the same relationship as Graph 5.1. It is the cottager's estimated section land value. In other words the general value of land within a short distance either side of his cottage. The dash line

$$Y = 25.5 + 10.2X$$

represents the value of land estimated by the cottagers if there was a road to their cottage site. The r value for this relationship is large enough to show significance at the .05 level.

Both lines start at the same point on the Y axis which indicates that cottagers close to Severn Falls do not consider the road to have any appreciatve extra affect on land values. The positive slope is much greater on the road value line which shows that the road value increases at an added rate of $7.60 per foot frontage per mile. If both these lines were significant, the land values would change from

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[16]Answers to questions 4 and either 6(a) or 6(b).

GRAPH 5·4

AFFECT OF A ROAD — SINGLE ACCESS

$Y = 25·5 + 10·2 X$

$Y = 25·5 + 2·6 X$

Land value per foot frontage

Distance from Severn Falls

$r = 0·3770$* (with road)

$r = 0·1712$ (without road)

* significant at ·05 level
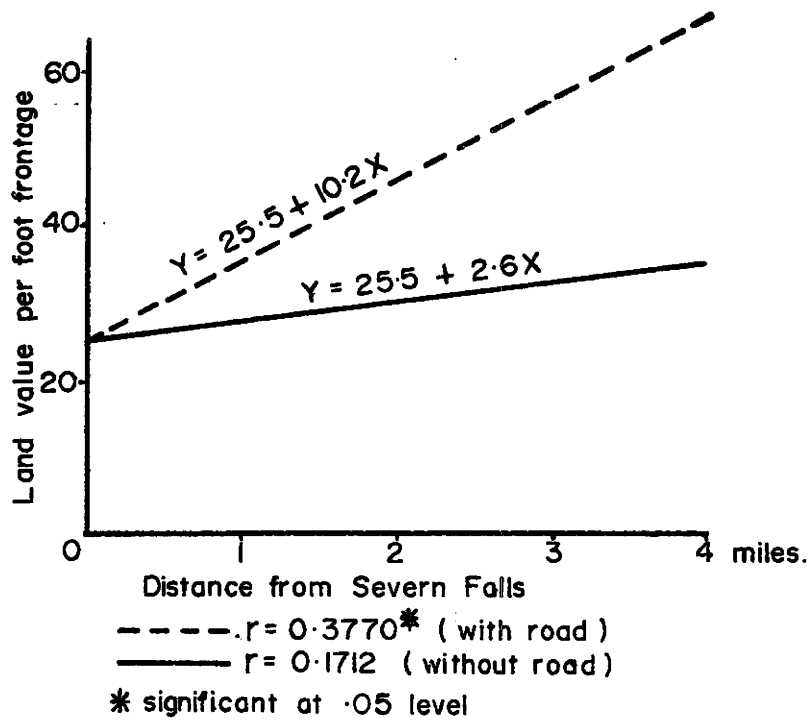
GRAPH 5·5

AFFECT OF A ROAD — DOUBLE ACCESS.

$Y = 46·2 - 2·0 X$

$Y = 33·3 - 2·9 X$

Land value per foot frontage

Distance from Severn Falls

$r = - 0·1872$ (with road)

$r = - 0·2787$ (without road)
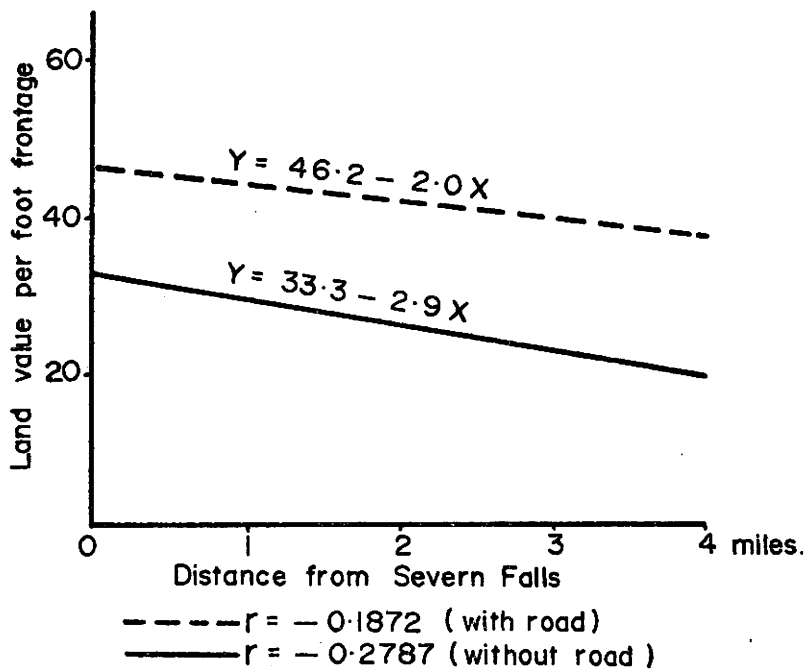
$33.30 per foot frontage without a road to $56.10 per foot frontage with a road for the same section of land three miles away from Severn Falls.

Double accessibility, Graph 5.5, shows an entirely different pattern. Neither of the lines are significant but in both cases the slope of the line is negative showing that land values decrease as distance away from Severn Falls increases. Because the two lines are almost parallel it appears that in double access areas, the value of a road is a constant, not affected by distance.

Interpretation. From the previous hypothesis testing the statement was made that single access cottagers might prefer privacy. Graph 5.4 does not appear to support this conclusion. If privacy is what the single access cottager desires, then the "with a road" line should have a negative slope, which is not the case. Through conversation with a large number of the single access cottagers, it was discovered that most realized that if their cottage was accessible by a road, the potential land value would probably increase. These cottagers were generally not interested in having a road, but the feeling was that a road would appeal to the "nouveau" cottager who is looking for convenience of access, and is willing to pay for it.

Graph 5.5 shows that the two land value lines are almost parallel. This appears to indicate that the value of a road to a cottage has an equal affect on land values regardless of the distance away from Severn Falls. Most double access cottagers had little trouble answering question 6(a) because they knew how much the road cost to construct and they knew how inconvenient it is when the road is not usable.

Value of a Road to the Cottager.

This testing is conducted to determine how the estimated value of
the road varies depending upon the distance away from both the low order
centre, and car-park area. The road value is calculated by finding the
difference between the answers to questions 4 and either 6(a) or 6(b).
Linear regression and correlation analysis is performed on the data with
road value as the dependent variable and the distance value as the in-
dependent variable.

Results. Graph 5.6 has two relationships: low order distance,
and car-park distance. The critical value for r in both relationships
are large enough to indicate that each are significant at the .05 level.

Graph 5.7 has only one line, low order centre distance, because
the distance from car-park to cottage does not vary in a double access
area. The critical value of r is too low to be significant for this
relationship.

From Graph 5.6 it is observed that as distances increase, so does
road value. Line,

$$Y = 7.5 + 2.1X,$$

(low order distance) has a positive slope starting at \$7.50 per foot
frontage with a road value of \$11.70 per foot frontage at two miles away
from Severn Falls. The car-park distance line,

$$Y = 2.4 + 6.8X$$

GRAPH 5·6

VALUE OF A ROAD – SINGLE ACCESS
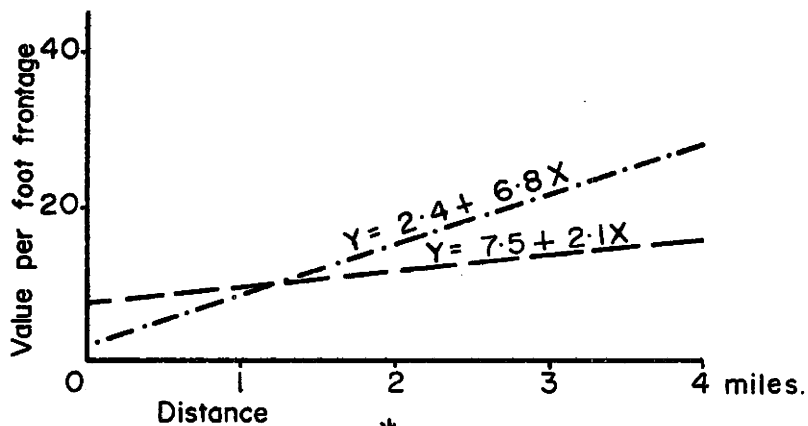
$r = 0.3494^{*}$ (low order distance)

$r = 0.3988^{*}$ (car–park distance)

✳ significant at ·05 level

GRAPH 5·7

VALUE OF A ROAD – DOUBLE ACCESS
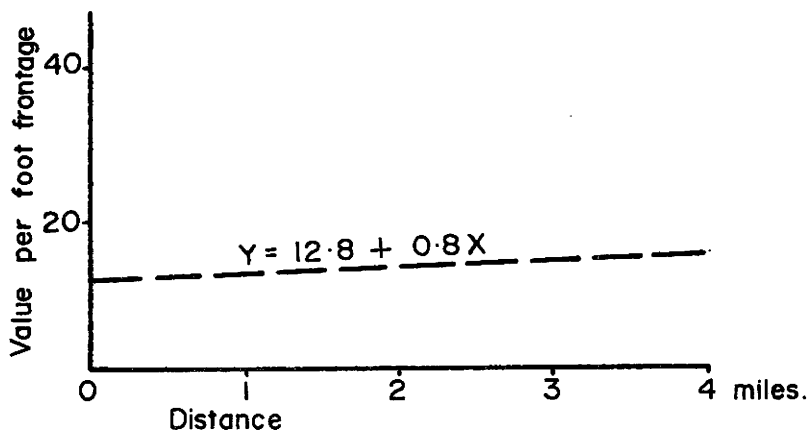
$r = 0.0950$ (low order distance)

starts lower on the vertical at $2.40 per foot frontage, intersects the low order distance line at about one mile and increases to $16.00 per foot frontage at two miles.

The relationship shown in Graph 5.7 indicates that the road value is almost a constant, and distance away from the low order centre has little affect on its value.

Interpretation. The point of intersection of the two lines on Graph 5.6 is of interest because it differentiates a distance at which a cottager's value of a road might change. Cottagers that are within one mile of both a low order centre and a car-park area would value road accessibility to the low order centre. Beyond the one mile point, road accessibility to the car-park becomes most valuable.

Mean Road Value

By using the same road value data as calculated for the previous problem, a mean road value is calculated for both single and double access cottage sites. Single access cottagers estimate that if a road was brought in and they could drive to their cottage, the value of the land would increase on the average by $11.80 per foot frontage. Cottagers with double access estimate that if they had to park their car at Severn Falls and travel by boat, the land value would decrease on the average by $14.40 per foot frontage. Therefore, the mean road values are $11.80 per foot frontage for single access sites and $14.40 per foot frontage for double access sites.

In conclusion, there appear to be two completely opposite attitudes towards the value of a road to a cottage site. Generally both the single

and double access cottager feels that the road increases the value of the cottage site.

The double access cottager values the road highly. The value of the road appears to be a constant in that a cottager 3 miles away from the low order centre feels that the road is the same value to him as another cottager 1/2 mile away from the low order centre. On the other hand, the single access cottager realizes that the road would increase the value of the site but the value is speculative as to what someone else might want. It is also shown that the road value increases greatly with distance away from the low order centre. Finally, the purpose of the road, be it shopping or travel to and from home, appears to affect the value of the road to the cottager.

Summary of Part II

From the road factor analysis, it is found that there is a distinct difference between single and double access cottagers in terms of their value of a road. Even though the null hypothesis is accepted for both the low order and car-park distance hypotheses, it is found that single access cottagers appear to attach greater value to land farther away from these functions. On the contrary, double access cottagers consider the land less valuable as the distance away from these functions increases.

It is shown that there is not an ideal distance that cottagers would prefer to be away from a low order centre. With about 90 percent of the cottagers preferring their present distance, the results are conclusive to this effect.

The road value testing also shows the contradicting results between single and double access cottagers. Road value for double access cottagers appears as a constant value of about 14 dollars per foot frontage. Single access cottagers feel that a road to the cottage would increase the value of the site at a rate of about 12 dollars per foot frontage per mile up to a distance of three miles.

CHAPTER VI

SUMMARY AND CONCLUSION

In Part I of this study, using the regression model, it has been possible to isolate seven variables that appear important in affecting cottage site desirability. The step-wise computation of the regression model is used to rank the variables in order of importance. The variable view is the most important factor in contributing to the value and desirability of cottage sites. The other significant variables listed in the order or importance are: the distance to a low order centre, the slope of the land, the assessed structure value, the length of sandy shoreline, the length of shoreline footage, and the distance to a car-park area.

It is suggested in Chapter II that this study area is considered a homogeneous area. Even though land values are calculated in the same manner throughout the study area, and the variables are measured in the same manner the results of the sub-area analysis points to the fact that the regions within the study area have differing characteristics. In Division A, six of the seven important variables are significant as many as two or three times. Assessed structure value is the only important variable that is not significant in this division. In Division D, view, assessed structure value and shoreline footage are significant in that order, but these are the only three statistically signi-

ficant variables. The results for Divisions B and C show that of the important variables, view, slope, car-park distance and shoreline footage are all statistically significant but only once. The important variables prove highly significant with a high variation of explanation in Division A, and to a lesser extent in the other sub-areas. Are the results like this because the choice of variables are better suited to Division A? Were land values estimated better by the cottage owners and the real estate agent in this division? Or are there other reasons?

In Part II of the study, the road access factor is tested and comparisons are made between the responses of cottagers that have to travel to their cottage by boat (single access) and cottagers that have the option of travelling to their cottage by either car or boat (double access). It is generally found that single access cottagers consider the value of both the land and a road to increase as the distance away from a low order centre and car-park area increases. But a road value increases at a rate greater than the general increase in land values if there was no road. On the contrary, double access cottagers consider that land values decrease slightly as distance increases away from the low order centre. It is also found that the value of a road is a constant and not affected by the distance away from the low order centre in double access areas.

Through conversation with both types of cottagers, it was found that they are completely different in their outlook towards a road. Single access cottagers do not want a road to their cottage and neither do they consider a road of value to them personally. The reason they value a road so highly is because it would have an appeal to other

cottagers if they ever decided to sell. The double access cottager, in many cases, would not have a cottage if it did not have a road. These cottagers enjoy the convenience of being able to drive to their cottage and are not interested in going through the troublesome routine of the single access cottager.

The results of this thesis have to be questioned to a certain extent because of the lack of objectivity of the dependent variable, and the lack of highly significant variables in the regression analysis. Only in Division A of the study area, which is the area from Sparrow Lake to the Swift Rapids Lock, are there a number of significant variables and the variation of explanation of the variables is over 50 percent. The opposite extreme is found in the divisions centered on Severn Falls. Only one variable is found significant with one of the dependent variables (with this variable accounting for only 9 percent of the explanation of land values in this area of the river). What factors could account for the large percentage of unexplained variation?

It is felt that perhaps some important cottage site desirability factors might have been overlooked. But it is still the opinion of the researcher that many of the selected variables which did not prove significant are still valid factors in contributing to cottage site desirability. The major problem of this study appears to be the dependent variable. Land values should be an accurate measure of site desirability but the problem of being able to calculate objective values for each site creates problems. Unless a qualified land appraiser could be used or the land was objectively valued by the assessment

department, it is unlikely that land values as a measure of site desirability should be used.

It was found that real estate agents and cottage owners were willing to give estimates of land value. The problem that arose was that cottage owners' land value estimates, were generally discrepant between neighbouring cottagers; in some cases by as much as 20 to 30 dollars per front footage. This is one of the reasons why three land value variables were calculated. It was hoped that by calculating the dependent variable in three different ways, one of the methods would prove successful so that more significant variables would be isolated. It was found that all three dependent variables were as equally similar in their results as they were different. It is not possible to determine which land value calculation is the best in producing a valid dependent variable, if in fact any of them are valid.

Land values are also used as the dependent variable in the road factor testing. For this reason it leads to some doubt of the results of the analysis carried out with this factor. Even though the researcher feels the relationships shown are generally valid, none of the relationships showed significance. Because of this, neither of the land value distance hypotheses were accepted; perhaps this is because land value is used as the dependent variable, or perhaps the area used to test the hypotheses was a poor choice.

The purposes of this study can be duplicated in other cottage areas, but it would be necessary to examine the cottage area and identify the variables that might be unique to that study area. For example, the water body size variable is tested in this study but in a cottage area

situated on a large lake, it would be unnecessary to test this variable. The road access study would also need modifying unless there are cottage sites with and without road access. It is likely that some modification of the factors, variables, and methods would be needed in order to fit this study into another study area.

The limitations of the study have already been noted. Because of this, it is considered necessary to develop another research approach that may be tried if this study is to be repeated. In the new approach it would not be necessary to preselect variable, measure the variables for each site, or ask the cottager to estimate land values. Instead, the interviewing would simply be to ask the cottager what he likes about his site and/or what he would prefer in terms of an ideal site. When this is done, the cottager could rank these factors in the order that he feels they are important. By this method it is possible to determine the significant factors by the number of times cottagers mention them. The overall rank of the factors would be easily worked, in the same manner in which the variables for this study were ranked.

It might also be interesting to ask a series of choice questions to discover additional factors that may not be answered by the above method. Some of the questions that might be used to do this are: Would you prefer a cottage on an island or mainland? Is the distance your cottage is away from the store of importance to you? and/or, If it was possible would you have a road to your cottage? It might even be possible for the cottager to estimate how much a road or lack of road would

affect the value of his site.

Virtually, the same objectives that were hoped to be achieved by the methods used in this thesis could be carried out with other less complicated and sophisticated methods with perhaps better results.

APPENDIX I

QUESTIONNAIRE

1. What would you estimate the market value of land to be within this section of the river?

$_____
per foot frontage

2. What would you estimate the market value of your particular site to be?

$_____
per foot frontage

3. What is the preferred distance that you would like your cottage to be away from

_____
miles

4. (a) If you and the other cottagers along this section of the river had no road to your cottage, thus having to park your car at   what would you estimate the market value of your land would be within this section of the river?

$_____
per foot frontage

(b) If you and other cottagers along this section of the river had a road and were able to drive a car to your cottage site, what would you estimate the market value of your land would be within this section of the river?

$_____
per foot frontage

5. How long does it usually take you to drive from your cottage to

_____
minutes or hours

6. How long does it usually take you to drive from your cottage to

_____
minutes

APPENDIX II

McMASTER UNIVERSITY

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DEPARTMENT OF GEOGRAPHY

QUESTIONNAIRE FOR COTTAGE OWNERS

1. If your cottage site with all its advantages and disadvantages could be moved anywhere along this side of the river, what distance would you like to be away from Severn Falls? _____
   miles

2. How long does it usually take you (total lapsed time) to drive (car and boat) from your cottage to Coldwater? _____
   hrs. or mins.

3. How long does it usually take you to drive (car or boat) from your cottage to Severn Falls? _____
   mins.

4. Within this *section* of the river what would you estimate the value (market value) of land to be per foot frontage of shoreline? $_____
   per foot frongate

5. What would you estimate the value (market value) of *land* to be per foot frontage of your particular cottage *site*? $_____
   per foot frontage

6. (a) If you and the other cottagers along this section of the river had no road to your cottage, thus having to park your car at Severn Falls, what would you estimate the market value of your land would be within this section of the river? $_____
   per foot frontage

   OR

   (b) If you and other cottagers along this section of the river had a road and were able to drive a car to your cottage site, what would you estimate the market value of your land would be within this section of the river? $_____
   per foot frontage

APPENDIX III

QUESTIONNAIRE FOR COTTAGE OWNERS

1. Within this section of the river, what would you estimate the value (market value) of land to be per foot frontage of shore-line? $\$\underline{\hspace{3cm}}$

    per foot frontage

2. What would you estimate the value (market value) of *land* to be per foot frontage of your particular cottage *site*?
    $\$\underline{\hspace{3cm}}$
    per foot frontage

APPENDIX IV

DATA COLLECTION SHEET

Site Factors

1. View: _____ degrees

2. Slope: _____ degrees

3. Shoreline: - rocky _____ %

     - sandy _____ %

     - weedy, marshy, _____ %

4. Water Area: _____ feet (map)

5. Island: _____   Mainland: _____

6. Direction of Face: N. ___   S. ___   E. ___   W. ___

Local Factors

7. Cottage Density: E. _____ x _____ W.
    ⎯⎯⎯⎯⎯⎯⎯ ⎯⎯⎯⎯⎯⎯⎯
    1/8 mi.   1/8 mi.

8. Low Order Distance: _____ mi. (map)

9. Car-Park Distance: _____ mi. (map)

     Car to Cottage: Yes ___   No ___

Human Factors

10. Property Frontage: _____ feet

11. Assessed Value: $_____

12. Home Address: _____ City

     _____ miles from study area.

APPENDIX V

SUMMARY OF INDEPENDENT VARIABLES - HOW MEASURED

Measures of Site Factors

1. View: The maximum angle of vision of river water expressed in degrees and measured from a point directly in front of the cottage.

2. Slope: The angle of slope, measured in degrees, from in front of the cottage to the closest point of water on the river's edge.

3. (a) Shoreline: A composite value of the shore frontage using % of weedy, rocky and sandy type.

    (b) Frontage of sandy shoreline: Number of feet of sandy shore-line for each cottage site.

    (c) Frontage of rocky shoreline: Number of feet of rocky shore-line for each cottage site.

    (d) Sandy shoreline: yes or no.

4. Water body size: Distance measured in feet from the water's edge to the nearest point of land on the far shore, or point of restricting width.

5. Aspect: The direction in which the cottage faces - north, south, east or west.

6. Island (or mainland: Island yes or no.

Measures of Local Factors

7. Density: The total number of cottages within 1/8th of a mile each side of the sample cottage, giving a number of cottages for 1/4 mile areas.

8. Low order distance: The actual distance, measured in tenths of a mile from the nearest low order centre to the cottage site, by the most direct water route.

9.   Car-park distance: The actual distance, measured in tenths of a
                         mile from the location where a cottager parks his
                         car to his cottage site, by the route usually
                         taken.

Measures of Human Factors

10. Shoreline frontage: Number of feet of actual shoreline as recorded
                          on the assessment roll.

11. Value of structures: Assessed value of structures as recorded on
                           the assessment roll.

12. Distance from home: A measurement in miles for the distance from
                          a cottager's home to his cottage site.

APPENDIX VI

APPENDIX VI

MEANS AND STANDARD DEVIATION FOR THE ENTIRE SAMPLE

n = 187

VARIABLE	MEAN	STANDARD DEVIATION
1. View	169.0909 (degrees)	70.2729
2. Slope	19.7487 (degrees)	6.8026
3. Shoreline	100.6427	24.6560
4. Water Area	884.8128 (feet)	483.6112
5. Density	5.5134	3.1080
6. Low Order Distance	4.0583 (miles)	2.1583
7. Car Park Distance	1.5142 (miles)	2.2377
8. Shoreline Length	250.2834 (feet)	186.5937
9. North	0.4171	0.4944
10. West	0.1987	0.3995
11. South	0.1283	0.3354
12. East	0.2567	0.4380
13. Sandy Shoreline	0.3850	0.4879
14. Length Rocky	212.3102 (feet)	186.5526
15. Length Sandy	20.7112	37.5640
16. Island	0.1818	0.3867
17. Assessed Value	787.4332 (dollars)	317.6021
18. Distance Home	104.2995 (miles)	78.2830
19. Land Value	41.1769 (dollars)	12.3734
20. Land Value	41.3503 (dollars)	16.7588
21. Land Value	40.7985 (dollars)	13.4709

APPENDIX VII

GRAPH A7·1
VARIABLE X1 - VIEW
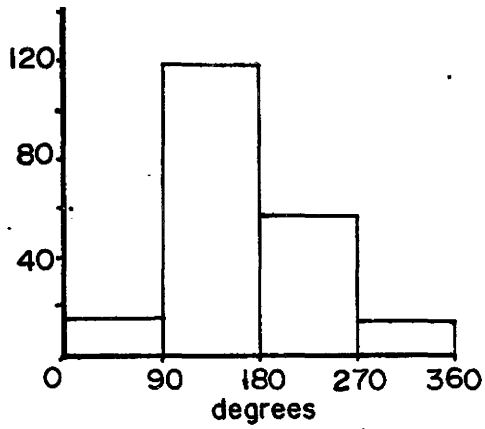
GRAPH A7·2
VARIABLE X2 - SLOPE
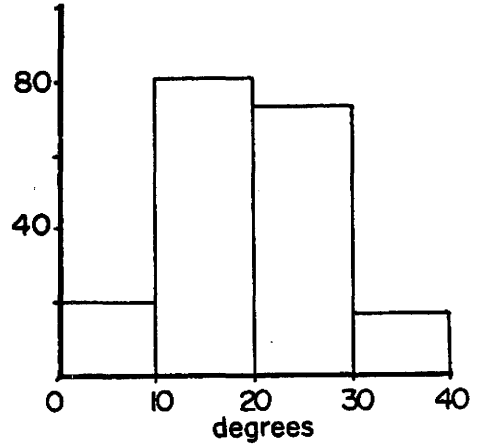
GRAPH A7·3
VARIABLE X3 - SHORLINE
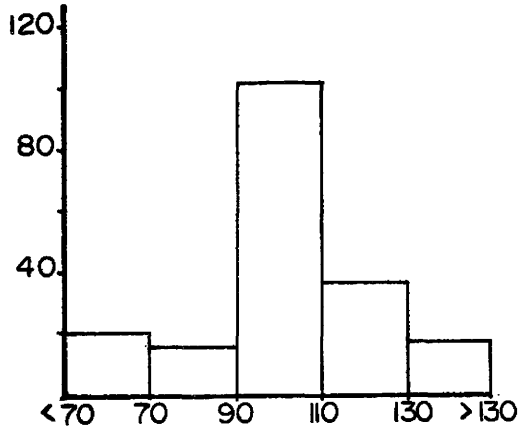
GRAPH A7·4
VARIABLE X4 – WATER BODY SIZE
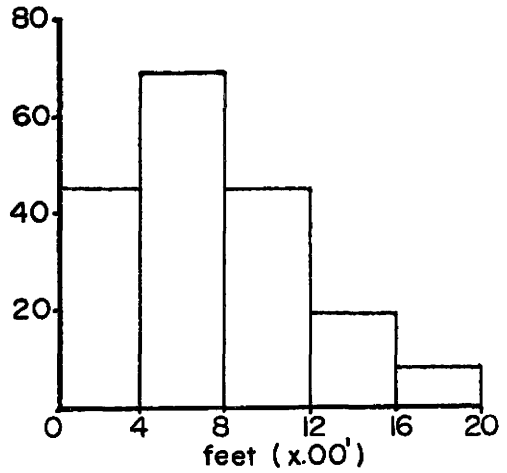
GRAPH A7·5
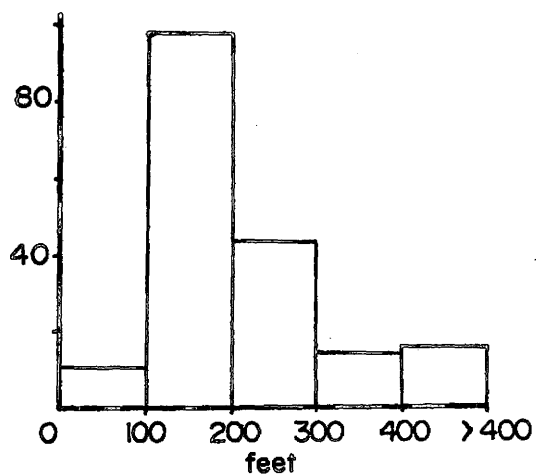VARIABLE X5 - COTTAGE DENSITY
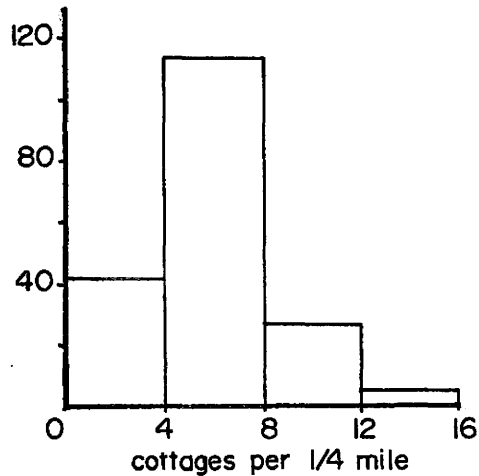
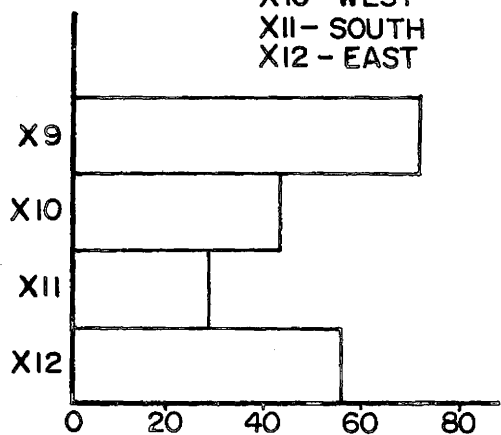GRAPH A7·6
VARIABLE X6 – LOW ORDER DISTANCE
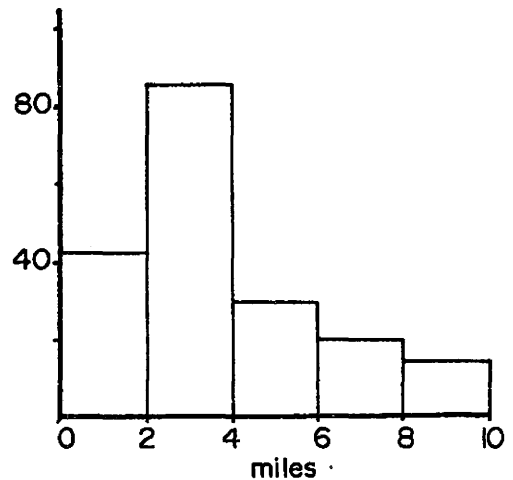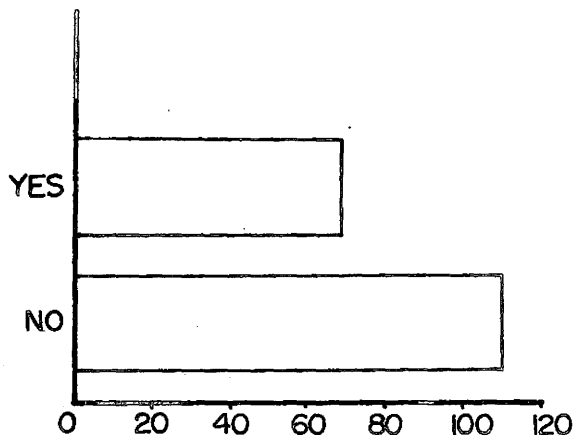
GRAPH A7·7

VARIABLE X7 – CAR-PARK DISTANCE
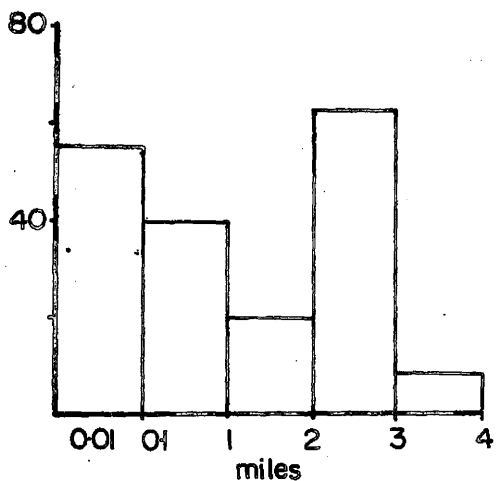
GRAPH A7·8

VARIABLE X8 – SHORELINE FOOTAGE

GRAPH A7·9
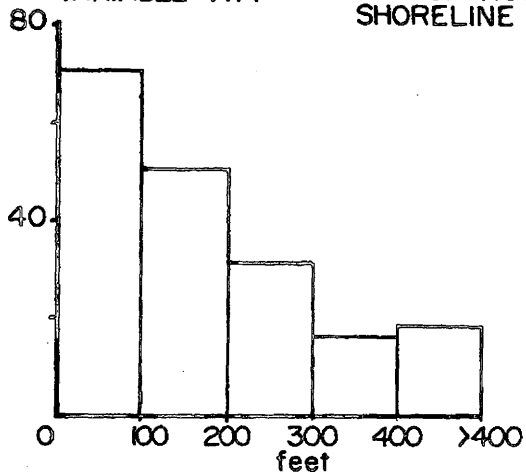
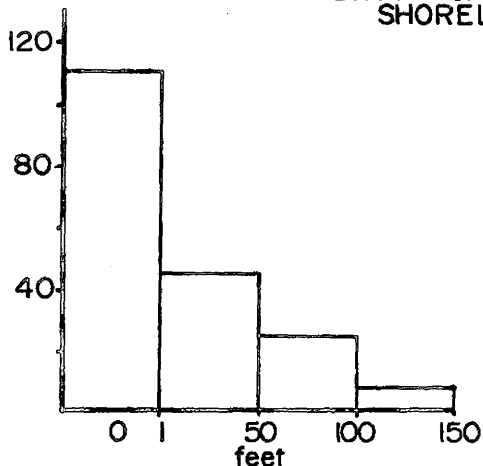VARIABLES X9 – NORTH
X10 – WEST
XII – SOUTH
X12 – EAST

GRAPH A7·10
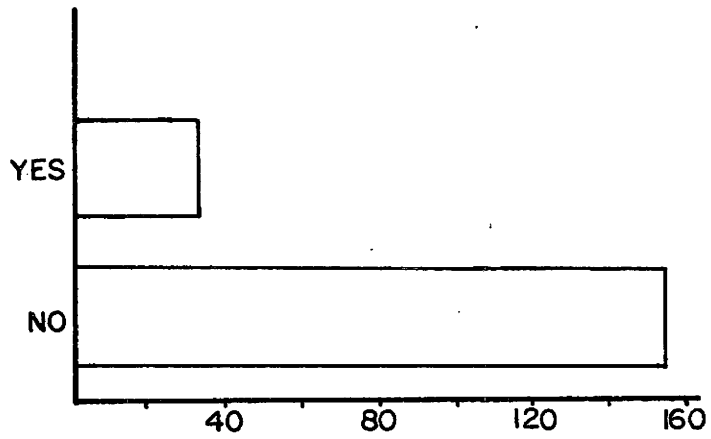
VARIABLE X13 – SANDY SHORELINE

GRAPH A7·11

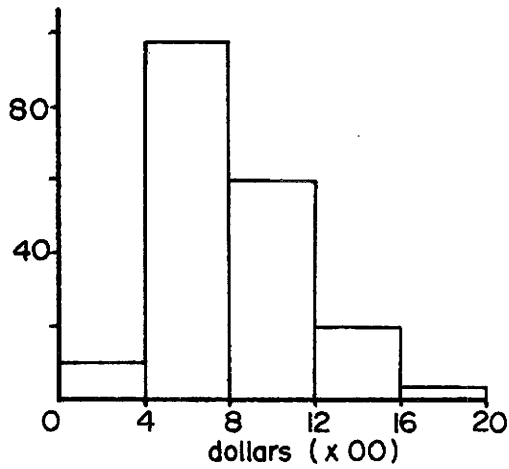VARIABLE X14 – LENGTH OF ROCKY
SHORELINE
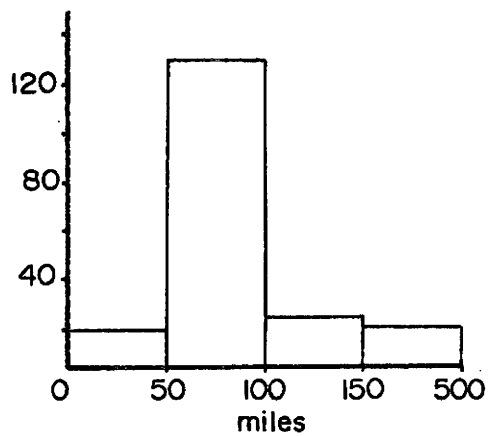

GRAPH A7·12

VARIABLE X15 – LENGTH OF SANDY
SHORELINE

120.

GRAPH A7·13

VARIABLE X16 – ISLAND

GRAPH A7·14

VARIABLE X17 – ASSESSED STRUCTURE VALUE

dollars (x 00)

GRAPH A7·15

VARIABLE X18 – DISTANCE FROM HOME

miles

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