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A FEASIBILITY STUDY
OF
COMMERCIAL UPLAND GAME BIRD FARMS
IN WATERLOO COUNTY, ONTARIO

by
Robert John McClure

Submitted in partial fulfillment of the requirements
for the Master of Arts Degree in Geography

116611

Department of Geography
Waterloo Lutheran University
Waterloo, Ontario
1972

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Robert John McClure

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CHAPTER ONE

THE PROBLEM

A. INTRODUCTION AND BACKGROUND

In Canada today only a small number of persons depend on wild game as a main source of food supply. Hunting has become a recreational pastime where it was once a necessity, and now this recreational right is being threatened with extinction. Each year numerous cultural phenomena decrease the amount of suitable hunting area situated near urban centers. These actions include; urban expansion, the posting of private land to prohibit hunting, the development of private preserves, and the leasing of large tracts of land by clubs and individuals to keep other hunters out.

These factors of changing land use combine to decrease the absolute amount of suitable hunting areas situated near urban areas that are accessible to the general hunter.

Still other forces are affecting the recreational hunter: these however, act on the relative availability of hunting areas instead of the absolute volume of land being utilized. An increasing pressure on limited facilities due to population increase is the largest single factor in this group, but also included are; preservationists and their war against conservationists, and the growing

unpopularity of hunters based purely on humanitarian grounds.

It can be seen that there is an inverse relationship between the number of hunters and the acreage of suitable hunting lands situated near urban centers. As the yearly number of hunters increases absolutely, the acreage available for hunting decreases both relatively and absolutely.

This problem of decreasing hunting areas and facilities can only be solved by the establishment of areas that are open to the hunter in the same manner that golf courses and ski resorts are open to golfers and skiers. This means the development of more hunting areas or game farms as specialized recreational sites, established to meet the demand of the hunting sportsmen in Ontario.

There are twenty-seven upland game bird hunting preserves,¹ nineteen Provincial Hunting Areas² and four Wildlife Extension Areas³ presently operating in Ontario. The facilities offered by these areas vary a great deal. Only nine of the hunting preserves meet the minimum standards of the North American Game Breeders and Shooting Preserve Association,⁴ and they all offer hunting for ring-neck pheasants and various combinations of ducks, partridge, and quail.⁵ The Provincial Hunting Areas are all being developed as multi-use recreational areas that allow hunting for ducks and pheasants during the open season.⁶

In the future the Department of Lands and Forests plans to obtain more hunting areas in order to meet the demand.⁷ However, the increasing need for specialized hunting areas cannot be met by government agencies and conservation authorities alone.⁸ It appears that private entrepreneurs could in fact develop a portion of the needed facilities by providing game farms as specialized hunting areas.

B. OBJECTIVES AND SCOPE

Objectives

The major objective of this thesis is to investigate the present patterns and characteristics of Waterloo County hunters in relation to upland game birds. This goal will be approached empirically by means of a questionnaire. The data obtained shall also be utilized to satisfy three other objectives.

The first of these is to examine the demand on the part of the hunters, for facilities to hunt upland birds. The second area, is to determine the willingness on the part of the hunters to pay for new facilities. Thirdly, actually an extension of the second objective, is an attempt to place a dollar value on the potential market for an upland bird game farm situated in Waterloo County.

A second questionnaire will be used to investigate some of the characteristics of upland bird game farms, and game farm users, presently operating in Ontario.

Scope

The study area is limited to Waterloo County and licensed hunters who either:

- a. reside in Waterloo County;
- b. belong to a hunting club in Waterloo County; or
- c. hunt in Waterloo County.

This investigation will deal only with hunters and their relationship with upland birds.

For the purposes of this study the following terms need to be defined as they are used by the author in this investigation.

- licensed hunter --a hunter who presently has a resident hunting license covering the period from mid-September to the end of February.
- upland birds --this will include; ducks, grouse, partridge, pheasants, and quail.
- hunting club --a club open to public membership in which the majority (more than fifty per cent) of members have a hunting license, and are oriented towards hunting and the proper management of wildlife.
- game farm --an area that is properly licensed and operated, where hunters can harvest pen-reared upland birds at a certain price for each bird bagged.

properly licensed --licensed under Ontario Regulation 15-68 and subsequent amendments, which deal with the operation of a game farm.

C. THE AREA INVOLVED

The study area of Waterloo County is situated in Central Mid-Western Ontario, and lies entirely within the bounds of the Grand River Water Shed. (Figure 1)

Selection of this area is based on several parameters, not the least of which is the author's personal interest in game farms and the need for specialized hunting areas situated near urban centers.

The population and urban growth rates in Waterloo County have been phenomenal, and several large urban complexes exist in the area. (Figure 2) The complex of Kitchener, Waterloo, and Bridgeport is the largest, and recently Statistics Canada released the information that Kitchener, with a growth rate of forty-three per cent per decade, has the third fastest growth rate in Canada.⁹

The third reason for choosing Waterloo County is the number of licensed resident hunters. These licenses run from mid-September to the end of February, and 8,797 were issued in 1970.¹⁰ This amounts to approximately three decimal seven per cent of the county's population, but does not include farmers who hunt on their own land without a license, (farmers

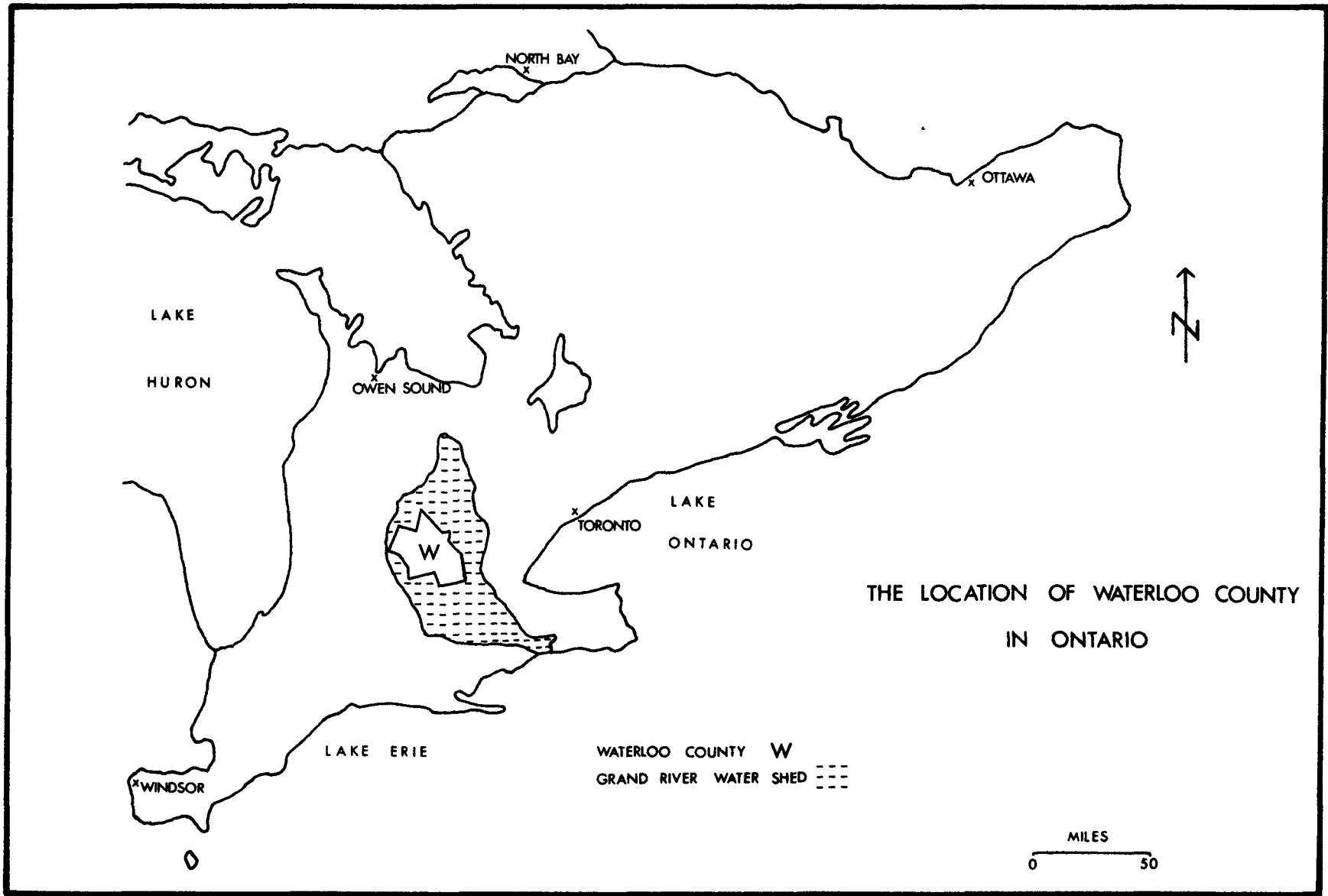


FIGURE ONE

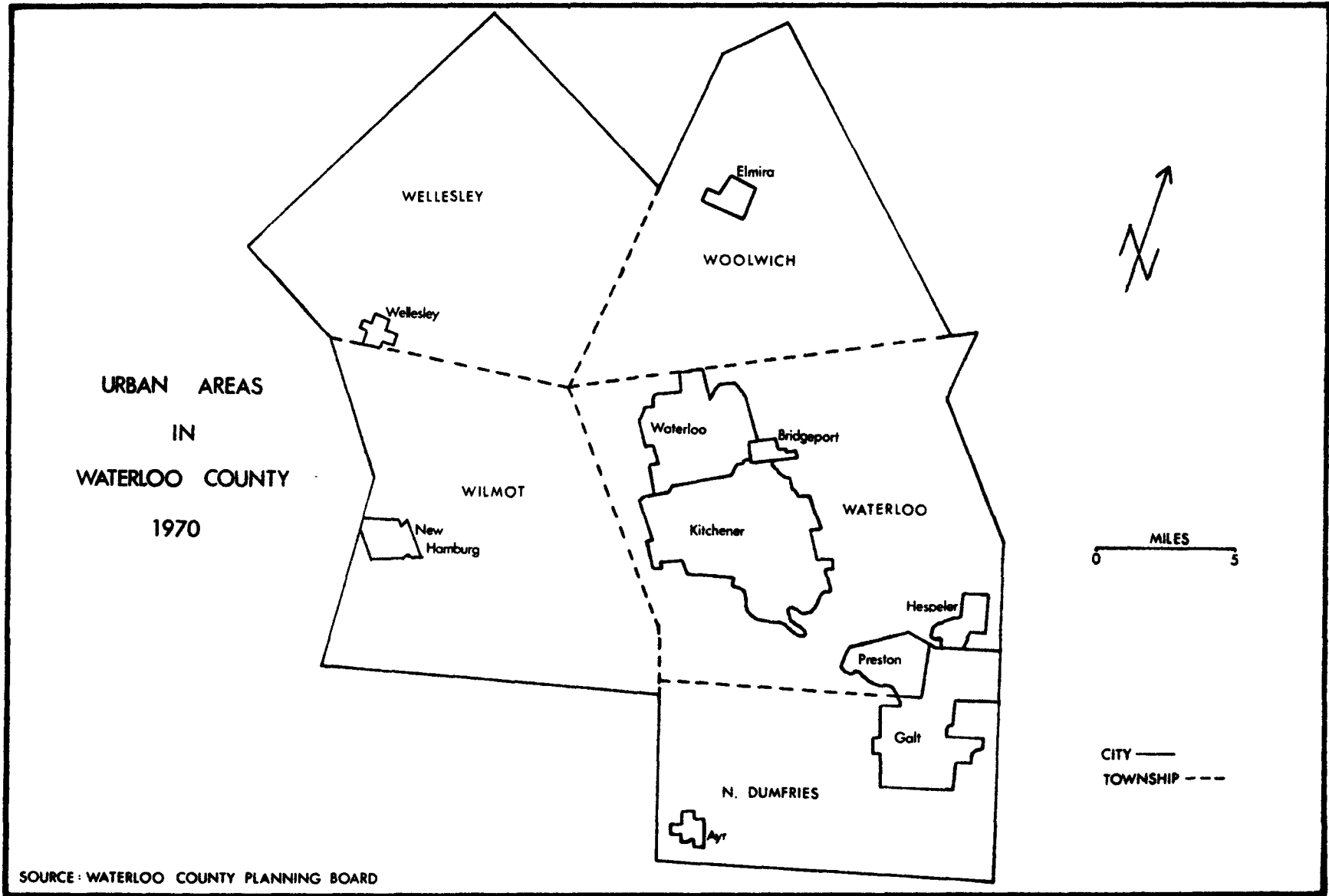


FIGURE TWO

do not legally need a license to hunt small game on their own property) or people that do not bother with the formality of obtaining a hunting permit. These facts tend to indicate a rather substantial market in terms of selling hunting equipment and providing hunters with recreational areas.

Fourthly, there is no licensed game farm for upland birds presently operating in Waterloo County that is open to the public.¹¹ This seems rather odd because other areas of high population density have at least one game farm facility.

The fifth reason is that none of the present Provincial Hunting Areas are located within Waterloo County.¹² (Figure 3)

Sixthly, the county has good potential to support upland birds naturally,¹³ and should therefore be easily adaptable to game farm management practices.

The seventh reason for picking Waterloo County is the location, which lends itself well to the field work needed to conduct the study. The close proximity to the area will increase the availability of information from all parties concerned.

The author feels that these reasons justify the use of the Waterloo County as the area for the study.

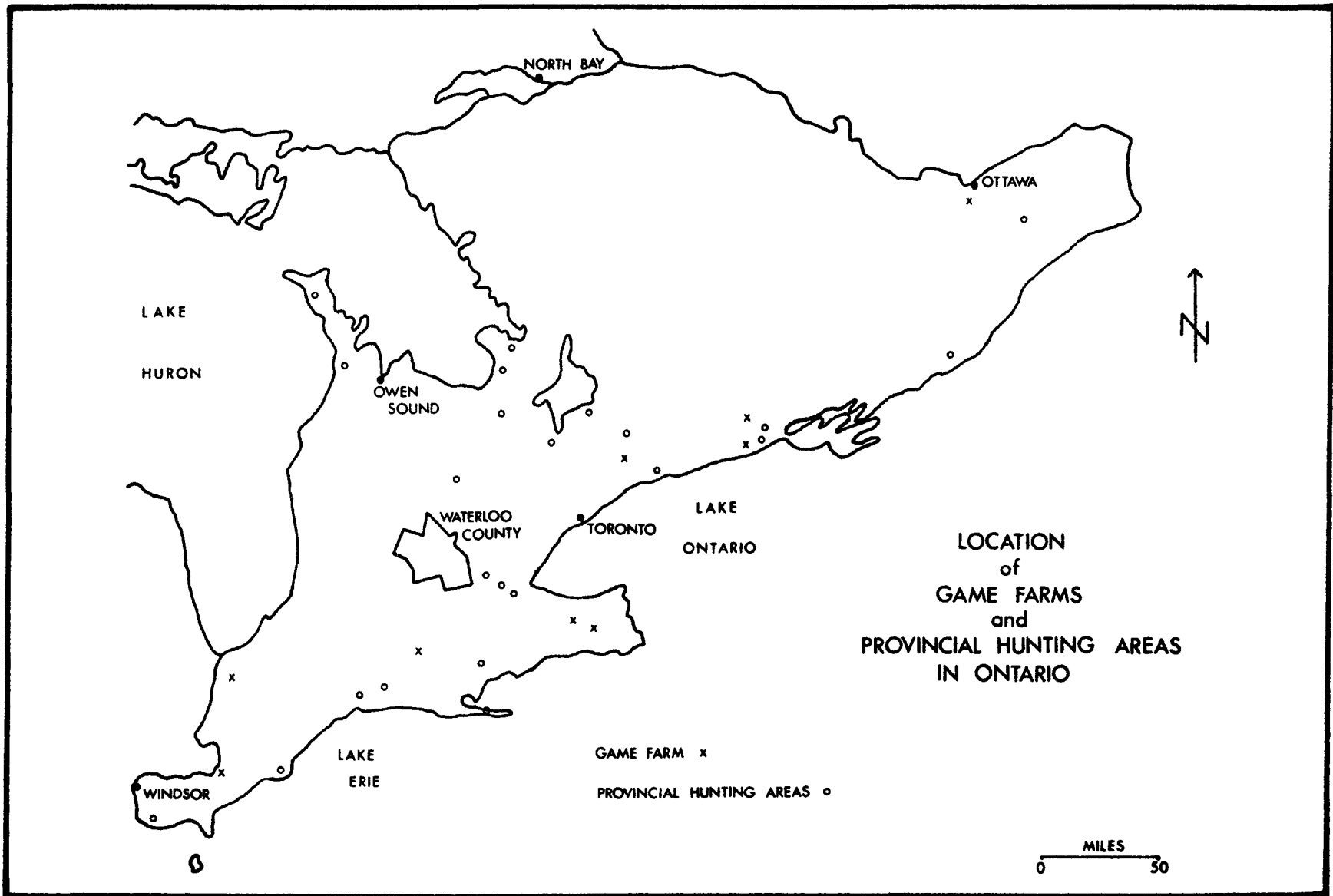


FIGURE THREE

D. METHODOLOGY

In order to conduct a study of this nature, it is necessary to go into the field and obtain first hand empirical data. The problem is approached by utilizing two questionnaires that are set up to obtain all the information needed and deemed relevant to the study.

The first questionnaire is designed to obtain information from the hunters. The data from this source provides the main body of this thesis. The data is utilized to describe and analyse the present patterns, characteristics, and potential market of hunters in Waterloo County in relation to upland birds.

The major problem was in trying to obtain a random sample by a method that would be recognized as reliable and free of bias. There is no possible way that a list of addresses for the 8,797 resident hunters could be obtained.¹⁴ The Department of Lands and Forests does not have this information for their own use, since it has never been compiled,¹⁵ and 1970 is the only year that the number of resident hunters has been tabulated by county.¹⁶ Therefore, to obtain a workable sample it became necessary to turn to the various hunting and conservation clubs in Waterloo County.

The various Township Municipal Offices (Appendix 3) supplied a complete list of all the clubs mentioned above. The list proved to be rather

extensive and the author decided therefore, to deal only with the clubs in which a majority of members had a hunting license, and were oriented towards hunting and the proper management of wildlife.

In order to separate the hunting clubs from the rest of the list, a member of the executive for each of the clubs was contacted. Three of the executives interviewed were secretaries, while the remainder were club presidents. It was based on the response of these people as to whether the clubs qualified as hunting clubs. Eight of the persons contacted signified that their particular club was a hunting club according to the definition of the term for the purposes of this study. Seven of these eight agreed to co-operate in supplying information for this research.

In order to obtain completed questionnaires the author attended the December monthly meeting for each club. It was hoped to collect data from between two per cent and three per cent of the 8,797 hunters in the county by this method. A total of two hundred and seventeen usable questionnaires were obtained in this fashion and constituted a two decimal five per cent sample.

The author felt that this sample could be bias, so further steps were taken to get a larger sample. An additional two hundred and ten usable questionnaires, a two decimal four per cent sample, were gathered by the following techniques.

1. Questionnaires were placed in high order hunting equipment outlets where hunters were asked to complete the questionnaire.
2. Small towns were visited and hunters encountered were asked to complete the questionnaire.
3. Hunters were interviewed in the field during the hunting season.
4. A list of three hundred and seventy-four hunters was compiled by various means and a random sample was asked to supply information by filling out questionnaires.

The two hundred and ten questionnaires netted in this manner, that were usable, contained twenty-six individuals who belonged to the seven hunting clubs used in the survey. These questionnaires are therefore counted as club members in the analysis.

All the various methods resulted in the following breakdown of usable questionnaires and constituted a four decimal nine per cent sample.

Hunting Club Members	243
Non-Hunting Club Members	<u>184</u>
Total	427

In order to obtain further insight into both hunter's activities and game farms, a second questionnaire (Appendix 6) was devised and sent to the nine operators of game farms in Ontario as listed in the North American Shooting Preserve Directory,¹⁷ and licensed by the Department

of Lands and Forests.¹⁸ This information was mostly for background material and only averages and ranges in the data obtained are utilized directly in this paper. All nine of the preserve operators answered the questionnaire sent to them and showed a definite interest in the study.

FOOTNOTES TO CHAPTER ONE

¹ Ontario Department of Lands and Forests, Statistics, 1971, (Toronto: Department of Lands and Forests, 1971), p.28.

² Ontario Department of Lands and Forests, Wildlife Management Areas In Ontario, 1971, (Toronto: Department of Lands and Forests, 1971), p.2.

³ Ibid.

⁴ North American Game Breeders and Shooting Preserve Association North American Shooting Preserve Directory 1970-71, (New York: Outdoor Life, 1970), p.14.

⁵ Ibid.

⁶ Ontario Department of Lands and Forests, Wildlife Management Areas In Ontario, 1971, (Toronto: Department of Lands and Forests, 1971), p.3-32.

⁷ Interview: Mr. W.D. Mansell, Supervisor of Fish and Wildlife, Department of Lands and Forests, November 15, 1971, Hespeler.

⁸ R.D. Teagrie, "Wildlife Enterprises On Private Land" in A Manual of Wildlife Conservation, (Washington D.C.: The Wildlife Society, 1971), p.140-144.

⁹ The Toronto Globe and Mail, November 22, 1971.

¹⁰ Ontario Department of Lands and Forests, Wildlife Branch, Parliament Buildings, Queen's Park, Toronto: unpublished research papers, November 14, 1971.

¹¹ Interview: Mr. W.D. Mansell, Supervisor of Fish and Wildlife, Department of Lands and Forests, November 15, 1971, Hespeler.

¹² Ontario Department of Lands and Forests, Wildlife Management Areas In Ontario, 1971, (Toronto: Department of Lands and Forests, 1971), p.16-17.

¹³ Canada Land Inventory, (ARDA), Wildlife Capability In Waterloo County (Ottawa: Queens Printer), 1968.

FOOTNOTES TO CHAPTER ONE

¹⁴Interview: R.H. Trotter, Supervisor of Fish and Wildlife, Department of Lands and Forests, December 7, 1971, Maple.

¹⁵Ibid.

¹⁶Ibid.

¹⁷North American Game Breeders and Shooting Preserve Association, North American Shooting Preserve Directory 1970-71, (New York: Outdoor Life, 1970), p.14.

¹⁸Ontario Department of Lands and Forests, License Branch, Parliament Buildings, Queen's Park, Toronto.

CHAPTER TWO

GAME FARMS

A. HISTORY AND DEVELOPMENT OF GAME FARMS

A decree issued by King Henry VIII of England in 1536 coined the term "shooting preserve" and established a closed area in what is now metropolitan London to the hunting of pheasants, herons and partridges.¹ It is not clear whether this area was a private shooting preserve for his own use or a type of refuge for wild game.

Since then the term shooting preserve has been used in many different ways, and the shooting preserve concept has worn many titles, such as fee hunting, game farm, put and take shooting, pay-as-you-shoot hunting, etc.² Texas is the only area where a shooting preserve is called a "shooting resort".³ In Canada the popular phrase is "game farm" or a combination of game farm and shooting preserve. (i.e. Upland Game Farm and Shooting Preserve.)

The concept of game farms was slow in getting started. Wild game had always been relatively abundant, and a large portion of the North American population was rural; places to hunt were plentiful, and so was the game. But urban and rural areas expanded as the nations grew,

and game habitat shrank. The result was fewer places to hunt and less small game. With this effect came the recognition of the need for game farms.⁴

The passing of the Bayne Bill, 1911, in New York State legalized game farms for the first time in North America.⁵ But hunters were not quick to endorse the game farm concept and being suspicious of the idea they did not favour legislation to permit the establishment and operation of game farms.⁶ Game had always been a free resource, belonging to everyone, and it was not to be sold. Putting a price tag on a game bird seemed to be "unsporting", and some hunters condemned it as a return to the European System,⁷ where only the rich had hunting privileges.

The attitude of game department officials toward the game farm concept was mixed. Depending on the vision of the official, the concept was either resented or endorsed. Writing in the foreward of 'American Game Preserve Shooting', Seth Gordon, former executive director of the Pennsylvania Game Commission, stated:

"The sportsman who has a desire for more shooting than is afforded by public administration and who has the means for developing shooting should be given every reasonable aid. It can easily be done without adversely affecting public game or public shooting. On the contrary, a substantial percentage of the birds produced or liberated escape to adjacent areas open to the public."⁸

Regulations can be implemented to allow each sportsman his fair share of the game harvest; little can be done however to guarantee each hunter an opportunity to hunt. Game habitat is required for this opportunity, and most game habitat near urban areas is privately owned.

Game departments do obtain and manage public hunting areas. Examples of this can be seen in the Provincial Hunting Areas established by the Ontario Department of Lands and Forests. These lands however, are expensive, and there is a limit to the number of such areas that can be maintained by government organizations. Because of this hunters will continue to depend on private land to provide a large percentage of their hunting. The private landowner cannot be expected to allow free access and use of his land indefinitely.

In the early development of game farms many problems existed. The greatest of these appears to have been the lack of suitable legislation governing their operation. Good game farm legislation protects the operator as well as assuring the customers of a top quality hunting experience. The natural wildlife resources should also be protected from improper exploitation by this same legislation.

Little progress was made in the development of game farms until the early 1950's and it was 1954 when game farms started to come on strong.⁹ The same year a major breakthrough occurred when the Sporting Arms and Ammunition Manufacturer's Institute developed a model statute for the

establishment and operation of game farms.¹⁰ This appears to have provided the guideline needed, and most of the legislation throughout the United States is based on this model statute.

In the early 1950's other factors were at work, and unknowingly contributed to the rapid spread of the game farm industry.

The first of these was an expanding human population. Higher pay scales, shorter work weeks, and a willingness to spend money on hunting sparked the young industry and aided greatly in the speed of development. These factors also attributed to the increase in the amount of hunting licenses sold. In Ontario the increase was fifty per cent from 1950 to 1960;¹¹ it was approximately the same percentage increase in the United States.

The second factor acting on the industry was the mechanization of game propagation and the development of improved feeds and medications for wildlife. This was due to the application of domestic poultry raising techniques to the area of game bird propagation. These facts appear to have kept the production cost per bird at a minimum, in spite of rising costs in the rest of the economy. This had the affect of making game farm utilization seem less expensive than it actually was, and increased the willingness of hunters to patronize game farms.

Increased restrictions on public hunting opportunity were implemented in the early 1950's in an effort to match the harvest with the available

game. These laws resulted in decreased bag limits and a reduction in the length of open hunting seasons. The sportsman naturally started to look for other places to enjoy his hunting pastime.

Before long an increasing number of sportsmen wanted to do something about improving the hunting opportunity and the chance to enjoy a day in the field. Several industries were also concerned, for economic reasons, and in 1952 Nilo Farms was established to serve as a demonstration and experimental game farm for potential operators, state legislators, game officials and hunters.¹² This venture was backed by the Sporting Arms and Manufacturer's Institute and operated by John M. Olin.¹³ Nilo Farms is still one of the top upland bird game farm establishments in North America and is known all over the world as the 'showcase' of game farms.

From a slow start in the early 1950's the game farm industry mushroomed to seven hundred and fifty-six at the end of 1954, 2,121 by 1964, and 2,500 in 1965, with over two million game birds harvested annually.¹⁴ By the end of 1970, there were almost three thousand game farms operating in North America.¹⁵ This works out to a greater than five hundred per cent increase in the total number of game farms over this twenty year period.

When looking at the locations where legislation for game farms first developed; New York,¹⁶ New Jersey,¹⁷ California,¹⁸ Connecticut¹⁹ and Pennsylvania²⁰, it can be seen that the development and increase in game farms was correlated with areas of urban expansion and high

population. This appears to indicate that the increase in game farms is to some extent a reflection of the decrease in open areas available for hunting. If this is true, the role of game farms lies in the years ahead, and the hunting tradition will continue, even in the shadows of our expanding cities.

B. REVIEW OF THE LITERATURE

The amount of material written on the subjects of hunters, hunting, game farms and wildlife is voluminous. These works however, can be divided into six rather broad areas:

1. Policy and Administration;
2. People and Wildlife;
3. Wildlife Management;
4. Wildlife Law;
5. Wildlife: Private and Public Land; and
6. Wildlife Research

These areas have no well-defined boundaries, making it extremely difficult to discuss one area by itself. This closeness causes a high level of interaction, with inputs and outputs of facts and ideas being freely exchanged.

The material written in relation to game farms and hunter patterns and characteristics falls into all of these areas, and varies from habitat analysis to the formulation of laws that govern the harvest of wildlife.

A large portion of these works are in the form of technical research projects but many fill the pages of journals with easy and enlightening reading.

Various articles have been written about game farms as specialized recreation areas, but these are few and far between. Like most of the material about hunter patterns and characteristics, these works are of a general nature and give only the large picture, usually on the level of a country wide survey.

The first major publication to deal with game farms came in 1933 when Aldo Leopold published his book on 'Game Management'. In this work Leopold treats the game farm as a tool of wildlife management more than a recreational area. Although he recognized and talked about the recreational value and potential, the main idea Leopold expressed is that privately operated game farms function well as experimental areas for upland birds and their habitat, producing worthwhile results and not being limited by the budget constraints and political manoeuvring that haunts government game authorities.

It was 1958 before any large scale investigations were planned that included game farms and hunters. The Outdoor Recreation Resources Review Commission (O.R.R.R.C.) was formed in June of that year to study the present and future recreational needs and recreation resources in the United States. This study was designed to deal with all types of outdoor recreation and it was not intended to single out hunters

or game farms. The answers to the questionnaires put a great deal of the focus on these two areas however, and showed that fourteen per cent of the population presently hunt and that an additional four per cent would like to hunt but don't for various reasons.²¹ When both first and second choices of outdoor recreation presently utilized were tabulated, those who hunt rose to twenty per cent, and then to twenty-two per cent when the third outdoor activity was included.²² The fourteen per cent who indicated hunting as their primary outdoor recreation pursuit was larger than the percentage for any other outdoor activity.²³

The final results of the Commission were published in a twenty-seven volume series in January of 1962. No less than eight of these reports deal with various aspects of hunter characteristics and game farms. One volume is devoted entirely to hunters and is entitled 'Hunting In The United States--Its Present and Future Role'.

This report approaches the topic of hunters and the hunting experience from the viewpoint of establishing an inventory of the over-all picture. The only concrete conclusion arrived at that is applicable to the entire United States is that there is a demand on the part of hunters for areas and facilities where they can pursue their chosen outdoor activity. This conclusion is backed-up by recommendation forty-one of the study.

"The states should license, encourage, and carefully regulate public shooting preserves of a commercial nature, and allow only commercially produced pen-reared game to be used for such shooting."²⁴

Report number eleven in the O.R.R.R.C. series contains information on game farms. This data was obtained by compiling the results of two hundred and thirty-two questionnaires completed by game farm owner/operators across the United States.²⁵ A total of fifty-two per cent of these offered only shooting for upland game birds.²⁶

This report, like the one on hunting, is approached with the idea of establishing an inventory of facilities and experiences offered. Once again the demand for hunting facilities is dealt with in a general over-view fashion, concluding by indicating that as urban growth, population growth, and more private land posting continue, the role of shooting preserves (game farms) will increase.²⁷

One important aspect of O.R.R.R.C.-eleven is what exactly they thought a game farm was, and how it generally operated.

"a shooting preserve is a privately owned or leased acreage on which artificially propagated game is released for the purpose of hunting, usually for a fee, over an extended season. Good game cover is specially planned and cultivated; game birds are carefully bred, reared, and conditioned. At maturity these birds are released in accordance with state and federal regulations to provide hunting under natural conditions. A shooting preserve is a place of convenience for sportsmen unable or unwilling to spend long and perhaps fruitless hours searching for unposted coverts in which legal game may--or, just as often, may not--be flushed.

No two shooting preserves are alike. This variety works to the hunter's advantage. Some preserves operate as full-fledged resorts with many attractive features and comforts for all members of a sportsman's family. Other shooting preserves simply provide daily-fee hunting with no frills.

Charges vary depending upon services and facilities offered. Some preserves charge by the number of birds bagged, others by the number released. Some preserves offer attractive membership rates. In all instances, the sportsman and shooting preserve operator agree on cost before entering the hunting fields. There are shooting preserves to fit every purse and taste; many cater to hourly wage earners and sportsmen of average income."²⁸

Since Leopold's book appeared in 1933 and the O.R.R.R.C. reports in 1962, there have been volumes of material written that pertain to game farms in an indirect manner. These works deal with ecology, habitat analysis and numerous other areas that are not directly applicable to game farms. Although many books have been written on 'how to' topics about various aspects of the game farm concept, relatively little has been published that deals specifically with game farms as recreational areas and demand by hunters for this type of facility.

The first truly enlightening volume appeared in 1966 when Edward Kozicky and John Madson published a book entitled 'Shooting Preserve Management: The Nilo System.' It is the most complete, as well as the only complete work ever written about Game Farm Management, and it can be regarded as a milestone in the field of Game Farm Management.²⁹ The book is an extremely informative and well written summary of all the aspects of the Nilo System and the demands that hunters make on such a game farm facility.

Nilo Farms is situated in western Illinois and this famous experimental and demonstration shooting preserve has become known throughout the world as the showcase of the shooting preserve concept since its development in 1952.

Kozicky and Madson, both wildlife biologists, are the two leading authorities on game farms in North America. Dr. Kozicky has played one of the leading roles in the development of the game farm concept, particularly in the United States, and he is in part responsible for the 'model statute' developed in 1954 that has served as the basis for most game farm legislation in North America since that time. Both of these men have contributed scores of articles to the growing library of material on game farms.

The two leading journals that deal continuously with articles on game farms, and publish most of Kozicky's and Madson's materials, are 'Game Bird Breeders Gazette' and 'Modern Game Breeding'. Many other journals also print works relevant to game farms, but not to the same extent the two periodicals previously mentioned do.

The majority of literature published is the result of research projects by various individuals and conservation and wildlife authorities across North America. The Pennsylvania, Missouri, and North Dakota State Game and Fish Departments are leaders in this area. The monographs produced describe and explain the ecology and management of various

species of game birds. Although the technical data from such investigations is not always directly transferable to other regions and the game farm concept, the general guidelines and information provide a knowledgeable base on which new information can be built and existing material expanded upon. The deficiency in these studies is that they only allude to hunter demand and game farms as recreational areas, and seldom give insight into hunter patterns and characteristics.

The amount of independent material and studies prepared and completed at the university level, that deal with hunters and game farms is limited. A thesis completed in 1970 at Michigan State University by Jeffrey Greene is an investigation of the social-economic characteristics of Game Farm Clientele in Michigan. Another thesis, completed by L.R. Shelton at Mississippi State University in 1969 deals with the economic aspects of wildlife management on private landholdings based on the demand for facilities and areas to hunt.

The author was able to find only a few studies conducted that deal with hunter patterns and characteristics in relation to specific types of wildlife. Some studies have been completed that deal with the economic expenditures of hunters and the success ratio in various types of hunting, but it appears that to date funds have been spent on obtaining knowledge and information about specific wildlife species and their habitat, and the general overview of hunter demand, while the area of hunter patterns and characteristics in relation to these various species has been virtually unexplored.

It can easily be seen by the lack of literature that a real void is evident in this area of knowledge regarding hunter patterns and characteristics. In view of this fact and because of the absolute increase in hunters each year it is quite evident that further research is needed in this area.

A selected bibliography is included at the end of this chapter to show the type of material that is presently available in relation to hunter characteristics and patterns.

C. GAME FARMS IN ONTARIO

There are approximately twenty-seven upland bird game farms operating in Ontario.³⁰ In order to determine some of the characteristics and facilities offered by these establishments, questionnaires were sent to the nine game farms listed in the North American Shooting Preserve Directory. The bulk of material in this section is based on the results and responses of these nine sources of information.

It was felt that these nine individual game farms would provide a workable sample for several reasons. The first of these is that they constitute thirty-three and a third per cent of the total game farms population. Secondly, these nine recreational areas account for over fifty per cent of all game farm clientele in Ontario. Thirdly, several of the other units are private clubs and therefore not the concern of this study. The fourth reason is the fact that game farms are required by law to keep very extensive and complete records on all

the customers they have as well as the birds and facilities utilized.

The questions will generally be discussed in the order they occurred, and the questionnaire may be consulted for the exact wording of each inquiry.

Question one, which asked the name of the game farm, is answered in Appendix 7 and the location of these nine game farms appears in Figure 4. It can be seen that not one of these units is located particularly close to Waterloo County in order to take advantage of the 8,797 resident hunters who would possibly be interested in using such a facility.

The results of questions two and three show that the average game farm in Ontario has been in operation since 1963 and that six of these units are still operated by the original owner. Question eleven will explain why these three particular game farms have changed ownership. The range in opening dates is from 1958 to the latest one in 1970. These dates tend to illustrate a growth in the number of quality game farms over the years. During the same period the total number of game farm licenses issued in the province has dropped from a high of thirty-eight to the present twenty-seven.³¹ The implications of this will be discussed further at a later point in the study.

The next several questions, show that the range in game farm size is one hundred to four hundred and fifty acres with a mean of three hundred and fifteen acres for the nine businesses surveyed. Seven

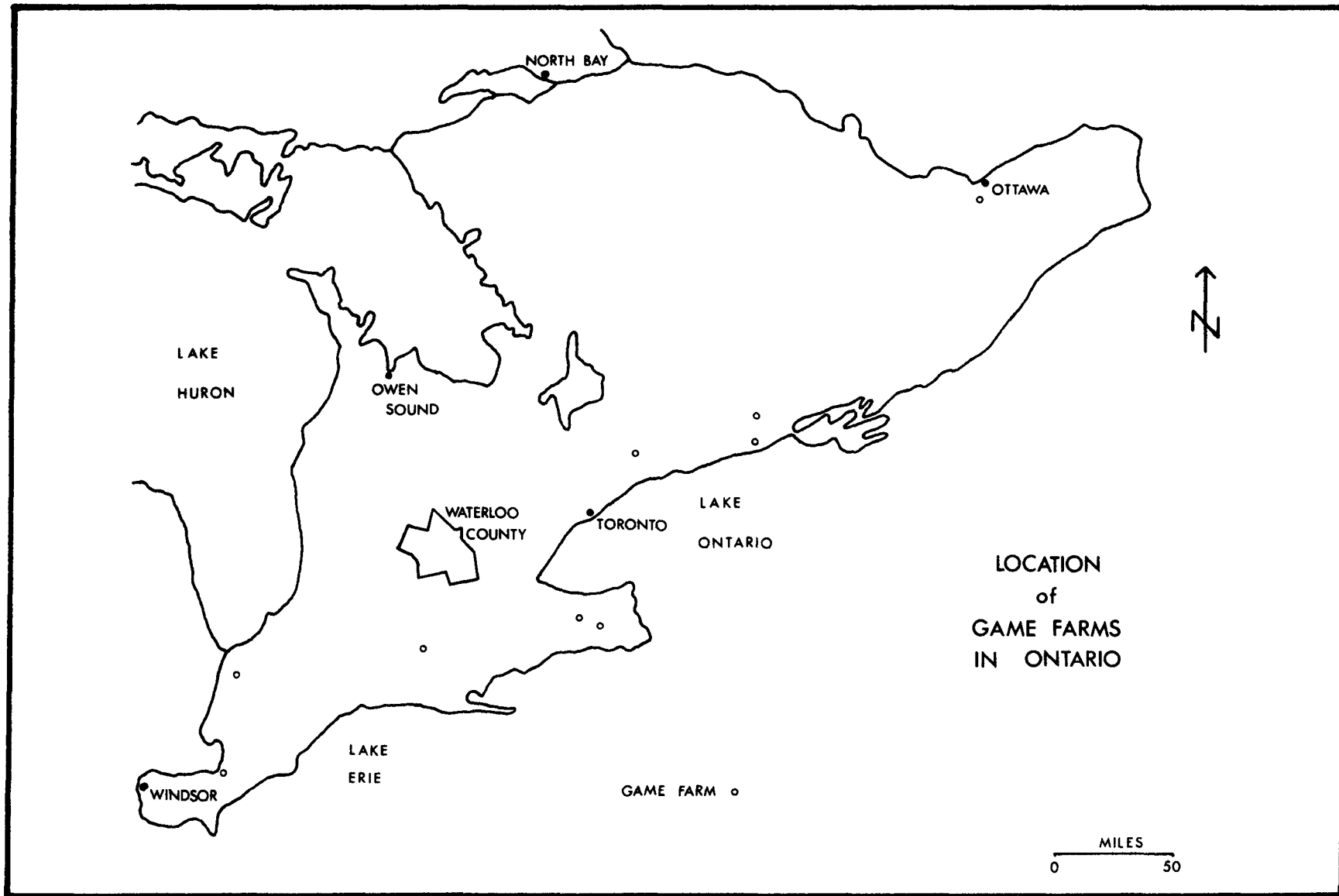


FIGURE FOUR

of these game farms are now fifty acres or more larger than originally, and one individual has added three hundred and fifty acres to his very successful game farm enterprise.

All nine of these establishments utilize their entire property for hunting and all nine also indicated that expansion of facilities is planned within the next two or three years. These facilities could be increased acreage, another species of upland birds, or one of many other additions. This tends to indicate that there is a demand for game farm operations, and that hunters are willing to pay. It can also be noted that these nine units must offer good quality hunting experiences or else the demand and hunting pressure would not be on their particular units.

The topography of the game farms in the survey group is very similar in all cases. Most indicated that their operation is situated on submarginal agricultural land with various combinations of rolling hills, high grass fields, swale, planted cover, and some swampy areas. Each operator mentioned the point that corn fields, after cutting, constitute at least part of their hunting area along with hay and wheat stubble in other fields. The pictures and pamphlets that accompanied some of the returned questionnaires showed areas that looked to have a very high potential as territory where upland game birds would abound, and that is the idea behind the cover and topography of a top quality game farm.

The game farm owner/operators were asked about the initial development of their particular site. It is surprising, and interesting, to note that only two of the establishments surveyed had considered alternate **site** before deciding to develop their particular location, and that only one of the nine owner/operators had conducted a survey to investigate the cost of producing game birds and to determine if in fact the game farm business was prospering, before going ahead and developing his own unit.

This haphazard approach, if true for the entire industry, could account for the high turnover in new game farms each year. These facts could also be taken to indicate that at the outset the business and managerial skills of the owner/operator are not really that important. A demand exists, and if a new unit supplies a good quality hunting experience, the operation will succeed in spite of the owner/operators original shortcomings. This is not to say these individuals are not good game farm managers; it is to say only that they showed a definite lack of incentive to investigate the safety of their original investment.

As previously indicated only two of the owner/operators considered alternative sites before developing their particular game farm. The factors that influenced their decisions on where to develop were the location of the site in relation to areas of high population; they wanted to be near these areas of potential clientele, and secondly, the physical features and characteristics of the site itself; they wanted an area that could be developed to suit their purpose.

The other owner/operators acquired their businesses by different methods, which account for the apparent lack of investigations undertaken to study the game farm industry before becoming a part of it. Several individuals inherited their operations while two others started out as private hunting paradises that suddenly turned into profitable commercial enterprises. Another unit came into being as the result of renting the hunting rights to a tract of land for one fall and winter.

These points erase the assumption that owner/operators showed a lack of business sense in the initial outset and instead clarifies one common thread that shows through this otherwise haphazard development; that being a positive response of owner/operators to provide facilities and areas to hunt, in order to meet the demand of the hunting populace.

Question twelve sheds light on the types of facilities that the survey group offers their clientele. Table 1 shows that these facilities are very uniform in their offering by the different game farms.

TABLE 1

GAME FARM FACILITIES

<u>Facility</u>	<u>No. of clubs offering facility</u>
trained dogs (to use on farm)	9
dog handlers (guides)	9
clubhouse	9
meals for hunters	9
trap and skeet shooting	9
dressed birds	9
board dogs	8
train dogs	8
raise dogs to sell	8

The above mentioned facilities are provided in addition to hunting for various upland birds. The majority of the businesses also offer other extras such as guns and ammunition for sale, and guns for rent.

As far as species of birds offered, only one of the game farms is limited to one type, and it is the ring-necked pheasant. Four of the units have facilities for two species of birds and the remaining five of the operations provide three types of birds for the enjoyment of their clientele. A breakdown of how many game farms offer which species of birds shows that what has often been stated is true, the ring-necked pheasant is indeed the backbone of the game farm industry.

This fact is illustrated in Table 2, and further documented by noting that all twenty-seven game farms in Ontario offer ring-necked pheasant facilities while the next highest species offering is quail with nine game farms utilizing them.³²

TABLE 2

SPECIES OF BIRDS OFFERED ON GAME FARMS

<u>Species</u>	<u>No. of game farms using them</u>
Pheasant	9
Quail	5
Partridge	5
Mallard	2

The prices charged per bird vary with the species offered and the game farm utilized. The following table gives the price break-down as well as the average number of birds taken per hunter on one hunt.

TABLE 3

PRICES CHARGED FOR BIRDS

<u>Species</u>	<u>Price Range</u>	<u>Average</u>	<u>Average No. Taken</u>	<u>Price</u>
Pheasant	\$ 4-\$ 6	\$5.25	4	\$21.00
Partridge	\$ 3-\$ 4	\$3.75	3	\$11.25
Quail	\$ 2-\$ 3	\$2.50	3	\$ 7.50
Ducks (by day)	\$10-\$25	(Depends on time of season)		

It can be seen that the average number of birds taken does not vary to any great degree between the different species. Except for pheasants, the average take per species was very similar among all nine game farms. The pheasant harvest ranged from two to ten birds. This can partly be explained by the various 'package deals' which are available at the different game farms and allow for a minimum and maximum number of birds to be harvested.

The reason that duck hunters are charged by the day instead of the bird is because Federal Wildlife Legislation does not allow ducks to be raised for use on game farms. These units can however, charge for the use of their duck blinds and pond facilities.

The questionnaire revealed that one of the game farms does not encourage hunters to utilize their own dogs. The other eight game farms tend to encourage hunters to bring their own dogs. This is done by selling, training, and boarding bird dogs along with no extra charge to the hunter using his own dog to hunt their game farms. In some cases the hunter with his own dog is given a discount on his hunting cost.

This practice is exactly the opposite to most game farms in the United States. South of the border hunters are not usually allowed the privilege of using their own dogs on game farms. When they are, it is often accompanied by a raise in the price of each bird harvested, and in some instances the price doubles.

The number of hunters that use game farms in Ontario has increased steadily from a starting point of 1,777 in 1962, the first year that accurate information was tabulated, and in 1971 they totaled 6,051.³³ The nine game farms used in this survey had 4,285 customers³⁴ accounting for more than fifty per cent of the total business for the 1970-71 season and averaged four hundred and seventy-six clients apiece. Table 4 gives a periodic picture of the game farm business from 1962 to 1971.

It can be seen that 1969 had the highest number of operating game farms, but for some reason the clientele numbers dropped. In 1970 the number of hunters was back at the 1968 level, but seven of the game farms

had closed. The total number of operating game farms dropped again in 1971, and at the same time the business serviced 1,251 additional customers.

TABLE 4
GAME FARMS AND CLIENTELE

<u>*Year</u>	<u>No. of Game Farms</u>	<u>Total Clientele</u>
1962	31	1,777
1965	33	4,304
1968	34	4,799
1969	38	3,916
1970	31	4,800
1971	27	6,051

*The YEAR means the spring of the year mentioned and the fall of the preceeding year.

This growth pattern can be taken to indicate an increasing demand for good quality facilities, thus forcing the marginal suppliers to close their operations.

The average percentage of 'returning clientele' for the nine game farms was eighty per cent, with a low of seventy-five per cent and a high of ninety per cent. This percentage is substantially larger than the sixty-five per cent to seventy per cent returning clientele set as a guideline by Olin Industries.³⁵ Olin figures that if over this percentage of clients return then the game farm is operating satisfactorily and that the customers are happy with the facilities and the quality of the hunting experience offered. By this measure

the nine establishments surveyed appear to be top quality units that apparently give their clientele the type of experience they enjoy.

The owner/operators all indicated the average age of their clientele to be in the thirty-five to forty year old range. One individual also noted that the age of his clients ranged from sixteen to eighty-four years.

The entire group of game farms revealed that they could in fact handle more hunters with their present facilities. Table 5 and Figure 5 quickly show this to be the case.

TABLE 5

DAILY HUNTING PRESSURE ON GAME FARMS

<u>Day</u>	<u>% of Total Hunting Pressure</u>	<u>% Range</u>
Sunday	43.3%	40-50
Monday	2.3%	0-5
Tuesday	4.0%	2-5
Wednesday	6.7%	5-10
Thursday	4.0%	2-5
Friday	2.0%	0-5
Saturday	<u>37.7%</u>	35-40
	100.0%	

It can be seen that Saturday and Sunday account for eighty-one per cent of the total hunting pressure on the nine sample game farms. Even if these two days are running at full capacity, which is not known, a very definite amount of hunting opportunity is not being used during the week. The daily figures are very similar for all nine game farms.

DAILY HUNTING PRESSURE ON GAME FARMS

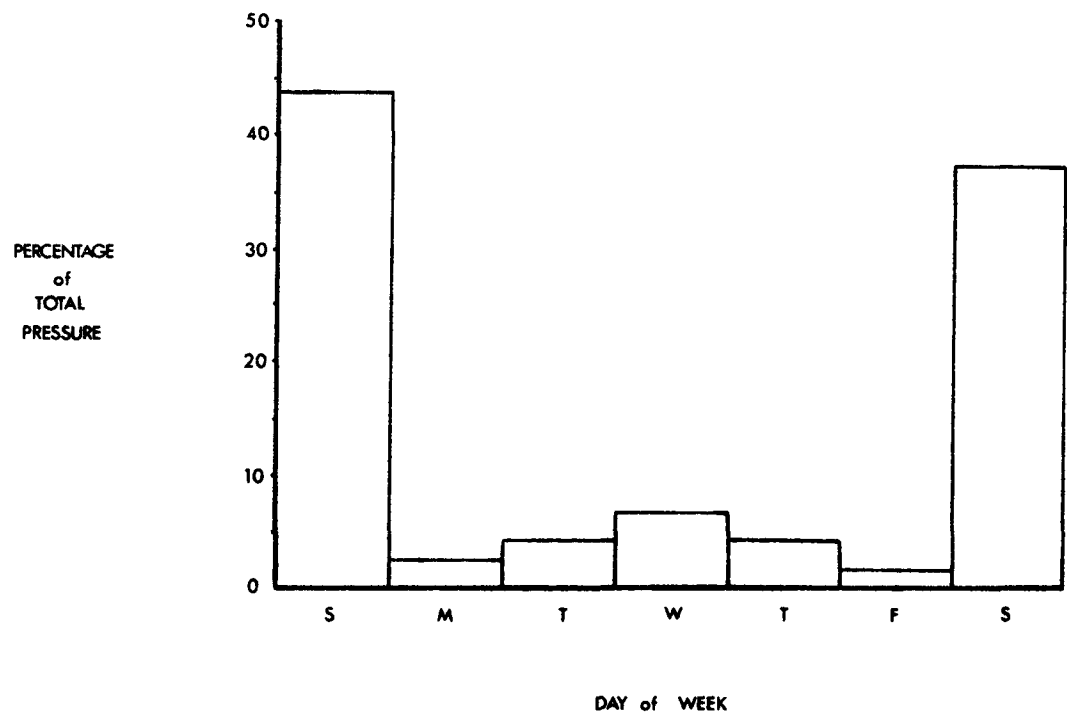


FIGURE FIVE

The hunting pressure can partially be explained by two points. The first is that one game farm does not allow hunting on Monday and another does not have hunting on Friday. The second factor, and most important, that influences the pattern of hunting pressure is the way the average work week is set up. Most workers would only be free to frequent a game farm facility on Saturday or Sunday since they are occupied at work during the rest of the week.

The large majority, eighty-two decimal eight per cent, of the game farm clientele spend four or less hours in the field. A complete list is given in Table 6 and illustrated in Figure 6 which shows the actual breakdown of the time hunters usually spend in the field.

TABLE 6

LENGTH OF HUNT ON GAME FARMS

<u>Time</u>	<u>Average</u>	<u>Range</u>
less than 2 hours	40.6%	5-90
2 to 4 hours	42.2%	10-80
over 4 hours	<u>17.2%</u>	0-25
	100.0%	

Question twenty-two dealt with the size of the hunting parties on game farms. The following table and bar-graph summarize this information.

LENGTH OF HUNT ON GAME FARMS

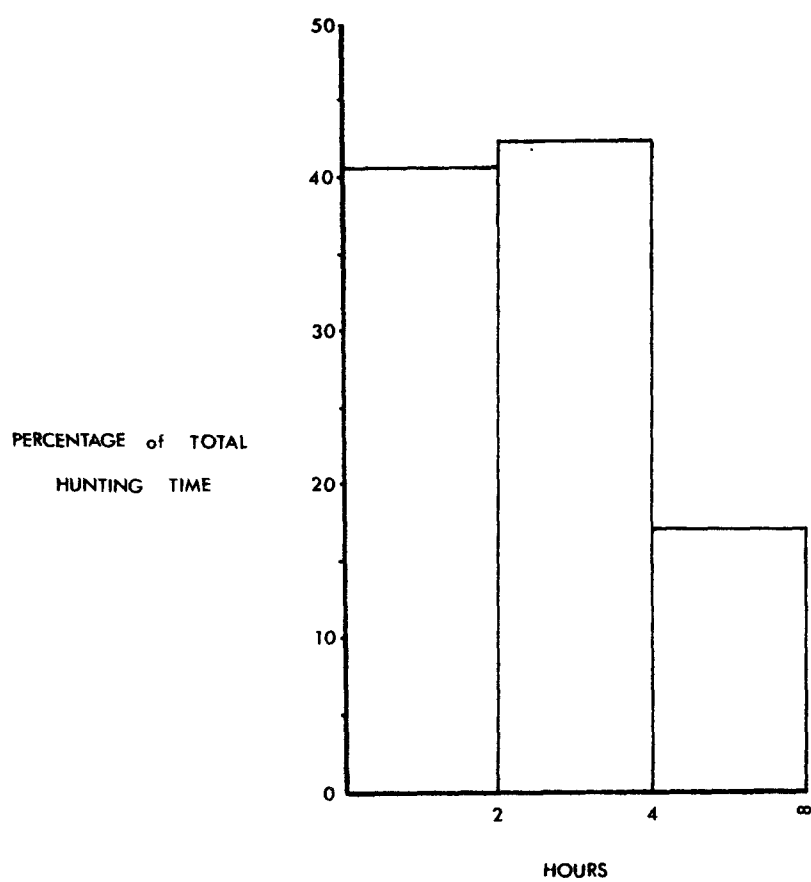


FIGURE SIX

TABLE 7

PARTY SIZE ON GAME FARMS

<u>% of Hunters</u>	<u>Party Size</u>
2.3%	1
18.3%	2
24.4%	3
45.6%	4
<u>9.4%</u>	more than 4
100.0%	

The fact that seventy per cent of the hunters use a party size of three or four could reflect one or both of the following practices. The first of these is that the individuals enjoy hunting in groups of these sizes and therefore do so. Secondly, these party sizes could be the result of the owner/operators attempts to get the largest possible number of hunters in the field at one time and still keep an acceptable level of hunter satisfaction.

This second reason is more than likely the cause of actual party size since several of the game farms stipulate the party size as well as the number of birds to be harvested by each client on the two busiest days of the week. This also causes the average party size to be between three and four. The group size of four individuals is the most common with forty-five decimal six per cent of the hunters utilizing this size of party.

PARTY SIZE OF GAME FARM USERS

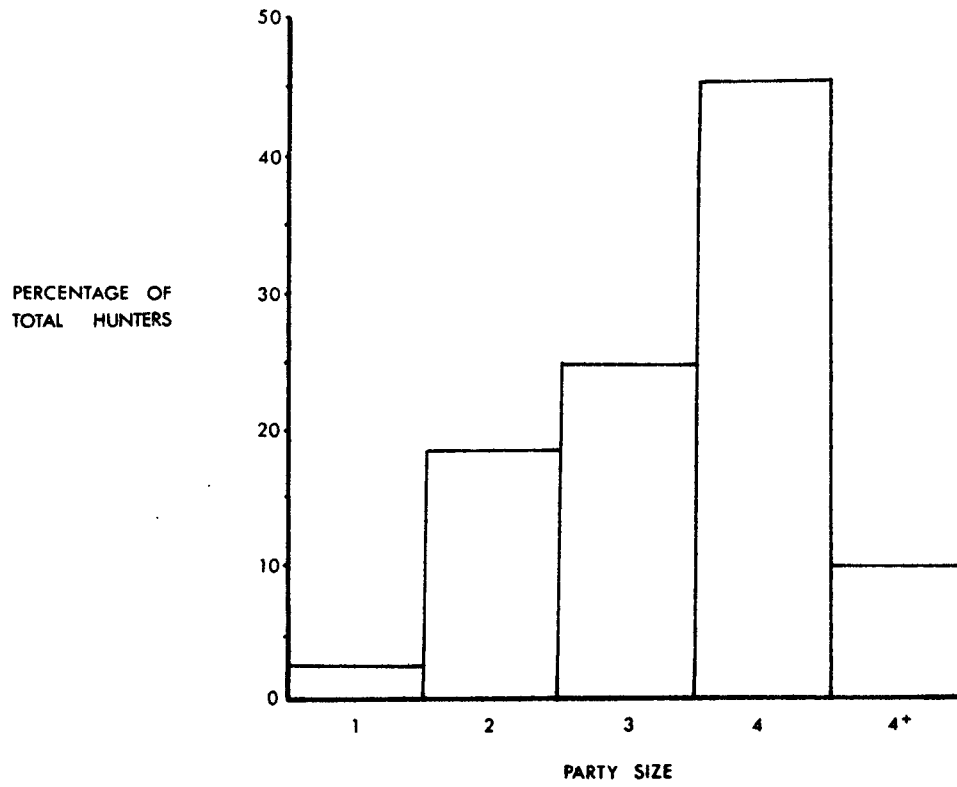


FIGURE SEVEN

The average percentage of game farm clientele belonging to hunting clubs is forty per cent and the range goes from a low of ten per cent on one to a high of sixty per cent on another. Because of the various definitions used in regard to what constitutes a 'hunting club', the above figures may not be true indicators of the percentage of hunting club clientele who utilize game farms according to the definition of terms as they apply to this study. For this reason these facts are not of a particularly useful nature at present.

The mean distance that hunters travel to use game farm facilities is approximately thirty-seven miles. Table 8 and Figure 8 illustrate this point as well as showing the overall breakdown of the percentage of game farm clientele that travel what distances.

TABLE 8

DISTANCE TRAVELLED BY GAME FARM CLIENTELE

<u>%</u>	<u>Miles</u>
0.0%	less than 5
5.0%	5-15
10.0%	16-25
14.3%	26-40
50.7%	41-60
<u>20.0%</u>	over 60
100.0%	MEAN = 37

It can be seen that eighty per cent of the clientele travel sixty miles or less to the game farm which they utilize. This mileage corresponds

DISTANCE TRAVELLED BY GAME FARM USERS

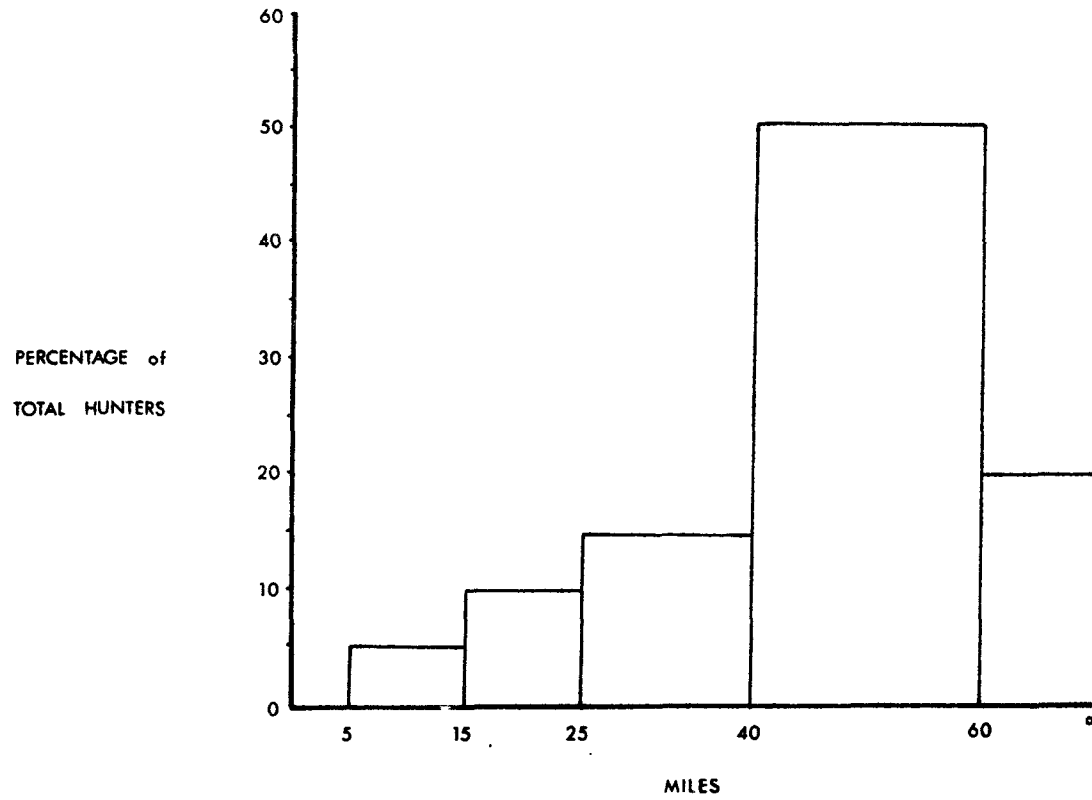


FIGURE EIGHT

with the approximate travelling time of one to one and one-half hours at a maximum. The largest area of draw is from the forty-one to sixty mile range, accounting for slightly greater than fifty per cent of the total game farm users, while only twenty per cent travel greater than sixty miles to hunt on a game farm.

The owner/operator questionnaire reveals some of the characteristics of game farms and game farm clientele in Ontario. Perhaps the most important parameter uncovered is the response of owner/operators to supply facilities in order to meet the apparent demand for areas to hunt on the part of Ontario hunters. Other characteristics revealed will be compared to the hunters of Waterloo County.

FOOTNOTES TO CHAPTER TWO

¹ Aldo Leopold, Game Management, (New York: Charles Scribner's Sons, 1933), p.11.

² Charley Dickey, "How Shooting Preserves Developed in America", in Modern Game Breeding, (300 Front Street, Boiling Springs, Pa., (26(7):), 1956.

³ Edward Kozicky and John Madson, Shooting Preserve Management--The Nilo System, (East Alton: Winchester Western Press, 1966), p.20.

⁴ Edward Kozicky, "Shooting Preserves--A Challenge", in Modern Game Breeding, (300 Frong Street, Boiling Springs, Pa., (27(2):) 1957), p.10-17.

⁵ H. Noonan, "The Shooting Preserve in New York", in The New York State Conservationist, (Albany, N.Y.: State of N.Y. Cons. Dept., Dec.-Jan. 1958-1959), p.5.

⁶ Edward Kozicky, "Will There be a Transition From Free Hunting to Paid Shooting?", in Proceedings of the Society of American Foresters, (Washington, D.C.: Soc. of Am. Foresters, 1958), p.105-107.

⁷ Edward Kozicky and John Madson, Shooting Preserve Management--The Nilo System, (East Alton: Winchester Western Press, 1966), p.20.

⁸ L. Smith, American Game Preserve Shooting, (Garden City: Garden City Publishing Co., Inc., 1937), p.forward.

⁹ Edward Kozicky and John Madson, "The Shooting Preserve Concept", in A Manual of Wildlife Conservation, (Washington, D.C.: The Wildlife Society, 1971), p.136-139.

¹⁰ Ibid.

¹¹ Ontario Department of Lands and Forests, Statistics, 1971, (Toronto: Dept. of Lands and Forests, 1971), p.30.

¹² Charlie Gillham, "About Nilo Farms", in Game Breeders Gazette, (1328 Allen Park Drive, Salt Lake City, Utah, 7(7), 1958), p.32-34.

¹³ Edward Kozicky and John Madson, Shooting Preserve Management--The Nilo System, (East Alton: Winchester Western Press, 1966), p.22.

¹⁴ Ibid., p.23.

¹⁵ North American Game Breeders and Shooting Preserve Association, North American Shooting Preserve Directory 1970-1971, (New York: Outdoor Life, 1970), p.16.

FOOTNOTES TO CHAPTER TWO

¹⁶H. Noonan, "The Shooting Preserve In New York", in The New York State Conservationist (Albany: N.Y., State of N.Y. Cons. Dept., Dec.-Jan., 1958-59), p.5.

¹⁷L. G. MacNamara, "Shooting Preserves In New Jersey", in New Jersey Outdoors (Trenton: N.Y. Dir. of Fish and Game, 11(8): 1961), p.7-14.

¹⁸H. Harper, et. al., A Review of the Licensed Pheasant Club Program In California 1939-1963, (Sacramento: Cal. Dept. of Fish and Game, 1965), p.19.

¹⁹L. Williamson, "Regulated Shooting Preserves In Connecticut", from Trans. N. Am. Wildlife Conf., (Washington, D.C.: Wildlife Management Institute, 5:1940), p.354-359.

²⁰J. Sullivan, "Fee Shooting's Twentieth Anniversary" in Pennsylvania Game News (Harrisburg: Pa. Game Comm., 19(1), 1958), p.2.

²¹Michigan State University, Outdoor Recreation Resources Review Commission, Report No. 19, (Washington: U.S. Government Printing Office, 1962), p.40.

²²Ibid.

²³Ibid.

²⁴Michigan State University, Outdoor Recreation Resources Review Commission, Report No. 6, (Washington: U.S. Government Printing Office, 1962), p.37.

²⁵Michigan State University, Outdoor Recreation Resources Review Commission, Report No. 11 (Washington: U.S. Government Printing Office, 1962), p.39.

²⁶Ibid., p.40.

²⁷Ibid., p.42.

²⁸Ibid., p.39-40.

²⁹Letter: Dr. A.N. Moen, Professor of Wildlife Science, Cornell University, September 3, 1971, Ithaca.

³⁰Ontario Department of Lands and Forests, Statistics, 1971 (Toronto: Dept. of Lands and Forests, 1971), p.28.

³¹Ibid., 1962-1971.

³²Ibid., 1971.

FOOTNOTES TO CHAPTER TWO

³³6,051 is the value for pheasant only, there are also 3,315 hunter days for quail, but it is not known how many quail hunters shoot pheasants on the same trip. It is estimated at ninety-eight per cent to one hundred per cent.

³⁴Ontario Department of Lands and Forests, Statistics, 1971 (Toronto: Dept. of Lands and Forests, 1971), p.28.

³⁵Edward Kozicky and John Madson, Shooting Preserve Management--The Nilo System, (East Alton: Winchester Western Press, 1966), p.237.

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C H A P T E R T H R E E

THE HUNTERS OF WATERLOO COUNTY

A. PRESENT PATTERNS AND CHARACTERISTICS

(i) Location, Travel Patterns, and Party Size Characteristics

As previously stated the patterns and characteristics of the hunters were pursued by means of a questionnaire. (Appendix 2) The exact wording of the questions can be referred to as the tabulated results are discussed. The format of this analysis generally follows the order in which the questions were asked.

The first characteristic to be considered was age. This question was left open-ended, and the data placed in classes or groupings at a later time. All four hundred and twenty-seven of the usable questionnaires tabulated in the analysis had this question answered. The following table and bar graph illustrate the results obtained.

TABLE 9

AGES OF RESPONDENTS

<u>AGE</u>	<u>NO. OF RESPONDENTS</u>	<u>PERCENTAGE</u>
20 or less	14	3.2%
21 - 30	99	23.2%
31 - 40	141	33.0%
41 - 50	113	26.5%
51 - 60	57	13.4%
over 60	3	.7%
TOTAL	427	100.0%

Mean age for ungrouped data 38; Median age for ungrouped data 37.

AGE DISTRIBUTION

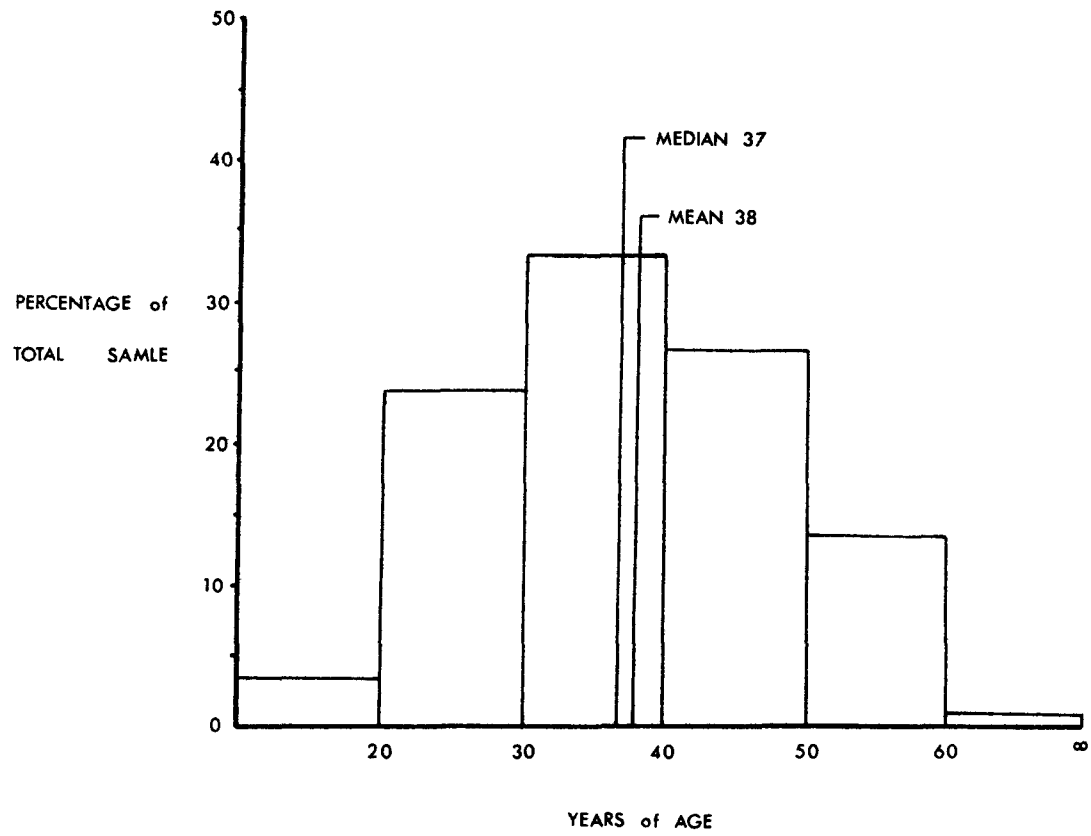


FIGURE NINE

It can be seen that the largest single group is the thirty-one to forty year category, and that eighty-two decimal seven per cent of the sample are over twenty, but not over fifty years of age. This data will be used at a later stage of the analysis to see if age shows any relationship with other hunter characteristics.

The number of respondents residing in Waterloo County was three hundred and ninety-two (ninety-one decimal eight per cent) of the four hundred and twenty-seven hunters questioned. Of this total two hundred and forty (fifty-six decimal two per cent) live in a city or a town with a population of 2,500 or greater. Table 10 gives the locations of the residences of the hunters surveyed and enables comparisons among the groups as well as with the population distribution throughout the county. Only thirty-nine (nine decimal two per cent) of the hunters questioned live on farms.

The data from Table 10 will be utilized to look at differences and similarities in the characteristics and patterns of urban and rural hunters.

The hunting club members constituted two hundred and forty-three (fifty-six decimal nine per cent) of the sample. It is not known what percentage of the total hunter population belong to clubs, and the method of data collection does not allow us to induce this figure. Therefore the fifty-six decimal nine per cent of club members is only true for the sample population.

TABLE 10

DISTRIBUTION OF SAMPLE

<u>Location</u>	<u>No. of Respondents</u>	<u>Percentage of Sample</u>	<u>Assessed Population*</u>	<u>Percentage Population</u>
Cities and Towns	240	56.2%	204,750	87.1%
Elmira	25	5.8%	4,462	1.9%
Galt	24	5.6%	36,900	15.7%
Hespeler	18	4.2%	6,082	2.6%
Kitchener	54	12.7%	105,661	44.9%
New Hamburg	30	7.0%	2,816	1.2%
Out of County	20	4.7%	----	----
Preston	16	3.8%	15,185	6.5%
Waterloo	53	12.4%	33,644	14.3%
Townships	187	43.8%	30,613	12.9%
North Dumfries	40	9.4%	3,912	1.7%
Out of County	15	3.5%	----	----
Waterloo	14	3.3%	8,544	3.6%
Wellesley	32	7.5%	5,157	2.1%
Wilmont	44	10.3%	6,858	2.9%
Woolwich	42	9.8%	6,142	2.6%
Total Study Area	427	100.0%	235,363	100.0%

*Source: Fyfe, 1969

Hunters presently hunting upland birds in Waterloo County numbered two hundred and ninety-four (sixty-eight decimal nine per cent) with only thirty (seven per cent) persons questioned not hunting upland birds at all. This shows a rather large percentage (ninety-three per cent) hunting upland birds and Table 11 shows the response of the club

members compared to that of the non-club members. This is illustrated so that a Chi-Square Test can be run to determine if a significant difference exists between the responses of the two groups. (Table 12)

TABLE 11

WHERE RESPONDENTS HUNT

	<u>Club</u>		<u>Non-Club</u>		<u>Combined</u>	
In County	167	68.7%	127	69.0%	294	68.9%
Out of County	62	25.6%	41	22.3%	103	24.1%
Not at all	<u>14</u>	<u>5.7%</u>	<u>16</u>	<u>8.7%</u>	<u>30</u>	<u>7.0%</u>
Total	243	100.0%	184	100.0%	427	100.0%

TABLE 12

CHI-SQUARE ON WHERE RESPONDENTS HUNT

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
68.7	69.9	-1.2	14.4	.021
25.6	23.3	2.3	52.9	.23
5.7	8.7	-3.0	9.0	<u>1.04</u>

$$x^2 = 1.291$$

The null hypothesis tested with the chi-square test is; there is no significant difference in hunting locations utilized by the non-club members and the hunting club members.

The calculated χ^2 value is 1.291. The table value for chi-square, at the decimal zero five level of significance and two degrees of freedom is 5.991. Therefore, since the calculated value is the smaller of the two only chance is involved and the null hypothesis can not be rejected. This means that no significant difference exists between the hunting locations of the club and non-club members. Therefore the author will assume that all the patterns and characteristics of these two groups of upland bird hunters show no significant differences.

All of those hunting upland birds outside of Waterloo County, and eighteen of those not hunting upland birds at all, gave the following reasons, in various combinations, for doing so.

1. The lack of upland birds available in Waterloo County.
2. The relative lack of upland birds available in Waterloo County as compared to other nearby areas.
3. The lack of facilities and areas where upland birds can be hunted in the county.
4. The relative lack of facilities and areas where upland birds can be hunted in the county, compared to other nearby areas.

The most common reply was 'no birds in Waterloo County'. This in fact could be the problem. Forty-three of those who do hunt upland birds in the county added comments to indicate that the availability of birds was decreasing and the number of hunters in the field was increasing. Thirty-seven of these also indicated that they hunt out of the county, and in some cases more often than not.

It would be interesting to determine the degree of satisfaction among those hunters utilizing areas of Waterloo County to hunt upland birds. The possibility exists that this satisfaction is actually quite low, or at least low relative to other nearby areas.

Before carrying the analysis any further it should be noted that the thirty non-bird hunters will be left out until the second part of the questionnaire is discussed.

Assuming that hunters usually travel to an area where they receive a quality hunting experience, the following data is designed to show the distances these hunters travel to obtain their particular levels of satisfaction. Table 13 and Figure 10 illustrate these points and show a rather even spread of hunters over the various distance groups. If our assumption is correct, we can deduce that the geographic areas offering satisfaction may vary, but not necessarily the levels of satisfaction.

With regards to Table 13 and Figure 10, it should be noted that twenty-one of the thirty-seven persons travelling less than five miles are from Wilmot Township. The remainder of the Wilmot group of forty-four is divided with seventeen in the five to fifteen mile group and six in the sixteen to twenty-five mile category. None of the other resident groups show this high propensity to hunt close to home. (Table 14).

DISTANCE TRAVELLED BY HUNTERS

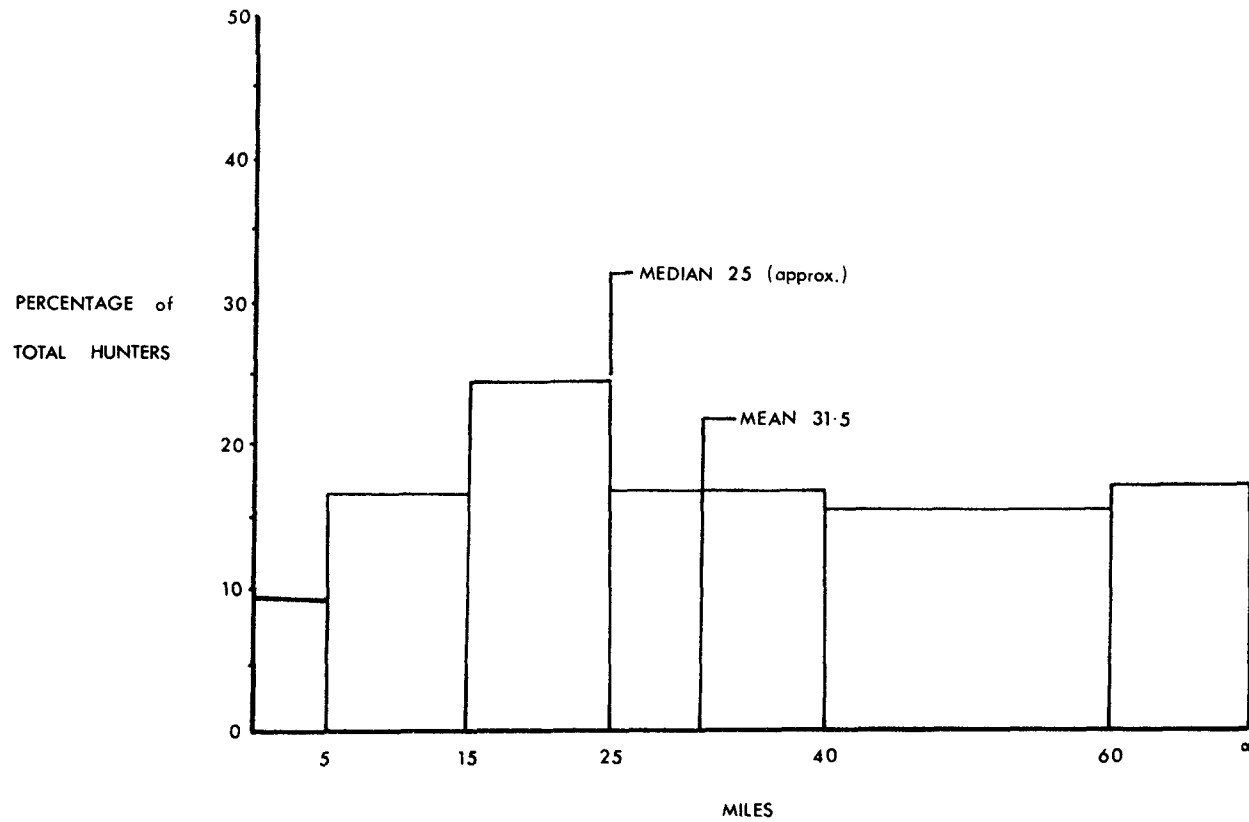


FIGURE TEN

TABLE 13

DISTANCE TRAVELLED BY HUNTERS

<u>Distance (in miles)</u>	<u>Respondents</u>	<u>Percentage</u>
Less than 5	37	9.3%
5 - 15	66	16.6%
16 - 25	97	24.4%
26 - 40	67	16.9%
41 - 60	61	15.4%
Over 60	<u>69</u>	<u>17.4%</u>
TOTAL	*397	100.0%

MEAN 31.5 miles

MEDIAN approximately 25 miles (the 199th hunter is the last one in the 16-25 group)

* the thirty non-bird hunters have been dropped.

** in the greater than sixty group used value of eighty to determine mean.

A closer look at the distances travelled and the number of hunters in each category shows that distance does not appear to affect the hunting experience of hunters as a group. This is to say that the usual drop-off in the number of participants as distance increases does not occur. When the cumulative percentages are tabulated and graphed however, a gently sloping curve shows a definite drop in the percentage of hunters as the distance travelled increases.

Table 14 shows the distance travelled compared to the residence locations of the survey group. It can be immediately seen that differences appear to exist in the distances travelled compared to residence.

The first patterns that seem to develop are between the rural or township residents, and those living in urban areas. By plotting these data on graphs, (Figure 12) we can compare one group to the other.

TABLE 14

LOCATION AND DISTANCE USUALLY TRAVELLED

Table 4B Location	Non- Upland Bird Hunters	Distance In Miles						Totals
		5	5-15	16-25	26-40	41-60	60	
<u>City or Town</u>								
Elmira	2	1	1	6	10	3	2	23
Galt	5	-	2	9	6	1	1	19
Hespeler	-	-	1	10	5	1	1	18
Kitchener	2	-	-	8	8	16	20	52
New Hamburg	2	2	4	7	5	5	5	28
Out of County	-	-	-	2	1	13	4	20
Preston	4	-	2	3	-	-	7	12
Waterloo	3	-	1	8	4	18	19	50
<u>Township</u>								
North Dumfries	4	2	17	3	9	2	3	36
Out of County	-	-	2	1	6	-	6	15
Waterloo	7	1	3	1	2	-	-	7
Wellesley	-	6	7	17	1	1	-	32
Wilmot	-	21	17	6	-	-	-	44
Woolwich	1	4	9	16	10	1	1	41
<u>TOTALS</u>	30	37	66	97	67	61	69	397
City Total	Urban	3	10	53	39	57	59	
Township Total	Rural	34	56	44	28	4	10	

In Figure 12A the absolute number of hunters is compared to the distance travelled. It can be seen that a larger number of urban residents travel greater distances and that the rural residents travel a shorter distance on the average. Similarly, in Figures 12B and 12C, this fact is illustrated.

CUMULATIVE PERCENTAGE : DISTANCE TRAVELLED

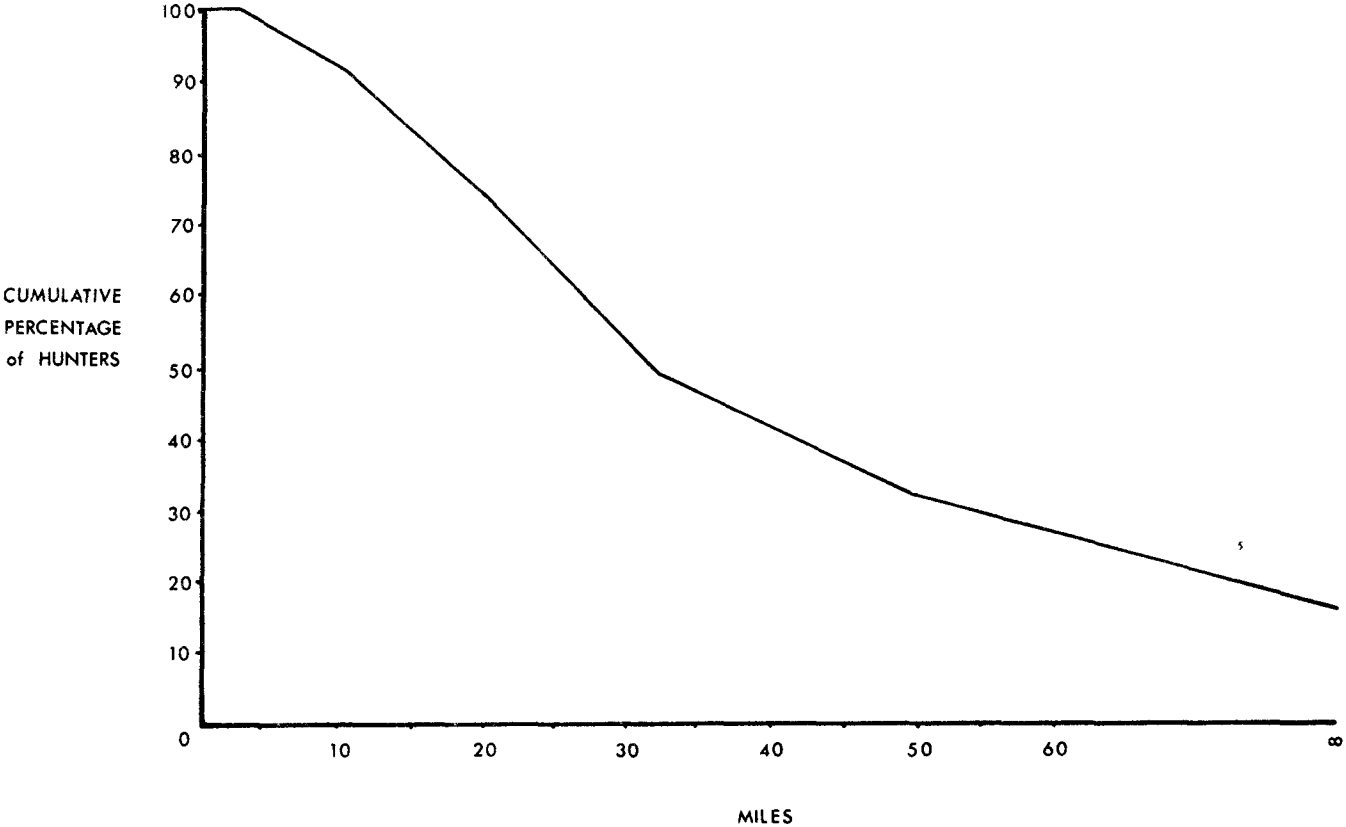


FIGURE ELEVEN

CITY AND RURAL HUNTERS : DISTANCE TRAVELLED

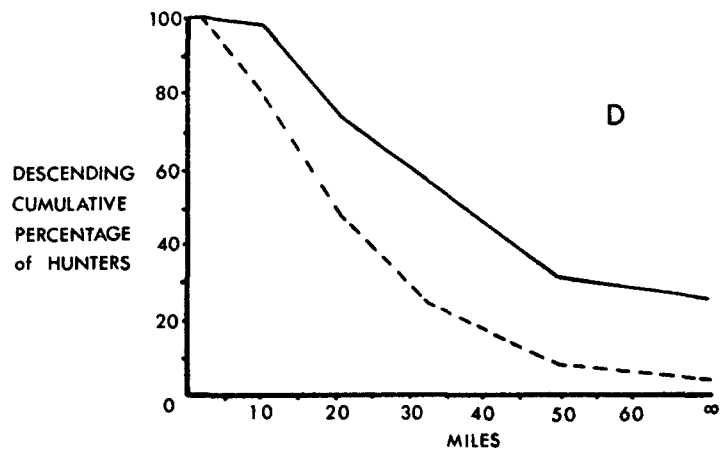
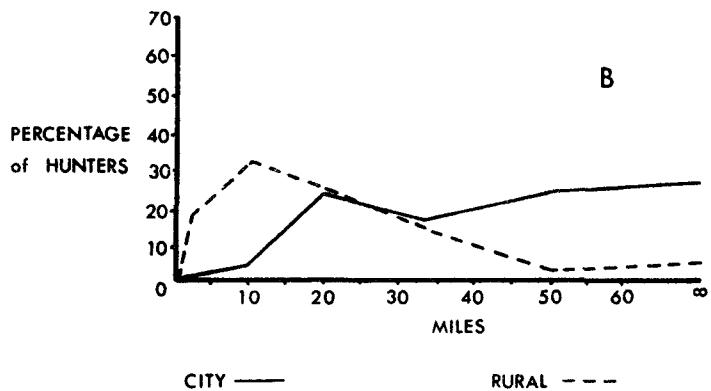
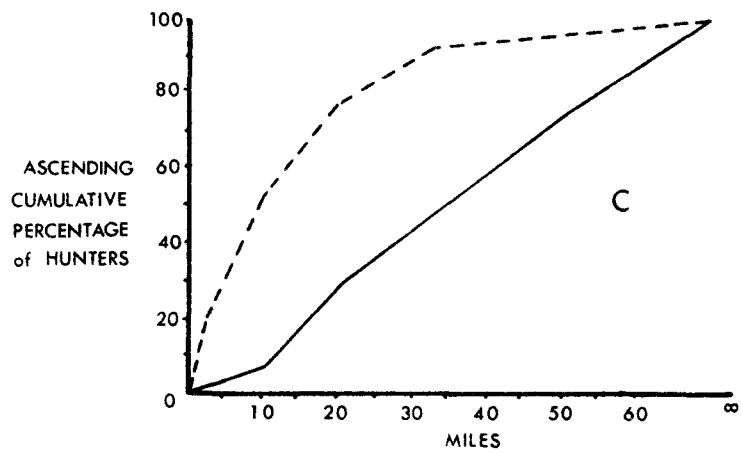
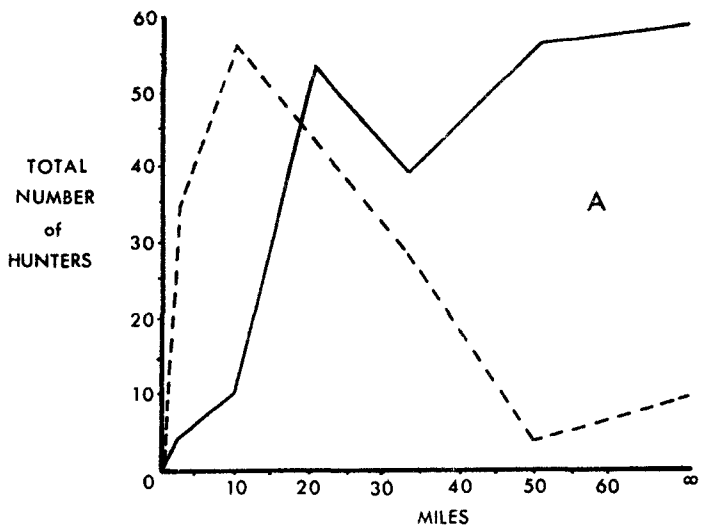


FIGURE TWELVE

In order to determine if this difference was significant, two chi-square tests were run on the data. The null hypothesis tested was: that no significant difference exists in the distances travelled by urban and rural hunters.

TABLE 15

CHI-SQUARE ON DISTANCES TRAVELLED

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
3	34	-31	961	28.264
10	56	-46	2116	37.786
53	44	11	121	2.750
39	28	11	121	4.321
57	4	53	2809	702.250
59	10	49	2401	<u>240.100</u>
				$x^2 = 1015.291$

TABLE 16

CHI-SQUARE ON DISTANCES TRAVELLED

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
1.4	19.3	-17.9	320.41	16.602
4.5	31.8	-27.3	745.29	23.437
23.9	25.0	- 1.1	1.21	.048
17.7	15.9	1.8	3.24	.204
25.8	2.3	23.5	552.25	240.109
26.7	5.7	21.0	441.00	<u>77.368</u>
				$x^2 = 357.768$

The table value for chi-square at the decimal zero five level of significance and five degrees of freedom is 11.070. In both tests the calculated value is greater than the table value. Therefore, in both instances, the null hypothesis is rejected, and it is assumed that a significant difference does exist in the distances travelled to hunt by the urban dwelling and rural based hunters.

City size may be one of the factors which attributes to the differences in distance travelled. Hunters from the larger urban centers can travel up to ten miles, and more, before they are even out of the city limits. Therefore, this group is forced to go at least part of the total distance travelled in order to reach an area where hunting is permitted, whereas the township dwellers need only travel one mile at the most to reach such an area.

The characteristic of hunting close to home that belongs to the Wilmot group could possibly be taken to indicate that Wilmot Township has better than average hunting opportunities for upland birds when compared to the rest of the county. No reliable conclusions can be reached in this study however, since it is not known if there is a large influx into Wilmot Township on the part of outside residents which would tend to indicate a better hunting experience.

With Waterloo County measuring approximately twenty-five miles by thirty-five miles in size it is reasonable to assume that all of the hunters travelling forty-one miles or greater are leaving the

county. By the same token those travelling fifteen miles or less can be assumed to remain within the boundaries of Waterloo County. It is the hunters travelling between sixteen and forty miles (forty-one decimal three per cent) that could possibly be either in or out of the county. On the assumption that one-half of these individuals leave the county to hunt, a total of fifty-three decimal four per cent of the sample group are found to hunt outside of Waterloo County at least part of the time. This fact cannot be substantiated from the present study with documented evidence since the survey group was not asked to identify their usual destinations. If however, the assumptions are true, it can be seen that the majority of hunters within the county are going elsewhere to enjoy their hunting experiences in relation to upland game birds.

In Table 17 below, the distances usually travelled by Waterloo County hunters are compared to the distances travelled by game farm clientele in Ontario. The null hypothesis tested is that no significant difference exists in the distances travelled by these two groups.

The calculated χ^2 value is eighty-three decimal twelve while the table value at the decimal zero five level of confidence and five degrees of freedom is eleven decimal zero seven. Therefore a significant difference exists and the null hypothesis is rejected. This indicates that there is a difference in the distances travelled by Waterloo County hunters and game farm clientele.

TABLE 17

CHI-SQUARE ON DISTANCES TRAVELLED:WATERLOO COUNTY HUNTERS AND GAME FARM CLIENTELE

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
9.3	0.0	9.3	86.49	0.0
16.6	5.0	13.6	184.96	36.99
24.4	10.0	14.4	207.36	20.74
16.9	14.3	2.6	6.76	.47
15.4	50.7	-35.3	1246.09	24.58
17.4	20.0	- 2.6	6.76	<u>.34</u>
				$\chi^2 = 83.12$

Even though the chi-square results show a difference in the over-all distances travelled several similarities do exist. An additional test, Table 18, shows that no significant difference exists in three aspects of the distances travelled.

TABLE 18

TEST OF THREE ASPECTS OF DISTANCE TRAVELLED

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
16.9	14.3	2.6	6.76	.47
17.4	20.0	-2.6	6.76	.34
82.6	80.0	2.6	6.76	<u>.08</u>
				$\chi^2 = .89$

In this test the first row is the twenty-six to forty mile group, the second row is the over sixty mile category, and the third row represents the hunters travelling sixty miles or less to hunt.

The calculated χ^2 value is decimal eighty-nine and the table value at the decimal zero five level of confidence with two degrees of freedom is 5.991. Therefore, no significant difference exists between these three characteristics of the game farm clientele and the Waterloo County hunters, although other aspects of the distances travelled are very dissimilar.

As expected a rather large percentage of the sample would like to hunt closer to home. A total of three hundred and twenty-five (eighty-one decimal nine per cent) of the hunters indicated this desire.

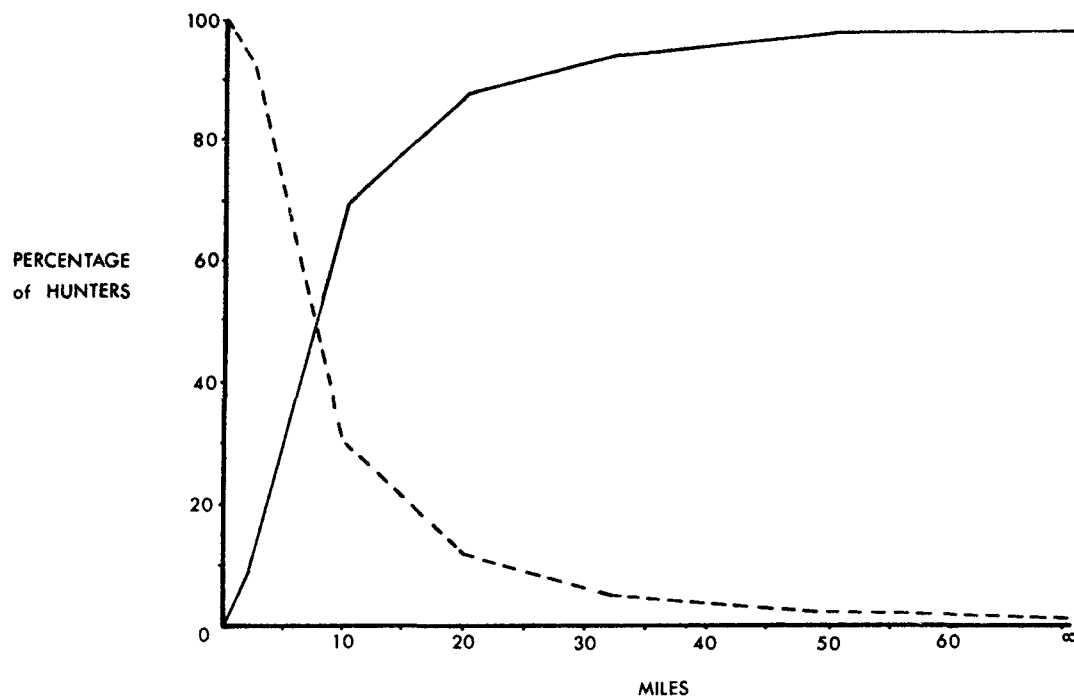
TABLE 19

DISTANCE: HUNT CLOSER TO HOME

	Distance in Miles											
	<5		5 - 15		16 - 25		26 - 40		41 - 60		>60	
Want Closer	34	91.9%	20	30.3%	12	12.4%	4	6.0%	1	1.6%	1	1.5%
Do not Want Closer	3	8.1%	46	69.7%	85	87.6%	63	94.0%	60	98.4%	68	98.5%
TOTAL	37	100.0%	66	100.0%	97	100.0%	67	100.0%	61	100.0%	69	100.0%

By plotting the results of Table 19, the distance travelled compared to wanting to hunt closer to home, on a graph, (Figure 13) we can see that as the distance travelled increases the chance of wanting to hunt closer to home also increases. Stated another way this illustrates that the closer to home a person hunts, the less likely he is to

DISTANCE : HUNT CLOSER TO HOME



WOULD LIKE TO HUNT CLOSER TO HOME —

DO NOT WANT TO HUNT CLOSER TO HOME ---

FIGURE THIRTEEN

want to hunt even closer to home. In its present form this data does not show how much closer to home these individuals would like to hunt.

The greatest distance that persons had travelled to hunt upland birds varied drastically. The range being from three to eighteen hundred miles and the mean one hundred and four miles. This mean is distorted due to the several individuals travelling extremely long distances, and the median of sixty-one miles can be assumed to be a better measure of central tendency in this instance.

In relation to time, it appears that as the actual distance travelled increases so does the length of time thought to be reasonable to travel to an area to hunt upland birds. Table 20 gives a synopsis of the distance travelled and reasonable time data. Figure 14 illustrates this material further.

TABLE 20

REASONABLE TIME* TO TRAVEL

Distance in Miles	<5	5 - 15	16 - 25	26 - 40	41 - 60	>60
Reasonable Travel Time	1/2 hr.	1 hr.	1 3/4 hr.	1 3/4 hr.	1 3/4 hr.	2 1/4 hr.

*Rounded to the nearest one-quarter hour, and shown as averages.

It is quickly seen that the average reasonable time value in each category is more than sufficient to travel the distance in miles of the categories. If we assume an average travel distance of forty miles

CUMULATIVE PERCENTAGE COMPARISON OF DISTANCE TRAVELLED
AND DISTANCE THOUGHT REASONABLE TO TRAVEL

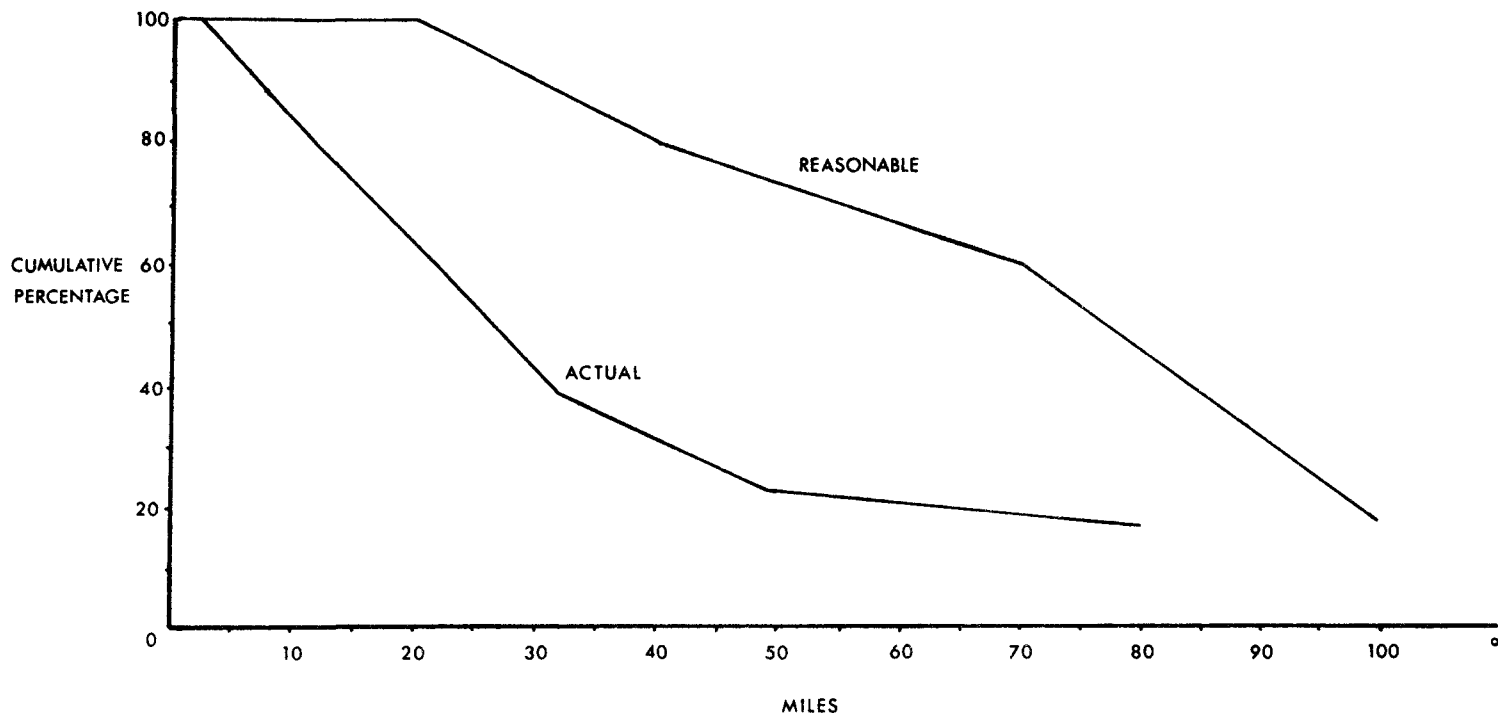


FIGURE FOURTEEN

per hour, it can be shown that the hunters in the survey travel less distance to hunt than what they could travel if their reasonable time values are converted to distance.

Information tabulated, on distance and reasonable time, before the data was grouped, indicated that fifty-nine decimal eight per cent of the sample felt that between one and two hours was a reasonable time to travel. A total of twenty-one decimal eight per cent thought that less than one hour was reasonable. If these hunters travel only the distance they feel reasonable, then eighty-one decimal six per cent of the survey group will travel two hours or less. If the two hours are converted to miles, at an average of forty miles travelled per hour, then eighty-one decimal six per cent of the hunters will travel eighty miles or less to hunt.

The data compiled illustrates that sixty-five per cent of the hunters surveyed preferred to, or at least usually do hunt in parties of two and four individuals. The average party size, rounded to the nearest whole hunter, is three, but in actuality only eighteen decimal four per cent of the hunters use this size of group in their usual hunt. A complete breakdown of party size appears in Table 21 and is demonstrated in Figure 15.

When the average party size is plotted against the distance travelled it appears that as the distance increases the average party size also increases. Table 22 and Figure 16 illustrate this particular phenomenon.

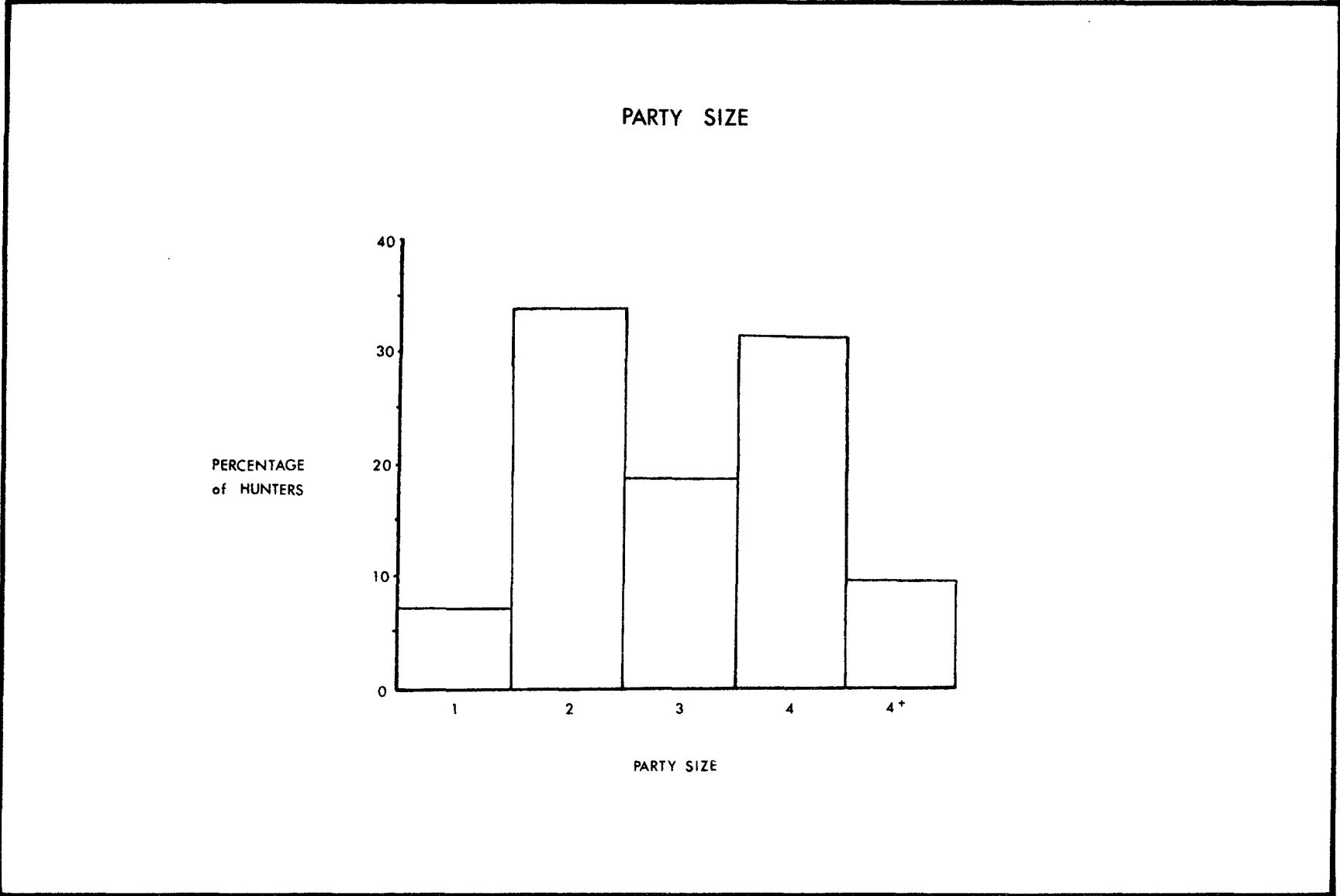


FIGURE FIFTEEN

TABLE 21

PARTY SIZE

<u>Size</u>	<u>Respondents</u>	<u>Percentage</u>
Yourself alone	28	7.0%
Party of 2	134	33.8%
Party of 3	73	18.4%
Party of 4	124	31.2%
More than 4*	<u>38</u>	<u>9.6%</u>
TOTAL	397	100.0%

*Used a value of five to calculate group average.

TABLE 22

PARTY SIZE COMPARED TO DISTANCE TRAVELLED

Distance in Miles	<5	5-15	16-25	26-40	41-60	>60
Average Party Size	1.3	2.0	3.0	3.3	4.4	4.0

*Rounded to the nearest tenth.

The average party size will likely decrease with a further increase in the distance travelled. The over sixty mile group has a combined average party size of four, but several large groups place this value higher than it possibly should be. This decrease in party size would be due to the time factor and the cost incurred in making longer hunts.

PARTY SIZE COMPARED TO DISTANCE TRAVELLED

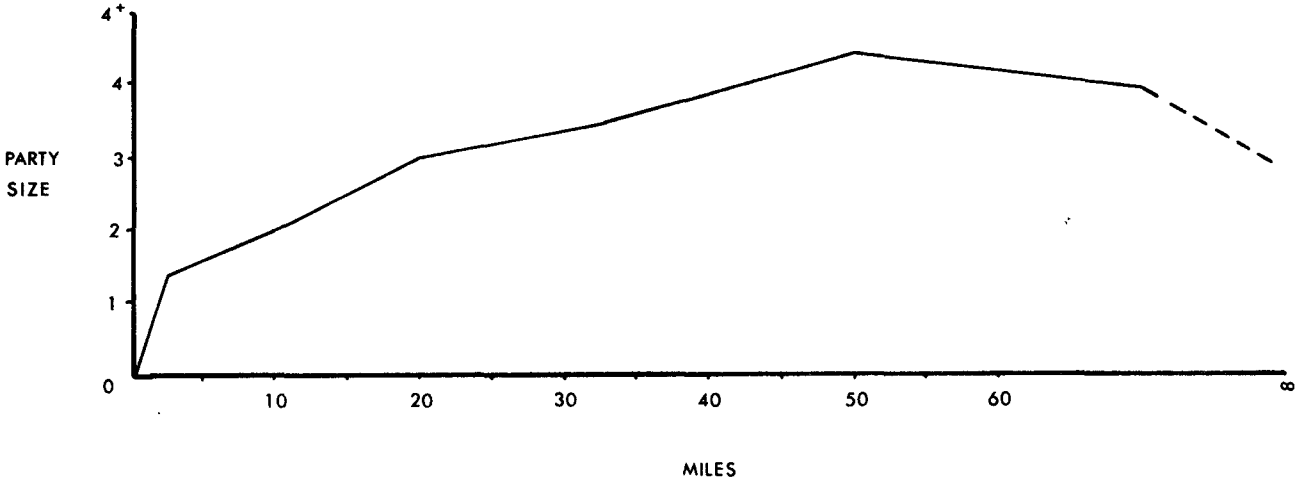


FIGURE SIXTEEN

It is probable that some hunters feel the additional outlay is not proportional to the increase return in the quality of the hunting experience, and therefore only smaller parties of hunters would travel these longer distances.

In Table 23 below the party sizes used on game farms in Ontario are compared to the party sizes utilized by the hunters in Waterloo County. The null hypothesis being tested is that there is no significant difference in the party sizes used by the two groups.

TABLE 23
COMPARISON OF PARTY SIZES

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
2.3	7.0	- 4.7	22.09	3.156
18.3	33.8	-15.5	240.25	7.108
24.4	18.4	6.0	36.0	1.957
45.6	31.2	14.4	207.36	6.646
9.4	9.6	- 0.2	.04	<u>.004</u>
				$x^2 = 22.027$

The calculated x^2 value is 22.027 while the table value at the decimal zero five level of confidence and four degrees of freedom is 9.488. Therefore, a significant difference does exist between the two groups and their usual party size and the null hypothesis is rejected.

Even though the overall patterns exhibit a significant difference, further testing on the party sizes of one, three and more than four

individuals shows that no significant difference exists between these particular groups. This tends to show that similarities, as well as differences do enter into the characteristics of party size in relation to game farm users and the hunters of Waterloo County.

TABLE 24

A FURTHER COMPARISON OF PARTY SIZE

<u>Observed</u>	<u>Expected</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
2.3	7.0	-4.7	22.09	3.156
24.4	18.4	6.0	36.00	1.957
9.4	9.6	-0.2	0.04	<u>.004</u>
				$\chi^2 = 5.117$

The calculated χ^2 value is 5.117 and the table value at the decimal zero five level of significance is 5.991 with two degrees of freedom.

Therefore, no significant difference exists between the two groups in regard to party sizes of one, three and over four individuals.

(ii) Hunting Pressure by Species

In order to determine which species of upland birds are subjected to the greatest hunting pressure the sample group was asked to rank the upland birds from one to five, with one being the species they hunted most often. A small problem arose in this question when several persons merely checked (✓) off the species that they hunted instead of ranking them. This resulted in eleven of the questionnaires not being used in this analysis. The tabulated results of this data are shown and illustrated.

TABLE 25

HUNTER'S CHOICE OF SPECIES

<u>Species</u>	<u>Ranked Position</u>					<u>TOTAL B</u>	<u>Percentage of Hunters</u>
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>		
Duck	209	79	50	20	16	374	94.2%
Grouse	30	34	37	38	40	179	45.1%
Partridge	39	82	52	32	7	212	54.4%
Pheasant	105	106	91	18	7	327	82.3%
Quail	3	5	26	31	21	153	38.5%
TOTAL A	386	313	256	139	91	(397	= 100.0%)

In way of explanation of Table 25, it should be noted that Total A indicates the number of hunters ranking choices from one to five and Total B shows the total number of persons hunting each particular species of upland bird.

By using the Total A data it can be determined exactly how many hunters pursue one, two, three, four or five different species of upland birds. To the nearest whole bird, the average hunter is a potential harvester of three different species. A complete breakdown appears in the following chart.

TABLE 26

NUMBER OF SPECIES HUNTED

<u>No. of Species</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>No. of Hunters</u>	73	57	117	48	91

In plotting the cumulative percentages of the hunters compared to the number of different species hunted, it can be shown that as the number of species increases, the number or percentage of total hunter population decreases. Figure 17 illustrates this inverse relationship.

In order to better illustrate the hunting pressure by species, weighted values were given to each bird according to the position in which it was ranked by the individual hunters. This weighting was done proportionate to the rank given. This is to say that for each hunter giving a bird his first choice, that species received a score of five, if the bird received the hunter's second choice it was given a score of four, and so on down until the bird that received the hunter's fifth choice obtained a score of one.

<u>Hunter's Choice</u>	<u>Weighted Score Given</u>
1	5
2	4
3	3
4	2
5	1

This method allowed Table 27 to be tabulated and is illustrated further in Figure 18. It can readily be seen that duck and pheasant account for a substantial portion of the total hunting pressure by species.

CUMULATIVE PERCENTAGE OF HUNTERS
COMPARED TO THE NUMBER OF SPECIES HUNTED

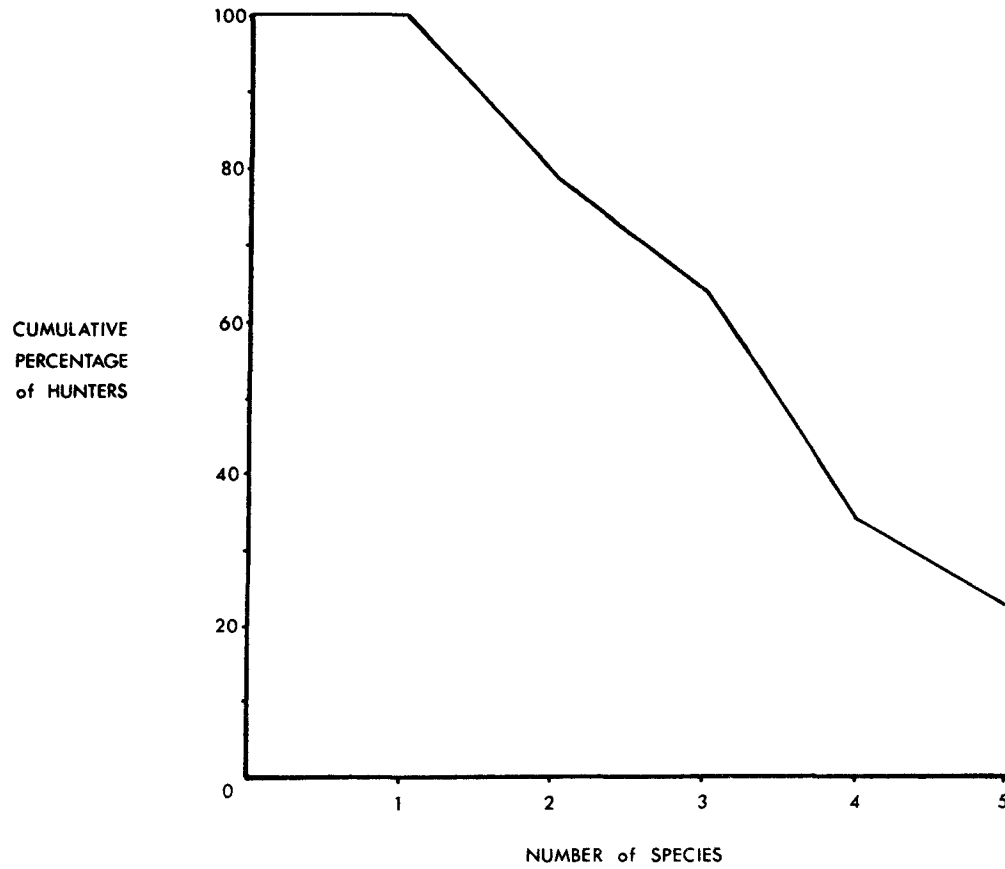


FIGURE SEVENTEEN

TABLE 27
HUNTING PRESSURE BY SPECIES

<u>Species</u>	<u>Weighted Score</u>	<u>Percentage</u>	<u>Rank</u>
Duck	1537	35.8%	1
Grouse	513	12.0%	4
Partridge	750	17.5%	3
Pheasant	1265	29.5%	2
Quail	<u>224</u>	<u>5.2%</u>	5
TOTAL	4289	100.0%	

One problem exists with the hunting pressure by species data. This is the fact that the analysis does not include the number of days hunted for each species. This information could not be tabulated from the questionnaire. Therefore, in order for the hunting pressure results to be meaningful, we must assume that each hunter spends a proportionate length of time hunting each species in direct relationship with the rank he attributed to each species.

In order to obtain a better estimation of hunting pressure by species, the author decided to calculate a weighted score for the first three choices only. This was done for two reasons, the first being that the average number of species hunted was three, and secondly, it was felt this method would eliminate error due to hunters ranking all five species when they only hunt two or three.

Table 28 and Figure 19 illustrate the new weighted scores, and show that the extremes have become more extreme.

HUNTING PRESSURE BY SPECIES

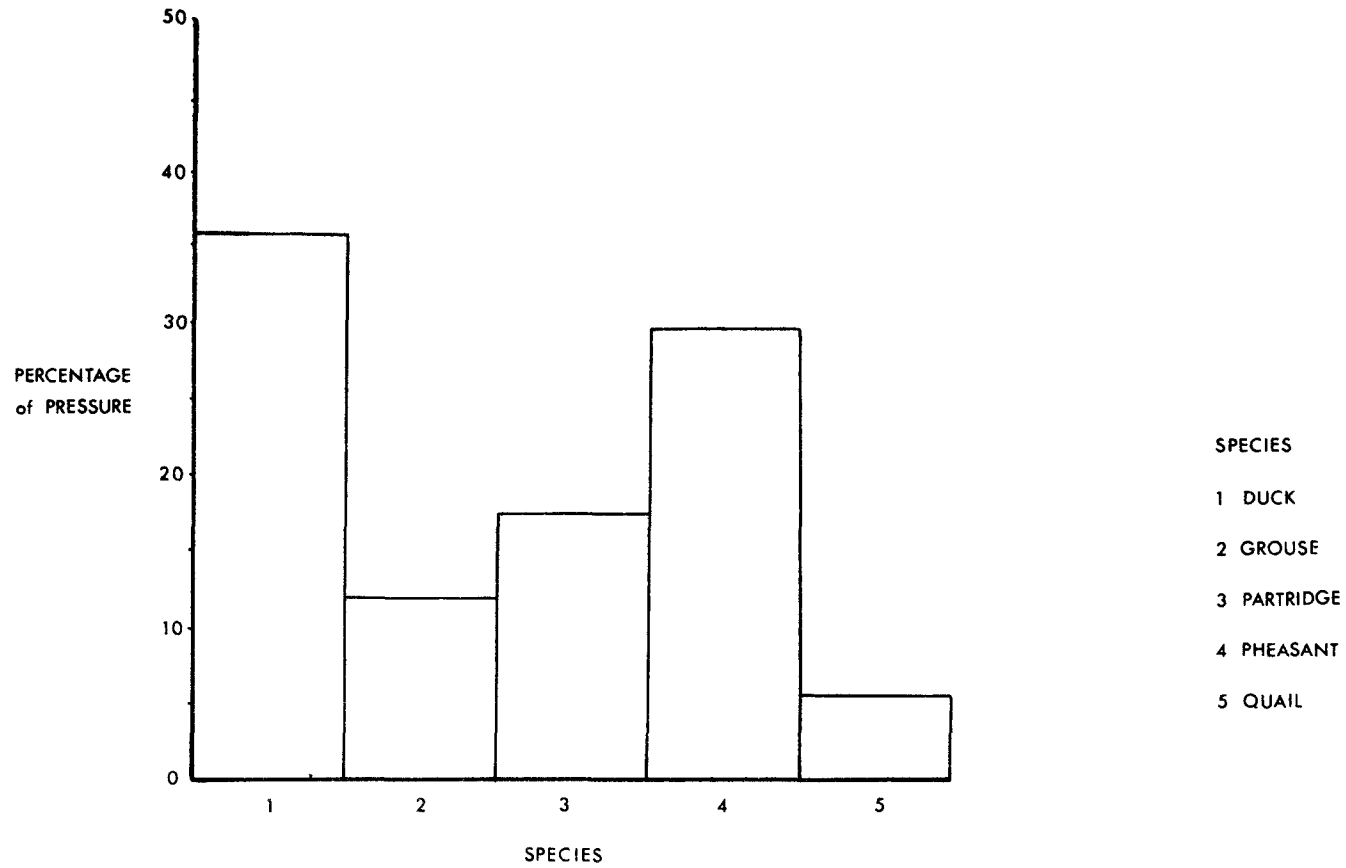


FIGURE EIGHTEEN

TABLE 28

HUNTING PRESSURE BY SPECIES: WEIGHTED SCORES

<u>Species</u>	<u>Weighted Score</u>	<u>Percentage</u>
Duck	835	41.4%
Grouse	195	9.7%
Partridge	323	16.0%
Pheasant	618	30.7%
Quail	<u>45</u>	<u>2.2%</u>
TOTAL	2016	100.0%

(iii) Hunting Experience and Characteristics

The type of land that hunters presently hunt for upland birds varies with the species desired. This was expected since each of the five species used in this study has different needs with regard to habitat composition.

Some of the more common characteristics mentioned included: abandoned farm land with high grass fields and overgrown fence rows; gently rolling hills; and swale and swampy areas. The features most often mentioned were cornfields and wheat fields after the crops had been harvested. The second most popular reply included small lakes and ponds.

The two hundred and nine individuals that indicated duck as their most often hunted species, show that a large number of duck hunters hunt in the field and not lakes, marshes or ponds. Of this group ninety-one

HUNTING PRESSURE BY SPECIES : WEIGHTED SCORES

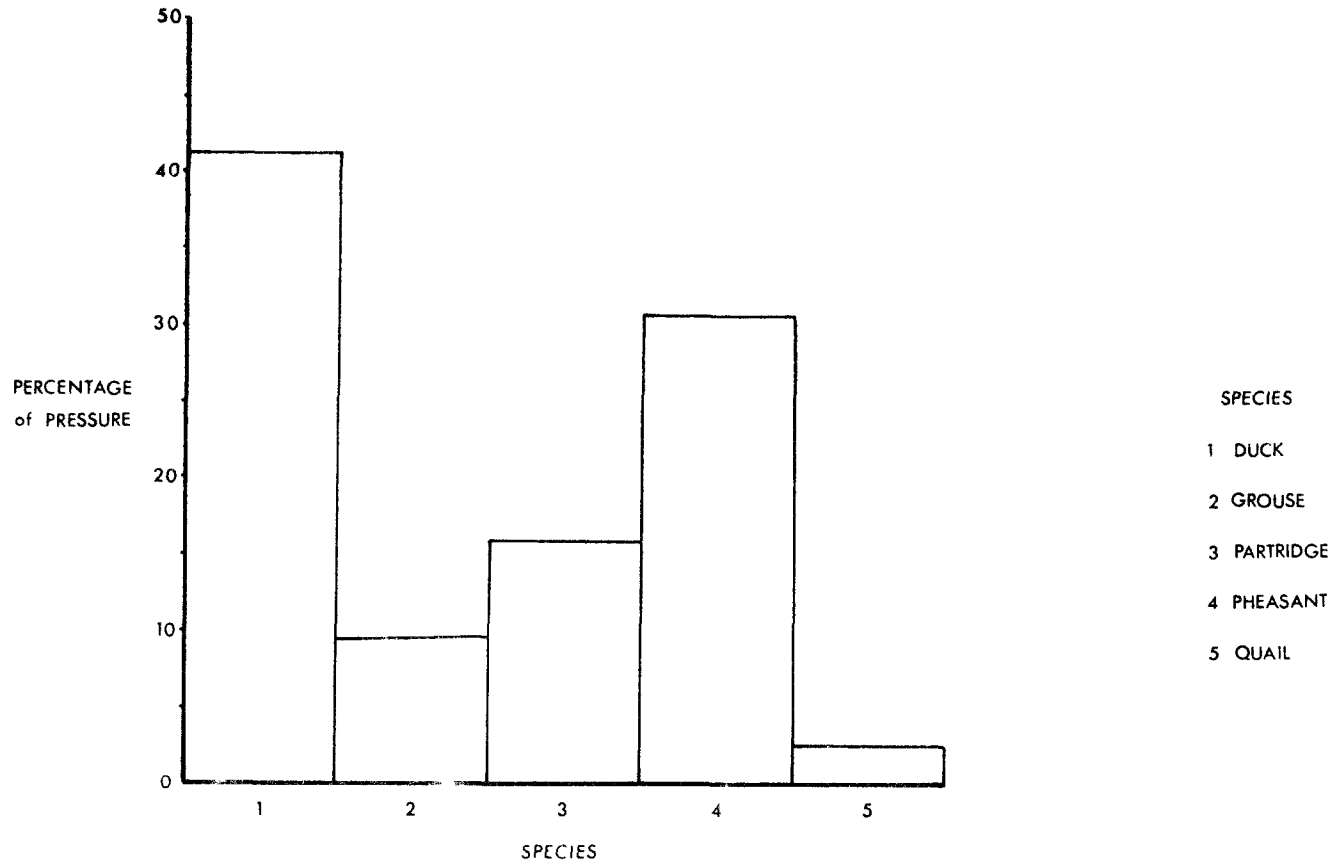


FIGURE NINETEEN

did not mention water in relation to the area where they presently hunt. All of these however, mentioned corn and wheat fields after the crops had been harvested.

The incidence of trained bird dog owners among the sample group is substantially larger than was expected. A total of sixty-one respondents (fifteen decimal four per cent) indicated that they owned such a dog. Of the three hundred and thirty-six who do not own dogs, one hundred and nine (thirty-two decimal five per cent) have hunted upland birds with a trained dog. This shows that forty-seven decimal nine per cent of the hunters surveyed have had experience with a trained dog in conjunction with upland bird hunting. Only seventeen (four decimal three per cent) of these individuals however, have never hunted upland birds without a trained dog.

The relationship between hunters and land ownership reveals that sixty-one decimal seven per cent of all these individuals do most of their upland bird hunting on private land owned by persons other than themselves. Table 29 gives a complete breakdown of the land ownership and is further illustrated in Figure 20.

TABLE 29

LAND OWNERSHIP

<u>Owner</u>	<u>Respondents</u>	<u>Percentage</u>
Public	124	31.2%
Club	17	4.3%
Private (other than yourself)	245	61.7%
Yourself	<u>11</u>	<u>2.8%</u>
TOTAL	397	100.0%

LAND OWNERSHIP

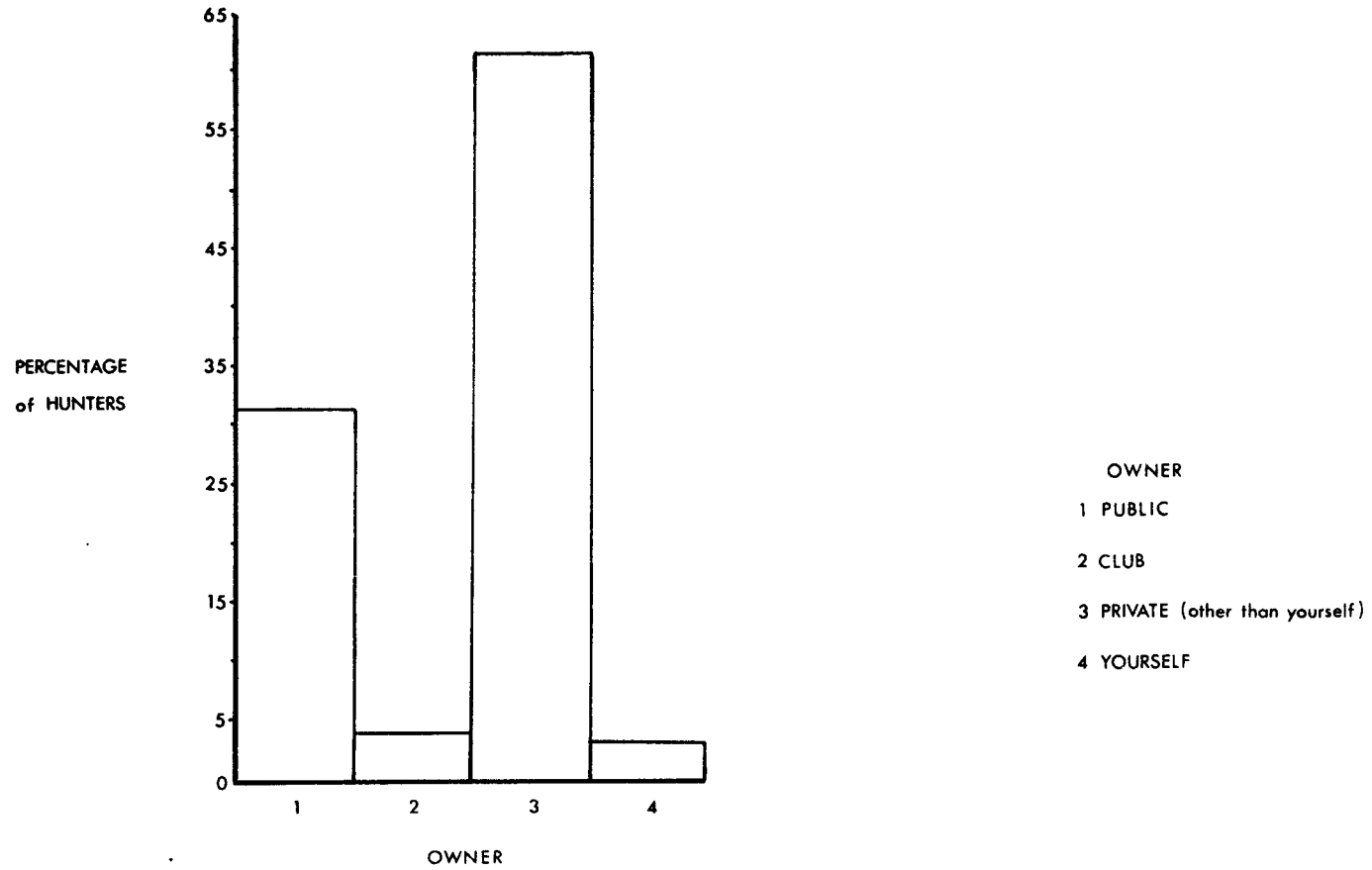


FIGURE TWENTY

The respondents in the club category include eight that belong to private clubs which are set up specifically to provide an upland bird hunting opportunity for the members. A total of nine individuals hunting on land they own themselves are presently residing on a farm. This shows that private land is very definitely the major source of hunting opportunity.

The average number of days that the sample group hunt for upland game birds is six decimal two and the median is four days with a range of one to sixty days. The individual utilizing sixty days hunting time is retired, and hunts almost every day of the year. His estimate was over three hundred hunting days for the entire year, and when you exclude Sundays this is a very large percentage of the total available hunting days. The second highest value was fifty days, and from this point the value dropped quite drastically to twenty-four days and then to twenty. The two individuals with the fifty and sixty day values, both hunt on their own land and usually within five miles of their home.

These rather large extremes in the number of days hunted may be suspected of increasing the average number of hunting days per hunter. Table 30 shows that this affect is minimal. The average days hunted by individuals travelling less than five miles is twelve decimal four days. By omitting these two extreme cases the mean value drops only to twelve decimal one days.

TABLE 30

TRIP FREQUENCY*

Distance Travelled (miles)	< 5	5-15	16-25	26-40	41-60	>60
Frequency of Trip (mean)	12.4	7.8	2.9	6.7	6.0	5.6
<25 and >26 Miles (mean)		7.7			6.1	

*Rounded to the nearest tenth

The number of days hunted appears to be related inversely with the distance travelled. Figure 21 illustrates this point, and the irregularity in the sixteen to twenty-five mile group which can be explained.

The sixteen to twenty-five mile group contained a much larger portion of individuals hunting only one and two times per year for upland birds. When this group is dropped from the analysis the average days hunted in the sixteen to twenty-five mile category jumps to seven decimal one. If this value is used in Figure 21, it can be seen that the irregularity disappears. Although this technique may not be statistically valid, the chance does exist that the sample hunters in the sixteen to twenty-five class are not representative of the total hunter population that fits into this distance range due to the large number of one and two day hunters.

By assuming that the new value, of seven decimal one days, is in fact the average for the sixteen to twenty-five mile grouping, the inverse

FREQUENCY OF TRIP

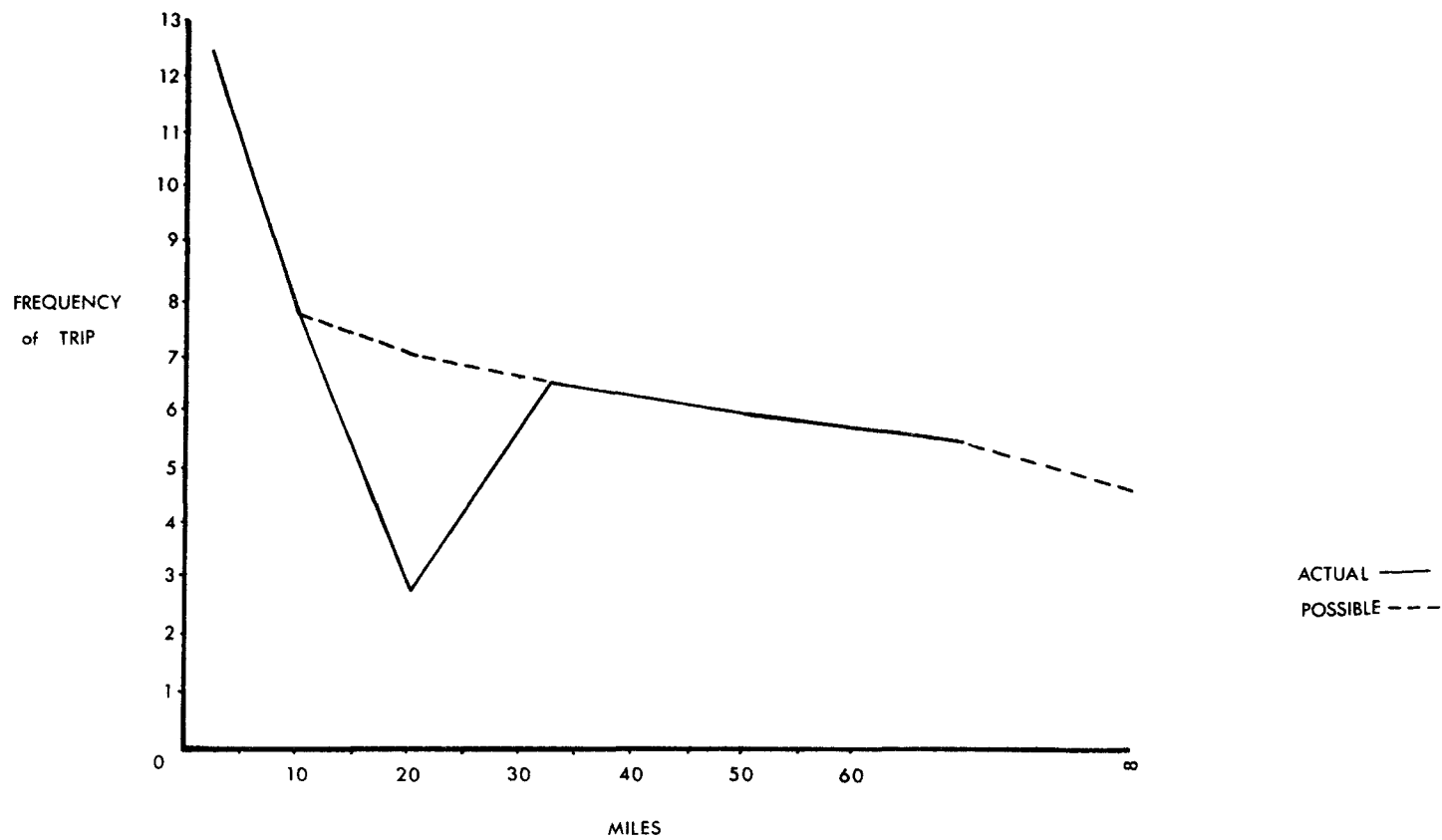


FIGURE TWENTY-ONE

relationship between the average number of hunting trips and the distance travelled can be readily seen. The reasons for this are not directly attainable from the questionnaire, but, most likely include a combination of cost, time, and quality of hunting experience.

After looking at the distances travelled and the number of trips for upland birds it is noted that three hundred and sixty-three (ninety-one decimal four per cent) of the sample group would hunt upland birds more often if better facilities were available in Waterloo County. This characteristic is the opposite of the hunters in Ohio where the majority would not hunt more often with an extended season or more facilities.¹ The thirty-four (eight decimal six per cent) that would not hunt more often contain nineteen of whom do not live in the county. The remaining fifteen in this group hunt from four to thirteen days now.

(iv) Hunting Pressure By The Day

The data collected revealed that one hundred and ninety-eight (forty-nine decimal nine per cent) of the sample hunters use only Saturdays to hunt and that Saturdays receive seventy-four decimal eight per cent of the total hunting pressure. Table 31 and Figure 22 show the complete breakdown of hunting pressure by the day.

Part of the pressure distribution includes four men for each of Sunday, Monday and Wednesday, who hunt only on those days.

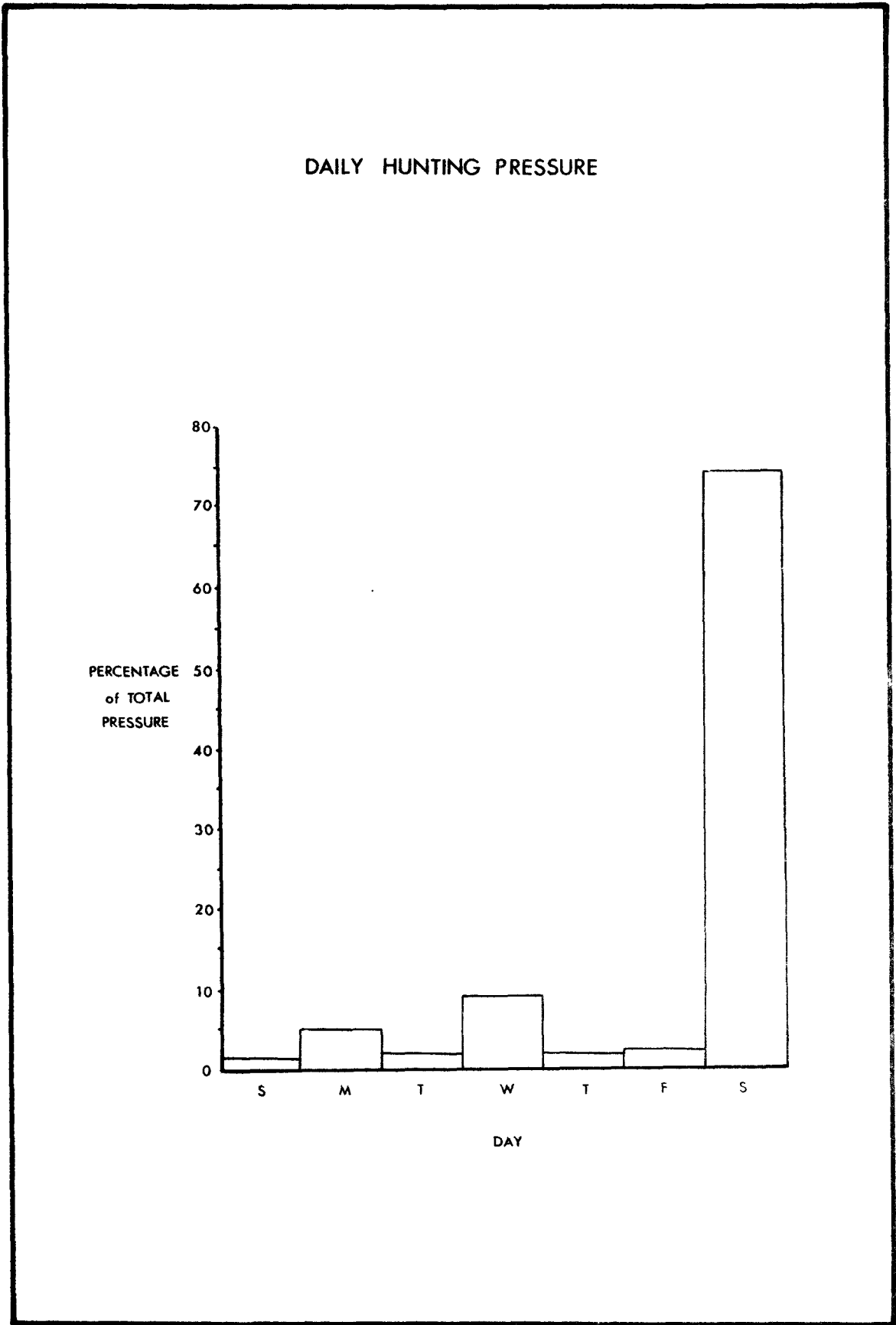


FIGURE TWENTY-TWO

TABLE 31

HUNTING PRESSURE BY THE DAY

1.9%	Sunday
5.0%	Monday
3.4%	Tuesday
9.4%	Wednesday
2.1%	Thursday
3.4%	Friday
<u>74.8%</u>	Saturday
100.0%	

By looking at the daily hunting pressure on game farms (Table 5 and Figure 5) and those of the Waterloo County hunters it can be seen that the week days exhibit similar overall characteristics. The total pressure on the weekends is quite similar, with game farms having a value of eighty-one per cent and Waterloo County hunters exhibiting a value of seventy-six decimal six per cent of the total hunting pressure. However, the weekend hunting differs markedly. This is the result of game farms being open for Sunday business.

The average length of time spent in the field, tabulated in Table 33 and illustrated in Figure 24 demonstrates that as the distance travelled increases so does the length of time spent in the field. Before looking at these however, Table 32 and Figure 23 show a breakdown of the data before analysis.

TABLE 33
TIME SPENT IN THE FIELD

<u>Time</u>	<u>Respondents</u>	<u>Percentage</u>
less than 2 hours	28	7.1%
2-4 hours	220	55.4%
more than 4 hours	<u>149</u>	<u>37.5%</u>
TOTAL	397	100.0%

In the less than two hour group, twenty-five of the respondents travel less than five miles to hunt an average of twelve decimal four days of upland bird hunting a year. This is exactly double the average for the entire sample. Of the people in the over four hour group, one hundred and twenty-eight travel more than twenty-five miles to hunt with the average number of days being six decimal one, only slightly less than the mean.

When the data is completely tabulated by distance travelled, Table 32 results, and a visual representation is provided in Figure 24.

TABLE 32
HOURS IN THE FIELD*

Distance Travelled (Miles)	<5	5-15	16-25	26-40	41-60	>60
Hours in Field (Ave.)**	2	2.5	3	3	4	5

* Rounded to the nearest .25 hour

**Used a value of six hours for individuals in the less than sixty group in computing the mean.

TIME SPENT IN THE FIELD

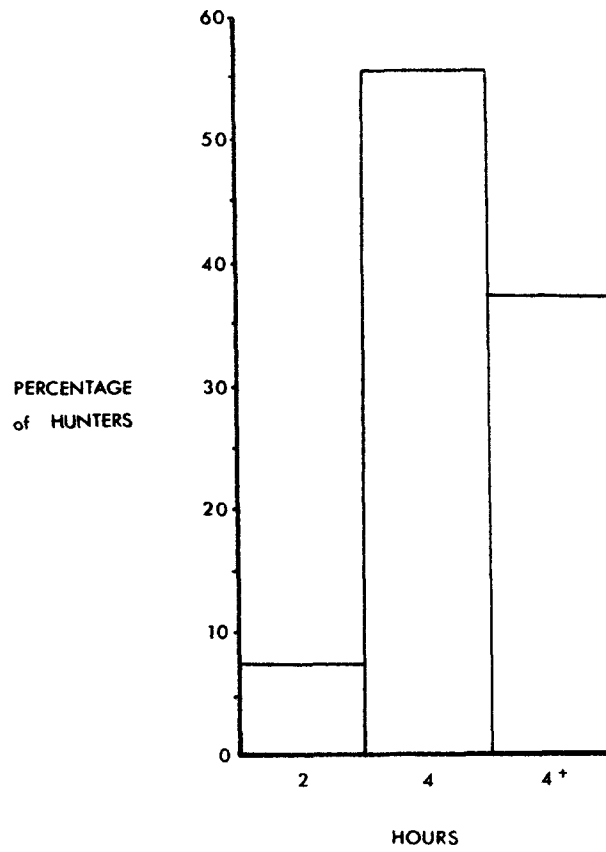


FIGURE TWENTY-THREE

HOURS IN THE FIELD

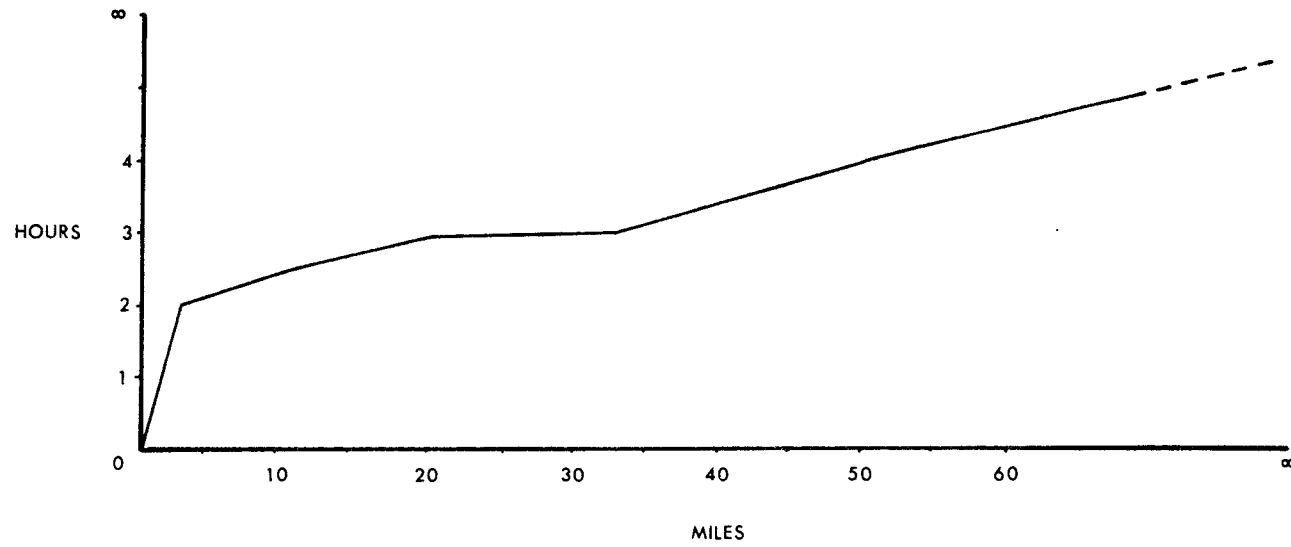


FIGURE TWENTY-FOUR

The relationship between increased hours per hunt and increased distance travelled cannot be quantitatively explained from the results of this investigation. It is expected however, that this is the result of an attempt to maximize the hunting experience in relation to time, cost, and satisfaction, on the part of the hunter.

(v) Knowledge and Use of Game Farms

Over one-half, two hundred and ten (fifty-two decimal nine per cent), of the hunters surveyed indicated a knowledge of at least one operating game farm that offers hunting facilities for upland birds. There is no accurate method of measuring the degree of this knowledge, but a partial indication is obtained by noting that ninety-two (forty-three decimal eight per cent) of the knowledgeable group have hunted upland birds on a game farm. When this value, ninety-two, is compared to the entire sample it represents twenty-three decimal two per cent of the survey group. This indicates that approximately one-quarter of the hunters have an experience to accompany their knowledge of game farms.

The number of hunters having hunted pen-reared birds on private land totaled two hundred and six (fifty-one decimal nine per cent), which includes the ninety-two game farm users. This leaves one hundred and fourteen (twenty-eight decimal seven per cent) of the sample group that have hunted artificially propagated birds but have not used game farms.

These pen-reared upland birds may have come from three possible sources, but there is no way to systematically determine this. The most plausible of these sources, are the birds raised and released under the auspicious of government agencies. Private clubs are a second source, and from our questionnaire we can determine that at least eight of the hunters surveyed had access to such a source of pen-reared upland birds. The third source of this type of game is the birds raised and released by private individuals. It is suspected that at least two of the survey group do this since they stated that it is alright to raise and release your birds for personal hunting, but this should not become a wide-spread practice.

This brings us to the second section of the hunter questionnaire. For the rest of the analysis the thirty individuals who indicated that they do not hunt upland birds are again included in the calculations.

(vi) Preferences For Facilities

Of the total four hundred and twenty-seven hunters questioned, three hundred and sixty-nine (eighty-six decimal four per cent) would like to have the opportunity to hunt upland birds for up to six months of the year. Of the thirty non-bird hunters, sixteen indicated they would like this opportunity. This data supports a commonly held opinion that a large majority of hunters would be agreeable to extended seasons on upland birds.

The answers to the inquiry regarding the type of land that hunters want to use is almost identical to the land they presently utilize.

This information shows that if hunters are not completely satisfied with their present hunting areas, the reason is not only based on the topography and physical characteristics of the land.

The hunters indicated a strong desire for the opportunity of hunting upland birds on private land within the boundaries of Waterloo County. With three hundred and eight-six (ninety decimal four per cent) of the survey group stating this desire, it can be seen that hunters, or at least a large portion of them, are interested in hunting facilities on private land within the county. This value is greater than all of the sample group (two hundred and forty-five or sixty-one decimal seven per cent) that hunt on private land at the present time.

The average desired size for a game farm in Waterloo County appears to be nine hundred and two acres. This is extremely large. In fact, it is three hundred and two acres larger than legal size. Ontario Regulation 15-68, and subsequent amendments, state that a game farm cannot be less than one hundred acres, nor can it exceed six hundred acres in size, unless the land is an island.²

This nine hundred and two acre size however, does not give a proper estimation of the desired size for two reasons. In the first place the author appears to have made a mistake by supplying the example of one square mile equals six hundred and forty acres. A total of one hundred and sixty-two respondents gave their desired size as six hundred and forty acres. It can be seen that this fact distorts the data, and most likely increases the average acreage by a substantial margin. Also, this rather large example may have influenced others to

indicate larger areas than they normally would have.

The range in desired size was forty to ten thousand acres with the median being six hundred and forty acres. Eight persons indicated a desired size of six thousand four hundred acres (ten by six hundred and forty) and a total of one hundred hunters wanted areas of one thousand acres or larger.

Since it is extremely hard to judge acreages of these sizes, and the fact that such a large portion of the respondents appear to have been influenced by the example supplied, the author does not feel justified in putting any faith in the validity of the nine hundred and two acres calculated as the average desired size for a game farm in Waterloo County.

(vii) Potential Hunting Pressure by Species

Earlier in the analysis hunting pressure on the various different species was examined. At this point the potential pressure per species is tabulated and discussed. This is based on the responses of the hunters in relation to what types of birds they would like a game farm operator to utilize. Table 34 shows these responses, and is readily comparable to Table 25.

Several questionnaires (ten) had to be omitted from the analysis at this point because the desired species were checked (✓) off instead of being ranked one to five.

TABLE 34

SPECIES DESIRED ON GAME FARMS

<u>Species</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>TOTAL B</u>	<u>Percentage of Hunters</u>
Duck	126	103	76	36	36	377	88.3%
Grouse	27	42	67	100	30	266	62.3%
Partridge	28	88	86	45	17	264	61.8%
Pheasant	230	114	32	6	14	396	92.7%
Quail	<u>6</u>	<u>28</u>	<u>57</u>	<u>70</u>	<u>75</u>	236	55.3%
TOTAL A	417	375	318	257	172		

By using the Total A data it can be determined exactly how many hunters would like to pursue one, two, three, four or five different species of upland birds. The average hunter would like to be able to hunt (to the nearest whole bird) four different species. This is one more species than the hunters presently pursue. A complete breakdown appears in Table 35 and it can be directly compared to Table 26.

TABLE 35

NUMBER OF SPECIES DESIRED

<u>No. of Species</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>No. of Hunters</u>	42	57	61	85	172

The same method of weighting the answers is used here, to determine the potential hunting pressure per species, as in the earlier calculation of the actual hunting pressure by species. Table 36 shows the results of this, and Figure 25 illustrates the point further.

POTENTIAL PRESSURE BY SPECIES

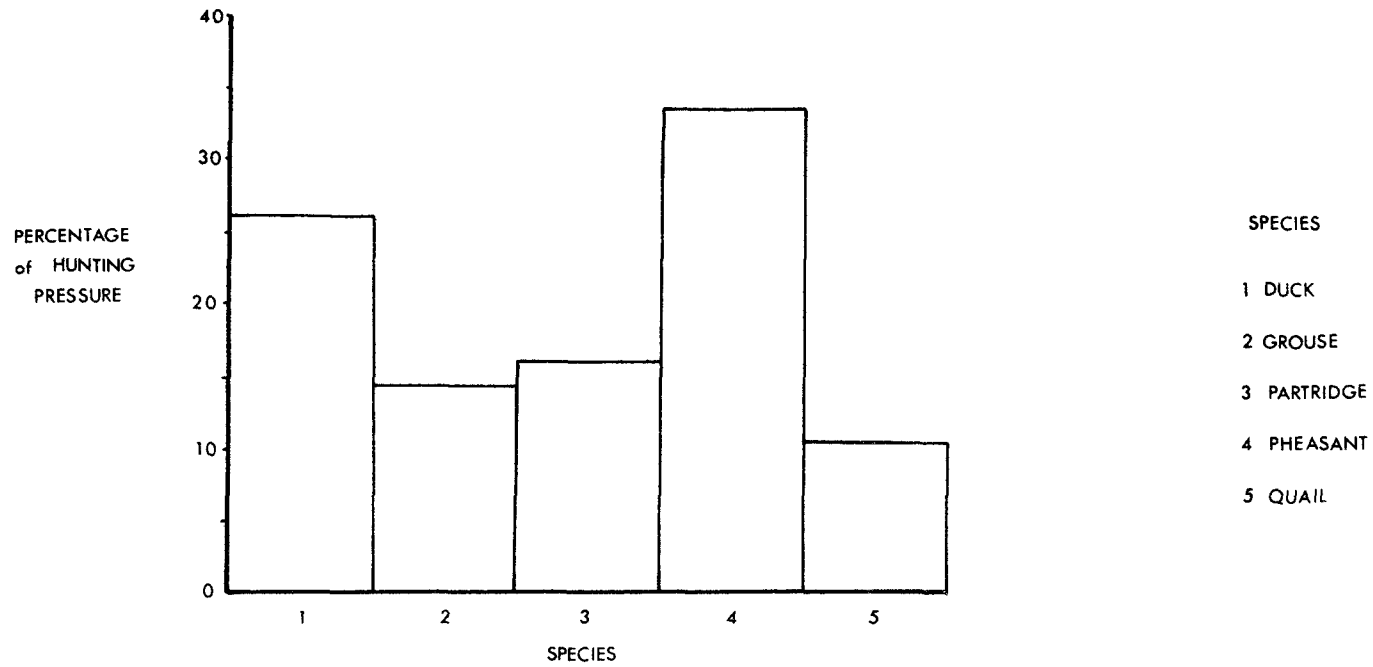


FIGURE TWENTY-FIVE

TABLE 36

POTENTIAL PRESSURE BY SPECIES

<u>Species</u>	<u>Weighted Score</u>	<u>Percentage</u>	<u>Rank</u>
Duck	1378	26.4%	2
Grouse	734	14.0%	4
Partridge	857	16.4%	3
Pheasant	1728	33.1%	1
Quail	<u>528</u>	<u>10.1%</u>	5
TOTAL	5225	100.0%	

Although the absolute weighted values changed for all five species there is only one change in the relative ranking of the birds. This instance involves duck and pheasant, resulting in pheasant having the greatest potential hunting pressure. All of the birds however, showed a percentage change, and therefore a chi-square tests were run with the null hypothesis being that no significant difference exists between the species presently hunted and the species hunters would like to be able to hunt.

TABLE 37

CHI-SQUARE: ACTUAL AND POTENTIAL PRESSURE

<u>Expected</u>	<u>Observed</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
1537	1378	-159	25281	16.448
513	734	221	48841	95.207
750	857	107	11449	15.265
1265	1728	463	214369	169.462
224	528	304	92416	<u>412.571</u>
				$\chi^2 = 708.953$

TABLE 38

CHI-SQUARE: ACTUAL AND POTENTIAL PRESSURE

<u>Expected</u>	<u>Observed</u>	<u>O-E</u>	<u>O-E²</u>	<u>O-E²/E</u>
94.2	88.3	- 5.9	34.81	.369
45.1	62.3	17.2	295.84	6.560
54.4	61.8	7.4	54.76	1.007
82.3	92.7	10.4	108.16	1.314
38.5	55.3	16.8	282.24	<u>7.331</u>
				$\chi^2 = 16.581$

The table value at the decimal zero five level of significance and four degrees of freedom is 9.488. In both tests the calculated value is greater. Therefore the null hypothesis is rejected in both instances, and we can assume that a significant difference does exist between the species of birds now hunted, and those which hunters would like a game farm in Waterloo County to utilize.

(viii) Willingness To Pay

It is interesting to note that three hundred and twelve (seventy-three per cent) of the survey group indicated that they would be willing to pay for the opportunity of hunting upland birds behind a well-trained bird dog on a game farm situated in Waterloo County. This is a very substantial portion of the sample, and the prices that they are willing to pay appear in Table 23.

Several relationships appear to develop in this data, which will be touched on here, and dealt with in more detail later.

The first of these points is that ninety-one of the ninety-two hunters having utilized game farms, which provide trained bird dogs, are willing to pay for the opportunity of doing so again.

The second point shows that one hundred and three of the one hundred and nine people who have hunted behind a well-trained bird dog are willing to pay to hunt behind such a dog on a game farm in Waterloo County.

Eighteen of the individuals willing to pay are from the thirty non-bird hunters. Perhaps they use dogs in other types of hunting, thus realizing the value of having a good dog in on the hunt.

The fourth point here, is that forty-four of the sixty-one dog owners are willing to pay to hunt behind a well-trained bird dog.

All of these facts appear to indicate that knowledge of, and the experience of using a well-trained bird dog increases the willingness of the individual to pay for that opportunity.

The data on Table 39 supports the desired species (Table 34) ranking by way of the average price that the hunters are willing to pay for each different bird.

The demand curves calculated from the willingness to pay data (Figure 26) indicate that as the price per bird increases, the number of hunters

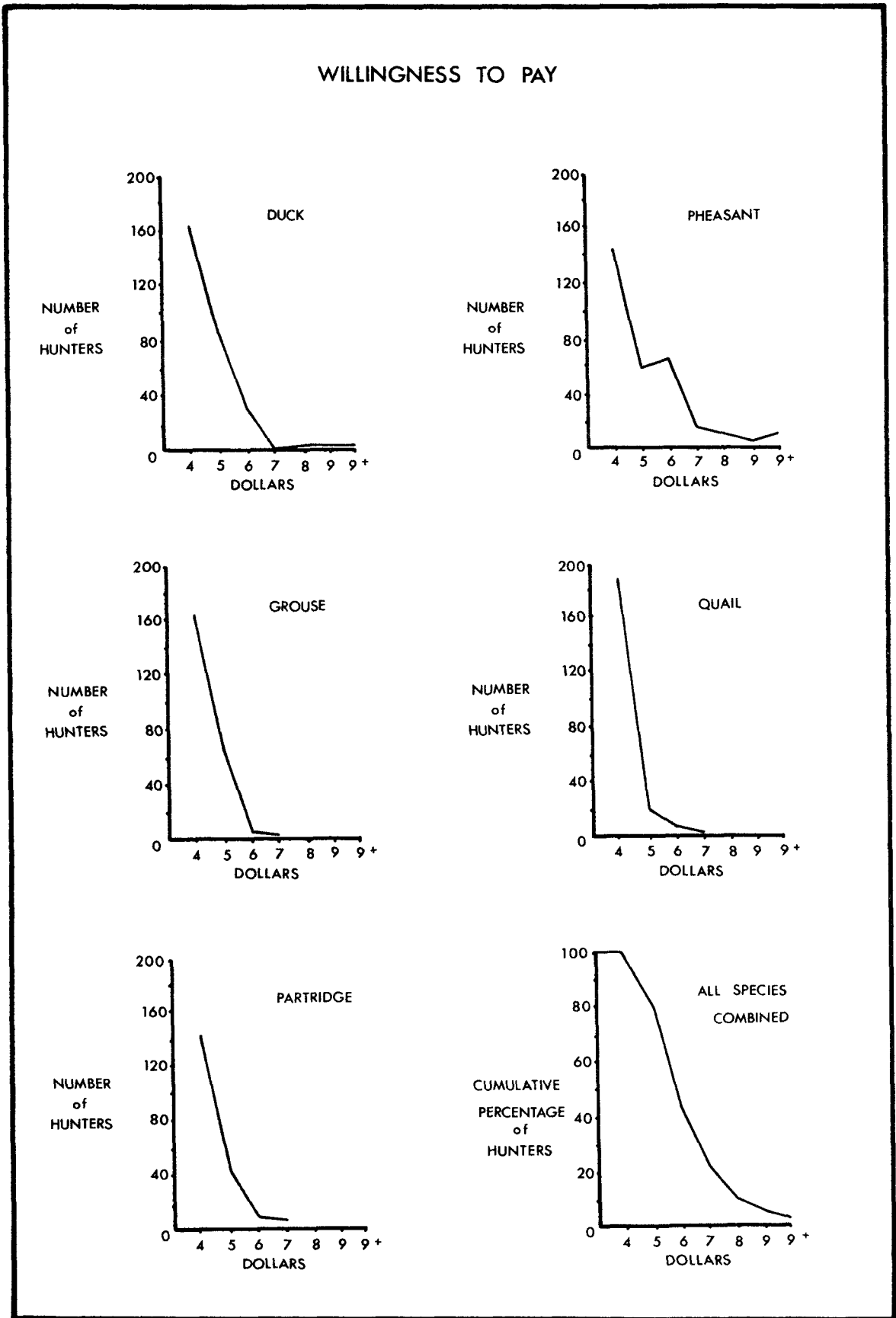


FIGURE TWENTY-SIX

TABLE 39

WILLINGNESS TO PAY: BY SPECIES

<u>Species</u>	Dollar Value							<u>Total*</u>	<u>%</u>	<u>Av.Pr.</u>
	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>9⁺</u>			
Duck	164	90	32	0	1	1	2	290	67.9	\$4.60
Grouse	161	63	3	1	0	0	0	228	53.4	\$4.32
Partridge	140	42	6	4	0	0	0	192	45.0	\$4.34
Pheasant	144	59	63	17	10	4	11	308	72.1	\$5.14
Quail	188	23	11	1	0	0	0	153	35.8	\$4.31

*Shows number of hunters willing to pay for that species. Four of the hunters indicated a willingness to pay, but it was less than the four dollars minimum.

willing to pay the new price decreases. Figure 26F combines all of these curves and plots the dollar value per bird against the percentage of the sample group who would pay the various prices stated. The result is a definite inverse relationship, which illustrates that decreasing prices increase the willingness to pay of a larger percentage of the surveyed hunters.

The data compiled with regards to the hunters' willingness to pay for the opportunity of hunting upland birds on private land using his own dog may be questionable as to its validity since only sixty-one of the sample group do in fact presently own an upland bird dog. It happens however, that fifty-eight of these replied they would be willing to pay for such an opportunity. Also, eight-six of the positive replies have hunted on game farms, and therefore should have experience with trained dogs, and ninety-nine others have used trained upland bird dogs. For these reasons the data is presented in Table 40 and can be compared directly with Table 39.

TABLE 40

WILLINGNESS TO PAY: USING OWN DOG

<u>Species</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>9⁺</u>	<u>Total*</u>	<u>%</u>	<u>Ave.Pr.</u>
Duck	114	65	30	3	7	4	1	244	57.1	\$4.80
Grouse	105	18	6	1	0	0	0	130	30.4	\$4.25
Partridge	142	34	2	0	1	0	0	179	41.9	\$4.24
Pheasant	109	68	46	0	4	8	0	235	55.0	\$4.92
Quail	113	31	1	0	0	0	0	145	34.0	\$4.23

* Shows number of hunters willing to pay for that species.

Although the results indicate only a small difference in the prices between the five species, duck and pheasant still fill the top two locations.

When asked if they would hunt at least once on a game farm in Waterloo County with a price tag of six dollars for each bird bagged of their favourite species, three hundred and two (seventy decimal seven per cent) of the respondents indicated that they would. Further inquiry revealed that at this rate the hunters would harvest an average of two decimal six birds, the range being from one to eight and the median two. Interesting to note, is the fact that over fifty per cent indicated they would take two birds. One point that should be mentioned in conjunction with this area, is the large portion of hunters who stated earlier that the maximum they would pay was four and five dollars per bird, while in this question they went along with six dollars.

A couple of interesting relationships develop further in this analysis of willingness to pay. These are the roles of knowledge and experience with trained dogs and game farms compared to the actual willingness to pay of the individuals. A further breakdown of the data compiled reveals these points.

The most common reason given for answering in the negative is that, 'it is not sporting to shoot on a game farm', and sixty-eight used this type of reply. Eleven did not comment in this regard, and only seven sighted 'too expensive' as the reason. It is interesting to note that only nine of the sixty-eight know of a game farm, and none of them have actually hunted on one. This tends to show a development between lack of knowledge and not being willing to use a game farm.

A further analysis shows that thirty-nine of none-willing hunters know of game farms and that one individual has in fact hunted on a game farm. However, eighty-seven do not know of an operating game farm and only six have hunted with trained bird dogs.

By taking a further look at the three hundred and two individuals willing to use a game farm we can see that: ninety-one of them have used game farms; sixty-one own bird dogs, and one hundred and three others have hunted with a trained bird dog.

All these facts combined tend to indicate a definite relationship between experience and knowledge of game farms and trained dogs and

the willingness of a hunter to use a game farm. The analysis shows that as knowledge and experience increase, the probability of a hunting sportsman being willing to use a game farm also increases.

(ix) The Value of The Sample Market

One of the major objectives of this study is to investigate the potential market for an upland bird game farm in Waterloo County. The next several paragraphs deal with the analysis of the last question in the questionnaire which gives a great deal of insight into the market potential.

At a rate of six dollars per bird, and two birds per trip, three hundred and six (greater than seventy per cent) of the hunters indicated they would hunt one or more times on a game farm over a six month period. The average number of trips by these men is three decimal one and ranged from one to twenty with a median of three trips. This creates nine hundred and fifty-seven hunting days with a harvest of 1,915 birds.

Further analysis of this question reveals the following information:

- 306 of survey group would use a game farm,
- 3.1 would be the average number of visits,
- 957 would be the total number of visits,
- 1,914 birds would be utilized,
- \$11,484.00 gross income would be realized,
- \$37.53 would be the average cost of 3.1 visits.

All of these facts tend to show that a market exists, and that there is a willingness on the part of the majority of hunters to pay for the use of good facilities. The next chapter of this study will take a closer look at the potential market for a game farm using upland birds situated in Waterloo County.

FOOTNOTES TO CHAPTER THREE

¹T.J. Peterle, "Characteristics of Some Ohio Hunters", in Journal of Wildlife Management, Vol. 31, No. 2, 1967, p.375-389.

²Government of Ontario, Revised Regulations of Ontario, Vol. 11, Toronto: Queens Printer, 1970).

C H A P T E R F O U R

THE MARKET POTENTIAL

A. THE VALUE OF THE MARKET POTENTIAL

The analysis of hunter patterns and characteristics illustrates that a market exists for an upland bird game farm in Waterloo County. A quick look at the features of this demand is in order before proceeding to investigate the dollar value involved with the market potential.

In the first section of the questionnaire two sets of responses show that three hundred and twenty-five (eighty-one decimal nine per cent) of the survey group would like to be able to hunt closer to home and that three hundred and sixty-three (ninety-one decimal four per cent) would hunt more often if better facilities were available within Waterloo County. A properly situated game farm would fill the demands of both these situations.

Characteristics which evolved in the later portion of the investigation show that three hundred and sixty-nine (eighty-six decimal four per cent) of the hunters would like to hunt up to six months a year for upland birds and that three hundred and eighty-six (ninety decimal four per cent) of those surveyed would appreciate the opportunity to hunt upland birds on private land in Waterloo County. Once again a game farm in the county would fill the hunter's desires.

The four preceding points tend to illustrate a demand on the part of the hunters for better facilities closer to home and within Waterloo County. All that remains now is to determine the willingness of the hunters to pay for such facilities.

The last portion of the inquiry dealt with the willingness of the hunters to pay for facilities, and shows that approximately seventy-three per cent of the hunters are willing to pay various prices to have the facilities which they desire. A total of seventy-one decimal six per cent indicated a willingness to utilize a game farm at a price of six dollars per bird harvested. If this last percentage holds true for the entire hunter population within the county, then 6,298 potential clientele are available. This is more than adequate to support a game farm, but, it is necessary to take a closer look at these figures.

The investigation revealed that three hundred and six (seventy-one decimal six per cent) of the four hundred and twenty-seven hunters questioned would use a game farm, and that they would create nine hundred and fifty-seven hunting days on such a facility. This percentage appears to be extremely high. Therefore, the following manipulations are performed in order to allow for errors, of various sorts, in determining the percentage of potential game farm clientele and to maximize the market's potential value while at the same time minimizing the chances of projecting an unreliable estimate of the market value.

The first instance of over estimating the potential of the market may result due to the seven per cent of the sample that do not hunt upland birds at the present time. The figure is much lower than the actual, and should be approximately twenty-five per cent. This approximation is based on two facts.

The first reason for changing this percentage value is that non-upland bird hunters showed a lack of interest in completing questionnaires. At least sixty individuals declined supplying information for this reason. Secondly, the types of clubs visited may have created a bias toward bird hunters. For these reasons then, the author has chosen to raise the non-bird hunters from a value of seven per cent to a value of twenty-five per cent. To do this an additional eighteen per cent (eighteen plus seven equal twenty-five) is taken from the potential user value of seventy-one decimal six per cent. This leaves fifty-three decimal six per cent as the portion of the entire group who would use a game farm. There are three other points which will change this estimation even further.

The number of hunters who answered that they would use a game farm facility only once was sixty-three. Due to the wording of the question these individuals may have felt intimidated and therefore answered yes. This accounts for fourteen decimal eight per cent of the sample, and by taking these off of the potential clientele value of fifty-three decimal six per cent we arrive at a new figure of thirty-eight decimal eight per cent.

The next change is the result of thirty-eight hunters who would hunt only grouse or else only duck on a game farm. Since it is not legal to sell these birds on a game farm, eight decimal nine per cent must be removed from the potential user value. This leaves twenty-nine decimal nine per cent as the percentage of hunters who might frequent a game farm in Waterloo County.

The last change is caused by thirty-seven hunters who answered by saying they would hunt more than once on a game farm facility, while at the present time these individuals hunt only one day a year. Therefore a last value of eight decimal seven per cent is removed from the twenty-nine decimal nine per cent which leaves a potential market of twenty-one decimal two per cent of all the hunters in Waterloo County.

This places 1,865 of the total 8,797 licensed hunters on the list of potential users. If this value is accurate then the potential Waterloo County market is thirty decimal nine per cent the size of the present Ontario market.

Now the problem of placing a value on the market presents itself. In order to do this we must once again work with the sample group and the number of trips that they would average.

The data obtained showed three hundred and six individuals generating nine hundred and fifty-seven days of game farm usage. In order to

eliminate the possibility of error in this we must once again manipulate the figures to allow for mistakes, and to obtain a more reliable projection.

From the total nine hundred and fifty-seven days we must subtract two hundred and thirty days. These are the result of the sixty-three days used by the hunters utilizing a game farm for only one day, the ~~seventy-three~~ days generated by the thirty-eight men who hunt only grouse or duck, plus the ninety-four days built up by the thirty-seven who only hunt one day at the present time. These figures leave seven hundred and twenty-seven hunting days belonging to one hundred and sixty-eight individuals.

At a value of twelve dollars¹ a trip the market from the sample group is worth \$8,724, with the average hunter making four decimal three trips per season at an overall cost of \$51.60. The number of birds harvested would be 1,454 or eight decimal six per hunter. It appears therefore, that the sample group alone could support a small game farm with limited overhead and operating costs.

With the values arrived at, we can now estimate the value of the market potential. By taking the average of four decimal three trips and a market of 1,865 hunters we can generate approximately 8,020 hunting days worth \$96,234. This is providing that the game farm offers the hunters their favourite species and that the hunters take two birds on each hunt.

The number of birds harvested would be approximately 16,000, which is more than three times the 5,000 bird level which appears to be the turnover needed for a successful operation.² The possibility exists that more than one game farm could be operated profitably in the County of Waterloo.

FOOTNOTES TO CHAPTER FOUR

¹Green in his study of Michigan game farm clientele found that fifty-three per cent of these individuals spent over twenty-one dollars on each trip. Ontario game farm users presently spend between seven dollars and fifty cents and twenty-one dollars, depending on the species hunted. Therefore, the value of the market potential may in fact be higher than the estimation based on twelve dollars per hunt.

²Edward Kozicky and John Madson, Shooting Preserve Management--The Nilo System, (East Alton: Winchester Western Press, 1966), p.231.

C H A P T E R F I V E

CONCLUSIONS

A. SUMMARY

Hunting provides an opportunity for participant involvement in outdoor recreation. The companionship and relaxation made possible by this sport contribute to the well-being of the hunter and allows the development of skills and good sportsmanship. These in turn contribute to the enjoyment of outdoor recreation.

The financial input of hunters is quite significant. The monies payed for licenses, food, lodging, travel, and equipment form a sizable portion of the income in the sports and tourist industry.

The sport of hunting is under pressure for various reasons. One of these facts is the lack of areas suitable and available to service the large urban complexes developing in Ontario. Specialized facilities are needed to alleviate this problem, whether governmentally or privately operated.

The privately owned and operated game farms are one solution to this situation. The present market is expanding yearly and game farms show signs of improving and expanding in order to meet the demand. The

present location of these game farms however, does not allow for proper utilization of the same by the hunters in Waterloo County.

The patterns and characteristics of the Waterloo County hunters show a need and a want for more and better facilities closer to home and within Waterloo County. One parameter of the hunting population is that hunting areas have the natural habitat components of the particular species being hunted. This, along with the distance they are willing to travel, should help in locating a new facility where it would be utilized by the hunters of Waterloo County.

The results of this investigation show that there is a market for a game farm utilizing upland birds in Waterloo County. The hunters from the survey group alone, and the number of birds they would harvest, provide a more than adequate market for the first year of operation for a game farm. The total market potential, of \$96,234, is quite substantial, and this is without counting the hunters from outside the county that may be attracted by a game farm. All indications point to a definite market with the potential of supporting at least one game farm.

B. RECOMMENDATIONS

The recommendations cited here are the results of the data collected on the questionnaires and the ideas expressed in verbal exchanges with the hunters of Waterloo County.

The first, and perhaps foremost of these, is the need for further studies on hunter patterns and characteristics in relation to specific species of game and the urban based recreationist.

The second recommendation is actually a combination of ideas that game farm operators might find worthwhile to develop. The first of these is the objective of improving the image of game farms as recreational areas. Secondly, these operators should sell the sport and hunting experience as such, and not place the emphasis on the number of birds bagged. Thirdly, steps should be implemented to encourage more usage of present facilities on week days.

The third major recommendation is that a facility be established to take advantage of the market within Waterloo County. This could be a privately operated unit or run by a government agency.

The last recommendation is that an inventory be taken in relation to upland birds and upland bird habitat in Waterloo County. More detail is needed than is presently available from the ARDA Series of wildlife classifications.

C. EVALUATION OF STUDY

This study contributes to the field of geography in that it helps explain the earth-wide man-land system. This knowledge is in the form

of hunter patterns and characteristics that have potential value in recreational geography and resources management. The materials and data utilized provide information that was not available before, and could have worth in future planning practices in Waterloo County.

It is an accepted fact that recreational facilities should be provided for all segments of the population. This thesis helps in this direction in four ways. The first of these is that the research establishes a demand on the part of Waterloo County hunters for more facilities within the county. Secondly, the work shows that the hunters are willing to pay for more facilities. The third point is that the need for more hunting areas will increase in the future. The last idea here, is that the twenty-one decimal two per cent figure could be used to see if the number of potential game farm users is high enough in an area to support a commercially operated and privately owned game farm.

D. AREAS FOR FUTURE RESEARCH

During the course of the study many interesting areas for further research were uncovered. A few of these ideas will be touched on here, but it is not possible to mention all the alternatives at the present time.

1. The socio-economic characteristics of hunters in relation to specific types of game.

2. The degree of hunter satisfaction with different types of hunting experiences.
3. The patterns and characteristics of hunters in relation to other species of game birds and animals.
4. Research into the demand for outdoor recreational facilities of varying types.
5. Research into the planning design of recreation areas so that hunters will derive the benefits as an end result.
6. Evaluation studies to determine the role and quality of presently existing upland bird facilities.
7. Studies in relation to the economic aspects of wildlife enterprises.
8. Investigations into the role of government agencies in supplying hunting facilities.

These topics as well as many others, need attention and enlightening research. Geographers can contribute to this because of their concern with the man-environment relationships in the individual situation and the larger overall picture involved in utilizing our wildlife resources.

A P P E N D I C E S

A P P E N D I X O N E

THE MINIMUM STANDARDS OF THE NORTH AMERICAN
GAME BREEDERS AND SHOOTING PRESERVE ASSOCIATION

THE MINIMUM STANDARDS OF
THE NORTH AMERICAN GAME BREEDERS AND SHOOTING PRESERVE ASSOCIATION

The North American Game Breeders and Shooting Preserve Association has the following minimum standards for shooting preserves.

1. The area should look like good hunting country, with a blend of natural and cultivated cover.
2. Pheasants, quail and partridge should be full-plumaged, more than sixteen weeks old, and of the same colour and conformation as their wild counterparts.
3. Well-trained dogs should be available for the guests and to reduce crippling loss of game.
4. Preserve operators should clean and package the game birds harvested by their clientele.

A P P E N D I X T W O

THE HUNTER QUESTIONNAIRE

HUNTER QUESTIONNAIRE

This questionnaire is designed to shed light on the activities and patterns of hunters in Waterloo County with the hope of determining the market for and possible location of future hunting facilities for upland birds in the area.

The study could not be completed without your help. Your time and co-operation are greatly appreciated.

This questionnaire may be completed by any licensed hunter who is:

- a resident of Waterloo County;
- or a member of a hunting club in Waterloo County;
- or hunts in Waterloo County.

DEFINITIONS

Game Farm: or shooting preserve is an area that is privately operated where hunters can shoot upland birds at a certain price for each bagged bird.

Upland Birds: in this study the term shall mean: ducks, grouse, partridge, pheasants, and quail.

AGE: _____

1. Do you live in Waterloo County? YES _____ NO _____
2. Do you live in a city with a population of 2500 or greater? YES _____ NO _____
 - a. If YES, in what city or town do you live? _____
 - b. If NO, in what township do you live? _____

Do you live on a farm? YES _____ NO _____
3. Are you a member of a hunting club in Waterloo County? YES _____ NO _____
 - a. If YES, what is the name of the Club? _____
4. Do you hunt upland birds in Waterloo County? YES _____ NO _____
 - a. If NO, why not? _____

5. When you go hunting for upland birds, how far do you usually travel to reach your hunting area? (check only one)

_____ less than 5 miles

_____ 5 - 15 miles

_____ 16 - 25 miles

_____ 26 - 40 miles

_____ 41 - 60 miles

_____ more than 60 miles
6. Would you like to be able to hunt upland birds closer to home?

YES _____ NO _____
7. What is the greatest distance you have travelled to hunt upland birds?

_____ miles.
8. In relation to TIME, how long would you consider reasonable in travelling to a hunting area for upland birds? _____ time.

16. If better hunting facilities were available in Waterloo County, would you hunt upland birds more often? YES NO

17. On which days do you usually hunt? (indicate as a % of total time)

- Sunday
- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday

100% total time

18. When hunting upland birds, what is the usual length of time that you spend in the field? (Check only one)

- less than 2 hours
- 2 - 4 hours
- more than 4 hours

19. Do you know of any game farms that offer hunters shooting for upland birds? YES NO

20. Have you ever hunted upland birds on a game farm? YES NO

21. Have you ever hunted pen-reared upland birds on private land? YES NO

XXXXXXXXXXXXXXXXXXXXXXXXXXXX

1. Would you like to have the opportunity to hunt upland birds for up to six months of each year? (Oct.-March) YES NO

2. On what type of land would you like to be able to hunt upland birds? (list physical characteristics)

3. Would you like to have the opportunity to hunt top quality upland birds on private land in Waterloo County? YES NO

4. Assuming a game farm were to be established in Waterloo County, what species of upland birds would you prefer the operator to offer? (rank from 1 to 5, with 1 having the highest preference)

Duck Grouse Partridge Pheasant Quail

5. Assuming a game farm for upland birds were to be established in Waterloo County, what size would you prefer the hunting area to be?
(1 sq. mile equals 640 acres) _____ size in acres

6. Would you be willing to pay for the opportunity of hunting upland birds behind a well-trained bird dog? YES _____ NO _____

If YES, what is the maximum price per bagged bird that you would be willing to pay? (Circle dollar value per bird)

Duck	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Grouse	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Partridge	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Pheasant	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Quail	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9

7. Would you be willing to pay for the opportunity of hunting upland birds on private land using your own dog? YES _____ NO _____

If YES, what is the maximum price per bagged bird that you would be willing to pay? (Circle dollar value per bird)

Duck	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Grouse	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Partridge	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Pheasant	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9
Quail	\$4,	\$5,	\$6,	\$7,	\$8,	\$9,	more than \$9

8. Assuming a game farm for upland birds were to be established in Waterloo County, and the price per bagged bird of your favourite species was \$6.00, would you hunt there at least once to find out first hand how a game farm really functions? YES _____ NO _____

a. If YES, how many birds would you shoot at this price?
(Assume no bag limit) _____ no. of birds

b. If NO, why would you not do so? _____

9. At the rate of \$6.00 per bird, how often would you hunt on a game farm in one season? (assume 2 birds per hunt and a season from Oct. to March) _____ no. of times

A P P E N D I X T H R E E

THE TOWNSHIP MUNICIPAL OFFICES

TOWNSHIP MUNICIPAL OFFICES

<u>Township</u>	<u>Location</u>	<u>Phone</u>
North Dumfries	Galt	621-0340
Waterloo	Waterloo	745-7367
Wilmot	Baden	634-5482
Wellesley	Crosshill	699-5532
Woolwich	Conestogo	664-2186

A P P E N D I X F O U R

THE HUNTING CLUBS USED IN THE STUDY

HUNTING CLUBS USED IN THE STUDY

Bridgeport Rod and Gun Club,
John Rutherford,
Bridgeport, 745-5344

Elmira Rod and Gun Club,
Eugen Stinson,
Elmira, 669-5149

Greenwood Rod and Gun Club,
Lewis Nowak,
St. Agatha, 742-7376

Linwood Rod and Gun Club,
Art Dunn,
Linwood, 698-2663

Waterloo County Fish and
Game Protective Association,
Robert Madill,
Preston, 653-9987

Waterloo Rod and Gun Club,
John W. Vogel,
St. Jacobs, 745-5503

Wilmot Rod and Gun Club,
William Petznick,
Baden, 634-5925

A P P E N D I X F I V E

THE LETTER TO THE GAME FARM OWNERS

December 10, 1971

Dear Sir:

I am a university student working towards a Master's Degree. My research is with regards to the hunters in Waterloo County, and my specific interest is the present hunting patterns of these hunters in their quest for upland birds.

Part of the study includes a history of game farm development in Ontario, and how the present farms are set up. In order to do a proper job of this portion of the research it is necessary for me to get information directly from the existing game farms. For this reason I am enclosing a questionnaire which I would ask you to complete. A stamped, self-addressed envelope is also included to ease the problem of returning the questionnaire.

All of the information supplied by you will be strictly confidential, there will be no way that anyone will be able to determine which information belongs to which game farm because only the sum totals and averages for all the game farms shall be used.

I would also like to receive a copy of your advertising brochure and a map of your game farm if one is available.

Thanking you in advance for your time and assistance, and looking forward to a reply at your earliest convenience. The study could not be completed without your co-operation and effort. Any comments you may have will be welcome and greatly appreciated.

Yours sincerely,

(Robert McClure)

A P P E N D I X S I X

THE OWNER/OPERATOR QUESTIONNAIRE

GAME FARM OWNER/OPERATOR QUESTIONNAIRE

1. Name of Game Farm? _____
2. In what year was the game farm established? _____
3. Is the game farm presently owned by the original owner? YES _____ NO _____
 (a) If NO, how long has the present owner owned the game farm? _____
4. What is the present acreage of the game farm? _____ acres.
5. What was the original acreage of the game farm? _____ acres.
6. How many acres can presently be 'hunted' on your game farm? _____ acres.
7. Do you plan to expand the size of your operation in the next
 2 or 3 years? YES _____ NO _____
8. How would you describe the topography of your game farm?

9. Were various alternative sites considered before deciding to develop
 or buy this particular game farm? YES _____ NO _____
10. Was any type of study or survey carried out before you decided to
 develop your game farm? YES _____ NO _____
 (a) If YES, what type of information were you seeking?

11. What factors influenced your decision to develop or buy this
 particular game farm?

12. What type of facilities do you offer your clientele?
 trained dogs _____ club house _____
 dog handlers _____ other (Specify) _____

13. What species, and price per bird, do you offer?

Species	Price
_____	_____
_____	_____
_____	_____

14. What is the average number of birds taken per hunter on one hunt at your game farm?

Species	Price
_____	_____
_____	_____
_____	_____

15. Do you allow hunters to use their own dogs on your game farm? YES ___ NO ___

(a) If YES, does this alter the price charged, and in what way?

16. What is the total number of hunters using your facilities?

1968-69 _____, 1969-70 _____, 1970-71 _____, estimated 1971-72 _____

17. Could you properly handle more hunters with your present facilities?

YES ___ NO ___

18. What percentage of your customers are 'returning clientele'? _____%

19. What is the average age of your hunter clientele? _____ years.

20. Indicate as a percentage of your total business, which days are hunted most frequently.

- _____ % Sunday
- _____ % Monday
- _____ % Tuesday
- _____ % Wednesday
- _____ % Thursday
- _____ % Friday
- _____ % Saturday

21. Indicate as a percentage of your total clientele, what percentages stay in the field for the following lengths of time.

_____ % less than 2 hours

_____ % 2 - 4 hours

_____ % over 4 hours

22. What percentage of your clientele hunt in the following party sizes? (excluding a guide or dog handler provided by the game farm.)

_____ % one

_____ % two

_____ % three

_____ % four

_____ % more than 4

23. What percentage of your clientele belong to hunting clubs? (i.e. Rod and Gun Clubs) _____%

24. What percentage of your clientele travel the following distances to reach your game farm?

_____ % less than 5 miles

_____ % 5 - 15 miles

_____ % 16 - 25 miles

_____ % 26 - 40 miles

_____ % 41 - 60 miles

_____ % over 60 miles

25. What advertising methods do you employ?

26. Please add any additional points or comments that you feel should be included in this study.

A P P E N D I X S E V E N

THE GAME FARMS USED IN THE STUDY

THE GAME FARMS USED IN THE STUDY

Bradley Farms Ltd.,
John Bradley,
Box 507, Chatham

Grafton Game Farm,
Jack Reymes,
Grafton

Brendean Game Farm and
Shooting Preserve,
Fred Plunkett,
R.R.4, Uxbridge

Hard Oil Shooting Preserve,
Robert Shain,
R.R.3, Petrolia

Bruce Dale Game Farm,
Jack Ross,
R.R.4, Fenwick

Ridgeway Hunting Preserve,
Alex Komaromi,
Box 46, R.R.9, Ottawa

Crawford Game Farm,
John Crawford,
R.R.2, Burgessville

Twenty Valley Game Farm,
Dean Wismer and Sons,
R.R.1, Jordan Station

White Ring Game Farm,
Ronald James,
R.R.3, Hastings

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