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WORKING PAPER NO. 27
WILDLIFE MANAGEMENT:
ADEQUACY OF AND PROBLEMS IN REGULATION
by
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RÉSUMÉ

Dans la présente étude, l'auteur tente de mesurer le degré d'efficacité des lois et règlements qui régissent l'aménagement de la faune.

Il n'existe pas d'ouvrages complets sur la faune et l'aménagement de la faune au Canada. Pour se faire une idée de la situation, il a donc fallu recourir à un ensemble de publications privées et gouvernementales consacrées à la faune et interviewer des représentants d'organismes privés et publics.

La faune étant très différente dans chaque province et dans chaque territoire, son aménagement varie également. L'étude porte principalement sur l'Ontario et la Colombie-Britannique. Dans la partie densément peuplée du Sud de l'Ontario, les problèmes d'aménagement de la faune sont reliés surtout à l'expansion démographique et à la croissance industrielle. Les terres sauvages de l'Ontario sont en grande partie aux mains de propriétaires privés. Au contraire, en Colombie-Britannique, le territoire est relativement moins exploité et plus de 95 % de l'habitat sauvage est propriété de la Couronne. Comme on y chasse surtout le gros gibier, l'aménagement de la faune doit être conçu en conséquence.

L'auteur évite d'aborder les thèmes théoriques traditionnels de la récréation. Il s'attarde plutôt aux dangers qui menacent la faune et aux difficultés que doivent solutionner les organismes de protection de la faune devant les problèmes typiques de l'invasion des chasseurs et de l'aliénation de l'habitat sauvage.

Après une brève introduction, le chapitre 1 présente une description et un relevé de la faune du Canada, tandis que le chapitre 2 relève d'importants aspects d'un certain nombre de systèmes d'exploitation de la faune utilisés dans d'autres pays.

Au chapitre 3, l'auteur passe en revue les diverses méthodes employées pour calculer la valeur de la ressource, et il examine au chapitre 4 les objectifs officiels de certains organismes canadiens de protection de la faune.

Au chapitre 5, il fait l'historique de la législation canadienne sur la faune, et examine la structure des lois et des règlements actuels.

Il donne, au chapitre 6, de nombreux exemples pour illustrer les problèmes qui confrontent les responsables de l'aménagement de la faune dans les domaines de la chasse, du braconnage, et surtout de l'aliénation de l'habitat sauvage. Ces problèmes constituent les terrains d'essai de divers règlements concernant

la protection de la faune. Certains de ces problèmes sont limités à des endroits particuliers et existent depuis des décennies, voire même depuis des siècles, tandis que d'autres sont nouveaux et se présentent d'une façon globale.

Une catégorie particulière de problèmes, ceux qui concernent les oiseaux migrateurs et les espèces menacées, se rattachent à des questions de coopération internationale et sont liés aux conflits existant entre les chasseurs et les exploitants agricoles au Canada. Ces problèmes sont exposés au chapitre 7.

Dans le dernier chapitre, l'auteur se demande, à la lumière de l'expérience récente, si les règlements existants sont suffisants. Il formule également quelques propositions, comme par exemple un plus grand usage du système de prix pour rationner une ressource limitée.

Summary

The study looks at the degree of effectiveness of laws and regulations in the area of wildlife management.

Comprehensive sources on wildlife and wildlife management do not exist in Canada. Thus a picture of the situation had to be constructed from a mosaic of private and government publications devoted to wildlife as well as interviews with officials from private and governmental agencies.

Wildlife and wildlife management differs widely between provinces and territories. The study focuses mainly on Ontario and British Columbia. Ontario, heavily populated in the southern part, experiences problems in wildlife management mainly due to population pressure and industrial growth. Much of the land base in Ontario is in private hands. Much of British Columbia, on the other hand, is relatively undeveloped and over ninety-five per cent of wildlife habitat is Crown land. British Columbia is big game country requiring a special approach to wildlife management.

The study avoids references to the traditional theoretical approaches in recreation. Rather, it focuses on the problems encountered by wildlife and wildlife agencies when confronted with the basic issue of hunting pressure and habitat alienation.

After a brief introduction (Chapter 1) this study defines the nature and dimensions of the resource in Canada. Important aspects of a number of foreign wildlife harvesting systems are introduced in Chapter 2.

Chapter 3 reviews the various methods employed to estimate the value of the resource, followed by a discussion of the official goals and objectives of selected wildlife agencies in Canada (Chapter 4).

The next chapter explains the historical development of wildlife laws in Canada, and looks at the structure of present laws and regulations (Chapter 5).

The problems of wildlife management are illustrated with a considerable number of examples in the areas of hunting pressure, poaching, and especially habitat alienation (Chapter 6). These problems are the testing grounds of the array of existing wildlife rules and regulations. Some of these problems are local and have existed for decades and centuries. Others are being felt for the first time and appear to exist on a global scale.

Migratory birds and endangered species present a variety of special problems revolving around international cooperation and the conflicts between hunters and farmers in Canada. These problems are discussed in Chapter 7.

The concluding chapter focuses on the adequacy of existing rules and regulations in the light of recent experience. Some alternate approaches, such as the greater use of the price system in rationing a scarce resource, have been suggested.

Chapter 1

INTRODUCTION

The goal of this study was to look at the degree and the effectiveness of laws and regulations in the area of wildlife management.

It became clear from the beginning that no comprehensive sources on wildlife and wildlife management existed in Canada. A picture of the situation had to be constructed from a mosaic of private and government publications devoted to wildlife as well as interviews with officials from private and governmental agencies.

It became also obvious that wildlife and wildlife management differs widely between provinces and territories. The study focuses mainly on Ontario and British Columbia. Ontario, heavily populated in the southern part, would experience problems in wildlife management mainly due to population pressure and industrial growth. Much of the land base in Ontario is in private hands. Much of British Columbia, on the other hand, is relatively undeveloped and over ninety-five percent of wildlife habitat is Crown land. British Columbia is big game country requiring a special approach to wildlife management.

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Important aspects of a number of foreign wildlife harvesting systems are introduced early (Chapter 2).

Chapter 3 reviews the various methods employed to estimate the value of the resource, followed by a discussion of the official goals and objectives of selected wildlife agencies in Canada.

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Migratory birds and endangered species present special problems and thus merit separate discussion. The concluding chapter focuses on the adequacy of existing rules and regulations in the light of recent experience. Some alternative approaches are suggested that might ameliorate the problems.

A few areas have been omitted or touched upon only slightly because of time constraints. One such area is the relationship between native Indians and wildlife. The area is extremely complicated because of recent divergent judicial opinions and native claims.

It should be noted at this point that the term wildlife is rarely precisely defined. On the one hand, what is commonly discussed is game, and much of this study refers to game, the

part of wildlife most important in the eyes of man. On the other hand, the term wildlife can also mean all non-domestic animals. It will generally be clear from the text what the term wildlife implies.

Chapter 2

THE NATURE AND DIMENSIONS OF THE RESOURCE

The nature of the resource is defined by characteristics inherent in the resource and the relationship of man to the resource. These include cultural, social, economic and legal dimensions of the resource.

Wildlife species can exist and survive on their own without contact with mankind. All species, including wildlife, exist within nature in a complex system of interrelationships. The predator-prey relationship is only one of many. Each species of wildlife lives within a space called the habitat and shares this space with many other species of wildlife and species of flora.

Disregarding man and his activities, each species of wildlife exist in an environment of cooperation and competition with other species. Changes in climate and the resulting changes in flora and abundance of other species affect the number, health and productivity of each species. Over long periods of time some species or subspecies become extinct, while new species evolve.

Man concerns himself with only a small fraction of the millions of species known today. His relationship and attitude to wildlife differs between cultures or societies and changes over time. With these changes the nature of the resource changes.

The dimensions of the resource depends on a variety of perceived relationships or aspects. They include the spiritual, cultural, economic, legal or social aspects. In our society the economic and legal aspects are generally viewed as paramount and strongly influence our attitude toward wildlife.

In Canada, as in many countries, wildlife is held in trust by the government for the people. Wildlife is a common property resource on both private and public land.

The exploitative aspects of a common property resource are generally well known. It should suffice to note that with a sufficiently large population and in the absence of restrictions of any kind a common property resource may be exploited severely. In the case of wildlife a species may be reduced in number until the species is unable to reproduce sufficiently to survive. The fate of the dodo bird, the passenger pigeon and the buffalo are well known examples of the unrestrained exploitation of a species. Of those only the buffalo, now protected by law, survives.

Hunting pressure on wildlife, either commercial or recreational, can lead to an exhaustion of a part of the resource. Thus the necessity for restrictions. In Canada there are a great number of restrictions designed to protect the resource from excessive use and exploitation. For purposes of analysis it is useful to distinguish between the consumptive and non-consumptive use of wildlife. The former implies hunting and killing, the latter observing wildlife.

The consumptive use of wildlife in Canada is considered recreation - an outdoor sport - not an economic activity. The consumptive use of wildlife is free to all residents except for a small licence fee. This basically free entry results in a large number of people wishing to use the resource. The resulting pressure on the resource requires that other, non-price measures must be employed to protect the resource from undue exploitation. The absence of a substantial user fee to allocate the resource among competing users, leads at the same time to a loss of rent which could accrue to the resource. The absence of a free market to establish a price also means that a conventional calculation of the economic value of wildlife is not possible.

Wildlife is, within limits, a renewable resource. In order to exist and renew itself wildlife species require a habitat of a particular quality. Landowners, i.e., owners of the wildlife habitat, receive little or no financial remuneration for wildlife habitat maintenance and protection. Indeed, wildlife and the hunter often cause damage to the habitat and/or property of the landowner. As a result, landowners have few incentives to care for wildlife and wildlife habitat.

Wildlife is managed by government agencies. These agencies are guardians of the wildlife resource. The general goal of these agencies is to exploit the resource in an orderly sustained manner. The provision of game for the hunter is one of the prime tasks of wildlife managers. However wildlife managers have little control over quality of habitat in the case of crown lands and practically no control in the case of private lands.

In relationship to the size and complexity of the resource wildlife agencies have small professional staffs and very low budgets.¹ Budget expenditures are often covered by direct income from licence fees. Only minute amounts of taxes appear to be transferred from general revenue to the various wildlife branches. In other words society expects wildlife to "stand on its own feet." In British Columbia this is changing and in excess of fifty per cent of the budget are provided from other government sources.²

Although wildlife constitutes a recreational resource for most Canadians, it forms an important part of livelihood for specific groups. For example: The trapping of fur bearing animals provides income to a small group of Canadians and, to Canada's Indians and Eskimos, wildlife constitutes an important source of food. These groups are generally allowed to hunt in defined areas outside the restrictions set up for the non-native population.

Summary

In Canada wildlife is owned by the crown in trust for the people. Wildlife is a common property resource. It may be exploited at a nominal charge by anyone. A great many non-price measures prevent the exhaustion of the resource. Government agencies manage wildlife for the user, who does not take part in managing the resource. Agencies and users are mainly hunting oriented and basically manage and exploit game species. In order to exist, wildlife needs a habitat of a particular quality. Wildlife managers have little control over habitat.

At this point it appears useful to discuss the dimensions of other wildlife management systems. Such a comparison enables us to realize that the Canadian system is only one of several possible successfully operating systems. We will begin by discussing a number of relevant aspects of the Central European system of wildlife management.

Aspects of Wildlife Management - Central Europe³

In large parts of Europe the rights to reduce game into possession belongs to the landowner. In order to exercise this right, the land must be of a certain minimum size and the landowner must be an accredited hunter. This means he must attend a special course, and pass an examination. The special course covers a variety of topics concerned with the management of wildlife.

The landowner may also lease his land for a certain minimum number of years to an accredited hunter or hunting organization. The owner or his lessee has a number of responsibilities. In general he must feed the game in the winter and he must make a yearly inventory of the game. An official plan approved by government wildlife agencies describes the number of

game of both sexes and social classes to be harvested. The owner or lessee is liable for not fulfilling the plan and for over-shooting. Above a certain limit he is also liable for damage to crops caused by game. For very large hunting preserves game keepers must be employed. The harvested game remains the property of the owner or lessee and he can sell it on the open market. The hunter generally has a right to the trophy and the viscera only but may purchase the harvested game from the landowner or lessee.

This system presents a very efficient type of game management. The landowner-lessee manages the game, pays the costs and receives the revenue. The manager is licenced and must acquire knowledge of game management. The government supervises the management. Hunters must have had a minimum training in wildlife management and must join hunting organizations. Hunts for small game are collective hunts, a type of social event. Open seasons are long and insure that the prescribed number of animals are harvested. Although efficient this system has a number of disadvantages: it does not accommodate those people who have a non-consumptive interest in wildlife. Moreover the system is site specific and has problems with migratory wildlife.

Wildlife Harvesting in Texas⁴

It is unlawful in Texas, as it is in most of Canada, to buy and sell game animals. Government wildlife agencies regulate seasons, bag limits and enforce other game regulations. The landowner however has the right to limit access to his property and may decide how many and what kind of games shall be taken. He may not break wildlife laws but must stay within them.

Landowners often lease hunting privileges. They do so in a number of ways: They may lease the privilege for a season or more to a select group of hunters. These hunters and their

families often purchase additional access privileges for non-comsumptive recreation such as camping, boating, horseback riding. Alternately large corporations may hold long-term leases, build expensive hunting lodges and swimming pools where guests and their own senior executive personnel are entertained. Some commercial hunting clubs hold leases in a variety of game habitats. In the case of long-term leases, hunters frequently develop proprietary interest in the wildlife resources.

The landowner may also lease hunting rights by the day, or he may offer catered hunting through a broker. In the latter system brokers or outfitters lease large acreages for a season and "sell" hunting rights on smaller pieces of land on a daily or weekly basis.

Lately ranchers have introduced exotic species, not covered by game laws, on their property and sell hunting rights for these species. Occasionally ranchers have been known to charge extra for the harvested animals. This practice could be, but has not been, tested by the courts.

The system, as it developed in Texas, was made easier by two fundamental conditions: first, landowners in Texas hold most of the available land. Holdings are large, at times encompassing several counties. Second, trespass laws, although relatively lenient, are strictly enforced.⁵ A system similar to that in Texas, while unsuitable for Ontario, may well fit for British Columbia, where forest companies lease large areas of crownland.

The system seems to be working well in the sense that there exists ample game in Texas, and the abuse of hunting laws and hunting privileges are rare. Private property owners are conservative and take care of the game stock which constitutes part of their "capital." Moreover, the income received by ranchers forms a substantial portion of their total income.⁶

Conclusion

The discussion of the game management and harvesting system of Central Europe and of Texas shows that different methods not only shift the management aspect but also change the nature of the resource as perceived by the local inhabitants. In Canada in the past hunting was available basically to all who wish to do so. In Texas economic forces select the persons who wish to exploit the scarce game resource. The Central European system uses both compulsory education and economic criteria to select those who are allowed to hunt. The use of economic criteria reduces the number of hunters and eases the pressure on game populations.

Notes

1. D.J. Neave, "Evolutionn of Wildlife Harvesting Systems," Fortieth Federal-Provincial Wildlife Conference, Transaction 1976 (Ottawa: Environment Canada, Wildlife Service, 1976).
2. Information supplied by D.J. Robinson, Director, Fish and Wildlife Branch, British Columbia.
3. A.B. Bubenik, "Evolution of Wildlife Harvesting Systems in Europe," op. cit., p. 97.
4. J.G. Teer, "Evolution of Wildlife Harvesting Systems in Texas," op. cit., p. 114.
5. Ibid.
6. Ibid.

Chapter 3

THE VALUE OF WILDLIFE

The preceding chapter made it clear that in Canada, wildlife and/or much of the wildlife experience cannot be purchased in the marketplace. Thus the acceptable and customary method of evaluation, namely, using the market price as an indication of value, is not available. To compensate for this deficiency a number of other approaches have been developed. They are basically of two types.

The most accepted methods attempt to impute a value to the resource. It is generally assumed that existing fees underestimate the value of the resource. In order to arrive at a higher and more appropriate value for the resource, researchers generally use existing expenditure patterns of users to estimate additional resource values. It is the goal of these methods to arrive at a plausible monetary estimate of the value of the resource.

The second type of approach avoids monetary evaluation. Instead, it focuses on qualitative aspects. Psychological, ecological or even socio-cultural benefits of wildlife are ascertained by analyzing the sources of their benefit or value.

This chapter will discuss both approaches, starting with a discussion of the sources of wildlife values. The second half of the chapter will present the accepted methods of economic evaluation. Some actual estimates of economic values will be given. The chapter concludes with a summary of evaluation procedures and their applicability.

The Sources of Wildlife Value

A number of writers have analyzed the benefits and values of wildlife in qualitative terms. There is no common agreement as to the number of categories or their importance. The emphasis that each writer places on a particular source of benefit appears to be largely a function of his training. Thus biologists will spend considerable time discussing the ecological value of particular species. A wildlife officer may concentrate on the hunting aspect as a source of benefit and value. In the following pages examples of different types of categorization will be presented.

William Langford and Donald Cocheba distinguish four sources of wildlife value: recreational hunting, nonhunting activities, existence value and option value.¹

(1) Recreational Hunting

This particular contact with wildlife has generally been considered the most important of all sources of value. Indeed, it can truthfully be said that a large number of people considered the value of wildlife to be synonymous with the value of game encountered in recreational hunting. Even today, wildlife management exists largely for the purpose of providing sufficient game for recreational hunters.

Recreational hunting is probably the most visible contact between wildlife and man. In the first place, mostly large mammals like bear, moose, caribou or fox are involved. In the second place, hunter activity can be observed easily and regularly. In the third, hunters are well-organized and, in the past, have acted very effectively on their own behalf. Finally, the expenditure of hunters on guns, clothing, accommodation and

other hunting-related expenditures is large and can readily be calculated. The approximately 830,000 big game hunting licenses and 1,100,000 small game licenses issued in Canada in 1973-74 gives an indication of the number of people involved in recreational hunting.² For a detailed breakdown of these figures turn to Appendix A.

While much of the "pleasure" of the hunt is the hunt itself and the final kill, hunters spend a considerable amount of time in activities directly associated with hunting. According to a study done for the B.C. Fish and Wildlife Branch by Quadra Consultants of Vancouver, hunters spent 14 days afield during the 1970-71 season. Of these they spent 2.8 days exploring the territory, 2.1 days in shooting practice, 1.6 days stalking and photographing game, and 0.6 days training dogs.³ The number of man-days of hunting and the number of big game killed in British Columbia are listed in Appendix B.

(2) Non-hunting Activities

Langford and Cocheba divide all nonhunting activities into four subcategories:⁴

Wildlife-based activities such as wildlife observation and photography form the first category. This type of activity would occur especially in parks where wildlife is protected and thus relatively tame. The outings of Nature Clubs to observe birds or other wildlife are included in this category as is the use of wildlife for medical and biological research.

The second category, called wildlife-related activities, refers to a large number of outdoor activities such as hiking, canoeing or picnicing which frequently involve some sighting of wildlife. Indeed it is often on outings not primarily intended to view wildlife where the majority of encounters are made.

Endemic wildlife activities form the third group.

These activities can be pursued from one's own backyard - watching a flock of geese on their way south or a loon diving for food.

The fourth and final category, recording-based wildlife activities encompass the watching of films or TV shows, the viewing of photographs and the reading of books that show and describe wildlife. These activities are very popular especially when they deal with species of wildlife which the viewer can never hope to observe in the wild, such as grizzlies or whales. Shows and books on wildlife are favourites of children. For city children recording-based wildlife activities frequently form the only source of knowledge on wildlife.

The value of nonhunting activities can be expressed in terms of population participation rates in wildlife watching, or in terms of expenditures on wildlife (birdseed, etc.). Another indication of the value of wildlife may be gained by looking at changes in the membership in animal-related organizations. Membership in the National Audubon Society in the United States, for example, increased from 32,000 in 1960 to 260,000 in 1975.⁵ The number of articles written and published on wildlife topics may be taken as an additional index of interest in wildlife and an indication of the value of wildlife.

(3) Existence Value

Many people will get satisfaction simply from knowing that certain types of wildlife exist. One may take pleasure in the knowledge that the largest mammal ever to have existed, namely the whale, still lives today; or the cheetah which can go within a split second from rest to 100 km/hour and keep this speed for at least for a kilometer.

(4) Option Value

Some people may also be willing to support wildlife with their money or donations if this support will hold open the option of viewing or hunting wildlife in the future.

Recreational hunting, non-hunting activities, assistance value and option value are the four main sources of value as proposed by Langford and Cocheba. We shall now turn to look at another, somewhat different approach taken by delegates to the thirty-ninth Federal-Provincial Wildlife Conference.⁶ Here, all value inherent in wildlife was grouped into three broad categories: ecological values, economic values, and socio-cultural values.⁷

We will begin by discussing briefly the first and last category, leaving an explanation of the economic values for the next part of this chapter.

Ecological Values

Wildlife forms an integral part in the pattern of relations between organisms and their environment. The system is very complex but appears to possess a tendency toward maximizing energy flows. Reductions in any part of the system would tend to reduce energy flows and the stability of the total system.

Past research suggests that nature exists in a dynamic balance. Changes in any one part of the ecosystem may cause problems in other parts. In Borneo, for example, health officials attempted to reduce flies in rural villages using DDT. As a result large levels of DDT built up in lizards eating poisoned flies. This killed the cats eating the lizards. Rats previously killed by the cats proliferated and threatened a plague.⁸

Animals are also indicators of changes in the environment and form at times a sensitive warning system of man's activities. A decrease in the population of birds of prey awoke the public to the dangers of DDT in the environment. Fish were the first indicators of mercury pollution.

Thus wildlife fulfills several important ecological functions: it helps to maximize energy flows within the system, stabilizes the system and warns of failures within.

Socio-Cultural Values

Game once was an important part of man's diet and Canadian culture and society was stimulated by the fur, fish and timber trade. Moreover wildlife reminds Canadians of their evolution and our dependency on the soil-plant-animal-man food chain. Some writers stress that an extension of the system of ethics to the relationship with the earth and its living creatures is culturally valuable.⁹

The relationship between man and wildlife is widely thought to be more valuable than any relationships between man and machines. According to this viewpoint, wildlife, which influenced people in words and song since childhood, is deemed worthy of protection and enhancement and has an intrinsic value apart from the economic value of hunting and trapping. This value is reflected in the socio-cultural relationship between people and wildlife. It has been shaped in the past and continues to influence mankind in the present.

The Economic Value of Wildlife

Prices in an economy serve as a measure of value of the product as well as the inputs from which the product was made. Market prices therefore are important indicators of the value of resources and determine the allocation of resources between competing uses. Changes in relative prices will lead to changes in the value and use of resources. All this works well as long as market prices exist. In the absence of market prices the value of resources cannot easily be ascertained. In conflict situations, the noncommercial use of a resource will usually be eliminated in favour of the commercial use. The reduction or elimination of wildlife habitat in favour of agricultural or industrial utilization of the land is a case in point. The usual reaction of commercial society to a nonexistent market price is that if the value of a resource cannot be ascertained it does not have a value. In response to this dilemma, economists have attempted to develop alternate methods of evaluation.

In the following section five methods of economic evaluation will be explained. This will be followed by a numerical example and a numerical comparison of some of the methods discussed.

It should be noted at this point that the methods described below were developed for use in the estimation of recreational resources. Applied to wildlife they estimate the value of the wildlife experience for specific sites. It is important to realize that the estimates do reflect the value of the wildlife experience (hunting, observing, etc.) and the value of the site, rather than the value of wildlife or the wildlife species. While the distinction is important, it is in most cases, not crucial as wildlife, experience, and site are interrelated and can rarely be considered independently of each other.

(1) The Gross Expenditure Method

The gross expenditure method adds all expenditures associated with the wildlife experience. Travel costs, expenditures on food, specific clothing, and equipment, as well as all license fees are included in the estimates. Some researchers also include estimates of the opportunity cost of time spent at the resource.

The gross expenditure method has been severely criticized for overestimating the value of the resource. It is argued that part of the food expenditures would have occurred even if a person would have stayed home; that expensive lodging is valued for its own sake and does not reflect the value of the site.

In spite of these criticisms and possibly because of the resulting high values attributed to wildlife the value of the wildlife resource obtained by this method is often quoted.¹⁰

(2) The Net Expenditure Method

Quadra Economic Consultants attempted to measure the net benefit of the wildlife resource to the province of British Columbia.¹¹ They concentrated mainly on the net value of hunting looking at resident, non-resident, trapping and subsistence hunting.

License fees and an estimate of daily fees resident hunters would have been willing to pay if required formed the estimate of the net value of hunting by residents. Quadra refused to include in the estimate the expenditures of resident hunters on travel, food and lodging, arguing that these are associated costs which do not reflect the value of hunting any more than the costs of driving to the supermarket store measure the value of food purchases.

Non-resident hunters contributed to the net value of hunting through license purchases, the net expenditures on food, lodging, etc., and net gains from guiding. Net expenditures are gross expenditures minus costs incurred while providing these goods and services.

The net value of trapping was calculated by subtracting an estimate of costs incurred in trapping from the value of the furs sold.

Finally, Quadra estimated the value of subsistence hunting by calculating the value of the meat obtained less the costs incurred in getting the meat. The value of a pound of game meat was thought to be equal to the value of a pound of beef. The actual data are shown in Table 1 on page 24.

(3) The Hotelling-Clawson Method¹²

This technique assumes that any existing fees are an underestimate of the price people would be willing to pay for the use of the resource. Broadly speaking, differences in travel costs between concentric zones around the site are used as proxies for increases in fees. Estimates are obtained in the following manner: a series of concentric travel zones are drawn around the site in question. Visitors from each zone are thought to have identical travel costs. The relationship between changes in fees and changes in travel costs is the following: if travel costs increase from zone one to zone two by ten dollars and the number of visitors from zone two is fifteen percent less than from zone one, then a ten dollar increase in fees for the site is thought to decrease attendance by fifteen percent. From this kind of information a demand curve for the site can be calculated. The resulting demand curve shows the number of visitations as a function of entrance fees. From this demand curve a value of the site can be ascertained.

The Hotelling-Clawson technique is based on a number of restrictive assumptions. For example, visitors are expected to respond to a fee change as they would to a change in travel costs. There is also an implicit assumption about the absence of alternate sites.

In spite of these restrictions the Hotelling-Clawson method is capable of providing rough estimates of the value of a specific site.

(4) The Pearse Method¹³

This method uses expenditure differences of visitors within a given income class as an indicator of extra market benefits received by visitors.

After total trip expenditures and income of visitors have been obtained by questionnaire, visitors are grouped by income class. Within any class people with the highest expenditure are assumed to have received no extra benefit. The difference between the highest expenditure and other expenditures within a given class is assumed to represent the extra market values. The total of all differences added for all income classes is assumed to be a measure of extra value of the site.

Underlying the Pearse technique are a number of assumptions. The most restrictive is that preferences among participants regarding money and site experience are homogeneous.

(5) Willingness to Pay Technique

This approach concentrates on a questionnaire or interview for the purpose of ascertaining the values people put on a specific resource.

Although this approach appears promising, the accuracy of the response depends heavily on the surveyor and the survey method. Moreover, people have to be able to understand that willingness to pay implies also ability to pay.

Examples of Evaluation

(1) Comparing the Methods¹⁴

Employing three different methods W. Phillips made alternate estimates of Alberta Big Game Hunting Benefits in 1975. The three methods gave widely differing results. The Pearse method was the highest with an estimate of \$50.86 million. The Willingness to Pay methods showed benefits of \$5.73 million. The lowest estimate was attained by the Hotelling-Clawson method with \$3.81 million. Details of the comparison are shown in Appendix C.

The methods obviously need improvement or refinement if they are to be taken as estimates of the actual value of the resource as perceived by present users of the site.

(2) The Value of Wildlife in British Columbia

Quadra Economic Consultants Ltd.¹⁵ prepared an estimate of the value of wildlife for the Fish and Wildlife Branch of the Department of Recreation and Conservation in British Columbia. They made two estimates: the first was an estimate of gross expenditure on wildlife, basically hunting. In it they included a brief separate estimate of gross expenditures on nonconsumptive recreation for fish and wildlife.

The second was an estimate of the direct benefits of the wildlife resource (basically hunting) to the province of British Columbia. A summary of the data is listed below.

Table 1

SUMMARY OF VALUES FROM DIRECT USE OF WILDLIFE RESOURCES

Users	Measure of Value		Provincial Direct Benefits
Resident	Licences	\$ 2,068,000	\$ 2,068,000
Hunters	Expenditures	64,831,000	--
	Value of Recreation	32,496,000	32,496,000
Sub-Total:			\$34,564,000
Non-Resident	Licences	1,103,000	1,103,000
Hunters	Expenditures	4,329,000	1,420,000
			\$ 2,523,000
Subsistence			
Hunting	Value of Harvest	1,000,000	1,000,000
Trapping	Value of Furs	1,200,000	840,000
Total of Provincial Direct Benefits:			\$38,927,000

Source: Quadra Economic Consultants, Fish and Wildlife in B.C.,
A Review of Resource Values (Victoria: B.C. Fish and
Wildlife Branch, 1977).

Gross expenditure is three times the value of direct benefits, \$104 million versus \$39 million. The net gain to the province is somewhat less, due to the costs of regulation and management of the resource.

Problems of Evaluation

It is obvious that the evaluation methods discussed provide no exact and consistent data on the value of the resource. Instead, the value of the resource is either described in qualitative terms or with data which diverge widely between methods.

Yet there are other, far more serious problems contained in the estimation procedures. The arguments and/or data do not lend themselves easily for use in the decision-making process. For example, they do not indicate whether more or less

funds should be allocated to the management or enhancement of wildlife. Nor do they give guidelines for the setting of license fees. Furthermore estimates of the value of wildlife cannot be used as guides for individual species or individual sites as the estimates omit the existence and/or value of alternate sites.¹⁶

Moreover, current estimates are poor indicators of the value of wildlife for future generations. In the first place, the use of a high real private discount rate would reduce the present value of wildlife experiences a decade hence to nearly zero. A generally accepted social discount rate, in fact, does not exist. The discount rate chosen in the evaluation is therefore of crucial importance.

The most problem-filled aspect of wildlife resource evaluation, however, does not lie with inadequacy of reliable data. Even the best estimates of the value of the resource can rarely compete with the commercial value of the alternate use of the area. Just as agricultural land is alienated when it comes into conflict with the development of housing, estimated values of wildlife and wildlife habitat cannot compete with the commercial values of agriculture, forestry or mining.

Because of the problems encountered in the estimation of the values of wildlife, arguments for the preservation of wildlife and wildlife habitat are therefore often phrased in qualitative terms. Yet in a society where market decisions are highly respected and where the creation of new jobs means a livelihood for many unemployed, the priorities accorded wildlife and wildlife habitat continue to be limited.

Before closing this chapter two other value sources of wildlife should be mentioned. The first is trapping, the second

is subsistence hunting. Some aspects of trapping are discussed in Appendix D. The total value of pelts from trapping was less than 50 million dollars in 1977-78 in a stable but slowly declining industry. However, a few words need to be said about subsistence hunting.

The use of wildlife as a major source of food, clothing, tools and ornaments has been common throughout the world. Even today some of the Indian and Eskimo tribes of Canada obtain a large portion of their food from wildlife sources. Caribou and other ungulates form an important source of protein for native people. Indeed, hunting is extremely important on reserves where unemployment can be as high as ninety percent. Here wildlife still is the sustainer of human life.

Even among so-called recreational hunters, the meat from the kill is highly valued as a replacement for beef or pork. This is especially so in the northern areas of the provinces from British Columbia to Quebec as well as in the Yukon and in the Northwest Territories. Even hunters from the cities cite the value of meat as food - low fat, high protein and no additives - as an important reason for hunting.¹⁷

Quadra Economic Consultants estimate the annual value of subsistence hunting at roughly \$1 million for British Columbia.¹⁸

Notes

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5. Thomas A. More, "The Demand for Nonconsumptive Wildlife Uses: A Review of the Literature," Forest Service General Technical Report NE-52 (Bromall, P.A.: Department of Agriculture, 1979).
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12. Marion Clawson, "Methods of Measuring the Demand For and Value Of Outdoor Recreation," RRF Reprint No. 10 (Washington, D.C.: Resources for the Future, 1959).
13. Peter Pearse, "A New Approach to the Evaluation of Non-priced Recreational Resources," Land Economics, Vol. 49, No. 1, 1968.
14. W. Phillip "Wildlife Economic Values" Thirty-Nine Federal-Provincial Wild-Life Conference, Transactions, (Ottawa: Environment Canada, 1976).
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16. A thorough discussion of the theoretical aspects of game valuations are found in Anthony Scott, "The Valuation of Game Resources: Some Theoretical Aspects," Canada, Dept. of Fisheries, Canadian Fisheries Reports, Special Issue, May 4th, 1965.
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Chapter 4

GOALS AND OBJECTIVES OF WILDLIFE MANAGEMENT

Since World War II enormous changes have occurred in the world. Population and consumption have increased rapidly. Together with the use of powerful technologies this increase has put enormous pressures on the environment. The exploitation of natural resources has increased manifold.

These changes and pressures naturally came to be felt in the area of wildlife management. Taking British Columbia as an example this chapter focuses on past changes in wildlife management. We then look at the new proposed Wildlife Management Plan of British Columbia as well as the goals and objectives of other provinces.

Changes in British Columbia

Historical changes in British Columbia were outlined in Vancouver by P.A. Larkin, an expert in Animal Resource Ecology, in a keynote address to the International Association of Fish and Wildlife Agencies.¹

After World War II fish and game protection was considered part of the job of the Provincial Police. The object of the Game Commission was to protect and maintain the wildlife resources, namely game, so that it might be enjoyed by the public forever. A certain maximum sustained yield could be taken every year according to gentlemen's rules which true sportsmen observed and which the Game Wardens enforced. In brief the management of wildlife meant primarily the management of people.

Over the years the province developed with dam construction, increased logging, mineral exploitation, and

pollution. The population increased and the numbers and character of sportsmen changed. Many were careless with firearms, and some were mainly concerned with shooting meat for the freezer.

As a result, pressure on game increased and the work of Fish and Game officials became more difficult and demanding. In the decade of the sixties they attempted to supply a sustained yield to increasing populations and worried about the winter range of deer and all ungulates. The emphasis changed from the management of people to the management of game species.

During the last decade the emphasis shifted again from conservation to conserving, from using what nature provided to not using a resource unless a need exists. The Department of Fish and Game became the Department of Fish and Wildlife and a much broader and larger spectrum of the population became involved in the use and conservation of wildlife as opposed to game.

During these years large areas inhabited by a variety of species became alienated from wildlife and wildlife administrators became aware of the importance of wildlife habitat. As the complex interrelationships of various wildlife species became better known the word ecology became part of the vocabulary and the goal of maximum sustained yield gave way to the goal of optimum sustained yield.

Proposed Wildlife Management Plan for British Columbia

The decade of the seventies appear to have been a period of adversity for the B.C. Fish and Game Branch of the Department of Recreation and Conservation. The Branch operated for several years without an appointed director. An outside investigator, M. Mair, probed the operation of the Branch and submitted a hard-hitting report to the government critical of the manage-

ment and goals of the Branch.² The government chose not to make this report public for some time.

Criticism of the Branch's action mounted. A number of wildlife organizations demanded that the Branch develop a specific wildlife management plan and accused the Branch of being "... more interested in protecting the interests of miners and loggers than [the interests] of wildlife."³

To resolve these criticisms the Branch made public a new Wildlife Management Plan early in 1979. The plan had been in preparation for about six years being continuously modified as it was developed.

The Plan calls for several new thrusts or strategies for improved wildlife distribution and numbers within the major biophysical zones in the Province, to accommodate public demands for observation, hunting, and commercial use, where definable.⁴

Because of the Plan's novel approach we shall discuss it in detail. The entire Plan consists of an overall plan for the province, plans for eight resource management regions and twenty-eight provincial wildlife species plans. Ten public hearings were held in different locations in the Province in the summer of 1979. All interested parties submitted their viewpoint and concerns on the contents of the proposed new plan. A final series of plans are being prepared utilizing the public input whenever feasible.

The overall, the regional, and the species plans specify, among others, the habitat required, research to be done, number of animals to be protected and managed, hunter days of recreation expected, and funding required.

For example, the Moose Management Plan for British Columbia⁵ is a thirty-page document divided into several

parts: the resource and its habitat, management, bibliography and appendices. The first part gives the taxonomy and description, distribution and numbers, biology, habitat, uses and conflicts. The section on management lists the objectives, policies and management prescriptions. The appendix contains a history of regulation for moose, hunter harvest, hunting effort and data on the value of moose hunting. A coloured map shows the distribution of moose in British Columbia.

Briefly, the main points are the following: The moose is the largest member of the deer family and is the second most sought after species by hunters. It is widely distributed and reaches its greatest abundance in young forests or in willow stands along rivers or lakes. The population is estimated at 240,000 plus or minus 10 percent. Moose have a low reproductive rate. There are three objectives for moose management in British Columbia. The first objective is to increase the moose population to 300,000 animals distributed through its present range. The second objective is to provide opportunities for people to view moose in their natural habitat. The third objective is to provide 600,000 hunter days of recreation and an annual sustained hunter kill of 30,000 moose.

The Moose Management Plan continues to devote several pages to management prescriptions. It also details the areas of conflict. They are four in number: the gradual alteration and destruction of moose habitat; the deterioration or decline of browse quality; moose-vehicle collisions and use of the moose resource.

The Moose Management Plan of British Columbia appears to be clear, precise and explicit. It informs the public about the present state of moose management and states clearly the intentions of the Wildlife Branch. The plan is specific enough to allow for cost estimates. It can serve as a goal and a yardstick against which future Wildlife Branch actions may be judged.

The basic goal of the Branch is to protect existing populations and their particular habitats. Some species such as deer, moose and black bears can live near people's backyards. With some consideration relatively large numbers can be sustained. Other species like the grizzly bear and the caribou need large undisturbed areas. The new regional plans will specify what the problems and costs of maintaining certain species are.⁶

After developing and testing the specific goals and objectives the Branch hopes for a revision of the existing Wildlife Act, incorporating the new goals and objectives. To obtain the widest public input, the Branch held a series of regional public meetings. At these meetings representatives of wildlife organizations and private individuals expressed a number of concerns.

The major criticism was that the Branch manages wildlife mainly in the interests of two user groups: hunters and trappers. It was repeatedly suggested that the prime objective of the Branch should be the protection and conservation of ecological systems, not the maintenance of game populations. To do this the Branch must have control or a significant voice over the land base. Clear-cut logging, the neglect of nuisance wildlife in urban areas, regulations to control non-consumptive users of wildlife habitat, and a strong opposition to big game ranching, were some of the other concerns expressed by members of the public.⁷

The overall reception of the proposed Wildlife Management Plan was, however, very positive. Citizens applauded the Plan's basic approach, namely, to state goals and objectives explicitly and in detail, to set specific targets and to accept responsibility for meeting these targets.

Other Management Plans

The proposed British Columbia Wildlife Management Plan was modelled after plans already existing in California, Arizona, and Colorado. The Colorado Plan avoids difficult terminology and is easy to understand. The Plan specifies details of each species the Colorado Wildlife Board intends to manage. It states long-range goals, anticipates problems of achieving these goals, suggests strategies to be employed and the degree of cooperation needed from other government departments.⁸

In Canada, British Columbia appears to be the only province with goals and objectives expressed in specific regional and species plans. In comparison to British Columbia, most other provincial goals and objectives seem vague. Explicit and detailed plans do not exist.

For example, the goal of the Fisheries and Wildlife Branch of the Department of Tourism and Renewable Resources in Saskatchewan is to:

maintain the quality and availability of fish and wildlife and develop the unique features of these resources for the people of the province.⁹

The Department of Lands and Forests in Nova Scotia has responsibilities pertaining to the productivity of forests, the supply of forest products, the conservation of water and enhancement of wildlife and recreational values. The objectives of the Wildlife Division are recognized as:

- (a) to maintain all species of vertebrate wildlife for their intrinsic and ecological values;
- (b) preserve or improve wildlife habitat;
- (c) regulate man's use of wildlife; and
- (d) minimize direct competition or conflict between man and wildlife.¹⁰

Wildlife Branches in the Yukon and Northwest Territories appear to be basically concerned with compiling records, determining the productivity of wildlife populations, developing adequate legislation and enforcing current hunting regulation.

The goal of the Wildlife Branch of the Government of the Yukon is:

To maintain Yukon fish and wildlife population at, or enhance them to, carrying capacity levels for public enjoyment and benefit, now and in the future. To do so by protecting and managing the populations and their environment on a sound scientific basis.¹¹

The Wildlife Branch of the Province of Ontario is part of the Ministry of Natural Resources. The official objectives of the wildlife program are:

- to provide protection, conservation and enhancement of the wildlife and wildlife habitat of the Province for its cultural value and to support the social and economic objectives;
- to provide an optimum number and variety of wildlife-based outdoor recreational opportunities accessible to and for the continuing benefit of the people of Ontario;
- to provide a continuous, sustained, optimum contribution to the economy of Ontario through Tourism and its related industries, and through the commercial utilization of wildlife.¹²

An interview with officials of the Wildlife Branch¹³ of the Ministry of Natural Resources in Ontario revealed that the Branch does not necessarily attempt to maximize harvest for hunters but wishes to manage the wildlife population to the carrying capacity of the range. This is a change in philosophy and presumably represents a greater ecological awareness.

Some people in the Branch also feel the resource should be managed for the sake of wildlife itself, not to provide recreation. The suggestion was made that it might even be appropriate to have "an animal bill of rights."

These remarks indicate that a discrepancy might exist in a Wildlife Branch between officials goals and the practices of Branch officials. This difference is likely the result of changing attitudes of officials as a result of developments in the field and the relatively static nature of official goals.

Looking at goals, objectives and organizational structures of the various agencies responsible for wildlife management, a few observations suggest themselves:

- (1) The agencies responsible for wildlife management are branches or divisions of a ministry. This clearly bears out the subordinate status of the agencies and, of course, of wildlife.
- (2) Wildlife is frequently seen in terms of its commercial value and is associated with recreation and tourism. A "Between the lines" interpretation of the objectives for wildlife may read: "every species is expected to contribute to the economy. Species that do not support the social and economic objectives will be left to fend for themselves."
- (3) Although the agencies responsible for wildlife are called Wildlife Branches, they appear to be concerned mainly with a few selected species, mostly game species. Wildlife is manipulated mainly for the benefit of people. This represents the accepted anthropocentric viewpoint of people to be discussed later. (See Appendix G).

- (4) There seems to exist some recognition of the ecological value of species. This value, however, is usually stated as an adjunct to other values.

This peripheral treatment of the ecological importance of all species of wildlife however may involve the greatest subtle threat to the welfare of human populations. In the words of the Manitoba Environmental Council:

The necessity of maintaining biosphere diversity is so important to human survival that it should have clear priority over any diversion of nutrients or energy to any individual species (namely man) to the exclusion of others.¹⁴

However laudable these sentiments, the facts are that nutrients and energy are continuously and increasingly being diverted to man's purposes. Such a diversion is the result of established practices in the private and public sector. Officials at the Ontario Wildlife Branch, for example, stated quite clearly that, to a large extent, wildlife management is dependent on and subordinate to forest management practices. Forest management practices, however, are the result of specific business calculations, which are unlikely to attach a high value to wildlife, except insofar as costs are involved in meeting the legal requirements of wildlife and fisheries departments.

The above reinforces some of the conclusions reached in Chapter 3. The inability to establish comparable economic values for wildlife may lead to relative neglect in the consideration of wildlife, or the funding of other organisations that are responsible for their management. It is reflected in the goals and objectives of wildlife agencies and the auxiliary role these agencies play in their respective departments.

- (5) The goals and objectives of wildlife management often abound with motherhood statements such as "... to provide a continuous, sustained, optimum contribution to the eco-

onomy..." or, "... develop the unique features of the resource for the people..." and, again, "... on a sound scientific basis...."

With the exception of the proposed Wildlife Management Plan of British Columbia, the goals and objectives are vague and of little help in the decision-making process. Some of the goals are non-operational and are of little help in the case of resource conflicts.

Notes

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Chapter 5

WILDLIFE LAWS AND REGULATIONS

The survival of many species of wildlife depends to a large extent on the laws and regulations determining if, when and under what conditions people may hunt, harass and kill the species. Stringent legislation has been especially necessary in the case of game species.

This chapter traces the history of game law from Roman times and looks at examples of federal and provincial acts and game regulations. Later, two specific provincial hunting regulations issued each year are discussed.

Under Roman law wildlife was not subject to claims of ownership, unless such claims meant possession. The common law held ownership of such wildlife to be in the sovereign in trust for the people.¹ The doctrine of sovereign ownership passed first to England and then to the colonies.

In an Assize of the Forest proclaimed in 1184 by Lord King Henry, he "forbids anyone to offend against him, in particular touching his forests or his forest game. He forbids that anyone shall have bows and arrows, hounds, or harriers in his forest except by licence from the king or other duly authorized person."² The King further commanded that all owners of woods within the boundaries of the Royal Forest appoint foresters and in every county twelve knights shall be appointed as custodians of his game and his wood.

The right to hunt wild animals was considered a very basic right and was dealt with in the Magna Carta and the charter of the Forest in 1225. Since that time the title to wild animals

is vested in the crown and held by the sovereign "in trust" for the benefit of all "common" people.³

Some other principles of common law hold that free, roaming wild animals are ownerless but that a qualified property (right to access) in wild animals rests with the landowner only while live wild animals remain on his land. Furthermore, the right of property in dead wild animals is vested with either the landowner or a grantee of permission to hunt.⁴

British common law that suited the Canadian situation was later adopted in Canada. The British North America Act described the powers of the federal and provincial governments. Basically, the federal government received the power to legislate on matters of important national concern. The provinces ruled on local matters.

Legislative authority over wildlife was never specifically outlined in the British North America Act, nor in the Resource Transfer Agreement of 1930. Judicial decisions have ruled that the majority of wildlife legislation comes under provincial authority. In special circumstances the federal government enacts paramount legislation. Through its Empire Treaty powers the federal government has enacted the Migratory Birds Convention Act. The regulations of the Act are paramount to provincial legislation. The provinces may, however, enact their own laws on migratory birds viewing the protection given by the Migratory Bird Convention Act as a minimum. Conflicts over proprietary rights, should they arise, would have to be settled by the Supreme Court.⁵

The Consideration of Individual Acts

In this section we will consider the Canada Wildlife Act, the British Columbia Wildlife Act, the Ontario Game and Fish Act and the Ontario Endangered Species Act, and, finally, the New

Brunswick Endangered Species Act. A discussion of these acts may enable the reader to ascertain the degree of protection accorded to wildlife in Canada.

The Canada Wildlife Act⁶

The Canada Wildlife Act, assented to in 1973, is a relatively short document. The Act falls under the jurisdiction of the Minister of the Environment. The Minister may carry out measures for the conservation of wildlife, make agreements with the government of any province respecting wildlife and may provide for the sharing of costs of joined federal-provincial programs. Further, the Minister may, in cooperation with the provinces, take all necessary measures required for the protection of any species in danger of extinction.

The Governor in Council may authorize the Minister to purchase, lease or acquire lands with respect to migratory birds and, in cooperation with a province, other wildlife. The Governor in Council may make regulations prohibiting entry on lands under the control of the Minister and prescribing measures for the conservation of wildlife.

The British Columbia Wildlife Act⁷

The B.C. Wildlife Act consists of eight Parts, each part dealing with a particular aspect of wildlife legislation.

Part One provides for the interpretation of the Act, i.e., definitions. In contrast to the Canada Wildlife Act where wildlife meant any non-domestic species of animal, the B.C. Act defines wildlife as all game and any other species of vertebrates designated as wildlife. This definition very clearly shows the origin of the present Act from a previous Fish and Game Act.

Part Two addresses itself to hunting and trapping prohibitions. The Act states, for example, that hunting from an aircraft and hunting at night is illegal. In case of injury to the habitat the Crown may sue for damages. Birds, nests and eggs are protected and hunting on clear or cultivated land without consent of the occupier is illegal. The selling and buying of wildlife meat, except as authorized, is forbidden.

Part Three deals mainly with the issuance of licenses and permits, and their suspension or cancellation. Part Four of the Act discusses the regulations and licenses required for trapping, guiding and taxidermy. Part Five explains search warrants, seizures of equipment, penalties and the issuance of wildlife tickets (summons).

Penalties vary from a minimum of \$50 to a maximum term of imprisonment of six months, both for taking, capturing, injuring or killing a creature. The illegal killing of a black bear can cost from \$25 to seven days in jail. Unauthorized killing of grizzlies or moose may cost between \$600 and \$1,000 and/or 90 days in jail.

Part Six describes the employees of the Wildlife Branch and explains the terms under which land may be acquired. It also sets forth appeal procedures for penalties received.

Part Seven details the various regulations. They are grouped into thirty-three broad categories, from specifying open and closed seasons to the calibre of a fire-arm and the frequency it may be discharged.

It is basically these regulations - changed periodically or yearly to accommodate changes in wildlife populations - which protect wildlife populations and, to a much lesser degree, wildlife habitat.

The Game and Fish Act of Ontario⁸

The Game and Fish Act of Ontario, at present under extensive review, appears cumbersome in contrast to the well-organized British Columbia Wildlife Act.

After discussing the general provisions and the subject of licenses, the Act discusses the conditions under which game animals may be hunted. This is followed by separate sections on game birds, fur-bearing animals, fish, frogs and dogs. Finally, the Act states the provisions (offences, payments, cancellations of licenses) and the regulations permitted under the Act.

The Endangered Species Act of Ontario⁹ was enacted in 1971, the first such Canadian Act. The Act is short (one page). It basically states that the Lieutenant Governor in Council may make regulations declaring any species of flora and fauna to be threatened with extinction. No person shall wilfully kill or injure any flora or fauna or destroy or attempt to destroy any flora or fauna or its habitat declared in the regulation to be threatened with extinction. The maximum fine is \$3,000, or imprisonment for six months, or both.

The Endangered Species Act of New Brunswick,¹⁰ enacted in 1976, is equally brief, containing essentially the same provisions. It does not, however, attempt to protect the habitat of an endangered fauna. The fines are less, \$25-\$1,000 and/or 100 days in jail.

The protection of endangered species in other provinces is usually included in other acts. In British Columbia the Wildlife Act and the Ecological Reserves Act make provisions for protection of rare and endangered species. Alberta has a clause in its Wildlife Act that provides for the designation and protection of endangered species. In Quebec, animal or plant species threatened with disappearance or extinction may be protected by

an ecological reserve on any land according to the Quebec Ecological Reserves Act. Other provinces and territories provide protection of wildlife and wildlife habitat through various game acts or ordinances.¹¹

It appears, therefore, that some wildlife, mainly game, has a large measure of legal protection. The Acts considered in this chapter give the Minister and his officials broad powers to regulate and enforce a broad range of protection devices. The regulations apply generally to game but include other species of wildlife as well as their habitat. While game is usually explicitly included in the legislation, other species frequently are not included unless especially designated. Thus there exists no a priori blanket protection for wildlife in Canada. It is legal to hunt, kill or harass a broad range of wildlife not specifically included in the legislation.

We will now turn to look at two specific examples of yearly hunting regulations.

Yearly Regulations

Every year the Wildlife Branches of various government departments publish summaries or synopses of hunting regulations to be read and followed by hunters of that province. These regulations vary in size and detail. We will look at two such summaries: Prince Edward Island and British Columbia.

The British Columbia regulations form an impressive document of sixty pages mostly in small type.¹² The booklet begins with two pages of definitions and exact drawings of horns of various bighorn that may be legally killed.

Pages four and five contain a long list of actions unlawful in British Columbia and a description of various license fees. The list of unlawful activities is basically a precise

summary of the B.C. Wildlife Act. There are also special restrictions on grizzly bears.

Licensees are required to carry a firearm permit (\$1.00). A resident of Canada who wishes to hunt all game and carry firearms must pay seven dollars; a non-resident seventy-five dollars.

Pages five and six explain bag limits and possession limits, protected, rare and endangered species and describes the method of compulsory reporting in effect in British Columbia. It is mandatory for all hunters in B.C. to stop at designated checking points and report certain species of game killed by the hunter. Among these are caribou, grizzly bear and cougar. The data collected enable the wildlife branch to estimate existing populations and next year's allowable harvest.

The booklet continues to discuss the applicability of various hunting methods, shooting laws, ecological reserves, parks, etc. It then gives general information (open seasons, bag limits) that apply to all of British Columbia.

The synopsis also contains a special appeal to sportsmen to observe, record and report all fish and wildlife violations and phone a toll-free number. Finally, the last pages of the synopsis give maps and regulations for specific areas in the province's administrative regions. They include open seasons, bag limits for various species, as well as special, closed and no shooting areas. Each region is subdivided into as many as fifty-six subregions.

Overall, the British Columbia Synopsis of hunting regulations is well designed, precise and remarkably detailed. It is already obvious from the synopsis that wildlife management and hunting form an important aspect of life in British Columbia.

In contrast to British Columbia, the Summary of the Hunting Regulations of Prince Edward Island is a small, one-page document.¹³ The pamphlet states the open season, daily bag and possession of game, fur bearing animals and migratory birds, license fees (\$4.00 for residents, \$20.00 for non-residents), and lists for various dates the official sunrise and sunset for the purposes of enforcement of the fish and game act. The pamphlets also states some unlawful activities with respect to hunting. For example, in Prince Edward Island it is unlawful to hunt or shoot on Sundays.

Prince Edward Island has only small game: pheasant, grouse, partridge, rabbit, fox and raccoon. For fur-bearing animals such as beaver and muskrat, a trapping license is required.

All provinces and territories issue hunting regulations to the hunter. The hunter and the general citizen appears to be adequately instructed and guided. Infractions of the law should not be due to ignorance of the existing regulations.

CHAPTER 1 - 5: A BRIEF REVIEW

Before going into a discussion on specific problems in the field of wildlife management, let us briefly summarize the main conclusions of the preceeding chapters.

In Canada, as in many other countries, wildlife is a common property resource held by the government in trust for the people. As a common property resource it is therefore subject to the usual exploitation and abuse unless protected by laws and regulations. Management systems may differ widely between countries. The system may involve extensive training and duties of hunters and landowners as in Europe, or it may involve the subsidiary use of the market system as in Texas. Both methods serve to reduce hunting pressure.

Although there is common agreement that wildlife has a value, there is in practice no commonly accepted method of evaluation. Some of the evaluation methods are qualitative in nature. The existing quantitative methods are insufficiently precise.

The lack of exact economic values presents serious problems when, for example, a conflict exists between agriculture or forestry and wildlife about the use of a specific site. The lack of precise economic data on the value of wildlife may in part have contributed to the limited priority given to, and hence the decline of a number of wildlife species in the past. It continues to be a serious problem for the future.

In Canada, wildlife is "managed" by the provincial and, to a lesser degree, the federal government. Responsibility usually rests with the fish and game or fish and wildlife branches of a government department. The goals and objectives of these branches are usually subordinate to other goals of their own or other departments. Partly because of the lack of exact economic values on wildlife, partly because of the subordinate structure

of the wildlife branches, the goals of these branches are generally couched in vague terms. The highly specific wildlife management goals of British Columbia prove that direct, specific goals are possible for wildlife agencies.

The various wildlife branches in Canada rely heavily on a series of very specific provincial and federal wildlife laws and regulations. In the past government wildlife agencies have used these regulations to manage, i.e., protect wildlife. But declining numbers of wildlife, mainly game indicate that their endeavours have not always been successful.

Having looked at the various methods of evaluation and having discussed the statutes and objectives of government wildlife agencies, as well as the laws and regulations with respect to wildlife, we now turn to consider examples of specific wildlife management problems.

Notes

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2. Roger of Hovedan, "Echo From Ancient Days," Wildlife Review, Vol. 7, No. 9.
3. Weatherill, Simmons and Kerr, "Ownership of Wildlife in Canada," Federal-Provincial Conference, Transactions 1979 (Ottawa: Minister of the Environment, 1979).
4. Ibid.
5. Ibid.
6. Canada Wildlife Act, S.C. n.d., c. 21, 29th Parl., 1st Sess.
7. British Columbia Wildlife Act, R.S.B.C. 1979, c. 433.
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12. Province of British Columbia, Ministry of the Environment, British Columbia Hunting Regulation Synopsis, 1980-81 (Victoria, B.C.: Queen's Printer, 1980).
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Chapter 6

PROBLEMS AND ILLUSTRATIONS OF WILDLIFE MANAGEMENT

Wildlife management usually means game management. Although there have been some recent exceptions, non-game species - except for endangered species - are rarely managed by wildlife agencies. The problems and illustrations of wildlife management presented in this chapter, especially Part A, thus deal with game species, mainly big game species: deer, moose, bighorn sheep and caribou.

The chapter is divided into two parts. Part A addresses itself to the conventional problem of management: hunting pressure and illegal hunting. Part B deals basically with the problem of diminishing wildlife habitat. This problem is widespread and has increased manifold in the last two to three decades. It has reached crisis proportions for some species and is, from the point of government wildlife agencies, the most difficult to deal with.

Part A: Hunting Pressure and Illegal Activities

(1) The Decline in Populations

Since the mid-1950s the number of deer in Ontario has decreased by almost seventy per cent.¹ The provincial herd of moose today is thirty-five per cent smaller than it was fifteen years ago.² In Saskatchewan the northern moose population declined markedly in 1973 and harvests had to be reduced to one-third.³ British Columbia's caribou declined from 25,000 in 1970 to about 10,000 in 1979.⁴ The Kaminuriak herd in the Northwest Territories is dwindling rapidly and will disappear in five to seven years if trends continue.⁵

A sometimes slow, sometimes rapid decline of game populations is experienced in many parts of Canada. Reasons for the decline include increased hunting pressure, poaching, deteriorating habitat quality, predation, climate and in some cases highway kill. A Saskatchewan study on winter deer mortality rate found the major causes of death to be:

Table 2⁶

<u>Cause of Death</u>	<u>Percentage of Animals</u>
Malnutrition	30
Collision/Cars & Trains	21
Predation	20
Diseases	29
	<u>100</u>

Source: "Winter Deer Mortality," Canadian Wildlife Administration, Vol. 1, No. 1, June 1975.

Take the case of the caribou. Caribou tend to have long migration routes. In order to migrate from the summer to the winter range, the caribou will have to cross the highway twice each year. Caribou are very shy animals easily disturbed by men's activity with often drastic results. Any bad experience - hunting, harassment, etc., - leads the caribou to change their migration route. The Western Arctic caribou herd of north-central Alaska declined from 240,000 head in 1970 to 50,000 seven years later. The Forty Mile herd north of Dawson City numbered 500,000 about fifty years ago and ranged from Alaska to the south western parts of the Yukon. Today, only about 5,000 animals are left, migrating for only short distances.

It appears that increased activity of any kind disturbs the caribou. In flight from hunting, construction or towing traffic they may burn up several days worth of energy and females carrying young are prone to abort.⁷ Native groups are particularly concerned as the caribou still form a substantial part of their diet. It is feared the demise of the caribou will create new native welfare communities.⁸

Species such as the caribou and grizzly bear are called climax habitat species. They need much undisturbed habitat and do not get along well with men. Even the Peary caribou that do not form huge herds but travel in small bands of five to twenty-five individuals have shown a drastic decrease in number over the last decade. Reproduction has virtually halted on several arctic inlands. The Inuit blame the decline on the influence of men, especially late winter seismic operations.⁹

The construction of the 417 mile Dempster Highway from Dawson City in the Yukon to Inuvik has focused attention on the possible decline of the third largest caribou herd in North America, the Porcupine Herd that numbers more than 100,000 animals.

At first all major conservation groups in North America were strictly opposed to the Dempster Highway. Later, in order to minimize negative contacts between man and the caribou, environmentalists made a number of suggestions. These were: (1) have cars run in convoys to reduce caribou traffic fatalities; (2) close the highway during the time of migration; and (3) outlaw hunting in the area or have a no hunting zone on either side of the highway. The example of Mt. Kinley Park in Alaska shows that protected animals may accept man as a harmless part of the environment. Mt. Kinley Park attracts thousand of tourists observing the plentiful game along eighty-two miles of roadway.¹⁰

Factors other than highway construction, highway traffic, or seismic activities influence the survival of the caribou. In the Selkirk Mountains of British Columbia live a relic sub-species of woodland caribou. The thirty or so animals alive today are a remnant of large herds that roamed the area. In winter the caribou depends for food mainly on lichen which grow best on mature stems of sub-alpine fir and Englemann Spruce.

In recent years logging of mature timber as well as collision with vehicles are threatening the survival of the animals.^{11,12}

Hunting and poaching are under the control of wildlife agencies. Harvests by hunters can be and are controlled in a number of ways, including: (1) time of season; (2) length of season; (3) shooting hours; (4) closed areas; (5) restrictions on type of animal; (6) bag limits (daily, seasonal, lifetime); (7) restrictions on hunting methods (firearms, use of aids); (8) limiting number of hunters by area or type of animals taken; (9) special qualifications (residency, special training, use of guides; and (10) licence fees.¹³

Depending on the estimates of existing game populations, these methods of control are frequently revised. For the 1978-79 hunting season for example, British Columbia instituted stricter regulations on the hunting of grizzly and added limited entry hunting areas. Because of declining caribou populations, harvested caribou must be inspected by branch officials.¹⁴

(2) The Pressure of Hunting

One of the most common problems is that the number of would be hunters is significantly larger than existing game populations can support. For example: In Saskatchewan a computer was used to select 11,380 licence holders from 25,343 applicants.¹⁵ Ontario used a lottery system to allocate 20 moose to more than 3,000 eager applicants in a controlled moose hunt. This particular instance shows well the severity of hunting pressure and it will be described in detail.

At 6:00 a.m. on November 13th, 1978, more than 1,000 hunters awaited their luck on the moose lottery in an open field near Ottawa. The rules were simple, the hunt would last until November 19th or until the quota of twenty moose had been taken;

thirty names would be picked each morning during the daily draw. Each successful applicant could declare one hunting partner from those in attendance. All sixty hunters had to report back to the headquarters by 6:00 p.m. and bring in all moose kills for examination by Ministry biologists. If the hunter was unsuccessful in the draw or the hunt, he could try again the next morning. Moose hunting took place only inside designated boundaries.

During the five-day hunt twelve bulls, five cows and three calves were harvested. The hunt attracted 3,271 moose hunters and 300 actually took part. A post hunt aerial census indicated at least fifteen moose still remained in this forested area.¹⁶

A reduction in the length of the season appears to be the most common method of reducing hunting pressure. However, a limit seems to have been reached with this method¹⁷ and other approaches such as closure of areas to non-residents or closure to all hunters, forced group hunting (two or more licences are required for one animal), and lotteries are employed to reduce hunting pressure.

Rationalizing the kill, that is to say, killing those members of the herd as to maximize the future growth of the herd, has been attempted in Quebec. First the less efficient producers (young and old) are killed, then a growth maximizing sex ratio is established and licences for bulls and cows are issued accordingly.¹⁸

Finally, improving quality of the habitat is another method of addressing the problem of hunting pressure. Instead of reducing the demand, the supply is increased. This method will be discussed separately.

Surprisingly - at least from the viewpoint of economists - the use of the price system as a means of rationing wildlife has been studiously avoided. Although fees are raised periodically, increases bear no relation to demand for and supply of wildlife to be harvested. It is not entirely clear why this is so. Wildlife managers certainly must be aware of the potential power of the price system to reduce hunting pressure. Presumably it is the political process that avoids any reference to the price system.

Although a general downward trend is indisputable, it is naturally nearly impossible to make accurate estimates of animal populations. Deer populations, for example can be estimated only within plus or minus thirty per cent by means of a life table analysis.¹⁹ The inability to make precise estimates makes planning for the future more difficult. At the same time it is hard to tell in the short-run whether or not wildlife agencies protect animal populations sufficiently. It should be emphasised, that the long-term decrease of certain wildlife species occurs in spite of the many restrictions that are applied by wildlife managers.

Judging from comments in the literature, wildlife managers are very aware that wildlife is expected to make a "sustained economic contribution" to the economy and provide recreation for a large number of people. Increased controls to reduce hunting pressure appear to be applied hesitantly and only as a means of last resort. To quote from a statement by the Wildlife Branch of the Province of Quebec:

Considering that moose hunting is first and foremost a recreative activity, and considering the fact that this activity must remain accessible to the highest possible number of amateurs, giving a set hunters' quota is considered as a last resort means.²⁰

The reticence of wildlife managers to employ the price mechanism or use strict rules that might reduce the "recreative" activity of hunters, would, at least in part, account for the many declining game species in Canada.

(3) Poaching Game

Poaching is the illegal taking of game. Not surprisingly it is difficult to obtain accurate information about which species are affected most and the amount of poaching undertaken in various areas. A number of points, however, may be noted.

Poaching is higher in the less populated northern regions of Canada than in central or southern parts. Most poaching will be done for food, although some poaching occurs for trophies. The head of a large ram can be illegally traded for 5,000 dollars and more. Such rewards are a good reason for the existence of poaching rings.²¹

Simulation studies done in the United States have shown that about only one per cent of poaching is discovered. In 1977, an investigation by the California Department of Fish and Game revealed that some 50,000 deer were killed illegally. The legal take in 1977 was 36,687 deer.²²

The number of convictions under the Migratory Birds Act is approximately 1,500 - 2,000 across Canada per year. For migratory birds the success rate in discovering illegal activities is thought to be somewhere between one and ten percent.²³ Assessing five birds bagged for each illegal activity, the total number of birds shot illegally each year in Canada is between 100,000 and 1,000,000. Data on convictions on the illegal hunting of other wildlife were not obtainable.

Fines paid for illegal hunting are generally quite low. Fines for the illegal hunting of migratory birds vary between ten and three hundred dollars.

Occasionally the lenient treatment of offenders against wildlife enrages the public. A recent case involving the illegal shooting of three rams above the two rams legally harvested provides a good example of such leniency. The offenders, two United States citizens, paid \$6,000 for the whole hunting trip. The fine for killing three rams illegally was only one hundred dollars and confiscation of the harvested, relatively rare, animals.²⁴

A much stronger emphasis on law enforcement to prevent illegal activities, especially poaching, was recommended by a special investigator into the operations of the Wildlife Branch in British Columbia. He suggested the employment of a paramilitary force in problem areas. But this was rejected by the Minister.²⁵ Fisheries Environment Canada in conjunction with the B.C. Fish and Wildlife Branch has set up a 24-hour office in Vancouver that will handle toll-free calls from anywhere in British Columbia. Anyone witnessing a violation of fish or game laws is asked to call this service.

Poaching is, of course, a worldwide problem. Elephants, lions, crocodiles, to name a few, are poached on a large scale. Judging from the literature it appears that poaching and other illegal activities do represent a considerable problem for wildlife managers. A curtailment of illegal activities depends on better and more law enforcement. Enforcement on a larger scale costs more money and funds are very scarce in the field of wildlife management. Total budgets for all provincial wildlife agencies was less than 50 million dollars in 1978-79 (for details see Appendix E).

Part B: Habitat Alienations

Sauce is Sauce

The law doth punish man or woman
who steals the goose from off the common,
but lets the greater felon loose
that steals the common from the goose.

Old English Proverb

The goals of wildlife management are usually expressed in terms of maximizing or optimizing the commercial use of wildlife or the recreational pleasure of people. Objectives are mostly stated in terms of protecting or enhancing a certain number of species of wildlife, usually game. Implicit in these statements is the existence and preservation of a suitable habitat. Wildlife and habitat ordinarily cannot be separated.

Over the last decades large areas of habitat have been alienated from wildlife. This occurred basically as a result of population pressure and the concomittant growth of agriculture, of industry, of highways, and of recreation.

Habitat alienation occurs in a variety of ways. Intrusion into habitat results from the building of roads and highways into previously inaccessible areas or from the use of all-terrain vehicles such as snowmobiles. Appropriation of habitat takes place in use conflicts. For example, the grazing of cattle on a range frequented by wildlife constitutes appropriation. The destruction of wildlife habitat accompanies the building of dams, of mines and certain types of logging activity.

A particular insidious kind of alienation is represented by the dispersion of chemicals into the environment. This alienation is subtle, difficult to detect, and difficult to prove.

The draining of wetlands constitutes another common source of alienation. Occasionally drained area is used for a new housing development. More frequently, however, the land is used for agricultural purposes. The species most affected are waterfowl and other migratory birds.

Alienation from the above sources is vast in scope and requires further discussion. The remainder of this chapter is devoted to an analysis of the many forces leading to habitat alienation.

(1) Habitat Intrusion

The activities of logging, mining and hydro electric companies frequently intrude deep into heretofore inaccessible territory. Logging and mining companies must build roads to reach the site of their operation. The same is true for hydro electric power projects. The latter also require extensive clearing on power line right-of-ways.

Governments too build highways into virgin territory. These sometimes stretch for hundreds of miles. The recently completed Dempster Highway in the Yukon provides a good example. Popular all-terrain vehicles enable people to encroach on wildlife habitat on a regular basis with potentially disastrous results. Wildlife managers and conservation groups alike are concerned that the increased penetration of the wildlife habitat that occurs relentlessly will unduly disturb wildlife, increase hunting pressure, and destroy wildlife habitat.

During the last decade a rapid increase in the use of four-wheel drive vehicles, trail bikes and snowmobiles occurred. For example, approximately one million snowmobiles existed in Canada in 1978.²⁶ Snowmobiling especially has a number of negative environmental effects. Snowmobiles disturb wildlife and injure vegetation. They lower the insulative values of the snow

reducing the temperature at ground level. They have been used deliberately to harass animals. During the cold winter months plants and wildlife are most vulnerable. Deer are easily frightened and seedlings break easily. At the same time, snow and snowmobiles open up previously inaccessible territory to large numbers of people.²⁷

Deer, elk and moose are easily disturbed by the noise of the machines. A herd of 150 cow elk and calves was observed to climb from their resting place across a steep mountain ridge through deep snow after it had briefly sighted and heard the sound of three snowmobiles at a distance of about 4 km.^{28,29,30}

Biologists have found that during the deep winter deer apparently slow down their metabolism and go into a state of semi-hibernation. While they normally require little food, any exhaustive exercise means a loss of irreplaceable food energy.³¹ Available evidence suggests that harsh disturbances jeopardize the winter survival of wildlife. Despite this, ATV's, throughout Canada, are generally permitted to cruise grasslands and forests at will.

To avoid damage to wildlife and to habitat, some regions have enacted special laws. In Oregon a range under a coordinated resource management plan was closed to all vehicular traffic from December 1st to May 1st. Previous to the closure snowmobilers had pursued elk herds and the number of elk had dropped sharply.³² In Nova Scotia ATV's had impaired the fragile environment of beaches. The use of ATV's was forbidden on beaches under the Beaches Preservation and Protection Act.³³

A hunter preference survey taken in Kamloops, British Columbia, revealed that many hunters judge snowmobiles to be the most disruptive element in their hunting experience.³⁴

Yet at present the prevention of habitat intrusion and destruction by ATV's lie outside the jurisdiction of wildlife branches. Occasionally wildlife branches appear to be able to voice their opinion on the location of new roads. However, their function is purely advisory and the branches cannot decide on specific routes.³⁵

(2) Habitat Appropriation and Destruction

A considerable portion of wildlife habitat has been appropriated by the cattle industry. The grazing of cattle on rangeland frequented by wildlife means of course less food for wildlife. The case of the bighorn sheep in the Chilcotin in British Columbia will serve as an example.

A seventy-square mile area near Williams Lake, British Columbia serves as the home for the world's largest band of California bighorn sheep. The herd consists of about 400 animals and is known as the Junction Band. They, and about 2,800 other bighorn in locations throughout British Columbia and California are the remnants of possibly one million animals which roamed the Northwest in the beginning of the 19th century.

The seventy-square mile area was, until recently, leased as grazing land to the Gang Ranch. The huge Gang Ranch encompasses 37,000 acres of deeded land, 23,500 acres of leased crown land, and about 600,000 acres of grazing permits. In 1968 the range was severely over-grazed by 1,800 steer. The lack of feed and a severe winter led to the death of one-third of the Junction herd.³⁶ Finally, in 1975, and mostly through the persistence of the regional wildlife biologist, 11,000 acres of the Junction Grassland were returned to the Crown.³⁷

The Junction band of bighorn sheep is, of course, only one of the many cases of conflict between wildlife on the one hand, and agriculture, logging, mining, and hydro-electric

development on the other hand. To reconcile user conflict, wildlife agencies have employed a number of different approaches. We shall discuss three different methods.

(a) Integrated Resource Management

Within a specified area the aim of integrated resource management is to enhance all the uses of the area. At McClennan Mountain near Clearwater, British Columbia, wildlife managers, logging companies and ranchers agreed to cooperate in an effort to resolve user conflicts. Their labour was successful and one of the main beneficiaries was wildlife. The logging company in the area agreed to discontinue the practice of clear logging which leaves no shelter for animals. Instead, they cut small area blocks of timber leaving alternate blocks of timber undisturbed. The uncut areas provided shelter for game in the winter while the open areas provided food for deer and even for cattle at certain times of the year. Soil erosion and water retention also was improved.³⁸

A similar approach, called Coordinated Resource Management Planning, was developed in Oregon. The objectives of the plan were to coordinate livestock grazing, watersheds, wildlife habitat, wood products and recreation within a given area. In 1976 Oregon had about seventy-five such plans encompassing 2.5 million acres, and was adding new plans at the rate of 25 a year.

In British Columbia a special task force from the forest service, from the Lands Branch, from Agriculture and from the Wildlife Branch brings together wildlife biologists, ranchers and loggers who work out the problems of their area in small group sessions. They may meet over a period of weeks and after thoroughly analysing the issues and problems set up the details of a Management Plan, specifying the rights and duties of each user in the area.³⁹ This novel approach has a special

advantage for wildlife, since wildlife becomes an equal partner in the plan with explicit rights on habitat. Part of the responsibility for wildlife is shifted from the Wildlife Branch to the users, i.e., the people of the planning region.

Saskatchewan is another province that has attempted to reconcile conflicts with wildlife on Crown land. Faced with the likelihood of diminished range land for wildlife as a result of a Department of Agriculture goal to increase beef production by 60% in ten years, Fisheries and Wildlife Branch officials felt an urgent need to be involved in controlling and modifying the development of new grasslands.

In 1975 the Grazing Land Committee with senior staff of the Departments of Agriculture, Environment, and of Tourism and Renewable Resources was established. The Committee has set down guidelines stating the minimum of native vegetation required to maintain productive wildlife habitat.⁴⁰

The holders of Crown land grazing leases who wish to develop the leased land received technical advice that takes into consideration wildlife habitat quality. A similar process is in effect for Crown land designated as community pasture. Very substantial benefits are said to have accrued to wildlife habitat through community pasture planning.⁴¹

(b) Habitat Management Workshops

In Southern Ontario much of the land is in private hands. The management of wildlife populations, therefore, depends mainly on the good will and attitude of the owners of these lands.

In order to improve wildlife habitat on private lands the Wildlife Branch of the Ontario Ministry of Natural Resources and field staff conducted a three-day workshop for seventy-five

forestry and wildlife field staff. Information on the management of small wildlife and deer, as well as on forests and wildlife-based recreation was disbursed to all participants of the workshop.⁴²

(c) Public Participation

At the Grant's Lake Game Bird Refuge twenty miles from Winnipeg a chaotic situation existed during the waterfowl hunting season. Excessive numbers of hunters resulted in intensive firing, traffic congestion, annoyance to landowners and a nearly impossible task to enforce hunting regulation.

In a series of public meetings, specific problem areas emerged. A management planning committee, consisting of landowners, hunters and wildlife officials was formed. The committee proposed to limit the number of hunters on Crown land and leave private landowners free to determine who could hunt on their land. The public was informed widely about the new rules. Although there were a few minor problems, hunter and landowner response was favourable.⁴³ In this example, a conflict existed between hunters themselves (too many) and between hunters and landowners. It was possible to reach a broad consensus through public input on the small group level.

The previous examples show that government wildlife agencies attempt to establish mechanisms by which wildlife interests may be protected and user conflicts resolved. In all cases the agencies seek the cooperation of other users. They attempt to convince other government agencies, or private land users, to adopt land and forest management practices which are beneficial to wildlife.

The available literature suggests that these cooperative ventures appear to be successful and bring noticeable benefits to wildlife. Again there exists a lack of definite data on

the degree of benefit gained and costs incurred. There is also a decided lack of information on how specific ventures fit into the overall picture of wildlife management. One gains the impression though that much of the effort of wildlife management is piecemeal and mainly in reaction to events over which the agency has no control. This is no doubt due to lack of power and responsibility provincial wildlife agencies appear to have, relative to the provincial land, forestry, and agriculture departments.

All these activities change wildlife habitat in varying degrees. In the process, the habitat of some species of wildlife is destroyed and habitat for other species is created.

Consider first for instance logging and forest operations. Forest harvesting leads to significant changes in vegetation and has a marked influence on forest wildlife. The cutting of mature stands of timber, while beneficial to some species may have detrimental effects on other species or the same species at a different time of the year.

The woodland caribou, for example, requires ground and tree lichens from undisturbed mature coniferous stands for food. Moose and white-tailed deer need closed-canopy forests for winter protection from wind chill and deep snow. Large dead trees provide nest and den sites for birds and mammals.

The damage caused by logging can be severe. To quote:

One forest operation can destroy more habitat, kill more fish and wildlife, wreck more nests, move more animals, and influence more cover over a longer time than a game manager with today's funds can create, plant, stock, raise or import in a decade.⁴⁴

Clear-cutting is especially damaging. This method denudes the area of all cover for wildlife. If done along streams the temperature of the water is raised significantly in

the summer and lowered in the winter, reducing fish survival. Moreover, clear-cut logging leads, especially in mountainous terrain, to rapid soil erosion.

Forest fire supervision saves valuable timber resources. But forest fires also act as natural thinning agents providing abundant forage for wildlife. New growth gives food for moose, white-tailed deer and a variety of other mammals.⁴⁵

A few wildlife species, such as the woodland caribou and the grizzly thrive mainly in large undisturbed habitats which become fewer with increases in the demand for forest products and poor reforestation practices.

Wildlife managers have attempted to influence logging practices. They prefer the use of block or strip cutting which leaves some of the growth standing and provides both food and shelter for wildlife. But clear-cut logging is the cheapest harvesting method and thus preferred by logging companies. The preservation of mature stands for wildlife management will be accommodated only with difficulty. "Unfortunately, wildlife needs are not being taken into account in the calculation of the annual allowable cut for most forest management units in the Province [of British Columbia]."⁴⁶

While the present forest management practices are mostly detrimental to wildlife, plans of forest companies do not bode well for wildlife. The attempt of forest companies to increase productivity has led to genetic research in trees. It has been proposed to establish tree plantations using so-called super trees.⁴⁷ Super trees grow faster than ordinary trees. Their shape would depend on their use. Lumber would require tall trees with relatively strong fibres. Trees designed for wood chips would presumably grow fast in volume with fibre suited for pulp wood. Judging from past experience in similar situations,

the new super trees will likely be planted on monoculture tree plantations. Fertilizers and many insecticides will have to be employed for optimum growth and suppression of disease. The effect on wildlife may be considerable.

Second, consider coal mining. Several Canadian provinces, especially British Columbia and Alberta, have significant coal deposits. During the time of cheap and plentiful energy from oil, very few deposits were mined.

The end of the era of cheap energy, however, signals the beginning of the renewed interest in coal deposits. In 1976 close to one million acres were under license for coal exploration land development. The feasibility of a gigantic open-pit mine in the Interior, to fuel a 2,000 megawatt electrical plant, is currently being examined by B.C. Hydro.⁴⁸ The large-scale aspects of future coal mining, especially open-pit mining, constitutes a new potential hazard to the environment in general and to wildlife in particular.

In Kentucky, a state which has suffered cruelly from strip mining, the legislators described this devastation in a preamble to a tough strip mining law which they passed in 1966. The text read:

The general assembly finds that the unregulated strip mining of coal causes soil erosion, damage from rolling stones and overburden, land slides, stream pollution, accumulation of stagnant water and the seepage of contaminated water, increases the likelihood of floods, destroys the value of land for agricultural purposes, destroys esthetic values, counteracts efforts for the conservation of soil, water and other natural resources, destroys or impairs the property rights of citizens, creates fire hazards, and in general creates hazards dangerous to life and property, so as to constitute an imminent and inordinate peril to the welfare of the commonwealth.⁴⁹

Interestingly enough the negative effects on wildlife are not mentioned explicitly in this description of man-made horrors. It is clear however, that wildlife and its habitat would be strongly affected. Mining activity interferes with traditional migration routes, calving grounds and leads to the direct loss of winter and summer range. Especially severe would be the effects of the degradation of the watershed.

Interestingly there exists a positive correlation between energy-bearing sedimentary formations and productive mountain sheep habitats. Thus coal mining will affect some species more heavily than others. The damage to wildlife as a result of coal mining varies also directly with the magnitude of the mining operation. Because of the increasing demand for energy by nations around the world and the potential for large coal exports, it is likely that major coal mining developments will occur in British Columbia and Alberta.

Third, take dam construction. Dams are built for a variety of reasons: flood control, power production and water storage. The construction of dams implies that large areas of wildlife habitat are covered with water. The areas lost are often rivers and the wetland surrounding them. Wetlands are probably the most fertile in terms of wildlife habitat.

Dams not only change the upstream but also the downstream habitat drastically. While the species of wildlife affected will vary, all animals relying on flowing fresh water or the wetland will be affected. They include beaver, muskrats, waterfowl, bears, moose and a variety of birds. These man-created large bodies of water also change the climate of the area. This changes the fauna and affects wildlife. The combined effect of many dams, such as in British Columbia, will have a noticeable effect on wildlife habitat and wildlife species.

Fourth, take the case of chemical contaminants. Problems in the reproductive cycle of birds alerted the world to the damaging effects of insecticides on certain species of wildlife. Insecticides should properly be called biocides as they kill or affect wildlife other than insects. It has already been noted that the effects of certain chemicals on the environment may not be felt for a decade or two, at which time the damage may be difficult to reverse.

Spray programs, using various types of biocides, continue today across Canada. At present there exists in Canada some 90,000 commercial chemicals which are not regulated and which have never undergone adequate testing for environmental and health hazards. Many of the chemicals used in the economy do not exist in nature and deteriorate only after long-time periods. Furthermore, some chemicals while slowly accumulating in lower plants and animals, bear strongly upon animals at the apex of the food chain.

The continued massive use of chemicals is due to the requirements of modern technology employed, the demands of the competitive system, and the response of governments. Agriculture, for example, depends heavily on the use of pesticides, herbicides and fertilizers. They are required to keep monoculture crops healthy and farmers' yields high and competitive. Governments, too, often appear to be concerned mainly with cost-effectiveness in the short-run, preferring chemicals that work fast and are less expensive than other, safer alternatives.

In order to win a suit against the use of a chemical, the plaintiff must prove that the chemical is unsafe. Such proof is ordinarily very expensive and difficult to obtain. On occasion government agencies with relevant data have withheld them on the grounds that the information is of a proprietary nature and that making it public would destroy working relationships between the department and the industry.⁵⁰

Chemicals left over from industrial processes, have to be disposed of. This frequently poses habitat problems. Industrial chemicals and other chemical wastes are frequently stored in containers which deteriorate in a few years. When dumped, these chemicals seep into water supplies and are absorbed by plants, animals or people. In Ontario there are at least twenty-two such chemical dumpsites.⁵¹ The issue of chemical wastes and their dispersion in the environment is often made more difficult because of a lack of clear regulatory and jurisdictional responsibility over the disposal of chemicals.

Finally there is the example of acid rain. Industrial smoke stacks spew forth a large number of contaminants. Some of these combine with water and form sulphuric or nitric acids. In the atmosphere these contaminants combine with the rain and shower indiscriminately over the earth. The falling rain raises the acidity content of soils and, in particular, of lakes. Acidity is harmful to certain types of fish. Some die out, others show signs of decline. When the acidity reaches certain levels lakes become sterile, void of most animal life. Acid rain also triggers chemical reactions with metals which become lethal to fish.⁵² The problem of acid rain is a global problem. Acidity has been increasingly recognized as a problem in industrial Europe. As a result of prevailing winds, for instance, industrial airborne emissions are picked up in England and precipitate in Norway and Sweden. As a result, many Swedish lakes are "dead" and tree growth of Swedish forests has been retarded. Lichens, the winter food of caribou, have been shown to be very sensitive to acid rain, decreasing with increased acidity.

In Canada the problem is as yet not as severe except for specific areas. Lakes in southwestern and north-eastern Ontario for example, have become highly acidic. The superstack of Cominco in Sudbury dilutes the emissions over a large area. It poses a threat to the clear rocky Shield lakes

with low capacity to buffer acid rain. Additional acidity is "imported" by weather from the United States and the shift from oil to coal production as a major source of energy prompts further concern for Canadians. Large power plants, even with some emission control, will by sheer numbers increase the acidity levels of lakes within their windshed.

Pesticides, herbicides, industrial chemicals, oil compounds and acid rain are injected in large quantities into natural systems.⁵³ Their reaction with the flora and fauna is complex. Lags of years and sometimes decades occur between dispersion of the chemical in the environment the observation and measurement of negative effects, lengthy negotiations with producers and users of the chemical, appropriate legislation, and finally the restriction or withdrawal of the chemical compound.

Habitat intrusion, appropriation and destruction has been described in this chapter in terms of sectoral use: agriculture, industry, and transportation. No doubt, a large percentage of habitat alienation is promoted by the activities of business and government enterprise. Yet there are literally millions of small activities, done by ordinary people, that have a similar effect: the cottager who dredges the lake in front of his property, the tourist who roams in the fields and leaves his garbage behind, the houseowner who converts the field behind the house into a grassed lot employing herbicides and fertilizers: These people all intrude, appropriate, and destroy wildlife habitat. It is easy to recognize the impact of large projects, yet difficult to perceive of the disappearance of habitat as the result of the ordinary action of people in the ordinary course of life.⁵⁴

Habitat Protection

The preceding sections have detailed a growing trend of alienation of wildlife habitat. Wildlife managers have attempted

to counter this major threat to wildlife in two ways: special arrangements in the case of individual projects and the designation of Crown land and acquisition of private land for improved wildlife protection and management. Some of the types of areas established and some of the acts under which they are established are described below.

Wildlife management areas are lands in which wildlife receives some special consideration, such as special no-hunting zones. In Ontario there is a bewildering array of such zones variously called wildlife management areas, wildlife extension landowner agreement areas, recreation areas, provincial wildlife areas and provincial parks.⁵⁵ British Columbia has small ecological reserves on ninety-three permanently designated sites.⁵⁶ The government of Canada has 42 National Wildlife Areas with approximately 50,000 acres. There are also 81 bird sanctuaries, some on private land.⁵⁷

The Canadian and many provincial wildlife acts have provision for designation of Crown lands and/or the acquisition of private lands for the purpose of establishing areas in which wildlife receives special protection.

Section 4 of the Canadian Wildlife Act allows for the designation of public lands for research and conservation and section 5 provides for agreements with respect to conversation to be made with the provinces.⁵⁸ Section 19(e) of the Territorial Land Act empowers the Governor in Council to set apart and appropriate territorial lands for use as ... game preserves, game sanctuaries, and bird sanctuaries.⁵⁹

Section 67 of the B.C. Wildlife Act allows the Minister to acquire, accept or expropriate land for the purpose of conservation or management of wildlife.⁶⁰

The Ontario Game and Fish Act states under section 6. (1) that land may be acquired under The Public Works Act for the purposes of management, perpetuation and rehabilitation of the wildlife resources in Ontario. Section 6. (3) of the same act allows for agreements with the landowners for the purposes mentioned in section 6. (1) above.⁶¹

Thus there exists a variety of legislative instruments available to governments for the acquisition of private or the designation of Crown lands for the purpose of wildlife protection and management.

Indeed, the purchase of private and the designation of Crown lands for wildlife management occurs regularly. Frequently the changes in land status are not only for the benefit of wildlife but for recreation in general. The province of Ontario purchased approximately 80,000 acres for parks over the last decade.⁶²

It was not possible in the framework of this project to ascertain the amount and quality of land acquisition of the senior governments for the purpose of improved wildlife management. However, it appears that these purchases have not been sufficient to offset the serious deterioration of the existing wildlife habitat. In other words, the attempts of governments to protect wildlife specifically were more than offset by the damage done to wildlife as a result of the normal and continuing alienation of habitat.

The acquisition of additional wildlife protection areas faces a number of problems. If private lands are involved, government expenditures increase. The price tag is often high. If public lands are involved, a change in the status of the land frequently involves the alienation of the land from some previously stipulated economic goal. For example, mining may have to be outlawed or the amount of logging reduced in the area.

A deterioration of the overall wildlife habitat also occurs because the designated or acquired areas are usually quite small, between a few to a few hundred acres. Many wildlife species, however, require larger habitat areas for survival. One large area of fifty thousand acres would provide considerably better protection for wildlife than fifty separate areas of one thousand acres each.⁶³ Yet the cost of establishing large areas in the populated parts of Canada is prohibitive because of existing residential and commercial development.

Other than the outright acquisition of land for wildlife purposes, a significant part of the work of wildlife agencies is devoted to reconciling use conflicts and raising public and private consciousness about wildlife issues. Three types of approaches may be singled out for example.

Summary of Problems and Illustrations of Wildlife Management

Government wildlife agencies face two major problems. Problem number one is the increased pressure of people, especially hunters, on an essentially limited wildlife resource. Problem number two is the severe and increasing alienation of habitat.

Wildlife agencies have used in the past a variety of methods to reduce the pressure from legal and illegal hunting. Tighter controls to ration the available supply of game are introduced every year. Use of the price system as a method of controlling demand and allocating wildlife resources is essentially rejected by wildlife managers. But, in spite of numerous rules and regulations, game populations have shown, and continue to show, a declining trend.

Alienation of habitat: intrusion, appropriation, and destruction has, over the last decade or two, become a major threat to wildlife. Habitat alienation is the result of a number

of factors: population increases, increased demand by agriculture and recreation, an intensive search for new sources of energy, and the imposition of large scale technology on the wildlife environment.

The damage inflicted by new technologies on the environment and on wildlife is often subtle and unanticipated. Research and understanding of harmful effects frequently lags far behind the introduction of the damaging technology. Wildlife agencies often have neither the funds nor the jurisdiction to contain the tide of injury to wildlife habitat. Attempts to safeguard and set aside islands of wildlife habitat are generally insufficient to stem the decrease of specific wildlife population. Recent trends indicate a decrease in wildlife populations, and increases in the number of species on the endangered list. It should be noted, however, that some kinds of wildlife such as the white-tailed deer thrive in many disturbed habitats. In these cases not alienation of habitat, but hunting pressure, leads to a diminution of the species.

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Chapter 7

MIGRATORY BIRDS AND ENDANGERED SPECIES

Migratory Birds

Many birds in Canada are migratory, flying northward in the spring and southward in the fall. Some species stay within Canada's borders but others fly thousands of miles to warmer climates. This section looks at some of the special regulations covering migratory birds, especially game birds, and considers the problems of vanishing wetland.

It has been conservatively estimated that North America's duck and goose population numbered 200 million when the white man arrived. The first reduction of waterfowl occurred in the last half of the 19th century. Free from the limitations of hunting seasons and bag limits, commercial hunters slaughtered millions of birds each year. At first these birds were used for food. Later the egrets and herons were mainly slaughtered for their plumage, to adorn the hats of fashionable women in society.¹

By the turn of the century waterfowl numbers had been reduced drastically. The public became alarmed and demanded that the government take some action. The Federal Government in Canada and the United States responded and signed a Migratory Birds Convention Act.

The Act applies to the provinces and the adjacent territorial waters. It protects all migratory birds, and establishes the terms under which migratory birds may be hunted. The Act, in detail, concerns itself with possession, shipment, bait restrictions, hunting methods and equipment and the issuance of special scientific, agricultural and airport permits. It is interesting

to note that Indians and Inuit anywhere in Canada may hunt migratory birds without a Federal permit. Fines for violating the regulations are a minimum of ten and a maximum of three hundred dollars and/or six months imprisonment.²

A separate schedule for the provinces and territories lists the open seasons as well as bag and possession limits for residents and nonresidents. Although the Act protects all migratory birds, the schedules are concerned with game birds - ducks, geese, rails, sandhill cranes, etc. The regulations prohibit the depositing of oil or any other harmful substances anywhere in Canada in any waters or areas frequented by migratory birds. The regulations also forbid disturbing of nests and the possession of any migratory bird, their nest or egg by anyone unless authorized. There are more severe restrictions for National Wildlife Areas and Migratory Bird Sanctuaries, where even entry during the nesting season may be prohibited.³

Provinces may and do establish separate laws and regulations concerning migratory birds. They may do so taking the federal legislation as a minimum legislation.

In spite of the Migratory Bird Act and stringent regulations, North America experienced a drastic decline in waterfowl population in the early part of this century. American sportsmen established a foundation in 1929 to determine the reasons for the decline. The foundation's study concluded that 70% of North America's waterfowl populations depended on breeding grounds in the wetland of Alberta, Saskatchewan and Manitoba and that many of these wetlands had been converted by agricultural use. This conversion to agricultural, commercial and recreational uses begun in the last century and increased in the latter half of this century as a result of population increase, economic growth and government subsidies in land reclamation schemes. Federal, provincial and federal governments have used public funds to help in the conversion of these "unproductive" lands.

ARDA for example spent millions of dollars for flood control and drainage schemes.⁴ Provincial expenditures for land drainage in Ontario have grown to twenty-five million dollars annually.⁵ Yet these wetlands are unproductive only when viewed from the point of agriculture and commerce. They are one of the most productive habitats when considered from the viewpoint of wildlife and wildlife management.

Wetlands are not only important for birds, they also form an attractive habitat for other species such as salamander, snakes, turtles and aquatic insects. A host of smaller animals live around marshes; lemmings, muskrats and beavers. There are predators such as mink, otter, bobcats. Birds make use of swamps and sloughs. Over one hundred bird species as well as ducks, geese and other waterfowl feed, breed, and nest together with herons, rails, king-fishers, owls and ospreys, with moulting mallards using the wetlands as cover.⁶

Wetland acreage in Canada has decreased dramatically during the last decades as a result of drainage and conversion. Originally there were 5.7 million acres of wetlands in southern Ontario, today only about 0.7 million acres remain.⁷ In the prairies there has been a loss of five million acres of wetland. Sixty percent of the marshes on the St. Lawrence River estuary and seventy percent of the Fraser River estuary have been lost.⁸ Additional wetlands are slated for commercial development in the Fraser Delta.

Hydro Developments can lead to the loss of large areas. The Grand Rapids Hydro development in Saskatchewan, for example, led to the loss of 2.8 million acres of wetlands in the Saskatchewan River delta. From cursory observation it appears, however, that the Churchill Falls Power Developments has led to an increase of waterfowl in the area.⁹

To counteract the sharp decrease in wetland, a number of agencies are buying existing wetlands or restoring wetlands to their original condition. The best known is Duck's Unlimited, established in the United States in 1937 and in Canada in 1938. Duck's Unlimited is a private nonprofit organization dedicated to the preservation of waterfowl habitat. During the past forty years Duck's Unlimited (Canada) has spent over 48 million dollars on nearly 1,500 projects. These projects encompass some 1.5 million acres of habitat with 10,000 miles of shoreline.¹⁰

The Nature Conservancy of Canada, a catalyst that draws together groups of citizens concerned about Canada's natural heritage, purchases wildlife habitat for conservation purposes frequently with funds made available by the senior levels of government. In 1979 the Nature Conservancy of Canada was involved in projects totalling 4,113 acres, involving about 1.5 million dollars of governmental and other grants.¹¹

Purchases of private wetlands can be rather expensive. For example, the Ontario Land Compensation Board awarded over two million dollars to Rattray Park Estates for fifty acres adjacent to a marsh.¹²

While people concerned about the preservation of wetlands rejoice in new acquisitions, farmers are not so sure. Their fields are regularly pillaged by waterfowl. Although they may receive some compensation from the provincial and federal governments, it does not cover the complete loss.¹⁴ As a result farmers prefer to drain the wetlands on or near their property. They are supported by the Department of Agriculture.

Since their migration takes then across the United States, Mexico and other Central and South American countries, the future of migratory birds depends strongly on the rigour with which these countries enforce the laws for the protection of migratory birds.

Factors other than rapidly dwindling habitat may affect the inhabitants of Canada's remaining wetlands. In 1979 wildlife biologists have observed an unusually low nesting success rate. The reasons for the low rate are not known.¹⁵

Endangered Species

As a direct result of habitat encroachment and chemical pollution of the environment, several of Canada's wildlife species have been put on the endangered species list. A partial list includes the Great Prairie Chicken, the Northern Kit Fox, the Arctic Fox, the Wood Bison and the Vancouver Island Marmot.¹⁶

There are a number of specific reasons for the decrease in their numbers. For example, the conversion of grassland to farmland destroyed the habitat of the Greater Prairie Chicken. It is now found only on Manitoulin Island; as the farms replaced the grasslands and farmers killed hens as a pest, the Northern Kit Fox found survival increasingly difficult. A few may still live in Saskatchewan's Cypress Hills.

The Arctic Fox is desired for his fur. Harvesting combined with sharp fluctuations in fox numbers have reduced the Arctic fox population considerably. The Wood Bison, once near extinction, had reached 2,000 by 1922. However, a series of diseases reduced their number drastically; the Vancouver Marmot, extremely vulnerable to sudden changes in environment such as logging, is near extinction. Fewer than one hundred are left on the rocky mountain sides of central Vancouver Island.

From the viewpoint of scarcity, there are a number of official categories. Animals may be abundant or they may be rare, threatened and finally endangered. The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has catalogued

thirty-two birds and mammals. The species include:¹⁷

Rare: Ivory Gull
Great Gray Owl
Ipswich Sparrow
Plain Pocket Gopher
Grey Fox

Threatened: Burrowing Owl
Peary Caribou

Endangered: Kirtland's Warbler

Still to be catalogued are marine mammals, fish, amphibians and reptiles.

The list above is expected to grow in the next years and decades. Likely candidates to be included in the list are:¹⁸

Greater Sandhill Crane
Fox Squirrel
Grizzly Bear
American Marten (Nfld.)
American Badger

The Province of Ontario has twelve species that are officially listed as endangered and threatened. Among them are:¹⁹

Bald Eagle
White Pelican
Piping Plover
Blue Racer
Golden Eagle
Peregrine Falcon
Kirtland Warbler
West Virginia Butterfly
Timber Rattle Snake
Eastern Cougar
Lake Erie Water Snake
Eskimo Curlew

The number of species on the list is expected to grow in the next years and especially decades. What then should be the appropriate strategy, the proper course of action?

Attempts to preserve and increase the species involve the allocation of considerable habitat and funds. In view of the shortage of resources it has been suggested to apply to problem species the triage system developed in World War I. The triage system works in the following manner. When large numbers of wounded arrived at a military hospital, they were divided into three groups: the first group contained all those who were thought to recover with no, or a minimum of, attention. All those beyond help were left to die. Those who could benefit most from medical attention formed the third group and nearly all resources were employed to help the wounded in this group.

Some wildlife managers believe that this method may be applicable to rare, threatened and endangered species. In other words, wildlife managers when confronted with a low probability of success would make the conscious decision not to employ scarce resource to help certain threatened or endangered species to survive with the result that they likely become extinct.²⁰

The problem with most endangered species is basically the problem of disappearing ecosystems. Most old "natural habitats" have already vanished or are vanishing at a rapid rate. Some species will even thrive in an altered environment. But specialized species dependent on climax ecosystems are going to disappear as the climax system disappears.²¹

One of the greatest vanishing acts has been the destruction of the Canadian Plains and the slaughter of 60 million buffalo in a span of twenty years. As man converted the grasslands into wheatfields, and the grasslands disappeared so did the bison, the elk and the antelope.²²

It seems that the rehabilitation of endangered species depends on the existence of sufficient habitat, suitable for the species, not on breeding attempts. To avoid threats of extinction to additional species of wildlife foresight, caution and

special funds will be required. In a larger framework the current fate of Canada's wildlife reflects some deep-rooted beliefs about man's place in the universe. (See Appendix G.)

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Chapter 8

CONCLUSIONS

In the previous chapters an attempt has been made to describe the present problems of wildlife management. It appears from the analysis that in spite of an array of rules and regulation, the management of wildlife in Canada is beset by a number of serious problems. These problems occur on a provincial, national and even global scale: reduced and threatened species in a shrinking or vanishing habitat. These conditions are precipitated by population pressure, past attitudes towards wildlife and the enormously powerful and successful "engine of progress" - technology in the service of a competitive economic system. One may alternately view these problems as originating from a lifestyle that requires ever greater resources for ever greater numbers of people.

The Existing Rules

The roots of the present problems reach far into the past. Over centuries wildlife (especially game) in North America has been treated as a common property resource. For most Canadians the taking of game has become and is viewed as a recreational experience, separated from the ordinary market forces of supply, demand and price. However, what has no price is often considered to have no scarcity value and hence is likely to be excessively exploited.

Thus relatively early in Canada's history it became necessary to protect wildlife, mainly game, from commercial exploitation and recreational hunting. More rules became necessary as the population multiplied and hunting pressure increased. New technologies of killing have put additional strain on existing animal populations.

Today a considerable number of provincial and federal regulations attempt to protect existing wildlife, especially game. Although it is impossible within the framework of this project to judge specific rules, there is no doubt at all about the necessity and desirability of existing wildlife rules and regulations: only they give protection to Canada's wildlife populations. Indeed, trends indicate that more regulations will be required to adequately protect existing species. To give two examples:

- (1) All terrain vehicles frequently are used to harass and kill wildlife. A small number of snowmobiles by pursuing wildlife in deep winter can easily exhaust and kill a large number of wildlife, especially ungulates.
- (2) The disposal of all kinds of garbage in the environment, especially chemical substances effect the health and reproductive capacity of wildlife species. The most prominent current example is acid rain.

Thus the need for more regulations in the future. The existing regulations while numerous, are often not well enforced. Poaching of wildlife and other infractions seem to be common. In addition, judges appear unusually lenient in passing sentence on poachers. This leniency is a poor deterrent to would-be offenders. Heavy fines, on the other hand, indicate importance. If society deems it important to protect wildlife, fines must be substantial to curb infractions.

It has been suggested elsewhere that special law enforcement units might be formed to deal with special problem cases and in specific areas, and that wildlife officers should receive training in law enforcement practices.¹ Other suggestions, such as education of the public through television, compulsory courses for hunters, and province-wide toll-free phone numbers to report observed infractions, have been advanced as a means of increasing the effectiveness of existing regulations.

The present wildlife regulations were designed to reduce exploitation and control hunting pressure, and in the main they are effective. In quite a few areas, however, game populations are decreasing and it appears that some wildlife agencies have been hesitant to reduce the allowable harvest accordingly. Long-term decline in the numbers of certain game species does not necessarily indicate that existing hunting regulations are inadequate in protecting wildlife from hunting pressure. At least part of the decline in some species results from an alienation of suitable habitat.

Habitat Protection

Indeed the decrease of wildlife populations from alienation of the necessary habitat has been substantial and is expected to continue. The reductions are due to a number of factors. Two of these factors are: the absence of an acceptable economic evaluation of wildlife and the lack of a land use policy based on ecological principles.

Traditional land policy is based on judicial, economic, demographic and political concepts. The factors involved in economic activities such as insurance, banking, taxation and property law, when combined with traditional land use policy form a very resistant barrier to the ecosystem approach. The needs of man traditionally outweigh those of other species, and few give ultimate priority to ecological requirements such as wildlife habitat.²

Thus a comprehensive land use policy based on solely ecological principles is not likely to be established in the near future although the concept may become more attractive for survival at a later date. What more immediate methods then can be used to protect wildlife habitat?

It is certain that due to many different conditions a variety of approaches could be used. Among these are: integrated management plans for wildlife, logging and cattle; coordination of forest and wildlife management, providing incentives and advice to owners whose land is managed in accordance with established principles of wildlife habitat management; instructions and advice to cottagers and hobby farmers on the preservation of wildlife habitat; provincial laws requiring special shoreline zoning along lakes and rivers for the protection of wildlife habitat.³ These are some of the approaches which promise benefits to wildlife and man in the near future.

Governments frequently buy land for park purposes or as wildlife preserves. As indicated previously, these purchases are often very expensive. Another and less expensive method of allocating land for wildlife habitat is the zoning of existing agricultural and forest land such that the land must remain in a form compatible with effective wildlife management.

Provinces that have a substantial proportion of crown land could, if they so desired, convert a substantial proportion into multiple use areas. Any user of the land would among others, have to satisfy specific requirements laid down by government wildlife agencies. These special areas should be large in order to accommodate a large number of species. Studies have shown that two small areas are able to support up to fifty percent fewer species than one large area equal in size to the two smaller ones.⁴

A variety of arrangements protecting wildlife are possible. The decisive ingredient is the degree of willingness and concern on the part of legislators and the public. At present the limited funds available to wildlife branches suggests that governments and the public at large attach no special sense of urgency to additional wildlife protection.

Economic Values of Wildlife

Very few statements are as impressive in our society as proof of a high economic value. It is in this area that existing wildlife rules and management could be changed to allow for the generation and expression of information on the economic value of wildlife.

To begin with, a comprehensive calculation of the economic value of wildlife in Canada could be undertaken. Based on existing albeit imperfect methods, the evaluation would serve as a benchmark and focus attention on wildlife. It is unfortunate that forty-four federal/provincial wildlife conferences have not yet produced an economic valuation of wildlife in Canada.

Much of the expenditure on wildlife is collected from hunters in the form of licence fees. There is a strong presumption that the existing fees are much lower than people would be willing to pay. Hunting has been seen as a recreational experience to be supplied at nominal cost. This view may have been justified at a time when game was plentiful and hunting pressure low. However, declining herds of game and increasing herds of hunters and would-be hunters have changed the situation. Very short open seasons and low hunting success is not necessarily in the best interest of game, hunter and wildlife agency. In this system of low nominal licence fees the hunter pays indirectly by exerting much effort and encountering low success. The agency receives low fees and thus has available few resources for the management and protection of wildlife.

A considerable increase in license fees could lower the number of hunters, lead to an increase in the open season and the success rate, and add to the resources of the wildlife agency. Lotteries are a second best method of selecting hunters, since this method associates hunting and wildlife with luck, disregards the willingness of some hunters to pay a high price for the experience, and ignores that a shrinking number of game

means that each animal commands an increasing scarcity value to society. Thus wildlife agencies should seriously consider the price mechanisms as an additional method of reducing hunting pressure on crown lands.

Commercially operated game farms may be another method of easing hunting pressure on the remaining lands, as well as increasing the number of satisfied hunters. (For a detailed description of game farming see Appendix F.) A variety of systems are possible. For example, forest licences could be issued in conjunction with game farm licences. The holder of these licences would then pay 'head fees' (flat fees for each animal hunted) and obey certain government regulations. Like the European system the farm licence holders might be required to hire wildlife biologists who remain employed by the government. Hunters would pay a fee to the licence holder for the privilege of hunting and a price for the meat and fur after a successful kill. These and other arrangements could be attempted and refined over time.

Wildlife agencies could also separate permission to hunt from permission to keep the animal. In this system a hunter would buy a licence to hunt and would pay for the animal (meat, hide) after the successful kill if he so wishes. If not, the animal could be purchased by anyone else. This method would raise additional revenues as some people are mainly interested in the hunt, others mainly in the meat.

In the past wildlife agencies have explicitly and implicitly managed mainly game for the benefit of hunters. Hunter license fees contributed a major source of income for wildlife agencies. A change in goals and activities could open up new sources of income. If the prime objective of wildlife agencies is seen as to protecting and restoring wildlife for present and future generations, an excellent case could be made for a

strengthening of the resources directed to wildlife agencies from general taxes. This might entail a reduction of effort towards activities and groups other than hunters and animals other than game.

Conceivably a tax on recreation equipment and a tax on the conversion of unimproved land into "improved" land could be considered. Many forms of recreation, for example, involve intrusion into animal habitat and the improvement of undeveloped land usually means some form of wildlife habitat alienation. Biocides that affect wildlife negatively might also be considered for taxation.

There thus exist a variety of taxation measures that might be used for the protection and nurturing of wildlife and wildlife habitat. As certain species of wildlife become increasingly scarce and wildlife habitat shrinks, the value of the remaining species and habitat will increase. On these general grounds additional funding of wildlife programmes may be justified.

The Cooperation of the Public

Nature, game and wildlife organizations have shown significant increases in membership over the last decade. As the nation has become more urbanized and some species of wildlife threatened, people have become concerned that their children may be deprived the opportunity of observing certain species of wildlife or experiencing an unspoiled wildlife habitat. This is not wholly a selfish motive. Many people are to some degree aware that for hundreds of thousands of years mankind survived because of wildlife and that man and wildlife share a common heritage.

A considerable number of people are therefore willing to support wildlife with time or money. The Canadian Wildlife Federation for example on behalf of their dues paying members

lobbies for the protection of wildlife. Many people join organizations to become involved in the management of wildlife. They may count birds or help to feed deer in the winter. Many are willing to help clean polluted streams or lakes, and would be willing to become involved in the protection of wildlife and wildlife habitat in cooperation with the various wildlife agencies. Wildlife agencies could make suggestions, give advice and organize wildlife projects. Such projects, involving half a dozen organizations have been successful in British Columbia.⁵

Game clubs may wish to become involved in the management of wildlife in specific districts. Game licenses at reduced rates could be available to clubs that help to manage wildlife and wildlife areas. Club members may even help to police the area by reporting observed infractions to the appropriate wildlife agencies.

Wildlife agencies could also take the initiative in setting up educational programs for people who would like to hunt, observe, canoe or camp in secluded wilderness areas. Such courses or programs would help to keep animals and habitat as undisturbed as possible.

Without further elaboration, these suggestions are meant to show that the scope of wildlife management (not the agency) could be expanded and diversified. Some of these suggestions would increase the role of the private sector and could lead to a greater emphasis on the price system as a method of allocation without reducing the availability of the resource.

This would reduce the need for more stringent controls in game management and enable wildlife agencies to devote their scarce resource to other problems such as endangered species, habitat alienation and the introduction of new technologies detrimental to wildlife.

The problems expected to arise in the future will require significantly more rules and regulations. Many of the new rules will be contained in Acts other than the Wildlife Acts: zoning laws, pollution laws or tax acts. Yet new and greater regulation, as well as the introduction of new methods of wildlife management, appears to be a necessity to safeguard existing wildlife species.

Notes

1. "Recommendations of the Mair Report," B.C. Outdoors, March 1978.
2. Lynton K. Caldwell, "The Ecosystem as a Criterion for Public Land Policy," Natural Resources Journal, Vol. 10, No. 2, April 1970.
3. Douglas A. Yanggen and Jon A. Kusler, "Natural Resource Protection through Shoreland Regulation: Wisconsin," Land Economics, February 1968.
4. Myers, Norman, The Sinking Ark (Toronto: Pergamon Press, 1979).
5. B.C. Outdoors, December 1977.

APPENDICES

Appendix A

Table 1: Number of big-game hunting licences issued by province of sale and residence of purchaser 1973-74

Province	Moose	Caribou	Deer	Elk	Sheep goat	Bear	Polar bear	Buffalo	Cougar	Total
Nfld.	Prov. res.	851	...	...	...	1,877	...	...	...	12,420
	Non-res.	405	...	...	...	274	...	...	...	2,377
	Total	1,256	...	...	...	2,151	...	...	...	14,797
P.E.I.	Prov. res.	...	...	...	...	...	...	...	...	...
	Non-res.	...	...	...	...	...	...	...	...	...
	Total	...	...	...	...	...	...	...	...	...
N.S.	Prov. res.	...	65,879	...	...	...	...	...	...	66,879
	Non-res.	...	590	...	...	...	...	...	...	590
	Total	...	66,469	...	...	...	...	...	...	67,469
N.B.	Prov. res.	...	69,913	...	...	6,159	...	...	...	78,529
	Non-res.	...	2,163	...	...	1,152	...	...	...	3,315
	Total	...	72,076	...	...	7,308	...	...	...	81,184
Que.	Prov. res.	1,775	67,844	...	...	3,809	...	...	...	141,511
	Non-res.	...	2,392	...	...	3,029	...	...	...	8,645
	Total	1,775	70,236	...	...	6,838	...	...	...	150,156
Ont.	Prov. res.	...	88,448	...	...	1,343	...	...	...	170,111
	Non-res.	...	5,590	...	...	9,405	...	...	...	32,066
	Total	...	94,038	...	...	10,748	...	...	...	202,177
Man.	Prov. res.	190	39,300	514	...	780	...	...	...	51,707
	Non-res.	25	340	...	...	243	...	...	...	2,166
	Total	215	39,640	514	...	1,023	...	...	...	53,873
Sask.	Prov. res.	432	75,603	1,687	...	1,153	...	...	...	84,018
	Non-res.	25	524	...	...	54	...	...	...	982
	Total	457	76,127	1,687	...	1,207	...	...	...	85,000
Alta.	Prov. res.	374	77,163	18,869	1,581	4,217	...	...	52	152,901
	Non-res.	40	250	320	107	441	...	...	3	4,875
	Total	414	77,413	19,189	1,688	4,658	...	...	55	157,776
B.C.	Prov. res.	...	...	...	...	...	...	...	...	...
	Non-res.	...	...	...	...	...	...	...	...	...
	Total	69,180	7,748	172,447	10,790	8,690	26,495	...	597	295,946
Y.T.	Prov. res.	...	...	...	...	...	...	...	...	...
	Non-res.	...	...	...	...	...	...	...	...	...
	Total	...	...	...	...	...	...	...	...	4,000
N.W.T.	Prov. res.	1,229	...	...	...	...	0	189	...	1,418
	Non-res.	165	...	...	...	...	4	44	...	213
	Total	1,394	...	...	...	...	4	233	...	1,631
Canada	Prov. res.	229,495	3,622	484,150	21,070	19,335	0	189	52	...
	Non-res.	27,809	495	11,849	320	14,598	4	44	3	...
	Total	326,484	11,865	668,445	32,180	10,387	4	233	652	...

Source: Fortieth Federal-Provincial Wildlife Conference, Transactions 1976, (Ottawa: Environment Canada, 1976).

Appendix A

Table 2: Number of small-game hunting licences issued, revenue derived, and harvests by residence of purchaser, 1973-74

Province		Licences	Revenue	Harvest
Newfoundland	Prov. res.	50,013	..	..
	Non-res.	2,500	..	..
	Total	52,513	..	..
P.E.I.	Prov. res.	4,700	9,400	24,000
	Non-res.	180	1,800	..
	Total	4,880	11,200	24,000
Nova Scotia	Prov. res.	44,872	89,744	292,143
	Non-res.	166	2,490	..
	Total	45,038	92,234	292,143
New Brunswick	Prov. res.	19,218	38,436	..
	Non-res.	529	12,610	..
	Total	19,747	51,046	..
Quebec	Prov. res.	210,275	847,024	..
	Non-res.	4,083	69,406	..
	Total	214,358	916,430	..
Ontario	Prov. res.	376,406	1,037,880	3,609,322
	Non-res.	8,341	282,982	151,300
	Total	384,747	1,321,862	3,760,622
Manitoba	Prov. res.	44,504	184,824	107,824
	Non-res.	3,745	..	4,671
	Total	48,249	184,824	112,495
Saskatchewan	Prov. res.	56,915	221,331	195,061
	Non-res.	6,507	238,410	..
	Total	63,422	459,741	195,061
Alberta	Prov. res.	75,588	188,970	..
	Non-res.	6,821	83,290	..
	Total	82,409	272,260	..
British Columbia	Prov. res.	169,161	676,642	722,966
	Non-res.	7,602	187,610	...
	Total	176,763	864,252	722,966
Yukon Territory	Prov. res.	107	427	5,868
	Non-res.	50	750	..
	Total	157	1,177	5,868
N.W.T.	Prov. res.	1,281	2,562	4,872
	Non-res.	166	1,080	..
	Total	1,447	3,642	4,872
Canada	Prov. res.	1,053,040	3,297,240	4,962,056
	Non-res.	40,690	881,428	155,971
	Total	1,093,730	4,178,668	5,118,027

Source: Fortieth Federal-Provincial Wildlife Conference, Transactions 1976, (Ottawa: Environment Canada, 1976).

Appendix B

Table 1: Number of big-game hunters and man-days of recreation, 1973-74

Province	Moose	Caribou	Deer	Elk	Sheep goat	Bear	Polar bear	Buffalo	Cougar	Total
Nfld.										
Hunters	..	..	...	...	...	..	...	...	...	..
Rec. days	..	..	...	...	...	..	...	...	...	..
P.E.I.										
Hunters	...	...	...	...	...	...	...	...	...	...
Rec. days	...	...	...	...	...	...	...	...	...	...
N.S.										
Hunters	..	...	..	...	...	..	...	...	...	..
Rec. days	..	...	..	...	...	..	...	...	...	..
N.B.										
Hunters	2,460	...	72,075	...	...	7,308	...	...	...	81,843
Rec. days	12,300	...	360,375	...	...	36,540	...	...	...	109,215
Que.										
Hunters	..	..	..	...	...	..	...	...	...	..
Rec. days	..	..	..	...	...	..	...	...	...	..
Ont.										
Hunters	91,214	...	87,312	...	...	10,273	...	...	...	188,799
Rec. days	767,900	...	490,200	...	...	55,647	...	...	...	1,313,747
Man.										
Hunters	11,430	151	36,340	483	...	..	...	...	...	..
Rec. days	91,174	650	177,603	2,961	...	..	...	...	...	..
Sask.										
Hunters	..	..	..	...	...	..	...	...	...	..
Rec. days	34,789	2,239	331,421	9,447	...	4,828	...	...	...	382,724
Alta.										
Hunters	..	..	..	..	..	..	...	...	...	..
Rec. days	..	..	..	..	..	..	...	...	...	..
B.C.										
Hunters	53,982	..	96,720	7,759	3,092	..	...	...	...	..
Rec. days	..	..	..	..	..	..	...	...	...	..
Y.T.										
Hunters	..	..	...	...	...	..	...	...	...	..
Rec. days	..	..	...	...	...	..	...	...	...	..
N.W.T.										
Hunters	163	..	..	...	..	..	4	94	...	261
Rec. days	2,282	..	..	...	..	..	84	282	...	2,648
Canada										
Hunters	159,249	151	292,447	8,242	3,092	17,581	4	94	...	..
Rec. days	908,445	2,239	1,359,599	2,961	...	97,051	84	282	...	..

Source: Fortleth Federal-Provincial Wildlife Conference, Transactions 1976,
(Ottawa: Environment Canada, 1976).

Appendix B

Table 2: Number of big-game harvested within province by residence of hunter, 1973-74

Province	Moose	Caribou	Deer	Elk	Sheep goat	Bear	Polar bear	Buffalo	Cougar	Total
Nfld.										
Prov. res.	..	..	...	...	...	..	...	...	...	..
Non-res.	..	..	...	...	...	..	...	...	...	..
Total	..	..	...	...	...	..	...	...	...	..
P.E.I.										
Prov. res.	...	...	...	...	...	...	...	...	...	...
Non-res.	...	...	...	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...	...	...	...
N.S.										
Prov. res.	..	...	..	...	...	..	...	...	...	..
Non-res.	..	...	..	...	...	..	...	...	...	..
Total	321	...	19,567	...	...	113	...	...	...	20,001
N.B.										
Prov. res.	1,143	...	3,856	...	...	449	...	...	...	5,448
Non-res.	...	...	417	...	...	161	...	...	...	578
Total	1,143	...	4,273	...	...	610	...	...	...	6,026
Que.										
Prov. res.	..	..	..	...	...	..	...	...	...	..
Non-res.	..	..	..	...	...	..	...	...	...	..
Total	7,566	1,231	6,039	...	...	433	...	...	...	15,269
Ont.										
Prov. res.	9,767	...	15,139	...	...	3,707	...	...	...	28,613
Non-res.	3,801	...	1,526	...	...	2,703	...	...	...	8,030
Total	13,568	...	16,665	...	...	6,410	...	...	...	36,643
Man.										
Prov. res.	3,572	28	15,821	573	...	..	...	...	...	19,994
Non-res.	379	1	..	..	...	..	...	...	...	380
Total	3,951	29	15,821	573	...	..	...	...	...	20,374
Sask.										
Prov. res.	..	..	..	..	...	..	...	...	...	..
Non-res.	..	..	..	..	...	..	...	...	...	..
Total	..	..	..	..	...	..	...	...	...	..
Alta.										
Prov. res.	..	19	..	..	201	..	...	...	21	241
Non-res.	..	5	..	..	36	..	...	...	3	44
Total	..	24	..	..	237	..	...	...	24	285
B.C.										
Prov. res.	18,164	1,295	47,406	1,171	865	3,777	...	...	..	72,788
Non-res.	2,751	630	195	171	537	538	...	...	..	4,822
Total	20,915	1,925	47,601	1,342	1,502	4,315	...	...	..	77,600
Y.T.										
Prov. res.	..	..	...	...	..	..	...	...	...	..
Non-res.	..	..	...	...	..	..	...	...	...	..
Total	..	..	...	...	..	..	...	...	...	..
N.W.T.										
Prov. res.	47	581	...	...	3	8	0	36	...	675
Non-res.	30	74	...	...	110	30	2	43	...	289
Total	77	655	...	...	113	38	2	79	...	964
Canada										
Prov. res.	40,580	3,154	107,828	1,744	1,169	8,487	0	36	...	159,994
Non-res.	6,961	710	2,138	171	683	3,432	2	43	...	11,919
Total	47,541	3,864	109,966	1,915	1,852	11,919	2	79	...	171,913

Source: Fortleth Federal-Provincial Wildlife Conference, Transactions 1976, (Ottawa: Environment Canada, 1976).

Appendix C

Alternative Estimates of Alberta Big Game Hunting Benefits, 1969 (million dollars)

	Willingness to Pay			Hotelling-Clawson		Pearce	
	Resident hunters	Non-res. hunters	Resident hunters	Non-res. hunters	Resident hunters	Non-res. hunters	
Market benefits (licence sales)	0.86	0.29	0.86	0.29	0.86	0.29	
Extra market benefits	4.66	0.45	2.71	0.47	48.88	1.35	
	5.11		3.18		50.23		
Total benefits	<u>5.52</u>	<u>0.74</u>	<u>3.58</u>	<u>0.76</u>	<u>49.75</u>	<u>1.64</u>	
	6.26		4.34		51.39		
Mgt. costs	0.53		0.53		0.53		
Net benefits	<u>5.73</u>		<u>3.81</u>		<u>50.86</u>		

Source: W. Phillips, "Wildlife Economic Values", Thirty-ninth Federal-Provincial Wildlife Conference, Transactions 1975, (Ottawa; Environment Canada, 1976).

Appendix D

THE TRAPPING OF FUR-BEARING ANIMALS

The fur trade is one of Canada's oldest trades and was an important factor in the economic growth of Canada. The name most associated with the fur trade is the Hudson Bay Company which at one time had complete control over the Canadian fur trade.

Laws controlling the trapping of fur-bearing animals were instituted early in an attempt to halt the decline of certain species. Because of a lack of law enforcement the fur harvests declined. After World War II trapping became more rigidly controlled. Today trap lines are registered and trappers have exclusive rights for a specific area. Trappers are licenced and must trap only during the open season. Each species has a quota, a maximum amount that can be harvested. To guard against under-harvesting, the trapper in Ontario is required to take at least seventy-five percent of each quota.¹ The total value of pelts from trapping was 48 million dollars in Canada in 1977-78.² The fur harvest is relatively stable although prices for pelts fluctuate.

Notes (Appendix D)

1. Colleen Pokes, "Furbearer Management in Ontario," Ontario Fish and Wildlife Review, Vol. 18, No. 3, Fall 1979.
2. Calculated from data in Statistics Canada, Fur Production 1978, Catalogue No. 23-207.
3. Traveller, "They Still Take So Long to Die," B.C. Outdoors, December 1977.

Appendix E

REVENUE AND EXPENDITURES OF WILDLIFE BRANCHES IN CANADA¹

1978 - 1979

(in thousands of dollars)

	Revenue	Expenditure
Alberta	2,782	2,787
British Columbia	5,922 ²	
Manitoba	1,183	2,421
Newfoundland	900	3,000
North West Territories	200	4,500
Nova Scotia	1,252	1,300
Ontario	11,554	11,344
Yukon	349	1,403
Saskatchewan	1,947	

Notes

1. Source: Calculated from data in: Canadian Wildlife Administration, Vol. 6, June 1980.
2. Fishing and Hunting.

Appendix F

GAME FARMING

Increased hunting pressure and demand for meat has led to a renewed interest in the farming of wildlife.

The degree of farming and the type of animal involved varies. In Germany game, especially deer, must be fed in the winter time.¹ This feeding program may be looked upon as a type of farming. In China deer are farmed in three different ways: free-ranging, grazing behind fences and living in brick yards with food supplied by the people of the area.² In Australia ranchers have been allowed to capture a limited number of wild deer and propagate the deer in captivity.³ David Hopcraft, a wildlife biologist in Kenya, has published a special glossy pamphlet in which he advocates the concept of wildlife ranching.⁴ Wildlife ranching in Africa would reverse the trend of desertification. No heavy investment in irrigation would be necessary as much wildlife requires little or no water.

Edmund S. Telfer and George W. Scotter, research scientists with the Canadian Wildlife Service in Edmonton, Alberta, have proposed game ranching in connection with Aspen forest maximum biomass production in the boreal mixed wood section and adjacent areas in Western Canada and the Arctic regions.⁵ Game ranching could be done in conjunction with cattle ranching and/or Aspen forest management.

All these proposals suggest that to keep wild game, especially large ungulates, under close surveillance or in fenced areas so that systematic harvesting may be possible.

Game would generally be native to the region. For Canada moose, elk, bison and mule deer have been suggested.

Scandinavian countries of course have had domestic herds of reindeer for decades. From the viewpoint of nutrition game meat contains extremely low levels of saturated fat.

The biggest impediment to game ranching are game laws. These generally forbid the ranching of wild game as well as the sale and purchase of game meat. With increased hunting pressure and acute problems in wildlife management changes in legislation could occur which would make game ranching a reality.

It should be noted that the economic viability of game ranching has never been proven in Canada. In addition, problems relating to the existence of two separate types of game - wild and domesticated - may be encountered.

Notes (Appendix F)

1. A.B. Bubenik, "Evolution of Wildlife Harvesting Systems in Europe," Fortieth Federal/Provincial Wildlife Conference, Transactions 1976 (Ottawa: Environment Canada, Wildlife Service, 1976).
2. Peter Elworthy, "The New Long March," The Deer Farmer, Summer 1979. The Deer Farmer is published in Wellington, New Zealand.
3. Ronald Anderson, "Prices Surge as the Deer Bug Hits Australia," op. cit., p. 7.
4. David Hopcraft, Wildlife Ranching, A New Concept of Land Use (no place or date of publication, post 1975).
5. E.S. Telfer and George W. Scotter, "Potential for Game Ranching in Boreal Aspen Forests of Western Canada," Journal of Range Management, Vol. 28, No. 3, May 1975, p. 172-80. See also G.W. Scotter and E.S. Telfer, "Potential for Red Meat Production from Wildlife in Boreal and Arctic Regions," Proceedings of The Circumpolar Conference on Northern Ecology (Ottawa: National Research Council, 1975).
6. J.G. Teer, "Evolution of Wildlife Harvesting Systems in Texas," Fortieth Federal/Provincial Wildlife Conference, Transactions 1976 (Ottawa: Environment Canada Wildlife Service, 1976).

Appendix G

ATTITUDES TOWARDS WILDLIFE: A MATTER OF PERCEPTION

A poll by Weekend Magazine in 1979 found that twenty-nine per cent of Canadians have hunted in some time in their lives, while ten per cent of the population hunted the previous year.¹ In general Canadians approve of hunting but would like to see more restrictions. Approval is strongest among hunters and the rural population. Fifty-four per cent of non-hunters would support a ban on hunting except as a source of food, while only thirty-one per cent of hunters would approve of such a ban. These figures suggest that a significant proportion of hunters hunt for recreational purposes. Fifty-two per cent of hunters agree that seasons should be reduced and fifty-nine per cent believe that bag limits should be reduced. People strongly disapprove of seal hunting, and fur hunting was described in terms reminiscent of Oscar Wilde as "the unspeakable in pursuit of the uneatable".²

This poll, like others taken, reveals some fundamental disagreements among Canadians about the killing and treatment of wildlife. Discussions on wildlife issues often tend to become emotional and heated. Underlying the opinions and emotions are the differing perceptions people may have of man's place in the universe. An understanding of the various underlying philosophies (Weltanschauungen) will help explain the different positions taken by people on the topic of wildlife, wildlife management or wildlife habitat. In general three broad categories are distinguishable along the spectrum of beliefs.

(a) Anthropocentric

A frequently occurring belief is that man is the master and has dominion over all animals. This viewpoint is reinforced

by certain sections of the bible. Some christian dogmas also state that animals do not have a soul and by implication are inferior to people.

People who hold this view would generally approve of hunting and the killing of animals. This view may be reinforced by the belief that to live is to struggle. Darwin maintained that in this struggle only the fit survive. Thus man is seen as an important part of the predator-prey relationship.

A more secular version focusses on the importance of technology and the benefits of the economic system. Persons of this mind tend to speak of the "price of progress" that has to be paid. In their view the extinction of some species, through the permanent loss of certain types of habitat is unavoidable and of little consequence in the general scheme of the universe. The noted Naturalist Roderick Hoig-Brown called these people "the boomers" - progress at any price.

The concept of anthropocentricity provides a common denominator for such views, with the world revolving around and for the benefit of man. The wildlife management objectives of the British Columbia Fish and Wildlife Branch are an example of anthropocentricity. The objectives are:

"To ensure that within the constraints of land capability and the biological limits of each species, wildlife is available in sufficient quantity and diversity of species to meet the recreational and commercial needs of society".³

The maximum sustained yield, so fashionable in the management of renewable natural resources, proposes to maximize the physical yeild available to man. The concept of maximization, even if it is amended to take account of economic

criteria, may neglect the ecological need of other users of the resource. Forests, for example, have been managed with little concern for game and none for non-game species.

(b) Ecological

During the last two decades, in response to concerns over pollution and despoilation a different view has become popular. The concept of ecological systems recognizes the interrelationship of process and beings. Within the framework of ecology, man becomes a part of the natural system. This system is seen as supporting man and his activities. The greater the diversity within the system the greater the stability of the ecosystem. People adopting the ecological viewpoint will generally insist on the careful "husbanding" of all resources, game and non-game animals, flora and fauna. The sustained maximization of one species over others is judged not to be in the long-term interest of other species and of mankind. A system favouring the management and harvesting of mono-cultures is inherently unstable and requires higher energy inputs to maintain. The ecological viewpoint then requires the dethroning of man the master to be replaced by man the steward (of planet earth). The philosophy of the Federation of Ontario Naturalists is expressed in these terms:

"Man, we believe, must be viewed as a steward rather than master of the landscape. Society must develop a land ethic which implies a respect and reverence for living things and their sustaining ecological relationships.⁴

The ecological viewpoint generally accepts a large measure of responsibility for the welfare of future generations by maintaining a diverse and viable ecosystem. People and organizations embracing the ecological viewpoint tend to consider all species as worthy of protection. This may be at odds with traditional wildlife management goals that unduly emphasize the management of fish and game for sportsmen.

(c) Moralistic

A small but perhaps increasing proportion of Canadians believe for a variety of reasons that man should avoid the killing of animals. Most would not object to the killing of animals for food, i.e., the slaughtering of cattle, nor would they object to fishing as a recreational activity. However, a considerable number of people do not condone the recreational killing of game.

The Manitoba Environmental Council believes that man is a species among many and has no biological right to kill except for survival.⁵

The well-known underwater explorer, Jacques Cousteau, feels that people who enjoy the sport of taking fish and game are perverse. Daniel J. Morant, environmental coordinator for the Cousteau Society wrote to B.C. Outdoors:

"Stated simply, we do not think that the intent of an "outdoor" experience should be to kill animals. Killing a fish just to hang [it] on the wall is not a nice thing to do. We are not against the idea of catching fish as a food item".⁶

In holding that the killing of wildlife is not an acceptable recreational experience, these people may be expected to advocate more closed areas, shorter seasons and more funds employed for the welfare of animals and for those persons who in addition to hunters who simply wish to observe and photograph wildlife. Among them are a surprisingly number of former hunters.

The anthropocentric, ecological and moralistic approaches are, to a degree, abstractions used to illuminate differing attitudes towards wildlife. While the perceptions of each individual are, of course, unique the abstractions aid in

Notes

1. "The Weekend Poll: Hunting," Weekend Magazine, Vol. 29, No. 37, September 15, 1979.
2. Ibid.
3. "Land Use Conflicts and Wildlife Habitat Management Programmes in British Columbia," Canadian Wildlife Administration, Vol. 2, No. 3, June 1978.
4. "The FON Philosophy: A Statement," Ontario Naturalist, Vol. 19, No. 1, Spring 1979.
5. "New Wildlife Philosophy for Manitoba," Nature Canada, January-March, 1977.
6. "Editorial: Jacques Cousteau Attacks Sportsfishermen," B.C. Outdoors, November 1978.

understanding the different opinions and arguments advanced by individuals and organizations on the subject of wildlife; they help to explain the pressures brought to bear on and the diverse approaches developed by wildlife managements. They also underly the qualitative and quantitative estimates of the value of wildlife advanced in Chapter 3.

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Peters, J. E

Wildlife management

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