WILDLIFE VALUES IN FORESTRY IN ONTARIO¹

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SUMMARY

The objective of land use is to produce the most in values for the greatest possible number of people. In the province of Ontario the concept of single-use forestry has been abandoned both in legislation and planning. Examples are given where wildlife management and forestry have impinged on each other, and the conclusion in these cases is that sound management should produce few problems. On non-agricultural open lands in the vicinity of metropolitan areas, wildlife management and forestry together become economical where advantage is also taken of the urgent need for open space for many forms of outdoor recreation.

Forest trees and wildlife are alike living, renewable products of the land; dependent on its soil and moisture. The forest manager and the wildlife manager have an identical task, that of producing the most in values for the greatest possible number of people on a continuing basis. There may be more limited objectives in the minds of some but they are all overruled by the basic social obligation. There was a day when thinking and planning alike were in terms of a single land use. Indeed, I scarcely recall the words "multiple use" from my years in forestry school. They were certainly not emphasized. Nowadays it is recognized that other products and uses are quite compatible with logs and bolts and may even outweigh them. The term "site" has been brought into use to express the capacity of land to produce quantity and quality in logs and bolts. The term "total site" as explained by Hills (1958) can be made to express the capacity of land to produce values of all kinds.

This concept came into being in my own province of Ontario with the necessity of weighing land potential for agriculture against forestry, and the other values, wildlife, recreation, watershed protection and many others, came crowding in. It became apparent that, in terms of productive units of land, various uses could be combined, so that in some cases all could function together, where none could exist separately. The recent Canadian Agricultural Rehabilitation and Development Act (ARDA) is based on this fact, and has for its purpose increasing the standard of living in marginal agricultural areas by bringing all conceivable resources into the management scheme.

As different values can exist compatibly in the same land, so the needless sacrifice of any of them anywhere is indefensible, and the failure to make the most of all of them is a dereliction of sound management. We have, I

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think, moved into a realistic and up-to-date position in the Province of Ontario, because our legislation has been revised on a multiple-use basis, so that the terms "forestry purposes", "forest management" and the like now officially include such things as fisheries and wildlife management, and the provision for, and management of, public recreation—in fact, any activity required to achieve the greatest realization of values from land under management as forest. The same principle applies to lands whose primary use is for wildlife management or as public parks. There forestry finds its place. This still allows for the fact that there are some places where trees ought not to be cut, others where some or all game ought not to be harvested, and still others where, despite the shortage of places for outdoor recreation, the public should, for protection of some natural features, or in the interest of science, be excluded. The determination must be made on the basis of an adequate assessment of all the inherent values of the land, and the human needs to be served. It has proven more expedient to modernize existing legal pigeon holes for land use planning than to create new ones, where those created by new legislation might be, ultimately, no more satisfactory than those already existing.

At present we have legal provision for forest management areas, fish and wildlife management areas, provincial parks, "wilderness areas" which are in effect nature reserves, and "conservation areas", which should, and occasionally do, combine all the others.

I have already mentioned that a realization of other values may make it possible to practice forestry economically. There are several places where forestry and wildlife impinge more directly on each other. I hope to be able to discuss them in terms of the basic principles involved.

In Ontario, so far as we know, man is the only animal that has ever dominated the environment. In the North American Grassland the bison (*Bison bison*) and the elk (*Cervus canadensis*) may have participated, along with fire, in determining the location of the boundary. We in Ontario had nothing like that. We have had, however, circumstances under which certain species have appeared to dominate the vegetation, though man may still have been at the root of the trouble.

The relation of the white tailed deer (*Odocoileus virginianus*), our commonest ungulate, to the forest is complicated. The species is one which has been truthfully described as being more abundant now than it was when Columbus landed. It thrives on the fringes of agricultural land and has been able to extend its range. Its natural enemies have been persecuted, and are widely absent, and it is controlled over most of its range only by man and its food supply. The latter includes forest regeneration. It has a long history of over-protection because of its popularity as a game animal and the refusal of the public to accept a degree of utilization that would provide control. Wherever this is true, forest regeneration is limited to species deer will not eat.

Wildlife biologists recognize that the finest deer herds are to be found where the number of animals is a little less than the carrying capacity of the range, the carrying capacity being the number that can be supported on a permanent basis without deterioration of the environment. In such a deer herd the weights run high—especially those of fawns and yearlings—and antler

growth is good. The animals mature early; fawns grow antlers and female fawns are bred at half a year old. This is, of course, in keeping with the physical vigour shown by body weight. Most important, they have a high recruitment rate, which means that if no controls are in operation they will soon reach and then exceed carrying capacity.

These characters will identify a population controlled by predators, including man. When the caribou (*Rangifer tarandus v. arcticus*) herds of the Canadian Arctic suffered a crash decline, although an effort was made to check human and carnivore depredations, it was most alarming to see a very low recruitment rate. Not until the fawn crop went back to normal was there any hope that the crisis might pass.

When deer exceed carrying capacity, preferred food plants are destroyed, and then all other palatables. When the food supply becomes deficient the body weights diminish, especially those of younger animals, and antler growth, again that of the young, becomes reduced. Winter is the critical time; there is always enough food in summer. When the age composition of the herd becomes distorted, it becomes evident that low recruitment and differential mortality have combined to reduce the number of young.

Pressure on the vegetation is obvious where there is a browse line on older vegetation. It is a little more subtle to pick up the selective effect on regeneration. The exclosure plot is useful as a device for regeneration studies, but even more so to give to an incredulous public visual proof of what is happening. In parts of the United States public sentiment has enforced over-protection of deer for many years, at a staggering cost in forest products. Large private owners of forest land have been so ill-informed as to what was happening that they opposed rational deer herd management. The interesting thing is that in the long run the potential of the land for supporting deer on a proper sustained-yield and multiple-use basis declines because the carrying capacity itself declines.

In Ontario it is not so simple as all that. The northern limit of the deer range cuts sharply across the province, well within our developed area. It was not until we had studied the problems of this boundary that we began to understand it. It is a fluctuating boundary. Deer occur beyond it, but they are not in huntable herds. Periodically it shrinks southward. A study of these shrinkages shows that a combination of extreme cold, and snow that restrict movement in winter, is lethal, and that "winter kill" as we call it, recurs over all of our most important deer range, regularly enough that the herd, no matter how protected, never, in the last analysis, seriously exceeds carrying capacity. Bear in mind that the recuperation from such losses is rapid. It is rapid enough that in the areas that are hunted intensively we have the ideal condition of a good deer herd that does not control the structure of its plant environment. In sanctuary areas, although we have never reached the stage where we had a physically degenerate herd, we do reach the stage where both quantity and quality of regeneration of such valuable tree species as yellow birch (*Betula lutea*), sugar maple (*Acer saccharum*), hemlock (*Tsuga canadensis*) and cedar (*Thuja occidentalis*) are seriously affected. The deer are still in fine shape and even the forest looks good, until you start a regeneration study.

One might ask, why sanctuary for a species that has demonstrated such biological potency? Seventy years ago a large area known as Algonquin Provincial Park was set aside, dedicated to forest management and to wildlife preservation. It has achieved enough success in both fields that a number of communities are dependent on the forest products, and the public image of a deer sanctuary is dear to the people of the province. That the two might prove incompatible never crossed the minds of the founding fathers.

Why could not predators have been allowed to control the deer? There is only one deer predator, the timber wolf (*Canis lupus*). It has had a bad press from time immemorial, and only recently have we been able to see it as an essential component of our forest wildlife, and to protect it in our preserve. Under protection it is becoming obvious that there is an upper limit to its numbers, possibly derived from toleration limits within its own species. The limit is one that, in the preserve, would require each wolf, on an area basis, to deal with an annual surplus of at least one hundred deer. Wolves hunt for food, and, confronted with abundance, may even kill more than they need, but the wildest accusations of wolf-haters have never credited them with such a slaughter. With full bellies, the pack is more likely to sleep and play than to do an extra stint in the interest of forest regeneration.

So popular is the park that it has recently been enlarged into an area hunted heavily for years. It has now been accepted that this hunting shall go on, under strict controls. This may be the chance to develop a new public image for the park, capable of being expanded into the long-established area. At least we can try.

Farther south there are no climatic checks on deer, so that they are quite able to destroy everything palatable in the forest. Because of the popular prejudice behind over-protection immense areas of forest are held back by over-numerous deer. We may be fortunate in the partial climatic control present in Ontario because our hunters are still so few in comparison that they might not be able to hold back our deer herd. In the tiny peninsula of Rondeau Provincial Park on Lake Erie, south of climatic controls, it is only by constant vigilance that we are able to keep deer from eating the understory right out of the forest.

This is only one side of the coin. On the other we have 100,000 hunters to whom the deer season is the high spot of the year, who depend for their sport on an animal that in turn lives in the early successional stages of the forest. As the canopy closes, the capacity of the forest to support deer is reduced. Normally, cutting operations should keep a constant succession of openings available. However, we have large areas of closed-canopy stands of hardwoods that are not at present being used, and are even deteriorating so that they become less attractive to potential users. Surely these old stands would be better given a dose of silvicide, so that thrifty new growth could become useful to present generations of deer hunters and future generations of foresters.

Again, though most conifer stands are kept open by logging, the deer, under pressure of winter, tend to "yard" as we say, often in the low stands of white cedar (*Thuja occidentalis*). These stands are more important as game lands than for any other use. When they close in, the deer over a large

area are affected. The demand for cedar wood and poles is poor, and it becomes imperative to subsidize stand improvement in the interest of game management.

Up to the closing years of the last world war, we never had to think of such measures, because 100,000 to 300,000 acres of first-class deer range in our best deer country was created every year by fire. In recent years this has been reduced, on the average, to about one percent of former levels. There are just as many fires. Obviously, there was nothing to be proud of in a condition where the range deficiencies caused by bad forest management are made up for by more bad forest management. Controlled burning, silviculture should all be used, based on the consideration of all values inherent in the forest and not on forest products alone.

We are in a good position to manage deer. Our climate assures us that they will never get completely out of hand. Our people use efficient harvest methods, and sound forestry demands that a large portion of our forest should be in a condition highly productive of deer.

No climatic controls have ever limited the moose (*Alces alces*) which inhabits our pulpwood forests. In recent years its numbers have surged upwards. This increase was certainly helped by the insect epidemics of the 1940's, which destroyed over-mature balsam (*Abies balsamea*) and produced a rich new growth. The staple winter browse of moose is balsam, but of course they can reach just so high and no higher. We might use our moose surplus if they were accessible, but at present the moose range is relatively roadless, or worse still, penetrated by company roads closed to the hunters. When we turn to the foresters, we find them complacent about young balsams, which are in competition with the more valuable spruce (*Picea*) species, in which the moose are not interested. As long as there is a chance to get spruce, the more balsam eaten the better. Later, when a balsam has finally grown into a stick of pulpwood, then the whole landscape may be poisoned to protect it. Our experience shows that the moose, as soon as they lose condition, are whacked down by disease. There are no predators that can really touch them, and never were.

Like the deer, the whole moose story is a confusion of poor management, but in this case the lag in forest management is serious. There ought to be no over-mature balsam stands. If there are, we should weigh the perpetuation of their over-maturity against the advantages, from all points of view, of having a young forest. At the same time, we have to kill more moose. Surplus moose, surplus balsam—what is the difference?

The porcupine (*Erethizon dorsatum*) feeds selectively on pines, especially white pine (*P. strobus*), and hemlock (*Tsuga canadensis*), and has been locally destructive. Under natural conditions the animal is kept under control by a predator, the fisher (*Martes pennanti*). Because the fisher produces one of the most valuable furs, it was at one time threatened with extermination. Sustained-yield management of the resource of fur-bearing animals is well advanced toward restoring the fisher to its pristine numbers, and removing what porcupine problem there was. The problem is clearly seen to be a result of bad wildlife management in the first place.

One of the most striking phenomena of northern forests is that of the cycle of numbers in many animals species. It has the effect of removing from the forester's concern some whose effect on the forest would be devastating if they ever maintained the numbers occasionally attained. Such are the snowshoe hare (*Lepus americanus*) and a great variety of rodents. The latter, when abundant, make away with most tree seeds. It behooves anyone who plans artificial seeding to pick a year when mice are scarce. Shrews, on the other hand, were their abundance to be maintained, could eliminate ground-pupating insects, such as sawflies, from our list of worries, but they too are periodically scarce.

Most game species thrive in the early stages of forest succession. We can close this part of our story with one that does not—the woodland caribou (*Rangifer tarandus v. caribou*). This animal of the northern forest lives on tree and ground lichens which take years to mature and are completely destroyed by fire. The impact of civilization on its range was at first seen in great fires that raged uncontrolled. The caribou survived on islands in our larger lakes, and in scattered bands elsewhere. Their plight, compared with their former numbers, is a measure of the degree to which the great fires were unusual, and man-made. Please remember that I am not referring to *Rangifer tarandus v. arcticus* of the northern tundra, whose decline has had so much publicity. We have none of those in Ontario. Of recent years we have begun to tame the fires of the north woods, and, to our delight, we find our caribou increasing to the point where we can foresee a small crop for future utilization. One thing caribou can do is justify forest fire suppression in areas too remote for any foreseeable pulp or timber cuttings.

This by no means covers the areas where wildlife values and forestry meet under Ontario conditions. I propose, however, to deal with only one more, far removed from the northern wilderness, and of growing importance. This is in non-agricultural lands in densely populated areas where a balance has to be struck between wildlife, forestry and recreational values, with some thought also to such things as the preservation of natural areas in the interest of science.

Southern Ontario is one of the richest agricultural areas in the world. It was one of the most rewarding lands ever penetrated by a pioneering community. Basic soil complexity was masked by a rich organic residue from the original forest, which kept alive for an unreasonably long time the philosophy that the forest had to be destroyed and the whole land put under the plough. When the uplands were all cleared, regardless of rock, sand and slope, there remained the swamps or wetlands. A man describing himself as a meteorologist proposed to the Ontario Agricultural Commission of 1881 (q.v.) that if only the swamps could be drained and ploughed, the very climate itself would improve. Inevitably as the organic layer was dissipated, sterile sands appeared, the bedrock was scraped, the wet sandy substratum of the gleisols appeared, erosion marred the slopes, and, where the war on swamps was successfully pursued, springs and wells went dry.

Poor farms were, of course, abandoned. As soon as it became evident that some were not even good pasture, there arose a movement for re-forestation, which has now been in full swing for more than fifty years. It is, however, a movement that was founded on the feeling that it is a shame to

have land lying derelict, rather than on any expectation of profit. In no financial sense can the reforestation of derelict southern Ontario farm land be looked on as an investment. Indeed, when it became clear that the growing of Christmas trees was in fact profitable, this form of enterprise was left outside the field of public forestry, and, in private hands, is considered on the borderline between forestry and agriculture. It can pay even better on good land than on poor. Reforestation, in the strict sense, has been a form of public conscience-salving, and a private hobby. When it comes to financial gain, both public and private owners have been well advised to remember the tenth beatitude, "Blessed are they that expect nothing, for they shall not be disappointed."

However, while all this has been going on there has been another development in southern Ontario that has put a different complexion on many things. This area, a peninsula of rich land in the Great Lakes, with forest, minerals and hydro-electric power near at hand, has a potential for industrialization that would be hard to match anywhere. This is now being realized. The population has doubled since the second world war and the whole area is rapidly taking a new shape as a succession of Standard Metropolitan Areas.

The Standard Metropolitan Area is not the industrial sprawl, or conurbation, itself. It is a concept of modern geographers (Clawson 1960) which is no sooner comprehended than its force is realized, and the necessity that we should base our thinking on it. The S.M.A. is the area over which the presence of the metropolis dominates land use. The observed facts about the S.M.A. are very important, and not what we might expect at first sight. In spite of the gobbling up of rich land by the conurbation, the agricultural production of the S.M.A. increased, because the most intensive methods are applied on the best lands. Poor lands do not go back into crops. On the contrary, the new agricultural production is on a smaller area, and lands that do not justify the most intensive use drop out of production. At the same time there is an enormous demand for outdoor recreation, especially day-use recreation, brought on by the increase in wealth, leisure, roads, and automobiles.

Part of this land, unfit for any agriculture, was the basis of the old statement that there were two million acres of land in Southern Ontario suitable only for growing trees. Obviously this statement expresses a single-use philosophy. There always were wildlife and recreational values in this land. It now appears that there is an even larger area of land that does not repay intensive agriculture, capable of multiple-use management in which agriculture can have only a minor part. The forest then becomes, instead of an uneconomic form of land-healing, an economic part of an important whole. What some of these values amount to may be judged by the fact that this year a few old fields near Toronto grossed roughly ten dollars per acre per year from public pheasant shooting, and similar areas privately operated grossed anywhere from one to three hundred dollars per acre per year, costs being correspondingly higher. Of course, such operations cannot be expanded indefinitely into all the available acreage. There is plenty of room for trees, but they have to be balanced with recreational uses. Perhaps the largest single outdoor recreational activity is the family picnic, which favours semi-natural areas rather than landscaped parks.

Foresters and wildlife biologists are the first in the field in applying their respective disciplines to these lands so obviously related to their tasks of management. The recognition of multiple use has made it imperative that each should learn something about the other's work—beyond, I should add, the little incorporated in undergraduate courses. This has been recognized recently by the establishment of mutual post-graduate diploma courses for the two groups at the University of Toronto. However, I suggest that the management of public recreation goes far beyond the mere management of the forest, the fisheries, and the wildlife. Much valuable recreation is non-exploitive so far as these resources are concerned. It uses space and time, and the resources named contribute only a sort of quality to the environment. We must expand our concepts of land use and values to take care of all outdoor recreation.

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