FORESTRY AND WILDLIFE RELATIONSHIP ON VANCOUVER ISLAND

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The next paper is by a man now tramping the hills somewhere on a far away Pacific Island. D. J. Robinson is a game biologist with the British Columbia Game Commission. Don was born, raised and learned his trade on the coast of British Columbia. Don is a pure biologist by training, but he was raised in a country which is known for its logging. The forests that he knows so well are among the most productive lands in the world, not only for trees, but for deer and grouse.

Timber production is the primary industry on Vancouver Island. As was true in the past, the bulk of the forest harvest at present and for some time in the future must come from old growth stands of Douglas fir, hemlock, balsam, cedar and spruce. These stands did not, and do not at present, harbor game species nor indeed birds or mammals of any kind in abundance. In primitive times game was associated with burns and areas of poor quality timber along the east coast of Vancouver Island and the Gulf Islands. Journals of early settlers in the 1850's record the lack of game in areas now supporting large populations of deer and blue grouse. The last 10 to 20 years have seen more game present on an Island-wide basis than any period in the past; this is a direct result of logging.

The production of game on Vancouver Island can be divided on the basis of ecological units upon which various types of forestry practices have been imposed. Under the original forest cover, game populations varied from sparse to local abundance. In general the balsam—spruce and hemlock—fir climax associations of the wetter west coast and north central regions did not contain much game. The drier east and south coast Douglas fir areas produced some game species with the best populations on the poor site areas where the forest canopy was open and the plant association more varied in respect to trees, shrubs and ground cover.

The advent of logging has changed these elements and their relationship to game production. Past logging practices such as adjacent settings of 1,000 acres or more, plus widespread fires, built up blocks of 50 to 200 square miles with similar ecological conditions. Where this occurred along the east coast Douglas fir belt, game populations soared to impressive levels, with blue grouse breeding densities of a pair every three acres, and deer in excess of 50 to 60 per square mile. Similar logging practices along the west coast in the hemlock—fir—balsam sub-climax and in the north coast hemlock—spruce climax have not brought about high game production. Reasons for this are varied, but climate and rapid regrowth of ground cover are two major factors.

Removal of the forest cover allows the game-producing potential of each area to be realized. The climax or sub-climax plant association on Vancouver Island, with a few exceptions such as the Garry oak—arbutus type around

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Victoria, does not produce game in economic numbers. But the early seral stages after logging are highly productive.

The situation for fish is quite different. The original forest cover made for stability of stream flow, probably the most important single factor in fish production. Large, clear cut areas and burns changed the run-off pattern in respect to time, duration, temperature and volume. Extreme fluctuations of flow from flood to dry beds became common, resulting in lowered fish production. With the regeneration of plant cover, the run-off tends to be more stable, a development which may take up to 25 years or more. Unfortunately this does not always restore streams to their former condition for the character of stream beds has often been changed by a decade or two of freshets.

The most serious loss attributable to this type of logging is soil destruction. Generally it is not too severe, but on steep hillsides and ridge crowns where repeated fires have followed logging, the loss has been excessive. Erosion is costly to all users of a watershed for it adversely affects water run-off, and the ability to grow trees and to produce game.

So far we have been talking about the more immediate effects of past logging practices. The impact of such methods continues to be in evidence until such time as the area is relogged. Following the initial period of game abundance, these large clear cuts choke up with vegetation and become less productive. The rise and decline of a deer population subsequent to clearing is most remarkable. The first sign of change is the deterioration of animal quality. Deer raised on new slashes exhibit rapid growth rates during the first 18 months of life. This is a reflection of high quality nutrients available in the vegetation ingested during the spring and early summer months, the annual growing period. Deer having such ideal food conditions have well developed antlers and weigh 100 to 140 pounds in the round when just over one year old.

Our experimental coast black-tail deer, held in captivity at a high plane of nutrition, may have 3- or 4-point antlers and weigh 160 to 170 pounds at 16 months. This has only been approached in the wild on areas classified as high site forest areas and where the soil is suitable for agricultural purposes.

The combination of soil fertility, new plants and new species in their initial growth phases, increased insolation, and differential growth and maturation periods of herbs and grasses all contribute toward optimum growth of deer. Unfortunately this beneficial period does not last. A rapid decline begins in three years. Within 5 to 6 years the growth rates have slowed down so one and one-half and two and one-half year olds are down 20 to 30 per cent by weight. While the individual size is beginning to go down, the population continues to build up as the factors affecting population size lag behind the factors influencing individual size. Ultimately the point is reached when deer density goes down and the individuals are small. The population tends to dwindle as the area becomes less and less hospitable. Until such time as the site is relogged or burned, the value for game production remains low.

Blue grouse follow the same pattern of initial abundance during the early seral stages following logging and burning of large areas. However, their decline is even more rapid than that of deer, and generally the period from

high to low production spans 15 years or less. During the first decade of high production, harvests of a bird per acre are possible. It is noteworthy that, due to their migratory habits, the adult males never contribute more than 1 to 2 per cent to the harvest. Indeed, the harvest on this species when taken from large burns or clear cuts has the peculiar property of females outnumbering males two to one. Yet nowhere can it be shown that hunting has caused a population decline. The fact of the matter is that by the opening of the season in late August or early September, the exact date depending upon the fire hazard, there has been ample escapement. In every case population declines have coincided with regrowth of dense ground cover precluding successful brood-raising. When this recruitment to the population declines, the total number of birds rapidly dwindles. The past harvests of this species, which ran between 50,000 and 75,000 annually off relatively small areas, will not be repeated because new logging methods do not furnish the same habitat. However, by stepping up the harvest efficiency and encouraging season-long hunting, the take will run between 25,000 and 40,000; and more important, it will provide many more man hours of recreation.

The establishment of vegetation which spells the end for blue grouse initiates the stabilization of water run-off and improvement to the status of the water table. These trends continue throughout the life of the plantation and favor the increase of anadromous fish. While the streams never return to their former condition, due to scouring, erosion and obstructions, the overall effect of the new plant cover, whether of so-called weed species or of economic species, is beneficial.

In addition to the above affects to fish and game, these large clear cuts have created related forestry problems. For example, extensive stands of undesirable tree species, such as willow and alder, become established, preventing or hindering reforestation with Douglas fir. Aerial reseeding and hand planting must often wait until spraying by selective herbicides has opened these stands. Such treatment may also encourage a local game eruption. The fire hazard in large second growth conifer and deciduous stands is often high, much higher than if old stands, acting as fire breaks, were present. In summary, past logging practices caused the establishment of large game populations which lasted for a decade or two then dwindled. Soil and water were adversely affected. This era of logging created either feasts or famines in respect to wild life.

So far we have discussed past logging methods and how they affected fish and game populations. Let us now examine present forestry practices and relate their present effect upon wildlife.

The forest industry in British Columbia has undergone a remarkable transition in the past 10 years. The establishment and expansion of a pulp and paper industry on Vancouver Island has allowed a greater utilization of logging wastes. Methods of logging have changed, especially on the east coast and southern tip which are the most productive game areas, enabling companies to log and reforest more efficiently. With patch logging creating networks with roads every one-quarter to one-half mile, best use can be made of the timber according to season, species, maturity and demands of the market. With this system working on a 60-70 year rotation period, the area becomes a changing

patchwork with all types of forest succession from fresh slash to mature or merchantable timber. Superimpose this diversified vegetation on an area with considerable variation in elevation and the result is an ideal situation for game and fish. When reforestation is carried out, the forest cover is rapidly replaced on the logged-off land. For the conservation of water this is excellent. The most significant change is the stability which the areas tend to exhibit in terms of game and fish production. This stability will only be apparent from an overall view as each small sub-unit, usually less than 200 to 300 acres, goes through a cycle of plant and animal populations similar to the large clear cuts; the individual ups and downs are masked by others in opposite phases. However, there exist several significant differences. First, the early seral stages are telescoped due to proximity of natural conifer seed sources, reforesting practices and a decline in practice of slash burning. Second, the economic game species—deer, elk and blue grouse—utilize these areas for a longer period of time annually and also serally. While twenty-year conifer plantations in excess of 2,000 acres may hold only residual deer, the same age class in smaller units will be used by deer as escape cover, for winter feeding and as loafing areas as long as adjacent patches of new logging or mature timber are available. The altitudinal differential allows a gradual upwards drift of animals following the spring growth of plants. Also the slashes of mixed age and mature timber allow a greater selection of food species throughout the year. Third, blue grouse do not use these smaller slash units to the same degree as large areas that have been clear cut. On a population basis the large clear cuts produce 10 to 15 times as many birds per square unit. Thus many birds are not harvested. After only 10 to 12 years the population declines while the hunting conditions for the remainder are such that shooting is nearly impossible due to denser cover. The smaller patch logged areas, while not having the boom of blue grouse numbers, will produce as many or more birds and, of more importance, will supply more recreation over the cutting cycle.

In terms of run-off and water-table the newer cutting practices and reforestation mean improved stream stability, lower summer temperature and larger minimum flows. These bring obvious benefits to fish populations, especially those species such as cutthroat, steelhead, coho and some spring salmon which spend up to two years in fresh water before going to sea.

The practice of sustained yield forestry in place of a "cut and get out" policy has brought the following benefits to game and fish:

1. Maintains the water and soil potential of the area;
2. Brings about a measure of stability in the management of game and fish;
3. Permits greater recreational use of the fish and game resource.

Logging, both of the old and new types, has produced game as a by-product, where the potential existed; however, present day trends produce game in a more stable and lasting manner without undue loss of soil and water.

While game is a by-product of forestry, it can and does co-act with certain aspects of industry. Reforestation, an integral part of forest management, bears the brunt of the reaction between forests and game. Initially most of the large clear cuts were hand planted with Douglas fir. This was done mainly in the

spring coincident with the arrival of the blue grouse coming down the mountains to breed. The tips and buds of the newly planted seedlings were eaten and often whole plants were pulled up. Deer were also a problem, not so much in early spring, but in winter and in May and June. Grouse damage is confined in the main to the first and second year after planting, but deer damage can and does occur for a decade or more. While such damage is generally not serious on naturally reseeded areas with 1500 to 3000 or more seedlings per acre, it is of utmost importance on hand planted sites with a much lower seedling density. This damage has been brought about by excessive populations of deer and grouse which in turn were caused by the method of logging. The patch system of logging has to some degree alleviated damage by preventing abnormal concentrations of animals. In the past problems were caused by the pattern of forest cutting followed by improper harvesting of the resulting game populations. Various companies on Vancouver Island have tried repellents with varying success; another has tried covering all seedlings with wire cones. One company has had reasonable success treating seedlings with a fertilizer which also acted as a repellent. Tests are now underway to introduce selenium into nursery stock to act as a systemic repellent. If it works, one more hazard of tree farming will be reduced.

These practices, I believe, are not too well suited for large acreages but seem adequate for protection on a local scale such as on certain bench lands. Basically the problem of deer damage to young conifers appears to be solved best by the application of proper game management principles. On Vancouver Island, browsing on young conifers can be kept at levels not inimical to good forestry if proper harvest can be secured. This is a big "if" and is only possible with the backing of the company whose trees are being damaged. This backing can best be expressed in allowing some form of hunter access, for without some system of public hunting, control over ungulate populations can not be guaranteed.

There exists on Vancouver Island a variety of access schemes running from full public access to limited access. No access for recreational purposes is permitted by some companies. The ownership of the land influences access and, when several types of land alienation such as Forest Management Licences, private Tree Farms and timber leases are adjacent to Crown Lands, the problems become complex. There can be no doubt that the integration of forest management, game management and public recreation can be accomplished. It is not expected that a general panacea will be evolved, but public recreation as one aspect of multiple use of timber lands is gradually being recognized.

The management and production of the major game species depend on the forestry program; cutting schedules and methods, reforestation, spraying, insecticides and herbicides, all influence wildlife either positively or negatively. The decrease in game and fish populations represents a depletion of a natural renewable resource, either in terms of recreation or in dollars and cents. With the use of insecticides for control of forest insects becoming more common, it would lower conflict with fishery interests if the chemists could devise a spray lethal to insects but non-toxic to fish.

Certain trends appear inevitable in the management of our forests.

1. New tree species will probably be used. At present various species of pines and poplars are being tried. These are fast-growing trees suitable for pulping, and some are especially susceptible to deer and elk damage. One test area planted with poplar (*Populus trichocarpa*) has had little success due to elk browsing. This site was and is an elk wintering ground. It was, therefore, suggested that either a less palatable species be planted such as *Abies* sp. or that wire cones be put around the seedlings. This episode points out the desirability of foresters and game managers co-operating during reforestation plans in order to prevent future problems.

2. Another trend towards increased utilization of the timber crop results in less debris on the forest floor and less need for extensive slash burning. A slightly different floral association develops when an area is not burned, but soil stability is much higher, benefiting both trees and wildlife.

3. A third foreseeable trend is a shorter cutting cycle, resulting in a greater game potential.

4. The fourth and last trend is the demise of the extensive uniform-age, single-species stands of second growth. These plantations of Douglas fir are dangerous from a forestry point of view in their susceptibility to disease, insects and fire. Small patches of mixed species located according to soil, insolation, rainfall, etc., will be much safer and in the long run will probably produce more wood, wildlife and recreation.

Summing up the relationship between forest management and the other users of forest land, it is obvious who sets the standard. Wildlife and other recreational by-products of the forest industry depend upon sustained forest management for their existence. Co-operation by allowing public use of the lands involved is mandatory, for without utilization of natural resources—be they forests, wildlife or fish—management is next to impossible. The rewards to the forest industry are twofold; first, relief from uncontrolled wildlife populations, and second, the value of community relations derived from multiple forest use.