January 15, 1988

File: 43.48

OKANAGAN SPORTSMEN

Re: Okanagan Deer Harvest Report

The enclosed report is for the information of your club members and other sportsmen. It reports on past results of the Okanagan deer harvest strategy and lays out the future strategy direction. Some changes indicated in the report will be proposed for the 1988 deer hunting seasons. Sportsmen can look forward to deer harvest success that in general should be better than that currently enjoyed.

Yours truly,

[Signature]

E.C. Lincoln
Wildlife Section Head
Wildlife Management Program

RCL/bar

Enclosure
DEER HARVEST MANAGEMENT IN THE OKANAGAN:
PAST RESULTS AND FUTURE DIRECTIONS

by R.C. Lincoln
Wildlife Section Head
Wildlife Management Program
December 1987
SUMMARY OF PAST OKANAGAN DEER MANAGEMENT RESULTS

At the B.C. Wildlife Federation meeting of December 12, 1987, Okanagan deer harvest strategies were discussed at length. Some club representatives expressed an interest in reviewing past results of the Okanagan deer harvest strategy. We have summarized the currently available data in the following graphs. Figure #1 shows an increasing harvest of deer. On statistical analysis this amounts to an average increase in harvest of about 4% to 7% per year over the years represented. A reader might initially think this was because the numbers of Okanagan deer hunters might have been increasing. However, Figure #2 suggests the numbers of these hunters was more or less stable at about 16,000 per year. In contrast, Figure #3 suggests the harvest increase is because deer hunters in the Okanagan have been increasingly successful in bagging deer. This increasing success rate was apparently a result of increased availability of deer in the areas hunted. Figure #4 suggests the amount of effort to harvest a deer has been decreasing. The primary reason for the increased ease with which a deer can be bagged seems to be increasing deer density. Therefore, the total number of deer seems to have been increasing by about 4% to 7% per year through the last 10 years. This is a fairly rapid rate of increase in Okanagan deer.

It could be speculated that the increasing harvest was due to coincidental factors such as proliferation of access roads into "deer country" or weather affecting hunter success, etc. Comparison of deer harvest data to parallel data of the two adjacent management regions was used to assess these types of factors. Our interpretation presumes that many of the coincidental factors would prevail over more than just one administrative region. Figure #5 illustrates the increasing Okanagan harvest in relation to the deer harvests in the Thompson-Nicola and Kootenay regions. The Okanagan shows a relatively consistent and stable increase. On average, deer harvests in all three regions have increased significantly over the period. As in
Figure #2, Figure #6 illustrates the more or less stable numbers of Okanagan deer hunters in relation to these adjacent regions. Figure #7 shows a general trend towards increasing deer hunter success in all three regions. In recent years, the Okanagan deer hunter success rate has been notably good. Figure #8 shows that throughout almost the entire span of the data, it has required fewer days to bag a deer in the Okanagan than adjacent regions.

In composite, these comparisons support the interpretation of a rapidly increasing deer population in the Okanagan. Incidentally, they suggest that deer hunters in the Okanagan have enjoyed comparatively high success rates. However, Okanagan deer habitat capacity will not allow for continuing improvements in deer hunter success indicators solely through continuing increases in deer population density. Instead, further improvements will come, in large part, through improved deer harvest efficiency and population management.

FUTURE DIRECTION OF OKANAGAN DEER MANAGEMENT

Okanagan B.C. Wildlife Federation representatives are committed to the wildlife resource conservation ethic. Deer are a major game species in the Okanagan. This resource is under substantial and increasing pressure from a host of factors such as habitat loss, habitat degradation, road kills, poaching, etc., etc. A prime concern of these Federation members is that the deer resource not be over-exploited. They have lobbied hard for very conservative harvests of deer.

This conservation objective has been accommodated in the Okanagan deer management strategy. In the Okanagan where roads are abundant, suggesting a potential for localized over-harvest, and where the wildlife management staffing capacity does not allow for careful monitoring of local deer herd status, it is prudent to be fairly conservative in harvest strategy. "Buck-only" seasons are very
conservative. We believe that this conservative deer harvest strategy has accurately reflected the wishes of Okanagan BCWF representatives. The Okanagan region has the most conservative deer hunting seasons in British Columbia.

Conservative deer harvests have advantages in addition to assurances that local, un-monitored deer herds where access roads are abundant, are not being over-exploited. One of these additional advantages is that hunters seem very pleased with the quality of their hunting experience in the Okanagan. Whether or not an individual deer hunter was successful, we have received many reports suggesting the hunt was of high quality and enjoyable based on the number of deer seen. Other advantages are naturalists, tourists, sportsmen and others who enjoy the many deer viewing opportunities throughout all seasons of the year. Cougar and other predatory wildlife also benefit from these conservative deer seasons.

Conservative deer harvests also have substantial disadvantages. Increased road-kills, orchard conflicts, and possible range over-crowding resulting in reduced productivity or winter mortalities, are but a few. Conservative Okanagan seasons have been suggested as being inefficient and wasteful of deer harvest potential. They have been suggested as contributing to the apparent province-wide decline in hunter licence sales though discouragement of unsuccessful hunters.

Liberalization of our deer seasons has been suggested. There is a broad spectrum of legitimate deer harvest strategies between the current conservative regime through to intensive harvest at the so called "maximum sustained yield". Within this spectrum, we believe there is adequate latitude to moderately increase deer harvest while continuing to meet the wishes of the B.C. Wildlife Federation to maintain Okanagan deer population productivity. Conservative increases in deer harvest are on the near horizon for the Okanagan.
They will include improved apportionment of the harvest:

- between our two species of deer;
- between the two sexes of deer; and
- later perhaps between different age classes of deer (e.g. minimum or maximum antler size restrictions).

Separate seasons for mule deer versus whitetailed deer are already in effect in some management units. The next major change will be a moderate harvest of female deer. The immediate objective will be to decrease the numbers of hunter days to harvest a deer ("hunter effort") with the expectation that the proportion of hunters who are successful should increase ("success rate"). This in turn will hopefully encourage more deer hunters to participate in Okanagan deer seasons resulting in an increased harvest. The harvest regime will not reduce deer productivity but will maintain or more likely, increase deer productivity. An increased public participation in deer hunting will aid in more clearly illustrating the value of the deer resource to society. Hunter surveys are one of the few quantitative ways by which a social need can be shown for continuing habitat and population management.

A.D. Peatt of this office is developing a plan to increase deer harvest. Using data from a number of intensive deer harvest studies, it can be shown that such an increase in harvest can be obtained at the same time as increasing deer productivity in terms of fawn production and total sustainable harvest. However, in recognition of B.C. Wildlife Federation's apparent satisfaction with past results of our deer harvest strategy, Mr. Peatt's recommendations will be moderate and cautious. The proposal will entail conservative harvests of antlerless deer starting in 1988. Details will be forwarded to you soon.
NUMBER OF DEER HARVESTED
OKANAGAN, SUB-REGION 8

FROM HUNTER SAMPLE AND GUIDE RETURNS. DECEMBER, 1987

FIGURE #1
NUMBER OF DEER HUNTERS
OKANAGAN, SUB-REGION 8

FROM HUNTER SAMPLE AND GUIDE RETURNS; GRAPHD DEC. 1987

FIGURE #2
DEER HUNTER SUCCESS RATE
OKANAGAN, SUB-REGION 8

FROM HUNTER SAMPLE AND GUIDE RETURNS: GRAPHE DEC. 1987

FIGURE #3
HUNTER EFFORT PER DEER HARVESTED
OKANAGAN, SUB-REGION 8

FROM HUNTER SAMPLE AND GUIDE RETURNS; GRAPHEO DEC. 1987

FIGURE #4
NUMBER OF DEER HARVESTED
THOMPSON-NICOLA (3), KOOTENAY (4), AND OKANAGAN (8) REGIONS

FROM HUNTER SAMPLE AND GUIDE RETURNS; GRAPHED DEC. 1987

FIGURE #5
NUMBER OF DEER HUNTERS
THOMPSON-NICOLA (3), KOOTENAY (4), OKANAGAN (8) REGIONS

FROM HUNTER SAMPLE AND GUIDE RETURNS, GRAPHED DEC. 1987

FIGURE #6
DEER HUNTER SUCCESS RATE
THOMPSON-NICOLA (3), KOOTENAY (4), AND OKANAGAN (8) REGIONS

FROM HUNTER SAMPLE AND GUIDE RETURNS; GRAPHED DEC. 1987

FIGURE #7
HUNTER EFFORT PER DEER HARVESTED
THOMPSON-NICOLA (3), KOOTENAY (4), AND OKANAGAN (8) REGIONS

FROM HUNTER SAMPLE AND GUIDE RETURNS, GRAPHED DEC. 1987

FIGURE #8
AN IMPROVED DEER HARVEST STRATEGY
FOR THE MAIN OKANAGAN VALLEY

A.D. Peatt
Wildlife Biologist
Wildlife Management Program
January 1988
I. INTRODUCTION

New management programs, however beneficial, will sometimes be met with skepticism amongst the users simply because it is a change from past practice. New programs must be introduced in moderation, with caution, and with accountability to demonstrate that the choices made were the correct ones. The strategy outlined here is conservative. It will not lead to over-exploitation of the deer resource. It will serve to improve deer herd productivity and condition, increase harvest, and reduce negative aspects of roadkills and crop damage. Higher deer density may not always be a good thing - for the deer resource or the hunters. Our agency still suffers public criticism caused by the poorly conceived antlerless kills in the 1950s and 1960s. This proposal is far from that situation, and is deserving of your full support because it will benefit both deer and hunter.

II. A BIT OF DEER BIOLOGY

Deer are density dependent creatures, which is to say that they have "built-in" responses to environmental factors affecting the resources available to them. In most circumstances, these responses serve to stabilize population fluctuations brought about by harvest, catastrophe, or environmental variation. A population can be described in terms of reproduction, mortality, immigration and emigration. Reproduction, the recruitment of young animals into the population and mortality, the deaths of animals in the population are of greatest concern in deer management. It is important to note that, as a deer population grows and approaches its carrying capacity (representing the maximum number of deer an area will sustain without destruction of habitat), the population's productivity (the number of new animals entering the population) declines. This is usually controlled by two mechanisms. As forage availability declines, competition for food results in substantially increased winter
mortalities (of adults and juveniles) and in substantially decreased production of fawns. Therefore, larger populations are less productive of young animals (per adult) than smaller populations restricted by mortality to some optimum level. The major mortality, in this case, should ideally be hunter harvest. Hunter harvest can be managed to substitute for other types of mortality such as roadkills, certain diseases and predation. Maintaining a high harvest from a population somewhat below its carrying capacity has been shown to be the most productive and efficient means of managing a deer herd where hunter harvest is the primary demand. If one is to affect the population in a manner which will make that population more productive, then one must manage those animals producing the recruits (and ultimately the harvest), that is, the does.

The figure below is a graph of a deer population studied by Dr. Dale McCullough for the past 20 years. In addition to his work, data was available for the enclosed herd dating from 1928. Dr. McCullough's work represents the most comprehensive deer management data available anywhere. As can be seen, as the population grows from zero, the number of recruits to the population grows as well. At point 'I' the population is at its greatest productivity. Point 'I' is also where the population supports its Maximum Sustained Yield (MSY), that is, the point at which the greatest (but not necessarily the most desirable) harvest can be maintained. Beyond MSY, as the population grows nearer the limit of its resource availability (K), recruitment declines. From a practical management standpoint, the best place to be is somewhere to the right of 'I', but to the left of 'K'. Such a location will give a moderately high population, yielding a high degree of harvestable animals.

Owing to the density-dependent responses of the deer, the size of a population at such a level is self-adjusting, and thereby remains fairly stable in the face of environmental variation or unregulated
losses such as poaching and disease. Maintaining a population at MSY or lower (the left side of 'I') is much more hazardous because errors and catastrophes are de-stabilizing, rather than self-correcting.

The main Okanagan Valley (and other areas of the region) has escalating problems associated with increasing deer density. Habitat degradation, increasing deer/agriculture damage and a high incidence of roadkills are a few of the obvious symptoms. But think further, how many times have you heard or said: "Gosh (or words to that effect), I saw plenty of does out there, but no bucks." or, "Golly, there are a lot of does without fawns - something must be wrong!". Unless deer management adjustments are made, these symptoms will get worse.

Deer seasons restricted to bucks-only is one way of ensuring a minimum harvest. Because does are spared under buck-only hunting, the post-hunt population grows toward its carrying capacity. Our population is growing at a rate of up to 7% per year! As the population approaches carrying capacity, productivity declines due to the deer's density dependent responses. This results in a reduction
of all recruitment, including the recruitment of bucks. Since the harvest is dependent on recruitment, a harvest of only bucks assures a low recruitment of bucks to be harvested. According to McCullough, buck-only hunting invariably results in:

- high residual populations of predominately females
- low overall recruitment rates, and
- legal (antlered) bucks comprising 10% or less of the population.

Intuition tells you that a large population means a large harvest, so very restrictive seasons must be best. It is unfortunate that this appealing presumption works in the opposite manner. Everyone is concerned with conserving the deer resource, in particular with assuring that hunting activity does not harm that resource. None-the-less, the primary justification for deer hunting is the harvest that results. The failing of buck-only hunting for yielding bucks, much less total deer, can be seen in the figure below, where the potential harvest curve is separated by sex as based on Dr. McCullough's studies.
III. THE PROGRAM

By cautiously harvesting antlerless animals, we can hold the deer population at a higher level of productivity and thereby reap many benefits. We can, over time, achieve:

1. higher total deer harvest
2. higher buck harvest
3. improved hunter success
4. more deer hunting participation
5. a broader degree of hunter satisfaction
6. fewer deer-vehicle collisions
7. reduced deer damage complaints
8. improved deer health (larger body size, larger antlers, better condition)
9. lowered deer age distribution
10. lowered vulnerability to predation
11. some measure of habitat recovery in degraded areas, and
12. less likelihood of population fluctuation due to environmental catastrophe.

Hunters will be able to demonstrate that their activity can be used to scientifically manipulate the deer population to meet the desired criteria of maximal human benefit through optimal use of the deer resource. Who is to be served by this strategy? Primarily hunters, but also agriculturists, the general public, and the deer themselves. This strategy is more efficient, and a more beneficial use of the deer resource than our traditional buck-only seasons. The cost? To achieve these goals means that post-hunt (fall and winter) there will be fewer deer than what could currently be seen. To increase productivity and thus harvest, means the population density must be held somewhat below the carrying capacity.

The goals of the program will therefore be:

1. To improve hunter success, deer herd condition, and hopefully hunter participation by increasing harvest of both bucks and does.
2. To reduce post-hunt populations to effect a reduction in roadkills and crop damage.
3. To ensure that deer are used wisely and efficiently, achieving optimal human benefit and demonstrating that hunter harvest can be used to effectively manage the deer resource to its benefit.
The criteria for success of the program will be:

1. Increased total harvest of deer, including an increase in the buck harvest.
2. Increased deer hunter participation and success.
3. Perceptive improvement in hunter satisfaction (more animals available for harvest, greater proportion of bucks in the population).
4. Decreased roadkills and crop damage complaints.

Very conservative antlerless harvests will be implemented under the Limited Entry Hunting Program. Because this will present a major new opportunity to deer hunters, LEH is initially important to avoid the possibility of localized over-harvest, which might occur through unregulated concentrations of hunters. Also, LEH will allow for better assessment of hunter demand for antlerless deer and assessment of success rates. Over time, if the program is successful in meeting the established objectives, the harvest could be opened to a very short general open season. Thereafter, if the public wishes to further extend the demonstrated benefits of a proven management strategy, the harvest of does can be slowly increased. Increases would have to be made cautiously, based on the responses of harvest and deer population productivity resulting from previous seasons. Although remaining very conservative, increasing the take of antlerless deer should serve to increase total buck-kill, reproductive rates, individual weights and antler size.
Because we, as managers, do not have the staff resources to devote our time exclusively to deer management, we must maintain the deer population at a point yielding moderately high deer density below carrying capacity and yet providing enough of a harvest to meet public demand. Much higher harvests than what is proposed are sustainable, but are not practical, nor desirable. Extensive liberalization of the deer seasons would create a much greater need to more closely monitor the deer population. We do not have the staff or the resources to accommodate such a program. Maintaining a moderately high population with slightly more liberal seasons than at present provides us with an appropriate management buffer, well within our workload capability.

From our perception of public demand, the best place to maintain the deer herd would be, on the first graph, somewhat to the left of 'K', but well below 'I'. At such a point, the population would remain at moderately high density, be more productive of young animals, support a higher harvest, and most important, would tend to be self-stabilizing in the face of unforeseen fluctuation.

Post-season monitoring will consist of:

1. Obtaining reasonably precise estimates of the buck and doe harvests from the LEH survey and Hunter Sample. Modelling the buck harvest against the doe harvest, the buck harvest should increase.


3. Cross-checking all data against other ancillary observations, such as change in DAPA value by winter range, incidence of fawn breeding (if any), age structure of harvest, spring carryovers, density transects, carcass weights, embryo rates, and antler size.
IV. SEASON SPECIFICS

Season Area: Management Units 8-01, 8-02, 8-08, 8-09, 8-10, 8-22

Rationale: This is a good area to evaluate the strategy owing to the presence of both deer species, the high incidence of deer damage to crops, high roadkills, and the proximity of a large number of hunters. Entire Management Units are required so as to affect the populations on a herd basis and to permit monitoring through our current data system (LEH survey and Hunter Sample).

Logistics: Antlerless harvest will be controlled by LEH authorization. Antlerless deer taken will be part of the current regional bag limit (i.e. no change). The number of antlerless deer harvested will be based on the current average buck harvest, proportioned by Management Unit. Annual adjustment of the number of authorizations can be made by assessment of the previous year's number of authorizations and the proportion of hunters who are successful. The number of authorizations issued in the first year will cautiously assume a high success rate (50% of authorizations issued) to test the actual number of authorizations required. (Comparable West Kootenay success rates range from 25% to 36%)

- Current harvest in these M.U.'s is about 1400 bucks
- Estimated population (pre-hunt) is 13000 - 15000
- Buck harvest currently is 9.3% to 10.8% of the pre-hunt population.
From McCullough's studies, MSY (both sexes) for mule deer constitutes 27% of the pre-hunt population. For whitetailed deer, MSY constitutes 49% of the pre-hunt population. Being more conservative, we will attempt to increase total harvest only moderately to perhaps 15% of the estimated pre-hunt population.

At 15% total harvest (both sexes):

- target harvest (total) will be approximately 1950 animals
  (based on the minimum pre-hunt population estimate of 13000)
- 1400 of these will be bucks (unchanged in first year)
- about 550 will therefore be antlerless animals, proportioned between the 6 Units and the two deer species.

Authorizations to be issued by species by Management Unit:

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<th>Anticipated WT Antlerless Harvest</th>
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<th>Anticipated MD Antlerless Harvest</th>
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Season Date: October 10 to November 15 (late opening to ensure fawns are at their heaviest for harvest).

* M.U. 8-08 reduced from 260 due to possible influence of Thompson-Nicola antlerless season.