

Successful and unsuccessful attempts to resolve caribou management and timber harvesting issues in west central Alberta

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Abstract: Research studies of woodland caribou in west central Alberta began in 1979 in response to proposed timber harvesting on their winter ranges. Using results from initial studies, timber harvest guidelines were developed. A recent review of these guidelines, and the assumptions on which they were based, has resulted in a renegotiation by government and industry of timber harvesting on caribou range in west central Alberta. Caribou range in west central Alberta overlaps many jurisdictional boundaries: federal and provincial lands, four Forest Management Agreement Areas, three Alberta Land and Forest Service Regions and two Alberta Fish and Wildlife Service Regions. This jurisdictional complexity in combination with other factors such as total allocation of the timber resources, high levels of petroleum, natural gas and coal extraction activities, a high level of concern by public groups for caribou conservation and recent understanding of woodland caribou needs for abundant space has made resolution of caribou/timber harvest conflicts exceedingly slow and often relatively unproductive. This paper reviews 10 years of trying to resolve conflicts between timber harvesting and caribou conservation through meetings, committees, integrated resource planning, policy papers and public consultation. We describe what might be learned by other jurisdictions that are trying to resolve similar caribou/timber harvesting issues. We conclude with an overview of recent timber harvest planning initiatives on caribou range in west central Alberta.

Key words: *Rangifer*, woodland caribou, timber management, landscape planning, habitat management, conflict resolution, Alberta

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Introduction

As in many other jurisdictions (Darby & Duquette, 1986; Cichowski & Banner, 1993; Stevenson, 1991), maintaining woodland caribou (*Rangifer tarandus caribou*) populations in commercial forests is a complex issue in west central Alberta (WCA). Various factors contribute to this complexity. In WCA virtually all timber resources on caribou winter range have been allocated to forest products companies. In several cases more than one company has been awarded harvesting rights on a given winter range (up to three companies on one range). Annual allowable cut calculations have been made without consideration of caribou habitat requirements. A considerable amount of timber harvesting has occurred on caribou winter range in WCA, and there are demands for continued harvesting as these ranges are largely composed of merchantable and

operable timber lands. Our current data (Hervieux *et al.*, 1993) indicate that on at least some winter ranges in WCA, caribou prefer highly merchantable mature and overmature forest stands, especially during deep-snow winter conditions. In addition to removing critical habitat for caribou, the current timber harvesting strategy (patterns of small, dispersed cut and reserve blocks), has considerable potential to increase the distribution and abundance of other ungulate species (moose, elk, white-tailed and mule deer) on caribou range. An increased prey base may result in increased predator numbers (Seip, 1991), primarily wolves, and a corresponding increase in predation rates on caribou. Other factors including petroleum and natural gas exploration and production projects, coal mining, human recreational activities, and the occurrence of a primary highway on caribou range all increase the challeng-

es involved in managing caribou populations in WCA.

The intent of this paper is to provide a description of past and present attempts to integrate caribou population and habitat management with timber harvest planning in WCA. Together with reports such as Racey *et al.* (1991) and Stevenson *et al.* (1991), we hope that a description of our activities in WCA may be of some value to those facing similar issues in other areas.

Background on WCA caribou and industry

Initial caribou studies in WCA (1979 - 1984) described a migratory mountain caribou population and a more sedentary forest-dwelling population (Edmonds & Bloomfield, 1984). Both populations were below the probable food based carrying capacity of their range and had high adult and calf mortality primarily related to predation and man-caused factors (Edmonds, 1988; Edmonds & Smith, 1991). The migratory population calves, summers and breeds in mountainous areas that have protected status (Jasper National Park, Willmore Wilderness Park, etc.). However these caribou winter on multiple use lands in the foothills that are available for industrial, recreational and other human activities. Their year-round range encompasses about 15,000 km² which includes summer range in British Columbia. The forest-dwelling, non-migratory population inhabits about 1600 km² of unprotected, multiple use provincial lands on the eastern edge of the foothills. We currently estimate 400 - 500 mountain caribou using three winter ranges (Redrock Creek, Prairie Creek and A la Peche) and 60 - 100 forest caribou use the Little Smoky range (Fig. 1). Caribou range in WCA is primarily lodgepole pine (*Pinus contorta*) and lodgepole pine/spruce (*Picea* spp.) forest, greater than 80 years of age, interspersed with relatively small muskegs that provide terrestrial and arboreal lichens.

Two of the three mountain caribou winter ranges have had some timber harvesting since completion of the initial caribou studies in 1984. About 15% of the Redrock winter range and 10% of the A la Peche winter range has been impacted by first-pass logging. Negotiations over further logging within those two winter ranges and within the other two unlogged ranges have been ongoing since the mid-1980's.

Early timber management guidelines

Increased emphasis on understanding WCA caribou populations and habitat in the late 1970's and early 1980's was triggered by demands for new major logging entries on to the Redrock and A La Peche winter ranges. Special timber management plans

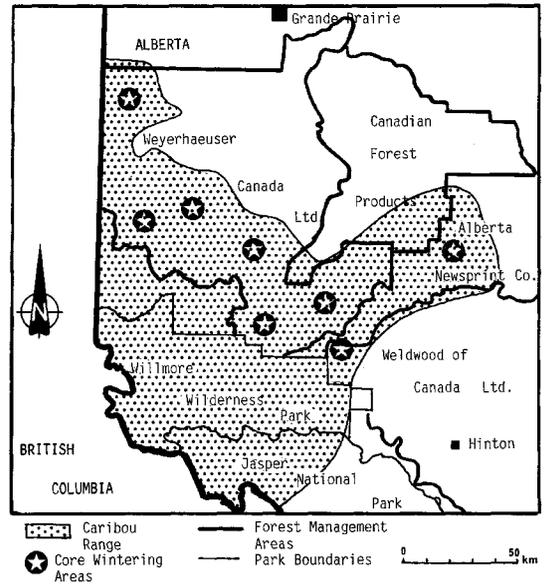


Fig. 1. Woodland caribou distribution and location of Forest Management Agreement Areas in west central Alberta.

were quickly developed in an attempt to mitigate the affects of those logging programs on caribou. A main emphasis was to protect areas of forest for the production of terrestrial and arboreal lichens. Also, those plans were composed of measures that did not deviate greatly from standard ground rules for timber harvesting in Alberta and as a result had negligible affect on the annual allowable cut. A description of the range specific plans follows.

Redrock Creek

Using 4 years of radio telemetry relocation data (up to 11 collared caribou) and some winter ground tracking, a Redrock winter range was delineated. This winter range was then subdivided into several zones based on the apparent importance of parts of the range to caribou (Procter and Gamble Cellulose, 1989). As a result of this zonation process, 60% of the winter range was made available for logging with a two-pass system. The remaining winter range was deferred from timber harvesting for 80 years, at which time a two-pass system would be initiated. The areas subject to this 80 year deferral were small (2.6 km² to 74.0 km² in size) relative to caribou travel patterns. Most of the deferred areas contained little or no merchantable timber volumes (meadow complexes, rocky ridges, younger pulp stands).

In Alberta two-pass logging involves laying out a series of first-pass cut blocks and second-pass reserve blocks in a checker board pattern through-

hout all operable, merchantable timber. Block size can vary to a maximum of 60 ha. Reserve blocks are harvested once timber regeneration in adjacent first-pass blocks has reached 2 - 3 meters in height . A timber rotation age of 100 years was established for the Redrock area. A goal of the Redrock plan was to use cutblock sizes that mimiced natural openings with the hope that caribou would use the cutblocks for foraging, travelling and other activities.

A La Peche

The A La Peche winter range was delineated using radio telemetry relocation data from 8 collared caribou collected over 3 years and four years of winter ground surveys. A three-pass system (with a 120 - 150 year rotation) was planned for about two-thirds of the range and in the remainder a two-pass logging system would apply. The three-pass system was to be used in areas known to produce terrestrial and arboreal lichens. A three-pass system involves a pattern of cut blocks, reserve-one and reserve-two blocks being laid out in a checker board pattern throughout the operable, merchantable timber. Harvest of reserve-one and then reserve-two blocks would require that regeneration had reached 2 - 3 meters in adjacent harvested blocks. Cut blocks could be up to 60 ha. in size and were to approximate the shape of natural forest openings (narrow and winding). The intent of this three-pass system was to leave about one-third of the area available as a foraging area, with perhaps another one-third available as travel/security cover.

Other winter ranges and reflections on early guidelines

The prospect of timber harvesting in the Prairie Creek and Little Smoky winter ranges (Fig. 1) remained a contentious issue during and after early work in Redrock and A La Peche. Throughout much of the 1980's, Alberta Fish and Wildlife Division field staff argued that portions of the Prairie Creek and Little Smoky winter ranges, 194 km² and 450 km², respectively, should be subject to a 30 year deferral from timber harvesting. A moratorium was sought to provide a reserve of effective habitat for caribou populations and to provide an experimental control in view of the unpredictable results of logging in Redrock and A La Peche winter ranges.

To date a timber harvesting moratorium for Prairie Creek has not been agreed to by senior levels in government. Much of the timber within Prairie Creek is at or past typical rotation age; government and industry timber managers felt that harvesting was required. In 1989 the Alberta Forest Service and the Fish and Wildlife Division agreed to

a 30 year deferral for timber harvesting within a central portion of the Little Smoky range; an area that contained timber which was younger on average than preferred rotation age. Timber harvesting has continued to expand into the Redrock and A La Peche ranges as per the original caribou management plans.

Since development of these plans in the mid 1980's Alberta Fish and Wildlife Division field staff have had growing concerns that they were inadequate for the long term habitat needs of resident caribou populations. It was also becoming difficult to explain to an increasingly knowledgeable public how our plans might work. In view of new research and proposals being presented by various workers (Bergerud *et al.*, 1984; Bergerud & Page, 1987; Darby *et al.*, 1989; Seip, 1990; 1991) it was felt that the two and three-pass logging systems being used in Redrock and A La Peche would prove unsatisfactory in many ways. We had placed too much emphasis on maintaining foraging habitat and had not given enough consideration to the effects of increases in alternate prey and concentrating caribou into the remaining areas of useable habitat. Two factors that would possibly subject caribou to increased rates of predation on the winter range. Caribou habitat management no longer seemed clear or straight forward and the era of committees, working groups and policy statements began.

Committees, plans and processes

Over the past decade, concern that we had not adequately addressed issues relating to timber harvesting (and other industrial/recreational activities) on caribou range has resulted in a variety of government, industry and public initiatives in Alberta. These initiatives were started at local, regional or provincial levels and overall have attempted to develop a consensus on how to manage caribou herds and ranges. The following list discusses each major process in chronological order, to provide some insight on how issues have and have addressed in Alberta.

1984. The Fish and Wildlife Division produced the "Status of the Fish and Wildlife Resource in Alberta" (Paetkau, 1984). A report endorsed by the Provincial Government which argued that existing caribou populations and ranges in the province should be increased or at least maintained. This report provided an overall frame work for Fish and Wildlife Division activities, however, it had little affect on the allocation/management of timber and other resources.

1986. The Fish and Wildlife Division produced the "Woodland Caribou Provincial Restoration Plan" (Edmonds, 1986), a report which discussed ways to stem an apparent decline in provincial and especially WCA caribou populations. Few of the recommendations listed in the plan were adopted. Some aspects, especially discussions of wolf management, resulted in considerable public debate.
1987. Caribou were listed as endangered under the Alberta Wildlife Act.
1989. The West Central Alberta Caribou Technical Committee was formed. This was an ad hoc group of representatives from industry, government and public interest groups who attempted to exchange information and seek possible solutions to issues relating to industrial activity on WCA caribou ranges. After several years of meetings, no consensus had been reached and the group has disbanded. However, knowledge level of caribou biology and resource industry's requirements for operation was greatly increased.
1989. The Fox Creek/Knight and Berland Integrated Resource Plans were initiated. Part of a provincial scale planning framework, these plans identify broad land management priorities in and around the Little Smoky and A La Peche ranges. In 1993 a Kakwa plan similarly began to set management priorities for parts of the Redrock and Prairie Creek ranges. All of these plans are ongoing and have yet to produce products.
1991. Alberta Forestry, Lands and Wildlife with Alberta Minerals Division produced the "Procedural Guide for Petroleum and Natural Gas Activity on Caribou Range" (Alberta Forestry, Lands and Wildlife, 1991). This is a policy paper which sanctioned general protection procedures for provincial caribou populations and habitat in relation to oil and gas development. Oil and gas development is to occur on caribou ranges so long as the "integrity" of caribou habitats and populations are maintained. What habitat and population integrity means, and how to insure it, has been left to industry and government field staff to determine. This policy paper did result in the formation of five government/industry committees which are to develop range specific operating plans for oil/gas and in some cases timber harvesting activities. Several of the committees have developed oil/gas guidelines, but in some cases these guidelines have been contested by some companies.
1991. A working group of Alberta Forest Service and Fish and Wildlife Division staff was formed to develop provincial timber management guidelines for caribou range. No consensus could be reached and the group disbanded after 18 months of periodic meetings.
1991. Alberta Fish and Wildlife Division released a provincial management plan for wolves (Alberta Fish and Wildlife Division, 1991). This policy paper requires that prior to wolf management, regional data sets must clearly indicate that wolf predation is a primary factor limiting ungulate populations.
1991. The Alberta Forest Products Association (various companies) completed a dialogue with the Alberta Environmental Network (public interest groups) on caribou/forestry issues. Agreement was reached on a list of factors which might limit caribou populations in the province.
1993. By this time all Forest Management Agreement holders had formed local public advisory boards and local Fish and Wildlife/Forest Service/Industry committees to, at least in part, resolve caribou/timber harvesting issues at the local level. No specific plans have been finalized yet.
1993. Alberta Fish and Wildlife Services released a provincial plan, the "Strategy for the Conservation of Woodland Caribou in Alberta" (Alberta Fish and Wildlife Services, 1993). This plan proposed general caribou management prescriptions on a range by range basis. Using a risk assessment process it was argued that two-thirds of the provincial caribou population could be maintained; largely herds in protected areas and in areas of low current conflict with industry. Industrial activity on remaining ranges would proceed with the possibility of some attempts to mitigate negative affects on caribou. The report did recognize unique aspects of mountain caribou in WCA and suggested that timber harvesting rights be purchased back from industry to protect some winter ranges. Upon its release, this plan was strongly criticised by government agencies, public groups

and by industry. This criticism led to abandonment of the draft plan and the formation of a new stakeholders committee (Alberta Caribou Conservation Strategy Development Committee) to recommend a provincial policy for caribou management activities.

Overall, the last decade of committees and process in Alberta have produced few results that address specific management issues on caribou range. To a certain extent, key decisions have been left to government and industry field staff, with little policy framework available to help resolve disputes. Although progress has been slow, the debate about industrial activity on caribou range has become more focused. A decade ago the overall knowledge level among the various stakeholder groups was low. We were all doing our own thing and talking past each other. Now most stakeholders have had an opportunity for input and have adopted a true problem solving perspective. The current stakeholders committee process will hopefully work towards a much needed provincial overview as to objectives, priorities and management options for caribou populations.

Current timber harvest planning on WCA caribou ranges

A deficiency of our early timber harvesting plans was that we did not give adequate consideration to how much useable and effective habitat would be available for caribou populations into the future. To correct this situation we are now trying to develop a timber planning system that uses a landscape perspective to specifically consider the issue of caribou habitat supply and quality through time. Most local government and industry staff generally agree that timber harvesting will occur on most or all WCA caribou ranges subject to the following general principles.

1. Each winter range will again be delineated using current information. We will outline landscapes that now are or have the potential to be good winter habitat areas for caribou, that are large enough to support existing or target caribou populations (see below), that are relatively undisturbed and that allow for some management flexibility. Using these criteria we have increased or are negotiating increases in the sizes of several winter ranges; Redrock from 329 km² to 920 km², Prairie Creek from 194 km² to 560 km², A la Pêche from 600 km² to 970 km² and Little Smoky from 450 km² to 1600 km².
2. Each range will be described as to current habitat supply and quality (stand types and ages). We will attempt to project future caribou habitat

supply/quality in view of natural forest succession. This information will be reviewed to determine how timber harvesting, in the absence of wildfire, could be used to renew caribou habitat through time. The rationale being that harvesting could occur in given stand type/age classes as the availability of those habitats increased through forest succession and thus maintain winter ranges in a state similar to current composition.

3. We will strive to not unduly reduce the near term availability of any one stand type or age class in our sequencing of timber harvest.
4. Timber harvesting would be brought onto caribou winter ranges in a manner to, as much as possible, avoid fragmenting the range with cut blocks and areas of regenerating timber. We would try to take as much timber as possible out of as small an area as possible while still addressing other important management issues (eg. watershed and fisheries protection, stand regeneration).
5. In the near term, timber harvesting would stay out of presently defined range core areas, as recommended by Cichowski & Banner (1993) and Darby & Duquette (1986).
6. We would be careful that the proportion of a winter range harvested at any one time was not so large as to unduly constrain the resident caribou population with regard to the area available for dispersion to avoid predators and seekout forage and optimal snow conditions. As noted by Stevenson (1991), it is not obvious how to determine the amount of range a caribou population requires. We propose that two methods might be used to tackle the issue. First, we could try to leave enough useable habitat to allow the population densities of resident caribou to emulate caribou densities reported in literature (eg. Seip, 1991) for apparently stable populations. Second, by way of an impact assessment we might determine what the consequences of a planned logging entry would be on existing caribou population densities and decide if that change (increase) was acceptable. Both of these techniques would require an estimate of current caribou population size and agreement on population goals for each range.

The principles listed above are general. Specific planning and operational criteria still need to be agreed upon for several of the principles. Some criteria and decisions will be arbitrary. Timber harvest planning in view of the above discussion is beginning on a range by range basis in WCA. For example, our original plans for Redrock have been abandoned and a re-assessment for the A la Pêche and Little Smoky ranges is required. Not all of the identified timber volume in those ranges was harvested under the old plans; provi-

ding an opportunity for a new approach. In Redrock we will meet further timber harvesting needs by accelerating the initiation of reserve block harvesting within the current layout area. Subject to agreement on a new harvest sequencing plan, no further harvesting will occur outside of this layout area for one or more decades thereby avoiding further habitat fragmentation of the Redrock range. Within Prairie Creek a relatively small harvesting area is being identified well away from the current core use portion of the winter range. Local government and industry personnel have agreed to develop sustained yield timber calculations for both Redrock and Prairie Creek ranges that specifically take into account a caribou habitat supply analysis. This will be a major achievement.

Conclusion

Despite slow progress over more than a decade, there are encouraging aspects to our management activities in WCA. Although some WCA caribou populations may only be approximately stable (Edmonds & Smith, 1991), we still have functioning caribou populations and habitats to work with. Also, caribou conservation is clearly a shared goal between government, industry and the public. It seems that we have side stepped absolute gridlock and are now discussing alternate strategies in a risk/benefit framework. A major issue will arise if addressing long term caribou habitat supply has significant effects on near term timber supplies (i.e. annual allowable cut) for industry. If such an issue occurs, it will require resolution at senior levels.

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