

## Of reindeer and man, modern and Neanderthal: A creation story founded on a historic perspective on how to conserve wildlife, woodland caribou in particular

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**Abstract:** A review of successful systems of wildlife conservation, the North American included, suggests that broad public support and determined effort by volunteers is essential for wildlife conservation. Since North American wildlife conservation is the only large-scale system of sustainable natural resource use, and exemplifies the great economic and cultural benefits of a renewable resource held in common, its lessons may be profitably applied to Rangifer conservation. Animals that have value are surrounded by myths that tell of their relationship to humans. In our Anglo-American culture reindeer and caribou are rather deficient in this respect. However, reindeer feature prominently in the rise of modern humans and the demise of Neanderthal man early in the Upper Paleolithic. The colonization by humans of the periglacial environments during the last glaciation depended on the rich periglacial megafauna, Rangifer included. Archeological sites of the European Upper Paleolithic show that reindeer were the most important food source. The Upper Paleolithic, characterized by exceptional physical development and health of people, as well as by the first flowering of art, extended from Spain to Crimea with surprisingly little cultural change for some 25 000 years. While the cave paintings express an infatuation with dangerous game (woolly mammoth, woolly rhino, steppe wisent, giant deer, cave lions, bears etc), the archeological sites indicate that reindeer was the staple food. Reindeer play a minor role in cave art. Neither this art, nor archeological sites, show any evidence of warfare. It is hypothesized that during a mid-glacial interstadial modern people entered Europe having developed a highly successful system of hunting reindeer using interception based on the discovery of chronologic time. This led to a first flowering of culture based on a rich economy, but also to additional hunting mortality of the periglacial mega-herbivores that Neanderthal people depended on. That would explain the slow decline into extinction of the previously invincible Neanderthal people. Therefore, modern humans owe much of what they are to reindeer. We need to reciprocate. What is urgently required is a foundation formed by volunteers for the conservation of caribou, similar to the Rocky Mountain Elk Foundation, focusing on the severely endangered woodland caribou.

**Key words:** caribou conservation, cave art, extinction, megafauna, Rangifer tarandus, Upper Paleolithic.

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### Successful conservation models

A review of the conservation of migratory caribou and reindeer (*Rangifer tarandus*) and its unquestionable successes, indicates that conservation of these animals follows the principles of successful conservation of other species. However, this only highlights the fact that, by contrast, woodland type caribou and reindeer, with the exception of Newfoundland caribou, have not prospered and that some unique pop-

ulations are in imminent danger of extinction. As my basis of comparison I have used first the North American model of wildlife conservation that arose in the past 80 years, as it not only led to the return of wildlife continentally, but is remarkable in other ways as well. It shows how to hold and manage a renewable natural resource in public trust so as to defeat Garrett Hardin's Tragedy of the Commons (Hardin, 1968), that the resource is being used not

merely in a sustainable fashion, but has expanded and multiplied, that a public resource can generate through the private sector remarkable wealth and employment, that some markets in wildlife actually do foster conservation, while others - in particular the sale of dead wildlife - are highly detrimental, and while wildlife conservation is linked to a broad-based public support, it is but a fragment of that public which supports wildlife substantially in return for the use of that resource. Put less delicately, wildlife has blossomed because hunters volunteered great effort and finances in order to see wildlife prosper (Geist, 1981; 1995; Geist et al., 2001). The following paper is thus a discourse on the much vaunted "human factors" in wildlife conservation.

Using the North American conservation model one can delineate the conditions for successful conservation, and in so doing discover that these appear to be universals. For conservation of a species to be successful there needs to be an organized, politically potent clientele promoting that species. That clientele is instrumental in generating systems to monitor and investigate said species, it fosters common belief about the species that stimulate, entertain and unify the clientele, it insures just and fair distribution of spoils generated by the resource, it functions in an open and democratic process that reinforces the clientele member's status, generates innovation, maintains and augments useful traditions, and enshrines and celebrates its successes symbolically. You may notice that these factors apply to such grass-roots conservation organizations as Ducks Unlimited, or The Rocky Mountain Elk Foundation, Foundation for North American Wild Sheep, the Wild Turkey Federation and others, but also to current societal structures - aboriginal and modern - that support migratory barren ground caribou in North America and migratory reindeer in Eurasia. There is the grass-roots clientele of hunters, users of caribou and reindeer that are most anxious to see these animals prosper. These users are organized to see that there is monitoring, research as well as open discussions of management, and the translation of their concerns into effective political action. Moreover, some of these users are not merely rationally or economically involved with reindeer or caribou, but have a deep emotional bond to these animals, maintain a tradition of myths and celebrate the culture that thrives about migratory Rangifer. These animals are thus far more than a source of livelihood or economics, but are a source of ongoing cultural identity, entertainment, education, the very societal glue of communities that hunt migratory caribou or reindeer. Formal gatherings to discuss Rangifer biol-

ogy and management are an expression of this grass root concern and signify the importance this animal has to people living in arctic landscape

While the above is valid for migratory caribou and reindeer, it is not for most forest or woodland forms, be they Eurasian or North American. The woodland forms are the usually large-bodied races on the southern rim of Rangifer's continental distribution here and in Asia. The societal factors that do apply to elk (*Cervus elaphus canadensis*) via the Rocky Mountain Elk Foundation or to mountain sheep (*Ovis dalli*, *Ovis canadensis*) via the Foundation for North American Wild Sheep, have no counter part for woodland caribou. Why are elk so captivating to so many persons, but woodland caribou are not? Is it the scenic splendor of mountains which frames elk, as opposed to gloomy tamarack and black spruce bogs that hide woodland caribou, as my son Karl, a wildlife artist, suggests? Is it that herds of migratory caribou pouring across the television screen obliterate concern for the dying woodland forms? It is significant in this context that elk or mountain sheep have little role in the livelihood of most members of the respective elk and sheep conservation organization. Yet there is much passion for these animals, even by those that have little hope, if any, of someday hunting elk or sheep. Instead, members celebrate their identity with other like-minded via well-attended meetings to raise funds for conservation, share journals and news letters, support arts and crafts symbolizing elk and sheep, weave together tall tales of shared experiences and become active politically in diverse ways. In a recent book the Foundation for North American Wild Sheep and the Boone & Crockett Club celebrated a quarter century of success in mountain sheep conservation, in which wild sheep populations across North America increased by nearly 50 percent (Towell & Geist, 1999).

Please note this success is based on private effort without recourse to coercive or punitive legislation. It was done without noticeable national or international publicity or public incitement, in short, quite different from activities associated with conventional environmental movements. Yet these quiet private efforts were eminently successful as seen by the increase in distribution and numbers of elk and wild sheep. Could this be duplicated for woodland caribou? There are no clubs organized to specifically rehabilitate woodland caribou in mainland North America, although the Newfoundland caribou, a colorful woodland form by convergence, is thriving. It does so due to the dedicated support of Newfoundland's citizen. The Newfoundland caribou is a subspecies quite distinct in pelage characteristics

from other caribou. Put in other words: placing woodland caribou on an endangered species list might have some benefits, but having an organized citizen group root aggressively for woodland caribou would be much better.

### Pitfalls in caribou taxonomy

A brief excursion into caribou taxonomy is essential at this point. The common term Woodland Caribou encompasses a collection of diverse boreal forest (taiga) and mountain-welling caribou, as, unfortunately does the taxonomic name *Rangifer tarandus* caribou Gmelin 1788, as used by Banfield (1961). The common and scientific name have been applied not only to the usually large, dark caribou with minimal display coat markings and their diagnostic short antlers, but also to sedentary populations of barren-ground caribou (*R. t. groenlandicus* Linnaeus 1767) that happen to have achieved large body size, to the colorful Newfoundland caribou (*R. t. terraenovae* Bangs 1896), to the migratory Labrador caribou (*R. t. caboti* Allen 1914), and to the big Osborn's caribou (*R. t. osborni* Allen 1902) of north-western British Columbia. Banfield (1961) lumped caribou of the same skull length into the same subspecies (see Geist, 1998: 319-326). If one confines the terms Woodland caribou or *R. t. caribou* to just the dark, southern form with its diagnostic pelage and antler form, then one realizes how few Woodland Caribou are left and how critical it is to find ways to uphold their numbers. In Eurasia three subspecies have at least some woodland characteristics, the European forest reindeer *R. t. fennicus* Lonnberg 1909, the Siberian forest reindeer *R. t. valentinae* Flerov 1933 and the far-eastern Okhotsk reindeer *R. t. phylarchus* Hollister 1912, which, judging from its nuptial coat, is a true caribou and not a reindeer (Heptner et al., 1988; Geist, 1998: 326-328).

### Modern man and reindeer: A modern creation story

Essential to conservation are positive myths that celebrate the animal. What positive myths exist in general in North America about caribou? Rudolf the Red-Nosed Reindeer and his fellow reindeer pulling Santa's sleigh at Christmas time, comes closest. However, even here there is erosion. Quite often one sees today white-tailed deer (*Odocoileus virginianus*), antlered "Bambies", replace the reindeer. White-tailed deer with their smaller, more-baby-like faces and big eyes have become, increasingly, the symbolic deer of North America and even Europe (Geist, 2001). We have considerable mythology about hors-

es, dogs, cats - even pigs! Currently, there is little mythology or public knowledge about caribou and reindeer, excepting in aboriginal and northern communities that depend on caribou for sustenance. There is little celebration of caribou or reindeer in arts and crafts, as there is of elk, deer or even mountain sheep. There are but a few songs, poems or popular books dedicated to caribou or reindeer and even such are invariably about the migratory barren ground forms (Calef, 1981; Russell, 1998). There are no annual conventions dedicated to caribou that draw thousands of urban-based lay persons for attendance as is the case for elk, mountain sheep or turkeys.

Excepting northern communities, North American society does not celebrate caribou or reindeer. However, we ought to! The reindeer may well have been the very best friend we ever had, and even more noteworthy, reindeer may have been essential to the rise and success of modern humans. Without reindeer Neanderthal might still be alive and well in Europe and modern culture may have never arisen. Buried deep in the studies of diverse scholarly disciplines are data and insights that show just how important the Eurasian version of caribou, the reindeer, once was to us in our struggle to survive and thrive. It happened during a critical formative period of modern humans, during the early Upper Paleolithic, late in the Pleistocene, when we gained the upper hand and displaced the once invincible Neanderthal man. Yet there is no evidence for warfare. Neanderthal people faded slowly into extinction over many millennia, just as we only slowly colonized all of ice age Europe. Reindeer appear to be the key-species that made our ascent possible and shaped us towards creating the modern world we live in. It's a tale based on interdigitating caribou biology with periglacial ecology and archeology.

An enlightened veterinarian once quipped that a perfectly balanced ration for a cat, was a mouse. What, one may ask, might it be for humans? Despite the popular "out of Africa hypothesis" of human origin, the answer appears to be a reindeer or caribou. Reindeer, are not merely the staple food of people living in cold circumpolar climates, but were the chief food of the European Upper Paleolithic (Bouchud, 1975; David, 1985; see Geist, 1998: 335-336). That is, the aboriginal Ice Age ancestors of Europeans were tied closely to a food economy dominated by reindeer, and that for some 30 000 years during the latter half of the last, the Würm Glaciation. Reindeer are thus not only "in the genes" of northern Europeans, Asians and North Americans, but very much "in the genes" of all those who descended from the Eurasian Cro-magnid popula-

tions of the late Pleistocene. The following is based on my book (Geist, 1978) and on an excellent summary article on Neanderthal man in *Der Spiegel* (Schult, 2000), unless otherwise cited.

The Upper Paleolithic was a crucial and remarkable period of both, human history and evolution. Here people reached a degree of luxurious physical development unequaled since. It was a period of great cultural activity as well as stability over a huge geographic area, as reflected in the nature of its vibrant art and artifacts, and in the lack of evidence for warfare (in sharp contrast to the following Mesolithic and subsequent periods). There were many unique attributes: for instance, we expect colonizing populations of large mammals exploiting virgin habitats to grow into luxury phenotypes. That is, normally, a passing phenomenon, because with population growth and the occupation of available habitat, body size soon shrinks, as resources are reduced by intra-specific competition. However, humans in the Upper Paleolithic appear to be exempt from that rule. They show superlative physical development not only when they enter Europe about 40 000 years ago, but for millennia after millennia till the close of the glacial period about 12 000 years ago. Not only are individuals tall, with rugged athletic bodies and bones free of diseases, but they also achieve brain sizes about a quarter greater than ours. Brain size in large mammals tends to shrink with domestication and poor nutrition.

The Upper Paleolithic was the first age of Art flourishing as evidenced by cave paintings, carvings, sculptures and decorations of clothing and self. It displayed in the Venus Cult a conspicuous focus on woman as expressed in carvings, personal adornments, cave sculptures and pebble art. There is nothing remotely comparable in earlier cultures or in contemporary Neanderthal artifacts. Music, as an idea, was already developed as evidenced by bone flutes and whistles, and so was apparently symbolism, as evidenced by abstract signs that accompany Upper Paleolithic cave art.

We can decipher some of that culture by applying our modern knowledge of how to grow large, athletic human bodies. Some of that is found not in anthropology, but in Animal Science, an agricultural discipline which focuses on how to manipulate the growth of live stock environmentally. Their findings reflect also on human biology. The athletic bodies, but above all the large cortex of the brain indicate a luxurious ontogenetic development, luxurious not only in food, but in conditions that had to be deliberately maintained in order that children might achieve the physical development they did. Out of necessity, the focus had to be on generating condi-

tions fostering motherhood, from before conception towards - and that's crucial - a long lactation period to support the child's growth. This must have been followed by an ontogeny made deliberately rich in physical and intellectual activity. Since lactation is here a critical factor, every effort had to be applied to keep mothers in a contented state, as stress quickly terminates milk production. The emphasis on highly developed bodies and brains can only be achieved by a conspicuous manipulation of reproduction, with a knowledgeable emphasis on individual development and welfare. Excellent physical and mental development was probably a precondition for the demanding athletic and intellectual challenges mastered routinely by our ice age ancestors. The Venus Cult appears a logical outgrowth of extreme concern about the state of female partners, in the demanding role of giving birth and nurturing children of high physical and intellectual abilities, and this insured the continuity of the tribe under very hard living conditions. Emphasis was thus on individuals as irreplaceable, precious carriers of tribal life, not on massive reproduction - as in agricultural cultures, which by necessity are linked to warfare and high mortality. In the Upper Paleolithic attention was heaped on an individual to foster its abilities, not on maximizing tribal numbers. However, with great value placed on each individual, warfare becomes unthinkable - particularly against physically superior neighbors such as Neanderthal man.

Cave art shows us some of these demands, namely, mastery with primitive weapons over large, powerful, intelligent creatures that populated the late Pleistocene megafauna. Cave art is a record of achievements, occasional bragging (Geist, 1978: 322-323; Guthrie, 1999). There is infatuation with the megafauna and dangerous hunts, but no evidence of bragging about warfare. Meanwhile, the bulk of the food came from reindeer.

Moreover, our modern Cro-magnoid ancestors did not appear within a landscape unoccupied by humans, quite the contrary. They appeared in Europe despite the presence of Neanderthal people. They slowly, ever so slowly replaced Neanderthal people as these shrank in distribution over some five to seven millennia and went finally extinct about 28 000 years ago. There is no evidence that the "take over" by Cro-magnoids was hostile, as there is no evidence for warfare, neither in the archeological record nor in the copious, expressive cave art. Overlap of Neanderthal's Mousterian and Cro-Magnon's Upper Paleolithic artifacts are exceptional. Neanderthal and Cro-Magnon remained segregated. This displacement of Neanderthal man is most remarkable, as in earlier millennia Neanderthal dominated modern

people and displaced them as well as confined them geographically. Thus at the beginning of the last, the Würm glaciation, about 80 000 years ago, Mousterian tool kits replace pre-Aurignacian tool kits in the Mediterranean basin. In short, Neanderthal replaces us and confines us in North Africa. However, at the first glacial maximum about 60 000 BP and maximum desertification in Africa, modern people skirted around Neanderthal to the south and east and break out through the Levant, the eastern Mediterranean, to colonize southern Asia and Australia. That left Neanderthal in control of Europe for as long as glacial conditions lasted. During glaciations Neanderthal appeared invincible.

However, a long interstadial erupted about 40 000 years BP, which marked the entrance of modern people into Europe - despite Neanderthal. The onset of interstadial or interglacial conditions is a very difficult time for humans. Neanderthal would have been affected. While this interstadial ebbed and flowed modern people formed a wedge between the continental ice sheath to the north, and the alpine glaciers to the south. This wedge of modern people slowly expanded west and south, and Neanderthal slowly shrank in distribution around mountain ranges, and finally suffered extinction. This left modern humans as the sole occupants of Europe with the return to full glacial conditions in the second half of the Würm Glaciation.

Neanderthal man was very different from us. When placing the idiosyncrasies of its morphology into the ecology and behavior of its preferred prey, the largest-bodied as well as the hairiest of the periglacial megafauna, then it appears the Neanderthal hunted in a unique and dangerous way. He specialized in close-quarter confrontation hunting, in which only two hunters needed to cooperate. Parasitizing its prey's proclivity to confront predators, hunter A lures the prey into an attack. Hunter B attaches himself to the prey's hair distracting it from A. While B hangs onto the bucking, whirling beast, hunter A kills the prey with hand-held weapons (Geist, 1978; 1981). This hypothesis explains not only much of the characteristic morphology of Neanderthal, but also of its weapon, its frequent bone breakages and its pattern of bone breakages, which followed that of rodeo cowboys. Neanderthal men had to be enormously strong, quick, exceedingly agile and utterly death-defiant, but also very kind, generous and caring to companions to allow recovery from bone breakages. Moreover, during the early Würm Glaciation Neanderthal man changes progressively, enhancing its anatomical characteristic. That suggests that its mode of hunting selected severely for highly compe-

tent confrontation hunters. This would indicate, for instance, that hybridization with modern people was unlikely, as it lowered crucial physical abilities in the hybrid, making it impossible for it to safely match the hunting abilities of pure Neanderthal men. Hybrids would lead short lives and be poor providers. Archeological evidence suggests that Neanderthal People dismembered large prey and probably froze or buried it in large chunks. Confrontation hunting paid off, in that it minimized the need for dangerous hunting, by producing large masses of meat from large prey at set periods. Neanderthal probably lived from kill to kill. However, that must have limited Neanderthal man to the best existing wintering areas of the megafauna where prey densities were sufficient to insure living from kill to kill. Neanderthal people apparently lived at much lower density than did Cro-Magnon people, as well as in smaller social groups.

How can one account for this gradual displacement of Neanderthal by Cro-Magnon people, as well as for the superlative physical development of Cro-magnoids, despite competition by Neanderthal people for the wildlife resources of Europe? One can make a case that the reindeer played a key role in the explanation. Without reindeer, Neanderthal would probably be still around and there would probably have been no remarkable Upper Paleolithic, and probably no modern world.

Reindeer are central to explaining how modern man displaced Neanderthal man without the need for overt warfare. Reindeer and caribou are favored by interglacial conditions when tundra and alpine plant communities expand at the expense of periglacial loess-steppe, which shrinks in response to glacial withdrawal. As the loess-steppe shrinks, so does its associated megafauna of large grazers, such as mammoth (*Mammuthus primigenius*), rhino (*Coelodonta antiquitatis*), bison (*Bison priscus*), horses (*Equus przewalskii*) and giant deer (*Megaloceros giganteus*). That is, the primary food of Neanderthal man, the mega-herbivores of the periglacial loess steppes, shrinks in abundance and geographic distribution. However, reindeer become more abundant.

Cro-Magnon had developed a new way to harvest reindeer. These were taken in interception hunts, killed in excess, and the excess converted into stored foods. The ability to intercept reindeer depended on linking reindeer migrations to chronologic time. Such is apparently expressed in lunar calendars, as were carried about in the form of the "baton de commandement" from reindeer antlers (Marshack, 1972). The discovery and use of chronologic time was an enormous innovation, which was probably derived from two sources: (1) an ancient origin of

modern-type people in the deserts of North Africa, and therefore exposure and challenges of clear night skies, inviting observation. Modern people arise from archaic populations during the enormous Penultimate or Riss glaciations beginning about 225 000 years ago, a glaciation that during its maxima must have turned most of Africa into a desert. (2) Interstadials bring some deglaciation and thus the rise of ocean shore-lines above the continental shelves, creating large expanses of shallow, productive seas. This would lead to coastal boat technology and a general need for navigation. Given the ability to keep calendar-time chronologically, one can apply such to predicting reindeer migrations, as such move by chronologic time. Given the ability to predict reindeer migrations, one can plan ahead, kill in excess of current need and conserve the rest for future use.

This requires the ability to conserve meat and fat. Many Upper Paleolithic sites appear to be meat-processing sites. These are characterized by large accumulations of small, thin blades, such as would be required carving meat thinly in order to dry and smoke it. Cro-magnoids, as already noted, appear to have their origins in deserts. They were, therefore, students of the movements of heavenly bodies, as well as the conservation of food through desiccation, long before they settled in the rich, periglacial regions of glacial Europe. These technical innovations probably led to their domination of Neanderthal despite the latter's superior strength, agility and speed.

Being able to kill an excess of reindeer, and thereby securing adequate food for the long term, Cro-magnoids were free to indulge in recreation and fancies. One of these was to hunt truly dangerous game. In short, while they ate reindeer, they dreamt of challenging woolly mammoth, woolly rhino, bison, bears (*Ursus arctos*), lions (*Panthera leo*), giant stags etc. Migratory tundra reindeer were clearly identified as such by the archeological record, and by reindeer images in cave art. Other smaller-bodied hoofed mammals were also taken, ibex (*Capra ibex*) and chamois (*Rupicapra rubicapra*) in colder climatic periods, red deer (*Cervus elaphus*), aurochs (*Bos primigenius*) and horses in warmer periods. However, cave art suggests that hunters were dreaming of much more dangerous, demanding game. With their food secured they were free to hunt the remnants of the periglacial megafauna - that Neanderthal probably depended on.

With the coming of Cro-Magnon people to Europe about 40 000 years ago, woolly mammoth and the giant deer decreased in abundance and eventually went extinct (Lister, 1994; 1995). Both had co-exist-

ed with Neanderthal man for tens of thousands of years as one of its prey species. If Cro-Magnon as well as Neanderthal man made inroads into the populations of the slow-to-reproduce megafauna, at a period when this fauna was declining due to a warming climate, then it would push Neanderthal increasingly towards the mountain fronts where the alpine glaciers there. Right up against the glacial fronts were the winter ranges of the megafauna as illustrated today by the periglacial ecology of caribou in Greenland (Meldgaard, 1986). Cold temperatures at the glacial front insure powdery snow throughout winter, snow soft enough to be scraped from forage. During warm cycles much of the winter forage, except at the glacial fronts, may be iced over by sudden melts and becomes unavailable to wintering mega-herbivores. We expect their populations to decline. It is thus likely that while reindeer were the staple food of the Upper Paleolithic, it allowed modern hunters to focus on more glamorous, but declining species (giant deer, mammoth, woolly rhino, steppe bison, horses) and deplete them further, essentially robbing Neanderthal people of their food supply.

The above is currently a mere hypothesis, but a hopeful one. New findings might disprove or support it. In the meantime it may serve as an example of how a wildlife species may gain relevance for a broader public. Without reindeer, human history in Eurasia would have been very different. Neanderthal people might have survived and we might not be here.

## Where do we go?

Our history shows two principle approaches to wildlife conservation, a monopolistic one and a populist one. In the former a small group within society holds exclusive rights to some of the wildlife resource from which it draws benefits and which it in turn protects and fosters. The populist model, however, makes all citizens de facto owner of the resource, and these delegate management authority through their political leadership. The monopolistic model was most common in the history of wildlife in Europe, and entailed the exclusive right to wildlife by an elite. This model informs us that exclusive monopolies over wildlife lead to severe repercussions by the excluded, and to a public dislike of wildlife, which in Europe has never been eliminated. The monopolistic model, but in limited form, has also a history in North America, such as the Hudson's Bay monopoly on beavers, or the division of a landscape into exclusive trapping or guiding territories, as practiced in British Columbia (Ball, 1985). The best

example of the populist model is the modern system of wildlife conservation in North America (Geist, 1995; Geist et al., 2001). It is an exceedingly successful model which in less than a century returned wildlife to North America from the edge of extinction. It is similar to the native model of moose (*Alces alces*) management among Labrador Cree. It is this model which has pregnant lessons for all management of natural resources, woodland caribou included.

What can one learn from history? One learns that caribou conservation thrives by a broad, but organized public support. Currently, caribou do not enjoy the support or attention that elk, deer, wild sheep, turkeys and grouse have over much of this continent. Only migratory caribou and reindeer in the north enjoy great local support, but this does not extend to the declining remnants of the woodland forms, here and in Eurasia. It is admirable to have meetings such as we have here with a strong mix of native stakeholders, managers and scientists. However, it is imperative to reach beyond and make caribou relevant continentally and vivid stories why caribou and reindeer are important to us are relevant in this context. There is need for a broadly based Caribou Foundation that can act effectively in the political arena - irrespective of endangered species legislation. In particular we need a foundation for the endangered woodland caribou and reindeer. The larger question being is how to make this happen.

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