A POLICY ORIENTED ANALYSIS OF THE GAME FARMING AND GAME RANCHING POTENTIAL OF THE YUKON

VOLUME II
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

PREPARED FOR

GOVERNMENT OF YUKON
DEPARTMENT OF
RENEWABLE RESOURCES

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BY

HOWARD PAISH & ASSOCIATES LTD.
NATURAL RESOURCE
PLANNING AND ANALYSIS

WHITEHORSE, YUKON

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FOREWORD

The commercial farming or ranching of game animal species that have traditionally been managed, allocated and used as wild animals, is relatively new to Canada. Game farms for the production and display of wild animals have been with us for some time and Yukon has its own Yukon Game Farm. But the farming of game for the commercial production of meat and by-products is new, although there has been a long history of commercial wildlife use in the Territory. Trapping and the outfitting of big game hunters are both important seasonal economic activities, and the commercial harvest and sale of wild game meat was legal in Yukon until 1947.

Applications for asistance under the Canada/Yukon Economic Development Renewable Resources Subagreement have demonstrated an interest in game farming and game ranching by several Yukoners.

Given the extremely limited experience with game farming and game ranching, in Yukon and elsewhere in Canada, and recognizing the need for policy for this emerging area of resource use that is quite new to Canada, the Yukon Government initiated this policy-oriented analysis of game farming and game ranching for the Yukon in August of 1986.

The work has been carried out under contract by Howard Paish and Associates Ltd. for the Policy and Planning Branch of the Department of Renewable Resources. A Steering Committee made up of representatives from the Policy and Planning, Wildlife, and Agriculture Branches of the Department of Renewable Resources, the Small Business Branch of the Department of Mines and Economic Development, and the Council for Yukon Indians has maintained liaison between the consultants and the client, reviewing the interim reports as the work proceeded and offering suggestions and comments on that work.

The objectives of the study as set out in the terms of reference were:

> "The objectives of this study will be to examine all issues surrounding the development of a wildlife ranching industry in Yukon and to assess the feasibility of game farming through analyzing and making recommendations respecting:
>
> (a) a comprehensive game ranching policy for Yukon covering intensive game farming and extensive ranching activities;
> (b) the legislative framework required to implement the policy;
> (c) the infrastructure and related costs necessary to sustain a game ranching industry in Yukon;
> (d) the biological land habitat issues to be addressed;

(e) farm management;
(f) the marketing of game ranching production."

The species considered in the study were the large hoofed animals (ungulates), including elk, reindeer, muskox, caribou, buffalo, deer, and moose. The study did not address fur farming.

The work has been divided into three distinct phases. Phase 1 was a background/overview to examine the historical, geographic and current status of game ranching as it might apply to the Yukon, the types of species and products expected, biological concerns, management issues, and market definition.

It identified the species and types of farm operation to be considered in the subsequent phases. Phase 2 required a Yukon-specific perspective for the more general information assembled in Phase 1, a more detailed analysis of the biological requirements for the species selected, and a more refined analysis of management issues such as land requirements, legislation and regulations, land use and resource conflicts, native involvement, and farm management practices. Phase 2 also required an economic feasibility assessment based on the development of a self-sustaining game ranching/farming industry for the territory, economic analysis of the types of operations considered for further study, and consideration of marketing strategies, infrastructures, and potential benefits such as employment, import replacement, export replacement, research, education and training and other spin-off benefits. Phase 3 of the study required the preparation of comprehensive conclusions and recommendations for the direction that game farming and game ranching could take in Yukon, and the preparation of a summary of the Phase 1 and Phase 2 technical reports.

This document provides a summary of the technical work carried out during Phases 1 and 2 of the study assignment and the conclusions and recommendations. The full technical details and bibliography are provided in Volume 1 Technical Report.

Before starting the work, the contractors requested that they not become involved in programs already underway to establish reindeer and elk farming operations in Yukon, until, at least, the final stages of the work. Both proposals predated the commissioning of the study. It would have been difficult to carry out the type of objective analysis that our terms of reference called for it we were to be associated at the time with committments that had already been made. The consultants are particularly grateful to the client and the members of the study committee for ensuring that degree of detachment.

The proponents of game farming and game ranching see the issue as an avenue for agricultural diversification and the

creation of a new product-line. They point to the successes of deer farming in other parts of the work, particularly New Zealand, and have concentrated most of their efforts on the agricultural technology needed to commercially produce animal tissue from animals that have not traditionally been a part of agriculture in Canada.

The opponents of game farming and ranching, primarily provincial hunters' organizations and other wildlife interest groups, are concerned that making the sale of game meat and other game products legal, will provide an incentive for poaching wild game stocks. In addition, they are concerned about the potential spread of disease from domestic game animals to wild herds, the danger of interbreeding between domesticated game and wild animals, the increasing potential for the privatization of what is traditionally considered a completely public resource, and fears for the increasing alienation of the lands that are important to wildlife.

The resulting argument is beginning to rival leg-hold traps and predation control as a current wildlife issue.

Our conclusions and recommendations support the concept of game ranching and game farming for the Yukon. We have recommended that game farming and game ranching be recognized as legitimate agricultural activities, and receive the same kind of support that would be provided to other agricultural endeavours. The study points out that while total economic self-sufficiency might be difficult, particular attention should be paid to the part-time farmer who realistically makes up the bulk of the agricultural community in Yukon. The study suggests that the best way that the Yukon Government can support game farming and game ranching is through the provision of the overall governmental infrastructure such as research and development, advice to farmers, the provision of meat inspection services, and assistance in the provision of large animal veterinary services that would serve not only the game farmers but the agricultural community as a whole. This type of support is recommended over individual subsidies.

The study suggests that Yukon should closely monitor developments elsewhere in Canada on this newly emerging area of agricultural interest, and take advantage of the research and development on all aspects of game farming and game ranching that will inevitably be carried on. There appears to be no particular advantage that Yukon would enjoy from getting into game ranching early, and the study recommends that a prudent, cautious approach would best serve the resource realities of the Territory.

Native and wildlife interest groups express the same concerns about game ranching and game farming that have been expressed elsewhere in Canada, and these have already been set out briefly in this introduction. The agricultural community supports the

concept of game animals becoming another agricultural product-line in Yukon, and recognizes that the type of infrastructure required - inspection, veterinary services, etc. - will be required for any form of livestock production in the Territory.

In conclusion, the authors of this report appreciate the help and interest that has been provided by many people, both in Yukon and elsewhere in Canada. Their advice has been heeded, and their concerns have hopefully been expressed in our work. Nonetheless, the assignment has been an independent assessment. The views expressed in it are those of the contractor, and do not necessarily reflect the views of the steering committee. The work simply reflects the conclusions of the consulting team and their recommendations to the Government of the Yukon.

The consulting team is confident that the results of our work will enable Yukoners and their government to consider game farming and game ranching in a more reasoned manner than the emotion-charged controversy that seems to be surrounding the discussion of game farming and game ranching in the western provinces, and to decide on the future of this newly emerging resource activity within the context of Yukon's resource realities.

SUMMARY

The first two phases of the Policy Oriented Analysis of the Game Farming and Game Ranching Potential of the Yukon provided a technical background/overview and a feasibility analysis. This summary consolidates the results of those two phases. The results of Phase 3 are set out in the Conclusions and Recommendations section which follows.

THE ISSUE

The broad generic issue being addressed is the commercial use of animal tissues that have traditionally been unavailable for commerce in Canada, and a radical shift in the way in which some game species are managed, allocated and used.

There is nothing new about commercial use of wildlife in Canada. Fur trapping was the country's founding industry, and there has never been a serious argument about the principle of the commercial use of fish and the commercial raising of game birds. Traditionally, however, large game animals have been allotted to hunters, and the main objections to game farming/ranching are coming from the hunting fraternity, although the commercial use of game animals for sport hunting through guiding, is considered acceptable by them.

DEFINITIONS

The terms game farming and game ranching have been used virtually interchangeably in recent public discussion of the issue. The following definitions have been used for this assignment.

Game farming is an operation whereby conventional enclosure-type agriculture methods are practised on a group of new species. In a Yukon context, elk and buffalo would be a substitute for cattle. Supplemental feeding would be required.

Lands considered during this analysis are those already allocated for agricultural use in the Whitehorse area.

Game ranching involves the extensive use of range lands for the production of animal tissue from native forage. A total enclosure would still be required. Lands that could presumably become available as a result of a land claim settlement could serve as a base for game ranching if the owners of those lands were interested.

Wild Harvest is defined as a harvest of animals that are genuinely surplus to conservation, subsistence and recreational uses from a natural population.

In addition to these definitions, three further sequential "policy oriented definitions" have been used.

Technical Issues: This involves all of the technical, scientific, land, legal, regulatory, farm management, and economic and marketing requirements for the commercial production of game animal tissue.

Economic and Marketing Issues: Given that it is technically possible to carry out some form of game ranching/farming, is it worthwhile doing it from an economic standpoint?

Social Issues: Given that it would be technically possible and economically feasible to undertake game farming and ranching, does that still mean that such a venture would be desirable? Does the reverse hold?

Social concern seems to be the principal stumbling block to game ranching/farming elsewhere in Canada. The proponents of game ranching see the issue as one of simply domesticating "new" species and concentrate on the technology and the economics. The critics home in on some technical arguments, but the fundamental concern is the proposed shift away from the traditional way in which game has been allocated, managed and used,and the fear of encouraging an illegal market in game products.

A HISTORIC AND GEOGRAPHIC PERSPECTIVE

Game farming and game ranching implies an agricultural focus. Throughout the world and throughout history, the importance of game as a product of the land has been acknowledged. In many parts of the world, game is considered private property and is managed as such. In North America, game is a common property resource with a common right to use. In terms of consumptive use, it is managed almost exclusively for hunters. North American Indians saw game as a product of the land, and although there was a broad common ownership of all of the land and its resources, harvesting rights were allocated to families and individuals; at times on a virtual private property basis. The concept of common-property equalling common right-to-use was introduced by European settlers.

In Europe virtually all game is considered a private economic asset, but within a game and hunting management perspective, not an agricultural perspective. A thousand years of tradition has grown up around game management and the focus has been the sporting (hunting) use of game animals. Game meat and other game by-products readily find their way into the marketplace, so game is not restricted to use only by hunters as is virtually the case in Canada.

In North America early settlers sought alternatives to the European tradition, based on privilege, that they had left behind. That search led to the common property concept of resource ownership, and management allocation and use systems that have evolved in North America.

It became apparent in the latter part of the nineteenth century that wildlife was suffering through the rapid settlement of the continent. Market hunting often gets the blame although it was largely the agent of other needs to remove wildlife. A century of successful Prairie cereal farming could hardly have co-existed with several million buffalo! Wildlife populations dropped to low levels, some species were eliminated and from the 1880's on, every North American jurisdiction started some form of game management. International treaties were implemented and National Parks Systems were established in the U.S. and Canada.

In the United States today, buffalo ranching has developed in a number of states for both meat production and sport hunting. Disease problems that preclude live animal exports have inhibited elk ranching. In some states however private land holdings are used for elk production and a number of Indian reserves have entered into something similar to game ranching, as we have defined it. Large private game-ranch holdings mainly for introduced species exist in Texas, but the emphasis is on sport hunting.

A domestic reindeer herd exists in Alaska but its use seems to be confined largely to local consumption.

In Canada the upsurge in interest in game farming/ranching has been partly brought about through a need to diversify the agricultural product base as a result of Canada's changing position in world cereal markets, resulting from a general worldwide over-production of cereals.

An important factor in the current interest is the apparent success of game farming in New Zealand and a healthy market for the sale of live elk to that country.

In Canada, buffalo have been ranched for some time in the Western Provinces, and apart from Wood Buffalo in the Yukon, North West Territories, Alberta and Manitoba, they are considered domestic animals.

The whole issue of game ranching/farming is reaching a high profile in Western Canada. Manitoba has recently outlawed elk farming, and new policies are currently being developed in Alberta, Saskatchewan and British Columbia.

In the North West Territories wild muskox and caribou are harvested for meat sales and the domesticated reindeer herd at Tuktoyaktuk is successfully marketing reindeer meat in Canada, including Yukon, and overseas. The loss of European sources of reindeer as a result of the Chernobyl disaster has put a premium on Canadian reindeer meat.

Game farming/ranching and a wild harvest for commercial animal tissue production is practised in many other parts of the world, in addition to the marketing-oriented management style in Europe that provides animal tissue for the marketplace.

The most spectacular current success is in New Zealand which will almost certainly be the major force in the world venison market by the 1990s. Deer were introduced into New Zealand in the late nineteenth century for sporting and aesthetic purposes. They quickly became a pest, destroying natural vegetation, and were treated as such until the European venison market was tapped in the 1950's. That led to a considerable herd decline, and a shift was made to commercial venison farming to meet market demands.

In Yukon there has been no commercial farm operation aimed at providing animal tissue, however the Yukon Game Farm has operated with considerable success for a number of years in providing animals for the live animal market and in looking after research animals.

Market hunting continued in Yukon until 1947, and that market hunting made a substantial contribution to food supply during the

Gold Rush and in the intervening years. Yukon was the last North American jurisdiction to end market hunting.

THE SPECIES CONSIDERED FOR GAME FARMING/RANCHING

Seven species were considered for game farming/ranching in Yukon.

Elk were introduced into Yukon in the 1950's from Elk Island National Park. A herd of 49 animals released in the Braeburn area south of Carmacks has expanded very slowly, but the animals have shown that they can survive under Yukon conditions and individual animals from that herd are healthy. Elk have also been raised successfully at the Yukon Game Farm.

This study has concluded that elk would be a suitable animal for both game farming and game ranching in Yukon.

Plains Buffalo were introduced to Yukon in the 1950's, but did not establish as a herd. Wood Buffalo were introduced in 1985 to the Nisling Valley area west of Carmacks as part of an effort to re-establish the Wood Buffalo to its natural habitat. Buffalo have demonstrated that they can survive well in Yukon conditions, and are considered suitable for both game farming and game ranching. However, there is a serious bottleneck in supply, since Yukon has established that Wood Buffalo only will be introduced to the territory.

Caribou are the most numerous large mammal in Yukon but their wide ranging nature renders them unsuitable for enclosure agriculture, particularly when a semi-domesticated version exists in the reindeer.

Moose are the focus of resident and subsistence hunting interest in Yukon. While they could contribute to a species mix in a ranching situation, their proneness to density-related disease makes them unsuitable as an animal for game farming or anything other than very low density ranching.

Mule Deer exist in the wild in Yukon and have been successfully raised at the Yukon Game Farm. Neither Mule Deer nor White-Tailed Deer are being farmed beyond the curiosity stage. There are concerns over White-Tail carrying a disease fatal to moose, however the smaller carcass size is attracting some interest in Mule Deer. Compared with elk or buffalo, however, deer are not considered a good choice for game farming or game ranching in Yukon.

Muskox have been the subject of agricultural experimentation in Alaska but the research is inconclusive. They can be a

difficult animal to domesticate and their status as a farmable animal is uncertain. Until more conclusive information is available on their suitability, they are not given a high priority for Yukon.

Reindeer are a domesticated sub-species of Barrenground Caribou originating in Northern Europe, and have been successfully herded in Alaska and on the Tuktoyaktuk Peninsula in the North West Territories. Their natural habitat is the Northern Tundra where they are heavily dependent on a natural lichen diet.

While reindeer have been raised successfully in captivity for experimental herds, it has only been possible to document one serious attempt at a commercial herd.

Both research and commercial herd operators indicate that these animals have severe difficulty in adjusting from their natural tundra diet, to the kind of diet available to them in captivity.

Because of the presence of wild caribou in southern Yukon, reindeer would have to be enclosed in a farm situation and we have recommended that reindeer husbandry in Yukon should be considered as purely experimental at this time.

The matrix charts at the back of this report provide more detail on each of these species.

Our Phase 1 report recommended that more detailed consideration should be given to elk, buffalo, reindeer and muskox for game farming and to the elk-buffalo-moose combination for game ranching in the Phase 2 analysis.

GENERAL SPECIES REQUIREMENTS

Habitat

Little, reliable site-specific information is available on habitats in Yukon, and such information would have to be generated for any proposed game ranching projects.

For game farming, sufficient tree cover and living space are the main requirements, since artificial feeding would make up for natural forage deficiencies.

For game ranching, the appropriate forage mix for elk, buffalo and moose is available in Yukon. The area selected and the size of the enclosure would determine stocking densities.

For any wild harvest there is a general consensus that

habitat for moose and caribou is not a major limiting factor in Yukon.

Space Requirements

For game farming, artificial support through feeding, protection from predators and shelter reduces the space requirements that the same species would need in the wild. A quarter-section of land (160 acres) in Yukon could support a herd of 30-40 elk or buffalo with supplemental feeding.

The quality of the range would determine the size of a game ranch, but an area in the order of ten square miles would be considered a minimum for Yukon.

Migrating species with extensive space requirements such as caribou are automatically excluded for any type of enclosure husbandry.

Interaction Between Wild and Enclosed Animals

Diseases are dealt with below, however there are also problems of other interactions between enclosed and wild animals, particularly during the rut. There are concerns that undesirable genetic traits from introduced stock could be transmitted to wild animals. A good example is the possibility of reindeer interacting with wild caribou. This is a two-way street because the game farmer does not want valuable captive animals to escape or be bred by what might be inferior wild stock.

The solution is straightforward - the highest standards for fencing and fence maintenance, and enforcement of those standards.

Disease

Buffalo and elk are susceptible to many of same diseases as domestic animals and are governed by federal inspection requirements for interprovincial/territorial movement. There is some concern over the enforceability of interprovincial animal movement regulations, and moves are under way to strengthen these regulations, and their enforcement, through a co-operative policy being developed by Western Canadian Wildlife agencies. This policy would require the strict inspection of all animals crossing interprovincial or territorial boundaries, the permanent identification of all animals in captivity and a central interprovincial registry of all such animals. In addition to

disease control, these last two measures would have a much broader regulatory and enforcement value.

For the actual farm or ranch operations, disease control is a normal part of overall husbandry, and large-animal veterinary services are considered essential.

Predator Control

Given that the production of animal tissue for commercial purposes is considered a bona-fide agricultural activity, then the usual arguments about predator control as a part of a wild animal population, may no longer apply. If captive wildlife is to be considered as property it would receive whatever protection is considered appropriate for any livestock operation and this is a political decision not a technical one. However good fencing can prevent most predation.

If predator control is a necessary element for successful game ranching/farming or any other form of livestock husbandry in Yukon, and if such control is considered to be socially unacceptable, then that should be taken into account before a decision is made to go ahead with game farming or ranching.

THE PRODUCTS FROM GAME FARMING/RANCHING

With the exception of sport hunting, products from both game ranching and game farming would be the same and they are summarized accordingly.

Meat production in North America is highly competitive, and game meat would be a specialty product that should command a premium price above that paid for conventional domestic meats.

A major obstacle to the sale of such meat is inspection requirements, and in Yukon, meat sold in restaurants in Whitehorse must be inspected - in practice this really applies throughout the territory as the major meat outlets only sell inspected meat.

The cost of providing facilities to meet federal inspection standards appear prohibitive, however, procedures have been changed somewhat so that the slaughter of reindeer and muskox and caribou in the North West Territories, and a proposed harvest of wild caribou in Quebec can still meet federal health inspection standards.

Successful mobile abattoir systems using travelling meat inspectors have proven successful in New Zealand and Scandinavia

and such systems could be developed for Yukon. The major problem, however, would still be that the small number of animals to be slaughtered at one time would make slaughter and inspection costs prohibitively high.

Private "farm-gate" sales do not require inspection, however this would preclude the premium price sales to restaurants.

Antler Velvet: The developing antlers from elk are removed surgically before they have hardened, and are dried to produce a pharmaceutical product that is used extensively in oriental medicine. The market for antler velvet is highly volatile, and while it provides income when the price is high, it cannot be relied on as a basis for a stable industry. Reindeer produce a lower quality velvet than elk.

Carcass By-Products: The hides, horns and hooves from slaughtered animals can be used in the local curio/tourist market. Given a sufficient volume, other by-products, blood, and offal etc., could be processed for fur farms or for dog food. However the major bottleneck to any by-products industry, and indeed to the industry as a whole, would be the small number of animals available initially.

Sport Hunting: Given a large enough enclosure, surplus mature animals could be sold through trophy hunts. However this approach is not acceptable to most Canadian hunters, although hunting on game-ranches is proving to be successful and profitable in the United States.

In economic terms, however, a high value for the trophy is an advantage that game animals have over domestic animals. A mature bull elk or a buffalo that could provide a rather poor quality carcass worth $500, could be worth $5,000 or more as a trophy. However this will be a serious concern for hunting and probably for non-hunting groups.

Live Animals: The high prices for live animals for breeding stock has attracted considerable attention in Canada as a result of the demand for Canadian Elk in New Zealand. The general consensus is that this is a short-term market as breeding herds reach capacity, and eventually animal prices will stabilize to reflect the earnings which can be realized through the sale of meat.

MANAGEMENT ISSUES

A Change in Tradition

Game ranching/farming marks a significant departure from the manner in which North Americans, Canadians, and Yukoners have traditionally perceived wildlife allocation, management and use. It suggests an alternative use for game, based on economic efficiencies, rather than on the common property ownership, common right-to-use philosophy that currently prevails. In practice, although the resource is common property, the actual allocation of game for consumptive use is to a much smaller segment of the total population - recreational and subsistence users.

Although there are some straightforward technical and economic dimensions to this whole allocation and use question, any changes will require a political decision on allocation and use and the sensitive secondary issues that go with it, such as land alienation and predator control.

Public Attitudes In Yukon

Concern has been expressed by the Council for Yukon Indians and the Fish and Game Association about the extent of land alienation that would be required; a concern common to any form of agriculture.

The Fish and Game Association is also concerned about the spread of disease from captive to wild animals, the problem of genetic dilution, and the potential for illegal sales of game products.

The Council for Yukon Indians is on record as wishing to be fully consulted on any proposals for game ranching or farming.

The agricultural community in Yukon is positive about game ranching, particularly since much of the infrastructure needed for game products - meat inspection, veterinary services etc. - would also be needed for traditional livestock production.

Legislation and Regulation

Game in Yukon is currently protected by the Wildlife Act and associated regulations, and is geared mainly to regulate hunting and trapping, with conservation as its underlying theme.

Game farming and game ranching cut across the philosophy underlying the Wildlife Act. Major regulatory concerns include:

- the ownership of animals;
- enforcible legislation to ensure proper containment;
- adequate inspection for disease;
- recording, packaging, and inspection requirements to prevent the entry of illegal wild products into the marketplace.

There are provisions for exemptions to the Wildlife Act through various licences and permits which could, in a piecemeal manner, facilitate commercial game farming/ranching. During an experimental phase this would probably suffice. A long term approach would involve amending the existing Wildlife Act, thus paving the way for more comprehensive regulation or even an independent statute to run parallel to the Wildlife Act.

Another major regulatory issue is meat inspection. At present municipal regulations require that all meat sold in Whitehorse meets federal inspection requirements. The same is not true for the rest of the territory, but that is not really a practical concern because existing meat outlets only handle inspected meat.

The Territorial agriculture branch is at present developing meat inspection standards, and game meat would fall within the provisions of those standards. Inspection procedures have been changed in North West Territories for the slaughter of reindeer and for the wild harvest of muskox and caribou, and portable abattoir systems are operating in other parts of the world. Comparable procedures, inspection requirements and appropriate regulatory mechanisms could be developed for the relatively small volume of products that would require inspection in Yukon.

Land Requirements

The land requirement for game farming is straightforward. On a relatively small acreage, game farming is consistent with the current approach to land disposition for agriculture. Game farming simply uses species not traditionally considered domestic.

For game ranching, Indian lands allocated through land claim settlements could be considered if the owners so wished.

Procedures for obtaining large land parcels do exist. Although they are complicated they could apply to game ranching just as they do for any other purpose. Since game ranching involves no significant change to the actual land, beyond fencing, long-term leases rather than outright alienation, would be more appropriate than granting title.

There is no reason why other resource interests such as forestry, small game, fur bearers, fisheries, or even recreational use, consistent with large animal husbandry, should be affected.

FARM MANAGEMENT

At the practical Farm operations level, game farming/ranching will be no different from any other form of agriculture and attract both full time and part time farmers with the emphasis on the latter group.

Game farming/ranching is not labour intensive, but the operators must have a good "feel" for livestock.

The seasonal cycle for animal handling, disease control, control for breeding, calving and slaughtering follow the traditional farm cycle.

Specialized handling facilities and corrals are required for elk, in particular, and handling is easier when animals are confined in a semi-darkened area.

There are problems with the isolation of Yukon with respect to the exchange of ideas among a small number of operators, and the availability of veterinary services.

While elk and buffalo would likely do well on locally produced feed, it will be necessary to import specialized feeds for reindeer.

ECONOMIC CONSIDERATIONS

Assuming a start-from-scratch approach, and bearing in mind the Yukon Government's goal of supporting the developing of "a self-sustaining agriculture industry in Yukon .... and not invest in operational activities that are non competitive and that will need government subsidies," the economics for game farming and game ranching do not appear attractive. However the typical Yukon part-time farmer would likely be far less affected by high start-up costs. He provides his own subsidies, operates on a small scale, and could probably run an economically viable operation.

For a fully self-sufficient game farming operation, a high level of initial investment is required in the order of $400,000 to $450,000 and annual costs in the $17,000 to $20,000 range can be expected, excluding labour costs. There would be no income for the first two years and perhaps $20,000 annually after five years of operations. Very simply, there would be virtually no return on

capital investment and at best a very modest labour return to the operator for about a ten-year period. Projections beyond that point are uncertain.

Naturally these projections would be scaled down substantially by the more typical part-time farmer who is prepared to follow lifestyle and rural residential objectives rather than strict economic efficiency. Game farm products could still reach the marketplace from a number of smaller part-time operations that are subsidized in part by the operator's off-farm income.

The same constraints apply to game ranching, however high fencing costs would make a self-sustaining, economically viable unit unattractive in anything but the very long range scenario (20 years) with a very modest return on investment but fair wages for labour.

A wild harvest of the Porcupine caribou herd in the Old Crow area would show a good return on a relatively low level of investment and could result in a quick pay-back on that capital and substantial annual returns to the participants. There are, however, strong legal, traditional, cultural, political and other social obstacles to such a venture.

RECOMMENDATIONS

Recommendations were made at the end of the Phase 1 Overview primarily to focus the work for the Phase 2 Feasibility Analysis. The Phase 2 recommendations summarized the work from both phases.

The detailed conclusions are set out in the next section of this report, Conclusions and Recommendations.

CONCLUSIONS AND RECOMMENDATIONS

Our terms of reference called for recommendations respecting "a comprehensive game ranching policy for Yukon." The balance of the study objectives, for which recommendations are required, are essentially the details that contribute to the development and implementation of that policy: legislation, infrastructure, biological, land and habitat concerns, farm management and marketing.

The title used throughout this work has been "A Policy Oriented Analysis of the Game Farming and Game Ranching Potential of the Yukon". The focus is clearly policy. No matter how much technical detail has been assembled and analyzed in the first two phases of the report, that detail by itself is not policy. It can only provide the background for recommendations to the Yukon Government on the direction it could take with respect to game farming and game ranching.

The consultants are not naive enough to assume that the technical work of the type carried out in this assignment should be the only basis for setting policy. Throughout the work we have placed a heavy emphasis on the social, cultural, lifestyle, ethical, and moral concerns that are every bit as important as the technical and economic "nuts and bolts".

A clear sequence for policy development has been established. First, deal with the technical considerations - is it technically possible to carry out game farming or game ranching in Yukon? Second, if ventures are technically possible - do they meet the test of economic viability?

Finally, even if an operation appears to be technically possible and economically viable - is it still worth carrying out from an overall socio-political perspective?

A comment on that sequence has already been given. Both the Yukon Government Steering Committee and the consultants realized that while the wild-harvest concept seemed technically possible and economically viable, it didn't meet social and political criteria.

In the conclusions and recommendations perspectives are provided, based on the technical and economic considerations, and our judgements on the broader, social factors.

The order in which the conclusions and recommendations are set out does not necessarily reflect the order of priority, although the more general conclusions are dealt with first. The recommendations immediately follow the appropriate discussion and conclusion.

Agricultural Policy

The December 1985 Discussion Paper "The Future of the Yukon's Renewable Resources" (the Green Paper) has this to say of agriculture:

> "The primary goal of the agriculture unit of Renewable Resources is to support the development of a self-sustaining agricultural industry in the Yukon."

It goes on to say:

> "The Yukon Government is committed to preparing an agricultural policy. This policy will determine, to a large extent, how land is released for farming. The policy will emphasize that agricultural activities in Yukon must be self-sufficient and must be based on market demands. In other words we should grow and produce what we can competitively sell to local consumers, and not invest in operations or activities that are non-competitive and that will need government subsidies."

Given that as a statement of intended policy, it would appear that full-time game farming and game ranching do not meet the requirements that agricultural activities be self-sufficient and not be in need of government subsidies. While game farming and game ranching, as defined in this assignment, are technically feasible, such ventures would show no return on capital investment and only a modest return to the operator for at least a ten year period. Projections beyond that point are uncertain.

However, the majority of Yukon farmers are part-time operators and if farming or ranching operations do not have to be self-sustaining and if different objectives were considered, then economic prospects would seem more attractive. High start-up costs incorporating land preparation, acquisition of stock, and fencing and facility preparation make the projects uneconomic; assuming a start-from-scratch operation, and would provide limited return on investment or labour to the start-from-scratch operator.

Assuming that the farmer already owns the land and does not require a return on labour because he is a part-time or hobby farmer, then costs are removed. An individual can justify being a part-time operator because he sees farming as part of a rural-residential lifestyle, so a lifestyle objective is added.

Another high cost would be acquisition of stock from commercial sources. The proposed research and development experimental program for elk introduction would make animals available from a government to government transfer, and they would be available at cost to new game farmers. Part of the justification for this is a release to the wild and the concept is

a form of subsidy, although the Green Paper indicates that government should not invest in operations that will need government subsidies.

Research and development for an industry as a whole, along with the provision of stock at cost, is in our judgement, a worthwhile long range approach to subsidization, rather than the traditional year to year approach to individual subsidies that has plagued agriculture elsewhere and which will be referred to elsewhere in this discussion and conclusions section. A research and development objective has been added to the lifestyle objective.

If part of the research and development effort is to provide animals for release to the wild, then a conservation objective is also added.

Animal tissue is simply one product line within an overall agricultural perspective. This study has shown that there is likely to be a specialized market niche for game meat and perhaps by-products to complement the tourist industry. There could be a market for live animals although this is uncertain, and there is a relatively unstable export market for elk antler velvet.

If these products can be brought to market by part-time farmers aided by research and development and low-cost stock, then this might be more preferable than an agricultural policy based on strict full time self-sufficiency, that depends on the provision of a full time income and where that fails, falls back on subsidies.

The product still enters the Yukon economy, and some employment will be created by the operations without the need for startup subsidies and continuing subsidies, hidden or otherwise.

Although it is not strictly within our terms of reference, we suggest that the points made here would hold true for most agriculture in Yukon. Game was considered as a product-line because it was thought there might be some special advantage that game animals would have in a Yukon setting as an overall component of Yukon agriculture. The evidence that we have assembled does not suggest this. However, it does suggest that given a broader range of objectives, economic objectives can still be met without the need for subsidies.

We would therefore recommend that:

(1) the Yukon Government ensure that the objective of economic self-sufficiency as implied in the 1985 Green Paper as a rationale for agricultural development, allow for the special circumstances of the part-time farmer;

(2) subsidies be restricted to the conduct of carefully monitored, experimental research and development programs, the provision of stock from government to government transfers, and assistance with veterinary services and meat inspection through a research and development program;

(3) these programs be carefully monitored; that representatives from non-agricultural interests be part of the monitoring process; and, that the programs should have a built-in termination date that is always subject to review on the basis of experience.

Note: This latter provision for a built-in termination is important because initial research and development support and start up financial assistance have of a way of becoming a routine part of business.

Game Farming

Game farming as defined and described in this assessment, is likely to be technically feasible for elk and buffalo; although the availability of Wood buffalo stock precludes the early potential for game farming for that species. It is our judgement that muskox and reindeer are unlikely to prove satisfactory for tissue production and by-products in Yukon, and any farming for those species would have to be considered purely experimental.

The economics for these species have been described briefly in Conclusion 1 and, realistically, programs for elk and buffalo, should still be considered experimental and subject to careful monitoring and assessment.

It is recommended that:

(4) the Experimental Co-operative Elk Farming Project on the Penner property proceed with very careful monitoring, and that consideration be given to providing additional stock to those already planned for 1987.

(5) any additional game farming operations for elk proceed on the basis of the experience obtained from the experimental programme.

(6) farming for muskox and reindeer be considered purely experimental in Yukon, and that financial support from government reflect this experimental status.

Game Ranching

Game ranching as defined and described in this report, would likely be technically feasible in Yukon for an elk-buffalo-moose combination, but would be unlikely to succeed purely on economic viability.

Given additional social objectives, however, an experimental project could be considered. Stock availability would be a concern, particularly for buffalo and more information is required on possible buffalo sources from the North West Territories.

A major drawback to game ranching would be objections to the alienation of large blocks of land for this purpose. Lands made available to Indian bands under land claim settlements would be candidate areas if the owners of that land were interested. For non Indian participation, lands should only be made available on a leasehold basis.

It is recommended that:

(7) the support of the Council for Yukon Indians and Indian Bands be sought for an experimental mixed stock game ranch of the type described in this assessment with the same criteria applying that have been recommended for the Co-operative Elk Project;

(8) if consideration is given to any other ranching venture, lands be made available only on a leasehold basis during a ten to fifteen year experimental stage, and that any developments be in keeping with Yukon Government grazing policy.

Wild Harvest

While a wild harvest of animals from the Porcupine caribou herd was considered to be technically feasible and economically viable, the social, institutional, legal, cultural, international, and political constraints appear insurmountable at this time.

It is recommended that:

(9) a technical 'Watching Brief' be maintained on the potential for a wild harvest and that government discuss the technical and economic aspects of the concept as set out in this assessment with representatives of the Old Crow Band and the Council for Yukon Indians.

Social Issues

There is concern over game ranching and farming by the existing subsistence and recreational users of wildife. Traditionally game animals have been managed in the interests of those subsistence and recreational user groups, and game farming and ranching suggests a shift from that traditional pattern.

The issue is one of value judgements and tradition as much as technical and economic questions.

The results of this assignment satisfy us that the potential for disease transfer and genetic mixing between captive and wild stocks can be controlled given strict requirements for disease inspection, fence construction and maintenance.

Given the existing importance of wild game stock, any game ranching or farming policy must ensure that the genetic integrity and health of wild stocks is maintained as the first priority.

It is recommended that:

(10) the technical and economic rationale for game farming and game ranching receive a thorough public discussion and that eventual policy reflect the value judgements and concerns of both consumptive and non-consumptive users of game species, and agricultural interests.

Land Issues

Land availability for game farming should not be considered outside of current agricultural land availability provisions.

It is recommended that:

(11) if game farming is to proceed then lands must be made available for that purpose through existing land acquisition channels.

(Recommendation No.8 deals with land for game ranching.)

The existing land improvement requirements for granting title for agricultural purposes are inconsistent with land requirements for game farming. While some arable land is required for game farming, good quality natural land with tree cover, particularly Aspen, is important. A major requirement for game farming is adequate fencing, and the costs for this would reflect a financial commitment to improving land for agriculture comparable to land breaking.

It is recommended that:

(12) game fencing to a standard appropriate for game farming be considered as "land improvements" to meet the requirements for granting title.

Legal and Regulatory Issues

There are four areas of legal and regulatory concern:

(i) The maintenance of the health and genetic integrity of indigenous wild game animals in Yukon.

(ii) The inspection of meat products to satisfy public health requirements.

(iii) The prevention of illegally taken game products from entering the market.

(iv) The internal administrative infrastructure for game farming/ranching.

Wildlife Concerns

The existing Wildlife Act is predicated mainly on recreational hunting, trapping and conservation. The Act has sufficient provisions for exemptions through permits and licences to enable the proposed experimental approaches to game farming/ranching to proceed.

In our judgement this "temporary permitting" approach is preferable at this time for the experimental approach that is planned. It would be premature in our judgement to give game ranching/farming the status that separate legislation would imply, when its future is still uncertain.

Since the welfare and management of indigenous game animals is a major legislated priority for Yukon, it is appropriate that the Wildlife Act be the regulatory mechanism for Game Farming/Ranching during the experimental phase, and that the merits of any change from this be assessed as a part of the

experimental programme.

The Wildlife Branch has the appropriate enforcement capability to enforce animal health inspection and fencing requirements to ensure that indigenous game animals are safeguarded. However, any additional costs involved should be a charge against game farming/ranching and not be at the expense of existing wildlife programmes and responsibilities.

It is recommended that:

(13) permits and licences under the Wildlife Act be used to regulate the experimental phase of game farm/ranch development in Yukon, and that the Wildlife Branch be the agency responsible for administering and enforcing all aspects of game farming/ranching that could have any influence on the welfare of indigenous game animals;

(14) the costs of any additional administration and enforcement by the Wildlife Branch be considered as a cost against agriculture.

Meat Inspection

Inspection procedures for meat are currently being developed by the Yukon Agricultural Branch. While the existing Federal Health standards should be maintained, consideration should be given to developing simpler procedures than those called for at a full scale commercial slaughter plant. The very small number of animals available for slaughter in Yukon at a given time will make such procedures expensive.

It is recommended that:

(15) the development of meat inspection procedures at a level consistent with existing Federal Health Inspection Requirements be developed as a part of the experimental game ranching/farming approach, and that the Yukon Agricultural Branch have the responsibility for this aspect of regulation.

There is a major concern elsewhere in Canada that by making farming/ranching and the sale of game meat legal, an avenue will be opened for illegally taken live animals, and game meat to enter the marketplace. These concerns do not appear to be as strong in Yukon, however they must be addressed.

A system must be established whereby all animals entering a game farm operation must be permanently identified, and accurate records kept of that animal at a central registry, until its

death. This would apply to animals imported to the Territory and to all animals born in captivity.

Permanent identification systems are already in effect for pedigree livestock; animals are tattooed, central records are kept, and those same records are used by individual breeding facilities. For wildlife, a similar inter agency system is in effect for falcons, as is a system for the permanent identification of mountain sheep trophies.

In our judgement, while an ear tagging system may be appropriate for the farmer's herd control needs, it would be inadequate as a control to prevent the illegal entry of wild animals to domestic herds. A more permanent identification such as tatooing is needed.

The same principle should apply to the identification of meat after slaughter. Carcass marking similar to that required for meat grading would be required. In our judgement, such marking should be to a very high standard and the development of such an approach should be an element of Research and Development.

The principle for both of the identification systems suggested is no different from existing requirements for the tagging of animals taken by hunting, although the "practice" should be more closely regulated.

It is recommended that:

(16) a system of permanent identification for all animals entering any game farm operation be established, that permanent records of all such identification be maintained.

(17) a foolproof system of identifying game meat from the point of slaughter to eventual retail sale be developed for Yukon as a part of the Research and Development program.

(18) eventual regulations to control the identification systems outlined in recommendations 16 and 17 above, carry heavy penalties for infractions, preferably loss of license/permit privileges for game farm/ranch operators and meat processors and retailers.

Business Infrastructure

The only other regulatory concern is the type of day by day administration called for by any government regulated or assisted programme. The proposed steering committee for the experimental elk project would be the logical group to develop any

administrative mechanisms that are needed based on the experience of the experiment. In our judgment it would be inappropriate to develop bureaucratic mechanisms without an understanding of what the actual resource management realities will be.

It is recommended that:

(19) the terms of reference for the committee administering the agreement for the Experimental Co-operative Elk Farming venture include such matters as extension services offering advice to game farmers/ranchers, the provision of veterinary services, marketing assistance and advice, liaison between government and the private sector and any other matters of a day-to-day industry infrastructure nature that the experimental programme identifies. A review of the disposition of the raised animals should be a major priority.

Marketing

There is little reliable marketing experience for elk meat - the product that would likely be the eventual stable mainstay of a Yukon Game Farming/Ranching industry although imported New Zealand red deer venison, a similar meat, has had good acceptance for the small quantities imported to Canada. The industry that has developed thus far in Canada has relied on live animal and antler velvet sales.

Live animals will eventually stabilize at well below their current levels, almost certainly before Yukon farmers could benefit from such sales. The velvet antler market shows wide year to year fluctuations, and the likely small volume of Yukon product and remoteness from buyers poses problems.

In our judgement the best long term potential is to raise elk and buffalo (if stock becomes available), for the specialty meat market, catering primarily to tourists visiting Yukon restaurants. This strategy would ensure the highest possible value - added to a local product. The discussion of the experimental elk farm suggests that animals could be available for test marketing. Buffalo meat is well established in markets outside Yukon, and there has been limited success with local sales of reindeer meat from the North West Territories.

It is recommended that:

(20) the test marketing of elk meat in Yukon restaurants be a major priority for the co-operative experimental elk farming venture.

Final Conclusions

The conclusions and recommendations thus far have recommended a cautious experimental approach to game farming and game ranching for the Yukon.

There are no special advantages that Yukon would enjoy in trying to develop game oriented agriculture in a hurry. Given the overall status of the industry in Canada there are good reasons for maintaining a "watching brief" on developments elsewhere. This "watching brief" could be accompanied by the co-operative experimental game farming venture already described, and a similar game ranching venture that we have proposed.

We have concluded that the Yukon Government can best support game farming and ranching through this Research and Development approach, an important element of which would be the development of an infrastructure for the type of industry best suited to Yukon realities. Given the fledgling state of game farming and ranching in Canada, the future is far from certain. The infrastructure should include such issues as meat inspection, extension, advisory and marketing services, veterinary services and the type of financial support that could benefit the industry as a whole, rather than start the industry out with a patchwork of subsidies to individual operators.

Notwithstanding the uncertainty, and the prospects for, at best a very modest return on capital and labour, there will be those who want to take the risks and go ahead anyway.

It is our judgement that through appropriate permits under the Wildlife Act that government has the ability to control such operations. We have made our position quite clear on the rest of the infrastructure that is needed - develop it on the basis of a well-maintained experimental approach, and by carefully watching developments elsewhere. This in no way implies that the Yukon Government would be discouraging game oriented agriculture, but rather would be taking a positive, yet prudent, approach to an industry with uncertain prospects.

It is recommended that:

(21) Yukon Government consider game farming and game ranching as a legitimate element of agriculture in Yukon, that qualifies for whatever support, financial or otherwise, the Government sees fit to provide for agricultural development, regardless of its type.

(22) any Government commitments that are made to game farming and game ranching, financial or otherwise, reflect the industry's as yet uncertain future.

(23) the major emphasis for Government support for game farming and game ranching be through Research and Development, the provision of infrastructure, and the maintenance of a "watching brief" on developments in the industry in Canada and elsewhere.

APPENDIX I

SUMMARY MATRICES

YUKON GAME RANCHING/FARMING ANALYSIS - MATRIX #1 - GAME FARMING

FACTOR	MOOSE	CARIBOU	ELK	BUFFALO	MUSKOX	WT/MULE DEER	REINDEER
BIOLOGICAL OPPORTUNITIES AND CONSTRAINTS	-No experience in North America. -Use local browse, adapt well to hay, etc. -Probably severe density related constraints.	-Considered unsuitable because of migratory nature.	-Have survived in Yukon both in the wild and on a farm environment. -Adapt well to a farm environment. -Adapt well to hay and make efficient use of local feed.	-Have survived in Yukon through release and in enclosures. -Farm experience mainly for Plains Buffalo. -Inconclusive information for Wood Buffalo.	-Strong social/herd instincts may cause problems. -Never farmed in Yukon before. -Alaskan experience is still inconclusive.	-Extreme northern limit of range. -Yukon Game Farms feel could be raised successfully for meat.	-Potential farming areas far removed from native range - severe diet/nutrition problems may result. -May face problems with migratory nature on an enclosed farm.
MARKETING: POTENTIAL PRODUCTS	-Limited live animal market. -Meat - local specialty market - restaurants, -etc. -S.E. Alaska and ferry system a good potential market. -Low quality velvet. -Hard antler/hides tourist interest.		-Live animals - may be too late. -Meat - local specialty market - restaurants, etc. -S.E. Alaska and ferry system a good potential market. -Velvet:limited volatile market. -Need bulk to attract buyers. -Hard antler/hides tourist interest.	-No separate live animal market. -Meat - local specialty market - restaurants, etc. -S.E. Alaska and ferry system a good potential market. -Horns/hides tourist interest.	-Animal probably too valuable for meat use. -Quviut - very high value product.	-Limited live animal market. -Meat - local specialty market - restaurants, etc. -Smaller carcass may be desirable. -S.E. Alaska and ferry system a good potential market. -Low quality velvet. -Hard antler/hide tourist interest.	-Meat/hide market already established in S. Canada. -Low quality velvet.
DISEASE	-Under natural conditions relatively disease free.		-Relatively disease free. -Need vet. nearby.	-Wood Buffalo in Wood Buffalo Nat'l. Park have brucellosis, T.B., Anthrax. -Need good stock inspection.	-Potential problems with lungworm. -Farming far south of natural range may lead to new disease problems.	-White Tail pose a severe disease threat to native moose (Meningeal Worm).	-Problem with respect to potential proximity to wild caribou.
PREDATION	-Farm-style predator control.		-Farm-style predator control.	-Farm-style predator control.	-Farm-style predator control.	-Farm-style predator control.	-Farm-style predator control.
LEGAL/ REGULATORY FACTORS	-Meat inspection required.		-Elk are a wild animal with special status. -Existing regulations quite vague, based on Yukon Game Farm experience. -Ownership question.	-Special wild animal status. -Yukon established as a Wood Buffalo only area.	-Native species/special status. -May be killed by Inuit with a permit.	-Native species (Mule Deer) with special status.	-Domestic animal. -Fencing requirement in Yukon Wildlife Act.
COMPATIBILITY WITH NATIVE SPECIES	-May have problems with animals outside fence during the rut.		-Need good fence and good stock.	-Need stock and a much stronger fence than for elk.	-May contract new diseases.	-White Tail present potential serious disease problems.	-Potential for hybridization with native caribou poses a serious constraint.
SOURCES OF STOCK	-Orphaned calves. -Local stock.		-No local stock available. -YTG transfer from Elk Is. National Park planned.	-Plains Buffalo no problem. -Wood buffalo may be a problem; need a fair number.	-Very high stock price. -Estimate $15-20,000 per animal.	-Little information available.	-N.W.T. Tuktoyaktuk.
ANIMAL HUSBANDRY AND MANAGEMENT	-Don't respond well to constant handling. -May have problems with fences during rut.		-Any Game Farm operator must have good level of basic animal husbandry knowledge.	-Easier than elk but still need a good livestock handling background.	-Very hard on fences. -Aggressive, dangerous animal to farm. -Difficult to control in small groups.	-Similar to Elk but bucks can be very aggressive to humans during rut.	-Limited experience in farm environment. -Highly specialized diet required.
SOCIAL ACCEPTANCE	-Expect resistance from native and non-native hunters.		-Elk may be most acceptable species as they are not part of Yukon hunting tradition.	-Buffalo have a similar status to elk and are probably as acceptable a species.	-Probably not an issue.	-Mule Deer have a similar status to elk and buffalo but White Tail could face strong resistance because of potential disease hazard.	-Strong objection from wildlife interests and serious questions from agricultural community.
LAND AVAILABILITY	-Small land base required for farming.		-Small land base required for farming.	-Small land base required for farming.	-Small land base required for farming.	-Small land base required for farming.	-Small land base required for farming.

YUKON GAME RANCHING/FARMING ANALYSIS - MATRIX #2 - GAME RANCHING

FACTOR	MOOSE	CARIBOU	ELK	BUFFALO	MUSKOX	WT/MULE DEER	REINDEER
BIOLOGICAL OPPORTUNITIES AND CONSTRAINTS	-Apparently successful in Elk Island National Park. -Has been done successfully in USSR. -Applicability to Canada unknown. (Further analysis underway.)	-Considered unsuitable because of migratory nature. -Can't fence in a large enough area to accommodate seasonal movements.	-Survived in Yukon through release and in enclosures. -Could be integrated with other species as in Elk Is. to optimize range use.	-Survived in Yukon through release and in enclosures. -Could be integrated with other species as in Elk Is. to optimize range use. -Ranch experience mainly for Plains Buffalo.	-Very little information available (Alaskan -experience still inconclusive.) -May lose advantage of large land base if not in area with natural feed.	-Very little information available. -May lose advantage of large land base if not in area with natural feed. -Yukon Game Farms feel mule deer could be raised successfully for meat.	-Potential ranch areas far removed from native range - severe diet/ nutrition problems may result. -Migratory nature may cause problems.
MARKETING: POTENTIAL PRODUCTS	-Limited live animal market. -Meat - local specialty market - restaurants, etc. -S.E. Alaska and ferry system a good potential market. -Bulk velvet a possibility. -Hard antler/ hides tourist interest. -Potential for sport hunting.		-Live animals - may be too late -Meat - local specialty market - restaurants,etc -S.E. Alaska & ferry system a good potential market. -Bulk velvet a possibility. -Hard antler/ hides tourist interest. -Large number of animals may require export market. -Potential for sport hunting.	-No live animal market. -No velvet. -Meat - local specialty market - restaurants,etc -S.E. Alaska and ferry system a good potential market. -Large number of animals may require export market. -Potential for sport hunting.	-Probably too expensive stock for economic meat production. Quviut - high value product.	-Limited live animal market. -Meat - local specialty market - restaurants,etc -S.E. Alaska & ferry system a good potential market. -Bulk velvet a possibility. -Hard antler/ hides tourist interest. -Potential for sport hunting. -Smaller carcasses may be more desirable.	-Meat/hide market already established in S. Canada. -Bulk velvet sales possible.
DISEASE	-Under natural conditions relatively disease free.		-Relatively disease free. -Decreased density should lower disease problems. -Need vet./ inspection facility close.	-Relatively disease free. -Decreased density should lower disease problems. -Need vet./ inspection facility close.	-Potential problems with lungworm. -Farming far south of natural range may lead to new disease problems.	-White Tail pose a severe disease threat to native moose (Meningeal Worm).	-Problem with respect to potential proximity to wild caribou.
PREDATION	-Extensive predator control would be necessary within the enclosure.		-Extensive predator control would be necessary within the enclosure.	-Extensive predator control would be necessary within the enclosure.	-Extensive predator control would be necessary within the enclosure.	-Extensive predator control would be necessary within the enclosure.	-Extensive predator control would be necessary within the enclosure.
LEGAL/ REGULATORY FACTORS	-Meat inspection required.		-Wild animal w/ special status. -Existing regs. quite vague, based on Yukon Game Farm experience.	-Wild animal with special Status. -Yukon established as Wood Buffalo only area.	-Native species on Arctic Coast with -special status.	-Wild animal w/ special status. -Existing regs. quite vague, based on Yukon Game Farm experience.	-Domestic animal. -Fencing requirement in Yukon Wildlife Act.
COMPATIBILITY WITH NATIVE SPECIES	-Could be a real problem keeping fences up during rut.		-Similar problem as with moose if ranch established in an area with wild elk.	-Similar problem as with moose if ranch established in an area with wild buffalo.	-Bigger land area leads to more chances of disease from wild species.	-White Tail present potential serious disease problems.	-Potential for hybridization with wild caribou poses a serious constraint.
SOURCES OF STOCK	-Orphaned calves. -Local stock. -Need large numbers.		-Little or no local stock available. -YTG transfer from Elk Is. Nat'l Park planned.	-Plains Buffalo no problem but Wood Buffalo could pose a constraint due to ranch number needed to ranch	-High stock price est. at -$15-20,000 per animal. -need many to make a ranch feasible.	-Little information available.	-N.W.T. Tuktoyaktuk.
ANIMAL HUSBANDRY AND MANAGEMENT	-May be easier than farming. -Possibility for intergration with other species to optimize range use.		-2 Scenarios: 1-intensive winter feeding; may require farm within a ranch for winter care. 2-limited winter feeding; use natural forage & feed as required.	-2 Scenarios: 1-intensive winter feeding; may require farm within a ranch for winter care. 2-limited winter feeding; use natural forage & feed as required.	-Possibility of extreme fence repair cost.	-Similar to Elk but bucks can be very aggressive to humans during rut.	-Limited ranch experience in non-Arctic environment. -Highly specialized diet requirements decrease advantage of land base.
SOCIAL ACCEPTANCE	-Expect resistance from native and non-native hunters.		-Wild animal w/ special status. -May be acceptable because not part of Yukon hunting tradition.	-Wild animal w/ special status. -May be acceptable because not part of Yukon hunting tradition.	-Probably not an issue.	-Wild animal w/ special status. -May be acceptable because not part of Yukon hunting tradition.	-Strong objection from wildlife interests and serious questions from agricultural community.
LAND AVAILABILITY	-Requires large land base. -Native land claims a possibility.		-Requires large land base. -Native land claims a possibility.	-Requires large land base -Native land claims a possibility.	-Requires large land base. -Native land claims a possibility.	-Requires large land base. -Native land claims a possibility.	-Requires large land base. -Native land claims a possibility.

YUKON GAME RANCHING/FARMING ANALYSIS - MATRIX #3 - WILD HARVEST

FACTOR	MOOSE	CARIBOU	ELK	BUFFALO	MUSKOX	WT/MULE DEER	REINDEER
BIOLOGICAL OPPORTUNITIES AND CONSTRAINTS	-Technically feasible feasible with intensive management.	-Technically feasible feasible with intensive management.	-Not feasible. -No surplus.	-Not feasible -No surplus.	-Not feasible. -No surplus.	-Not feasible. -No surplus.	-Not feasible. -No wild population.
MARKETING: POTENTIAL PRODUCTS	-Meat - local specialty market - restaurants, etc. -S.E. Alaska and ferry system a good potential market. -Hides, hard antler market a possibility. -Size of market depends on size of cull.	-Velvet - could pose time problems for cull. -Meat - local specialty market - restaurants, etc. -S.E. Alaska and ferry system a good potential market. -Hides, hard antler market a possibility.					
DISEASE	-Carcass inspection a must. -Processing facilities required in field. -Increased density may increase disease.	-Carcass inspection a must. -Processing facilities required in field. -Increased density may increase disease.					
PREDATION	-Predator control required, consistent with harvest objectives.	-Predator control required, consistent with harvest objectives.					
LEGAL/ REGULATORY FACTORS	-Administration falls exclusively to the Wildlife Branch, except for meat inspection.	-Administration falls exclusively to the Wildlife Branch, except for meat inspection.					
COMPATABILITY WITH NATIVE SPECIES	-Not applicable, except for predators.	-Not applicable except for predators.					
SOURCES OF STOCK	-Local moose herds.	-Possibilities: Porcupine Herd Bonnett Plume Herd					
ANIMAL HUSBANDRY AND MANAGEMENT	-Very high level of wild herd management required.	-Very high level of wild herd management required.					
SOCIAL ACCEPTANCE	-Probably very questionable because of traditional patterns of management and use.	-Probably very questionable because of traditional patterns of management and use.					
LAND AVAILABILITY	-Not an issue.	-Not an issue.					