

# Socioeconomic Evaluation of Reindeer Herding in Northwestern Alaska

LARRY L. NAYLOR<sup>1</sup>, RICHARD O. STERN<sup>2</sup>, WAYNE C. THOMAS<sup>3</sup>  
AND EDWARD L. AROBIO<sup>4</sup>

**ABSTRACT.** Recent proposals to create new federal lands and management jurisdiction in Alaska, associated with the Alaska Native Claims Settlement Act (1971) and pending government legislation, have combined to bring this Native industry into prominence once again. Based on an interdisciplinary study undertaken from 1976 through 1977, contemporary herding is discussed, set against the background of history, the economic considerations and the unique Native culture and lifestyle. Reindeer herding has become an integral part of the social organization, value and cultural systems, as well as economy, of northwestern Alaska. Changes in the industry, whether to improve herding operations or as a result of government legislation, would greatly affect the people and economy of the region.

**RÉSUMÉ.** Les recentes propositions de creer de nouvelles terres fédérales ainsi qu'une juridiction de direction, en Alaska, associée à une reglementant les plaintes des indigènes, d'Alaska et à une legislation gouvernementale en suspens, tout cela s'est combiné pour mettre de nouveau en vedette le travail des indigènes. L'autre discute de la harde contemporaine, à partir d'une étude interdisciplinaire, entreprise de 1976 à 1977; c'est un défi à histoire, aux considerations économiques, à la culture et au style de vie des indigènes. La harde de rennes est devenue une partie integrale de l'organisation sociale, des systemes de valeur et de culture, tout autant que d'economie dans l'Alaska du N.W. Les gens et l'economie de la region seraient grandement affectés par des changements dans leur labeur, destinés à ameliorer les actions concernant les troupeaux ou comme resultant d'une legislation gouvernementale.

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## INTRODUCTION

Over the years, a great many studies have been done on the Native reindeer herding industry in northwestern Alaska. A large number of these studies have concentrated on the general development of the industry, particularly as it gradually became incorporated into the unique Native Alaskan lifestyle (Lantis, 1950). Other studies have focused on more limited aspects of the industry as it evolved in specific geographical regions of Alaska (Luick, 1973), or on various economic aspects of it (Brady, 1968; Olson, 1969). The biological aspects of reindeer herding have also received a great deal of

<sup>1</sup>Department of Sociology and Anthropology, North Texas State University, Denton, Texas 76203, U.S.A. (Formerly with the Institute of Arctic Biology, University of Alaska, Fairbanks.)

<sup>2</sup>Department of Natural Resources, Division of Research and Development, State of Alaska. (Formerly with the Institute of Arctic Biology, University of Alaska, Fairbanks.)

<sup>3</sup>Agricultural Experiment Station, University of Alaska, Fairbanks, Alaska 99701, U.S.A. (Contribution No. J-141)

<sup>4</sup>Agricultural Experiment Station, University of Alaska, Fairbanks, Alaska 99701, U.S.A.

attention (Luick, 1979). The fact that the industry has existed within an environment that has experienced rapid and extensive culture change has not gone unstudied (Van Stone, 1960). In fact, a primary reason for the current volume of literature is the constant change experienced within the industry since the introduction of reindeer to Alaska. Studies of reindeer herding in Alaska have been done or supported by government agencies which have had some responsibility for the industry over the years. This historical legacy, the recent Alaska Native Claims Settlement Act (1971), and the still more recent and pending government legislation, have combined to bring this Native American industry into prominence once again (Stern *et al.*, 1977).

A new project, reported here in condensed form, was undertaken to evaluate the socioeconomic aspects of this industry. The research initiated during 1976 continued through 1977. It was occasioned by a number of proposals to create new federal lands and management jurisdictions in that area of Alaska where reindeer herding has become an integral part of the Native lifestyle and economy. The goal was more than simply to add to the large body of literature already in existence about reindeer herding. Indeed, because of the extent of the literature, part of the project was directed at evaluating it and delineating just what we did and did not know about reindeer herding in Alaska and its history. In essence, the research evaluated the present state of the reindeer industry economically and in relation to the unique Native culture, lifestyle and mixed economy of northwestern Alaska.

#### RESEARCH DESIGN

As this particular project represented an attempt to relate the economics of herding with the sociocultural context, something of the way the research was done may prove of value. While there may be wider theoretical implications in the research design, the present discussion will be brief and oriented toward providing a framework within which the factual description can be considered. In the context of Native Alaskan culture, the people exist in a mixed tradition and economy, combining a Native tradition with a Euro-American system and lifestyle. An integrated approach, combining anthropology and economics, was utilized throughout the research and analysis to unravel the complex matrix of factors associated with contemporary reindeer herding in this particular sociocultural context. Anthropology provided the sociocultural perspective, along with field methods well suited to research in Alaska's Native communities. Economics provided a method by which the economic aspects of reindeer herding within regional, state and national contexts could be considered.

In theoretical terms, the research drew on cultural ecology of anthropology and microtheory of economics. Cultural ecology seeks to understand the relationships between population dynamics, social organization and the culture of human groups, and the environments in which they are found. The sociocultural analysis addressed the relationship of the sociocultural structure

and the reindeer herd-owner as a member of the community. Microeconomics focused on the behavior of individual economic units (e.g., reindeer herds) and their relationship to each other, to other economic sectors, and to the economy as a whole. Related economic and sociocultural data were analyzed within the economic context to explore the process of decision making in the reindeer industry. As our primary purpose was to gather as much data as possible on past and present herding practices, particularly with regard to herding and land uses, the future potential of the industry, and its impact on the people and economy of the region, the history of the industry was also reviewed. The intensive literature search and evaluation aided in the identification of significant variables for consideration during the actual field research phase of the project.

#### REINDEER BIOLOGY

While our primary concern was oriented toward the socioeconomic aspects of reindeer herding, attention had to be paid to the biological aspects of herding because of the direct relationship between the two. This information places the human interactions with reindeer in their proper biological perspective. Unfortunately, while such biological aspects have already been extensively studied, few would suggest that a perfect understanding exists. The relationship of the reindeer to range, feeding preferences and tolerances, the function of antler in feeding adaptation, the ecology of fire in range regeneration and succession, and the growth dynamics of reindeer under various feeding conditions are but a few of the problems which remain to be investigated. For the purposes of this study, the reindeer life-cycle, seasonal movement, antler growth and function, and forage preferences are significant. These variables must be addressed, however briefly, because of their importance in the association between humans and reindeer.

Reindeer are the domestic, or semi-domestic, form of *Rangifer tarandus* spp. Throughout North America, reindeer in the wild are usually called caribou. There are relatively few differences in behavior or morphology (structure) that allow one to distinguish between reindeer and caribou. Where differences appear to exist, such as the reindeer's tendency toward a smaller size, they can nearly always be attributed to the domestication of the animal, e.g., human control of its movements and protection from predators, disease or parasites; or to husbandry techniques imposed to enhance its survival. Perhaps the most notable difference between the caribou and the reindeer, for which no satisfactory explanation has yet been offered, lies in color. Reindeer tend to be lighter in color than caribou and more often are spotted.

The natural life span of the reindeer varies from ten to fifteen years. Both cows and bulls usually reach sexual maturity by the second year. Reproductive capabilities extend for about ten years, and a single bull can impregnate up to twenty or more cows during a single rutting season. Pregnant cows instinctively move to the same calving grounds year after year. The actual calving season usually lasts from about mid-April through the

month of May. A single calf is born to most cows each spring. The most crucial period in the annual round of the reindeer comes in late winter and early spring. It is during this period that predators often kill and scatter herds, a sudden freeze can keep the animals from their food sources, and the cow and her newly born calf usually separate from the herd.

Following this critical time period, and with the advent of summer, the herds move to high windy ground in an effort to escape the flying insects that swarm on the tundra. During the summer months, antlers are regenerated, having been dropped during the winter by the bulls and in the spring by the barren females. Cows with calves lose their antlers after parturition. By July, antlers are again fully developed, although the internal spongy tissue does not harden until fall. During the summer months the antler is covered with a soft, furry material which resembles velvet, giving rise to the term "velvet antler." The winter coat of the reindeer is shed during late spring and early summer. With the approach of fall, the reindeer move inland toward the more sheltered areas. As the rutting season approaches, the scattered herds regroup once again. Bulls gather harems of cows about them during the rutting season, from October through November. After this rutting period, and throughout the winter, the sexes graze separately. The yearly cycle is then repeated.

Reindeer are basically social animals, and within the herd are a number of hierarchically ordered groups. Central to this grouping is the reindeer antler which has been postulated as playing a key role in the status of individual animals. The antler also plays a role in access to females and the control of grazing areas. The harvesting of the antler by humans has raised a number of questions only now being investigated. Of particular concern is the impact of antler harvesting on bull performance and on the recognition factor of calves to mothers.

The relationship between reindeer and their food resources is a critical factor in herd survival. Much of this relationship remains imperfectly understood. The basic food sources for the reindeer in winter and early spring are lichens. Food during the summer includes lichens, various grasses, marsh plants, and the leaves of the birch and willow. Lichens are held to be the principle component of the reindeer diet. Unfortunately, lichens grow extremely slowly, and when overgrazed, burned, trampled, or otherwise severely damaged, their regeneration can take 20 to 40 years.

Reindeer herd-owners make use of this biological and ecological information in the management of their herds. Crucial decisions are based on such knowledge and good herd management is often a reflection of how well a herd-owner utilizes the available information on reindeer needs and behavior. When such biological/ecological knowledge is coupled with good husbandry skills that facilitate herd increases, the herd-owner's chances of success are obviously enhanced. Knowledge about the natural life span and the reproduction capabilities of the reindeer helps the herder establish good bull:cow ratios for the herd. The knowledge that age-sex classes of animals group at particular times of the year can assist the herd-owner with round-up decisions, e.g., when to hold the round-up, or how much effort might be

required. Knowledge of the general feeding habits of reindeer is essential for any planned rotational grazing. Familiarity with the seasonal movement patterns of the herd assists the herder in locating the animals for slaughter, branding, castrating or dehorning activities. Increased surveillance during the critical calving period can lead to an increased calf survival rate. The importance of biological/ecological information to herding practices therefore rests in management implications. Such information cannot be slighted, nor its significance minimized, even in a socioeconomic consideration of the reindeer industry.

#### HISTORICAL SUMMARY

To gain a fuller understanding of contemporary reindeer herding, it is necessary to have some conception of its historical evolution since the introduction of reindeer into Alaska in 1892. Such a historical survey can shed light on many of the current issues and perspectives of the industry. Many of the current issues, problems and industry potential are well rooted in the past. While it is not possible or desirable to provide all of the historical detail within this presentation, the historical legacy can be briefly summarized by the major periods of its evolution in Alaska and the rather consistent themes identifiable throughout its history. The reindeer herding industry has gone through three major periods: 1) the developmental period (1892-1914); 2) the period of intensive non-Native ownership and attempts at commercial exploitation (1914-1939); and 3) the modern period of restricted ownership and attempts to create a self-sustaining Native industry (1940-present). Each of these periods contributed both continuity and uniqueness to the historical legacy, contemporary herding, and the attitudes toward it.

While the history can be viewed in relation to the major time periods of its evolution, it can also be considered in relation to the major themes represented throughout its history. The first recurring theme evident through the industry's history points clearly to the intention of the government to provide a self-sustaining Native industry. The second theme focuses on the continual problem of non-Native ownership and involvement in the reindeer industry. Thirdly, constant changes in policy and authority over the industry have created inconsistency leading to suspicion on the part of Native herders. Recurring pressures, both natural and man-made, have continually affected herd operations. Finally, there has been insufficient feedback between research programs and the needs as well as desires of the Native herd-owners.

In constructing this historical summary of reindeer in Alaska, numerous government documents, personal communications and the previous research efforts of a great many people have been utilized. Of particular usefulness have been Ray (1965, 1975), Ward (1955, 1956), Lomen (1954), U.S. Bureau of Education Reports (1917, 1918, 1919, 1921, 1923), Lantis (1950), Olson (1969), and Jackson (1903). For the bulk of the presentation, the authors have

relied primarily on Ray and Ward. Except where statements have been taken directly from these sources, citations have been kept to a minimum. For the complete listing of all the literature on which this historical summary has been constructed, the reader is referred to Stern (1977) and Stern *et al.* (1977).

#### *Traditional Context*

Prior to the 19th century white contact, the Eskimo people of northwestern Alaska subsisted primarily from the resources of the land, sea and air (Ray, 1964). Relatively stable food resources, in the form of sea mammals and caribou, allowed them to establish relatively permanent villages along the coasts and rivers. Other foods were used to supplement these basic resources as they became seasonally available. When food was abundant the Eskimos lived well. In times of scarcity, they ranged great distances to locate alternative resources. Well-established trade routes moved goods from the interior to the coast. Siberian and European trade goods later became an integral part of this network, so by the time of the introduction of reindeer herding to Alaska, extensive contact with outsiders was already well underway.

The first sustained contacts with the outside world were with the whalers in search of the lucrative whale. As such contacts increased well into 1875, hunting and trading for ivory, furs and baleen also increased. With the whalers came rifles, liquor, new diseases and the beginnings of major disruptions of traditional social relations and culture. Along with these influences came a substantial decrease and relocation of the native population. This was followed by a population increase in the early 20th century, a trend that continues into the present largely because of modern medical care systems and high birth rates (Alonso and Rust, 1976; Rodgers, 1971; Hippler, 1969). During this same period between 1850 and 1890, for reasons not yet understood, the caribou available for Native subsistence also decreased substantially. By 1880, there were few caribou left in northwestern Alaska except at the "center of habitation" in the Central Brooks Range (Spencer, 1968; Burch, 1972; Ray, 1975). The numbers of caribou remained low until the 1930's. Caribou hunting populations have seemingly always faced herd size fluctuations. Characteristically, such groups have had to repeatedly shift their hunting emphasis and utilize alternative food resources. While the residents of northwestern Alaska changed their subsistence strategies, they had more alternatives in the form of sea mammals, fish and seals (Ray, 1964). However, it was because of a perceived food scarcity that the Reverend Sheldon Jackson was able to introduce reindeer into Alaska in 1892.

#### *Developmental Period (1892-1914)*

Upon seeing many of the contact conditions as represented above, the poor living conditions of the people, and the decline in the food resource base of the region, Sheldon Jackson proposed to bring reindeer from Siberia to Alaska in 1892 (Jackson, 1903; Ray, 1965). His purpose was twofold: to save

the Eskimos from starvation, and to promote industrial education among the Natives. Jackson also proposed to bring Siberian herders to Alaska to teach the Alaskan Eskimo how to herd reindeer. Based on some initial successes in raising funds for his project, he succeeded in persuading the government to appropriate moneys for importation of reindeer and administration of the program. From this beginning, until 1902 when the Russian Czar forbade the export of any more reindeer, some 1280 reindeer were imported into Alaska (Ray, 1965; 1975). Jackson's original plan to bring Siberian herders into Alaska was less successful because of a Siberian reluctance to teach, and also as a result of traditional animosities between Siberian and Alaskan Eskimos. In 1894, Lapp herders were secured from Norway for the purpose, lured by promises of reindeer as the means of payment (Churchill, 1906). This was in direct contravention of restrictions placed on Alaskans in their use of the reindeer. Natives were not permitted to slaughter animals for food or furs, which the Lapps were permitted to do (Ray, 1965; 1975). Different contracts clearly show the differential privileges (RG 75, entry 812, "Contracts," National Archives). This represents the first in a long line of contradictions experienced by Native herders throughout the entire history of the industry in Alaska.

During these early years, as cited in Ray (1965, 1975) and Ward (1955, 1956), a number of conditions and events had significant impact on the fledgling industry. Herd numbers did increase but more by chance than through good management practices. While mild winters and light fawn losses partially contributed to the increases, at the same time local overgrazing was common. According to Ray (1975), during the developmental period, gifts of reindeer by various missions convinced the Natives that they were not going to benefit from this industry. After the first four years, only one herd was totally in Native hands and this herd was ultimately borrowed by the government for emergency food. By 1902, nearly 50% of the existing 4226 reindeer in Alaska were in non-Native hands. The remaining 2591 animals were in Native hands, held by 43 individual herders in herds that ranged from 4 up to 269 animals (Churchill, 1906). The fact that such a small number was under Native control directly contradicted the original plans for a Native reindeer industry. The situation did not go unnoticed in Washington, and the first of many investigations into herding operations was ordered by the government in 1905 (Churchill, 1906).

A number of other events affected the development of the industry. Various "rescue" missions to provide food for stranded whalers repeatedly took reindeer from northwest Alaska, particularly from the Natives. Despite the fact that such missions were generally proved to be unnecessary, "borrowed" herds were never returned (Ray, 1975; Bockstoce, 1977). The Nome gold rush, bringing additional immigrants into the region, put great pressures on the herds as many animals were sold for food or used as draught animals by the miners. A measles epidemic and a pneumonia epidemic combined in a devastating sweep through the region in 1900. Many Natives directly involved in the reindeer herding industry perished along with many non-Natives.

While hers increased, so did the problems associated with herding, some of which were resolved and many of which were not (Ray, 1965; 1975). Reindeer theft and range damage continually plagued many owners. Poor supervision resulted in overgrazing. Differential treatment of Lapp and Eskimo owners caused bitterness. As some non-Native ownership decreased following the first investigations, new non-Native ownership moved into the industry to replace it. This ushered in a new period of reindeer ownership dispute and new directions for government policy. Apprenticeship training programs were unsuccessful because of rapidly changing conditions of apprenticeship, most of which were ill-suited to the traditional system of education (Ray, 1975). The constant debates in Washington and Alaska over goals and control of the industry (religious or secular control) failed to be adequately resolved (Stern *et al.*, 1977:53-56).

Despite these problems, there were some positive things occurring. The herd increases got the industry off to a good start. By the end of this period, reindeer were taken out of the hands of the missions (Ray, 1975). According to the records of the Bureau of Education (1912), surpluses made it possible for limited shipments of reindeer meat to be made to Seattle in 1911. The following period was to expand on this marketing of reindeer. By placing as many animals as possible in the hands of Natives, the Bureau of Education set the stage for the selection of better herd-owners and the development of a "reindeer aristocracy" (Churchill, 1906). The next period was to be identified with new problems, new directions and numerous experiments in the government program to make the reindeer operations a truly Native industry.

#### *Non-Native Ownership (1914-1939)*

Various documents indicate that during this period the reindeer herds throughout Alaska increased more than tenfold, from 57 000 animals to a peak of over 600 000 by the early 1930's. Thereafter, the herds declined precipitously to some 250 000 animals by the end of the decade (Palmer, 1944). The entire period was characterized by non-Native ownership and the many associated problems. The government, aware of the situation and of the problems which accompanied it even within the initial developmental period, attempted on numerous occasions to correct this by ensuring as much as possible that the reindeer were in Native hands. According to their figures contained in the Report of Work of the Bureau of Education for Alaska (1917), they had largely succeeded, reporting some 69% of the 67 448 reindeer in the hands of Natives. A closer examination of these figures reveals that in actual practice, Native herds generally held so few animals that most could not be considered viable, nor was there much chance of them becoming so (Lantis, 1950). Average herd size was only 688 and individual ownership averaged 48 animals. All reindeer in Native hands were grouped into 98 herds. With such small numbers, few herds could be utilized as productive units. While the government pursued the goal of Native ownership, it actually was contributing to the decline of the industry.



Non-Native ownership persisted despite the government's expressed intentions against it (Churchill, 1906). Such ownership in northwest Alaska increased during this period in terms of numbers of animals owned by other than Natives, and encompassed slaughtering, range and marketing activities as well. Conflicts between the Native interests and the non-Native interests developed on the range and in the United States Congress. While not the only example of non-Native ownership, the Lomen family involvement in reindeer operations is significant, certainly the one with the greatest and most lasting impact on the industry.

The Lomen family was involved in the reindeer industry until 1940 when all non-Native ownership was ended (Lomen, 1954). Their activities reached into every aspect of reindeer operations, and the family's involvement represents a significant episode in the history and development of reindeer herding in Alaska. Because of their ability to acquire large numbers of reindeer, control marketing and intimidate Native herders on their own range, the Lomens developed great influence and power over the direction of the industry in Alaska and in Washington (U.S. Bureau of Education, 1919). The various "rights" and "wrongs" of their activities have been debated for years, and in fact are still being debated today. Whatever the actual truth of their involvement, the legacy is real. A great deal of the hostility between Natives and non-Natives in the region today, and a great many of the problems which continue to plague the industry, originated with the Lomens' involvement. Repeated investigations into the family business, in pursuance of the government's intention that the industry be restricted to Natives, ultimately culminated in the passage of the Reindeer Act (1937), which ended non-Native ownership. Whether or not the Lomens can be credited, directly or indirectly, with the ultimate passage of this act, on some points there is little debate. The family did acquire large numbers of reindeer during this period. The family did attempt to promote outside markets for reindeer meat and by-products. The failure of such attempts to create outside markets did lead to increased local competition. Many of the family activities had negative consequences for the development of Native operations. Natives still remember with bitterness the involvement of the Lomens in the industry, and many of their current difficulties are perceived as a direct outgrowth of the Lomen activities.

While a great deal of time and energy was directed at the non-Native ownership problem, according to the U.S. Bureau of Education (1917, 1918, 1919, 1923), the government did try various means to improve the Native herding operations as well. Associations and fairs were established to improve herding practices and cooperative management. Joint-stock companies were also established. These Native joint-stock companies were the predominant system of Native herd ownership in the years 1925-1950. Unfortunately, all such efforts failed for they relied on Native co-ownership, something that never succeeded. Large owner was pitted against small owner, and under the joint-stock companies, the practice of paying for labor with reindeer and the methods of allocating stock led to insurmountable

difficulties. An individual's herd increased faster on paper than in actual animals. Operating capital was not easily generated. Existing grazing areas were insufficient to accommodate the larger herds created. Round-ups were incomplete and often involved mixed herds. Good husbandry practices were seldom followed, resulting in the slaughter of the best breeding stock of the herds. The government agencies responsible for overseeing the herding operations had little experience, inadequate funding and even less authority to correct the problems.

It is significant to note that during this period, especially in the earlier days, according to accounts from the period and informants' statements, a number of Native herders were establishing viable herds, herds of sufficient size to enable their owners to live off them and derive income. This income translated into many herders becoming local entrepreneurs, buying stores, trading in furs, and acquiring property. Using their newly developed income source, Natives initiated activities characteristic of Euro-American culture, activities which continue into the present. Their prestige, influence and status increased and served to markedly differentiate Native herding.

Some time between 1932 and 1935, reindeer numbers in Alaska began a dramatic decline, much of which is attributed to neglect (Palmer, 1944). Because of the problems of co-ownership, many herds were simply ignored, neither managed nor handled for several years in succession. Other reasons for the decline were loss of markets for reindeer meat, predation by wolves, reindeer joining caribou herds, overgrazing and possibly diseases (Burch, 1975).

The historical legacy of the non-Native ownership period evolved from the increasing/decreasing reindeer numbers, the bitterness associated with non-Native ownership issues, and the many unsuccessful attempts to improve Native operations. Many of the Native perspectives toward the reindeer industry were formulated during this time and as consequences of these events, and are still prevalent today. The period was not altogether negative for Native Alaskans; the passage in 1937 of the Reindeer Act was one very positive consequence. By this act, all reindeer in the hands of non-Natives was to be ended and the government goal of establishing an industry restricted totally to Natives was to become a reality. The actual purchase of non-Native reindeer was accomplished in 1940.

#### *Modern Period (1940-present)*

With the purchase of all non-Native owned reindeer, the industry moved into a new phase in its development; however, many of the old problems remained. The major thrusts of the modern period were determined by 1) the government distribution system for putting the purchased reindeer in the hands of individual Natives; 2) World War II, which was to find the industry all but ignored; and 3) herd losses due to natural causes. The period also was marked by increased uncertainty regarding the most effective policy for government intervention in the industry.

To expedite the distribution of the reindeer purchased from non-Native owners, the government established herds from which loans to individual herders were made beginning in 1944. During the war, though markets for reindeer products did improve (Rouse *et al.*, 1948), herd numbers in Alaska continued to decrease. These losses continued into the 1950's and 1960's, until by the late 1960's reindeer herding was confined almost entirely to the Seward Peninsula. In the latter years the losses were largely attributable to the straying of reindeer herds into wild caribou herds moving through northwestern Alaska, and to increased predation.

Other problems faced by Native herders in the modern period include the relatively small returns generated by herds of the size typically operated by Alaskan herders, lack of reliable marketing systems, and the need to meet village meat needs even though doing so may retard desired herd growth. In attempting the resolution of these problems, the Native reindeer herding operations, activities and interests have come into conflict with conservation interests and the competing responsibilities of the government agencies responsible for both areas. Much of the uncertainty that has developed in the modern period can be directly related to these competing interests and to the lack of consistent policy on the part of the government agencies which now hold some responsibilities for overseeing the reindeer industry or aspects of its operations. For example, the U.S. Bureau of Land Management (BLM) now has the control of range use permits and the protection of range resources. At times problems occur between herders and BLM when, for example, disagreements arise over grazing permit boundaries or range carrying capacity.

A great deal of the uncertainty has also evolved from the many and frequent examinations of the industry since the 1950's (Lantis, 1950; Olson, 1969). In the course of such studies, problems have been identified which have also been associated with the traditional and subsistence culture behaviors of the people. Resource managers and herders alike are faced with the difficult problems and conflicts of herding and traditional lifestyles. Good herding practices are often at variance with traditional customs and desires. Wage labor continues to attract Natives away from herding. Good range is scarce for both domestic herds and the indigenous animals of the area. The environment poses great difficulties; herding is difficult in the harsh terrain and seasonal hazards such as predators, fire, foul weather and disease are ever present. Family life and herding often compete for time and energy. Solving the problems of predators often puts the Native herder in direct conflict with government-supported conservation (management) programs. The ultimate outcome of the reindeer industry is dependent on changes within it which will be caused by economic, social, cultural and government factors. In discussing these factors, the present distribution of reindeer on the Seward Peninsula as it existed in 1976 will be emphasized (see Figure 1 and Table 1). By way of definition, the Peninsula is that area lying west of the Inglutalik River, west of the South Fork of the Buckland River, west of the Mongoak River, including all of the Baldwin Peninsula. In 1976, 14 reindeer herds

totalling approximately 17 400 animals, representing 75% of the reindeer estimated in Alaska, were on the Seward Peninsula.



Fig. 1. Reindeer Grazing Permits, Seward Peninsula. 1976 Boundaries Approximate. (Source: Bureau of Land Management, Fairbanks District Office, Kotzebue Field Office).

Table 1: Reindeer Herd Operations, Seward Peninsula, 1976

Village	Operator	Estimated Herd Size
Golovin	Aukongak	2000
Nome	Davis	1500
Shishmaref	Goodhope	2350
Koyuk	Henry	500
Buckland	Hadley	1750
Nome	Johnson	100
Teller	Kakaruk	2250
Deering	Karmun	1350
Kotzebue	NANA	3000
Wales	Ongtowasruk	500
Brevig Mission	Olanna	450
Nome	Trigg	500
Brevig Mission	Tocktoo	450
Shishmaref	Wegiouanna	725

Source: Department of the Interior (1976).

## MARKETING WITHIN THE SOCIAL CONTEXT

“Making a living” in the villages on the Seward Peninsula is a combination of two economies: a subsistence economy which relies on the local environment, tradition, and technology (Eisler, n.d.); and a superimposed market economy, with wholesale and retail outlets, offering goods and services in terms of credit and payment. In reindeer herding, we find a merging of these two economies and their accompanying value systems. To understand the reindeer herding industry, it is necessary to consider the differences between the “primitive economics” of the subsistence economy and the formal methods and practices of modern marketing systems. Marketing and the sociocultural context are taken together. (Unless otherwise noted, the data provided derive from the field investigations undertaken by the authors.)

*Marketing*

The butchering and marketing of reindeer meat is generally done by the individual herd-owners. In recent years, an estimated 80% to 90% of the meat sold from Seward Peninsula herds has been consumed within the region. The remaining meat goes to Anchorage and the “lower 48 states” and is marketed as Alaskan sausage and specialty meat. Slaughtering usually occurs during the winter months, in the field, with exact times of slaughter corresponding to herders’ individual preferences, location of the herd, weather and availability of labor.

As suggested by Olson (1969), at the village level, reindeer meat is distributed: 1) as wage-meat payments; 2) as sales to village residents; and 3) as sales to village stores. For example, in one village catered to by one of the smaller herd operators, the researchers found that in 1976, 15% of the 87 village residents were directly employed in herding operations. During handlings, an additional 17% of the population became employed in herd operations on a part-time basis. Throughout the year, approximately \$4850 in labor costs were paid by the herd-owner, including both wage and wage-meat payments. The actual breakdown is complex. At the fall butchering, 10 additional laborers were hired. Rather than receiving wages in cash, all preferred to be paid in meat. Payments averaged out to 1.5 carcasses per worker. At the spring handlings, 15 additional laborers were hired and paid in cash at \$68 per individual. The records of the owner further indicated that 100 total carcasses were sold through the village store (also owned by the herder) at 95¢ per lb. For this particular village, the totals indicated that 164 animals, 1.9 carcasses or 229 lbs. of reindeer meat per individual resident, were provided out of the local herd.

Another set of figures covering nine communities, each with its own herd, and with a combined population of 1233 people, indicated that approximately 400 carcasses were used in 1976 for wage-payments. This amounts to a per capita consumption of .32 reindeer or 39 lbs. The general pattern that emerges finds larger herd-owners selling their animals, primarily to stores in Nome and

Kotzebue, and at times making export sales to the contiguous United States, while virtually all herders with fewer than 1000 animals distribute nearly all of their production in their villages. Distribution is accomplished through direct sales or through stores. Native preferences are for reindeer and caribou meat rather than expensive imported beef, pork and chicken. Caribou and reindeer meat are virtually identical in composition and nutritive value (Cooperative Extension Service, 1973).

In 1975, as reported by Alaska Crop and Livestock Reporting Service (1975), the value of all reindeer production in Alaska was estimated to total \$391,500. Of this total, 95.5% was derived from meat production and velvet antler sales, and 4.5% from the sale of hides and other by-products. From 1972-1975, the value of reindeer production increased yearly, with the largest increases coming in 1974 and 1975 (see Table 2). The increased value is attributed in part to increased prices received for meat and for reindeer antler; meat production actually decreased from 1972 through 1974. Against this general state-wide background, total reindeer product sales on the Seward Peninsula for 1976 have been estimated at \$264,740. This represented an increase of \$45,300 over 1975 (see Table 3). The rise in total revenue is generally attributed to increased prices received for meat and antlers. Between 1960 and 1976, the price received for meat increased from 40 to 85 cents per pound. There are a number of reasons suggested in economic theory for this price rise. The following factors have tended to increase consumer demand

Table 2: Value of Reindeer Production-Alaska, 1972 - 1975.

Year	Reindeer Meat		Value of Antler, Hides, Meat and Other By-Products	Total
	Lbs. Produced	Value		
1975	345,000	\$308,000	\$83,500	\$391,500
1974	300,000	205,000	60,000	265,000
1973	324,000	182,000	34,000	216,000
1972	328,000	166,000	49,000	215,000

Source: Alaska Crop and Livestock Reporting Service, Palmer, Alaska (1973a, 1975, 1976).

Table 3: Value of Reindeer Product Sales — Seward Peninsula, 1975 - 1976.

Year	Reindeer Meat Sales		Antler Sales	Total
	Lbs. of Sales	Value		
1976	218,400	\$185,640	\$79,100	\$264,740
1975	211,920	158,940	60,500	219,440

Sources: Herd Owners, Antler Buyers, BLM Case Files.

for reindeer meat by shifting the demand curve: population growth in the region; increased incomes of regional residents due in part to increased transfer payments such as food stamps; resident preference for reindeer and caribou meat; the general price increases for substitutes for these meats; and the demise of the Western Arctic Caribou Herd. State-imposed hunting limits restricted annual harvest from this herd from a previous 14 000 to 3000 in 1976-1977. On the supply side, reindeer, as indicated by pounds of meat sold, has decreased since 1968 when 420 600 pounds of reindeer meat were sold from Seward Peninsula herds.

Reindeer velvet antler is sold for use in oriental medicines. The sale of antler has become increasingly important as a source of revenue for reindeer herders. Over the last few years, production (approximately 15 000 pounds in 1977) has remained fairly stable but the most common received price in 1977 more than doubled that of 1975. The majority of sellers received \$8 per pound in 1977. One herd-owner who used competitive bidding to sell antler received nearly \$24 per pound. The increase in antler price (herd-owners received approximately \$4.60 per pound in 1976) can be largely attributed to greater numbers of buyers in a market which has exhibited little expansion in supply. Antlers are harvested from the middle of June to the middle of July, when the antler is in the development stage and most desired by the buyers.

#### *Reindeer Herders and Social Relationships*

Set against the marketing of reindeer products are the interrelationships between the herd-owner and other village people. Such interrelationships focus in three main areas: 1) the herd-owner and other villager relations that focus on kinship; 2) herd-owner and other villager relations based on extra-kinship considerations; and 3) the relations between the herd-owners themselves. The village orientation of the herd-owner is a major limiting factor in the ability of the reindeer industry to produce and market more meat. On the other hand, it is a fortunate one in that it does serve to restrict owners from herd expansion beyond current range capacity. Most ranges are stocked below current estimated carrying capacities. This situation is the result of a number of factors; perhaps the most significant is the finite production objectives of most owners themselves. While most herd-owners would like to increase their herds, they lack the motivation to actually do so. Small herd-owners are more motivated to increasing their relatively small incomes and satisfying village and personal needs with greater certainty.

From an opportunity-cost perspective, alternate activities are of higher value after some level of herd production has been reached. This orientation is not unlike that in other societies which are organized along domestic modes of production (Sahlins, 1972). Villagers identify and interact with village herd-owners, whose territorial perspective is therefore an important factor in the development of the industry. The Reindeer Herders' Association has not been able to overcome this local orientation which serves to direct much of the industry's activities. Traditional Eskimo culture has always lacked social

mechanisms for permanent non-kinship-based institutional interaction. The current socioeconomic systems are well rooted in the past (Ray, 1964; Burch, 1975).

Historically, Native villages were part of a regional network (Ray, 1964). Each village had a territorial region associated with it, with certain major villages serving as territorial centres and smaller villages occupied on a seasonal basis. Families lived in the larger villages, linked by common residence and varying degrees of kinship. The smaller villages were nearly always occupied by closely related kin. This pattern was closely related to wealth acquisition. According to Burch (1975), major changes took place in the strategies and patterns of affiliation by which a person endeavored to acquire wealth. A decline in natural resources (traditional symbols of wealth) caused people to turn to simple survival rather than the accumulation of wealth. Epidemics and disasters undermined efforts to organize groups of followers sufficient to acquire and maintain wealth. A shift also occurred away from the accumulation of food reserves, to a participation in the developing fur, skin and whale bone trade. This shift placed greater emphasis on relationships with partners and non-Natives and less on kin affiliations (Burch, 1975). This pattern continued for some years. As small traders went out of business in the 1930's, this trade dropped off dramatically and the inducement to live in small family units for trapping purposes ended (Burch, 1975). Settlement patterns again changed as people moved to the mission/school/store villages.

The way in which villagers now acquire wealth in northwestern Alaska has become the same as that dominating the Euro-American society — money buys material possessions which represent wealth (Burch, 1975). In order to acquire money, one must have employment, and this in turn implies associating with non-kin and non-Natives, a rarity in traditional Native culture. Values and expectations inherent in kinship systems have thus changed over time in response to changing environment and social conditions. The values that used to be measured in terms of bowhead whales, walrus and caribou, are no longer viable. The animals have declined dramatically in recent years or their harvests have come under increased governmental control. In turning their attention to other means of surviving and acquiring wealth, people have turned toward market activities and wage-labor employment. This has placed greater importance on outside relations.

The best evidence that the traditional system still predominates, however, rests with the structure of the primary residence unit among Seward Peninsula Natives, the household. The household combines the physical dwelling (itself evolving into a poor copy of the Euro-American style of housing) and the personnel who inhabit the dwelling. Burch (1975) and Carrasco (1963) reported that normal household personnel consisted of related kin rather than the basic nuclear family found with the dominant culture pattern, and this was confirmed during this more recent research. The pattern is essentially one of interacting families, drawing from a wide kindred network. The introduction, and on the surface the apparent acceptance, of



predominantly Euro-American social institutions has not substantially altered this pattern or the traditional village social environment. Such social institutions tend to simply overlie the more traditional structure, giving a picture of a blending of the "old" and the "new." The appearance cannot lead to the conclusion that the Native has become totally market-oriented, or has fully accepted the market-dominated system of the dominant society. The role and value of subsistence activities is well documented.

The role of the reindeer herder varies from village to village. Generally herd-owners tend to be quite typical of other Natives in the region, despite their roles as politicians, entrepreneurs and successful businessmen in the herding industry. Most do aspire to an economically viable herd and the economic security that can accompany this. The variability comes with herd size and the herd-owner's own economic strategy which combines his financial need, political need and personal desires. Most herd-owners interact with non-Natives (e.g., government representatives or Korean antler buyers) more than other natives do. Owners also become major employers for village residents (generally anyone related or viewed as family), and thus are significant forces in regional economies. Throughout all his activities, the herd-owner is still largely guided by traditional relationships (Burch, 1975; Carrasco, 1963), primarily based on kinship relations and obligations, but this may be changing. While a herd-owner relies on his immediate family, a herder's other kin can be called upon to provide labor in herding operations but increasingly with expectations of being paid.

#### SOCIOECONOMICS OF REINDEER HERDING

Reindeer herd management requires a knowledge of reindeer behavior and needs, as well as knowledge of the location, distribution, abundance, and use of the various reindeer foods on any particular range. Herding also presupposes the ability, judgment and experience to move animals safely to the proper range at the right time of day and season. Reindeer husbandry, on the other hand, requires that the herder be skilled in various aspects of reproduction and herd increase. All of these skills must be used in defining the herd plan or explicit goals established by the herder. The herd itself is viewed as a capital asset and represents wealth. Various husbandry practices are combined with conditions of the environment and social, cultural and economic considerations in making virtually all herd management decisions. The knowledge is generally acquired through experience and informal instruction, usually father to son, though women also acquire such knowledge and skill.

While there is great variability in herding practices, each individual being influenced by such idiosyncratic factors as the availability of income, personnel, the exigencies of particular herds, as well as the weather, availability of fuel, buyers and so on, nevertheless a general representation of the yearly round of activities is useful. Such a representation illustrates the activities and associated problems faced by the herder during the course of a year.

Most herders are primarily concerned with generating sufficient income for themselves and their families. Because this is rarely accomplished through herding alone, herders usually combine herding activities with other activities such as subsistence hunting, fishing and gathering, and/or such entrepreneurial enterprises as running community stores, renting houses, or engaging in wage labor. Herding activities are scheduled to minimize conflicts with employment, subsistence activity, seasonality, and the availability of necessary labor. Often, the tasks of herding are combined with those of subsistence pursuits. In such circumstances, compromises are usually reached between the culturally significant subsistence activity and diet, and the demands of the herding operation. The general round of herding activities is thus intricately associated with the annual round of subsistence activities as well. Table 4 summarizes the yearly round of herding activities.

As soon as freeze-up occurs, the herder's mobility expands because of the increasing use of the snow-machine for herding. Typically, two handlings take place between October and April. During this time, herders may be hired to check on the herds and their movements. Such hired hands may be acquired on a more or less constant basis. One handling may occur in the early winter, another in late winter. Available labor, number of animals to be slaughtered, weather and the herder's own work schedule help to determine whether a complete or partial handling will occur. If the handling is for marking purposes, the entire herd must be corralled and ear-marked. If slaughter is the main purpose, a complete round-up is unnecessary. When the herder knows how many animals he has and how many he wants to kill for market, a group may be simply located, driven near to the camp or village and slaughtered on the snow-covered ground.

The early winter handlings are primarily for such slaughtering activities. The animals are considered in prime condition at this time. In late winter, the herder is mostly interested in how many animals he has and whether he can afford to butcher, or he may be interested in the skins. As spring approaches, the herder's mobility is reduced but the reindeer are most apt to move the farthest in searching of grazing areas or for calving activity. Calving, lasting from April to June, is the most critical time of the year for the herder. Calving success will determine the herder's actions over the next year. Newly born animals face the greatest number of hazards at this time: sudden temperature drops, predators, icing, or simply bad weather. Most herders try to be present with their herds during calvings but spring is also the time of intensified subsistence activities which often complete for the herders' time.

During the summer months, as the reindeer move to obtain some relief from insects and heat, some herders take advantage of this movement pattern by constructing corrals in these areas, and making use of powerboats for handling activity. Over the last decade, the summer handlings have taken on greater importance. Developing markets for the velvet antler, particularly in oriental countries, have now resulted in a steady cash income for the herders. To harvest antler, herd are brought together in late June and early July, when the antler is most marketable. Airplanes, helicopters and all-terrain vehicles

have all been used in these round-ups. Some slaughtering, castrating and counting may also occur during these handlings. Following these summer handlings, the herds may not be seen again for one or two months. At this time, the herder relies on chance observations to keep track of a herd's movements. Should there be a demand for meat or hides, a late summer handling might be held.

It has already been mentioned that traditional subsistence activities often conflict with herding activity. For example, in spring, seal hunting, waterfowl hunting and, following break-up, fishing all become important. By early July, or when most of the ice has gone, salmon fishing occupies the time of most people. This activity continues through July and August throughout the area. Berry-picking also becomes a common activity throughout late summer as villagers store hundreds of pounds of various berries and edible plants to eat during the winter months. Using the Kangyikmiut or Buckland River area as representative, Table 5 is provided on traditional subsistence activities. A comparison of this table with Table 4 provides some measure of the major conflict periods.

The primary activities of the herder over the course of the year continue to involve calving, summer velvet antler sales, and slaughtering. In general, this means that the reindeer are usually handled three to four times a year. This round of activity has remained fairly consistent over the years, except for the technological changes which have recently been introduced. Over the last ten years, the Reindeer Herders' Association has assumed more of the coordinating functions of the industry. Now, an Association representative attends almost every handling and assists the herder with the herd tallies. In addition, the Association helps herders with materials and supplies necessary for the construction or repair of corrals and cabins, which have become part of good herd management. Earlier logistic and communication difficulties experienced by herders have been partially alleviated by the installation of telephone systems through the area, the increased use of citizen band radios, and fixed-wing aircraft and helicopter use.

In 1977, herd sizes on the Seward Peninsula fell into one of four categories: less than 1000 reindeer (four herds); between 1000 and 2000 reindeer (five herds averaging 1300 animals); between 2000 and 3000 reindeer (two herds); and over 4000 reindeer (one herd).

The costs of herding include labor, gas and oil, food, airplane charters, and capital investments for snow-machines, corrals and cabins. Labor represents the greatest single production cost for herders. Yearly production costs for herders with typical herds of 600, 1300, 2400 and 4000 animals (the average in each class) in 1977 were estimated at \$11,620, \$23,858, \$33,172, and \$116,200 respectively. The jump in the last category is attributed to the fact that this herding operation employs year-round handlers on a full-time basis. Herd revenues based on meat and antler sales, again for 1977, have been estimated at \$11,400, \$33,540, \$55,296, and \$158,582, respectively. All but the last category received the same price for meat and antler, the last receiving substantially more for its antler as a result of competitive bidding. Based on these figures, a herd of less than 1000 is not economically viable.

**Table 4: Generalized Reindeer Herding and Seasonal Round of Activities.**

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
<b>Biological activities</b>			Spring Migration					Fall Migration				
				calving						rut		
<b>Seasonal hazards</b>				Ravens Bears Foxes Wolves			Insects			Caribou Migrations and Hunters		
<b>Environmental conditions</b>			Crusting snow		Breakup					Freezeup		
<b>Herding activities</b>	Slaughter					Antler Cutting		(Slaughter) Prime Hides			Slaughter Meat and Hide Marketing	

Indicated Primary Slaughtering Times

Table 5: Traditional Subsistence Cycle (Buckland River Areas).

Month	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Activity			Fishing Caribou Hunting			Beluga Hunting		Berrying			Fishing Caribou Hunting	
Location			Upriver (fishing) Downriver (Caribou Corral)			Escholtz Bay				Upriver (fishing)		

(Adapted from Lucier, 1954: 215, In: Ray, 1964: 85)

Regionally, the reindeer industry is a small part of the total economy of northwest Alaska (Kobuk and Nome Labor Market Areas). At the village level, it can represent a major part of the economy. For example, direct employment in reindeer herding accounted for only 0.9% of the total employment in the northwest region in 1976. Regional aggregate personal income for both herd-owners and labor directly employed in herding operations amounted to only \$309,000. For a village however, the case can be quite different. In one representative Seward Peninsula village of some 87 individuals, 15% of the labor force was employed in the reindeer industry. In this same village, a substantial number of other village residents also derived income from part-time work within the industry. Thus a major source of village income was derived from the reindeer industry. The aggregate personal income generated in this village in 1976 amounted to approximately \$18,000, fully one-fourth of which came directly from herding involvements.

Reindeer herding as traditionally practiced in Alaska has been a part of both the subsistence and cash economies because most herd-owners operate on a partial subsistence basis generating minimal profits. Generally, herds have been smaller than would be allowed by their current BLM grazing permits, extensively managed, and often provide only a small surplus over variable production costs. However, it appears that meat production and firm (herd-owner) incomes could increase substantially from existing herds. In 1976, 17 425 reindeer were estimated to be present on the Seward Peninsula. In that same year, the BLM determined the grazing carrying capacity to be 32 000 reindeer. Assuming that all herds expanded to the number allowed, meat production could increase to 800 000 pounds. This figure is 266% above 1976 production levels. Aggregate regional income (based on 1977 product prices) would increase to \$600,000 from the sale of meat and antlers.

These increases would probably necessitate changes in herd management. Baseline range resource research by USDA Soil Conservation Service is providing crucial decision-making information. Specifically, meat production and firm incomes could increase in one of three ways: 1) improved production practices with current herd sizes; 2) expanded herd sizes without improved practices; or 3) greater herd sizes with improved management (see Figure 2). An in-depth presentation of these options is presented in Stern *et al.* (1977).

In exploring these options, it is important to bear in mind that the socioeconomic impacts of any increase, decrease, or stability in herd sizes and operations are not independent of other biological, sociocultural and economic factors. Any change in land usage, ownership or management jurisdiction over lands utilized in the herding industry is tied to numerous government regulations. This means that any change in land use is also tied to such additional concerns as fire control policies, subsistence and wildlife management policy, all-terrain vehicle use, mineral and petrochemical explorations, and development centers and tourism, to name but a few. Not so directly related, but nevertheless just as significant are such factors as population growth and distribution, market value of reindeer meat and by-products, marketing and slaughtering activities, caribou and predation

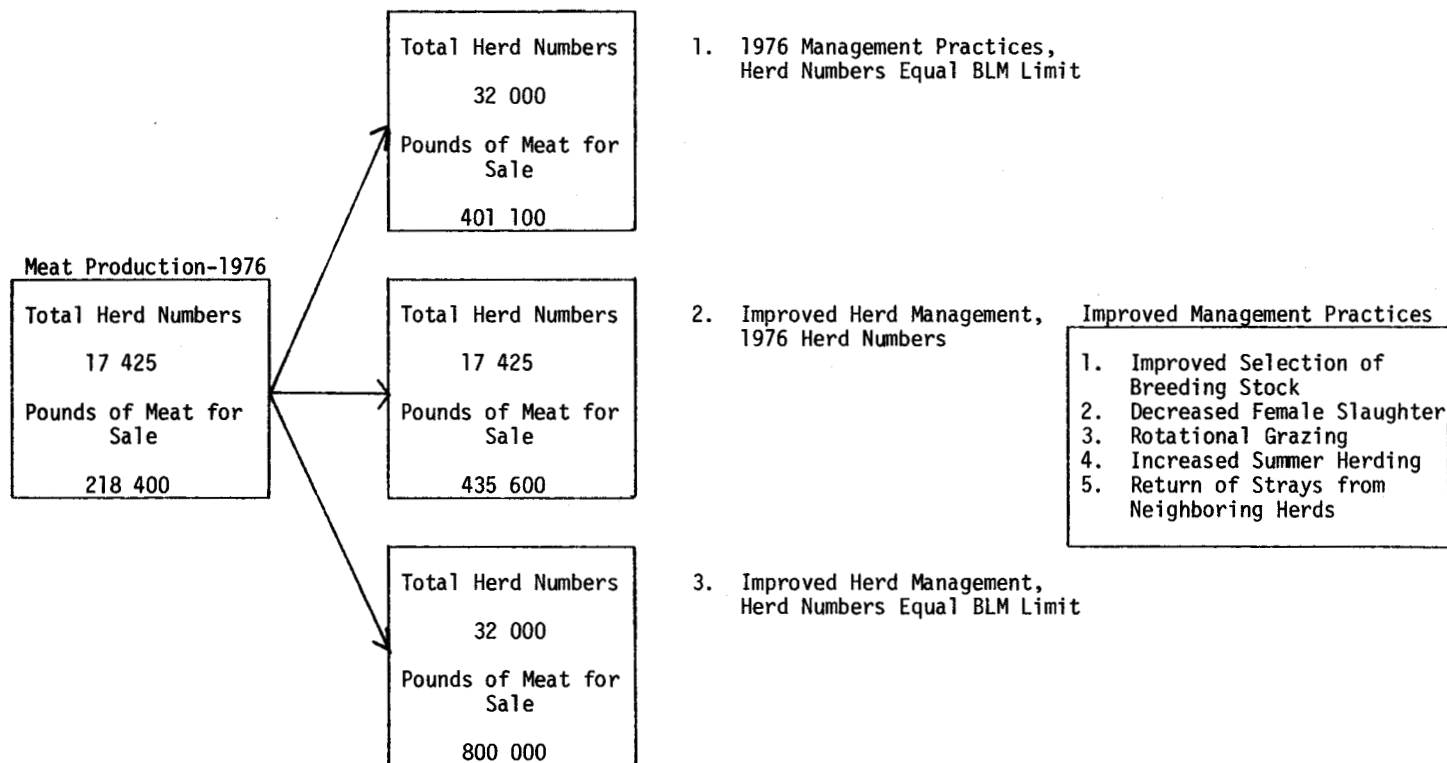


FIG. 2. Potential meat production for sale from Seward Peninsula reindeer herds.

problems, inflation, production costs and gasoline availability, alternative foods, labor opportunities, and policies adopted by the Reindeer Herders' Association. Weather, disease and loss of labor resources with increased acculturation of the young Native are also to be considered.

Given any of the available options, as suggested in Figure 2, there will be impacts to current herding activities and operations. For example, increased production is desired by herd-owners and certainly justified on the basis of economic projections. Increased production can be easily achieved with the application of readily available husbandry techniques. Year-round herding and surveillance, more selective breeding and slaughtering, and the marketing of fawn meat rather than adult reindeer meat would all lead to increased production. The net result would be to make more meat and increased income available on both the individual and community levels. However, such changes require other changes not so desirable. For example, year-round herding would further erode the subsistence activities of the herd-owners and herders. That this part of Native lifestyle is highly prized, and will not be easily relinquished, has already been demonstrated. There would also have to be a change in the eating preferences of the region, as adult reindeer meat is currently preferred over fawn meat. Such considerations permeate every one of the options available in changing herd practices.

Achievement of either increased productivity or increased herd numbers appears unlikely when considering the past history of reindeer production in Alaska. However, the creation of the Native Regional and Village Corporations under the Alaska Native Claims Settlement Act may be a major factor in overcoming past production problems. These corporations have the potential to take over ownership of herds, and have substantially greater financial resources to invest in their individual herds. One regional corporation, NANA, was the largest owner of reindeer according to data from 1977, the base year for this study. Should Native corporation involvement increase, it could change the role of reindeer in the village life of northwestern Alaska.

#### CONCLUSIONS

The picture of reindeer herding which emerges is one based on: 1) the biology and ecology of reindeer, including the limits and possibilities which these imply for the individual herders and government agencies involved with herding operations; 2) the historical continuity within the industry since its introduction into Alaska in 1892; 3) The interplay of restraints on herding within the context of contemporary Native village life; 4) the influence of the market economy on both the herder and consumer of reindeer; and 5) the activities of local, state, and federal government agencies.

It is clear that the government has intended that this industry be a Native one. The goal has been finally realized, but reaching it has left many scars and much bitterness that continue to plague the industry. The period of non-Native ownership was particularly significant in the legacy now shaping the industry's development and future directions. The inconsistency of



government policy and frequently competing interests have left the industry with an uncertain future and made Natives suspicious of proposed actions and policies (Stern *et al.*, 1977: 30-146). It is also clear that despite the many attempts to study the issues and aspects of reindeer herding operations, there has been insufficient communication with the Native herders, and the needs and desires of the herders themselves have been overlooked. Research has done little to change the lot of the herder in any significant way. Based on the authors' research, most of the government policy being proposed would not be supported by herd-owners, the Reindeer Herders' Association, or more importantly, the people of the Seward Peninsula (Stern *et al.*, 1977: 1-4). Changes introduced without adequate alternatives would deprive the people of an important food source, as well as taking away enterprises that individuals have built up over a great many years with the encouragement of the government. It is apparent that any change in the industry would adversely affect the people and economy of the region.

There is little doubt that the reindeer herding industry is a vital part of the social and economic environment on the Seward Peninsula. It has become an integral part of the contemporary lifestyle, integrated into the social organization, culture, values and seasonal round of subsistence activities of most people in the region. For 85 years, it has been the product of historical, cultural and biological forces. While it began as an alternative for those unable to make a living in the traditional way, it has now evolved its own tradition and is valued in the same way as the older subsistence activities, as a supplemental economic activity. Since the 1950's, interest in reindeer herding has increased and more people have become involved in it. In the historical legacy however, forces have combined to confuse the Native herder as to the roles of government agencies and personnel. In the contemporary socioeconomic milieu of the Seward Peninsula, herding provides personal satisfaction and prestige for herd-owners. There are conflicts to be resolved, but by making use of the available resources and opportunities, herding is an aspect of the total adaptation — by individual, household and village — to the arctic environment. The alternative to such adaptation is economic specialization, which does not appear as a viable, long-term adaptive alternative in arctic conditions.

Reindeer herding provides meat, reindeer by-products, income and employment to the people of the area. The industry provides private sector employment in a region where public sector employment is the norm. There are no known alternative industries or activities shown to be as economically and socially compatible or acceptable to the people of the region as herding. It provides employment in an otherwise limited employment situation. Villages have become dependent on their local herds. Current herding practices are rational within this current sociocultural context and economic system of northwestern Alaska. The price received for meat has increased along with personal income levels, consumer preference for reindeer meat over imported meats, and the prices to be paid for such import substitutes. Rising production costs for labor, fuel and equipment tend to maintain small herd operations at marginal levels.

The industry provides a source of high-quality red meat protein as an alternative to imported meats and to local wildlife that has increasingly come under more government control. Reindeer meat has thus become a significant part of the Native diet; in fact, its consumption has steadily increased. While all Natives participate in subsistence activities and in the cash/wage economy to some degree, herding provides a primary means of income. Most conflicts resulting from competition between herding and subsistence activities could be resolved by planned herd movement (relocations) and rotational grazing.

The abstract concept of the acculturation process refers to economic, social and psychological change resulting from accommodation to one culture by the members of another, especially in the areas of technology, economics and values. Natives have been undergoing acculturation for many years and this process will continue, spurred along by numerous actions, activities and events such as the Alaska Native Claims Settlement Act. A great many activities and events have combined to give rise to what can only be termed a class system among Natives themselves. As herd-owners and herders gain more experience in dealing with federal and state agencies, and as the Reindeer Herders' Association gains experience and increases its efficiency, this process will continue and even be accelerated somewhat. Although the federal agencies prefer to believe they are not contributing to this culture change and acculturation process, in fact they are. The very presence of agencies and agency personnel cannot but affect the lives of the Natives. This is certainly true where extra-village and regional orientations to problem solving are increasing.

The larger reindeer herding operations have some probability for success, but success will depend on improvements in current herding practices. As with smaller herd-owners, any changes made will be in direct conflict with tradition, government policies, and perhaps the desires of the people themselves. What happens with regard to antler sales, meat sales, the rate of Native acculturation, and natural catastrophes within the environment will all affect the ultimate direction of this Native industry.

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