ESKIMOS, REINDEER, AND LAND

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Preface

The following report is based on an interdisciplinary research study undertaken to investigate the social, economic, and cultural aspects of reindeer herding in northwestern Alaska. The project was funded by the National Park Service, U.S. Department of the Interior, and carried out by staff of the University of Alaska, Fairbanks. The primary purpose of the research project was to gather data on the past and present reindeer herding practices of the region, but also to seek information on herding and land uses, the future potential of this essentially Native industry, and its impacts on the people and economy of the area. Such a study was deemed essential – to assess the potential impacts of any policy changes or land management decisions which might stem from pending legislation to create new national interest lands in the region. This report responds to those needs as outlined in the contract between the University of Alaska, Fairbanks, and the National Park Service. The entire history of reindeer herding in the region is treated in the report, as well as the social, cultural, and economic aspects of the industry, at present and given changes in certain of the variables identified as crucial in its continued operation.

There are many significant socioeconomic aspects of reindeer herding; these are addressed in Chapters VI, VII, VIII, and IX of this report. The sociocultural analysis of reindeer herding (Chapter VI) examines the relationship between the social structure of the village and the reindeer herd owner who is a member of that village. For Eskimo villagers, ties of kinship and friendship have obligatory behaviors connected with them. In this regard, the herd–owner's role in the village, his status, his authority, and his role as an agent of cultural change, an employer, and a politician are all examined. Conceptually different from the sociocultural analysis, but intimately allied with it, is the economic analysis (Chapters VII and VIII) of the reindeer industry. The economic field data and related social data bearing on the economy were analyzed using relevant economic theory.

Firm and consumer activity was explored to provide insight into economic decision making regarding reindeer. Chapter IX investigates the effects of changing land ownership or management of reindeer grazing lands or reindeer herding. Potential conflicts between reindeer herding and subsistence, wildlife, fire–control, aircraft, and all terrain vehicles are identified and possible mitigating measures provided. The picture of reindeer herding which emerges from this study is one based on: 1) the biology and ecology of the reindeer, to include the limits and possibilities which these imply for Native herders and federal agencies; 2) the historical continuity of reindeer herding since its introduction to mainland Alaska in 1892; 3) the interplay of restraints on reindeer herding in the cultural milieu of contemporary 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 governments, particularly as they relate to reindeer herding and the ownership and management of grazing land.

Except for Chapter IX, the material in this study is based on research which ended in late 1977 and should provide an accurate picture of reindeer herding through that year. Where possible, material published after 1977 has been included in an attempt to update the analysis. Chapter IX was completed in 1980 and covers most of the major issues dealing with reindeer herding and land management between 1978 and 1980.

Many individuals and organizations have contributed in both tangible and intangible ways to the completion of this research. We especially thank the reindeer herders of the Seward Peninsula and the surrounding region who willingly gave of their time and knowledge to the research. We single out both Dan Karmum, Coordinator of the Reindeer Herders Association, and Clifford Weyiouanna, President of the Reindeer Herders Association, who were particularly helpful. The staffs of the Institute of Arctic Biology, Agricultural Experiment Station, and Anthropology Program of the University of Alaska contributed in many ways. Thanks to Bill Workman and Jack Luick of the Agricultural Experiment Station and Institute of Arctic Biology, respectively, University of Alaska for reviewing several chapters. The personnel of several agencies also assisted the researchers during the execution of this research. These agencies include the Bureau of Land Management, National Park Service, United States Fish & Wildlife Service, and the Bureau of Indian Affairs. Financial support for the publication of this study was provided by the Alaska Humanities Forum; Agricultural Experiment Station, University of Alaska; National Park Service; and the Bureau of Indian Affairs.

Chapter I
Introduction

The Alaska Native Claims Settlement Act of 1971 (ANCSA), Public Law 92–203, directed the Secretary of the Interior to withdraw up to 80 million acres of public lands under Section 17 d(2) of the Act. These lands were to be considered as possible additions to, or for the creation of units in, the National Park, National Wildlife Refuge, National Forest, and National Wild and Scenic River Systems. Agencies of the Departments of the Interior and Agriculture prepared recommendations for d(2) proposals. Four of the proposed areas were in northwestern Alaska where reindeer herding has been an important feature of the economy of the people for many years. Under d(2) legislation proposed by Morris Udall (H.R. 39), a Chukchi–Imuruk National Monument on the Seward Peninsula and a Cape Krusenstern National Monument at Cape Krusenstern, to be managed by the National Park Service, were proposed. A Noatak National Preserve, to be managed by the National Park Service, with assistance on request from the United States Fish and Wildlife Service in the administration of wildlife resources, was proposed for a large portion of the Noatak River basin. A Selawik National Wildlife Refuge was proposed above the village of Selawik in the Selawik River basin. In northwestern Alaska, enactment of any or all of these proposals would have a profound effect on the reindeer–herding industry's current status and future. Accordingly, the National Park Service contracted with the University of Alaska, Fairbanks, to conduct research on the socioeconomic status of reindeer herding in northwestern Alaska and provide basic data for the management of reindeer grazing. This report contains the results of that research.

Research was concentrated on the four northwest Alaska proposal areas as described in H.R. 39 (introduced January 4, 1977). The investigators recognize that these proposals were changed as a consequence of d(2) hearings in the Congress of the United States. Keeping track of all the changes and counter–proposals was not possible in all cases during the course of research; thus, for the purposes of this report, the four areas as originally defined were emphasized. In total area, the four proposals included some twelve million acres of land. These proposal areas and adjoining regions supported vast numbers of reindeer in the past but currently only the Seward Peninsula has large numbers of reindeer (see Figure 1). In this report we concentrate on the contemporary activities on the Seward Peninsula, emphasizing the historical aspects of reindeer herding throughout northwestern Alaska as well.

As work was being completed on this report, the 96th Congress finally passed d(2) legislation after years of struggle. The four areas used as a basis for this study remained essentially the same in the bill passed by the Congress and signed by the President on December 2, 1980. One significant change, however, was the replacement of the proposed Chukchi–Imuruk National Monument on the Seward Peninsula with the Bering Land Bridge National Preserve.

The first stage in the research program was to identify all the available literature on the social, economic, historic, and cultural aspects of reindeer herding in northwestern Alaska. An annotated bibliography of these sources was prepared (Stern, 1977) as part of this research project. A review of this literature leads to the suggestion that reindeer herding has not contributed its full potential to the economy of rural Alaska for a number of reasons, examined herein. Despite the tremendous number of published articles, books, and reports, and a wealth of unpublished materials that are available, no comprehensive historical summary and analysis of the reindeer industry in Alaska exists. Such a summary and analysis is provided here.

During the second stage in the research program, extended periods of resident field research were conducted by the investigators. Richard O. Stern undertook an extended period of resident research in the Seward Peninsula region from December, 1976, until the beginning of September, 1977. At various times, the other investigators undertook field research with the reindeer herders for periods lasting up to six weeks at a time. The fieldwork portion of the research concentrated on collecting data on significant variables which were identified by the researchers during the examination of the written sources; in addition, we evaluated the contribution which could be gained from securing these data.

Chapter II
Reindeer biology and ecology

Our primary concern is with the socioeconomic aspects of reindeer herding, therefore the discussion below concerning reindeer and ecology will be only a general one, and is presented in order to place the human interactions with reindeer in their proper biological perspective. Reindeer biology and ecology have been researched extensively, but few biologists would state that a perfect understanding of all aspects of reindeer biology, ethology, and ecology exists. The relationship of reindeer to their range, feeding preferences and tolerances, the function of antler in feeding adaptations, the ecology of fire in range

regeneration and succession, and the growth dynamics of reindeer under various feeding regimes are but a few of the problems which remain to be investigated. Current research efforts are being directed towards the resolution of some of these questions. A number of useful sources exist which present in more detail the information which is abstracted here (Luick et al., 1975; Pegau, 1968, 1970a, 1970b; Skoog, 1968; Zhigunov, 1968; Espmark, 1964a, 1964b, 1971; Stern, 1977; Courtwright, 1959; and Klein, 1970, 1971).

Reindeer biology and life cycle

Reindeer are the domestic or semidomestic form of the animal *Rangifer tarandus* spp. In North America, reindeer in the wild are usually called caribou. In Siberia and Scandinavia, the term "reindeer" usually refers to animals kept under human control (i.e. domesticated), while "wild reindeer" is the term used to distinguish those animals which roam unherded in the wild. The Saame (Lapp) term for such wild, unmarked reindeer is peurat (Ingold, 1976). Following Skoog (1968), domesticated reindeer will be referred to in this chapter as "reindeer," and the wild reindeer will be referred to as "caribou." There are relatively few differences in behavior and morphology that allow one to distinguish between reindeer and caribou. A general trend toward smaller size in reindeer may be viewed as part of the overall trend toward smaller animal size in domesticated animals. An alternative explanation is that the trend results from human attempts to maximize herd size by controlling their movements, protecting them from the natural selection forces of predators, disease, and parasites, as well as manipulating the genetics of reproduction through husbandry techniques to enhance survival. Pelage also varies between reindeer and caribou, with reindeer tending to be lighter in color spotted more often than caribou.

The natural life span of reindeer varies from ten to fifteen years. Cows are usually fertile by their second year, some becoming so by sixteen months. Sexual maturity in bulls is likewise reached by the second year. Cows remain fertile up to ten years. After the tenth year, successful pregnancies decrease as the cow becomes less able to forage successfully during winter and spring pregnancy. Some bulls can lose their potency after a few years while others remain fertile for at least ten years. A single bull can impregnate twenty or more cows during the rutting season. Bull–to–cow ratio is one of the most important factors in herd management.

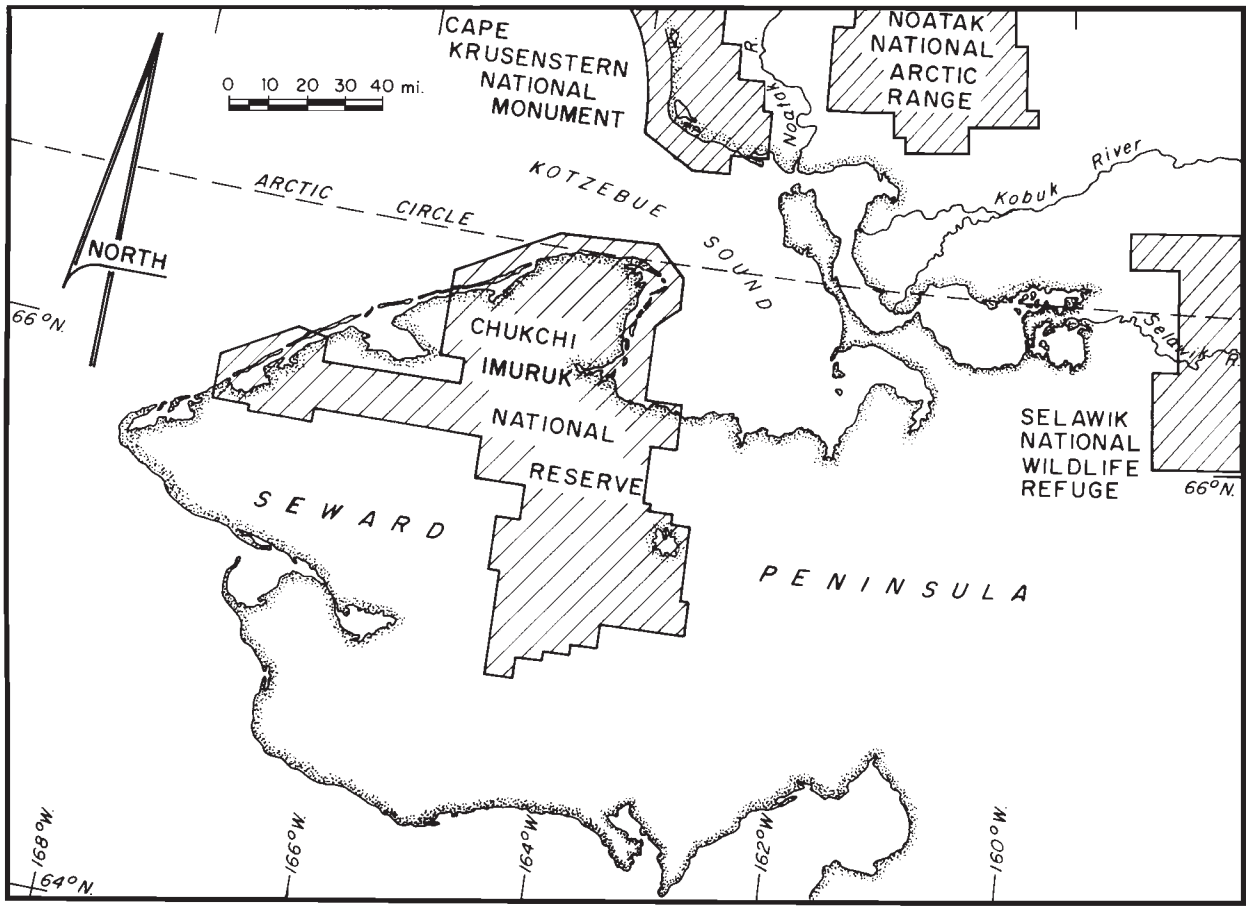


FIGURE 1. Northwestern Alaska d(2) proposals by Secretary of the Interior Rogers B. Morton, 1974.

For convenience in describing the yearly cycle of activities and events in a reindeer herd, we will begin in the early spring as the herd is beginning its movement to the calving grounds. Pregnant cows move instinctively to the same calving grounds year after year from their winter ranges. In caribou, this spring migration of up to tens of thousands of animals has generated the popular conception of long annual treks by the animals. In general, reindeer migrate less than caribou. In mid–April, calving begins and continues through May. A single calf is born to most cows every spring. Late winter and spring are critical times for the reindeer, the long winter having depleted the animal's health and body fat reserves. Calving may still occur during sub–zero temperatures. Predators such as wolves, bears, foxes, and ravens may kill many animals or frighten and scatter the herds. An early rainfall with a sudden drop in temperature may cause ice conditions on top of the snow that reindeer cannot break through to reach the plants below. Soft snow makes travelling difficult for the animals. After birth and as summer approaches, the newborn calves and their mothers tend to separate briefly from the herd, during which time the calf apparently learns to recognize its mother. The hot summer months on the tundra bring on swarms of warble flies, mosquitoes, blackflies, and other flying insects which harass the herds. At this time, the reindeer move to high, windy places such as ridge–tops, or to the cooler, breezier shores of lakes or the ocean to seek relief.

During the summer, antlers are regrown, having been dropped during the winter by bulls and in the spring by steers, barren females, and yearlings. Pregnant females usually retain their antlers until after parturition (Espmark, 1971). By July, the new antler is fully developed, although the internal mass of spongy tissue does not fully harden until fall. In July, the antlers are covered by a soft, furry material which resembles velvet, thus giving rise to the term "velvet antler" for this stage in their development. The velvet on the antlers dies and is rubbed off during late summer and fall. The winter coat of the reindeer also tends to be shed during late spring and early summer. Underlying the old winter coat is a new growth of shorter, thick black hair. This hair grows during the summer months while the reindeer feed on nutritious summer forage plants and achieves their greatest weight gains.

As fall approaches, the reindeer tend to move inland toward more sheltered areas. As rutting season approaches, the groups of reindeer that have scattered throughout the yearly cycle tend to regroup. In northwest Alaska, rut begins in September and lasts into October, occurring when the antlers of the males have grown to their largest size. Reindeer are the most difficult to handle at this time of year. The bulls gather "harems" of cows around them, while castrated males tend to form groups by themselves (Espmark, 1964a). However, during the winter, bulls and steers tend to group together to graze while the cows with their calves graze together. Favorite wintering areas tend to be in open forest with loose snow and on the windswept slopes of hills where ample forage is available.

Forage requirements and carrying capacity

Reindeer (and caribou) eat various lichens during the winter and early spring. In summer, various grasses, marsh plants, and the leaves of birch and willow become included in the diet. Mushrooms and occasionally small mammals and bird eggs are eaten (Skoog, 1968). Lichens are extremely brittle when dry in the summer, and they can be easily damaged when reindeer walk on them. When lichen ranges are overgrazed or burned, the regeneration process may require 20 to 40 years or longer. Thus, the availability of food resources can vary seasonally and regionally for reindeer, a condition that can also extend over a long period of time. The relationship between reindeer and their food resources is a critical factor in herd survival. The relationship between reindeer growth, nutrition, reproduction, and mortality is still imperfectly understood.

The carrying capacity of reindeer ranges is currently thought to be determined by the amount and quality of available winter–range lichens. These winter ranges are limited compared with summer ranges. The lichens that dominate these ranges can grow extremely slowly, as noted by Pegau (1968, 1970a, 1970b), and are thought to be more susceptible to overgrazing vis a vis summer forage. When lichens are overgrazed, burned, trampled, or otherwise damaged, regrowth can take decades.

Antler growth and function

Reindeer are social animals, and within the herd are a number of hierarchically ordered groups. Individual animals tend to recognize others within their own group. Reindeer are unique among the Cervidae (deer) family in that both males and females grow antlers. These antlers are postulated to play a key role in the status of an individual animal. Body size, age, strength, sex, and season are also factors. During the winter, the various age–sex classes shed their antlers at different times with pregnant females the last to drop their antlers. Dominant animals tend to control access to the best grazing locations, and in winter, when animals have to paw through 40 to 80 cm (17 to 34 inches) of snow to reach forage, a dominant animal using its antlers and body action can displace a subordinate one

at the feeding craters. Antler retention by pregnant females during late winter, a time of forage scarcity, may thus be an important adaptive feature and a significant factor in the dominance hierarchy, since it allows them access to the best available forage (Espmark, 1964b). The possible biological effects of antler harvesting by man are being investigated by the Institute of Arctic Biology, University of Alaska (Luick, 1977). Of particular concern is the impact of such harvesting on bulls' performance during the breeding season and on the recognition of their mothers by calves (Espmark, 1971).

Reindeer ecology

Reindeer–herd management requires a knowledge of both reindeer behavior and needs, as well as a knowledge of the location, distribution, abundance, and use of the various reindeer foods on any particular range. A useful distinction exists between herding and husbandry (Paine, 1964, 1972). Herding includes all the knowledge outlined above, plus the ability, judgment, and experience to move the animals safely to the proper range at the right time of the day or season. Husbandry on the other hand includes another set of skills concerned with reindeer reproduction and herd increase. The herd owner uses all these skills together to execute a plan or implicit set of goals in herd management. As a husbander, the owner views the herd as a capital asset, one which can be nurtured towards future security and which represents wealth. Decisions which the herder/ owner must make in the husbandry context include: how many bulls to castrate to raise as marketable steers; how many steers, bulls, old cows to slaughter; optimal bull–to–cow ratios necessary to assure herd increase; calving mortality; elimination of diseased stock; and range conditions. The owner/ herder must also consider a number of other environmental, economic, and social considerations and factors. Throughout this report, management will be used to refer to both of these allied concepts of herding and husbandry.

Referring to the Kautokeino Lapps of northern Norway, Paine (1972) suggests that husbandry decisions can be thought of as:

Alternative allocations of reindeer capital:

a) Minimal necessary allocation of male animals as draft animals: castration;

b) Selective allocation of animals to the realization of cultural values, in particular the provision of outer clothing where premium is placed on color and other qualities of the skins: slaughter (both males and females); and

c) Allocation of animals to the realization of liquid capital, i.e. money: retention of maximum number of females as breeding animals and also of a select number of stud bulls; marketing of male animals. (Paine, 1972).

In cultures which have long traditions of reindeer herding, such as those of the Lapps or the Chukchi, there is a distinct age separation among herders in the herding and husbandry branches of knowledge. Almost every man is a herder of greater or lesser ability. Only some men manage to develop their herds through the application of husbandry knowledge and skills so that their herds grow. Young men and boys rapidly acquire herding knowledge and abilities through experience and informal instruction. Women and girls can also acquire such knowledge and skills. The skills in husbandry, however, rest with older men who have acquired their own herds and built them up over time. As their vigor to herd animals declines, their social status, political power, and decision–making abilities increase. Leeds (1965) has drawn attention to the almost "embarrassing neatness of fit" between Chukchi social institutions and the ecological demands placed upon a mobile, reindeer–herding society.

On the Seward Peninsula, the reindeer herd owners do make use of their knowledge of the biology and ecology of reindeer to manage their herds. For example, the knowledge that different age–sex classes of animals tend to group together at various times of the year is used to decide when and how much effort will be required to round up animals for the purposes of corralling, butchering, and castrating. Groups of animals may also be brought together or dispersed under the owners' supervision according to plans for rotational grazing of particular areas of range. With the current extensive herding practices on Seward Peninsula, groups of bulls often roam unmarked but not unaccounted for by herders. These bulls no doubt service females during the rut, allowing the herd owners to maintain lower bull–to cow ratios in their tended and fully counted herds. An examination of the seasonal round of the reindeer owners of Seward Peninsula demonstrates further how they utilize biological and ecological knowledge.

Generalized yearly herding activity

Throughout this report, great emphasis is placed on variability in herd management practices. Consequently, a generalized yearly round of contemporary herding activities does not really apply to the particular activities of any one herd owner. Individual herding and husbandry decisions are influenced by idiosyncratic factors, such as availability of other income and/or personnel to assist, and by exigencies of particular herds. Herding decisions are also influenced by factors beyond the individual's control, such as weather, availability of fuel, and availability of a buyer and his laborers for the summer handling/velvet–antler cutting. Be that as it may, a general round of activities is presented for

the purpose of illustrating the activities and associated problems faced by the herd owner during the course of the year.

Herd owners are primarily concerned with generating enough income in order to secure food for themselves and their families. Herding is usually combined with other activities during the course of the year to produce such income. These other activities include: subsistence hunting, fishing, and gathering; entrepreneurial enterprises such as stores and housing rentals; and wage labor.

Herding activities are therefore scheduled to minimize conflicts with employment, subsistence activities, seasonal variations in weather, and necessary labor. Every herd owner and his family participates in some subsistence hunting, fishing, and gathering activity to a greater or lesser degree. Often, reindeer–herding/husbandry tasks are combined with subsistence–related activities, as for example during late summer butcherings when the family will pick berries and fish while the herd owner attends to locating and butchering the animals. During winter–herding activities, the herders may hunt for ptarmigan, rabbits, and furbearers, or set traps and snares for small game and predators. In the spring, following months of winter isolation indoors, when warmer weather and longer daylight hours combine to make outdoor living extremely attractive, herd owners are torn between going hunting and looking after their herds. A compromise is often reached, as the meat and oil furnished by seal, walrus, whale, and beluga hunting is a culturally important part of the diet. No family likes to rely solely on reindeer meat or store–bought foods when the "native foods" (nikipiak) are available from the land and sea. The general round of activities associated with herding is provided in Table 1.

As shown in the table, as soon as freeze–up occurs (when fresh and salt water bodies are frozen solidly enough to travel on) and there is solid snow cover, the herder's mobility increases. At the same time herder mobility is increasing, the reindeer are sometimes restricted in their movements because of the snow and the difficulty encountered in moving across ice. Some herd owners travel by snow machine on a regular basis to check their herds throughout the winter. During the winter months, a herd owner may hire one or two men to stay more or less constantly with his reindeer. These herders live in cabins located throughout the herd owner's range, or occasionally they simply camp out of doors. One herd, which has a rotational grazing plan and is also the largest herd on Seward Peninsula, is tended by full–time herders on a continual basis during the winter. These herders are supplied regularly by airplane by another one of the herders who is an airplane owner/pilot. Another herd owner who has recently acquired a small plane intends to use it to scout for his herd and then radio its location to his herders.

Often, two handlings take place during the winter months, from October to April. One handling may occur in the early winter, sometime between October and December. The other is a late–winter handling in February or March. The availability of labor, the number of animals to be slaughtered, the weather, and the herd owner's own work–schedule are factors which determine whether or not to round up completely or just to butcher during such handlings. Depending on the reasons for the handling, the entire herd may not be rounded up or corralled. If the primary purpose of the handling is to mark deer for identification, then the entire herd needs to be rounded up, put through the corral, and branded by ear marks. Each herd owner has his own ear mark pattern to identify his animals. If the main purpose is to butcher a certain number of animals for market, however, a complete roundup is not necessary.

Table 1. *Generalized reindeer herding and seasonal round of activities.*

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Biological events			Spring migration					Fall migration				
				Calving					Rut			
Seasonal hazards				Ravens, Bears, Foxes, Wolves			Insects		Caribou migrations and hunters			
Environmental hazards			Crusting snow		Breakup				Freezeup			
Herding activity	Slaughter**					Antler cutting		(Slaughter) Prime hides			Slaughter** Meat marketing, hides	

** Indicates primary slaughtering times

The herd owner knows how many animals he has and how many he wants to slaughter for the market. A group may be located, driven by snow machines to either near the village or a herd owner's camp, and slaughtered on the snow–covered ground.

The primary reason for the early–winter handlings is to slaughter animals for the market. It is at this time of year that the animals are in prime condition for marketing their meat. In the late–winter handling, the herd owner may be concerned with knowing how many animals he can afford to butcher for the market, and thus may simply put the animals through the corral in order to count and mark them, and make such a determination. Hides are in the best condition in early winter for bedding, and in late winter for mukluk pieces and craft sewing.

In the spring (May–June), soft snow conditions, overflow water on the rivers, and the coming of breakup greatly reduces the herder's mobility. Snow machines are not so efficient under such conditions. At the same time, the reindeer are inclined to travel farther, moving from the winter grazing areas to the traditional calving grounds.

The calving season, which lasts from about April 15 to June 1, is the most critical time of the year for the herd owner. The calving success of his herd will determine his course of action for the next year, and will affect his plans for butchering, herding, and husbandry. Subzero spring temperatures, predators, bad weather, and icing are all hazards to the new born calf. Most herd owners try to be present with the herd as much as possible during this period, but spring is also a time of intensification of subsistence–related activities.

For a newly established herd, the first two calving seasons are the most difficult for the herd owner. Prior to actual calving, females will instinctively try to migrate to their traditional calving grounds. These are between 10 and 50 miles apart on Seward Peninsula ranges. If the new herd owner can hold his animals on their new range at this critical period, the females will come to accept it as their new calving ground after a couple of years. The historical record is full of stories of newly established herds which left their assigned ranges and returned to the customary calving grounds.

During the summer, the reindeer tend to move along the coast or lakes, where a breeze provides some relief from the insects and heat. Herd owners take advantage of this movement toward coastal locations by utilizing corrals along coasts and rivers which are easily accessible by power boats.

Reindeer herding sometimes conflicts with the subsistence activities of northwest Alaskan Eskimos. For example, in the spring, seal hunting, waterfowl hunting, and, after break–up, fishing are all important activities. Beluga (white whale) and seal hunting continue into late June. By early July, most of the sea ice is gone; and commercial salmon fishing and subsistence fishing in the Kotzebue Sound area and southern Seward Peninsula occupy many people's time in July and August. Berry–picking trips are also common throughout the late summer. Some villagers store hundreds of pounds of salmonberries, blueberries, crowberries, and other edible plants to eat during the winter months. (The traditional yearly round of subsistence activity, based on the Kangyikmiut, Buckland River, area, is provided in Table 2.)

In the last decade, the summer handlings have taken on a new importance for the herd owners. The sale of velvet antlers to Oriental buyers provides a quick source of cash income. To harvest the antler, the herd owners round up their animals in late June and early July, well after the calving season. In the past couple of years, one major antler buyer has supplied a small helicopter and labor to assist in the roundups. Travel across the wet, uneven tundra is difficult at this time of year. Some all–terrain vehicles are used by some of the herd owners; however, the machines' reliability are not as good as desired. In the summer of 1977, most summer roundups to bring the reindeer into the corrals have been done on foot after the antler buyer's helicopter located and drove the herds to the mouth of the corral. In addition to the antler cutting during summer roundups, some castrating, marking, and butchering takes place. After the summer handling, the herds may not be seen again for one or two months or until August or September. Most herd owners do deep track of their herd's location during the summer,

Table 2. *Traditional subsistence cycle (Buckland River area).*

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Activity	Fishing									Fishing		
	Caribou hunting									Caribou hunting		
						Beluga hunting						
								Berrying				
Location	Upriver (fishing)									Upriver (fishing)		
	Downriver (caribou corral)											
						Escholtz Bay						

(adapted from Lucier 1954, In: Ray 1964)

relying on reports from charter pilots flying between villages, their own observations while on subsistence–related travels, and reports of other villagers who have seen some animals during their own travels. Depending on the owner, market needs, and available labor, a late–summer butchering may take place. The hides are prime in the late summer/early fall for clothing, and the animal fat, a culturally desirable part of the animal, is most copious just before the cold winter months.

Over the last ten years, the Reindeer Herders Association has taken over many coordinating functions from the Bureau of Indian Affairs (BIA). An association representative usually attends every handling and keeps tallies of the various owners' animals. In addition, supplies may be brought by the association representative for the construction and repair of corrals and cabins necessary for herd management. The logistics and communications of roundups have been made easier with the installation of usually reliable phone systems in the villages and the increasing use of citizens' band (CB) radios between villages, camps, boats, and snow machines.

Today, the major activities for the reindeer owner over the course of the year involve calving, summer velvet–antler sales, winter corralings to count and mark animals, and winter and sometimes a summer, butchering for marketing reindeer meat. In general, the reindeer are handled three to four times a year, while at the same time the herd owner may find himself in conflict with his other economic activities.

Chapter III
Introduction of reindeer herding in Alaska

General historical summary

Reindeer herding in Alaska has gone through three major stages of development. During the first stage, from 1892 to 1914, the industry was introduced to mainland Alaska and experienced its early growth. At this time, the ownership of reindeer was largely confined to the government, missions, individual Lapps, and Eskimos. Beginning in 1914, the non–Native ownership of reindeer increased and a period of commercial exploitation of reindeer began which would last until 1939. Since 1940, ownership of reindeer has been restricted to Alaskan Natives, commercial exploitation has been relatively unimportant up to the last ten years or so, and government efforts have been directed at establishing a self–sustaining Native enterprise (Lantis, 1950; Olson, 1969).

Since the 19th century, the Eskimos of northwestern Alaska have been exposed to a number of Euro–American influences. These resulted from contacts with whalers, missionaries, government employees, and non–Native settlers who introduced changes in the lives of the people in the form of new technology and new ideas. Significant changes in the traditional hunting cycle, settlement pattern, social organization, and population size and distribution of all Eskimo groups in northwest Alaska were initiated during the period from 1850 to 1890 (Burch, 1975; Ray, 1975). In the years following the passage of the Organic Act of 1884, there was a marked increase in the number of whites entering the Territory of Alaska. While the Organic Act had provided for a civil government in Alaska, the remote Territory experienced minimal administrative attention during its earlier years due to inadequate appropriations for such service and its remoteness from the continental United States. In addition to the American whalers and those of other nations along the western coast, Revenue Service personnel, government teachers of the Bureau of Education, and missionaries also found their way into northwestern Alaska during this period. In addition, traders, miners, and others made their way to northwestern Alaska for varying lengths of time before (and after) reindeer were first brought to Alaska in 1891 and located on the islands of Amnaknak and Unalaska. The increased pressure on the natural food resources of the Eskimos by these newcomers has often been cited as the rationale for importing the reindeer into Alaska.

Reindeer were first imported from Siberia by the Reverend Sheldon Jackson, General Agent for Education in Alaska, in 1891 on a trial basis for the avowed purpose of providing a stable food supply for the Native inhabitants. The Bureau of Education was initially charged with distributing the reindeer among the Natives of northwestern Alaska. The first year's successful importation of reindeer demonstrated that obtaining and shipping them from Siberia was feasible and in 1892 reindeer were first shipped to mainland Alaska. Congressional appropriations were then obtained for subsequent years. Some $158,000 was spent on the importation, purchase, and administration of reindeer between 1893 and 1903.

During the decade 1892 to 1902, the United States Government imported some 1,280 reindeer into Alaska from Siberia. By the time the Czarist government forbade any more exports in 1902, there were some 5,148 reindeer in Alaska, resulting from the importations and natural increase. The Reverend Sheldon Jackson pursued a policy of placing the reindeer into the hands of the mission churches, for their use and subsequent distributions to the Natives. Lapps were brought from Scandinavia to teach reindeer herding to the Alaskan Eskimos, and by the early 1900s they owned a large proportion of

the reindeer. A 1906 investigation by the Department of the Interior resulted in Jackson's leaving office and a different Bureau of Education policy regarding reindeer ownership and distribution. One of the central goals of the new policy was to place more reindeer directly into the hands of Native owners.

By 1916, there were over 1,200 Eskimo herd owners in Alaska; however, the average herd size amounted to less than 50 reindeer per owner. Range problems were also beginning to appear and many small herds mingled and strayed. Native ownership of reindeer actually began to increase shortly after the gold–mining industry boom was over on the Seward Peninsula. For the most part, the Lapps and the mission churches, and not the Eskimos themselves, profited most from the sale of reindeer to mining camps and prospectors and from the freighting of the miners' outfits. By 1920, the local markets had decreased substantially and, with them, the financial rewards of herding. Observers also report a deterioration of range quality by this time due to over–grazing. The coastal strip ten or so miles wide and the areas nearest the villages were badly deteriorated (Lantis, 1950). In the 1920s, extensive white ownership of reindeer, particularly by the Lomens who were involved in various enterprises, caused some economic conflicts and many range disputes with Natives. Reindeer ownership and accounting had become major concerns of the Bureau of Education by 1929. In that year, reindeer administration in Alaska was placed in the hands of the Governor's Office. Between 1920 and 1929, the Lomens exported considerable amounts of reindeer meat to markets in the continental United States, a practice that ended with the start of the Great Depression, as did the plans for implementing major administrative changes within the Reindeer Service.

The situation deteriorated rapidly between 1929 and 1937. While the Lomens lobbied actively for favorable range regulations, marketing privileges, and the settlement of disputes in reindeer matters, the depression caused them to lose their export market. Decreasing fur prices and lower incomes from trapping, combined with excess numbers of Native–owned reindeer, drove the local demand for reindeer down. By 1937, reindeer were slaughtered but not purchased, range deterioration was a clear problem, disease and predators were taking large numbers of animals, and Native interest in herding declined. Responsibility for the Reindeer Service was transferred to the Bureau of Indian Affairs in 1937. Herds continued to increase through the early 1930s. In 1932, an estimated 640,000 reindeer existed in Alaska, a figure that was to decrease to 250,000 over the next eight years. By 1950, only an estimated 25,000 reindeer remained.

The Reindeer Act of 1937 was the culmination of efforts to resolve the problems with reindeer which had developed over the preceding decade. The act restricted ownership to Natives, provided for government aid, and authorized appropriations for the purchase of all reindeer and improvements owned by non–Natives. The actual purchase was completed in 1940. During both World War II and the postwar recovery period, little attention was paid to the declining industry and remote people in northwest

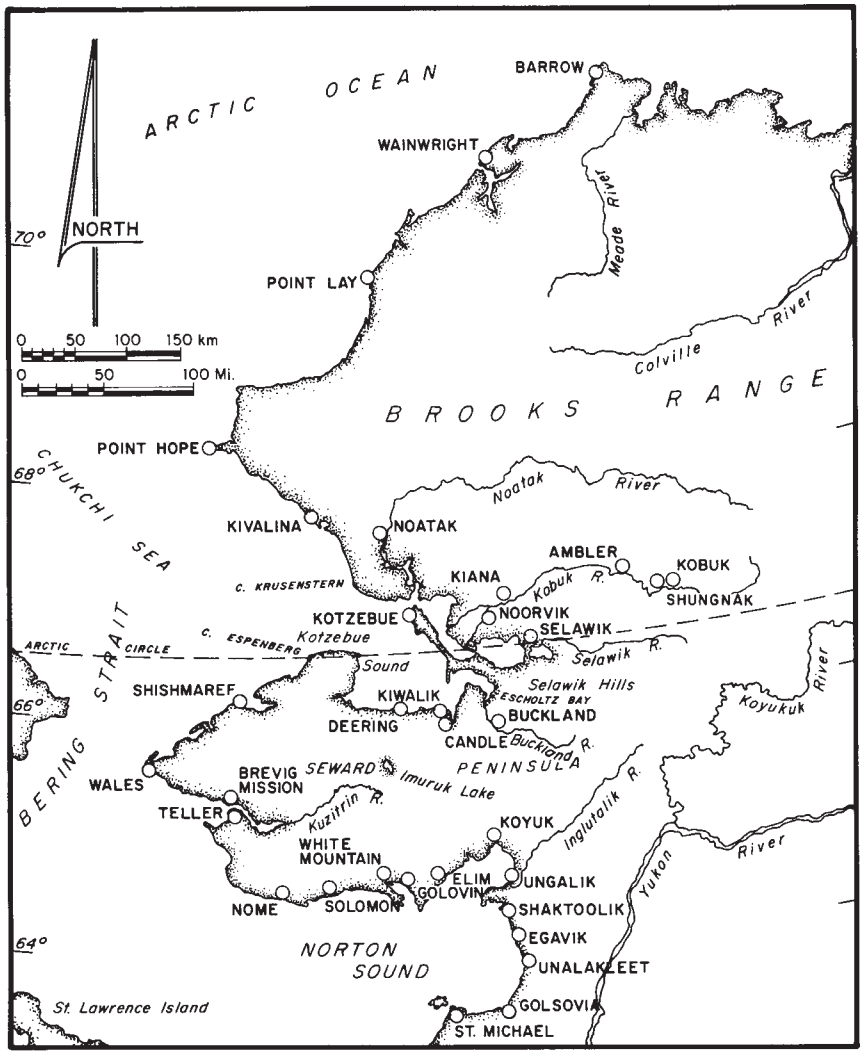


FIGURE 2. Northwestern Alaska geography.

Alaska. During the late 1940s and early 1950s, herds were reestablished throughout Alaska, this time with carefully selected and experienced reindeer men in charge.

All the herds east of Kotzebue Sound failed by 1966, with caribou largely being held responsible for the failures. However, from 1960 to the present, there has been considerable interest in the successful development of a Native reindeer industry. Numerous studies have indicated its economic and ecological feasibility. Unfortunately, this new view of reindeer as a commercial resource has not been easy to translate into successful operations.

In early 1977, there were fifteen reindeer herds grouped together in northwestern Alaska. All but the Shaktoolik herd were confined to the Seward Peninsula. This herd and those at Stebbins, and on St. Lawrence, Nunivak, Hagemeister. and Kodiak Islands, and the scattered herds on the Aleutian Islands under the management of the U.S. Fish and Wildlife Service, are not generally considered in this report. On the Seward Peninsula, total numbers of reindeer were estimated to be less than 20,000. Herd size ranged from 100 or less to some 4,000 head.

As J. Sidney Rood, one–time General Reindeer Superintendent, said, "the roots of present problems lie in the past;" (1937) and so it is that the current status of the reindeer industry is the result of natural and social forces which have been operating for a long time. Figure 2, Northwestern Alaska Geography, is presented to show the location of major settlements, rivers, and other geographic features referred to throughout the remainder of this report.

Conditions prior to the introduction of reindeer

For thousands of years, the Eskimo peoples of Alaska have lived on the resources of the land, sea, and air. In northwestern Alaska, a relatively stable source of food in the form of sea mammals and caribou allowed the Native inhabitants of the region to live in semipermanent villages along the coast and rivers. Some groups depended on a mixed economy of fish, caribou, and sea mammals. This diet was supplemented by whatever other items were seasonally available: berries in the fall and late summer, bear when it could be taken, small mammals such as rabbit, and waterfowl. Wherever the people lived or moved to hunt, trap, fish, and harvest, they made use of the resources available to them. When food was plenty, they lived abundantly and happily; in times of scarcity, they ranged far and wide, or made use of alternative resources when and if they became available. Well–established trade routes moved products from the interior regions (caribou skins, fish, wooden bowls, and jade) to the coast in exchange for the products of the sea (ugruk skins for umiat covers, rope, blubber, meat, and muktuk). Siberian trade items (reindeer hides, especially spotted fawn skins), and, later, European trade goods (metal, cloth, tobacco, rifles) became an integral part of this trade network of goods.

Prior to the introduction of reindeer into Alaska, cultural contact was extensive. During the period from 1848 to 1854, American whalers pushed northward into the Chukchi Sea and Arctic Ocean, pursuing the products of baleen whaling: oil for lamps, and baleen for corset stays, skirt hoops, and buggy whips. As the number of whalers increased, after 1875, hunting and trading for furs, baleen, and walrus ivory also increased in importance to ensure a profitable trip. The Pacific Steam Whaling Company established shore stations at Point Barrow (1884) and Point Hope (1887). Port Clarence (near Teller) became a major resupply point (Ray, 1975). Techniques for overwintering in the Arctic were quickly developed, with the crew living on board or on shore nearby while the ship was locked in the Arctic ice for eight months of the year. Establishing winter quarters enabled them to start the following whaling season much earlier than before, and some ships, operating in this way, stayed out from their home ports in New England or San Francisco for as long as five years. During the long winter months, the whalers traded with the Natives; hired men to hunt for them; and amused themselves with games, liquor, and Native women (Bockstoce, 1977a, 1977b).

Trade in metal products such as pans, nails, and tools, and in staples such as flour, coffee, tea, tobacco, and liquor (which was illegal), became firmly established during the 1850s to 1890s, a period that has been referred to as the "early transitional period" by Burch (1975). Trade in repeating rifles, which also was supposed to be illegal in the later nineteenth century (1880s), increased, as the government was largely unsuccessful in deterring it using only the Revenue Cutter Service. Sailors also brought measles and venereal diseases. In general, the presence of such diseases signaled the start of major disruptions of the aboriginal kinship and social systems.

According to some authorities, the Native populations were reduced by about 50% between 1850 and 1880 (Foote and Williamson, 1966; Burch, 1975; Hall, 1977). Ray suggests, however, that the population did not decrease (1964, 1975), and actually asserts that the Native population in the Bering Straits region increased substantially by the turn of the century. Despite Ray's interpretation, it is generally accepted that by the twentieth century the Eskimo population of the region was on the increase, and is still continuing today with the advent of modern medical care to the villages and a high birth rate (Alonso and Rust, 1976; Rogers, 1971; Hippler, 1969).

Since the original importation of reindeer to mainland

Alaska in 1892, anthropologists, historians, and other scholars have debated the validity of Sheldon Jackson's assertions that the Eskimos were in such desperate plight for food as he claimed. Bockstoce, Foote, and others have convincingly demonstrated the decline in marine mammal resources on the northwest Alaskan coast between 1850 and 1890 (Bockstoce, 1977a; Foote, 1965). During the period from 1850 to the turn of the century, the caribou, which was the primary land resource utilized by Eskimos, was also decreasing (Skoog, 1968; Burch, 1972). The reasons for this decline are not altogether clear. It appears that the caribou population which inhabited the Seward Peninsula may have been an overflow population of the western Arctic caribou herd from their center of habitation in the central Brooks Range. A number of biologists have observed that caribou populations of the world undergo cyclical population fluctuations that are relatively independent of the effects of human predation (Skoog, 1968; Burch, 1972). While it is commonly stated that firearms were largely responsible for the decline of caribou on the Seward Peninsula between 1850 and 1900, an alternative interpretation suggests that the decline in numbers was largely due to natural causes. This interpretation better fits the data (Skoog, 1968; Burch, 1972; Ray, 1975).

By 1880 there were very few caribou left on the Seward Peninsula, and by 1890 there were few animals that could be found at all except near the "center of habitation" of the western Arctic caribou herd in the central Brooks Range (Skoog, 1968). Sometime after 1930, caribou began to return to areas along the Chukchi Sea and the Noatak and Kobuk River drainages. Residents of Kivalina and Noatak villages again began to harvest caribou for the first time in several decades. The caribou that have repopulated this area have been credited with luring away many of the reindeer from the reindeer herds located near these villages.

Between 1970 and 1977 the western Arctic caribou herd declined from an estimated 240,000 animals to around 60,000. The resulting "caribou crisis" in northwestern Alaska today is a recurring situation that, prehistorically, could have been met in one of two ways. When a predator population is totally dependent on a single prey species, and that prey declines in numbers and/or density, the predators can either: 1) utilize alternative food resources or strategies; 2) reduce their numbers correspondingly by death and/or emigration; or 3) some combination of these (Odum, 1971). The caribou–hunting human populations have faced this situation throughout their occupation of interior northwestern Alaska. Characteristically, they have shifted their hunting emphasis to other regions (emigration) and utilized alternative food resources (strategy change) by fishing or exploiting mammals other than caribou (Campbell, 1968; Spencer, 1959; Hall, 1975; Hickey, 1976). This is a gross oversimplification of the specific historical instances of hunter/gatherer subsistence strategies. A more elegant treatment of this problem would have to take into account a number of other variables: resource abundance, distribution, and availability; settlement location; and human demography, to name but a few (Jochim, 1976).

In this report, a comparison of the northwestern Alaska interior Eskimo groups and the caribou–hunting groups of the Seward Peninsula is revealing. While such a comparison must be very general and based completely on secondary sources, it can be demonstrated that caribou were the mainstay of both groups and that changes in caribou distribution and abundance did cause changes in the subsistence strategies of the groups. The Seward Peninsula groups were less drastically affected by the caribou's abandonment of the peninsula because they had more alternative food resources to exploit such as beluga, fish, and seals (Ray, 1964). In contrast, interior northwest Alaska was virtually abandoned during the half a century from 1890 to 1940 when the caribou were low in numbers.

According to Burch (1975), the boundary between his early and intermediate transitional periods varies from place to place. The year 1890 serves as a convenient marking point with the establishment of schools, missions, and reindeer herds as events which signal the change. The actual changes which took place during his "early transitional period" (1850–1890) may be summarized briefly. Despite disagreements about the order of magnitude (and even the direction of the change, Ray, 1964, 1975), it is generally agreed that the Eskimo population of northwestern Alaska had both declined in numbers and changed their subsistence patterns as well as settlement locations during the period. The marine and terrestrial food resources of the region had also declined, essentially from overhunting by and for whites to supply a commercial market and from natural causes such as diseases and predation. The use of firearms by Natives was probably a minor factor.

By the time reindeer were brought to the Seward Peninsula in 1892, several effects had resulted from the contact with Euro–Americans (Burch, 1972; Skoog, 1968). Foreign diseases already had been introduced. Traditional food resources had been depleted. Bowhead whales and walrus were reduced in number. Caribou were no longer present on the Seward Peninsula. Firearms were known and utilized, but played little part in the elimination of caribou from Seward Peninsula. Alcohol and its use was known. Contacts with white technology had been taking place for several decades, at least on a sporadic basis. Between 1819 and 1880, Foote attributes

the greater detrimental effects on the Native population to "the spread of foreign diseases and the reduction of food sources. The introduction of firearms, alcohol, and new ideas appears to have been of secondary importance" (Foote, 1964).

In Burch's early transitional period, from 1850 to 1890, he sees serious disruptions to Eskimo life stemming from contagious diseases and the introduction of liquor through white contact "exacerbated by the drastic decline of the caribou population" (Burch, 1975). The population was both reduced in numbers and displaced in location compared to the precontact period. These demographic changes forced a number of changes in the social organization of northwestern Alaska Eskimo society. As Burch (1975) provides an adequate discussion of these changes, it will not be necessary to repeat them here.

Reindeer introduction

When the Reverend Sheldon Jackson first toured the arctic region of Alaska, he was dismayed by the conditions he saw. The conditions were basically as have been described above, but Jackson failed to place them in historical perspective or in a cultural position relative to the southeast Alaskan Indians with whom he was used to working. The semisubterranean houses of the Eskimos appeared wet and cold. Little did he realize the excellent protection they offered during the long arctic winters. The declining resource base alarmed him, as did the declining self–respect and cultural viability of the northwestern Alaskan Eskimos. To "save" the Eskimos from starvation and to promote industrial education, he proposed to bring reindeer from Siberia to Alaska. He also proposed to bring Siberian reindeer herders to teach the Alaskan Eskimos how to herd reindeer. Through this scheme he believed he could save the Eskimos' stomachs and dignity at the same time (Ray, 1965; Ward, 1955, 1956).

While Jackson initially failed to secure Congressional funding for his project, he did succeed in raising $2,146 through public subscriptions, mostly in small amounts donated by philanthropic churchgoers. This money was used in 1891 to buy 16 reindeer in Siberia and locate them on Amaknak and Unalaska Islands. Following the success of this purchasing and transportation scheme, the Bureau of Education agreed to administer the money for the remainder of the project. On July 4, 1892, 171 reindeer were brought from Siberia and located at the newly created Teller Reindeer Station. Teller Reindeer Station at Port Clarence originally had been a school for the Eskimos of the area, but with the introduction of reindeer it was designated the reindeer training station for the Eskimo herders. Following the first year's overall success in purchasing and shipping reindeer from Siberia to Alaska, Congress agreed to appropriate money for additional importations and for administrating the program thereafter. Over the next ten years, 1,280 reindeer were brought to Alaska, until 1902, when the Russian Czar forbade all further exports of reindeer from Russia. Unfortunately, the Siberians whom Jackson had thought would be able to train the Alaskan Eskimos proved to be reluctant teachers. No one seemed to have considered that traditionally the Siberians and Alaskans had been bitter enemies. In addition to language barriers, it was difficult to persuade the Siberians to divulge their animal herding and husbandry knowledge. In the summer of 1894, William Kjellmann, a Norwegian–American teacher employed by the Bureau of Education, was instructed by Jackson to bring Lapp herders and their families from Norway to teach reindeer herding. In the summer of 1894, Lapps with their families arrived at the Teller Station. They were promised, as partial payment for their services, what reindeer they required for food and clothing. This was in direct contradiction to Native use of reindeer, for up to this time no Eskimo had been permitted to slaughter reindeer for food.

The increases that occurred in reindeer numbers during the first two years of the industry were apparently more fortuitous than the result of good herding practices. Herds were kept close to the Teller Reindeer Station and after two years of grazing, the vegetation within a three mile radius of the station had been completely depleted. Such overgrazing had taken place that new grazing areas had to be found. Despite this overgrazing, the mild winters aided the herds to increase steadily without heavy calf losses in the spring. In August, 1894, the Congregational Mission at Wales, under the charge of William T. Lopp, received a gift of 100 reindeer from Jackson in accordance with Jackson's plan to furnish reindeer to the missions. The Lapps who had come to teach the Eskimos basic husbandry and herding of reindeer were also given permission to utilize any animals they wanted. They were also paid salaries of 1,200 kroner a year. As no Eskimo owned a successfully operating herd at this time, the gift of reindeer to the mission and the presence of the Lapps with their preferential use of reindeer led the Eskimos to conclude that they were not going to benefit from the reindeer industry.

Kjellmann resigned as third superintendent of the Teller Station in the summer of 1895 over disagreements with Captain Healy of the Bear, although his official reason for resigning was his wife's health (Ray, 1975). Kjellmann had been a capable administrator with keen insight into the problems which were developing with the reindeer situation. He did return to the Teller Reindeer Station in 1896 as superintendent.

Early development

In 1896 there were 1,175 reindeer in Alaska, distributed in four herds spread out between Wales and Golovin Bay. One of these was the government herd at Teller Reindeer Station, while the other three were mission herds at Wales and at Golovin. To alleviate suspicion that no Eskimos would ever get their own herds, Jackson loaned 100 reindeer in January of 1895 to Charley Antisarlook, an Eskimo reindeer apprentice. With the 15 reindeer he had earned as an apprentice, Charley moved his newly acquired herd to the Synrock River. By the end of two calving seasons, his herd had increased to 217 head. Four years after the introduction of reindeer into Alaska, only one herd was in Eskimo hands, and few Eskimos had even tasted reindeer meat (Ray, 1965). By 1896, the mission herd at Wales had increased to 168 animals, while the herds at Golovin Bay belonging to the Swedish Covenant and the Episcopal Missions numbered some 130 head. The remainder of the reindeer, some 650 animals, were located at the Teller Reindeer Station. In 1900, the Lutheran Mission at Teller, under the charge of T. L. Brevig, was loaned 100 deer. Brevig had been recruited to come to Alaska from Norway because he could speak Saame (Lappish) and minister to the Lapps. In addition, he also spoke English and Norwegian, and he quickly mastered Eskimo (Brevig, 1944). The numbers of reindeer in Alaska loaned to missions up to the year 1902 are provided in Table 3. Lapps and other non–Native owned 860 reindeer; the missions owned 1,635; a total of 2,591 were owned by 43 Eskimos.

A drive of reindeer to Barrow in 1898 for the relief of whalers stranded there, followed by another aborted drive up the Yukon to Circle for the relief of miners in the same year, served to distribute reindeer over a large part of Alaska. Kjellmann had made a second trip to Norway in 1897 to recruit families to come to Alaska to teach reindeer herding to the Eskimos. While he was in Norway, news came that miners in the gold fields up the Yukon River were in danger of starving. Congress was persuaded to authorize $200,000 to bring over Lapps and 539 reindeer steers which were then to be driven from Haines to Circle. As this meshed perfectly with Jackson's original plans to bring Lapps to Alaska as reindeer instructors, he went to Norway to intercept Kjellmann. In the fall of 1897, 113 Lapplanders, Finns, and Norwegians, representing 63 herders, signed contracts to come to Alaska.

The acquired reindeer were shipped by railroad from the east coast to Seattle, by boat northward to Haines, and then driven to Circle by Hedley E. Redmyer and a crew of six men, including five Lapps. By April 15, 1898, 362 animals had died. When the "relief" finally arrived in Circle on February 28, 1899, only 114 animals had survived the journey (Redmyer, 1951). Antisarlook's 100 loan deer were taken back and shipped to St. Michael, there to be sent up the Yukon River. At St. Michael, it was decided that they would not survive such a trip, but the deer were not returned to Antisarlook. Instead, more reindeer were borrowed from Antisarlook and the mission herd at Wales to be driven north to save "starving" whalers at Barrow (Ray, 1965, 1975).

The second drive evolved when reports came from Barrow that four whaling ships had been crushed in early winter ice east of Barrow. Five other ships had also been forced to winter in emergency quarters as well. Vessels that had escaped the ice pack brought word that insufficient food supplies existed at Barrow for all the men trapped there for the winter. Lieutenant D.H. Jarvis, Lieutenant E.P. Bertholf, and Surgeon S.J. Call of the Revenue Cutter Bear set out from Nelson Island to borrow all the Lapp's deer at Wales and the remainder of Antisarlook's herd to provide the whalers with food. Seven Eskimo herders and apprentices were hired to help with the drive. Between January 19 and March 19, 1898, 448 reindeer were driven the 1,200 kilometers (750 miles) between Wales and Point Barrow, with only 382 reindeer surviving the trip. Once at Barrow, it was discovered that most of the "starving" whalers were actually quite well supplied with

Table 3. *Reindeer belonging to missions in Alaska, 1892–1902.*

Mission Station Herds Location	When loaned	When due	No. loaned	In herd 1902
Cape Prince of Wales (Congregational Mission)	Aug. 1894	gift	118	224
Golovin Bay (Swedish Evangelical Mission)	Jan. 1896	1901	50	264
(Protestant Espiscopal Mission)	Jan. 1896	1901	50	89
Point Barrow (Presbyterian)	Sept. 1898	1903	100	238
Gambell, St. Lawrence Island (Presbyterian)	July 1900	1905	70	150
Teller (Norwegian Evangelical Lutheran)	Sept. 1900	1905	100	221
Nulato (Roman Catholic)	Mar. 1901	1906	100	151
Bethel (Moravian)	Feb. 1901	1906	88	188
Carmel (Nushugak River) (Moravian)	Feb. 1901	1906	88	188
Kotzebue (California Yearly Meeting–Friends)	Sept. 1901	1906	95	160

(Source: Jackson, 1903.)

food, thanks to the fine organizational efforts of Charles Brower and others (Bockstoce, 1977b). Of the reindeer actually reaching Barrow, only 180 were actually slaughtered for food. The remainder of the animals were to form the nucleus of the herd started at Point Barrow under the direction of the Presbyterian Mission. In this way, reindeer herds were distributed from St. Michael to Point Barrow. But instead of benefitting, elevating, and assisting the Eskimos to become self supporting, Caucasians were aided.

In the decade following these "rescues," reindeer were also distributed throughout northwestern Alaska through additional loans to missions, loans to independent Lapps who had served their apprenticeship and wished to start their own herds, and loans to individual Natives who wished to run their own local herds. The 1,635 reindeer owned by Alaskan missions in 1902 contrasts with 2,591 owned by 43 Eskimos and the 922 reindeer owned by the government and other non–Natives. The average herd size for the 43 Eskimo owners of reindeer in 1902 was approximately 60 reindeer, ranging in actual herds of from 4 to 269 head. Most authorities agree that a herd of reindeer needs to be at least 1,000 to 2,000 head to be economically viable (Lantis, 1950; Olson, 1969; Zhuginov, 1968). Nearly 50 per cent of the total 4,148 reindeer in Alaska by 1902 were in non–Native hands. This situation was not what the original project had called for. It was met with dissatisfaction in Washington, and special agent Frank C. Churchill was sent to investigate Alaska's schools and reindeer program in 1905 (Churchill, 1906). The dissatisfaction with the schools resulted from Jackson's policy of keeping education and religious training together in teacher recruitment and daily instruction. Jackson's opponents wished to see a more secular educational system in Alaska.

Figure 3 (Reindeer in Alaska) is presented to show the distribution and duration of reindeer herding in various areas of northwestern Alaska. An examination of Table 4 shows that by about 1910, reindeer were distributed throughout northwest Alaska, from Bethel on the Kuskokwim River delta to Barrow.

Another event of some significance in the history of reindeer herding came with the Nome Gold Rush, which was accompanied by a tremendous immigration of non–Natives to the Seward Peninsula. During the Gold Rush, reindeer were used as draught animals, a practice that continued for some years. Animals were either hired out to miners for freighting (the particular approach of the Lapp owners) or animals were sold outright to the miners. Reindeer meat was also sold to the populace of the booming towns. Because of a limited supply of reindeer meat, some meat was imported from Siberia during the winter of 1899–1900 to feed the 2,500 people then at Nome as well. In 1900, a measles and pneumonia epidemic swept the region. Many Natives and non–Natives alike died, including herder Charley Antisarlook and his two brothers. His wife Mary inherited the herd.

During the first decade of the twentieth century, several problems in reindeer herding emerged. Some of these problems were resolved, while others emerged to continue into the 1920s. Problems with

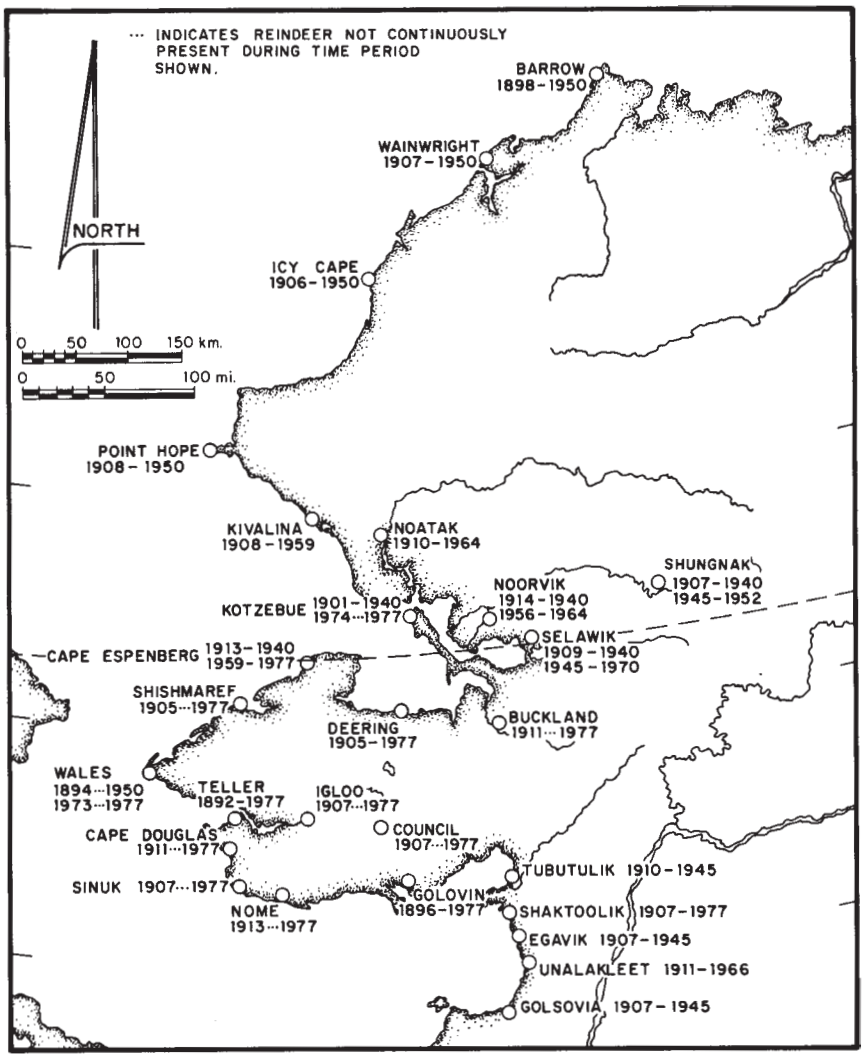


FIGURE 3. Reindeer in northwestern Alaska, 1892-1977.

Table 4. *Reindeer in Alaska, 1892–1915. Distribution and date of establishment of the herds.*

Stations and Herds	Date	Stations and Herds	Date
Teller	1892	Noatak	1910
Wales No. 1 (Mission)	1894	Shishmaref No. 3	1910
Golovin No. 1 (Mission)	1896	Tubutulik	1910
Barrow No. 1	1898	Bethel No. 2 (Kilohalin)	1911
Bethel No. 7 (Mission)	1901	Buckland No. 1	1911
Kotzebue No. 1	1901	Cape Douglas No. 1 (Okbaok)	1911
Bethel No. 5 (Taluksak)	1902	Deering No. 2 (Goodhope R.)	1911
Deering No. 1 (Lane R.)	1905	Unalakleet No. 2 (South R.)	1911
Kivalina No. 1 (South R.)	1905	Wales No. 2 (Ootennas)	1911
Shishmaref No. 1	1905	Bethel No. 3 (Kivigluk)	1912
Icy Cape	1906	Igloo No. 2	1912
Bethel No. 4 (Nukluak)	1907	Spruce Creek	1912
Council	1907	Bethel No. l (Akoolakotak)	1913
Egavik	1907	Bethel No. 6 (Oungogtulit)	1913
Golsovia No. 1	1907	Cape Espenberg	1913
Igloo No. 1	1907	Deering No. 3 (Kugruk R.)	1913
Shaktoolik	1907	Iglotalik No. 2 (Bonanza)	1913
Shungnak	1907	Nome	1913
Sinuk	1907	Buckland No. 2 (Sokweena)	1914
Wainwright	1907	Cape Douglas No. 2 (Dunnak)	1914
Golovin No. 2	1908	Golsovia No. 2 (Pitnuktalik)	1914
Kivalina No. 2 (North R.)	1908	Igloo No. 3	1914
Mountain Village	1908	Wales No. 4 (Cape York)	1914
Point Hope	1908	Kotzebue No. 3 (Lomen/Lapp)	1914
Wales No. 3 (Kozuks)	1908	Bethel No. 8 (Kalkak)	1915
Barrow No. 2	1909	Igloo No. 4	1915
Selawik	1909	Kivalina No. 3	1915
Shishmaref No. 2	1909	Kivalina No. 4	
1915glotalik No. 1	1910	Shishmaref No. 4	1915
Kotzebue No. 2	1910	Shishmaref No. 5 (Keok)	1915

reindeer thefts and range damage plagued some owners. Government policy towards reindeer ownership changed after Churchill's 1906 investigation. Inadequate supervision of herd growth contributed to general range overstocking. Differential treatment of Lapp and Eskimo owners caused bitterness between the two groups. Lastly, the acquisition of reindeer and ranges by the Lomen family, beginning in 1914, ushered in new problems concerning Native and non–Native ownership (e.g., marketing) and another new direction for government policy on reindeer herding.

After the initial gold strike boom at Nome, many prospectors remained to explore the coast and interior of Seward Peninsula for precious metals. Reindeer teams continued to deliver mail and freight, but not all went well for the Native reindeer owners. As mentioned above, Charley Antisarlook died in a measles epidemic in 1900. His widow, Mary, took her few remaining reindeer (those that had not been borrowed to save the whalers at Barrow) from Synrock to Unalakleet because theft and range fires made it difficult to continue herding them on the Seward Peninsula. The slowdown of economic growth of Seward Peninsula caused additional problems for Native owners. Perhaps most importantly, the government policy, as formulated by Sheldon Jackson, was not truly protective of Native interests in reindeer. Jackson had believed that reindeer would ensure the continuance of the missionary stations to which Eskimos could then flock, ceasing their nomadic way of life, seen by some to include "begging and immorality," and congregating around the missions, which would have assured food supplies and spiritual aid (Jackson 1903). It is readily apparent that in Jackson's mind, reindeer represented a means by which he could attain his missionary goals and to ensure the permanence of mission stations as opposed to providing a direct benefit for Natives.

Reindeer had increased so significantly during the first 15 years in Alaska that by 1906 administering them became a serious problem (Table 5). Although the originally stated goal of the program had been to provide food as well as a source of skins and industry for the Eskimos, by 1905 various Lapps, missions, and the government still owned more reindeer than did the Natives (Table 5). In addition, the apprenticeship method of training had not been

Table 5 *Ownership of reindeer in Alaska, compared: 1905, 1911, and 1915.*

	Number of owners			Percentage owned of total reindeer			Number of reindeer		
Owners	1905	1911	1915	1905	1911	1915	1905	1911	1915
Natives	85	460	1,140	41%	60%	66%	4,859	20,071	46,683
Government	N/A	N/A	N/A	24%	11%	5%	2,500	3,951	3 ,408
Missions	N/A	N/A	N/A	11%	14%	10%	1,163	4,664	6,890
Lapps/other non–Natives	N/A	N/A	N/A	16%	15%	19%	1,712	4,944	13,262
Total reindeer							10,234	33,629	70,243

(Sources: Churchill, 1906; U.S. Bureau of Education, 1912, 1917).

successful as the conditions of apprenticeship continually changed from year to year (Ray, 1975). Without clearly discernible rewards to be gained from becoming involved with reindeer, it was difficult to persuade young men to enter the apprenticeship program. Some of those who did become so involved appear to have been socially marginal as well as very young (Ray, 1975). It was not until the pattern of ownership changed following Churchill's 1905 investigation that herding became a viable pursuit. Following the change in ownership patterns, herding knowledge passed from father, as a private herd owner, to son as a matter of practical instruction and on–the–job learning. This pattern suited Eskimo educational approaches far better than did a formalized contractual apprenticeship system.

The different contracts made by Sheldon Jackson with missions and Eskimos clearly show the different privileges given to the Lapps (RG 75, entry 812 "Contracts" National Archives Building). In an agreement between the U.S. Bureau of Education and the Friend's Church at Kotzebue, dated September 1, 1902, the Friend's Mission, Sheldon Jackson—

> agree(d) to pay the salary for 5 years of an experienced Lapp to teach the native boys herding, not to exceed 5 years, and also to furnish said Lapp with clothing and rations for the first year...and further agreed to furnish shelter, clothing and rations to the Lapp herder. (Churchill, 1906).

An agreement of the same date with a Native herder was not so generous. At variance with the above contract, no food or clothing were to be provided for the Native, nor could he dispose of animals except with the permission of the mission and the Bureau of Education. In addition, the agreement with the Native was for 17 years, as opposed to five for Lapps. Further restrictions were placed on the Native with regard to slaughtering and inheritance. A Native could slaughter male reindeer for his family, but only with the permission of the local superintendent. Upon the death of a herder, half the herd reverted to the government or the mission.

For the first 15 years, both in Alaska and Washington, controversy existed over the goals and the control of the reindeer program. Generally, the disagreements focused on the religious versus the secular control of education in the Territory, rather than on reindeer herding per se. Under Jackson's policy, all teachers were required to be members of a church. In his capacity as general agent, he was able to enforce this policy. He was also able to obtain government support for the missionary activities by contracting with the missions to run "contract schools". Through his efforts, church and education were strongly interrelated during the early Territorial years of Alaska. Since the reindeer supervisors at the local level were all also the educational teachers, Native reindeer herders were forced into various degrees of contact with religion and education. Jackson was not without support for this policy. The Moravian missions and the Swedish Evangelical mission schools were among Jackson's firmest supporters, as was the Presbyterian church (Hinckley, 1966).

Special Agent Frank C. Churchill's investigation of Alaskan schools and the reindeer service represents a turning point in the government policy toward both. Churchill was an Indian Agent, an experienced investigator, and a firm believer in the concept of separating secular educational and government activities from missionary proselytizing. Although he was charged with investigating the conditions of education in Alaska, his recommendations concerning the reindeer industry are most important in the present context. E.A. Hitchcock, Secretary of the Interior under Theodore Roosevelt, charged Churchill with investigating all aspects of the operation of the reindeer program, including the status and condition of the herds, and making recommendations regarding "...whether or not either the loaning of reindeer to the missions maintaining schools, or the loaning of the same to the Natives as a method of industrial education should be continued or abandoned" (Churchill, 1906).

Based on his investigations made during the summer of 1905, Churchill submitted an initial report to the Secretary of the Interior on December 11, 1905. Subsequently, three supplemental reports were submitted. Following Churchill's report and recommendations, Sheldon Jackson was asked to resign. The long battle between the supporters of combined missions and schools and the supporters of separate church and state activities, with most government officials in the latter camp, ended with Jackson's resignation (Ray, 1975). While Jackson did resign, he did not completely leave educational affairs in Alaska until 1908.

For someone like Churchill, who believed in careful separation of church and state, the ambiguous ownership status of government, mission, and private reindeer must have been distressing. His recommendations to straighten out the situation were unambiguous:

> Until (the ownership of reindeer can be determined) ...I am unable to determine with sufficient certainty (what rules should be put into force) to warrant positive recommendations in certain particulars, but I beg leave to refer to the general trend of this report, throughout which the general policy of getting the animals into the hands of the natives as fast as their capacity for caring for them can be developed has been made prominent. (Churchill, 1906).

The proposed rules and regulations governing the Alaska reindeer service which Churchill had been asked to comment upon were put into effect on June 10, 1907, and December 7, 1908. The rules were an attempt to manage the ever–increasing numbers of reindeer and to stop the involvement of the missions in herding activity. Female reindeer were especially restricted from sale, transfer, and slaughter while they remained in Native herds. On the other hand, the herds of the Lapps, the missions, and the non–Native owners were not subject to these same rules. This group was actually encouraged to act to further their own self–interests, more often than not in open conflict with Native interests and government policy.

By 1914, over 20 years after reindeer were first brought to Alaska, Jackson's original goals for Natives had virtually been fulfilled. Churchill's investigations had been instrumental in forcing large–scale transfers of reindeer into Native hands. (Compare ownership figures for 1915 and 1905, Table 5.) The natural increases in reindeer numbers now made reindeer available to most northwest Alaskan Eskimos who wanted them. Beyond satisfying the local needs, a surplus of stock existed for export. Starting in 1909, arrangements were made with the Department of Agriculture for the export of reindeer meat, hides, and antlers through the Bureau of Education. In October of 1911, about 125 carcasses were shipped from Nome to Seattle. This represented the first sale and export of reindeer meat by Eskimo herders. Prices in Seattle ranged from 25 to 75 cents a pound for the 18,750 pounds of meat exported (U.S. Bureau of Education, 1912).

Overall, the local superintendents of the Bureau of Education (the village school teachers) were very successful in placing reindeer into Native hands. As can be seen in Table 5, by 1915 the ownership pattern of reindeer in Alaska was considerably altered as compared with the pattern of 1905. Within the program, however, were the seeds of many new problems—problems a dispersed ownership policy could not prevent. By placing as many reindeer in Native herds as possible, the Bureau of Education was setting the stage for the natural selection of better herders/owners to succeed, thus creating for a few years a "reindeer aristocracy," the possible development of which Churchill had foreseen (1906). During the following period, characterized by reindeer fairs and adequate local markets for Native owned deer, wealthy herd owners were highly respected and envied. Secondly, by encouraging the production of as many animals as possible without first securing adequate export markets, the Bureau created an economic vacuum that was quickly filled by non–Native owners, who were not restricted in the disposal of their deer by Bureau of Education rules, as has been pointed out above.

Chapter IV
Non–Native ownership of reindeer: 1914–1940

As we have seen, non–Native ownership of reindeer was not unknown prior to 1914. The missions which had been given herds between 1894 and 1902 constituted an earlier precedent, as did Lapp ownership of reindeer received in payment for their services as teachers and herders. Large scale Lapp ownership of reindeer began when their contracts with the government expired in 1901. With their privately owned herds, they dispersed by 1911 from the Seward Peninsula area to new grazing grounds located at Unalakleet, Eaton Tanana, Golovin, Kotzebue, and Bethel (U.S. Bureau of Education, 1912). The advantages of new grazing areas led to substantial increases in their herds.

Many Eskimos owned and tended deer by 1914; however, many of the owners had so few deer that their herds could not be considered viable economic production units. The 1917 Report of the Work of the Bureau of Education for Alaska shows 1,568 Natives owned reindeer; of this number, active herders and owners totaled 1,398. The 67,448 reindeer (69% of the 98,582 reindeer in this territory) in 98 Native herds represent an average herd size of only 688 reindeer. The average number of reindeer owned by any one individual was about 48. With such small private herds, there was little chance that many of them could be utilized as productive herds in a commercial marketing system. Such a system needs a minimum of 1,000 animals in the herd, and 2,000 to 3,000 are preferable (Lantis, 1950; Olsen, 1969; Zhigunov, 1968). In its effort to get reindeer into the hands of as many Natives as possible, the government was actually contributing to the downfall of the enterprise. Between 1914 and 1922, Lomen and Company acquired reindeer and ranges which competed with the Natives' interests. Therefore, the two forces then at work contributing to problems of the reindeer industry were: small Native–owned herds and competition between the Native herders and the non–Native owners.

Average herd size for 1917 for the Native owners masks a great variability in the number of animals actually owned by individuals. Both small and large herds could be found; and both large and small herds belonging to many individuals often occupied the same range. The roundup and marking reports for Deering, for example, show that in the years 1905 to 1915, three herds were established. The first herd, Deering No. 1, was established in 1905 by Eskimos who had earned reindeer working for the Wales mission herd. In 1910, 498 reindeer were being run in the Deering No. 1 herd distributed as follows: 294

reindeer owned by six Native herders, 53 reindeer belonging to six Native owners, and six reindeer owned by one apprentice who worked for the mission. The total reindeer owned by the 13 Natives and the mission numbered 498, hardly a substantial increase from the 343 reindeer originally brought from Wales by three Native apprentices to Deering in 1905. Even those 343 original reindeer were not equally owned by the three apprentices; one owned 318, one 21, and the third but four. The Deering No. 2 herd was started near the Goodhope River in 1911; the No. 3 herd, started in 1913, was kept in the Kugruk River area; while the No. 1 herd was kept in the Lane River region. Table 6 shows the distribution of ownership of these three herds as of 1915 (U.S. Bureau of Education, 1917; Churchill, 1906).

Table 6 also indicates that no Lapps owned reindeer in the Deering area, nor were there any government or mission apprentices by 1915. In the three herds of the Deering area, 12 herders owned 1,548 reindeer, and herders cared for an additional 545 reindeer owned by 3 other individuals. A total of 2,516 reindeer were herded in the Deering area and provided the basis for reindeer meat, hides, and by–products for Deering's population, which included a number of non–Native miners who lived and worked in the Inmachuk River and surrounding region. The Native population of the Deering area had been substantially reduced in 1914 when a number of families left the area under the leadership of the Friend's missionary and moved to the newly established village of Noorvik in the lower Kobuk River delta.

Lomen & Company

Private white ownership of reindeer exclusively for business purposes began in 1914 with the purchase by the Lomen brothers of the Alfred Nilima herd of Kotzebue. The Lomen family operated Lomen and Company in Nome, an organization of various business interests dating from the 1900 Gold Rush. The holdings of the company included a drug store, a photography studio, a freighting and lightering enterprise, and a reindeer operation. The patriarch of the organization was Gudbrand Lomen, a Norwegian–American who was also the Federal District Court Judge for the Second Judicial District in Nome. His sons, Carl, Alfred, and Ralph, managed the company affairs from Nome, New York, and Seattle offices. Between 1914 and 1921, the company purchased some 8,700 reindeer, which were to become the nuclei of herds established at Buckland, Egavik, Kotzebue, and Teller. In addition, cold–storage plants to handle reindeer were constructed at Egavik, Elephant Point, and Golovin, and one was purchased at Nome.

Lomen and Company was organized in 1914 to handle the newly purchased reindeer and to manage what the Lomens expected would be a rapidly developing industry. When the Lomens purchased their first reindeer, they had the financial backing of Jafet Lindeberg, a Norwegian miner who had become wealthy during the early days of the Nome Gold Rush. Alfred Nilima was able to sell 1,200 deer to the company because of increases he had enjoyed from his herd. Two additional herds (one at Golovin,

Table 6. *Ownership and distribution of reindeer in Deering Village, 1915.*

	Deering no. 1 (estabL. 1905)	Deering no. 2 (estabL. 1911)	Deering no. 3 (estabL. 1913)	Totals
Non–Native ownership				
Mission reindeer		112		112
Government reindeer		30		30
Native ownership				
Herders number	5	4	3	12
Reindeer	771	431	346	1,548
Owners number	5	15	13	33
Reindeer	37	225	283	545
Apprentices working for the herders and other Native owners				
Native owners Number	2	5	3	10
Reindeer	64	169	48	281
Total Natives	12	24	19	55
Total reindeer owned by Natives	872	825	677	2,374
Sled reindeer (included in total reindeer)				
Trained	15	18	14	47
Being trained	5	1	5	11
Total reindeer in herd	872	967	677	2,516

(Source: U.S. Bureau of Education, 1917).

the other at Teller) were purchased from the Swedish Evangelical Society in 1916. With the continual purchase of non–Native and mission–owned herds, by 1929 the total purchases of reindeer by the Lomens amounted to 14,083 animals (Lomen Family Collection, n.d.).

When government investigations of the reindeer industry began in the 1930s, one of their primary goals was to identify the legality of non–Native ownership of reindeer, primarily that of the Lomens. Reindeer Service and Bureau of Education employees such as William Lopp fought with the Lomens and other white owners for years over the legality of their ownership of reindeer. In 1921, United States Attorney Fred Harrison of Nome wrote to the Attorney General regarding the Teller herd sales: "The Government would be unable to prove that it had any property right in the deer" (Quoted in a letter from Ernest Walker Sawyer to Secretary of the Interior Wilbur, May 3, 1930).

Lindeberg's support of the Lomens ended in 1921 when he suffered financial reverses as president of the Miner's and Merchant's Bank in Nome. The closing of a Tacoma bank forced him to end his backing of the Lomens' various enterprises. Following the loss of Lindeberg's support, Carl Lomen set out to raise capital for the businesses.

Lomen Reindeer and Trading Corporation was organized in 1923 with holdings of 30,000 to 40,000 reindeer and an authorized capital stock of $1,500,000 in their initial organization. Upon buying out Lomen and Company, Lomen Reindeer and Trading Company issued $2.00 in stock for every $1.00 share held in Lomen and Company (Warren Report, 1935).

In an effort to repay past debts, promote the reindeer business, and place it on a sound financial footing, the Lomens attempted to secure capital through company reorganization and the insurance of new ownership shares. The Lomen Reindeer Corporation, changed in 1933 to the Northwestern Livestock Corporation, was organized in March, 1927. Stock was issued and used to gain limited financial resources as well as repaying a $316,290 loan made to the Lomens several years earlier by A.H. Burroughs and Leonard and Arthur Baldwin. Even with this success, the Lomens were never able to secure enough capital to overcome the problems facing the reindeer business. During his trips to New York to raise capital, Carl Lomen opened sales offices there and Seattle.

Promotional campaigns for reindeer were conducted by Carl Lomen with such success that he became known during this period as the "reindeer king" of Alaska (Lomen, 1954). Between 1930 and 1933, several subsidiaries were formed under the Lomen Reindeer Corporation. The Alaska Livestock and Packing Company, the Lomen Commercial Company, and the Nunivak Development Company were all created in 1930. Part of the stock holdings of the parent Lomen Reindeer Corporation in Alaska Livestock and Packing Company were sold in small blocks to west–coast residents. The family hope was to create awareness of and a market for reindeer of which by 1930 they had more than enough, but for which their had no major market outlet. Alaska Livestock and Packing Company was created to operate the herds and the packing house aspects of the reindeer business. A store was also purchased in Candle in 1931. The Dexter herd at Golovin was purchased in 1929.

While the Lomens maintained that their policy was to export reindeer meat to the continental United States and to leave the local markets to the Native owners, this did not resolve problems between them and the Native herders. The history of meat sales which began in 1918 is provided in Table 7. Although export sales warded off a direct confrontation for years, conflict was ultimately unavoidable. When miners and their supportive merchants began to move out of the Seward Peninsula in the 1910s, the reindeer herds were larger than ever and still increasing. Throughout the 1920s, the number of Native–owned reindeer continued to increase, but the marketing potential for reindeer decreased as the local markets declined. Meanwhile, the Lomen Reindeer and Trading Corporation expanded to include ocean freighting services, trading posts, and lighterage and commercial slaughtering services.

In order for the Lomens to achieve vertical integration, a series of other steps were taken. The Enterprise Steamship Company was organized with a capital stock of $5,000, and the coastal vessels *Nokatak* and *Silver Wave (I)* were acquired. The Elephant Point Natural Cold Storage Plant was con-

Table 7. *Yearly reindeer meat sales by the Lomens, 1914–1937.*

Year	Number of carcasses	Year	Number of carcasses
1914	no data	1926	ca. 3,600
1915	no data	1927	9,000
1916	no data	1928	12,000
1917	no data	1919	14,500
1918	624	1930	14,368
1919	no data	1931	602
1920	no data	1932	1,943
1921	no data	1933	3,200
1922	no data	1934	no data
1923	no data	1935	no data
1924	1,109	1936	no data
1925	3,600	1937	no data

structed on Escholtz Bay to hold carcasses before shipment to markets in the 48 contiguous states. At Teller, another corral and processing plant were constructed. When the *Silver Wave (I)* was wrecked in ice off Cape Espenberg in the fall of 1924, she was replaced quickly by the *Silver Wave (II)*, a sixty foot, twin–screw motor vessel. The Enterprise Steamship Company was reorganized and renamed the Arctic Transport Company between 1927 and 1929. The *M.S. Sierra*, a 2,000–ton ship, was purchased, as were the 240–foot *Arthur J. Baldwin* and the *Donaldson*. Only four years after Lomen and Company acquired reindeer, their activities were reviewed by the Bureau of Education, as noted in the reports for 1917–1918. The Bureau felt that they had done three things which promised well for the industry:

1) They developed an outside market, mostly in Minneapolis, shipping ca. 624 carcasses;

2) They were buying steers on the hoof for shipment to the states; and at $10 a head, large local Native owners were anxious to sell, thus leaving a bigger local market for smaller herds; and,

3) They conducted large drives of steers from herds across Seward Peninsula to demonstrate its feasibility. (U.S. Bureau of Education, 1919).

At that time, Superintendent Walter C. Shields wrote that he did not believe many problems would develop as long as white reindeer owners continued their current policy. Any friction between white and Native owners was more likely to come over the issue of grazing grounds.

The Governor of Alaska, John F. A. Strong, had a rather different attitude, which was expressed in the same report.

> Perhaps the attitude of the Bureau of Education is somewhat at variance with my own, but I believe that where the reindeer industry can be encouraged among the whites without detriment to the Natives, every assistance should be offered, for it is only through the white owners and shippers that it will be possible to add to the food supply of the country at large. (U.S. Bureau of Education, 1919).

In these differences of opinion between Governor Strong and Superintendent Shields can be seen the roots for a conflict between supporters of reindeer as a Native industry for the benefit of the Alaskan Eskimos and supporters of the reindeer industry as a commercial enterprise, as represented by the Lomens' involvement in the production and marketing of reindeer products.

The Lomen family's involvement in reindeer up to 1940 is a significant episode in the history of reindeer operations. Leaving aside the legal questions which were eventually raised about the ownership of reindeer, the use of ranges, and grazing rights, it is clear that the Lomens acquired both deer and range between 1914 and 1923. They attempted to establish markets for the sale of reindeer meat. Their efforts were concentrated at developing markets outside of Alaska as the local market was already served adequately by the Native herds. In establishing these markets, they attempted to gain a vertical integration of the reindeer industry by controlling the supply, storage, and distribution of reindeer products. To some extent they also attempted to create their own market demand for the meat in the continental United States. While this appears on the surface to be simply a case of an effort to establish a successful business operation, there is more to the Lomens' involvement with reindeer. The activities surrounding their efforts were, more often than not, at the expense of the Eskimos for whom the government had introduced reindeer in the first place. Interpretations of their involvement have been debated for many years.

The 1917 report submitted by Superintendent Shields listed seven recommendations for the reindeer industry in Alaska. He observed that warble–fly damage in the herds appeared to be increasing, and recommended: 1) expert supervision for the herds; 2) Native supervision, especially as chief herders; 3) importation of 200 Siberian bulls to improve the breeding stock; 4) settlement of grazing rights disputes; 5) funds to support *The Eskimo* (newspaper), which served as a communications link between the Native reindeer herders; 6) continuation of the reindeer fairs for at least three more years; and lastly, 7) that the Chief of the Alaska Division of the Bureau of Education should make a winter visit to Alaska to aid the reindeer industry (U.S. Bureau of Education, 1918).

The 1917 report was to be Walter C. Shields' last, for he died in the influenza epidemic of December, 1918/January, 1919. Shields was a well–traveled man, capable with both a dog–team and reindeer, and well respected by the Natives on Seward Peninsula. Shields' death dealt a blow to the reindeer industry and the Native interests. His organizational abilities and the respect the Eskimos had placed in him were irreplaceable.

Epidemics, company herds, and fairs

The influenza (Spanish flu) epidemic of 1918/1919 was disastrous for the Eskimo reindeer herders. In some villages, five out of seven people died. Mary's Igloo had a population of some 300 to 400 people prior to the flu, while after the epidemic the population of the village numbered only 90 to 100 persons. The reindeer herders at two of the four camps surrounding the village were saved by their isolation, but only two people in one of the camps survived

(Oquilluk, 1973). The flu spread along the coast from southern Alaska via Unalakleet, Colovin, and Nome, and was carried to Wales by the mail carrier. When the news of the impending disaster reached Shishmaref, before any one infected arrived, the village council decided to deny entry to the village to anyone until the flu had run its course. A barricade was erected southwest of the village and no one was permitted to cross it. In this way, the flu was prevented from reaching any further north than Shishmaref (Oquilluk, 197 3; Keithahn , 1963).

Once the influenza had run its course, it left many problems behind. In addition to losing the estimated 900 people who died on the Seward Peninsula, the remaining population was psychologically marked by the experience. The epidemic reduced the number of experienced reindeer herders, as well as the pool of men on which to draw for future training. Some observers of the industry, such as Shields, had suggested that herding and management needed improvement in some areas even before the flu (U.S. Bureau of Education, 1918). Significant problems were also left in the wake of the epidemic regarding the estates of deceased Native reindeer owners. Could reindeer acquired by inheritance be legally sold? Could whites inherit reindeer? It was not until the various reindeer investigations of the 1930s that a Solicitor's Opinion was obtained on these matters. In the intervening decade, the reindeer not only increased in numbers, but more and more were placed into the hands of non–Native owners.

During this period, conflicts between the demands of school and the demands of the increasing reindeer herds also appeared. Charles N. Replogle, the teacher and Friends missionary at Noorvik, reported that nearly every family in that newly established village (formed in 1914 largely by immigration from the Deering and Candle area) owned reindeer and were not without their problems. "In all the work and progress of the business there has been and remains yet the problem of the herder's family" (U.S. Bureau of Education, 1918). Among the family problems were the parents' desires to have their children with them to help with the reindeer, to have their children learn the business which also meant during the winter when school was usually in session, and the perceived need to be a specialist in herding in order to succeed. Replogle noted, too, that the help of a wife was essential in reindeer camps, and that the rotation of families between the herds and the village had helped to ease the problem of long absences for the schoolchildren. While much individual variation in skills had existed among adult Eskimos in the past, most had been generalists in the sense that they knew a variety of skills well enough to be able to make a living. Reindeer herding, however, was meant to be a full–time occupation as the Bureau of Education saw it for the Eskimos.

Between 1918 and 1920, William T. Lopp, Chief of the Alaska Division of the Bureau of Education, urged the consolidation of reindeer owned by individuals into "company" or cooperatively managed herds. It was his belief that this would bring about better herding and management. Lopp was not the first to suggest a company type of organization. Charles S. Thomson, Missionary of the Congregational Church at Wales, and Dr. James H. Hamilton, teacher at Diomede, wrote Lopp on September 16, 1911:

> As a substitute for the ownership of individual deer by natives, indicated by ear markings, we suggest that the natives be permitted to own herds on the corporation plan, each owning a fractional share of the entire herd; viz., an undivided interest, according to his investment, and receive from time to time a pro rata share of the profits in the form of dividends. (U.S. Bureau of Education, 1912).

The Bureau of Education believed that reindeer fairs could be a way to encourage cooperative management of the Native reindeer herds. At such fairs, they suggested to the Eskimo reindeer owners that clubs be formed to promote better herd management. The first Reindeer Fair was held at Igloo in January of 1915. At this fair, speeches were made by the various delegates: Superintendent Shields, Carl Lomen, and others. Bureau of Education employees talked about how cooperation and kindness would work in favor of the Eskimo herders (Bureau of Education, 1917). Fairs held in subsequent years at Igloo, Noatak, Noorvik, and Unalakleet provided a meeting place for reindeer owners to organize "clubs" or "owners associations." By and large, it appears to have been the large herd owners who most favored the formation of associations. By virtue of their political and economic advantage, they tended to dominate the "Reindeer Companies" which were formally organized in the early 1900s. Because of their large reindeer holdings, company–type organization favored their political and economic ambitions.

Meanwhile, the number of reindeer continued to increase. Since the 1890s, the Bureau of Education had been responsible for administrating the reindeer herds, but the Reindeer Service consisted mostly of the "local reindeer supervisors" who were also the school teachers in most villages. Double duty was often beyond the expertise and desires of the teachers, who found themselves entangled in disputes over inheritances, ranges, and reindeer about which they had no knowledge. A general reindeer superintendent was supposed to oversee the work of the local supervisors, but little guidance was given. The regional superintendent of the Bureau of Education tried to visit the herds, attend the handlings, and

approve the tallies along with the local teachers, all in addition to his principal job of administrating the schools. The logistics of this in the 1920s, compounded by limited budgets, severely impaired the superintendent's ability to do any of these tasks well.

Reacting in part to the recommendations of Superintendent Shields' 1917 report, the Bureau of Education did two things in 1920 which affected Native reindeer operations. The *U.S.S. Boxer*, acquired from the United States Navy to bring school supplies north to Alaska from the continental United States, was also charged with taking reindeer carcasses back to the contiguous United States for sale on behalf of the Natives. The *Boxer* had a carrying capacity of 500 tons and for years provided the means by which Native herders were able to market animals beyond their local area. In some years, carcasses were only transshipped for Native herders and associations to meet with other steamers heading south to continental United States markets (U.S. Bureau of Education, 1923). Later, the *U.S.M.S. North Star*, belonging to the Bureau of Indian Affairs, performed the same functions.

Also in 1920, the Bureau of Biological Survey (BBS), in conjunction with the Bureau of Education, began a series of experiments to cross–breed reindeer and caribou on Nunivak Island. Under a cooperative agreement between the Lomens and the Bureau of Biological Survey, Nunivak Island was to be used to conduct "...investigations, experiments and demonstrations for the improvement of the reindeer industry in Alaska" (U.S. Bureau of Education, 1921). The cooperative agreement providing for the experiment was protested by the island residents. Although the experiments were meant to improve the breeding stock of all herds, island residents objected to the Lomens' presence on Nunivak Island. Lomen and Company claimed the island as their rangeland. Natives claimed that the Lomen–operated store and reindeer herd on Nunivak Island were not being operated in the best interests of the Natives. The later reindeer investigations of the 1930s looked into these charges and counter–charges, but no conclusion was reached. The cross–breeding experiments failed to benefit either the Lomens or the Natives in the long run.

By 1922, there were approximately 259,000 reindeer in Alaska. Two–thirds of those reindeer were in Native hands while the remaining third were owned by whites, Lapps, and the government. Virtually all mission herds had been sold to the government or non–Natives. From historical accounts, contemporary accounts of the period, and informants' statements, it appears that a number of individual Natives were starting to amass large enough herds to be able to live largely from the income of their herds. These men had learned reindeer herding at an early age, as apprentices or as boys helping their fathers with the herds. They stayed out from the villages for most of the winter with the herds, patrolling their range and keeping their reindeer under surveillance. They generally drove sled deer, as opposed to dog teams, which were used more by trappers. Some individuals were successful trappers at the same time they were successful herders.

Using the capital represented by their herds, their familiarity with the newly introduced items of western culture, and their own initiative, herders began developing into entrepreneurs. Several herders started and operated their own small stores, trading reindeer for fur skins and selling what supplies they had on hand. In one village on the Seward Peninsula, for example, a cooperative reindeer association was formed August 7, 1924. At that time, the largest herd owner was also a trader, trapper, and owner of the only gas powered boat in the village. Of the 59 owners of reindeer in the village at the time, he owned the most reindeer, a total of 603, while only five of the other herders owned more than 100 deer. The remaining owners owned between one and 92 reindeer, for an average of only 16 per individual. In total numbers, six people controlled 1,505 of the 2,425 total reindeer in the village (U.S. Bureau of Indian Affairs, n.d.).

In 1924, with reindeer numbers steadily increasing, it became apparent that changes were necessary if the reindeer industry were to continue as a viable operation. In a memorandum dated February 15, L.J. Palmer advised the Chief of Biological Survey that 242,000 reindeer existed in Alaska, with an average herd size of 2,000 head. He also stated that herds could be expected to increase in the future to an average of 7,500.

> The need of using large grazing units will necessitate the establishment of co–operative herds among the numerous small owners, and this will result in the formation of many co–operative associations or livestock companies, especially among the Eskimos. As a natural development of the rapidly growing use of the open range, there is certain to be established in the very near future a grazing permit system for the control of range and regulation of the reindeer grazing. (Palmer, 1924).

Palmer also advised that herds of mixed non–Native and Native ownership be split where feasible and placed on separate ranges. Such separation would prevent conflicts between Natives and non–Natives over the ownership of herd increases and over the use of rangeland. He also urged the adoption of a ten point program of herd management, emphasizing open herding, a ratio of 5 to 10 bulls per 100 female deer, and "proper" selection of the

best animals, both males and females, for breeding purposes.

Palmer's advocacy of open herding was based on his belief that it resulted in better calving percentages and healthier stock. In a memorandum of December 8, 1923, he addressed this problem with data to support his belief: . .

> that the herds in the Illiamna Lake section and the Pt. Barrow section are in poorer condition generally than elsewhere ...it develops that the herds are very closely herded and otherwise poorly handled. Consequently it is our opinion that the close herding and poor management is the chief cause for the less successful results in these sections. (Palmer, 1923).

He was also correct when he predicted that grazing permits would be established. In 1927, Congress passed the Alaska Grazing Act, which called for the General Land Office (now the Bureau of Land Management) to issue grazing permits for reindeer and other livestock in Alaska. Applications for permits were taken by the General Land Office, but the Great Depression appears to have prevented the actual issuance of permits to Native associations and non–Native herd owners alike.

By the mid–1920s, the small private holdings of the Native owners, coupled with problems in inheritance and sales, the proliferation of identifying earmarks, and disputes over range and handlings, caused the Bureau of Education to re–examine its policies. One attempt at resolving some of the problems came with introduction of the joint stock–ownership system. Under this system, the animals belonging to the people of any one village were to be herded by paid herders. Upwards of 50 people in a village often owned reindeer in numbers varying from one to two to several thousand animals. However, under the system of the Native "company herds," management became rather more difficult than easier because of several complicating factors. The lack of adequate local markets and the practice of paying for labor in meat and not wages prevented the companies from generating enough cash to pay expenses. There were no enforceable restrictions on grazing or on the number of animals allowed on ranges. Ranges at that time were well established by customary use, by occupancy, and by permit applications pending with the General Land Office. The net result was that the herds were allowed to grow too large to herd and manage effectively.

Additional problems, although less severe, only compounded the difficulties. Roundups were often incomplete and herds that were rounded up were often of mixed ownership. An insufficient number of males were castrated, providing insufficient numbers of marketable steers or leaving a number of poor breeders in the herds. Often, men experienced in the reindeer business had no more voice in the management of the company herds than owners of only a couple of reindeer who had had little or no herding experience. Lastly, the government employees who were charged with reindeer matters had only advisory authority. They could not order a reduction in herd numbers to protect the rapidly deteriorating ranges. The summer ranges along the coastal strip of Seward Peninsula were being substantially overgrazed.

During the joint stock company period, companies operated not so much like their counterparts in the continental United States which were profit–motivated organizations, but more as a vehicle for managing the village herds in a fair manner. A chief herder was selected from among all company members to control herd operations. This individual, usually an experienced reindeer man and often one of the largest herd owners, was placed in charge of the day–to–day operations of the herd. Members of the company primarily contributed labor, assisted during handlings and corrallings, helped guard the herd, and butchered animals from it. Families sometimes stayed out with the herders. Roundups and corrallings, though often incomplete, remained major social events. Payment for labor and other services to the company was made in the form of "shares" added to one's account. No formal stock certificates were issued; accounts were kept in ledger books under the name of each herd co–owner. Credits for labor and services, and debits for butchering or food purchased from the village store were recorded for each co–owner in the ledger books. While shares were supposed to represent reindeer, in fact they represented only an abstraction, since shares paid to one's account for labor services and shares paid in on the basis of percentage increases in the herd were not distinguished. Percentage increases were given on the basis of the total number of animals owned by individual owned. Since only the females one owned contributed to the increases, shares should have been based on the numbers of breeding females, not on the total number of animals, but such was not the case.

This problem of giving percentage increases based on total numbers of animals instead of on the number of breeding females owned caused herds to increase faster on the books than in reality. Shares of stock, each representing one reindeer (regardless of sex), quickly became inflated. As the share system worked, in the spring of each year a percentage increase was given to each herd co–owner based on the spring calving successes. The increases were calculated at a rate of 50 to 60% of the owner's previous share total. The shares received were actually reduced by ten per cent before they were given to

the owner. This ten per cent represented a "tax" which was added to the company treasury and from which company expenses were supposed to be met. Such expenses as food, materials, and labor were to be paid from this treasury account.

The flaw in the system came with calculating the shares to be paid to herd co–owners. There was no distinction made between male and female reindeer owned by each shareholder. One share represented one reindeer, regardless of that animal's potential for future herd increases. In the absence of complete yearly roundups and adequate markings of animals as to their owners, the number of reindeer listed per shareholder increased faster on paper than in actual herd counts. Within a few years, reconciliation between the ledger shares owned by company members and their actual reindeer in the herd had become impossible.

In addition to the problem of determining actual numbers of reindeer owned by each herder, there were other difficulties that grew out of the "company" period. Theoretically, every co–owner (shareholder or company association member) had an equal say in the management of the company herd. According to informants, conflicts between large and small herd owners did develop. The small owners were viewed as "too bossy" by the large owners. To compound the problem, since the small owners had less at stake in the management of the herd, they apparently paid less attention to proper slaughtering practices and contributed virtually no labor in the yearly operations of the herd. By not cooperating with the larger owners, the effectiveness of the larger owners, who had more vested interest in the herd and the overall operation, was greatly reduced. This lack of cooperation was detrimental to the herd operations, for the larger owners were generally the better herders and husbanders. The large owners tended to have more experience, ability, and desire to handle reindeer, whereas the small owners had sometimes never even seen their animals. Small owners also often butchered more than their shares entitled them to take, or butchered without obtaining butchering permits from the company officers. The larger owners were powerless to prevent such activities since they could invoke no formal sanctions. Complaints to the Reindeer Service personnel and to the school teachers often went uninvestigated due to lack of time, money, and interest on the part of the government employees.

The stock associations continued for a period of about 25 years (1925 to 1950). The effectiveness of the stock association type of herd management steadily declined during this period. For example, during the early years of the Deering Reindeer Stock Company, the herds were well tended and corralings took place on a regular basis. During the late 1920s, company members realized that June handlings for the purpose of obtaining fiscal reindeer counts were expensive and difficult to arrange because of summer travel logistics. There were also conflicts with subsistence activities. They concluded such counts were unnecessary when the winter handlings could take care of all the June requirements. Constant herding declined steadily as there was the feeling that herding on a continual basis was not necessary as reindeer increased without constant herding.

After the peak years in the early 1930s, herd sizes began to decline as some herds were not handled or herded for stretches of several years in succession. At the time of the Depression, when there was virtually no wage labor available, many herds were simply abandoned. High percentage increases continued to be given to herd co–owners even though the herds continued to decline throughout the 1930s. In the late 1930s, it became increasingly apparent to Eskimo herd owners and the Reindeer Service alike that the stock ownership companies were not managing the herds effectively. The Federal government initiated a change in the policy reverting back to the Lapp–like individual ownership of reindeer. The effects of the company period are still being felt today, however, particularly when old issues relating to reindeer ownership and range use are brought up that date back to this period.

During the decade 1920 to 1930, the principal problem facing the reindeer industry was too many reindeer, or conversely, inadequate markets for the numbers of reindeer available for slaughter. As mentioned earlier, the Lomens attempted to create markets in the continental United States through vigorous promotion of reindeer products. In Seattle and California, their efforts were met with opposition from cattle interests. Shipping problems and local ordinances banning reindeer meat sales in the western states led to the downfall of A.A. Selden and Axel Gottlieb's plans for their Eskimo Sisters Reindeer Company in Pacific Grove, California (Selden, n.d.).

In an attempt to bolster the development of a market, a herd was established in interior Alaska at Cantwell in 1922. Reindeer Service employee Ben B. Mozee led a drive of 1,437 reindeer from Goodnews Bay to the Broad Pass area. The goal of this drive was to set up a herd near the recently completed Alaska Railroad so that the railroad could transport reindeer to its ice–free terminus at Whittier. Predators, lack of constant herding, personnel changes, and losses to caribou herds contributed to the demise of the Cantwell reindeer industry by 1928 (Luick, 1973).

The largest drive of reindeer in the 1930s to new grazing grounds was a Lomen–organized drive of 3,000 head of reindeer from Seward Peninsula to the headwaters of the Mackenzie River in the Northwest

Territories of Canada. Field examinations by the Porsild brothers had determined that range was adequate and that a social and economic need for reindeer existed in Canada's north (Porsild, 1929). Field Superintendent for the Lomen Reindeer Corporation, Dan Crowley, and Chief Herder Andrew Bahr directed the drive. Only ten per cent of the original animals taken completed the thousand–mile trip from the Naboktoolik corral on Escholtz Bay. Calves born along the route during the five–year drive did replace most of those animals lost, so that 2,375 reindeer were ultimately delivered at the Kittigazuit corral in March, 1935. During the original field investigations of the area, the cooperation of the Alaska Reindeer Service and the Bureau of Biological Survey had been secured, but the difficulties which the Alaska reindeer industry was facing at the time were not appreciated. The Canadian reindeer industry located at the Mackenzie Delta developed along lines parallel to the Alaska industry, but without ever going through a disruptive period of non–Native competition (Stager and Denike, 1972; Miller, 1935; Scotter, 1972a, 1972b; Hill, 1967; Lomen, 1954; Evans, 1934a, 1934b, 1934c, 1934d, 1946).

Reindeer investigations

The Great Depression which began in 1929 had impacts on Alaska which are often overlooked by historians of the period. As the United States sought its way out of its economic problems under the Hoover and Roosevelt administrations, enough commotion was stirred up about reindeer to bring a Federal investigating team to Alaska virtually every year for the next ten years. Their reports and recommendations span thousands of pages, most of which lie neglected and forgotten on the dusty shelves of the National Archives in Washington, D.C. (Stern, 1977). Hearings in Washington into reindeer matters were also a significant factor in the eventual purchase of all non–Native–owned reindeer and properties by the Federal government in 1940. Protests by members of the Reindeer Service about Lomen activities, letters from the Native reindeer associations, and letters from various church and missionary groups throughout the 1930s pressured the Secretary of the Interior to take action.

Most protests centered on three main issues. The Lomens were charged with unfairly taking range lands which belonged to Native herders based on customary use at Buckland, Teller (Igloo range), and Golovin, as well as other ranges beyond the Seward Peninsula. The Lomens and their agents were charged with unfair range rules and practices, including the marking of mavericks to the Lomen herds, at the disadvantage of the Native herders. Lastly, the Natives regarded the non–Native owners as unlawful interlopers in an enterprise established for their benefit.

A principal point of conflict concerned the Lomen occupation of ranges which Natives claimed. In each of four contested ranges on the Seward Peninsula, the history of occupation shows that it was Lapps (Kotzebue) or Natives and missions (Buckland, Teller/Igloo, and Golovin) who first used these contested ranges for herding. The Lomens moved on to these ranges as their herds increased and as they purchased reindeer from Lapps, missions, and Natives. Once on the ranges, they refused to withdraw their reindeer, and further, charged Native herd owners a grazing fee for the use of the range which they had formerly occupied (Chance, 1930). The Reindeer Committee of 1931 recommended the separation of the herds in the Teller and Buckland areas, but by the time the Survey of the Alaska Reindeer Service was released in 1933, this still had not been accomplished. The Trowbridge–Cillman Survey concluded that the separation of Lomen and Native herds on the Teller range was not necessary because of mutual agreements, and that the separation of herds on the Buckland range would resolve the dispute in that area.

The Lomens were often charged with questionable practices in the reindeer business. They were dealing with Native people who seldom had any formal education beyond a few years of elementary school. Punishment was still received for even speaking the Eskimo language in classrooms. At reindeer handlings, Lomen company representatives claimed unmarked reindeer (calves and mavericks) on a percentage basis of Lomen animals present at the handling. Ernest Walker Sawyer wrote to Governor George Parks that the net result of the application of the percentage marking system was to reduce the number of reindeer marked to Natives while the number of deer marked to the Lomens increased (Sawyer to Parks, October 3, 1930, see Appendix I). It was perceived that through the percentage marking system, the Lomens marked to their herds far more reindeer than they might actually have been entitled to from their natural herd increases.

As previously noted, the Lomen companies went through four separate corporate reorganizations with their reindeer business. When the Lomen Reindeer Corporation was organized in 1927, the stock which was issued for the company was allegedly inflated beyond the assets held by the company, but this was never substantiated by actual counts of the animals on the range. Most importantly, the Natives regarded the Lomens as unfairly competing with them in an enterprise which had been established for the Native's benefit. The twin issues of unfair marking practices and occupation of Eskimo claimed ranges served, from the Native viewpoint, to justify the charge of unfair competition.

The letters of C.L. Andrews provide a most vivid documentation of this period of conflict between the Lomens and Eskimos based on his familiarity with the region and its problems. Andrews had served as a teacher at Kivalina and as a leader and reindeer supervisor with the Reindeer Service on Seward Peninsula. He had also been a Customs Agent in Alaska from 1897 to 1909, had been with the Duke of Abruzzi on the Mt. St. Elias Expedition of 1897, a newspaper and magazine writer, and author of several books based on his Alaskan experiences (Andrews, 1926, 1935, 1938, 1939). While his viewpoints on the situation must be regarded as favoring the Eskimo position, his data and eloquently written, lengthy letters of protest to the Indian Rights Association and the Department of the Interior presented his case clearly. He saw himself protecting the interests of a defenseless people against the:

> deliberate plot (which) has been deliberately and persistently pursued for the past 15 years to break the Rules and Regulations of the Interior Service (sic Department) in Alaska ...violating the spirit of the contracts of the Missions holding reindeer in Alaska, (in) trust for distribution to the natives, and to appropriate lands which by right of occupation properly belonged to the natives. (Andrews, 1930).

The letters of Andrews and others sympathetic to the Eskimo's position to the Secretary of the Interior caused enough of a stir to prompt the latter to send a special representative, Ernest Walker Sawyer, to investigate matters. Sawyer had been involved in the management and planning for the Alaska Railroad, so he was generally familiar with the Territory and its problems. In October, 1930, he reported his findings to Governor Parks (1930a). Sawyer believed that the Lomen marking practices were unfair to the Native herds (Sawyer, 1930b; see also Appendix I).

Secretarial Order No. 380, signed by Secretary of the Interior Ray Lyman Wilbur in 1929, formally placed the responsibility for reindeer matters in the hands of Governor George Parks. This ended Bureau of Education involvement with reindeer at high administrative levels, but still left local–level matters in the teachers' hands. Parks himself was a political appointee and directly responsible to the Secretary of the Interior. With administrative responsibility for reindeer herding resting in his office, Governor Parks set out to reorganize the bureaucracy responsible for reindeer in Alaska. Within six months after administration was placed in his office, a document supporting the estimates for appropriations, an organizational chart, and a statement on the current status of the industry were sent to E.K. Burlew, Administrative Assistant to the Secretary of the Interior (Parks, 1930). Nineteen new positions were proposed, to be filled over the course of five years, including a general reindeer superintendent, four district reindeer supervisors, and fourteen reindeer foremen. Operating on a budget of $122,590, these employees would take over the duties of the then present personnel:

> ...two district supervisors on full time, 3 district school superintendents on part time, 38 Government teachers on part time, 30 Government apprentices on full time caring for 360,000 reindeer in 73 herds extending along several thousand miles of coastline and grazing upon an area of 100,000 square miles. (Parks, 1930).

Parks was also concerned that Government policy:

> ...proceed with the work until such time as the natives are competent to manage their own affairs, (and in all fairness to the natives) this seems to me to be the only policy that can be followed, then it is most essential that the teachers of the Office of Education be relieved of this extra work, and an organization created which will be able to administer the reindeer industry, that in a period of a few years, the natives will be able to carry on the work and the Government withdraw from the field. Assuming that the Government will continue to administer the reindeer herds in an advisory capacity to the natives, careful attention has been given to planning for the smallest organization possible to carry this into effect with all possible expediency. (Parks, 1930).

In the plan for reorganization, (Tables 8 and 9), one sees clearly that Parks hoped to have the Natives fully in control of their reindeer with the Federal role reduced to that of an advisor. Curiously, this is the situation which exists today: the Federal role remains an advisory one with the Bureau of Land Management responsible for range protection and grazing–permit assignments.

The territorial governor thus inherited a long–standing problem from the Bureau of Education. The Lomens and other non–Native owners of reindeer had been the targets of objections from Eskimo reindeer owners and from sympathetic Bureau of Education and Reindeer Service employees for over a dozen years. The original sale of reindeer to the Lomens had been taken to court where it had been declared valid (Andrews, 1930).

While the legal statement closed the matter in the minds of the Lomens, the Eskimos and their supporters still believed that the Lomens were unfairly competing with the Native industry. As the local markets decreased in the 1920s, the reindeer belonging

Table 8. *Organization of the Alaska Reindeer Service in 1930.*

	Secretary of the Interior				
	Governor				
	General Reindeer Superintendent (Mozee)				
Headquarters Office Clerk	5 District Supervisors in Field				
	Seward Peninsula District	Northwestern District	Southwestern District	Western District	Central District
	Schmidt	Morelander (B of E)	Gardner (B of E)	Rood	Beck (B of E)
	131,519 deer	157,174 deer	16,459 deer	61,762 deer	2,529 deer
	11 teachers (B of E)	10 teachers (B of E)	7 teachers (B of E)	9 teachers (B of E)	1 teachers (B of E)

(Source: Parks, 1930).

to individual Natives and to joint stock associations increased far beyond the local demand, and such protests became more vocal.

In order to determine the status of the reindeer industry and the sources of the problem which were causing so many protests, the Secretary of the Interior conducted Reindeer Hearings in Washington, D.C., in February and March, 1931. The investigating committee consisted of Senator John B. Kendrick from Wyoming, Representative Scott Leavitt from Montana, and former Assistant Attorney General Charles P. Sisson. (Kendrick, Leavitt and Sisson Committee, transcript of Reindeer Committee hearings, and transmittal to Secretary of the Interior, in Elmer E. Rasmuson Library, Arctic Archives, University of Alaska, Fairbanks, Alaska). At the conclusion of the hearings, findings and recommendations were forwarded to the Secretary of the Interior and were accepted on March 30, 1931. Among the steps recommended by the committee were the establishment of a Reindeer Council in Alaska and the establishment of Range Rules. In addition, the committee recommended that roundups be held for the purpose of establishing ownership and numbers of reindeer on the ranges, that reindeer be transferred to separate Native and non–Native ranges, that marketing methods be made more equitable, and that the Reindeer Service be expanded.

Until there was an adequate supervisory force in the Alaska Reindeer Service to handle the transfer of reindeer from Lomen to Eskimo ranges, to supervise roundups, to settle ownership disputes, and to develop marketing outlets for Native–owned reindeer, the recommendations of the committee could not be put into effect. To expedite the implementation of the recommendations, three new unit managers were hired in August and September, 1931, bringing the Reindeer Service personnel to eight (including one temporary clerk at Nome), distributed as follows: General Reindeer Superintendent in

Table 9. *Governor Parks' proposed reorganization of the Alaska Reindeer Service in 1930.*

	Secretary of the Interior			
	Governor			
	General Reindeer Superintendent (Mozee)			
Headquarters Office Clerk	4 district supervisors in field			
	Seward Peninsula District	Northwestern District	Southwestern District	Western District
	Nome (Schmidt)	Kotzebue	Dillingham	Bethel (Rood)
	6 Foremen	4 Foremen	1 Foreman	3 Foremen
	Wales	Barrow	Dillingham	Pilot Station
	Nome	Pt. Hope		Akiak
	White Mtn.	Kotzebue		Quinhagak
	Shaktoolik	Deering		
	Unalakleet			
	Savoonga			
	131,519 deer	157,174 deer	16,459 deer	61,762 deer

(Source: Parks, 1930).

Nome; five unit Managers stationed at Nome, Teller, Bethel, Candle, and Egavik; and two clerks at Nome (one of them temporary). These eight civil servants were expected to administer the estimated 500,000 to 800,000 reindeer and 78 Native reindeer associations with 5,878 members spread out over approximately 100,000 square miles of the territory.

Compounding the difficulties of administering so many animals and people spread out over such a vast area came the administrative transfer of the Reindeer Service itself. The Reindeer Service was transferred from the Bureau of Education of the Alaska Territorial Governor's Office of the Division of Territories, Department of the Interior, effective November 1, 1929. This change was part of an internal reorganization of the Bureau of Education, itself dissolved in 1931. The Alaska Division of the Bureau, with its responsibilities for education, health, and welfare of Alaskan Natives, was transferred to the Office of Indian Affairs (later the Bureau of Indian Affairs). During a brief but, as we shall see, crucial time lasting from February 1936 to July 1937, the Reindeer Service was within the administration of the Office of Territories and Island Possessions. Within the Division of Territories, the Reindeer Service received strong support from Ernest Gruening, then the Director of the Division. On July 1, 1937, reindeer administration was transferred back to the Alaska Division, which had been part of the Office of Indian Affairs since 1931.

The findings of the Reindeer Committee (1931) had favored keeping the Lomens off Native ranges as much as possible. Lomen and Company proposed to the newly established Reindeer Council that all the reindeer on the Seward Peninsula should be placed under one management scheme (U.S. Department of the Interior, 1931). Returns from the herds would be based on the number of female reindeer owned by the various co–managers of the herds. This suggestion was turned down by the Reindeer Council.

The Reindeer Council met only a few times in 1931 and 1932. Its major achievement was the adoption of a set of Range Rules on June 23, 1931. These rules differed little from the ones developed previously by the Lomens for their own herds and they served to work for the Lomens' benefit. The marking of calves and mavericks to their herds was continued on the same basis as before. The council was largely ineffective in dealing with the problems of the industry, and, in fact, served as a vehicle to exacerbate some of the already existing problems. The Lomens' influence with the Reindeer Council is suggested in the Range Rules adapted by the council. When these rules are compared with those used by the Lomen Company prior to 1929, it seems apparent that rules pertaining to markings, stray ownership, and mixing of herds were simply carried over from the Lomens' own range rules to the Reindeer Council's rules. Other interpretations are also possible, however. A comparison of the adopted rules and the Lomen rules is provided as Appendix II.

After only one year of existence, the Reindeer Council was stripped of regulatory powers in 1932 but continued to function in an advisory capacity for a brief time. The inability of the council to handle reindeer matters effectively had two causes: the composition of the council and the fact that it had no authority to enforce its decisions. The council was composed of: the Governor of Alaska as ex–officio chairman, the Chief of the Alaska Division of the Office of Indian Affairs, the General Reindeer Supervisor of the Alaska Reindeer Service, a representative chosen by and from Eskimo owners, and a representative of the Lomen interests.

In addition, the council never had the support of the herd owners nor the trust of the Reindeer Service personnel. Native representation on the council was limited to two men who shared only one vote. Although the Reindeer Service had a representative on the council with one vote, they resented the fact that the Lomen representative on the council also had one of the five votes. They maintained the position that a member from a private business enterprise had no right to be on a government council in an enterprise established to help Natives.

Reindeer Act of 1937

The political circumstances leading up to the passage of a Reindeer Act of 1937 were tremendously complex. The Trowbridge Gillman report (Survey of the Alaska Reindeer Service, 1931–1933, released in February, 1933) was discredited by many of the same parties who had originally questioned the Reindeer Committee hearings (U.S. Department of the Interior, 1933). A large portion of the criticism came from C.L. Andrews, who sent written protests to anyone who would read them. A series of critical articles also appeared in the *Indian Truth* magazine. It was reported that the results of the earlier Kendrick Committee (the 1931 Reindeer Committee) investigation and its recommendations, which were supposed to have been carried out by the Field Representatives Trowbridge and Gillman, were never implemented (*Indian Truth*, March, April, 1933). An earlier article appearing in this same magazine in February, 1932, entitled "Eskimo Reindeer Seriously Threatened," caused many sympathetic missionary and church groups to deluge the Secretary of the Interior's office with letters and telegram of protest over the reindeer situation (*Indian Truth*, 1932). Thousands of these letters were answered with a form letter which told the protesters that a field party (Trowbridge, Gillman, and Brewster) was going "to Alaska to aid the Governor in a fair and orderly

re–organization and adjustment of the ownership of the deer and expedite the making of range leases as recommended by the Reindeer Committee..." (Wilbur, 1932).

Trowbridge and Gillman managed to antagonize every person they dealt with in the Reindeer Service, as evidenced in their reports. Their charges against the General Reindeer Superintendent, Ben B. Mozee, resulted in his being transferred to the Alaska Educational Service, a transfer he rejected, electing instead to serve as United States Marshall in Nome. Brewster was appointed General Reindeer Superintendent, but the damaged relationship between the Reindeer Service and the Natives continued. Protests against him combined with ill health forced him to retire to Montana in 1934. He was replaced by Paul Stafford, the Teller Unit Manager, who served as the Acting General Reindeer Superintendent from 1934 to January 1936. J. Sidney Rood, the Nome–Golovin Unit Manager, became the Acting General Reindeer Superintendent in January, 1936, when Stafford was transferred to the Grazing Branch, Salt Lake City.

Legal opinion on the question of disposition of reindeer to non–Natives through inheritance, sales, and other means came in 1932. In response to questions posed by Field Representatives Trowbridge and Gillman, in a letter to Governor George Parks, the Solicitor for the Department of the Interior, E.C. Finney, gave opinions for the following questions:

> 1. Is there any authority of law for employees of the Reindeer Service to settle estates involving property consisting of reindeer and make distribution of reindeer owned by the estate, considering the fact that all natives of Alaska are citizens under the law?
> 2 Does Section 23 of the Reindeer Regulations authorize distribution of reindeer of estates of natives considering that said section clearly refers to "herders" and further, that many natives own reindeer who have never been herders, have bought reindeer outright, and own reindeer which were the result of the natural increase from those given them by the Government, or increase from those they purchased?
> 3 If the regulations are supported by law, as to the disposition " reindeer by the Reindeer Service or any other branch of or the Interior Department, does such authority cover instances where the estates include other property and which must be probated by the courts of Alaska? (Trowbridge and Gillman, 1932).

Solicitor Finney replied, in part:

> I am of the opinion, that question 1 must be answered in the negative. If the reindeer are owned by the native in his own right, altogether free from restriction, it is not a case where the Government should take any part in the administration of the estate. But if there be such restricted property, then the case should be handled in the manner above outlined or under such regulations as may be adopted. But I do not think an employee of the Reindeer Service could be authorized to settle such estates. That function is lodged in the Secretary of the Interior. Question 2 is substantially answered in the answer to question 1. Where the deceased native owned the reindeer without restriction there is no authority for the Department to administer on them, that function being appropriate for a local court. Question 3 seems to relate to cases where both restricted and unrestricted property is involved. In such case this Department can only deal with the restricted property, leaving the free property for disposal under local law.
>
> Regarding the general observations by the said field representatives (author's note–Trowbridge and Gillman) as to restrictions in the regulations on the sale of reindeer, reference is made to the authority for such regulations in section 39, title 48, U.S. Code... (Trowbridge and Gillman, 1932).

By establishing the technical legality of many of the Lomen purchases of reindeer, Trowbridge and Gillman went on to conclude that "the Government should not purchase existing reindeer marketing facilities or establish competitive agencies" (U.S. Department of the Interior, 1933). At this particular time, the Lomens had no wish to sell out to the government. Drastically reduced market potential would cause the Lomens to change their minds within a few years.

It was immediately apparent when the Trowbridge–Gillman report was released in February, 1933, that the recommendations contained in the Reindeer Committee's (1931) findings and the actions of the field representatives were very different. Superintendent Ben B. Mozee was fired from the Reindeer Service and replaced by Lyman Brewster, who had been one of the investigators with Trowbridge and Gillman. In *The Reindeer Problem in Alaska*, privately printed for Mozee (1933) in Nome, he critically evaluated the actions and recommendations made in the *Survey of the Alaska Reindeer Service, 1931–1933*. While Mozee's point–by–point evaluation cannot be repeated here, Mozee's bitterness at the unfair treatment which the Natives

received in the hands of Trowbridge and Gillman is clear (Mozee, 1933). A telegram to Ray Lyman Wilbur summed up his feelings. In that communication, he charged that Trowbridge, Gillman, and Brewster conducted their investigations with prejudice, that they failed to learn the terminology of the reindeer business, that they failed to spend enough time in villages to make adequate investigations, that they failed to review the records, and that they were intentionally vindicating the Lomens at the expense of the Native people whom the Reindeer Service was supposed to serve (Mozee, 1933). In reaction to the storm of protests that followed the release of the "Survey," Mozee's dismissal, and the continuing Lomen domination of the Seward Peninsula, more investigations were undertaken.

The first investigation was conducted by the Division of Education of the Office of Indian Affairs (OIA). The Alaska Division had responsibilities for Indian education, health, and welfare, and, prior to 1929 and again after 1937, for reindeer. W. Cameron Ryan, Jr., Director of the Division of Education, OIA, submitted a confidential report on the reindeer situation in Alaska to the Secretary of Interior, dated June 7, 1933, in which he reviewed the history of reindeer in Alaska and made the following comments:

> The fundamental issue in the reindeer controversy can be very simply stated: Is the Government engaged in the reindeer enterprise primarily for the economic and social development of the Alaskan Native, or for the benefit of private commercial interests?. . .
>
> There can be but one answer: The Alaska reindeer enterprise, so far as the Government's work with natives through the Department of the Interior is concerned, should be regarded as essentially a developmental and educational enterprise primarily intended for the benefit of the Natives.... This fundamental principle has been almost completely overlooked in recent handling of reindeer matters. Those in control have given considerable attention to the questions of herd management and marketing (and rightly so) but they have largely lost sight of the original purpose for which the reindeer industry was established. . . . The reindeer situation has been further complicated by the type of private business that has been influential in it. It is impossible to read the testimony of the Lomens themselves without coming to the conclusion that here is a group that were determined by hook or by crook to get possession of Native deer; that defied and denounced government representatives engaged in protecting the interests of Natives; that would go to almost any lengths to achieve their particular brand of business success. It is important to be fair to this group, but it is necessary to recognize it for what it is — an aggressive, domineering, cynical outfit, made bitter by the partial thwarting of many of its grandiose schemes. (Ryan, 1933, emphasis in the original).

On June 9, 1933, Special Agent Roy Nash began a second investigation of the reindeer industry for the Secretary of the Interior. On January 11, 1934, his confidential report submitted to the Secretary of the Interior was a "report adverse to the Lomen Reindeer Corporation" (Nash, 1934). The report consisted of 140 pages of narrative with hundreds of additional pages of appendices. In general, the report vindicated the people who had all along protested the actions of the Lomens, as well as the actions of the Field Representatives Trowbridge and Gillman. Nash submitted recommendations regarding the General Reindeer Superintendent for Alaska on November 15, 1933, even before his investigations were complete. Among the recommendations made, he suggested:

> I. Elimination of Mr. Brewster as General Reindeer Superintendent because of Native opposition.
>
> II. Reinstatement of Tom Lopp for two years to replace Brewster while his successor is developed from the present Unit Managers, Stafford, Briggs, Mattick and Kendrick. Mr. Lopp was connected with the education of Natives in Alaska for thirty years, part of which was spent as Chief of the Alaska Division.
>
> III. If this is not approved, the reinstatement of former Superintendent Mozee.
>
> IV. If neither II nor III is accepted, the promotion of District Manager Briggs to the position of General Reindeer Superintendent. (Nash, 1933).

In his formal report, Nash went further by stating:

> Since 1915, the Lomen Reindeer Corporation (now Northwestern Livestock Co.) has been invading ranges long occupied by government wards; forcing Eskimos to run their reindeer with those of the corporation; piling up huge herding and management costs; taking restricted Indian property to reimburse themselves for whatever they considered the Eskimos' share of those costs. The corporation must be stopped in its tracks right now and a complete separation of white and Native herds effected.
>
> Recommendations:
>
> Administrative: Approval applications

for grazing leases by Native companies on Teller and Buckland ranges; deny applications of corporation for same, and order Teller region vacated within twelve months; abolish Reindeer Council; transfer Reindeer Service to Office of Indian Affairs; give Nunivak Islanders reindeer.

Legal: Determine titles to reindeer; demand of the corporation an accounting for the whole period and recover for their misappropriation of restricted Indian property, by court action if necessary.

Legislative: Revise law on marks and brands; suggest to Congress a comprehensive reindeer code.

International: Request Canada to check earmarks and numbers in each mark when receiving reindeer at mouth of the Mackenzie River this spring. (Nash, 1934).

Within the body of Nash's report are careful justifications for each of the recommendations given briefly above. His insight into the reindeer controversy contrasts sharply with some of the previous investigators. With reference to abolishing the reindeer council, he wrote:

> Experience has not indicated that the Reindeer Council fulfills any useful function; I recommend it be abolished.
>
> A Reindeer Service with power, rather than a committee for acrimonious discussion is indicated. *With any frontier service, a maximum of trust and a minimum of red tape is desirable—so the original set–up be such as to merit trust.* (Nash, 1934, emphasis ours).

By 1934, it was obvious to the Lomens that they would not be able to operate their reindeer–herding business in the absence of large–scale markets in the continental United States. With plenty of Native– owned reindeer available locally, there was no Alaska market for Lomen reindeer. Lomens' financial backers, the Baldwins, offered to sell the holdings of the Lomen Reindeer Company to the United States. Interior Secretary Harold L. Ickes appointed a committee consisting of Assistant Secretary Oscar L. Shapman, E.K. Burlew, Harry Slattery (Personal Assistant to the Secretary), Paul W. Gordon (Director of Education for Alaska), and J. Kennard Cheadle "to study and consider the question of policy involved in a proposed trust of certain reindeer operations for Natives of Alaska" (Chapman Committee, 1934). The Baldwins' original proposal was made December 27, 1933, but was rejected because a combined Native–Lomen operation of the reindeer business would have entailed complicated legal and financial considerations, and a complex administration. The Baldwins' second proposal, dated June 26, 1934, was accepted in principle by the Chapman Committee. They believed that Eskimo control of marketing was the solution to the reindeer problem and concluded :

> It is therefore proposed that the Government secure for the use and benefit of the Natives such herds, range leases, abattoirs, cold storage plants and range equipment as seem essential to return to the Alaskan Eskimos control of this industry and to release them from the present controversies and tensions. (Chapman Committee, 1934).

The Lomens were successful in securing a loan approval from the Reconstruction Finance Corporation in 1933 to aid their declining operation. Governor Parks supported the loan application, which had mentioned the value of the Lomens' operation as an employer of Eskimos. The basis for the RFC loan appears to have been a December 31, 1932, balance sheet by the Lomen Reindeer Corporation. The herds were valued at $4,325,000 and the property belonging to their various other reindeer enterprises at $4,611,068.87. But despite RFC approval of the $1,247,500 loan, it was never granted (Lomen, 1954). Baldwin offered to sell all these assets for $950,000:

> Accordingly, I hereby offer to cause to be transferred to the Government or its nominee, free of all liens and encumbrances, the following property:
>
> 1. the entire herd of reindeer on Nunivak Island.
> 2. Warehouses, corrals, and other herd equipment, store stock of merchandise, including accounts receivable from Natives, and equipment other than floating equipment.
> 3. All the reindeer belonging to the Alaska Livestock and Packing Company in Alaska, wherever located.
> 4. All range equipment, including corral systems, wherever located.
> 5. The cold storage plants located at: Egavik, Igloo Point, Baldwin, Teller, Golovin, and the cold storage barge "Trinder" now located at Baldwin.
> 6. The abattoirs located at: Egavik, Baldwin, Teller, Golovin, and all other buildings used in the slaughter or dressing of reindeer. (Chapman Committee, 1934).

Naturally, the Chapman Committee was curious as to why nearly nine million dollars of assets would be offered for sale for less than one million dollars. They recommended to Secretary Ickes that Baldwins' offer be accepted in principle, pending an auditor's and appraiser's investigation of the Lomen holdings. In addition, the committee asked

for authorization to negotiate for the finances required to undertake the purchase.

Louis M. Warren was charged with auditing the records of the Northwestern Livestock Corporation. He examined only the records kept by the company in Seattle, and noted that they were incomplete. A thorough examination would have required him to travel to Nome, which he did not do. In a January, 1935, report, he estimated that the Lomens owned 250,000 reindeer, a figure arrived at "by computation based on statistics compiled in the early years of the industry" (Warren Report, 1935); in other words, on percentage increases in the herds. There had been no complete reindeer roundup for over five years, despite the fact that the Reindeer Committee (1931), Trowbridge–Gillman "Survey" (1933), and Nash's investigations (1934) had all recommended that one be held to determine numbers and ownership (Warren Report, 1935).

At the time of Warren's audit and report, it was apparent that the Lomens' reindeer business might not survive.

> The condition of the Northwestern Livestock Corporation and subsidiary companies, while not precarious, should be of great concern to the officers and stockholders of this enterprise. The companies have experienced heavy losses, resulting in a deficit of over $500,000 for the period covered by this report.
>
> The causes of the present unfavorable conditions may be summarized as follows:
>
> Insufficient volume of business.
>
> Too low a margin of gross profit; due in a measure to the low meat prices that obtained throughout the period.
>
> Insufficient production resulting in high unit cost.
>
> Heavy fixed charges due to unproductive and idle equipment.
>
> Extraordinary losses.
>
> Borrowing of money with consequent interest charges in order to furnish funds for these purposes.
>
> In general, a protracted depression in the reindeer industry. (Warren Report, 1935).

In addition to the financial report on the Northwestern Livestock Corporation, the government undertook an appraisal of all of the physical structures owned and operated by the Lomens. Architect N. Lester Troast surveyed the structures, prepared blueprints of them and their physical surroundings, and appraised their value (Troast, 1935). Troast's and Warren's reports constituted the basis for estimating the amount of the appropriations needed to purchase the Lomen holdings within the next few years.

In the summer of 1936, the Senate Committee on Indian Affairs held hearings concerning the status of the reindeer industry and on general conditions in Alaska. J. Sidney Rood, who had recently been made the Acting General Reindeer Superintendent, prepared testimony for the Committee. In his "Statement to the Senate Committee on Indian Affairs Regarding Reindeer in Alaska" (1936), Rood urged that legislation be introduced to grant authority to the Reindeer Service to issue grazing leases, that Native–owned reindeer be established as restricted property, and that white ownership be eliminated from needed ranges by fair and equitable means.

A third investigation into the condition of Eskimos in northwestern Alaska, which included observations and recommendations concerning the reindeer industry, was prepared by Field Representative Oscar H. Lipps of the Office of Indian Affairs in 1936. Lipps was charged with evaluating the social and economic status of Natives of northwestern Alaska to determine how the provisions of the Indian Reorganization Act of May 1, 1936, could be applied to them. Lipps noted the large numbers of reindeer in the territory, the use the Natives made of the animals, and the economic control which the trading posts apparently had over the Eskimos "through extending credit until the Eskimos were so deeply in debt that they are held virtually in a semi–economic peonage to the traders and are no longer free agents." He found in addition that the Native stores which had been organized in the past, sometimes as part of the joint–stock reindeer companies, to be ".. .under–capitalized and poorly managed." In his recommendations regarding the application of the IRA to Eskimo villages, Lipps suggested that the Reindeer Service to coordinate its plans with those of other social welfare, health, and education programs of the Office of Indian Affairs, and to utilize the teachers as local reindeer supervisors. It would also allow organized Native groups to "...secure loans from the revolving credit fund to finance this important enterprise" (Lipps, 1936).

The passage of the Reindeer Act on September 1, 1937, (P.L. 50, Stat 900) came only after some tremendous opposition on the part of some congressmen. The basic objection to the bill centered on the authorization of $2,000,000 to purchase private property in Alaska at a time when economic conditions in the United States were not secure. Some congressmen did not think that the additional monies spent to purchase reindeer and processing equipment were called for when an appropriation for managing reindeer affairs already existed. The remarks of Representative Rich of Pennsylvania to the House on August 20, 1937, were typical.

> Mr. Speaker, it is a mighty fine thing to be a Santa Claus, but Santa Claus should come only on Christmas. We have been a

pretty good Santa Claus to the citizens of Alaska. We have also seen a pretty good Santa Claus to the Eskimos of Alaska. When we had the Interior Department appropriation bill up before the House, and when the Delegate from Alaska (Mr. Dimond) was before the Committee, he made a special request to take care of the Eskimos of Alaska. In that appropriation bill we gave $33,500 to the Reindeer Service in Alaska. They requested that we increase the amount this year by $5,000. We made an increase in the Interior Department appropriation bill in order that we might furnish reindeer enough to take care of the Eskimos in Alaska, and I thought we had done so, according to the request of the Department.

Let us see now what this bill actually does. A private corporation has been formed in Alaska. This bill provides for the purchase of cold–storage plants, an abattoir, a system of corrals for these reindeer, and a lot of camps and camping equipment. The bill also provides, and this is in accordance with the statement of a representative of this corporation himself, for the purchase of the corporation in which is included 250,000 reindeer. This is what he told me. I asked what the value of these reindeer is, and he said $3 apiece. Three dollars times 250,000 is $750,000. You are going to pay $750,000 for reindeer, and you are going to furnish $1,250,000 to buy up a lot of this equipment and put the Government in the slaughterhouse business. This is what you are going to do. (U.S. Congress. House of Representatives, 1937).

Administrative responsibilities for reindeer were transferred to the Alaska Division of the Office of Indian Affairs on July 1, 1937. With the Reindeer Service in the Office of Indian Affairs, and with the authority of the Reindeer Act behind it, the Reindeer Service set about reorganizing itself into an effective agency. From February 13, 1936, to July 1, 1937, the Reindeer Service had been operating within the Interior Department under the Division of Territories and Island Possessions. Paul W. Gordon, then Chief of the Division, had been a powerful ally of the Reindeer Service in its efforts to extinguish non–Native ownership of reindeer. In a "Memorandum Regarding the Reindeer Service of the Office of Indian Affairs" (1937), Rood summarized the situation by the end of 1937. Native–owned reindeer totaled 364,480 (67%) and non–Native–owned totaled 179,520 (33%), for a total estimate of 544,000. The number of reindeer supposedly on all ranges was reported. The need for special Native assistants with all herds to carry out constant herding was stressed, as were the needs to appoint immediately a General Reindeer Superintendent, develop outside markets, fill funded Reindeer Service positions, and purchase non–Native–owned reindeer and property as authorized by the Reindeer Act.

In order to determine the actual number of reindeer and the value of the improvements owned by all non–Natives, Congress authorized a committee to study and estimate these figures in the summer of 1938. The Reindeer Appraisal Committee (also referred to as the Rachford Committee) investigation report was submitted to Congress (Rachford Committee, 1938). It was rather curious that Congress appointed an independent committee to assess numbers of reindeer rather than asking the Reindeer Service for the data. The Rachford Committee worked closely with members of the Reindeer Service in Alaska to carry out their task. Congress took until August, 1939, to appropriate the money authorized under the Reindeer Act. Instead of the $2,000,000 authorized, only $720,000 was appropriated for the purchase of non–Native owned reindeer and facilities and $75,000 for the administrative expenses to extinguish the non–Native equity. These amounts grew out of the work done by the Rachford Committee in the summer of 1938. The appraisal committee had only been able to find approximately 180,000 head of non–Native owned reindeer compared with the claims of more than 500,000 animals made by the non–Native owners in their declarations of ownership following the passage of the Reindeer Act. The Rachford Committee's estimate of 180,000 reindeer was apparently accurate at the time it was made (summer 1938), but for the later Reindeer Acquisition Unit, additional roundups were necessary. Four dollars a head was set as the maximum average cost for the purchase of animals. Nunivak Island reindeer were exempted from this maximum and higher prices could be paid on Nunivak for individual animals. Chas. G. Burdick was appointed Special Representative of the Secretary of the Interior on November 1, 1939. Burdick was given the responsibility for carrying out the provisions of the Reindeer Act. Walter J. Clark was sent as the Fiscal Agent from the Office of Indian Affairs. Edward C. Kelly, Special Assistant to the Attorney General, was added to the staff in February of 1940 to handle the legal aspects of the purchasing program and to examine property titles. One fulltime and one part–time clerk–stenographer were also added to the staff. From the field, Burdick reported that negotiations with some of the non–Native owners were somewhat difficult.

Each wanted as much money as possible. With few exceptions, claims submitted in

> 1958, pursuant to the act of September 1, 1937, were greatly in excess of reindeer on the range. Points of ten or more years' standing were brought up by various owners and settled. Questions of previous markings, reindeer gathered and driven to new ranges by the government or others with no check on ownership or recompense to the claimants, Native killing of white–owned reindeer for food, fox–bait, or dog food, drift of reindeer from range to range, co–ownership on ranges where a stray ownership status only was enjoyed, value of reindeer, number of reindeer, decrease in white–owned deer where no killing was done and increase of Native ownership in the same herds when the Natives were killing many deer, allowance for the spring fawn crop of 1940— all were discussed, worked out and settled as equitably as possible for both the vendor and the Government. (Burdick, 1940).

The roundups and purchases were finally completed during the winter of 1939–1940. In contrast to the 500,615 reindeer claimed in declarations of ownership provided in 1938, and the 180,000 estimate of the Rachford Committee in 1938, only 84,001 were actually rounded up and purchased by the government. The Alaska Livestock and Packing Company, claiming 260,000, sold only 25,000. The Nunivak Development Co. (Northwestern Livestock Co.) claimed 15,000, and actually sold 17,000. Other claims were six to eight times higher than the numbers eventually found and sold. The winter of 1938–1939 had been an especially severe one, with heavy snowfall, intense predation, and spring storms. However, it seems unlikely that a real reduction from 500,000 animals to 84,000 actually took place. A more satisfactory explanation is that the original claims were exaggerated in the hope that the government would purchase reindeer based solely on the numbers claimed, without conducting a roundup. The figures provided by the Rachford Committee would tend to support this conclusion.

For nearly $500,000, the Federal government ended the non–Native involvement in the production and processing of reindeer in Alaska. "With our withdrawal from the industry, we could think only that it would be interesting, and doubtless not a little heart rending, to sit back and watch how the Government would deal with the problem" (Lomen, 1954).

Burdick's report (1940) of the Reindeer Acquisition Unit summarized the actual expenditures:

Appropriation		$795,000.00
Reindeer purchased	333,003.00	
Improvements purchased	112,925.72	
Administrative costs	45,673.48	
Total actual cost of acquisition program		$491,602.20

Decline in reindeer herds is probably the chief characteristic of the 1930s. The reasons for the decline in reindeer during this time and in the 1940s are numerous. While some authorities place greater or lesser emphasis on one or another reason, it is most reasonable to assume that all the factors in combination were operating to reduce the herd size. Predation by wolves, and in a few reported cases by coyotes, was intense on some herds (U.S. Fish and Wildlife Service, n.d.). Changing migration routes and the increasing numbers of animals in the western Arctic and other caribou herds of the territory took away many reindeer. Since reindeer tend to join caribou herds which move through their range, this event was not unexpected. Informants recount that the thousands of caribou which passed through simply swallowed up the reindeer herds as they passed. The herds between Cape Krusenstern on the west, the Noatak River on the east, and Wainwright on the north were particularly impacted by caribou during the 1930s.

In addition to predation and caribou losses, some additional causes can be found for the decline of the reindeer industry, such as disease, poor herd management which resulted in straying, and overgrazing. The inability to fulfill reward expectations caused many persons to abandon their herds, especially when confronted with massive losses of animals from causes that appeared to be beyond their control. During the Great Depression, the income from fox trapping also decreased and caused many herders who had trapped while tending their own (or company) herds to abandon this practice as well as to move into established villages (Burch, 1975).

By 1936, reindeer were distributed from Barter Island to the Yukon–Kuskokwim delta area and beyond. Table 10 and Figure 4 show the distribution of reindeer in northwestern Alaska, including the Seward Peninsula and the various ranges allocated to the various herd owners by the United States Reindeer Service. Data for Figure 4 and Table 10 are taken from an original map in the National Archives Building (Record Group 75, Records of the Bureau of Indian Affairs), prepared by J. Sidney Rood.

Chapter V
Native ownership and the period of reconstruction: 1940–1977

Following the purchase of non–Native–owned reindeer by the United States Government in 1940, reindeer herding moved into an entirely new phase which lasts through the present. The policy of the

Bureau of Indian Affairs has been to encourage the development of individual ownership, based on a Lapp–like model of ownership and herd management.

> The reindeer industry we hope to create for the future is this: one which is similar to Lapland's, namely individual enterprisers and their herder–partners, maintaining vigilant custody of such breeding–stock as they can manage, grazing their stock within natural grazing units under Government authority on a head basis. The number of head they will attempt to manage with a single herding crew will be 3,000 or less because they themselves will find the law of diminishing returns operative if they attempt handling more. Keeping within the amounts of reindeer which the Government permits herders to graze, the number and size of herds will be limited by the rewards which herders are able to obtain from herd crops: supply and demand. This will cause some to fail, others to thrive. Competition between herding crews will exist; they will be actuated by fear of losing money by losing strays, by hope of extra rewards for especially good management, by pride in demonstrating their efficiency to other herders, by shame should they fail. *We hope to develop the Natives to develop reindeer* so that, little by little, the Government can reduce supervision to the minimum needed to protect pastures, acquaint owners with more efficient techniques, and give owners freedom — to do what they ought with regard to the rights of others. (Rood, 1943, original emphasis).

It is ironic to note that it has taken up to the present time to reach these goals. The grazing units are now government determined and controlled through a system of grazing permits issued by the Bureau of Land Management. The reindeer industry now consists largely of individual ownership of herds. The Reindeer Herders Association, through its contract with the Bureau of Indian Affairs, attempts to acquaint owners with more efficient techniques. In all these things, the government, both state and Federal, has reduced its role to the minimum needed to protect pastures.

During World War II, the reindeer industry was largely ignored in the face of global conflict. Some experimental clothing was manufactured, so that for a brief time the demand for calf skins and leggings was high. By the end of World War II, Alaska's herds were reduced to less than 100,000 animals. The general overall effect of the war years on the Natives of Alaska cannot be ignored either. For the first time in their lives, many young men traveled great distances beyond their local regions. They saw the many modern conveniences of the outside world, learned of different living conditions elsewhere in the United

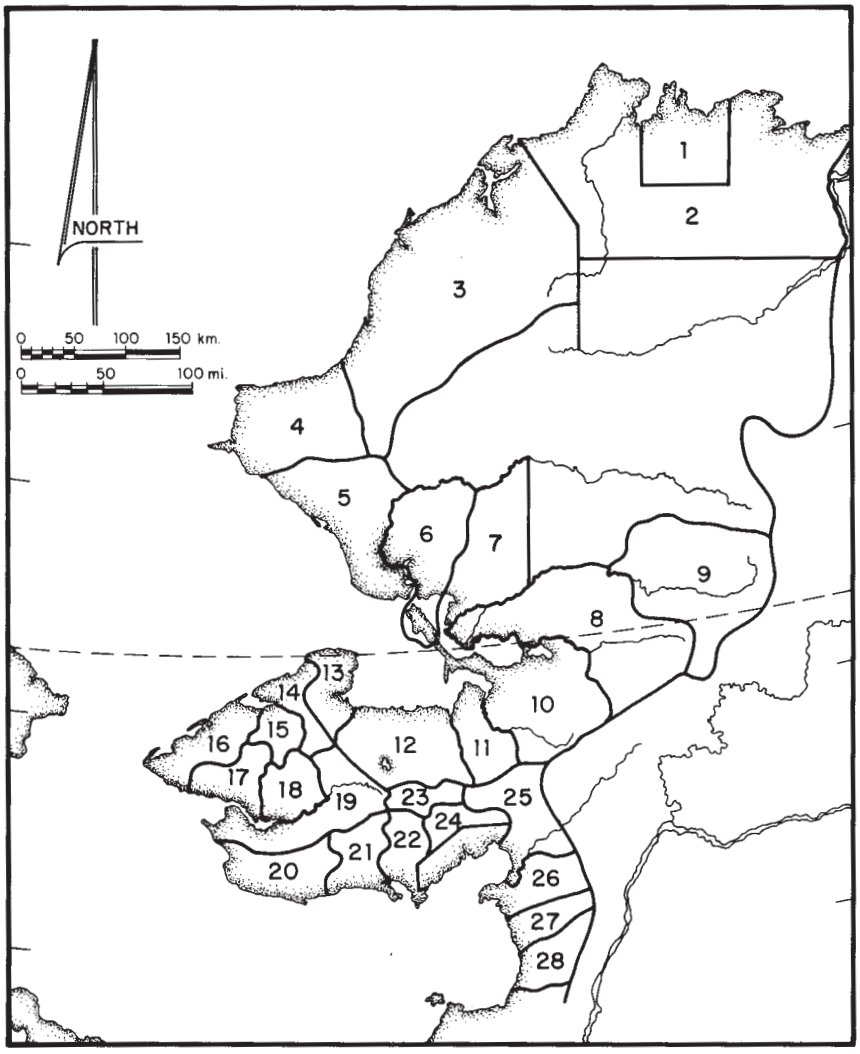


FIGURE 4. Reindeer herd operations in northwestern Alaska, U.S. Reindeer Service, 1936. (Unit numbers shown in Table 10 correspond to areas shown above.)

States, and were taught new skills. As many of these newly acquired skills could not be used in the villages, some never returned and others who did come back were dissatisfied with the life and conditions they found there. The increased use of airplanes and the establishment of health facilities, radio, and all–weather landing strips in virtually every village caused further changes in the values of the Eskimos of northwestern Alaska.

As discussed previously, the administration of reindeer had been transferred from the Office of the Governor of Alaska to the Alaska Division of the Bureau of Indian Affairs in 1937. Within the BIA, the Division of Education had administrative responsibility until March 1941, when reindeer administration was internally transferred. This time, the move was from the Division of Education to the Division of Extension and Industry and the Division of Forestry and Grazing. "This transfer placed administration of the reindeer industry on the same basis as that prevailing for the Indian range and livestock resources on the various reservations located in the States" (Arnold et al., 1941).

Table 10. *Reindeer herd operations in northwest Alaska, 1936.*

Northwestern District:
Barrow Unit
1. Brower Brothers Herd
2 Farthest North Reindeer Co. herds
3. Wainwright Reindeer Co. herds
4. Pt. Hope Reindeer and Trading Co. herds
5. Kivalina–Noatak Reindeer Co.
6. Kotzebue Sound Reindeer Co. herds
7. Noorvik Reindeer Co. herds
Buckland Unit
8. Selawik Reindeer and Trading Co. herds
9. Shungnak Reindeer and Trading Co. herds
10. Alaska Livestock and Packing Co., Kotzebue herd
11. Alaska Livestock and Packing Co. and Buckland Eskimo Reindeer Co. herds
12. Deering Reindeer Co. herd
13. Nuglunuktuk Reindeer Co. herd
Seward Peninsula District:
Teller Unit
14. Shishmaref Reindeer Co. herd
15. Allockeok herd
16. Cape Reindeer Assoc. herd
17 Alaska Livestock and Packing Co. and native herd (Teller)
18. Inland Reindeer Assoc. herd
19. Igloo Reindeer Assoc. herd
Nome–Golovin Unit
20. Nome–Douglas Reindeer Assoc. herd
21. Council Native Reindeer Assoc. herd
22. Alaska Livestock and Packing Co. Golovin herds
23. Alaska Livestock and Packing Co. Upper Koyuk herds
24. Elim Reindeer Assoc. herd Egavik Unit
25. Koyuk Reindeer Assoc. herd
26. Shaktoolik Reindeer Assoc. herd
27. Alaska Livestock and Packing Co. Egavik herd
Unalakleet Unit
28. Unalakleet Grazing Assoc. herd

Numerous additional herds were located south of the area covered by figure 4. These herds fall beyond the geographic scope of this report and are not illustrated.

The 1940s

In the summer of 1941, L.D. Arnold, Director of Forestry; A.C. Cooley, Director of Extension and Industry; Frank B. Lenzie, Regional Forester at Spokane; and John M. Cooper, Director of the Sheep Breeding Laboratory at Fort Wingate, New Mexico, visited Alaska to observe and report on the status and management of reindeer in Alaska (Arnold et al., 1941). Their report contained an itinerary of their travel, a brief history of the reindeer industry, and the current state of knowledge concerning reindeer husbandry, grazing, range requirements, losses, range management, research, and administration. They accepted Sheldon Jackson's original premise that reindeer were introduced for the benefit of the Natives who were in dire need of food to replace the animals lost to Euro–American whalers and the caribou decline. They note that ". . the policy of the Government is to assist the Natives in the conduct of their business on a subsistence basis" (Arnold et al., 1941).

Among the conclusions reached and recommendations made by the investigators, great emphasis was placed on improved herding and husbandry methods. Based on their experiences with grazing and range management in the lower 48, the investigators believed that for the reindeer industry:

> ...the most effective steps that can be taken to halt reindeer losses are: (1) Constant herding; (2) An intensive campaign for the control of wolves; (3) Improved corral handlings; (4) Improvement in methods of handling and slaughter of deer; and (5) Research on range and stock management, the control of parasites, and the utilization of meat, skins, and slaughter by–products. (Arnold et al., 1941).

Two other problems facing the industry were also addressed: association ownership and administration. It was recommended that ownership of reindeer by the associations be continued, "...but that every effort should be made toward (a) future operation that will insure an improvement in deer management, maintenance of range, and a greater income in terms of meat and skins to the Native stockholders" (Arnold et al., 1941). The investigating

committee also found the administrative set–up of the Reindeer Service: "...logical, and will work to advantage providing adequate facilities and personnel are furnished to carry it on" (Arnold et al., 1941). These two problems were both resolved as an unplanned consequence of the American entry into World War II.

It was apparent to some people in the Reindeer Service, even in 1942, that the stock associations were a failure. Rood, the General Reindeer Superintendent, observed that the associations were ruled by "indifferent owners," who by their large numbers and votes could very democratically send their associations towards ruin and create disharmony between small owners and good herders.

> These incompetent association–debating societies, governed by the votes of untutored people who knew nothing about shares, percentages, accounts, taxes, dividends, papers, or intricate business of any formal type, and most of whom evinced no desire to manage herds properly, created a disastrous balance of nature (when the wolves found reindeer to be an easy prey in the 1930s). We should allow these associations to die by hurrying conveyance of their remaining reindeer to whatever individual stockholder will manage them. (Rood, 1943).

Rood also stated that the government erred in urging the formation of stock associations. In his opinion, it was a "re–enunciation of an earlier faulty policy of distributing reindeer to all Natives" (Rood, 1943). Rood observed that not all Natives would make good herders, and that ownership should be confined to a few individuals and their herder–partners. Others now share this same opinion (Olson, 1969).

Rood (1943) presented some good comments and insights, which are worth repeating, into the problems facing the industry at the start of World War II. Based on excerpts from letters of local school teachers, who were also the local reindeer supervisors, and Rood's own comments, the following problems could be listed:

1) No close herding has been done in the Bering Unit (Seward Peninsula) for several years.
2) Absentee ownership discouraged good herding practices. Absentee ownership of 57.5% at Wales, 44.3% at Igloo, 44% at Deering, 16.4% at Inland Association, 23.5% at Shishmaref, and 33.3% at Teller were reported.
3) Wolf predation took substantial numbers of animals.
4) Good reindeer were slaughtered from all herds as feed for dog teams.
5) Lack of year–round herding, with accompanying lack of interest is herd welfare, resulted in indiscriminate killing (No. 4 above) and a failure to return butchering permits (illegal killing).

At the start of World War II, the military activities at Nome were substantially enlarged. A good market was therefore created locally for reindeer meat. Both the military and civilian defense workers provided the market. Merchants could not store enough meat in their cold storage facilities to meet the demands as such facilities had been built for the lower prewar demand. Ironically, attempts to round up animals for sale in this newly established and lucrative market were largely unsuccessful. This was due primarily to the Native's more intense interest in obtaining wage labor, hunting, and/or fishing rather than tending to the herds. A few association members did go out and butcher for meat sales. As it developed, they very often made good money from animals which were not entirely theirs. Finding competent herders was also nearly impossible as wages for longshoring and other jobs offered a minimum of $1.00 per hour.

Increased labor expenses for herding made it difficult to attract and hold qualified herders within the government herds as well. The General Reindeer Superintendent wrote to Claude M. Hirst, the General Superintendent of the Alaska Indian Service:

> In March, 1941, constant herding was commenced (with the Golovin Government herd of 3,000 reindeer). The best Native herders in the region were engaged. They quit in June, 1941, to take advantage of opportunities for high wages at longshoring, freighting and mining. Other able–bodied, energetic Natives in this region had also procured summer and fall work at high wages. We tried to hire Elim Natives; they were engaged by the CAA on the Moses Point airfield at $6.50 per day.... The only way we could hold them (the original herders hired back in the fall) would be to increase their pay to at least $600 per month for the staff. (Rood, 1942).

In private industry, semiskilled laborers were able to earn up to $540 per month. The government reindeer herds could not afford to compete with such wages with their budget constraints. At this time, government herds existed at Escholtz Bay (6,000), Golovin (3,000), Naknek (2,500–3,000), Nunivak Island (19,650), Hooper Bay (1,500), and Egavik (1,000). An overall management plan needed to be developed to place all government–owned reindeer into Native hands. "The Government's aim is not to operate a Government reindeer business" (Rood, 1942). Providing financing aid to interested Natives and better management of breeding stock already in Native hands were crucial to setting the reindeer industry on its feet after the elimination of non–Native owners.

Table 11. *Herds established 1944–1952.*

Date	Owner	Number loaned
1946	Lawrence Gray	500 head
1951	Charley Clark	850 head
1944	York Wilson and Henry Weber	1,066 head
1948	Ross Stalker	856 head
1945	Siegfried Aukongak	500 head
1950	Johnny Kakarak	500 head
1952	Andrew Skin	868 head

(Anon., 1953).

Wartime inflation reduced the effective operating budget of the Reindeer Service and additional funding or administrative support was not forthcoming.

After the purchase of non–Native herds was completed in 1940, the Reindeer Service attempted to reorganize itself and to establish the range rules and regulations as authorized in the 1937 Reindeer Act. The proposed rules and regulations caused much debate within the Bureau of Indian Affairs. Some criticized the proposed regulations as being too detailed and not providing enough general policy guidelines for the industry and its development. Other critics contended that the proposed rules and regulations made it too difficult for interested Natives to obtain the newly acquired government reindeer. The central issue in the debate focused on the direction in which the government was going in the distribution of reindeer to Natives and not so much on the appropriateness of the rules and regulations for the management of the reindeer industry in Alaska. It was not until the late 1940s that a definite policy on the lending of reindeer to qualified individuals was formulated.

When the government acquired thousands of reindeer in 1940, the plan was to use some as model herds and to lend the remainder to individuals who showed an interest in and an ability in herding. A policy of lending small herds of 300 to 800 animals was started with the provision that the loan was to be repaid after a number of years. From 1947 to 1953, the government ran a herd at Escholtz Bay which served as the primary source for loan deer. Chester Sevick, an experienced herder, was placed in charge of this particular herd (Sevick,1973).

Starting in 1944, the Bureau of Indian Affairs began a "repayment in kind" program. Reindeer from the Government–owned herds were lent to individuals who wanted to operate a reindeer herd. After a period of years, the herd operator was required to pay back to the government the same number of animals he had been lent to start his herd. From 1944 to 1952, 2,356 head were lent directly to Natives on the Seward Peninsula and in the Kotzebue Sound region. Animals were taken from the Escholtz Bay Government Herd to start seven new herds (see Table 11).

Seventeen small herds were started during the 1950s, but by 1960 only ten (including government herds) contained more than 1,000 reindeer. The herds on the periphery of the expanding caribou population's grazing areas lost more animals to the migrating caribou than were born (compare Figures 5 and 6). Between 1947 and 1952, thousands of reindeer were lost: Barrow, three herds lost, 1950–51; Wainwright, 1,100 head lost in 1947; Point Hope, 250 head lost in early 1948; Kivalina herd completely lost, 1947; Mickey Thomas' herd borrowed from Kugruk Company placed with Escholtz Bay herd upon his death in 1950; Topkok herd lost to wolves and over butchering 1950; Nelson Island herd lost to wolves and over butchering in 1947; Government Egavik herd transferred to St. Michael after wolf losses in 1948; and Hooper Bay herd, suffering heavy losses in 1947–1948, was moved to St. Michael in 1950 (Anon., 1953). Throughout the BIA Annual Land Operations reports for the 1950s there were pleas for additional money and personnel so that the program could be made effective (U.S. Government, BIA, 1950–1960).

Figures 5, 6, 7, and 8 and Tables 12, 13, and 14 require some explanation. Not all of the herds extant in Alaska for the years 1948, 1958, and 1968, respectively, are listed. Only those herds in the geographic region of concern relevant to this report are listed, that is, northwest Alaska. Secondly, Figures 7 and 8 and Table 14 are limited to the Seward Peninsula and do not show herds at Shaktoolik or Stebbins. Next, the column indicating the number of years in operation may be a confusing number. The years given are the number of years the owner/operator has had control of that particular herd. The herd may have existed in that village or region under different ownership/management prior to government purchase or loan. For example, the Escholtz Bay Government herd "...was started with 4,500 reindeer from Teresa Creek corrals from the old Lomen herds in 1941. In 1942, an additional 1,500 head were driven from the Deering range to the Kotzebue range. During the first winter, the herd suffered a loss from straying of 1,500 head" (Rouse et al., 1948). Lastly, some herds have been consolidated or otherwise recombined during the ten year intervals between the various figures. For example, the remnants of the Stalker herd at Noatak/Kotzebue formed the basis for the Government Demonstration Herd based at Nome starting in 1965. In the fall of 1974, this herd was turned over to NANA Reindeer Enterprises, Inc. The NANA herd ranges on the Baldwin Peninsula, the northern shores of Escholtz Bay, and the Kiwalik River area, all of which was formerly under permit to Lawrence Gray

and Charlie Clark, respectively.

Figure 5 and Table 12 illustrate the location of reindeer herds in 1948; Figure 6 and Table 13, 1958; and Figure 7 and Table 14, 1968. A comparison of Figures 5, 6, 7, and 8 shows the changing distribution of reindeer throughout the last 40 years. On these maps, the areas indicated as not having herds were not totally without reindeer at this time, particularly on the Seward Peninsula. Scattered reindeer belonging to the old company herds roamed unattended throughout the Seward Peninsula. A few Eskimos rounded up the remnants of these scattered herds and they were used as the nucleus for private herd operations during the 1940s and 1950s. The numbers in parentheses after the "village or region" designation in Tables 12, 13, and 14 refer to the locations of the herds as shown in the Figures 5, 6, and 7 for the years 1948, 1958, and 1968, respectively. The boundaries of the locations are approximate and are taken from descriptions of the herds' locations given in the various Bureau of Indian Affairs Land Operations reports (BIA, 1958, 1968) and the Rouse, Mountjoy and Belcher (1948) report. The Bureau of Land Management did not assign grazing permits for the modern herds until 1962, although the old General Land Office had taken applications and issued some grazing permits for reindeer in the 1920s and 1930s under the authority of the Alaska Grazing Act of March 4, 1927 (44 Stat. 1452).

Between 1944 and 1945, the Reindeer Service was again reorganized. When the Service was originally placed under the administration of the Division of Extension and Industry and the Division of Forestry and Grazing (1941–1944), seven administrative units were used for the management of the reindeer industry. These seven were reduced to three: Arctic Unit, Bering Unit, and Yukon–Kuskokwim Unit. This change reflected the decreasing number of animals in the territory and the declining government support for the industry during World War II. Between 1944 and 1947, the supervisory personnel working with reindeer were further reduced from a staff of five (one Reindeer Supervisor and four Unit Managers) to one Unit Manager.

The newly purchased government reindeer were kept in several herds during World War II. The Escholtz Bay herd became the nucleus for many Native loans, the first of which was made in 1944. Government–operated herds were also located at Golovin, Egavik, Hooper Bay, Nunivak Island, and St. Michael–Stebbins (a mixed government/privately run herd) (Rouse et al., 1948). A number of herds

Table 12. *Reindeer herd operations, government and private, 1948.*

Village or geographic area	Operator	Years in operation	Estimated herd size
Nunivak Island	Government	8	purchased 10,000
Hooper Bay	Government (Niles Smith, Chief Herder)	15	500
St. Michael–Stebbins	Mixed government and privately owned (Dan Boucher, Chief Herder)	8	400
Egavik (1)	Government	8	220
Escholtz Bay (2)	Government (Chester Sevick, Chief Herder)	8	3,750
Golovin (3)	Government loan to Siegfried Aukongak	2	1,177
Kiwalik (Candle) (4)	Mickey Thomas	2	600
Kotzebue (5)	Henry Weber and York Wilson	4	2,600
Selawik (6)	Charlie Smith	3	1,332
Shungnak (7)	Lawrence Gray	3	400
Point Hope (8)	Point Hope Reindeer Co.	ca. 25	250
Kivalina–Noatak (9)	Kivalina–Noatak Reindeer Co. (remnant herd)	ca. 25	100
Wainwright (10)	Wainwright Reindeer Assoc.	ca. 25	300
Cape Halkett (11)	Cape Halkett Assoc. reindeer borrowed by Steven Reuben	2	400
Barrow (12)	Albert Hopson reindeer borrowed from Northern Frontier Assoc.	2	600
Barrow (13)	Tommy Brower	44	1,250
Teller (14)	Fred Topkok (Topkok Reindeer Co.)	4	650

(The numbers in parentheses refer to Figure 5). (Source: Rouse, Mountjoy, and Belcher, 1948).

under Native control also continued to operate during World War II. By 1948, of the seventeen herds under various forms of management and control, six were government owned or were newly established loan herds, one was a mixed government/privately owned herd, and the reminder were in private hands (see Figure 5 and Table 12). Range conditions were reported as generally good. Problems with wolves were reported as less serious than they had been a decade, or even five years earlier (Rouse et al., 1948).

Uncertainty about the best course for Government policy caused much examination of the reindeer industry in the early 1950s. An internal memorandum of the Bureau of Indian Affairs is worth quoting at some length. While phrased in somewhat ethnocentric terms concerning the Eskimo's cultural behavior, the problems identified are, to a certain extent, the problems which continue to confound reindeer herders and resource managers in northwest Alaska today.

In addition to the problem of reduced supervisory personnel, the newly established herds faced social and economic difficulties as reported in the 1953 Bureau of Indian Affairs manuscript:

> Generally it is difficult to get new borrowers started. They have no money, very few items of the equipment which is needed, and no funds to pay labor. Either they must have a Nunivak loan for butchering to provide cash, or they must be permitted to butcher some of the borrowed deer immediately. They lack an adequate sense of money management. Money on hand is to be spent without adequate consideration of possible needs next week or month. Borrowers are reluctant to take herds into a strange grazing area with the possibility of not having extra help available when needed.
>
> Current Problems
>
> 1. It is difficult to get the people to constantly do a good job of herding. This is partly due to a carry over from management practices of an earlier day and partially due to the problem of getting people to change a way of life from a hunting and fishing economy to a pastoral economy.
>
> 2. Other jobs are more attractive, pay higher wages, and the people can live in the villages with their friends.
>
> 3. Good winter range is scarce. There are areas where good winter feed is available but generally it is far inland where herders do not want to take herds or there is danger of caribou taking the herd.
>
> 4. Young men are not particularly interested in reindeer. They will work for a while at herds but are not interested in making a life's work of reindeer.
>
> 5. The elements are difficult to combat.

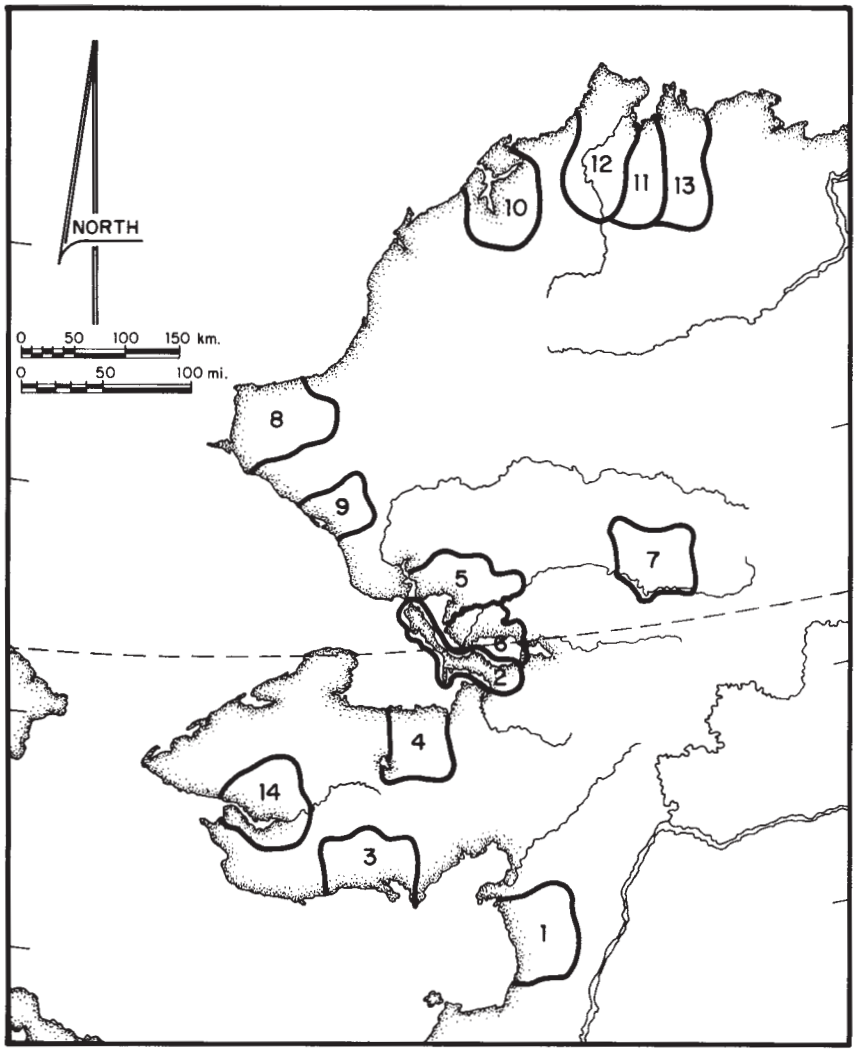


FIGURE 5. Reindeer herd operations in northwestern Alaska, government and private, 1948. (Numbers shown in Table 12 correspond to those shown above.)

Table 13. *Reindeer herd operations, government and private, 1958.*

Village or region	Operator	Years in operation	Estimated herd size
Nunivak Island	Nunivak Development Project (government owned)	18	10,349
Stebbins	Stebbins Community Assoc.	18	2,700
Unalakleet and Egavik (1)	John Kotongan	4	650
Selawik and Kotzebue (2)	George Keats and Lawrence Gray plus government–owned Escholtz Bay reindeer herd	13	2,065
Golovin (3)	Siegfried Aukongak	12	5,231
Candle (Kiwalik) (4)	Charlie Clark	7	3,500+
Noorvik (5)	Louis Commack	2	900
Selawik (6)	William Sheldon	1	1,000
Selawik (7)	Andrew Skin	3	1,800
Buckland (8)	Paul Hadley	5	1,500
Deering (9)	Edward Karmun and Elmer Thomas	0.5	1,100
Cape Espenberg (10)	Harold Dimmick and Fred Goodhope, Sr.	0.5	1,562
Teller(ll)	Johnny Kakaruk	8	2,250
Noatak (12)	Ross and Johnson Stalker	2	1,097

(The numbers in parentheses refer to Figure 6). (Source: Bureau of Indian Affairs, 1958).

> Summer herding must be on foot and the mosquitoes are numerous. Winter cold, snow and blizzards are to be contended with. Permanent camps or houses cannot very well be constructed due to the high cost and the fact that the herds should be kept on the move.
>
> 6. Herders with children should have the children in school. Yet a herder if he is to remain in camp wants his family with him. A man without a woman in camp to cook and keep his clothing repaired is in for a tough time. Also, they are unable to attend church services.
>
> 7. Although they are born and raised in the country, Natives do not like the cold, the storms, etc., any better than anybody else. They do not like to herd out of the immediate area where they know the country.
>
> 8. They do not care for the continuous responsibility and grind of herding. They prefer to hunt and fish but they do this when the weather conditions and the mood suits them.
>
> 9. Although wolves are not numerous they do kill deer and make herding more difficult. They are worse in the winter probably due to scarcity of other food. (Anon., 1953).

Although an attitude of wanting to help "rehabilitate" the reindeer industry was present in the Bureau of Indian Affairs in the late 1940s, a counter–attitude existed also.

> We believe there is another point that should be given careful consideration, and that is the need of reindeer by the Natives. There is no question but that at the time the reindeer herds were established, they were badly needed by the Natives. Since that time, however, there has been a substantial change in the economy of the Natives, especially during the past 5 or 6 years. The various activities of the armed forces and other agencies of the Federal government in Alaska have greatly increased the employment opportunities of the Natives. The establishment of airports and an efficient radio system have greatly facilitated transportation and communication. These improvements no doubt had a material effect on the economy of the Natives and their dependence on the wildlife resources for subsistence and clothing. We believe that the survey which the General Superintendent now proposes to conduct in cooperation with the Fish and Wildlife Service should determine whether the reindeer herds are an essential part of the economy of the Natives of all parts of Alaska. (Arnold, 1948).

The proposed survey was undertaken by Charles H. Rouse, biologist, U.S. Fish and Wildlife Service; Charles R. Mountjoy, Director of Native Resources, Alaska Native Services; and Dale M. Belcher, Assistant Director of Native Resources, Alaska Native Services (Rouse et al., 1948). Conditions seemed favorable for a revitalization of the industry. The reindeer survey, made jointly by the U.S. Fish and Wildlife Service and the Alaska Native Service in 1948, concluded that:

> There is sufficient foundation stock with which to build and range conditions are sufficiently good to allow for some expansion. There is a definite need for reindeer products and the market for these products in a

limited amount within the Territory appears stable. Since the establishment of new herds is dependent largely upon the number available from Government owned herds, it will be possible to control the number of herds and the range allotments which they occupy. In order to prevent a recurrence of the too rapid development of the reindeer herds, it appears advisable to limit the number of herds that can be established and also see that each operator limits his herd to a number he can adequately care for. This should ordinarily not be over 2,000 head. If the herds are maintained near the principal markets along the Bering Sea and Arctic coasts it should be possible to dispose of surpluses readily and at sufficient profit to provide a reasonably good livelihood for a limited number of families engaged in raising these animals. To facilitate the orderly development of this industry, an administrative force of the following personnel is recommended: Assistant Director of Native Resources, Range Examiner, Agricultural Extension Agent, Fieldmen (2). As the industry develops it may be necessary to expand this force to keep pace with the work required. (Rouse et al., 1948).

The 1950s

By 1953, thirteen years after the government had acquired the non–Native interests, some officials in the BIA felt that it would be best for the bureau to withdraw from its activities connected with the reindeer industry. A conference concluded:

1 The Reindeer Act of 1937 should be amended to allow for greater flexibility in developing the reindeer industry and not restrict it to Natives only.

2. Present Government owned reindeer on the mainland of Alaska should be loaned, if possible, and range permitting, to the present Native reindeer operators for the purpose of building up their herds into economic units and for loans to carefully selected new applicants in establishing themselves in the reindeer business.

3. Loans are to be made on a cash basis and not "in kind".

4. A program to be worked out for turning the reindeer on Nunivak Island over to the Native people as soon as possible.

5. Arrangements are to be made for all Government owned reindeer on the other islands to be loaned to selected Natives or turned over to the Fish and Wildlife Service, if interested, otherwise sold to the highest bidders.

6. Control of the ranges to be established and the agency responsible for it determined.

7. Director Wade on his return to Alaska...to work out tentative legislation for it which would enable the Bureau of Indian

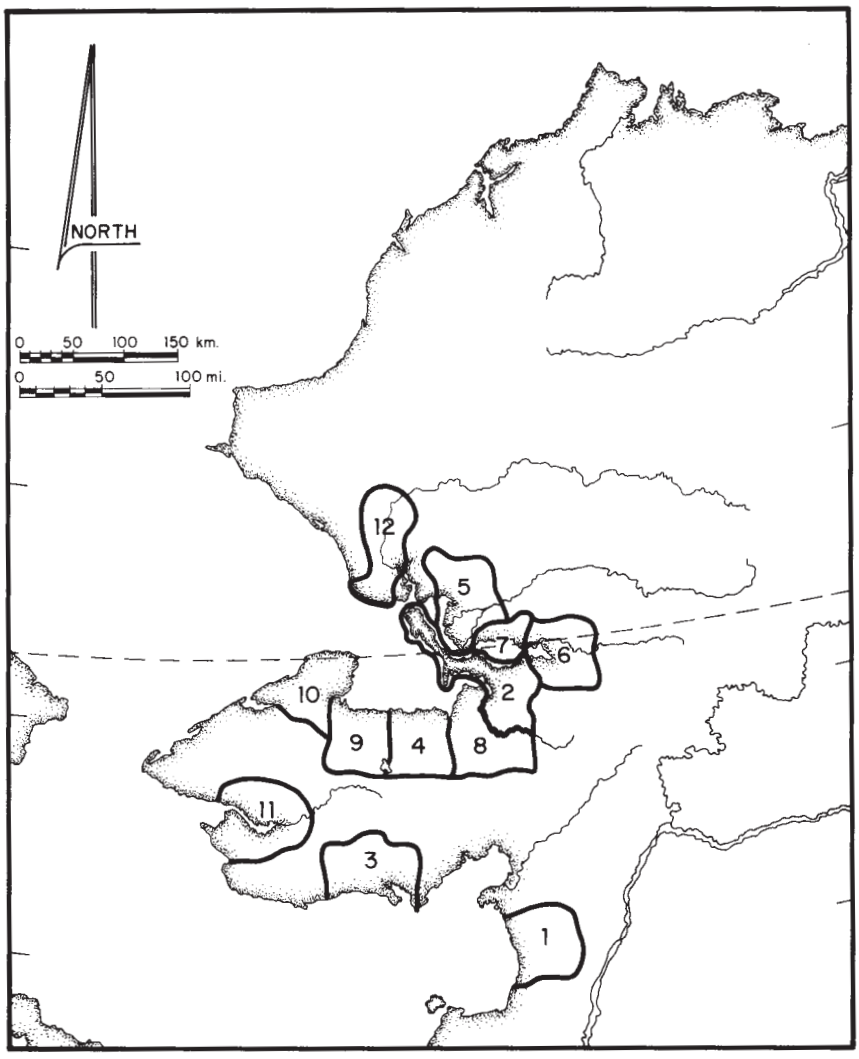


FIGURE 6. Reindeer herd operations in northwestern Alaska, government and private, 1958. (Numbers shown in Table 13 correspond to those shown above.)

Affairs) to carry out the foregoing conclusions. (U.S. Bureau of Indian Affairs, 1953b).

By and large, all of the goals outlined at the conclusion of the conference were achieved by 1970, without any additional legislation, with the exception of the amendment to the Reindeer Act. Nunivak Island reindeer were turned over to Mekoryuk Natives (Bering Sea Reindeer Products) in 1970. In 1968, in a cooperative agreement with the State of Alaska, the BIA, and the Bureau of Land Management, the latter agency undertook the supervision of ranges.

During the 1950s an occasional flight for the purpose of shooting wolves was made by the United States Fish and Wildlife Service predator control agents. The Territorial Division of Game was basically reluctant to use public funds to assist individual business enterprises. This attitude of viewing the reindeer herders as businessmen on a par with the cattle ranchers of the continental United States has continued to the present day within some agencies of government.

Starting in 1959, the BIA and the United States Fish and Wildlife Service undertook a cooperative agreement to operate an airplane based in Kotzebue for predator control. The predator control agent of the United States Fish and Wildlife Service working with the Range Conservation Officer of BIA aided the herders by shooting wolves and dropping poisoned bait. Herders themselves reported considerable predation on herds. They also shot wolves with some regularity. Grizzly bears were also shot by the herders, especially in the spring calving season. At Nunivak Island, the Bureau of Sport Fisheries and Wildlife also aided BIA's Nunivak Island Development Project through the aircraft cooperative agreement. In 1965, the Bureau of Sport Fisheries and Wildlife did not receive an appropriation to continue predator control in Alaska. Consequently, the BIA undertook to fund the program. In 1966, known losses to Seward Peninsula herds from wolves, foxes, bears, and wolverines were estimated at 615 calves and 440 adult reindeer. A federal ban on aerial wolf hunting went into effect in 1971. With the exception of a short–lived, aerial hunting program in the winter of 1976–77, predator control has been entirely in the hands of the herders since the late 1960s. On some ranges, predation has been a persistent problem over the last 20 years. The eastern ranges on Seward Peninsula seem especially prone to wolf predation, possibly by wolf populations which generally prey on the western Arctic caribou herd.

During the same period from World War II to the early 1970s, caribou returned in ever increasing numbers to the regions of northwestern Alaska where they had been previously unsighted for decades. Ranges occupied by reindeer were increasingly being traversed by the returning caribou herds. Many reindeer were quickly lost to these migrating herds. Because of the loose or "open" herding which was practiced, losses to caribou continued to be a major cause for the herd failures throughout the 1950s and 1960s (see Tables 13, 14). By the mid–1960s, active reindeer herds were no longer present north or northeast of Kotzebue Sound. Losses to caribou and wolf predation were identified as the major causes for the decline of herds in that area. The increased numbers of caribou created a two–fold problem for the herders. On the one hand, the migratory caribou tended to "steal" reindeer who joined with the moving caribou. On the other hand, the presence of caribou, and a year round, open hunting season with no limit on caribou take until the fall of 1976, decreased the market potential for reindeer.

Despite the failure of many herds located between Noatak and Barrow, the Kobuk and Selawik Rivers, and south of Norton Sound during the 1950s, a number of newly established herds did survive. This

Table 14. *Reindeer herd operations, government and private, Seward Peninsula, 1968.*

Village or region	Operator	Years in operation	Estimated herd size
Nunivak Island (Mekoryuk)	Government	28	10,200
Golovin (1)	Siegfried Aukongak	22	4,500
Candle (2)	Charlie Clark	17	984
Selawik (3)	Lawrence Gray	23	1,250
Buckland (4)	Paul Hadley	15	1,947
Deering (5)	Alfred Karmun and James Moto, Jr.	5	1,914
Shishmaref (6)	Fred Goodhope, Sr.	10	2,782
Teller (7)	Johnny Kakaruk	18	2,957
Teller (8)	Ralph Kugzruk	3	600
Nome (9)	Lawrence Davis	1.5	525
Nome (10)	Government Model Herd	3	643
Koyuk(ll)	Archie Henry	7	517

(The numbers in parentheses refer to Figure 7). (Source: Bureau of Indian Affairs, 1968).

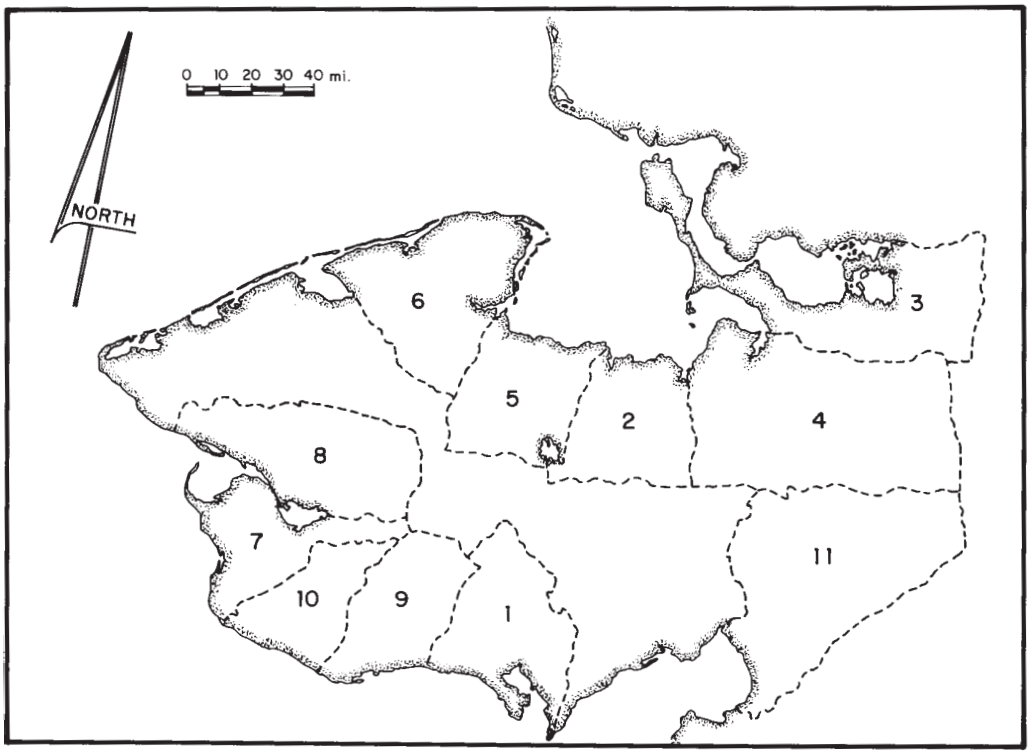


FIGURE 7. Reindeer herd operations, government and private, Seward Peninsula, 1968. (Numbers shown in Table 14 correspond to those shown above.)

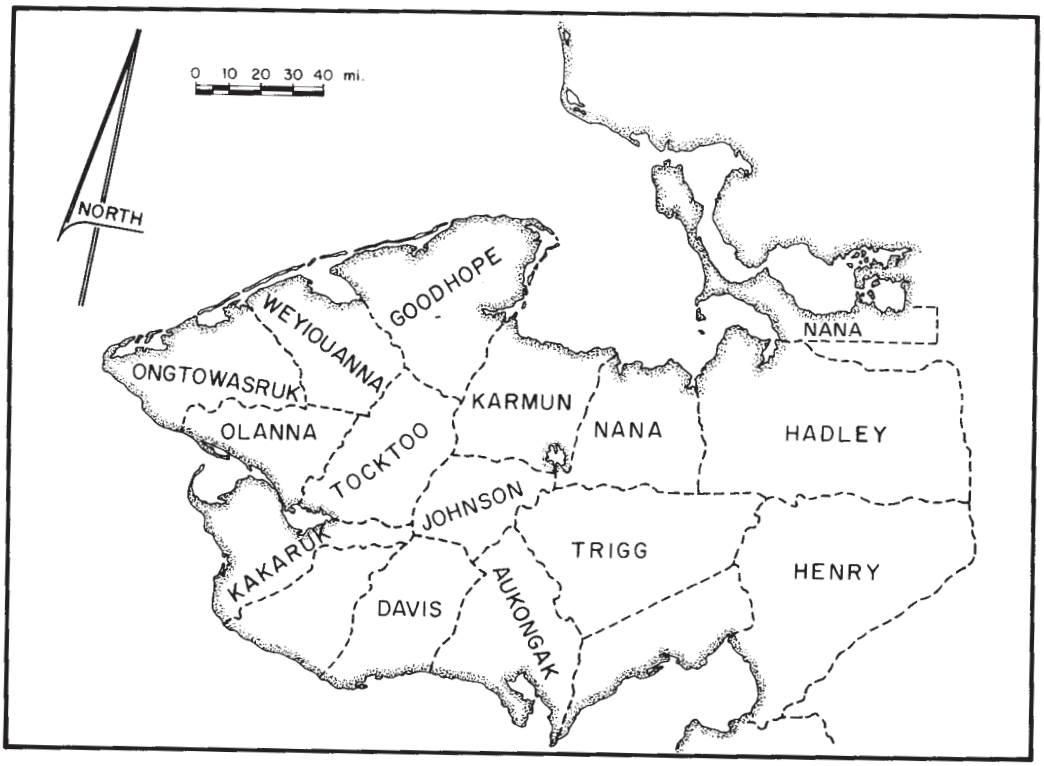


FIGURE 8. Reindeer grazing permits, Seward Peninsula; 1977. (Bureau of Land Management, Fairbanks District Office.)

trial–and–error herd establishment period resulted in the emergence of several relatively stable herds. Most of these herds are owned by older men with accumulated reindeer experience since their early childhood. They and their families manage the herds, usually as part of a diverse number of activities. With few exceptions, reindeer herding is not the sole enterprise of herd owners. In an attempt to make a living, subsistence hunting, fishing, and gathering are often done in connection with herding activities. Seasonal and permanent employment is also sought after and entrepreneurship usually contributes to the reindeer owner's household income. This is not necessarily a recent pattern of

Table 15 *Annual estimates of total reindeer numbers in Alaska, 1891–1977.*

Year	Number	Source	Year	Number	Source
1891	16	Jackson, 1902	1936	594,000	Hanson, 1952
1892	171	"	1937	544,000	Rood, 1943
1893	346	"	1938	544,647	Palmer, 1944a
1894	588	"	1939	377,712	"
1895	891	"	1940	252,550	"
1896	1,100	"	1941	206,785	"
1897	1,466	"	1942	169,000	"
1898	2,062	"	1943	128,700	"
1899	2,837	"	1944	N/A	
1900	3,323	"	1945	N/A	
1901	4,412	"	1946	N/A	
1902	5,148	"	1947	N/A	
1903	6,282	Jackson, 1903–1908;	1948	32,623	Rouse et al., 1948
1904	8,189	Skoog, 1968	1949	27,920	"
1905	10,241	"	1950	25,000	BIA Annual Reports,
1906	12,878	"	1951	27,245	1950 to 1971
1907	15,839	"	1952	26,700	"
1908	19,322	"	1953	26,200	"
1909	22,915	U.S. Bureau of Education,	1954	25,200	"
1910	27,325	1909 to 1927a	1955	28,500	"
1911	33,629	"	1956	36,200	"
1912	38,476	"	1957	39,800	"
1913	47,266	"	1958	49,300	"
1914	57,872	"	1959	43,200	"
1915	70,243	"	1960	43,500	"
1916	82,151	"	1961	39,900	"
1917	98,582	"	1962	40,000	"
1918	N/A		1963	38,600	"
1919	145,000	"	1964	38,540	"
1920	180,000	"	1965	35,269	"
1921	216,000	"	1966	37,248	"
1922	259,000	"	1967	33,150	"
1923	300,000	"	1968	30,794	"
1924	350,000	"	1969	31,038	"
1925	350,000	"	1970	30,251	"
1926	N/A		1971	N/A	
1927	N/A		1972	27,399	BLM data and
1928	321,116	"	1973	N/A	author's notes
1929	599,825	"	1974	N/A	
1930	468,000	Palmer, 1944a	1975	29,100	"
1931	510,000	"	1976	N/A	
1932	641,000	Hanson, 1952	1977	24,100	"
1933	N/A				
1934	N/A				
1935	N/A				

household (family) organization. Among some families who are now or used to be herd owners, there is a history of experimenting with a variety of new opportunities for cash income and adopting novel methods of resource exploitation.

The 1960s–1970s

During the 1960s, the introduction of the snow machine into northwestern Alaskan Eskimo culture caused substantial changes in the winter activities of people. Accompanied by other forces of acculturation (widespread public health sen•ices, increased access to goods and services from urban Alaska and the continental United States and increased cash–income opportunities, to name but a few), the snow machine has remained an outstanding symbol of the direction and magnitude of socioeconomic change in the Arctic. The initial acceptance of the machines was slow, based in part on a "wait and see if they work" attitude. Once their performance and reliability proved that their advantages outweighed their disadvantages compared to dog traction, purchases of new and used machines increased (Hall, 1971).

In 1965, tracked vehicles were reportedly used by the reindeer herders for the first time, and a photograph of a snow–machine pulling a sled loaded with a live reindeer appears in the BIA Land Operations Report (BIA, 1965). By 1969, every herd owner on Seward Peninsula used snow machines for herding operations, as well as other winter activities. Techniques were developed to conduct winter roundups using the new technology. Many of these paralleled the experiences among Lapp herders in Scandinavia in adapting the new technology and the changing socioeconomic conditions of reindeer herding to the requirements of the animals and the geography of the range (Pelto, 1973; Pelto and Muller–Wille, 1972; Pelto et al., 1968; Muller–Wille and Pelto, 1971). (See also Chapter VI).

The 1968 cooperative agreement made the Bureau of Land Management responsible for range assignment and protection through the issuance of grazing permits and monitoring of range conditions. The BLM had already begun a program of issuing range permits in 1962, under authority of reindeer grazing regulations contained in 43 CFR. Reindeer–grazing permits on the public domain were issued for ten–year periods. BIA personnel cooperated to explain the permits to herd owners, while BLM personnel attempted to assess the range quality and carrying capacity. Until research was done on relatively small localities in the late 1960s (Pegau, 1968, 1970a, 1970b), no scientific data were available on reindeer range quality for Seward Peninsula. NANA Reindeer Corporation's recent survey of its range, done in conjunction with USDA Soil Conservation Service and University of Alaska Geophysical Institute personnel, is a first step in the application of modern range management techniques to reindeer herding (George et al., 1977).

Up to 1968, the BIA continued to manage the ranching and training aspects of reindeer herding. Since then, BIA's role in reindeer herding has changed substantially. The bureau is now withdrawing from an active role in reindeer herding. Its role now is largely confined to the distribution of the few remaining government–owned reindeer and the collection and loaning of any deer which are returned to their custody. Most importantly, they provide monies to operate the Reindeer Herders Association, incorporated in 1971 (formerly the Northwest Alaska Reindeer Herders Association, organized in 1964) through a grant to Kawerak, Inc., the nonprofit social services arm of the Bering Straits Native Corporation.

At the state level, several agencies regularly interact with the herd owners. The Alaska Department of Fish and Game (ADF&G) has field offices in Nome and Kotzebue. Game biologists and Alaska Department of Public Safety, Wildlife Protection officers (game wardens) are stationed in both towns. As livestock owners, reindeer owners are entitled under state law to protect their herds against predators. From World War II to 1971, the Bureau of Sports Fisheries and Wildlife (later United States Fish and Wildlife Service) cooperated with the BIA in a program of predator control which included aerial hunting of wolves on Seward Peninsula and other reindeer ranges. Herd owners often complain about what they view as a lack of cooperation from ADF&G to help them with their predation problems. They apparently do not realize that ADF&G is not in the predator control business for their benefit in the same way that the Bureau of Sports Fisheries and Wildlife/BIA were with their predator control assistance.

The Alaska State Department of Commerce and Economic Development has also assisted the herd owners in the past. With its aid, a reindeer slaughtering and processing facility was constructed at Nome in 1969, and operations began there in 1970. Several other state agencies also deal with the reindeer herders with some regularity. The Alaska State Division of Agriculture gathers economic statistics from the herds through the Reindeer Herders Association. Researchers from the University of Alaska interact with the reindeer herd owners in the course of special research, development, and experimental projects. The Government Demonstration Herd (Model Herd) at Nome represented one such project. The Cantwell Reindeer Research Station was developed in 1967/68 and facilities were provided on the University of Alaska campus at Fairbanks to provide baseline data on reindeer physiology, metabolism, parasites, brucellosis control, and husbandry.

General summary – reindeer in Alaska

A brief recapitulation of the major themes presented in this historical treatment of reindeer herding is in order here. Four major trends or characteristics can be found in the history of reindeer herding. It is clear from government policy, legislative action, and appropriations, that it has been the government's intent to provide a self–sustaining Native industry for the benefit of Alaskan Natives through the introduction and support of the reindeer industry. Secondly, the period of non–Native involvement in reindeer herding, particularly on a corporate basis competing with local Native interests, has been detrimental to the welfare of the Native aspect of the industry. Government action to terminate non–Native involvement with reindeer herding clearly recognized this fact. Thirdly, the changes in administrative authority and government policy have not been combined to provide any sense of continuity in the specific policy or direction for the reindeer program. This, combined with high turnover in personnel and the very real difficulties faced by village Alaskans in the areas of health, education, and welfare, has created an atmosphere of suspicion and distrust of most government officials. On the frontier, an individual is known by the actions he takes and the trust which he inspires over a long period of time. The reindeer program has been plagued by some of the worst of these problems, as the disruptive events cited in the reports of the 1930s investigations show. This is also reflected in the current uncertainty by the reindeer herders over future policy on the part of various Federal land management agencies.

Last, but not least, there has been insufficient feedback between the research programs funded by various state and federal agencies on reindeer biology, ecology, and physiology, and the needs and desires of the Native herders. While much research has added substantially to our baseline knowledge of reindeer, most has failed to improve the lot of the reindeer herder in any significant way. This research is a two way street. In order to make optimal use of all of the data accumulated through research, the herder must have an adequate education, particularly if he is to make use of the research to improve his herding and husbandry efforts. Thus, improved reindeer handling will only come about in the context of a general improvement in the education and welfare of village Alaskans in general.

Throughout this historical treatment of reindeer herding, reference has been made to the increasing, and during the 1930s and 1940, the decreasing, reindeer herds. These changes are depicted in Table 15, which covers the total number of reindeer in Alaska from 1891 through 1977. In Table 16, the numbers of reindeer found on the Seward Peninsula from 1951 through 1977 are given. At one time in 1932, 127,331 reindeer were estimated to be grazing on the Seward Peninsula. Of this number, 32,523 were Lomen owned.

For the remainder of this report, the Seward Peninsula is defined as that area lying west of the Inglutalik River, west of the South Fork of the Buckland River, west of the Mangoak River, including all of the Baldwin Peninsula. Herds based out of Selawik are not included in the Seward Peninsula totals with the exception of the government–operated herd of Escholtz Bay which ranged in the Selawik Hills during its years of operation (1945 to early 1950s). Herds based at Shaktoolik, Savoonga, Stebbins, and Unalakleet are not included in the Seward Peninsula totals.

Chapter VI
Reindeer herders and social relationships

The network of relationships between the herd owners, the villagers, and the merchants is a complex one. The village orientation of the herd owners is a major limiting factor in the ability of the reindeer industry to produce more meat than is currently available. This village orientation is in some ways a fortunate one from the point of view of range conservation because it restricts most herd owners from seeking to expand herd size up to or beyond the carrying capacity of the present ranges. Although accurate and timely surveys of carrying capacity are not available for all ranges, it is generally true that most ranges are stocked below the current estimated carrying capacity. This less–than–capacity utilization is the result of a number of factors, but the most significant one which must be taken into account is the finite production objectives of the herd owners. This is to say that, although most herd owners would like to increase their stock on the range, they are not motivated to do so. They are motivated more by the desire to increase their relatively small incomes from herding in order to satisfy village and personal needs with greater certainty than to fill potential markets which may exist outside the villages. This orientation is a common characteristic in societies which are organized along domestic modes of production (Sahlins, 1972).

In terms of the relations between herd owners, the territorial perspective of the Eskimo herder is an important factor. The village identification of a herd owner is the label by which other people know him and interact with him. Secondarily, his personality and individual characteristics are his distinguishing features. The local orientation of the herd

owners and the inability of the Reindeer Herders Association to function aggressively are interrelated. Because it is a recently formed, voluntary association, and because Eskimo culture traditionally lacks social mechanisms for permanent, nonkin–based, institutional interaction, the Reindeer Herders' Association is not yet a strong lobbying force on behalf of the herders. It is reasonable to expect the efficiency of the association to increase in the future as skills and more experience in dealing with a non–Native bureaucracy are obtained. This is part of a general trend of increased extra–village awareness which is leading toward a regional approach in problem solving and management.

Historical overview: Seward Peninsula social organization

Villages on the Seward Peninsula today are the products of recent economic and social pressures as well as of a socioeconomic system that has its roots in antiquity. In the nineteenth century, the villages were part of a region–wide, economic and social system. Ray (1964) argues that each village had a territorial region associated with it; and that certain major, large villages functioned as territorial centers. Smaller villages located within these "tribal" territories were used on only a seasonal basis. Major villages tended to be located at river mouths while the smaller ones, often consisting of only a couple of houses, were located at strategic resource–extracting points. While many families lived in the larger villages and were linked by common residence and varying degrees of kinship, the small villages were occupied mainly by closely related kin. The distribution of Native Allotment parcels on Seward Peninsula reflects this pattern of common winter residence in a large village with outlying parcels of subsistence–related lands. For the nineteenth century, the units were:

> Buckland River (Kangyik); Deering (Inmachuk or Kugalik, in the nineteenth century this also included people of the Kiwalik River); Tapkakmiut (in the nineteenth century this included Shishmaref or Kikkiktuk, Cape Espenberg or Tukutat, and Goodhope River or Pittak); Wales (Kingegan); Little Diomede Island (Ingalik); King Island (Ukuivuk); Port Clarence (principally Sinramiut, also included Nook); Kauwerak; Nome (the largest village was Ayasayuk at Cape Nome, also included Sledge Island, or Ayak); Golovin (Chinik); Fish River (Irathluik); and Koyuk. (Ray, 1964) (Figure 9, and Table 17).

In the early phase of Burch's (1975) transitional period (1850–1890), three major changes took place in northwest Alaska which caused changes in the strategies and patterns of affiliation by which a person endeavored to acquire wealth. The first major change was the drastic decrease in the numbers of animals which represented wealth: the bowhead whales, walrus, and caribou. With depleted natural resources, most people had to turn their attention to working simply at survival, and the accumulation of wealth was not possible. Second, the reduced numbers of people and the accompanying changes in distribution and settlement patterns simply altered the chances of successfully accumulating wealth. Epidemics and diseases undermined the work undertaken to organize an efficient group of followers which every wealthy man needed to insure his rise to wealth and power, and once there to maintain it. The third major change which occurred involved a "shift from the accumulation of food reserves to trade in skins, furs, and whale bone (baleen) as the primary source of wealth" (Burch, 1975). Burch further notes that this shift in emphasis placed greater importance on relationships with partners and non–Natives and less importance on affiliation with kinsmen.

For the intermediate phase of Burch's transitional period, (1890–1940) wealthy Eskimos were virtually

Table 16. *Reindeer on the Seward Peninsula, 1951–1977.*

Year	Total reindeer in Alaska	Reindeer on Seward Peninsula
1951	27,245	6,570
1952	26,700	7,675
1953	26,200	8,470
1954	25,200	8,997
1955	28,500	8,950
1956	36,200	10,441
1957	39,800	13,896
1958	49,300	17,208
1959	43,200	17,979
1960	43,500	18,529
1961	39,900	16,405
1962	40,000	17,940
1963	38,600	18,880
1964	38,540	20,449
1965	35,269	18,944
1966	37,248	22,168
1967	33,150	18,795
1968	30,794	16,369
1969	31,038	17,009
1970	30,251	20,292
1971	N/A	N/A
1972	27,399	19,828
1973	N/A	17,397
1974	N/A	N/A
1975	29,100	20,600
1976	N/A	17,425
1977	24,100	17,800

nonexistent in Northwest Alaska.

> A few men were in the process of accumulating considerable capital in the form of domesticated reindeer herds during the 1920s, and some of them might have become extremely well–to–do in time. However, for a set of reasons too complex to go into here, this possibility was eventually denied them. (Burch, 1975).
>
> The complexities relate largely to U.S. Government policy, which was opposed to the expansion of individually owned herds. (Burch, 1975).

While it is true that government policy in the 1920s favored the establishment of communally operated herds, there was no effort to undermine the individually owned herds. Large herd owners were to benefit most by the creation of association herds. They were able, at least for a short period of time before the reindeer declined, to recruit labor from the associations. As the herds declined in the 1930s, not even the large owners could offer sufficient inducements to be able to recruit labor.

Burch (1975) points out three factors that changed the conditions favoring population dispersal during the Great Depression. First, during the 1930s the price of furs dropped drastically. Thus, the stimulus to live in "small local family units" for the purpose of trapping was removed. Secondly, the small, independent, white traders who had lived in or near the small, dispersed communities by and large went out of business. They had been a main source of food, supplies, and cash income based on the furs that were traded with them. Their going out of business, and the consequent lack of such a local source of food, supplies, and cash income, induced many Eskimo families to move out of the bush and into the mission/school /store villages. Lastly, the decline in the reindeer herds and the disappearance of any good reason to practice "close" or "intensive" herding motivated many herd owners to locate more or less permanently back in their villages. The Native reindeer companies could not afford to pay wages to their herders, and by the mid–1930s the Lomens and other non–Native–owned herds could not export enough meat (the lower 48 markets having disappeared in the early 1930s) to make it profitable for them to keep herders permanently on their payrolls.

In addition to changing the conditions which stimulated population dispersals, the depression created a number of conditions which made relocation in villages more favorable than it had been. The government supported many of the schools and village stores during this period, and they were the only ones which remained solvent. The teacher or some other government agent located in the villages disbursed welfare funds which became available. Lastly, the Civilian Conservation Corps make–work projects began in the mid–1930s. These included shelter–cabin construction, wolf–hunting programs, trail improvements, and road construction or improvement. These CCC projects were also administered through the government agents located at the mission/school villages (Burch, 1975).

During the "recent" period, as identified by Burch, (1940–1970), the way in which one acquires wealth in northwest Alaska has become the same as that which dominates Euro–American society money buys the material possessions which represent

Table 17. *Northwestern Alaska regional groupings, circa 1850.*

Map number	Designation	Estimated 1850 population
1	Colville River	575
2	Ikpikpak River, Barrow	
3	Meade River, Barrow	
4	Barrow	
	(Barrow proper area total)	700
5	Northwest Coast	475
6	Utukok River	200
7	Point Hope	975
8	Kivalina	350
9	Upper Noatak River	450
10	Lower Noatak River	300
11	Central Brooks Range	300
12	Kobuk River	975
13	Kobuk Delta	275
14	Kotzebue	425
15	Selawik River	950
16	South Kotzebue Sound	325
16a	Buckland	
16b	Deering	
16c	Candle	
17	Tapquq	375
18	Wales	750
19	Diomede Island	300
20	Port Clarence	275
21	Kauwerak (Kuzitrin River)	200
22	Nome (including Sledge Island)	900
23	King Island	275
24	Fish River	undetermined
25	Koyuk River	undetermined
26	Shaktoolik	undetermined
27	Unalakleet	undetermined

(Koyukon Indian groups on the Koyukuk Kiver are not shown)
(Burch, 1975; Burch and Correll, 1972; Ray, 1964, 1975; and others).

wealth. In order to acquire money, one must have a job, and this in turn implies associating with nonkin and non–Natives. It can be seen that the values and expectations inherent in the kinship system have changed over time in response to the changing environmental and social conditions.

> In fact, by the recent period, close affiliation with large numbers of kin was sometimes disastrous for people with ambition. No matter how hard one worked, and no matter how much money he earned, his kin would be sure to spend it.... Here, we have the final irony: the accumulation of wealth for most northwest Alaska Eskimos in the recent period meant either the absence or the rejection of the very sort of relationships that had been so essential to its attainment in the traditional era. (Burch, 1975).

Factors beyond mere economic success produce social status and prestige for an individual in Alaska villages. These factors have changed during the period of contract with Euro–Americans, just as they no doubt did under changing conditions during the prehistoric period. In the traditional period, it was possible for some individual Eskimos to acquire wealth which exceeded that of other Eskimos.

The means used to acquire this wealth depended on the aspiring person's success in manipulating his relationships with the "right" people (most of whom had to be kinsmen), his luck, and his personal qualities. The accumulation of wealth through affiliation with the "right" people could be a complex, lifetime process, with no guarantee of success. The flexibility of Eskimo social organization offered great latitude in the strategies of affiliation which the aspiring person could choose. This flexibility is revealed in case histories and analyses which show the functioning of augmentation, extension, and multiple connections which serve to increase the number of individuals with whom an aspiring wealthy person could interact to reach his goals (Burch, 1975).

Contemporary social organization

The primary residence unit of the Eskimo on the Seward Peninsula is the household. Within this concept of household lie two related concerns. One centers on the physical dwelling in which the household unit lives while the other focuses on the personnel who constitute the household.

The physical dwellings vary widely. It is not uncommon in villages to see sod–covered houses, log structures, frame houses, while at the same time prefabricated module units, and even trailer homes are all used as residences. Housing is a major concern of all village residents. Alaska State Housing Authority homes are supplied through Federal and state housing programs with a minimal cost to qualified applicants. Although these houses are grossly underinsulated for winter conditions in the Arctic, most people hope to acquire one. Fuel costs may range from 200 to 400 dollars (1977 figures) per month yet, the desirability of a new house for social prestige overrides the economic disadvantages. The addition of indoor plumbing and running water through Public Health Service water projects to the villages makes the new houses even more desirable.

In the general region outside the villages, there are an equally large number of different dwellings. The size, location, and condition of these places (variously called "camps," "the old place," "my land," or "my cabin") depends on their utilization. During the yearly cycle of activities, people will travel to these camps for periods ranging from one day to weeks or months. In summer, a canvas tent is usually erected over a wooden frame for eating, cooking, and sleeping. A tent affords summer protection from the elements and insects and is more comfortable and easier to regulate the temperature in than a well–insulated winter cabin. Tents are usually made of 10– to 14–ounce white cotton canvas with four foot walls, and are usually either 8x10 or 12x14 feet in size. Virtually every household has at least one such tent, often more if it is a large household.

In such camps, parents prefer to let the teenagers have their own tent as well. It might also be well to point out that, during the summer in villages, it is not uncommon to see a tent pitched beside a permanent dwelling. Teenagers, young adults, or visitors more often tend to use them since their summer nocturnal habits may interfere with the adult household routine. At one summer reindeer handling, eight men slept in one of the tents while couples and children slept in two other tents. This is an interesting persistence of the tradition of placing single males and visitors under one roof. In traditional times, this roof would have been that of the village *kazgi*.

The house of most Seward Peninsula Eskimos is small by North American standards. Most houses measure 16 to 14 by 24 to 32 feet. Older houses often have had many alterations such as new rooms added, heating/cooking stove locations changed, insulation and paneling upgraded, etc. Within each house, there is at least one large multipurpose room. It is here that most food preparation and consumption, equipment manufacture and repair, and visiting takes place. At night, it may become a sleeping room. Partitioned off from this main room by either curtains or walls are the usual sleeping areas. Within the sleeping area, a bed and often a dresser or some sort of storage container will be found. Access to the house is generally through a storm–shed, or porch. The double–door system (arctic entryway) minimizes drafts in winter. The storm–shed is also the depository for tools, raw materials, and small equipment.

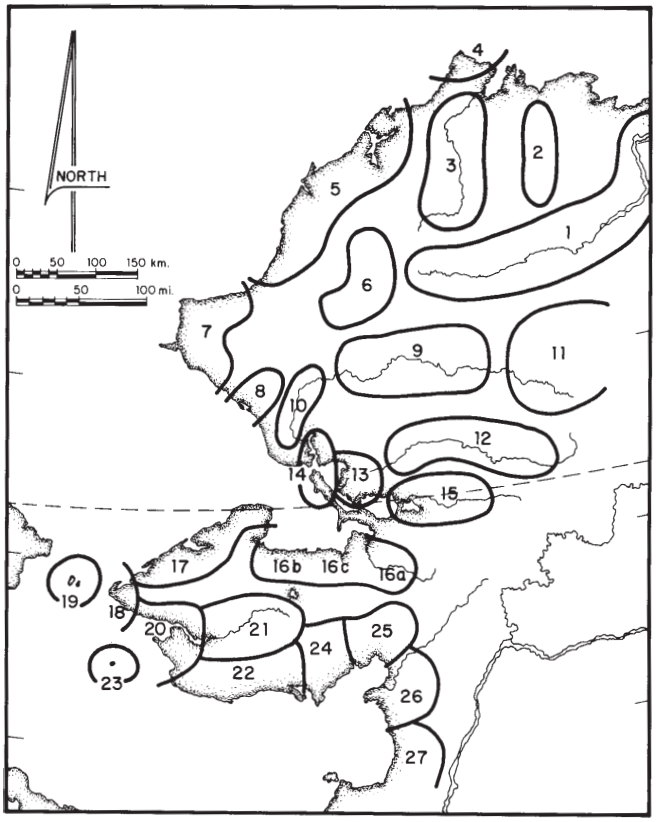


FIGURE 9. Northwestern Alaska regional groupings, circa 1950. (Numbers shown in Table 17 correspond to those shown above.)

When cold enough in winter, it serves as a safe place to store foods. Many households which can afford a freezer do not have room for it within the house, so it is often placed in the storm–shed. A curtained–off area is provided for honey–bucket facilities in older houses, while in the newer houses there is a bathroom complete with sink, flush toilet, and bathtub–shower stall. Since running water is not yet available in any village except Nome and Kotzebue, the flush toilet is superfluous, and a honey bucket normally rests in its place.

Surrounding the houses, there are various outbuildings: outhouses, storage sheds, and sometimes small workshops. These types of structures are typically constructed from delivered scrap lumber or any other material that might be available. The high cost of new lumber delivered to villages makes most villagers cautious in the use of it. New lumber and plywood is used in the construction of boats and houses before other projects. The "winterization project" brings many board feet of materials to the villages at little cost. These materials are destined to go into improvements on currently standing structures to insulate them better and bring down the costs of winter heating. Plans are being made for the construction of, new cabins, improvements to older houses, and other projects, to make use of this inexpensive building material.

The houses of reindeer–herd owners are not radically different from those of their neighbors. Although people say that the reindeer herd owners are rich, it is not possible to distinguish them on the basis of their housing in most cases. One herd owner's home has running water from an internal storage container in the basement that is pumped through the shower and sink systems (but not the toilet). His grandchildren fill the tank with ice in winter, and from jerry jugs of water in summer. This frame house was constructed by the herd owner and his family in the last couple of years, but it will be only a short matter of time until most other qualified village residents will receive equivalent new housing.

What becomes of old dwellings when new housing is put into a village is interesting. Categories of use tend to disguise the variation. Storage, housing for boarding students, teenage children, rental to teachers or nonresidents who must remain in the village for a period of time, demolition and re–cycling of the salvagable materials, or relocation to another site in the village are but a few uses. The general trend in housing is to replace a few multipurpose rooms with more single–purpose rooms. This space utilization is derived from the dominant culture (non–Native North America) and is not the traditional Eskimo model. Agencies which are planning the introduction of modern housing and building techniques would be wise to examine the experiences of Canada and Lappland before repeating mistakes made in other parts of the world (Ingold, 1976; Kerri, 1977; Zrudlo, 1975).

Household personnel

The concept of household referred to in the preceding section refers to "any set of individuals living in one house" (Burch, 1975). In actuality, there are two levels of household organization. Burch, following Carrasco (1963), calls these two levels "domestic families" and "local families."

> A *domestic family* is defined as a family organization whose members occupy a single dwelling.
>
> A *local family*, by contrast, would be a family whose members occupy different dwellings, but whose members still operate in terms of a single overriding family organization (Burch, 1975, original emphasis).

Figure 10 illustrates the difference between a domestic and a local family based on field data. The parents of (A), (B), (C), and (D) were reindeer herd owners. (B) was born in a reindeer camp in the early years of this century. (B) grew up with reindeer herds and would have taken over his father's herd, but the Great Depression and declining markets forced him to seek employment in the mines and stores of the mining towns. When his brother (A) started a

herd after World War II, (B) eventually went into partnership with him, until (A) retired, due to ill health. (B)'s sons were old enough to manage the reindeer by then. Currently, (G) is in charge of handling daily affairs of the herd, and it is he who sells the meat to villagers. (B)'s role with the herd is largely administrative, handling records and offering advice to his sons. (B) and (G) occupy new houses, built around the older house which (B) built after working many years as a store clerk and miner. (B) and (G)'s old houses now function as a store and storehouses, respectively. (B)'s niece, (E), was adopted by (B) and his wife after (B)'s sister (D) died. (E) no longer lives in the village. Because of the large size of (G)'s family and the proximity of (B) and (G)'s houses, two of (G)'s children and their adopted daughter (born to one of (G)'s unmarried children) usually eat and sleep in (B)'s house. (B)'s daughter (I) lives in a town with her husband and children, but usually returns to her home village during the summer and at holidays. The unmarried son (F) lives alone in a small house. (C), (B)'s younger brother, lives in the same town as (I) and her family, with his family. Thus, there are five domestic families living in the one village–(A), (B), (F), (G), and (H)–who interact as one local family.

The pattern of domestic families interacting as local families occurs throughout the Seward Peninsula. It is not only evident among the reindeer herd–owning families, but can be found in the other work groups that combine to hunt, fish, or build. On a day–today basis, the individuals of a domestic family group interact with their relatives, affines or consanguines who make up other domestic family units. The type of work to be performed, how well individuals are getting along, and the location of houses determines the formation and dissolution of the work groups, whose members may or may not be part of a local family.

In the towns in northwestern Alaska (Barrow, Kotzebue, Bethel, and Nome) there are signs that a Native elite is emerging from the previously ranked (not egalitarian) society. The members of this elite tend to be better educated, extensively travelled, and interact more with non–Natives than do their peers. While they are usually bilingual, some do not even speak Inupiat. Most of this elite tend to aspire towards the dominant middle–class Euro–American values of upward social and wide geographic mobility, with its attendant houses, cars, and material possessions. At the village level, this elite is not yet quite so obvious in its material manifestations. In one village, members of two local families engaged in reindeer herding and other businesses account for three of the five trucks in town. The other two belong to two brothers, each of whom operates a store. The one, large, stake–bed truck belonging to one of the reindeer–owning local families is used

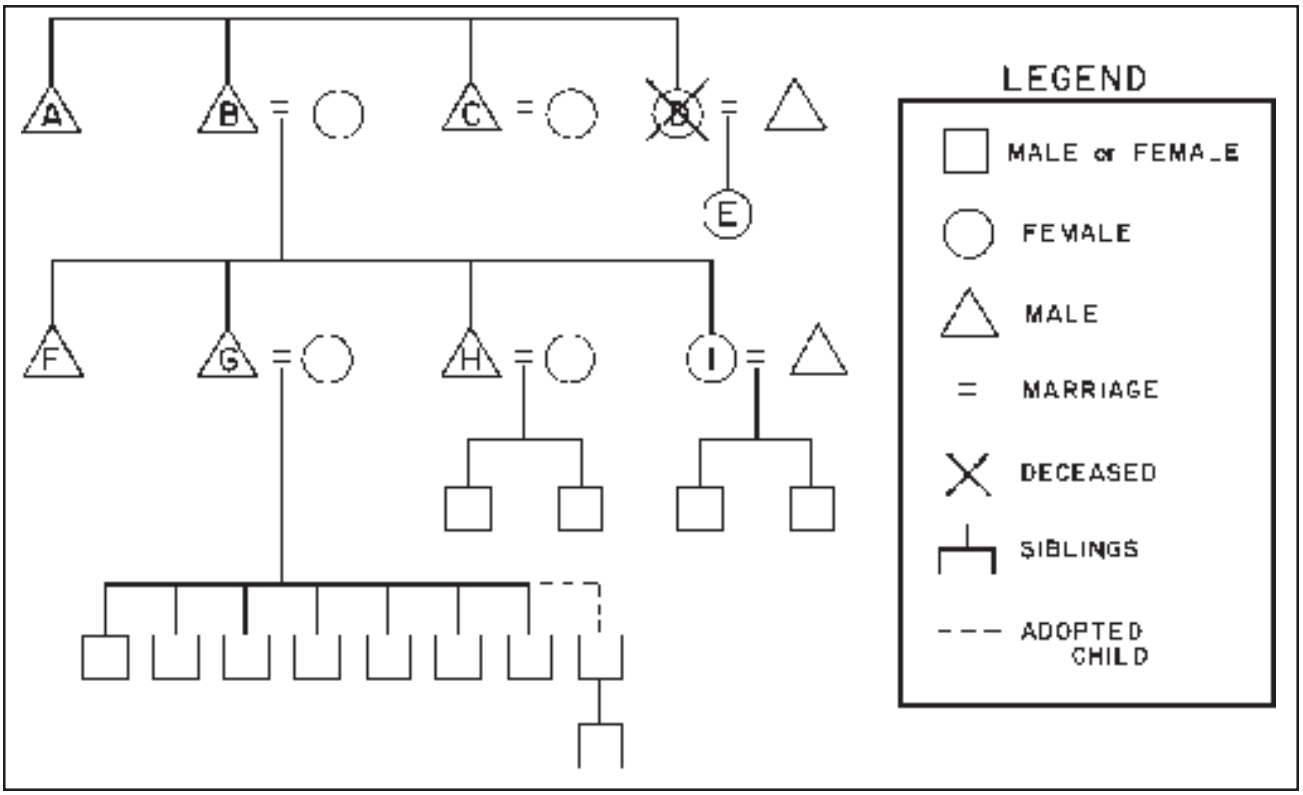


FIGURE 10. Household social organization.

mostly in connection with their duties as the local representative of the air carrier.

Village organization

The general trend during the transitional period (1850 to the present) has been the centralization of populations in permanent villages. Many of the villages are located where there was a precontact village, but the "modern" villages differ in several ways. Whereas the large, pre–contact villages were "permanent" in the seasonal round of the time, they were largely unoccupied during the summer months when the population dispersed in pursuit of summer fish, berries, and other resources. The modern villages are occupied year round but seasonal movements are still made out of the village. The traditional village existed at a particular location because it was close to a major food resource, as fish at river mouths or access to marine mammals (e.g., Wales). The main reason for the existence of most modern villages is the location there of government or the services of government agencies, as well as missions and churches. Trading posts, schools, and reindeer herds came to the villages during the late nineteenth century and the early years of the twentieth century. The establishment of these institutions enforced the centralizing tendency. Mining was locally important at various times. While this picture varies greatly in detail from village to village, in general it reflects what has happened over the past century.

Villages are composed of households. Households occupy houses distributed along paths and roadways. At an outsider's first glance, the village is an unorganized conglomeration of houses placed at random. Nevertheless, there exists a tight socio–spatial organization of houses and their occupants. The impression of unorganization disappears once the observer comes to know the houses and the people who inhabit them.

Village institutions

There are a large number of institutions within any village. All of these are necessary to operate and maintain the various functions of the village. In a sense, they are all overlays on the traditional social organization of the village, since their presence is traceable directly to the presence of Euro–American institutions and their requisites. Through time, however, these overlays have been integrated into the contemporary social organization of the village. Through a feedback process, they have affected and been affected by the village social organization, the personalities of the individuals who occupy positions of power and responsibility, and representatives of the various agencies concerned.

In addition to reindeer herding, the following is a partial list of new institutions present in most Seward Peninsula villages today: the Indian Reorganization Act (IRA) Council, Alaska Native Industries Cooperative Association (ANICA) store, other stores run by private parties, school board, village corporation, city council, regional corporation, church and church council, Alaska Department of Fish and Game (ADF&C) advisory board, National Guard, health–care programs, and village police and fire services. From this partial listing, one sees an enormous proliferation of jobs and of administrative positions, most of which have been created in the past 15 years. The villagers who are active on the various boards, committees, and councils tend to be part of the educated, rising elite described previously. Through their participation in these activities, they are able to use their positions for furthering the welfare of their fellow villagers, as well as furthering their own careers. This often creates conflicts of interest which are resolved in various ways. Resigning from the position, or abstaining from the decision–making are common ways. In the former case, the individual is usually reelected or appointed to the position, simply because there is no one else who can or who wants to fill it. In the latter case, a decision is usually already made prior to any formal abstention from the decision making. As often as not, the conflict of interest is simply overlooked in the interests of expediency. Non–Natives viewing the operation of these supposedly "democratic" institutions often react with surprise at the autocracy with which they function. The important point is that they do function, not that they fail to operate along the democratic principles espoused by the observer.

It is in the operation of these institutions that one sees the reindeer herd owners interacting with other villagers in an extra kinship context. This is not to say that kinship is not a factor in the operation of the institutions, but it is not supposed to be. In this paradox, the forum for tremendous conflict is established. The "great tradition" or dominant culture (in this case, of course, Euro–American) introduces institutions which are adapted to the demands of American society. When they are transferred in toto to the "little tradition" (Eskimo society), it should not be unexpected that they will be modified to suit the culture into which they are placed. For example, the National Guard armory in most villages is supposed to be a building used solely for the defense training of Guardsmen and the storage of supplies. In reality, the buildings are used for a number of purposes. At various times, the armory may serve as a theater, courtroom, dining hall, dormitory, or meeting hall, all functions above and beyond the original scope of its purpose. This is not to say that such functions are improper; indeed, most are in line with the National Guard's purpose in public services. But anywhere else where other specialized structures

and institutions were available, such uses of the armory would probably not be tolerated (cf Redfield 1953 for a further discussion of "little" and "great" traditions).

When the reindeer herd owner (or members of his local family) are present in these institutions, his role may not be that of the village reindeer herder. He is, as it were, wearing another hat at such times. But the villagers are always aware that the herd owner is not acting solely out of a motivation to facilitate the greatest good for the greatest number at such times. He is acting both for the interests he represents and his own. As noted above, conflicts of interest may be resolved in a number of ways, including being overlooked (or denied). Status in these institutional settings is derived from factors of sex, age, seniority, and personal charisma, as well as the vested authority from the position which a herder occupies. The herd owner's leadership abilities may be most severely tested in a situation that pits his kindred and him against the other factions of villagers in one or more of the village institutions.

Thus, there is great variability in the roles which the various reindeer herd owners play, both in their own villages and in the regional context of the reindeer industry. This variability has at least three principal sources. Some variability comes from the size of the herd. Different herd sizes require different amounts of time and labor to manage. Another source of variability comes from the herd owner's own management "style." This, in turn, is related to such factors as the presence of roads, which allow some herd owners to sell live reindeer on the hoof to buyers who then slaughter, process, and transport the animals. Additional factors may stem from the place of reindeer herding in the household economic strategy, or the individual herd owner's current financial and political needs and desires. A third factor involves the size, location, and condition of the range to which the herd owner is assigned. As we have noted, reindeer on the Seward Peninsula tend to drift westward (along the coast) during the summer months as they seek relief from insects. Herds thus tend to receive reindeer from the eastern neighbors. In their totality, all of these factors combine to produce the behavior of the herd owner in the framework of other village institutions.

Most of the non–Natives who reside permanently in villages are attached to one or more of these institutions. With the phasing out of state–operated schools in most villages, and the construction and operation of Rural Education Attendance Area (REAA) high schools in most villages, non–Native village residents are mostly attached to the schools and their operation. A pastor/missionary and his family also live in most villages. Temporary residents, or short–term visitors who remain from several weeks to a few hours, make up the remainder of the non–Native population. Most of these non–Natives are specialists of one sort or another in health services, human services, construction, or research.

As businessmen, the herd owner/operators must interact with an increasingly larger number of non–Natives. These include state and Federal agencies or their representatives; businessmen in the towns where quantities of meat may be sold, supplies purchased, or services sought; and increasing numbers of researchers (the authors of this report included) who come to the villages and Reindeer Herder Association meetings for various purposes and lengths of time. While Nelson could write in 1969 that the two most frequent questions a newcomer to a village could expect were "What are you here for•" and "When are you planning to leave•," a third question arises in the post–ANCSA period. "Who do you represent!" is not an uncommonly heard question (Nelson, 1969).

Since 1964, many of the herd owners have been involved with a San Francisco–based Korean businessman. This individual purchases velvet antler from the herd owners, which is then processed by him and sold as a tonic to the oriental market. It is this individual who has helped to develop the market, the processing, and the procuring techniques for Seward Peninsula velvet antler to the mutual benefit of himself and the herders. The effects of antler harvest are poorly understood. Some biological questions concerning the effect of velvet–antler harvesting on the social structure and the health and nutrition of the herds are currently being researched by the University of Alaska (Luick, 1977). At least one herd owner feels that the use of a small helicopter to round up the animals in late June/July for the antler harvest is an unacceptable practice because the reindeer are herded at a run, and the calves may not be able to keep up with the older reindeer or may be trampled. While the helicopter is viewed as an increase in efficiency by antler buyers, it is viewed as undesirable by some herd owners.

The herd owner as employer in the village

Within the villages, which are often home to one or more reindeer owners, the herd owners are viewed in different ways. To some people, the herd owner may be father, father–in–law, brother, uncle, or son. The kinship relationship between any two people is an important sociocultural factor in all interactions between people in northwestern Alaska. Burch notes the strong role which family relationships still play in social interactions (1975). These family relationships play no less an important role in those social relationships involving reindeer herding. In the larger, more accultured villages such as Nome,

Kotzebue, and Barrow, where Natives have numerous interactions with nonkin and non–Natives, kinship relationships as a means for structuring social organization are not as strong (or at least perhaps not so readily observable) as in the smaller villagers, kinship is still overwhelmingly the organizing principle. Thus, the herd owner as employer, and his social role in village life as a herd owner and leader, are affected by his kinship ties with other villagers, as well as by his personal attributes and abilities.

The organization of domestic families and local families as social and work groups has been discussed. At various times during the year, reindeer herding requires additional personnel that exceed the number of competent and available kin that can be called upon to help without expecting to be paid directly. When this happens, the herd owner/operator must become an employer. In addition to the kin who are hired, some nonkin may be engaged to aid with roundups, marking, and butchering. At some handlings close enough to the village to be reached easily by snow machine or boat, there may be more people present than are actually necessary to perform the work. A happy, almost holiday atmosphere prevails at these times, with food, coffee, and sometimes accommodations being provided by the herder/owner.

The herd owner oversees the operations at a handling. It is he who calls the earmarks and age/sex of animals being counted through a chute. He may delegate this authority to a son or other qualified person. With the advice and general mutual consent of other adult males, he decides when to commence the handling, when to take a break, and which males are to be castrated or butchered. Often a father or uncle who has had reindeer experience offers advice on particular animals. This person may actually do the castrating or butchering, or one of the "hired hands" may perform this task.

Specific individuals may be hired by the herd owner at an hourly rate of $4–$6, or a daily rate of $45, if they are good workers and fast skinners and butchers. Food, coffee, accommodations, sometimes fuel, and even cigarettes are included as part of the "salary." In lieu of cash, the worker may request wage payments in the form of meat. Some herders do not consider the use of meat as wages as part of their overall herding costs. They tend to be generous when, for example, a reindeer quarter valued at $26 (30 pounds at 85 cents per pound) is paid out for only a few hours work. If there is not enough meat available, the herd owner may offer to pay the worker at some time in the future when meat is available. In the context of patron client relations, this serves to extend the period of time in which the client is in the sphere of the patron's influence. During this time, the client may draw on his credit with the patron, as happens when the herd owner also handles retail items as a small entrepreneur. Several herd owner/operators do run small stores.

Members of the herd owner's immediate family are important assets to him in the herding operations. During roundups, the wife and daughters may cook and clean up after crews whose numbers can range from two to twenty. At large holdings, additional women and girls are employed as cooks and cleanup crews. As often as not, those women are related to the herd owner's wife (sisters or cousins) and the younger girls are friends and relatives of his children. There is some contrast between summer and winter handlings in this regard. During the winter/spring handlings, teenagers are most often away at school and thus unavailable for hire. In the summer, reindeer camp is an opportunity to get away from the village for a short time and earn a bit of money.

The male relatives of the herd owners are often retained not only to aid in the reindeer handlings, but for regular checks on the herd during the winter. This entails a snow machine ride to locate, bunch up, and drive the reindeer to the point on the range where the herder wishes to have them graze. Depending on the weather conditions, ease or difficulty of locating all the animals, mechanical troubles with the snow machines, and other factors, such a search and roundup trip may take one to five days. During this time, the herder's food, fuel, spare snowmachine parts, and accommodations will be provided by the herd owner. If the task takes considerably longer than was expected, the herders are not paid "overtime" but can expect a bonus of reindeer meat or supplies from the herd owner, in addition to their agreed–upon salaries. Herd owners earn a reputation for stinginess if they withhold more than their workers think they should receive, or are considered generous if they give "bonuses" without hesitation. Spencer (1959) reports that stinginess and greediness are abhorred in Eskimo culture. It is not uncommon to hear parents admonishing their children "Don't be stingy", when the children protest sharing candy or some other food or toy. Generosity is praised, and this cultural value is inculcated in children during the socialization process.

Figure 11 presents the kinship network of one herd owner, (E), in a Seward Peninsula village. This kinship chart represents only a portion of the affinal and consanguineal relations of the individual. Without presenting the actual chart of connections, this herd owner is related to a number of other herders besides (K), his father–in–law. (E) cooperates with two other herd owners from another village in handlings, markings, and slaughterings. The cooperation is reciprocal between the three. Although (E) has a relatively small herd, he has a number of other enterprises in the village, including a small store which operates out of the front room of his house,

the management of two houses which are rented to the school teachers, and helping his father, (C), who is the local commercial airlines representative in the village. In addition to all these cash income–generating activities, (E) hunts, fishes, and has been an ivory carver in the past. His wife, (F), maintains the household with two children and high school student boarders during the winter. She also fishes, and gathers berries during the summer. Her brother, (I), is gradually assuming the operation of his father's herd, and he and (E) get along relatively well, although actual cooperation in the management of their herds, which occupy adjacent ranges, will not likely occur until the father–in–law (K) has passed from the scene. Relations between (K) and (E) are not smooth. (K) claims (E) still owes him reindeer which were loaned to him to start his herd, and this charge is exacerbated by (K)'s drinking. (F) manages to keep tensions to a minimum and she and her brother (I) serve to keep the two local families in communication concerning affairs of mutual concern.

Since virtually every villager on Seward Peninsula can trace a real kinship (or a fictive augmentation of kinship) with other villagers, it is conceptually difficult to separate relatives from nonrelatives in the Euro–American sense of these concepts. Many young people do not know the Inupiat terms for all of the cousin classifications, yet unhesitatingly call distant relatives "cousins" in English. In the emerging political area of pan–Eskimo identity, this "cousin" concept is more akin to "brotherhood" than actual affinal or consanguineal kinship. Herders hire distant relatives for various herding tasks at various times in addition to hiring them in connection with their own entrepreneurial activities.

Few non–Natives are employed directly by the herd owner in his operation. The non–Natives who are employed are largely employed indirectly. For example, the air–taxi operators who are hired to scout for reindeer are directly employed by the herd owner, whereas they may receive employment indirectly when the antler buyer charters aircraft to fly the antlers to Nome from the corralling sites. The air taxi pilots give information on herd locations, sizes, and movements freely to the herders. In return, they can expect to be called to work for the herd owner either as spotters and drivers of the reindeer with their airplane, or when the herder is shipping meat into one of the towns (Kotzebue or Nome). In addition, individual herd owners have friendly relations with one or more pilots and use their air taxi service more or less exclusively when they are traveling on nonreindeer–herding business or pleasure trips. The commercial air carriers are employed by the herd owners in the sense that they often utilize the regularly scheduled cargo and/or

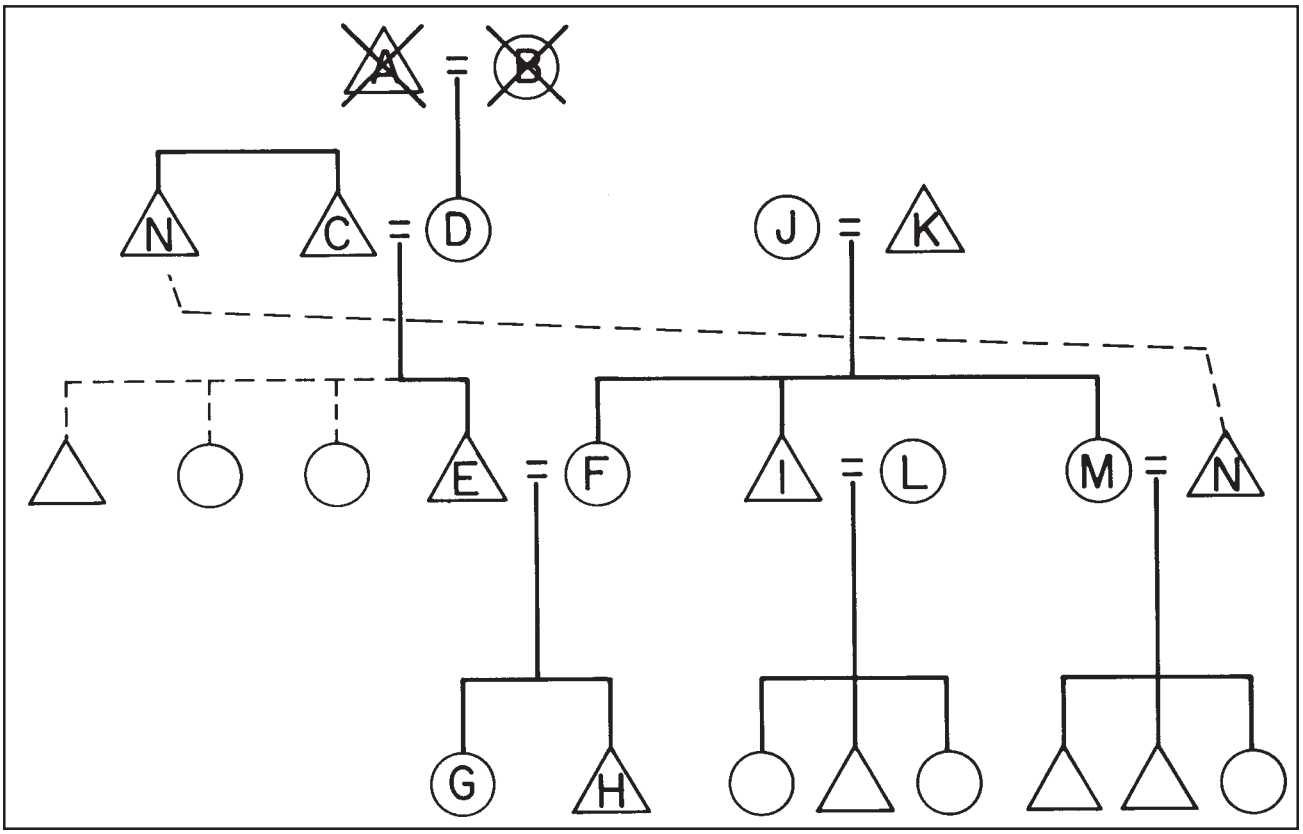


FIGURE 11. The kinship network of a herder in a Seward Peninsula village.

passenger flights to ship meat or for travel.

The income which accrues to the herd owner through his herding operations and other businesses (if he has any) is disposed of directly in the form of payments for labor costs, supplies and services, and indirectly when it is spent on nonherding purchases such as food, fuel, housing, clothing, and other items involved in the operation of any family budget. In summary, the herd owner is an employer by directly engaging individuals, non–Natives and Eskimo alike, in his herding operations. He also serves to stimulate the village and regional economies by the very presence of his herding operation and other businesses by spending and investing his income through the purchase of goods and services from other businesses.

In some respects, the herd owner and the wealth that his herd and businesses represent have a historic analog in traditional Eskimo social organization. The position and power of the village *umialik* are reflected in some herd owners' behavior. The *umialik* was "a good and honest man who looked after the interests of his supporting crew" (Spencer, 1959). English glosses of *umialik* include hunt group leader, chief, rich man (Spencer, 1959) and, depending on the context, boss, underwriter, creditor, employer, and boat captain (Burch, 1975). The *umialik* recruited his crew by the strength of his moral character and resources. On the coast, this crew took part in the whaling activities and associated rituals. In the interior, the crew took part in caribou drives and surrounds, and building and repairing the caribou fences and stone cairns which were used to drive the caribou into small lakes or narrow passes. In these places, with their mobility restricted, the caribou were killed. Small kayaks were used to pursue them in lakes, where the caribou would be speared with a lance; or they would be shot with bow and arrows at surprise surrounds in the case of land hunts at passes. Interior Seward Peninsula has many of these old caribou traps where the animals were driven into the lakes. Several are known in the Kuzitrin Lake and Imuruk Lake area (Powers et al., 1975).

The resources which the *umialik* used to recruit and keep a group of followers were the products of the labor which he and his wife put into accumulating them. These included a boat, a store of food supplies, and tools and weapons with which to outfit the hunting group. Considerable energy is needed in order to accumulate these. Paralleling this situation was the effort which the reindeer herd owner today must expend in both herd management and politicking. Most herd owners are active in local and regional politics through the participation in the village or regional corporation and other political institutions, such as the IRA Councils and the Reindeer Herders Association. The herd owner uses the material resources at his disposal (his herd, boat, snow machine, etc.) as well as his group of followers (his kindred and family) to achieve economic and political success. Since herding is not in most cases the sole source of income for the herd owner, he may be able to afford to take a loss in one reaches a size large enough to be considered economical (as the section on production costs and revenues shows). On the other hand, one year's loss, or several in a row, can lead to discouragement and abandonment of herding as part of the household economic strategy.

Herd owner characterization

It is not possible to paint a picture of a "typical reindeer herd owner" for there is a great deal of variation among them. This is particularly true in terms of their education, age, skills, or other factors which constitute their personality. Nonetheless, one can and must make some generalizations about herd owners. They do tend to fall into two age groups: the younger men in their late 20s and 30s, and older men in their 50s and 60s. The younger men have accumulated experience with reindeer through their fathers who were herders. The older men who are herders became so with their families at a young age, or entered the reindeer business by acquiring herds, then developing their skills through trial and error as they sought to build up their herds. Figures have been provided which indicate the accumulated reindeer experience of many of the contemporary herd owners (cf Tables 12, 13, and 14).

Generally, herd owners have less than a high school education, but there are a few exceptions. Most are also skilled in other areas, such as heavy equipment operation and repair, retail sales, mining, or general labor. Some are accomplished politicians in local village government, or within the village or regional corporation. Some are even involved at the inter–regional level. Cumulatively, they are not atypical of other Eskimos of the region in their assortment of job skills, experience, and upbringing. The only exception lies in the fact that they are reindeer herd owners.

The economic analysis of the reindeer herds will indicate that many herd owners do not generate sufficient income from reindeer herding to provide their total yearly income or food supply (Chapter VIII). This being the case, a question can be posed as to why they bother to herd reindeer at all. When this question is posed, answers vary. Some say that they enjoy the opportunity to be out of doors, which tending to reindeer matters afford them. Others indicate that the income and meat provided for their families and their village motivates them to keep on herding. Within the context of the mixed economic strategies which most households must rely on in

order to provide sufficient food, housing, and income, reindeer herding must be understood as only one aspect of the overall strategy employed by either households or individuals. This means they must have both inclination and the administrative ability to secure the necessary grazing permit from the Bureau of Land Management and a sufficient number of reindeer to stock their assigned range. Once these two prerequisites are fulfilled, the aspiring herd owner must make do with low returns of meat and income from his herd for several years before it increases in size to the point where it is economically viable. The failure rate of herds which attempt to reach this level, somewhat over 1,000 reindeer, is high. Nevertheless, herd owners continue to aspire to develop an economically viable herd. Other entrepreneurial activities of herd owners such as storekeeping and housing rentals, as well as securing steady employment in the villages (through the outside institutions) reflects this aspiration to economic security, as well as representing the mixed economic strategy typical of village households.

It is necessary to explore some of the different cultural definitions of "success" in this regard. Obviously, the management practices currently followed do not conform with those necessary to a high–yield, profit–maximizing plan of operations. Yet reindeer herding operations have operated on a partial–subsistence, partial cash income basis for the thirty–odd years since reestablishing herds following World War II. We suggest that this persistent pattern has its roots in the expectations of the herders and their collective experiences with reindeer herding. It has been noted that a herd owner, ironically enough, may be able to earn more income as a wage earner himself than in supplying more meat to a community which would be accompanied by increased demands on him. There are a few young men employed as herders today. The few who have their own herds are exceptions, since Olson (1969) notes a generation gap between the older, experienced reindeer men, almost all of whom are over fifty, and the younger men in their twenties and thirties. "Success" is taken to mean a wage job by most young Eskimos. Subsistence hunting takes on a recreational aspect since it affords time away from the village, home, and the tedium of a nine–to–five job. "Failure" is what happens to a person who does not take care of his family, depends on welfare, drinks excessively, and abuses his family physically.

Chapter VII
Marketing of reindeer products

This chapter is concerned with the marketing of reindeer products. Topics to be discussed include the marketing of reindeer meat, the marketing of velvet antler, and the combined value of all reindeer products sold or used in the home by herd owners. In our discussion of reindeer meat marketing, we will consider the time of year and methods by which reindeer are slaughtered and meat distributed, the quantity and value of the reindeer meat produced in Alaska and the Seward Peninsula from 1960 to 1977, the prices received by herd owners for carcass reindeer meat, and the protein contribution of reindeer meat to residents of northwest Alaska. The analysis of velvet–antler marketing will focus on antler–harvesting procedures, a summary of prices received by herd owners for this product over the last several years, and the quantity and value of velvet–antler production in Alaska for the years 1975–1977. The last major topic, value of reindeer products, describes the quantity and value of all reindeer products produced from all Alaska reindeer herds between 1972 and 1977 and gives the quantity and value of reindeer product sales from the Seward Peninsula for 1975–1977.

Marketing of reindeer meat

Through 1977, the main product from Alaska reindeer herds in terms of quantity and value of production was carcass reindeer meat. In 1977, Alaska reindeer herd owners produced 312,000 pounds of dressed reindeer meat and sold 256,000 pounds (Alaska Crop and Livestock Reporting Service, 1978). The remaining 56,000 pounds were used by herd owners in the home and as payment for labor used during normal herd operations. The main source of carcass reindeer meat is steers, although some bulls, cows, and calves are included in any year's total production. The bulk of the slaughtering activity occurs in October through February. A variable number of reindeer can be slaughtered throughout the year, however. Although a reindeer carcass can weigh 150 pounds and more, the total recent production figures for Alaska indicate an average of approximately 120 pounds per carcass. (This average weight is based on field observation, individual herd records, and the U.S. Department of the Interior, BIA, Annual Land Operation Reports 1960–1971.)

Marketing methods

In 1977, all herd owners on the Seward Peninsula butchered and marketed their own reindeer, with

the exception of two who sold live reindeer and the buyers butchered and marketed these reindeer. An estimated 80 to 9O percent of the reindeer meat sold in the past few years from Seward Peninsula herds has been consumed within the region. The remaining reindeer meat produced in recent years has gone to Anchorage and the "lower 48 states." That portion going to Anchorage has been used in the making of sausage while the meat going to the "lower 48" has been marketed as a specialty meat.

All slaughtering of reindeer on the Seward Peninsula is done in the field. Even those reindeer carcasses that will leave northwest Alaska, and which therefore must be government inspected, are killed in the field and then brought to the Nome reindeer slaughter plant for inspection. The majority of slaughtering takes place during the winter months when herders have a mobility advantage over the reindeer. With the use of snow machines, herders can move faster than reindeer over the snow–covered ground. Two other reasons account for the slaughtering of reindeer during winter months. First, if the slaughtering can be accomplished during the first part of winter, the reindeer will be in their best condition following summer weight gains. Second, slaughtering in subfreezing temperatures quickly freezes carcasses for delivery to buyers. For these reasons, most of the reindeer slaughtering takes place from October through February. Slaughtering does occur at other times of the year on a limited basis, mainly for the owner's home consumption. The exact time when each herd butchers depends on individual preference, the location of the reindeer, weather, and availability of labor.

As has been noted before, the production from individual herds is distributed in a number of ways (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. Owners of the larger herds also sell meat to the region's two largest population centers, Nome and Kotzebue.

The first of the village distribution channels involves wage–meat payments and herd owner home use. Many village residents receive part of their yearly meat supply by working for a herd owner at handlings or butcherings and receiving reindeer meat as payment in lieu of cash. Herd owners value reindeer meat as wages at current market price. But often herd owners will "overpay" workers by providing them with more meat than they have earned by their time actually worked. An explanation for this behavior is herd owners acting as village umialiks. (See Chapter VI).

Reindeer herds on the Seward Peninsula are based at the villages of Shishmaref, Wales, Brevig Mission, Koyuk, Golovin, Teller, Deering, and Buckland, and at the towns of Nome and Kotzebue. The population of the villages is estimated to total 1,233 people. In 1976, approximately 400 reindeer carcasses were used by herd owners in these villages specifically for home consumption and labor payment. The per capita consumption from this method of distribution amounted to approximately .32 reindeer carcass (39 pounds) per village resident.

A second method of village distribution is sales directly to village residents. In one instance in the summer of 1977, this took the form of a herd owner taking orders for reindeer meat from the back of a pickup truck as he was bringing the carcasses of four or five reindeer into the village. Through August of 1977, herd owners were selling reindeer meat to village residents for 85 cents per pound.

A final type of village distribution is the sale of carcasses to village stores. These stores usually sell reindeer meat as sides or quarters and ten cents per pound is added to the price exacted by the herd owner as a handling charge. In 1976 and the first half of 1977, this produced a price at village stores of 95 cents per pound. Villages stores generally have reindeer meat only during the winter months since they have little or no cold storage facilities. It is doubtful if reindeer meat would be available in the summer even if more storage were available. There are basically two reasons for this. First, it is difficult to slaughter reindeer in the summer because of the problems in getting close to them, and second, reindeer are in the best condition for slaughter in the first part of winter.

Herd owners with less than 1,000 reindeer generally distribute all their reindeer meat in the village through either home consumption, wage–meat payments, sales to village stores, or sales to village residents. Larger herd owners, besides using these same channels, also sell reindeer meat to the two population centers of northwest Alaska: Nome and Kotzebue, and at times also make sales out of the region. In 1976, Nome stores sold approximately 100,000 pounds of reindeer meat, while stores in Kotzebue sold approximately 54,000 pounds of reindeer meat. During the winter of 1976–1977, reindeer retail cuts sold for approximately $1.70 per pound as stew meat, $1.90 per pound as shoulder cuts, and $2.00 per pound as hind cuts in Nome and Kotzebue. Prices for a competing source of protein in Nome, Alaska, were given in the March 1977 Quarterly Food Price Index. They were $2.99 per pound for beef round steak, $2.04 per pound for beef chuck roast, and $1.79 per pound for beef hamburger (Thomas, 1977). As with village stores, reindeer meat is generally available only in Nome and Kotzebue stores during winter months. These stores would like to carry reindeer meat on a year–round basis; however, production is not large enough to meet this de-

sire. Freezer facilities in the towns are sufficient to hold a large supply of reindeer meat during the summer months. These towns are also not subjected to the frequent power outages which the villages experience.

In the winter of 1976–1977, in contrast to other owners, two herd owners marketed their excess reindeer as live reindeer, thus eliminating the problems of butchering and making marketing arrangements. These two herd owners received $70 per head for these live reindeer. If the reindeer averaged 120 pounds per carcass, these owners received 60 cents per pound for the dressed meat. However, they did not pay any costs of slaughter. This marketing option may be currently available only to these two owners as they manage their herding operations on the one area of the Seward Peninsula which has a road system. This makes it relatively easy and inexpensive for meat buyers to reach the reindeer.

Alaska reindeer meat production: 1960–1977

Total production, sales, and home and herd use of reindeer slaughtered by Alaska reindeer herd owners for the years 1960–1977 are provided in Table 18. This period was characterized by generally increasing production until 1968, at which time a general decline can be noted. From 1960 through 1968, except for the years 1962 and 1967, total production increased yearly. In 1968, total production amounted to 754,000 pounds of dressed reindeer meat, 608,000 pounds of sales, and 146,000 pounds of reindeer meat used in home and herd operations. During this same period, the value of production generally increased, with the value of production estimated to be $324,000 in 1968.

From 1969 through 1977, production generally declined with 1976 being the low point when only 286,000 pounds of production occurred: 234,000 pounds of sales and 52,000 pounds of home and herd use. In 1977, production rebounded over the previous year as 312,000 pounds of production was accomplished. The value of production followed the quantity of production through 1972. However, in 1973, although production was lower than the previous year, the value of this production was $16,000 greater. Again in 1974, production fell but the value of the production increased over the previous year. The largest slaughter since 1971 occurred in 1975. This factor, combined with increased meet prices, raised the value of reindeer meat produced in Alaska to $308,000, a figure only exceeded by the value of the 1968 production. The 1968 slaughter was 409,000 pounds greater than the quantity of reindeer meat produced in 1975. In both 1976 and 1977, meat production was below the level of 1975 with per pound carcass meat values remaining relatively stable in these years.

Table 18. *Production and sale of reindeer meat by Alaskan reindeer herders, 1960–1977.*

	Total production		Sales		Home and herd use	
	Pounds	Value	Pounds	Value	Pounds	Value
Year	dr. wt.[a]	($)[b]	dr. wt.[a]	($)[b]	dr. wt.[a]	($)[b]
1977	312	275	256	225	56	50
1976	286	243	234	199	52	44
1975	345	308	287	257	58	51
1974	300	205	220	150	80	55
1973	324	182	261	144	63	32
1972	328	166	239	121	89	45
1971	456	235	365	188	91	47
1970	615	300	479	241	136	59
1969	585	277	458	219	127	58
1968	754	324	608	260	146	64
1967	692	265	517	188	175	77
1966	701	249	546	190	155	59
1965	637	242	522	200	115	42
1964	660	254	504	195	156	59
1963	490	179	394	138	96	41
1962	482	182	372	139	110	43
1961	485	181	364	136	121	45
1960	450	180	330	132	120	48

[a]dr. wt. = dress weight (in thousands of pounds).

[b] (in thousands of dollars).

Source: Alaska Crop and Livestock Reporting Service 1973–1978.

As with total reindeer numbers in Alaska, the overall decline in reindeer meat production between 1960 and 1977 was caused largely by the decline of the Nunivak Island reindeer herd, instead of a general decline in reindeer numbers in all areas of Alaska. In 1960, the Nunivak herd totaled 16,000 reindeer, of which 1,625 were butchered. In 1964, this herd totaled 13,200 reindeer, and of this number 2,826 were butchered; while in 1968 the herd totaled 10,200 and 1,749 reindeer were butchered. However, in 1976, this herd had decreased to 4,000 reindeer, of which only 301 were butchered. The 1977 slaughter consisted of 187 reindeer. If these carcasses averaged 120 pounds, Nunivak accounted for 195,000 pounds of the reindeer meat slaughter in Alaska in 1960, 339,120 pounds in 1964, 209,880 pounds in 1968, 36,120 pounds in 1976, but only 22,440 pounds in 1977.

Seward Peninsula reindeer meat sales: 1960–1977

Reindeer meat sales by herds on the Seward Peninsula for the years 1960–1977 are given in Table 19. This table does not

include the reindeer meat used by herd owners in home and herd operations. (Except for 1976, home and herd operation information has not been available since 1971. In 1976, approximately 400 carcasses [48,000 pounds were used for these purposes.) The quantity of meat sales by Seward Peninsula herds did not decline from beginning to end for the period 1960–1977, although a decline was seen in production by Alaska reindeer herds as a whole. This occurred because reindeer numbers have remained relatively constant on the Peninsula since 1960, varying from a high of 22,168 in 1966, to a low of 16,369 in 1968. In 1976, the estimated number of reindeer was 17,425; while in 1977, reindeer were estimated at 17,800 animals.

The value of reindeer meat sales on the Seward Peninsula showed an overall increase during this period. In 1960, the value of reindeer meat sales to herd owners on the Seward Peninsula amounted to $38,064. In 1977, the value of reindeer meat sales was estimated at $201,380, the highest value in all the listed years.

Price received by herders: 1960–1977

The average price per pound received by Alaska reindeer herd owners for reindeer meat for the years 1960–1977 is provided in Table 20. From 1960 through 1968, the price per pound remained relatively stable, averaging 37 cents per pound. In 1969, the price rose 6 cents over the 1968 price of 42 cents. In the period 1970–1973, the price rose slowly, reaching 55 cents in 1973. The period from 1974–1977 was one of rapid changes. The 1974 price rose 15 cents. In 1975 and 1976, the price rose 5 cents and 10 cents, respectively, over the preceding year. In 1976, herd owners received 85 cents per pound for their reindeer meat. This price prevailed until the end of August, 1977.

There are a number of reasons suggested in economic theory for the increase in price received by Alaska reindeer herd owners for carcass reindeer meat (Burk, 1968). The following factors have tended to increase the consumer demand in northwest Alaska: population growth in the region, increased earned incomes of region residents, increased transfer payments such as food stamps, a perceived preference for reindeer and caribou meat, general price increases of substitutes for these meats, and the demise of the Western Arctic Caribou Herd. In 1974, the NANA Regional Corporation estimated that the region's residents consumed 14,000 caribou annually (Mauneluk Association, Inc., 1974). During the winter of 1976–1977, state–imposed hunting restrictions limited the harvest to 3,000 caribou. On the supply side, supplies of reindeer in northwest Alaska, as evidenced by numbers of animals annually slaughtered, although showing some variation up and down, have remained relatively stable since 1969, averaging an annual sale of 1,835 carcasses from Seward Peninsula reindeer herds. Increasing demand with a comparatively stable reindeer supply has put upward pressure on prices.

Table 19. *Reindeer meat sales by Seward Peninsula reindeer herders, 1960–1977.*

Year	Est. no. reindeer on Seward Pen.	Number carcasses sold	Pounds meat sold	Value (dollars)
1977	17,800	1,974	236,920[a]	201,380
1976	17,425	1,820	218,400[a]	185,640
1975	20,600	1,766	211,920[a]	158,940
1974	n/a[b]	1,164	139,680[a]	97,776
1973	17,397	n/a	n/a	n/a
1972	19,828	n/a	n/a	n/a
1971	n/a	2,263	271,560	141,211
1970	20,292	2,168	260,160	130,080
1969	17,009	1,792	215,040	103,219
1968	16,369	3,505	420,600	176,652
1967	18,795	2,434	292,080	105,148
1966	22,168	2,790	334,800	113,832
1965	18,944	1,527	183,240	69,631
1964	20,449	1,266	147,120	51,492
1963	18,880	1,043	125,160	46,309
1962	17,940	1,339	160,680	59,229
1961	16,405	912	109,440	40,492
1960	18,529	688	82,560	38,064

[a]Carcasses assumed to average 120 pounds, actual figures not available.
[b]n/a= data not available.
Sources: U.S. Dept. of the Interior, BIA, Annual Land Operation Reports 1960–1971, Alaska Crop and Livestock Reporting Service 1973–1978, Reindeer Herders, BLM Case Files.

Protein contribution of reindeer

As noted earlier, the per capita consumption of reindeer meat on Seward Peninsula from wage–meats (400 carcasses) in 1976 was .32 carcasses per village resident per year (1,233 residents in the eight villages with herds) or approximately 39 pounds of reindeer meat. Sales to village residents and to village and town stores totaled approximately 1,550 animals in 1976, which, at an average of 120 pounds each, would represent some 186,000 pounds of meat. Combining the town

Table 20. *Price per pound received by herd owners for reindeer meat, 1960–1977.*

Year	Price per pound (cents)	Year	Price per pound (cents)
1977	85a	1968	42
1976	85	1967	36
1975	75	1966	34
1974	70	1965	38
1973	55	1964	35
1972	51	1963	37
1971	52	1962	37
1970	50	1961	37
1969	48	1960	40

[a]January–August.

Sources: U.S. Dept. of the Interior, BIA Annual Land Operation Reports 1960–1971, Alaska Crop and Livestock Reporting Service 1973–1976, Reindeer Herders.

(Nome and Kotzebue) population figures with those of the villages (6,249 people, 1975 figures) and totaling all reindeer meat consumed regardless of by what means it was obtained (approximately 234,000 pounds), yields a per capita consumption figure of 37 pounds for the Seward Peninsula. Thus, per capita consumption of reindeer meat in the towns and in the villages on Seward Peninsula from both wage–meats and purchases was about equal.

The figures for the villages reflect the payment of meat as wages to villagers. In the towns, there are few people who earn reindeer meat in this manner. Additionally, the figures for Nome and Kotzebue reflect a higher percentage of non–Natives in the population than do the figures for the villages. The non–Native buyers are probably following meat consumption patterns developed in the "lower 48," so they buy the customary meats rather than reindeer, which is a novelty to them. This implies that the per capita Native consumption of reindeer meat in the towns may actually be higher than in the villages. Part of the reason may be that people living in villages have a greater opportunity to obtain other traditional foods.

Recent studies of the impacts of Eskimo acculturation in terms of diet are reported by Draper (1977). Although direct comparisons are not possible, there exists the high probability that Seward Peninsula villages are roughly comparable to Wainwright and Point Hope, where data are available. At these villages, a study of diet in 1971 and 1972 concluded that:

> Wainwright adults obtained nearly half of their calories from native sources and about three–quarters of their protein. At Point Hope, where dietary acculturation is more extensive, less than one–quarter of the calories in the adult diet were obtained from indigenous foods, which nevertheless provided over half of dietary protein. The proportion of native foods in the diet of children, on the average, was about half that in the diet of adults. (Draper, 1977).

Since caribou were present near both of these villages in the two years studied, we assume that they made up a portion of the diet. Caribou and reindeer are virtually identical in composition and nutritive value (University of Alaska, 1973). Granted these assumptions and having already indicated that there is a high per capita consumption of reindeer on Seward Peninsula, it is suggested that reindeer represent a significant contribution to the protein intake and, consequently, the overall health of the Seward Peninsula population.

Table 21 is presented to show comparative nutritional data for reindeer and other meat products. A comparison of the figures in Table 21 shows that reindeer is a high–protein, red–meat source, low in fat and high in calories. Its lower cost relative to these other meats has been discussed. Coupled with the fact that it is a locally desired product, one can see the value of reindeer meat as a protein source for northwest Alaska.

The study by Draper (1977) contains implications for the health of the residents of this region.

> While the primitive Eskimo was beset by serious nutritional crises, these problems arose not from deficiencies in the quality of his native diet but from periodic breakdowns in his food supply as a result of natural forces.... He ate a balanced diet for one simple reason: there was little else to eat. The modern Eskimo has for the first time the opportunity to make significant food choices. Presented with an array of exotic new foods which he is not equipped by personal experience or education to evaluate, he tends to choose badly. In general, the items he selects are below the average quality of the U.S. mixed diet and of the foods they replace in his native diet. His nutritional status is deteriorating, in terms of both undernutrition and overnutrition, in direct relation to the proportion of processed foods in his diet. (Draper, 1977).

On the basis of this and the data obtained in this study, reindeer can be viewed as important to the diet of Seward Peninsula peoples and if excluded could accelerate the current undesirable decline in the nutritional status of these people.

Conventional wisdom of modern nutritionists recommend a mixed diet consisting of foods from four groups: cereals, fruits and vegetables, meat, and dairy products. The precontact diet of most Eskimos consisted almost entirely of meat and fish. This

paradox suggests that Eskimos have made certain metabolic adjustments in order to sustain life and health in the rigorous arctic environment. Many of these metabolic adjustments have been investigated (Milan, 1962; Milan and Evonuk, 1967; Milan et al., 1963), but the exact nature of the relationship between Eskimo diet and metabolism is still imperfectly understood.

Marketing of reindeer velvet antler

Reindeer velvet antler is sold for use in oriental medicines. Although the supposed power of antlers from several deer species, including reindeer, have gained wide notoriety as aphrodisiacs, most antler buyers insist that reindeer antlers are not sold as aphrodisiacs. Rather, antlers are seen as having the ability to restore and strengthen the body. To practitioners of oriental medicine, antlers are useful in treating, for example, convulsions, vaginal hemorrhage, and bladder stones. In this view, any sexual enhancement results from better health, not from the antler itself. Most of the reindeer velvet antler harvested from Alaskan reindeer herds is destined for final sale in the Orient, with South Korea being the largest consuming country. It appears that deer antlers are used by older people in these countries. Buyers have expressed concern that the younger members of these populations may not adopt the use of antlers as have their parents. This can only be viewed as speculation at this time because no demand studies for antler have been undertaken.

Harvesting of reindeer antler

Velvet antler can be harvested only at summer handlings. In order to overcome the traditional difficulties of summer herding, the herds are now driven into the corrals for antler harvesting by a helicopter swinging back and forth behind the reindeer. This is a faster method than the herding on foot which was used until a few years ago. Once a herd is corralled, the reindeer are pushed single file through a chute at the end of the corral. As each adult reindeer moves through the chute it is held by four men and most of its antler is removed using a hand–held cutter. A rubber band is twisted around the remaining antler to prevent excessive bleeding. The smaller calf antlers are left intact.

Antler is harvested at the end of June or during the first part of July because it is during this period that the antler is most desirable: it is the largest size possible, but the inside of the antler still has a spongy texture. If the antler is allowed to continue to develop, it eventually becomes completely ossified. For this reason, antler buyers prefer not to purchase antler after the middle of July.

Price history

The price per pound received by reindeer herd owners for velvet antler has increased steadily in recent years. In 1969, herd owners received $1.00 per pound. In 1972, the price rose to $3.50 per pound; in 1975, to $4.32 per pound; and by 1976, the price had risen to $5.58 per pound. These price increases likely are a result of additional buyers attempting to purchase reindeer antlers. In 1977, two different prices were received. Except for one herd, all owners on the Seward Peninsula were under a multi–year contract and received $8.00 per pound. One herd received $23.76 per pound for its velvet antler production in 1977, the result of competitive bidding.

The sale of reindeer velvet antler has become an increasingly important source of income to Alaska reindeer herd owners. Based on information supplied by buyers and herd owners, the pounds and the value of sales for all Alaska reindeer herds for the years 1975–1977 are presented in Table 22. During these three years the quantity sold remained relatively stable. Price received, however, increased yearly, to where, in 1977, the value of sales more than doubled the 1975 level. The Seward Peninsula (Table 23) accounted for all sales of velvet antler from Alaska for the years 1976 and 1977. In 1975, antler sales from Nunivak Island accounted for $5,310 (8 per cent) of total sales.

Value of reindeer products

In 1977, the value of sales and home use of reindeer products from all Alaska reindeer herds was estimated to total $471,000 (Alaska Crop and Live-

Table 21. C*omposition of foods, 100 grams, edible portion.*

Meat	Moisture (percent)	Food energy (calories)	Protein (grams)	Fat (grams)
Beef, good grade, raw, 100% lean[a]	72.1	139	21.8	5.1
Chicken, light meat without skin, raw[a]	73.7	117	23.4	1.9
Pork, fresh, carcass, raw, fat class (total edible 41% lean, 59% fat)[a]	33.4	553	9.1	57.0
Reindeer, raw flesh[b]	70.1	117	26.6	1.2

[a]Data from Watt et al., 1963: Table 1.
[b]Data from University of Alaska, 1973.

stock Reporting Service, 1978). Of this total, 95 percent ($446,673) was derived from reindeer meat and velvet antler. Five percent ($24,327) came from the production of hides, leggings (lower leg skins used for making mukluks), and meat by–products. On the Seward Peninsula, the value of the 1977 meat and antler sales was estimated to total $373,053.

The value of all reindeer products produced in Alaska for the years 1972–1977 is presented in Table 24. This production value includes reindeer meat and meat by–products, velvet antler, and reindeer hides and leggings. It includes meat and meat by–products used in the home and/or for herd operations. For the years 1972–1977, with the exception of 1977, the total value of all production increased yearly. This increased value was due largely to increased prices for reindeer meat and velvet antler. Reindeer meat production from all Alaska herds actually showed a downward trend in the years 1972–1977, as was discussed previously.

The value of reindeer meat sales and velvet antler sales on the Seward Peninsula for the years 1975 through 1977 is provided in Table 25. (This table was constructed with data from interviews gathered by interviewing herd owners and antler buyers, and the examination of BLM case files.) The value of hides and meat by–products is not available, but likely accounted for only an additional four to five per cent of total value. Sales in 1977 were $108,313 greater than in 1976, an increase of 41 per cent. Most of the increase was due to higher antler prices between 1976 and 1977. Antler production increased by approximately ten per cent while the value of antler production rose by $92,573, a 117 per cent increase.

Table 22. *Velvet antler sales—Alaska, 1975–1977.*

Year	Pounds	Sale Value
1977	15,037	$171,673
1976	13,661	79,085
1975	15,058	65,829

Table 23. *Velvet antler sales—Seward Peninsula, 1975–1977.*

Year	Pounds	Sale Value
1977	15,037	$171,673
1976	13,661	79,085
1975	14,173	60,519

Chapter VIII Socioeconomics of reindeer herding

The analysis of the socioeconomics of reindeer herding presented in this chapter is based primarily on research conducted in 1976 and 1977. In a few instances, literature published after 1977 has been included in an attempt to update the chapter. Nevertheless, because it was impossible to cover all the socioeconomic changes which occurred more recently in the Alaskan reindeer industry, the picture of reindeer herding which emerges from this chapter is principally of the earlier period.

Production and herd management

Herd Sizes

In early 1977, thirteen individuals and one Native corporation had permits to graze reindeer on the Seward Peninsula, not including the herd at Shaktoolik. Based on the reindeer which overwintered, total reindeer numbers were estimated at 17,800 animals. Herds could be divided into four size classes: less than 1000 reindeer, between 1000 and 2000 reindeer, between 2000 and 3000 reindeer, and over 4000 reindeer. Six herd owners had less than 1000 reindeer each, two of these herds numbered less than 100 reindeer per herd. The remaining four herds in this category averaged 600 animals. There were five herd owners with between 1000 and 2000 reindeer, an average of 1300 reindeer per herd. Two herd owners had between 2000 and 3000 reindeer each. These herds averaged 2400 reindeer. One herd, however, was estimated between 4000 and 4500 animals.

Herding

With the exception of one herd, reindeer herds on the Seward Peninsula are not herded year–round but are left untended for much of the year. The greatest amount of herding occurs during the winter and spring calving season, with little or no herding taking place during the summer. Even during the winter, herding is generally limited to checking the herd condition and location, as the reindeer, for the most part, select their own range. This may take the form of observing the reindeer daily, simply checking on their whereabouts three or four times a week, or only occasional observation of the reindeer's whereabouts during the winter. The majority of herd owners employ one or two herders from November to May to help with this herding. Another function of winter herding centers on attempts to return strays to the main group. However, as herding is currently practiced, it is almost impossible to keep bulls with the main herd after the fall rut, as they tend to stay away from the females. Other winter–herding chores include determining the availability of forage where the herd is grazing and watching for predators. If little forage is available, the herd may be moved. If predators are near the herd, attempts are made to

eliminate them.

Although herding is not constant during the winter and herders are not with the reindeer continuously, it should not be assumed that herders do not know the location of the reindeer most of the time. The reindeer are checked often enough for owners to know the general location of the herd. Herd owners also receive reports of reindeer whereabouts from pilots and villagers who see the reindeer in the course of travel and subsistence activities away from the village.

During the months of June through September, reindeer move about as they please, seeking their own range. They are not herded during this period except for one handling in late June or early July for velvet–antler harvesting. On the Seward Peninsula, reindeer tend to graze into the prevailing westerly winds during the summer in an attempt to stay cool and avoid summer insects. Since they are not herded, reindeer are free to move from one range to another. Unless a herd owner has a barrier on the western edge of his grazing permit, such as the coast or mountains, some of his reindeer can and do drift to his western neighbor's range. Part of several owners' success has come from receiving stray reindeer from eastern neighbors. Although the adult reindeer have been earmarked by their rightful owners, the calves have not and will become additions to the western neighbor's herd. Failure to notify another herder about strays or failure to return strays is a sore point between some herd owners.

Herding is extremely difficult during the summer because reindeer have greater mobility than herders. Reindeer move faster across the summer tundra than men on foot. Herding reindeer on foot is the traditional method of summer herding. Even when all–terrain vehicles are used, it is still difficult to keep up with reindeer as much of the terrain is covered by water. Reindeer swim easily across the many bodies of water on the Seward Peninsula while all–terrain vehicles are less versatile. They do not float and have questionable mechanical reliability.

Table 24. *Value of reindeer production—Alaska, 1972–1977.*

Year	Reindeer meat	Antler, hides and meat byproducts	Total
1977	$275,000	$196,000	$471,000
1976	243,000	258,000[a]	501,000
1975	308,000	83,500	391,500
1974	205,000	60,000	265,000
1973	182,000	34,000	216,000
1972	166,000	49,000	215,000

[a]Includes sale of live reindeer.

Source: Alaska Crop and Livestock Reporting Service 1973–1978.

Table 25. *Value of reindeer product sales—Seward Peninsula, 1975–1977.*

Year	Reindeer meat sales	Antler sales	Total
1977	$201,380	$171,673	$373,053
1976	185,640	79,100	264,740
1975	158,940	60,500	219,440

Besides straying, several other problems arise from allowing reindeer to move about untended. One writer has observed the following :

> A herd that is left untended for much of the year is more wild than domestic; virtually impossible to locate in its entirety for marking, castrating, and slaughtering; and selects its own range. This makes it impossible for a herder to attempt to achieve a bull–to–cow ratio he may desire, or to slaughter on the basis of complete knowledge of herd composition. (Olson, 1969).

Allowing reindeer to select their own range causes the overutilization of some ranges and the underutilization of other ranges. Inefficient use of range can reduce reindeer weights, calf crops, and range carrying capacity.

One herd is handled differently on the Seward Peninsula. Its reindeer are kept together using full–time herders who stay with the reindeer virtually year–round. Each day, during the winter, an attempt is made to bunch the herd and return strays to the main herd. During the summer, although herder mobility is reduced and the herd cannot be kept as close together as in winter, the herders still camp near the herd, attempting to return strays to the main herd and watching for predators.

Employee turnover appears to be high with full–time herding. Generalizing from the experience of the one herd using full–time herders, and from the current cycle of seasonal activities which most villagers still practice on the Seward Peninsula, it may be difficult to attract and retain herders. Even then, the herders may prefer a less routinized cycle of activities. Indeed, one of the complaints voiced about full–time herding is that it is boring and not varied enough to suit the challenges and changes which Eskimos enjoy.

Slaughtering

Most commercial slaughtering takes place during the months of October through February. As discussed in Chapter VII, this is the preferred time of year for several reasons. First, during this period, herders have a mobility advantage over reindeer with the use of snow machines. Snow machines can move faster over snow than reindeer, allowing the reindeer to be approached. Second, reindeer are in their best condition in the first part of winter. The

green pastures and warm temperatures during the summer have allowed the reindeer to add fat to their bodies in preparation for the long, Arctic winter. In addition, since the reindeer are field slaughtered and field dressed (hides and internal organs removed), there is little need for cold storage when transporting carcasses. The carcasses freeze quickly in the subzero temperatures and the danger of spoilage is reduced.

Most commercial slaughtering takes place without the herds being corralled. When slaughtering is to take place, the usual procedure is for a work crew to ride snow machines to within a short distance of the herd. The reindeer are then shot and dressed. If the carcasses are to go to the herd owner's village they will be transported normally by snow machine. Shipments to stores in Nome and Kotzebue will most often be sent by airplane with the meat buyers paying the transportation charge, 6 to 12 cents per pound in 1977, according to the distance. Depending on the size of the slaughtering crew, the location of the reindeer, and the Arctic weather, between 20 to 30 reindeer can be killed and dressed per day.

The slaughtering of reindeer in the field is not always the simple process it may first appear to be and the actual quantity of meat obtained from the slaughtering may result as much from circumstance as plan. A herd owner may plan to butcher a certain number of steers and old bulls during a winter slaughtering. However, this may not be possible since (1) inclement weather may interfere with roundup activities, (2) the herd may be scattered and difficult to locate, or (3) females may be located more easily as they group together. These problems may result in the slaughtering of fewer reindeer than intended, or slaughtering reindeer of the wrong age, size, or sex such as productive females.

Information from BLM case files, herd–owner records, and BIA Annual Land Operation Reports 1960–1971 give approximations of slaughter numbers. Between 1970 and 1976, herd owners with less than 1000 reindeer slaughtered an average of 10 per cent of their herds yearly. Herd owners with between 1000 reindeer and 2000 reindeer slaughtered an average of 18 per cent of their herds annually, while herd owners having between 2000 and 3000 reindeer slaughtered an average of 16 per cent of their herds. For average herd sizes of 600 reindeer, 1300 reindeer, and 2400 reindeer, this results in an annual slaughter of 60 reindeer, 234 reindeer, and 384 reindeer.

It is important to understand that these annual slaughter percentages were not developed from complete herd counts. It is rare that a herd owner can bring together all of his animals at one time. This means that herd slaughter estimates may be high or low. We have no estimate of annual slaughter for a herd of 4000 or more animals, the owners of the only herd of this size on the Seward Peninsula during our field investigations was attempting to increase the herd number and in 1976 only slaughtered 150 reindeer culls. However, with constant herding it is likely that at least 20 to 25 per cent could be slaughtered annually without decreasing herd size (Palmer, 1934).

Corrallings

Many herds are corralled twice a year, in February or March, and again in late June or early July. During the February or March handling, the reindeer are tallied, unmarked reindeer earmarked, and nonbreeding bulls castrated. Some butchering may also occur, but most of these carcasses are for wage–meat payments, with few carcasses sold. From field observations, it appears these handlings need approximately 15 workers to handle the reindeer. Workers are needed to fill the corral pockets, to push the reindeer from pocket to pocket, and to hold the reindeer at the end of the chute for earmarking, castrating, and counting. Wages for labor in 1977 ranged from $4 to $6 per hour, with the exact wage varying from location to location. Wages may actually take the form of cash, meat, or skins. The actual handling takes from 1 to 2 days to complete, but several days may be spent beforehand by the herd owner and a small crew in clearing the corral of snow that has accumulated in the preceding months. Often the corral pockets have been completely filled with snow.

The late June or early July handling is conducted for one basic reason – the sale of velvet antler for use in oriental medicines. In the past few years, the reindeer have been herded into the corrals with the use of a small helicopter provided by the antler buyer. This has taken the place of the traditional method of summer herding, with men on foot driving the reindeer into the corrals. Once in the corrals, the reindeer have most of their antler removed using a hand–held cutter. The amount of antler which is removed depends on the degree of antler development; the parts of the antler which have ossified are not taken. At this handling, calves will be earmarked and the herd tallied as well. Some herd owners also castrate nonbreeding bulls at this handling and a few reindeer may be butchered.

Herds with less than 1000 reindeer produced an average of 1.1 pounds of velvet antler per reindeer in 1977. Herds with between 1000 and 2000 reindeer produced an average of .93 pound of velvet antler per reindeer, while herds of between 2000 and 3000 reindeer produced an average of .84 pound of velvet antler per reindeer. The herd of 4000 reindeer produced an average of .81 pound of velvet antler per reindeer. These herd estimates include calves

which were not dehorned and reindeer that were not corralled. Luick (1979) found that in 1978 the average antler harvest for reindeer actually having antler removed was 1.82 pounds per reindeer. Individual reindeer antlers can be of greater weight. Bull antler weights of 2 to 10 pounds have been recorded (Luick, 1978).

Calving

Reindeer calving season lasts from approximately April 15 to May 31, with the peak period about May 1. This is one of the most important times of the year for a herd's continued success. Herders are with the reindeer as much as possible at this time of year since the herds are especially vulnerable to predators. Based on BLM case files and herd owner records, the percent of calves to adult females observed at summer handlings on the Seward Peninsula averaged 57 to 64 per cent between 1970 and 1976. This calf–to–cow ratio averaged 64 per cent for herds of less than 1000 reindeer; 57 per cent for herds of 1000 to 2000 animals, and 58 per cent for herds of between 2000 and 3000 head. Calf summer survival for the herd of 4000 reindeer was 55 per cent in 1975 and 85 per cent in 1977.

Although herders are generally with the herd during the actual calving period, a recent study of the Mackenzie Delta (Canada) herd suggests that calf mortality is greater during the months of June and July than during the actual calving period (Nowosad, 1975). If this study is applicable to Alaska, then the percent of calves to adult females at summer handlings (late June or early July) might be increased with additional summer care of the herds. However, labor may not be available even if herd owners wished to do this, since herding wages may not be sufficient to entice potential employees to forego subsistence activities or other employment opportunities.

Reindeer enterprise budgets

Costs

The major annual costs for reindeer–herding operations are for labor, snow machines, gas and oil, air charters, food, corrals, and cabins. Costs presented in Tables 26–29 are from 1976 and 1977 and are basically from herd owners estimates and field observations, since records are not generally available. With some exceptions, herd owners are poor record keepers. These estimates of costs should, therefore, be thought of as minimums because some cost items may not have been identified.

Labor was the largest cost to most herd owners whether they employed only part–time labor at handlings and butcherings, or handling and butchering labor plus one or two winter herders, or full–time herders. Part–time labor at handlings and butcherings received $4 to $6 per hour depending on herd location. Wages were higher if the herds were located near Nome and Kotzebue. These wages were paid in the form of cash, meat, skins, or in combination. Winter herders (November–May) received approximately $250 per month plus food and supplies, which was estimated to bring the total bill to $500 per month. The one herd employing full–time herders spent over $28,000 per herder per year on salaries, taxes, and benefits.

No charge was included in the budgets for owner labor. If owner–operators had foregone activities which would have returned positive benefits during the time they were engaged in reindeer herding, then a charge should have been included to reflect these lost opportunities, implying that labor costs may have been underestimated in the budgets in Tables 26–29. The difficulty arises in allocating family income from subsistence activities to one member or, in this case, the reindeer herd owner. It can be argued that nonreindeer oriented family members are at least capable of generating the subsistence portion of household income.

A major change in herding in the last 12 years is the replacement of dog teams and foot travel for herding with snow machines. Depending on herd location, these machines cost from $2,000 to $2,300 in 1977. The further from Nome or Kotzebue a machine is shipped, the greater the expense. Herd owners purchase new machines annually as this is cheaper than paying for repairs to a year–old machine. Given this practice, approximately $200 a machine was spent annually in minor repairs and maintenance. Herd owners estimated at least $3,000 per year was expended for gasoline and oil for snow machines, pickup trucks, boats, etc. In northwest Alaska, gasoline cost from $1 to $2 per gallon. Gasoline shipped to individuals in villages in 55–gallon drums was the most expensive; bulk fuel purchased from village stores was less expensive.

Herd owners provided food for workers at handlings, in 1977 estimated at $600 to $1,000. This figure does not include the value of reindeer meat slaughtered and used for camp food, and consequently lost as revenue.

With the limited herding that takes place with most herds today, the use of airplanes to locate scattered reindeer is important. If reindeer are scattered and cannot be located by snow machine for handlings and slaughterings, chartered aircraft are used to find the reindeer. Once spotted, herders can then ride to the reindeer on snow machines. Air charters cost typically over $100 per hour in 1976 and 1977.

The majority of herd owners had one corral for handling their reindeer and one range cabin. The estimated costs of these corrals and cabins was be-

tween $5000 and $10,000 each. Repairs to corrals and cabins was estimated to average $200 each per year.

There was one more major cost. Except for one herd, herd owners were charged $2 by the antler buyer for every pound of antler harvested as payment for providing a partial handling crew in the summer, providing a helicopter to drive the reindeer into the corral, and shipping the antler from the field to Nome. One herd owner organized all these tasks independent of any buyer.

Yearly costs for typical herds of 600, 1300, 2400 and 4000 reindeer (the average size herd within each size class) are provided in Tables 26, 27, 28, and 29. Again, these costs are for the winter of 1976–1977 and the summer of 1977. The value of wage–meat payments are included in the costs. The straight–line method of calculating depreciation was used for corrals and range cabins. Additionally, an investment charge was included for each corral or cabin. A 6 per cent interest rate was used in calculating the investment cost. This rate was charged for intermediate–term and long–term loans from the Alaska State Agricultural Revolving Loan Fund in 1977.

Annual costs for a herd of 600 reindeer included only hired labor as part–time labor for handlings and butcherings. One new snow machine was purchased yearly. For 1300 reindeer, one winter herder was employed from November through May and two snow machines were purchased annually. For 2400 reindeer, two winter herders were employed and two snow machines were purchased each year. Fulltime herders were used only with the 4000–reindeer herd. This herd in 1977 was managed for expansion and limited slaughter to culls.

However, to show this herd at full production, an annual slaughter of 800 reindeer was assumed. Other differences in budget categories can be observed. Food and fuel information are only available as a combined cost. This herd provided all labor, herding, and shipping for its velvet–antler production and there was no charge from the antler buyer for these items. It was assumed that this herd purchased three snow machines yearly. Two corrals were used during handlings. A $1000 per year land rental charge was also included.

Costs for a typical herd of 600 reindeer totaled slightly less than $12,000. For the representative herd of 1300 reindeer, costs were approximately double. The major increases were from the addition of one winter herder and the purchase of a second snow machine. Costs for an average herd of 2400 reindeer increased to approximately $33,000. Costs for the herd of 4000 reindeer were almost five times greater than for a herd of 1300 reindeer. This dramatic increase is due to the use of full–time herders. It can be viewed as a different system of reindeer production and the per–reindeer costs are not directly comparable to the smaller herds.

Revenues

Revenues for the four herd sizes used previously are given in Table 30. The average annual meat production and the 1977 velvet antler production for different herd sizes as described earlier is used in this analysis. Slaughter is comprised primarily of steer carcasses weighing an average of 120 pounds

Table 26. *Costs–600 reindeer.*

Annual ownership costs					
Item	Original cost	Life	Depreciation[a]	Investment[b]	Total
1. Corral	$5,000.00	20 yrs.	$250.00	$150.00	$400.00
2. Cabin	5,000.00	20 yrs.	250.00	150.00	400.00
					Subtotal $800.00

Annual cash costs	
Item	Cost/year
1. Part–time labor for winter and summer handlings	$1,500.00[c]
2. Food for handlings	600.00
3. Snow machine purchase – 1 @ $2,200	2,200.00
4. Gas and oil	3,000.00
5. Snow–machine repair	200.00
6. Corral repair	200.00
7. Cabin repair	200.00
8. Air charter	1,000.00
9. Labor to butcher 60 reindeer	600.00[c]
10. Charge by antler buyer for herding, labor, shipping	1,320.00
Subtotal	$10,820.00
Total cost/year	$11,620.00

[a]Straight line method: $\frac{\text{Original cost}}{\text{life}}$ [b]$\frac{\text{Original cost}}{2}$ x 6%

[c]Value of meat–wage payments included.

(U.S. Department of Interior, Bureau of Indian Affairs, 1960–1971). Reindeer carcasses are assumed to sell for 85 cents per pound. Because of the variation in prices received for velvet antler in 1977, we used three antler prices in developing Table 30: $8 per pound, $12 per pound, and $23.76 per pound. Any revenues herd owners might gain through the sale of reindeer skins, leggings, or meat byproducts are not included. An optimistic prediction would be that revenues could increase by 4 or 5 per cent through the sale of these items. We have no estimate of the additional costs incurred in obtaining this additional income.

Net herder income

As one would expect, for herds of between 600 and 2400 reindeer, income increases as herd size increases (Table 31). However, for the herd of 4000 reindeer, income was less than for a herd of 2,400 reindeer at all antler prices. Does this mean that a herd of 4000 reindeer is economically less advantageous? This is not likely for two reasons. The present analysis did not taken into consideration the increased efficiencies that are likely to come through year–round herding. Second, our 4000 animal herd is modeled after a herd that has only been in existence since 1975 and it is being expanded through reduced herd harvest. In a recent study (Arobio et al., 1980), firm net incomes were found to increase as herd size expanded.

Regional Considerations

The reindeer industry is a small part of the total economy of northwestern Alaska in terms of the people it employs and the wages and salary payments the industry makes. Nonetheless, at the village level, herding is an important part of the local economy.

Regional Employment

In 1976, the average, monthly, nonagricultural wage and salary employment in the Kobuk and Nome labor market areas was estimated at 2952 persons (Alaska Statistical Quarterly, 1976). According to interviews with herd owners, between 25 and 30 individuals received a major portion of their employment from reindeer herding on the Seward Peninsula in 1976–1977. This figure is comprised of herd owner–operators, full–time herders, and winter herders. Employment within the region, with the addition of the relatively full–time herding employment, totalled approximately 2979 workers in 1976. Reindeer herding accounted for only 0.9 per cent of the total employment within northwest Alaska.

In terms of part–time employment, a larger number of residents or the region are employed typically during a year. Approximately 250 people are employed yearly on a part–time basis during handlings and butcherings. For an individual this would provide normally from 2 to 12 days of annual employment. At the wage scale described earlier, $4 to $6 per hour, an individual working 2 days, 8 hours a day, would earn from $64 to $96. An individual working 12 days a year, 8 hours per day, would earn from $384 to $576. These wages would be paid in cash, meat, or in combination.

Table 27. *Costs–1300 reindeer.*

Annual ownership costs					
Item	Original cost	Life	Depreciation[a]	Investment[b]	Total
1. Corral	$5,000.00	20 yrs.	$250.00	$150.00	$400.00
2. Cabin	5,000.00	20 yrs.	250.00	150.00	400.00
				Subtotal	$800.00
Annual cash costs					
Item					Cost/year
1. Part–time labor for winter and summer handlings					$2,250.00[c]
2. Food for handlings					750.00
3. One winter herder – $250/month/7 months					1,750.00[c]
4. Food and supplies for herder – $250/month/7 months					1,750.00
5. Snow–machine purchase – 2 at $2,200					4,400.00
6. Cas and oil					3,600.00
7. Snow machine repair – 2 at $200					400.00
8. Corral repair					200.00
9. Cabin repair					200.00
10. Air charter					3,000.00
11. Labor to butcher 234 reindeer					2,340.00
12. Charge by antler buyer for herding, labor, shipping					2,418.00
				Subtotal	$23,058.00
				Total cost/year	$23,858.00

[a]Straight line method: $\frac{\text{Original cost}}{\text{life}}$ [b]$\frac{\text{Original cost}}{2}$ x 6%

[c]Value of meat–wage payments included.

Table 28. *Costs–2400 reindeer.*

Annual ownership costs					
Item	Original cost	Life	Depreciation[a]	Investment[b]	Total
1. Corral	$5,000.00	20 yrs.	$250.00	$150.00	$400.00
2. Cabin	5,000.00	20 yrs.	250.00	150.00	400.00
					Subtotal $800.00
Annual cash costs					
Item					Cost/year
1. Part–time labor for winter and summer handlings					$3,000.00[c]
2. Food for handlings					1,000.00
3. Two winter herders – $250/month/7months					3,500.00[c]
4. Food and supplies for herders – $250/month/7 months					3,500.00
5. Snow–machine purchase – 2 at $2,200					4,400.00
6. Gas and oil					4,000.00
7. Snow–machine repair – 2 at $200					400.00
8. Corral repair					200.00
9. Cabin repair					200.00
10. Air charter					4,000.00
11. Labor to butcher 384 reindeer					3,840.00
12. Charge by antler buyer for herding, labor, shipping					4,032.00
					Subtotal $32,372.00
					Total cost/year $33,172.00

[a]Straight line method: $\frac{\text{Original cost}}{\text{life}}$ [b] $\frac{\text{Original cost}}{2}$ x 6%

[c]Value of meat–wage payments included.

Regional personal income

According to data supplied by herd owners and estimates based on Table 31, reindeer herding on the Seward Peninsula generated an estimated (including value of reindeer meat consumed by herd owners and paid to labor) $309,000 of aggregate personal income to reindeer herd owners and labor employed directly in herding operations in 1976. This income is the combination of net income (gross income of reindeer product sales minus production costs) from individual herds plus the payments these herds made to labor. The income can be disaggregated into labor income of approximately $162,000 and herd–owner income of $147,000. Of the total,

Table 29. *Costs–4000 reindeer.*

Annual ownership costs					
Item	Original cost	Life	Depreciation[a]	Investment[b]	Total
1. 2 Corrals	$20,000.00	20 yrs.	$1,000.00	$600.00	$1,600.00
2. Cabin	5,000.00	20 yrs.	250.00	150.00	400.00
					Subtotal $2,000.00
Annual cash costs					
Item					Cost/year
1. 3 full–time herders (including taxes and benefits)					$85,000.00
2. Land rental					1,000.00
3. Snow–machine purchase – 3 at $2,000					6,000.00
4. Snow–machine repair – 3 at $200					600.00
5. Corral repair – 2 at $200					400.00
6. Cabin repair					200.00
7. Food and fuel					4,500.00
8. Shipping and freight					500.00
9. Air charter					8,000.00
10. Labor to slaughter 800 reindeer					8,000.00
					Subtotal $114,200.00
					Total cost/year $116,200.00

[a]Straight line method: $\frac{\text{Original cost}}{\text{life}}$ [b]$\frac{\text{Original cost}}{2}$ x 6%

[c]Value of meat–wage payments included.

Table 30. *Reindeer herd revenues.*

Herd size	Reindeer meat revenue[a]	Antler revenue			
		$8.00/lb.	$12.00/lb	$23.76/lb	Total
600	60 carcasses x 120 lbs = 7,200 lbs x 85 cents/lb = $ 6,120.00	660 lbs. = $5,280.00			$ 11,400.00
			660 lbs = $7,920.00		14,040.00
				660 lbs = $15,681.60	21,801.60
1,300	234 carcasses x 120 lbs = 28,080 lbs x 85 cents/lb = $23,868.00	1,209 lbs = $ 9,672.00			33,540.00
			1,209 lbs= $14,508.00		38,376.00
				1,209 lbs = $28,725.84	52,593.84
2,400	384 carcasses x 120 lbs = 46,080 lbs x 85 cents/lb = $39,168.00	2,016 lbs = $16,128.00			55,296.00
			2,016 lbs = $24,192.00		63,360.00
				2,016 lbs = $47,900.16	87,068.16
4,000	800 carcasses x 120 lbs = 96,000 lbs x 85 cents/lb = $81,600.00	3,240 lbs = $25,920.00			107,520.00
			3,240 lbs = $38,880.00		120,480.00
				3,240 lbs = $76,982.40	158,582.40

[a]Value of home meat consumption included.

$40,800 (13 per cent) came from wage–meat payments and herd owner home consumption. Approximately 400 reindeer carcasses were used in this manner in 1976.

The above is not all of the personal income that resulted from reindeer herding on the Seward Peninsula in 1976. It does not account for net income which accrued to retailers from the sale of reindeer meat or antler, nor does it account for the addition to net incomes of firms which sold products or services to reindeer–herd owners. In addition, the wages these firms paid to labor that was needed to conduct business with reindeer–herd owners were not estimated.

Village considerations

Although reindeer herding is of relatively minor importance to the regional economy of northwest Alaska in terms of the wages and salaries it generates, the case is much different for an individual village where a reindeer herd is located. The contribution of reindeer herding to village employment, wages, and salaries, and in meeting the village protein requirements is of greater relative importance than its contribution to northwest Alaska as a whole. As an example, a brief analysis of a representative village located on the Seward Peninsula would be informative. This village has a population of 87. A reindeer herd of between 1000 and 2000 reindeer is headquartered here. The herd is owned and operated by a local family.

The village has approximately 20 employed individuals. Seventeen of these residents are employed on a full– or part–time basis in the following occupations: construction, government services, education, retail trade, and domestic services. Three village residents (the herd owner, his son, and one winter herder) receive a major share of their yearly employment from reindeer herding. This amounts to 15 per cent of the village employment, compared with 0.9 per cent of regional employment in 1976. At handlings and butcherings, up to an additional 15 of the village residents (17 per cent) are employed on a part–time basis. Some of these people may only work for 1 to 2 days, while others may receive up to 12 days of yearly employment. As described earlier, this can result in yearly part–time income per individual of from $64 to $576.

In 1976, this herd paid approximately $4590 (including value of wage–meat payments) in wages to part–time workers. In addition, the winter herder received approximately $3500 in wages and supplies. This herd provided a net income of approximately $10,000 to the herd owner and his family in 1976. The approximate, aggregate, personal income generated by this herd to village residents (including

Table 31. *Net herder income.*[a]

	Antler and meat revenue				Income		
Herd Size	$8.00/lb	$12.00/lb	$23.76/lb	Production Costs	$8.00/lb	$12.00/lb	$23.76/lb
600	$11,400.00	$14,040.00	$21,801.60	$11,620.00	($220.00)	$ 2,420.00	$10,181.60
1,300	33,540.00	38,376.00	52,593.84	23,858.00	9,682.00	14,518.00	28,735.84
2,400	55,296.00	65,360.00	87,068.16	33,172.00	22,124.00	30,188.00	53,896.16
4,000	107,520.00	120,480.00	158,582.40	116,200.00	(8.680.00)	4.280.00	42.382.40

[a]Three estimates of revenue and three estimates of income for each herd size are provided. In all estimates, meat sells for 85 cents per pound. Meat revenues are combined with antler revenue using three antler prices: $8.00, $12.00, and $23.76 per pound; to give the estimates of total revenue for each herd size. Income estimates are total revenues minus production costs.

the two owner–operators) totaled $18,000. Not included was income received by regional commercial airlines and air–taxi operators for herding and freighting services or others who provided products or services to the reindeer herd.

In 1976, 64 reindeer carcasses were used by the herd owner as payment to labor or for home consumption. These carcasses had an approximate value of $6530. Most villagers receive a combination of meat and cash for part–time work. A villager is likely to receive reindeer meat as payment when working at winter butcherings and cash when working at a spring or summer handling. For example, in the fall of 1976, 10 villagers were hired to help at a butchering. Wages were $4 per hour; however, all the workers desired to be paid in meat. For this work, they received 1.5 reindeer carcasses each. Later, in March of 1977, 15 village residents were hired to help with the handling. At this handling, everyone was paid in cash. Each received $68 for two days work.

In 1976, approximately 100 reindeer carcasses were sold by the herd owner to village residents through a store run by another of his sons. This meat sold for 95 cents per pound. In meeting the protein requirements of the village residents, 164 reindeer carcasses were consumed in 1976. This is a per–capita consumption of 1.9 reindeer carcasses per villager. The village herd provided approximately 229 pounds of meat per resident.

Reindeer industry potential

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 minimum profits. Generally, herds have been smaller than allowed by grazing permits. Herd owners have not specialized in the herding of reindeer. Other activities in which they participate include subsistence hunting, fishing, gathering, wage labor (fire–fighting is of importance), and entrepreneurial enterprises such as owning small stores or renting houses.

Nevertheless, it appears that meat and antler production and firm incomes have the potential to increase with more intensive herd management. This could result through 1) expanded herd numbers, 2) improved management practices, or 3) changes in production orientation.

In 1976, the Fairbanks Office of the Bureau of Land Management permitted the grazing of 32,000 reindeer on the Seward Peninsula. This figure does not include the herd at Shaktoolik, on the edge of the peninsula, which had a permit for 1200 animals. In 1977, it was estimated that only 17,800 reindeer grazed on the Seward Peninsula. This was 55 per cent of the permitted number. By doubling the 1977 production of reindeer meat and velvet antler, an approximation can be made of potential production from herds at their maximum permitted level. Of course, this assumes no increase or decrease in production on a percentage basis for individual herds. Regional meat production under this scenario would amount to approximately 473,840 pounds and antler production 30,074 pounds. At the prices received by the majority of herd owners in 1977, gross meat revenues would equal $402,764, and antler revenues would total $240,592. At $23.76 per pound, antler revenues would be $714,558. These figures are gross revenues, not net returns; still, the aggregate personnel income to the region would increase sharply above the levels reported earlier.

Even without expanded herd numbers, individual herds may well have the ability to increase production and incomes through improved management practices. The practices described below assume that the current emphasis of steer production for meat continues. If herders shift their production orientation from emphasizing meat to antler production, then some of these management changes may not be applicable.

Production could increase in individual herds with improvements in animal husbandry practices, in the short run by decreasing the slaughter of productive females, increasing calf survival; and in the long run with improved selection of breeding stock, improved sex composition of herds, and more efficient range use. For an individual herd these improvements

would be shown in increased carcass weights and an increased percentage of the herd which could be slaughtered annually.

Increased carcass weights could come from a number of sources. This could happen immediately by only butchering steers, old bulls, and old cows, instead of butchering any group of reindeer which can be located and may include productive females.

Herders sometimes slaughter females when steers and bulls are difficult to locate. According to Palmer (1934), there are significant differences in weights between male and female reindeer. During field work for this research, differences in weights were also observed. For example, in one instance during the winter of 1976–1977, 18 reindeer carcasses, most of which were female, were observed being shipped. They had an average carcass weight of 115 pounds. In another instance, the slaughter of 8 bulls was observed. These reindeer averaged 145 pounds per carcass.

Herders prefer not to slaughter females, but in some instances it is easier to locate females than steers and bulls. During the course of the field work, one researcher was present at the slaughtering of 15 reindeer. All reindeer butchered were pregnant females, since these were the most easily located reindeer. A change in production techniques that would help to increase the percent of steers and bulls in the yearly slaughter is to butcher at a corralling conducted in the early winter, instead of slaughtering without corralling the herd, which is the present practice. At the same time, the herd could be tallied, bulls castrated, and reindeer earmarked, thus eliminating the need for a spring corralling. This may be a wise decision in any case, since corralling in the early winter would remove much of the problem of snow–filled corrals which are prevalent in the spring. With the reindeer in a corral, the herder would have an opportunity to select the reindeer he wanted to butcher. In addition, since rifles would not be needed to kill the reindeer, inadvertent killing of reindeer through poor marksmanship would be eliminated.

Some herders have argued that reindeer acquire a gamey taste after being corralled for several hours. If this is a problem, a method to overcome this difficulty might be to slaughter after the reindeer have been released from the corral for a few days. Animals scheduled for slaughter could still be selected while the herd was corralled. These reindeer could then be kept together until slaughter.

In the long run, carcass weight could be increased through the selection of the superior reindeer for breeding and eliminating inferior bulls and cows. According to a 1946 reindeer management guide, adult carcasses at that time averaged 125 pounds, while ten years previously they had averaged 150 pounds (U.S. Department of the Interior, Office of Indian Affairs, 1946). Poor sire selection was cited as the major reason for the decline. At present, the only sire selection criterion appears to be for coat color, not size. Spotted reindeer are preferred for their hides in making parkas and mukluks, while almost completely white reindeer are desired for the help this color gives the herder in spotting reindeer from a distance during the summer when the ground cover is predominantly green. Sires should be selected on the basis of size (U.S. Department of the Interior, Office of Indian Affairs, 1946).

More efficient range use could have a major affect on reindeer weights. Klein (1967) has shown the decreases in weights, as well as productive ability of herds, when reindeer overgraze their range. The most efficient use of range would require more herding than is currently employed. Pegau (1968) has applied Siberian studies to Alaska and has suggested that only the top 1/4 to 1/3 of the lichen podetium be grazed and then the herd moved. Although he applied this to increasing per acre carrying capacities, it seems that better use of range could increase weights of existing reindeer, if herd sizes were not increased.

For the production alternative examined here, herds would also benefit in the long–run from improved sex composition. Currently, bull–to–cow ratios range from 1 to 5, to 1 to 10 with the majority of herds near 1 to 5. Herds would benefit from eliminating some of these bulls and replacing them with females. Bull–to–cow ratios are recommended to be between 1 to 10 and 1 to 15 (Department of the Interior, 1946; Zhigunov, 1968). The ideal number of bulls may even be lower since Skuncke (1969) suggests that a virile bull can serve 30 to 40 cows.

A second source of increased meat production could result from increasing the percent of a herd which could be slaughtered annually. Herd owners in the period 1970–1976 slaughtered 10 to 18 per cent of their herds yearly. It is possible that this could be increased to between 20 and 25 per cent with better management. It has been show that herds in Alaska can increase yearly by 25 to 33 percent in better–managed herds (Palmer, 1934).

A technique to increase slaughter is to emphasize calf survival. If calf mortality in Alaska follows the same pattern as reported for Canada (Nowosad, 1975) and is significant immediately following the time herds leave the calving grounds, it would benefit herd owners to stay with the herds themselves or to hire a herder to stay with the herd during the month of June. Difficulties in implementing this improvement include scheduling conflict with subsistence activities in the spring, wage–labor opportunities, and traveling over the terrain during spring break–up which overlaps the calving season and the

critical period for calves during June.

Another method to increase slaughtering percent is to make sure reindeer which have drifted to another reindeer owner's range are returned. This would require attending neighboring herder handlings and returning reindeer to their proper range. This is not an unknown practice, as it is occasionally done now, but not consistently.

It is difficult to determine accurately how much production and net incomes could increase with the implementation of improved management practices. However, if slaughter could be increased to 20 per cent of the overwintering herds in 1977 and carcass weights increased to an average of 125 pounds, meat production would equal 445,000 pounds. For 32,000 reindeer, meat production would total 800,000 pounds. At 1977 prices, this meat would provide gross revenues to herders of between $378,250 (17,800 reindeer) and $680,000 (32,000 reindeer). A summary of potential meat production resulting from increased reindeer numbers on the Seward Peninsula or improved management practices is presented in Table 32. We have little basis on which to determine whether per–animal antler production would increase under these practices.

Again, the above are estimates of added gross revenues, not net gains, and for these herd management practices to be of benefit to herders, the additional costs of these improvements must be less than the added revenues. Additionally, the implementation of these procedures may require full–time herding and thus may only be practical for large herds.

Two recent studies have examined the economic potential of the reindeer industry under alternative production orientations. Luick (1978) estimated the gross revenues for four alternative herd management options for a herd of 2,000 reindeer and finds that structuring a herd to maximize the production of wet–velvet antler provides the largest gross revenues. On a herd basis, potential gross revenues are estimated at $327,935 if antler sells at $10/pound and $471,875 with antler selling for $20/pound. These are significantly above the revenues received currently by herders.

In a second study, Arobio et al. (1980) examined optimum herd structure using a mathematical programming technique. Again, maximizing wet–velvet antler production was found to be the management option that provides the largest returns. Using the most commonly received meat and antler prices for 1977, potential net returns for herds of 1000, 2000, and 3000 reindeer are estimated at $30,000, $62,000, and $106,500 respectively. In this analysis estimated variable production costs were deducted from gross revenues in an attempt to estimate potential firm incomes. Although problems were noted with the data used in this analysis, and thus some level of error is likely associated with estimated net returns, the conclusion drawn from this study is that reindeer herds have the highest potential to increase incomes through alternative herd organization.

At this point, it is useful to summarize some of the general conclusions that can be drawn from the preceding analysis. First, it seems that per–herd meat and antler production and firm incomes can increase through changes in production practices or changes in herd orientations. Exact increases in income are difficult to determine at this time because better data on carcass and antler weight, reindeer mortality, calving percentage, production costs, forage requirements, etc. are needed. Next, a herd structured to maximize antler production will decrease its meat–producing capability. This could have a serious effect on regional meat supplies if all herds adopted this option without an increase in herd size. If herds expanded, meat production could be enhanced even under this management alternative. Finally, expanded numbers of reindeer on the Seward Peninsula have the potential to provide additional fulltime employment, increased hours of part–time employment, and regional incomes.

We have already indicated that herd owners are often considered "rich" by village standards. Increased production and its attendant increase in income may exacerbate this perception. In all likelihood, however, the network of generalized reciprocity among kin in the village probably will serve to see that some portion of the increased income is distributed throughout the village. This probably would not take the form of direct cash gifts, but gifts of new material items or food, or gifts of reindeer meat and byproducts are likely, just as such things are given today.

The previous discussion has been based upon constant and increased herd sizes. Under conditions of decreases in herd size, reduced income from herding operations can be expected. It is shown earlier in this chapter that herds with less than 1,000 animals have difficulty in producing returns above total annual costs. When interest in tending a small herd declines, the herd is usually lost to caribou, other reindeer herds, or becomes feral. Thus, herd owners strive to at least keep a minimum herd size, and, under favorable circumstances, to increase their herd size. Factors which lead to herd decreases have been discussed in the historical section. Predation, disease, losses to caribou, poaching, adverse weather conditions, losses in available range land, and range quality are just some of these factors. To these reasons, we might add the possibility of straying caused by National Preserve visitors or hikers who disturb the animals. In the worst of all possible worlds, or

what is sometimes referred to as the maximum credible event by disaster planners, all of the reindeer on Seward Peninsula could be lost. For the owners, this would mean that an important source of income and meat would be unavailable to them. The meat would be lost to the people of the region. Wages paid to labor by the reindeer industry would disappear.

More realistically, one can predict that, under present conditions and management, certain herds are going to increase for periods of time while others will decline. This suggests the possibility, in light of relatively steady numbers of animals on the Seward Peninsula over the last 20 years, that under current management practices the region has reached an equilibrium in reindeer numbers relative to the range and its carrying capacity. More intensive herd management, however, could increase the number of reindeer on the Peninsula.

Chapter IX
Reindeer herding and land

Alaska land issues

The passage of the Alaska Native Claims Settlement Act (P.L. 92–203, 85 Stat. 688) in 1971 has forced the reindeer herders increasingly to come to grips with political issues and the often divergent interests of other groups, Native and non–Native alike. This settlement act, or ANCSA as it is commonly abbreviated, is the culmination of years of struggle on the part of Alaskan Natives to secure their land claims and rights to traditional ways of life. It is beyond the scope of this study to describe all the provisions of ANCSA or the political and cultural struggle which went on to secure its passage without running the risk of oversimplifying some aspects or omitting others. Several excellent accounts have already undertaken this task, and the interested reader is referred to those sources (Arnold, 1978; Case, 1978; Hanrahan and Gruenstein, 1977). Consequently, only those portions most relevant to reindeer herding will be reviewed.

Table 32. Potential meat production for sale from Seward Peninsula reindeer herds.

Actual production for 1977: Total Herd – 17,800 head Meat for sale – 296,920 lbs.
Potential production for 1977, assuming herd numbers equal to BLM limit, with 1977 management practices: Total herd – 32,000 head Meat for sale – 473,840 lbs.
Potential production for 1977, assuming actual 1977 herd number, with improved herd–management practices[a] Total herd – 17,800 head Meat for sale – 445,000 lbs.
Potential production for 1977, assuming herd numbers equal to BLM limit, with improved herd–management practices[a]: Total herd – 32,000 head Meat for sale – 800,000 lbs.
[a]Improved herd–management practices: 1. Improved Selection of Breeding Stock 2. Decreased Female Slaughter 3. Rotational Grazing 4. Increased Herding 5. Return of Strays from Neighboring Herds

The Alaska Statehood Act (72 Stat. 399) passed Congress on July 7, 1958, and was signed into law by President Eisenhower on January 3, 1959. The act entitled the 49th state to select and receive title to some 104 million acres of "vacant, unappropriated and unreserved" Federal lands in Alaska. Additional millions of acres of tidal and nontidal "submerged lands" vested in the state, many of which have still to be identified. Since nearly 99 per cent of Alaska's 375 million acres was in Federal stewardship at that time, selection of the land entitlement seemed a straightforward task. Soon after state officials made their initial selections of land and received tentative approval to them, protests by Natives surfaced. While the state had made its selections based on the potential of recreational gas, oil, and other natural resources, Natives were concerned about the impacts of the state selections on their hunting, fishing, and trapping grounds. The U.S. Department of the Interior (DOI) was asked to turn down the state selections.

Faced with Native protests over state land selections, most authorities agreed that only Congress could adequately address the Alaskan Native land claims. Secretary of the Interior Stewart Udall invoked a "land freeze" in 1966. The freeze stopped the tentative approval and patent of state–selected Federal lands to the State of Alaska until Congress could act upon the Native land claims issue.

Starting in 1967, a Land Claims Task Force comprised of state representatives, Native leaders, the year–old Alaska Federation of Natives (AFN), and DOI representatives was formed and prepared a bill. Introduced by Senator Ernest Gruening (D–Alaska) in 1968, it was supported generally by then Governor Walter J. Hickel. One of Secretary Udall's last acts as Secretary of the Interior was to formalize the land freeze by Secretarial Order before leaving office after Richard Nixon's election in 1968.

Alaska Governor Walter Hickel was nominated by

the newly elected President to serve as Interior Secretary. In trouble with environmental groups at his confirmation hearings because of his prodevelopment orientation as governor, he wooed Alaskan Native interests to support his nomination in return for a continuation of the land freeze until December of 1970. The continued land freeze bought time with which to prepare further legislation to settle the land claims. A major point of dispute was the issue of revenue sharing of mineral estates. While the principles that the settlement would include land and cash were settled, the exact provisions remained open. The state oil lease sales at Prudhoe Bay in 1969 showed dramatically how relatively small tracts of land could be worth large sums of money. Various oil companies paid over $900 million to the state for the right to develop the Prudhoe Bay oil and natural gas deposits on Alaska's North Slope. The publication of the massive volume, *Alaska Natives and the Land* by the Federal Field Committee for Development Planning in Alaska, underscored the bleak economic, health, and social conditions in most of Alaska's Native villages (Fitzgerald et al., 1968). The validity of Native land claims was thus reasserted at the same time that the political and economic climates favored passage of a bill.

The AFN's proposal in May of 1969 provided a 40–million acre land settlement, a $500 million appropriation for disbursement, a share in perpetuity from revenues produced on state lands relinquished by the Natives, and the creation of corporations to handle the settlement at village, regional, and state levels. The continuing land freeze was delaying the construction of a pipeline to transport crude oil from Prudhoe Bay to the ice–free, southern terminus at Valdez. The interested oil companies, contractors, the state, AFN, and DOI all recognized that the construction of the trans–Alaska pipeline would not begin until legislation settling the land claims had been passed. By late 1971, both the House and Senate had passed slightly differing bills; the differences between the two bills had to be resolved in one acceptable to both bodies. A joint conference committee undertook the task of producing a compromise bill; and a 29–page bill, largely favorable to the AFN position emerged. The settlement was accepted; and on December 18, 1971, President Nixon signed the Alaska Native Claims Settlement Act (85 Stat. 688 as amended) into law.

The major provisions of ANCSA must be understood in order to make sense of the current political and economic happenings in Alaska. Basically, the act provides for a cash and land settlement. Some 215 Native Village Corporations are entitled to select 22 million acres of land, in addition to the selection by 12 Regional Corporations of some 16 million acres under a complex land–loss formula. The exact acreage entitlements are determined by the numbers of Natives enrolled in a village and region. Compensation for the enrollees amounts to $962.5 million dollars paid over a number of years by funds from the Federal treasury, with an initial payment of some $462.5 million dollars. The remainder of the cash settlement comes from a 2 per cent royalty charge paid into the Alaska Native Fund (of the Federal treasury) from mineral development on state and Federal lands until the full $500 million remainder is paid into the fund. Village Corporations receive fee simple title to the surface estate of selected lands, while the regional corporation receives title to the subsurface estate of both village and regional selected lands, as well as the surface estate of the regional lands. Some exceptions exist: villages in southeastern Alaska receive title to only one township (23,040 acres) regardless of their enrollment. The 1959 award of the Tlingit–Haida claims settlement justified this smaller land award. "Section 19 reservations" could opt to receive title to the surface and subsurface estates regardless of enrollment.

Native land selections made within certain Federal reserves, such as the National Petroleum Reserve–Alaska (KPR–A, formerly the Naval Petroleum Reserve No. 4, or Pet 4) on the North Slope, and existing wildlife refuges administered by the U.S. Fish and Wildlife Service (U.S. DOI) were subject to certain limitations. Special Native Corporations organized in the non–Native cities of Juneau, Kenai, Kodiak, and Sitka were entitled to lands, as were Native "groups" of less than 25 persons. The Alaska Native Allotment Act of 1906, which allowed for up to 160 acres in four parcels to any bona fide Native, was repealed. Cemetery and historic sites could be selected by the Regional Corporations and fee title received. Title to the surface estate of a "reindeer–husbandry headquarters" can be acquired by herders from village corporations lands (Section 14(c)(l)). The total land settlement is some 44 million acres, none of which is subject to taxation until 1991. In the meantime, nearly three times that amount of land remains withdrawn by the Federal government, subject to valid existing rights, from all forms of appropriation under the public land laws, including the mining and mineral–leasing laws, and from selection under the provisions of the Alaska Statehood Act.

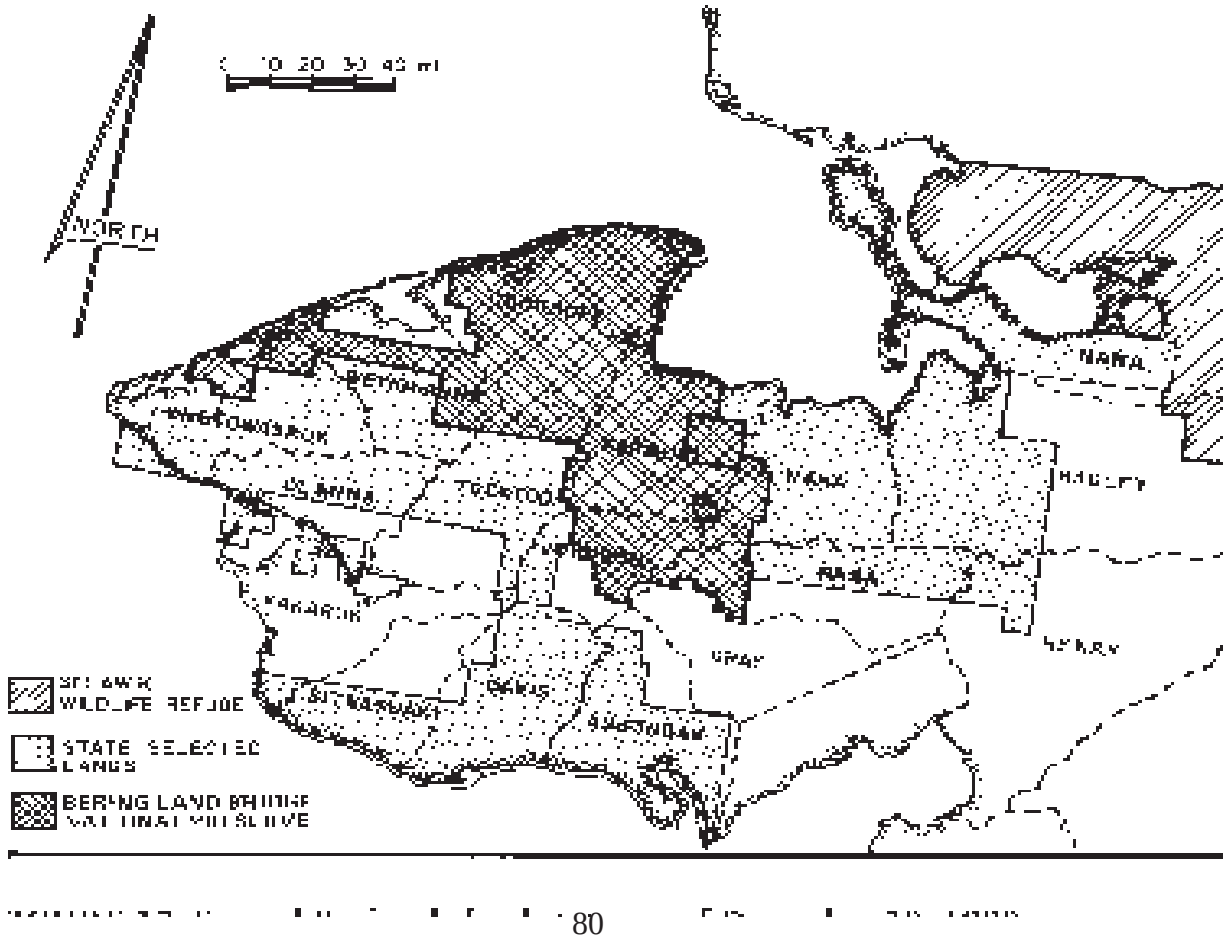
In a fashion, ANCSA has continued the land freeze of the 1960s by prohibiting most economic developments in the state until the Native lands were selected and conveyed. Although the act was meant to "be accomplished rapidly, with certainty, in conformity with the real economic and social needs of Natives, without litigation, with maximum participation by Natives in decisions affecting their'

rights and property, without establishing any permanent racially defined institutions, rights, privileges or obligations…" (Section 2(b)), the implementation of the act under these terms has been slow. Litigation has delayed many aspects of the implementation process.

Finally, but not least in significance, Section 17d(2) of ANCSA directed the Secretary of the Interior to withdraw up to 80 million acres of unreserved public lands for study "for addition to or creation as units of the National Park, Forest, Wildlife Refuge, and Wild and Scenic River Systems" provided that the state and Native Corporations could continue to make selections and obtain patents on such withdrawn lands. The 95th Congress of 1978–1979 failed to act on a d(2) lands bill prior to the expiration of the d(2) withdrawals on December 18, 1978. With the expiration of the d(2) withdrawals, pressure was mounted by Native groups and environmental organizations and prodevelopment interests alike to keep these lands in some type of planning and nondevelopment status. On November 16, 1978, Secretary Andrus withdrew over 98 million acres of land under the Federal Land Policy and Management Act of 1976 and placed them into three–year study areas under Section 204(e) of the act. In a further action, President Carter on December 1, 1978, used the authority granted him under the 1906 Federal Antiquities Act to place 56 million acres of land withdrawn under Section 204(e) into National Monuments. Thirteen new units and additions to the National Monument system administered by the National Park Service, two new monuments, administered by the National Forest Service and two new National Monuments administered by the United States Fish and Wildlife Service were created on December 1, 1978 (Federal Register, 1979).

The first session of the 96th Congress failed to pass an Alaska national interest lands bill and in early 1980 most of the land withdrawn under Section 204(e) and not designated as National Monuments became 20–year withdrawals under Section 204(e) of the Federal Land Policy and Management Act of 1976. The Selawik Wildlife Refuge in Northwest Alaska was created from this withdrawal.

As 1980 neared an end, Congress finally passed d(2) legislation as the second session of the 96th Congress neared adjournment and the bill was signed into law by President Jimmy Carter on December 2, 1980. Except for one change, the four d(2) proposals described in Chapter I and which formed the basis for this study remained essentially the same under the passed legislation. The one significant change was that the area on the Seward Peninsula originally proposed in 1977 as the Chuckchi–Imuruk National Monument became the



Bering Land Bridge National Preserve (from December 1978 until passage of the d(2) legislation, this area was one of the thirteen National Monuments in Alaska created by President Carter and was designated the Bering Land Bridge National Monument). Figure 12 is presented to show the land status on the Seward Peninsula as of late 1980.

Focusing now more closely on the Seward Peninsula, an examination of the administrative and political boundaries reveals the following. The northern portion of the Seward Peninsula is part of NANA Regional Corporation Inc.'s domain, while the southern two–thirds is part of the Bering Straits Native Corporation's (BSNC) area. Both of these institutions are regional profit–making corporations incorporated and organized under ANCSA. The regional corporations were mandated to be for profit, while the Village Corporations could opt for either profit, or non–profit status under ANCSA.

Both regional corporations have nonprofit arms which are involved with health, welfare, social, cultural, and recreational activities for their respective regions. Mauneluk, Inc. represents the NANA area for these matters, while Kawerak, Inc., is the BSNC counterpart. The Reindeer Herders Association Inc. operates through grants and contracts based at Kawerak's headquarters in Nome.

In the NANA region, 10 of the 11 village corporations which originally organized under ANCSA merged with NANA Regional Corporation in 1976. This action left Kikiktagruk Inupiat Inc., the Kotzebue village corporation, as the sole village corporation in the region. Kotzebue is the largest village in the region, and serves as a regional service and distribution center. Accordingly, business opportunities are greater; and the financial success of the village corporation is already established. NANA Regional Corporation has done well financially since the passage of ANCSA, especially when compared to most of the other regionals. By investing in diverse businesses such as oilfield catering, pipeline security, waste–disposal systems, banking, lumber, hardware, fuel supply and distribution, as well as reindeer herding, NANA has achieved an enviable portfolio, at the same time largely avoiding the bickering which early after ANCSA's passage characterized relations between the village corporations and their regional big brothers.

The Bering Straits Regional Corporation (BSNC) on the other hand, has not fared as well. Faced with widespread, numerous (20 as opposed to NANA's 11), small villages, agreements on land selections have been slow. At the same time, poor investments and management resulted in multimillion–dollar losses to the corporation over its first few years. Recent changes in the board of directors and president coupled with sounder financial strategies appear to have placed the corporation on a firmer economic footing. Nome's village corporation, Sitnasuak Native Corporation, has acquired the grazing permit for the former BIA Model Herd permit area just outside of Nome, and intends to establish a herd in the area.

As described above, the NANA villages merged with the regional corporation. However, the individual herders based at Buckland and Deering did not surrender any of their autonomy in the merger. Mergers, or joint ventures, are being considered as are joint management schemes between NANA and adjacent herders. Because NANA's herd is increasing, it is seeking additional winter grazing lands. Each of the individual, or subsistence herders are faced with a potential conflict with their regional corporation over herding territory. While joint herding ventures are economically sound, they may not be completely socially acceptable to family– and village oriented herders.

In the BSNC portion of the Seward Peninsula, the member villages are not yet in the position of competing for range resources. Herders report that there is a great deal of interest in joint ventures using village lands and privately owned reindeer to forge a viable economic alliance where land ownership or management patterns require it. Every village will eventually gain title to a large block of land surrounding the village itself. Elim village chose to acquire its entire former reserve, and could utilize it to graze reindeer if they so choose. Interim conveyance of the Norton Bay Native Reservation (Elim) lands was completed by the U.S. DOI's Bureau of Land Management in summer 1979.

Rather than waiting for Congress to act on the Alaska national interest lands issue, the Alaska Federation of Natives approached the State of Alaska and the U.S. Department of Interior and Agriculture in 1978 to establish a cooperative planning body. The resulting Alaska Land Managers Cooperative Task Force was brought together by a Memorandum of Agreement among these four groups. A number of subcommittees were established including one on reindeer herding. The Land Managers Task Force provides a forum for dialogue among the affected groups. The subcommittee chairmen report to the members of the Task Force directly. To date, the Reindeer Subcommittee has been able to help fund and coordinate range surveys undertaken by the Soil Conservation Service (U.S. Department of Agriculture) similar to the one done in 1977 (Preston, 1977). Permit regulations and procedures for grazing on U.S. DOI lands once administered by BLM, but now under NPS and USF&WS jurisdiction, are being standardized.

State of Alaska concerns are being anticipated through the subcommittee, as the state will eventu-

ally receive title to several million acres of land on the Seward Peninsula. Updates on the land status of national interest lands legislation are presented at subcommittee meetings. Because representatives of the Reindeer Herders Association are on the subcommittee, this information gets disseminated rapidly among the herders for their consideration. In addition to pragmatic concerns such as range surveys, a major product of the Reindeer Subcommittee is policy recommendations for reindeer grazing on differing land jurisdictions. While no members are bound by these policies, they form working guidelines for internal policy development within the various agencies.

Significant amounts of real estate on the Seward Peninsula are claimed by or patented to individuals and corporations under mineral entries, especially placer gold mining. The state has selected several large blocks of land for their mineral and grazing potential. These state land selections lie south of Deering and Candle, to the east of Wales, and north of Teller and Brevig Mission. A major Federal holding is the 2,590,000–acre Bering Land Bridge National Preserve. The Preserve is administered by the National Park Service and lies in the northcentral portion of the Seward Peninsula. The changing land ownership and management patterns on the Seward Peninsula have major implications for the reindeer herding industry.

Policy considerations and mitigating measures

We will conclude this chapter with a brief analysis of several policy areas because the future of reindeer herding will depend upon the policies of various land owners and managers in addition to the desires of the reindeer herders themselves. These policies are not presented as being comprehensive and inflexible, but rather to identify key issues which must be resolved for the future well–being of the reindeer industry. While no individual or organization is likely to agree completely with this section, it reflects the different agency mandates, institutional directions, and personal preferences of the affected parties, rather than (we hope) shortcomings in the analyses themselves. We have chosen not to address issues that are clearly peripheral to herding, but which can and, ultimately do have an impact on the herding industry.

Fitzsimmons (1976) writes that at least three variables contribute significantly to development in National Park Service areas: "(1) the financial, in terms of obtaining funds for park projects; (2) the esthetic, in terms of containing development below some threshold of excessive scenic depreciation; and, (3) the social, in terms of striking a balance among divergent visitor expectations and opinions." It is not impossible for the National Park Service or the U.S. Fish and Wildlife Service to function as required by their Congressional mandate while at the same time maintaining reindeer herding within park, preserve, refuge, or monument lands. Since "reserve designation would allow existing grazing to continue to the extent that it could fill the niche of the extirpated caribou" (U.S. DOI, 1974), ways and means should be explored to see that the activities of the Federal agencies and the reindeer herders continue to be coordinated. For example, shelter cabins that might be erected for National Preserve visitors and agency personnel could also double as range cabins. Visitor expectations and opinions regarding reindeer herding and Native life in general could be positively emphasized with information and promotional literature which describe the role and significance of reindeer herding in the village economy and in people's lives. It remains to be seen whether promises made to continue to permit reindeer herding on national– interest lands will be kept.

The socioeconomic impacts of increased, constant, or even declining herd sizes on the herders, the villages, the range, and the region do not take place independently of other biological, social, and economic factors. Prominent among these factors are the changing land–ownership and land–management jurisdictions on Federal lands in northwest Alaska, and the policies and management regulations being developed for these lands. Additional factors relating directly to management policies on public lands include: subsistence and wildlife management, fire control policy, aircraft use, and all terrain–vehicle (atv) use, to mention but a few. We will comment briefly on these.

Changing land ownership

Changing land–ownership and management patterns over northwestern Alaska is a major problem which reindeer herd operators currently face. The emerging checkerboard pattern of ownership and management is viewed by some as the foremost problem facing herding for it means that some form of cooperative agreement must be secured by the reindeer herders with adjacent private, corporate, state, and Federal land owners and managers. Since all of these parties have somewhat different and often conflicting attitudes, policies, and regulations for herding, the individual owner is often in a quandary about how to resolve the conflict. The Reindeer Herders Association successfully sought assurances that reindeer herding would continue to be allowed by permit on Federal lands on the Seward Peninsula in the legislative language of the recently passed d(2) bill.

The Alaska Department of Natural Resources

(DNR) is responsible for the management of reindeer herding on state lands, among its other myriad functions. Responsibilities toward reindeer herding have only recently been recognized and, directed action is only beginning. A threefold breakdown of state responsibilities is now in effect. The Division of Forest, Land, and Water Management is responsible for the management of the range resource which the herders use, the granting of reindeer permits or leases, and the establishment of permit (or lease) sizes and locations. This latter function will be carried out in conjunction with the Division of Agriculture which will also work with the herders on marketing techniques and extension and education services. Coordination of the education and development activities will take place with members of the University of Alaska who are involved in reindeer–related research. Last, the Division of Research and Development, DNR, will formulate general state reindeer policy, evaluate and recommend which state lands should be set aside for reindeer grazing, and coordinate state participation with the reindeer herders.

Subsistence and wildlife management policy

Policy regarding subsistence and wildlife management will affect reindeer herding. If subsistence utilization of resources is restricted or prohibited, reindeer may have to provide a greater portion of the village nutritional requirements. This could provide increased revenues for herd owners since prices received would be expected to increase under conditions of increased demand and stable supplies.

It currently appears to be the intent of the Department of the Interior to permit subsistence activities to continue on National Preserve lands. If these activities are allowed to continue at current levels, the effect on reindeer herding will be to perpetuate the status quo of the reindeer industry which is located on those Federal lands. A situation somewhere between complete curtailment of subsistence activities and the continuation of current harvest levels seems most likely to develop. Demand for reindeer meat and byproducts will increase regardless of the restrictions placed on subsistence utilization of public lands on the Seward Peninsula. The increased demand will come with increasing human population in the region, increasing costs for other meat products, and a preference among most residents of the region for reindeer over other red–meat products.

Under wildlife management considerations, two major areas of concern emerge. First, some predator control is necessary to protect the reindeer herds. Until recently, herd owners were aided by the Bureau of Indian Affairs and the U.S. Fish and Wildlife Service in their predator control efforts. Wolves can scatter a herd far and wide, in addition to killing the reindeer. Bears, ravens, and other predators, including man, also kill or harass reindeer. If all predator control is eliminated on Federal lands on the Seward Peninsula, reindeer herding will be adversely impacted. During the fall and early winter of 1977, more wolves were reported on the eastern Seward Peninsula than in recent years. Herders also reported wolf kills, in addition to scattered and lost reindeer.

Predator control in general, and of the wolf in particular, is a highly emotional topic. Wolves are not an endangered species in Alaska. The decline in the Western Arctic Caribou Herd has been attributed to some extent to predation by wolves (Greiner, 1976). It would appear at this time that limited, uniform predator control will be necessary on the Seward Peninsula in order to allow reindeer herding to continue at all. This may develop into a political compromise whereby predator control to protect reindeer herds would be allowed on one unit of national–interest lands, for example the Bering Land Bridge National Preserve where reindeer are grazed, and not allowed on another where caribou are present. Thus, potential prey and habitat for wolves would be available, but not at the expense of the reindeer herds.

Another alternative has been suggested to resolve the conflict between reindeer and bear predation. Under this proposal, herders would notify Alaska Department of Fish and Game officials in Nome or Kotzebue whenever they are experiencing bear predation. Since bear predation takes place largely in the spring when there is a legal open season, ADF&G officers could instruct registered guides to take a client to the area, and allow the client to shoot the problem bear. While this arrangement has yet to be completely considered and implemented, the herders see several difficulties such as the slow response time of the ADF&G/guide/client link; no resolution of the immediate problem of the predacious bear; and logistical difficulties in contacting ADF&G from field or village locations and directing the guide/client to the precise location of the problem. Nonetheless, this is a positive approach by ADF&G to a very real problem faced by the herders. This in itself is encouraging given the long history of less–than–amiable relations between the Native subsistence users and the state agency charged with preservation of game and enforcement of the fish and game laws.

Another area of concern for wildlife management is the interaction of reindeer with birds during their nesting season. This coincides more or less in both time and space with the summer antler harvesting,

roundup activities. Research funded by the National Park Service and the U.S. Fish and Wildlife Service over several years has provided data on the nesting birds and their habitat, abundance and distribution, reindeer foraging and foot placement, and reindeer and nesting bird interactions (Wright, 1978). During the research, "few direct interactions between reindeer and nesting birds were observed" although probably many interactions were not observed due to distance of the observers from the herds (1978). A literature review did not find that eggs were a significant part of reindeer or caribou diets. The effect of indirect impacts caused by reindeer grazing such as foliage depletion or range deterioration was not found to be significant on the bird populations. To minimize impacts of reindeer grazing on bird life, Wright suggests that the timing of herding and corralling and the routes used during the summer operations should take nesting–bird distributions and activities into account (1978).

Management or grazing permits could stipulate that reindeer be kept away from nesting areas such as salt grass meadows, coastal tundra, and low–medium willows. Research should be continued to determine the long–range effect of reindeer interactions with birds and other wildlife for optimum management of these public resources.

Fire–control policy

Fire–control policy will affect reindeer operations, but because the role of fire in the tundra ecosystem is still imperfectly understood, one cannot accurately predict the impacts other than in a most general way. NANA Regional Corporation sponsored a two–day meeting in November 1977 to discuss the impacts on the region of the severe tundra fires in the summer of 1977. At these meetings, some experts suggested that fire may have beneficial effects in both the short and the long run by releasing nutrients and promoting succession in the plant communities which reindeer and caribou graze. If the biologists are correct, then a policy of allowing naturally caused tundra fires to burn themselves out may have advantages over suppression efforts by increasing the amount of available forage.

On the other hand, adverse effects of large tundra fires may outweigh this benefit. Distribution of existing reindeer ranges, increased stream siltation, with resultant loss of fish habitat or damage to property, unaesthetic appearance of the environment, and hazardous flying conditions all may occur. Income from fire fighting would be foregone to the residents of the region if fires were allowed to burn without suppression efforts. Policy regarding fire suppression should be made on the biological, social, and economic merits of alternatives.

Aircraft policy

Restrictions on aircraft use have potential for adversely affecting herding operations. Aircraft are currently used extensively by herd owners. Meat is shipped to markets by air, although most of these flights utilize the village landing strips. During the antler harvest season, aircraft are used to haul the antler buyers, his crew, and the velvet antler. At this time of year, landings are made by wheel–equipped planes on beaches and gravel bars. During the winter, wheel– and ski–equipped planes are used to locate the herds and to keep track of herd movements. Landings are made often on snow covered, frozen lakes. Only two herders have airplanes themselves, but others express interest in learning to fly. All herd owners utilize chartered aircraft in their herding operations to some extent throughout the year. The major antler purchaser used a two–man helicopter to locate reindeer in the summer and drive them into the corral for antler harvesting until a crash during a 1978 roundup resulted in the loss of the aircraft and pilot. Another model helicopter has been used in subsequent roundups. The elimination or restriction of use of a helicopter on Federal lands would substantially increase the difficulty, and the cost of antler harvesting could probably not be recovered. Since antler sales are a major portion of herd owners' income, this would have an undesirable effect on herd owners.

All–terrain vehicle (ATV) policy

Changes in current herd–management practices could result from various Federal and state regulations affecting Seward Peninsula lands. For example, the total ban on the use of snow machines on public lands would probably have the effect of putting the herd owners out of business. The snow machine has been adopted by Eskimos because it is a practical and efficient alternative to dog teams under current conditions (Hall, 1971). A return to dog teams may be held by some people as a romantic ideal. To force such a return by regulation or law would impose the need for procuring, raising, training, feeding, and maintaining the teams upon people who have changed to a more economical alternative. These same observations also hold true for draft reindeer under current conditions. Partial restrictions on snow machine use, such as limiting them to snow–covered ground and to the winter season, would probably not adversely affect herd operations.

One herd owner uses a small tracked vehicle to move to his summer range and a corral that was used for summer handlings up to 1976. The tracks from this activity run through national interest lands from the Deering–Utica road, west along the divide between the Immachuk and Goodhope River. This corral is still used for winter handlings, but

snow machines are used to travel to it in the winter.

Other herders own various all–terrain vehicles besides the ubiquitous snow machines. High purchase and operating costs combined with mechanical problems have led to their infrequent use in recent years. Concern over the possible adverse impacts to vegetation led the National Park Service to sponsor research on this question. Results reported by Racine (1979) indicate that natural revegetation rates vary with the degree of disturbance to the tundra. The use of light–weight atv's was found to cause little or no severe tundra disturbance under most conditions. Mitigation of the impacts could be undertaken by 1) selecting the most environmentally safe atv's available; 2) selecting certain travel routes which minimize tundra disturbances; and 3) using modified or alternative roundup methods during the summer (Racine, 1979).

Summary

This chapter has brought the reader to the present in the ongoing evolution of the reindeer industry and its role in the lives of the people of northwestern Alaska. The emphasis has been on the contemporary situation, one which owes most of its problems as well as its potential to the passage of the Alaska Native Claims Settlement Act. The institutional vehicle used in ANCSA to deliver the money, lands, and services of the settlement has been the Native corporation. Because the corporate and not the tribal concept was used, the experience of Alaskan Natives with the Federal government has been both profoundly different from the experiences of other American Indian groups, and distressingly familiar in other ways. Areas of similarity are found in the unreasonably long time it has taken for the Federal government to respond to the pressing social, economic, and political needs of Natives under the trust relationship which the Federal government holds with Native Americans. Another area is in the exemptions in various pieces of legislation for Natives to protect their subsistence needs. The Reindeer Act for example, was passed in part to provide a "means of subsistence for the Eskimos and other Natives of Alaska" (25 USC 250 et seq 1970). Last, Alaskan Natives have been considered United States citizens since 1924; they were extended the right to acquire title to lands which they utilized under the 1906 Alaska Native Allotment Act, to acquire townsite lots in 1926, and to acquire the lands, economic development, and local government powers provided by the 1934 Indian Reorganization Act provided by the IRA Alaska amendments passed in 1936.

Differences in the relationship can be traced to the historical treatment of Alaskan Natives by the courts, the different sociocultural integration of most Native groups compared to the tribes of the continental United States, and the legal construction of ANCSA as "Native" legislation which only terminated those titles and claims base on aboriginal title or use and occupancy. The various reports on ANCSA prior to its passage and other sections of the act indicate that it was Congress' intent to protect Native subsistence in other ways. ANCSA's passage did not and was never intended to terminate Native's rights and privileges under other applicable state and Federal statutes, a point frequently disregarded in the often emotional debates concerning access to and the allocation of ever–diminishing resources. The relationship of the Federal government to Natives will continue in four major areas, portions of which have been touched upon in other parts of this volume. These are: 1) the settlement of Native land claims and the subsequent protection of those lands; 2) the provision of various human services (health, education, welfare); 3) the protection of subsistence activities under applicable Federal (and state) laws; and, 4) the promotion of Native government (cf. Case, 1978).

A final point concerning contemporay reindeer herding will be made. The geopolitical map of Alaska today is crisscrossed with state, Federal, Native, borough, private, and military holdings in a checkerboard fashion that is underscored by the fact that, in 1959, at statehood, some 99 percent of the land was in Federal stewardship. Reindeer, birds, and other animals, including humans have traveled over the lands without regard for the location of township and section lines on status plats. Each land owner and manager has a different philosophy about the highest and best uses of the land. Inevitably, pressure on the resources, renewable and non–renewable alike, is going to increase. The political and economic maneuverings to control larger land holdings, crucial ranges, and greater numbers of reindeer for the commercial market pose a dilemma for traditionally family– and village–oriented herders whose subsistence lifestyle is already assaulted by forces beyond their comprehension and control. Already burdened with the twin problems of access to the lands and waters for subsistence purposes, and the regulation of species types, numbers, and manner and time of taking, subsistence–oriented Alaskans and the reindeer herders alike will have to become more intensively involved in the political arena to continue being permitted to derive their living from the resources and lands of their ancestors.

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Appendix 1

MEMORANDUM

Juneau, Alaska
October 3, 1930

For Governor Parks:

Suppose 5,000 Native deer go over to a Lomen range in January, 1930, and their increase is 1,500.

Suppose they join a Lomen herd of 20,000. The Lomen increase, if taken at 30 per cent, would be 6,000.

The total deer on the range are now 32,500.

A roundup occurs September 1, 1930, and 8,000 adults are brought in.

These 8,000 would have with them 2,400 fawns.

If both the Native and Lomen deer had been fully marked, then the Natives should be entitled to 20 per cent of the 2,400 fawns, or 480.

This roundup of 8,000 out of 25,000 would be a 32 per cent roundup.

Sixty–eight per cent of the Native deer would still be on the range.

Sixty–eight per cent of the Native fawn increase would in 1931 be mavericks which Lomens would claim under the existing custom.

Now suppose there is no roundup in the spring of 1931, and a roundup occurs in July, 1931.

The Native has 5,000 marked adults
1,500 unmarked yearlings
1,950 fawns unmarked
Total Native 8,450

Lomens should have 20,000 marked adults
6,000 unmarked yearlings
7,800 unmarked fawns
Total Lomen 33,800

There is now on July 1, 1931, a total of 42,250 deer on the range.

If a complete roundup would occur July 1, 1931:

Lomen would get 20,000 marked
7,500 yearlings (mavericks)

and a percentage of fawns, as follows: 80 per cent of 9,750, or 7,800.

The Lomen total is, on July 2nd, *35,300* and the Native total is *6,950*.

The Native percentage of ownership has been reduced from 20 per cent to 16.4 per cent in one year, and the Native not only has lost 1,500 deer but his future percentage is 18 per cent less than it should be.

What *usually happens is something* like *this*:

5,000 of the Native deer join a Lomen herd in January, 1930.

The Native deer are perhaps 20 per cent marked and the Lomen deer are perhaps 75 percent marked.

4,000 unmarked Native deer

1,000 marked Native deer (including 500 females)

The 20,000 Lomen deed would be:
15,000 marked (7,500 female)
5,000 unmarked

The increase is over 30 per cent, or 7,500 fawns for the herd.

Lomen's tally would show they now own 20/21 of 32,500 and the Natives now own 1120/21,280 or 5 per cent of the herd instead of 20 per cent. The co–owners with Lomen would profit by this transaction, but Lomens have bought out many of their big co–owners until they own the big percentage of their herds.

Ernest Walker Sawyer

Appendix 2

Comparison of Reindeer Council Range Rules and Lomen Corporation Range Rules(1931)

Reindeer Council Range Rules.

"(1) *Marking Notification.* The herd manager shall notify, in writing, the owners or agents of all bordering herds, as designated by the General Reindeer Superintendent, as to the time and place of the marking of a herd, at least two weeks in advance of such marking, so that representatives of such bordering herds may be present at the marking. The Reindeer Service will have a representative at every roundup when such a representative is available."

Lomen Reindeer Corporation Range Rules.

"*Marking, Notification*. We will notify, in writing, the owners or agents of our neighbouring herds, as to the time, and place of the marking of our herds, at least two weeks in advance of such marking so that representatives of such neighboring herds may be present at the marking of our herds, and they are invited to be present at such markings."

Lomen Reindeer Corporation Range Rules.

"*Marking Fawns to Stray Owners*. 'Stray' owners in company herds will receive ten per cent less than the percentage of fawn increase for the year, with a maximum percentage of 50 on two or more females, including yearling females, and increase will be given only on even numbers of such stray females. The odd number will not receive increase when based on a 50% fawn increase.

"Any owner of stray deer, when such number exceeds one hundred females not satisfied with the fawn increase on females, may, by written request to our Nome office, and by payment of pro rata of herd expenses for the year, share in pro rata division of fawns."

Reindeer Council Range Rules and Regulations.

"(4) *Marking Fawns to Stray Owners*. Stray owners in a herd shall not pay herding fees, but will receive a smaller percentage of increase than co–owners of a herd figured as follows: When the percentage of increase in the total herd, based on adult females, runs 60 or more per cent, the stray owners will receive 50 per cent increase. Whenever the total fawn increase in a herd runs less than 60 per cent, based on adult females, the percentage of fawn due such stray owners shall be computed as follows: Take the per cent of fawn increase of the herd for the year, based on adult females, and subtract therefrom the figure ten. The result will be the per cent of fawn due stray owners for that year. Percentages for stray owners will be based on two or more adult females, and increases will be given only on even numbers of such stray females. The first fawn marked shall be a male. The odd number will not receive fawn increase. Mavericks shall be the property of the herd in which they are found.

"Overs and Shorts: When fawns or mavericks, either male or female, are marked to an owner, in excess of the number his percentage calls for, said owner is 'over.' When a smaller number of fawns or mavericks, either male or female, is marked to an owner than his percentage calls for said owner is 'short.' Corrections of such 'overs and shorts' are to be made in kind, male or female mavericks, at the next marking season and females of such co–owner debited or credited prior to the establishment of new percentages in said herd, and "overs and shorts" must balance in number and kind in order to be correct on the annual marking return for said year."

Lomen Reindeer Corporation Range Rules.

"*Herd Expenses by Co–Owners*. Expenses may be paid co–owners, in cash, in labor,—when on company payroll— or in reindeer on the hoof when ranging with a company herd. Hereafter, whenever a co–owner desires to pay herd expenses in reindeer, the Lomen Reindeer Corporation will accept same on the following basis and at the follwing value:

"When said deer range with our herd, we will credit any owner for reindeer re–marked to us or butchered, with $3.00 per head."

Reindeer Council Rules and Regulations.

"(21) *The Standard Herding Fee* per head per year for each adult female will be based on the coast of herding prorated against the coowners on the basis of ownership of adult female deer in the herd as counted during the current marking season except when a written agreement has been entered into."

"(22) *Herding Fees may include* chief herder's salary, wages and subsistence to herders, cost of marking roundup, cost of maintenance and wages of marking crew during marking, construction and maintenance of marking equipment.

"A detailed cost account including all items constituting the herding fee for the past fiscal year ending June 30 must be sent to the General Reindeer Superintendent on or before September 1, and a copy kept on file for inspection by any owner or owners."