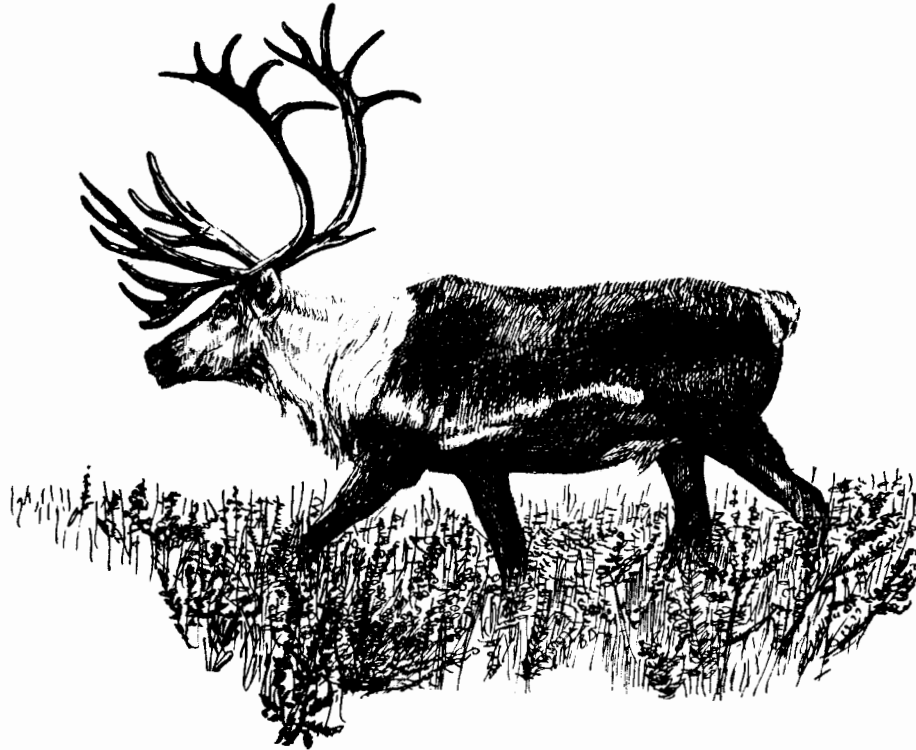


ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

POPULATION SIZE OF THE ALASKA
PENINSULA CARIBOU HERD

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FINAL REPORT (RESEARCH)

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Job Title: Population Size of the
Alaska Peninsula Caribou
Herd

Period Covered: January 15, 1974 to February 1, 1976

SUMMARY

A photo-extrapolation census of the Alaska Peninsula caribou herd between Port Moller and King Salmon resulted in a November 1975 population estimate of 10,342 caribou. Calf:100 cow ratios obtained in July and November were 49.2 and 44.6, respectively. In November the sex ratio was 33 males:100 females. The photo census between Cold Bay and Port Moller resulted in a July 1975 population estimate of 2,627 with a calf:cow ratio of 49:100. A photo census of Unimak Island (with no composition count) resulted in a minimum population estimate of 3,334.

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BACKGROUND

Alaska Peninsula caribou (*Rangifer tarandus*) once moved back and forth from Unimak Island across Isanotski Strait annually (Murie 1935). These movements were documented since the late 1800's (Skoog 1968). No one knows for sure when the last movement took place but caribou no longer cross the strait so Unimak Island caribou are now considered a separate herd. Murie (1935) estimated the Unimak Island herd to contain 7,000 animals.

When caribou stopped moving across the Isanotski Strait a new herd was formed on the Peninsula which ranged from Isanotski Strait and Cold Bay to Port Moller. Murie (1935) estimated that this herd contained 2,500 animals. North of Port Moller caribou were free to move on and off the Peninsula and did so until the turn of the century (Osgood 1904). Because the caribou stopped moving off the Peninsula a separate herd which now ranges between King Salmon and Port Moller was formed. No early estimates of population numbers are available but by the late 1940's Nelson (1949) estimated only 2,500 animals for all of the Alaska Peninsula and Unimak Island.

The size of the Alaska Peninsula caribou herd was unknown until this study, although the population was thought to be moderately large (20-30,000) and increasing. Caribou seasons and bag limits on the Alaska Peninsula are liberal at this time. Peninsula residents utilize the herd for subsistence and the sport hunting kill is thought to be increasing. Oil exploration and impending development may affect the status of the caribou population. Population data were needed to assess current management policies and to establish future direction. A population census and associated sex and age composition data were needed to provide the necessary information.

OBJECTIVES

To provide information on the current population size, distribution and sex and age composition of the Alaska Peninsula caribou herd.

PROCEDURES

Population Estimate

Reconnaissance flights were made, starting in early June, to determine distribution and the start of calving. This was carried on in conjunction with the brown bear (*Ursus arctos*) tagging work at Black Lake (Job 4.4R). Flights were made almost daily by the bear tagging crew. On June 14 two Cessna 180's were chartered and moved to Port Heiden. Flights were made daily as weather permitted until all of the caribou habitat had been surveyed from the Cinder River to the south end of the Alaska Peninsula and portions of Unimak Island.

To obtain an estimate of total numbers, a modification of a direct caribou count method was used whereby a population estimate is extrapolated from counts made on vertical aerial photographs of post-calving aggregations of caribou (Pegau and Hemming 1972). Extrapolations involved the use of ratios obtained from sex and age composition counts made at the time of photography and also during the period of the rut in November. Post-calving composition data were used to determine the percentage of cows in the post-calving aggregations. The total number of adult cows was then estimated on the assumption that all cows were in these post-calving aggregations. Composition data obtained during the rut were used to estimate the true composition of the population, as the most random sex and age distribution occurs at that time. The October bull/cow, yearling/cow, and calf/cow ratios were then used to compute an estimate of the total population by extrapolation from the post-calving cow total (Pegau & Hemming 1972).

Productivity

The natality rate was roughly estimated by determining the proportion of females with calves on the calving grounds.

Mortality

No attempt at determining natural mortality was made since this was a one-year survey. At the present time no caribou harvest data are systematically collected for the Alaska Peninsula.

Sex and Age Structure

Sex and age structure of the population was computed by analyzing information from the sex and age composition counts taken in the spring post-calving survey and fall counts. Counts were made from the ground using 15-60X spotting scopes. Only genital characteristics were used for sex identification. Calves were differentiated from adults on the basis of body size. For groups of 25 or less or groups where a ground count was impossible a helicopter was maneuvered close to the caribou and counting was done from the air.

Movements and Distribution

Seasonal movements and distribution patterns were determined from previous published records, data on file in ADF&G offices and data gathered during this study.

FINDINGS

Population Estimate

It was determined about mid-June that the caribou were scattered and not all calving was taking place on the traditional calving grounds (Fig. 1). Many animals were still in the Meshik River drainage and had not moved onto the flats near Black and Wildman Lakes. The weather during early June had been unseasonably cool and snow was still falling on June 5. This was thought to be a possible cause in delaying the caribou's movement to the calving grounds. Many calves were born in the headwaters of the Meshik River and probably never reached the low flat areas along the Bristol Bay coast. On June 16 both 180's were released and Nick Steen started weekly flights from King Salmon to determine the caribou's progress in forming post-calving aggregations.

By July 7 it was determined that the caribou had formed post-calving aggregations and were ready to be photographed. Fifteen caribou were found on a previous flight on the Pacific side of the Aleutian Range between Port Moller to the Aniakchak River. On a July 7 flight to Cold Bay less than 25 caribou were seen between the Meshik River and Port Moller. No flights were made northeast of the Cinder River during the early July census. It is possible that a large group of caribou may have been near Becharof Lake but on a previous flight in June no caribou were seen above the Cinder River.

On July 8 the caribou at Cinder River and the groups in the Meshik River drainage were photographed (Table 1). The weather at Port Heiden was clear with unlimited visibility, however, when we tried to photograph the caribou near Trader Mountain, north of Cold Bay, the ceiling was less than 1000 feet and fog was obscuring part of the herd. The same conditions existed on June 9 and the forecast was for more of the same so the photo plane was released and returned to Anchorage.

Table 1. Number of caribou counted from aerial photos and composition counts done in July 1975.

Date	Location	Number of caribou	Calves/100 cows
7/8	Cinder River	1364	60
7/8	Meshik River	9015*	48
7/12	Trader Mountain Area	2627	49
7/23	Unimak Island	3334	No comp count
	Total	16340	

* Includes 252 caribou counted in Meshik but not included in aerial photos.

ALASKA PENINSULA

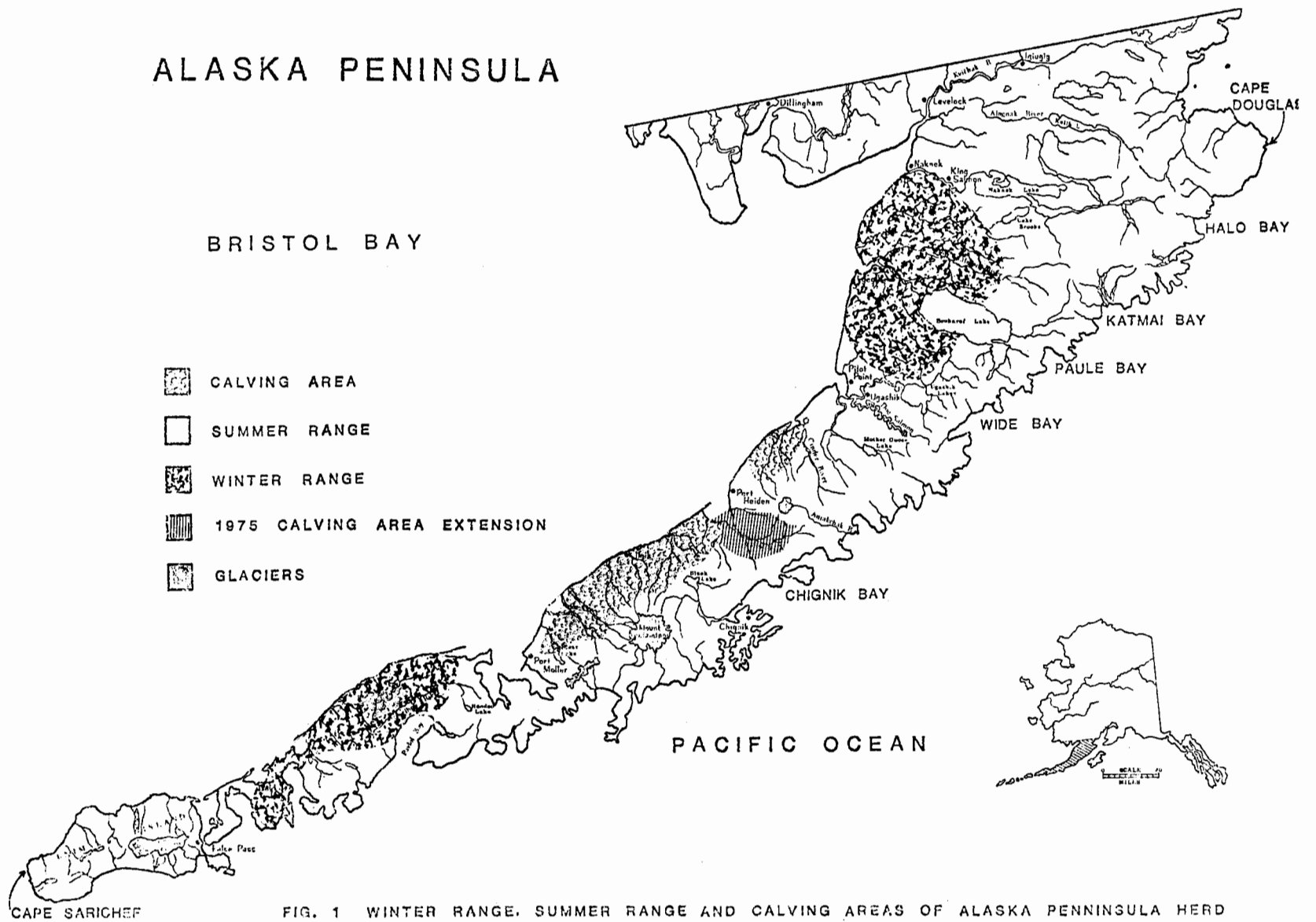


FIG. 1 WINTER RANGE, SUMMER RANGE AND CALVING AREAS OF ALASKA PENINSULA HERD

The helicopter, a Jet Ranger 206A, arrived on July 9 in the afternoon. A flight was made to the Cinder River and a composition count was made (Table 2). On a flight to start a composition count of the Meshik groups on the evening of July 9 the helicopter had an engine failure over the village of Meshik. The helicopter was inoperable until the evening of July 11. Bad weather, 40 knot southeast winds, rain, low ceilings and fog would have prevented flights on July 10 and 11 even if repairs had been completed sooner.

Table 2. Sex and age composition of the Port Moller, King Salmon portion of the Alaska Peninsula herd, July 9-12 and November 4-5, 1975.

Date	Total mm per 100 ff	Calves per 100 ff	Calves (%)	Cows (%)	Bulls (%)	N
7/9-12	24.2	49.2	667(26.8)	1357 (56.9)	329 (16.3)	2025
11/4-5	33.0	44.6	602 (25.1)	1349 (56.3)	445 (18.6)	2396

On July 12 the weather had improved and a composition count of the caribou in the Meshik drainage was made (Table 2). Nick Steen looked for the herd around the Black Hills, Trader Mountain and Pavlof Twin north of Cold Bay using a Cessna 180 and photographed a group near Trader Mountain with a 35 mm camera (Table 1). The evening of July 12 the helicopter and 180 were moved to Cold Bay.

On the morning of July 13 the 180 and helicopter were used to search for the caribou on Unimak Island. The fog around the south end of the island and high winds made a thorough search impossible and no caribou were located. During the afternoon a composition count of the Trader Mountain group, photographed the day before, was made (Tables 1 and 3). Another attempt to locate caribou on Unimak Island was made on July 14 but rain and wind made the search unsuccessful.

Table 3. Sex and age composition of the Cold Bay, Port Moller portion of the Alaska Peninsula caribou herd, July 13.

Date	Total mm per 100 ff	Calves per 100 ff	Calves (%)	Cows (%)	Bulls (%)	N
7/13	19.8	49.0	235 (29.0)	480 (59.3)	95 (11.7)	810

Nick Steen was able to photograph the Unimak herd on July 23 from a Cessna 180 using a hand-held 35 mm camera (Table 1). The weather was fair but Cape Sarichef was covered by fog. Steen felt that he covered at least 90 percent of the island.

Sex and age composition counts were made between Port Moller and King Salmon again on November 4 and 5. During the two days of counting 2,396 caribou were classified. The caribou were concentrated in an area between the hills south of Egegik and King Salmon. No composition count was attempted on the Cold Bay to Port Moller herd or the Unimak Island herd.

The counts yielded a bull:cow ratio of 33:100 and a calf:cow ratio of 44.6:100 (Table 2). These ratios were used to extrapolate a minimum November population between Port Moller and King Salmon as follows:

Post-calving estimate = 10,379 x 56.10 percent cows =	5,822 cows
5,822 x .330 (November bull:cow ratio) =	1,921 bulls
5,822 x .446 (November calf:cow ratio) =	<u>2,597</u> calves
Total November Estimate	<u>10,340</u>

Conditions were atypical during the 1975 survey and could have resulted in a very low population estimate. A population of 15 to 20 thousand may be closer to the actual number of caribou in that herd. Spring was very late, a snow storm occurred as late as June 5 at Black Lake and many cows had their calves before reaching the traditional calving grounds. Many cows may not have ever reached traditional calving areas and consequently were not present in the post-calving aggregations which were photographed. We attempted to fly all of the Peninsula looking for small groups of caribou before and after the aerial photos were taken but it is possible to miss even large groups.

The atypical spring and summer weather carried through to the breeding season in October. During the rut or breeding seasons caribou are thought to be randomly mixed (Pegau and Hemming 1972). It is then that the bulls, cows yearlings and calves are all together. It is the only time that the true composition of the herd can be ascertained. Very few small groups could be located in October and no large groups could be found until the first of November. By then many large bulls had shed their antlers and no rutting activity could be observed.

Because the composition counts were done so late in the fall some bulls may already have left the large groups counted in November and would not have been included in the herd composition.

Productivity

The Calving Area

The caribou between Port Moller and King Salmon normally calve on the coastal plains between Bear River and Port Heiden with a segment north of Port Heiden near the Cinder River (Hemming 1971). Many caribou were on the traditional calving grounds but many more calved in areas not normally used such as the Meshik River and the plains north of Cinder River (Fig. 1).

The Cold Bay segment of the Alaska Peninsula population calves in the Trader Mountain area between the Black Hills and Pavlof Sister Mountain ([Fig. 1] [Hemming 1971]). The Unimak Island segment seems to prefer the south end of the Island for calving but little work has been done to confirm this.

Calving Distribution and Progression

The Three Hills area west of Wildman Lake is normally the center of calving activity. Lesser numbers calve to the south as far as Bear River and to the north as far as the Meshik River, with another group around Cinder River. In 1975 the center of calving was near Three Hills as usual, however, large groups of cows and calves were found in the Meshik River Valley (Fig. 1).

The calving period normally lasts from May 20 to June 15 with a peak around June 1 (Hemming and Glenn 1969), but this year no calves were seen until May 25 with a peak in the first or second week of June. The post-calving aggregations finally formed around July 5.

Calf Mortality

Data on calf mortality are very limited. No dead calves were found during the 1975 survey but dead calves have been found in previous years by biologists tagging brown bears. One dead calf was seen picked up by a brown bear and consumed during the 1974 bear tagging season. Brown bears, which are plentiful on the coastal plains during the calving period, would seem to be potentially significant predators on caribou calves. Wolves (*Canis lupus*) are also present in that area but are not as numerous as bears and probably play a lesser role as a cause of calf mortality. However, wolves have a less varied diet than bears and their role as a predator on caribou cannot be discounted. No calf mortality studies are presently planned for the Peninsula.

Sampling Problems

A few problems arose with the sampling technique. Sex of adults was easily determined but yearlings presented more of a problem. The only criterion used for sex differentiation was the presence or absence of a vulva which is easily distinguished on adult cows but not on yearlings. Bos (1974) discussed the problems associated with determining the sex of caribou and found the same problem in the Nelchina herd. Bos assisted with the first part of the composition counts ensuring more accurate classification.

Sex of animals comprising groups of 25 or less was determined from the helicopter. Larger groups were sexed from the ground using 15-60X variable power spotting scopes. Herding the animals with the helicopter past an observer was not as efficient as approaching the herds from the ground.

Sex and Age Structure

Composition counts have only been made on the Port Moller to King Salmon portion of the Peninsula caribou herd in 1968, 1970 and in 1975 (Table 4). The count in 1968 was made from a fixed-wing aircraft and the accuracy of classification may have been poor. The 1970 count was made from the ground by Lee Glenn and Jim Faro with the aid of a helicopter. Data were collected and classified as excellent, good and poor. Only the excellent and good data are presented in Table 4. The 1975 data were collected from the ground or from the air using a Bell 206B helicopter on groups of less than 25 or in situations where ground work was impossible.

More information is needed to discuss population trends with confidence. It would appear that calf survival until fall is generally good. Unless a high percentage of calves die during the winter, the population has the potential to increase for several years.

The bull/cow ratio appears to be declining, probably as a result of hunter selectivity. Faro (ADF&G Pers. Comm.) speculated that the Peninsula bull/cow ratio would decline as sport hunting increased, since sport hunters would select large males. It appears that a noticeable decline has occurred but more data are needed to determine if this is a long-term trend.

Table 4. Comparison of sex and age composition counts done on the Port Moller to King Salmon portion of the Alaska Peninsula caribou herd in 1968, 1970 and 1975.

Date	Total mm/100 ff	Calves/100 ff	Calves (%)	Cows (%)	Bulls(%)
10/3 - 6/1968	46.8	49.5	1055(22.5)	2131(45.4)	997(21.2)
10/15-17/1970	48.3	46.1	713(23.7)	1577(51.5)	747(24.8)
11/4 - 5/1975	33.0	44.6	602(25.1)	1349(56.3)	445(18.6)

Movements and Distribution

Movements and distribution of the Alaska Peninsula caribou have been described sporadically since the middle 1800's (Murie 1935 and 1959, Elliott 1875, Osgood 1904, Hemming 1971). However, the movements of the Unimak herd are not well documented. I feel that these caribou calve near the south end of the island. During the 1975 survey caribou were found only on the southern end of Unimak Island but trails were observed along the western coastal plains.

Caribou between Port Moller and Cold Bay move south after calving and winter near Cold Bay, moving north in the spring to the calving grounds near Trader Mountain (Hemming 1971).

A general drift from the northern part of the Peninsula takes place in February or March as the caribou move southwestward toward the calving grounds. The route depends on their location during the winter but normally is a straight line paralleling the coast. Most cows reach the grounds by mid-May (Hemming 1971).

During spring 1975 caribou were still found on the plains from Egegik to Port Moller but a general shift was noted toward the calving grounds.

After calving, the caribou between Port Moller and King Salmon drift northward, but caribou can be found almost any place between Port Moller and King Salmon throughout the summer and early fall. By mid-October the rut is well underway and the caribou are generally in the area north of the Cinder River. In 1975, however, they could not be found in large groups. By November 1, 1975 most of the herd occupied the area between Egegik and King Salmon. At one point the caribou were bunched just south of the Naknek River and it appeared they would cross the river for the first time in many years. Perhaps because of hunting pressure from King Salmon or for other unknown reasons, the main herd turned and dispersed and no crossing occurred.

Most of these caribou winter in an area bounded on the south by Pilot Point, on the west by Bristol Bay, on the north by the Naknek River and on the east by the Aleutian Range. Normally by March they move slowly south and are on the calving grounds by mid-May.

A group of at least 1,000 caribou calves near the Cinder River and seems to remain in the same area all year. A group was located during the November composition count near the Cinder River that had remained there all winter according to local residents who fly the area regularly.

Many movements of caribou are not well understood or have no logical pattern. Certain movements have been repeated for several years such as the movement to and from the calving grounds and to the wintering areas, but within these large movements caribou may deviate from the normal path and much work remains to be done to determine if these movements have any significance.

RECOMMENDATIONS

Herd status surveys should continue on an annual basis. These could be in the form of 35mm photo surveys from fixed-winged aircraft.

An IBM harvest ticket program should be initiated on the Alaska Peninsula and a method should be explored to obtain "subsistence" harvest numbers.

ACKNOWLEDGEMENTS

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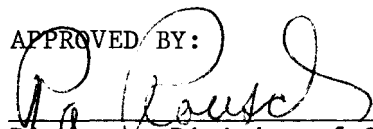
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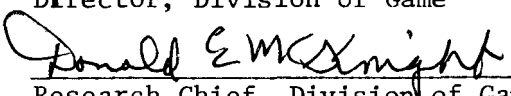
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