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JUNEAU, ALASKA

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REPORT ON 1966-67 MOOSE STUDIES

by

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Annual Project Segment Report
Federal Aid in Wildlife Restoration
Project W-15-R-2 and 3, Work Plan K

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LIST OF PERSONNEL RESPONSIBLE FOR CARRYING OUT THE MOOSE RESEARCH PROGRAM.

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Leader	R. A. Rausch	Fairbanks
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	Loyal Johnson	Cordova & Yakutat
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WORK PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-15-R-2 & 3 TITLE: Big Game Investigations

WORK PLAN: K TITLE: Moose

JOB NO.: 1, 2, 3, 4, 5, 6, & 7 (W-15-R-2)
1, 2, 3, 4, 5, 6, 7 & 8* (W-15-R-3)

PERIOD COVERED: July 1, 1966 to December 31, 1967
(July 1, 1966 to June 30, 1967, W-15-R-2)
(July 1, 1967 to December 31, 1967, W-15-R-3)

ABSTRACT

Moose Publications

A draft of a note describing the technique currently used to prepare moose incisors for age determination was completed. Compilation of all past aerial sex and age composition counts was completed in preparation for the forthcoming comprehensive report.

Harvest

In 1966, 31,549 harvest tickets were issued compared to 32,924 in 1965. The proportion returned in 1966 (89.4%) was lower than in previous years (92-94%), probably due to the use of one reminder letter in 1966 compared to two in previous years. Resident interest in moose hunting appears to be declining while non-resident interest has increased. Twenty percent of the people who obtained harvest tickets did not hunt. Of those who hunted, 32% (7,048) were successful. Hunter success, relationship of residence to Unit hunted, and means of transportation were studied through harvest ticket returns and questionnaires included with reminder letters.

* Job K-8 reported upon by the Alaska Cooperative Wildlife Research Unit.

Success varied widely between Units and appeared correlated with the means of transport used. Units where airplanes or other specialized equipment were used showed the highest success rates, those where cars were more widely used had lower success rates. More data was considered necessary before analysis of residence:Unit hunted relationships would be meaningful.

Range Inventories

Two 0.1 acre exclosures were built in the Matanuska Valley, one near the outlets of the Matanuska and Knik Rivers, the other near the north end of the Willow airstrip.

Sex and Age Composition

Sex and age composition ratios derived from aerial count data gathered since the early 1950's were compiled in this report as a preliminary step toward completing a comprehensive report of moose research. Analyses of these data are not available at this time. The 1966 sex and age ratios reflect fair to very good production and survival to about 6 months of age. In Unit 5, 9, and certain areas of Unit 13, 15, and 20, production was poor, and seemed related to an imbalance between population and range. In areas with higher utilization of moose, production appeared to be consistently better than in areas with lower utilization.

Production

Limited aerial counts during calving indicate very good initial production in the Matanuska and Susitna Valleys and poor to fair production in the Tanana Valley near Fairbanks where the moose population is only beginning to recover from winter losses incurred during the preceding 2 years.

Tagging and Movements

Eighty moose were captured using succinylcholine chloride and marked with collars and ear tags in the Matanuska Valley. Fifty moose were handled similarly on Fort Richardson. Subsequent sightings provided information on winter movements which proved to be limited in most cases. Some difficulty was found with response of the moose to drug dosage, which seemed to change in the Matanuska Valley as winter progressed. The cause of the changes has not been determined.

Biological data collected included some live weights, pregnancy information obtained by palpation, tests for brucellosis (113 moose, all negative) and leptospirosis (93 moose, all negative), incidence of Nematodirella eggs in feces (4 of 21 samples), and non-hunting mortality.

Range-Productivity Relationships

This study, which is a joint venture between the U.S. Bureau of Sport Fisheries and Wildlife and the Alaska Department of Fish and Game, was active in three phases: construction, analysis of soils, and vegetation typing. Construction progressed to the point where two of the pens were constructed during this report period, and the remaining pens are completed except for stringing the woven wire. Mr. Freeman Stevens, U.S. Forest Service, Juneau, completed a soils survey on the four 1-square-mile study areas. Mr. Robert Hinman and Mr. Greg Bos completed the type map for the moose enclosures.

RECOMMENDATIONS

Slight alterations in the harvest ticket format and program could enable the Department to obtain data on success rates and methods of transportation used in each Game Management Unit, which will in turn give us a clearer view of the type and extent of use an area is receiving. As trends develop and are identified, our regulations and other management plans can be adjusted to accommodate changing needs.

Lack of access to available moose populations continues to be the major limiting factor on the harvest of moose in Alaska. Rausch (1967) pointed out that policies delineating philosophies of management need to be formulated and agreements reached with cooperating agencies to provide a sound basis for long-range land and resource use programs. In this way the various recreational uses of moose can best be served.

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PERIOD COVERED: July 1, 1966 to December 31, 1967
(July 1, 1966 to June 30, 1967, W-15-R-2)
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This segment report contains considerable information that was not carried out under W-15-R-2. These data are primarily the results of aerial sex and age composition counts that have been conducted in Alaska for the past 15 to 20 years. This compilation of past data is the first installment of what will be a comprehensive review of all past research and management conducted on Alaska's moose populations.

Other data presented that was supported only in a nominal way by Federal Aid funds includes essential preliminary studies associated with the Kenai Moose Research Station enclosures. The Bureau of Land Management contributed aerial photography of the four enclosures in pan, modified infra-red, and color (see Vegetation Analysis). The preliminary soils survey and analysis was contributed by the U.S. Forest Service (see Soils Survey).

OBJECTIVES

To obtain and evaluate information on the status of Alaska's moose populations in terms of productivity, trends of abundance, fertility, movements, sex and age composition, and harvest to guide annual management decisions.

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* Job K-8 reported upon by the Alaska Cooperative Wildlife Research Unit.

TECHNIQUES

Harvest Statistics

Characteristics of the 1966 harvest of moose were determined from a mandatory harvest ticket report and from age determinations based on cementum deposits on incisor teeth. A detailed explanation of the mandatory harvest ticket system was reported on previously (Rausch et al, 1966). Teeth used in making age determinations were obtained at checking stations, from voluntary returns by individual hunters, and by the field collection trips by biologists.

Sex and Age Composition

The relative proportions of sex and age classes of moose populations throughout the State have been sampled by aerial counts for the past 15 to 20 years. Ideally, aerial segregation counts are made of identifiable populations to insure that the same parameters of populations have the opportunity of being assessed annually. In practice, however, delineation of indentifiable groups is difficult and costly. Moose within indentifiable geographic areas have been counted while the task of sorting populations continues.

Count techniques have been modified with time, but certain attributes have been constant since the inception of the technique. Aerial counts are most effective if flown when the ground has a uniform complete fresh cover of snow. Counts should be completed before antler shedding begins in late November and early December. Most of the counts were made with Piper PA-18, 150 hp Supercub aircraft. Counts in the early 1950's did utilize other aircraft. Generally, these aircraft had less power, shorter ranges, and poorer visibility. In recent years, helicopters have been used on certain counts.

Counts of predetermined areas generally are flown in a transect pattern of .5 to 1 mile between transect lines and at altitudes of 300 feet or less above the terrain. In mountainous regions, contour transects often are necessary. Moose observed have, with slight variation, been recorded in one of four categories:

1. Young bulls - Antler spikes or forks with little or no palmation; antler spread seldom exceeds 30" - 34". Considered to be yearlings.

2. Adult bulls - Antlers with palmation ranging from small to large.

3. Cows - Antlerless moose other than calves.

4. Calves - Young-of-the-year, distinguished by their small size, short rostrum, and light-tan to white patch on each shoulder.

Department personnel taking part in the 1966 counts included: R.A. Rausch, Richard Bishop, Art Bratlie, Jack Didrickson, Loyal Johnson, Frank Jones, Robert Hinman, Howard Wood, Karl Schneider and Lee Miller.

Census Techniques

A random stratified sampling technique potentially useful in estimating moose populations was conducted for the second year in the Matanuska Valley area (Rausch, 1967).

Range Inventories

Plant enclosures will be erected in various strategic locations throughout the Matanuska and Susitna Valleys. A crew of men (minimum of two) will utilize mechanical post hole diggers following locations of the enclosures by a surveying crew. Posts will be placed on 10' 11" centers, braced and covered with 1" x 2" mesh, 9 to 11 gauge wire on the bottom and 2" x 4" mesh wire on the top. Both top and bottom wires are 4' high for a total 8' high fence. The enclosure is 66' square which encompasses 1/10 acre. All posts and diagonal braces are 4" x 4" material. All horizontal pieces are 2" x 4" spruce. All wood which comes in contact with the ground is to be dipped in a preservative such as penta. Top and bottom wires are to be hop ringed together to aid in creating a moose-proof enclosure. Construction crews will be extremely careful not to damage vegetation inside the fence.

The following materials are required to construct a moose exclosure:

40 pieces 4" x 4" x 12' spruce
80 pieces 2" x 4" x 12' spruce
300 ft. 1" x 2" mesh welded wire fence, 11 gauge

300 ft. 2" x 4" mesh welded wire fence, 11 gauge
25 lb. 20d common nails
25 lb. 1-1/4" galvanized staples
5 lb. hog rings

Productivity

Collections of gravid uteri were not large enough to yield information on productivity trends, because the few antlerless seasons held in the most important units preceded the main breeding period.

Adult Tagging

Techniques used to capture adult moose were similar to those described in the 1966 report (W-15-R-1, Work Plan K, pages 106-114). Minor modification of equipment included adapting the 32 gauge Palmer Cap-Chur shotgun to use a 22 cal. powder charge as the propellant for the syringe. The Palmer shotgun was originally designed for 32 gauge shotgun cartridges, but these cartridges performed erratically. The 22 cal. charge was more reliable but on occasion resulted in excessive penetration of muscle tissue.

Whenever possible darts were placed in deep musculature such as the semi membranosus or adductor magnus of the thigh.

Drugs

Succinylcholine chloride in liquid or powder form was used in all capture attempts in 1966 and 1967.

Marking

A description of the neck collars and how to read them was included in the 1966 report (W-15-R-1, Work Plan K). The system was altered slightly in 1967 by adding a third color to the collar (See Appendix A).

Because the technique is somewhat complicated for field use, a detailed description is provided as follows:

1. The pendant number is routed into a 2-1/4" x 2-1/2" black nylon marker and colored yellow (1966) or white (1967).

2. The year tagged is noted by a single piece of plastic located on the median dorsal portion of the collar, colored yellow in 1966, and orange in 1967.

3. The area in which the moose was collared is represented by four plastic strips flanking each side of the plastic strip denoting year. During 1966, the area color was blue. During 1967 the area color was orange. It was necessary to use one of the area plastic strips for the individual code.

4. The collar color is used as a year check. In 1966, it was yellow, and in 1967, red and white braid.

5. Individual coding was accomplished in 1966 using the two colored plastic strips closest to the pendant, and switching from right to left to obtain two times as many combinations. Left or right refers to the observer's left or right as he faces the moose. In 1967, the three colored plastic strips closest to the pendant were used, thus diminishing to three the number of area strips.

A similar program of adult marking was conducted on the Ft. Richardson military reservation by military conservation officials Dimitri Bader, Tom Walker and Darwin Biwer. Technical assistance was given by the Department of Fish and Game.

Range-Productivity Interrelationships

The techniques employed are included in the narratives describing the separate research functions. I organized the report in this manner to properly credit the non-state agencies who contributed to the Job.

FINDINGS

Publications

A draft of a note describing the technique used to prepare moose incisor sections for age determination was completed and revision is underway.

All sex and age composition counts completed through 1966 were compiled for the forthcoming comprehensive report. Annual and long-term comparisons can be made in all Units and parts of Units with a history of counting.

HARVEST STATISTICS

Statewide Moose Harvest, 1966

The estimated statewide harvest of moose during the 1966 season totaled 7,048 moose. The harvest was comprised of 5,448 antlered, 1,451 antlerless, and 155 sex unknown moose (Table 1).

The harvest estimates are based upon a 90 percent return of 31,000 harvest tickets that were issued to prospective hunters at no cost to the hunter.

The harvest ticket system has been in effect for only four years. Conclusions about statewide trends in the moose harvest are not warranted at this time because of major annual changes in seasons and bag limits, minor changes in access and in methods and means regulations, and extremes in seasonal weather patterns before or during hunting seasons. For these reasons an analysis of annual variations in the magnitude of harvest is presented for each of the game management units that together have yielded from 63 to 74 percent of the annual harvest (Units 13, 14, 15, and 20). Units 1, 5, 7, 9, and 16 annually produce relatively fewer moose but are important locally and are discussed in some detail. Data from the remaining units are pooled, as the Unit harvests are too low to reflect moose population age composition or potential yields if hunting pressure and access were present.

Moose Harvest 1963-1966, Unit 13

The annual production of bull moose has been amazingly consistent (Table 1). In 1964, concurrent with a successful antlerless season, the harvest of bulls dropped about 10 per cent. The significance, if any, of this slight temporary change is not known. The harvest has been maintained even though production of calves as measured by aerial sex and age composition counts has been only fair.

Seemingly erratic production of antlerless moose is an artifact of changes in season length. In 1963 and 1964, a

Table 1. Moose Harvest by Game Management Unit, 1963-1966, Alaska.

Unit	Year	♂	♂*	♀	♀*	Sex Unknown	Total
1	1963	149		1		0	150
	1964	158		65		0	223
	1965	128		35		4	167
	1966	168		60		2	230
5	1963	189		111		2	302
	1964	154		111		0	265
	1965	153		125		4	282
	1966	116		90		6	212
6	1963	15		2		0	17
	1964	15		0		0	15
	1965	24		0		0	24
	1966	23		1		0	24
7	1963	251		174		2	427
	1964	163		206		0	369
	1965	60		1		0	61
	1966	112		1		0	113
9	1963	179	0	46	0	2	227
	1964	184	1	64	0	0	249
	1965	200	13	63	5	4	285
	1966	240	0	75	0	8	323
11	1963	86		37		0	123
	1964	89		38		0	127
	1965	116		70		2	188
	1966	89		69		5	163
12	1963	138		22		1	161
	1964	145		16		0	161
	1965	151		33		6	190
	1966	156		19		7	182
13	1963	1,385		343		7	1,735
	1964	1,213		394		0	1,607
	1965	1,318		3		10	1,331
	1966	1,336		181		36	1,553
14	1963	925		557		4	1,486
	1964	795		525		0	1,320
	1965	1,127		1,125		10	2,262
	1966	565		202		9	776
15	1963	1,021		417		2	1,440
	1964	1,212		858		0	2,070
	1965	841		731		12	1,584
	1966	819		307		18	1,144

* These columns indicate second moose taken in units 9, 19, 21, 24, 25 where the bag limit is two moose.

Table 1. Moose Harvest by Game Management Unit, 1963-1966, Alaska. (cont.)

Unit	Year	♂	♂*	♀	♀*	Sex Unknown	Total
16	1963	344		27		2	373
	1964	262		61		0	323
	1965	333		52		7	392
	1966	393		144		18	555
17	1963	61		0		0	61
	1964	31		1		0	32
	1965	41		1		0	42
	1966	25		1		0	26
18	1963	75		3		0	78
	1964	39		0		0	39
	1965	28		0		2	30
	1966	31		1		1	33
19	1963	144	0	24	0	0	168
	1964	93	3	31	2	0	129
	1965	114	7	27	1	1	150
	1966	130	6	39	4	4	183
20	1963	1,324		131		2	1,457
	1964	1,034		242		0	1,276
	1965	1,050		140		33	1,223
	1966	814		157		28	999
21	1963	168	0	72	0	7	247
	1964	125	12	43	6	0	186
	1965	87	9	30	1	1	128
	1966	106	8	46	4	2	166
22	1963	68		1		0	69
	1964	57		0		0	57
	1965	55		3		2	60
	1966	52		1		1	54
23	1963	76		1		0	77
	1964	73		0		0	73
	1965	44		0		1	45
	1966	68		0		1	69
24	1963	92	0	4	0	0	96
	1964	81	3	18	0	0	102
	1965	58	8	14	0	4	84
	1966	50	2	17	0	3	72
25	1963	77	0	2	0	0	79
	1964	55	0	2	0	0	57
	1965	51	1	1	0	0	53
	1966	69	1	12	7	2	91

Table 1. Moose Harvest by Game Management Unit, 1963-1966, Alaska. (cont.)

Unit	Year	♂	♂*	♀	♀*	Sex Unknown	Total
26	1963	13		0		0	13
	1964	13		0		0	13
	1965	0		0		1	1
	1966	12		0		0	12
Unknown Unit	1963	59		4		1	64
	1964	6		1		70	77
	1965	32		9		0	41
	1966	57		13		9	79
TOTALS	1963	6,839	0	1,979	0	32	8,850
	1964	5,997	19	2,676	8	70	8,770
	1965	6,011	38	2,463	7	104	8,623
	1966	5,431	17	1,436	15	155	7,054

seven-day season was held from September 24 to 30. In 1965, there was no antlerless season and in 1966, a two-day season was held from September 29 to 30. Much of the harvest of antlerless moose takes place at timberline where the moose tend to congregate during rut activities. This behavior coupled with the fact that the highway system penetrates alpine areas makes the late September period ideal for achieving a large harvest of bull and antlerless moose.

Moose Harvest 1963-1966, Unit 14

Unit 14 is probably the most intensively hunted Unit in the State, due to its large human population and extensive road system. Its confusing regulatory history (Table 2) is reflected by variations in the annual harvest (Table 1). The total harvest has fluctuated nearly 300 percent during a 4-year recording period. Harvest of antlerless animals has fluctuated even more violently with a range of nearly 500 percent from the highest to the lowest production year.

A review of hunting seasons is necessary in order to appreciate their role in the annual fluctuations in harvests.

Table 2. Moose Hunting Seasons, Unit 14, 1963-1966.

Year	Bull	Antlerless
1963	August 20 - September 30 November 1 - November 30	September 24 - September 30
1964	November 1 - November 30 (Matanuska Valley) August 20 - September 30 (Rest of Unit)	November 23 - November 25* (Matanuska Valley) November 23 - November 30 (Rest of Unit)
1965	November 1 - November 30 (Matanuska Valley) August 20 - September 30 November 1 - November 30 (Rest of Unit)	November 27 November 23 - November 30**
1966	August 20 - September 30 November 1 - November 30	September 29 - September 30 (Matanuska Valley) September 25 - September 30 (Rest of Unit)

* Matanuska Valley season shortened by emergency regulation SC 28, season established for one day, November 24.

** Eagle River drainage closed by emergency regulation SC 35 at midnight, November 28, 1965.

In the Matanuska Valley, seasons on antlered moose have been reasonably consistent; however, in 1964 and 1965, the early season was eliminated in an effort to test the theory that an intense harvest of bulls was having an adverse effect on the breeding of the cows during their first estrus cycle. While the harvest data is unquestionably affected by climatological phenomena through their effects on distribution and availability of moose to hunters, it appears that hunters were able to achieve a good harvest during the shortened seasons. The 1965 harvest, the highest on record for the area, was enhanced by unusual accumulations of snow which seemed to precipitate an early movement of moose into the valley floor where road access is excellent. The same conditions prevailed in 1964, but hunting conditions were generally not as good as in 1965. Warm weather followed by sudden freezing created a crust on the snow. The crust conditions combined with extreme low temperatures and high winds during a portion of the season undoubtedly reduced hunting success.

The sustainable annual harvest of antlered males of all ages in the Matanuska Valley is not known precisely, but the number of available 1-1/2-year-old males, which comprise most of the male segment of the population, can be estimated. On the basis of aerial sex and age composition counts and rough estimates of total population, about 500 1-1/2-year-old bulls should be available annually.

The largest moose population in Unit 14 exists between Willow and Talkeetna. While the sustainable annual male harvest in this area cannot be determined easily, it is clear that with present access, only a minimal harvest can be obtained.

The harvest of antlerless animals also reflects the vicissitudes of weather and length and timing of seasons. Generally, seasons are most successful if held during November or early December after the moose have moved into the valley floor where access is good. The outstanding example occurred on November 27, 1965 when approximately 600 antlerless moose were taken in the Matanuska Valley.

In all probability, the harvest of both antlered and antlerless moose will fluctuate considerably until regulations stabilize for a sufficient period to accurately measure the net productivity of the herd. Of course, hunter interest and weather will affect the outcome of any experimentation with season changes.

Moose Harvest, 1963-1966, Unit 15

Moose harvests in Unit 15, like Unit 14, have been affected by regulatory changes, weather, and accessibility. Harvests of antlered males show some decrease, particularly in the lower portion of the Peninsula, and may reflect reduced abundance of harvestable male animals. There are no recent complete aerial surveys that were made at a time when the bull proportion of the population could be evaluated. Partial counts suggest few antlered males remain in the lowland areas with hunting the probable mortality factor.

The large harvests in 1963 and 1964 coincide with snowfall that apparently precipitated migrations to accessible lowland areas. The chronology of the harvest for 1964 verified this observation (Rausch, 1966, Table 72).

The reduced harvest in 1965 may represent the relative availability of antlered moose. Again late November provided the bulk of the harvest (Rausch, 1967, Figure 6).

In 1966, the season was shortened by closing the last 10 days of November. The last week of the season did not produce the dramatic harvest characteristic of late November. The reasons may be twofold, 1) the movement to lowland areas was delayed by mild weather, 2) the last 10 days of the moose season traditionally produce the largest kill in this area.

Understanding the fluctuations in harvest of antlerless moose appears equally complex. Again, weather and regulatory changes apparently caused most of the observed variations (Table 1). In 1963, the season was from September 24 to 30, a period when most moose are not in the accessible lowland areas. The larger harvest in 1964 and 1965 occurred during November seasons when snowfall or normal migration patterns had brought the moose into lowland areas. A season change in 1966 reverted the open period to late September and resulted in a much reduced harvest. The essential point seems to be that in order to effect sizeable harvests over the entire Kenai Peninsula and to ensure harvesting from most population segments, a November or December season is required.

Moose Harvest, 1963-1966, Unit 20

The relatively large population center of Fairbanks and the access available by roads makes Unit 20 the most important

moose hunting Unit in the Interior-Arctic region.

The seasons on antlered moose have remained essentially constant, being August 20 to September 30 and November 1 to November 30. A slight deviation occurred in 1966 when the season closed on September 28 in 20A and 20C, two major subdivisions of the Unit.

The harvest has been characterized by an extreme high in 1963 and a low in 1966. The latter can be explained in part by unusual drought during the summer which resulted in many rivers not being navigable during the hunting season and to the fact that survival of yearlings, the most important cohort from a hunter's standpoint, was especially poor in Unit 20B and A.

The reasons for the larger harvest in 1963 are not known. Opposition to hunting antlerless moose has produced rather conservative regulations for much of Unit 20 that has reasonable access. Thus the area around Fairbanks which has the best highway and river access has never been opened to antlerless hunts. The areas requiring an airplane or specialized off-road equipment to gain access have had liberal antlerless seasons of up to 38 days. Even a liberal season has not offset the lack of access. In 20C there is a fair correlation between length of season and harvest. In 1964, an 8-day antlerless season, September 22 to 30, produced the largest harvest to date. Present data suggests that late September and October seasons on antlerless moose in Unit 20 will provide the best results. November and December seasons have been tried, but the extremely cold and unpredictable weather seems to curtail hunter interest. Extending the seasons from August 20 through December might provide additional opportunity for recreation without endangering present stocks of moose.

Other Important Units

Harvests of moose in Game Management Unit 1, while not large, have been reasonably consistent. Most of the harvest occurs in the Haines-Chilkat Valley area where antlerless moose have been hunted since 1964 (Table 1). Age composition information and aerial count data suggest this is a productive herd capable of sustaining the present harvests. Other herds that are important locally include the Stikine River and Berner's Bay populations. Only antlered males are harvested from these populations.

Data from Game Management Unit 5, (Yakutat) show a remarkably stable harvest under consistent regulations except for the 1966 season (Table 1). Observations by Game Biologist Loyal Johnson suggest extremely inclement weather may have been the principal deterrent to success in that season.

Analysis of other criteria does suggest rather poor survival of the calves-of-the-year for the past two years. Initial production of calves seems to be the highest reported for any area in North America and a large portion of the yearling females (12-24 months old) are breeding. The reasons for the failure of their offspring to survive are not known. One hypothesis concerns a population readjustment following an eruption. Other animal populations have exhibited such an adjustment period after introduction to a new environment. Moose first reached the Yakutat area, presumably from Canada, 30 to 35 years ago. Some range extension may still be going on, particularly to the north toward Cordova. The center of the range exhibits adverse population effects with heavy browsing of willows in some locations. Additional population data are needed in order to test the foregoing hypothesis.

Game Management Unit 9, the Alaska Peninsula, has become the object of increased interest by trophy hunters as some of the largest sets of antlers have been taken there. Liberalization of the bag limit to two moose of either sex in 1964 has not had much impact on the total harvest. Few people (18 in 1965) take two moose. There has been a 50 percent increase in total harvest since 1963 but the sex composition of the harvest has averaged approximately 80 percent males and 20 percent antlerless moose.

Game Management Unit 16, the west drainages of the lower Susitna River, exhibited a considerably increased harvest in 1966 concurrent with more restrictive regulations in adjoining Unit 14 and nearby Unit 15. Apparently some hunters responded to the shortened seasons in the latter Units by using aircraft (the only practical means for hunting in Unit 16) to hunt moose. The abundant moose populations in Unit 16 may be the object of increased utilization with the advent of lottery-type permit hunts in Units 14 and 15 and with the construction of an access road to the Petersville-Cache Creek areas near the excellent moose areas at the foot of the Kahiltna Glacier.

Moose harvests in the remaining Units, while extremely important to local human populations, are not large enough to exhibit trends. In Units 18, 19, 21, 23, 24 and 25 failure to issue or return harvest tickets complicates interpretation of the data. Personal knowledge of the food habits of some villages suggests the harvest estimates for most if not all of the foregoing units are minimal.

Sub-Unit Designations

Several of the Game Management Units, notably 1, 5, 7, 13, 14, 15 and 20, have been divided into geographic sub-units for the purpose of providing additional insight into the harvest of specific or identifiable herds, areas having good access, and problem management areas. Recording of the harvests for these sub-units may yield invaluable trends. At present the data have not been recorded for a long enough period to be meaningful except for a few populations. The data are presented here in tabular form with appropriate place name designations on maps (except for Unit 20) as a permanent record (Table 3-6 and Figs. 1-3).

Harvest Chronology

Bar graphs illustrating the harvest chronology for Units 13, 14, 15 and 20 are shown in Fig. 4. Harvest chronology for the male harvest component has been computed for the past three seasons for Unit 13. The pattern has been nearly identical each year with a large harvest on opening week (15 to 20 percent of the season's harvest), followed by a dip in the second period which is followed by successively increased harvests to the end of September. Eighty to 85 percent of the harvest of fall moose in Unit 13 occurs during the first season, August 20-September 30. With additional experience it should be possible to predict the magnitude of the harvest with reasonable accuracy based upon the returns from the first two or three weeks of the season.

Because antlered moose were not hunted in the Matanuska Valley during the early season in 1964 and 1965, the chronology data for the Unit is not complete and few comparisons can be made. This year's data (Fig. 4) show that approximately 43 percent of the harvest of antlered males occurred in November. The last week was especially important accounting for 20 percent of the total harvest. The pattern established for the early

Table 3. Moose harvest in sub-units of Unit 13, 1966

Unit	♂	♀	No Sex	Total
13-A (1)	200	42	7	249
13-B (2)	83	7	4	94
13-C (3)	101	15	3	119
13-D (4)	119	31	4	154
13-E (5)	82	14	0	96
13-F (6)	328	25	7	360
13-G (7)	56	10	1	67
13-H (8)	7	3	0	10
13-I (7)	290	22	6	318
13-10 (sub-unit unknown)	70	12	4	86
TOTAL UNIT 13	1,336	181	36	1,553

Table 4. Moose harvest in sub-units of Unit 14, 1966

Unit	♂	♀	No Sex	Total
14-1	219	66	3	288
14-2	86	57	0	143
14-3	48	20	4	72
14-4	63	26	0	89
14-5	69	13	0	82
14-6	51	12	1	64
14-10 (sub-unit unknown)	29	8	1	38
TOTAL UNIT 14	565	202	9	776

Table 5. Moose harvest in sub-units of Unit 15, 1966

Unit	♂	♀	No Sex	Total
15-A	382	185	6	573
15-B	119	26	4	149
15-C	258	68	5	331
15-(sub-unit unknown)	60	28	3	91
TOTAL UNIT 15	819	307	18	1,144

Table 6. Moose harvest in sub-units of Unit 20, 1966

Unit	♂	♀	No Sex	Total
20-A	108	34	3	145
20-B	113	4	1	118
20-C	417	117	13	547
20-10 (sub-unit unknown)	176	2	11	189
TOTAL UNIT 20	814	157	28	999

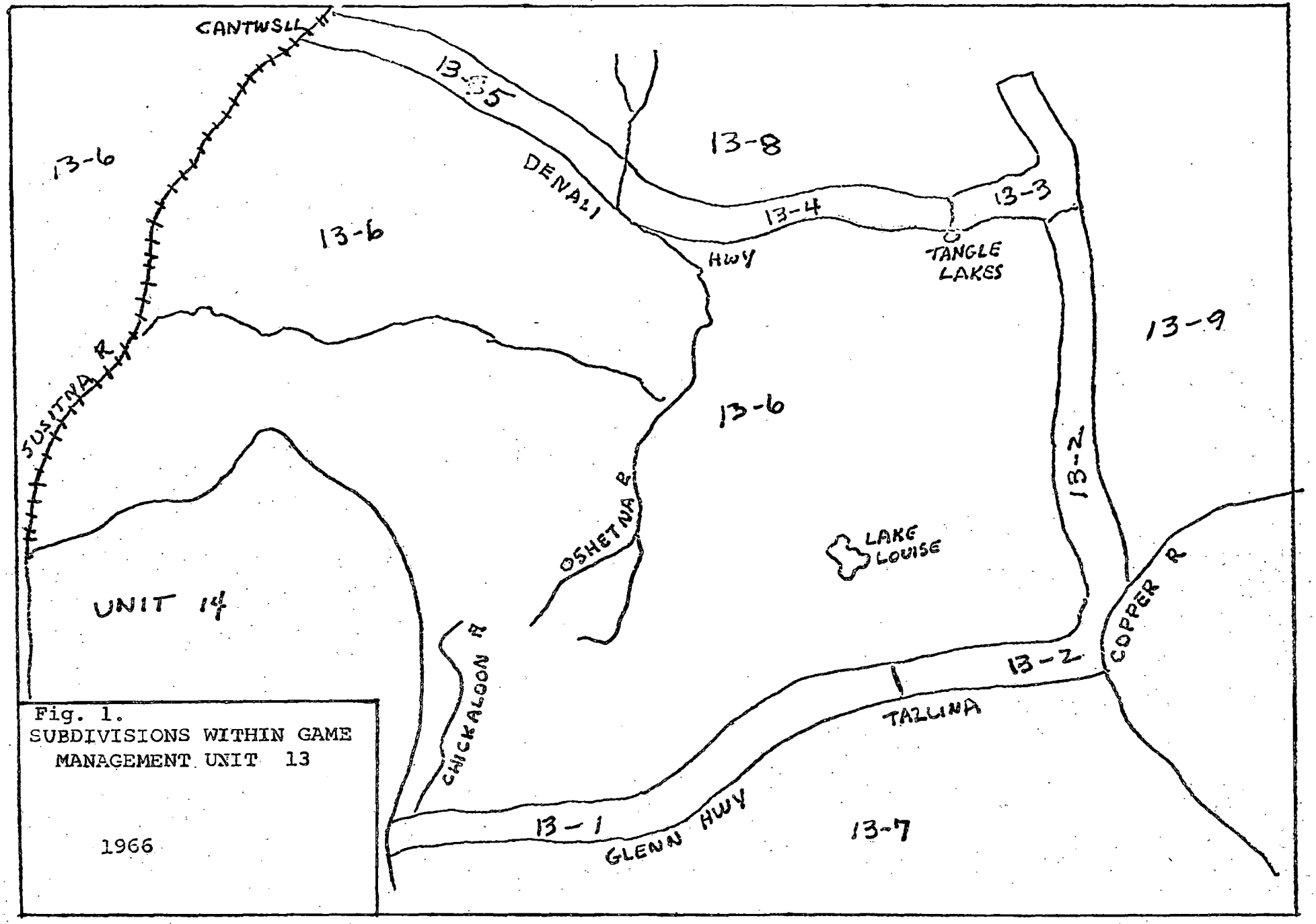


Fig. 1.
SUBDIVISIONS WITHIN GAME MANAGEMENT UNIT 13

1966

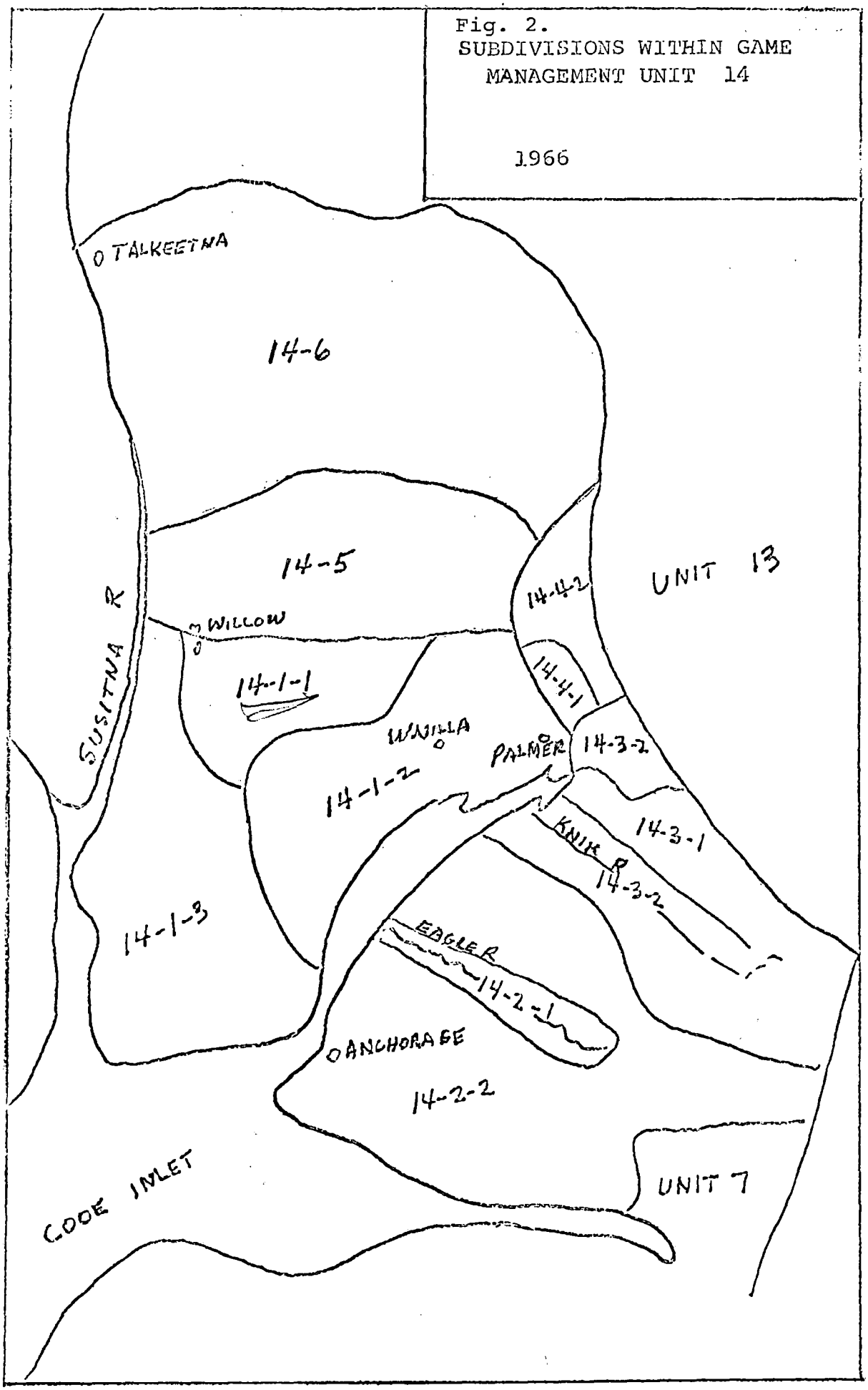


Fig. 2.
SUBDIVISIONS WITHIN GAME
MANAGEMENT UNIT 14
1966
TALKEETNA
14-6
14-5
SUSITNA R
WILLOW
14-1-1
UNIT 13
14-4-2
14-4-1
WASILLA
PALMER
14-3-2
14-1-2
KNIK R
14-3-1
14-3-2
14-1-3
EAGLE R
14-2-1
ANCHORAGE
14-2-2
UNIT 7
COOK INLET

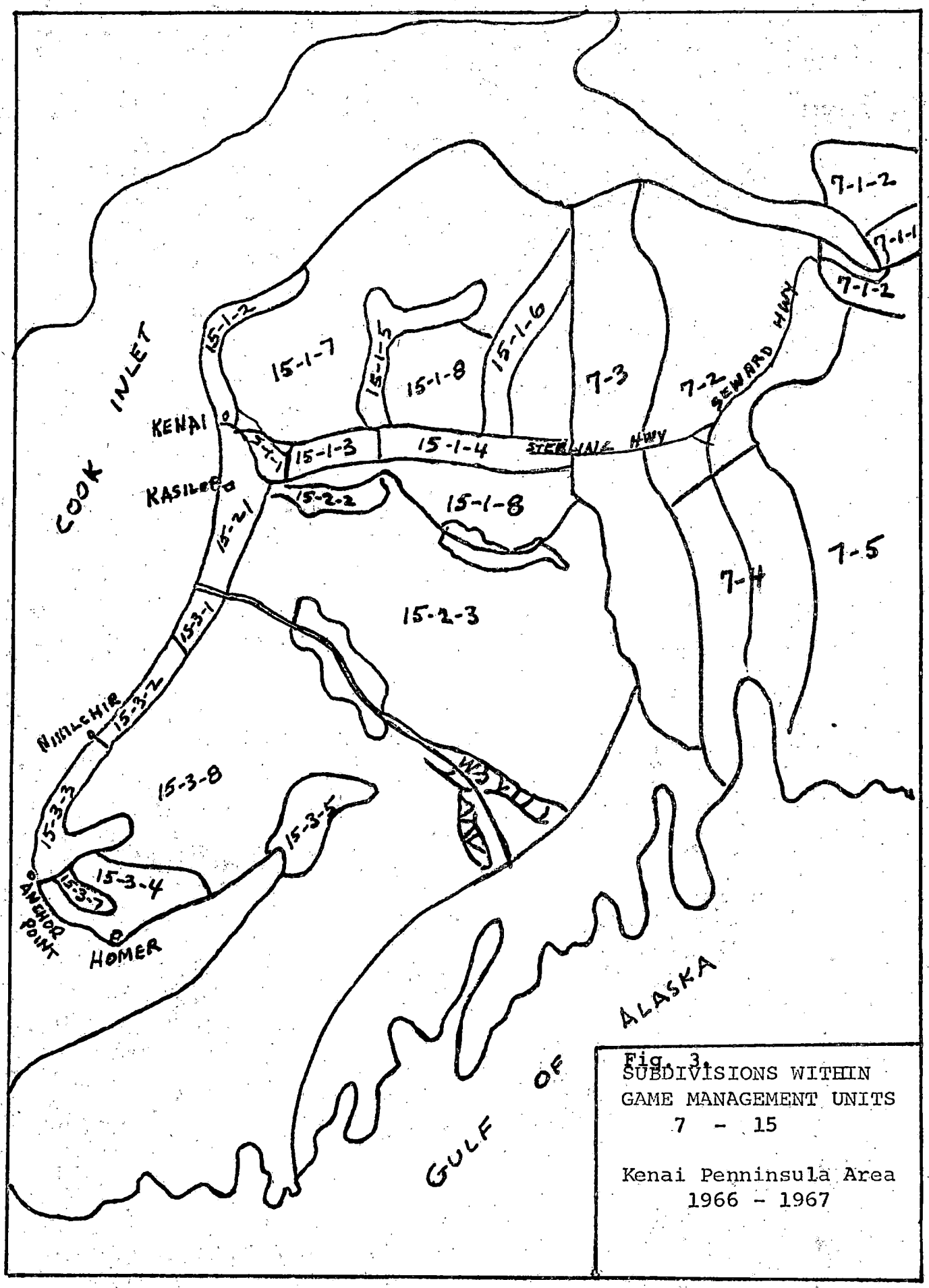
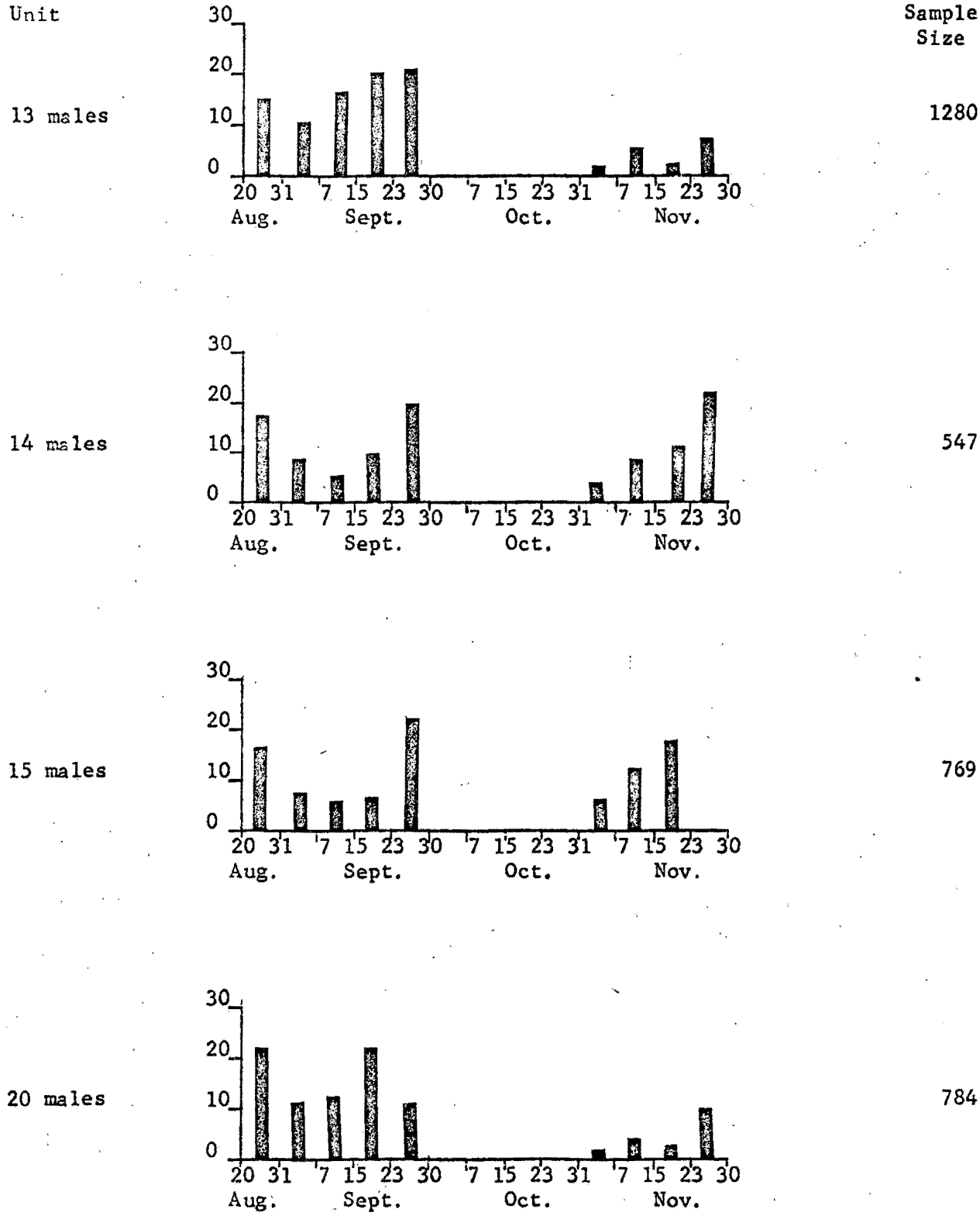


Fig. 3.
SUBDIVISIONS WITHIN
GAME MANAGEMENT UNITS
7 - 15

Kenai Penninsula Area
1966 - 1967

Fig. 4. CHRONOLOGY OF MOOSE HARVEST, EXPRESSED IN PERCENT BY PERIOD, 1966



season is similar to that of Unit 13, but the proportion of the total harvest is considerably smaller. I assume that November is an important portion of the season here because many of the animals are at timberline during the early season and access is not particularly good.

The chronology of harvest changed considerably in Unit 15 with the elimination of the last week of November from the season. In 1964 and 1965, in excess of 50 percent of the harvest of bulls took place during the month of November (Fig. 1). In 1966 only 38 percent of the harvest took place during the same period.

The pattern of harvest during the early season (Aug. 20-Sept. 30) did not change appreciably, with the exception of the last week of September when approximately 23 percent of the annual harvest occurred. In the two preceding years this period accounted for about 10 percent of the annual harvest. Weather conditions may have changed or more probably, the spectre of a short November season was an additional stimulus to the hunters.

The chronology of moose harvest in Game Management Unit 20 has been most consistent and is only slightly different from Unit 13 (Fig. 4). The opening week seems especially important. This is followed by a dip and then gradual improvement with a peak harvest occurring during the third week of September in all 3 years, whereas the last week of the first season seems most productive for that period in Units 13, 14, and 15. The slight change in Interior Alaska may represent local attitudes, weather, or moose behavior characteristics not known to me.

Chronology data is available for all management units but the relatively low harvests in the remaining units cast some doubt on the meaningfulness of annual comparisons. Chronology data can be used to estimate harvests, make decisions relative to reducing or increasing harvests through season manipulations, and to gain further insight into population characteristics, such as population age distribution, i.e. yearling males are considered more vulnerable to hunters than are other age classes, and the harvest during the first week of season tends to confirm or refute estimates of yearling survival which are based on aerial counts.

Age Composition of 1966 Moose Harvest

The age distributions of moose harvested by hunters from Units 5, 13, 14, 15, 20, 22 and miscellaneous units are presented in Fig. 5.

The ages were assigned using the cementum deposition technique first described for moose by Sergeant and Pimlott (1959). Processing of hundreds of teeth required a modification of their method of preparing tooth sections. We devised a technique involving grinding sections with a standard bench grinder using a fine Carborundum wheel and hand-holding the tooth. A longitudinal, labio-lingual section is ground sufficiently thin to allow transmission of enough light to detect the layers of cementum (usually about 0.5 mm). A variable power dissecting miscroscope at 7X to 15X is used to examine the sections.

Age determination based on cementum deposits proved accurate when tested on known-age specimens. Two and three-year-old animals do present some problems as the cementum layers are not always distinct. The layering in dentine may prove useful as a cross check of the age of such animals.

Population age structures derived from harvests are subject to a number of biases. For example, yearling males are believed to be more vulnerable to hunters than are other age classes (Pimlott, 1959). Still, population age structure data collected for a number of hunting seasons when compared to other population data may yield valuable insight into the condition of the population. The perennial problem of inadequate sample size plagues interpretation of the data from some areas but trends may become apparent with time. Only the data collected during the 1966 hunting season is presented in Fig. 5. These data all tend to support trends detected during previous years (Rausch, 1966, 1967).

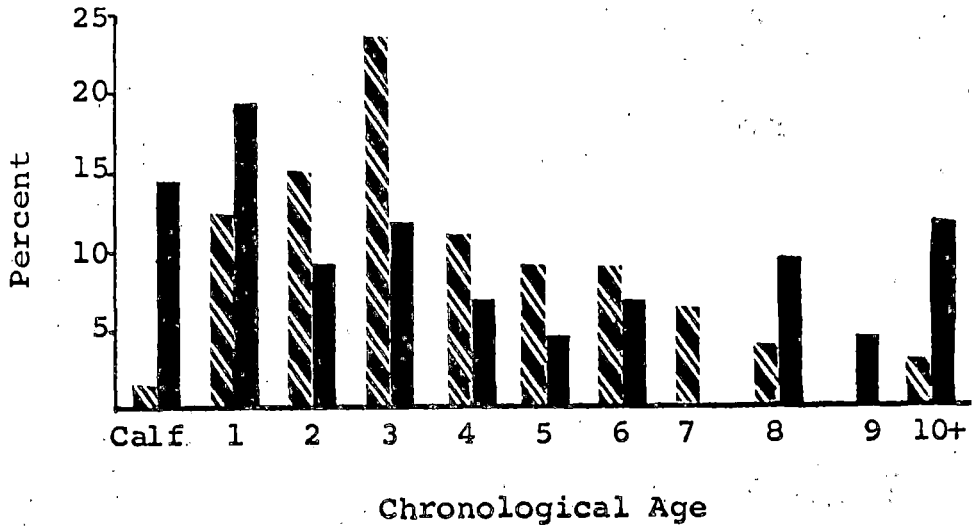
Data from the Yakutat sample illustrates the sensitivity to population characteristics obtainable using the cementum age determination technique. In 1964 the yearling class constituted nearly 40 percent of the harvest. Based only on that year, one might suspect that intensive hunting had altered the age composition of the male population segment. Subsequent harvests in 1965 and 1966 showed that the same strong cohort persisted.

Fig. 5. Age distribution of moose harvested in 1966.

GAME MANAGEMENT UNIT 5
(Yakutat)

Males
Sample Size 71

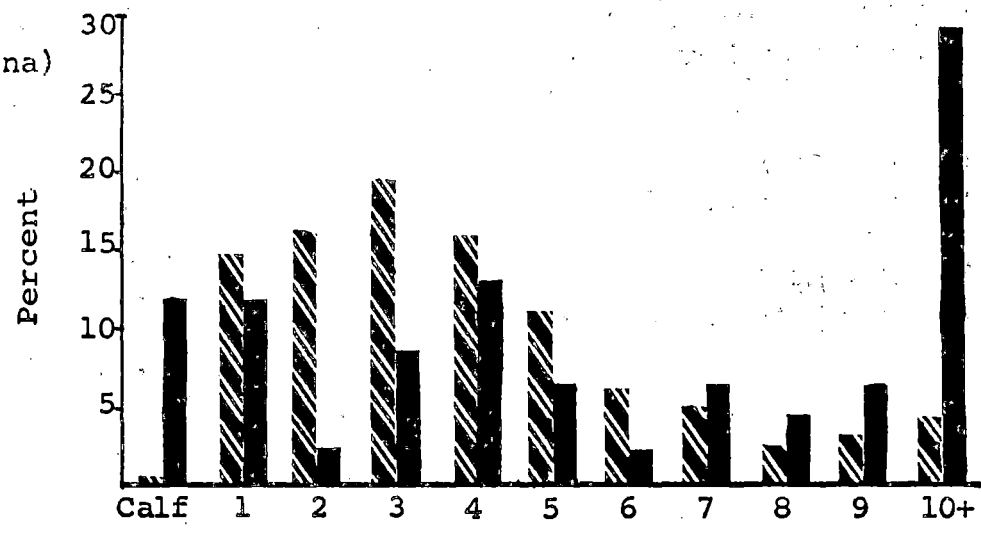
Females
Sample Size 42



GAME MANAGEMENT UNIT 13
(All Unit 13 plus Nabesna)

Males
Sample Size 222

Females
Sample Size 46



GAME MANAGEMENT UNIT 13
(Denali only)

Males
Sample Size 126

Females
Sample Size 32

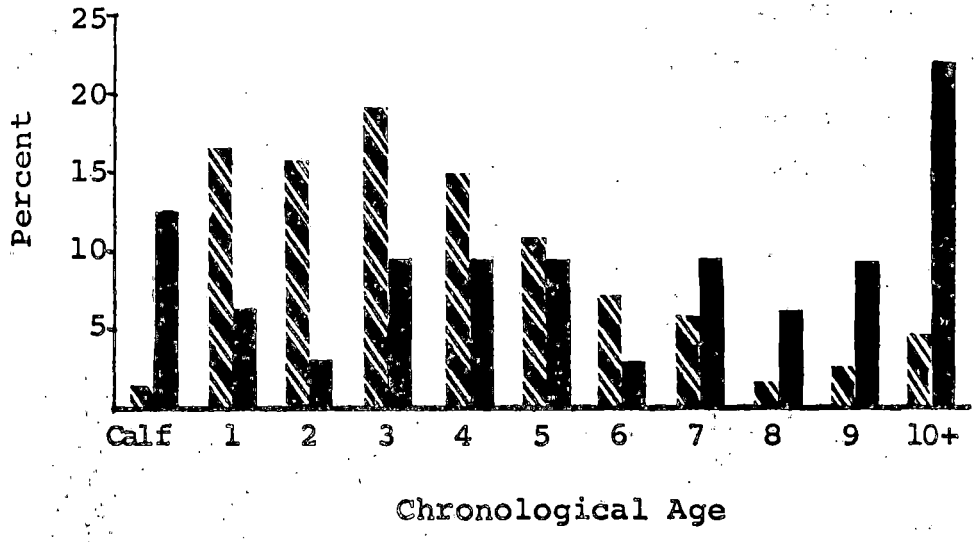
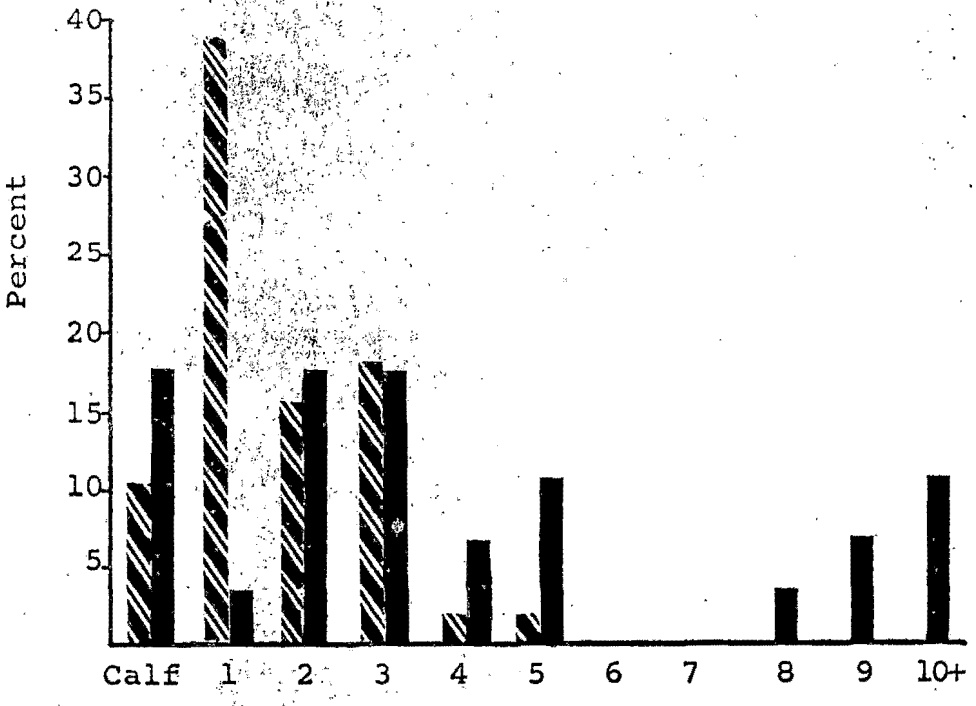


Fig. 5. Age distribution of moose harvested in 1966 (cont.).

GAME MANAGEMENT UNIT 14
(Matanuska Valley)

Males
Sample Size 44

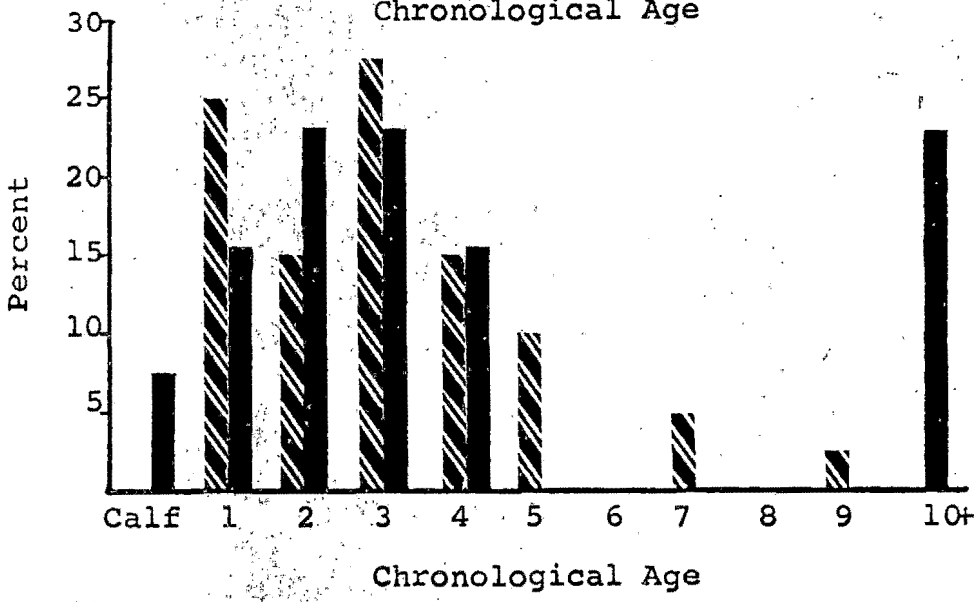
Females
Sample Size 28



GAME MANAGEMENT UNIT 14
(Other than Matanuska Valley)

Males
Sample Size 40

Females
Sample Size 13



GAME MANAGEMENT UNIT 14
(All Areas)

Males
Sample Size 84

Females
Sample Size 41

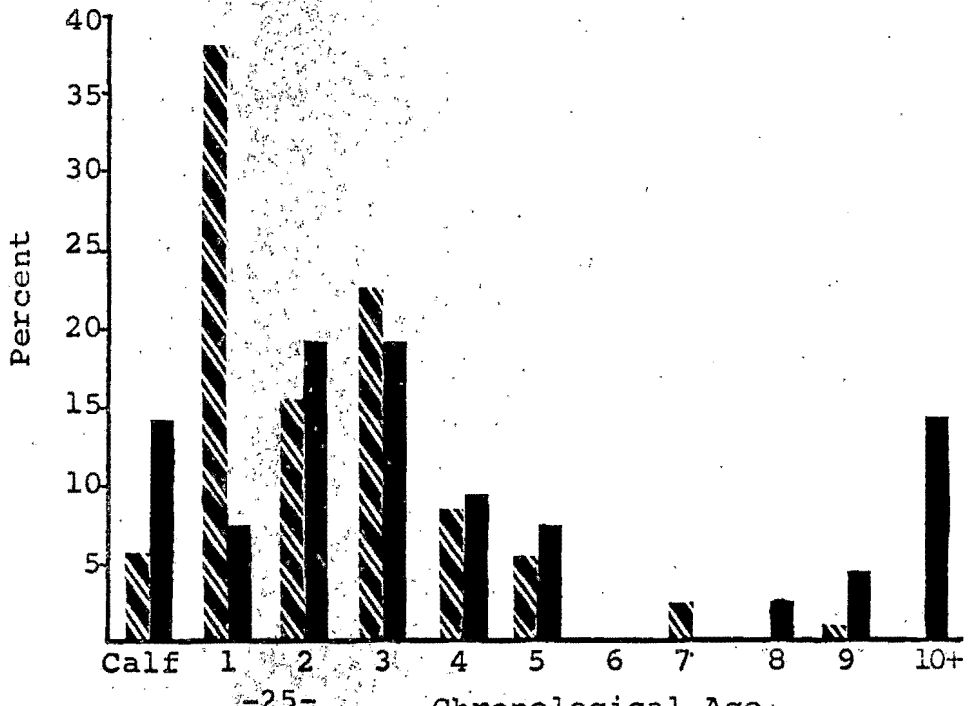
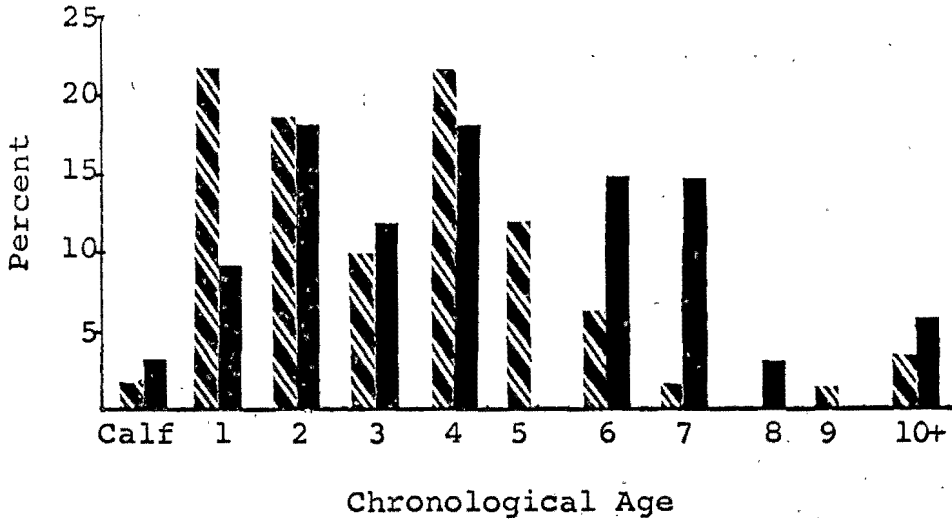


Fig. 5. Age distribution of moose harvested in 1966 (cont.).

GAME MANAGEMENT UNIT 15

Males
Sample Size 59

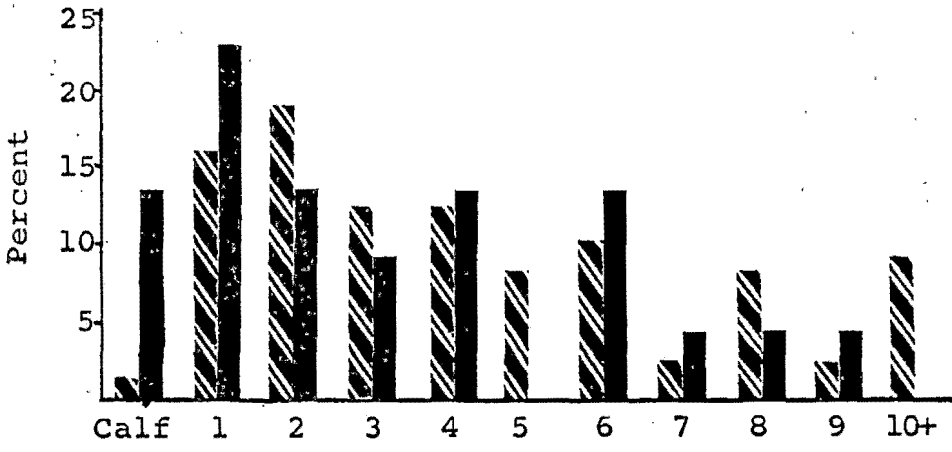
Females
Sample Size 33



GAME MANAGEMENT UNIT 20
(All)

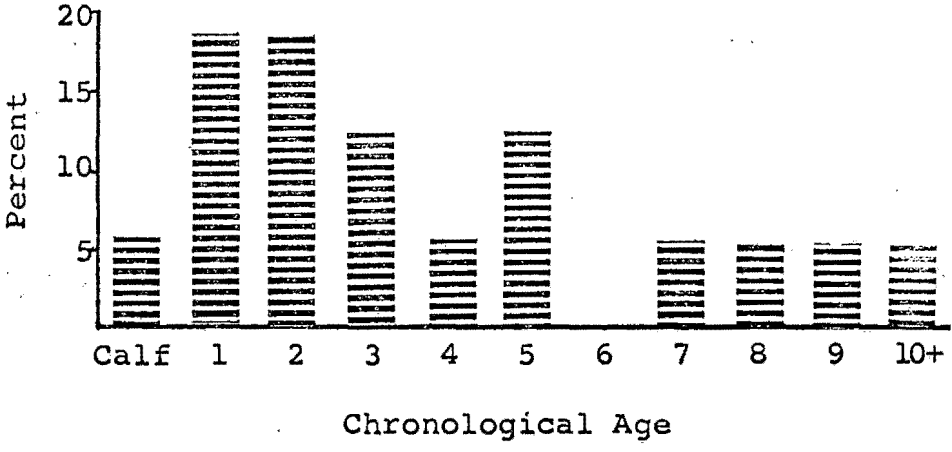
Males
Sample Size 89

Females
Sample Size 22



GAME MANAGEMENT UNIT 20
(20-A)

Both Sexes
Sample Size 16



GAME MANAGEMENT UNIT 20
(20-B)

Both Sexes
Sample Size 40

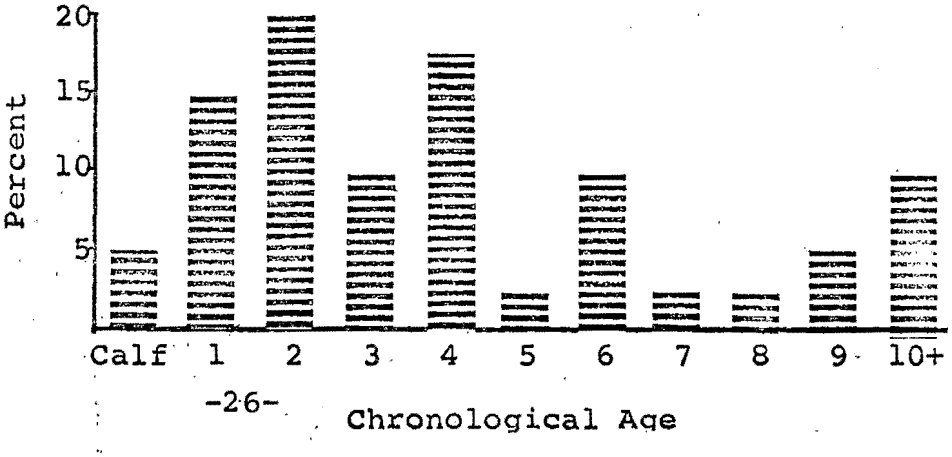
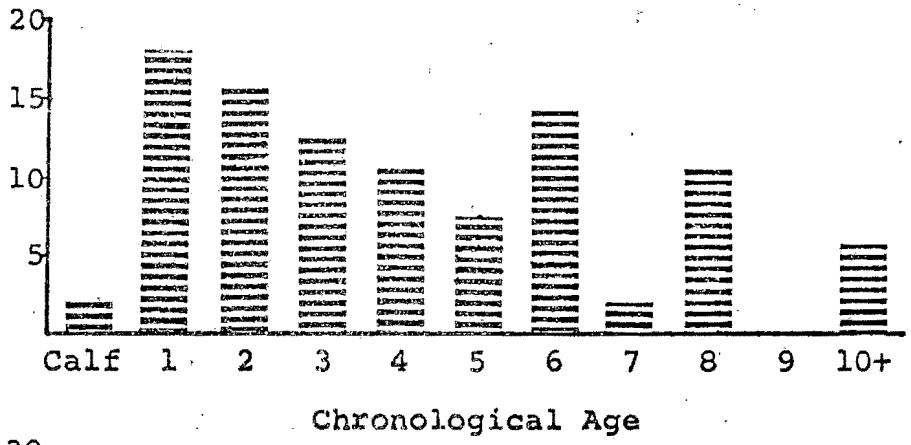


Fig. 5. Age distribution of moose harvested in 1966 (cont.).

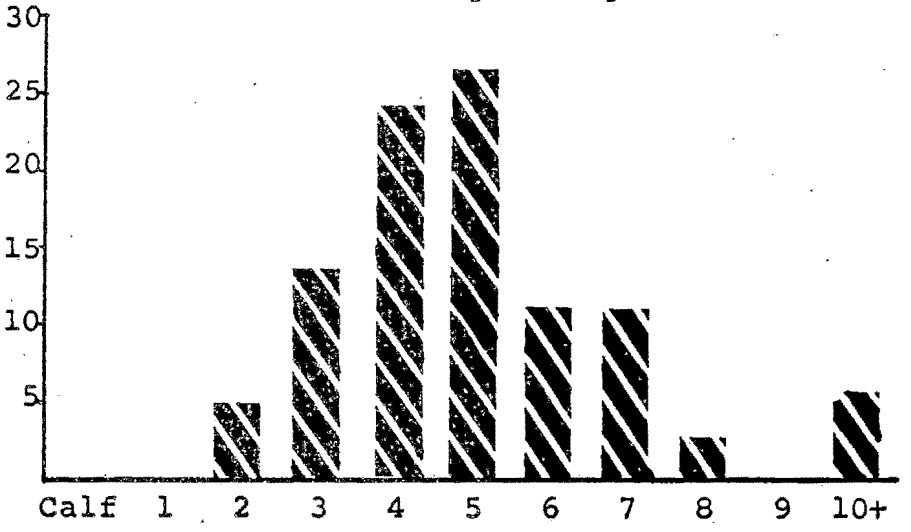
GAME MANAGEMENT UNIT 20
(20-C)

Both Sexes
Sample Size 55



GAME MANAGEMENT UNITS
20 and 12
(Taylor Highway)

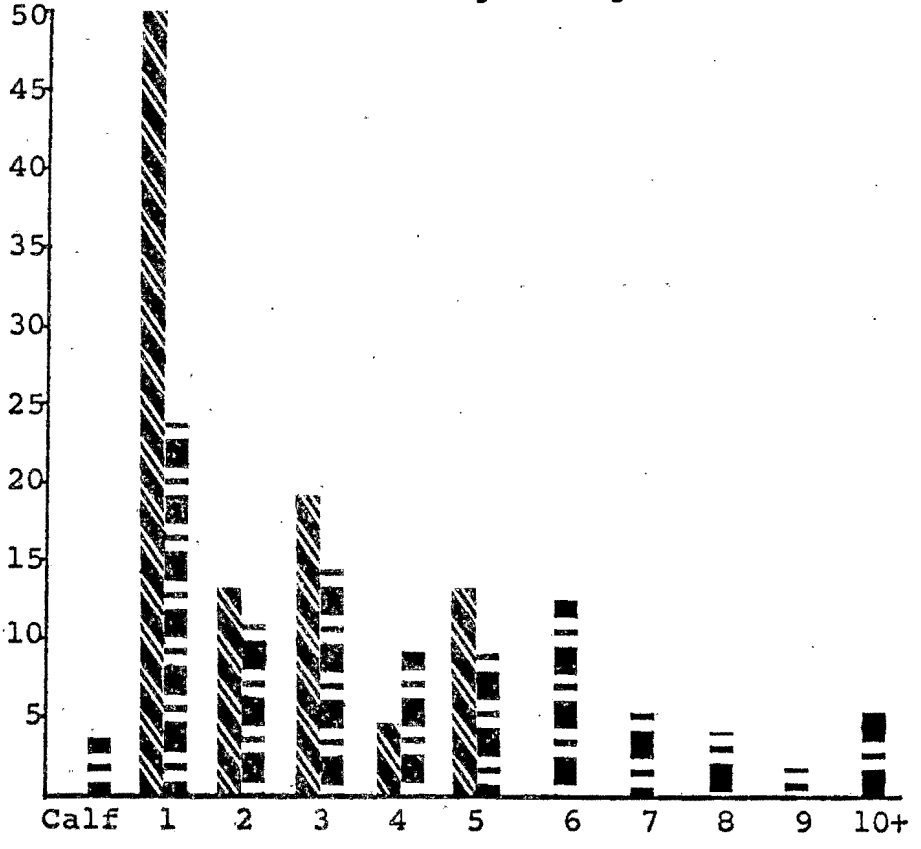
Males Only
(No significant female kill)
Sample Size 37



MISCELLANEOUS UNITS

Unit 22
Males Only
Sample Size 22

Composite Units 19,21, 22,23,23,25
Both Sexes
Sample Size 55



through the third year and strongly suggests that calves born in 1963 did survive in unusual numbers through the 1964, 1965, and 1966 hunting seasons. In fact, in 1966 the harvest of 3-year-old males exceeded the harvest of yearling males--an age class believed to be exceptionally vulnerable to hunting. The information on age composition fits nicely with other population data from Yakutat.

Harvest Ticket Program

The essential features of Alaska's harvest ticket program have been described in previous segment reports (Rausch 1966, 1967) and in a publication (Rausch et al 1966). A comparison of ticket distribution and retrieval since 1963 is provided in Table 7.

The harvest ticket program may not yet have been in operation long enough to yield true trend estimates, but the first 4 years of operation do provide sufficient data for speculation.

Hunter interest when residents and non-residents are considered together has not increased during the past 4 years. We know that more non-resident moose tags are being sold each year; therefore, it appears that resident interest may be decreasing even though total resident population is increasing. This statistic fits the data presented by Peterle (1967) quite well. The results from 1964 are anomalous and suggest a rather sharp drop in hunter participation and an increased hunter success. The sheep harvest data follows this pattern also (Rausch and Jones, 1965). I believe the reduced effort is directly related to the catastrophic earthquake which struck Southcentral Alaska in March 1964. The massive effort to reconstruct the damaged areas provided continuous work for many people who normally terminate in early fall when the construction season usually ends. Thus, there were fewer people available to hunt. Those who traditionally hunt did so with their usual proficiency. Other unknown factors may also influence annual participation by individuals who evidence a desire to hunt by picking up a free harvest ticket but who subsequently fail to exercise their privilege of hunting.

It appears that approximately 20 percent of the tickets are issued to individuals who do not hunt. An analysis of 480 tickets turned in after the February cut-off date for compiling

Table 7. Summary of moose harvest ticket program 1963-1966.

ISSUANCE & RETURN	1963 No.	1963 %*	1964 No.	1964 %*	1965 No.	1965 %*	1966 No.	1966 %*
Tickets issued	32,412	100	29,904	100	32,924	100	31,549	100
Ticket reports returned	30,563	94.2	27,731	92.7	30,864	93.8	28,210	89.4
Ticket reports outstanding	1,849	5.8	2,173	7.3	2,060	6.2	3,339	10.6
Could not contact	------	----	791	2.6	862	2.6	637	2.0
No response to reminder letters	------	----	1,382	4.6	1,198	3.6	2,702	8.5

* Percentages for issuance based on tickets issued.

ANALYSIS OF RETURNS	No.	%**	No.	%**	No.	%**	No.	%**
Successful hunters	8,860	35.2	8,770	41.4	8,620	----	7,048	32.2
Antlered kill	6,847	----	6,016	----	6,040	----	5,450	----
Antlerless kill	1,981	----	2,684	----	2,470	----	1,444	----
Sex unknown kill	32	----	70	----	104	----	154	----
Unsuccessful hunters	16,287	64.8	12,365	58.6	-----	----	14,791	67.8
Did not hunt	5,415	16.7	6,380	21.3	-----	----	6,371	20.1
Total, unsuccessful did not hunt	21,702	71.0	18,745	67.5	22,244	67.5	21,162	75.0

** Percentages: For successful and unsuccessful based on number who hunted; for did not hunt and total, unsuccessful and did not hunt, based on reports returned.

data shows that 90 percent of the late tickets were submitted by individuals who did not hunt, hunted unsuccessfully, or provided no information. Establishing a fee for the harvest ticket might reduce this problem, but the desirability of such a change is not a proper consideration here.

From 1963-1965 over 90 percent of all tickets issued were retrieved. Maintenance of this level of return required sending delinquent permittees one or two reminder letters. This portion of the program has been expensive, difficult to coordinate and caused irritation to members of the public who received a reminder letter after they had submitted the required report. In 1966 problems attendent to the sheep harvest ticket program reminder letter mail-out were so great that a decision was made to send only one reminder letter to delinquent moose ticket holders. This probably accounts for the drop in retrieval rate to 89.4 percent. As mentioned earlier, only 10 percent of a sample of 480 late tickets were from successful hunters. Extrapolation to the total of the outstanding tickets would add only 270 moose to the harvest.

In view of the high voluntary return of tickets by successful hunters and the problems associated with mailing approximately 10,000 first reminder letters, a second reminder letter does not appear warranted.

Additional Analyses of Harvest Tickets

In order to keep abreast of management needs and to provide tools necessary for more precision in management of indentifiable moose populations and problem geographic areas, three new types of information were extracted from harvest ticket reports and the returned reminder letters. These include an index to hunting success for each game management unit, a listing of hunter-residence and hunting area by Game Management Unit and sub-unit, and a listing of the methods of transportation used by successful and unsuccessful hunters. The latter two compilations are rather lengthy, but they are presented in detail because management problems frequently revolve about small geographic areas. Since this is the first year that these indices have been compiled, caution should be exercised in interpretation. Trends reflecting patterns of hunting success, geographic hunting habits of individuals, and

preferred transportation equipment probably will not be evident until data from several years is available.

Index to Hunting Success

The index to hunting success for each Game Management Unit is presented in Table 8. The index was constructed from direct enumeration of the number of moose reported for each unit using the ratio derived from "total known unsuccessful" and the "total unsuccessful area given." The assumption is that the number of hunters who failed to report where they hunted unsuccessfully was proportional for each unit. At present there is no way for evaluating this assumption. Unsuccessful hunters totalled 14,791 of which 4,149 or 28 percent indicated the Unit in which they hunted unsuccessfully. The estimates in Table 8 were obtained in the following manner: unsuccessful Unit reported = .28X of estimated total unsuccessful hunters. There is no way of determining the precision of the hunter-success index, but the estimates seem reasonable. Units such as 13, 14, 15, and 20 that are hunted intensively and where cars are used extensively for weekend or "family" hunts show a lower success ratio than do Units with abundant moose populations where access is limited to aircraft or riverboats. Examples are Units 9, 11, 16, 24 and 25.

Hunter Residence and Areas Hunted

The residence of successful hunters is presented in Tables 9 and 10. This breakdown will provide additional insight into local problems concerning "outsiders" utilizing resources regarded as private property by some residents. A detailed breakdown of residence of successful hunters is listed in Table 10.

A detailed listing of the unit and sub-unit areas where unsuccessful hunters hunted is provided in Table 11. These totals could be compared with sub-unit harvest totals to arrive at another index to success for local areas. The validity of such comparisons cannot be evaluated at this time. For this year the data is presented without analysis.

Transportation Used by Successful and Unsuccessful Hunters

A survey of transportation methods of successful and

Table 8. Index to Moose Hunter Success, 1966. Estimates Based on Replies to Harvest Ticket Follow-up Letters and Reported Moose Harvest.

Unit	Reported Unsuccessful Unit Given	Estimated Unsuccessful	Reported Successful	Total Estimated Hunters	Percent Successful
1	293	1,045	230	1,275	18.0
5	103	367	212	579	36.6
6	42	150	24	174	13.8
7	93	332	113	445	25.4
9	55	196	323	519	62.2
11	28	100	163	263	62.0
12	109	389	182	571	31.9
13	732	2,610	1,553	4,163	37.3
14	962	3,430	776	4,206	18.4
15	515	1,836	1,144	2,980	39.4
16	76	271	555	826	67.2
17	18	64	26	90	28.9
18	29	103	33	136	24.3
19	46	164	183	347	52.7
20	895	3,191	994	4,185	23.8
21	38	136	166	302	55.0
22	63	225	54	279	19.4
23	23	82	69	151	45.7
24	6	21	72	93	77.4
25	19	68	83	151	55.0
26	4	14	12	26	46.2
TOTALS	4,149	14,794	6,967	21,761	32.0
Statewide Total Unsuccessful Reported With and Without Unit Given		14,791			

unsuccessful hunters was conducted in conjunction with the reminder letters to delinquent permittees. It was intended to provide further insight into the characteristics of moose hunters and moose hunting. The results from the 1966 hunting seasons are presented in Tables 12 through 15.

In this first effort ten types of transportation were listed: car, tracked vehicle, river boat, tote goat, horses, four-wheel drive, swamp buggy, airplane, snow-go, and afoot. The instructions provided hunters the opportunity to list as many of the separate types of hunting transportation as required.

The specific methods of transportation used on successful hunts are listed in Tables 12 and 13 for those hunters who used one or two types of transportation. These hunters accounted for 605 (84 percent) of 724 moose for which method of transport was listed.

Methods of unsuccessful hunters are listed in Tables 14 and 15. Again only those who used one or two methods are listed.

Discussion

The data suggests that cars in combination with walking is a popular method for seeking moose. The reported car-afoot accounted for 193 (20 percent) of 724 moose and 2,062 (52 percent) of the 3,987 hunts reported as unsuccessful.

Among hunters who used one method of transport those who used aircraft accounted for 128 (18 percent) of 724 moose reported. Only 86 of 2,147 unsuccessful hunters using one method of transport did so with aircraft. The success ratio of those individuals using expensive specialized equipment seems high.

Table 9. Summary, Hunter Residence of Successful Moose Hunters, 1966.

Unit	Residence Within Unit	Residence Outside Unit	Out of State	Foreign Country	Total Known	Total not Known
1	174	46	1	0	221	9
5	47	118	40	1	206	6
6	19	2	0	0	21	3
7	37	64	8	0	109	4
9	66	103	69	13	251	72
11	3	116	16	0	135	28
12	31	96	29	5	161	21
13	138	1,035	217	0	1,390	163
14	658	22	24	1	705	71
15	532	482	34	8	1,056	88
16	4	404	67	2	477	78
17	20	0	1	0	21	5
18	24	2	0	0	26	7
19	69	47	5	2	123	60
20	742	97	55	4	898	96
21	53	69	0	0	122	44
22	46	1	1	0	48	6
23	50	10	1	0	61	8
24	50	12	5	0	67	5
25	37	27	10	0	74	9
26	2	8	2	0	12	12

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 1	Number of Successful Hunters
Ketchikan	7
Wrangell	22
Petersburg	16
Douglas	9
Juneau	65
Sitka	3
Fort Richardson	1
Haines	90
Chitna	1
Skagway	3
Fairbanks	1
Wrangell	1
Fort Yukon	1
Oregon	1
Unit 5	
Anchorage	11
Annette	2
Auke Bay	6
Cordova	2
Douglas	9
Hoonah	3
Juneau	46
Kenai	1
Ketchikan	10
Haines	1
Mt. Edgecumbe	3
Pelican	1
Sitka	17
Petersburg	2
Wrangell	4
Yakutat	47
California	7
Hawaii	2
Illinois	1
Ohio	1
Oregon	2
Washington	27
Italy	1
Unit 6	
Anchorage	2
Cordova	19

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 7	Number of Successful Hunters
Anchorage	49
Chugiak	1
Cooper Landing	2
Copper Center	1
Hope	1
Kenai	3
Moose Pass	7
Palmer	1
Seward	27
Soldotna	1
Wildwood	1
Elmendorf AFB	5
Fort Richardson	2
California	3
Georgia	1
Michigan	1
Tennessee	2
Indiana	1

Unit 9	
Anchorage	40
Aniak	1
Auke Bay	2
Cantwell	1
Chignik	3
Chignik Lagoon	5
Cohoe	1
Cold Bay	3
Dillingham	16
Eagle River	3
Fairbanks	1
Homer	1
Iliamna	1
Kenai	1
Kodiak	15
King Salmon	10
Kotzebue	1
Levelock	6
Manokotak	1
Naknek	27
Palmer	3
Pedro Bay	2
Sand Point	2
Seldovia	1
Seward	2
Skwentna	1
South Naknek	6
Unalakleet	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 9 (Cont.)	Number of Successful Hunters
Wasilla	1
Elmendorf AFB	3
Fort Richardson	2
Kodiak	3
APO - FPO	3
California	10
Colorado	1
Florida	3
Illinois	11
Indiana	3
Iowa	1
Louisiana	5
Maryland	1
Missouri	4
Montana	1
New York	2
North Dakota	1
Ohio	1
Oregon	4
South Dakota	2
Texas	4
Utah	2
Washington	8
West Virginia	1
Wisconsin	3
Wyoming	1
Austria	2
Germany	9
Japan	2
Unit 11	
Anchorage	67
Auke Bay	2
Chitna	2
Copper Center	1
Cordova	13
Eagle River	2
Fairbanks	4
Gakona	6
Glennallen	6
Haines	1
Juneau	1
Sitka	1
Skagway	1
Valdez	11

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 11 (Cont.)	Number of Successful Hunters
California	2
Florida	3
Georgia	1
Idaho	1
Louisiana	1
Michigan	1
Montana	1
Oklahoma	1
Oregon	3
Pennsylvania	1
Washington	1

Unit 12	
Anchorage	42
College	1
Cordova	1
Delta Junction	4
Fairbanks	11
Gakona	8
Girdwood	1
Glennallen	3
Haines	1
Kenai	1
Ketchikan	3
Northway	6
Nulato	1
Palmer	2
Seward	1
Sitka	6
Skagway	1
Tanacross	2
Tanana	1
Tetlin	2
Tok	21
Valdez	1
Eielson AFB	3
Elmendorf AFB	3
Ward Cove	1
California	6
Colorado	4
Illinois	2
Maryland	2
Michigan	1
Montana	1
New York	1
North Dakota	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 12 (Cont.)	Number of Successful Hunters
Oregon	3
Pennsylvania	2
Texas	1
Utah	3
Wisconsin	1
Washington	1
Austria	1
Germany	3
Spain	1
Unit 13	
Ambler	1
Anchorage	497
Anchor Point	2
Auke Bay	2
Cantwell	18
Chitina	1
Chugiak	20
Clam Gulch	2
College	18
Copper Center	27
Cordova	5
Delta Junction	9
Douglas	3
Eagle River	37
Eska	2
Fairbanks	132
Gakona	37
Glennallen	45
Homer	1
Juneau	18
Kenai	10
Ketchikan	9
Kodiak	2
McKinley Park	3
Moose Pass	1
Naknek	1
Ninilchik	2
North Pole	3
Northway	1
Palmer	89
Paxson	7
Pelican	1
Petersburg	4
Seward	3
Sitka	2

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 13 (Cont.)	Number of Successful Hunters
Skagway	8
Sleetmute	4
Summit	1
Sutton	5
Talkeetna	5
Tanana	1
Tok	13
Unalaska	2
Valdez	18
Ward Cove	2
Wasilla	9
Wrangell	6
Eielson AFB	27
Elmendorf AFB	30
Fort Greely	5
Fort Richardson	12
Fort Wainwright	8
APO - FPO	2
Alabama	1
Arizona	2
Arkansas	1
California	55
Colorado	6
Georgia	1
Idaho	2
Illinois	11
Indiana	2
Iowa	2
Kansas	1
Louisiana	2
Michigan	6
Minnesota	10
Mississippi	2
Montana	1
New Mexico	4
New York	5
North Carolina	2
North Dakota	5
Ohio	10
Oklahoma	2
Oregon	22
Pennsylvania	6
South Dakota	3
Texas	10
Utah	6
Virginia	1
Washington	28
West Virginia	1
Wisconsin	6
Wyoming	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 14	Number of Successful Hunters
Anchorage	361
Annette	1
Auke Bay	1
Chugiak	14
Eagle River	39
Eska	1
Fairbanks	2
Girdwood	7
Glennallen	1
Juneau	1
Kenai	1
Palmer	124
Seward	2
Sutton	14
Talkeetna	1
Wasilla	42
Willow	13
Elmendorf AFB	43
Fort Richardson	6
APO - FPO	6
California	7
Idaho	1
Illinois	1
Michigan	2
Minnesota	2
Missouri	1
Oregon	4
Texas	2
Utah	1
Washington	2
Wisconsin	1
Germany	1

Unit 15	
Anaktuvuk Pass	2
Anchorage	343
Anchor Point	30
Auke Bay	1
Chignik Lagoon	1
Chugiak	4
Clam Gulch	6
Cohoe	3
Cold Bay	2

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 15 (Cont.)	Number of Successful Hunters
Cooper Landing	2
Copper Center	1
Cordova	2
Eagle River	4
Fairbanks	6
Homer	66
Juneau	8
Kasilof	25
Kenai	135
Kodiak	16
Moose Pass	2
Ninilchik	91
Seldovia	4
Seward	48
Sitka	2
Soldotna	147
Sterling	20
Tanana	2
Toynek	1
Wildwood	5
Elmendorf AFB	28
Fort Richardson	6
APO - FPO	1
California	7
Connecticut	1
Hawaii	2
Indiana	1
Iowa	2
Massachusetts	1
Missouri	3
Oregon	5
Pennsylvania	1
South Dakota	1
Utah	2
Virginia	1
Washington	5
Wisconsin	2
Germany	8
Unit 16	
Anchorage	337
Bethel	1
Chugiak	10
Eagle River	11
Glennallen	1
Juneau	2

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 16 (Cont.)	Number of Successful Hunters
Kalskag	1
Kenai	8
Moose Pass	1
Ninilchik	1
Palmer	5
Seward	2
Sitka	1
Skwentna	3
Soldotna	5
Sterling	2
Talkeetna	10
Toyonek	1
Wasilla	7
Willow	3
Elmendorf AFB	19
Fort Richardson	10
APO - FPO	1
California	13
Colorado	2
Connecticut	1
Illinois	2
Minnesota	1
Oklahoma	2
Oregon	3
Pennsylvania	1
Tennessee	1
Texas	2
Utah	1
Washington	4
Canada	1
Germany	1
Unit 17	
Aleknagik	6
Dillingham	9
Ekwak	4
New Stuyahok	1
California	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 24	Number of Successful Hunters
Allakaket	20
Anchorage	2
Bettles Field	8
Fairbanks	2
Fort Yukon	1
Galena	2
Hughes	8
Huslia	14
Nenana	1
Tanana	1
Eielson AFB	1
Fort Greely	1
Fort Wainwright	1
Georgia	1
Illinois	1
Texas	2
Utah	1
Unit 25	
Barrow	1
Beaver	1
Chalkyitsik	3
Circle	4
College	4
Eagle	1
Eagle River	1
Fairbanks	15
Fort Yukon	31
Stevens Village	1
Tok	1
Venetie	1
California	3
Maryland	1
New York	1
Tennessee	1
Texas	1
Washington	3
Unit 26	
Barrow	2
Fairbanks	4
Huslia	1
Kiana	2
Kotzebue	1
Missouri	1
Texas	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 21 (Cont.)	Number of Successful Hunters
Nome	2
Red Devil	2
Shageluk	1
Tanana	38
Unalakleet	2
Wasilla	1
Eielson AFB	1
Fort Greely	1
Fort Wainwright	1
Unit 22	
Elim	1
Fairbanks	1
Indian	1
Koyuk	2
Moses Point	1
Nome	21
Shaktoolik	1
Shishmaref	5
Teller	4
Unalakleet	10
Utah	1
Unit 23	
Ambler	2
Anchorage	1
Buckland	3
Delta Junction	1
Elim	1
Fairbanks	2
Kiana	6
Kobuk	10
Kotzebue	15
Noatak	3
Noorvik	5
Shishmaref	3
Shungnak	6
Teller	2
Alabama	1

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 20 (Cont.)	Number of Successful Hunters
Alabama	1
California	12
Colorado	1
Connecticut	1
Hawaii	2
Kansas	1
Louisiana	2
Michigan	2
Minnesota	1
Montana	1
Nebraska	1
New Mexico	2
New York	2
Ohio	1
Oklahoma	1
Oregon	9
Pennsylvania	3
Rhode Island	1
Utah	1
Washington	9
Wisconsin	1
Austria	1
Germany	3
Unit 21	
Akiak	2
Allakaket	1
Anchorage	2
Aniak	3
Bethel	22
Delta Junction	1
Dillingham	1
Fairbanks	11
Flat	1
Fortuna Ledge	1
Fort Yukon	2
Galena	11
Holy Cross	3
Huslia	2
Kalskag	1
Kasigluk	1
Kenai	1
Kotzebue	2
McGrath	1
Napakiak	1
Nenana	2

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 20	Number of Successful Hunters
Anchorage	20
Auke Bay	3
Barrow	2
Beaver	1
Cantwell	3
Chicken	2
Circle	2
Circle Springs	1
Clear	30
College	71
Cordova	2
Delta Junction	66
Dot Lake	1
Douglas	3
Eagle	4
Ester	3
Fairbanks	393
Fort Yukon	4
Glennallen	1
Haines	3
Healy Fork	7
Hoonah	1
Juneau	20
Ketchikan	1
Lake Minchumina	6
McKinley Park	2
Manley Hot Springs	2
Nenana	32
Nome	2
North Pole	9
Northway	1
Palmer	3
Skagway	2
South Naknek	2
Sterling	1
Tanana	3
Tok	12
Usabelli	3
Wasilla	2
Eielson AFB	41
Elmendorf AFB	3
Fort Greely	42
Fort Richardson	1
Fort Wainwright	26

Table 10. Residence of moose hunters successful in Game Management Units 1 through 26.

Unit 18	Number of Successful Hunters
Akiachak	2
Akiak	2
Bethel	10
Eek	4
Fortuna Ledge	2
Juneau	1
Kwethluk	2
Nunapitchuk	1
Quinhagak	1
Teller	1
Unit 19	
Akiachak	1
Akiak	9
Anchorage	4
Aniak	15
Auke Bay	1
Bethel	20
Cantwell	1
Crooked Creek	7
Delta Junction	1
Dillingham	1
Galena	1
Kalskag	1
Kasigluk	2
Kenai	1
Kotzebue	1
Kwethluk	1
McGrath	38
Medfra	5
Nikolski	1
Red Devil	1
Sleetmute	1
Soldotna	1
Elmendorf AFB	2
California	2
Florida	1
Mississippi	1
Ohio	1
Austria	1
Germany	1

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
UNIT 1			
Unuk River	1-1-1	8	
Stikine River	1-1-2	65	
Muddy River, Thomas Bay	1-1-3	20	93
Taku River	1-2-1	40	
Berners Bay	1-2-2	51	91
Lower Chilkat River	1-3-1	5	
Upper Chilkat River	1-3-2	6	
Chilkat Lake	1-3-5	6	
Chilkat Valley (exact area unknown)	1-3-10	92	109
			293
UNIT 2			
	2	9	9
UNIT 5			
Yakutat Road System	5-1-1	54	
Situk Strip	5-1-3	7	61
Ahrnklin, Seal and Antlen Rivers	5-2	3	3
Dangerous River	5-3-1	5	
Dangerous River Strip	5-3-2	3	8
Harlequin Lake	5-4	7	7
Italio River	5-5-1	5	5
Square Lake	5-7-2	8	8
Tanis Mesa	5-8	2	2
Dry Bay, Alsek River	5-9-1	5	
East River Strip	5-9-3	1	6

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
UNIT 5 (Cont.)			
Sub Unit Unknown	5-10	3	103
UNIT 6			
	6	42	42
UNIT 7	7-1	1	
Portage, 20 Mile River	7-1-1	9	
Remainder of 7-1	7-1-2	4	14
	7-2	30	30
	7-3	17	17
	7-4	12	12
	7-5	4	4
	7-10	16	93
UNIT 9	9	55	55
UNIT 11	11	28	28
UNIT 12	12	109	109
UNIT 13			
Glenn Highway	13-1	156	156
Glennallen	13-2	54	54
Paxson	13-3	88	88
Denali Highway, 20 mile to 80 mile	13-4	77	77
Mile 80 to McKinley Park	13-5	22	22
Center Unit 13, including Lake Louise, Oshetna River, Susitna River	13-6	119	119
Copper Center, 2 miles south Glenn Highway	13-7	28	28

Table 11 Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
UNIT 13, (Cont.)			
Area 2 miles north and west Denali Highway, Richardson Highway	13-8	1	1
Two miles east of Richardson Highway to Copper River	13-9	58	58
Sub-Unit Unknown	13-10	129	732
UNIT 14			
Houston to Willow	14-1-1	8	
Matanuska Valley	14-1-2	378	
Susitna Flats	14-1-3	16	
Unknown	14-1-8	1	403
Eagle River Drainage	14-2-1	44	
All other 14-B	14-2-2	72	116
Knik River Drainage	14-3-1	33	
All other 14-C	14-3-2	28	61
Sutton, Jonesville, Wolverine	14-4-1	31	
Mile 61 Glenn to 76 Mile	14-4-2	9	40
Willow	14-5	164	
Talkeetna	14-6	116	280
Sub-Unit Unknown	14-10	62	62
UNIT 15			
Kenai-East Forelands Road	15-1-1	16	
Kenai Spur Road (Soldotna to Kenai)	15-1-2	15	
Sterling Highway, Mile 95 to 81 Soldotna/Sterling	15-1-3	7	

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
Mile 81 to 55 Sterling to east Boundary 15	15-1-4	11	
Swanson River Road, Swan Lake Road	15-1-5	43	
Mystery Creek-Pipeline Road	15-1-6	21	
All other Areas	15-1-7	7	
Moose River	15-1-8	86	296
Mile 95 to 110 Soldotna to Kasilof River, Kalifonsky Beach	15-2-1	0	
Funny River Road, Homestead Area	15-2-2	16	
Balance of 15-B	15-2-3	6	31
Mile 110 to 118 Kasilof River to Clam Gulch	15-3-1	12	
Mile 118 to 135, Clam Gulch to Ninilchik Oil Well Road	15-3-2	17	
Mile 135 to 156 Ninilchik to Anchor Point	15-3-3	15	
All roads south and east of Anchor Point, Sterling Mile 156 to 180, Diamond Ridge Homer Area, Ohlson Mtn., east roads	15-3-4	57	
Fox River Drainage	15-3-5	3	
Deep Creek, Caribou Hills, and Ninilchik Dome	15-3-6	8	
Anchor River Drainage	15-3-7	2	
Balance of 15-C	15-3-8	11	125
Sub Unit Unknown	15-10	150	150
			515

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
UNIT 16	16	76	76
UNIT 17	17	18	18
UNIT 18	18	29	29
UNIT 19	19	46	46
UNIT 20			
Totatlanika River	20-1-29	3	
Tanana River	20-1-30	5	
McDonald Creek	20-1-31	1	
Military Bombing Range	20-1-33	33	
Blair Lakes	20-1-34	5	
Salchaket Slough	20-1-35	8	
Wood River	20-1-36	15	
Clear Creek	20-1-37	1	
Clear	20-1-39	1	
Gold King Creek	20-1-44	3	
Delta Junction	20-1-48	7	
No specific locality	20-1-49	11	93
	20-2-33	2	
Chena Hot Springs Road	20-2-50	54	
Farmers Loop Road	20-2-51	2	
Steese Highway	20-2-52	61	
Richardson Highway	20-2-54	13	
Fielson AFB	20-2-55	11	
Badger Road	20-2-56	8	
Elliott Highway	20-2-58	3	

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
Fairbanks Vicinity	20-2-59	83	
Freeman Road	20-2-62	1	
Cleary Summit	20-2-67	3	
Fairbanks Creek Road	20-2-71	1	
Chatanika	20-2-72	3	
Sheep Creek Road	20-2-73	3	
Nenana Road	20-2-74	4	
Murphy Dome	20-2-75	3	
Gilmore Creek	20-2-77	3	
Fish Creek	20-2-79	1	
Chena Pump Road	20-2-81	4	
Goldstream Valley	20-2-83	9	
Tanana River	20-2-84	10	
Moose Creek	20-2-85	2	
Chena River	20-2-89	9	
Chatanika River	20-2-90	2	
No Specific Locality	20-2-94	5	300
	20-3-44	1	
	20-3-52	1	
	20-3-54	1	
	20-3-59	5	
Jarvis Creek	20-3-96	3	
Big Delta	20-3-97	34	
Donnelly Dome	20-3-98	8	
Old Richardson Trail	20-3-101	1	

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Total
Fort Greely	20-3-103	20	
Richardson Highway	20-3-104	11	
Gerstle River	20-3-105	1	
Shaw Creek	20-3-106	11	
Isabelle Pass, Black Rapids	20-3-107	3	
Johnson River	20-3-109	1	
Delta-Clearwater	20-3-110	4	
Richardson Clearwater	20-3-111	3	
Clearwater	20-3-112	9	
Salcha River	20-3-113	18	
Clearwater Lake	20-3-114	2	
Tanana River	20-3-115	2	
Goodpaster River	20-3-116	11	
Delta River	20-3-118	3	
Livengood	20-3-123	37	
Elliott Highway	20-3-124	8	
Manley Road	20-3-125	3	
Manley Hot Springs	20-3-126	21	
Tolovana River	20-3-128	1	
Rampart	20-3-129	1	
Nenana	20-3-131	17	
Clear Highway	20-3-132	7	
Nenana River	20-3-133	6	
Ferry	20-3-134	7	
Nenana Highway	20-3-135	9	

Table 11. Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	I.M. Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
Clear	20-3-136	10	
Savage River	20-3-141	2	
Healy	20-3-145	21	
Rex	20-3-147	1	
Minto Flats	20-3-149	10	
Lignite	20-3-150	1	
Alaska Highway	20-3-152	1	
Healy Lake	20-3-155	2	
Taylor Highway	20-3-160	49	
Chicken	20-3-161	3	
Eagle	20-3-162	2	
Boundary	20-3-163	1	
Fortymile	20-3-165	12	
Mt. Fairplay	20-3-167	2	
Central	20-3-172	2	
Steese Highway	20-3-175	45	
Baker Creek	20-3-176	2	
Circle City	20-3-177	7	
Circle Hot Springs	20-3-178	4	
Central	20-3-179	8	
Birch Creek	20-3-180	5	
Yukon River	20-3-181	5	
Nome Creek	20-3-184	1	
Beaver Creek	20-3-185	5	

Table 11 Hunting areas reported by unsuccessful moose hunters, 1966 (cont.)

Unit and Sub-Unit	IBM Area Designation	No. Unsuccessful Reporting	Unit and Sub-Unit Totals
No specific area	20-3-186	7	
	20-3-198	1	
	20-3-204	1	480
Unknown		22	22
			895
	21	38	38
	22	63	63
	23	23	23
	24	6	6
	25	19	19
	26	4	4
	27	1	1

Table 12. Summary, Means of Transport, Successful Moose Hunters, 1966.

Persons using single means of transport	481
Persons using two means	192
Persons using three means	44
Persons using five or more means	8
Total Hunters Contacted	725

Table 13. Summary, Means of Transport, Successful Moose Hunters, 1966.

Single Means Used			
1	Car	61	
2	Tracked Vehicle	35	
3	River Boat	79	
4	Tote Gote	0	
5	Horses	10	
6	Four-wheel Drive	58	
7	Swamp Buggy	25	
8	Airplane	128	
9	Snow-Go	13	
10	Afoot	72	481
Two Means Used			
1,2	Car - Tracked Vehicle	5	
1,3	Car - River Boat	13	
1,4	Car - Tote Gote	2	
1,5	Car - Horses	2	
1,6	Car - Four-wheel Drive	4	
1,8	Car - Airplane	8	
1,9	Car - Snow-Go	4	
1,10	Car - Afoot	50	88
2,3	Tracked Vehicle - River Boat	2	
2,6	Tracked Vehicle - Four-wheel Drive	2	
2,7	Tracked Vehicle - Swamp Buggy	1	
2,8	Tracked Vehicle - Airplane	3	
2,9	Tracked Vehicle - Snow-Go	1	
2,10	Tracked Vehicle - Afoot	1	10
3,6	River Boat - Four-wheel Drive	2	
3,8	River Boat - Airplane	4	
3,10	River Boat - Afoot	13	19
4,9	Tote Gote - Snow-Go	1	1
5,10	Horses - Afoot	1	1
6,7	Four-wheel Drive - Swamp Buggy	2	
6,8	Four-wheel Drive - Airplane	1	
6,9	Four-wheel Drive - Snow-Go	3	
6,10	Four-wheel Drive - Afoot	26	32
7,8	Swamp Buggy - Airplane	1	1
8,9	Airplane - Snow-Go	1	
8,10	Airplane - Afoot	36	37
9,10	Snow-Go - Afoot	3	3
			192

Table 14. Summary of means of transport, unsuccessful moose hunters, 1966.

Persons using single means	2,147
Persons using two means	1,357
Persons using three means	375
Persons using four means	73
Persons using five means	21
Persons using six means	8
Persons using seven or more means	6
Total Hunters Contacted	3,987

Table 15. Summary of means of transport, unsuccessful moose hunters, 1966.

Single Means Used			
1	Car	1,004	
2	Tracked Vehicle	75	
3	River Boat	225	
4	Tote Gote	7	
5	Horses	25	
6	Four-wheel Drive	264	
7	Swamp Buggy	51	
8	Airplane	86	
9	Snow-Go	33	
10	Afoot	377	2,147
Two Means Used			
1,2	Car - Tracked Vehicle	47	
1,3	Car - River Boat	94	
1,4	Car - Tote Gote	7	
1,5	Car - Horses	3	
1,6	Car - Four-wheel Drive	101	
1,7	Car - Swamp Buggy	11	
1,8	Car - Airplane	44	
1,9	Car - Snow-Go	59	
1,10	Car - Afoot	681	1,047
2,3	Tracked Vehicle - River Boat	4	
2,5	Tracked Vehicle - Horses	1	
2,6	Tracked Vehicle - Four-wheel Drive	11	
2,7	Tracked Vehicle - Swamp Buggy	3	
2,8	Tracked Vehicle - Airplane	3	
2,10	Tracked Vehicle - Afoot	13	35
3,4	River Boat - Tote Gote	1	
3,5	River Boat - Horses	1	
3,6	River Boat - Four-wheel Drive	17	
3,7	River Boat - Swamp Buggy	1	
3,8	River Boat - Airplane	14	
3,9	River Boat - Snow-Go	5	
3,10	River Boat - Afoot	47	86
4,6	Tote Gote - Four-wheel Drive	1	
4,7	Tote Gote - Swamp Buggy	2	
4,8	Tote Gote - Airplane	1	
4,10	Tote Gote - Afoot	5	9
5,10	Horses - Afoot	3	3

Table 15. Summary of means of transport, unsuccessful moose hunters, 1966. (Cont.)

Two Means Used (Cont.)			
6,7	Four-wheel Drive - Swamp Buggy	4	
6,8	Four-wheel Drive - Airplane	7	
6,9	Four-wheel Drive - Snow-Go	19	
6,10	Four-wheel Drive - Afoot	89	119
7,8	Swamp Buggy - Airplane	1	
7,10	Swamp Buggy - Afoot	7	8
8,9	Airplane - Snow-Go	4	
8,10	Airplane - Afoot	34	38
9,10	Snow-Go - Afoot	12	12
			1,357

Range Inventories

During the summer of 1966, crews consisting of Doug Jones, Ed Bellringer Jr., Ray Inglesi, Jay Bergstrand, Ed Cramer, Ron Somerville, Lon Bottcher, Ken Maederer, and Jack Didrickson placed two exclosures in the Matanuska Valley. Number one is located on the new Glenn Highway cut-off to Palmer in the area of the Knik and Matanuska River outlets at T 16N,R1E,Sec 10. Number two exclosure is located near the northern end of the Willow airstrip at T 19N,R 4W,Sec 7. The remainder of the exclosures will be built as time and materials are available.

Work on the forest-type map of the Lower Susitna Valley is being continued by the Division of Lands, Alaska Department of Natural Resources.

The climatological phase of this job has been inactive except for literature research which continues in an effort to determine what characteristics of snow may affect the distribution and survival of moose and to learn what techniques are best for measuring these snow characteristics.

SEX AND AGE COMPOSITION

The data presented under this job are a summary of all the aerial sex and age composition counts in Alaska for which reliable records exist. The volume of data to be assembled and reviewed precluded completion of a similarly comprehensive review of analyses of the data for this report. These analyses have been recorded in Federal Aid reports dating back to 1949. It was felt that to have all the available data in one source warranted the effort to assemble it at this time even though the analysis could not accompany the data. The data are accompanied by descriptions and maps of established count areas in most cases.

Descriptions of moose population composition count areas

INTRODUCTION: Moose population composition counts have been made and presented on the basis of known populations of moose or on the basis of physiographically similar range.

In the past, data has been presented with reference to a well known landmark, physiographic area, or community. The following descriptions of count areas are further arranged by game management unit. In some cases count areas listed under one broad area, e.g. Tok count areas, may fall in more than one game management unit, in which case they are cross-referenced.

The descriptions define the outer limits of specific counting areas. Since the objective of these counts is to obtain a sample of sex and age composition rather than to obtain a count of all the moose in an area, all of a specific count area may not be examined in any given year. Parts of these areas contain very low densities of moose in October and November when most counts are done, and therefore may be excluded if time, weather, or finances are limiting.

The descriptions and illustrations presented here provide records of areas counted in the past, and specific guidelines to counting areas to be covered in the future. However, as knowledge of the distribution and movements of specific moose populations increases, revisions of these count areas will be made so that sex and age composition data will better reflect the actual composition in specific populations.

Unit 1, Southeastern

Haines (Fig. 6)

Takhin River valley to its source, Chilkat River valley upstream to its confluence with the Tahini River, and the Klehini River valley upstream to Jarvis Creek.

COMMENT: Annual coverage variable.

Stikine River (not illustrated)

Stikine River valley from its mouth to the Canadian border; intensity of coverage is variable.

Taku River (not illustrated)

Taku River from its mouth to the Canadian border (coverage variable).

Berner's Bay (not illustrated)

Berner's, Lace, and Antler River valleys (coverage variable).

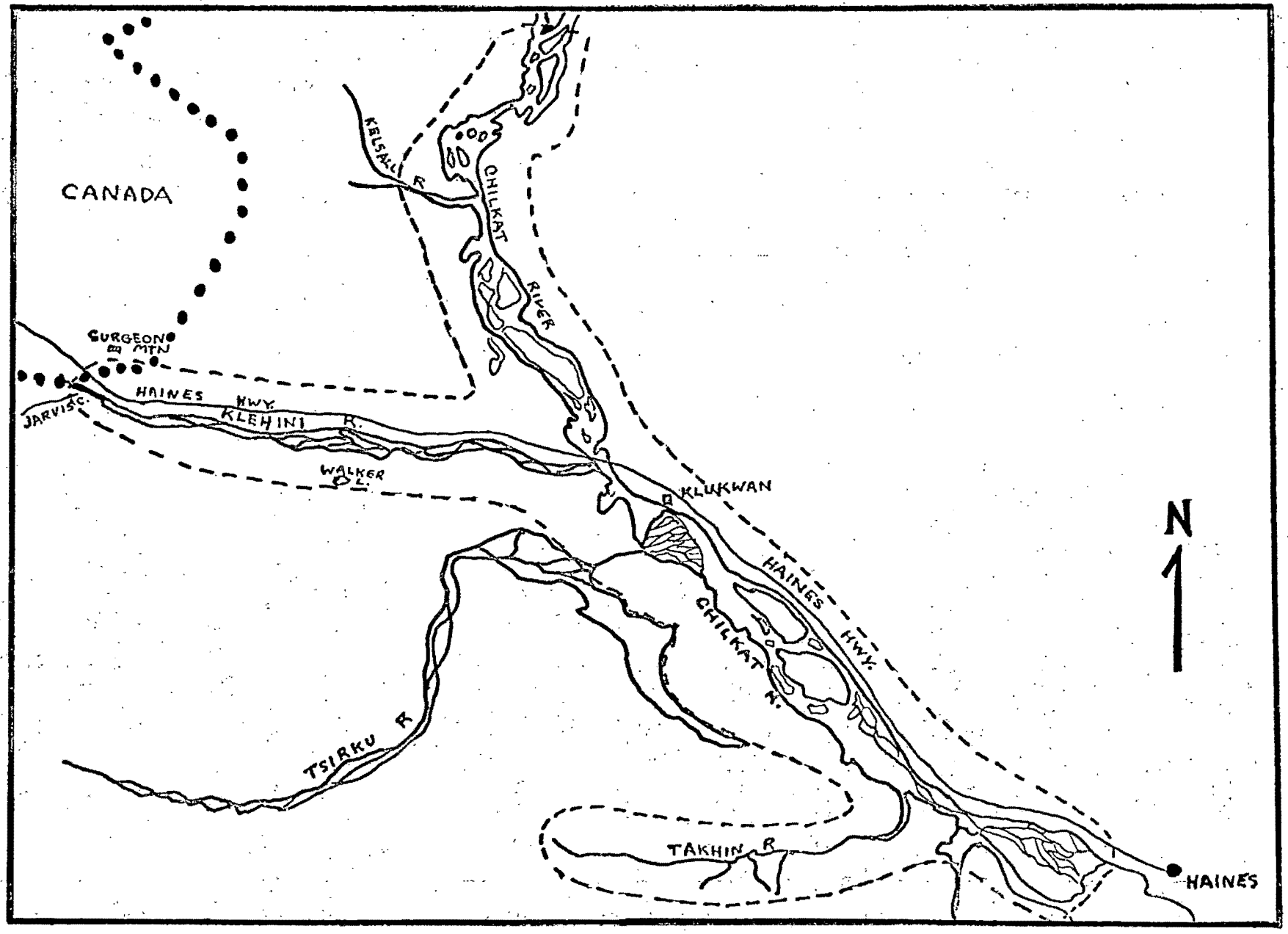


Fig. 6. Moose population composition count areas. Unit 1, Haines.

Table 16. Moose Sex and Age Ratios, Berner's Bay, Unit 1, 1960-1965.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Berner's Bay	1/61	---	---	---	---	---	---	---	50.0	---	8
Berner's Bay	2/61	---	---	---	---	---	---	---	37.5	---	8
Berner's Bay	3/61	---	---	---	---	---	---	---	40.0	---	8
Berner's Bay	1/62	---	---	---	---	---	---	---	6.3	---	17
Berner's Bay	2/62	---	---	---	---	---	---	---	18.2	---	11
Berner's Bay	11/62	100.0	---	---	---	---	14.3	---	6.7	---	15
Berner's Bay	12/62	200.0	---	---	---	---	33.3	---	10.0	13	20
Berner's Bay	3/63	---	---	---	---	---	---	---	18.7	11	16
Berner's Bay	2/64	---	---	---	---	---	---	60.0	32.0	20	25
Berner's Bay	1964-65	NO COUNT									
Berner's Bay	1/66	---	---	---	---	---	---	33.3	35.1	38	37
Berner's Bay	1966	NO COUNT									

* Count Area Not Illustrated.

Table 17. Moose Sex and Age Ratios, Haines Area, Unit 1, 1961-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Haines Area	1961-62	No data. Only total moose observed were recorded.									
Chilkat River	12/62	---	---	---	---	---	---	---	21.5	---	181
Chilkat River	3/63	---	---	---	---	---	---	---	10.4	---	96
Haines	11/63	---	---	---	---	---	---	---	18.7	---	193
Upper Chilkat	11/65	18.5	5.6	42.8	3.0	22.2	50.0	14.3	27.0	125	100
Klehini River	11/65	200.0	66.7	50.0	22.2	---	0.0	0.0	0.0	23	9
Big & Little Salmon Rivers	11/65	125.0	25.0	25.0	7.7	25.0	100.0	0.0	30.8	65	13
Chilkat Lake	11/65	40.0	13.3	50.0	5.9	40.0	66.7	33.3	29.4	85	34
Takhin River	11/65	58.0	24.0	70.5	7.6	100.0	48.0	33.3	15.3	196	157
Lower Chilkat River	11/65	22.7	13.6	150.0	8.3	75.0	36.4	0.0	22.2	45	36
Total, Haines	1965	41.2	15.5	60.5	6.6	63.0	49.3	19.2	20.9	116	349
Portions of Chilkat, Klehini, Takhin	11/66	33.3	15.9	91.7	7.5	46.3	68.8	21.8	32.2	140	295

* See map of count area, Fig. 6.

Table 18. Moose Sex and Age Ratios, Stikine River, Unit 1, 1952-1965.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Stikine River	3/52	60.0	---	---	---	---	96.0	---	19.0	---	126
Stikine River	1/55	---	---	---	---	---	---	---	20.0	15	30
Stikine River	1/56	---	---	---	---	---	---	---	27.8	24	36
Stikine River	2/57	---	---	---	---	---	---	---	31.9	---	47
Stikine River	9/58	21.9	---	---	---	---	---	---	25.0	23	52
Stikine River	9/59	31.3	---	---	---	---	---	---	21.4	28	28
Stikine River	9/60	57.1	---	---	---	---	---	---	26.7	7	15
Stikine River	1/61	---	---	---	---	---	---	---	8.9	70	56
Stikine River	3/61	---	---	---	---	---	---	---	22.2	47	99
Stikine River	12/62	---	---	---	---	---	---	---	19.2	42	125
Stikine River	3/63	---	---	---	---	---	---	---	18.2	21	44
Stikine River	4/63	---	---	---	---	---	---	---	21.3	27	75

* Count Area Not Illustrated.

Table 18. Moose Sex and Age Ratios, Stikine River, Unit 1, 1952-1965. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Stikine River	2/64	---	---	---	---	---	---	50.0	6.7	30	45
Stikine River & Flats	2/64	---	---	---	---	---	---	0.0	13.8	73	116
Stikine River	3/64	---	---	---	---	---	---	30.8	13.4	39	127
Stikine River	2/65	---	---	---	---	---	---	---	16.0	48	119

Table 19. Moose Sex and Age Ratios, Taku River, Unit 1, 1961-1964.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Taku River	1960-61	---	---	---	---	---	---	---	---	---	38
Taku River	3/62	---	---	---	---	---	---	---	13.3	---	15
Taku River	11/62	2.9	---	---	---	---	17.1	---	14.3	---	42
Taku River	12/62	6.3	---	---	---	---	31.3	---	20.8	13	24
Taku River	2/63	---	---	---	---	---	---	---	5.5	51	55
Taku River	3/63	---	---	---	---	---	---	---	21.6	---	37
Taku River	4/64	---	---	---	---	---	---	---	8.5	23	59
Taku River	1964-66	NO COUNTS									

Unit 5, Yakutat (Fig. 7)

Area 1, Situk-Dangerous River

NORTH: A line from the foothills to the Gulf of Alaska on the benchland between the Situk River and Yakutat Bay.

EAST: The margin of the benchlands from the east side of the Situk Lake to Harlequin Lake.

SOUTH: The north side of Harlequin Lake west to the Dangerous River; along the Dangerous River west to the Gulf of Alaska.

WEST: Beach line, from Dangerous River north to the road to the beach near the military airport.

Area 2, Dangerous River-Italio River

NORTH: Dangerous River, from the Gulf to Harlequin Lake.

EAST: From Dangerous River south along the west shore of Harlequin Lake, then south to Italio River.

SOUTH: Italio River, from the foothills west to the Gulf.

WEST: Ocean beach, north from a point west of where the Italio River swings northwestward, to Dangerous River.

Area 3, Italio River-Alsek River

NORTH: From the ocean beach northeast to the Italio River and along the Italio River northeasterly to the foothills.

EAST: Foothills, from Italio River south to Alsek River.

SOUTH: Alsek River, from foothills to ocean.

Area 4, Dry Bay

NORTH & EAST: Alsek River from the ocean to Alsek Glacier.

SOUTH: Deception Hills from Alsek Glacier to Grand Plateau Glacier, and along its stream bed to the ocean.

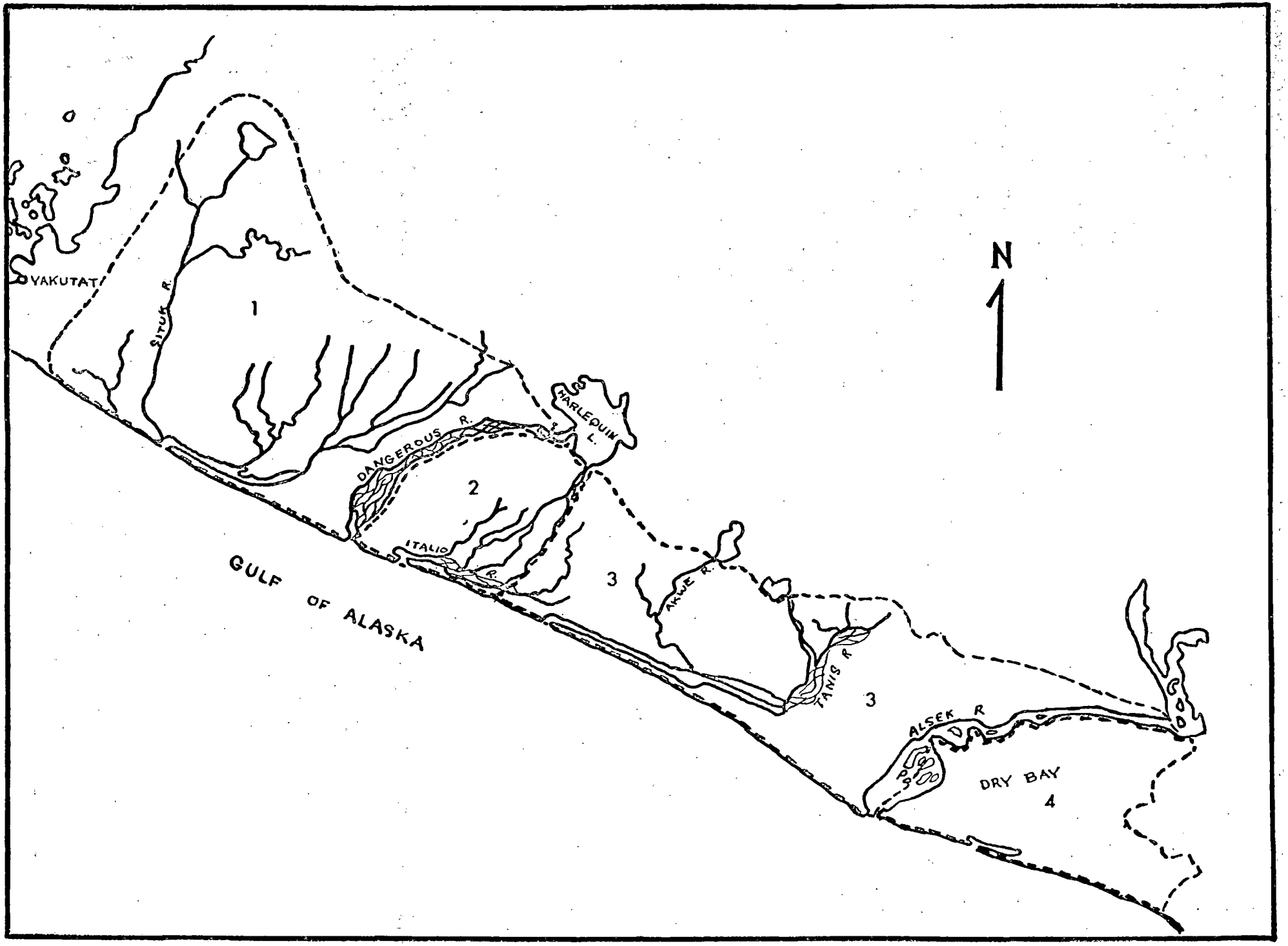


Fig. 7 Moose composition count areas, Unit 5, Yakutat.

Table 20. Moose Sex and Age Ratios, Yakutat, Unit 5, 1959-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Coastal Flats, Yakutat-Dry Bay	9/59	111.0	---	---	---	---	32.9	---	13.5	---	178
Not Specified	11/60	79.8	9.1	12.9	4.4	64.3	28.2	16.7	13.6	---	206
East River to Alsek River	11/65	126.1	30.4	31.8	12.1	233.3	26.1	0.0	10.3	18	58
Alsek River to Tanis River	11/65	61.6	11.0	21.6	5.8	80.0	27.4	5.3	14.5	46	138
Dangerous River to Situk River	11/65	41.9	11.8	39.3	7.3	122.2	19.4	5.9	12.0	56	150
Italio River to Dangerous River	11/65	40.0	6.2	18.2	3.7	50.0	24.6	0.0	15.0	33	107
Italio River to Tanis River	11/65	40.4	2.1	5.6	1.2	11.1	38.3	12.5	21.4	34	84
Total, Yakutat	1965	52.5	10.3	24.4	5.8	79.5	25.9	5.4	14.5	40	537

* See Fig. 7, map of count areas.

Table 20. Moose Sex and Age Ratios, Yakutat, Unit 5, 1959-1966, (cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
1 Dohn River to Tanis River	10/66	50.0	7.0	15.0	4.0	80.0	17.0	2.3	10.0	136	449
2 Dangerous River to Arnklin River, Lower Section	10/66	47.0	2.6	7.0	1.6	28.5	18.0	0.0	12.0	75	60
3 Dangerous River to Arnklin River, Upper Section	10/66	50.0	3.0	3.2	1.8	44.4	14.0	13.0	8.3	135	108
4 Tanis River to Dangerous River & Upper Susitna	10/66	30.0	7.1	31.0	4.9	85.7	17.0	17.0	11.0	140	307
Total, Yakutat	1966	42.0	6.2	17.0	3.9	75.0	17.0	8.0	10.4	130	924

Unit 6, Cordova (not illustrated)

COPPER RIVER

From Mountain Slough east to the Copper River, and from the foothills of the Chugach Mountains to the Gulf of Alaska.

MARTIN RIVER

Martin River valley from Deadwood Lake to the Copper River.

Table 21. Moose Sex and Age Ratios, Cordova Area, Unit 6, 1963-1965.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Copper River Delta	3/63	---	---	---	---	---	---	10.0	32.8	29	67
Cordova Area	1-2 1964	---	---	---	---	---	---	25.0	33.1	17	136
Mile 6--McKinley Park, North of Highway	12/64	---	---	---	---	---	---	11.1	32.3	18	31
Mile 6--McKinley Park, South of Highway	12/64	---	---	---	---	---	---	21.7	31.1	31	90
East of Copper River, South of Martin River	12/64	---	---	---	---	---	---	0.0	25.0	2	4
East of Copper River, South of Martin River	12/64	---	---	---	---	---	---	40.0	29.2	36	48
Total	1964	---	---	---	---	---	---	23.3	30.6	22	173
Martin River	1/66	---	---	---	---	---	---	20.8	31.2	36	93

* Count Areas Not Illustrated.

Unit 7, Eastern Kenai Peninsula (Fig. 8).

Due to the topography in Unit 7, most count areas are confined to a particular drainage and are described in these terms.

Area 1

The drainages of Resurrection River from Summit Creek at its source to Resurrection Bay, including the drainages of Salmon and Bear Creeks as far north as Bear Lake, and into the foothills east of Seward.

Area 2

The drainages of Ptarmingan Creek from its headwaters to its mouth on Kenai Lake.

Area 3

The drainages of Snow River, and the South Fork of the Snow River east of the Seward Highway, and the upper drainages of Salmon Creek and its tributaries east of the Seward Highway, including Bear Lake and its tributaries.

Area 4

The drainages of Johnson Creek and Upper Trail Lake from Johnson Creek Summit to a generally east-west line across Upper Trail Lake indicating the mouth of the Upper Trail Lake valley; and the drainages of Trail Creek from its headwaters and Mile 43, Alaska Railroad, to Upper Trail Lake.

Area 5

The drainages of the Placer River from Luebner Lake to Turnagain Arm; the drainage of Skookum Creek, and the drainages of Portage Creek from Portage Lake and Bear Valley to Turnagain Arm.

Area 6

The drainages of the Twentymile and the Glacier Rivers from their headwaters to Turnagain Arm.

Unit 7, Eastern Kenai Peninsula (cont.)

Area 7

The drainages of Seattle Creek from Turnagain Arm upstream to its first western tributary.

Area 8

The drainages of Little Indian Creek from its headwaters to Chickaloon Bay.

Area 9

The drainages of Big Indian Creek from its headwaters to chickaloon Bay.

Area 10

The drainages of Resurrection Creek from its headwaters and the headwaters of its tributaries to Turnagain Arm.

Area 11

The drainages of Bear Creek, Bay Creek, Sunset Creek, and Sunrise Creek from their headwaters to Turnagain Arm, and the drainages of Sixmile Creek from the Seward Highway to Turnagain Arm.

Area 12

The drainages of Juneau Creek from its headwaters to the Kenai River.

Area 13

The drainages of Quartz Creek from Devil's Creek to Kenai Lake, and the valley from Moose Pass north to the northern junction of the Seward and Sterling Highways.

Area 14

The drainage of Quartz Creek from and including Devil's Creek

and Jerome Lake upstream, including both sides of the road to Colorado Creek and the north end of Summit Lake.

Area 15

WESTERN SECTION: The drainages of Canyon Creek from Summit Lake downstream to Sixmile Creek, and the drainage of Bench Creek from Bench Lake downstream to Sixmile Creek.

EASTERN SECTION: The drainage of Granite Creek from Peters Creek upstream to its head; and the drainage of Ingram Creek from where it leaves the foothills downstream to Turnagain Arm.

Area 16

The drainages of Russian River from its headwaters to the Kenai River.

Area 17

The drainages of Cooper Creek from the narrows in Cooper Lake downstream to the Kenai R., including the area between Schooner Bend and Cooper Landing along the Kenai River.

Area 18

NORTH: From Cooper Landing east to the mouth of Quartz Creek; from Quartz Creek east along the north shore of Kenai Lake to the Trail River valley.

EAST: A north-south line along the west side of the Trail River valley, running from the foothills to Kenai Lake.

SOUTH: North beach of Kenai Lake from the eastern boundary west to Porcupine Island, then south across the lake to the foothills east of Cooper Lake; then south and west to include the upper part of Cooper Lake; northwesterly around the mountains between Kenai Lake and Cooper Creek, then north to Cooper Landing.

Unit 7, Eastern Kenai Peninsula (cont.)

Area 19

The drainages of the Trail River from its mouth upstream to the beginning of the Trail Creek-Johnson Creek valley (area 4), including the Grant Lake drainage and the Moose Creek-Carter Creek drainage at the west end of Upper Trail Lake.

Area 20

SOUTH: Drainages of the headwaters of the Chickaloon River from Swan Lake to its confluence with the fork draining American Pass, and including the valley of that fork.

NORTH: Tributaries of the Chickaloon River lying south of and separated from Big Indian Creek by a divide.

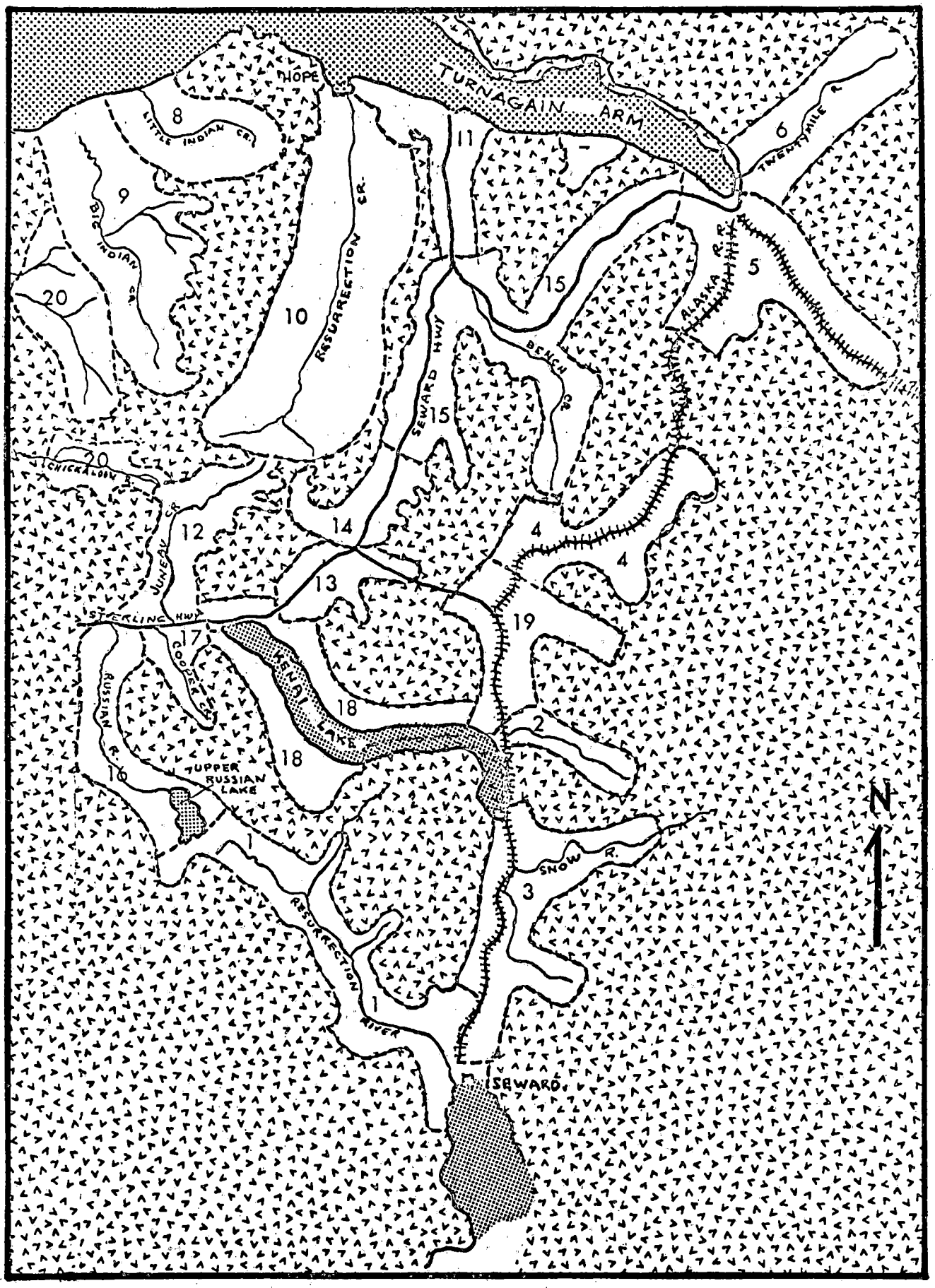


Fig. 8 **Moose composition count areas, Unit 7**

Table 22. Moose Sex and Age Ratios, Chugach National Forest, Unit 7, 1960-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Miscellaneous											
Resurrection R. & Resurrection Cr.	11/60	32	13	73	8	84	30	8	18	---	132
1											
Resurrection R.	11/61	6	4	200	3	33	26	0.0	19		62
Resurrection R.	2/64	---	---	---	---	---	---	16.0	39	29	77
2											
Ptarmigan Cr.	2/64	---	---	---	---	---	---	0.0	29	51	18
3											
Snow R.	2/64	---	---	---	---	---	---	12.5	32	24	31
4											
Trail R.	2/64	---	---	---	---	---	---	18.8	33	29	63
5											
Portage Flats	2/64	---	---	---	---	---	---	7.8	36	121	196
Placer R.	1/66	---	---	---	---	---	---	0.0	20.7	41	29
Portage Cr.	11/66	---	---	---	---	---	---	0.0	38.5	43	13

* See Fig. 8 Map of Count Areas

Table 22. Moose Sex and Age Ratios, Chugach National Forest, Unit 7, 1960-1966. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
6											
Twenty-Mile R.	2/64	---	---	---	---	---	---	7.7	29	32	68
Twenty-Mile R.	1/66	---	---	---	---	---	---	17.6	19.8	67	101
Twenty-Mile R.	11/66	8.5	7.0	500.0	4.4	27.8	50.7	20.0	31.6	76	114
7											
Seattle Cr.	2/64	---	---	---	---	---	---	25.0	42	60	12
8											
Big & Little Indian Cr. & Chickaloon R. (8,9,&20).	11/61	47	---	---	---	---	19	3	11	---	283
Little Indian Cr.	2/64	---	---	---	---	---	---	33.0	31	26	13
9											
Big Indian Cr.	2/64	---	---	---	---	---	---	0.0	28	51	47
10											
Resurrection Cr.	1/64	---	---	---	---	---	---	6.7	20	27	174
Resurrection Cr.	11/66	26.5	2.4	10.0	1.8	80.0	6.0	0.0	4.5	---	110

Table 22. Moose Sex and Age Ratios, Chugach National Forest, Unit 7, 1960-1966. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
11											
Sixmile & Bea Cr.	1/64	---	---	---	---	---	---	0.0	29	18	28
12											
Juneau Cr.	11/61	11.0	5	75	3	23	39	9	26	---	96
Juneau Cr.	12/62	23.2	15.2	191.7	10.0	53.5	28.8	22.9	18.8	---	229
Juneau Cr.	1&2/64	---	---	---	---	---	---	9.3	25	96	256
Juneau Cr.	1/66	---	---	---	---	---	---	0.0	10.9	85	192
Juneau Cr.	11/66	16.5	2.9	21.7	2.1	143.6	22.9	2.9	16.5	---	237
13											
Quartz Cr.	1-2/64	---	---	---	---	---	---	6.5	33	64	162
Quartz Cr.	1/66	---	---	---	---	---	---	3.2	23.9	43	142
Quartz Cr.	12/66	22.0	9.0	69.2	5.9	60.0	30.0	4.0	19.7	---	152
14											
Devil's Cr.-Summit L.	2/64	---	---	---	---	---	---	0.0	26	45	50

Table 22. Moose Sex and Age Ratios, Chugach National Forest, Unit 7, 1960-1966. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♀ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
15 Summit L.-Ingram Cr.	2/64	---	---	---	---	---	---	4.8	32	47	71
16 Russian L.	2/64	---	---	---	---	---	---	18.2	38	41	45
17 Kenai R.	2/64	---	---	---	---	---	---	0.0	34	21	44
18 Kenai L.	2/64	---	---	---	---	---	---	0.0	21	24	24
19 Trail Lake	2/64	---	---	---	---	---	---	0.0	30	40	10
Trail Lake	1/66	---	---	---	---	---	---	17.6	19.8	67	101
Trail Lake	11/66	8.5	7.0	500.0	4.4	27.8	50.7	20.0	31.6	76	114

Table 22. Moose Sex and Age Ratios, Chugach National Forest, Unit 7, Totals, 1960-1966.

Total, 1960-1962. Data limited to one area or less per year. See area values										
1963 (2/64)	---	---	---	---	---	---	8.2	30	43	1383
1965 (1-2/66)	---	---	---	---	---	---	7.0	18.9	52	587
1966 (11/66)	17.4	4.6	36.2	3.2	34.7	22.7	8.7	18.4	---	656

Unit 9, Alaska Peninsula (Fig. 9).

Cinder River

Drainages of Cinder River from and including High Creek upstream to the headwaters of the various tributaries plus the upper drainages of Pumice Creek.

Mother Goose Lake

Drainages of King Salmon River, from the most westerly foothills east (upstream) to the headwaters of the various tributaries of the King Salmon River.

Dog Salmon River

Drainages of the Dog Salmon River from the western extremity of the hills between Dog Salmon River and Lower Ugashik Lake upstream to the headwaters of the various tributaries; and the drainages of the southwest corner of Lower Ugashik Lake, from Lenora Lake on the east to the extreme western end of Lower Ugashik Lake.

Ugashik Lakes

The eastern drainages of the Ugashik Lakes from Lenora Lake on the south to the north end of Upper Ugashik Lake.

COMMENT: Additional count areas on the Alaska Peninsula are anticipated.

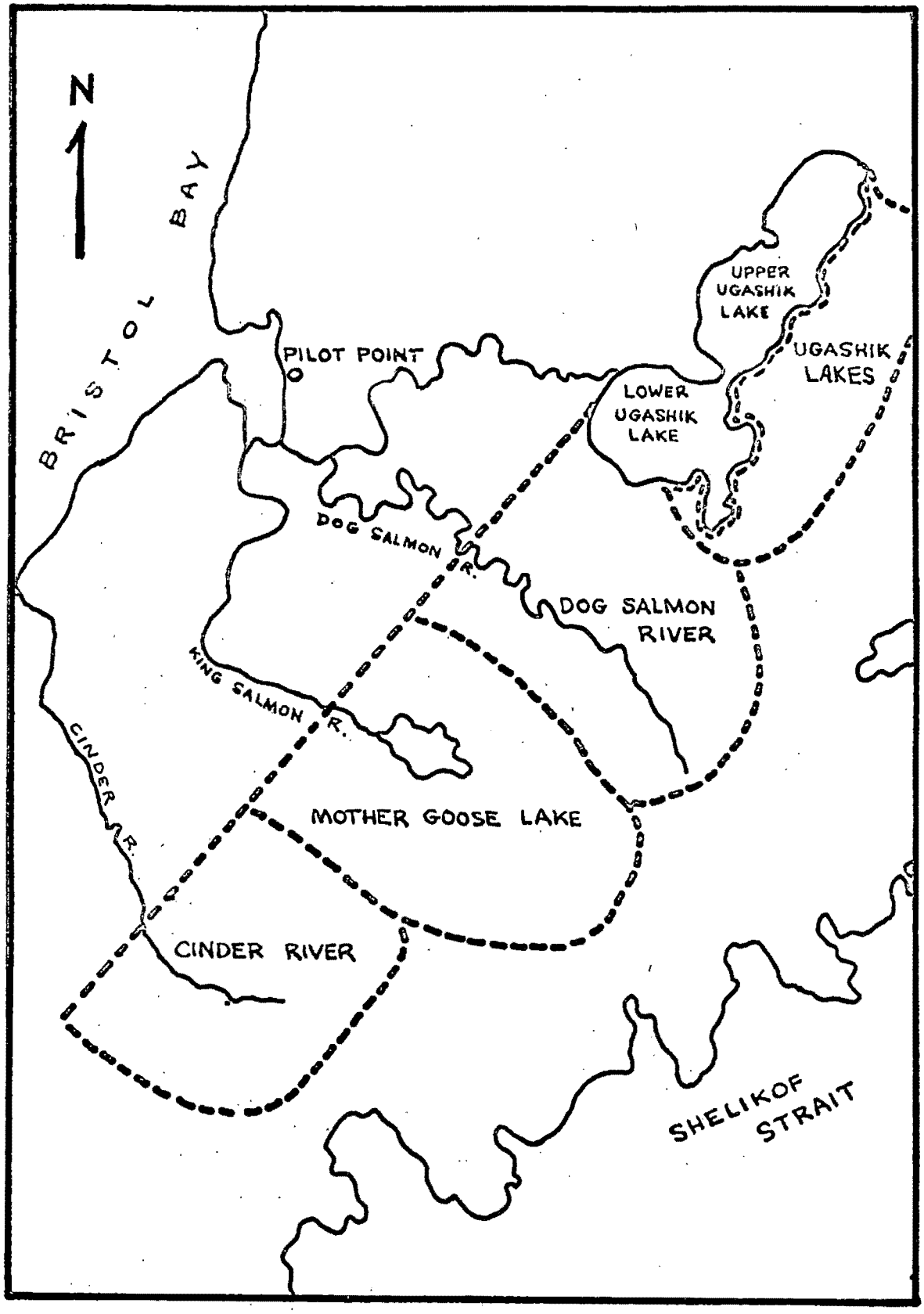


Fig. 9 Moose composition count areas. Unit 9, Alaska Peninsula.

Table 23. Moose Sex and Age Ratios, Alaska Peninsula, Unit 9, 1953-1966.*

Area	Date	♂:♀ Ratio	Small ♂ : 100 ♀	Small ♂ : Large ♂	Percent Small ♂	Small ♂ : ♂ Calf Ratio	Calves/100 ♀	Twins:100 Cows w/calf	Percent Calves	Moose Per Hour	Total Moose
Not specified	1/53	---	---	---	---	---	---	33.3	16.0	---	518
Cinder River	11/62	86.0	14.9	20.9	6.8	90.0	33.1	---	15.1	74	265
Cinder River	4/63	---	---	---	---	---	---	9.1	14.6	41	82
Cinder River	11/64	84.2	10.9	14.9	5.2	84.6	25.7	15.6	12.3	106	424
Cinder River	11/66	62.6	9.9	18.8	4.8	49.1	40.5	21.6	19.6	150	270
Mother Goose Lake	11/62	59.5	15.8	36.1	8.0	84.8	38.2	---	18.9	128	486
Mother Goose Lake	4/63	---	---	---	---	---	---	21.1	9.0	85	255
Mother Goose Lake	11/64	54.2	10.9	25.2	6.4	128.8	16.9	7.3	9.9	199	597
Mother Goose Lake	11/66	39.6	7.5	23.5	4.3	57.1	26.4	16.7	14.9	104	94
Dog Salmon River	11/62	118.8	10.9	25.0	10.1	282.4	16.8	---	7.1	94	238
Dog Salmon River	4/63	---	---	---	---	---	---	23.3	17.4	76	213
Dog Salmon River	11/64	77.2	15.2	24.5	8.2	436.4	7.0	0.0	3.8	145	291
Dog Salmon River	11/66	88.7	16.9	23.6	7.6	113.3	29.8	15.6	13.5	120	275
Ugashik Lakes	11/62	77.6	3.0	4.0	1.6	80.0	7.5	---	4.0	56	124
Ugashik Lakes	11/66	93.9	21.2	29.2	9.5	164.7	25.8	13.3	11.6	46	147

* See Fig. 9. Map of count area.

Table 23. Moose Sex and Age Ratios, Alaska Peninsula, Unit 9, Summary, 1953-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Alaska Peninsula	1962	99.4	19.0	23.6	8.2	115.2	33.0	24.4	14.2	91	1,113
Total, Alaska Peninsula	4/63	---	---	---	---	---	---	20.0	13.1	71	550
Total, Alaska Peninsula	4/64	62.1	11.9	23.7	6.4	97.5	24.4	17.5	13.1	104	1,852
Total, Alaska** Peninsula	11/64	67.8	11.8	21.2	6.4	137.7	17.2	9.9	9.3	146	1,312
Total, Alaska Peninsula	1966	73.5	13.9	23.3	6.6	85.9	32.4	16.3	15.4	96	786

**Breakdown by areas not given. Areas included were Cinder River, Mother Goose Lake, Dog Salmon River, Ugashik Lakes.

Unit 11 (See Unit 20C, Tok Area).

Unit 12 (See Unit 13, Nelchina Basin, and Unit 20C, Tok Area).

Unit 13, Nelchina Basin (Fig. 10).

The Mt. Drum-Mt. Sanford count area (#11) which is in Unit 12 traditionally has been reported with other counts from the Nelchina Basin.

Area 1, Wells Creek-Upper Nenana

WEST: From the Denali Highway at Mile 115 north along the unnamed creek draining the west side of Pyramid Peak to Bruskasna Creek.

NORTH: From Bruskasna Creek east along the foothills to the Nenana Glacier.

EAST: From Nenana Glacier generally south along the divide between the Nenana and Susitna Rivers, to a point just east of headwaters of Brushkana Creek.

SOUTH: Along Brushkana Creek from its most easterly headwaters north of the Denali Highway to where it crosses the Highway, then west along the Denali Highway to Mile 115.

COMMENT: The Monahan Flats and the area between the Nenana River and the Denali Highway included in this area generally contain too few moose to warrant intensive counting using transects. The observer can best determine what sort of coverage the number of moose present warrants based on conditions that prevail when the counts are made.

Area 2, Maclaren River

NORTH: The Maclaren Glacier and adjacent mountain slopes, from the Maclaren River on the west, east to the divide between the Maclaren River drainage and drainages to the east.

EAST & SOUTH: The divide between the Maclaren River and drainages to the east, from the Alaska Range south to Mile 34.5 on the Denali Highway and continuing south and west along the divide to the Susitna River.

Unit 13, Nelchina Basin (cont.)

WEST: The Susitna River from the south boundary to the mouth of the Maclaren River, and up the east bank of the Maclaren River to the Alaska Range.

Area 3, Upper Susitna

NORTH: By the mountains and glaciers between the heads of the East and West Forks of the Susitna River.

EAST: By the divide between the Susitna River and the Maclaren River-Clearwater Creek drainages, from the headwaters of the Susitna River south to the divide between Windy Creek and Valdez Creek at Pass Creek.

SOUTH: By the divide between Windy Creek and Valdez Creek from the Susitna River to the headwaters of Pass Creek.

WEST: By a line from the divide between the West Fork, Susitna River, and the Nenana River headwaters south to Mile 85, Denali Highway, and south along the Highway and the Susitna River to the south boundary.

COMMENT: Portions of the Monahan Flats may not warrant intensive counting.

Area 4

Combined with Area 6; no longer defined as a separate count area.

Area 5, Alphabet Hills

NORTH: The Denali Highway, from Mile 7 (the divide between Hungry Hollow and the Gulkana River) to the divide between the Tangle Lakes drainage and the Maclaren River drainage (Mile 34.5 Denali Highway).

EAST: By the divide between Hungry Hollow and the Gulkana River, from the Denali highway south to the Middle Fork, Gulkana River and along the Gulkana River south to its junction with the West Fork, Gulkana River.

Unit 13, Nelchina Basin (cont.)

SOUTH: By the West Fork Gulkana River and its main tributaries from its mouth to its headwaters, and along the northern tributaries of the Tyone River and the Tyone River itself west to the Susitna River.

WEST: By the divide between the Maclaren River (Area 2) and drainages to the east and south from the Denali Highway to the Susitna River.

COMMENT: Spruce-covered benchland north of the West Fork does not warrant intensive counting except possibly on late winter counts.

Area 6, Clearwater-Maclaren

NORTH: By the mountains and glaciers from the divide between the Susitna River and the Maclaren River, east to the Maclaren River.

EAST: By the Maclaren River from its headwaters to the Susitna River.

SOUTH: Confluence of Susitna and Maclaren Rivers.

WEST: The divide between the Clearwater Creek-Maclaren River drainage and the Upper Susitna drainage and the divide between Windy Creek and Valdez Creek from the Susitna River north to the Alaska Range.

Area 7, Jay Creek-Coal Creek-Watana Creek

SOUTH, EAST AND NORTH: By Susitna River from Watana Creek east and north to the Denali Highway Bridge, then along the Denali Highway to Canyon Creek.

WEST: Canyon Creek, from where it crosses the Denali Highway to the west side of Butte Lake, down to Butte Creek, down the valley of Deadman Creek to Big Lake, to Delusion Creek, to Watana Creek, to the Susitna River.

COMMENT: Portion of area counted may vary with the distribution of moose.

Unit 13, Nelchina Basin (cont.)

Area 8, Paxon to Sourdough

NORTH: The Denali Highway, from its junction with the Richardson Highway to about Mile 7 (the divide between Hungry Hollow and Upper Gulkana River drainages).

EAST: The Richardson Highway from its intersection with the Denali Highway, south to Mile 145, Richardson Highway.

SOUTH: By a line from Mile 145, Richardson Highway, west to the Gulkana River opposite the mouth of the West Fork of the Gulkana River.

WEST: By the divide between Hungry Hollow and the Upper Gulkana River south to the Middle Fork, Gulkana River, and by the Gulkana River south from that point to its confluence with the West Fork, Gulkana River.

COMMENT: See Area 9.

Area 9, Paxson to Sourdough, east of Highway

NORTH: By a line from Paxson east to the middle of Wolverine Mountain.

EAST: A line running south from Wolverine Mountain to the east base of Rount Top Mountain, then angling southwesterly to a point 4 miles due east of Mile 145, Richardson Highway.

SOUTH: A line from Mile 145, Richardson Highway to the east boundary.

WEST: By the Richardson Highway from Paxson to Mile 145.

COMMENT: South end of Areas 8 and 9 are largely in spruce cover and may not warrant intensive coverage.

Area 10, Upper Gakona

NORTH: Gakona Glacier and adjacent hills from north of Gunn Lake east to Devil's Lake.

Unit 13, Nelchina Basin (cont.)

EAST: A line running from Devil's Lake through Alder Lake, Caribou Lake, and paralleling the Gakona River at about 2 miles distance.

SOUTH: A line perpendicular to the river at Otter Creek from the east boundary to the west boundary.

WEST: A line paralleling the river 1 to 1-1/2 miles from the river, from the south boundary north through Wolverine Mountain, the east end of Upper Fish Lake, through the middle of Gunn Lake to the north boundary.

Area 11, Mt. Drum-Mt. Sanford

The area is somewhat crescent shaped with the upper boundary following the edge of browse growth (about 4500' elevation) and moose distribution, which depends on snow depth, extending up the Sanford River to Sanford Glacier on the west side and down on the east side to about 2200' elevation, and following this contour south around Mt. Drum to the Nadina River; then up to the Nadina Glacier to again meet the upper boundary.

COMMENT: Distribution of moose and portion counted may vary from year to year.

Area 12, Lake Louise Flats

WEST AND NORTH: Glenn Highway at Mendeltna Creek north to Old Man Lake, then a line from north end of Old Man Lake westerly to Curtis Lake, north past the west end of Lilly Lake and angling east to the outlet of Tyone Lake; northeasterly to include the hills north and east of Tyone Lake.

EAST: A line from the hills north and east of Tyone Lake southwesterly to Bell Lake, southeasterly to Hill Lake and on to Salmon Berry Lake and Rat Lake, along Little Woods Creek to the Glenn Highway.

SOUTH: The Glenn Highway from Little Woods Creek west to Mendeltna Creek.

Unit 13, Nelchina Basin (cont.)

COMMENT: Moose distribution varies; moose usually found on and around various hills and benchlands in October and November when counts are usually made.

Area 13, Little Nelchina

Bounded by the Oshetna River from about Square Lake to Nowhere Creek; southeast to the junction of various creeks forming the Little Nelchina River, on to the junction of Bubb and Flat Creeks, to Crooked Creek, south on Crooked Creek to the Glenn Highway, east along the Glenn Highway to Cache Creek; then north around Slide Mountain to Marie Lake; northwest to Fourth of July Creek, and angling westerly to the Oshetna River near Square Lake.

Area 14, Clarence Lake-Black River

NORTH: Susitna River from opposite Jay Creek east to the confluence of Oshetna and Susitna Rivers.

EAST: Oshetna River from its confluence with the Susitna River south to Granite Creek.

SOUTH: Up Granite Creek to its headwaters, and a line from its headwaters to the headwaters of the Black River.

WEST: Black River valley north to Gilbert Creek, along Gilbert Creek, and north to a point across from Jay Creek on the Susitna River.

Area 15, Klutina-Tazlina

NORTH: From Tazlina Lake east along the north side of the valley in which high lake is situated to the north end of St. Anne Lake, angling southeasterly past the south side of Hudson Lake toward the north side of Stuck Mountain, as far as the east side of the Klutina River Valley.

EAST: East side of Klutina River valley (2000' elev.).

Unit 13, Nelchina Basin (cont.)

SOUTH. From the east side of the Klutina River valley, west to and along the north shore of Klutina Lake, west around West Peak, then along the south boundary of the Kaina Creek drainage, then to Tazlina Lake.

WEST: Tazlina Lake.

Area 16, Upper Chistochina

NORTH: Glaciers and headwaters of West Fork and main Chistochina River, from 1 mile west of the West Fork east to Chisna Pass.

EAST: A line from Chisna Pass south across Powell Creek and down the divide between the Chisna and Chistochina Rivers to the vicinity of Red Mountain Creek, then due south parallel to the Chistochina River about 1-1/2 miles east of the Chistochina, to an east-west line at the south end of Sinona Lake.

SOUTH: From about 1-1/2 miles east of the Chistochina River west to the west end of Sinona Lake.

WEST: From the west end of Sinona Lake north to Daisy Creek, north along Daisy Creek, then north parallel to the Chistochina to the West Fork at a distance of about 1 mile from the stream.

Unit 14, Anchorage Area

Eagle River (not illustrated)

Drainage of Eagle River, from the Glenn Highway upstream to its headwaters.

Peters Creek-Ship Creek (not illustrated)

Portions of Peters Creek and Ship Creek are counted annually or biannually. Specific area covered varies.

Ft. Richardson-Elmendorf AFB (not illustrated)

Portions of the Ft. Richardson-Elmendorf complex have been counted periodically. Again, the specific area covered varies.

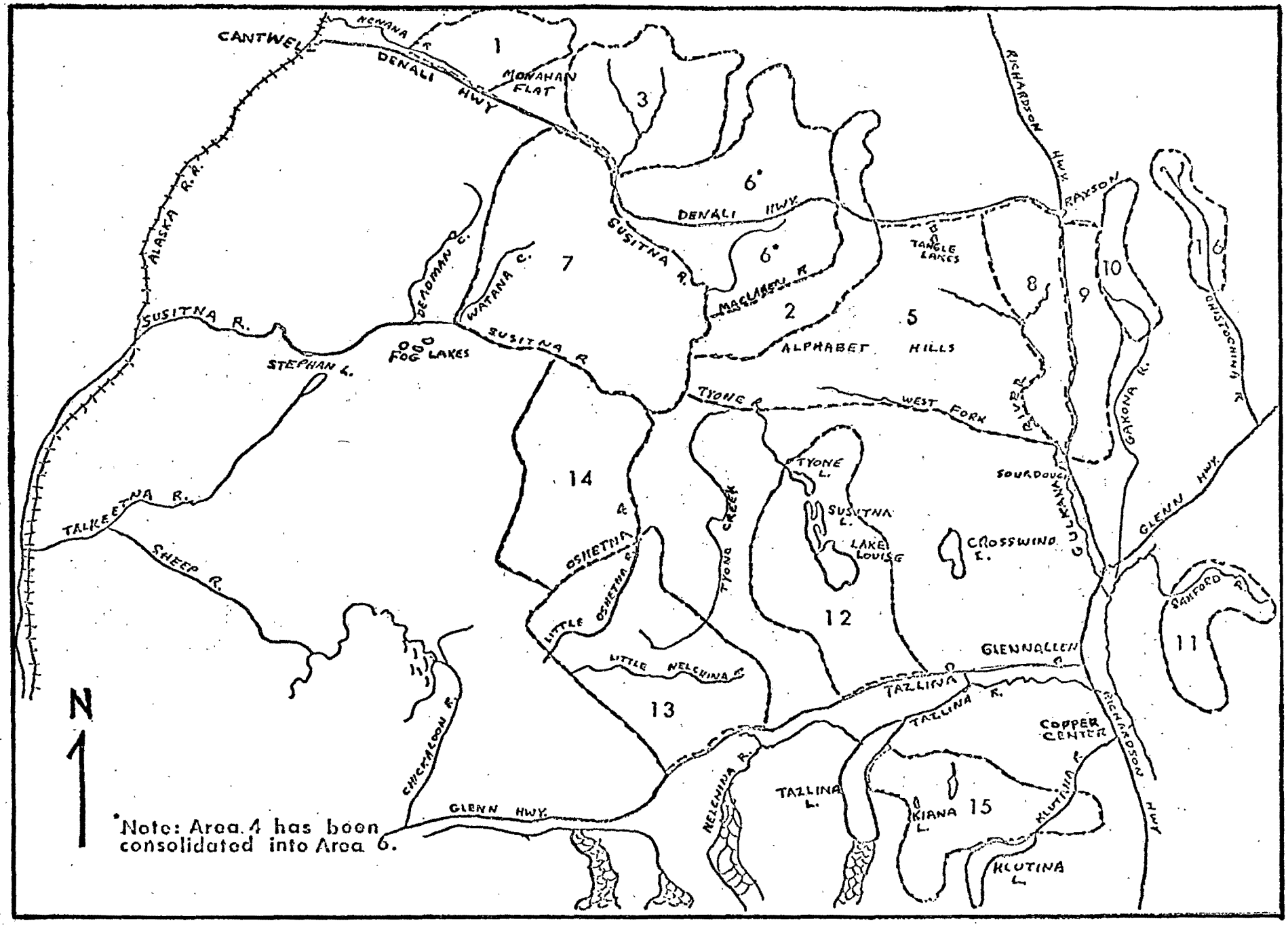


Fig. 10 Moose composition count areas, Unit 13 Nelchina Basin.

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Units 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Maclaren River-Clearwater Creek South of Denali Hwy (6)	10/62	24.1	14.5	150.0	9.9	133.3	21.7	0.0	14.9	74	121
Maclaren River-Clearwater Creek North of Denali Highway (6)	11/63	35.3	11.6	48.9	6.4	51.7	44.8	9.6	24.9	175	699
Maclaren River-Clearwater Creek South of Denali Highway (6)	11/63	54.5	12.4	29.4	6.2	54.5	45.5	0.0	22.7	69	242
West side Maclaren R. South of Denali Highway (6)	3/64	---	---	---	---	---	---	23.5	25.6	103	82
East side Maclaren R. South of Denali Highway (2)	3/64	---	---	---	---	---	---	0.0	10.9	67	101
Total, Maclaren R. South of Denali Highway (6&2)	1965	---	---	---	---	---	---	14.3	17.5	170	183
Maclaren River - Clearwater Creek North of Denali Highway (6)	3/64	---	---	---	---	---	---	0.0	21.4	70	14

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 & 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
East Drainages of Maclaren River (2)	10/65	51.4	12.7	32.8	7.1	88.5	28.7	8.3	16.0	68	326
West Fork Maclaren R. (4)	10/65	29.4	5.0	20.5	3.3	42.9	23.3	2.4	15.3	250	275
Clearwater-Maclaren Area (6)	10/65	31.0	12.5	67.8	8.2	92.3	27.1	1.1	17.7	100	513
Maclaren River, South of Denali Highway (6&2)	11/66	41.7	5.9	16.5	3.5	44.1	26.8	1.5	15.8	91	430
Maclaren River Denali Reserve (6&2)	11/66	30.4	5.4	21.8	3.4	36.6	22.9	3.4	18.6	100	500
[6] Clearwater Creek	11/55	84.1	26.1	45.1	11.5	121.1	43.2	5.6	19.0	---	400
Clearwater Creek	1956	---	---	---	---	---	---	---	---	---	---
Clearwater Creek North of Denali Highway (6)	11/57	53.5	6.9	14.9	3.6	37.8	36.6	12.1	19.3	---	192

Table 24. Moose Sex and Age Ratios, Nelchina Basin, Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Clearwater Creek South of Denali Highway (6)	11/57	17.5	5.0	40.0	3.1	23.5	42.5	6.2	26.6	---	64
Total, Clearwater Cr. (6)	11/57	43.3	6.4	17.3	3.5	33.3	38.3	10.2	21.1	---	256
Clearwater Creek (6)	1958-64	(See Maclaren River & Clearwater Creek)									
Clearwater-Maclaren (6)	10/65	31.0	12.5	67.8	8.2	92.3	27.1	1.1	17.7	100	513
Clearwater Creek (6)	1966	(See Maclaren R. & Clearwater Creek)									
7											
Watana Creek-Coal Creek	11/55	160.2	46.9	41.4	15.2	196.3	47.8	8.0	15.5	---	348
Watana Creek-Coal Creek	10/56	74.3	14.2	23.5	7.2	123.1	23.0	0.0	11.7	38	223
Watana Creek-Coal Creek	1957-1965	NO COUNTS									
Watana Creek-Jay Cr. Coal Cr.	11/66	48.3	6.3	15.1	3.8	62.9	20.1	0.0	11.9	33	293

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
11											
Mt. Sanford & Mt. Drum	11/55	144.9	29.0	25.0	10.3	163.2	35.5	18.8	12.7	---	300
Mt. Sanford & Mt. Drum	10/56	145.0	15.0	11.5	5.5	100.0	30.0	25.0	10.9	54	55
Mt. Sanford & Mt. Drum	11/57	70.5	6.8	10.7	3.3	35.3	38.6	0.0	18.5	---	92
Mt. Sanford & Mt. Drum	11/58	140.6	12.3	9.6	4.5	72.2	34.0	2.9	12.4	---	291
Mt. Sanford & Mt. Drum	1959	---	---	---	---	---	---	---	---	---	---
Mt. Drum	11/60	80.0	16.0	25.0	7.3	88.9	36.0	12.5	16.4	48	110
Mt. Sanford & Mt. Drum	1961-1964	NO COUNTS									
Mt. Sanford & Mt. Drum	10/65	80.6	25.4	45.9	12.7	272.0	18.7	0.0	9.3	81	268
Mt. Sanford & Mt. Drum	1966	NO COUNTS MADE									

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Units 13 and 12, 1962-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
12											
Lake Louise & Lake Susitna	11/55	52.1	15.1	40.7	7.3	56.4	53.4	9.1	26.0	---	150
Lake Louise & Lake Susitna	10/56	49.6	12.2	32.6	6.8	85.7	28.5	6.1	16.0	---	219
Lake Louise & Lake Susitna	11/57	47.5	12.5	35.7	5.9	38.5	65.0	4.0	30.6	---	85
Lake Louise & Lake Susitna	10-11 1958	62.2	6.7	12.0	3.2	28.6	46.7	10.5	22.3	---	94
Lake Louise	10-11 1959	31.3	10.4	35.0	5.3	36.8	56.7	2.7	28.8	---	136
Lake Louise Flats	11/60	45.5	13.6	42.9	5.6	27.9	97.7	16.2	40.2	36	107
Lake Louise Flats	11/61	56.0	16.3	41.1	8.4	85.2	38.3	6.9	19.7	42	549
Lake Louise Flats	12/62	34.2	11.4	50.0	7.0	78.3	29.1	21.1	17.8	39	129
Lake Louise Flats	1963-64	NO COUNT MADE									

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Units 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
12											
Lake Louise Flats	10/65	32.5	10.0	44.4	6.1	61.5	32.5	8.3	19.7	12	66
Lake Louise Flats	1966	NO COUNTS MADE									
5											
Alphabet Hills (West Fork Gulkana)	11/55	82.6	30.9	60.2	13.1	116.8	52.9	9.8	22.5	---	449
Alphabet Hills (West Fork Gulkana)	10/56	52.0	8.0	18.2	4.8	114.3	14.0	0.0	8.4	---	83
Alphabet Hills (West Fork Gulkana)	11/57	81.6	20.5	33.6	9.4	109.7	37.4	5.1	17.1	---	843
Alphabet Hills (West Fork Gulkana)	10-11 1958	68.3	11.1	19.4	5.5	63.0	35.4	2.1	17.3	---	1154
Alphabet Ridge	10-11 1959	94.0	10.0	11.9	4.2	45.5	22.7	0.0	18.5	---	119

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose	
5											
Alphabet Hills	11/60	61.1	9.3	17.9	3.9	29.4	63.0	11.5	26.3	68	259
Alphabet Hills	11/61	56.1	10.8	24.0	5.6	56.1	38.7	3.8	19.9	60	413
Alphabet Hills	11/62	60.6	12.2	25.2	6.5	94.4	25.8	2.9	13.8	110	520
Alphabet Hills	11/63	77.9	9.0	13.1	4.1	41.5	43.4	3.9	19.6	90	270
Alphabet Hills	3/64	---	---	---	---	---	---	0.0	18.8	42	223
Alphabet Hills	10/65	40.6	10.6	35.5	6.1	61.6	34.5	1.3	19.7	118	1615
Alphabet Hills	11/66	44.3	5.6	14.5	3.3	42.3	26.4	1.2	15.4	63	1130
13 & 14											
Oshetna River, Tyone Cr., Nelchina R. (13&14)	11/55	105.7	28.3	36.6	10.1	76.3	74.2	12.4	26.5	---	445
Oshetna River, Tyone Cr., Nelchina R. (13&14)	10/56	69.9	7.5	12.1	3.8	51.9	29.0	0.0	14.6	33	185
Oshetna River-Tyone Cr. (13&14)	11/57	73.4	21.3	40.8	9.4	80.0	53.2	6.4	23.5	---	213
Little Nelchina (13)	11/57	87.8	24.5	38.7	10.4	104.3	46.9	15.0	20.0	---	115

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
13 & 14											
Total, Oshetna-Little Nelchina (13 & 14)	11/57	78.3	22.4	40.0	9.8	87.7	51.0	9.0	22.3	---	328
Oshetna River-Tyone Creek (13&14)	10-11 1958	69.4	12.7	22.4	5.7	47.2	53.7	10.8	24.1	---	299
Little Nelchina (13)	10-11 1958	61.4	6.8	12.5	3.4	33.3	40.9	0.0	20.2	---	89
Total, Oshetna-Little Nelchina (13&14)	10-11 1958	67.4	11.2	20.0	5.2	44.4	50.6	8.4	23.2	---	388
Oshetna River, Tyone Creek, (13&14) Nelchina River	1959	NO COUNTS MADE									
Little Nelchina (13)	11/60	66.7	0.0	0.0	0.0	0.0	133.3	50.0	44.4	---	9
Sanona Cr. (14)	11/60	120.7	20.7	20.7	7.4	70.6	58.6	0.0	21.0	---	81

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂: 100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Oshetna-Sanona (14)	1960	128.7	35.1	37.5	11.6	110.0	63.8	13.2	21.1	52	284
Little Nelchina (13)	11/61	41.0	22.6	122.5	11.6	84.5	53.5	16.0	27.5	84	422
Little Nelchina	1962-1964	NO COUNT MADE									
Big Oshetna (14)	10/65	17.4	5.8	50.0	4.2	52.6	22.1	0.0	15.8	50	120
Oshetna River (14)	11/66	20.0	9.0	82.4	5.9	53.8	33.5	0.0	21.8	62	238
Little Oshetna-Little Nelchina (13)	11/66	8.8	5.4	157.1	3.7	30.1	35.8	4.4	24.7	62	295
15											
Klutina-Tazlina (St. Anne-Kaina)	11/55	95.6	24.4	34.4	11.0	183.3	26.7	20.0	12.0	--	100
Klutina-Tazlina (St. Anne-Kaina)	10/56	120.0	20.0	20.0	7.9	120.0	33.3	0.0	13.2	17	38
Klutina-Tazlina (St. Anne-Kaina)	11/57	76.9	11.5	17.6	5.8	100.0	23.1	20.0	11.5	--	52

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves: 100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Klutina-Tazlina (St. Anne-Kaina)	10-11 1958	108.8	10.5	10.7	4.7	162.5	12.9	6.7	5.8	--	275
Klutina-Tazlina (St. Anne-Kaina)	1959	NO COUNT MADE									
Klutina-Tazlina (St. Anne-Kaina)	11/60	244.4	29.6	13.8	6.6	72.7	81.5	15.8	18.2	53	121
Klutina-Tazlina (St. Anne-Kaina)	11/61	68.0	14.7	27.5	7.4	100.0	29.3	15.8	14.8	39	148
Klutina-Tazlina	11/62	91.9	28.2	44.3	13.3	269.2	21.0	4.0	9.8	55	264
Klutina-Tazlina	1963-1964	NO COUNT MADE									
Klutina-Tazlina	10/65	69.7	14.1	25.5	7.8	233.0	12.1	9.1	6.7	44	180
Klutina-Tazlina St. Anne Lake	11/66	50.0	5.9	13.3	3.6	100.0	11.8	0.0	7.3	36	55

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂: 100 ♀	Small ♂:100 ♀	Small♂: 100 Large ♂	% Small ♂	Small ♂: 100 ♂ Calves	Calves : 100 ♀	Twins:100 ♀ w/calf	% Calves	Moose /Hour	Total Moose
1											
Wells Creek Nenana River	1955-1962		NO COUNTS MADE								
Wells Creek Nenana River	11/63	50.0	10.7	27.3	5.9	66.7	32.1	5.9	17.6	185	204
Wells Creek	3/64	---	---	---	---	---	---	9.1	19.4	33	62
Wells Creek, Upper Nenana	10/65	46.7	17.4	59.3	10.8	237.0	14.6	3.8	9.1	69	297
Wells Creek, Upper Nenana	11/66	23.3	4.3	22.6	2.9	34.1	25.2	7.9	16.9	55	243
3											
Upper Nenana- Upper Susitna	1955-1962		NO COUNTS MADE								
Upper Susitna	11/63	57.8	16.3	39.3	8.5	93.6	34.8	11.9	18.1	95	260
Upper Nenana- Upper Susitna	3/64	---	---	---	---	---	---	0.0	14.3	64	70
Upper Susitna	11/65	58.6	19.4	49.6	11.0	218.2	17.8	3.8	10.1	59	544

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Units 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Upper Susitna	11/66	46.6	13.3	39.1	7.7	108.7	24.1	2.3	14.1	50	326
Paxson Lake-Sourdough	1955-1960		NO COUNTS MADE								
Paxson Area	11/61	60.9	11.6	23.5	5.2	37.2	62.3	16.2	27.9	67	154
Paxson Area	11/62	30.3	13.6	81.8	8.0	66.7	40.9	8.0	23.9	64	113
Paxson Area	1963		NO COUNT MADE								
West of Paxson Lake	12/64	37.0	18.5	100.0	11.2	130.4	28.4	4.5	17.2	64	134
Fish Creek to Meire Lake & West of Paxson to Haggard Creek (8)	12/64	41.0	12.4	43.4	7.4	93.9	26.4	4.3	15.8	141	621
Paxson Lake-Sourdough	10/65	29.7	4.7	18.9	2.9	28.0	83.8	0.0	20.6	65	242

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

	Area	Date	♂:100♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
	Paxson Lake-Sourdough	11/66	28.6	0.0	0.0	0.0	0.0	28.6	10.5	18.2	25	121
9	Paxson-Sourdough East of Hwy.	10/65	30.7	8.0	35.0	6.0	27.5	58.0	4.1	44.0	52	116
	Paxson to Sourdough East of Hwy.	11/66	45.2	2.4	5.6	1.4	16.7	40.0	0.0	16.4	27	73
10	Upper Gakona River	1955-1956	NO COUNTS MADE									
	Upper Gakona River	11/57	88.1	27.1	44.4	11.7	123.1	44.1	---	19.0	--	137
	Upper Gakona River	10-11 1958	72.6	13.1	22.0	6.1	61.1	42.9	5.9	19.9	--	181
	Upper Gakona River	1959	NO COUNT MADE									

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

	Area	Date	♂:100♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
	Upper Gakona River	11/60	122.7	29.5	31.7	12.5	433.3	13.6	0.0	5.8	39	104
	Upper Gakona & Chistochina	11/61	127.1	26.3	26.1	9.9	137.8	38.1	4.7	14.4	108	313
	Upper Gakona & Chistochina	11/62	105.3	36.5	53.1	15.2	205.4	35.6	7.2	14.8	131	501
	Upper Gakona River	1963	---	---	---	---	---	---	---	---	---	---
	Upper Gakona River	1964	---	---	---	---	---	---	---	---	---	---
	Gakona Glacier	10/65	57.0	13.1	29.7	7.4	128.8	20.3	1.7	11.4	235	516
	Upper Gakona River	11/66	49.2	4.6	10.4	2.7	40.7	22.7	0.0	13.1	133	411
14	Black River-Goose Creek	1955-1956	NO COUNTS MADE									

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Clarence Lake, Black River	11/57	72.5	11.7	19.2	5.2	46.5	50.3	4.9	22.6	---	381
Clarence Lake, Black River	10-11 1958	86.8	11.2	14.8	5.0	60.3	37.1	7.4	16.6	---	441
Clarence Lake, Black River	1959	NO COUNT MADE									
Black River	11/60	74.4	25.6	52.6	11.6	111.0	46.2	40.0	20.9	---	86
Goose & Gilbert Creek	11/60	66.7	9.5	16.7	3.8	25.0	76.2	14.3	30.2	---	53
Total, Black River & Goose & Gilbert Creek	11/60	71.7	20.0	38.7	8.6	70.6	56.7	21.4	24.5	38	139
Black, Big & Little Oshetna River	11/61	62.0	26.7	75.6	12.3	95.8	55.7	7.6	25.6	173	555
Black, Big & Little Oshetna River, Sanona Creek	11/62	56.3	18.2	47.7	10.1	152.7	23.8	1.9	13.2	94	416

Table 24. Moose Sex and Age Ratios, Nelchina Basin Count Areas, Unit 13 and 12, 1952-1966 (Cont.).

	Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
	Black, Big & Little Oshetna River, Sanona Creek	1963-1964		NO COUNTS MADE								
	Black River-Goose Creek	10/65	28.6	10.8	60.6	7.2	100.0	21.6	0.0	14.4	80	278
	Black River-Goose Creek	1966		NO COUNTS MADE								
16												
	Chistochina Area	1955-1964		NO COUNTS MADE								
	Chistochina Area	10/65	113.2	23.2	25.7	9.6	166.7	27.8	5.0	11.5	121	364
	Chistochina Area	11/66	91.7	11.1	13.8	5.0	74.4	29.9	0.0	13.5	114	319

Table 24. Moose Sex and Age Ratios, Nelchina Basin Summary, Unit 13, 1952-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Not specified	1952	60.9	13.5	28.6	6.7	67.6	40.0	17.2	19.9	---	683
Not specified	1953	107.4	38.5	56.0	12.4	85.8	89.8	21.1	28.8	---	1,100
Not specified	1954	109.0	28.4	35.3	7.8	72.3	78.7	19.6	21.5	---	2,165
Total, Nelchina Basin	1955	99.7	28.8	41.8	11.5	110.0	52.4	10.1	21.0	---	2,491
Total, Nelchina Basin	1956	66.3	12.5	23.3	6.5	94.9	26.4	1.9	13.7	38	1,154
Total, Nelchina Basin	1957	69.3	15.9	29.8	7.5	76.6	41.5	6.0	19.7	---	2,387
Total, Nelchina Basin	1958	70.6	11.3	19.1	5.4	60.6	37.4	8.5	18.0	---	3,781
Total, Nelchina Basin	1959	58.1	10.3	19.4	4.9	40.0	51.3	1.7	24.5	---	245
Total, Nelchina Basin	1960	85.2	20.4	31.5	8.2	73.8	55.3	11.6	22.4	55	1,467
Total, Nelchina Basin	1961	63.5	20.3	47.1	9.7	88.7	45.9	10.1	21.9	70	2,977
Total, Nelchina Basin	1962	64.0	17.7	45.0	9.2	125.8	28.1	5.5	14.6	87	2,357

Table 24. Moose Sex and Age Ratios, Nelchina Basin Summary, Unit 13, 1952-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Nelchina Basin	1963	49.1	11.6	30.8	6.1	55.9	41.4	6.3	21.7	119	1,796
Total, Nelchina Basin	1964	---	---	---	---	---	---	4.5	17.0	73	1,514
Total, Nelchina Basin	1965	34.7	12.9	37.2	6.9	98.5	26.2	2.2	13.9	70	6,700
Total, Nelchina Basin	1966	34.1	6.4	18.8	3.8	48.3	26.6	2.2	15.9	63	4,534

Table 25. Moose Sex and Age Ratios, Anchorage Area, Unit 14, 1955-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Ft. Richardson	11/55	71.7	17.4	32.0	8.0	76.2	45.7	16.7	21.0	---	100
Ft. Richardson	11-12 1957	13.2	4.4	50.0	2.5	14.6	60.3	13.9	34.7	88	118
Ft. Richardson	11/58	30.9	9.6	44.9	5.5	45.4	42.2	6.6	24.4	---	398
Ft. Richardson	10-11 1959	12.5	5.0	66.7	2.9	16.7	53.3	14.3	34.8	---	69
Ft. Richardson	11/66	19.3	10.1	109.1	6.3	51.1	39.5	6.8	24.6	33	191
Peters Creek & Eagle Creek	11/55	31.8	9.1	40.0	6.0	92.3	19.7	0.0	13.0	---	100
Peters Creek & Eagle Creek	10/56	120.0	60.0	100.0	25.0	300.0	20.0	0.0	8.3	12	12
Peters Creek	10-11 1957	8.3	4.2	100.0	2.7	18.2	45.8	4.8	29.7	127	74
Eagle River	10-11 1957	26.1	6.5	33.3	3.9	31.6	41.3	5.6	24.7	140	154
Total, Peters Creek & Eagle River	10-11 1957	20.0	5.7	40.0	3.5	26.7	42.9	5.3	26.3	---	228
Peters Creek	11/60	22.2	13.9	166.7	9.5	125.0	22.2	6.7	15.2	---	105
Eagle River	11/60	15.8	7.9	100.0	4.9	37.5	42.1	0.0	26.2	---	61

* Count areas not illustrated.

Table 25. Moose Sex and Age Ratios, Anchorage Area, Unit 14, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose /Hour	Total Moose
Eagle River Below Bridge	2/67	---	---	---	---	---	---	0.0	0.0	40	12
Eagle River Above Bridge	2/67	---	---	---	---	---	---	3.8	26.9	83	108
Total, Eagle River	1966 (2/67)	---	---	---	---	---	---	3.4	26.7	75	120
Ship Creek & Timberline	10-11 1957	23.9	5.5	30.0	3.5	32.4	33.9	0.0	21.5	258	172
Ship Creek	11/60	47.7	15.9	50.0	7.4	50.0	63.6	0.0	29.5	---	95
Off Base Ship Creek Drainage	11/66	18.3	11.7	175.0	7.8	73.7	31.7	0.0	21.1	113	90
Elmendorf	11/66	27.3	9.1	50.0	4.0	22.2	81.8	0.0	36.0	31	25
Off Base Campbell Creek Drainage	11/66	7.7	0.0	0.0	0.0	0.0	38.5	0.0	26.3	48	19
Total, Anchorage Area	1960	27.9	13.0	87.0	7.7	66.7	39.0	1.7	23.0	58	261
Anchorage-Eklutna	11/61	6.3	5.5	700.0	3.8	280.0	39.4	12.5	27.0	71	185
Anchorage Area	12/62	17.5	4.6	36.0	3.2	35.3	26.3	8.5	18.3	52	279
Total, Anchorage Area	11/66	18.7	9.8	111.1	6.2	50.0	39.4	3.9	24.6	42	325

Unit 14, Matanuska Valley (Fig. 11).

Area 1

NORTH: The Hatcher Pass road from Willow east to the Little Susitna River.

EAST & SOUTH: Little Susitna River.

WEST: From the junction of the Little Susitna River and Alaska Railroad north along Alaska Railroad to Willow Creek.

Area 2

NORTH: Willow Creek, from Alaska Railroad west about 1.5 miles.

WEST: A north-south line from Willow Creek south on the west side of Big Lake (West of Nancy Lake), then angling east around the south side of Mud Lake and Flat Lake.

SOUTH: South shore of Mud Lake, Flat Lake, and Big Lake, to the Big Lake Road.

EAST: The road from Big Lake to the Alaska Railroad, then north and west along the Alaska Railroad to Willow Creek.

Area 3

NORTH: Palmer-Willow Highway, from the Wasilla-Goose Bay Road west to the Big Lake Road.

WEST: Big Lake Road to Big Lake, up Fish Creek to where it approaches Goose Creek, over to and down Goose Creek to Knik Arm.

SOUTH: Knik Arm, from Goose Creek, east to the Goose Bay Road.

EAST: Wasilla-Goose Bay Road, from Wasilla to Knik Arm.

Area 4

NORTH: Little Susitna River, from the Alaska Railroad east to its intersection with Schrock Road.

Unit 14, Matanuska Valley (cont.)

WEST: Palmer-Willow Highway, from the Little Susitna River to its junction with the Big Lake Road.

SOUTH: Palmer-Willow Highway from Big Lake Road, east to Schrock Road.

EAST: Schrock Road from the Palmer-Willow Highway to Little Susitna River.

Area 5

NORTH: Little Susitna River from Schrock Road north to its headwaters.

WEST: Schrock Road from Little Susitna River to Palmer-Willow Highway.

SOUTH: Palmer-Willow Highway from Schrock Road to the Matanuska River.

EAST: Matanuska River from its intersection with the Palmer-Willow Highway to Moose Creek, up Moose Creek, to the end of the road, then a line northwest to headwaters of the Little Susitna River.

Area 6

NORTH: Palmer-Willow Highway, from Wasilla to the Matanuska River.

SOUTH: Knik Arm, from Knik to Glenn Highway.

EAST: Glenn Highway, from Palmer to Knik Arm.

Area 7

NORTH: Wolverine Creek, from Matanuska River to north of Lazy Mountain.

WEST: Matanuska River, from Wolverine Creek to Knik Arm.

Unit 14, Matanuska Valley (cont.)

SOUTH: South side of Knik Arm from the Glenn Highway to Knik River, and east to Finger Lakes.

EAST: From Knik River north to Wolverine Creek.

Area 8

NORTH: A line along the foothills from Moose Creek east to Chickaloon River.

WEST: Moose Creek, from its headwaters to the Matanuska River.

SOUTH: Matanuska River, from Moose Creek to the Chickaloon River.

EAST: Chickaloon River, from Matanuska River north to Dome Creek.

Area 9

NORTH: Foothills of the Talkeetna Mountains from Chickaloon River across from Dome Creek, east to Fortress Creek.

WEST: Chickaloon River from Dome Creek, south to Matanuska River.

SOUTH: Matanuska River from Chickaloon River to Matanuska Glacier.

EAST: Fortress Creek, and Matanuska Glacier.

Unit 14, Lower Susitna River (Fig. 12).

Willow Creek-Little Willow Creek

NORTH: Little Willow Creek from the Susitna River to its headwaters.

EAST: The foothills of the Talkeetna Mountains, from Little Willow Creek south to the headwaters of Willow Creek.

SOUTH: Willow Creek, from its headwaters to the Susitna River.

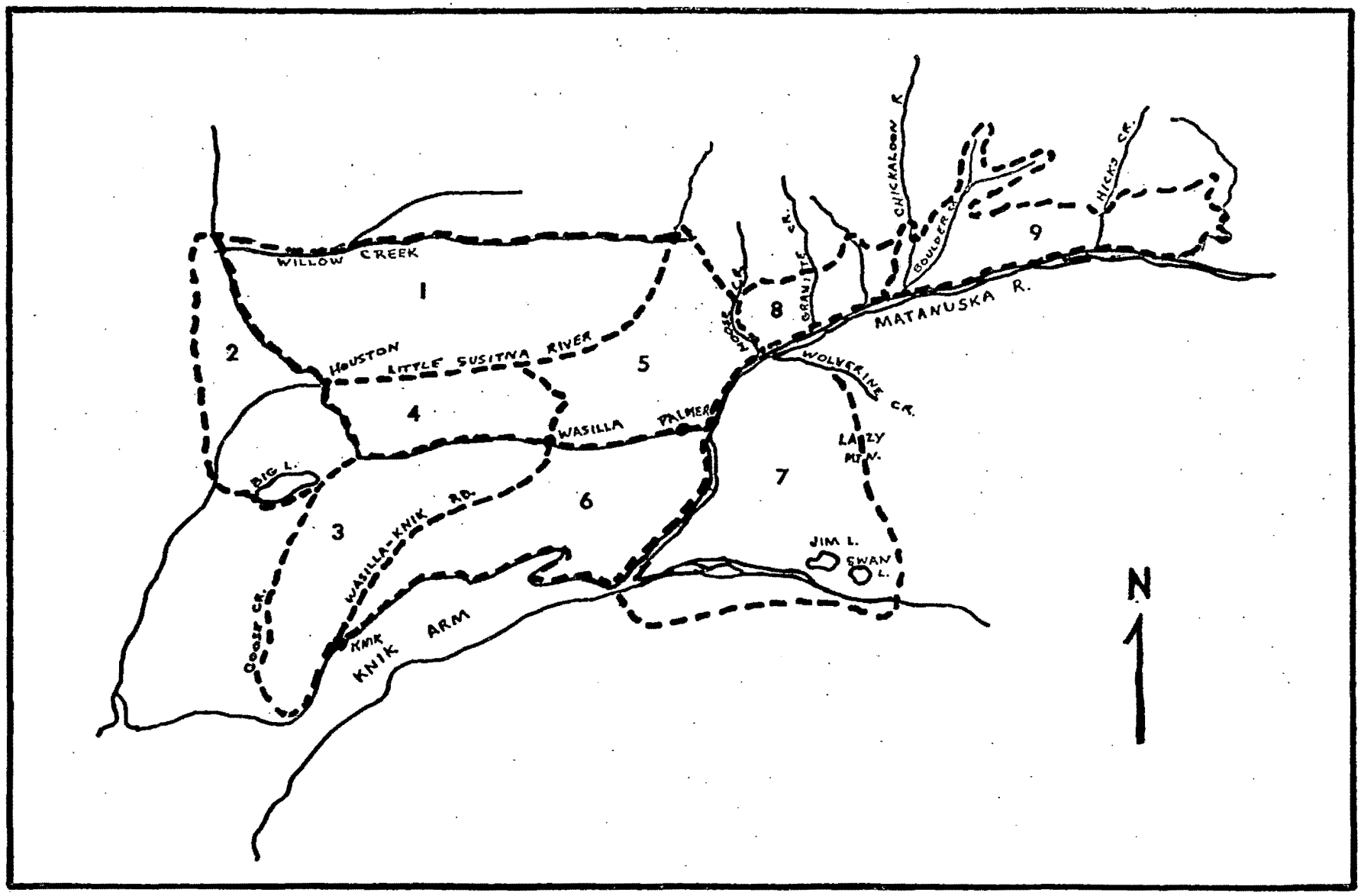


Fig. 11 Moose composition count areas, Unit 14, Matanuska Valley.

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Count Areas, Unit 14, 1955-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Upper Matanuska Valley	11/55	2.4	0.0	0.0	0.0	0.0	19.5	0.0	16.0	---	50
Matanuska Valley Lowland	11/55	8.3	3.7	80.0	2.5	17.6	42.1	3.7	28.0	---	1,300
Matanuska Valley Lowland	10/56	5.1	3.4	200.0	2.0	11.2	60.5	1.9	36.5	---	293
Matanuska Valley Lowland	1957	---	---	---	---	---	---	---	---	---	---
Matanuska Valley	11/58	NO FURTHER BREAKDOWN. SEE TOTALS PAGE 141-142.									
Matanuska Valley	10-11 1959	NO FURTHER BREAKDOWN. SEE TOTALS PAGE 141-142.									
Matanuska Valley Timberline	11/55	25.4	11.1	77.8	7.0	66.7	33.3	5.3	21.0	---	100

*See Figure 11, Map of Count Areas.

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Count Areas, Unit 14, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves ♂:100	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Matanuska Valley Timberline	10/56	18.1	5.7	46.2	3.6	27.9	41.0	2.4	25.7	---	167
Matanuska Valley Timberline	11-12 1957	14.8	8.9	150.0	6.0	53.6	33.1	9.8	22.4	142	250
Matanuska Valley	11/60	NO FURTHER BREAKDOWN. SEE TOTALS, PAGE 141-142.									
Matanuska Valley	11/61	NO FURTHER BREAKDOWN. SEE TOTALS, PAGE 141-142.									
Matanuska Valley	11/62	NO FURTHER BREAKDOWN. SEE TOTALS, PAGE 141-142.									
1	12/64	---	---	---	---	---	---	0.0	23.7	12	38
1	10/65	22.9	15.3	200.0	9.0	66.7	45.8	7.5	27.0	73	422
1	12/66	13.9	10.9	375.0	7.1	56.6	38.7	4.1	25.2	26	210
2	12/64	---	---	---	---	---	---	5.3	29.8	35	67
2	10/65	8.0	4.0	100.0	2.6	18.2	44.0	0.0	28.9	19	38

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Count Areas, Unit 14, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
2	12/66	14.8	11.1	300.0	6.7	42.9	51.9	0.0	31.1	30	90
3	12/64	---	---	---	---	---	---	6.3	28.8	89	236
3	10/65	9.7	6.5	200.0	4.1	26.7	48.4	7.1	30.6	49	49
3	12/66	25.0	23.3	1400.0	12.4	73.7	63.3	5.6	33.6	28	113
4	12/64	---	---	---	---	---	---	3.2	30.8	95	227
4	10/65	2.7	0.0	0.0	0.0	0.0	70.3	0.0	40.6	37	64
4	12/66	7.5	5.7	300.0	3.7	24.0	46.2	0.0	30.5	33	82
5	12/64	---	---	---	---	---	---	1.6	24.1	86	278
5	10/65	22.0	15.6	244.4	8.7	57.1	54.6	7.7	30.6	118	503
5	12/66	10.0	8.6	600.0	5.5	38.1	45.0	3.4	29.0	51	217

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Count Areas, Unit 14, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
6	12/64	---	---	---	---	---	---	2.9	33.9	100	310
6	10/65	50.0	50.0	0.0	25.0	200.0	50.0	0.0	25.0	6	8
6	12/66	11.8	11.8	---	6.7	36.4	64.7	0.0	36.7	10	30
7	12/64	---	---	---	---	---	---	1.6	24.6	155	256
7	10/65	40.9	14.1	52.5	8.3	100.0	28.2	10.5	16.7	101	252
7	12/66	24.1	20.4	550.0	11.9	86.3	47.2	13.3	27.6	44	185
8	12/66	14.2	6.6	88.2	4.3	34.9	38.1	9.0	24.6	78	350
9	11/66	9.8	3.8	63.6	2.5	18.7	40.8	8.8	27.1	69	277

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Unit 14, Summary, 1951-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Susitna-Matanuska Valley	11-12 1951	60.6	5.5	10.1	2.5	18.6	59.6	13.5	27.0	---	1,867
Susitna-Matanuska Valley	11/52	41.6	11.2	37.1	6.1	50.9	44.2	9.7	23.8	---	1,421
Susitna-Matanuska Valley	11/53	47.7	6.6	16.1	3.6	34.2	38.7	7.7	20.8	---	2,700
Total, Matanuska Valley	11/55	9.2	4.0	78.0	2.7	19.8	40.6	3.7	27.1	74	1,450
Total, Matanuska Valley	10/56	9.9	4.3	75.0	2.6	16.0	53.2	2.1	32.6	102	460
Total, Matanuska Valley	11-12 1957	7.6	4.8	166.7	3.0	19.0	50.0	8.8	31.7	141	662
Total, Matanuska Valley	11/58	6.2	2.9	86.2	1.9	12.2	47.1	6.5	30.7	---	1,338
Total, Matanuska Valley	10-11 1959	6.4	2.5	65.0	1.6	10.6	47.9	5.4	31.0	---	793

Table 26. Moose Sex and Age Ratios, Matanuska Valley, Unit 14, Summary, 1951-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Matanuska Valley	11/60	12.8	11.3	750.0	8.0	86.9	26.0	7.8	18.5	78	373
Total, Matanuska Valley	11/61	5.8	3.3	133.3	2.2	15.0	44.4	2.9	29.6	402	362
Total, Matanuska Valley	11/62	4.1	2.7	200.0	1.8	12.2	44.7	2.1	30.1	45	326
Total, Matanuska Valley	12/64	---	---	---	---	---	---	3.2	28.5	77	1,412
Total, Matanuska Valley	10/65	24.2	13.9	135.0	8.1	59.3	46.8	7.0	27.2	67	1,336
Total, Matanuska Valley	11-12 1966	14.6	11.4	408.5	6.7	45.7	48.4	4.9	29.5	41	1,554
Matanuska Valley, Areas 1-7 Only	11-12 1966	15.5	13.0	528.6	8.0	55.0	47.3	4.7	29.0	32	927

Unit 14, Lower Susitna River (cont.)

WEST: Susitna River, from Willow Creek north to Little Willow Creek.

Little Willow Creek-Kashwitna River

NORTH: Kashwitna River, from the Susitna River east to its headwaters.

EAST: Foothills of the Talkeetna Mountains, from Kashwitna River south to Little Willow Creek.

SOUTH: Little Willow Creek, from its headwaters to the Susitna River.

WEST: Susitna River, from Little Willow Creek, north to Kashwitna River.

Kashwitna River-Montana Creek

NORTH: Montana Creek, from the Susitna River to its headwaters.

EAST: Foothills of the Talkeetna Mountains from Montana Creek south to Kashwitna River.

SOUTH: Kashwitna River, from its headwaters to the Susitna River.

WEST: Susitna River, from Kashwitna River north to Montana Creek.

Montana Creek-Talkeetna River

NORTH: Talkeetna River, from the Susitna River to its headwaters.

EAST: Foothills of the Talkeetna Mountains, from the Talkeetna River south to Montana Creek.

SOUTH: Montana Creek, from its headwaters to the Susitna River.

WEST: Susitna River from Montana Creek north to the Talkeetna River.

Unit 14, Lower Susitna River (cont.)

COMMENT: Additional count areas north of the Talkeetna River are planned for the near future.

Unit 16, Lower Susitna River (Fig. 12)

Peters Hills-Kahiltna

NORTH: A line from Chelatna Lake easterly to and along Kahiltna Glacier, up the east side of Kahiltna Glacier to Hidden Creek, then easterly to the Tokichitna River.

EAST: A line from the Tokichitna River south and east around the base of the Peters Hills to Bear Creek east of the Little Peters Hills, down Bear Creek to the Kahiltna River.

SOUTH & WEST: Kahiltna River from Bear Creek to Treasure Creek, along Treasure Creek to the foothills, then westerly to Chelatna Lake.

Mt. Susitna-Mt. Beluga

NORTH: A line from the Talachulitna River northeast to the tributaries of Alexander Lake, marking off the south half of Beluga Mountain.

EAST: A line from the north boundary south along the east base of Mount Beluga, through Sucker Lake, along the east base of Mount Susitna, and southwesterly to Lewis Creek.

WEST: A line from Lewis Creek west around the base of Mount Susitna and along the west margin of the benchlands west of Mount Susitna and Mount Beluga, north to Talachulitna River.

Units 17-19 - No established count areas.

Unit 15, Lower Kenai Peninsula (Fig. 13).

Area 1, South Portion

NORTH: Kasilof River from Sterling Highway, east to the south shore of Tustumena Lake.

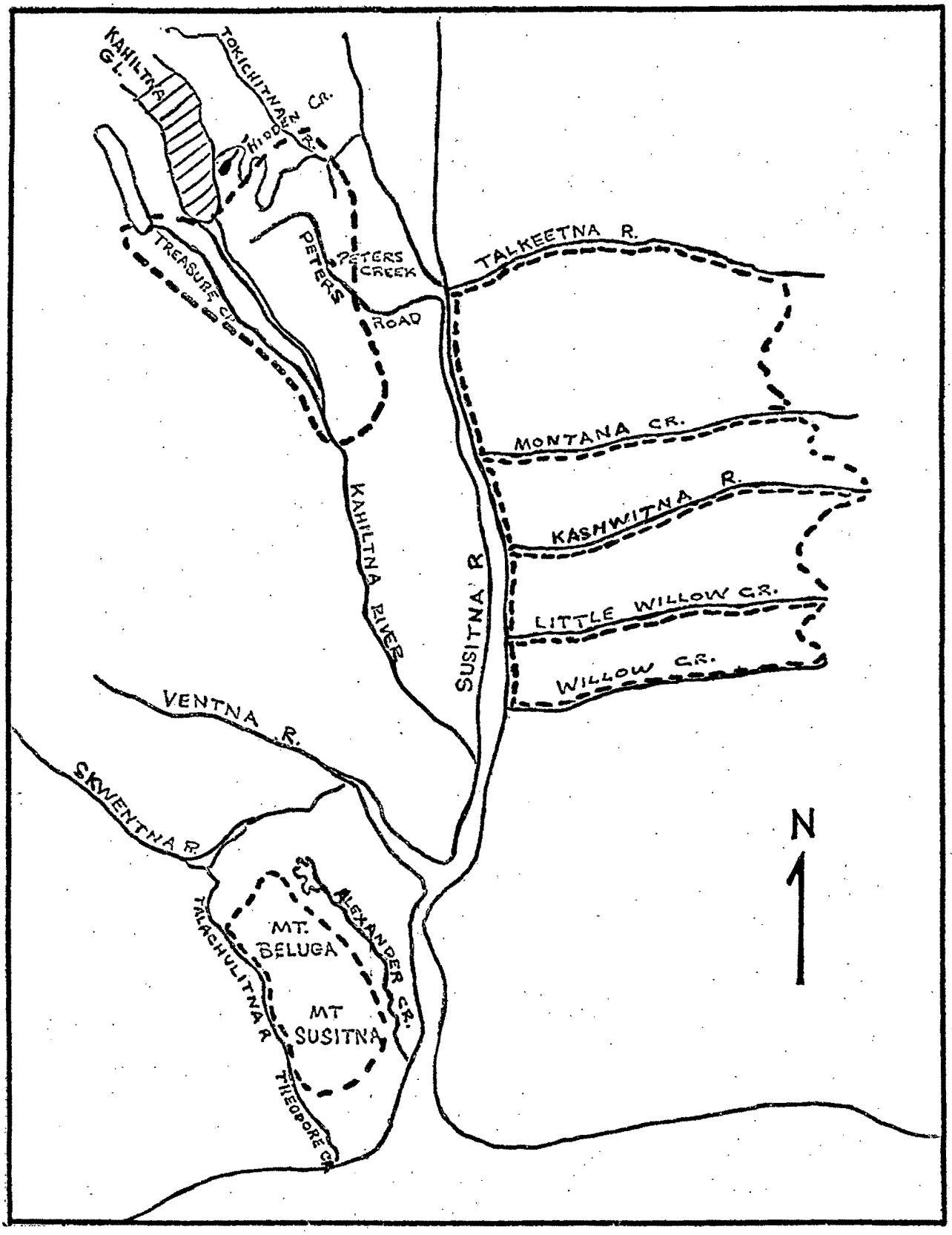


Fig. 12. Moose composition count areas, Units 14 and 16, Lower Susitna Valley.

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Willow Creek-Little Willow Creek											
Willow-Willow Creek	11/55	16.1	4.7	41.4	3.4	43.6	21.7	3.9	15.7	---	350
Willow-Willow Creek	10/56	27.5	6.2	29.3	4.0	46.2	27.0	10.6	17.5	117	595
Willow	11-12 1957	27.3	4.6	20.0	2.8	26.3	35.0	4.1	21.5	140	353
Willow	11/58	16.0	4.6	40.7	2.9	22.1	41.8	8.2	26.5	---	751
Willow	1959	NO COUNTS									
Willow	10/60	51.4	21.0	68.8	11.3	125.7	33.3	9.4	18.0	78	388
Willow	11/61	10.6	7.4	233.3	4.9	37.8	41.5	11.4	27.3	62	143
Willow	11/62	21.7	9.6	80.0	6.3	61.5	31.3	18.2	20.5	79	127
Willow-Little Willow	1963 (1/64)	---	---	---	---	---	---	3.0	21.4	---	640
Willow-Little Willow	10/65	15.4	6.2	67.9	4.2	39.8	31.4	4.6	21.1	203	852

*See Figure 12 Map of Count Areas

Table 27. Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Willow Creek-Little Willow Creek											
Willow-Little Willow	(2/65) 1966	---	---	---	---	---	---	3.2	21.3	103	301
Little Willow Creek-Kashwitna River											
Kashwitna	11-12 1957	66.0	7.5	12.9	3.8	44.4	34.0	3.8	17.0	139	318
Kashwitna	10-11 1959	62.5	14.7	30.9	7.5	83.6	35.3	11.7	17.8	---	1,127
Kashwitna	11/61	43.8	23.4	115.4	13.2	136.4	34.4	0.0	19.3	95	114
Kashwitna	11/62	31.1	6.6	26.7	4.2	53.3	24.6	7.1	15.8	38	95
Little Willow-Kashwitna	1963 (1/64)	---	---	---	---	---	---	1.2	18.3	---	464
Little Willow-Kashwitna	10/65	16.5	3.7	28.6	2.3	18.6	39.4	13.2	25.0	75	172
Little Willow-Kashwitna	1966 (2/67)	---	---	---	---	---	---	5.7	23.4	63	158

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Willow Creek-Kashwitna River											
Willow-Kashwitna	11-12 1957	43.9	5.9	15.4	3.3	33.8	34.6	4.0	19.4	140	671
Willow-Kashwitna	11/58	41.3	10.1	32.5	5.6	53.0	38.2	9.9	21.3	---	1,878
Willow-Kashwitna	10-11 1959	21.3	4.1	23.9	2.7	25.9	31.6	----	20.1	---	633
Willow-Kashwitna	11/61	24.1	13.9	137.5	8.6	72.1	38.6	7.0	23.7	73	257
Willow-Kashwitna	11/62	25.7	8.3	48.0	5.4	58.5	28.4	13.9	18.5	54	222
Willow-Kashwitna	1963 (1/64)	---	---	---	---	---	---	2.4	20.1	---	1,104
Willow-Kashwitna	10/65	15.6	5.8	59.7	3.9	35.7	32.7	6.2	21.8	158	1,024
Willow-Kashwitna	1966	SEE LITTLE WILLOW-KASHWITNA 1966									
Kashwitna-Montana											
Kashwitna-Montana	1963	---	---	---	---	---	---	0.0	21.1	---	465
Kashwitna-Montana	10/65	28.0	6.1	27.9	3.9	43.6	28.0	2.7	17.9	189	435
Kashwitna-Montana	1966	---	---	---	---	---	---	2.7	19.7	72	603

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Montana-Talkeetna											
Montana-Talkeetna	1963	---	---	---	---	---	---	3.2	21.2	139	471
Montana-Talkeetna	1965	31.7	6.1	23.8	3.8	40.0	30.5	8.7	18.8	133	133
Montana-Talkeetna	1966	---	---	---	---	---	---	4.1	22.9	100	551
Willow-Talkeetna											
Willow-Talkeetna, Kashwitna	11/60	60.3	21.4	54.9	11.0	124.0	34.5	9.9	17.7	71	565
Willow-Talkeetna	1963 (2/64)	---	---	---	---	---	---	1.8	20.6	---	2,040
Willow-Talkeetna	1964 (3/65)	---	---	---	---	---	---	17.9	14.0	29	379
Willow-Talkeetna	10/65	20.2	5.9	41.6	3.9	37.9	31.2	5.5	20.4	166	1,597
Willow-Talkeetna	1966	---	---	---	---	---	---	3.6	21.5	84	1,613

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Kahiltna - Peters Hills	11/55	84.7	14.4	20.5	6.8	106.6	27.1	6.9	12.8	---	500
Kahiltna Area	11-12 1957	88.6	10.2	13.0	4.4	47.4	43.2	18.8	18.6	102	204
Kahiltna Area	11/58	86.7	19.0	28.0	8.2	87.0	43.7	9.5	19.0	---	364
Peters Hills (Kahiltna)	11/60	110.1	18.2	19.8	7.2	92.3	39.4	25.8	15.5	47	251
Mt. Susitna-Mt. Beluga	11-12 1957	82.0	14.0	20.6	5.9	51.9	54.0	17.4	22.9	118	118
Mt. Susitna-Mt. Beluga	11/58	72.1	9.3	14.8	4.2	40.0	47.7	20.5	21.7	---	189
Mt. Susitna-Mt. Beluga	10-11 1959	97.4	7.7	8.6	3.4	57.1	26.9	5.0	12.0	---	175
Mt. Susitna-Mt. Beluga	11/60	60.4	14.4	23.8	6.5	75.3	38.1	8.5	17.3	54	445

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Mt. Susitna-Mt. Beluga (Cont.)	11/61	107.1	29.5	37.9	12.3	178.4	33.0	15.6	13.8	103	269
Mt. Susitna-Mt. Beluga	11/62	102.9	34.3	33.3	15.2	300.0	22.9	0.0	10.1	44	79
Mt. Susitna-Mt. Beluga	1/64	---	---	---	---	---	---	0.0	19.0	55	300
Miscellaneous Areas											
Railbelt, East	11/55	14.3	5.7	66.7	4.0	40.0	28.6	0.0	20.0	---	50
Willow-Montana Cr.-Timberline	11/55	72.0	11.9	19.7	5.6	59.6	39.8	0.0	18.8	---	250
Total, Railbelt - Timberline, Willow Montana Creek	11/55	58.8	10.5	21.6	5.3	56.1	37.3	0.0	19.0	---	300
Kashwitna River - Alexander Creek	10/56	65.7	12.1	22.6	5.7	53.3	45.5	7.1	21.5	52	209
Susitna Flats	11/58	63.1	21.5	51.9	11.0	113.3	32.3	5.0	16.5	---	127

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley Count Areas, Units 14 & 16, 1955-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Miscellaneous Areas (cont.)											
Little Peters Hills		196.3	22.2	12.8	5.1	57.1	77.8	23.5	20.0	30	105
Red Shirt - Nancy Lakes		---	---	---	---	---	---	0.0	23.0	42	100

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley, Units 14 & 16, Summary, 1955-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Lower Susitna	11/55	50.9	9.8	23.9	5.5	71.0	27.7	3.4	15.5	74	1,200
Total, Lower Susitna	10/56	35.3	7.4	26.7	4.5	48.3	30.8	9.6	18.5	91	804
Total, Lower Susitna	11-12 1957	47.9	7.4	15.4	3.8	39.0	37.9	8.3	19.6	127	993
Total, Lower Susitna	11/58	49.6	11.7	30.7	6.2	59.5	39.2	10.4	20.8	---	2,558
Total, Lower Susitna	10-11 1959	33.3	4.7	16.3	2.8	30.3	30.9	---	18.8	---	808
Total, Lower Susitna	11/60	60.4	18.6	30.8	8.4	97.0	38.3	12.9	17.3	55	1,366
Total, Lower Susitna	11/61	58.5	20.4	53.4	9.7	112.2	36.3	10.1	17.2	93	569
Total, Lower Susitna	10-11 1962	49.8	14.4	40.5	8.3	114.6	25.1	10.8	14.4	76	569

Table 27 Moose Sex and Age Ratios, Lower Susitna Valley, Units 14 & 16, Summary, 1955-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Lower Susitna, East of River*	1963 (1/64)	---	---	---	---	---	---	1.8	20.7	---	2,140
Total, Lower Susitna (Willow-Talkeetna)	1964 (3/65)	---	---	---	---	---	---	17.9	14.0	29	379
Total, Lower Susitna (Willow-Talkeetna)	10/65	20.2	5.9	41.6	3.9	37.9	31.2	5.5	20.4	166	1,597
Total, Lower Susitna (Willow-Talkeetna)	1966	---	---	---	---	---	---	3.6	21.5	84	1,613

* Mt. Susitna-Mt. Beluga not included in total.

Unit 15, Lower Kenai Peninsula (cont.)

EAST: Foothills of the Kenai Mountains from Tustumena Glacier outwash south to Fox River.

SOUTH: West along Fox River from foothills, northwesterly to Crooked Creek, west along Crooked Creek to the Sterling Highway.

Area 1, North Portion

NORTH: From the west end of the low hills north of Tustumena Lake east to the head of Slikok Creek and to Lake Emma.

EAST: Indian Creek from Emma Lake to Tustumena Lake.

SOUTH: North shore of Tustumena Lake from Indian Creek west to the end of the low hills north of Tustumena Lake.

WEST: A line from Tustumena Lake north to the starting point.

Area 2

NORTH: Kenai River from Cook Inlet east to the Sterling Highway.

EAST: Sterling Highway from Kenai River south to Kasilof River.

SOUTH: Kasilof River from Sterling Highway west to Cook Inlet.

WEST: Cook Inlet, from the mouth of the Kasilof River to the mouth of the Kenai River.

Area 3

NORTH: Kasilof River from Cook Inlet east to Sterling Highway.

EAST: Sterling Highway, from Kasilof River south to Clam Gulch.

SOUTH: A line from the Sterling Highway, at Clam Gulch west to Cook Inlet at the mouth of Clam Gulch.

WEST: Cook Inlet, from the mouth of Clam Gulch north to the Kasilof River.

Unit 15, Lower Kenai Peninsula (cont.)

Area 4

NORTH: Slikok Creek from the Sterling Highway east through Coal Creek Lake to the Low Hills north of Tustumena Lake.

EAST: From the west end of the low hills north of Tustumena Lake south to Tustumena Lake and along the west end of the lake to Kasilof River.

SOUTH: Kasilof River from Tustumena Lake west to the Sterling Highway.

WEST: Sterling Highway from Kasilof River north to Slikok Creek.

Area 5

NORTH: Funny River from beginning of benchland (1000' elevation) east to foothills of Kenai Mountains near the head of Bear Creek.

EAST: Foothills of Kenai Mountains near the head of Bear Creek south to Lake Emma.

SOUTH: A line from Lake Emma west to the west end of benchland (1000' elevation).

WEST: A line running northeasterly to meet the Funny River at right angles.

Area 6

NORTH & EAST: Glacier Creek from Tustumena Lake to Tustumena Glacier.

SOUTH: South edge of Tustumena Glacier outwash.

WEST: Tustumena Lake, from the south to the north end of the glacial outwash.

Unit 15, Lower Kenai Peninsula (cont.)

Area 7

NORTH: Kenai River, from Soldotna east to the Funny River, and east along the Funny River to the northwest corner of Area 5 (1000' elev.).

EAST: West end of benchland (1000' elev.) from Funny River south to Slikok Creek.

SOUTH: Headwaters of Slikok Creek west to Coal Creek Lake and west to intersection of Slikok Creek and Sterling Highway.

WEST: Sterling Highway, from Slikok Creek north to Soldotna.

Area 9

NORTH: Sterling Highway, from Soldotna east to Sterling.

EAST, SOUTH & WEST: Kenai River, from Sterling to Soldotna.

Area 10

NORTH: Kenai River, from Funny River east to Killey River.

EAST: Killey River, from Kenai River southeast to the limit of moose distribution and flyable conditions in the mountains.

SOUTH: A line southwest from the Upper Killey River to the headwaters of Bear Creek.

WEST: A line from the head of Bear Creek west to the Funny River, and along the Funny River to the Kenai River.

Area 11

NORTH: Sterling Highway, from landing strip east of Sterling east to the Skilak Lake Road, along the Skilak Lake Road to Sterling Highway at Jean Creek.

EAST, SOUTH & WEST: Kenai River, from Jean Creek west to Skilak Lake, along the north shore of Skilak Lake to the Kenai River, along the Kenai River to the landing strip east of Sterling.

Unit 15, Lower Kenai Peninsula (cont.)

Area 15

NORTH: Kenai River, from Killey River east to Skilak Lake.

EAST: Skilak Lake, from Kenai River south to King's River, up King's River and across to the Killey River drainage at its closest point.

SOUTH & WEST: Killey River, from the east boundary downstream to the Kenai River.

Area 16

NORTH: South shore of Skilak Lake from King's County Creek east to Cottonwood Creek.

EAST: Cottonwood Creek, from Skilak Lake to its headwaters and generally south to the confluence of Benjamin Creek and Killey River.

SOUTH: Killey River, from Benjamin Creek to the east boundary of Area 15.

WEST: From Killey River a line north to the nearest point on and along King's County Creek to Skilak Lake.

Area A

NORTH: Clam Gulch, from Cook Inlet to Sterling Highway.

EAST & SOUTH: From Sterling Highway generally south and west along the drainage of Ninilchik River to Cook Inlet.

WEST: Cook Inlet, from Ninilchik River north to Clam Gulch.

Area B

NORTH: Crooked Creek, from the Sterling Highway southeasterly to a generally north-south seismic trail.

EAST: North-South seismic trail, from Crooked Creek south to Deep Creek.

Unit 15, Lower Kenai Peninsula (cont.)

SOUTH: Deep Creek, from the seismic trail west to Cook Inlet.

WEST: Cook Inlet, from Deep Creek north to Ninilchik River.

Area C

NORTH: Deep Creek from its confluence with its southernmost tributary east nearly to its headwaters and then east to and along the south shore of Caribou Lake to the east end of the lake.

EAST: Fox Creek, from Caribou Lake to the edge of the bench-land (1000' elev.).

SOUTH: A line from Fox Creek west to the northernmost branch of the Anchor River, and along this branch to where it turns southward.

WEST: A line northwesterly from Anchor River to the west side of Ninilchik Dome, then to the southern tributary of Deep Creek, along this tributary to its confluence with Deep Creek.

Area H

NORTH: A line from Nikolai Creek west of Fox River to and along Fox River in an easterly direction into the foothills of the Kenai Mountains.

EAST: Foothills of the Kenai Mountains, from Fox River south to the mouth of Bradley River on Kachemak Bay.

SOUTH: North shore of Kachemak Bay, from Bradley River west to Fox Creek.

WEST: North along Fox Creek, from its mouth to Caribou Lake, and northeasterly to Nikolai Creek.

Anchor Point

NORTH & EAST: Along Deep Creek and its southern tributary to the west side of Ninilchik Dome, then southeasterly to Anchor River.

Unit 15, Lower Kenai Peninsula (cont.)

SOUTH: Southwesterly from the north and east boundary along Anchor River to its mouth.

WEST: Cook Inlet from the mouth of Anchor River north to Deep Creek.

Homer

NORTH: A line running east along the northernmost branch of the Anchor River from the point where the river turns south, to Fox Creek.

EAST & SOUTH: Fox Creek from the northern boundary line south to Kachemak Bay, and west along Kachemak Bay to the mouth of the Anchor River.

WEST: Anchor River from its mouth upstream to the northern boundary.

Kenai National Moose Range

Counting areas within the Moose Range have not been described or illustrated in this report. Coverage has varied over the years and only annual totals are presented.

Unit 20A, Alaska Range (Fig. 14).

Area 1

NORTH: A generally east-west line from the intersection of Tatlanika Creek and a sled road east along the north base of the Japan Hills and continuing parallel to and about 2 miles north of the foothills, east to the Little Delta River.

EAST: The Little Delta River from the north boundary south to Iowa Creek.

SOUTH & WEST: Iowa Creek from its mouth to its headwaters; then a line to Slide Creek, along Slide Creek to its headwaters; then a line to Threemile Creek, along Threemile Creek to the

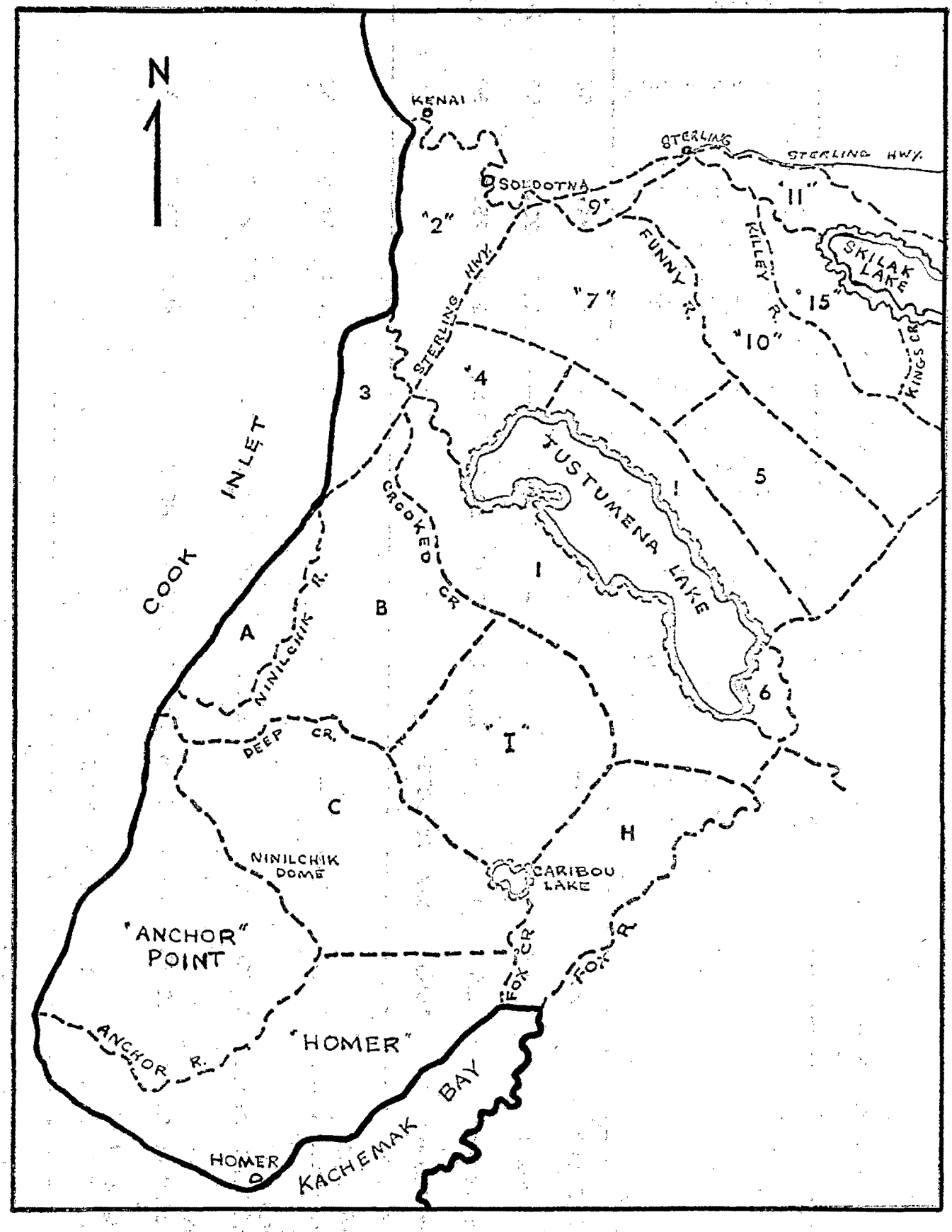


Fig. 13 Moose composition count areas, Unit 15, Lower Kenai Peninsula.

Table 28. Moose Sex and Age Ratios, Lower Kenai Count Areas, Unit 15, 1960-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Anchor Point	1/64	---	---	---	---	---	---	5.3	24.6	56	321
Anchor Point	12/64	---	---	---	---	---	---	1.7	23.5	52	260
Anchor Point	12/65	14.9	7.8	109.1	5.1	39.7	39.3	5.4	25.5	90	475
Anchor Point	1966	NOT COUNTED									
"A" West of Ninilchik River	1/64	---	---	---	---	---	---	11.4	34.0	68	150
"A" West of Ninilchik River	12/64	22.2	11.1	100.0	6.5	44.4	50.0	0.0	29.0	22	31
"A" West of Ninilchik River	12/65	29.4	17.6	150.0	10.4	88.9	39.7	8.7	23.5	33	115
"A" West of Ninilchik River	1966	NOT COUNTED									

* See Figure 13. Map of Count Areas.

Table 28. Moose Sex and Age Ratios, Lower Kenai Count Areas, Unit 15, 1960-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
"3" West of Kasilof River & Sterling Hwy.	1/64	---	---	---	---	---	---	0.0	35.1	47	57
"3" West of Kasilof River & Sterling Hwy.	12/64	21.1	17.7	233.3	9.6	90.3	32.6	3.8	21.2	146	146
"3" West of Kasilof River & Sterling Hwy.	12/65	13.3	13.3	---	8.9	72.7	36.7	0.0	24.4	13	45
"3" West of Kasilof River & Sterling Hwy.	1966	NOT COUNTED									
"1" West of Tustema Lake	1/64	---	---	---	---	---	---	13.7	20.8	51	288
"1" West of Tustema Lake	12/64	6.4	2.1	50.0	1.9	57.1	7.5	0.0	6.6	27	213
"1" West of Tustema Lake	12/65	4.0	1.0	0.0	0.0	0.0	22.0	22.2	17.5	18	63
"1" West of Tustema Lake	1966	NOT COUNTED									

Table 28. Moose Sex and Age Ratios, Lower Kenai Count Areas, Unit 15, 1960-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
"I" Caribou Hills	1/64	---	---	---	---	---	---	4.0	12.1	77	231
"I" Caribou Hills	12/64	165.4	23.1	16.2	2.3	46.2	100.0	0.0	10.0	80	259
"I" Caribou Hills	12/65	162.1	28.0	20.9	9.8	246.7	22.7	3.5	7.9	142	379
"I" Caribou Hills	1966	NOT COUNTED									
"B" Between Ninilchik & Deep Creek	1/64	---	---	---	---	---	---	9.1	27.3	35	41
"B" Between Ninilchik & Deep Creek	12/64	16.7	2.4	16.7	1.8	26.7	17.9	0.0	13.3	28	113
"B" Between Ninilchik & Deep Creek	12/65	0.0	0.0	0.0	0.0	0.0	22.2	0.0	18.2	12	33
"B" Between Ninilchik & Deep Creek	1966	NOT COUNTED									

Table 28. Moose Sex and Age Ratios, Lower Kenai Count Areas, Unit 15, 1960-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
"H" Fox River	1/64	---	---	---	---	---	---	11.8	24.5	51	233
"H" Fox River	12/64	60.7	24.6	68.2	4.8	46.9	104.9	3.3	20.6	82	310
"H" Fox River	11-12 1965	17.7	6.3	55.6	4.2	40.0	31.6	8.7	21.2	47	118
"H" Fox River	12/66	17.0	2.0	13.0	1.4	19.4	20.3	6.9	14.8	72	210
Homer	1/64	---	---	---	---	---	---	12.9	32.2	48	456
Homer	12/64	3.5	2.6	300.0	0.7	5.0	105.2	2.6	28.7	59	422
Homer	12/65	5.4	2.5	87.5	1.8	14.9	33.9	5.7	24.4	69	386
Homer	12/66	8.9	4.9	125.0	3.3	23.8	41.4	3.9	27.5	74	305
"C" Ninilchik Dome	1/64	---	---	---	---	---	---	11.4	35.9	47	223
"C" Ninilchik Dome	12/64	55.0	25.0	83.3	5.3	50.0	100.0	0.0	21.3	40	94
"C" Ninilchik Dome	12/65	45.0	32.8	269.6	21.3	310.0	21.2	5.9	13.7	77	291
"C" Ninilchik Dome	12/66	25.8	11.5	80.8	7.5	84.0	27.5	4.2	17.9	46	279

Table 28. Moose Sex and Age Ratios, Lower Kenai, Unit 15, Summary, 1960-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Lower Kenai	11/60	74.0	15.2	25.9	7.6	111.4	27.3	6.8	13.6	---	582
Total, Lower Kenai	11/61	175.2	12.4	7.6	4.2	141.7	17.5	0.0	5.9	---	405
Total, Lower Kenai	12/62	43.5	11.5	42.6	7.1	102.2	22.5	2.3	13.8	---	326
Total, Lower Kenai	1963-64 (1/64)	---	---	---	---	---	---	9.8	26.8	53	1,993
Total, Lower Kenai	12/64	22.4	7.8	53.6	2.8	5.6	24.3	2.1	19.5	52	1,848
Total, Lower Kenai	12/65	32.6	9.7	42.3	5.9	62.5	31.2	6.0	19.0	57	1,899
Total, Lower Kenai	12/66	16.9	6.3	59.6	4.3	41.2	30.7	4.5	20.8	61	794

Table 29. Moose Sex and Age Ratios, Kenai Moose Range, Unit 15, 1950-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Kenai Moose Range	11/50	---	---	---	---	---	---	---	6.6	---	1,158
Kenai Moose Range	Fall 1951	69.0	5.0	18.0	7.0	108.0	23.0	16.0	12.0	---	1.513
Kenai Moose Range	Fall 1952	50.0	8.0	33.0	10.0	156.0	21.0	6.0	12.0	---	1.136
Kenai Moose Range	Fall 1953	62.0	7.0	12.0	4.0	39.0	26.0	7.0	14.0	---	2,901
Kenai Moose Range	11-12 1954	84.0	12.0	14.0	6.0	90.0	27.0	6.0	12.0	---	2,048
Kenai Moose Range	11-12 1955	50.0	7.0	14.0	4.0	75.0	19.0	10.0	13.0	---	3,109
Kenai Moose Range	11-12 1956	51.0	6.0	13.0	4.0	54.0	24.0	10.0	14.0	---	3,777
Kenai Moose Range	11-12 1957	43.0	8.0	18.0	4.0	45.0	35.0	12.0	20.0	---	3,155

* Count areas not illustrated.

Table 29. Moose Sex and Age Ratios, Kenai Moose Range, Unit 15, 1950-1966* (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♀ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Kenai Moose Range	11-12 1958	44.0	9.0	21.0	5.0	43.0	42.0	15.0	23.0	---	3,373
Kenai Moose Range	11-12 1959	40.0	11.0	27.0	6.0	55.0	39.0	12.0	21.0	---	4,736
Kenai Moose Range	11-12 1960	34.0	8.6	28.0	4.6	35.1	49.1	14.7	26.0	---	3,482
Kenai Moose Range	11-12 1961	36.5	9.9	37.0	5.7	56.9	34.6	10.3	20.0	---	2,314
Kenai Moose Range	12/62	29.8	6.9	29.8	4.0	33.5	41.0	11.1	23.9	---	3,506
Kenai Moose Range	1963	NO COUNTS									
Kenai Moose Range	12/64	25.2	4.4	20.8	2.9	32.2	27.1	5.1	17.8	---	4,128
mi^2 census	11/65	22.8	---	---	---	---	28.9	---	19.4	---	589
mi^2 census	11/66	23.1	---	---	---	---	30.8	---	20.0	---	660

Data from Headquarters, Kenai National Moose Range, Kenai, Alaska, Narrative Reports and Personal Communications.

Unit 20A, Alaska Range (cont.)

Wood River; across Wood River and along the divide directly opposite, which separates the Upper Wood River from the small creeks draining the north slope of the foothills; then west to the head of Bonnifield Creek, and northwesterly to and along the divide between Tatlanika Creek on the west and Saint George and Fish Creeks on the east, to the north boundary.

UPPER WOOD RIVER: The drainages of the Wood River from Three-mile Creek upstream to the Wood River Glacier.

Specific boundaries for the following areas have not been decided upon. The counts made were done on a reconnaissance basis. Eventually permanent counting areas will be established at which time more complete descriptions will be written and illustrated.

REX DOME - TATLANIKA CREEK: The foothills from the flats south to Grubstake Creek on Tatlanika Creek and to the Liberty Bell Mine Road; the eastern drainage of Gold King Creek forms the eastern boundary, the west boundary is a north-south line intersecting the headwaters of Rex Creek.

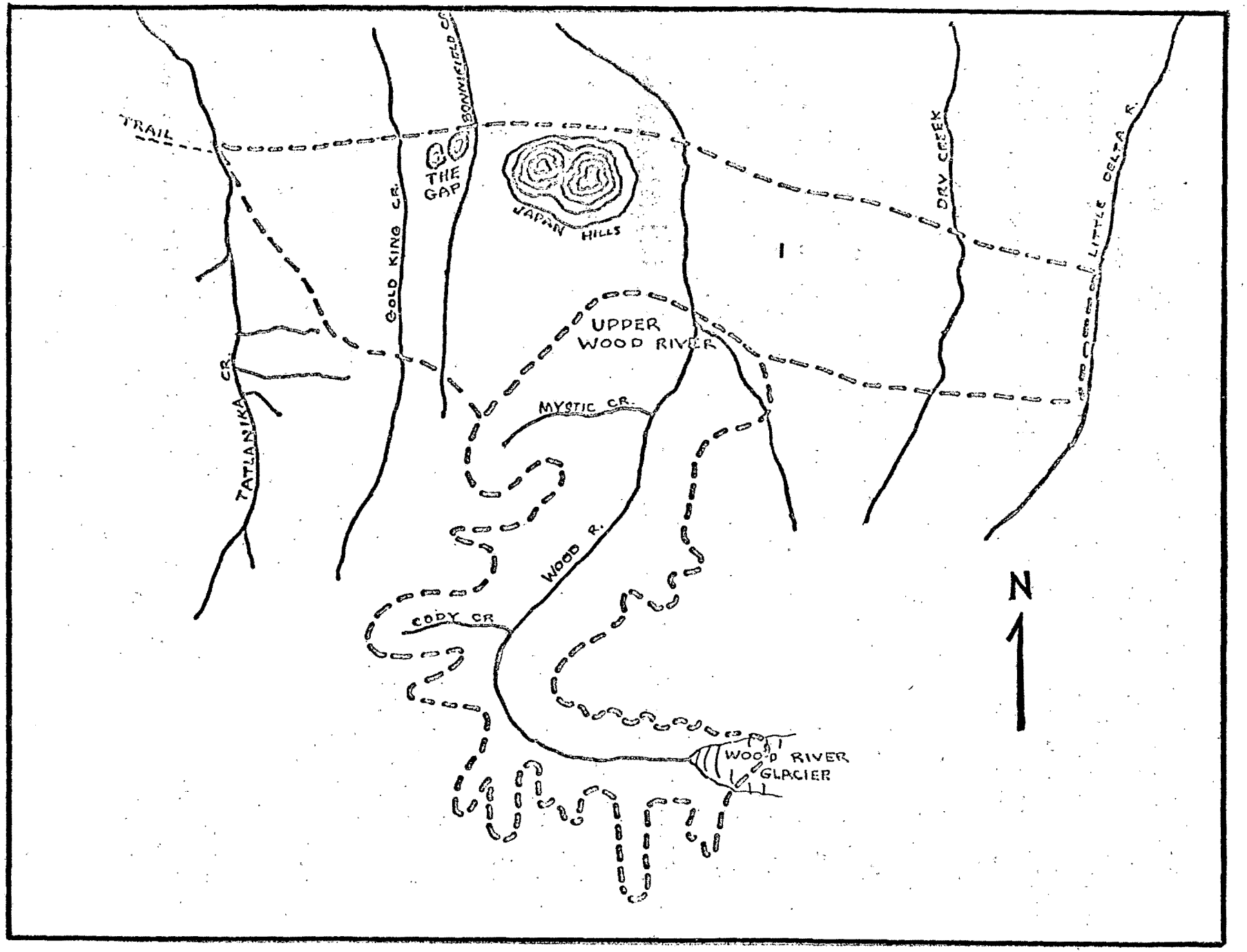
FERRY-HEALY-YANERT: Generally the area south of Ferry and the Liberty Bell Mine Road all the way to the south side of the Yanert drainage, and from the Wood River drainage west to the Nenana River.

LIGNITE-SAVAGE RIVER: Generally the area from the northern boundary of Mount McKinley Park north to the Stampede sled road, and from the Fairbanks-Anchorage Highway, west to the Savage River.

Unit 20A, Tanana Flats (Fig. 15).

Area 2

NORTH: An east-west line (which forms the northern boundary for areas 2, 4, 6 & 8), which lies about 1 mile south of Clear Creek Butte, from the military sled trail east to the Tanana River.



Fig, 14. Moose composition count areas, Unit 20A, Alaska Range.

Table 30. Moose Sex and Age Ratios, Alaska Range, Unit 20, 1956-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Foothills, Alaska Range 1	11/60	60.0	9.0	18.0	4.5	52.0	36.0	5.0	18.2	---	335
1	11/62	57.0	8.0	16.0	3.4	27.0	59.0	13.0	25.7	---	175
1	10/63	27.0	15.0	27.0	8.7	100.0	29.0	8.0	14.8	221	203
1	11/65	32.0	2.0	8.0	1.0	20.0	22.0	0.0	14.0	67	350
1	10/66	62.0	2.1	3.5	1.2	25.6	16.2	0.0	9.1	179	948
Wood River	10/56	95.6	13.2	16.0	5.8	85.7	30.8	0.0	13.6	---	260
Upper Wood River	11/65	68.0	7.0	12.0	4.0	65.0	23.0	6.0	12.0	169	389
Upper Wood River	10/66	48.4	2.3	4.9	1.3	23.3	19.5	2.4	11.6	103	372
Rex Dome-Tatlanika Dreek	10/66	64.8	2.3	3.8	1.3	33.3	14.1	0.0	7.9	92	229
Ferry-Healy Yanert	10/66	31.7	0.7	2.4	0.5	13.0	11.2	12.2	7.8	137	590

*See Fig. 14, Map of Count Areas.

Table 30. Moose Sex and Age Ratios, Alaska Range, Unit 20, 1956-1966. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Alaska Range, Unit 20A (Foothills-Wood River)	11/65	49.0	5.0	11.0	3.0	41.0	22.0	3.0	13.0	98	739
Total, Alaska Range East of Nenana River	10/66	50.3	1.7	3.5	1.0	22.7	15.0	3.2	9.0	143	2,139
Lignite-Savage River	10/66	50.0	0.0	0.0	0.0	0.0	42.0	0.0	22.0	38	50

Unit 20A, Tanana Flats (cont.)

EAST: Tanana River from the north boundary south to an east-west line intersecting the south end of the Blair Lakes Hills.

SOUTH: An east-west line intersecting the south end of Blair Lakes Hills, from the Tanana River west to the Blair Lake Hills.

WEST: The main north-south ridge of the Blair Lakes Hills from the southern boundary north to a point west of the Blair Lakes air strip; then due east to McDonald Creek (not named on U.S. G.S. maps), and north along McDonald Creek to the north boundary.

Area 3

NORTH & EAST: The middle of the Tanana River from the military sled trail south and east to the northern boundary of Area 2 and 6.

SOUTH: The east-west line lying about 1 mile south of Clear Creek Butte.

WEST: Military sled trail from the south boundary north to the middle of the Tanana River.

Area 4

NORTH: The east-west line lying about 1 mile south of Clear Creek Butte from the Bonnifield Trail east to the military sled trail.

EAST: The military sled trail from the north boundary south to the benchland on the north side of Blair Lakes Hills.

SOUTH: A generally east-west line from the military sled trail west along the edge of the heavy spruce to the Bonnifield Trail.

WEST: The Bonnifield trail from the south boundary north to a point about a mile south of Clear Creek Butte.

Area 5

NORTH: Tanana River from the Bonnifield Trail to the military sled trail.

Unit 20A, Tanana Flats (cont.)

EAST: Military sled trail from the Tanana River south to the east-west line 1 mile south of Clear Creek Butte.

SOUTH: The east-west line lying 1 mile south of Clear Creek Butte from the military sled trail west to the Bonnifield Trail.

WEST: Bonnifield Trail from the south boundary north to the Tanana River.

Area 6

NORTH: The east-west line lying 1 mile south of Clear Creek Butte, from the Military sled trail east to McDonald Creek.

EAST: McDonald Creek, from the north boundary south to a point due east of Blair Lakes airstrip.

SOUTH: A line from McDonald Creek west to the Blair Lakes airstrip.

WEST: Military sled trail, from Blair Lakes north to the north boundary.

Area 7

NORTH: Tanana River, from the mouth of Wood River east to the mouth of Crooked Creek.

EAST: Crooked Creek, from the Tanana River south to between the Wood River Buttes; then along a nameless creek draining south to the Wood River.

SOUTH & WEST: Wood River, from the eastern boundary north to the Tanana River.

Area 8

NORTH: The line lying 1 mile south of Clear Creek Butte, from Crooked Creek to the Bonnifield Trail.

Unit 20A, Tanana Flats (cont.)

EAST: The Bonnifield Trail from the north boundary south to a point roughly due east of the mouth of the nameless creek which is the eastern boundary of Area 7.

SOUTH: Generally east-west line running through the confluence of the Wood River and the nameless creek mentioned above.

WEST: The same anonymous creek, from the Wood River north to the Wood River Buttes, then along Crooked Creek to the north boundary.

Area 9

NORTH: The Tanana River from the mouth of Crooked Creek east to the Bonnifield Trail.

EAST: The Bonnifield Trail from the Tanana River south to the line 1 mile south of Clear Creek Butte.

SOUTH: The east-west line 1 mile south of Clear Creek Butte from the Bonnifield Trail west to Crooked Creek.

Unit 20A, Big Delta (Fig. 16).

See 20C. Three count areas west of the Delta River in 20A are included in the descriptions and illustration of Big Delta count areas.

Unit 20B, Tanana Valley (not illustrated)

Moose composition counts have been made periodically along several major tributaries of the Tanana River accessible by road and boat to Fairbanks. Some of the drainages extend into 20C, and some are entirely in 20C. For convenience they are considered together here.

In the fall and early winter moose in these drainages are widely dispersed which makes aerial counting difficult and inefficient. Specific count areas have not been established. Aerial counts are done on a reconnaisance basis in drainages of the Chatanika, Chena, Salcha and Goodpaster Rivers, and the upper part of Shaw Creek (the lower portion is in Area 8,

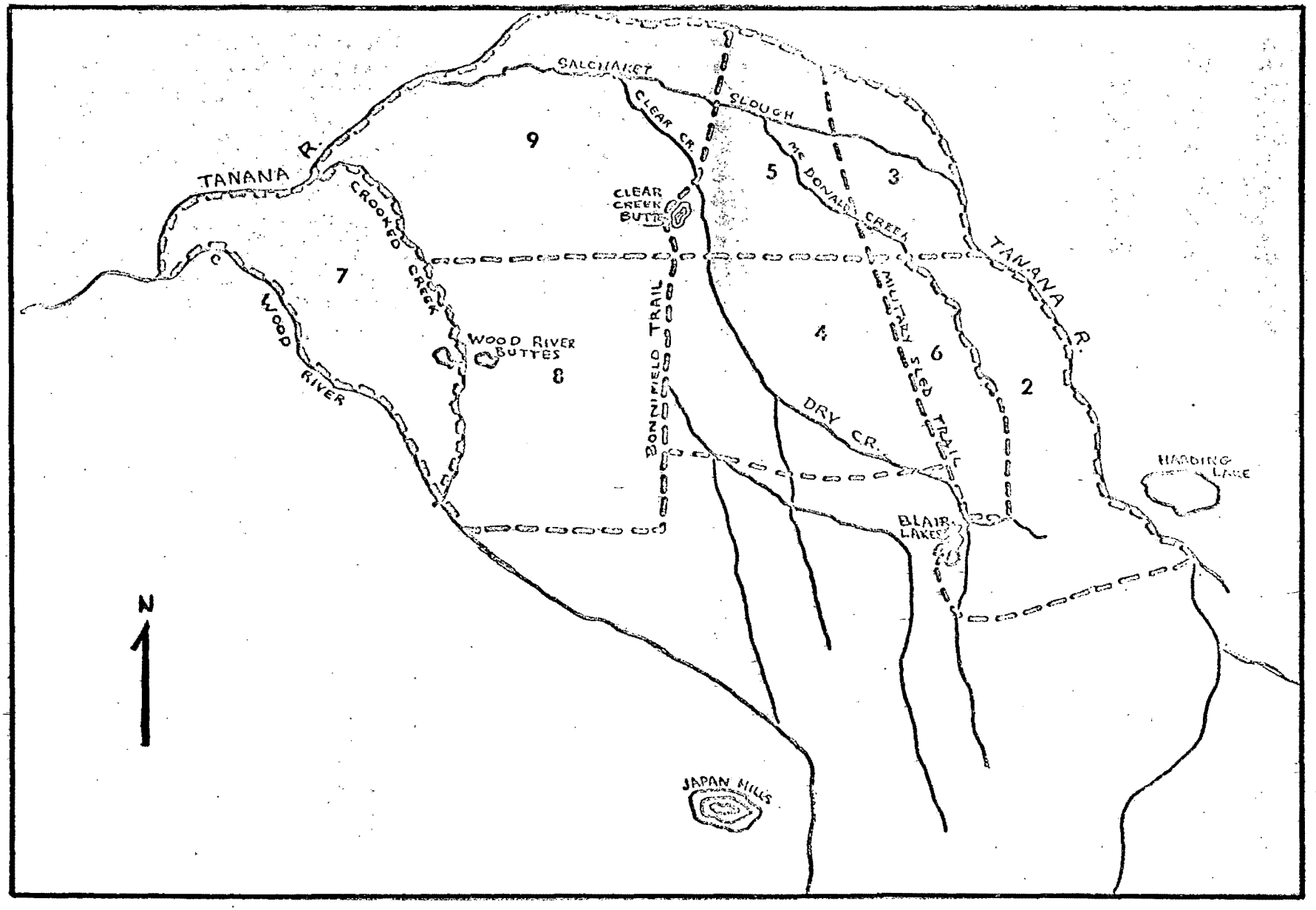


Fig. 15 Moose composition count areas, Unit 20A, Tanana Flats.

Table 31. Moose Sex and Age Ratios, Tanana Flats Count Areas, Unit 20, 1960-1966. *

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
2	11/60	50.0	19.0	60.0	10.0	100.0	25.0	0.0	20.0	---	60
2	12/62	51.0	13.0	35.0	7.8	100.0	27.0	0.0	14.6	---	151
2	10/63	73.0	14.0	24.0	8.2	80.0	36.0	0.0	17.0	66	88
2	11/65	54.0	9.0	20.0	5.0	83.0	22.0	0.0	13.0	37	285
2	10/66	66.0	2.0	3.0	0.8	13.0	26.0	0.0	13.4	31	119
3	11/60	68.0	17.0	33.0	17.9	72.0	48.0	0.0	22.0	---	177
3	12/62	33.0	2.0	11.0	1.7	33.0	14.0	0.0	10.0	---	60
3	10/63	60.0	18.0	43.0	8.5	71.0	50.0	5.0	23.9	160	176
3	11/65	31.0	6.0	23.0	3.0	33.0	35.0	0.0	21.0	45	86
3	10/66	9.0	2.0	25.0	1.2	10.0	38.0	0.0	25.6	59	82
4	11/60	69.0	11.0	19.0	5.6	71.0	31.0	0.0	15.7	---	108
4	12/62	19.0	2.0	13.0	1.2	8.0	54.0	0.0	31.3	---	163

*See Fig. 15, Map of Count Areas.

Table 31. Moose Sex and Age Ratios, Tanana Flats Count Areas, Unit 20, 1960-1966. (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
4	10/63	89.0	11.0	14.0	4.7	48.0	45.0	7.0	19.3	80	150
4	11/65	50.0	8.0	20.0	5.0	200.0	8.0	0.0	5.0	29	57
4	10/66	50.0	2.0	4.0	1.1	21.0	17.0	0.0	10.3	53	185
5	11/60	65.0	20.0	43.0	9.0	79.0	50.0	3.0	22.8	---	145
5	11/62	27.0	4.0	15.0	1.8	10.0	72.0	12.0	36.0	---	111
5	10/63	78.0	25.0	48.0	10.4	81.0	62.0	10.0	25.8	68	182
5	11/65	38.0	10.0	37.0	6.0	46.0	42.0	0.0	23.0	44	124
5	10/66	31.0	0.0	0.0	0.0	0.0	59.0	5.0	31.1	26	74
6	11/60	140.0	55.0	64.0	49.6	300.0	36.0	6.0	13.1	---	153
6	12/62	42.0	6.0	17.0	3.7	53.0	23.0	0.0	14.2	---	134
6	10/63	53.0	2.0	4.0	0.8	6.0	67.0	3.0	29.8	114	104
6	11/65	60.0	10.0	20.0	5.0	86.0	23.0	0.0	13.0	38	110
6	10/66	63.0	10.0	18.0	5.6	50.0	10.0	0.0	5.6	42	71

Table 31. Moose Sex and Age Ratios, Tanana Flats Count Areas, Unit 20, 1960-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
7	11/60	78.0	25.0	47.0	10.2	78.0	64.0	24.0	26.1	---	88
7	11/62	96.0	19.0	25.0	7.6	77.0	50.0	0.0	19.7	---	132
7	10/63	63.0	4.0	7.0	2.2	33.0	24.0	10.0	13.0	61	92
7	11/65	18.0	8.0	75.0	6.0	150.0	10.0	0.0	8.0	28	50
7	10/66	34.0	0.0	0.0	0.0	0.0	16.0	0.0	10.9	51	92
8	11/60	80.0	20.0	33.0	8.2	80.0	50.0	6.0	20.6	---	170
8	1962	NOT SURVEYED									
8	10/63	100.0	8.0	9.0	3.3	38.0	42.0	0.0	17.4	46	92
8	11/65	33.0	5.0	18.0	3.0	43.0	23.0	0.0	15.0	41	95
8	10/66	76.0	5.0	7.0	2.5	33.0	32.0	0.0	15.2	34	79
9	11/60	127.0	43.0	52.0	14.0	145.0	59.0	10.0	19.3	---	114
9	11/62	54.0	7.0	24.0	5.0	42.0	49.0	16.7	23.5	---	140

Table 31. Moose Sex and Age Ratios, Tanana Flats, Count Areas, Unit 20, 1960-1966 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
9	10/63	47.0	5.0	13.0	2.7	21.0	51.0	6.0	25.8	47	147
9	11/65	21.0	5.0	32.0	3.0	30.0	33.0	2.8	22.0	55	182
9	10/66	44.0	9.0	26.0	5.4	74.0	25.0	0.0	14.6	50	130

Table 31. Moose Sex and Age Ratios, Tanana Flats, Summary, 1956-1966.

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Tanana Flats*	10-11 1956	84.2	15.8	23.1	6.8	65.2	48.4	0.0	20.8	---	221
Total Tanana Flats* & Wood River	1956	89.8	14.5	19.3	6.3	73.0	39.8	0.0	17.3	---	427
Tanana River* Salchaket Sl.	10-12 1957	43.9	7.3	20.0	4.1	40.0	36.6	0.0	20.3	37	74
Tanana River* Salchaket Sl.	10-12 1958	53.1	21.4	67.7	10.8	100.0	42.9	13.5	21.6	69	194
Tanana River* Salchaket Sl.	11/59	69.5	14.6	26.7	6.7	60.0	48.8	25.8	22.2	---	180
Total, 2-9	1960	83.0	25.0	43.0	10.6	107.0	47.0	5.0	19.8	---	1,015
Total, 2-9	1962	43.0	8.0	23.0	4.3	39.0	22.0	4.7	22.1	---	891
Total, 2-9	1963	69.0	12.0	21.0	5.5	49.0	49.0	6.0	22.4	72	1,041
Total, 2-9	1965	40.0	8.0	24.0	5.0	58.0	26.0	0.7	16.0	40	989
Total, 2-9	1966	42.0	4.0	8.0	2.0	27.0	26.0	0.8	14.9	42	832

* Area counted in 1956-59 is only part of area counted from 1960-1966.

Unit 20B, Tanana Valley (cont.)

Big Delta count areas, 20C). In each case the area covered is generally the entire drainage modified by limitations of time, weather and finances.

Unit 20C, Big Delta (Fig. 16).

Area 1

NORTH: Tanana River, from Delta Creek east to the Delta River.

EAST: Delta River from the Tanana River south to an east-west line which if extended would pass through Ft. Greely.

SOUTH: The east-west line mentioned above, between Delta Creek and Delta River.

WEST: Delta Creek, from the east-west line mentioned above, north to the Tanana River.

Area 2

NORTH: The east-west line between Delta Creek and Delta River mentioned above.

EAST: Delta River, from the east-west line (above) south to the upper foothills of the Alaska Range.

SOUTH: Upper foothills of the Alaska Range, from Delta River to Delta Creek.

WEST: Delta Creek from upper foothills of Alaska Range north to the east-west line mentioned above.

Area 3

NORTH: Tanana River from Little Delta River to Delta Creek.

EAST: Delta Creek from Tanana River to upper foothills of Alaska Range.

SOUTH: Upper foothills, Alaska Range from Delta Creek to Little Delta River.

Unit 20C, Big Delta (cont.)

WEST: Little Delta River from upper foothills of Alaska Range north to the Tanana River.

Area 4

NORTH: Jarvis Creek, from its confluence with the Delta River east to where it runs nearly north-south.

EAST: Jarvis Creek, from the northerly boundary south to the foothills opposite Donnelly Dome, then south along the summit of these foothills, then south in the mountains east of the Richardson Highway at about 3000' elevation to Black Rapids.

SOUTH: An arbitrary boundary perpendicular to the Delta River at Black Rapids.

WEST: Foothills west of the Delta River, from Black Rapids north to the edge of the foothills and then along the Delta River north to the Tanana River.

Area 5

NORTH: Alaska Highway, from the Richardson Highway to the Gerstle River.

EAST: Gerstle River from Alaska Highway south to the upper foothills of the Alaska Range.

SOUTH: Upper foothills, Alaska Range, from the Gerstle River west to Jarvis Creek.

WEST: Jarvis Creek, from the foothills of the Alaska Range north to its intersection with the Richardson Highway; and the Richardson Highway from there to its junction with the Alaska Highway.

Area 6

NORTH: Tanana River from its intersection with the Richardson Highway east to where its course lies in a generally north-south direction.

Unit 20C, Big Delta (cont.)

EAST: A line from the Tanana River south to the Gerstle River where it bends northwesterly, and the Gerstle Ricer from that point south to the Alaska Highway.

SOUTH: Alaska Highway from Gerstle River to Delta Junction.

WEST: Richardson Highway from Delta Junction to the Tanana River.

Area 7, Healy Lake

NORTH & WEST: Volkmar River from its confluence with the Tanana River upstream along its southern fork to its headwaters.

EAST: (Approximate) Foothills lying east of Healy Lake, then bending southwesterly past Black Lake to the Tanana River.

SOUTH: Tanana River from the east boundary to the mouth of the Volkmar River.

Area 8, Shaw Creek Flats

NORTH, EAST & WEST: Summits of hills surrounding the Flats, upstream to about Gilles Creek.

SOUTH: Richardson Highway, from the foothills south of Shaw Creek to those north of Shaw Creek.

Unit 20C & 12, Tok Area (Fig. 17).

Area 1, Taylor Hwy.-Ketchumstuk

Drainages adjacent to or crossing the Taylor Highway; chiefly East & West Fork of the Dennison, Mosquito Fork, O'Brien Creek, including adjacent high country, e.g. Taylor Mountain, Fairplay, etc.

Area 2, Tok-Tanana Valley

The hills north of the Tanana River and the foothills of the Alaska Range from Tok to the vicinity of Healy Lake.

Fig. 16. Moose composition count areas, Unit 20C and 20A, Big Delta.

Table 32. Moose Sex and Age Ratios, Tanana Valley,* Unit 20, 1954-1964.**

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Zone	Total Moose
No specific location	1954	85.1	29.8	53.8	12.8	127.3	46.8	5.0	20.2	---	109
No specific location	7-8 1955	33.8	17.5	107.7	8.9	87.5	40.0	18.2	20.4	---	157
No specific location	9-10 1955	91.8	34.2	59.3	14.2	163.6	41.8	16.7	17.4	---	379
No specific location	11/55	123.6	49.3	66.4	15.3	184.8	53.4	13.0	16.6	---	476
Chena, Shaw Creek, Chatanika	10-11 1956	68.2	15.9	30.4	7.5	73.7	43.2	18.8	20.4	---	93
Chatanika to Goodpaster	10-12 1957	68.4	18.4	36.8	8.3	82.4	44.7	3.1	20.2	22	168
Chatanika to Goodpaster	10-12 1958	53.5	14.0	35.6	6.9	64.0	43.9	6.4	21.5	26	233

* Tanana Valley is a general term used to indicate various tributaries of the Tanana River, from the Chatanika River south to the Goodpaster River. In this usage it excludes Unit 20A, most of which is covered by "Tanana Flats" and "Alaska Range, U. 20," data.

** Count areas not illustrated, except Big Delta count areas, Fig. 16).

Table 32. Moose Sex and Age Ratios, Tanana Valley,* Unit 20, 1954-1964 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♀ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Chatanika to Goodpaster	11/59	37.5	10.0	36.4	4.8	29.6	67.5	15.0	32.1	---	84
Chatanika to Goodpaster	1960	---	---	---	---	---	---	---	---	---	---
Chatanika to Goodpaster	1961	---	---	---	---	---	---	---	---	---	---
Goodpaster, Volkmar, Shaw Creek	12/62	19.6	5.4	37.5	3.3	25.0	42.9	0.0	26.1	---	92
Chena River	11-12 1963	48.7	11.0	29.3	5.6	58.6	37.7	7.4	19.1	18	304
Salcha River	12/63	32.9	5.0	17.9	3.1	43.8	22.9	3.2	14.3	33	223
Shaw Creek	12/63	35.2	9.3	35.7	6.0	100.0	18.5	0.0	12.0	26	83
Goldstream Creek	12/63	18.2	12.1	200.0	6.3	34.8	69.7	21.1	36.5	25	63
Total of above for 1963	1963	38.3	8.7	29.2	4.9	53.7	32.3	8.6	18.3	23	673

Table 32. Moose Sex and Age Ratios, Tanana Valley,* Unit 20, 1954-1964 (Cont.)

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Goodpaster	1/64	---	---	---	---	---	---	17.6	9.8	29	204
Goodpaster River Healy Lake	12/64	---	---	---	---	---	---	9.5	16.1	---	143
Big Delta--1	11/60	36.4	18.2	100.0	9.8	76.9	47.2	8.3	25.5	---	102
Big Delta--2	11/60	18.9	2.7	16.7	1.6	11.8	45.9	0.0	27.4	---	62
Big Delta--3	11/60	33.3	11.1	50.0	6.7	66.7	33.3	0.0	20.0	---	15
Big Delta--4	11/60	12.5	4.2	50.0	2.2	13.3	62.5	0.0	32.6	---	46
Big Delta--5	11/60	58.2	7.3	14.3	3.4	27.6	52.7	11.5	25.0	---	116
Big Delta--6	11/60	30.9	18.2	142.9	9.0	69.0	26.2	0.0	26.1	---	111
Big Delta--7	11/60	61.1	16.7	37.5	7.9	66.7	50.0	12.5	23.7	---	38
Total, Big Delta	1960	36.8	11.9	47.6	6.1	46.9	50.6	4.9	26.1	---	490
Delta Junction (Big Delta)	1964	39.1	21.8	126.1	11.2	85.3	51.1	9.7	26.2	---	2,607

Unit 20C & 12, Tok Area (cont.)

Area 3, Tok River-Slana River

Drainages of the Tok & Slana Rivers, including portions of the Copper River drainage near Slana and Nabesna.

Annual variations in geographical units counted preclude precise delineation of the count areas on the map or in this description. A brief description of the local area counted is given with each group of data. Count area 2 near Tok extends into Unit 20C and Unit 12, and count area 3 is largely in Unit 12, although in some years adjacent portions of Unit 11 have also been counted.

Units 21-26 (not illustrated)

The only established count area in these units is the Yukon-Koyukuk area. A reconnaissance count is made in March covering the area within one to two miles of the river. On the Yukon this area between Tanana and Holy Cross is counted, and on the Koyukuk, from the mouth upstream to Allakaket, although the entire area may not be counted in any given year. Portions of tributary drainages have been counted as time permits.

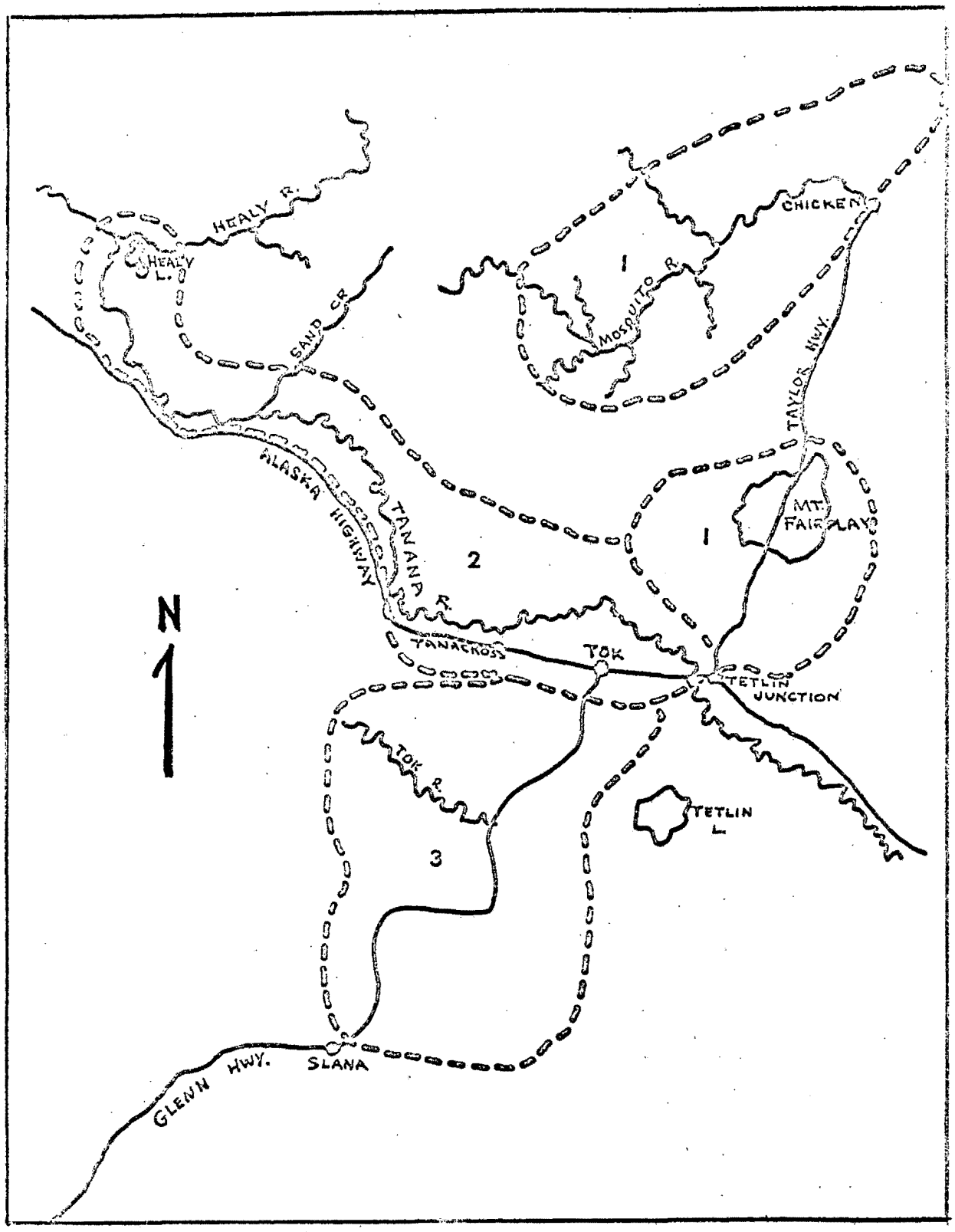


Fig. 17. Moose composition count areas, Units 20C and 12, Tok area.

Table 33. Moose Sex and Age Ratios, Tok Area, Unit 20 & 12, 1957-1966.*

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
[1]											
Fairplay, West Fork, Mosquito Fork, Ketchumstuk	10-11 1957	66.1	15.3	30.0	7.0	58.1	52.5	0.0	24.0	---	129
Mosquito Fork West Fork, Ketchumstuk	10-12 1958	91.5	20.3	28.5	8.5	88.8	45.8	8.0	19.1	40	141
Ketchumstuk-Mosquito Fork	10-12 1958	62.9	22.5	56.0	10.9	100.0	45.2	7.7	21.7	---	129
West Fork & Mosquito Fork	10-12 1959	108.3	44.8	70.5	16.8	165.4	54.2	13.0	20.3	28	253
West Fork	10/60	170.6	70.6	70.6	24.5	800.0	17.6	0.0	6.1	---	49
Mosquito Fork	10/60	85.5	13.0	18.0	6.2	100.0	26.1	0.0	12.3	---	146
Ketchumstuk	10/60	119.1	19.1	19.1	6.8	75.0	51.0	0.0	18.2	---	132
Mt. Fairplay	10/60	133.3	16.7	14.3	6.3	114.3	29.2	0.0	11.1	---	63

* See Figure 17, Map of Count Areas.

Table 33. Moose Sex and Age Ratios; Tok Area, Unit 20 & 12, 1957-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
1 (Cont.)											
Ketchumstuk Flats	1/64	---	---	---	---	---	---	0.0	20.7	15	58
Ketchumstuk Flats	1/65	---	---	---	---	---	---	4.1	18.8	---	271
Ketchumstuk-Mosquito Fork	10/66	59.4	14.7	32.8	8.6	247.1	11.9	0.0	6.9	82	245
Mt. Fairplay	10/66	41.8	11.9	40.0	7.0	80.0	29.9	0.0	17.4	172	115
2											
Tanacross	10/60	100.0	15.4	18.2	5.7	57.1	53.8	0.0	20.0	---	70
Tanacross	1/64	---	---	---	---	---	---	0.0	20.7	15	58
Tanana Flats near Tok	2-3 1965	---	---	---	---	---	---	0.0	19.2	---	73
Tanana Valley, Tok Midway Lake	11/65	75.0	18.8	33.3	8.3	75.0	50.0	0.0	22.2	11	36
Tanana Hills-Cathedral Rapids	11/65	35.3	11.8	50.0	6.5	50.0	47.1	0.0	25.8	21	31

Table 33. Moose Sex and Age Ratios, Tok Area, Unit 20 & 12, 1957-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
2 (Cont.)											
Tanana Hills-Wolf Lake	11/65	400.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	138	11
Alaska Range 7 Mile Hill West	11/65	63.9	25.0	64.3	19.8	200.0	25.0	0.0	19.8	28	91
Total, Area 2	11/65	67.3	21.5	46.9	13.6	135.3	31.8	0.0	20.1	21	169
2-Tanana Flats	10/66	68.1	14.5	27.0	7.5	111.1	26.1	0.0	13.4	43	134
3 Tok-Slana											
Tok-Slana Hwy. Area	2/65	---	---	---	---	---	---	7.9	19.3	---	425
Slana	11/65	51.2	27.4	115.0	15.4	209.1	26.2	5.0	14.8	53	149
Nabesna & Tanacross	11/65	80.0	20.0	33.3	9.1	50.0	40.0	100.0	18.2	33	11
Tok River-Little Tok River	11/65	53.3	16.0	66.7	9.1	171.4	18.7	8.3	10.6	88	132
Nabesna Road	11/65	33.8	17.5	107.7	10.5	107.7	32.5	8.3	19.5	35	133
Tok River Drainage	11/65	64.3	49.2	37.6	15.6	278.3	35.4	10.0	11.2	62	205

Table 33. Moose Sex and Age Ratios, Tok Area, Unit 20 & 12, 1957-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
3 Tok-Slana (Cont.)											
Tok-Slana Area 3A	10/66	37.9	10.2	37.0	6.4	98.2	20.8	1.9	13.1	68	419
Tok-Slana Area 3B	10/66	57.1	21.4	60.0	10.7	131.3	32.7	14.3	16.3	93	196
Total Tok-Slana Area	10/66	43.1	13.3	44.4	7.8	110.3	24.0	6.1	14.1	74	615
Miscellaneous Areas											
Northway Flats	1/64	---	---	---	---	---	---	0.0	21.7	30	60
Tetlin	1/64	---	---	---	---	---	---	0.0	21.2	22	66

Table 34 Moose Sex and Age Ratios, Koyukuk and Yukon Rivers, Units 21 & 24, 1954-1966 *

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
No specific locality, Koyukuk River	10-12 1954	131.6	65.8	100.0	21.0	161.3	81.6	36.7	26.1	---	119
Hughes-Koyukuk, Hog River, Huslia River	10-12 1957	79.5	15.9	25.0	6.2	48.3	65.9	23.9	25.7	35	226
Hughes to Hog River	10-12 1958	81.8	21.8	36.4	9.2	88.9	49.1	17.4	20.8	118	130
Dalke River to Kateel River	10-12 1958	23.5	8.0	52.0	4.1	28.6	56.2	27.1	29.0	157	314
Kateel River to Koyukuk	10-12 1958	68.9	22.2	47.6	9.2	76.9	57.8	13.0	23.9	99	109
Total, Koyukuk River	1958	43.5	13.4	44.3	6.3	48.6	55.0	19.0	26.0	132	553

* Count areas not illustrated.

Table 34 Moose Sex and Age Ratios, Koyukuk and Yukon Rivers, Units 21 & 24, 1954-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Koyukuk-Huslia	12/59	94.9	22.2	30.6	8.5	75.4	59.0	21.4	22.5	---	307
Huslia-Hughes	12/59	122.7	18.2	17.4	6.3	100.0	36.4	14.3	12.7	---	63
Total, Koyukuk River	1959	99.3	21.6	27.8	8.1	77.9	55.4	20.6	20.8	51	370
Koyukuk River, Koyukuk-Hughes	1/61	---	---	---	---	---	---	29.2	32.1	---	579
Koyukuk River Mouth to Roundabout Mountain	3/63	---	---	---	---	---	---	4.6	11.4	133	1,003
Koyukuk River Mouth to Roundabout Mountain	3/66	---	---	---	---	---	---	8.1	21.6	195	430
Roundabout Mountain to East of Winthrop Point	3/66	---	---	---	---	---	---	2.1	21.0	298	238
Total, Koyukuk River	1965-66	---	---	---	---	---	---	6.0	21.4	223	668

Table34 Moose Sex and Age Ratios, Yukon-Koyukuk Rivers, Units 21 & 24, 1954-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Lower Yukon River											
Paimiut-Anvik	11/62	36.8	15.8	75.0	10.3	194.1	16.3	21.4	10.6	---	320
Iditarod & Shageluk Hills	11/62	97.3	27.0	38.5	13.3	1000.0	5.4	0.0	2.7	---	75
Total, Lower Yukon	1962	45.9	16.3	57.1	10.1	222.2	14.6	20.0	9.1	---	395
Middle Yukon River											
Koyukuk-Kaltag	3/63	---	---	---	---	---	---	0.0	13.2	112	281
Koyukuk-Birches	3/63	---	---	---	---	---	---	11.6	17.8	116	269
Nowitna River Upstream from Mud River	3/63	---	---	---	---	---	---	6.3	17.5	48	97
Total, Middle Yukon	Spring 1963	---	---	---	---	---	---	6.3	15.8	95	647
Yukon River											
Tanana-Galena	3/66	---	---	---	---	---	---	4.2	18.2	79	165
Galena-Koyukuk	3/66	---	---	---	---	---	---	33.3	11.1	90	45

Table 34 Moose Sex and Age Ratios, Yukon-Koyukuk Rivers, Units 21 & 24, 1954-1966 (Cont.).

Area	Date	♂:100 ♀	Small ♂:100 ♀	Small ♂:100 ♀ Large ♂	% Small ♂	Small ♂:100 ♂ Calves	Calves:100 ♀	Twins:100 ♀ w/calf	% Calves	Moose/Hour	Total Moose
Total, Tanana-Koyukuk	1965-66	---	---	---	---	---	---	7.4	16.7	81	210
Koyukuk-Kaltag	3/66	---	---	---	---	---	---	---	---	0	0
Kaltag-Long Mountain	3/66	---	---	---	---	---	---	7.9	19.4	134	494
Total, Yukon River	1965-66	---	---	---	---	---	---	7.8	18.6	99	704
Total, Yukon & Koyukuk Rivers	1965-66	---	---	---	---	---	---	6.8	20.0	137	1,372

PRODUCTION

Counts to determine parturition rates were made in the Matanuska and Susitna Valleys, the Cordova area, the Yakutat area, in portions of the Trading Bay and Redoubt Bay areas (in cooperation with the Lands project), and on the Tanana Flats (Tables 35, 36, 37 and 38). Extensive parturition counts were not done in any area due to prior fiscal commitments. Leaf emergence and bad weather made counting difficult at Cordova in Unit 6. The same factors precluded obtaining a sufficiently large sample at Yakutat.

Interpretation of the data from Cordova is difficult due to the small sample size. In the Matanuska-Susitna Valley and the Trading Bay and Redoubt Bay areas initial production was very good. Production on the Tanana Flats was fair. Moose populations in this area are still in the process of recovering from the severe winter of 1965-1966.

Table 35. Summary of moose parturition counts, Cordova, Unit 6, 1967.

Area	Date	Newborn Calves ♀/0	♀/1	♀/2	♀/?	Yearlings W/0♀	♀/1	♀/2	Tagged	Total Calves	Total Yrlings	Total ♀	Calves: 100 ♀	Yrlings: 100 ♀	♂	Total Moose Hr
Copper R. Delta	6/2	16	1	0	1	5	7	1	*	1	9	31	3.2	29.0	11	52
Martin R. Valley	6/2	4	1	1	1	0	0	0	*	3	0	7	43.0	0.0	2	12
TOTAL		20	2	1	2	5	7	1	*	4	9	38	10.6	23.7	13	64

* No tagging done in this area.

Table 36. Summary of moose parturition counts, Matanuska and Susitna Valleys, Unit 14, 1967.

Area	Date	Newborn Calves ♀/0	♀/1	♀/2	♀/?	Yearlings W/0♀	♀/1	♀/2	Tagged E	Tagged C	*Total Calves	Total Yrlings	Total Calves: 100 ♀	Yrlings: 100 ♀	♂	Total Moose	Moose Hr
Little Willow to Big Willow	5/24	33	36	3	0	5	7	0	1	4	42	12	82	51.2	14.6	1	140	37
Kashwitna R. to Montana Cr.	5/25	29	35	7	4	2	7	0	0	0	49	9	82	59.8	11.0	2	142	29
Susitna Flats	5/29	21	16	6	1	3	1	0	0	0	28	4	45	62.2	8.9	6	82	27
Susitna Flats	6/2	12	14	7	1*	0	0	0	0	0	31	0	34	91.2	0.0	2	67	15
Palmer Hay Flats	5/31	6	7	2	2	7	7	0	2	1	11	14	24	45.8	58.3	1	50	25

* One set of triplets
*
* E=Ear Tagged C=Collared. Tagged moose data not restricted to yearlings.

Table 37. Summary of moose parturition counts, Trading and Redoubt Bays, Unit 16, 1967.

Area	Date	Newborn Calves ♀/0	♀/1	♀/2	♀/?	Yearlings W/0♀	♀/1	♀/2	Tagged	Total Calves	Total Yrlings	Total ♀	Calves: 100 ♀	Yrlings: 100 ♀	♂	Total Moose	Hr
Trading Bay Flats	6/7	19	20	6	12	3	3	0	*	32	6	60	53.3	10.0	15	113	24
Redoubt Bay Flats	6/9	15	16	15	12	1	0	0	*	46	1	58	79.3	1.7	10	115	29

* No tagging done in this area.

Table 38. Summary of moose parturition counts, Tanana Flats, Unit 20, 1967.

Area	Date	Newborn Calves ♀/0	♀/1	♀/2	♀/?	Yearlings W/0♀	♀/1	♀/2	Tagged	Total Calves	Total Yrlings	Total Calves: Yrlings: 100 ♀	100 ♀	♂	Total Moose	Moose/ Hr
I	5/31-6/1	117	43	6	8	2	21	0	6	55	23	195	28.2	11.8	147	420	75
II	6/4	49	33	1	5	0	7	0	1	35	7	95	36.8	7.4	129	266	78
III	6/2	18	13	0	5	1	3	0	0	13	4	39	33.4	10.3	76	132	34
Salchaket Tanana	6/1	7	6	1	0	4	0	0	0	8	4	18	44.4	22.2	1	30	20
TOTALS		191	95	8	18	7	31	0	7	111	38	347	32.0	11.0	353	848	59
Proposed Fairbanks Wildlife Center	5/31	11	1	0	0	0	2	0	0	1	2	14	7.1	14.2	2	19	24

TAGGING AND MOVEMENTS

Adult Tagging

A total of 80 moose were captured in the Matanuska Valley (Table 2, Appendix) and an additional 50 were captured by the military crew operating on Ft. Richardson (Table 3, Appendix) in 1966-67. In the Matanuska Valley direct mortality was low as only four moose died while being handled. One died from an overdose of drug, two strangled on regurgitated rumen contents, and one was accidentally injected twice with succinylcholine chloride.

Some problems were experienced with the drug. After the 1966 field trials a dosage of 21 to 22 mg of drug per adult moose was believed optimum. Experience in 1967 was contradictory between the Matanuska Valley and Ft. Richardson tests. It appeared that an increased dosage was required to anesthetize moose in the Matanuska Valley from January 30 to late March. During this period dosages in excess of 30 mg per animal were required. Analysis of drug stability and field techniques suggest that at present we do not have enough data to ascertain the factors causing the problem. There are several possibilities.

Succinylcholine chloride is not stable in solution at room temperature and it deteriorates more rapidly at higher temperatures. To avoid this problem, powdered succinylcholine chloride was used. It has a permanent shelf life. Unfortunately, it was stored in a refrigerator. Correspondence with the manufacturer indicated that the stronger drug solutions decompose more rapidly. They theorized that moisture accumulated while the bottles were exposed to room temperature and condensed in the refrigerator forming a "super" solution which affected the performance of the drug. No check was made to determine how the drug was handled by the Ft. Richardson crew.

A number of papers have discussed the pharmacological action of succinylcholine chloride and it is well documented that most ungulates do not have a wide tolerance to the drug (Harthoorn, 1965). Therefore, careful estimations of the animal's weight is required. The attempt to standardize the dosage at 21 to 22 mg per adult moose complicates interpretation of the observed variation in required dosages. In addition, no records were kept of the animals hit but not captured;

thus, the ratio of "hit and captured" vs. "hit and not captured" for the entire season for either study area is not available. Futhermore, weights of moose judged adult (yearlings and older) vary from approximately 600 pounds to 1,200 pounds. Therefore, individual dosages may have varied as much as 100 percent.

There is a possibility that physical condition of the animal may have varied sufficiently to cause a change in dosages required. Other researchers (Harthoorn, op cit) have suggested such responses in pregnant animals. Still the proximity of the Ft. Richardson study area where no response changes were noted strongly suggests drug deterioration or unnoticed changes in technique as the cause of the problem. Reactions of the individual moose to the drug along with pertinent data are compiled in Table 1 in the Appendix for all moose captured in 1965-66 and 1966-67.

Sightings of Marked Animals

A total of 70 sightings have been recorded of moose tagged in the Matanuska Valley (Table 4, Appendix). Most of the animals had not moved a great distance and movement patterns will not become evident until a larger body of data is accumulated.

A few movements of particular interest show that some of the animals tagged in 1966 were using areas within a few miles of their tagging location approximately one year later. Of course, additional seasonal movements may cause them to range 20 to 30 miles from the tagging area. One major objective of this study is to determine the relative consistency of use of a particular wintering area by adult moose. An unconfirmed report indicated one tagged animal had moved 57 miles in less than one year.

There were 17 sightings of tagged animals on Ft. Richardson. No unusual movements were recorded (Table 5, Appendix).

Miscellaneous Life History Data

Handling live animals provides an opportunity to take observations for future comparisons with the same animal or with the same population.

Age Structure of Populations

Age determinations based on cementum deposition techniques are presented in Figures 1 and 2 in the Appendix. There is a good correlation between the age distribution of this small sample and that of past samples obtained from hunter-killed animals (see Age Composition under Harvest). Calves are definitely under-represented primarily because taggers selected larger animals.

Blood Tests

The results of tests on blood samples from 72 moose for brucellosis and from 52 moose for leptospirosis of those captured in the Matanuska Valley in 1966-67 were all negative (Table 6, Appendix). Similar results were obtained from tests on 41 moose for brucellosis and 36 moose for leptospirosis of those captured on Ft. Richardson in 1966-67 (Table 7, Appendix).

Live Weights

On Ft. Richardson equipment was available which made it possible to weigh immobilized moose. These weights are recorded in Table 8 of the Appendix.

Parasites

Fecal samples from 21 moose were examined for parasites. Eggs of Nemotodirella were found in four samples (Table 9, Appendix).

Productivity

Palpation of the uterus of adult females was attempted on 10 animals (1967). The technique worked satisfactorily but investigators could not determine the number of fetuses present. Since both age and breeding conditions can be determined, the technique may provide additional data on the population contribution of the various age classes if a large enough sample is palpated.

Non-hunting Mortality

Moose mortality resulting from a variety of causes other than legal hunting is documented in conjunction with studies of tagging and movements, harvest, and population age composition. The data obtained are reviewed below.

Alaska Railroad Kills

The Alaska Railroad reported 11 moose killed by trains from July, 1966 to March, 1967. Three of these moose were between Palmer and Talkeetna. On May 1, 1967, 28 moose carcasses were counted between Palmer and Talkeetna by airplane (Table 11, Appendix).

On May 3, 8, 9, 10, and 11, 1967, biologists walked the tracks from Wasilla to Talkeetna and counted 55 moose carcasses (Table 12, Appendix). Some of the larger rivers were free of ice at that time and an unknown number of moose had already been washed downstream. Other moose had been blown up by section crews and were not located. A compilation of accession records and moose counted on the walk indicates that a minimum of 70 moose were killed between Palmer and Talkeetna between August 1, 1966 and May 11, 1967.

Of 52 railroad kills for which information is available, only 10 were salvaged for human consumption.

Miscellaneous Non-hunting Mortality

Moose mortality resulting from various sorts of mishaps in addition to railroad kills has been recorded in Table 13 of the Appendix. After the Alaska Railroad, the main causes of mortality are motor vehicles and poaching. Natural winter mortality follows these in importance. Mortality from accidents may contribute to lower natural winter mortality.

KENAI MOOSE RESEARCH STATION STUDIES OF THE INTERRELATIONSHIPS OF MOOSE AND THEIR HABITAT

Introduction

This study is a joint venture between the U. S. Bureau of Sport Fisheries and Wildlife and the Alaska Department of Fish and Game. Certain of the responsibilities for construction are borne by the State with land and mechanical assistance provided by the U. S. Bureau of Sport Fisheries and Wildlife. The design and execution of research activities are also jointly shared. This preliminary progress report is prepared to satisfy Federal Aid requirements and necessarily includes data gathered through the efforts of agencies other than those supported in part by Federal Aid monies. Cooperating agencies in addition to the co-sponsor that have contributed significantly to the essential preliminary studies include the Bureau of Land Management, aerial photography of the pens in pan, modified infra red and color (twice); the U. S. Forest Service, soils analysis and mapping; and the State Division of Lands, advice on photogrammetry problems.

SOILS OF THE KENAI RANGE ENCLOSURE STUDY AREA*

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Soils provide the moisture and nutrients that support land vegetation. They also reflect the climate in which plants grow. Soils are variable, and major differences in soil properties that affect plant growth can occur over short distances.

An understanding of soil-vegetation relationships is important in interpreting and extending results of research in ecological fields. Because of this, detailed soils information for the moose enclosure study area (Figure 1) was desired.

SOIL CLASSIFICATION

Because soils have many properties and develop under specific environments, differences between soils can be recognized. Soils developed in similar environments and with

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* Figures have been deleted in this copy of the report.

similar properties can also be recognized as members of the same soil taxonomic unit. The basic soil taxonomic unit, roughly equivalent to species in the botanical classification system, is the soil series. Naptowne and Tustumena are the two major upland soil series in the study area.

METHODS

Field work was done in June, 1966. Soils were examined, described, and sampled in the field. Information developed on the ground was used to map the soils on 1:3,000 black and white aerial photos in the office; 1:3,000 color aerial photos were also used to increase the accuracy of office soil delineations.

Soil samples were analyzed for chemical properties by the Soils Department of Washington State University, using standard techniques. Determinations and techniques were as follows:

Determination	Technique
organic matter	Walkley-Black
total nitrogen	Kjeldahl
phosphate	Peach and Greweling
cation exchange capacity	U.S.D.A. Handbook 60
exchangeable sodium, calcium, magnesium, and potassium	U.S.D.A. Handbook 60
pH	glass electrode pH meter (1:1 water:soil ratio except organic horizons where 2:1 ratio was used)

Reconnaissance-level information on soils of the area (Rieger, Samuel, 1963, Report of Reconnaissance Soil Survey, Kenai National Moose Range) and detailed information on nearby areas (Rieger, Samuel, G. W. Allen, A. D. Backer, E. G. Link, and B. B. Lovell, 1964, Soil Survey of Kenai-Kasilof Area Alaska) were available. This information was used extensively in this study.

RESULTS

The area is in part of the Kenai lowland. Late Pleistocene glaciers left a rolling topography with many depressions

and a few flat outwash terraces. A deposit of loess 1- to 2-feet deep covers the gravelly sandy till and outwash.

Two well-drained soils comprise the uplands of the area--the Naptowne series and Tustumena series. A number of imperfectly to very poorly drained soils occupy the depressions. These include the Salamatof, Doroshin, and Kalifonsky soils (see Rieger, et al, Soil Survey of Kenai-Kasilof Area Alaska).

The depressional soils were not sampled or individually mapped in this study. They were all included in one undifferentiated mapping unit--"Wetland" (symbol "W" on the maps).

The proportions of the various soils by individual enclosures are in Table 1.

SOILS

The Naptowne series (symbol "N") comprises well-drained Podzol soils derived from loess overlying glacial till (Figure 2). A typical profile for the study area follows:

Table 1. Proportion 1/ of the Various Soils in the Kenai Moose Enclosures Study Area.

Pen Number	Naptowne (N)	Tustumena (T)	Tustumena Soils, steep (TI)	Wet Soils (W)	Water
1	76	5	3	10	6
2	87	10	2/	3	0
3	87	1	2/	6	6
4	88	1	0	11	2/
All	85	4	1	7	3

1/ Determined by a 1-inch grid sampling of the 1:3,000 aerial photos.
2/ Less than 0.5 percent.

Horizon	Description
A2	0 - 1 inch. Gray (10YR5/1) silt loam. Weak medium platy structure; friable, nonsticky, slightly plastic; many roots. Very strongly acid (pH 4.5); abrupt wavy boundary.
B2	1 - 7 inches. Brown to dark brown (7.5YR4/4) silt loam; variegated with about 10 percent blotches of dark reddish brown (5YR3/2) along the upper edge and dark yellowish brown (10 YR4/4) and dark gray (10YR4/1); massive; friable, nonsticky, slightly plastic; common roots; medium acid (pH 5.6); gradual wavy boundary.
B3	7 - 15 inches. Olive brown (2.5Y4/4) silt loam; massive; friable, nonsticky, slightly plastic; common roots; slightly acid (pH 6.4); abrupt wavy boundary.
C	15 - 24 inches. Very dark grayish brown (2.5Y3/2) and dark grayish brown (2.5Y4/2) silt loam; massive; friable, nonsticky, slightly plastic; few roots; slightly acid (pH 6.4); abrupt wavy boundary.
IIC	24 - 30+ inches. Dark grayish brown (2.5Y4/2) gravelly sandy loam; massive; slightly firm; no roots; slightly acid.

These are the most extensive soils of the area, comprising about 85 percent of the total acreage. They produce excellent moose forage in the 1947 burned area (Figure 3). In areas where the overstory was not killed, however, little forage is produced (Figure 4). Four profiles were sampled for laboratory analysis, two under residual stands and two under birch regeneration.

Tustumena soils (symbol "T" and "TI") are well-drained Brown Podzolic soils derived from loess overlying glacial outwash or till (Figure 5). A typical profile for the study area follows:

Horizon	Description
O1	2 - 1.5 inches. Leaves, twigs, etc.
O2	1.5 - 0 inches. Dark reddish brown (5YR2/2) well decomposed organic matter.
(A2)	0 - 0.5 inches. Dark gray (10YR4/1) and gray (10YR5/1) silt loam; intermittent, 40 percent absent; extremely acid (pH 4.3); abrupt wavy boundary.
A1	0.5 - 2.5 inches. Black (N2/0 and 10YR2/1) silt loam; weak fine granular structure; friable; abundant roots; very strongly acid (pH 4.7); abrupt wavy boundary with tongues to 4 inches depth.
B2	2.5 - 4 inches. Dark brown (7.5YR4/4 and 3/2) silt loam; weak fine granular structure; friable; many roots, medium acid (pH 5.7); clear wavy boundary.
B3	4 - 10 inches. Brown to dark brown (10YR4/3), dark yellowish brown (10YR4/4) and dark olive brown (2.5Y4/2) silt loam; massive; friable; common roots; slightly acid (pH 6.1); gradual wavy boundary.
C	10 - 18 inches. Dark grayish brown (2.5Y4/2) silt loam; massive, very friable; few roots; slightly acid (pH 6.1); abrupt wavy boundary.
IIC	18+ inches. Olive (5Y4/3) very gravelly sand; 75 percent gravel, cobbles, and stones; medium acid (pH 6.0).

These soils are not extensive in the area, comprising only about 5 percent of the acreage. They are evidently slightly colder and/or less well-drained than the Naptowne soils. They are

mostly on outwash terraces (symbol "T"); but also occur on steep slopes along kettle margins (symbol "TI"). After the 1947 burn, these soils have come back directly to spruce regeneration (Figures 6 and 7) with very little moose forage.

Results of the soil chemical analyses are in Table 2. Both upland soils have low fertility status, although the Tustumena soils have slightly higher nitrogen and organic matter contents than the Naptowne soils, which in turn are higher in phosphate and exchangeable bases.

Physical properties of both soils (except the sandy substrata) are similar to those of the Cohoe soils given in Table 8, page 49 of Rieger, et al, Soil Survey of the Kenai-Kasilof Area Alaska. Their physical properties are good. They are friable and porous throughout. As long as the surface organic matter layer remains intact, erosion hazard is nil.

Soil Vegetation Relationships

The difference in vegetation on the two soils in the 1947 burned area is striking. No remnant stands were observed on the Tustumena soils.

The reasons for the lack of birch regeneration on the Tustumena soils are not clear. The Tustumena soils in this area are mostly on low-lying flats or cool slopes of deppressions (Figure 8). It is likely that they remain frozen longer in the spring than the Naptowne soils. This would also make them moister in the early part of the growing season. The combination of temperature and moisture appears to be responsible for the differences in vegetation.

The differences in vegetation have resulted in different soil chemical properties. These are most evident in the surface organic matter horizons where nutrient turnover is most active (Table 3). Naptowne soils have about 15 times as much "available" phosphate and more than twice as much "available" calcium, magnesium, and potassium as the Tustumena soils.

There is an indication that nitrogen status is lower under remnant stands than where the 1947 burn removed the overstory.

Table 2 --Chemical Properties of Upland Soils of the Kenai Moose Range Enclosures Study Area

Soil	Horizon	Depth (Inches)	Texture (field)	pH	Organic Matter (%)	Total Nitrogen (%)	Extract-able Phosphate (lbs/A)
Naptowne (K1)	02	2-0	Peat	4.2	---	.82	24+
(Remnant Stand)	A2	0-1	Silt Loam	4.5	8.0	0.16	22.7
	B2	1-7	Silt Loam	5.6	4.8	0.11	1.6
	B3	7-15	Silt Loam	6.4	1.6	0.06	0.9
	C	15-24	Silt Loam	6.4	0.5	0.04	4.1
	IIC	24-30	Gravelly sandy loam	---	---	---	---
Naptowne (K4)	02	1-0	Peat	4.3	---	0.46	24+
(Remnant Stand)	A2	0-1	Silt Loam	4.4	10.7	0.21	13.4
	B2	1-4	Silt Loam	5.6	7.2	0.17	1.6
	B3	4-8	Silt Loam	6.3	3.1	0.08	0.3
	C	8-17	Silt Loam	6.4	0.7	0.04	1.1
	IIC	17-26	Gravelly sandy loam	6.2	0.5	0.03	1.9
Naptowne (K3)	02	2-0	Peat	4.2	---	0.99	21.0
('47 Burn)	A2	0-1½	Silt Loam	4.6	10.8	0.15	5.7
	B2	1½-5	Silt Loam	6.1	4.0	0.11	4.4
	B3	5-9	Silt Loam	6.6	1.5	0.06	2.6
	C	9-15	Silt Loam	6.3	0.9	0.04	0.5
	IIC	15-28	Gravelly loamy sand	6.3	0.4	0.03	1.1

Table 2 --Chemical Properties of Upland Soils of the Kenai Moose Range Enclosures Study Area (cont.)

Soil	Horizon	Depth (Inches)	Texture (field)	pH	Organic Matter (%)	Total Nitrogen (%)	Extractable Phosphate (lbs/A)
Naptowne (K6)	02	1.5-0	Peat	4.4	---	1.11	24
('47 Burn)	A2	0-1	Silt Loam	4.9	8.3	0.15	2.9
	B2	1-3½	Silt Loam	5.9	4.1	0.10	trace
	B3	3½-9	Silt Loam	6.4	1.5	0.05	trace
	C	9-18	Silt Loam	6.4	0.5	0.03	trace
	IIC	18-24	Gravelly loamy sand	6.4	0.3	0.03	2.1
Tustemena (K2)	02	2-0	Peat	4.1	---	---	2.1
('47 Burn)	(A2)	0-½	(intermittent)	4.1	17.2	---	---
	A1	½-1½	Silt Loam	4.4	22.6	0.61	trace
	B2	1½-4	Silt Loam	5.7	8.2	0.22	trace
	B3	4-10	Silt Loam	6.0	7.1	0.18	0.3
	C	10-20	Silt Loam	6.0	1.3	0.06	1.1
	IIC	20-26	Loamy sand	5.8	0.4	0.02	0.9
Tustemena (K5)	02	1½-0	Peat	4.3	---	0.92	1.1
('47 Burn)	(A2)	0-½	(intermittent)	4.7	11.8	0.31	trace
	A1	½-2½	Silt Loam	5.2	18.2	0.31	trace
	B2	2½-4	Silt Loam	5.7	6.6	0.17	trace
	B3	4-10	Silt Loam	6.1	2.7	0.10	trace
	C	10-18	Silt Loam	6.1	0.8	0.06	1.6
	IIC	18-24	Gravelly sand	6.0	0.3	0.02	0.7

Table 2 --Chemical Properties of Upland Soils of the Kenai Moose Range Enclosures Study Area (Cont.)

Soil	Horizon	Depth (Inches)	Texture (field)	CEC	Na	Ca	Mg	K	Base Saturation %	C/N
				--------Meq per 100 gsm--------						
Naptowne (K1)	02	2-0	Peat	111	0.4	25.0	7.0	3.3	32	68
(Remnant Stand)	A2	0-1	Silt Loam	23	0.10	2.0	0.43	.18	12	35
	B2	1-7	Silt Loam	24	0.19	4.5	0.43	.08	22	30
	B3	7-15	Silt Loam	14	0.14	1.12	0.25	.16	12	19
	C	15-24	Silt Loam	6	0.09	1.12	0.17	.08	22	9
	IIC	24-30	Gravelly sandy loam	---	---	---	---	---	--	---
Naptowne (K4)	02	1-0	Peat	109	0.4	17.5	8.0	2.6	26	122
(Remnant Stand)	A2	0-1	Silt Loam	29	0.10	2.0	.62	.31	10	36
	B2	1-4	Silt Loam	33	0.07	2.0	.33	.15	8	30
	B3	4-8	Silt Loam	16	0.05	1.12	0	.08	8	27
	C	8-17	Silt Loam	8	0.05	.75	0	.08	11	12
	IIC	17-26	Gravelly sandy loam	5	0.05	.75	0	.08	18	12
Naptowne (K3)	02	2-0	Peat	83	0.4	11.9	4.5	2.6	24	57
('47 Burn)	A2	0-1½	Silt Loam	28	0.09	1.50	.33	.31	8	50
	B2	1½-5	Silt Loam	31	0.10	2.38	0	.18	9	25
	B3	5-9	Silt Loam	16	0.10	2.0	.17	.15	16	18
	C	9-15	Silt Loam	9	0.10	1.12	0	.16	16	16
	IIC	15-28	Gravelly loamy sand	4	0.07	.75	0	.15	25	9

Table 2 --Chemical Properties of Upland Soils of the Kenai Moose Range Enclosures Study Area (Cont.)

Soil	Horizon	Depth (Inches)	Texture (field)	CEC	Na	Ca	Mg	K	Base Saturation %	C/N
				--------Meq per 100 gsm--------						
Naptowne (K6)	02	1.5-0	Peat	98	0.4	20.0	6.0	2.8	30	50
('47 Burns)	A2	0-1	Silt Loam	21	0.09	2.38	.43	.24	15	39
	B2	1-3½	Silt Loam	24	0.09	1.50	0	.21	8	29
	B3	3½-9	Silt Loam	11	0.10	1.12	.33	.15	15	21
	C	9-18	Silt Loam	7	0.10	2.0	.82	.08	42	12
	IIC	18-24	Gravelly loamy sand	4	0.09	1.12	.43	.08	40	7
Tustemena (K2)	02	2-0	Peat	83	0.17	5.8	2.07	.74	11	---
('47 Burn)	(A2)	0-½	(intermittent)	40	0.2	5.6	0	0.58	16	---
	A1	½-1½	Silt Loam	70	0.12	2.0	0.72	.27	4	26
	B2	1½-4	Silt Loam	32	0.12	1.12	0.17	.08	5	26
	B3	4-10	Silt Loam	29	0.10	1.50	0.17	.05	6	28
	C	10-20	Silt Loam	9	0.10	.75	0	.08	10	15
	IIC	20-26	Loamy sand	3	0.07	.75	0	.08	28	14
Tustemena (K5)	02	1½-0	Peat	86	0.3	7.5	3.1	1.4	14	61
('47 Burn)	(A2)	0-½	(intermittent)	29	0.3	2.5	0	0.4	11	27
	A1	½-2½	Silt Loam	51	0.10	1.50	.17	.15	4	41
	B2	2½-4	Silt Loam	30	0.09	1.12	0	.08	4	27
	B3	4-10	Silt Loam	17	0.10	1.12	0	.05	7	19
	C	10-18	Silt Loam	8	0.07	.75	0	.05	11	9
	IIC	18-24	Gravelly sand	5	0.05	.75	0	.08	19	10

Table 3. Selected Chemical Properties of Surface Organic Horizons of Naptowne Soils with Birch-Dominated Vegetation and Tustumena Soils with Spruce-Dominated Vegetation.

Property	Naptowne O horizons (birch)		Tustumena O horizons (spruce)	
	Average	Range	Average	Range
Extractable Phosphate (lbs/Acre)	23.0+	21.0-24.0+	1.6	1.1-2.1
Base Saturation (percent)	28.0	24.0-32.0	12.5	11.0-14.0
Exchangeable Calcium (meq/100 gms)	18.6	11.9-25.0	6.6	5.8-7.5
Exchangeable Magnesium (meq/100 gms)	6.4	4.5-8.0	2.6	2.1-3.1
Exchangeable Potassium (meq/100 gms)	2.8	2.6-3.3	1.0	0.7-1.4

SUMMARY AND CONCLUSIONS

The upland soils of the study area are, for soils, fairly uniform. Naptowne soils occupy 85 percent of the area and Tustumena soils only 5 percent. Wet soils occupy 7 percent of the area and lakes 3 percent. There is some variation of proportions by individual enclosures.

Vegetation on Naptowne soils is dominated by birch, either regeneration after the 1947 burn or in remnant stands. Tustumena soils support only spruce regeneration. Moose forage production is much higher on Naptowne soils than Tustumena soils.

Both upland soils have low fertility status, but Naptowne soils are much higher in phosphate, calcium, magnesium, and potassium.

REPORT ON VEGETATION TYPING, MOOSE ENCLOSURE NO. 1

By Bob Hinman, Alaska Department of Fish and Game
now Regional Supervisor, Interior-Artic Region

Techniques

In the establishment of studies in the moose enclosure, it was determined that we should type map the vegetation in the area to a rather fine degree for the purposes of setting up various vegetative studies to be pursued throughout the State. Originally it was decided that we should type all major recognizable browse types down to a minimum size of approximately one-quarter of an acre. The Bureau of Land Management cooperated in this phase of the study by taking aerial photos of the complete study area, and making the prints available to us. Photos were taken in both black and white and modified infra-red at an altitude of approximately 1,500 feet, intending to provide photos with a photo-scale reciprocal of 3,000, or 1" equals 250'.

Our first step in photo analysis involved blocking out on the photos the usable area to be considered. For instance, using a series of photos along a flight line, the area on picture number 2 that is covered by the principal points of pictures number 1 and 3 is blocked out, together with the area on either side which is half of the overlap between the two adjacent lines of photos. This gives us the maximum area on a photo which can be analyzed with a minimum amount of distortion.

Before any actual analysis was attempted, I spent several days in the Division of Lands office with Bill Sacheck and Enzo Becia reviewing photo-analytic techniques and getting advice from them on photo typing. We also spent a day in the field checking out areas on the map which we had questioned, and arrived at some idea of the types which we were looking at on the photos.

Easily identified areas were first outlined on the photos, such as bodies of water, swamps, and groups of mature trees. More difficult types were then attempted, these being

primarily the various forms of lower vegetation. As typing progressed a number of questions arose as to exactly what we were looking at, and frequent field trips were necessary to accurately determine the types being identified. It was found that one could, with a little practice, accurately identify types both by the species present, such as birch or spruce, and by density of the stocking of the vegetation. Initially, areas of regrowth vegetation were typed as either "spruce-birch" or "birch-spruce" or "spruce only." In the first two types three density classes were delineated as either "dense," "medium," or "sparse."

When all photos had been gone over it was then necessary to check photos, both in line-of-flight and by adjacent lines of flight to see that vegetative type areas on adjacent photos coincided. If they did not, further analysis was obviously necessary to determine where various types began and ended.

At this point, the photo analysis was completed except for some checks necessary later to recheck on initial results obtained. The next step was to transfer the outline of the pen and the vegetative types within the pen from the photos to a work-sheet map. This was accomplished by using a sketch master machine borrowed from the Bureau of Sport Fish and Wildlife. Transfer was made at full scale, or in other words, the same scale as the photos. I had attempted to use a blowup of the 1" to the mile map to the proper scale to use as a base map, but found that there was insufficient detail at the magnification to make it worthwhile. In the transferring of the data from the photos to a map it was found that there was slight distortion of the topography at the edges of the photos, even though we were using only the center portions of them. With the equipment we were using, the only cure for this problem seemed to be the adjustment of features to a point midway between those indicated on adjacent photos.

Once all the information was transferred to the work-sheet map from the photos, the actual scale, which had been estimated at 250' to the inch, was determined by locating three points on photos which could be readily identified on the ground, and measuring the distances between these with a 100' tape on the ground, and measuring the distances accurately on the photos. By this means I determined that the actual scale was 247' per inch.

Total area within the pen was then determined by measuring the various sides of the pen and calculating the area within. All of the vegetation types transferred to the worksheet map had to be identified by checking back with the photos, and labeled. The areas of each of these types were then determined by using dot counting grids. I used a 64 dot to the square inch grid for large areas, and a 256 dot per square inch grid for smaller areas.

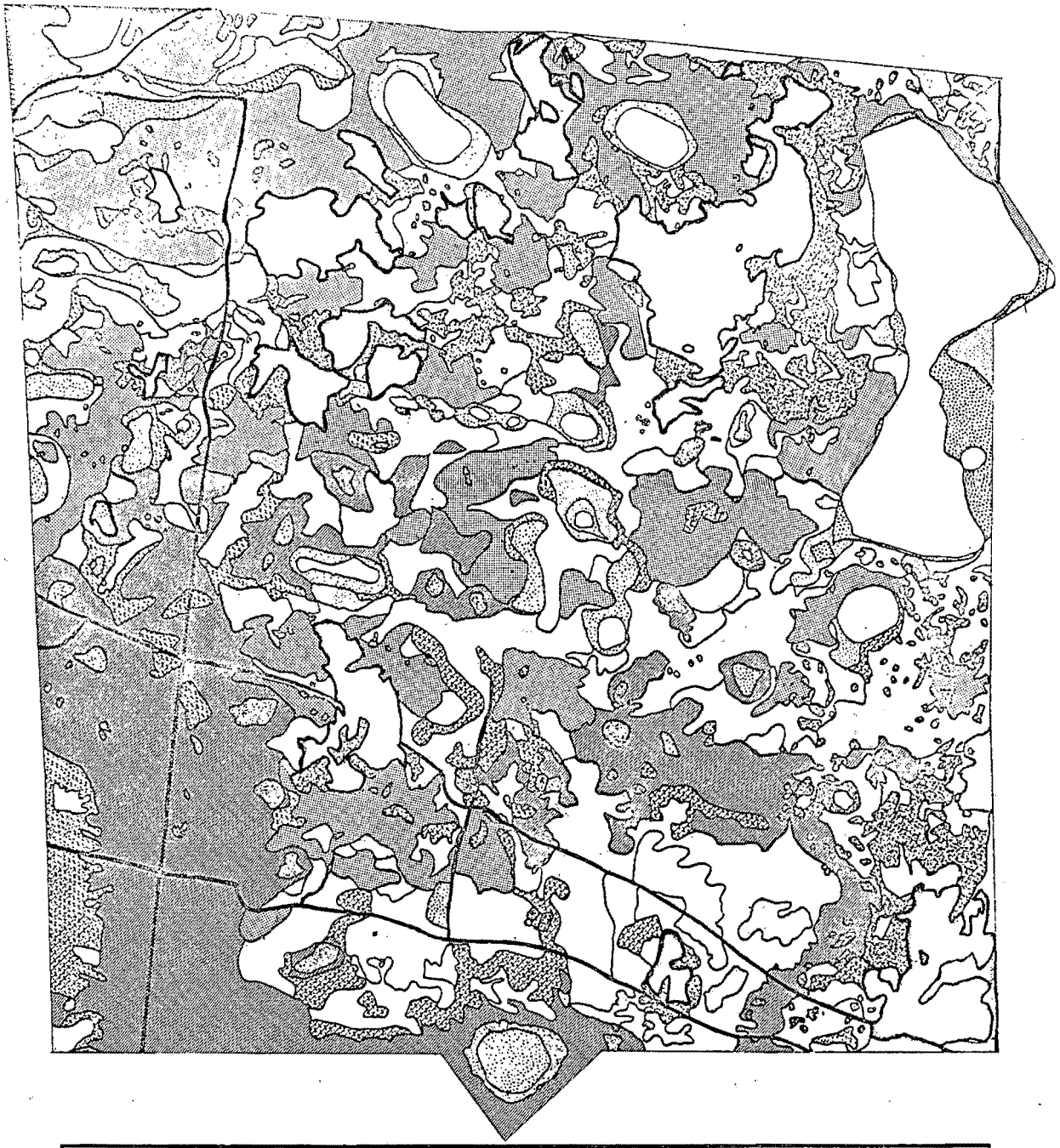
The final, or master copy, of the map was then prepared by tracing in ink on mylar, a copy of the work map, and the application of sheeting film to denote vegetation types. I then had a number copies reduced from the master copy for field use.

Results and Discussion

Vegetation types within the moose enclosure, although involving relatively few species, were fairly complex in distribution and design because of two factors (Figure 1 and Table 1). First, the area is typical valley glaciated topography with a great many small hills, small muskegs, and rapid changes in soil and vegetation types. In addition, the areas within the 1947 Kenai burn contained a number of islands of unburned vegetation. In the aggregate there is a considerable amount of type designated as marsh.

Since we had previously decided that in the first enclosure, studies of marsh would not be emphasized, a number of different types such as grass, sedge areas, black spruce, muskegs, and wet bogs, were all classified under the general heading as "marsh". It will be noted that the total area as calculated from the outside measurements of the enclosure was 626 acres. The sum of the areas calculated from each of the vegetative types comes to somewhat less than this and involves an error of about 6 percent. This was probably due to errors inherent in dot sampling, and the relatively large area at this scale of edges of types. None of the types as listed on the map have been described quantitatively as yet, and represent subjective analysis of the predominance of various species of vegetation, and relative density. Originally, I had typed the "birch-spruce" and "spruce-birch" regrowth areas in three density classes, but on further consideration decided to lump as

Figure 1. Vegetation type map of moose enclosure No. 1, Kenai Moose Research Station, Kenai National Moose Range, Alaska.



VEGETATION TYPE MAP MOOSE ENCLOSURE NO.1
KENAI NATIONAL MOOSE RANGE, ALASKA

FENCE LINE
SEISMIC TRAIL
EXCLOSURE

MATURE HARDWOODS, DENSE
MATURE HARDWOODS, THIN
MATURE SPRUCE
SPRUCE REGROWTH
SPRUCE-BIRCH REGROWTH
SPRUCE-LEDUM
BIRCH-SPRUCE REGROWTH DENSE
BIRCH-SPRUCE REGROWTH MEDIUM
BIRCH-SPRUCE REGROWTH, THIN
GRASS
SEDGE
WATER

Table 1. Estimated Acreages of vegetation types, Pen #1, Kenai Moose Research Station, 1966.

TYPE	ESTIMATED ACREAGE
Birch-spruce regrowth, dense	113
Birch-spruce regrowth, medium	95
Birch-spruce regrowth, thin	69
Spruce-birch regrowth	40
Spruce regrowth	89
Mature hardwoods, dense	52
Mature hardwoods, thin	46
Mature spruce	2
Spruce-Ledum	16
Grass	9
Sedge	28
Water	35
Total	594
Total enclosed by fence (approximately)	626

one type the medium density and the high density areas of both.* It is entirely possible that "spruce-birch" and "birch-spruce" areas might be considered the same vegetative type from a practical standpoint in the range research that we will do in the area, but this will need quantitative study to determine. One of the things which was confusing during the classification was the different appearance of the same species, for example, birch, in different areas; and it was found that there was some difference in types of the average vegetation in a number of areas, probably due to soil differences, that appeared different on the photographs. It was not possible to classify the mature, unburned hardwood areas from photos, and field checks were neccessary to determine the approximate composition of these stands. In only one case was the stand predominantly aspen; in all other cases the mature hardwoods are composed primarily of birch with a variable amount of aspen intermixed.

It should also be mentioned that the final vegetative typing was all done on the modified infra-red photos, rather than the pan film. It was found that it was much easier to differentiate between birch and spruce on the infra-red and easier to delineate around marshy areas. It probably would have been highly useful to have the color prints available of the area, also to better differentiate between birch and spruce, but these were not available at the time the typing was done.

In 1967 it was found that more detail in the type mapping was desirable to aid selection of sample plots for vegetation analysis which would be representative of the vegetation types. Greg Bos revised the type map accordingly, and included the major artificial features such as seismic trails, fence line, and exclosures. The vegetation types currently in use are shown in Table 1, and or the revised type map (Figure 1). These types are largely self explanatory. Regrowth refers to vegetation in areas burned in 1947. Mature refers to unburned stands. Dense, medium and thin are subjective estimates of the density of stocking (stems/unit area) in the vegetation type. "Birch-spruce" refers to a type characterized by a mixture of birch and spruce with birch dominant, and vice-versa.

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* After further consideration the delineation of vegetation types was again revised to the categories shown in Table 1.

Mature hardwoods are usually birch, with some aspen in certain areas.

APPENDIX

Data obtained from and in conjunction with tagging and movements studies in the Matanuska Valley and on Fort Richardson, 1966-1967.

FIGURE 1 AGE COMPOSITION OF MOOSE TAGGED IN THE MATANUSKA VALLEY -- 1967 (AGE DETERMINATION BASED ON CEMENTUM DEPOSITION)

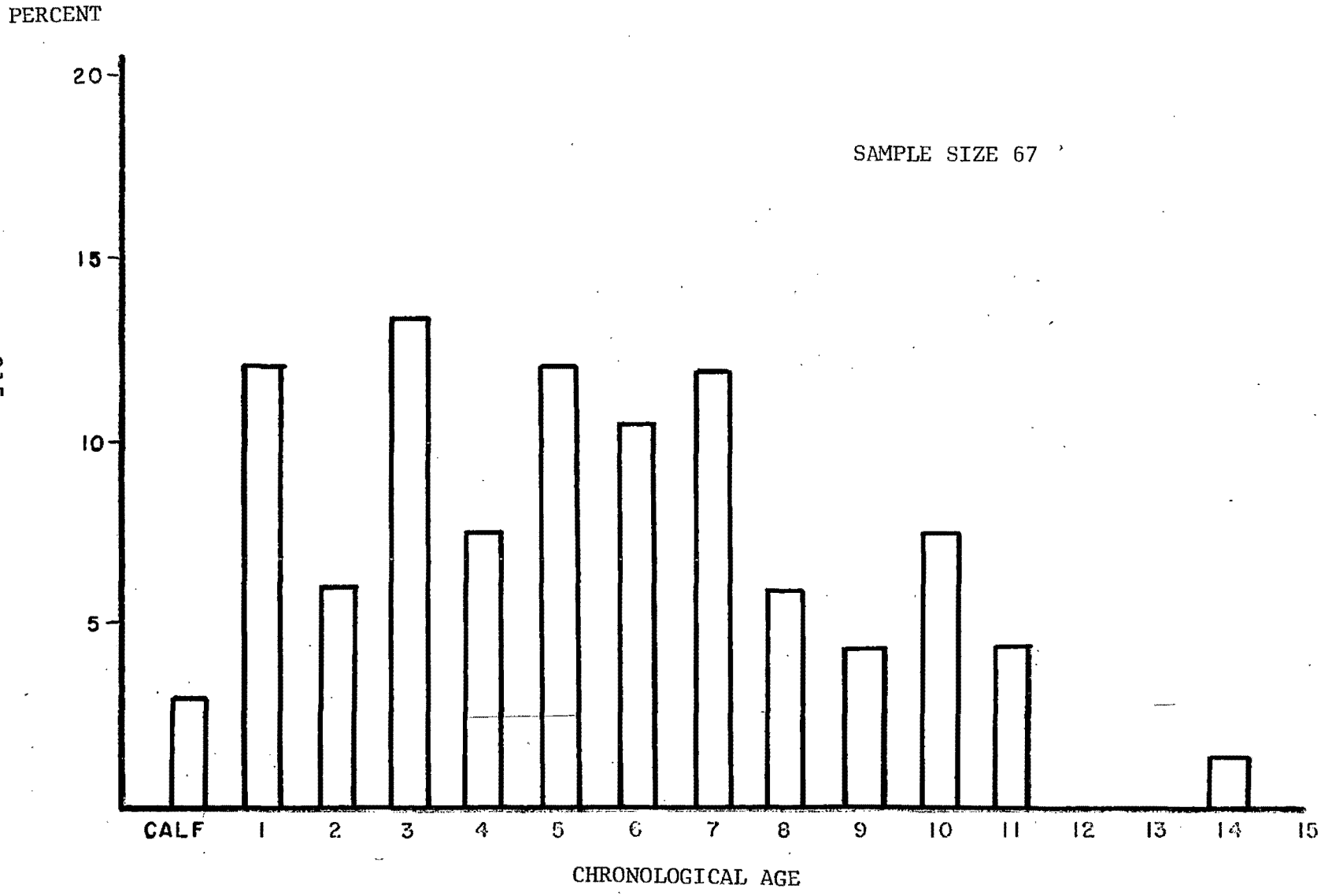

Figure 2. Age Composition of Moose Tagged on Fort Richardson--1967
(Age Determination Based on Cementum Deposition)

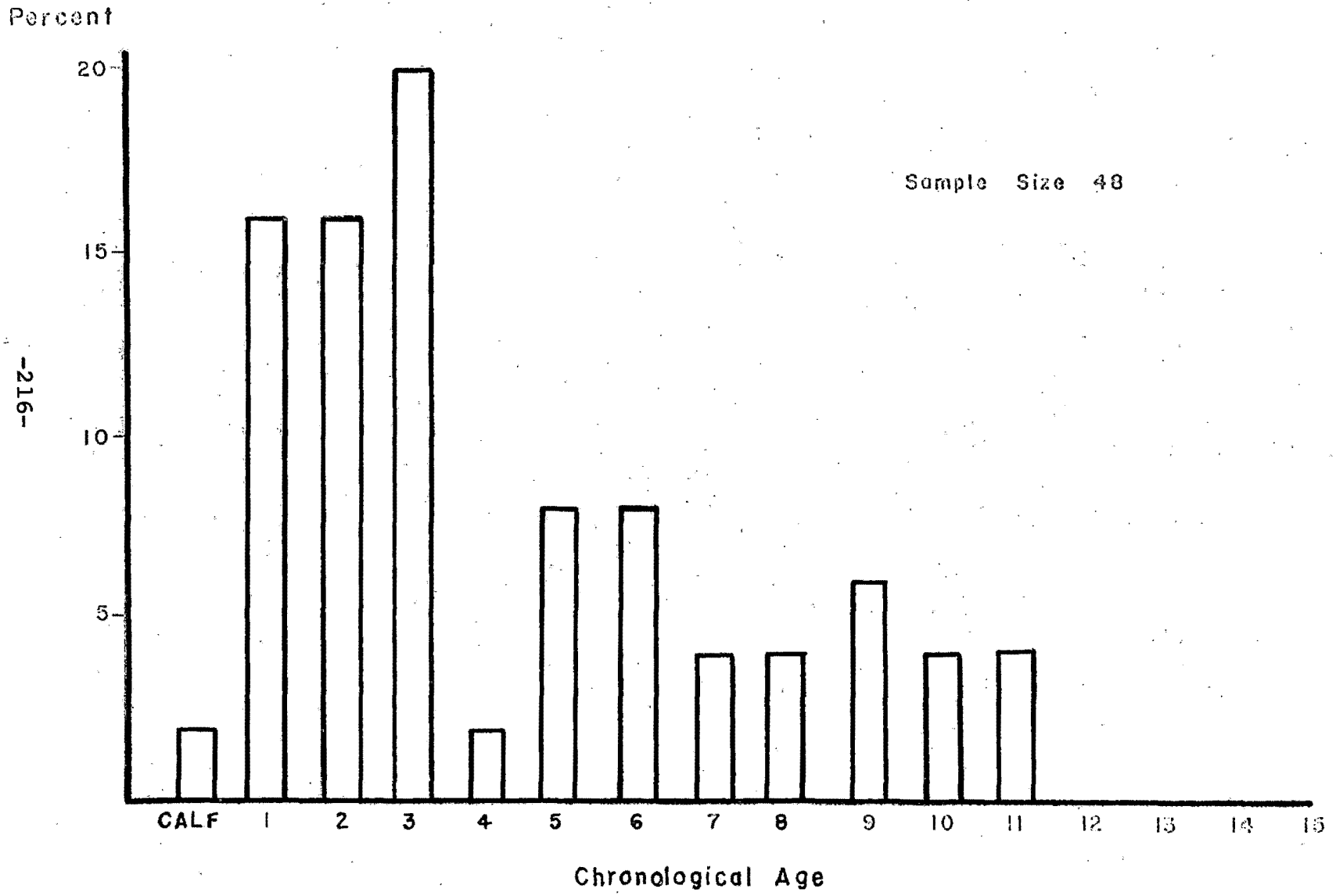

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67.

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
1-66	2/10/66	♀	Yes	A	1. Sucostrin--18mg. 2. Sucostrin--10mg.	Ham	15:00 Already down	Barb pulled off one dart. Possible freezing of drug.
2-66	2/11/66	♀	w/adult	A	1. Sucostrin--18mg. 2. Sucostrin--10mg.	Ham	Didn't go down 5:55	Possible freezing of drug.
3-66	2/15/66	♀	Yes	A	1. Pax IMMO "A" 30mg. 2. Pax IMMO "A" 20mg.	Ham	7:35 4:50	Got up when approached.
4-66	2/16/66	♀	Yes	A	1. Sucostrin--21mg.	Ham	5:49	Possible freezing of drug.
5-66	2/17/66	♀	No	A	1. Sucostrin--20mg.	Rt. Shoulder	4:10	Possible freezing of drug.
6-66	2/19/66	♂	w/adult	yrlg?	1. Sucostrin--18mg.	Rt. Ham	23:10	Possible freezing of drug.
7-66	2/18/66	♀	No	A	1. Sucostrin--20mg.	Left Ham	23:02	Possible freezing of drug.
8-66	3/2/66	♀	Unknown	A	1. Sucostrin--20mg.	Ham	Unknown	Possible freezing of drug.
9-66	3/3/66	♂	No	A	1. Sucostrin--20mg. 2. Sucostrin	Right Front Shoulder Abdominal Cav.	7:48 4:41	Moose got up and went down 3 or 4 times. Possible freezing of drug.
10-66	3/3/66	♀	Unknown	A	1. Sucostrin--20mg.	-----	22:00	Didn't see animal when it fe
11-66	3/4/66	♂	---	Calf	1. Anectine--12mg.	Rt. Rear Ham	11:38	Possible freezing of drug.
12-66	3/8/66	♀	No	A	1. Pax IMMO "A" 20mg.	Rt. Shoulder	22:46	Possible freezing of drug.
13-66	3/10/66	♀	Yes	A	1. Anectine--20mg.	Right Front Shoulder	37:20	Possible freezing of drug.
14-66	3/11/66	♀	Yes (twins)	A	1. Sucostrin--20mg.	Near Backbone	13:39	Killed 3/13/66--could not stay up.

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
15-66	3/11/66	♂	---	A	1. Sucostrin--20mg.	Ham	4:39	Possible freezing of drug.
16-66	3/15/66	♀	No	A	1. Anectine--24mg. 2. Anectine--24mg.	Rt. Rear Ham Rt. Rear Ham	--- 16:15	Didn't go down. Mixed drug w/50% H_2O/50% ethyl alcohol.
17-66	3/16/66	♀	w/adult	A	1. Anectine--24mg.	Ham	23:30	Mixed drug w/50% H_2O/50% ethyl alcohol.
18-66	3/16/66	♀	w/adult	A	1. Anectine--24mg.	Shoulder	15:20	Mixed drug w/50% H_2O/50% ethyl alcohol.
19-66	3/16/66	♀	No	A	1. Pax IMMO "A" 21mg.	-----	16:30	Mixed drug w/50% H_2O/50% ethyl alcohol.
20-66	3/16/66	♀	w/adult	Calf	1. Pax IMMO "A" 11mg.	Ham	21:15	Mixed drug w/50% H_2O/50% ethyl alcohol.
21-66	3/17/66	♂	---	3-4	1. Pax IMMO "A" 20mg.	-----	24:00	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
22-66	3/18/66	♀	No	A	1. Pax IMMO "A" 22mg.	Ham	18:30 Before	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
23-66	3/18/66	♂	w/adults	3+	1. Pax IMMO "A" 23mg.	Shoulder	23:30 Before	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
24-66	3/23/67	♀	w/adults	A	1. Anectine--22mg.	Shoulder	26:00 Before	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
25-66	3/23/67	♀	No	A	1. Anectine--22mg.	Hump	17:20 Before	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
26-66	3/24/66	♀	Yes	A	1. Anectine--24mg.	Shoulder	27:40 Before	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
27-66	3/25/66	♀	Yes	A	1. Anectine--24mg.	Lower Ham	23:27	Possible freezing of drug. Mixed drug w/50% H_2O/50% ethyl alcohol.
28-66	3/29/66	♀	Yes	A	1. Anectine--22mg. 2. Anectine--22mg.	----- 	--- 9:30	Didn't go down. No alcohol in drug.
29-66	3/29/66	♂	---	Calf	1. Anectine--11mg. 2. Anectine--Unknown	----- Ham	27:30 4:10	No alcohol in drug. No alcohol in drug.
30-66	4/5/66	♀	Yes	A	1. Anectine--22mg.	Hump	20:30 Before	No alcohol in drug.
31-66	4/6/66	♀	Yes	A	1. Anectine--22mg.	Midsection Near Ribs	24:15 Before	No alcohol in drug.
32-66	4/12/66	♀	Yes	3+	1. Anectine--22mg.	Rt. Rear Ham	14:00	No alcohol in drug.
33-66	4/12/66	♀	Yes	A	1. Anectine--22mg. 2. Anectine--22mg.	Missed Low Right Foreleg	--- 22:10	No alcohol in drug. No alcohol in drug.
34-66	4/13/66	♂	No	Calf	1. Anectine--11mg.	Ham	12:16	No alcohol in drug.
35-66	4/16/66	♀	No	A	1. Anectine--22mg.	Left Ham	14:50	No alcohol in drug.
1-67	1/16/67	♀	Yes	A	1. Anectine--22mg.	Right Ham	18:48	

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
2-67	1/18/67	♀	Yes	A	1. Anectine--22mg.	Rt. Shoulder	26:20	
3-67	1/19/67	♀	Yes	A	1. Anectine--22mg.	Left Front Hip	24:45 Before	
4-67	1/20/67	♀	Yes	A	1. Anectine--22mg.	Rt. Rear Hip	12:07	
5-67	1/21/67	♀	Yes	A	1. Anectine--22mg. 2. Anectine--22mg.	Shoulder Left Ham	--- 19:40	Didn't go down first time.
6-67	1/23/67	♂	w/adult	A	1. Anectine--22mg.	Left Side--Middle	24:45	
7-67	1/25/67	♀	No	A	1. Anectine--22mg.	Rt. Side Ham	Unknown	
8-67	1/25/67	♀	No	Calf	1. Anectine--11mg.	Right Front Shoulder	7:15 Before	
9-67	1/26/67	♀	No	1	1. Anectine--22mg.	Left Rear Ham	20:00	
10-67	1/26/67	♀	w/adult	7	1. Anectine--22mg.	Left Rear Ham	23:00 Before	
11-67	1/26/67	♀	Yes	4	1. Anectine--22mg.	Left Side--Ribs	22:00	
12-67	1/30/67	♀	Yes	3	1. Anectine--22mg.	Right Side--Hump	23:25	Alert--took long time to go down.
13-67	1/30/67	♂	No	1	1. Anectine--16 to 18mg.	Right Side Neck	Unknown	Artificial respiration
14-67	1/31/67	♀	Yes	7	1. Anectine--22mg.	Left Rear Ham	Unknown	
15-67	1/31/67	♀	Yes	11	1. Anectine--22mg.	Left Rear Ham	34:00 Before	

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
16-67	1/31/67	♀	w/adults	6	1. Anectine--22mg.	Right Side High in Back	Unknown	
17-67	1/30/67	♂	---	3	1. Anectine--22mg.	Base of Neck	21:00 Before	Artificial respiration--10 minutes.
18-67	2/2/67	♀	No	A	1. Anectine--11mg.	Left Ham	23:00	
19-67	2/3/67	♂	No	1	1. Anectine--23mg.	Left Ham	22:00 Before	
20-67	2/4/67	♀	No	3	1. Anectine--24mg.	Behind Right Front Shoulder	Unknown	
21-67	2/6/67	♀	Yes	6	1. Anectine--24mg.	Left Ham	20:00 Before	
22-67	2/7/67	♀	No	6	1. Anectine--24mg.	Front Right Shoulder	18:10	
23-67	2/8/67	♀	Yes	6	1. Anectine--24mg.	Lower Left Shoulder	24:45 Before	Artificial respiration--10 minutes.
24-67	2/2/67	♀	Yes	5	1. Anectine--24mg.	Left Side Rear Ham	Unknown	
25-67	2/9/67	♀	Yes	7	1. Anectine--24mg.	Top Rear Left Leg	24:40 Before	
26-67	2/9/67	♀	No	6	1. Anectine--24mg.	Upper Right Rear	Unknown	
27-67	2/10/67	♀	No	1	1. Anectine--24mg.	Left Rear 1/2 Way Down Leg	13:15	

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
28-67	2/13/67	♀	Yes	3	1. Anectine--24mg.	High Right Rear	23:47 Before	
29-67	2/8/67	♀	No	4	1. Anectine--24mg.	Neck	25:00 Before	Artificial respiration--10 minutes.
30-67	2/8/67	♀	Yes	A	1. Anectine--23.5mg.	Left Ham	20:00	
31-67	2/8/67	♀	Yes	A	1. Anectine--23.5mg.	Right Ham	22:00 Before	
32-67	2/9/67	♀	No	6	1. Anectine--24mg.	Right Flank	30:00 Before	
33-67	2/9/67	♀	Yes	9	1. Anectine--24mg.	Left Ham	18:00	
34-67	2/10/67	♀	Yes	4	1. Anectine--24mg.	Rt. Shoulder	9:40	Went down fast.
35-67	2/10/67	♀	No	2	1. Anectine--24mg.	Left Ham	20:00 Before	
36-67	2/14/67	♀	No	7	1. Anectine--24mg.	Left Rear Ham	22:30 Before	Drug mixed w/40% ethyl alcohol solution.
37-67	2/19/67	♀	No	11	1. Anectine--24mg.	Right Gut	25:00 Before	Drug mixed w/40% ethyl alcohol solution.
38-67	2/20/67	♀	No	A	1. Anectine--24mg.	Right Ham	24:40 Before	Drug mixed w/40% ethyl alcohol solution.
39-67	2/21/67	♀	No	9	1. Anectine--24mg.	Left Ham	18:35	Drug mixed w/40% ethyl alcohol solution.
40-67	2/21/67	♀	Yes	5	1. Anectine--24mg.	Right Ham High	18:25	Drug mixed w/40% ethyl alcohol solution.

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
41-67	2/15/67	♀	Yes	5	1. Anectine--24mg.	Left Ham	30:00 Before	Drug mixed w/40% ethyl alcohol solution.
42-67	2/17/67	♀	Yes	8	1. Anectine--24mg.	Left Ham	20:00 Before	Drug mixed w/40% ethyl alcohol solution.
43-67	2/17/67	♀	No	14	1. Anectine--24mg.	Right Ham	00:30 Before	Went down very fast.
44-67	2/21/67	♀	No	3	1. Anectine--24mg.	Rt. Shoulder High	17:00	Drug mixed w/40% ethyl alcohol solution.
45-67	2/22/67	♀	Yes	4	1. Anectine--24mg.	Right Ham	19:15 Before	Drug mixed w/40% ethyl alcohol solution.
46-67	2/25/67	♀	Yes	10	1. Anectine--25mg.	Ribs 1/2 Way up Left Side	20:15 Before	Drug mixed w/40% ethyl alcohol solution.
47-67	3/1/67	♀	Yes	3	1. Anectine--25mg.	Right Hump	7:50	No alcohol in with drug for remaining moose.
48-67	3/1/67	♀	Yes	2	1. Anectine--25mg.	Rt. Rear Ham	12:30	
49-67	3/4/67	♀	Yes	7	1. Anectine--25mg.	Loin--Ahead Right Ham	25:45	Took long time to go down.
50-67	3/9/67	♀	w/calves	Calf	1. Anectine--14mg.	Rt. Rear High	16:40	
51-67	3/10/67	♀	w/adult	1	1. Anectine--27mg.	Left Ham	14:05	Probably only portion of drug entered.
52-67	3/10/67	♀	No	1	1. Anectine--27mg.	Rt. Rear High	15:50	
53-67	3/11/67	♀	No	2	1. Anectine--25mg.	Left Rear High	15:35 Before	Artificial respiration

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
54-67	3/12/67	♀	w/adults	8	1. Anectine--30mg.	Ribs--Right Side	20:00 Before	Artificial respiration--15 minutes.
55-67	3/12/67	♂	No	1	1. Anectine--30mg.	Rt. Shoulder Low	20:00 Before	Artificial respiration--15 minutes.
56-67	3/14/67	♀	No	5	1. Anectine--29mg.	Left Ham	15:00	
57-67	3/14/67	♀	Yes	5	1. Anectine--30mg.	Right Ham	25:00 Before	Medium size moose--couldn't quite keep head up.
58-67	3/15/67	♀	Yes	9	1. Anectine--29.5mg.	Right Ham	25:00 Before	Large animal--alert.
59-67	3/15/67	♀	No	7	1. Anectine--29.5mg.	Right Ham	25:00 Before	
60-67	3/15/67	♀	Yes	7	1. Anectine--29.5mg.	Right Ham	22:00 Before	
61-67	3/15/67	♂	No	4	1. Anectine--29.5mg.	Right Ham	22:00 Before	
62-67	3/16/67	♀	Yes	10	1. Anectine--29mg.	-----	13:50	
63-67	3/16/67	♀	w/adult	6	1. Anectine--29mg.	Left Ham--High	22:00 Before	
64-67	3/17/67	♀	Yes	10	1. Anectine--29.5mg.	Left Ham--High	22:00 Before	Very alert.
65-67	3/20/67	♀	No	3	1. Anectine--30.5mg.	Right Hind Leg--Low	20:00 Before	
66-77	3/21/67	♀	w/adult	10	1. Anectine--32mg.	Right Ham High	14:50	

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
67-67	3/21/67	♂	No	3	1. Anectine--32mg.	Left Shoulder High	21:00 Before	Artificial respiration--10 minutes.
68-67	3/22/67	♀	Yes	8	1. Anectine--31.5mg.	Right Front Shoulder High	7:53	
69-67	3/21/67	♀	Yes	7	1. Anectine--32mg.	Right Side High	16:30	
70-67	3/22/67	♀	No	5	1. Anectine--31.5mg.	Left Ham High	13:25	Very alert.
71-67	3/24/67	♀	Yes	3	1. Anectine--31.5mg.	Left Front Shoulder	5:00 Before	Went down quickly but very alert.
72-67	3/26/67	♀	w/adult	A	1. Anectine--31.5mg.	Left Ham	20:00 Over	
73-67	3/27/67	♂	w/adult	Calf	1. Anectine--19mg.	Left Ham--High	22:00 Before	
74-67	3/27/67	♀	No	10	1. Anectine--32mg.	Right Ham	24:00 Before	Very little artificial respiration.
75-67	3/28/67	♀	w/adult	1	1. Anectine--31.5mg.	Left Ham	7:00	Artificial respiration--40 minutes.
76-67	3/28/67	♀	No	5	1. Anectine--31.5mg.	Left Ham	11:00	
77-67	3/29/67	♀	No	8	1. Anectine--31.5mg.	3" Below Anus	7:00	
78-67	3/29/67	♂	No	2	1. Anectine--31.5mg.	Right Side	20:00 Before	
79-67	4/1/67	♀	Yes	11	1. Anectine--30mg.	Left Ham	20:00 Before	

Table 1. Drug Effects on Moose Collared in Matanuska Valley, Winters of 1965-66, 1966-67 (Continued).

Specimen Number	Date	Sex	W/Calf?	Age	Drug & mg. of Dosage Dart #	Area Hit	Time to Go Down	Remarks
80-67	4/3/67	♀	No	5	1. Anectine--28mg.	Left Ham	20:00 Before	

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67.

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color: Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
1-67	3817	3818	1/16/67	♀	A	T17N,R1W Sec 2,SW 1/4	1	0	0	R-W	0	0	P	L
2-67	3819	3820	1/18/67	♀	A	T17N,R1E Sec 5	2	0	0	R-W	0	0	P	R
3-67	3821	3822	1/19/67	♀	A	T17N,R2E Sec 2,SE 1/4	3	0	0	R-W	0	0	W	L
4-67	3826	3827	1/20/67	♀	A	T18N,R2E Sec 23,SW 1/4	4	0	0	R-W	0	0	W	R
5-67	3823	3824	1/21/67	♀	A	T18N,R2E Sec 35,SW 1/4	5	0	0	R-W	0	0	B	L
6-67	3830	3831	1/23/67	♂	A	T18N,R2E Sec 35,NW 1/4	6	0	0	R-W	0	0	B	R
7-67	3832	3833	1/25/67	♀	A	T17N,R1W Sec 8,NE 1/4	7	0	0	R-W	0	0	Y	L
8-67	3834	3835	1/25/67	♀	Calf	T18N,R1E Sec 31,SW 1/4	8	0	0	R-W	0	0	Y	R
9-67	3836	3837	1/26/67	♀	1	T17N,R1W Sec 3,NE 1/4	9	0	0	R-W	0	P	0	L
10-67	3838	3839	1/26/67	♀	7	T17N,R1W Sec 5,SE 1/4	10	0	0	R-W	0	P	0	R
11-67	3840	3841	1/26/67	♀	4	T18N,R1E Sec 33,NE 1/4	11	0	0	R-W	0	P	W	L
12-67	3844	3845	1/30/67	♀	3	T18N,R2E Sec 35,SW 1/4	12	0	0	R-W	0	P	W	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
13-67	3846	3847	1/30/67	♂	1	T18N,R2E Sec 35,SW 1/4	13	0	0	R-W	0	P	B	L
14-67	3848	3849	1/31/67	♀	7	T18N,R1W Sec 36,NW 1/4	14	0	0	R-W	0	P	B	R
15-67	3850	3851	1/31/67	♀	11	T18N,R2W Sec 22,SW 1/4	15	0	0	R-W	0	P	Y	L
16-67	3852	3825	1/31/67	♀	6	T17N,R1W Sec 2,NW 1/4	16	0	0	R-W	0	P	Y	R
17-67	3856	3857	1/30/67	♂	3	T17N,R3W Sec 13,NW 1/4	17	0	0	R-W	0	W	0	L
18-67	3858	3859	2/2/67	♀	A	T17N,R1E Sec 27,NE 1/4	18	0	0	R-W	0	W	0	R
19-67	3860	3861	2/3/67	♂	1	T17N,R1W Sec 1,NW 1/4	19	0	0	R-W	0	W	P	L
20-67	3863	3864	2/4/67	♀	3	T17N,R1E Sec 32,NW 1/4	20	0	0	R-W	0	W	P	R
21-67	3862	3865	2/6/67	♀	6	T17N,R2E Sec 12,NW 1/4	21	0	0	R-W	0	W	B	L
22-67	3866	3867	2/7/67	♀	6	T16N,R1E Sec 10,NE 1/4	22	0	0	R-W	0	W	B	R
23-67	3868	3869	2/8/67	♀	6	T17N,R1W Sec 2,SW 1/4	23	0	0	R-W	0	W	Y	L
24-67	3854	3855	2/2/67	♀	5	T17N,R1W Sec 11,NE 1/4	24	0	0	R-W	0	W	Y	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color: Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
25-67	3870	3871	2/9/67	♀	7	T17N,R1W Sec 5,NE 1/4	25	0	0	R-W	0	B	0	L
26-67	3872	3873	2/9/67	♀	6	T17N,R3E Sec 1,SW 1/4	26	0	0	R-W	0	B	0	R
27-67	3875	3901	2/10/67	♀	1	T17N,R1E Sec 1,NE 1/4	27	0	0	R-W	0	B	P	L
28-67	3902	3903	2/13/67	♀	3	T18N,R1E Sec 34,NW 1/4	28	0	0	R-W	0	B	P	R
29-67	3951	3952	2/8/67	♀	4	T17N,R2E Sec 1,SW 1/4	29	0	0	R-W	0	B	W	L
30-67	3876	3877	2/8/67	♀	A	T17N,R2E Sec 12,NE 1/4	30	0	0	R-W	0	B	W	R
31-67	3878	3880	2/8/67	♀	A	T17N,R2E Sec 12,NE 1/4	31	0	0	R-W	0	B	Y	L
32-67	3881	3882	2/9/67	♀	6	T17N,R2E Sec 1,SE 1/4	32	0	0	R-W	0	B	Y	R
33-67	3883	3884	2/9/67	♀	9	T17N,R1E Sec 5	33	0	0	R-W	0	Y	0	L
34-67	3885	3886	2/10/67	♀	4	T17N,R2E Sec 1,NW 1/4	34	0	0	R-W	0	Y	0	R
35-67	3887	3888	2/10/67	♀	2	T17N,R2E Sec 1,SW 1/4	35	0	0	R-W	0	Y	P	L
36-67	3904	3905	2/14/67	♀	7	T17N,R2W Sec 2,SW 1/4	36	0	0	R-W	0	Y	P	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color: Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
37-67	3895	3896	2/19/67	♀	11	T18N,R1E Sec 29,SW 1/4	37	0	0	R-W	0	Y	W	L
38-67	3897	3898	2/20/67	♀	A	T17N,R1W Sec 3,SW 1/4	38	0	0	R-W	0	Y	W	R
39-67	3899	3900	2/21/67	♀	9	T18N,R1E Sec 30,SE 1/4	39	0	0	R-W	0	Y	B	L
40-67	4167	3906	2/21/67	♀	5	T17N,R1W Sec 13,NE 1/4	40	0	0	R-W	0	Y	B	R
41-67	3889	3890	2/15/67	♀	5	T17N,R2W Sec 12,NE 1/4	41	0	0	R-W	0	0	0	L
42-67	3891	3892	2/17/67	♀	8	T17N,R2W Sec 17,NW 1/4	42	0	0	R-W	0	0	0	R
43-67	3893	3894	2/17/67	♀	14	T17N,R3W Sec 21,SW 1/4	43	0	0	R-W	0	P	P	L
44-67	3907	3908	2/21/67	♀	3	T17N,R1W Sec 3,SW 1/4	44	0	0	R-W	0	P	P	R
45-67	3909	3910	2/22/67	♀	4	T17N,R1E Sec 3,NW 1/4	45	0	0	R-W	0	W	W	L
46-67	3911	3912	2/25/67	♀	10	T17N,R1E Sec 2	46	0	0	R-W	0	W	W	R
47-67	3913	3914	3/1/67	♀	3	T18N,R1E Sec 35,SE 1/4	47	0	0	R-W	0	Y	Y	L
48-67	3915	3916	3/1/67	♀	2	T18N,R1E Sec 27,NW 1/4	48	0	0	R-W	0	Y	Y	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color: Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
49-67	3917	3918	3/4/67	♀	7	T17N,R1E Sec 5,SE 1/4	49	0	0	R-W	0	B	B	L
50-67	3274	3276	3/9/67	♀	Calf	T18N,R1E Sec 31,NE 1/4	50	0	0	R-W	0	B	B	R
51-67	3919	3920	3/10/67	♀	1	T18N,R2E Sec 31,SE 1/4	51	0	0	R-W	Y	0	P	L
52-67	3921	3922	3/10/67	♀	1	T17N,R1W Sec 1,NE 1/4	52	0	0	R-W	Y	0	P	R
53-67	3923	3924	3/11/67	♀	2	T17N,R1E Sec 1,NW 1/4	53	0	0	R-W	Y	0	W	L
54-67	3925	3926	3/12/67	♀	8	T17N,R1W Sec 10,NW 1/4	54	0	0	R-W	Y	0	W	R
55-67	3927	3928	3/12/67	♂	1	T17N,R1W Sec 1,NE 1/4	55	0	0	R-W	Y	0	B	L
56-67	3929	3930	3/14/67	♀	5	T18N,R1E Sec 30,SE 1/4	56	0	0	R-W	Y	0	B	R
57-67	3931	3932	3/14/67	♀	5	T18N,R1E Sec 28,SE 1/4	57	0	0	R-W	Y	0	Y	L
58-67	3933	3934	3/15/67	♀	9	T17N,R1W Sec 11,SW 1/4	58	0	0	R-W	Y	0	Y	R
59-67	3935	3936	3/15/67	♀	7	T18N,R1E Sec 30,SE 1/4	59	0	0	R-W	Y	P	0	L
60-67	3937	3938	3/15/67	♀	7	T18N,R1E Sec 34,NE 1/4	101	0	0	R-W	Y	P	0	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
61-67	3939	3940	3/15/67	♂	4	T18N,R1E Sec 31,NE 1/4	102	0	0	R-W	Y	P	W	L
62-67	3941	3942	3/16/67	♀	10	T17N,R1E Sec 4,NW 1/4	103	0	0	R-W	Y	P	W	R
63-67	3943	3944	3/16/67	♀	6	T17N,R1W Sec 1,NW 1/4	104	0	0	R-W	Y	P	B	L
64-67	3945	3946	3/17/67	♀	10	T17N,R3W Sec 15,SE 1/4	105	0	0	R-W	Y	P	B	R
65-67	3947	3948	3/20/67	♀	3	T17N,R1W Sec 10,NW 1/4	106	0	0	R-W	Y	P	Y	L
66-67	3949	3950	3/21/67	♀	10	T17N,R1E Sec 4,NW 1/4	107	0	0	R-W	Y	P	Y	R
67-67	3953	3954	3/21/67	♂	3	T17N,R1W Sec 1,NE 1/4	108	0	0	R-W	Y	W	0	L
68-67	3961	3962	3/22/67	♀	8	T17N,R1W Sec 10,NW 1/4	109	0	0	R-W	Y	W	0	R
69-67	3957	3958	3/21/67	♀	7	T18N,R1E Sec 30,SE 1/4	110	0	0	R-W	y	W	P	L
70-67	3959	3960	3/22/67	♀	5	T18N,R1E Sec 34,SE 1/4	111	0	0	R-W	Y	W	P	R
71-67	3963	3964	3/24/67	♀	3	T16N,R3W Sec 26,NE 1/4	112	0	0	R-W	Y	W	B	L
72-67	3965	3966	3/26/67	♀	A	T18N,R1W Sec 35,NW 1/4	113	0	0	R-W	Y	W	B	R

Table 2. Moose Tagged and Collared in Matanuska Valley, Winter, 1966-67 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age (Years)	Location	Collar Color: Pendant	Year	Area	Collar	Above	Middle	Below	Left or Right
73-67	3967	3968	3/27/67	♂	Calf	T18N,R2E Sec 32,SE 1/4	114	0	0	R-W	Y	W	Y	L
74-67	3969	3970	3/27/67	♀	10	T18N,R1E Sec 32,NW 1/4	115	0	0	R-W	Y	W	Y	R
75-67	3971	3972	3/28/67	♀	1	T18N,R1E Sec 30,SW 1/4	116	0	0	R-W	Y	B	0	L
76-67	3973	3974	3/28/67	♀	5	T18N,R1E Sec 34,SE 1/4	117	0	0	R-W	Y	B	0	R
77-67	3975	3976	3/29/67	♀	8	T18N,R1E Sec 30,SW 1/4	118	0	0	R-W	Y	B	P	L
78-67	3977	3978	3/29/67	♂	2	T17N,R1W Sec 2,NE 1/4	119	0	0	R-W	Y	B	P	R
79-67	3981	3982	4/1/67	♀	11	T18N,R1E Sec 29,SW 1/4	120	0	0	R-W	Y	B	W	L
80-67	3985	3986	4/3/67	♀	5	T17N,R1W Sec 2,SE 1/4	121	0	0	R-W	Y	B	W	R

Table 3. Moose Tagged and Collared on Fort Richardson, 1967.

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age	Location	Pendant Number	Collar Code Left						Right
1-67	4001	4002	1/31/67	♀	Unk	T13N,R2W Sec 7,NW 1/4	1	G	G	G	G	G	G	G
2-67	4003	4004	1/31/67	♂	1	T13N,R2W Sec 18,NE 1/4	2	P	G	G	G	G	G	G
3-67	4005	4006	1/31/67	♀	4	T14N,R2W Sec 4,NW 1/4	3	G	G	G	G	G	G	P
4-67	4007	4008	2/1/67	♀	3	T14N,R2W Sec 20,NW 1/4	4	B	G	G	G	G	G	G
5-67	4009	4010	2/3/67	♂	2	T13N,R2W Sec 18,NE 1/4	5	G	G	G	G	G	G	B
6-67	4011	4012	2/6/67	♀	8	T14N,R2W Sec 27,NW 1/4	6	G	G	G	G	G	G	W
7-67	4013	4014	2/7/67	♀	1	T13N,R2W Sec 18,NE 1/4	7	W	G	G	G	G	G	G
8-67	4015	4016	2/7/67	♀	2	T13N,R2W Sec 17,NW 1/4	8	G	G	G	G	G	G	R
9-67	4017	4018	2/7/67	♂	2	T13N,R2W Sec 17,NW 1/4	9	G	G	G	G	G	G	R
10-67	4019	4020	2/7/67	♂	1	T13N,R2W Sec 8,SW 1/4	10	G	G	G	G	G	P	G
11-67	4021	4022	2/8/67	♀	1	T13N,R2W Sec 17,NW 1/4	100	G	G	G	G	G	B	G
12-67	4023	4024	2/8/67	♀	2	T13N,R2W Sec 17,NW 1/4	101	G	G	G	G	G	W	G

Table 3. Moose Tagged and Collared on Fort Richardson, 1967 (Continued)

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age	Location	Pendant Number	Collar Code Left						Right
13-67	4025	4026	2/8/67	♂	3	T13N,R2W Sec 7,SE 1/4	102	G	R	G	G	G	G	G
14-67	4027	4028	2/9/67	♀	6	T14N,R2W Sec 27,SW 1/4	103	G	P	G	G	G	G	G
15-67	4029	4030	2/10/67	♀	6	T14N,R2W Sec 20,NW 1/4	104	G	G	G	G	G	B	G
16-67	4031	4032	2/10/67	♂	Unk	T13N,R2W Sec 18,NE 1/4	105	G	W	G	G	G	G	G
18-67	4035	4036	2/14/67	♀	9	T13N,R3W Sec 12,NW 1/4	106	G	R	G	G	G	G	G
19-67	4037	4038	2/15/67	♂	Unk	T14N,R3W Sec 24,SW 1/4	107	G	G	G	G	P	G	G
20-67	4039	4040	2/17/67	♀	10	T13N,R2W Sec 18,NE 1/4	108	G	G	G	G	B	G	G
21-67	4041	4042	2/17/67	♀	3	T13N,R2W Sec 7,SW 1/4	109	G	G	G	G	W	G	G
22-67	4043	4044	2/28/67	♀	11	T14N,R2W Sec 20,NW 1/4	110	G	G	G	G	R	G	G
23-67	4045	4046	3/2/67	♀	2	T13N,R2W Sec 7,SW 1/4	111	G	G	P	G	G	G	G
24-67	4047	4048	3/2/67	♂	3	T13N,R2W Sec 7,SW 1/4	112	G	G	G	G	G	W	G
25-67	4049	4050	3/2/67	♂	3	T13N,R2W Sec 7,SW 1/4	113	G	G	B	G	G	G	G

Table 3. Moose Tagged and Collared on Fort Richardson, 1967 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age	Location	Pendant Number	Collar Code Left						Right
26-67	4051	4052	3/3/67	♀	3	T13N,R2W Sec 18,NE 1/4	114	G	G	G	P	G	G	G
27-67	4053	4054	3/3/67	♀	5	T13N,R2W Sec 17,NW 1/4	115	G	G	G	B	G	G	G
28-67	4055	4056	3/3/67	♂	3	T13N,R2W Sec 8,SE 1/4	116	G	G	G	W	G	G	G
29-67	4057	4058	3/6/67	♀	7	T14N,R2W Sec 27,NE 1/4	117	P	P	G	G	G	G	G
30-67	4059	4060	3/8/67	♀	2	T14N,R3W Sec 25,SE 1/4	118	G	G	G	G	G	P	P
31-67	4061	4062	3/8/67	♀	6	T14N,R3W Sec 19,SW 1/4	119	B	B	G	G	G	G	G
32-67	4063	4064	3/9/67	♀	3	T13N,R2W Sec 8,SW 1/4	120	G	G	G	G	G	B	B
33-67	4065	4066	3/9/67	♀	11	T13N,R2W Sec 8,SW 1/4	121	W	W	G	G	G	G	G
34-67	4067	4068	3/10/67	♀	9	T14N,R2W Sec 17,NW 1/4	122	G	G	G	G	G	W	W
35-67	4069	4070	3/10/67	♀	1	T14N,R2W Sec 17,NE 1/4	123	G	P	P	G	G	G	G
36-67	4071	4072	3/13/67	♂	5	T13N,R2W Sec 17,NE 1/4	124	G	G	G	G	P	P	G
37-67	4073	4074	3/13/67	♂	7	T13N,R2W Sec 17,NW 1/4	125	G	B	B	G	G	G	G

Table 3. Moose Tagged and Collared on Fort Richardson, 1967 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age	Location	Pendant Number	Collar Code Left						Right
38-67	4075	4076	3/13/67	♀	1	T13N,R2W Sec 17,NW 1/4	126	G	G	G	G	B	B	G
39-67	4077	4078	3/13/67	♀	1	T13N,R2W Sec 6,SW 1/4	127	G	W	W	G	G	G	G
40-67	4079	4080	3/14/67	♀	2	T14N,R3W Sec 1,NW 1/4	128	G	G	G	G	W	W	G
41-67	4081	4082	3/14/67	♀	6	T13N,R2W Sec 6,NW 1/4	129	G	G	P	P	G	G	G
42-67	4083	4084	3/15/67	♀	9	T13N,R2W Sec 17,SE 1/4	130	G	G	G	P	P	G	G
43-67	4085	4086	3/17/67	♀	10	T14N,R2W Sec 19,SE 1/4	131	G	G	B	B	G	G	G
44-67	4087	4088	3/20/67	♀	3	T13N,R2W Sec 8,SW 1/4	132	Y	Y	Y	B	B	Y	Y
45-67	4089	4090	3/20/67	♀	1	T13N,R2W Sec 17,NE 1/4	133	Y	Y	W	W	Y	Y	Y
46-67	4091	4092	3/23/67	♀	3	T13N,R2W Sec 17,NW 1/4	134	Y	Y	Y	W	W	Y	Y
47-67	4093	4094	3/27/67	♀	8	T14N,R3W Sec 35,SE 1/4	135	P	Y	P	Y	Y	Y	Y
48-67	4095	4096	3/27/67	♀	11	T14N,R3W Sec 35,SE 1/4	136	Y	Y	Y	Y	P	Y	P
49-67	4097	4098	3/28/67	♀	5	T14N,R3W Sec 36,NE 1/4	137	0	0	0	0	0	0	0

Table 3. Moose Tagged and Collared on Fort Richardson, 1967 (Continued).

Specimen Number	Ear Tag # Left	Ear Tag # Right	Tagging Date	Sex	Age	Location	Pendant Number	Collar Code Left						Right
50-67	4099	----	3/30/67	♀	5	T14N,R3W Sec 25,SE 1/4	138	W	W	W	W	W	W	W
51-67	----	4100	3/3067	♀	-1	T13N,R2W Sec 7,NW 1/4	139	P	G	B	B	B	B	B

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967.

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance moved (miles)	Direction
1	60	2/10/66	♀	T17N,R2W Sec 9,SW 1/4	2/16/66	T17N,R2W Sec 9,SW 1/4	6	---	---
2 Dead	64	2/18/66	♂	T18N,R1E Sec 14,NE 1/4	4/11/66	T18N,R1E Sec 14,SE 1/4	52	1/2	South
3 Dead	68	3/3/66	♂	T18N,R2E Sec 26,NW 1/4	8/27/66	T18N,R3E Sec 7	177	3	Northeast
4	72	3/10/66	♀	T17N,R3W Sec 29,NE 1/4	1/6/67	T17N,R3W Sec 14,NE 1/4	302	3 1/2	Northeast
5	72	3/10/66	♀	T17N,R3W Sec 29,NE 1/4	1/19/67	T17N,R3W Sec 36,SE 1/4	13	1	Southeast
6	72	3/10/66	♀	T17N,R3W Sec 29,NE 1/4	1/22/67	T17N,R3W Sec 21,NE 1/4	3	1 1/2	North
7	75	3/15/66	♀	T17N,R1E Sec 10,SE 1/4	2/21/67	T17N,R1W Sec 13,NE 1/4	343	4	West
8	76	3/16/66	♀	T17N,R1E Sec 1,NW 1/4	2/15/67	T18N,R1E Sec 19,SW 1/4	336	5 1/2	Northwest
9	76	3/16/66	♀	T17N,R1E Sec 1,NW 1/4	2/28/67	T18N,R1E Sec 30,SE 1/4	13	1 1/4	Southeast
10	76	3/16/66	♀	T17N,R1E Sec 1,NW 1/4	3/6/67	T18N,R1E Sec 31,SW 1/4	6	1 1/4	Southwest
11	76	3/16/66	♀	T17N,R1E Sec 1,NW 1/4	3/22/67	T18N,R1E Sec 30,SW 1/4	16	1	North
12 Dead	80	3/17/66	♂	T15N,R3W Sec 9,NW 1/4	8/20/66	T17N,R4W Sec 14	156	11 1/2	Northwest

*Days elapsed and distance moved: initial entry for an individual represents time elapsed and distance moved since tagging. Subsequent entries for the same individual represent time elapsed and distance moved since the last sighting.

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967 (Continued)

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* moved (miles)	Direction
13	91	4/12/66	♀	T16N,R2E Sec 10,NE 1/4	6/1/66	T16N,R1W Sec 10,NE 1/4	50	12	West
14	93	4/13/66	♂	T18N,R2E Sec 20,SE 1/4	1/30/67	T18N,R1E Sec 8	292	6	Northwest
15	2	1/18/67	♀	T17N,R1E Sec 5	2/7/67	T18N,R1E Sec 28,SW 1/4	20	2	North
16	2	1/18/67	♀	T17N,R1E Sec 5	3/24/67	T17N,R1E Sec 5,SE 1/4	45	2	South
17	3	1/19/67	♀	T17N,R2E Sec 2,SE 1/4	3/15/67	T17N,R2E Sec 14	55	2	South
18	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	1/24/67	T18N,R2E Sec 23,SW 1/4	4	---	---
19	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	1/26/67	T18N,R2E Sec 27,NE 1/4	2	1/2	Southwest
20	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	2/9/67	T17N,R2E Sec 2,NE 1/4	14	2 1/4	Southeast
21	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	2/16/67	T18N,R2E Sec 34,NE 1/4	7	1 1/2	Northwest
22	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	2/17/67	T18N,R2E Sec 34,NE 1/4	1	---	---
23	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	3/12/67	T17N,R2E Sec 2,SE 1/4	23	2	Southeast
24	4	1/20/67	♀	T18N,R2E Sec 23,SW 1/4	3/15/67	T17N,R2E Sec 14	3	1 1/2	Southwest

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967 (Continued)

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* moved (miles)	Direction
25	5	1/21/67	♀	T18N,R2E Sec 35,SW 1/4	1/26/67	T18N,R2E Sec 34,NW 1/4	5	1 1/4	Northwest
26	5	1/21/67	♀	T18N,R2E Sec 35,SW 1/4	2/6/67	T18N,R2E Sec 35,NW 1/4	11	1/8	East
27	5	1/21/67	♀	T18N,R2E Sec 35,SW 1/4	2/24/67	T17N,R2E Sec 14,SE 1/4	18	4	South
28	6	1/23/67	♂	T18N,R2E Sec 35,NW 1/4	2/12/67	T17N,R2E Sec 2,SE 1/4	20	2	South
29	9	1/26/67	♀	T17N,R1W Sec 3,NE 1/4	3/16/67	T17N,R1W Sec 1,SE 1/4	49	2 1/4	Southeast
30	9	1/26/67	♀	T17N,R1W Sec 3,NE 1/4	3/18/67	T17N,R1W Sec 1,SE 1/4	2	---	---
31	10	1/26/67	♀	T17N,R1W Sec 5,SE 1/4	2/13/67	T17N,R1W Sec 8,SE 1/4	18	3/4	South
32	11	1/26/67	♀	T18N,R1E Sec 33,NE 1/4	3/27/67	T18N,R1E Sec 35,SW 1/4	60	1 1/2	Southeast
33	12	1/27/67	♀	T18N,R2E Sec 35,SW 1/4	2/6/67	T17N,R2E Sec 2,NW 1/4	10	1/2	South
34	12	1/27/67	♀	T18N,R2E Sec 35,SW 1/4	3/1/67	T17N,R2E Sec 2,SE 1/4	23	1	Southeast
35	14	1/31/67	♀	T18N,R1W Sec 36,NW 1/4	2/9/67	T17N,R1W Sec 3,SE 1/4	9	2 1/4	Northeast
36	14	1/31/67	♀	T18N,R1W Sec 36,NW 1/4	3/8/67	T17N,R1W Sec 1	27	1	East

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967 (Cont'd)

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* Moved (miles)	Direction
37	14	1/31/67		T18N,R1W Sec 36,NW 1/4	3/9/67	T17N,R1W Sec 1	1	---	---
38	19	2/3/67		T17N,R1W Sec 1,NW 1/4	2/25/67	N18N,R1E Sec 29,SW 1/4	22	2 1/2	Northeast
39	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/14/67	T18N,R1E Sec 30,SE 1/4	17	1/2	West
40	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/17/67	T18N,R1E Sec 31,NE 1/4	3	1/2	South
41	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/18/67	T17N,R1W Sec 1,NE 1/4	1	1 1/2	Southwest
42	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/20/67	T17N,R1W Sec 1,NE 1/4	2	---	---
43	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/21/67	T18N,R1E Sec 30,SW 1/4	1	1 1/2	Northeast
44	19	2/3/67		T18N,R1W Sec 1,NW 1/4	3/24/67	T18N,R1E Sec 30,SE 1/4	3	3/4	East
45	28	2/13/67		T18N,R1E Sec 34,NW 1/4	2/24/67	T17N,R1E Sec 4,NE 1/4	11	1	Southwest
46	28	2/13/67		T18N,R1E Sec 34,NW 1/4	3/13/67	T17N,R1E Sec 4,NE 1/4	17	---	---
47	28	2/13/67		T18N,R1E Sec 34,NW 1/4	3/26/67	T17N,R1E Sec 5,SE 1/4	13	1 1/2	Southwest
48	29	2/8/67		T17N,R2E Sec 1,SW 1/4	2/10/67	T17N,R2E Sec 2,NE 1/4	2	1	Northwest

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967 (Continued).

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed	Distance (miles)	Direction
49	29	2/8/67	♀	T17N,R2E Sec 1,SW 1/4	2/18/67	T17N,R2E Sec 11,NE 1/4	8	1	South
50	30	2/8/67	♀	T17N,R2E Sec 12,NE 1/4	2/21/67	T17N,R2E Sec 14,SE 1/4	13	2	South
51	37	2/19/67	♀	T18N,R1E Sec 29,SW 1/4	2/27/67	T18N,R1E Sec 34,SE 1/4	18	3	Southeast
52 Dead	42	2/17/67	♀	T17N,R2W Sec 17,NW 1/4	3/13/67	T17N,R1W Sec 7	24	5 1/2	Northeast
53	43	2/17/67	♀	T17N,R3W Sec 21,SW 1/4	2/20/67	T17N,R3W Sec 21,SE 1/4	3	1	East
54	43	2/17/67	♀	T17N,R3W Sec 21,SW 1/4	3/8/67	T17N,R3W Sec 29,NE 1/4	16	1 1/4	Southwest
55	44	2/21/67	♀	T17N,R1W Sec 3,SW 1/4	3/11/67	T17N,R1W Sec 11,NW 1/4	18	1 1/4	Southeast
56	44	2/21/67	♀	T17N,R1W Sec 3,SW 1/4	3/13/67	T17N,R1W Sec 1,SW 1/4	2	1 1/4	Northeast
57	46	2/25/67	♀	T17N,R1E Sec 2	3/9/67	T18N,R2E Sec 31,SE 1/4	12	3	Northeast
58	46	2/25/67	♀	T17N,R1E Sec 2	3/10/67	T18N,R2E Sec 31,SW 1/4	1	3/4	West
59	46	2/25/67	♀	T17N,R1E Sec 2	3/12/67	T17N,R2E Sec 6,NE 1/4	2	3/4	Southeast
60	46	2/25/67	♀	T17N,R1E Sec 2	3/13/67	T18N,R2E Sec 31,SW 1/4	1	3/4	Northwest

Table 4. Collared Moose Movements in the Matanuska Valley, Alaska, 1966-1967 (Continued).

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* moved (miles)	Direction
61	46	2/25/67	♀	T17N,R1E Sec 2	3/14/67	T17N,R1E Sec 1,NE 1/4	1	3/4	Southwest
62	48	3/1/67	♀	T18N,R1E Sec 27,NW 1/4	3/27/67	T18N,R2E Sec 32,SE 1/4	26	5	Southeast
63	50	3/9/67	♀	T18N,R1E Sec 31,NE 1/4	3/14/67	T18N,R1E Sec 30,SE 1/4	5	1/2	North
64	51	3/10/67	♀	T18N,R2E Sec 31,SE 1/4	3/13/67	T18N,R2E Sec 32,SW 1/4	3	1/2	East
65	51	3/10/67	♀	T18N,R2E Sec 31,SE 1/4	3/16/67	T18N,R2E Sec 32,SW 1/4	3	---	---
66	52	3/10/67	♀	T17N,R1W Sec 1,NE 1/4	3/15/67	T18N,R1W Sec 25,SE 1/4	5	1 1/2	North
67	105	3/17/67	♀	T17N,R3W Sec 15,SE 1/4	3/21/67	T17N,R3W Sec 21,SE 1/4	4	1 1/2	Southwest
68	107	3/21/67	♀	T17N,R1E Sec 4,NW 1/4	3/26/67	T18N,R1E Sec 34,SE 1/4	5	1 3/4	Northeast
69	107	3/21/67	♀	T17N,R1E Sec 4,NW 1/4	3/27/67	T18N,R1E Sec 34,SE 1/4	1	---	---
70	107	3/21/67	♀	T17N,R1E Sec 4,NW 1/4	3/29/67	T17N,R1E Sec 4,NW 1/4	2	1 1/2	West

Table 5. Collared Moose Movements on Fort Richardson, Alaska, 1967.

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* moved (miles)	Direction
1	1	1/31/67	♀	T13N,R2W Sec 7,NW 1/4	4/3/67	T13N,R2W Sec 6,SW 1/4	62	0.5	North
2	1	1/31/67	♀	T13N,R2W Sec 7,NW 1/4	4/18/67	T14N,R2W Sec 17,SW 1/4	15	4.5	North
3	3	1/31/67	♀	T14N,R2W Sec 4,NW 1/4	3/3/67	T13N,R2W Sec 12,NE 1/4	31	7.5	Southeast
4	5	2/3/67	♂	T13N,R2W Sec 18,NE 1/4	2/28/67	T13N,R2W Sec 7,SE 1/4	25	0.5	North
5	6	2/6/67	♀	T14N,R2W Sec 27,NW 1/4	2/20/67	T14N,R2W Sec 22,SE 1/4	14	0.75	East
6	6	2/6/67	♀	T14N,R2W Sec 27,NW 1/4	4/18/67	T14N,R2W Sec 27,NE 1/4	57	0.5	South
7	7	2/7/67	♀	T13N,R2W Sec 18,NE 1/4	2/28/67	T13N,R2W Sec 7,SE 1/4	21	0.5	North
8	8	2/7/67	♀	T13N,R2W Sec 17,NW 1/4	3/19/67	T14N,R3W Sec 35,SE 1/4	40	3.5	Northwest
9	9	2/7/67	♂	T13N,R2W Sec 17,NW 1/4	3/10/67	T13N,R3W Sec 12,NE 1/4	31	2.0	Northwest
10	10	2/7/67	♂	T13N,R2W Sec 8,SW 1/4	No date	T13N,R2W Sec 7,SE 1/4	?	0.5	West
11	102	2/8/67	♂	T13N,R2W Sec 7,SE 1/4	3/10/67	T13N,R3W Sec 12,NE 1/4	30	0.5	Northwest
12	103	2/9/67	♀	T14N,R2W Sec 27,SW 1/4	3/20/67	T14N,R2W Sec 20,NW 1/4	39	4.5	Northeast

*Days elapsed and distance moved: initial entry represents time elapsed and distance moved since tagging. Subsequent entries for the same individual represent time elapsed and distance moved since the last sighting.

Table 5. Collared Moose Movements on Fort Richardson, Alaska, 1967 (continued).

Observation	Pendant Number	Date Tagged	Sex	Area Tagged	Date Seen	Area Seen	Days Elapsed*	Distance* moved (miles)	Direction
13	108	2/17/67	♀	T13N,R2W Sec 18,NE 1/4	3/3/67	T13N,R2W Sec 17,NW 1/4	14	0.5	East
14	117	3/6/67	♀	T14N,R2W Sec 27,NE 1/4	3/20/67	T14N,R2W Sec 33,NE 1/4	14	1.5	Southwest
15	127	3/13/67	♀	T13N,R2W Sec 6,SW 1/4	4/1/67	T14N,R3W Sec 36,SE 1/4	19	1.25	Northwest
16	129	3/14/67	♀	T13N,R2W Sec 6,NW 1/4	3/23/67	T14N,R2W Sec 20,NW 1/4	9	3.25	North
17	135	3/27/67	♀	T14N,R3W Sec 35,SE 1/4	3/28/67	T14N,R3W Sec 35,SE 1/4	1	0.0	---

Table 3. Blood Tests from Collared Moose, Matanuska Valley, 1967.

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
1	3817	3818	1/16/67	♀	A	Negative	---
2	3819	3820	1/18/67	♀	A	Negative	---
3	3821	3822	1/19/67	♀	A	Negative	---
4	3826	3827	1/20/67	♀	A	No Blood Sample	
5	3823	3824	1/21/67	♀	A	No Blood Sample	
6	3830	3831	1/23/67	♂	A	No Blood Sample	
7	3832	3833	1/25/67	♀	A	Negative	---
8	3834	3835	1/25/67	♀	Calf	No Blood Sample	
9	3836	3837	1/26/67	♀	1	Negative	---
10	3838	3839	1/27/67	♀	7	Negative	---
11	3840	3841	1/26/67	♀	4	Negative	---
12	3844	3845	1/30/67	♀	3	Negative	---
13	3846	3847	1/30/67	♂	1	Negative	---
14	3848	3849	1/31/67	♀	7	Negative	---
15	3850	3851	1/31/67	♀	11	Negative	---
16	3852	3825	1/31/67	♀	6	Negative	---
17	3856	3857	1/30/67	♂	3	Negative	---
18	3858	3859	2/2/67	♀	A	No Blood Sample	
19	3860	3861	2/3/67	♂	1	Negative	---
20	3863	3864	2/4/67	♀	3	Negative	---
21	3862	3865	2/6/67	♀	6	Negative	---
22	3866	3867	2/7/67	♀	6	Negative	---
23	3868	3869	2/8/67	♀	6	Negative	---
24	3854	3855	2/2/67	♀	5	Negative	---
25	3870	3871	2/9/67	♀	7	Negative	---

Table 6. Blood Tests from Collared Moose, Matanuska Valley, 1967 (Continued).

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
26	3872	3873	2/9/67	♀	6	No Blood Sample	
27	3875	3901	2/10/67	♀	1	Negative	Negative
28	3902	3903	2/13/67	♀	3	Negative	Negative
29	3951	3952	2/8/67	♀	4	Negative	Negative
30	3876	3877	2/8/67	♀	A	No Blood Sample	
31	3878	3880	2/8/67	♀	A	No Blood Sample	
32	3881	3882	2/9/67	♀	6	Negative	Negative
33	3883	3884	2/9/67	♀	9	Negative	Negative
34	3885	3886	2/10/67	♀	4	Negative	Negative
35	3887	3888	2/10/67	♀	2	Negative	Negative
36	3904	3905	2/14/67	♀	7	Negative	Negative
37	3895	3896	2/19/67	♀	11	Negative	Negative
38	3897	3898	2/20/67	♀	A	No Blood Sample	
39	3899	3900	2/21/67	♀	9	Negative	Negative
40	4167	3906	2/21/67	♀	5	Negative	Negative
41	3889	3890	2/15/67	♀	5	Negative	Negative
42	3891	3892	2/17/67	♀	8	Negative	Negative
43	3093	3894	2/17/67	♀	14	Negative	Negative
44	3907	3908	2/21/67	♀	3	Negative	Negative
45	3909	3910	2/22/67	♀	4	Negative	Negative
46	3911	3912	2/25/67	♀	10	Negative	Negative
47	3913	3914	3/1/67	♀	3	Negative	Negative
48	3915	3916	3/1/67	♀	2	Negative	Negative
49	3917	3918	3/4/67	♀	7	Negative	Negative
50	3274	3276	3/9/67	♀	Calf	Negative	Negative

Table 6. Blood Tests from Collared Moose, Matanuska Valley, 1967 (Continued)

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
51	3919	3920	3/10/67	♀	1	Negative	Negative
52	3921	3922	3/10/67	♀	1	Negative	Negative
53	3923	3924	3/11/67	♀	2	Negative	Negative
54	3925	3926	3/12/67	♀	8	Negative	Negative
55	3927	3928	3/12/67	♂	1	Negative	Negative
56	3929	3930	3/14/67	♀	5	Negative	Negative
57	3931	3932	3/14/67	♀	5	Negative	Negative
58	3933	3934	3/15/67	♀	9	Negative	Negative
59	3935	3936	3/15/67	♀	7	Negative	Negative
101	3937	3938	3/15/67	♀	7	Negative	Negative
102	3939	3940	3/15/67	♂	4	Negative	Negative
103	3941	3942	3/16/67	♀	10	Negative	Negative
104	3943	3944	3/16/67	♀	6	Negative	Negative
105	3945	3946	3/17/67	♀	10	Negative	Negative
106	3947	3948	3/20/67	♀	3	Negative	Negative
107	3949	3950	3/21/67	♀	10	Negative	Negative
108	3953	3954	3/21/67	♂	3	Negative	Negative
109	3961	3962	3/22/67	♀	8	Negative	Negative
110	3957	3958	3/21/67	♀	7	Negative	Negative
111	3959	3960	3/22/67	♀	5	Negative	Negative
112	3963	3964	3/24/67	♀	3	Negative	Negative
113	3965	3966	3/26/67	♀	A	No Blood Sample	
114	3967	3968	3/27/67	♂	Calf	Negative	Negative
115	3969	3970	3/27/67	♀	10	Negative	Negative
116	3971	3972	3/28/67	♀	1	Negative	Negative

Table 6. Blood Tests from Collared Moose, Matanuska Valley, 1967 (Continued).

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
117	3973	3974	3/28/67	♀	5	Negative	Negative
118	3975	3976	3/29/67	♀	8	Negative	Negative
119	3977	3978	3/29/67	♂	2	Negative	Negative
120	3981	3982	4/1/67	♀	11	Negative	Negative
121	3985	3986	4/3/67	♀	5	Negative	Negative
None (Died)	3979	3980	3/3/67	♀		Negative	Negative
None (Died)	3955	3956	3/21/67	♀		Negative	Negative

Table 7. Blood Tests from Collared Moose, Fort Richardson, 1967.

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
1	4001	4002	1/31/67	♀	Unknown	Not Run	Not Run
2	4003	4004	1/31/67	♂	1	Negative	Not Run
3	4005	4006	1/31/67	♀	4	Negative	Not Run
4	4007	4008	2/1/67	♀	3	Negative	Not Run
5	4009	4010	2/3/67	♂	2	Negative	Not Run
6	4011	4012	2/6/67	♀	8	Negative	Not Run
7	4013	4014	2/7/67	♀	1	Negative	Negative
8	4015	4016	2/7/67	♀	2	Negative	Negative
9	4017	4018	2/7/67	♂	2	Negative	Negative
10	4019	4020	2/7/67	♂	1	Negative	Negative
100	4021	4022	2/8/67	♀	1	Negative	Negative
101	4023	4024	2/8/67	♀	2	Negative	Negative
102	4025	4026	2/8/67	♂	3	Negative	Negative
103	4027	4028	2/9/67	♀	6	Negative	Negative
104	4029	4030	2/10/67	♀	6	Negative	Negative
105	4031	4032	2/10/67	♂	Unknown (Broken Tooth)	Not Run	Not Run
106	4035	4036	2/14/67	♀	9	Not Run, Hemo Poor	
107	4037	4038	2/15/67	♂	Unknown	Not Run, Hemo Poor	
108	4039	4040	2/17/67	♀	10	Not Run, Hemo Poor	
109	4041	4042	2/17/67	♀	3	Not Run, Hemo Poor	
110	4043	4044	2/28/67	♀	11	Negative	Negative
111	4045	4046	3/2/67	♀	2	Negative	Negative
112	4047	4048	3/2/67	♂	3	Negative	Negative
113	4049	4050	3/2/67	♂	3	Negative	Negative

Table 7. Blood Tests from Collared Moose, Fort Richardson, 1967 (Continued).

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
114	4051	4052	3/3/67	♀	3	Negative	Negative
115	4053	4054	3/3/67	♀	5	Negative	Negative
116	4055	4056	3/3/67	♂	3	Negative	Negative
117	4057	4058	3/6/67	♀	7	Negative	Negative
118	4059	4060	3/8/67	♀	2	Negative	Negative
119	4061	4062	3/8/67	♀	6	Negative	Negative
120	4063	4064	3/9/67	♀	3	Negative	Negative
121	4065	4066	3/9/67	♀	11	Negative	Negative
122	4067	4068	3/10/67	♀	9	Negative	Negative
123	4069	4070	3/10/67	♀	1	Negative	Negative
124	4071	4072	3/13/67	♂	5	Negative	Negative
125	4073	4074	3/13/67	♂	7	Negative	Negative
126	4075	4076	3/13/67	♀	1	Negative	Negative
127	4077	4078	3/13/67	♀	1	Negative	Negative
128	4079	4080	3/14/67	♀	2	Negative	Negative
129	4081	4082	3/14/67	♀	6	Negative	Negative
130	4083	4084	3/15/67	♀	9	Negative	Negative
131	4085	4086	3/17/67	♀	10	Negative	Negative
132	4087	4088	3/20/67	♀	3	Negative	Negative
133	4089	4090	3/20/67	♀	1	Negative	Negative
134	4091	4092	3/23/67	♀	3	Negative	Negative
135	4093	4094	3/27/67	♀	8	Negative	Negative
136	4095	4096	3/27/67	♀	11	Negative	Negative
137	4097	4098	3/28/67	♀	5	Not Run	Not Run

Table 7. Blood Tests from Collared Moose, Fort Richardson, 1967 (Continued).

Pendant Number	Ear Tag # Left	Ear Tag # Right	Date Collected	Sex	Age (Years)	Brucellosis	Leptospirosis
138	4099	No Ear Tag	3/30/67	♀	5	Not Run	Not Run
139	4100	No Ear Tag	3/30/67	♀	1	Not Run	Not Run

Table 8. Weights of Moose Collared on Fort Richardson, 1967.

Pendant Number	Sex	Age	Weight
9	M	2	825 lb.
108	F	10	1,035 lb.
109	F	3	745 lb.
111	F	2	715 lb.
112	M	3	860 lb.
113	M	3	750 lb.
114	F	3	735 lb.
115	F	5	905 lb.
116	M	3	660 lb.
117	F	7	1,000 lb.
120	F	3	930 lb.
121	F	11	855 lb.
122	F	9	957 lb.
124	M	5	980 lb.
125	M	7	920 lb.
126	F	1	570 lb.
129	F	6	1,000 lb.
131	F	10	930 lb.
132	F	3	705 lb.
133	F	1	600 lb.
134	F	3	800 lb.

Table 9. Parasites Found in Collared Moose Fecal Samples, Matanuska Valley, 1967.

Pendant Number	Sex	Age	Eggs Per Gram	Species
52	F	1	Negative	---
53	F	2	Negative	---
55	M	1	Negative	---
56	F	5	2	Nematodirella
57	F	5	2	Nematodirella
58	F	9	Negative	---
59	F	7	Negative	---
101	F	7	---	---
102	M	4	4	Nematodirella
103	F	10	Negative	---
105	F	10	Negative	---
106	F	3	Negative	---
107	F	10	Negative	---
108	M	3	Negative	---
None (Died)	F	--	Negative	---
110	F	7	Negative	---
111	F	5	Negative	---
112	F	3	Negative	---
115	F	10	Negative	---
117	F	5	2	Nematodirella
118	F	8	Negative	---
None (Died)	F	--	Negative	---

Table 10. Collared Moose Palpated in Matanuska Valley, Winter, 1966-67.

Pendant Number (Began w/#105)	Age	Date	W/Calf?	Pregnant	Remarks
105	10	3/17/67	Yes	Yes	
106	3	3/20/67	No	Yes	
107	10	3/21/67	Yes	Yes	
108	3	3/21/67	No	---♂	
109	8	3/22/67	Yes	Yes	
110	7	3/21/67	Yes	Yes	
111	5	3/22/67	No	Yes	
112	3	3/24/67	Yes	Yes	
113	--	3/26/67	No	---♀	Got up too early.
114	--	3/27/67	No	---♂ Calf	
115	10	3/27/67	No	Yes	
116	1	3/28/67	No	---♀	Man working alone.
117	5	3/28/67	No	Yes	
118	8	3/29/67	No	Yes	
119	2	3/29/67	No	---♂	
120	11	4/1/67	Yes	---♀	Man working alone.
121	5	4/3/67	No	---♀	Posterior against tree.

Table 11. Aerial survey of Alaska Railroad moose mortality, May 1, 1967.

Off: 1:07 p.m.
Land: 3:21 p.m.

U.S.F.W.S. Supercub N-724

Pilot: Wally Smith
Observer Jack Didrickson

Approximate Milepost	Number Dead
MP 173 West Side	1
White's Crossing East Side	1
One Mile Above West Side by Lake	1
MP 194 West Side	1
MP 203 West Side	1
Sheep Creek Lodge West Side MP 203	1
MP 203 East Side	3
MP 203 West Side	1
MP 203 West Side	1
MP 207 East Side	1
MP 222 West Side	1
MP 209 West Side	1
MP 209 West Side	1
MP 209 East Side	1
MP 209.3 West Side	1
MP 211 East Side	1
MP 213 East Side	1
Above Sunshine West Small Bridge	2
MP 218.5 East Side	1
MP 222 West Side	1
MP 224 East Side	1

Table 11. Aerial survey of Alaska Railroad moose mortality, May 1, 1967 (Cont.).

Approximate Milepost	Number Dead
MP 224 West Side	1
MP 224.5 East Side	1
MP 224.5 West Side	1
MP 225 East Side	1
TOTAL	28

Table 12. Ground survey of Alaska Railroad moose mortality, 1966-67

Accession Number	Sex	Age	Date Found	Location	Specimen	Remarks
24568	M		9/24/66	MP 198	Jaw	
24618	M		12/8/66	MP 212	None	Ear Tags 6176, 6177
24622	F		12/4/66	MP 183.8	Jaw	
24634	F		1/7/67	MP 183	Jaw	
24635	F		1/9/67	MP 178	Jaw	
24637	M		12/21/66	MP 205.3	Jaw	Ear Tags 6145, 6146
24640	F		1/19/67	MP 166.5	Jaw & Repro	
24648	M		2/4/67	MP 180	Jaw	
24651	M		12/31/66	MP 124	Jaw	
24659	F		3/2/67	MP 157.3	Jaw & Repro	
24661	F		3/6/67	MP 184	Jaw	
24670	M		3/2/67	MP 208	Jaw	
24672	F		3/7/67	MP 202	Jaw	
24679	F		3/13/67	MP 163	Jaw	Collared Moose #42 Ear Tags 3891, 3892
24697	F		3/10/67	MP 214	Jaw	
24698	F		2/15/67	MP 245	Jaw	
24699	F		3/15/67	MP 209	Jaw	
24700	M		3/5/67	MP 221	Jaw	
24701	M		4/5/67	MP 216	Jaw	
24702	F		4/16/67	MP 247	Jaw	
24703	M		3/10/67	MP 206	Jaw	
24704	M		4/16/67	MP 245	Jaw	
24708	F		5/3/67	MP 163	Head	Ear Tag 1162
24709	F		4/21/67	MP 213	Jaw	

Table 12. Ground survey of Alaska Railroad moose mortality, 1966-67 (Cont.).

Accession Number	Sex	Age	Date Found	Location	Specimen	Remarks
-----	?	Calf	5/8/67	MP 186.9	None	Feet & Hide Only
-----	F	Adult	5/8/67	MP 190.4	None	
-----	?	Calf	5/8/67	MP 195.3	None	Hind Leg & Guts
-----	?	Calf	5/8/67	MP 196	None	Head, Neck & Ribs
-----	F	Adult	5/8/67	MP 199	None	
-----	M	Calf	5/8/67	MP 199.3	None	
-----	?	?	5/8/67	MP 200.5	None	Gut Pile Only
-----	F	Adult	5/9/67	MP 203.5	None	
-----	F	Calf	5/9/67	MP 203.3	None	
-----	?	?	5/9/67	MP 203.3	None	
-----	F	Adult	5/9/67	MP 203.3	None	
-----	F	Calf	5/9/67	MP 212.1	None	
-----	F	Calf	5/9/67	MP 212.1	None	
-----	M	Calf	5/9/67	MP 203.3	None	
-----	?	?	5/10/67	MP 217.5	None	Hide Only
-----	F	Calf	5/10/67	MP 217.7	None	
-----	?	Adult	5/10/67	MP 217.7	None	Hide Only
-----	F	Adult	5/10/67	MP 224.3	None	
-----	?	Calf	5/10/67	MP 222.5	None	
-----	M	Calf	5/10/67	MP 225.7	None	
-----	?	Adult	5/11/67	MP 181	None	

Title 12. Ground survey of Alaska Railroad moose mortality, 1966-67 (Cont.).

Accession Number	Sex	Age	Date Found	Location	Specimen	Remarks
24710	F		4/18/67	MP 213	Jaw	
24711	M		4/19/67	MP 208	Jaw	
24712	F		4/20/67	MP 217	Jaw	
24713	F		5/8/67	MP 197.5	Jaw	
24714	M		5/8/67	MP 200.9	Jaw	
24715	F		5/9/67	MP 211.2	Jaw	
24716	M		5/9/67	MP 210.9	Jaw	
24717	F		5/9/67	MP 208.7	Jaw	
24718	M		5/9/67	MP 211.1	Jaw	
24719	F		5/10/67	MP 224	Jaw	
24720	F		5/10/67	MP 218.8	Jaw	
24721	M		5/10/67	MP 225.5	Jaw	
24722	F		5/10/67	MP 225.8	Jaw	
24723	M		5/10/67	MP 219	Jaw	
24724	M		5/10/67	MP 223.9	Jaw	
24725	F		5/9/67	MP 203.5	Jaw	
24726	F		5/9/67	MP 203.3	Jaw	
24727	F		5/9/67	MP 205.8	Jaw	
24728	M		5/9/67	MP 203.3	Jaw	
24729	F		5/9/67	MP 204.3	Jaw	
24730	F		5/9/67	MP 203.3	Jaw	
24731	F		5/9/67	MP 205.9	Jaw	
24732	M		5/9/67	MP 203.3	Jaw	
24733	M		5/11/67	MP 184.8	Jaw	
-----	?		5/8/67	MP 187	None	Gut Pile Only

Table 13. Reported non-hunting moose mortality, Matanuska Valley, August 1966 to May 1967.

Month	Sex			Specimens			Cause of Death							
	M	F	Unk	None	Jaw	Repro	Head	Road	Illegal	Nuisance	RR	Winter	Unk	Other
August	1	2	0	0	3	0	0	1	0	1	0	0	1	0
September	2	3	0	0	5	1	0	0	4	0	1	0	0	0
October	0	2	0	0	2	1	0	0	0	1	0	0	0	1 Starved after leg broken.
November	0	8	0	0	7	4	1	1	7	0	0	0	0	0
December	3	7	0	1	8	2	1	3	3	0	3	0	0	1 Shot after injury.
January	3	8	1	0	11	4	1	2	3	0	3	1	1	2 Tagging mortalities.
February	5	11	1	1	16	3	0	4	6	0	3	3	1	0
March	10	27	0	0	36	3	0	9	1	5	9	9	1	1 Found wounded. 1 Tagging mortality. 1 Caught in snare.
April	4	9	0	3	10	1	0	2	0	2	7	1	0	1 Tagging mortality.
May	12	23	10	0	23	0	1	1	0	0	44*	0	0	0
TOTALS	40	100	12	5	121	19	4	23	24	9	70	14	4	8

* Found on railroad walk. Killed throughout winter.

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