ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

STATE OF ALASKA
Keith H. Miller, Governor

DEPARTMENT OF FISH AND GAME
Wallace H. Noerenberg, Commissioner

DIVISION OF GAME
James A. Harper, Director

ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES
PART I - MOOSE, DEER, AND ELK

Edited and Compiled By
Donald E. McKnight, Management-Research Coordinator

Volume I
Federal Aid in Wildlife Restoration
Project W-17-~~1~~, Jobs No. 1, 2, and 13

(Printed June, 1970)

MEMORANDUM OF TRANSMITTAL

July 8, 1970

TO: Wallace H. Noerenberg, Commissioner
Alaska Department of Fish and Game

FROM: James A. Harper, Director
Division of Game
Alaska Department of Fish and Game

SUBJECT: Annual Report of Survey-Inventory Activities

Contained herein (in three parts) is the initial attempt to report specifically on game survey and inventory activities carried out by the Game Division staff in Alaska. These activities are reported on the basis of game species by Game Management Units. Because some species are not found in all Game Management Units or because no survey and inventory work was accomplished within certain of these Units for some species, these reports may appear incomplete. As effort is extended to obtain additional information on little-understood species and regions of the State, it is felt that the Annual Survey and Inventory Reports will become more complete and comprehensive.

I feel that these reports eventually will provide information on Alaska's game species which will be easily accessible and extremely useful for management purposes. This initial attempt to report on survey and inventory activities will serve primarily to point out areas and species which will require additional work. In some instances the quality of reports submitted by individual biologists could be greatly improved. I feel that this initial survey and inventory report will provide both incentive and guidelines which will result in better reports in future years.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 1 - Southeast Mainland

Seasons and bag limits:

Subunits 1A and 1B	September 15 - October 15; 1 bull
Subunit 1C	September 1 - October 15; 1 moose*

*Antlerless moose will be closed by Commissioner's announcement after 50 antlerless moose have been taken.

Harvest and Hunting Pressure:

Based on 75% of the 1969 harvest ticket returns (as of March 25, 1970), 139 moose were reported killed. This harvest was comprised of 112 bulls (80.6%), 25 cows (18.0%), and 2 unknown (1.4%). The harvest by Subunit was: 1A-29; 1B-31, and 1C-79 (52 bulls, 25 cows, and 2 unknown).

Because of incomplete harvest ticket returns comparisons cannot be made with past harvest figures; however, field information indicates a harvest equal to that in 1968 of 223 animals (41 cows were actually checked through the Haines check station). The five year average harvest (1964-1968) for Unit 1 was 213 animals, comprised of 157 bulls, 54 cows, and 2 unknown.

The Subunit 1B harvest has averaged 36 animals for the past six years (1963-1968). The five year average harvest (1964-1968) for Subunit 1C was 136 animals, comprised of 82 bulls, 53 cows, and 1 unknown. Harvest data for Subunits 1B and 1C are summarized in Appendix I.

Composition and Productivity:

Herd composition information collected in Berner's Bay - Taku River (Subunit 1B) areas revealed 10 bulls and 35 calves per 100 cows (Appendix II). Of 134 moose counted 24% were calves. Composition counts were not made in the Taku River area in 1968; therefore, no comparisons can be made on a Subunit basis. However, Berner's Bay herd composition information revealed 10 bulls and 19 calves per 100 cows in 1969 as compared to the 1968 findings of 24 bulls and 60 calves per 100 cows. Of 67 animals counted in the Berner's Bay area, 15% were calves as compared to 67 animals counted in 1968 of which 37% were calves.

Late fall herd composition information collected in Subunit 1C revealed 25 bulls and 34 calves per 100 cows as compared to 19 bulls and 28 calves per 100 cows in 1968. Of 145 animals counted, 21% were calves as compared to 19% calves of 375 animals counted in 1968. The six-year average (1962-1968*) calf percentage for Subunit 1C was 23%.

*Composition counts were not conducted in 1964.

Moose - GMU 1 - Southeastern

Management Summary and Recommendations:

Herd composition counts and harvest information indicate that moose population levels in Subunits 1B (with exception of Berner's Bay) and 1C have remained relatively stable over the past five years. Fall composition counts in the Berner's Bay area revealed a 60% drop in calf production as compared to the 1968 findings. Because of mild winter conditions during 1969-1970, winter mortality was expected to be light. In all probability a reasonable level of calf production is assured for the spring of 1970. In light of this information, it is recommended that seasons and bag limits remain unchanged.

Submitted by: David Zimmerman, Game Biologist II

Moose - GMU I - Southeastern

Appendix I. Moose harvest in Unit 1 and Subunits 1B & 1C, Southeast Alaska, 1963 - 1969.

Unit	Year	Male	Female	Sex Unknown	Total
1	1963	149	1	0	150
	1964	158	65	0	223
	1965	128	35	4	167
	1966	168	60	2	230
	1967	174	48	2	224
	1968	157	62	4	223
	(1969)	(112)	(25)	(2)	(139)
Subunit					
1(B)	1963	18	-	-	18
	1964	41	-	-	41
	1965	34	-	2	36
	1966	39	-	-	39
	1967	47		1	48
	1968	34		1	35
	(1969)	(31)			(31)
Taku					
	1963	15	-	-	15
	1964	35	-	-	35
	1965	23	-	2	25
	1966	29	-	-	29
	1967	30	-	-	30
	1968	13	-	1	14
	1969				
B. Bay					
	1963	3-5	-	-	3
	1964	6	-	-	6
	1965	11	-	-	11
	1966	10	-	-	10
	1967	17	-	1	18
	1968	21	-	-	21
	1969				

Appendix I (Cont.)

Moose harvest in Unit 1 and Subunits 1B & 1C, Southeast Alaska, 1963 - 1969.

Unit	Year	Male	Female	Sex Unknown	Total
1(C)	1960	45	-	-	45
	1961	63	-	-	63
	1962	66	-	-	62
	1963	81	-	-	81
	1964	79	65	-	144
	1965	66	34	1	101
	1966	92	60	-	152
	1967	90	47	-	137
	1968	82	61	2	145
	(1969)	(52)	(24)	(2)	(78)
	1969*	62*	41*	-	103*

( ) Harvest ticket returns as of March 25, 1970 - Incomplete.
* Harvest actually checked at the Haines Check Station.

Appendix II. Summary of fall moose population composition counts, Unit 1(C), 1(B), Southeast, Alaska, 1969.

Area	Date	Large ♂	Total ♂	♀ W/0	♀ W/1	♀ W/2	Total ♀	Total Adults	Lone Calves	Total Calves	Unid. Sex & Age	Total Moose	Count Time	Moose Per Hour
Portions of Chilkat, Takhin, Big Salmon, Klehini Rivers	11/22	23	23	63	25	3	91	114	0	31	0	145	2.1	69
Berner's Bay	11/22	5	5	43	8	1	52	57	0	10	0	67	0.8	84
Taku River	11/24	4	4	26	11	3	40	44	0	22	1	67	1.6	42
Total Unit 1(c), 1(b)		32	32	132	44	7	183	215	0	63	1	279	4.5	62

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 5 - Yakutat

Seasons and Bag Limits:

Aug. 10 - Nov. 30 One moose

Harvest and Hunting Pressure:

Based on 75% of the 1969 harvest ticket returns (as of March 25, 1970), 290 moose were reported killed. The harvest was comprised of 144 bulls (49.7%) and 146 cows (50.3%). The 1968 harvest was 313 animals and was comprised of 177 bulls, 133 cows, and 2 unknown. The six-year harvest average (1963-1968) was 273 animals, comprised of 157 bulls, 113 cows, and 3 unknown. Harvest data from 1963-1969 are summarized in Appendix I.

Composition and Productivity:

Late fall herd composition information collected in the Yakutat foreland area revealed 21 bulls and 13 calves per 100 cows. Of 593 animals counted, 10% were calves compared to 15% in the 1968 count of 784 animals. The six-year average calf percentage for the Yakutat foreland is 14%. Late winter herd composition counts conducted in this area revealed 27% calves of 684 animals identified (Total counted - 748).

Management Summary and Recommendations:

Herd composition and harvest information indicates that moose population levels in Unit 5 have remained relatively stable for the past five years. In light of this information, it is recommended that seasons and bag limits remain unchanged.

Submitted by: David Zimmerman, Game Biologist II

Moose - GMU 5 - Yakutat

Appendix I. Moose harvest in Game Management Unit 5, Yakutat, 1963 - 1969.

Year	Male	Female	Sex Unknown	Total
63	189	111	2	302
64	154	111	-	265
65	153	125	4	282
66	116	90	6	212
67	154	108	1	263
68	177	133	3	313
(69)	(144)	(146)	-	(290)

( ) Harvest ticket returns as of March 25, 1970 - Incomplete

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 6 - Prince William Sound - West of the Copper River

Seasons and bag limits:

Aug. 20 - Sept. 30	*One moose; up to 15 antlerless moose may be taken by permit only; dates and conditions of hunt will be described by Commissioner's announcement.

*Season on bulls subject to closure by field announcement.

A public drawing was held August 18, 1969 at the Cordova Union Hall for 15 antlerless permits. A total of 285 persons applied. The permit holders were allowed to hunt from August 20 through September 30.

Harvest and Hunting Pressure:

Approximately 30 bulls and 12 cows were harvested during the 1969 season. An estimated 10 more were taken illegally or reported crippled and lost. Thus, approximately 50 animals were removed from the herd. The 1968 harvest was comprised of 28 bulls and 8 cows for a total of 36 moose (Appendix I).

Because of the limited number of bulls available for harvest in 1969, the bull season was terminated by field announcement August 26 after seven days of hunting.

Hunting pressure by Cordova hunters is intense along the Copper River Highway. Probably 70 percent of the bull harvest occurs by noon of the second day. Most hunters hunt on foot from the road utilizing the tree stand technique; others utilize air boats, small track vehicles (Terra-Tigers) and aircraft.

Moose harvest ticket returns are not available at this date.

Composition and Productivity:

A survey was flown west of the Copper River on January 17, 1970 by Jim Foode (pilot) and Julius Reynolds (game biologist). Counting conditions were good and 193 moose were observed 25 percent of which were calves.

Totals observed during the three winter counts of 1967, 1969 and 1970 were 117, 152 and 193, respectively, indicating roughly a 30 percent increase annually after a limited harvest. The calf percentage during the past three years has remained nearly constant (Appendix II).

The sex ratio of the herd was not determined this year. The age structure of the bulls harvested indicates a low bull population. Twenty-two bulls harvested this season were aged by tooth cementum annuli; 19 (86.4 percent) were yearlings.

Moose - GMU 6 - Prince William Sound - West of the Copper River

Management Summary and Conclusions:

Upon reviewing the data available on this herd, two factors stand out: (1) the annual harvest under the present regulations does not keep the herd from increasing and (2) the bull segment is being closely cropped. In fact, one poor calf crop could seriously affect the number of bulls available for harvest. Therefore, the management plan should be designed to relieve some of the hunting pressure on the yearling bulls and at the same time stabilize the herd size to prevent possible range damage.

The above objectives can be met by shifting most of the annual harvest from the bulls to the cows with a closely controlled either-sex season. It would be necessary to (1) require hunters to register in order to determine hunting pressure and (2) require them to immediately report their kill. Authority to close the season when the desired number of moose has been obtained and to establish conditions of the hunt would be a necessity.

Recommendations:

The following proposal is suggested for that portion of Unit 6 lying west of the Copper River:

> One moose; dates, conditions and number of permits to be described by Commissioner's announcement.

Submitted by: Julius L. Reynolds, Game Biologist III

Moose - GMU 6 - West of the Copper River

Appendix I. Moose harvest, Unit 6 - west of the Copper River.

Date	Bulls	Cows	Unid.	Total	Hunters	Success
1965	20	0	0	20	?	?
1966	20	1	0	21	?	?
1967	23	0	0	23	?	?
1968	28	8	0	36	?	?
1969	*30	12	?	*42	?	?

*Estimated harvest, harvest ticket results not available.

Appendix II. Moose sex and age ratios, Unit 6 - west of the Copper River.

Date	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Calf % in Herd	Total Moose in Sample
1965			N O D A T A				
1966			N O D A T A				
12/67	13.5	6.8	6.7	39.0	7.1	25.6	117
1/69	-	-	-	-	21.9	26.3	152
1/70	-	-	-	-	26.3	24.9	193

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 6 - Prince William Sound - East of the Copper River

Seasons and bag limits:

Aug. 20 - Sept. 30 Nov. 1 - Nov. 30	One moose; provided that up to 25 antlerless moose may be taken by permit only. Dates, conditions and number of permits to be described by Commissioner's announcement.

A public drawing was held at the Cordova Union Hall, August 18, 1969, for 25 antlerless permits. Permits were valid from August 20 through September 30.

Harvest and Hunting Pressure:

Approximately 35 bulls and 7 cows were harvested during the 1969 season. This represents a significant change in hunting pressure compared to 1967 and 1968 when 14 and 15 bulls, respectively, were taken (Appendix I). The increased harvest is a reflection of the activities of several Cordova air boat operators who shifted their hunting to the Martin River country. Whereas this herd was previously considered fairly inaccessible, the air boat has now opened the door to greater access.

It was interesting to note that only 7 antlerless moose were reported taken by 25 permit holders on this first antlerless hunt east of the Copper River. The low take can be attributed to several factors: cost of reaching the hunting area, weather, and hunter preference for bulls.

Moose harvest ticket returns are not available at this date.

Composition and Productivity:

A herd composition survey was conducted on February 13, 1970 by Jim Foode (pilot) and Julius Reynolds (game biologist) east of the Copper River. The survey was flown under poor counting (snow) conditions and only 138 moose were observed. Twenty percent of the sample counted were calves. The twinning rate and calf percentage in the herd over the past four years indicate production is leveling off (Appendix II).

Management Summary and Conclusions:

Available data indicate that this introduced herd has passed through a period of rapid expansion and is now leveling off, although hunters are just starting to utilize this resource.

Moose - GMU 6 - East of the Copper River

The present bull season appears to be satisfactory although the November season is rarely utilized by hunters because of inclement weather and logistic problems. Instead of limiting antlerless permits to 25 persons as done this year, permits should be available to anyone having the means to hunt the east side providing they report their kill and the harvest is restricted to 25 cows.

Recommendations:

No regulatory changes in seasons or bag limits are recommended.

Submitted by: Julius L. Reynolds, Game Biologist III

Moose - GMU 6 - East of the Copper River

Appendix I. Moose harvest and hunting pressure, Unit 6 - east of the Copper River.

Year	Bulls	Cows	Unid.	Total	Hunters	Success
1965*	8	0	0	8	?	?
1966	3	0	0	3	?	?
1967	14	0	0	14	?	?
1968	15	0	0	15	?	?
1969	+35	+7	?	+42	?	?

*First year any harvest was recorded although the 1960-64 Unit 6 seasons permitted hunting.

+Estimated harvest; harvest ticket results not yet available.

Appendix II. Moose sex and age ratios, Unit 6 - east of the Copper River.

Date	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Calf % in Herd	Total Moose in Sample
12/64					36.4	26.0	52
1/66					20.8	31.0	93
12/67	76.1	37.0	39.1	70.2	25.5	28.5	207
1/69					25.0	21.4	201
2/70					17.4	20.3	138

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 7 - Seward

Seasons and bag limits:

Unit 7; only that portion which includes the drainages of Resurrection, Little Indian, Big Indian, Juneau Creek, and all Chickaloon River drainages	Aug. 20 - Sept. 30 Nov. 1 - Nov. 20	1 bull
Remainder of Unit 7	Aug. 20 - Sept. 30	1 bull

Harvest and Hunting Pressure:

Harvest ticket returns indicate that during the 1968 season, 481 hunters harvested 165 moose for a hunter success of 34 percent. Hunter success over the past three years has increased from 25.4 percent in 1966 to 34 percent in 1968 (Appendix I). Data for the 1969 general hunt are not yet available.

Harvest of bulls over the past four years has increased from 60 in 1965 to 165 in 1968. The 1968 harvest was 32 percent higher than the 1967 harvest and 32 percent above the five-year average of 123.

Composition and Productivity:

Late snows permitted only a partial survey of Unit 7 in 1969. The limited data available (Appendix II) suggest a slowly declining bull:cow ratio from 12.4 bulls:100 cows in 1966 to 12.0 bulls:100 cows in 1969. Calf production, observed at 32.6 calves:100 cows in 1968, and 34.3 calves:100 cows in 1969, is good.

Management Summary and Conclusions:

The increasing harvest and hunter success by a fairly constant number of hunters, and the increasing calf production may point to an increasing herd. Survival, as indicated by the low small-bull:cow ratios, appears low. However, considering the relatively small area involved and the increased access by means of boats, Forest Service trails, and commercial horse and airplane operations, hunters may be able to reach a large portion of the moose in the Unit and thus reduce the bull segment sufficiently to make male-calf survival appear lower than it is. At the same time, the increased access could result in improving hunting success for a time, even though the herd as a whole may not be growing.

Moose - GMU 7 - Seward

Range data supplied by the U. S. Forest Service shows high levels of utilization, especially in the Juneau Creek area. Heavy range use, despite a high bull harvest, demonstrates the need to harvest cows and thereby reduce the pressure on the range as well as to improve the bull:cow ratio.

Recommendations:

No changes in the general seasons or bag limits are recommended. Permits for up to 50 antlerless moose are recommended for the Juneau and Resurrection Creeks drainages, with dates and conditions of the hunt to be set by Commissioner's announcement.

Submitted by: Paul A. Le Roux, Game Biologist III

Moose - GMU 7 - Seward

Appendix I. Moose harvest and hunting pressure - Unit 7

Year	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1965	1st	*	*	0	*		
	2nd	*	*	0	*		
	Comb.**	60	1	0	61	*	*
1966	1st	*	*	0	*		
	2nd	*	*	0	*		
	Comb.	112	1	0	113	445	25.4
1967	1st	*	*	*	*		
	2nd	*	*	*	*		
	Comb.	123	1	1	125	414	30.0
1968	1st	140	1	0	141		
	2nd	19	0	0	19		
	Comb.	159	1	5	165	481	34.0
1969			N O D A T A A V A I L A B L E				

* Data not available
** Combined

Moose - GMU 7 - Seward

Appendix II. Moose sex and age ratios, Subunit 15(A).

Year	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
1965	-	-	-	-	7.0	586
1966	17.4	4.6	12.8	22.7	8.7	656
1967		N O S U R V E Y S C O N D U C T E D				
1968	14.4	5.4	9.0	32.6	5.2	737
1969*	12.0	3.5	8.5	34.3	20.9	430

* Partial survey covering Twenty-Mile River, Placer River, headwaters of Chickaloon and Juneau Creek.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 9 - Alaska Peninsula

Seasons and bag limits:

Aug. 20 - Dec. 31	2 moose, provided that only one moose may be taken before November 2.

Harvest and Hunting Pressure:

Harvest data for the fall of 1969 are not yet available. Over the past five years, the harvest has shown a steady increase (Appendix I). This increase has been primarily the result of trophy hunting for bulls; the harvest of cows has remained basically unchanged since 1965. When available, the 1969 harvest data will probably reflect this pattern of increasing utilization of the resource.

Composition and Productivity:

Four trend areas were surveyed during November, 1969, and a total of 620 moose was counted (Appendix II). The composition data for all areas shows 54 bulls per 100 cows. The overall sex ratio is biased by the inclusion of the data from the Katmai trend area. This area is located entirely within the boundaries of Katmai National Monument and is basically unhunted. If the Katmai data were excluded, the sex ratio would be only 35 bulls per 100 cows. The number of bulls per 100 cows has shown a continued decline since the first surveys were conducted on the Peninsula in 1962 (Appendix III). The 25 calves per 100 cows in 1969 falls at about the mid-point of the variation within this category since 1962.

Management Summary and Conclusions:

The harvest of moose on the Peninsula has shown continued increase over the years as its reputation for large bulls and liberal season and bag limits continues to attract hunters. The effects of selective hunting for bulls have been reflected in the composition data, and the sex ratio has been gradually altered to one in which cows predominate. In an effort to stabilize or reverse this trend, it is recommended that the bag limit be changed to two moose, only one of which may be an antlered bull.

There is some indication, including the pointed comments of long-time residents, that the moose population in the north-central part of the Peninsula is declining (Appendix IV). Although this is the heaviest hunted portion of the Peninsula, the magnitude of the harvest has not been such that hunting can be logically considered a factor in the decline. Instead, this appears to be a natural adjustment of the population to numbers

within the carrying capacity of the range.

Residents report that prior to the 1920's no moose were present in the area. Then, beginning with a few pioneering individuals, moose gradually increased in number until the population peaked in the mid-1960's. The present decline appears typical of population curves exhibited by animal populations introduced or reintroduced into new areas. Because the herd is presently being harvested well below the level of maximum sustained yield, a reduction in season length or overall bag limit will not serve to stabilize the population or return it to its former level of abundance. Instead, such reductions would restrict the hunting opportunity of Unit 9 residents who by necessity must utilize these animals as a winter meat supply.

Recommendations:

It is recommended that the existing season lengths and overall bag limit of two moose be maintained, but that only one of the two animals may be an antlered bull.

Submitted by: James B. Faro, Game Biologist III

Moose - GMU 9 - Alaska Peninsula

Appendix I. Moose harvest, Unit 9.

Year	Bulls	Cows	Unknown Sex	Total
1965	213	68	4	285
1966	240	78	8	323
1967	301	68	9	378
1968	366	72	5	443
1969*	-	-	-	-

* Information not available

Moose - GMU 9 - Alaska Peninsula

Appendix II. Moose sex and age ratios, Alaska Peninsula, Unit 9 - 1969.

Area	Date	Total MM Per 100FF	Large MM Per 100FF	Small MM Per 100FF	Calves Per 100FF	Twin Calves Per 100 Cows with Calves	Total Moose
Mother Goose Lake	11/14	28.1	15.6	12.5	20.6	3.1	242
Ugashik Lake	11/15	45.4	25.4	20.0	23.8	8.3	93
Katmai	11/30	93.6	65.2	28.4	35.8	30.0	251
Chekok Creek	11/19	68.4	57.9	10.5	5.3	-	34
All Peninsula		53.9	35.2	18.7	25.1	14.7	620

Appendix III. Moose sex and age ratios for all survey areas, Alaska Peninsula, Unit 9, 1962-1969.

Year	Total MM Per 100FF	Large MM Per 100FF	Small MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
1962	99.4	80.4	19.0	33.0	24.4	1,113
1963*	-	-	-	-	20.0	550
1964*	62.1	50.2	11.9	24.4	17.5	1,852
1964	67.8	56.0	11.8	17.2	9.9	1,312
1965**	-	-	-	-	-	-
1966	73.5	59.6	13.9	32.4	16.3	786
1967	73.0	59.0	14.0	24.0	30.0	1,447
1968	63.3	54.2	9.1	21.3	19.1	1,619
1969	53.9	35.2	18.7	25.1	14.7	620

* Surveyed in April; all other surveys made in the fall.
** Sex and age composition counts were not conducted in 1965.

Appendix IV. Fluctuation in moose numbers, Mother Goose Lake and Ugashik Lakes, 1962-1969.

Date	Mother Goose Lake		Ugashik Lakes	
	Moose per Hour[1]	Total Moose	Moose per Hour	Total Moose
1962	128	486	56	124
1964	199	597	-	-
1965[2]	-	-	-	-
1966	104	94	46	147
1967	100	844	36	18
1968	216	691	-	-
1969	105	242	26	93

[1] Moose/hour - Number of moose observed/hour of flying time in survey
[2] Sex and age composition counts not conducted.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 11 - Wrangell Mountains-Chitina River

Seasons and bag limits:

Aug. 20 - Sept. 30
Nov. 1 - Nov. 30 1 moose

Harvest and Hunting Pressure:

Unit 11 has a large moose population, at least in localized areas. Access is restricted to the Nabesna Road, a limited but unconnected road system in the McCarthy area, plus fly-in sites. As a result, the kill is very low for the whole Unit, but rather high for the Nabesna Road area which supported, in 1967 and 1968, about 50 percent of the total harvest and 70 percent of the antlerless harvest. Because of its limited access, most of the Unit is, in effect, a trophy hunting situation utilized by a few guides who have camps scattered throughout the area. Recent years' harvest information is shown in Appendix I.

Composition and Productivity:

Herd composition data are available for that area at the foot of Mt. Drum only. As one would expect, surveys back to 1955 show a high percentage of adult bulls and relatively poor calf production and survival. Results of aerial composition surveys are shown in Appendix II.

Distribution surveys in conjunction with the Lands project have shown that moose are distributed over most of the Unit, although much of its area is very marginal moose habitat.

Management Summary and Conclusions:

Limited hunting pressure, a climax ecological situation, and sparse moose densities would suggest a stable moose population. This supposition is supported by our survey data and casual observations of persons viewing the area.

Recommendations:

Access and harvest are minimal. In view of this, it is recommended that seasons and bag limits remain unchanged.

At least one sex and age composition count area should be established in the Nabesna Road area.

Submitted by: Loyal J. Johnson, Game Biologist III

Moose - GMU 11 - Wrangell Mountains-Chitina River

Appendix I. Moose harvest and hunting pressure - Unit 11.

Year	Bulls	Cows	Unid.	Total	Hunters	Percent Success
1963	86	37	0	123	-	-
1964	89	38	0	127	-	-
1965	116	70	2	188	-	-
1966	89	69	5	163	263	62
1967	108	70	2	180	317	57
1968	99	34	8	141	293	48
1969*	90	49	0	139	-	-

* Data incomplete at this time due to lack of harvest ticket analysis.

Moose - GMU 11 - Wrangell Mountains-Chitina River

Appendix II. Moose sex and age ratios - Unit 11, Mt. Sanford-Mt. Drum, 1955-1968.

Year	MM/ 100 FF	Small MM/ 100 FF	Large MM/ 100 FF	Calves/ 100 FF	Twins/100 FF with calves	Total Moose
1955	144.9	29.0	115.9	35.5	18.8	300
1956	145.0	15.0	130.0	30.0	25.0	55
1957	70.5	6.8	63.7	38.6	0.0	92
1958	140.6	12.3	128.3	34.0	2.9	291
1959			No Data			
1960	80.0	16.0	64.0	36.0	12.5	110
1961			No Data			
1962			No Data			
1963			No Data			
1964			No Data			
1965	80.6	25.4	55.2	18.7	0.0	268
1966			No Data			
1967	71.8	10.1	61.7	29.1	3.1	456
1968			No Data			
1969	71.0	11.0	60.0	27.7	4.9	299

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Management Unit 12 - Upper Tanana - White River

Seasons and Bag Limits:

Aug. 20 - Sept. 30 Nov. 1 - Nov. 30	1 moose; provided that antlerless moose may be taken only from Sept. 24 through Sept. 30

Harvest and Hunting Pressure:

The 1968 moose harvest, based on harvest ticket returns, was 164 moose. The 1968 harvest was not a significant change over the previous four-year average of 175 animals. This harvest was comprised of 132 bulls, 30 cows, and 2 of unknown sex. Harvest figures for 1969 are not yet available; however, little change is expected in the overall harvest.

Composition and Productivity:

Composition counts conducted during November 1969 revealed a calf:cow ratio of 20 calves per 100 cows. This is not a significant change over the five-year average of 19 calves per 100 cows. A sample of 324 animals was counted; about the same number as the average for the past five years.

Management Summary and Recommendations:

Harvest and population information indicate that the moose population in Unit 12 is static. No significant change in bag limit or length of season is recommended.

Submitted by: Larry Jennings, Game Biologist III

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 13 - Nelchina Basin

Seasons and bag limits:

Aug. 20 - Sept. 30
Nov. 1 - Nov. 20 1 bull

Harvest and Hunting Pressure:

Harvest ticket returns are not yet complete for regulatory year 1969-1970. A preliminary, hand-compiled count indicates, however, that the harvest will be very close to the seven-year average of 1,200 bulls.

Previous years' harvest ticket returns, license sales, check station data, and general observations indicate that hunting pressure is constant at about 4,100 hunters per year. Hunter success since 1966 has averaged 33 percent. The antlerless moose kill has never exceeded 400 animals in any one year. Harvest figures since 1966 are shown in Appendix I.

Some areas have fairly well-developed access trails for off-road vehicles and are intensively hunted. Much of the Unit is inaccessible and is, therefore, little hunted. Heavily hunted areas are the Oshetna River, Denali Highway, Gakona and Chistochina Rivers.

Composition and Productivity:

Annual sex and age composition surveys dating back to 1955 show that the number of bulls per 100 cows has decreased Unit wide; and markedly so in the Oshetna, Gakona, and Chistochina River areas. In 1969, the sex ratio for these areas was about 10 bulls per 100 cows.

Calf production, and apparently survival, have remained static and rather low at about 25 calves per 100 cows. This is especially true since the early 1960's when a major die-off occurred. The twinning rate has shown an increase of about 20 percent per year since 1965. A rather high incidence of yearling age-class bulls appeared in the 1968-1969 kill and in composition surveys, indicating good survival and production for that one year's cohort. Sex and age ratios noted during surveys since 1955 are shown in Appendix II.

Management Summary and Conclusions:

Herd composition surveys and harvest information, together with observations by local sportsmen, guide-outfitters and air taxi operators, indicate the following: (1) hunting pressure is constant or perhaps increasing slightly; (2) the bull:cow ratio is being depressed and in some areas is lower than it should be; (3) the female segment of the herd is not being adequately utilized; (4) Unit 13 is too large to manage properly as a single Unit and (5) access is limited and hunting pressure is concentrated.

Moose - GMU 13 - Nelchina Basin

Recommendations:

To bring about more intensive and proper management, it is recommended that: (1) Unit 13 be subdivided into smaller and more recognizable management units which isolate certain problem areas of under-harvest or over-harvest, access, etc.; (2) we increase utilization of the female segment of the herd; (3) we decrease kill of male segment in localized areas and (4) we distribute hunting pressure.

The regulations presented to the Board to begin achieving this goal are as follows:

Unit subdivision: Unit 13(A), the Oshetna River-Lake Louise area; 13(B), the Alphabet Hills-east half of Denali Highway; 13(C), east of Gakona River; 13(D), south of the Glenn Highway and west of Susitna River.

Seasons and bag limits:

13(A):	Aug. 20 - Sept. 20, Nov. 1 - Nov. 20;	1 bull plus 150 antlerless permits;
13(B):	Aug. 20 - Sept. 20, Nov. 1 - Nov. 20;	1 bull plus 400 antlerless moose (150 permits plus up to 250 moose by late season special hunt by Commissioner's announcement) except that antlerless moose may not be taken in the area between the Gulkana and Tangle Rivers and the Gakona River during the special hunt;
13(C):	Aug. 20 - Sept. 20, Nov. 1 - Nov. 20;	1 bull plus 300 antlerless moose (150 by permit, 150 by late season special hunt by Commissioner's announcement);
13(D):	Aug. 20 - Sept. 20, Nov. 1 - Nov. 20;	1 moose except that antlerless moose may be taken Sept. 28-30 only.

Submitted by: Loyal J. Johnson, Game Biologist III

Moose - GMU 13 - Nelchina Basin

Appendix I. Moose harvest and hunting pressure - Unit 13.

Year	Season	Bulls	Cows	Unid.	Total	Hunters	Percent Success
1966	1st	1,271	181				
	2nd	221	-				
TOTAL		1,336*	181	36	1,553	4,163	27
1967	1st	1,009	319				
	2nd	112	-				
TOTAL		1,217*	319	16	1,552	4,027	39
1968	1st	1,013	243				
	2nd	171	-				
TOTAL		1,240*	243	29	1,512	4,476	34
1969		No harvest data yet available					

* A number of "date unknown" kills are included.

Moose - GMU 13 - Nelchina Basin

Appendix II. Moose sex and age ratios - Unit 13.

Year	MM/ 100 FF	Small MM/ 100 FF	Large MM/ 100 FF	Calves/ 100 FF	Twins/100 FF with Calves	Total Moose
1955	99.7	28.8	70.9	52.4	10.1	2,491
1956	66.3	12.5	53.8	26.4	1.9	1,154
1957	69.3	15.9	53.4	41.5	6.3	2,387
1958	70.6	11.3	59.3	37.4	4.7	3,781
1959			Insufficient Data			
1960	85.2	20.4	64.8	55.3	11.6	1,467
1961	63.5	20.3	43.2	45.9	11.3	2,977
1962	64.0	20.3	43.7	28.1	5.8	2,357
1963	54.5	13.7	40.8	40.1	6.1	2,061
1964	39.6	11.4	28.2	28.4	4.7	1,524
1965	47.6	12.9	34.7	26.2	2.2	6,150
1966	40.5	6.4	34.1	26.6	2.2	4,534
1967	39.9	8.6	31.3	27.8	3.0	5,794
1968	29.9	4.8	25.1	32.8	4.1	3,042
1969	28.9	10.1	18.8	32.4	5.4	4,397

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 14(A)-Palmer

Seasons and bag limits:

Aug. 20 - Sept. 20 Nov. 1 - Nov. 20	One moose; antlerless moose may be taken by permit only (350 permits will be issued); dates and conditions of the hunt will be described by Commissioner's announcement.

Harvest and Hunting Pressure:

Average bull harvests over a given number of years are not meaningful when applied to this Subunit because irregular antlerless seasons tend to inflate the figure during certain years (see 1966, Appendix I) and deflate the figure during other years (see 1967, 1968, Appendix I). The final harvest ticket run for the 1969 harvest is not yet available due to the late requirement for harvest ticket submission.

Appendix I also reveals an increase in the number of bulls taken from 1967 to 1968 in Subunit 14(A) in spite of a 10 day reduction in the November season. The number of hunters increased by 63 percent, from 1,111 to 1,773, and the hunter success percentage also increased from 18 percent to 23 percent.

The harvest of antlerless moose has been erratic, with seasons cancelled in 1967 and 1968. Preliminary information obtained from a questionnaire, which approximately 80 percent of the antlerless moose hunters returned during the winter of 1969-70, indicates that 152 adult female moose were harvested out of 350 permits issued in Subunit 14(A). Antlerless hunters in Subunit 14(A) also reported harvesting 23 adult males and 24 calves (10 females and 14 males).

Composition and Productivity:

Although a lack of snow precluded sex and age composition counts in Subunit 14(A) during the winter of 1969-70, reliable data are available for the previous two years as shown in Appendix II. Bull:cow ratios have steadily increased from a low of 6.0 bulls:100 cows in 1959 to 16 bulls:100 cows in 1968 in spite of increasing hunter pressure and harvest.

In 1967 a statistical valid moose survey in a portion of Subunit 14(A) led to a total population estimate of 2,324 ± 341 moose. The area surveyed is roughly one-half of Subunit 14(A). Sex and age composition counts designed to reveal percentages of bulls, cows, and calves in the population contained samples in excess of 2,300 moose in 1967 and 1968 (Appendix II) in an area which roughly covers 3/4 of Subunit 14(A).

Moose - GMU 14(A) - Palmer

As shown in Appendix II, the fall composition count revealed 43.8 calves:100 females available in the fall of 1967. Weather conditions in Subunit 14(A) were generally good throughout the winter of 1967-68 and in the winter of 1968-69. In the spring of 1968, a yearling survival count was conducted, and a 28 yearling:100 female ratio was obtained, indicating good survival. Unhunted or seldom hunted populations generally have much lower survival rates (for example: Tanana Flats, 8 yearlings:100 females) unless they are a relatively new population expanding on good range.

Management Summary and Conclusions:

The Subunit 14(A) moose herd has suffered winter kill in the past decade, indicating that the population has been close to the upper limits of the capability of the range to support it during difficult winters when deep snow or other inimical factors cause population stress. Burned areas and man-made clearings which have reverted to browse created conditions which allowed expansion to the present herd size, but these conditions are rapidly disappearing. Fires are quickly extinguished, and clearings now made are utilized for agriculture. As noted, antlerless seasons have been cancelled in this Subunit in 1967 and 1968. In 1969, questionnaire information revealed that 152 adult females were taken. Management of this herd is not possible when the female segment is not harvested, or harvested in minimal numbers. Since survival and reproduction rates in the Subunit 14(A) moose herd are high, 350 antlerless permits must be considered minimal at this time.

Recommendations:

Five hundred antlerless moose permits for Subunit 14(A) are recommended for 1970. No change in the present bull season is recommended.

Submitted by: Jack C. Didrickson, Game Biologist III

Appendix I. Moose harvest and hunting pressure - Subunit 14(A).

Year	Date	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1966	8/20-9/30	First	144	4	0	148	Not Available	
	11/1-11/30	Second	129	5	1	135	"	
	9/29-9/30	Antlerless	0	80	0	80	"	
		Unk. Date	9	3	2	14	"	
		TOTAL	282	92	3	377	"	
1967	8/20-9/30	First	127	0	0	127	Not Available	
	11/1-11/20	Second	62	0	0	62	"	
	11/1-11/20*	Antlerless	-	-	-	-	"	
		Unk. Date	11	0	0	11	"	
		TOTAL	200	0	0	200	1,111	18.4
1968	8/20-9/30	First	187	0	0	187	Not Available	
	11/1-11/20	Second	209	0	0	209	"	
	To be announced*	Antlerless	-	-	-	-	"	
		Unk. Date	15	0	3	18	"	
		TOTAL	411	0	3	414	1,773	23.4
1969	8/20-9/20	First						
	11/1-11/20	Second						
	1/28-2/5,1970**	Antlerless		FINAL RUN NOT AVAILABLE				
		Unk. Date						
		TOTAL						

* Cancelled
** To be announced

Moose - GMU 14(A) - Palmer

Appendix II. Moose sex and age ratios - Subunit 14(A).

Year	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Yearlings Per 100FF	Total Moose in Sample
1966	15.0	11.1	3.8	44.6	5.7	--	1,277
1967	14.3	9.4	4.9	43.8	6.3	--	2,354
1968	16.4	6.8	9.6	48.4	6.5	28	2,379
1969	Sex and age composition counts were not conducted in 1969 due to unfavorable weather conditions.						

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 14(B) - Talkeetna

Seasons and bag limits:

Aug. 20 - Sept. 30 Nov. 1 - Nov. 20	One moose; 200 antlerless moose may be taken by permit only. Dates and conditions of the hunt will be described by Commissioner's announcement.

Harvest and Hunting Pressure:

Harvest data for the fall of 1969 are not yet available. Over the past three years the average bull harvest has been 148 moose. In 1968, the harvest was 143 bulls as shown in Appendix I. Antlerless seasons were cancelled in this Subunit in 1967 and 1968. A questionnaire received from 80 percent of the hunters participating in the antlerless hunt in the winter of 1969-70 revealed that 54 adult females and 39 adult males, along with 24 calves (18 males and 6 females) were harvested. Both the male and female segments of the Subunit 14(B) moose herd are underharvested due to restricted access. The area has only one main road traversing its length, with little other access.

Composition and Productivity:

Poor snow cover precluded sex and age composition surveys in this Subunit in 1969. Data from previous years' composition counts are presented in Appendix II. Snow cover came so late in 1966, after the moose had dropped their antlers, that only twinning rate and total count figures could be used. In 1968, a composition count was conducted in November; 35 bulls:100 cows were seen in the sample of 1,394 moose. It should be noted here that the bull:cow ratio in the Willow to Little Willow segment of the survey is generally low (12 bulls: 100 cows) because hunter accessibility is good and hunting tends to depress the overall bull:cow ratio. In the more northerly areas of Subunit 14(B), this ratio may run as high as 43 bulls:100 cows. In addition, a questionnaire returned by 80 percent of the 1969-70 antlerless hunters in Subunit 14(B) revealed that 42 percent of the adult moose taken were bulls, further indicating relatively high bull:cow ratios.

Productivity is good, with 41.5 calves:100 cows recorded in 1968 and 40.5 calves:100 cows in 1967. It is unlikely that these figures would have altered significantly during the winter of 1969.

Management Summary and Conclusions:

Composition surveys coupled with harvest information show that the moose herd in Subunit 14(B) is generally underharvested due primarily to a lack of

access. Although a large percentage of the land area in Subunit 14(B) is not conducive to aircraft hunting, this form of access should be encouraged as well as any other form of transportation which will allow the penetration of inaccessible areas. Until access is improved, the bull season in the Subunit is adequate. Some future consideration may have to be given to the area between Willow and Little Willow Creek towards shortening the season to protect the bull segment. Antlerless seasons by permit are also adequate, but in the future some consideration should be given to raising the number issued.

Recommendations:

No changes in the seasons or bag limits are recommended.

Submitted by: Jack C. Didrickson, Game Biologist III

Appendix I. Moose harvest and hunting pressure - Subunit 14(B).

Year	Date	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1966	8/20-9/30	First	51	11	1	63	Not Available	
	11/1-11/30	Second	60	1	0	61	"	
	9/25-9/30	Antlerless	0	12	0	12	"	
		Unk. Date	9	1	0	10	"	
		TOTAL	120	25	1	146	"	
1967	8/20-9/30	First	100	0	0	100	Not Available	
	11/1-11/20	Second	75	0	0	75	"	
	11/13-11/20*	Antlerless	-	-	-	-	"	
		Unk. Date	6	0	1	7	"	
		TOTAL	181	2	1	184	732	17.07
1968	8/20-9/30	First	67	0	0	67	Not Available	
	11/1-11/20	Second	67	0	0	67	"	
	To be announced*	Antlerless	-	-	-	-	"	
		Unk. Date	9	0	0	9	"	
		TOTAL	143	0	0	143	473	30.2
1969	8/20-9/30	First						
	11/1-11/20	Second						
	1/28-2/5,1970**	Antlerless		FINAL RUN NOT AVAILABLE				
		Unk. Date						
		TOTAL						

* Cancelled
** To be announced

Appendix II. Moose sex and age ratios - Subunit 14(B).

Date	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Yearlings Per 100FF	Total Moose in Sample
1966*	-	-	-	-	3.6	-	1,613
12/6/67**	28.2	10.5	17.7	40.5	6.2	-	371
11/26-27/68	34.8	10.7	24.0	41.5	10.6	27	1,394
1969***	-	-	-	-	-	-	-

* No date available
** Talkeetna to Montana Creek
*** Sex and age composition counts were not conducted in 1969 due to unfavorable weather conditions.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 14(C) - Anchorage

Seasons and bag limits:

Aug. 20 - Sept. 30	One bull
Nov. 1 - Nov. 20	

Harvest and Hunting Pressure:

The final IBM moose harvest data in Subunit 14(C) are not yet available due to the late requirement for harvest ticket submission. As depicted in Appendix I, the bull harvest in 1968 was 90 animals and the female harvest was 38 animals. The antlerless harvest took place only on Fort Richardson. Hunting pressure in Subunit 14(C) has decreased somewhat from 403 hunters in 1967 to 368 in 1968. The percentage of successful hunters increased from 29.8 percent in 1967 to 35 percent in 1968 due primarily to high success on the antlerless hunt.

In spite of the fact that there was no antlerless hunt in 1967 (Appendix I), 403 hunters participated in the harvest of moose in Subunit 14(C). In 1968, with an antlerless hunt designed to increase the numbers of participating hunters, only 368 actually hunted. It is believed that the regulation which declared the West Chugach Management Area restricted to hunting afoot is responsible for a portion of the decrease.

Results of recent archery hunt on International Airport property in Subunit 14(C) revealed that 22 moose were taken by 649 hunters in nearly 3,000 hours of hunting effort in January, February and March of 1970.

Composition and Productivity:

Annual sex and age composition counts have been made in selected areas of Subunit 14(C) as time, weather, and finances permitted. The data acquired from 1966 to 1968 are presented in Appendix II. Poor snow cover precluded the counts in 1969.

The Fort Richardson survey showed a calf:cow ratio of 27:100 in 1967 and 1968. In other areas, overall calf:cow ratios varied from 27.7 calves:100 cows to 46.8 calves:100 cows. This level of reproduction is generally considered fair to good. Bull:cow ratios have been fairly consistent through the last three years, averaging 18 to 23 bulls:100 cows; this is a higher ratio than in Subunit 14(A) which abutts Subunit 14(C) to the north.

Moose - GMU 14(C) - Anchorage

Management Summary and Conclusions:

The management of moose in Subunit 14(C) has unique problems because of the largest human population in the State of Alaska contained within its borders. It also has at least 2,268 square miles of relatively inaccessible area.

A proposal to place a large percentage of Subunit 14(C) into park status has recently been made. If the park is created and no hunting is allowed, hunter harvest will continue to diminish in Subunit 14(C), with a concurrent rise in road and train kills. The increase in the moose population in all probability will lead to range deterioration and ultimate loss of numbers.

During the years 1963, 1964, and 1965, in excess of 220 antlerless moose were taken each year in Subunit 14(C). In 1966, 72 antlerless moose were taken due to a repositioning of the season from November to September. In 1967, the antlerless season was cancelled. In the winter of 1968-69, a permit hunt for 50 moose was held on Ft. Richardson with a hunter success of 100 percent. An antlerless hunt has not been held to date in 1969-70, but composition counts coupled with past harvest data reveal that a reasonable number of antlerless moose could be cropped in Subunit 14(C), particularly in the area containing the road system which bisects Ft. Richardson. The hunt should be held by Commissioner's announcement when the moose are available to the permit holders.

Recommendations:

No changes are recommended in seasons or bag limits.

Submitted by: Jack C. Didrickson, Game Biologist III

Moose - GMU 14(C) - Anchorage

Appendix I. Moose harvest and hunting pressure - Subunit 14(C).

Year	Date	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1966	8/20-9/30	First	94	0	2	96	Not Available	
	11/1-11/30	Second	31	1	1	33	"	
	9/25-9/30	Antlerless	0	72	0	72	"	
		Unk. Date	9	4	1	14	"	
		TOTAL	134	77	4	215	"	
1967	8/20-9/30	First	43	0	0	43	Not Available	
	11/1-11/20	Second	11	0	0	11	"	
	None	Antlerless	0	1	0	1	"	
		Unk. Date	1	0	5	6	"	
		TOTAL	55	1	5	61	403	29.8
1968	8/20-9/30	First	60	0	0	60	Not Available	
	11/1-11/20	Second	14	0	0	14	"	
	2/20-2/22*	Antlerless	14	37	0	51	"	
		Unk. Date	2	1	0	3	"	
		TOTAL	90	38	0	128	368	35.0
1969	8/20-9/30	First						
	11/1-11/20	Second						
	None	Antlerless		FINAL RUN NOT AVAILABLE				
		Unk. Date						
		TOTAL						

* Ft. Richardson antlerless hunt

Appendix II. Moose sex and age ratios - Subunit 14(C).

Year	Month	Area	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Yearlings Per 100FF	Total Moose in Sample
1966	February*	Eagle River	-	-	-	-	3.4	26.7	120
	November	Ft. Richardson	13.9	10.1	9.2	39.5	6.8	24.6	33
	November	Off Base-Ship Cr.	18.3	11.7	6.6	31.7	0.0	21.1	90
	November	Elmendorf	27.3	9.1	18.2	81.8	0.0	36.0	25
	November	Off Base-Campbell Cr.	7.7	0.0	7.7	38.5	0.0	26.3	19
	November	Anchorage (Total)	18.7	9.8	8.9	39.4	3.9	24.6	325
1966	TOTALS	Subunit 14(C)	18.26	8.14	10.12	46.18	2.14	26.52	492
1967	December	Ft. Richardson	15.1	-	15.1	27.2	0.0	23.3	408
	December	Eagle River	22.1	14.7	7.4	51.5	3.12	29.66	118
1967	TOTALS	Subunit 14(C)	18.6	7.35	11.25	39.35	1.56	26.48	526
1968	December	Ft. Richardson	22.9	8.4	14.5	27.7	11.5	18.3	376
1968	TOTALS	Subunit 14(C)	22.9	8.4	14.5	27.7	11.5	18.3	376

* Late count in February of 1967. This count is not averaged in the total.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 15(A) - Kenai

Seasons and bag limits:

Aug. 20 - Sept. 20 Nov. 1 - Nov. 20	1 bull; Aircraft may not be used in any manner in hunting, including the transportation of game, hunters or hunting gear from August 20 through August 31.

Harvest and Hunting Pressure:

Harvest ticket returns indicate that in 1968, 1,092 hunters harvested 274 bull moose for a hunter success of 25 percent (Appendix I). The number of hunters and hunter success did not change significantly from 1967. Data from the 1969 general hunt are not available.

The bull harvest over the past four years shows a downward trend except for a slight rise in 1968. The 1968 harvest of 268 bulls was still down 24 percent from the four-year average of 352.

During the past five years, two antlerless hunts have been held. In 1965, 267 cows were taken in a November hunt; and in 1966, 185 cows were taken during a September hunt.

Composition and Productivity:

Sex and age composition counts conducted by the U. S. Fish and Wildlife Service in 1969 indicate 17.4 bulls and 42.8 calves per 100 cows (Appendix II). Bull:cow ratios appear to be declining; but, since data have not been collected at the same time of year and from the same areas each year, comparison is difficult. Calf production appears high, but again inconsistencies in data collection make comparisons difficult.

Management Summary and Conclusions:

The downward trend in the bull:cow ratio as indicated by the sex and age composition counts may or may not be valid. The high ratios observed in 1965 and 1966 were obtained in summer counts, while the 1967, 1968 and 1969 data were obtained from late fall and winter counts. Thus, the data may not be comparable and the apparent trend may not be occurring, or at least may not be of the magnitude indicated.

Production and survival (as indicated by the small-bull:cow ratios) appear to be high, pointing toward a healthy population.

Moose - GMU 15(A) - Kenai

The harvest has followed a downward trend through 1967, with a slight increase in 1968. This is probably related to other factors than decreasing availability of bulls in the area as a whole, although moderate to heavy hunting pressure along the very limited access roads may have reduced the number of bulls readily available to many hunters. Lack of antlerless seasons some years, decreased length of the season in 1968, poor hunting weather in 1967, and restriction of aircraft hunting in 1968 could all be expected to affect harvest and make interpretation of harvest data difficult.

In general, the harvest is light in Subunit 15(A). Increased utilization of the female segment of the herd would be desirable to help stabilize the herd, relieve pressure on winter browse, stimulate reproduction and provide more animals for the hunter.

Recommendations:

No changes in seasons or bag limits are recommended for the general moose hunt in Subunit 15(A). It is recommended that 700 antlerless permits be issued, with dates and conditions of the hunt to be set by Commissioner's announcement (estimated harvest from 700 permits, based on the success of past antlerless hunts, is 400 animals.)

It is further recommended that Subunit 15(A) be further subdivided for purposes of distributing hunting pressure during the moose hunt. Subdivision of the subunit into three parts has already been recommended to and tentatively adopted by the Board, with boundaries specified.

Submitted by: Paul A. Le Roux, Game Biologist III

Moose - GMU 15(A) - Kenai

Appendix I. Moose harvest and hunting pressure, Subunit 15(A).

Year	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1965	1st	*	0	0	*		
	2nd	*	267	0	*		
	Comb.**	513	267	0	780	*	*
1966	1st	211	185	0	396		
	2nd	137	0	0	137		
	Comb.	382	185	0	567	*	*
1967	1st	185	0	0	185		
	2nd	62	0	0	62		
	Comb.	247	0	0	247	1,036	24
1968	1st	166	1	0	166		
	2nd	91	0	0	91		
	Comb.	268	1	5	274	1,092	25
1969	1st	*	*	*	*		
	2nd	*	*	*	*		
	Ant.***		N O T H E L D				
	Comb.	*	*	*	*	*	*

* Data not available
** Combined
*** Antlerless

Totals of first and second seasons may be less than for combined seasons because of the inclusion of animals for which date of kill was not given.

Appendix II. Moose sex and age ratios, Subunit 15(A).

Month and Year	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
6/65*	43.8	-	-	32.6	8.3	1,200
6/66*	50.8	-	-	24.7	3.7	795
10/67**	11.7	4.3	-	34.3	15.8	575
12/68	20.0	9.0	-	46.9	5.1	2,529
11/69***	17.4	7.9	9.5	42.8	5.1	2,661

* June survey, lowlands only
** October survey, lowlands only
*** Mountains northeast of Hidden Lake and Hidden Creek not counted.

Counts conducted by U. S. Fish and Wildlife Service.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 15(B) - Soldotna

Seasons and bag limits:

Aug. 20 - Sept. 30 Nov. 1 - Nov. 20	1 moose; Antlerless moose may be taken by permit only. 100 antlerless moose permits will be issued for the Upper Skilak Bench area from Aug. 20 - Sept. 30. Persons holding unfilled permits on Sept. 30 may be allowed to take anterless moose at a later date in areas described by Commissioner's announcement only if conditions warrant.

Harvest and Hunting Pressure:

Harvest ticket returns indicate that 282 hunters harvested 108 bulls, 6 cows and 2 unidentified moose for a total kill of 116 during the 1968 season. Hunter success was 41 percent, up 11 percent from 1967 when 233 hunters took 69 bulls. The harvest of bulls was up 56 percent from 1967 and down 10 percent from the four-year average of 119 (Appendix I).

Restriction of the 1968 cow harvest to the Upper Skilak Bench, where access is very limited, resulted in a harvest of only six cows by 100 anterless permit holders. In the past five years, four antlerless hunts have been held with the average cow harvest being 58 animals.

No data are yet available for the 1969 general hunt. Preliminary data available from the 1969 antlerless hunt held February 19 - February 20, 1970 indicate a minimum kill of 80 moose of which 54 were cows and 26 were bulls. Fifty-one of the harvested cows were aged by the tooth annuli method; 12 percent were over 12 years old; 30 percent were over 10 years old; 40 percent were over 8 years old; and 42 percent were over 6 years old. Five of the 51 cows were calves. Of 26 bulls harvested, 9 were calves. Ages have not yet been determined for the remainder of the bulls.

Composition and Productivity:

Three sex and age composition counts have been conducted in this Unit since 1962 (Appendix II). The most recent count, conducted in 1967, was a partial count only. These limited data suggest low productivity with only 15.8 calves per 100 cows on the Funny River Benchlands in 1967, and 20.5 calves per 100 cows over the entire subunit in 1964. No trends can be established until more information is obtained.

Moose - GMU 15(B) - Soldotna

Management Summary and Conclusions:

The limited composition data available depict no reliable trends. Production and survival appear to be low on the Funny River Benchland; which is to be expected under conditions of underharvesting. Harvest data show a downward trend through 1967, with an increase in 1968. This apparent trend is probably related to changes in season and access rather than to the number of animals. The level of harvest in this area as a whole is generally low. Age composition of the female segment of the 1969 anterless harvest indicates the natural distribution expected of a lightly-hunted herd.

The major portion of this area will be designated by the U. S. Fish and Wildlife Service for trophy-bull management, and access may remain restricted. However, an increased harvest of females would be desirable to maintain the high bull:cow ratio as well as to stimulate production and provide better utilization of the resource.

Recommendations:

It is recommended that at least 200 anterless permits be issued for the Unit, with conditions of the hunt to be set by Commissioner's announcement. Subunit 15(B) should be divided into two parts during the antlerless season to better distribute hunting pressure and harvest. Boundaries have been delineated in recommendations to the Board.

No changes in seasons or bag limits are recommended for the general moose season.

Submitted by: Paul A. Le Roux, Game Biologist III

Moose - GMU 15(B) - Soldotna

Appendix I. Moose harvest and hunting pressure, Subunit 15(B).

Year	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1965	1st	*	0	0	*		
	2nd	*	193	0	*		
	Comb.**	183	193	0	376	*	*
1966	1st	60	26	0	86		
	2nd	56	0	0	56		
	Comb.	119	26	0	145	*	*
1967	1st	51	0	0	51		
	2nd	18	0	0	18		
	Comb.	69	0	0	69	233	30
1968	1st	67	5	0	72		
	2nd	35	0	0	35		
	Comb.	108	6	2	116	282	41
1969	1st	*	*	*	*		
	2nd	*	*	*	*		
	Ant.***	28	54	0	82		
	Comb.	*	*	*	*	*	*

* Data not available
** Combined
*** Antlerless

Total of first and second seasons may be less than for combined seasons because of inclusion of animals for which date of kill was not given.

Moose - GMU 15(B) - Soldotna

Appendix II. Moose sex and age ratios, Subunit 15(B).

Year	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
1962	43.2	5.9	37.3	33.8	8.1	1,832
1963			NO COUNTS CONDUCTED			
1964	44.0	5.3	38.7	20.5	5.2	1,437
1965-66			NO COUNTS CONDUCTED			
1967*	28.8	3.5	25.3	15.8	2.0	457
1968-69			NO COUNTS CONDUCTED			

* Funny River Benchlands only

Counts conducted by U. S. Fish and Wildlife Service.

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Subunit 15(C) - Homer

Seasons and bag limits:

Aug. 20 - Sept. 30 Nov. 1 - Nov. 20	1 moose; Antlerless moose may be taken by permit only. 150 antlerless moose permits will be issued for the Upper Deep Creek area from Aug. 20 - Sept. 30. Persons holding unfilled permits on Sept. 30 may be allowed to take antlerless moose at a later date in areas described by Commissioner's announcement only if conditions warrant.

Harvest and Hunting Pressure:

Harvest ticket returns from the 1968 hunt show that 404 bulls, 20 cows and 26 unidentified moose were reported taken by 972 hunters for a hunter success of 44 percent (Appendix I). The 1968 bull harvest was 51 percent higher than the 1967 harvest and 38 percent above the four-year average of 292.

Harvest data for the 1969 general hunt are not available at this time.

One hundred and fifty antlerless moose permit holders harvested 20 cow moose during the August 20 - September 30 season in 1968. Preliminary data from the 1969 antlerless hunt held from January 14 - January 21, 1970 indicate a minimum kill of 109 cows and 19 bulls. Of this total, four were female calves and five were male calves.

Ninety-four percent of the cows over two years of age which were examined were pregnant. Of 103 cows aged, 15 percent were over 12 years old, 24 percent were over 10 years old, 38 percent were over 8 years old and 53 percent were over 6 years old.

Composition and Productivity:

Sex and age composition counts conducted in 1969 indicate 13.9 bulls and 27.9 calves per 100 cows. A downward trend in the bull:cow ratio is evident (Appendix II) although there is no significant difference indicated between 1968 and 1969.

Calves per 100 cows dropped from 41.8 in 1968 to 27.9 in 1969. Lateness of the survey probably resulted in some antlerless bulls being classified as cows, lowering the apparent proportion of calves and bulls per 100 cows.

Moose - GMU 15(C) - Homer

Management Summary and Conclusions:

The increasing bull harvest and decreasing bull:cow ratios indicate moderate to heavy hunting pressure on the male segment of this herd. The relatively constant hunter success between 1967 and 1968, despite increased number of hunters, shows that adequate bulls were still available during that period.

Good calf production and survival point to a vigorous herd despite the apparent drop in calf production in 1969. As stated, this drop could have been the result of counting error or it could have resulted from lowered productivity due to a severe winter in 1968-69. However, the severe winter did not result in abnormally low calf survival over the winter in this area as manifested by the small-bull:cow ratio for 1969.

The age composition of those cows taken in 1969 is about as expected for a lightly-harvested population. Increased exploitation of the female segment should be beneficial in preventing overpopulation and range damage, in providing more animals for the hunter, in increasing the bull:cow proportion and in possibly enhancing calf production and survival.

Recommendations:

No change in general seasons or bag limits is recommended. The issuance of 250 antlerless permits is recommended, with dates and conditions to be set by Commissioner's announcement.

Submitted by: Paul A. Le Roux, Game Biologist III

Moose - GMU 15(C) - Homer

Appendix I. Moose harvest and hunting pressure, Subunit 15(C).

Year	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1965	1st	*	2	0	*		
	2nd	*	2	0	*		
	Comb.**	248	224	0	472	*	*
1966	1st	156	68	0	224		
	2nd	**	0	0	88		
	Comb.	248	68	0	316	*	*
1967	1st	187	0	0	187		
	2nd	81	0	0	81		
	Comb.	268	0	0	268	643	42
1968	1st	227	19	0	246		
	2nd	157	0	0	157		
	Comb.	404	20	5	429	972	44
1969	1st	*	*	*	*		
	2nd	*	*	*	*		
	Ant.***	19****	109****		128****	*	*
	Comb.	*	*	*	*	*	*
4-year average		292					

* Data not available
** Combined
*** Antlerless
**** Preliminary data

Total of first and second seasons may be less than for combined seasons because of inclusion of animals for which date of kill was not given.

Appendix II. Moose sex and age ratios, Subunit 15(C).

Year	Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
1965	32.6	9.7	22.9	31.2	6.0	1,899
1966	16.9	6.3	10.3	30.7	4.5	794
1967	21.0	6.7	14.3	40.0	14.0	3,038
1968	14.5	6.1	8.4	41.8	6.9	1,883
1969	13.9	6.5	7.4	27.9	5.8	1,636

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 16 - West Side of Cook Inlet

Seasons and bag limits:

Aug. 20 - Sept. 30	One moose; provided that antlerless moose may be taken only from Nov. 21 through Nov. 30.
Nov. 1 - Nov. 30	

Harvest and Hunting Pressure:

Harvest ticket data from 1969 are not yet available. The 1968 data (Appendix I) show that 227 bulls were taken during the first season and 183 bulls were taken from the late season. During the November antlerless season, 39 moose were taken. An additional 38 moose were reported taken but without the date included. In 1968, hunter success was 57 percent for the 860 hunters reporting.

In 1969, a checking station was operated in Unit 16 during the November antlerless moose hunt. A total of 102 moose was tallied through the station, including 33 antlerless males, 61 females, and 8 of unknown sex. Of the 24 calves taken, 15 were female, 6 were male, and 3 were of unknown sex.

From check station data, it appears that some 3,500 man-days of recreation were spent on the antlerless hunt.

Age data show that 70 percent of the adult moose taken in this season were over 5 years of age, and 17 percent were over 10 years of age, indicating a lightly harvested herd.

Plotting of kill locations on a map shows that harvest is well distributed throughout the Unit, primarily due to aircraft hunting.

Composition and Productivity:

Poor weather conditions precluded composition counts in 1969-70. Results of the 1967 and 1968 surveys are shown in Appendix II. The ratio of calves per 100 cows is fair to good in this Unit as a whole, averaging 40.5:100 in 1967, and 36.3:100 in 1968. The highest production, as indicated by a calf:cow ratio of 52.9:100, occurred in the Petersville Road area where hunting pressure and harvest are heaviest. The lowest production was observed in the Mount Susitna, Mount Beluga area where hunting pressure is low.

Bull:cow ratios for the Unit as a whole were seen to be 55.0:100 in 1967 and 31.7:100 in 1968. However, these ratios are not directly comparable since composition counts were conducted on different areas. The Peters Hills counts are comparable and show similar ratios of 25.5 bulls per 100 cows in 1967 and 27.4 bulls per 100 cows in 1968.

Moose - GMU 16 - West Side of Cook Inlet

The classification surveys in 1967 included a sample of 1,121 moose actually counted in the Peters Hills-Kahiltna area which represents less than 5 percent of the land area of Unit 16.

Management Summary and Conclusions:

Harvest and composition data indicate that Unit 16 is capable of sustaining a larger harvest. Lack of road access concentrates hunting pressure along the Petersville Road where some restrictions may become necessary in the future. Current regulations appear adequate for the present, however.

Recommendations:

No changes in seasons or bag limits are recommended.

Submitted by: Jack C. Didrickson, Game Biologist III

Appendix I. Moose harvest and hunting pressure - Unit 16.

Year	Date	Season	Bulls	Cows	Unid.	Total	Number of Hunters	Percent of Success
1966	8/20-9/30	First	162	1	3	166	Not Available	
	11/1-11/30	Second	210	0	14	224	"	
	11/23-11/30	Antlerless	0	134	0	134	"	
		Unk. Date	21	9	1	31	"	
		TOTAL	393	144	18	555	826	67.2
1967	8/20-9/30	First	168	0	1	169	Not Available	
	11/1-11/20	Second	97	0	0	97	"	
	11/13-11/20*	Antlerless	0	0	0	0	"	
		Unk. Date	16	0	0	16	"	
		TOTAL	281	0	1	282	505	56.0
1968	8/20-9/30	First	227	0	0	227	Not Available	
	11/1-11/20	Second	183	0	0	183	"	
	11/13-11/20	Antlerless	0	39	0	39	"	
		Unk. Date	22	7	9	38	"	
		TOTAL	432	46	9	487	860	57.0
1969	8/20-9/30	First						
	11/1-11/30	Second						
	11/21-11/30	Antlerless		FINAL RUN NOT AVAILABLE				
		Unk. Date						
		TOTAL						

* Cancelled

Moose - GMU 16 - West Side of Cook Inlet

Appendix II. Moose sex and age ratios - Unit 16.

Year		Total MM Per 100FF	Small MM Per 100FF	Large MM Per 100FF	Calves Per 100FF	Twin Calves Per 100FF with Calves	Total Moose in Sample
1966	TOTAL	NO COUNT DATA AVAILABLE					
1967	12/4-6 Kahiltna & Peters Hills	25.5	7.7	17.8	39.6	13.1	1,121
	12/4-6 Yentna	84.5	25.9	58.6	41.4	41.2	131
1967	TOTAL (12/4-6)	55.0	16.8	38.2	40.5	27.2	1,252
1968	12/12-17 Mt. Susitna & Mt. Beluga	48.1	7.4	40.7	18.3	4.5	457
	12/11+17 Peters Hills	27.4	9.0	18.4	37.8	6.9	496
	12/9+20 Petersville Rd.	19.6	9.8	9.8	52.9	12.5	91
1968	TOTAL (12/12-20)	31.7	8.7	23.0	36.3	8.0	1,044
1969		SURVEYS NOT COMPLETED DUE TO POOR COUNTING CONDITIONS					

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 17 - Bristol Bay

Seasons and bag limits:

Aug. 20 - Dec. 31 1 bull

Harvest and Hunting Pressure:

No information is available at this time.

Composition and Productivity:

No information is available at this time.

Management Summary and Conclusions:

To date, no work has been directed toward the moose in Unit 17. Moose are not abundant in the area, and those animals near outlying villages are subjected to heavy hunting pressure.

Recommendations:

No changes in season or bag limits are recommended.

Submitted by: James B. Faro, Game Biologist III

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 18 - Yukon - Kuskokwim Delta

Seasons and Bag Limits:

August 20 - December 31 One bull

Harvest and Hunting Pressure:

The harvest reported through harvest tickets has declined from 78 in 1963 to 9 in 1968. In 1960, the harvest was estimated at 33 moose in Unit 18 through interviews. These low figures reflect the limited use of harvest tickets, the reluctance of people to admit their actual harvest, and to a limited extent the lower densities of moose in much of Unit 18. Considerable effort must be expended to obtain more accurate harvest figures.

Hunting is for subsistence in most villages. The main exception is Bethel, where more recreational hunters live and where aircraft are used extensively. Compliance with the harvest ticket provision is better in Bethel.

Composition and Productivity:

No data have been gathered. Incidental reports of distribution have been recorded.

Management Summary and Recommendations:

Attempts to obtain better harvest information have not been successful. A simplified harvest ticket packet has been recommended. More personal contact is planned to facilitate gathering better harvest data. No changes in present regulations have been proposed. The present pattern of utilization is not considered detrimental, nor is it likely to change.

Submitted by: Richard Bishop, Game Biologist III

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 19 - McGrath

Seasons and Bag Limits:

August 20 - February 15	Two moose; only one of which may be antlerless; (antlerless moose may not be taken prior to October 1)

Harvest and Hunting Pressure:

The 1969-70 harvest ticket returns are not available for this Unit. In past years the reported harvest has varied from 108 to 183. Bohuslov estimated the 1960 harvest at 225 moose. These harvest estimates are all low, probably by at least 100 percent.

Harvest tickets are not widely understood nor used, and moose are traditionally taken outside the regular season but not reported by people on a subsistence economy.

Except in the immediate vicinity of villages, hunting pressure is light. Most hunting is done by boat, snow machine, and airplane. The airplane is used mainly by people with regular employment, boats and snow machines by those on a limited economy. An initial effort to obtain moose harvest figures by mail in 1969 was unsuccessful.

Composition and Productivity:

One composition count made on the Kuskokwim River between McGrath and Stony River in February showed a high proportion of twins (7.7 per 100 cows with calves) and good production (24.6 calves per 100 cows). Sample size was small, however (69 moose). Counts in the Stony River - Sleetmute sector were unsuccessful because moose had dispersed from the river by mid-March.

Management Summary and Recommendations:

Most hunting in Unit 19 is for subsistence. The present limit of two moose per person is adequate for most families to obtain their meat supply. The restriction on hunting cows could be removed with no ill effects on the moose population. It has only limited effect in practice, at best.

An extension of the season to the end of February was recommended to the Board to facilitate legal harvesting of moose in the spring when they are traditionally taken. The change should aid in obtaining more accurate harvest data.

Submitted by: Richard Bishop, Game Biologist III

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 20 - Fairbanks, Central Tanana

Seasons and Bag Limits:

Unit 20A	Aug. 20 - Nov. 30	1 moose; bull moose may not be taken from Oct. 1 - Oct. 31
Unit 20B	Aug. 20 - Sept. 30 Nov. 1 - Nov. 30	1 bull
Unit 20C	Aug. 20 - Sept. 30 Nov. 1 - Nov. 30	1 bull
	Sept. 28 - Oct. 4	1 antlerless moose

Harvest and Hunting Pressure:

Based on harvest ticket returns, the 1968 moose harvest was 1,007 animals; 151 more than were reported in 1967. The average kill over the past five years has been 1,162 animals.

The harvest in 1968 was comprised of 795 bulls, 177 cows, and 35 unidentified. This compares to the five-year average of 974 bulls, 171 cows, and 15 unidentified.

Total harvest by sub-unit in 1968 was 20A - 258, 20B - 141, 20C - 585. These figures represent a slight increase over harvest figures reported in 1967.

Composition and Productivity:

Sex and age composition and parturition information collected in Subunit 20A revealed 42 calves per 100 cows and a 21% calf crop in the herd. Calf percentages over the past five years have ranged between 15 and 20%. Yearling survival continues to improve, ranging from a low of 5% yearlings in the herd in 1967 to the present 25%.

Surveys in Unit 20B have not been complete enough to report on at this time.

Sex and age composition counts in Unit 20C (Taylor Highway area) indicate that the calf production in 1969 may be significantly higher than the previous four years. Twenty-eight calves per 100 cows were observed. The total number of moose observed on the counts was 365.

Management Summary and Recommendations:

Harvest and composition data indicate that the moose population in Unit 20 is under-exploited. Information obtained during the 1969 composition count indicates that calf production was higher than in previous years. Winter conditions in 1969-70 have been unusually mild, and it is highly likely that the population is increasing. It is recommended that the seasons and bag limits for Game Management Unit 20 remain unchanged.

Submitted by: Mel Buchholtz, Game Biologist II

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 21 - Middle Yukon

Seasons and Bag Limits:

August 20 - December 31	Two moose, one of which may be antlerless

Harvest and Hunting Pressure:

The reported harvest has declined from 247 moose in 1963 to 124 in 1968. Bohuslov estimated a harvest of 168 in 1960. The reasons for the decline are analagous to those mentioned in Unit 19. The error between reported and actual harvest is probably similar to that in Unit 19. The same attempt to obtain harvest data by mail was unsuccessful in Unit 21.

Hunting pressure is light except around villages. Most of the Unit is unhunted. Hunting patterns are similar to those in Unit 19.

Composition and Productivity:

Composition counts were made in April on parts of the Innoko drainage and the Yukon River between Holy Cross and Koyukuk.

In the Innoko drainage, of a sample of 220 moose, 10 percent were calves. Moose were already disbursing from the river bottoms which may have affected the data.

On the Yukon River, 1,004 moose were counted of which 16 percent were calves. Moose were concentrated on the bars and islands supporting willows. The percentage of calves was not high but was satisfactory.

Management Summary and Recommendations:

An extension of the season through February 28 was recommended to the Board to allow legal harvests of moose in early spring. The present bag limit allows most families to acquire their meat supply. The restriction on antlerless moose could be removed without ill effect with the present hunting pressure.

Submitted by: Mel Buchholtz, Game Biologist II

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 22 - Seward Peninsula

Seasons and Bag Limits:

Aug. 20 - Dec. 31 One bull

Harvest and Hunting Pressure:

Based on contacts with residents in Unit 22, the moose harvest was up in all areas. Hunting pressure is also increasing as more moose become available; thus, increasing a hunter's chances of being successful.

One area north of Nome near Salmon Lake, which is accessible by road, received the brunt of the hunting pressure in the Unit. Nearly 500 harvest tickets were issued to hunters from Nome and almost all hunted in this area. A harvest of over 30 bulls, of which 69% were 1 year old and 31% were 2 years or older (the oldest being 6 years old) as taken along the road system north of Salmon Lake. This is marginal moose habitat and the area appears to be a rutting site for a major segment of the population. This, in combination with the paucity of cover, increases the susceptibility of the bulls.

Harvest in the area north of Salmon Lake in 1968 was approximately 22 bulls.

Composition and Productivity:

Aerial surveys in 1967 and 1968 have produced very low figures that were obviously inaccurate (the harvest exceeded the counts). No counts were conducted in 1969 because of the lack of suitable aircraft in the area.

Management Summary and Conclusions:

Moose are increasing and expanding on the Seward Peninsula and they are continually being seen in new areas. This year 3 were taken near Wales on the extreme western tip of the Unit. Previously only one had been taken at Wales and that was last year.

The area north of Salmon Lake is receiving a disproportionate share of the hunting pressure due to its accessibility to a large population center, Nome. There is a very definite possibility that the bulls in this localized area could be overharvested causing a reduction in the population as some cows would fail to be bred.

Recommendations:

Seventy percent of the 1969 harvest was taken before September 15; 95% before October 1, and 99% by October 20. Based on this data, it is recommended that the season in that portion of Unit 22 north of Salmon Lake (including the drainages of the Kuzitrin, Kruzgamepa or Pilgrim Rivers) be reduced, with the season closing on September 15 instead of December 31. This will shift some of the hunting pressure to less heavily hunted areas. The season and bag limit in the rest of the Unit should remain the same. The new breakdown of the Unit should be as follows:

Unit 22, but only that portion that includes the Kuzitrin, Kruzgamepa or Pilgrim Rivers drainages from Salmon Lake north.	Aug. 20 - Sept. 15	One bull
Remainder of Unit 22	Aug. 20 - Dec. 31	One bull

Submitted by: Bob Pegau, Game Biologist II

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 23 - Kotzebue Sound

Seasons and Bag Limits:

Aug. 20 - Dec. 31 1 moose

Harvest and Hunting Pressure:

In the years 1963 through 1967 the harvest has varied from a low of 45 to a high of 77. The reported harvest in 1968 was only 34 moose, which constitutes the lowest recorded harvest since the harvest ticket was initiated. Thirty of the 34 moose were males, and 4 were females. The drop in harvest probably reflects a lack in distribution or the return of harvest tickets, or difficult hunting conditions. Harvest data for 1969 are not available.

Composition and Productivity:

No information is available on the moose population in Game Unit 23.

Management Summary and Recommendations:

Reports from Unit 23 indicate that the moose population is expanding in that area. The harvest of 34 moose would not significantly affect the moose population in Unit 23. No changes are recommended in the season or bag limit.

Submitted by: Oliver Burris, Game Biologist IV

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 24 - Koyukuk

Seasons and Bag Limits:

Aug. 20 - Dec. 31	2 moose; only one of which may be antlerless

Harvest and Hunting Pressure:

The harvest ticket returns from Game Management Unit 24 indicate that a total of 44 moose was taken in the 1968 season. Thirty-nine were males, and 4 were females, and 1 was of unknown sex. There were no second moose taken in that area in 1968. Since 1963 the harvest, as recorded by harvest tickets, has run from 72 to 102. The harvest ticket system in remote areas is not a very reliable means of determining the harvest. The total harvest in Unit 24 on even the highest years is insignificant to the population that is present.

Composition and Productivity:

There is no information available for the 1969 season on herd composition and production within Game Management Unit 24.

Management Summary and Recommendations:

Casual observations indicate that a sizeable moose population exists on the Koyukuk River drainage. The current reported harvest is not a significant influence on the population. No changes in season or bag limit are recommended at this time.

Submitted by: Mel Buchholtz, Game Biologist II

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 25 - Fort Yukon

Seasons and Bag Limits:

Aug. 20 - Dec. 31	2 moose; only one of which may be antlerless

Harvest and Hunting Pressure:

Harvest ticket returns for the 1968 moose season indicate that the harvest increased from 54 in 1967 to 72 in 1968. Harvest ticket returns in remote Units are not a reliable measure of the moose harvest; however, the small recorded harvest of 72 animals is well within the sustained yield capability of the moose herd in Unit 25. The harvest was composed of 46 males taken as first moose, 4 males as second moose; 19 females taken as first moose, and 2 females taken as second moose. There was one moose of unknown sex.

Composition and Productivity:

No composition or productivity information is available on the moose herd in Game Management Unit 25.

Management Summary and Recommendations:

The reported harvest of moose in Game Management Unit 25 is not a significant influence on the moose population. No changes in the season or bag limit are recommended.

Submitted by: Mel Buchholtz, Game Biologist II

MOOSE

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 26 - Arctic Slope

Seasons and Bag Limits:

Aug. 20 - Dec. 31 1 moose

Harvest and Hunting Pressure:

Based on harvest ticket returns, the moose harvest has varied from 1 to 20 animals over the past five years. This is not indicative of the actual harvest, which is definitely larger. More reliable harvest figures are not available.

Composition and Productivity:

Only limited information is available on the moose population in Unit 26. Surveys were conducted in the spring of 1969 on the Anaktuvuk and Colville Rivers. Data from the Anaktuvuk indicate excellent calf survival from 1968 (37% yearlings in the herd). Data from the Colville is more difficult to evaluate, but it appears this drainage also supports a healthy moose population.

Management Summary and Recommendations:

Preliminary information indicates that a sizeable moose population exists on the Arctic Slope, and that the inevitable increase in hunting pressure will not adversely affect the herd for at least several years.

Submitted by: Oliver Burris, Game Biologist IV

DEER

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 1 - Southeast Mainland

Seasons and Bag Limits:

Aug. 1 - Dec. 31	Four deer; provided that antlerless deer may be taken only from Oct. 1 - Dec. 31.

Harvest and Hunting Pressure:

Deer harvest statistics for all Units were obtained through hunter interviews. The reported deer kill in Subunit 1A was 1,518 animals (40% female) and in Subunit 1B, 114 animals (51% female). About 35 percent of the 1969 Alaska deer harvest was taken in Unit 1. Most of these were taken by hunters from the Ketchikan area who averaged 1.2 deer with an effort of 5.1 days per deer. Hunter success was 56 percent which was the highest for any Unit.

Composition and Productivity:

Winter losses averaged 1.2 dead deer per mile of beach in Unit 1. This was much higher than the average for the preceding ten years, but not as high as mortality observed in Units 3 and 4.

Habitat condition and trend transects showed a slight increase in vegetative cover since 1966. Deer winter use of Vaccinium spp. averaged 61 percent, the highest for all Units. Use was higher in Unit 1A than in the more northerly Unit 1B.

Management Summary and Recommendations:

Deer populations in Southeast Alaska are at the lowest level in many years; however, populations in Units 1A and 2 are higher than in Units 3 and 4. Hunter success was better in 1969 in Unit 1A than in any other Unit. Range use and condition indicate that deer populations are probably about in balance with habitat. No changes in seasons or bag limits are recommended.

Submitted by: Harry Merriam, Game Biologist IV

DEER

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 2 - Prince of Wales Island

Seasons and Bag Limits:

Aug. 1 - Dec. 31	Four deer; provided that antlerless deer may be taken only from Oct. 1 - Dec. 31

Harvest and Hunting Pressure:

Unit 2 receives less hunting pressure than any Unit in Southeast Alaska. Most hunting is by residents of Ketchikan and of the logging camps located on Prince of Wales Island. The reported deer harvest in 1969 was 527, 35 percent of which were females. Thirteen percent of the deer taken by Ketchikan hunters were killed in Unit 2.

Composition and Productivity:

Winter deer losses averaged 0.5 dead deer per mile of beach. Losses were higher than average for this Unit, but lower than that observed in any other Unit.

Habitat condition and trend transects in Unit 2 showed a slight increase in woody plant cover, but a decrease in forb abundance. Browse utilization averaged 39 percent, lower than any other Unit.

Management Summary and Recommendations:

Deer populations in Unit 2 are probably the healthiest in Southeast Alaska. Condition and trend transects show a slight decrease in plant abundance. Hunting pressure is low. No changes in seasons or bag limits are recommended.

Submitted by: Harry Merriam, Game Biologist IV

DEER

SURVEY-INVENTORY PROGRESS REPORTS - 1969

Game Management Unit 3 - Petersburg-Wrangell

Seasons and Bag Limits:

Aug. 1 - Dec. 15	Four deer; provided that antlerless deer may be taken only from Nov. 1 - Nov. 30. Exception: 2 antlered deer only on Mitkof Island

Harvest and Hunting Pressure:

The 1969 reported deer kill in Unit 3 was 795 animals. This harvest was distributed among hunters from all towns in Southeast Alaska. Hunter success averaged about 30 percent with the high effort of about 11 days per deer taken. Females comprised 43 percent of the kill.

Composition and Productivity:

Winter losses averaged 2.8 dead deer per mile of beach which is much higher than normal. Heaviest losses were on Mitkof and Kupreanof Islands.

An increase in both woody plants and forbs was observed on habitat condition and trend transects in Unit 3. Range condition appears to be improving after many years of high use. Average winter use of Vaccinium spp. was 58 percent.

Management Summary and Recommendations:

The deer population in Unit 3 is low. Hunting, however, is not of sufficient intensity to control deer numbers, even at the present low. The very low hunter success can also be attributed to weather conditions during the hunting season. Fall weather in 1969 was very mild and deer were never concentrated at low elevations. Hunters in Unit 3 normally wait until a heavy snowfall forces deer to the beach. This did not happen in 1969 and consequently success was poor.

Submitted by: Harry Merriam, Game Biologist IV

DEER

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 4 - Admiralty, Baranof, and Chichagof Islands

Seasons and Bag Limits:

Aug. 1 - Dec. 31	Four deer; provided that antlerless deer may be taken only from Oct. 1 - Dec. 31

Harvest and Hunting Pressure:

Residents from both Juneau and Sitka hunt mainly in Unit 4. It receives more hunting effort for deer than any other Unit. In 1969, the average hunter from these towns took 0.7 deer with an effort of about 8 days per deer. Hunter success in Unit 4 was 18 percent for Juneau hunters and 35 percent for hunters from Sitka. The total deer kill in Unit 4 was 1,756 animals. Females accounted for 55 percent of the take.

Composition and Productivity:

Winter losses in Unit 4 averaged 7.9 dead deer per mile of beach, the highest on record. Highest losses occurred on Admiralty Island.

Condition and trend transects showed a greater increase in both forbs and shrubs in Unit 4 than for any other Unit in Southeast Alaska. Winter browse use averaged 59 percent which is lower than normal. Range conditions, which were very poor from 1960 - 1965, are improving.

Management Summary and Recommendations:

Deer hunter success dropped from a record high in 1968 to corresponding low in 1969. Hunting could not have been a major factor for the reduction in deer numbers; there are not that many hunters. Winter losses in 1968-69 are undoubtably the major contributing factor to this reduction. Even with deer at a low level, present hunting pressure should not limit existing populations. No changes in seasons or bag limits are recommended.

Submitted by: Harry Merriam, Game Biologist IV

DEER

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 6 - Prince William Sound

Seasons and bag limits:

Aug. 1 - Dec. 31	Four deer; provided that antlerless deer may be taken only from September 15 - December 31.

Harvest and Hunting Pressure:

Harvest ticket returns are not available at this time. General information from hunters indicates that the 1969 harvest was well below par. There are no comparable harvest trend data available at this time.

Hunting pressure was reduced because the public knew the deer population was low as a result of the severe 1968-69 winter, and because snow depths were insufficient to push the deer onto the beaches during November and December.

Composition and Productivity:

Utilization and mortality studies, conducted in the spring of 1969 by the U. S. Forest Service with assistance from the Alaska Department of Fish and Game, indicated that snow depth during the preceding winter was so great in many areas that a large portion of winter browse was unavailable for deer utilization. Thus, a substantial winter die-off is believed to have occurred.

An alpine survey flown August 1, 1969 over Hinchinbrook Island revealed 126 deer which is below the 170 deer average for the preceding four years. A similar alpine survey over Hawkins Island on August 12, 1969 revealed 36 deer. The four-year average for Hawkins is 57 deer (Appendix I).

The number of deer jaws collected from hunters was insufficient to obtain adequate age data on the deer harvest.

Management Summary and Conclusions:

Present hunting regulations appear to have little or no affect on variations of deer abundance in Unit 6. Snow depth appears to be the controlling factor at present.

Recommendations:

No change in the regulations is recommended.

Submitted by: Julius L. Reynolds, Game Biologist III

Appendix I. Results of aerial alpine deer surveys (1965-69), Unit 6.

Year	Hawkins Island	Hinchinbrook Island
1965	46	216
1966	65	170
1967	18	92
1968	100	200
1969	38	126

DEER

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 8 - Kodiak and Adjacent Islands

Seasons and bag limits:

Unit 8, drainages of Chiniak Bay and from Cape Chiniak to Sequel Point	Aug. 1 - Nov. 1 1 deer, either sex after October 1
Remainder of Unit 8	Aug. 1 - Dec. 31 3 deer

Harvest and Hunting Pressure:

The total harvest for 1969 is estimated at 1,450 deer. This figure is based on personal interviews with 10 percent of the 1969 license holders. Hunter success was 43 percent. The average hunter was afield 6.3 days and bagged 1.0 deer. The 1969 harvest was down nearly 15 percent from the previous year. This decrease apparently resulted from a decrease in population levels following a severe winter, fewer hunters in the field and poorer hunting conditions in 1969. Though 1969 harvest statistics do not compare favorably with those of 1968, Appendix I shows they are comparable to the period 1965-1967. The 1969 data indicate populations were comparable to the previous five-year period, with the exception of last year. 1968 was apparently an exceptional year.

Composition and Productivity:

Productivity data were gathered by aerial observation during July and early August (Appendix II).

Observed fawn:doe ratios were higher (100:100) on the northern portion of Kodiak Island where hunting pressure is heavy. Fawn:doe ratios along the west side were much lower (47:100) where hunting pressure is relatively light. A decrease was noted in the 1969 trend count and harvest level. However, the decrease was not below the 1965-1967 figures. Harvest and census information indicate an upward trend in deer population levels for all areas except those adjacent to the Kodiak road system where the harvest remains nearly stable.

Management Summary and Conclusions:

The decrease in harvest experienced in 1969 can be attributed to the following factors: fewer hunters purchased licenses and went afield in 1969 than in 1968; weather conditions favorable for hunting experienced during the 1968 season were not experienced in 1969; deer population levels were apparently higher in 1968, the result of several moderate winters.

Deer - GMU 8 - Kodiak and Adjacent Islands

Recommendations:

Harvest data indicate that relatively few deer were harvested in outlying areas. In these areas, high deer densities have resulted in depressed productivity. For these reasons, it would be prudent to increase the present three deer limit to four. In addition, thirty days should be added to the present season south of Uganik and Ugak Bay.

Submitted by: Jack E. Alexander, Game Biologist II

Deer - GMU 8 - Kodiak and Adjacent Islands

Appendix I. Deer harvest figures for Kodiak Island, 1966-1969.

	1965	1966	1967	1968	1969
Number of hunters	950	1,180	1,800	2,300	1,440
Number of deer harvested	1,040	720	1,500	2,100	1,450
Percent of success	64	42	48	74	43
Number of deer per hunter	1.1	.6	.8	.94	1.0
Number of days per deer	5.9	9.3	5.7	5.0	6.3

Appendix II. Summary of deer aerial composition counts.

Area	Drainage	Flight Time	Male	Female	Fawns	Unknown	Total	Fawns/Doe
Chiniak Pen.	Middle Bay	11	1				1	
	Kalsin Bay	14			1	5	6	
	Sacramento	13		3	3		6	
	Saltery Cove	5					0	
	Portage	9					0	130:100
	SUBTOTAL	52	1	3	4	5	13	
Kizhuyak	Kekur Pt.	8	5			3	8	
	Sharatin	9		2	2	2	6	
	Anton Larsen	6	4	1	1		6	100:100
	SUBTOTAL	23	9	3	3	5	20	
Monashka Mt.		9		2	2	1	5	
Spruce Is.		8	2	2	1	3	8	
Whale Is.		10	2	3	3	1	9	86:100
	SUBTOTAL	27	4	7	6	5	22	
Uganik Is.		12	12	15	6	2	35	
Viekoda		11	15	9	4		28	
Port Bailey		10	9	12	7	2	30	47:100
	SUBTOTAL	33	36=39%	36=39%	17=18%	4	93	
	TOTAL	135	50=34%	49=34%	30=20%	19=12%	148	61:100

ELK

SURVEY-INVENTORY PROGRESS REPORT - 1969

Game Management Unit 8 - Kodiak and Adjacent Islands

Seasons and bag limits:

Unit 8, southeast of a line from Cape Paramanof to Cape Kazakof	Aug. 1 - Dec. 31 1 elk
Remainder of Afognak	Aug. 1 - Dec. 31 2 elk
Raspberry Island	No open season

Harvest and Hunting Pressure:

Personal interviews with elk hunters as the season progressed yielded the following information. A minimum of 187 hunters went afield during 1969. Thirty-six percent of these were successful for a total known harvest of 68 animals. Of this number, 41 percent (28) were males and 59 percent (40) were females.

Forty-six percent (31) of the total harvested animals were taken from the Malina herd. Fifty-nine percent (22) of these were females. The Interior herd produced 44 percent (30) of the known total harvest. Seventy-three percent (17) of these were female. Only 10 percent (7) of the harvest came from Raspberry Strait and Tonki herds. An excessive number of elk kills from the Malina herd resulted in an emergency closure of the Malina-Afognak Lake area in November 1969.

Elk numbers in the Malina herd have decreased from their 1961 high of 222 to less than 60 in 1969. Although complete harvest data are lacking, it is felt that the major causes of this decline have been an excessive harvest coupled with a possible natural decline from the maximum population level.

Known harvest from the Malina herd has closely paralleled observed calf production figures since 1967. In 1969 the known harvest surpassed the observed calf production (Appendix I).

Composition and Productivity:

Trend counts conducted in August indicated a continued downward trend in total elk numbers from the 1965 peak. The downward trend in numbers has been accompanied by a corresponding increase in calf:cow ratios (Appendix I).

Trend counts of the Interior herds of Afognak Island indicate a sharp decline in population numbers. An equally sharp increase in calf production was noted in 1969. The 1968 observed population of 259 elk decreased to 104 in

1969; a 40 percent decrease. The observed calf:cow ratios increased from 35:100 in 1968 to 52:100 in 1969. Again, known harvest exceeded observed calf production. It is possible that a portion of this herd was missed during 1969 census. The Raspberry Strait and Tonki Cape calf:cow ratios remained near the 1968 level, 36:100 and 29:100, respectively (Appendix II).

Management Summary and Conclusions:

Trend counts indicate decreased population levels in all major herds. Increased cow:calf ratios have been noted in the Malina and Interior herds.

Recommendations:

Harvest information indicates a harvest larger than the observed annual increase in the Malina and Interior herds. Because of the drastic decline in herd size, the Malina and Afognak Lake area should remain closed during the 1970 season. It is further recommended that there be a required reporting of harvested animals. This would help to overcome the lack of information concerning sex, age and number of animals harvested.

Submitted by: Jack E. Alexander, Game Biologist II

Elk - GMU 8 - Kodiak and Adjacent Islands

Appendix I. Results of elk composition counts - Malina herd, 1961-1969.

Year	M	%	F	%	Calves	%	Calves /Cow	Total
1961	26	12%	159	71%	37	17%	23:100	222
1962	14	9%	106	70%	32	21%	30:100	152
1965	13	6%	148	73%	44	21%	28:100	205
1966	9	6%	118	74%	31	20%	26:100	158
1967	14	9%	115	70%	35	21%	30:100	164
1968	34	24%	82	59%	24	17%	29:100	140
1969	6	6%	65	68%	25	26%	38:100	96

Appendix II. Results of elk composition counts - Raspberry Strait and Tonki Cape herds, 1961-1969.

Year	M	%	F	%	Calves	%	Calves /Cow	Total
1961	104	17%	392	65%	104	18%	26:100	600
1962	99	22%	255	56%	98	22%	38:100	452
1965	139	15%	588	64%	199	21%	34:100	926
1966	65	7%	676	75%	166	18%	25:100	907
1967	56	8%	521	72%	143	20%	27:100	720
1968	124	18%	432	62%	136	20%	31:100	692
1969	40	10%	267	65%	101	25%	38:100	408