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FURBEARER REPORT

by

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Volume VIII
Annual Project Segment Report
Federal Aid in Wildlife Restoration
Project W-13-R-3, Work Plan A

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STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 1

TITLE: Status of Furbearer
Resource Utilization and
Research

PERIOD COVERED: July 1, 1967 to June 30, 1968

ABSTRACT

No work was performed on this Job. Time and personnel were not available.

RECOMMENDATIONS

No recommendations are made relative to management.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 2

TITLE: Harvest of Fur Animals
in Alaska

PERIOD COVERED: July 1, 1967 to June 30, 1968

ABSTRACT

The harvest of furbearers for the 1966-67 season increased slightly more than 6,000 from the 1965-66 season. An increase of 14,200 muskrats was largely responsible for the over-all increase. The total economic value did not increase proportionally as mink and lynx declined rather sharply.

Harvest estimates were based on the relationship between the number of beaver pelts sealed and the number exported since 1961. The estimated furbearer harvest for the 1966-67 season was:

Beaver	-	12,067	White Fox	-	1,670
Muskrat	-	41,300	Other Fox	-	2,200
Mink	-	13,600	Lynx	-	1,920
Marten	-	5,510	Weasel	-	1,510
Land Otter	-	3,280	Squirrel	-	230

The approximate value of the harvest was \$1,029,400.00. The total value declined a little more than \$81,000.00 from the previous season. Mink was again the most valuable species with the harvest estimated at \$310,100.00. Beaver was second with a value of \$299,000.00. The most noticeable decline was in lynx, from \$214,400.00 in the 1965-66 season to \$67,200.00 in the 1966-67 season. Lynx values remained high, but as a result of normal population fluctuation, the harvest in the 1966-67 season was approximately one-third of the harvest of the previous season.

Harvest estimates were made for each Game Management Unit based on fur dealers reports and fur export reports. Numerous problems still exist in making reasonably accurate harvest estimates for Game Management Units. Incomplete information from fur dealers is the major cause of the innacuracies in the Game Management Unit harvest estimates.

RECOMMENDATIONS

1. Enforce the required submission of fur dealers reports to upgrade the quality of the basic data.
2. Initiate temporary and independent systems to determine the harvest of individual species or specific areas to check the accuracy of harvest estimates based on fur dealers reports and fur export reports.
3. Initiate a system to establish the average price received for raw pelts by trappers.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 1

TITLE: Status of Furbearer
Resource Utilization and
Research

PERIOD COVERED: July 1, 1967 to June 30, 1968

OBJECTIVES

1. Determine the utilization of furbearers in selected areas.
2. Plan future activities to obtain information needed to resolve problems in furbearer resource management.

TECHNIQUES

No work was performed on this Job.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3 TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A TITLE: Furbearers

JOB NO.: 2 TITLE: Harvest of Fur Animals
in Alaska

PERIOD COVERED: July 1, 1967 to June 30, 1968

OBJECTIVES

1. To estimate the number of animals pelted annually in Alaska, excluding seals and sea otter, by species and area.
2. To determine the approximate value of these furs.
3. To improve the systems used to obtain harvest data.

TECHNIQUES

Three data gathering systems are employed to determine the harvest of furbearers in Alaska. Licensed fur dealers are required to report purchases of all raw pelts. Persons shipping furs from Alaska are required to make a report of the kind and number of furs exported, and each beaver pelt must be sealed before being transported from the state. Because fur dealer's reports and fur export reports are also required on beaver pelts, beaver sealing records are used as a check to evaluate the accuracy of fur dealer's reports and fur export reports. Each fur dealer must also prepare export reports for those furs which he purchases; therefore, export reports serve as a check on the accuracy or completeness of fur dealer reports. The reporting period was October 1, 1966 to September 30, 1967. Reports received by the Department during the reporting period are coded for machine punching and compilation.

A new machine compilation program was prepared for the 1966-67 data. The new program was designed to provide information which was not utilized from previous reports and to facilitate processing of the data.

The information not previously compiled which the new program will provide is as follows:

1. Number of furs exported from each town and Game Management Unit each month.
2. Number of furs purchased from each trapper by town or residence and Game Management Unit each month.
3. Number and species of furs sold or exported by each trapper and average number of furs sold or exported by trappers from specific areas.
4. Total number of furs bought and exported by each fur dealer.

The program was not in proper operation and most new information the program was to provide was not in proper form.

A fur dealer's file was created on Unisort cards to aid in the reference to the newly established permanent fur dealer's code numbers. The file also indicates if the dealer has purchased or exported furs within any monthly period. Informational material sent to fur dealers and letters reminding fur dealers to submit reports are noted on the file.

FINDINGS

The 1966-67 estimated annual harvest of furbearers increased slightly more than 6,000 animals (Table 1). An increase of 14,200 muskrats was largely responsible for the total increase. The harvest of several of the more valuable species was substantially lower. Despite the larger harvest the value of the total harvest was lower than the 1965-66 season (Table 1).

Harvest estimates were prepared in the same way as the 1964-65 and 1965-66 estimates. The relationship between the number of beaver harvested since 1961 and the number of beaver exported since 1961 is assumed to be the same as the relationship between harvest of each species of fur animal and the corresponding number exported of that species. Comparing the harvest figures from the beaver sealing with the beaver export reports (Figure 1) reveals that the relationship between the number of beaver harvested and the number of beaver exported may vary greatly for any season.

Harvest of Furbearers by Game Management Unit

The harvest of furbearers by Game Management Unit is computed from the total statewide harvest. Only two types of information can be used to determine, with reasonable accuracy, the number of furbearers harvested in any Game Management Unit. The largest block of information is derived from fur dealer's reports where the trapper's residence is listed. Furs which the trapper is selling are then considered to have been harvested from the Game Management Unit in which the trapper lives. The second source of information is from fur export reports prepared by trappers. The

furbearers the trapper is exporting are considered to have been harvested from the Game Management Unit in which the trapper lives. Because fur buyers are negligent in submitting reports, when fur dealer reports and fur export reports made by trappers are combined they equal only about one-half to two-thirds of all the furs exported in most seasons. The two combined sources of information are used to establish the percentage of fur harvested within each Game Management Unit. This percentage of the total estimated harvest becomes the estimated harvest from the corresponding Game Management Unit.

This assumption, when applied to the actual harvest of furbearers by Game Management Unit, is often incorrect. For example, in Table 2, with the exception of beaver, there is practically no fur-bearer harvest listed for Game Management Unit 11. Trappers living in Game Management Unit 6, 12, and 13 harvest furbearers from Unit 11. Few trappers live in Unit 11; therefore, only a small harvest is accredited to that Unit.

Other obvious errors occur when species of furbearers which are not found in certain Game Management Units were harvested elsewhere by trappers living in that Game Management Unit. In Table 3 a comparison is made of the actual harvest of beaver with the estimated beaver harvest derived from fur export reports and fur dealer reports. The information contained in Table 3 indicates that the Game Management Unit harvest estimates may be of little value in some Units.

Game Management Unit harvest estimates indicate substantial harvest changes in some Game Management Units. The 1966-67 muskrat harvest increased approximately 14,000 from the 1965-66 harvest. Harvest estimates supported informal reports. High muskrat populations were reported from Unit 12 in the spring of 1966. The estimated harvest for that season was 5,200. In 1966-67 the harvest was estimated at 2,260. In Unit 18 the muskrat harvest increased from about 7,000 in 1965-66 to about 20,000 for the 1966-67 season. In Unit 20 the muskrat harvest increased from about 1,000 to approximately 5,000. In Unit 23 the harvest increased from approximately 1,000 to 4,000 and in Unit 24 the harvest went from practically 0 to 2,360. Unit 25 increased from a modest 4,000 to more than 13,000.

Harvest fluctuations can be attributed to only three major causes. An increase in the furbearer population and the resultant increase in success is probably the major cause contributing to a higher harvest. An increase in the value of the pelt of some furbearers will also stimulate an increased harvest. In many areas of Alaska trapping can be a major source of income. If income from other sources is reduced the result is often an increase in the trapping pressure with a resulting increase in harvest.

A population increase appears to be the cause of the increase in the muskrat harvest for the 1966-67 season. The average muskrat pelt price declined from \$1 in 1965-66 to about \$.60 in 1966-67 ruling out increased pelt value as the cause of the increased harvest. In Unit 18 where the harvest increased from about 7,000 to 20,000 muskrats, the commercial fishing season which is also a major source of increase, was one of the best in many years, thereby ruling out the third possibility.

The estimated harvest by Game Management Unit also supports lynx harvest and population information independantly obtained and reported under Job A-4. Harvest estimates indicated a substantial drop in the lynx harvest in three Game Management Units, Unit 20, 25 and 13. In the 1965-66 season these Game Management Units contained only remnant lynx populations even though the market remained high on lynx. The population decline resulted in a greatly reduced lynx harvest.

Value of Furbearer Harvest

Many species of furbearers have a wide distribution within Alaska. The value of these widely distributed species varies greatly throughout the State. Variations in pelt quality may be due to a number of causes both environmental and genetic. Pelt values listed in Table 4 are derived by establishing the average value of all sizes of pelts and the average value from all qualities of pelts throughout Alaska for a given auction date or price listing. This average is once again averaged for the auctions when most Alaskan furs for a particular species are sold. Pelt values also vary greatly depending upon the size of the pelt. At present no information is available on the percentages of various sized pelts from various areas. This method of establishing pelt values is indirect and does not provide information of primary interest.

Prices paid directly to trappers provide the incentive and reward for trapping. The price the trapper receives is much more valuable for interpreting variations in the harvest; however, a system to obtain this information has not been implemented.

Harvest Data

No basic changes have been made in the three systems utilized to obtain furbearer harvest information. The beaver sealing system provided the most accurate information for determining Unit and statewide harvest information. Fur export reports provided the most reliable information for determining the statewide harvest of other furbearers. Fur dealer reports provide the best information on furbearer harvest within Game Management Units except for beaver. Fur dealers reported only 52 percent of the furs which they exported (Table 6). This is a serious loss of information which biases the harvest estimates for Game Management Units. Several substitute and auxiliary systems are under consideration to improve the compilation of furbearer harvest data.

Table 1. Furbearer harvest and approximate value.

	1962-63		1963-64		1964-65		1965-66		1966-67	
	Number	Approx. Value \$	Number	Approx. Value \$	Number	Approx. Value \$	Number	Approx. Value \$	Number	Approx. Value \$
Beaver	19,619	400,000	14,046	281,000	8,556	165,600	11,426	228,500	12,057	299,000
Muskrat	85,000	85,000	49,000	49,000	38,800	40,700	27,100	27,100	41,300	24,800
Mink	22,000	660,000	22,500	500,000	18,400	435,600	15,800	347,600	13,600	310,100
Marten	8,000	128,000	6,200	93,000	10,400	127,600	7,510	112,600	5,510	86,000
Land Otter	3,000	66,000	2,300	57,000	3,270	85,000	4,010	112,300	3,280	75,400
White Fox	1,500	27,000	1,200	22,000	2,320	41,700	1,500	33,000	1,670	41,700
Other Fox	1,000	5,000	1,000	5,000	1,200	13,200	2,080	29,100	2,200	24,200
Lynx	2,500	32,500	4,700	47,000	4,650	102,300	6,210	217,400	1,920	67,200
Weasel	1,000	1,000	1,500	1,500	1,110	1,300	1,240	1,000	1,510	1,900
Squirrel	500	200	790	300	250	100	290	100	230	100
Total No.	144,119		103,236		88,956		77,166		83,277	
Total Value		1,404,700		1,055,800		1,013,270		1,108,600		930,400

Table 2. Estimated furbearer harvest, 1966-67 season, by Game Management Unit. The trapper's residence is used as the location where the furbearers were harvested.

Game Mgmt. Unit	Beaver**	Mink	Muskrat	Marten	Land Otter	White Fox	Other Fox	Weasel	Lynx	Squirrel
1	99	1,480	20	860	510	0	20	30	20	0
2	28	840	0	600	100	0	0	<10	0	0
3	9	1,370	0	340	300	0	0	20	0	<10
4	15	600	10	570	230	50*	0	<10	0	<10
5	0	0	0	0	0	0	0	0	0	0
6	222	60	40	20	<10	0	0	20	10	<10
7	14	60	20	10	20	0	<10	60	20	0
8	232	0	0	0	170	0	140	10	0	0
9	810	460	100	<10	210	20*	370	40	140	10
10	0	0	0	0	0	0	30	0	0	0
11	28	<10	0	0	<10	0	0	0	0	0
12	83	0	2,260	30	<10	0	<10	20	70	10
13	213	20	0	<10	<10	0	20	20	120	<10
14	463	120	250	370	20	160*	70	70	90	0

Table 2. Continued.

Game Mgmt. Unit	Beaver**	Mink	Muskrat	Marten	Land Otter	White Fox	Other Fox	Weasel	Lynx	Squirrel
15	50	150	0	0	20	0	< 10	20	10	0
16	625	80	< 10	170	0	0	10	70	50	0
17	2,711	230	540	< 10	210	< 10	480	10	30	0
18	765	3,540	19,800	50	1,090	860	570	80	330	0
19	1,105	1,560	180	450	100	0	10	< 10	< 10	0
20	2,164	680	1,220	740	60	20*	150	210	260	50
21	1,631	590	150	400	110	0	30	30	110	0
22	69	< 10	0	< 10	< 10	80	50	0	30	0
23	0	340	3,160	0	10	0	20	20	40	0
24	432	240	10	140	60	0	20	10	40	0
25	265	690	13,300	730	30	70*	180	70	490	140
26	0	0	0	0	0	390	< 10	0	0	< 10
Unknown	6	500	10	0	10	30	10	10	30	0

* White fox do not occur in these Units; the reported harvest is indicative of the possible inaccuracies of the estimates.

** Actual number of furs harvested from the Unit (not an estimate).

< Indicates less than.

Table 3. Comparison of actual harvest of beaver in 1967 with the estimated harvest derived from fur export reports and fur dealer reports.

Game Management Unit	Actual Number of Beaver Harvested from the Unit	Estimated Number of Beaver Harvested
1	99	490
2	28	0
3	9	40
4	15	130
6	222	50
7	14	240
8	232	70
9	810	1,360
11	28	0
12	83	0
13	213	50
14	463	440
15	50	20
16	625	150
17	2,711	3,780
18	765	1,260
19	1,105	1,660
20	2,164	1,030
21	1,631	1,420
22	69	40
23	0	0
24	432	620
25	265	550
Unknown	6	20

Table 4. Average pelt values, value of exported pelts, and value of the estimated harvest for the 1966-67 season.

Species	Average Value All Sizes and Areas	Number Exported	Value of Exported Pelts	Estimated Harvest	Value of Estimated Harvest
Beaver	\$24.80	11,278	\$279,694	12,057*	\$299,000
Mink	22.80	11,446	260,969	13,600	310,100
Muskrat	.60	34,677	20,806	41,300	24,800
Marten	15.60	4,620	72,072	5,510	86,000
Otter	23.00	2,750	63,250	3,280	75,400
White Fox	25.00	1,405	35,125	1,670	41,700
Other Fox	11.00	1,850	20,350	2,200	24,200
Weasel	1.25	1,270	1,587	1,920	67,200
Lynx	35.00	1,615	56,525	1,510	1,900
Squirrel	.45	<u>194</u>	<u>87</u>	<u>230</u>	<u>100</u>
Total Number		71,105		83,277	
Total Value			\$810,465		\$930,400

* Number of beaver sealed.

Table 5. 1966-67 comparison of percentage of pelts exported by trappers, fur dealers and other persons.

	Beaver	Mink	Muskrat	Marten	Otter	White Fox	Other Fox	Weasel	Lynx	Squirrel
% Exported by Trappers	8.4	20.1	5.2	23.8	24.0	11.0	33.9	29.8	20.1	37.1
% Exported by Fur Dealers	91.3	73.8	93.5	71.0	72.8	83.9	63.1	61.6	76.3	19.1
% Exported by Other Persons*	0.3	6.0	1.3	5.2	3.1	5.1	2.9	8.6	3.6	43.8
Total % Exported by Trappers		11.8								
Total % Exported by Fur Dealer		85.6								
Total % Exported by Other Persons		2.7								

* This category was previously included with the % exported by trappers in the data for 1964-65 and 1965-66.

Table 6. 1966-67 fur dealer export and fur dealer purchase comparison.

	Beaver	Mink	Muskrat	Marten	Otter	White Fox	Other Fox	Weasel	Lynx	Total	%
Pelts purchased by fur dealers from trappers	5,934	5,813	15,101	1,594	1,178	161	699	696	596	31,772	(52)
Pelts exported by fur dealers	10,292	8,452	32,419	3,280	2,003	1,179	1,168	782	1,232	60,807	(100)

Only 52% of the pelts exported by fur dealers were reported on purchase reports.

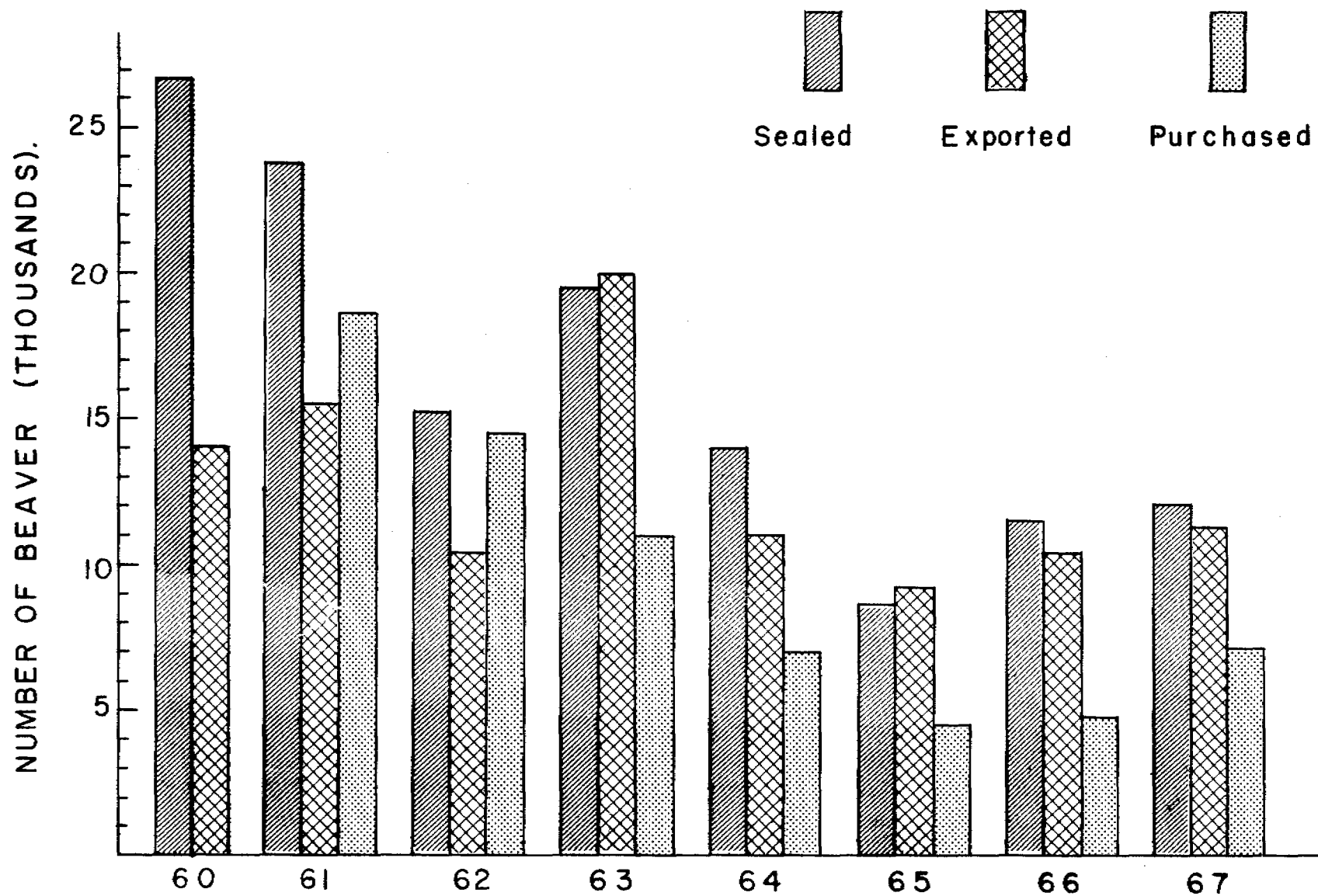


Fig. 1. Comparison of beaver sealed, beaver exported, and beaver purchased.

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STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3 TITLE: Small Game and Furbearer Investigations

STUDY PLAN: A TITLE: Furbearers

JOB NO.: 4 TITLE: Lynx: Productivity and Breeding

PERIOD COVERED: July 1, 1967 to June 30, 1967

ABSTRACT

The 1967-68 lynx collection contained 261 lynx. Only 2 percent were kits. The average number of placental scars per female was 1.45, a decrease from 2.31 in the 1966-67 season.

Trapper lynx harvest was the lowest recorded, 1.63 lynx per trapper. Trappers generally reported low lynx and hare populations. Trappers in the Fort Yukon area reported medium lynx and hare populations. Grouse populations were reported low to medium. Reports from all areas except Rampart and Glennallen indicated an increase in grouse numbers.

RECOMMENDATIONS

Based on the unpublished results of the 1961-64 lynx collections, it appears that the percentage of females in the 1967-68 collection is high. To avoid any potential delay in the recovery of lynx populations, the 1968-69 collection should be carefully monitored to determine if the carcasses purchased for the collection accurately represent the commercial harvest.

Collections from three previous seasons were limited to females. The high percentage of females may be a result of previous collecting activities, i.e. trappers may not have offered males for sale during the early part of the season.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 4

TITLE: Lynx: Productivity and
Breeding

PERIOD COVERED: July 1, 1967 to June 30, 1967

OBJECTIVES

To obtain data on the breeding and physical condition of lynx in Alaska from carcass examinations.

To determine annual productivity and to relate production of young to population trends of lynx.

To study relationships between lynx numbers and abundance of their prey.

TECHNIQUES

Skinned lynx carcasses are purchased from trappers. Collection dates range from November 1, 1967 to March 31, 1968. This collection was primarily limited to females. The carcasses are weighed and measured. The stomach contents are noted. The skull, ulna, radius, and reproductive tract are removed and processed for other observations. Skull characteristics and epiphyseal closure of the ulna and radius are used to determine the approximate age of the specimens, which is checked against age data from tooth sectioning.

The reproductive tracts are placed in water and frozen immediately after they are removed from the carcass. Later they are thawed and examined for placental scars. Both carnu are slit open. The locations of the placental scars are recorded on a diagramatic sketch of the uterus. The color and intensity of the pigment are also noted. The uterus and ovaries are then preserved in 10 percent formalin.

After the ovaries have hardened in formalin, they are macroscopically sectioned to reveal the number of corpora albicantia.

At the time the skulls, ulni and radii are cleaned the canine teeth are removed and preserved in 1 percent formalin. The teeth are then decalcified in an acid solution, sectioned, stained, mounted and examined under low-power magnification to determine the number of cementum layers on the tooth root.

Questionnaires are mailed to trappers to obtain information on trapping success and game populations. The questionnaire provides for observations of density and trends in lynx, hare, and grouse. Small maps were included with the questionnaires sent to trappers not participating the previous season.

An index has been established to evaluate the answers to the questionnaire. The index is derived by giving each answer a numerical value: high or more equals nine, medium or the same equals five, and low or fewer equals one. An index value of 9.00 would indicate that all responses indicated either a high population or the animals were more abundant. An index value of 1.00 would indicate that all responses indicated either a low population or that there were fewer animals than the previous year.

FINDINGS

Breeding and Physical Condition of Lynx

Canine teeth of adult lynx from the 1964-65 to the 1967-68 collection have been decalcified, sectioned, stained, and read to determine the number of cementum layers. Five to 10 percent of the collection will have to be rechecked by the same process using another canine tooth. The entire collection will be reread by other observers before the ages are tabulated.

Table 1 lists the sources and basic age break-down of the 1967-68 collection. The ages are determined by the degree of epiphyseal fusion and skull characteristics. Sex and age ratios for the entire collection are presented in Table 2.

Placental scar information is presented in Table 3. Lynx populations are low throughout the study area and the result is a very small sample of females for this period.

The average number of placental scars per female from the 1967-68 collection was 1.45, a decrease from 2.31 in 1966-67.

Lynx Numbers and Prey Abundance

Questionnaires have been mailed out to trappers around the close of the lynx trapping season since 1966. The response has been quite variable. One hundred and nine out of 295 returned the forms in 1966; 63 returned the forms in 1967; and 94 out of 255 returned questionnaires in 1968. The low return experienced in 1967 and 1968 is probably due to the low lynx population and the resulting low lynx catch.

Table 1. Lynx specimen record for 1967-68.

Fort Yukon Area

	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
Adults	4M 5F	1M 3F	4M 4F	4M 1F	2M 1F
Subadults	0 0	0 1F	0 0	0 0	0 0
Kits	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 1F</u>	<u>1M 0</u>
Total	9	5	8	6	4

Fairbanks Area

	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
Adults	0 3F	5M 4F	1M 1F	1M 0	1M 1F
Subadults	0 0	1M 1F	0 0	0 1F	0 0
Kits	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>
Total	3	11	2	2	2

Tok Area

	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
Adults	3M 2F	4M 3F	6M 3F	4M 0	5M 0
Subadults	0 0	0 0	0 0	0 0	1M 1F
Kits	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>1M 1F</u>
Total	5	7	9	4	9

Glennallen Area

	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
Adults	0 2F	7M 5F	2M 3F	3M 4F	8M 6F
Subadults	1M 1F	1M 2F	1M 4F	1M 2F	2M 2F
Kits	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>	<u>0 0</u>
Total	4	15	10	10	18

Table 1. Lynx specimen record for 1967-68 (Continued).

Other Areas									
	<u>November</u>		<u>December</u>		<u>January</u>		<u>February</u>		<u>March</u>
Adults	1M	2F	1M	1F	3M	3F	0	1F	1M 3F
Subadults	0	0	0	0	0	1F	1M	0	0 0
Kits	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u> <u>0</u>
Total	3		2		7		2		4

TOTAL AND PERCENTAGE	<u>November</u>	<u>December</u>	<u>January</u>	<u>February</u>	<u>March</u>
ALL AREAS	24 (15%)	40 (25%)	36 (22%)	24 (15%)	37 (23%)

SEASON TOTAL: 161

Table 2. Sex and age ratios of the 1967-68 lynx collection.

Kits F	Subadult F	Adult F	Kits M	Subadult M	Adult M
2 (1%)	16 (10%)	61 (38%)	2 (1%)	9 (6%)	71 (44%)
Kits M and F		Subadults M and F		Adults M and F	
4 (2%)		25 (16%)		132 (82%)	

Area Description

The area covered by the survey includes the Yukon Valley from the village of Tanana to the Canadian Border; the Tanana Valley from the mouth of the Tanana River to the Canadian Border; and the Copper River Valley from the headwaters to Chitna. The area has been subdivided into seven parts corresponding with trappers residences and patterns of lynx utilization. The seven areas are Fairbanks, Delta Junction, Tok, Glennallen, Ft. Yukon, Rampart, and Minchumina. A miscellaneous area has been established to include a few responses from the general area which do not fit into the seven sub-areas.

Lynx Populations

The average lynx harvested per trapper declined for the third consecutive year. The 1968 average was 1.63 lynx per trapper compared with 3.95 lynx per trapper in 1967 (Table 3). Ft. Yukon and Delta Junction were the only two areas where trappers did not unanimously report a low lynx population (Table 4). One trapper out of eight from Delta Junction reported a medium lynx population and six trappers out of nine in the Ft. Yukon area reported a medium lynx population. Sixty-nine of 91 trappers felt there were fewer lynx than the 1967-68 season than there were in the 1966-67 season. There were enough trappers in the Ft. Yukon area (three out of nine) who were of the opinion there were more lynx than in the 1967-68 season to raise the index above the 5.00 mark. One of eight trappers in Delta Junction was of the opinion there were more lynx than the previous season, and one of twelve trappers in the Tok area was of the opinion that there was an increase over the previous season (Table 4).

Hare Populations

Very low hare populations were reported in six of the seven areas (Table 5). Ft. Yukon was the exception. In 1967 Ft. Yukon trappers reported an index of 4.20 and in 1968 the index had increased to 5.89. Ft. Yukon trappers were the only trappers to report high hare populations in any of the seven areas. Ft. Yukon trappers had a significantly higher catch per trapper than trappers in the rest of the areas (Table 3). Despite generally low rabbit populations in the other areas, the index for all areas indicates there were more hare in the 1967-68 season than the previous season (Table 5).

Grouse Populations

Trappers reported a continuing increase in the abundance of grouse in all areas except Minchumina (Table 6). Only a small increase in the index was reported for Glennallen and an increasing number of Glennallen trappers believe there were more grouse than the previous season. Ft. Yukon had the highest abundance index and second highest trend index (Table 4). Minchumina had a higher trend index; however, only two trappers have been reporting from Minchumina and in 1968 they both agreed that there were more grouse than previous seasons.

Table 3. Summary of replies to the 1968 questionnaire on lynx harvest.

	<u>No. of Responses*</u>	<u>No. of Lynx Harvested</u>	<u>Average Catch per Trapper</u>
Fairbanks	17	9	.5
Delta Junction	6	4	.7
Tok	9	3	.3
Glennallen	19	18	.9
Fort Yukon	9	68	7.6
Rampart	4	7	1.7
Minchumina	1	0	0.0
Other Areas	6	7	1.2
Combined	71	116	1.63

Largest reported catch - 25

* Trappers not answering the question, "How many lynx did you take?" were considered to have trapped and not caught lynx.

Table 4. Summary of replies to the 1968 questionnaire on lynx populations.

	Abundance in 1967-68 Season				Comparison with 1966-67 Season			
	High	Medium	Low	Index*	More	Same	Fewer	Index*
Fairbanks	0	0	23	1.00	0	3	20	1.52
Delta Junction	0	1	7	1.50	1	1	6	2.50
Tok	0	0	12	1.00	1	1	10	2.00
Glennallen	0	0	24	1.00	0	6	18	2.00
Fort Yukon	0	6	3	3.64	3	4	2	5.45
Rampart	0	0	4	1.00	0	0	4	1.00
Minchumina	0	0	2	1.00	0	0	2	1.00
Other Areas	0	0	9	1.00	0	2	7	1.89
Combined	0	7	84	1.31	5	17	69	2.19

* See section on Techniques for explanation of index.

Table 5. Summary of replies to the 1968 questionnaire on hare populations.

	<u>Abundance in 1967-68 Season</u>				<u>Comparison with 1966-67 Season</u>			
	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Index*</u>	<u>More</u>	<u>Same</u>	<u>Fewer</u>	<u>Index*</u>
Fairbanks	0	3	20	1.52	5	9	9	4.30
Delta Junction	0	1	7	1.50	3	2	3	5.00
Tok	0	2	10	1.67	6	3	2	6.45
Glennallen	0	1	23	1.17	3	8	13	3.33
Fort Yukon	4	3	2	5.89	7	2	0	8.11
Rampart	0	0	5	1.00	0	1	4	1.80
Minchumina	0	0	2	1.00	1	1	0	7.00
Other Areas	0	2	8	1.80	2	6	1	5.44
	—	—	—	—	—	—	—	—
Combined	4	12	77	1.86	27	32	32	4.89

* See section on Techniques for explanation of index.

Table 6. Summary of replies to the 1968 questionnaire on grouse populations.

	<u>Abundance in 1967-68 Season</u>				<u>Comparison with 1966-67 Season</u>			
	<u>High</u>	<u>Medium</u>	<u>Low</u>	<u>Index*</u>	<u>More</u>	<u>Same</u>	<u>Fewer</u>	<u>Index*</u>
Fairbanks	4	11	8	3.78	14	5	4	6.74
Delta Junction	1	3	4	3.50	3	3	2	5.50
Tok	1	5	6	3.33	7	3	2	6.66
Glennallen	0	7	17	1.53	8	6	9	4.83
Fort Yukon	3	6	0	6.33	6	3	0	7.66
Rampart	1	2	2	4.20	1	2	2	4.20
Minchumina	0	1	1	3.00	2	0	0	9.00
Other Areas	1	5	3	4.11	4	3	1	6.50
	—	—	—	—	—	—	—	—
Combined	11	40	41	3.69	45	25	20	6.11

* See section on Techniques for explanation of index.

Comparable data for the 1966 survey and the 1967 survey are contained in Volume VIII Annual Project Segment Report, Federal Aid to Wildlife Restoration, Project W-13-R-2, Work Plan A.

Questionnaire form, letter to the trapper, and the report of the results of the survey which is sent to the trappers were essentially the same as those used in the 1967 survey and have therefore not been presented in this report.

PREPARED AND SUBMITTED BY:

APPROVED BY:

Oliver E. Burris
Study Leader


Director, Division of Game

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 6

TITLE: Lynx: Habits, Movements,
and Mortality

PERIOD COVERED: July 1, 1967 to June 30, 1968

ABSTRACT

Due to lack of personnel this Job was not initiated.

RECOMMENDATIONS

No recommendations are made relative to management.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 6

TITLE: Lynx: Habits, Movements,
and Mortality

PERIOD COVERED: July 1, 1967 to June 30, 1968

OBJECTIVES

1. To obtain information on lynx habits.
2. To experiment with various techniques of trapping and marking (including ingested stains and dyes) to learn of lynx movements.
3. To learn why trapping is selective for sex and age with regard to time.
4. To determine seasonal movements and changes of seasonal movement patterns at high and low lynx densities.

TECHNIQUES

Work was not started on this Job.

STUDY PLAN SEGMENT REPORT
FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 7

TITLE: Beaver: Affidavit Analysis

PERIOD COVERED: July 1, 1967 to June 30, 1968

ABSTRACT

High percentages of kits in the harvest for Game Management Units 9, 17, 18, 19b, and 21b were indicative of overharvest. Identifying tributaries where harvest problems are most severe is difficult because of inadequate harvest data.

RECOMMENDATIONS

Improve recording of harvest locations on beaver sealing documents. Redesign beaver trapline information forms (FG200) specifically to obtain information by management areas.

STUDY PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3 TITLE: Small Game and Furbearer Investigations

STUDY PLAN: A TITLE: Furbearers

JOB NO.: 7 TITLE: Beaver: Affidavit Analysis

PERIOD COVERED: July 1, 1967 to June 30, 1968

OBJECTIVES

To compile, analyze, and summarize available data on utilization of beaver populations.

TECHNIQUES

Since 1957 the stretched pelts of beaver have been sealed and measured to enumerate the harvest and separate the entire catch into age classes. In Alaska beaver hides are traditionally stretched round. The measurement used to establish age classes is the sum of the diameter taken from nose to base of tail and the medial diameter. The young of the year, or kits, are those beaver where the measurement is less than 53 inches, beaver skins measuring between 53 and 59 inches are considered yearlings, and pelts over 59 inches are adults. The data is compiled by Game Management Unit and comparisons are made yearly. The age breakdown, the total number of beaver harvested, the total number of trappers, and the average number of beaver per trapper is compared annually for each Game Management Unit.

Since 1964 several Game Management Units have been subdivided with different seasons and bag limits in the various subdivisions. Prior to 1966 no analysis was made of the harvest within the subunits. The harvest has been broken down by drainages in several Game Management Units to provide information on regulation changes.

FINDINGS

The standard beaver affidavit analysis made since 1957 is presented in Table 1. The 1967 harvest of 12,057 beaver increased only slightly over the 1966 harvest of 11,426. The average number of beaver per trapper took a substantial increase from 8.8 beaver per trapper in 1966 to 10.4 beaver per trapper in 1967. The tributary analysis which commenced in 1966 on Game Management Units 19 and 21 was expanded to include Units 7, 8, 9, 12 through 21, 24, and 25. The harvest data from Units 19 and 21 is compared for 1966 and 67. These are the only two Units in which comparable information is available for both years by Unit subdivisions.

Table 1. Beaver affidavit analysis, 1957-67.

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
1	1957	No open season						
	1958	15	24.8	35.7	64.3	330	38	8.7
	1959	15	24.6	37.7	62.3	69	8	8.6
	1960	15	6.9	31.0	69.0	115	14	8.2
	1961	15	28.5	45.9	54.0	99	12	8.2
	1962	15	21.9	34.2	65.8	42	5	8.4
	1963	15	12.4	31.3	68.6	180	20	9.0
	1964	50	16.1	32.7	67.1	204	17	12.0
	1965	50	17.7	43.5	56.5	62	5	12.4
	1966	50	18.9	44.5	55.0	180	19	9.6
2	1967	50	16.2	30.3	69.7	99	12	8.3
	1957	No open season						
	1958	15	22.7	36.4	63.7	22	10	2.2
	1959	15	22.2	37.0	63.0	27	2	13.5
	1960	15				75	13	5.8
	1961	15	25.0	39.2	58.9	56	8	7.0
	1962	15	No harvest reported					
	1963	15	21.1	53.7	46.1	52	5	10.4
	1964	50	21.6	49.7	50.3	157	12	13.1
	1965	50	24.7	54.8	45.2	73	8	9.1
3	1966	50	33.3	45.8	54.2	55	9	6.1
	1967	50	32.1	60.7	39.3	28	4	7.0
	1957	No open season						
	1958	15			100.0	115	13	8.35
	1959	15	6.3	6.2	93.8	16	3	5.3
	1960	15				57	17	2.8
	1961	15						
	1962	15	No harvest reported					

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
3	1963	15	31.6	57.9	42.1	21	5	4.2
	1964	50	22.5	42.5	57.5	40	3	13.3
	1965	50		33.3	66.6	6	1	6.0
	1966	50			100.0	4	3	1.3
	1967	50	11.1	55.5	44.5	9	4	2.1
	4 ^{1/2}							
	1962	15	30.5	56.8	33.2	36	3	12.0
	1963					16	1	16.0
	1964	50						
	1965	50			100.0	1	1	1.0
	1966	50	No harvest reported					
	1967	50	6.7	33.4	46.6	15	2	7.1
	6							
3	1957	20	24.1	40.0	60.0	245	16	15.3
	1958	20	12.9	28.0	72.0	264	15	17.6
	1959	20	14.3	20.2	79.8	168	11	15.3
	1960	40	14.3	35.7	64.3	304	15	20.3
	1961	40	13.2	31.0	68.9	264	15	17.6
	1962	40	13.5	27.1	72.9	155	10	15.5
	1963	50	13.7	24.4	75.6	305	11	27.7
	1964	50	12.3	29.0	71.0	155	8	19.4
	1965	50	20.7	41.5	57.8	135	13	10.4
	1966	50 and no limit ^{3/}	15.0	38.9	61.1	169	9	18.8
	1967	50 and no limit ^{3/}	13.5	32.9	67.1	222	7	31.5

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
7	1957	20	22.7	48.0	52.0	75	14	5.4
	1958	20	15.7	34.8	65.2	89	18	5.0
	1959	20	34.0	52.3	47.7	44	8	5.5
	1960	15	17.2	35.4	64.6	393	67	5.0
	1961	15	15.8	22.4	66.0	236	39	6.0
	1962	15	17.3	36.0	64.4	259	57	4.5
	1963	20	24.5	45.2	54.7	106	15	7.1
	1964	20	30.8	61.5	38.5	13	4	3.3
	1965	20	31.7	51.2	48.8	41	9	4.5
	1966	20	12.0	44.0	56.0	25	10	2.5
	1967	20	7.1	28.5	71.5	14	2	7.0
8	1957	15	23.6	32.9	67.1	140	15	9.3
	1958	20	21.3	35.7	64.3	235	24	9.8
	1959	20	22.7	40.9	59.1	154	12	12.9
	1960	40	28.4	47.7	52.3	369	25	14.8
	1961	No limit	20.1	34.4	64.9	154	10	15.4
	1962	No limit	18.3	33.3	56.7	185	13	14.2
	1963	No limit	22.7	42.4	55.6	268	22	12.2
	1964	No limit	23.3	48.6	51.4	210	18	11.7
	1965	No limit	33.3	51.0	49.0	102	11	9.3
	1966	No limit	25.6	43.2	56.8	199	16	12.4
	1967	No limit	18.5	40.5	59.5	232	9	25.7
9	1957	15	17.0	25.9	74.1	1,469	138	10.6
	1958	15	22.4	34.2	65.8	1,515	141	11.0
	1959	15	23.9	34.7	65.3	1,975	170	11.6
	1960	20	21.9	32.3	67.8	1,768	115	15.4

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
9	1961	20	19.8	32.0	67.3	2,319	161	14.4
	1962	15	28.3	38.0	62.0	933	82	11.3
	1963	15	19.9	34.9	65.1	2,080	161	12.9
	1964	15	26.3	37.9	62.0	951	91	10.5
	1965	15	17.6	31.4	68.6	494	47	10.6
	1966	40 & 15 ² / ₃	22.6	39.2	60.8	554	49	11.3
	1967	40 & 15 ³ / ₃	25.3	39.0	61.0	810	69	11.5
11	1957	20	12.8	15.4	84.6	39	5	7.8
	1958	20			100.0	20	4	5.0
	1959	20	8.5	16.9	83.1	59	5	11.8
	1960	20	35.0	50.0	50.0	20	2	10.0
	1961	20	5.0	30.0	70.0	20	2	10.0
	1962	20				2	1	2.0
	1963	20				16	3	5.3
	1964	20	5.1	30.8	69.2	39	6	6.5
	1965	20	16.7	25.0	75.0	12	2	6.0
	1966	20	0.0	50.0	50.0	4	2	2.0
	1967	20	3.6	10.7	89.3	28	2	14.0
12	1957	5	2.8	13.2	86.8	106	40	2.6
	1958	15	10.5	13.9	86.1	409	85	4.8
	1959	15	11.6	15.1	84.9	423	80	5.3
	1960	15	17.2	35.4	64.6	393	67	5.9
	1961	15	15.8	22.4	66.0	236	39	6.0
	1962	15	17.3	36.0	64.4	259	57	4.5
	1963	15	22.7	32.5	67.5	255	67	3.8
	1964	15	16.0	33.2	66.3	205	63	3.2
	1965	15	6.1	28.3	70.7	99	45	2.2
	1966	15	14.5	32.7	67.3	55	23	2.4
	1967	15	10.8	25.3	74.7	83	23	3.1

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
13	1957	20	20.0	23.5	71.5	165	24	6.9
	1958	20	12.9	22.5	71.5	473	59	8.0
	1959	20	16.4	28.3	71.7	385	37	10.4
	1960	20	23.2	36.9	63.1	507	59	8.6
	1961	20	23.9	44.3	55.0	206	21	9.8
	1962	20	27.5	34.0	66.0	98	13	7.5
	1963	20	19.1	40.6	59.4	335	51	6.6
	1964	20	20.7	34.8	64.1	376	43	8.7
	1965	20	14.6	36.5	63.5	137	28	4.9
	1966	20	19.1	32.8	67.2	257	41	6.3
	1967	20	14.6	34.3	65.7	213	31	6.3
14	1957	20	17.7	36.2	63.8	923	84	11.0
	1958	40	16.4	30.6	69.4	1,204	96	12.6
	1959	40	27.2	50.7	49.3	647	49	13.2
	1960	40	24.1	43.4	56.7	844	68	12.4
	1961	40	23.9	44.3	55.0	877	69	9.8
	1962	40	22.3	45.9	54.1	493	38	12.9
	1963	40	24.9	48.1	51.9	789	83	9.5
	1964	40	21.2	46.0	54.0	655	60	10.9
	1965	40	22.2	43.3	56.7	365	41	8.9
	1966	40	16.7	41.6	58.4	665	99	6.7
	1967	40	17.7	41.0	59.0	463	45	10.1
15	1957	20	17.2	37.9	62.1	303	26	11.7
	1958	40	16.4	27.5	72.5	360	30	12.0
	1959	40	29.8	46.4	53.6	168	15	11.2
	1960	40	17.5	35.3	64.7	379	20	18.9
	1961	40	15.1	33.9	66.1	438	20	21.9
	1962	40	17.7	33.9	66.1	180	14	12.8

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
15	1963	40	18.1	33.2	66.8	254	25	10.1
	1964	40	19.4	36.3	63.7	237	24	9.9
	1965	40	23.8	52.4	42.8	21	4	5.2
	1966	40	20.0	44.0	56.0	25	7	3.6
	1967	40	24.0	34.0	66.0	50	8	6.2
16	1957	20	19.4	41.9	58.1	62	5	12.4
	1958	40	13.7	25.7	74.3	1,148	45	25.5
	1959	40	22.1	39.7	60.3	1,715	72	23.8
	1960	40	15.1	35.3	64.7	2,200	95	23.2
	1961	40	20.9	37.9	62.3	1,309	63	20.7
	1962	40	34.3	43.3	56.7	524	34	15.4
	1963	40	18.1	38.3	61.7	1,305	66	19.7
	1964	40	19.5	38.7	62.3	798	39	20.5
	1965	40	15.7	42.5	57.5	381	17	22.4
	1966	40	15.9	39.6	60.4	510	28	18.2
	1967	40	20.5	43.4	56.6	625	27	23.4
17 ^{2/}	1957	10	22.9	36.8	63.2	367	46	8.0
	1958	15	19.1	33.0	67.0	3,165	263	12.0
	1959	10	19.6	29.4	70.6	3,245	369	8.8
	1960	15	24.3	34.2	65.8	3,721	279	13.3
	1961	15	23.1	24.7	65.2	2,849	230	12.3
	1962	15	29.5	41.5	58.5	1,903	175	10.8
	1963	15	23.3	36.8	63.2	2,172	189	11.5
	1964	15	28.4	38.4	61.6	1,766	180	9.8
	1965	15	22.1	34.9	65.1	957	97	9.9
	1966	15	25.2	37.9	62.1	1,424	143	10.0
	1967	15	25.3	37.0	63.0	2,711	215	12.6

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
18	1957	No open season						
	1958	No open season						
	1959	10	31.2	45.1	54.9	2,766	357	7.7
	1960	10	25.7	38.7	61.3	2,013	260	7.7
	1961	10	28.9	44.6	55.3	1,428	187	7.6
	1962	10	34.9	45.1	54.8	817	116	7.0
	1963	10	33.3	50.1	49.9	1,503	202	7.4
	1964	10	30.3	44.7	54.9	666	116	5.7
	1965	10	18.6	36.4	63.6	264	41	6.4
	1966	10	30.6	46.0	54.0	411	66	6.2
19	1967	10	31.7	48.6	51.4	765	100	7.6
	1957	15	12.5	24.8	75.2	2,200	200	11.1
	1958	20	15.5	24.0	76.0	3,852	256	15.1
	1959	20	16.3	29.3	70.7	4,034	284	14.2
	1960	20	16.7	30.0	70.0	3,128	210	14.9
	1961	20	17.5	30.8	69.1	4,576	307	14.9
	1962	20	19.7	35.2	65.8	3,035	219	13.9
	1963	15	20.0	34.9	65.1	2,250	196	11.4
	1964	25 & 15 ^{3/4}	20.0	32.6	67.3	2,148	176	12.2
	1965	25 & 15 ^{3/4}	30.7	42.5	57.5	1,290	128	10.1
20	1966	25 & 15 ^{3/4}	27.6	39.5	60.5	1,510	137	11.0
	1967	25 & 10 ^{3/4}	16.3	28.0	72.0	1,105	140	7.1
	1957	15	8.9	16.6	83.4	641	74	8.8
	1958	20	8.7	19.7	80.3	1,869	152	12.3
	1959	20	4.1	17.7	82.3	1,242	119	10.4
	1960	20	9.1	23.3	76.7	1,540	145	10.6
	1961	20	11.4	24.5	75.5	1,435	129	11.1
	1962	20	15.8	25.7	74.1	1,139	96	10.2
	1963	20	9.6	21.7	78.3	1,514	133	13.3

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
20	1964	25	12.2	23.0	76.0	2,176	194	11.2
	1965	25	9.6	24.4	76.7	1,671	163	10.2
	1966	25	14.5	30.5	69.5	1,415	231	6.1
	1967	25	9.0	22.4	77.6	2,164	187	11.1
21	1957	15	12.3	23.4	76.6	5,460	490	11.1
	1958	20	11.0	22.6	77.4	6,871	499	13.8
	1959	20	12.7	26.2	73.8	5,771	425	13.6
	1960	20	12.0	25.8	74.2	5,945	381	15.6
	1961	20	12.8	28.7	71.1	5,488	356	15.4
	1962	20	13.6	32.4	67.6	3,833	288	13.3
	1963	20	14.5	29.1	70.9	4,638	343	13.5
	1964	20	16.0	31.3	68.6	2,067	212	9.7
	1965	15	13.7	30.4	69.6	1,478	182	8.7
	1966	15	13.8	29.3	70.7	2,760	261	10.6
	1967	15	13.4	27.7	72.3	1,631	166	9.8
22	1957	No open season						
	1958	10	45.2	54.8	45.2	42	10	4.2
	1959	10	18.8	35.4	64.6	48	14	3.4
	1960	10	25.8	41.9	58.1	62	12	5.2
	1961	10	4.7	14.2	85.7	21	3	7.0
	1962	10	26.1	38.2	61.8	42	7	6.0
	1963	20						
	1964	50	19.4	27.6	72.4	98	14	7.0
	1965	50	2.3	13.6	86.4	44	4	11.0
	1966	50	23.2	37.7	62.3	69	6	11.5
	1967	50	20.3	39.1	60.9	69	7	9.6

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
23	1957	15			100.0	5	1	5.0
	1958	No open season						
	1959	15				0	0	
	1960	15				0	0	
	1961	15	12.5	50.0	50.0	8	1	8.0
	1962	15		30.0	70.0	7	2	3.5
	1963	15				3	1	3.0
	1964	15						
	1965	15			100.0	5	1	5.0
	1966	15				0	0	
	1967	20				0	0	
24	1957	20	8.2	22.0	78.0	1,486	96	15.5
	1958	25	6.2	23.2	76.8	1,841	105	17.5
	1959	25	6.8	17.6	82.4	1,434	97	14.8
	1960	25	13.0	30.2	69.8	1,375	79	17.4
	1961	25	11.1	30.9	68.5	1,333	88	15.1
	1962	25	8.2	27.8	72.2	1,066	71	15.0
	1963	25	9.5	27.9	72.1	965	70	13.7
	1964	15	6.9	19.0	80.6	578	64	9.0
	1965	15	3.9	22.2	77.7	436	55	7.9
	1966	15	6.9	17.9	82.1	577	69	7.5
	1967	15	7.6	21.7	78.3	432	43	10.0
25	1957	15	21.7	31.6	68.4	630	77	8.2
	1958	15	25.9	37.1	62.9	625	77	8.1
	1959	15	21.1	38.3	61.7	725	86	8.4
	1960	15	17.3	33.3	66.7	788	61	12.9
	1961	15	13.4	30.2	69.9	644	70	9.2

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
25	1962	15	15.8	29.1	70.9	430	44	9.8
	1963	20	14.6	27.9	72.1	464	63	7.4
	1964	20	18.4	30.9	69.1	488	63	7.7
	1965	20	21.5	35.9	64.1	382	47	8.1
	1966	20	22.1	33.6	66.4	478	88	5.4
	1967	20	22.6	36.6	63.4	265	38	6.4
Miscellaneous Areas	1966		22.5	43.8	56.2	80	10	8.0
	1967				100.0	6	3	2.0

Table 1. Beaver affidavit analysis, 1957-67 (continued).

Game Mgmt. Unit	Year	Limit	Percent Kits (Under 53")	Percent Kits and Yearlings (Under 59")	Percent Adults (Over 59")	Total No. of Beaver	No. of Trappers	Ave. No. Beaver/ Trapper
TOTAL	1957		13.8	25.8	74.2	14,344	1,351	10.6
	1958		14.1	26.2	73.8	24,484	1,940	12.6
	1959		17.9	31.0	69.0	25,115	2,223	11.3
	1960		16.4	29.4	70.6	26,504	2,028	13.1
	1961		17.6	32.2	67.4	23,859	1,800	13.2
	1962		19.1	33.4	66.6	15,187	1,289	11.7
	1963		18.5	34.0	66.0	19,619	1,739	11.3
	1964		19.5	33.6	66.3	14,046	1,589	8.8
	1965		17.4	33.4	66.6	8,556	949	9.0
	1966		---	---	---	11,426	1,316	8.8
	1967		18.2	32.8	67.2	12,057	1,165	10.4

1/ Either no open season or no beaver taken during 1957-1961 in Units 4, 5, 10 and 26.

2/ Part of Unit 17 closed in 1957 and 1958.

3/ Unit was divided with different bag limits in the subdivisions.

11 year average (1957-67)	17,736
11 year range (1957-67)	8,556 - 26,504
11 year average (1957-67) no. of trappers	1,589

Game Management Unit 9

Virtually all rivers and streams draining into Bristol Bay north and east of Ugashik Bay exceeded 25% kits in the harvest. Eighty-three percent of the beaver harvested in Unit 9 came from this area. Only 78 beaver or 9% of the harvest came from the Cook Inlet side of Unit 9 which has a bag limit of 40.

Game Management Unit 17

Three hundred and thirty-four beaver were harvested from the drainages of Unit 17 west of Cape Constantine. Forty-one percent of the 334 beaver were kits.

Several tributaries of the Nushagak River had very high percentages of kits in the harvest. Table 2 lists the tributaries for areas within the Nushagak drainage where the percentage of kits in the harvest exceeded 25%.

Table 2. Tributaries of the Nushagak with more than 25% kits in the harvest.

Stream or Area	Total No. of Beaver	% Kits	Average No. Beaver per Trapper	No. and % Trappers with Limit	
				No.	%
Wood R., Aleknagik L., Grant L., & Mucklung R.	88	29.5	9.8	3	(33)
Kukwuk & Nameless Cr.	371	30.7	12.0	14	(45)
Klutuk R.	151	33.1	11.6	6	(46)
Totals	610	31.2	11.5	23	(43)

Several other small tributaries; Portage Creek, Squaw Creek, and unspecified tributaries in the vicinity of Kolignek had more than 25% kits in the harvest but were not included in Table 2. In the entire Nushagak drainage, with a harvest of 1,754 beaver, 435 or 24.8% were kits. The tributaries indicating a high utilization of beaver were below the confluence of the Mulchatna River.

Game Management Unit 18

The 1967 tributary analysis of Game Management Unit 18 has revealed that the major streams contributing to the high percentage of kits harvested in the entire Unit are streams which drain into the Kuskokwim River and Kuskokwim Bay. Almost all of the tributaries, large or small, in this area have an excessively high percentage of kits. Sixty-five percent of the beaver harvested in Unit 18 are taken from tributaries which have a high percentage of kits in the harvest (Table 3).

Table 3. Drainages in Unit 18 with more than 25% kits in the harvest.

Stream or Area	Total No. of Beaver	% Kits	Average No. Beaver per Trapper	No. and % of Trappers with Limit	
				No.	%
Chuilnak (Yukon drainage)	84	26.2	6.5	4	(31)
Eek	78	34.6	6.0	3	(23)
Kwethluk R. & Kisigalook R.	122	47.5	6.8	6	(33)
Tuluksak	110	29.1	7.3	5	(33)
Unknown trib- utaries of Akiak & Lower Kalsag	102	34.0	5.4	1	(5.3)
Totals	496	35.1	6.4	19	(24)

Game Management Unit 19

Beaver population problems have been reported in Units 18 and 19 as early as 1961. As a result of these reports, Unit 19 was split for the 1964 season, with different bag limits and seasons in the two portions. It was not until after the 1966 harvest that an analysis was made of the harvest on all tributaries in Unit 19. The 1966 analysis indicated that the original restriction had been imposed on an area larger than necessary, and the restrictions did not control the problem. The size of the restricted area was reduced in 1967, and the season and bag limit was reduced in the restricted portion.

Table 4 compares the harvest in the three portions of Unit 19 created by the original subdivision and the re-division made in 1967.

Game Management Unit 20

Despite many local controversies which have been apparent in Unit 20 for a number of years, the beaver harvest has remained at a high level with a relatively small percentage of kits in the harvest. In 1967 only one group of four trappers residing in Nenana had a high percentage of kits in harvest. These trappers did not report the specific drainages they were trapping. Of the 92 beaver which they caught, 31.5% were kits. The next highest group was a similar group of trappers which did not report the specific drainages they trapped on or they trapped on small insignificant drainages in the vicinity of Tanana. Sixty-seven beaver were taken by the Tanana group of trappers and 17.9% were kits.

Game Management Unit 21

In 1966 the harvest from Game Management Unit 21 was analysed to identify the harvest from tributaries of the Yukon River within Unit 21. The tributaries draining into the west side of the Yukon River from the boundary of Unit 18 to and including the Anvik River, the beaver producing habitat on the east side of the Yukon River from the boundary of Unit 18 to the Innoko River, and some of the lower drainages of the Innoko River appeared to have higher percentages of kits in the harvest than the remainder of Game Management Unit 21. The season in that portion of Unit 21 described above was reduced 16 days over the season in the remainder of Unit 21.

Table 5 is a comparison of the harvest data from 1966 and 1967. The inability to separate the more conservative harvest of the upper Innoko River from the harvest on the lower Innoko River below Holikachuk tends to obscure the results of the harvest in Game Management Unit 21B. The Anvik River and the Paimiut Slough had the highest percentage of kits in 1966, with Bonasila River and the Innoko Flats having smaller percentages of kits. In 1967 the percentage of kits dropped on all of these tributaries.

Game Management Unit 24

The harvest in Game Management Unit 24 was identified to tributaries for the first time 1967. The 1967 harvest in Unit 24 was much smaller than any of the previous seasons (Table 1). The cause of decline in the harvest is not apparent, and the tributary analysis does not provide any clues to the cause of the decline.

Game Management Unit 25

A tributary analysis was also made of the 1967 harvest from Game Management Unit 25. The 1967 harvest was considerably lower than the harvest from the previous ten years (Table 1). The tributary analysis indicates that the harvest was very dispersed throughout the Unit. The only tributary with a significant harvest of beaver, also having a high percentage of kits in the harvest, was the Porcupine River. Only 119 beaver were harvested on the Porcupine and its tributaries, and 31 or 26.1% were kits.

Table 4. Unit 19 beaver harvest analysis by Sub-unit.

	Season Length in Days	Bag Limit	Harvest	Percent Kits	Number of Trappers	Average No. Beaver per Trapper	Number and % of Trap- pers with Limit	
							No.	%
Unit 19								
Sub-unit I								
1966	53	15	933	35.2	91	10.2	32	(35%)
1967	28	10	548	24.8	74	7.4	33	(45%)
Sub-unit II								
1966	53	15	224	12.9	19	11.8	4	(21%)
1967	75	25	248	10.1	24	8.5	2	(7%)
Sub-unit III								
1966	75	25	353	11.9	37	9.5	3	(8%)
1967	75	25	209	8.6	37	5.6	0	(0%)

Table 5. Beaver analysis Game Management Unit 21.

	Season Length in Days	Bag Limit	Harvest	Percent Kits	Number of Trappers	Average No. Beaver per Trapper	Number and % of Trap- pers with Limit	
							No.	%
GMU 21 (A)								
1966	59	15	1976	12.1	197	8.8	80	(40%)
1967	59	15	1213	13.1	122	9.9	42	(34%)
GMU 21 (B)*								
1966	59	15	791	17.9	76	10.4	30	(39%)
1967	43	15	418	14.3	44	9.5	13	(31%)

* Compilations for Game Management Unit 21B includes the entire Innoko drainage. The legal description of Game Management Unit 21B does not include any of the Innoko River above Holikachuk.

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APPROVED BY:


Director, Division of Game

STUDY PLAN SEGMENT REPORT

FEDERAL AID IN WILDLIFE RESTORATION

STATE: Alaska

PROJECT NO.: W-13-R-3

TITLE: Small Game and Furbearer
Investigations

STUDY PLAN: A

TITLE: Furbearers

JOB NO.: 8

TITLE: Beaver: Density, Productivity,
and Exploitation

PERIOD COVERED: July 1, 1967 to June 30, 1968

ABSTRACT

Beaver cache surveys were conducted on several tributaries of the Yukon and Kuskokwim Rivers. The reliability of the surveys has not been established.

More caches were seen when caches were counted from a canoe over parts of areas previously counted from an airplane.

The percentage of caches which can be counted from the air may be too small to use aircraft counts as an indicator of beaver population trends. It is also not known if the number of beaver caches in an area reflects beaver population levels.

RECOMMENDATIONS

No recommendations relative to management can be made at this time.

STUDY PLAN SEGMENT REPORT
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TITLE: Beaver: Density, Productivity,
and Exploitation

PERIOD COVERED: July 1, 1967 to June 30, 1968

OBJECTIVES

To gather data on density, productivity, and sex and age structure of beaver populations on selected study areas.

TECHNIQUES

Aerial surveys were conducted on several streams in the Yukon and Kuskokwim Drainages. An aerial survey on the Innoko River was made in a similar manner to the survey conducted in 1966. All observations of beaver houses with caches, beaver houses without caches, and beaver caches were recorded on 1/63,360 or 1/50,000 scale maps. The portion on the Innoko River surveyed in 1966 and 1967 corresponds with the boundaries of the surveys made in 1953, 1954, 1956 and 1957. The survey made on the Holitna River also covered the areas previously surveyed in the 1950's; However, the 1967 survey was expanded to include much more of the drainage. The 1967 counts were compared with the earlier counts.

Aerial counts were initiated on three new count areas, Birch Creek draining into the Yukon River from the south below Fort Yukon; the Chena River draining into the Tanana River at Fairbanks; and the Takotna River draining into the Kuskokwim River at McGrath. The Anvik River draining into the Yukon River at Anvik was also to be surveyed, but unseasonable weather and a lack of time prevented the survey.

The Chena River was navigated by canoe. Beaver caches were plotted on 1/63,360 scale maps and compared with the aerial survey over the same portion of the River.

Studies to determine the productivity, sex and age structure of beaver populations on selected areas were not initiated.

FINDINGS

Innoko River Beaver Cache Survey

Description of the area

The upper end of the count area is located approximately 5 1/2 air miles downstream from Ophir, 63° 09.9'N., 156° 41.7'W. The elevation of the stream at the upper end of the count area is approximately 600 ft. above mean sea level. This section of the count area extends downstream to the confluence with the Dishna River. The elevation of the stream at both the lower end of the Innoko portion and the Dishna portion is approximately 100 ft. above mean sea level. The Dishna portion of the Innoko count area commences approximately 24 miles up the Dishna River from the confluence of the Innoko River (63° 15.7'N., 157° 21.1'W.). The elevation of the Dishna River at the upper end of the Dishna portion of the count area commences at a point (63° 49.3'N., 157° 54.4'W.) about 12 1/2 air miles above the confluence of the Mud River with the Innoko River. The elevation of the Mud River at the upper end of the count areas is slightly higher than 100 ft. above mean sea level, and the elevation at the confluence with the Innoko River is less than 100 ft. above mean sea level. There is very little gradient within the Mud River portion of the area.

Innoko River survey results

Beaver houses and caches were counted on the Innoko River. Two-hundred and ninety houses with caches and houses without caches were observed. All of the houses and caches were plotted on 1/63,360 scale maps. One-hundred and thirty-six houses with caches were observed in 1967 compared with 94 houses with caches observed in the previous year.

Table 1. Innoko River aerial beaver cache counts.

Year	Houses with Caches		Houses without Caches	Total
	No.	%		
1953	177		--	177
1954	187		--	187
1956	111	(76.5%)	34	145
1957	154	(61.0%)	73	227
1966	94	(38.0%)	156	250
1967	136	(47.0%)	154	290

Chena River Beaver Cache Survey

Description of the area

The Chena River beaver survey area extends from the bridge crossing the Chena River at approximately Mile 42 1/2 on the Chena Hot Springs Road (64° 54.9'N., 146° 24.7'W.) to the Cushman Street Bridge in Fairbanks (64° 50.7'N., 140° 43.3'W.). The river and adjacent ponds, sloughs, and ox bows were surveyed by aircraft on October 10, 1967. On October 11, 12, and 13 the main river was surveyed by canoe. The canoe survey commenced approximately five miles below the point where the 1966 canoe survey started. Washouts in the road from the August 1967 flood prevented starting at the original starting point.

Chena River survey results

Fifty-five caches were observed from the canoe in 69 miles of river.

Table 2. Chena River beaver cache counts.

Year	Counting Method	Houses with caches on the main channel of the river.	Ave. number river miles per house with cache on the main stream.	Houses with caches on ponds, lakes, sloughs, and tributaries adjacent to the river.	Total houses with caches seen on all counts (no duplications).
1966	canoe	49	1.5	--	1966 - 49
1967	aircraft	33	2.3	22	
1967	canoe	55	1.25	--	1967 - 73

Forty-nine beaver caches were seen in the 1966 cache count which included approximately five more miles of the Chena River. In 1967 there was an average of one cache per 1.25 miles of river with a possible variation of about one tenth of a mile attributable to inaccuracies of measuring the distance. In 1966 the average was one cache per 1.5 to 1.6 miles of stream.

The cache count conducted with the aid of an aircraft resulted in 51 houses with caches or caches and 10 houses without caches being observed in the entire count area including lakes, ponds, and sloughs adjacent to the river which were not visible on the canoe survey. Thirty-three of the 51 caches observed from the aircraft were observed later by canoe on the river. By aircraft the average was only one cache per 2.3 river miles.

Obviously the aircraft is not as efficient as the canoe in locating beaver caches which are positioned on the main channel of the river.

In 1967 there was a total of 73 beaver caches observed in the count area; 55 from the canoe survey and 18 seen from the air on ponds and sloughs adjacent to the main river.

The total harvest of beaver from the Chena Drainage in the Spring of 1966 was approximately 200 beaver. An accurate accounting of the number of beaver which actually came from the area surveyed is impossible due to insufficient data on the location of the beaver harvest. A maximum of 178 beaver could have been harvested from the beaver survey area. The minimum number of beaver which were known to have been taken from the beaver survey area was 103.

Assuming the increase of beaver caches observed in 1967 reflects a larger beaver population, it is obvious that the population in the beaver survey area will sustain a minimum harvest of 103 beaver and may sustain a harvest approaching 178 beaver.

One of the objectives of commencing the canoe survey in 1966 was to determine if trappers' reports of beaver relocating on the main stream of the river because of extremely low water conditions were indeed valid. The increased number of beaver caches in 1967 following an unusually high flood would indicate that there was not an increased number of beaver caches on the Chena River in 1966 as a result of low water conditions. It is also unlikely that the low water conditions in the fall of 1966 caused unusual beaver mortality during the winter of 1966-67.

There is no information on the average number of beaver per colony in either 1966 or 1967. Therefore, it remains a possibility that the increased number of caches observed in 1967 did not reflect an increase in the beaver population.

Beaver Cache Surveys on the Holitna, Hoholitna Rivers

Description of the area

Beaver surveys were conducted on the Holitna and Hoholitna Rivers in 1953, 1954, 1956, and 1957. The count area extended from the confluence of the Holitna River with the Hoholitna River to Nogamut on the Holitna River. On the Hoholitna, the count area extended from the confluence with the Holitna River up to the confluence with an unnamed creek at approximately $61^{\circ} 05.6'N.$, $156^{\circ} 35.7'W.$

The area counted in 1967 is much larger than the original survey area. The Holitna River was surveyed from its confluence with the Hoholitna River to the point $60^{\circ} 45.0'N.$, $157^{\circ} 52.1'W.$ The Hoholitna was surveyed from its confluence with the Holitna upstream to where the river forks at approximately $64^{\circ} 54.6'N.$, $156^{\circ} 14.5'W.$ Each fork was then surveyed upstream to the point where it crosses longitude $156^{\circ} 00'W.$

The 1967 survey also included the Titnuk Creek drainage from the confluence of Titnuk Creek with the Holitna River upstream to the confluence with an unnamed tributary from the west which meets Titnuk Creek at 60° 47.1'W., 156° 57.3'N.

Holitna and Hoholitna beaver survey results

Table 3 compares the counts made on the Holitna and Hoholitna in the 1950's with the 1967 count. In 1953 and 1954 houses which did not have caches were not recorded. The 38 caches recorded in 1967 is the lowest count recorded on the river. However, considering the potential inaccuracies of this count and the difficulty of comparing the later count with the earlier ones, this figure may not represent a significantly lower population than the counts made in 1953 where 43 caches were observed and 1954 where 57 caches were observed.

Table 3. Holitna and Hoholitna Rivers aerial beaver cache counts.

Area	Year	Total No. Houses	Cache Present	Cache Absent
Holitna River	1953	26	26	--
	1954	29	29	--
	1956	59	51 (86%)	8 (14%)
	1957	55	39 (71%)	16 (29%)
	1967	19	17 (89%)	2 (11%)
Hoholitna River	1953	20	20	--
	1954	28	28	--
	1956	35	25 (71%)	10 (29%)
	1967	19	15 (79%)	4 (29%)
	1953	46	46	--
	1954	57	57	--
	1956	94	76 (81%)	18 (19%)
	1957	86	62 (72%)	24 (28%)
	1967	38	32 (84%)	6 (16%)

The 1967 count was fractured into three portions. Thirty houses with caches and five houses without caches were observed in the Holitna portions of the survey. The Holitna count area contains 115 miles of the Holitna River. Including all houses seen in ponds, sloughs and adjacent streams or channels, there was an average of one house with cache per 3.8 miles of stream. The average number of houses with caches occurring on the main stream itself was one house with cache per 16.4 miles.

Fifty-five houses with caches and nine houses without caches were observed in the Hoholitna portion of the survey. There were 119 miles of river in the Holitna portion, so there was an average of one house with cache per 2.2 miles of stream. Considering only those houses falling on the 119 miles of the Holitna River, the average was one house with cache per 7.9 miles of stream.

The Titnuk Creek portion is 95 miles long. There were 28 beaver houses with caches observed and 10 beaver houses without caches. The average for all houses with caches observed in the Titnuk Creek count area was one house with cache per 3.4 miles of stream.

Assuming that the number of caches seen per mile of stream on tributaries within a drainage can be used to compare beaver population within the count area, it appears that the Hoholitna has the largest beaver population on the three sub-areas of the Holitna Drainage.

Takotna River Beaver Aerial Survey

Description of the area

The Takotna River was surveyed by aircraft from a point where it intersects longitude $157^{\circ} 00'W.$ at latitude $62^{\circ} 31.0'N.$ to the confluence with the Nixon River ($63^{\circ} 02.7'N.$, $155^{\circ} 40'W.$). The Nixon River tributary was surveyed from $63^{\circ} 13.4'N.$, $155^{\circ} 30'W.$ to the confluence with the Takotna River.

Takotna River beaver survey results

Forty-eight beaver houses with caches and 22 beaver houses without caches were observed on the Takotna portion of the count. The Takotna River portion of the count was 116 miles long. The Nixon River portion was 35 river-miles long. Fifteen beaver houses with caches and 16 beaver houses without caches were observed on the Nixon River portion of the count. The total count was 63 caches and 38 beaver houses without caches.

The combined average for both portions of the Takotna count was one cache per 2.4 miles of stream including all caches seen adjacent to the main portion of the river. Considering only those caches located directly on the banks of the rivers, the average was one cache for every 4.4 miles of river.

Birch Creek Beaver Cache Survey

Description of the area

The original area surveyed commenced where the North Fork of Birch Creek crosses the Steese Highway ($65^{\circ} 24'N.$, $145^{\circ} 44'W.$) to Egil Island in Birch Creek ($66^{\circ} 15'N.$, $145^{\circ} 25'W.$). The count area has been modified to commence at the point where Birch Creek departs from the mountains ($65^{\circ} 23.3'N.$, $144^{\circ} 15.8'W.$). There were 265 miles of river in the original area. The modified area contains about 188 miles. Only one live and one

dead beaver house were observed in the upper 77 miles of the count area. The upper portion of the river was excluded because it was not typical beaver habitat.

Results of the Birch Creek beaver survey

Sixty-six houses with caches and 56 houses without caches were observed on the 1967 aerial survey. The frequency was one house with cache per 3.8 miles of stream including all caches seen on adjacent ponds, lakes, and sloughs. Only 25 caches or a frequency of one cache per 7.5 miles were observed on the banks of Birch Creek.

On September 27, 1966 a count of beaver caches was made by canoe over 17.5 miles of Birch Creek. The area surveyed commences at Jump Off Creek and continues downstream to the Birch Creek Bridge. Eleven houses with caches were observed. For this portion of the stream the frequency was one cache per 1.6 miles of stream. The plant composition of the cache, the depth of the water at the cache, the texture of the bottom material, and the depth of one house entrance under the surface of the water was recorded. Most of the information is presented in Table 4.

Another survey was made over the 17.5 mile stretch of Birch Creek above the bridge on July 26, 1968. At this season there were no caches, however, eight houses showed recent beaver activities such as peeled sticks, and packed mud. One house showing no activity was also observed. The significance of the 1966 and 1968 canoe surveys from Jump Off Creek to the Birch Creek Bridge are that in this stretch of river there were no beaver houses observed in the aerial count made on October 7, 1967.

DISCUSSION

No attempt has been made to compare beaver populations between different drainages. Obvious differences exist between the number of houses with caches seen per mile of stream between various drainages. However, at this time several unknowns still exist which make it difficult, if not impossible, to use the counts to compare the beaver populations or even to establish population trends within the survey areas. Comparing the canoe survey with the aerial survey on the Chena River it is obvious that a substantial percentage of the beaver colonies located on the river are not observed in the aerial surveys. If the relationship between the number seen from the air and the number seen from the canoe remains fairly constant it may be possible to use aerial surveys as an index to establish population trends.

The short survey by canoe made in 1966 and 1968 on Birch Creek indicate that the same type of error probably exists on other drainages. To establish the reliability of aerial cache counts come sort of check, such as a canoe survey should be initiated on the other count areas. It is equally imperative that some sort of check be made of the aerial count of beaver caches on the streams, ponds, lakes, and other bodies of water adjacent to the main stream.

To establish the reliability of the aircraft counts it may be necessary to consider the beaver populations living on the stream and the beaver population living on ponds and sloughs adjacent to the stream as different populations and treat them as statistically distinct populations.

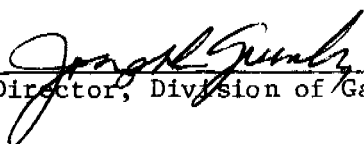
Two other variables must also be considered along with the previously mentioned inaccuracies of cache counts if cache counts are to be used to compare beaver populations in different areas. The meandering nature of streams in some areas would tend to discount the use of number of beaver houses per mile of stream as a means of comparing the beaver population between two distinctly separate drainages. Possibly some measure of the number of ponds and sloughs capable of supporting beaver within a specified distance of a main stream or the grade of the stream and width of the stream valley will have to be used in evaluating the differences in beaver population from one area to another.

Studies in other areas have indicated that substantial differences between the average number of beaver per colony can occur in different habitats. Some measure of these differences within the survey areas and between the survey areas must also be made to compare beaver populations.

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