ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

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FUR MAMMAL INVESTIGATIONS
SNOWSHOE HARE INVESTIGATIONS

by

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Volume III
Annual Project Segment Report
Federal Aid in Wildlife Restoration Act
Project W-6-R-3, Work Plans G & H

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FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 1 Title: Pelt Primeness Study, Southeastern Alaska

PERIOD COVERED: November 1, 1961 to April 15, 1962

ABSTRACT

Grades of 175 mink pelts trapped between November 30, 1961, and January 25, 1962, in Southeastern Alaska indicate that mink were generally prime by mid-December in 1961.

Two grading parties agreed on classification of 106 or 60 per cent of pelts but not on 69 or 40 per cent of pelts.

A higher proportion of the juvenile than the adult component of the sample was classed as having been taken too early.

Two criteria for aging mink proved 100 per cent reliable at the time of year that the study was conducted.

Thyroid and adrenal glands were taken from 84 mink for histological examination to investigate possible physiological responses related to primeness in mink.

Carcasses of mink were examined for parasites by Kenneth Neiland, Alaska Department of Fish and Game Parasitologist.

RECOMMENDATIONS

The reliability of determining optimum trapping dates by pelt grades is questionable. Disagreement between graders on pelt classification indicates that suitable standards for pelt classification do not exist. Conclusions derived from pelt primeness studies, therefore, are likely to be erroneous. One possible alternative would

be to submit specimens for actual sale and evaluate the data based on relative value of pelts.

Future pelt primeness studies must be preceeded by standardized pelt grading methods or other suitable criteria for determining actual peak value of pelts.

Ages of all specimens are necessary since juveniles become prime at a later date than adults.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 1 Title: Pelt Primeness Study, Southeastern Alaska

PERIOD COVERED: November 1, 1961 to April 15, 1962

OBJECTIVES

To determine by area when mink are of maximum market value, and to determine the physiological responses to environment that trigger primeness of mink pelts.

TECHNIQUES

Under contract, four trappers collected mink from north Behm Canal and Prince of Wales Island in the vicinity of Ketchikan and from Zimovia Straits and Wrangell Narrows in the vicinity of Wrangell and Petersburg.

Carcasses of mink received from the two Ketchikan trappers were examined for parasites. Carcasses from the Wrangell-Petersburg area were used to provide thyroid and adrenal glands for histological examination.

Skulls, femurs, and the baculum from males were used to determine ages of specimens.

Pelts were graded as having been taken "Too Early," "Prime," and "Too Late" by the Seattle Fur Exchange and by James Leekley, Director of the Petersburg Experimental Fur Farm at Petersburg.

FINDINGS

Pelt Grades

Between the 2 grading parties, 48 mink were classed as "Too Early." Grading parties were in disagreement on 31 or 64 per cent of the "Too Early" pelts.

Grades of 51 pelts classed as "Too Late" were subject to greater disagreemtnt since graders agreed on only 3 or 6 per cent of pelts.

Of the 175 pelts examined, graders agreed that 83 or 47 per cent were taken at the time of optimum market value.

The lack of agreement between grading parties makes interpretation of resulting data difficult. The validity of using grades upon which both grading parties do not agree as a basis for determining when mink are of optimum market value is questionable. For this reason evaluation was handled in the following manner:

Equal consideration was given to grades of each grader during preliminary analysis. "Too Early" grades of both parties are presented in Figure 1.

Although differences between classification of "Too Early" grades are conspicuous, both sets of data indicate that trapping should have started by mid-December. One would expect, however, that grades of one party are most reliable. Presuming that a period of optimum value existed and that most mink were prime during that period, a choice between sets of data is justifiable. Grades of "Too Early" pelts by the Seattle Fur Exchange appear most logical.

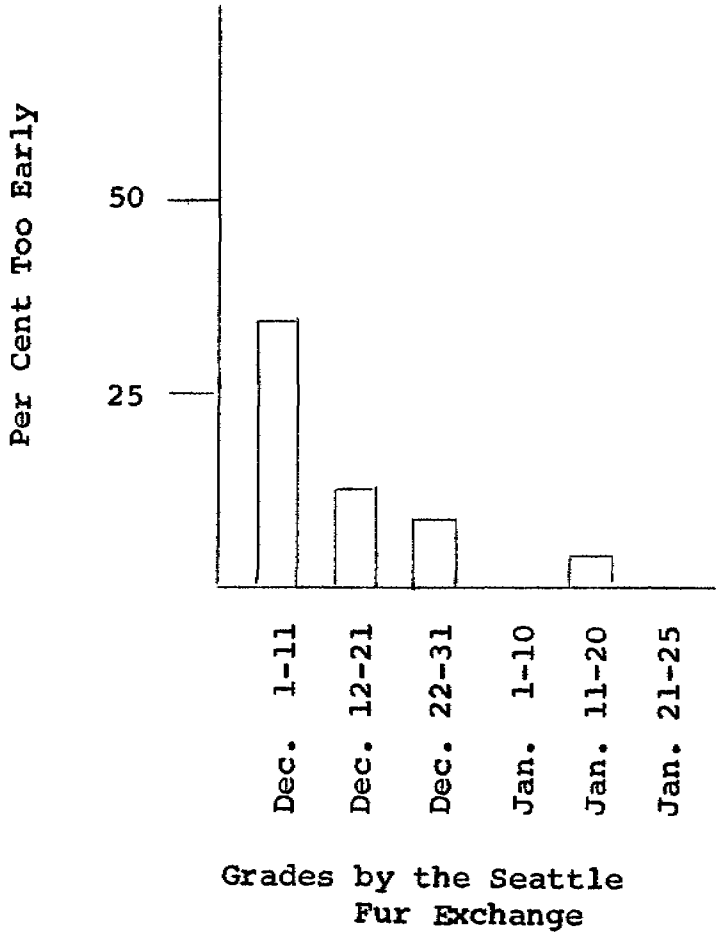
"Too Late" grades were subject to the most discrepency between graders. Figure 2 shows the percentage of pelts classed as having been taken "Too Late" by the Seattle Fur Exchange and James Leekley.

Using the same standards for choosing between the data of two graders on "Too Early" pelts, it is evident from Figure 2 that Leekley's "Too Late" grades are the most acceptable.

Figure 3 describes the period of optimum value for mink as derived from the foregoing selection of data. It is evident from these data that a trapping season of a month's duration would best have started on approximately December 10.

Pelt primeness studies conducted during the 1959-1960 and 1960-1961 season show that variation exists between timing of pelt primeness from year to year, (See Federal Aid in Wildlife Restoration Project W-6-R-1 and W-6-R-2, Pelt Primeness Studies).

Thus, opening dates for future seasons have to be based on several years' study. Mink populations are restricted to the beaches in Southeastern Alaska. The high trapper success



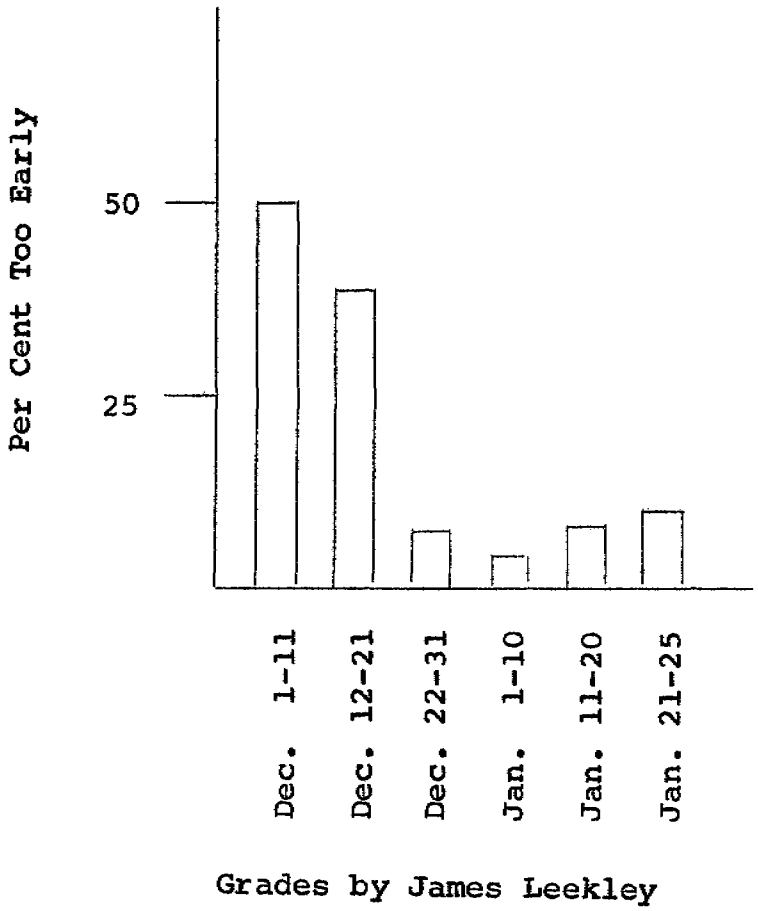


Figure 1. Per cent pelts taken too early.

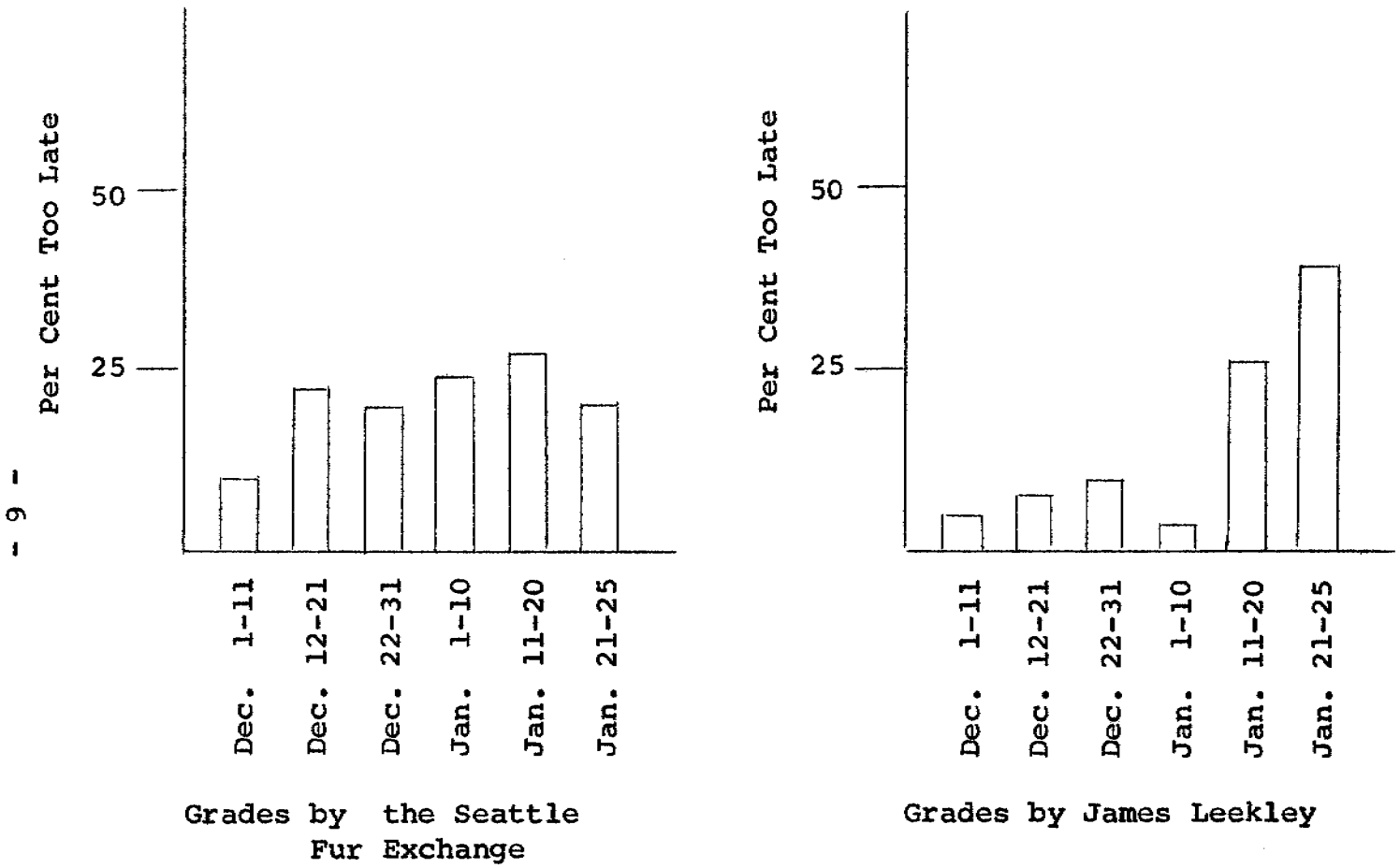


Figure 2. Per cent pelts taken too late.

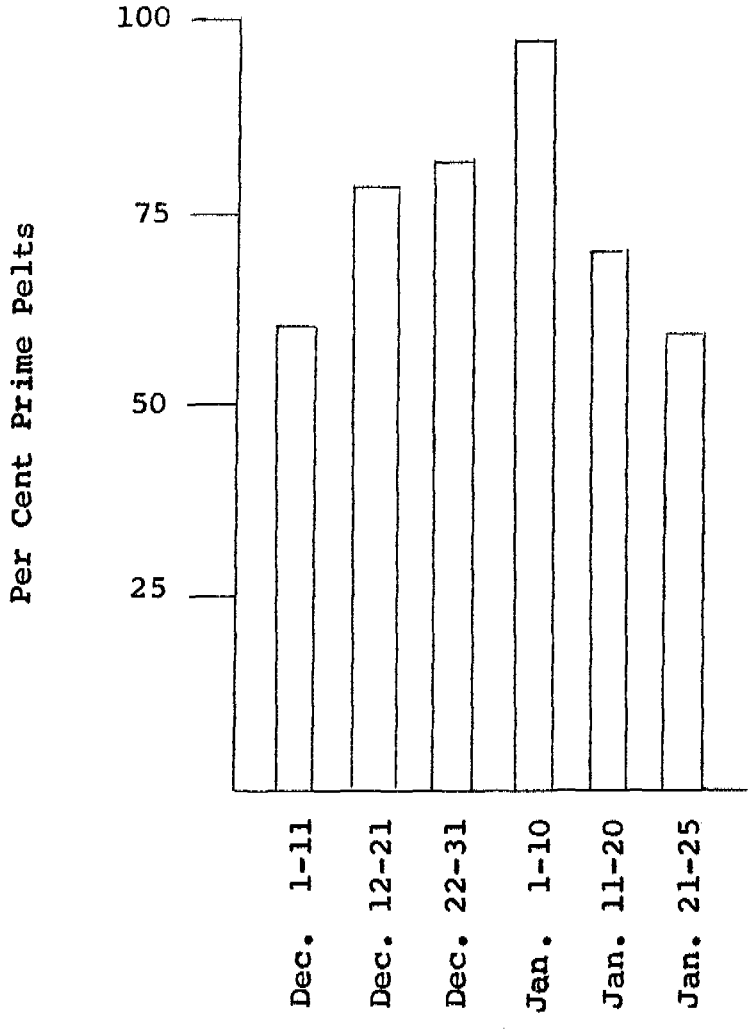


Figure 3. Calculated percentage prime pelts by selection of Seattle Fur Exchange too early grades and James Leekley's too late grades.

necessitates alternate year seasons to allow adequate reproductive recruitment. Seasons lasting more than a month in duration are not justified. On this premise, criteria for setting seasons are limited to the percentage occurrence of "Too Early" pelts in the catch. Juveniles become prime later than adults so the age composition of the catch plays an important role in timing of primeness. Figure 4 shows the percentage of juveniles in the juvenile component and the percentage of adults in the adult component that were taken "Too Early" as graded by the Seattle Fur Exchange.

Figure 5 shows the yearly variation in timing of primeness with regard to percentage occurrence of "Too Early" pelts.

Providing mink trapping seasons of a month's duration are standardized, the data indicate that openings would be set to best advantage around December 15.

Age Studies

One hundred and sixty-two of 175 mink were aged. Age criteria for adults included absence of the jugal and nasal sutures and the presence of the tubercle on the femur. Additionally, adult males have an enlargement on the proximal end of the baculum. Fifty-five specimens had missing parts. Of 66 complete female specimens examined, 3 were aged as juveniles by the presence of the nasal suture but as adults by the absence of the jugal suture and the presence of the tubercle of the femur; 1 juvenile female had an adult type jugal suture.

Fifty complete male specimens conformed to age as determined by the above listed methods with no contradiction between criteria.

Apparently the presence or absence of the femur tubercle in both sexes, and the appearance of the bacula in males, are the most reliable age criteria during December and January.

Parasites

Information on parasites, derived from the Ketchikan area sample of mink is found in Federal Aid in Wildlife Restoration Project W-6-R-3, Work Plan M.

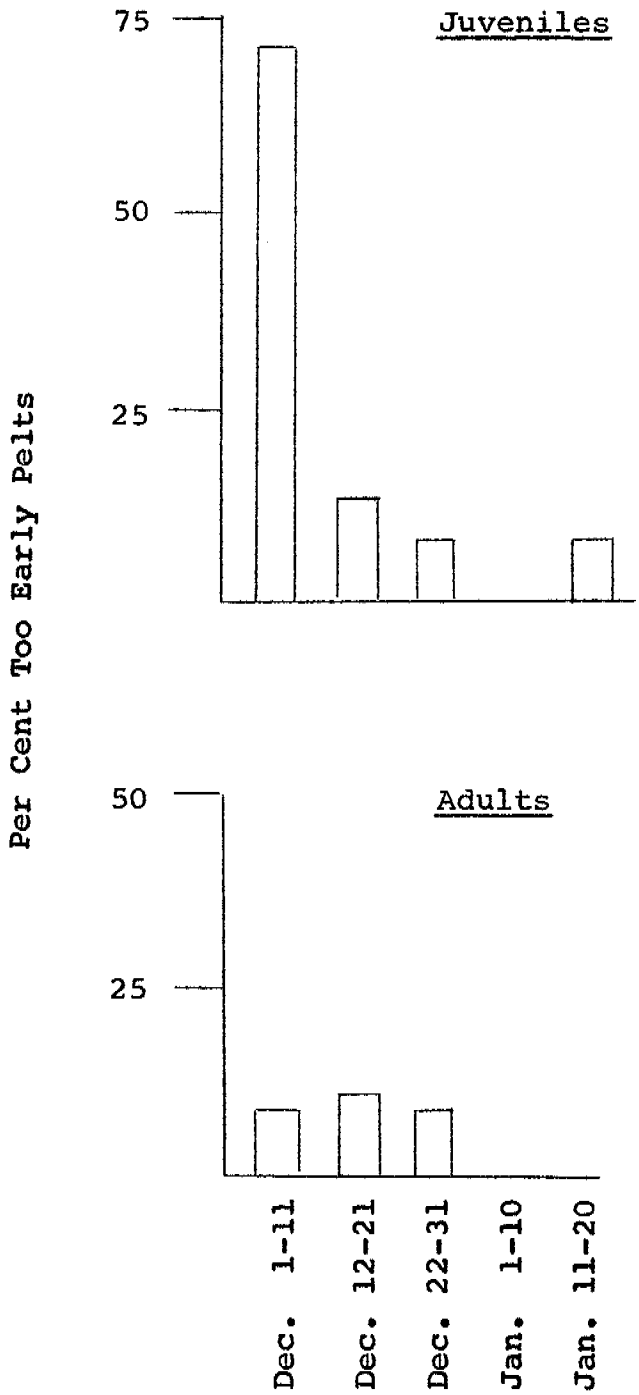


Figure 4. Seattle Fur Exchange grades of percentage juveniles and adults taken too early.

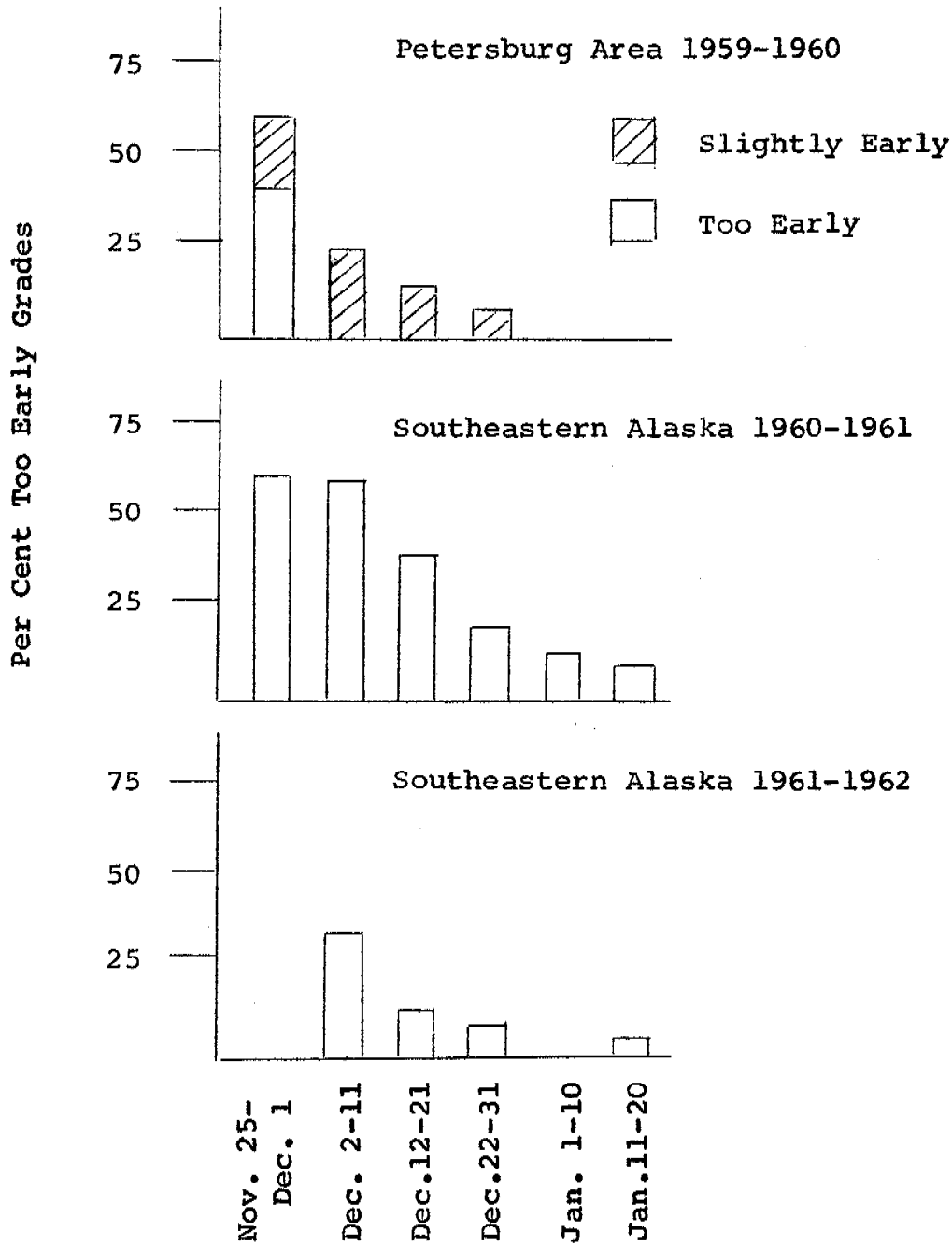


Figure 5. Yearly variation in timing of primeness of too early pelts.

Endocrine Gland Analysis

Thyroid and adrenal glands from mink taken in the Wrangell-Petersburg area were preserved for Dr. Roger Hoffman at Colgate University, Hamilton, New York. A report on the histology of these tissues will be forthcoming.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: G Title: Fur Mammal Investigations

Job No: 2-a Title: Ecology of the Beaver in the Kenai National Moose Range

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

The investigator began field work in early June. Areas of current beaver-salmon conflict are less common on the Kenai National Moose Range than was anticipated. Many of the former colonies have not been repopulated. Some of the work may be shifted to streams off the Range.

* A project of the Alaska Cooperative Wildlife Research Unit, College, Alaska, supervised by Robert F. Scott, Unit Leader, under contract to the Alaska Department of Fish and Game.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: G Title: Fur Mammal Investigations

Job No: 2-a Title: Ecology of the Beaver in the Kenai National Moose Range

PERIOD COVERED: July 1, 1961 to June 30, 1962

OBJECTIVES

To assemble historical records on beaver of the Kenai National Moose Range and concurrent pertinent records of other animal life with particular emphasis on moose, waterfowl, and salmon.

To record habitat conditions with respect to suitability of moose, waterfowl, and salmon in various successional stages of the beaver dams.

To determine present populations of beaver and the three major animal species of concern under various habitat conditions.

To develop management recommendations toward securing a satisfactory balance between beaver numbers and location and maintenance of desirable habitat of the three major species.

FINDINGS

The first half of the quarter was largely occupied by course work and final preparations for the field season. The investigator went to the Moose Range in late May. Surveys of suspected areas of beaver-salmon conflict were made, but detailed studies of the beaver impoundments were hindered by delays in equipment delivery. It became apparent that the degree of beaver-salmon conflict on the Range was lower than had been expected. In fact, it may be

* A project of the Alaska Cooperative Wildlife Research Unit, College, Alaska, supervised by Robert F. Scott, Unit Leader, under contract to the Alaska Department of Fish and Game.

necessary to shift much of the work to areas off, but adjacent to, the Range.

Selection of study plots, acquisition of delayed instruments and gear, and the construction of a device for controlling water level at beaver dams occupied most of June.

In the next quarter, beaver-salmon relationship studies will be emphasized. Limnological conditions and fish populations of streams and flowages in areas of conflict and no conflict will be compared. The water level control device will be tested. Field work will continue through September 10 and will be resumed in October.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 2-b Title: Beaver Investigations

PERIOD COVERED: July 1, 1961 to March 1, 1962

ABSTRACT

Production of beaver in 1961-1962 totalled 15,196 pelts, a reduction of nearly 36 per cent from the previous season. The reduced harvest was accompanied by a similar reduction in the number of active trappers. Unstable market conditions and severe weather during the season probably are responsible for the lowered production of beaver pelts.

The harvest statistics for Units 18, 19 and 21 suggest maximum desirable utilization may have been exceeded.

RECOMMENDATIONS

Analysis of the beaver harvest in Units 18, 19, 21 and 24 should be converted from the unit system to a drainage system.

The bag limit and season in Unit 19 should be reduced.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 2-b Title: Beaver Investigations

PERIOD COVERED: July 1, 1961 to March 1, 1962

ABSTRACT

Production of beaver in 1961-1962 totalled 15,196 pelts, a reduction of nearly 36 per cent from the previous season. The reduced harvest was accompanied by a similar reduction in the number of active trappers. Unstable market conditions and severe weather during the season probably are responsible for the lowered production of beaver pelts.

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Analysis of the beaver harvest in Units 18, 19, 21 and 24 should be converted from the unit system to a drainage system.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 2-b Title: Beaver Investigations

PERIOD COVERED: July 1, 1961 to March 1, 1962

OBJECTIVES

To establish beaver population levels and trends, and to establish additional new transects and check areas where previous investigations have indicated the need for it.

PROCEDURES

Harvest affidavits which are completed when beaver are presented for sealing were processed by the statistics section. Information obtained from the harvest affidavits include the number of trappers, the number of beaver taken, and the number of kits, yearlings, two-year-olds, and adults in the harvest. The harvest was recorded by game management unit. No new aerial transects or check areas were established or flown.

FINDINGS

The number of beaver harvested in Alaska during the 1961-1962 season was 15,196. This represents a decline of approximately 36 per cent from the previous season. The reduced production of beaver pelts was accompanied by a similar reduction in the number of active trappers. The reasons for the decrease in interest are not known precisely, but are undoubtedly related to the poor price prospect for beaver pelts at the beginning of the season, and the exceptionally deep accumulation of snow which was accompanied by unusually severe temperatures.

With few exceptions, the catch per unit of effort has been relatively constant since 1957. Likewise the percentage of adult beaver in the harvest has generally been constant. The combined indices suggest that the beaver population throughout Alaska is not being overutilized (Table 1). The harvest statistics do suggest some fluctuations in Units 19 and 21. In these units where beaver

Table 1. Beaver harvest information for 1961-1962.

Unit	Total Licenses	Legal Limit	% Trappers Limit	% Kits 50-53	% Yearlings 54-59	% 2-yr.olds 60-64	% Adults 65+	Average No.Beaver per License	Total Beaver Harvested
1	5	15		21.94	12.19	26.82	39.02	8.4	42
2	None	15							
3	None	15							
4	3	15		38.88	27.77	27.77	5.55	12	36
5	None	20							
6	10	40	20	13.54	13.54	32.90	40.00	15.5	155
7	1	20			33.33	33.33	33.33	3	3
8	13	NL*	NL*	18.37	20.54	31.35	25.40	14.2	185
9	82	15	37.8	28.28	11.68	22.07	39.94	11.37	933
10		NS**							
11	1	20							2
12	57	15	3.5	17.35	17.76	23.55	40.54	4.54	259
13	13	20	15.38	27.54	15.30	32.65	23.46	7.5	98
14	38	40	5.26	22.30	20.48	30.02	24.13	12.97	493

NL* = No Limit, NS** = No Season

Table 1 continued.

Unit	Total Licenses	Legal Limit	% Trappers Limit	% Kits 50-53	% Yearlings 54-59	% 2-yr.olds 60-64	% Adults 65+	Average No.Beaver per License	Total Beaver Harvested
15	14	40		17.77	16.11	30.00	36.11	12.85	180
16	34	40	2.94	34.45	23.85	33.39	23.28	15.41	524
17	175	15	31.42	29.52	11.87	23.75	34.78	10.87	1,903
18	116	10	33.62	35.37	10.77	24.84	29.00	7.04	817
19	219	20	24.20	19.78	14.29	23.78	41.99	13.85	3,035
20	96	20	22.91	10.24	15.18	24.14	50.04	11.86	1,139
21	288	20	31.59	13.62	18.44	30.01	37.64	13.35	3,847
22	7	10						6.00	42
23	2	15						3.50	7
24	71	25	14.08	8.24	18.57	28.04	44.18	15.01	1,066
25	44	15	25.00	15.80	13.25	31.86	39.06	9.77	430
26	NS**								
Totals	1,289	--	24.98	19.1	15.7	26.7	37.90	11.78	15,196

NS** = No Season

constitute a significant portion of the local economy, reduced seasons may be necessary.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 3 Title: Wolverine and Lynx Productivity and Breeding Biology Studies

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

One hundred twenty-five wolverines and 31 lynx specimens were obtained for studies of breeding biology and productivity during the initial year of this study. Of wolverine specimens, 61 per cent were males, and of lynx specimens, 58 per cent were males. Reproductive tracts and specimens useful for determination of age have been preserved for future studies. Recommendations to increase future collections of specimens include pre-season contact of trappers and encouraged use of wolverine hunting permits.

RECOMMENDATIONS

The success realized in acquiring lynx and wolverine specimens during the initial year of this study demonstrates that substantial numbers of carcasses suitable for studies of productivity can be obtained from trappers. To augment future collections it is recommended that effort be expended to contact trappers prior to the trapping season and that systematic procedures be established for picking up carcasses.

Special effort may also have to be made if collections or lynx specimens are to be increased due to their use as food for dogs and humans. This can perhaps be accomplished by greater

remunerative incentive. The cyclic abundance of this species also complicates making extensive collections of them during lows of the cycle.

Particular effort should be made to acquire both lynx and wolverine specimens during those months not included within the trapping season. Encouraged use of hunting permits to take wolverines as trophies would be helpful. Special effort should also be made to obtain specimens from all areas of the State, particularly from the Alaska Peninsula and Southeastern Alaska.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 3 Title: Wolverine and Lynx Productivity and Breeding Biology Studies

PERIOD COVERED: July 1, 1961 to June 30, 1962

OBJECTIVES

To determine factors relating to the breeding biology and productivity of these species.

TECHNIQUES

Lynx and wolverine specimens were obtained by purchase of carcasses from trappers and to a minor extent from hunters permitted to take wolverines on hunting permits.

FINDINGS

Work performed on this project during this initial year was limited to the collecting of specimens. One hundred and twenty-five wolverine and 31 lynx specimens were obtained (Tables 1 and 2). Gross measurements of reproductive tracts were taken and the following parts have been preserved for future studies of breeding biology and productivity as correlated with age factors: testes, bacula, ovaries, uteri, skulls, forelegs and eyes. Of wolverine specimens obtained, 61 per cent were males, and of lynx specimens, 58 per cent were males.

Table 1. A summary of wolverine specimens obtained for studies of breeding biology.

Collection Period	Males	Females	Totals
Sept.	0	1	1
Oct.	1	0	1
Nov.	5	1	6
Dec.	10	6	16
Jan.	13	9	22
Feb.	17	15	32
March	24	15	39
April	2	0	2
May	2	0	2
??	3	1	4
Totals	77	48	125

Table 2. A summary of lynx specimens obtained for studies of breeding biology.

Collection Period	Males	Females	Totals
Nov.	5	4	9
Dec.	0	2	2
Jan	12	7	19
July	1	0	1
Totals	18	13	31

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 4 Title: Mink Management Studies in the Yukon-Kuskokwim Delta, Alaska

PERIOD COVERED: June 1, 1961 to May 31, 1962

ABSTRACT

During the period covered, three field trips were made to the study area. A definite pattern of plant succession on pingos was noted, and it was found that natal den sites were found under a particular form of vegetation, bushes of Salix sp. or Spiraea beauverdiana. Comparison of harvest and climatic data superficially indicate a direct correlation which may help to explain causes for marked fluctuations in mink abundance. Trapping methods were found to be efficient in areas being trapped, but large areas of the delta received little if any trapping pressure. Few of the younger men in the region engage in trapping mink. Fluctuations in harvests were found to range from 7,000 to 40,000 mink per year. Average annual value during recent years has been approximately $25.00 per pelt.

RECOMMENDATIONS

Continued study of the ecology of natal den sites directed toward further establishing the role of climatic factors in survival of mink kits would add much to our knowledge of population fluctuations in the delta. At present, a study of this nature is highly recommended.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations

Work Plan: G Title: Fur Mammal Investigations

Job No: 4 Title: Mink Management Studies in the Yukon-Kuskokwim Delta, Alaska

PERIOD COVERED: June 1, 1961 to May 31, 1962

OBJECTIVES

To gather and evaluate information on the ecology of mink from the Yukon-Kuskokwim delta, working toward identifying factors affecting production and harvest, and attempting an explanation of the reported marked fluctuations in abundance of mink in this region.

TECHNIQUES

Data used for this study were collected during three field trips to the study area. The first and longest extended from June 1 to July 28. The second was during the first three weeks of November, and the last occurred during the third week of December.

Work during the summer of 1961 was directed at obtaining information on movements of mink on the delta through a tagging program and by direct observation. The factors governing selection of particular plant and soil conditions under and in which female mink make their natal dens were studied.

Relative abundance of mink as indicated by harvest records was compared with recorded climatic conditions in an effort to explain the fluctuations in abundance reported as characteristic of the study area.

The November field trip provided information on trapping methods employed by Eskimos of the area as well as information concerning effectiveness of methods used and food habits of mink at this time of year. This field trip proved to be one of the most interesting and most demanding of those made during this study.

The December field trip provided information about the success of the 1961-1962 trapping season as well as data on the sex ratio of animals taken.

Additional information on almost all phases of this study was obtained through continued correspondence with trappers and traders in the delta.

FINDINGS

A definite pattern of plant succession on pingos was noted. Pingos (mound-like topographic features) are numerous in the low-lying areas of the delta. In analyzing the vegetation of these features, it was found that they could be classed as one of three types depending upon the plant community they supported. The three types are: grass, a mixed vegetation, and tundra.

Secondary succession on pingos is caused by localized changes in relief, drainage, exposure, and ground ice conditions. The first plant to invade a growing pingo is Calamagrostis canadensis. This species was found on the smallest topographic features identified as growing pingos. The duration of dominance of this species apparently depends on the rate of accumulation or organic materials in the soil and the stability of the pingo. While mounds are forming they are comparatively unstable, and areas of extensive slumping are present. They are crisscrossed by deep cracks, particularly around the sides. Without exception, all pingos in this condition support communities composed almost entirely of C. canadensis.

As the stability of pingos increase and more organic material becomes incorporated into the soil, a second species, Spiraea beauverdiana, becomes established. Pingos supporting this type have been termed "mixed vegetation pingos." The codominant plant species are Calamagrostis canadensis and Spiraea beauverdiana with Calamagrostis on the decline and Spiraea increasing in importance. Other plants found on mixed-vegetation pingos include Angelica lucida, Artemisia tilesii, Petasites frigidus and Epilobium angustifolium.

The next stage in the succession is the appearance of mosses and lichens. These plants come in under S. beauverdiana. Perhaps S. beauverdiana is eliminated because its seeds do not reach mineral soil due to the presence of mosses and lichens. This insulating mat also permits the upper surface of frozen soil to rise and this may eventually kill the root system of Spiraea.

The thickness of the mat of mosses and lichens increases and other plants begin to invade. One of the first to invade is Rubus chamaemorus. The sequence of other plants which follow is unclear, but the plants include Ledum palustris decumbens, Vaccinium vitis, Vaccinium uliginosum and other plants found on the higher tundra of surrounding area. This association which I have termed the "tundra-type" is the climax community in this succession.

In the delta, natal den sites were found under bushy type vegetation such as Salix sp. or S. beauverdiana. There appear to be some definite reasons for this selectivity.

The delta is underlain by a thick layer of permafrost which comes very close to the surface especially under certain types of vegetation. The average depth to permafrost under tundra type vegetation was about seven inches. Under grass type vegetation the average was found to be about 11 inches. Depth to permafrost under S. beauverdiana or Salix sp. ranged from 8 to 20 inches with approximately 17 inches occurring on the majority of pingos on which active dens occurred.

This type of plant cover afforded other advantages besides deep unfrozen soil. A crude test to determine relative saturation of soil indicated that the soil was most friable under both Salix and Spiraea. Root systems extended farther into soil under both of these plant covers probably accounting for increased friability due to removal of soil moisture to a greater depth. They also impart stability to subterranean tunnels.

Superficially, there is a direct correlation between weather conditions during the breeding season and survival success of kits (indicated by abundance of mink during the trapping season). For the years in which we have records of the harvest, good harvests occurred during trapping seasons which followed springs and summers of favorable weather.

In this case, favorable weather means relatively warm weather with little precipitation and little cloud cover.

With respect to trapping methods and their effectiveness, it was found that the "Taluyak" (a modified fish trap used to capture mink) was more effective than steel traps for taking mink. Most mink are taken during the first three weeks of the trapping season. Trapping camps are occupied by two to six men and are concentrated in areas of high mink abundance. A relatively small percentage of the young men engage in trapping mink. Concentrated and decreasing effort have resulted in areas of the delta with little or no trapping pressure. These areas, mostly in the central portion of the delta, could withstand increased trapping pressure.

It was found that the main items of food taken by mink during November were fish, including blackfish, sticklebacks, cisco and whitefish. Mammals taken as food included muskrats and voles.

Fluctuations in harvests of mink from the delta have ranged between 7,000 to 40,000 pelts per year. The harvest of the 1961-1962 trapping season was the poorest on record, with approximately 7,000 pelts being taken. The average catch of mink in the Yukon-Kuskokwim delta is 15,000 to 20,000 mink and is valued at between $375,000 and $500,000.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: G Title: Fur Mammal Investigations

Job No: 5 Title: Ecology of the White Fox in Western and Northern Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

ABSTRACT

Most of the quarter was spent in completing course work for the semester and in preparing for field work on the project. The month of June was spent at Barrow, Dease Inlet, and other arctic coast points making preliminary surveys with the aid of a temporary field assistant. A late spring delayed work inland on the coastal plain and in the foothills of the Brooks Range. Specimens taken during the fur harvest continued to come in.

* A project of the Alaska Cooperative Wildlife Research Unit, College, Alaska, supervised by Robert F. Scott, Unit Leader, under contract to the Alaska Department of Fish and Game.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: G Title: Fur Mammal Investigations

Job No: 5 Title: Ecology of the White Fox in Western and Northern Alaska

PERIOD COVERED: July 1, 1961 to June 30, 1962

OBJECTIVES

To determine the life history, distribution and abundance of the white fox in north coastal Alaska and to examine factors affecting availability and value of this fur animal to local trappers.

FINDINGS

Course work, autopsies of animals taken during the fur harvest, and prepara ions for field work occupied most of the quarter. The investigator and Dwain Davies, an undergraduate student in the Department of Wildlife Management who will work as a field assistant during the summer, went to the Arctic Research Laboratory at Pt. Barrow on June 7. The traders and trappers who had provided harvest data and carcasses were visited; final information was gathered and accounts were settled. Reference materials for food habit studies were collected during a wait for an available airplane.

On June 24, most of the Inaru River and Teshekput Lake area was covered with a Cessna 195 in a search for adult foxes and active dens. No adult foxes were seen from the air and only six dens were noted. Both the lack of new vegetation and the relatively high flight speed of the aircraft detracted from the success of this flight.

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A ten-day trip to Lake Tusikvoak was started by weasel on June 27. Almost 50 dens were located, but all were inactive. Three adult foxes were seen. Data were collected at 20 den sites and the others were marked for later study.

Peter Lent of the University of Alberta, who has been studying caribou behavior in the Utukok River drainage, stated that white foxes were markedly scarcer this year than last.

During the next quarter the search for dens and foxes will be extended to the Half-Moon-Three area, Cape Simpson, and the region just east of Teshekput Lake. Data on den site ecology will be collected and general life history information gathered.

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JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: H Title: Snowshoe Hare Investigations

Job No: 1 Title: Methods of Determining Relative Abundance of Snowshoe Hares

PERIOD COVERED: July 1, 1960 to June 30, 1962

ABSTRACT

A segment of a continuing study of snowshoe hares was conducted from May 1960, to November 1961, near College, Alaska. Objectives regarding home range, reproduction, behavior, age determination criteria, and census methods were achieved by live-trapping and snaring.

The Schnabel (Krumholz) formula and Petersen ratio for estimating population size were invalidated by differential trap response. The calendar graph, Webb strip-census, Hartman toe-clip ratio, pellet count, and road survey all proved poor or useless as used during this study for estimating hare abundance in this area. An increase in hare sign in marginal habitat between 1958 and 1961 indicated an increase in population density.

Some hares were caught many times in succession in the same trap. Many more avoided traps, some for periods of nearly two years. Inclement weather restricted movements of hares.

Adult and juvenile sex ratios were 1:1. The season of births extended from mid-May to early August. There was a mean of 4.6 fetuses per female per pregnancy.

* A project of the Alaska Cooperative Wildlife Research Unit, College, Alaska, supervised by Robert F. Scott, Unit Leader, under contract to the Alaska Department of Fish and Game.

Exclusive-boundary-strip home range decreased significantly at the .01 level from 14.5 acres at a low population density to 13.1 acres at a higher density.

A hare's hind foot color cannot be used as an age criterion in Alaska in summer, since adults may have brown, white, or mottled hind feet. The epiphyseal groove appears to close at approximately seven months. Juvenile males can be recognized until December by a short, stubby penis, and juvenile females by a short, blunt vulva and lack of palpable teats. A combination of body weight and hind-foot length is recommended for determining the ages of juvenile hares. A lens weight of 160 mg. can be used to separate hares less than a year old from older hares.

RECOMMENDATIONS

Research should be continued on the difficult problem of developing a good snowshoe hare census method. Physiological studies should be conducted on hares over a long period of time to obtain information on the mechanisms involved in population fluctuations. Hare foods should be studied to learn if there is a fluctuation in nutritional quality from year to year.

JOB COMPLETION REPORT
RESEARCH PROJECT SEGMENT
FEDERAL AID IN WILDLIFE RESTORATION

State: Alaska

Project No: W-6-R-3 Name: Alaska Wildlife Investigations*

Work Plan: H Title: Snowshoe Hare Investigations

Job No: 1 Title: Methods of Determining Relative Abundance of Snowshoe Hares

PERIOD COVERED: July 1, 1960 to June 30, 1962

OBJECTIVES

To test various census methods which might prove useful under sub-arctic conditions; to determine the affect of population density on home range size of snowshoe hares in Interior Alaska; and to study reproduction, behavior, ecology, and age determination criteria of snowshoe hares in a taiga habitat.

TECHNIQUES

From May 1960, to November 1961, a field study was conducted on an increasing population of snowshoe hares on a 160 acre study area on Ballaine Road near College, Alaska. Data were obtained chiefly by live-trapping and snaring.

A detailed report of this study appears in thesis form and is on file at the Alaska Cooperative Wildlife Research Unit, University of Alaska, College, Alaska.

* A project of the Alaska Cooperative Wildlife Research Unit, College, Alaska, supervised by Robert F. Scott, Unit Leader, under contract to the Alaska Department of Fish and Game.

FINDINGS

An increase in hare sign in marginal habitat indicated that the hare population had increased between 1958 and 1961. No reliable method has been found for measuring this increase. The Schnabel (Krumholz) formula and the Petersen ratio were tested, but were invalidated by differential trap response. The calendar graph, Webb strip-census, and Hartman toe-clip ratio all proved poor or useless under Interior Alaska conditions. Indices tested were the number of hare runways crossing lines on the study area, and counts of hare pellets. Neither method, as tried, yielded reliable results.

Some hares acquired a "trap habit" and became caught in the same trap several times in succession. A larger number appeared to avoid traps after being caught once, some for periods up to two years. Most of these appeared to have remained close to the point of first capture.

Total trapping success was 14 per cent. It increased from a low of 6 per cent in May and June 1960, to 62 per cent in October, and diminished again during the winter. The summer of 1961 showed a success similar to that of 1960. During the entire study, recapture success was highest in May, decreased during the summer as young were added to the population, and increased again in the fall as the young were marked. Inclement weather restricted movements of hares, as shown by low trapping success on days following nights of rain or snow.

Counts of hares along roads were useless for determining the relative abundance of hares in the Fairbanks area because very few hares were seen, even where they were known to be abundant.

The earliest litters in 1961 were born in mid-May and the latest in early August. Lactation in some females appeared to be continuous from late May until late August. Dissection of 12 pregnant hares showed a mean of 4.6 fetuses per female per pregnancy.

In a cohort of 55 known-age hares at least 20 (36 per cent) survived at least 1 year, and at least 3 (5 per cent) survived at least 2 years. Differential trap response and emigration apparently contributed to this apparent high mortality.

Foxes, goshawks, and red-tailed hawks were probably the most important natural predators on hares.

The following internal parasites were found in hares: Mosgovoyia pectinata, Taenia pisiformis, Dirofilaria scapiceps, Obeliscoides cuniculi, and Protostrongylus boughtoni. Ticks were frequently found on hares in the summer of 1960, but were rare in the summer of 1961. Fleas seemed especially abundant on the hind feet of hares collected in the fall and early winter of 1960.

Home range size as calculated by the exclusive-boundary-strip method decreased significantly at the .01 level from 14.5 acres in a period of low population density (June 1959 - April 1960) to 13.1 acres in a period of higher density (May 1960 - November 1961). The mean adjusted home range length figures minimized differences in range area, and so were unsatisfactory for determining relative home range size.

The greatest dispersal movement noted, 1.6 miles in 14 days, was achieved by a juvenile female hare.

Snow covers shrubs and trees in winter in Interior Alaska, bending them to the snow surface and thus providing good cover for hares.

Evidence was found that hares occasionally use burrows.

Hares make a sound resembling a low click ("tch"), apparently when nervous.

Some agonistic, investigative, and possible displacement behavior was observed in hares.

Seventeen hare runways had a mean hardness of 717 g/cm^2 in Januray 1961. A hare, when standing, exerts about 9 g/cm^2 on the snow surface.

Two litters were found in simple depressions in the leaves, and one in a nest-like form. Leverets could move from their place of birth when less than 24 hours old. A six-day-old leveret had green plant material in its stomach.

Hares seemed to eat almost any green plant food available. Winter food consisted of small twigs and tips of most deciduous plants and heaths. In late winter, hares turned to the bark of willows, poplars, birch, and alders. Hares sometimes appeared to eat sand or gravel on roads. Hares ate frozen carcasses of other hares when a wound was present as a starting point.

The autumnal pelage change extended from the first week in August to the first of November, and the vernal change from late March to mid-June. Hares retained their winter coats for nearly five months and summer pelage for less than two months.

The color of a hare's hind feet cannot be used as an age criterion in summer, since adults may have brown, white, or mottled feet at this time. Epiphyseal groove closure in the humeri appears to occur at about seven months. Juvenile males have short, stubby penises until December. An adult male has a larger, posteriorly pointed penis. Juvenile females have short, blunt, hard-to-spread vulvas in summer and fall, and lack palpable teats. Adult females have palpable teats, and their vulvas, which spread easily, are longer and more pointed.

Body weight, hind-foot length, and lens weight were considered as age-determination criteria. None proved suitable, because of excessive variability. Matching body weight and hind-foot length may be an accurate method when used on juvenile hares with hind feet less than 100 mm. long. The year of birth of an adult hare cannot be determined by these criteria. A lens weight of 160 mg. can be used to separate hares less than a year old from older hares.

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