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A Data Report on Fish and Wildlife Resources of the Yukon River Basin Based on 1956 Field Investigations

May 1957

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UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

JUNEAU, ALASKA

A Data Report on Fish and Wildlife Resources of the YUKON RIVER BASIN

Based on 1956 Field Investigations

Territory of Alaska

May 1957
For Administrative Use Only

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PREFACE

During the late field season of 1955 the Coordinator of River Basin Studies, Mr. James T. McBroom, was conducted on an inspection tour of potential hydro-electric sites in Alaska by staff members of the Fish and Wildlife Service stationed in Alaska. As a result of that reconnaissance and following conferences, a foundation study of the Yukon River Basin was initiated.

Existing information of the biota, both quantitatively and qualitatively was exceedingly limited. The prime program developed for the initial phase of the study was a determination of distribution and abundance of fish and wildlife species; the extent of dependency and amount of utilization for such resources by native and resident human populations; and the development of techniques to obtain such data. The ultimate goal for the use of this data would be the determination of the affects any hydro-electric or other water development project would have on such resources.

Problems of access, weather and distance contribute significantly to the limited studies which may be conducted in any one period of time. The sheer size of the basin, 330,000 square miles (about 60,000 square miles larger than Texas) further indicates limitations in coverage which may be completed in one year by only four individuals.

This report serves two purposes--it presents data accumulated during the 1956 field season and provides a basis for future planning of field studies. Few conclusions have been reached and those which have been made are to be regarded as tentative. In essence, the

report seems to be composed of unrelated and often unorganized information. However true this may be, it was felt justifiable to include in this manner the information obtained rather than leave such data lying dormant in some obscure file. That the information contained herein will be valuable to many biologists and administrators of other branches of the U. S. Fish and Wildlife Service is highly probable--that it will be of great use and value to River Basin personnel is unquestionable. It is the belief and hope that this report will be the weakest of many to be prepared on the biota of the Yukon Drainage.

Although many individuals contributed significantly to the development of this report, special acknowledgement for the time, effort, and assistance is extended to the U. S. Game Management Agents Stan Fredrickson, Ray Trembley and Lyman Reynoldson, Sig Olson, Wildlife Management Biologist, Branch of Federal Aid in Wildlife Restoration, and George Warner, Fishery Management Biologist, Branch of Federal Aid in Fish Restoration.

LOCATION MAP - YUKON BASIN SHOWN IN RED

GENERAL

1. The Yukon River is one of the largest rivers of North America heading in British Columbia within 30 miles of the Pacific Ocean and flowing 2,300 miles to its many-mouthed delta into the Bering Sea. It flows about 1,300 miles within the Territory of Alaska, the remainder being located in Canada within the provinces of British Columbia and Yukon Territory. Within Alaska, the Yukon River has a latitude range from 61°-30' N. to 66°-30' N., with the more northern portion found in the Yukon Flats area which lies on the Arctic Circle. Approximately half of the total drainage area of 330,000 square miles is located in Alaska.

2. Having its origin in a series of lakes in both Yukon Territory and British Columbia the Yukon then flows northwesterly to Fort Yukon in Alaska, thence in a westerly direction for the remainder of its course to the Bering Sea. The surrounding terrain varies from mountains to the Yukon Flats type and finally the alluvial fan or delta type.

3. Some of the more important tributaries are the Andreafski, Innoko, Koyukuk, Melozitna, Nowitna, Tozitna, Tanana, Chandalar, and Porcupine Rivers, all in Alaska with the Stewart, Pelly, and White Rivers in Canada. The total length of the Yukon River in Alaska is 1,267 miles from the mouth at Nilak to the Alaska-Canada boundary. An elevation of 860 feet above sea level is listed for the Boundary damsite just inside the Alaskan border. This would be an average gradient of less than one foot-per-mile or approximately 0.68 feet

feet per mile. The lower portion is comparatively flat with a stream or river gradient from Kaltag to the mouth of only 0.2 feet-per-mile.

4. During the summer months, the Yukon River is open for navigation from the mouth to Whitehorse, Y. T., Canada. The Koyukuk, Tanana, and Porcupine River are tributaries to the main Yukon which are also navigable.

5. Tentative hydro-electric projects would provide tremendous quantities of electricity. For example, the proposed dam at Rampart (Fig. 1) would be only 200 feet high, yet it would impound 130 million acre-feet of water, inundate some 16,000 square miles, and produce more than 2,000,000 kilowatts. Other projects under consideration are located at Kaltag, Woodchopper, and Boundary. The Dawson, Taiya, and Taku would be in Canada.

6. Gauges have been installed and maintained for several years at only one location--Eagle, Alaska. Additional stations are now being operated at Rampart, Ruby, and Kaltag. Rampart has over one complete year's data, while the latter two have less than one. The data is listed in Table 1.

TABLE NO. 1 STREAM FLOW DATA - YUKON RIVER

Location		1956	1955	1954
Eagle	Mean	68,500 c.f.s.	72,280 c.f.s.	72,000 c.f.s.
	Maximum	230,000	278,000	305,000
	Minimum	7,800	13,000	11,000
Rampart	Mean	102,100	(Partial 1955, Jun,Jul,Aug,Sep)	
	Maximum	415,000	422,000	
	Minimum	9,000	118,000	

TABLE NO. 1 STREAM FLOW DATA - YUKON RIVER
(Continued)

Location	Miscellaneous Daily Readings 1957		1956	
Eagle	March 23	13,900 c.f.s.		
Rampart	March 22	16,800	October 1	156,000 c.f.s.
Ruby	April 7	28,400	October 1	254,000
Kaltag	April 6	32,300	October 2	283,000

7. The Corps of Engineers hope to maintain the gauges in cooperation with the U. S. Geological Survey. It is anticipated that development of the proposed hydro-electric projects would result in drastic changes in the salmon populations and other anadromous as well as resident fishery resources. Axiomatically, significant alterations of wildlife habitat would result. It has been theorized that such large masses of water (about the size of Lake Erie) as would be created as a result of impoundment would result in major climatical changes to the interior of Alaska.

8. The climate of the Yukon River drainage is generally subarctic with small amounts of precipitation and cold winter temperatures. The months of heaviest precipitation are July, August, and September. Much of this is in the form of rain but snow does occur each month of the year in some locales such as Fort Yukon. Some of the coldest temperatures on the North American continent occur in this region, with a -78° having been recorded at Fort Yukon. This same area

also has recorded temperatures as high as 100° F. Snowfall is not as heavy in the interior portions as in the coastal sections. Table 2 presents pertinent climatological data for selected stations within the drainage.

9. The Yukon Basin is essentially a sparsely populated area, being characterized by many small villages with 1950 populations of less than 200 people. The largest city within the Alaska portion of the drainage is Fairbanks. In 1950 the population of this city was 5,771 while the civilian population of the total Fairbanks environs was about 10,000 inhabitants. Additionally, two large military installations near Fairbanks further contribute to the population. Although exact numbers of military personnel and dependents living on these bases are classified, it has been estimated that the total population of the Fairbanks area, including Ladd and Eielson Air Force Bases, is about 35,000.

10. From the Canadian border to about Marshall, the native population is Indian, primarily of Athabaskan stock. Downstream from Marshall, Eskimos are the dominant native population. One of the most primitive of the Eskimo cultures remaining in Alaska is found from the Yukon Delta south to the Kuskokwim River. Table 3 gives pertinent populations of the basin.

TABLE NO. 2 CLIMATOLOGICAL DATA FOR SELECTED STATIONS, YUKON RIVER BASIN

Location	Length of Record (Years)	Snow-fall (Inches)	Temperatures Max.	Temperatures Min.	Average Precipitation per Month (Inches) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Dawson	37		92	-66	.87	.70	.52	.52	1.02	1.19	1.55	1.58	1.41	1.17	1.12	1.04	12.69
Eagle	?	52.7			.40	.40	.40	.40	.80	1.50	1.80	2.00	1.30	.80	.50	.40	
Fort Yukon	23	42.0	100	-78	.40	.41	.26	.27	.49	.80	1.07	1.27	.65	.60	.35	.31	6.88
Nenana	37	53.5	91	-76	.80	.74	.64	.25	.76	1.21	2.37	2.60	1.80	1.07	.75	.64	13.63
Ruby	6	75.0	98	-52	1.78	.99	.82	.31	.79	.71	3.06	3.82	2.77	1.06	.83	.83	17.77
Nulato	13		90	-62	1.41	.96	1.26	.38	.58	.83	2.41	2.64	2.10	1.87	1.21	.86	16.50
Holy Cross	29	91.2	93	-58	1.49	.97	1.29	.66	.67	1.31	2.70	3.78	2.91	1.67	1.29	1.32	22.06

TABLE NO. 3 POPULATION OF THE YUKON BASIN

Name of Village	Judicial Division	Recording District	1950	1939
Akulurak Village	Second	Wade Hampton	197	162
Alakanuk Village	Second	Wade Hampton	140	61
Alatna Village	Fourth	Koyukuk	31	28
Allakaket Village	Fourth	Koyukuk	79	105
Anvik Village	Fourth	Nulato	99	110
Arctic Village	Fourth	Fairbanks	53	24
Arctic Contractors	Fourth	Fairbanks	44	—
Beaver Village	Fourth	Fairbanks	101	88
Bettles Village	Fourth	Fairbanks	47	19
Big Delta	Fourth	Fairbanks	155	---
Cantwell Village	Fourth	Fairbanks	67	17
Central Village	Fourth	Circle	41	---
Chaneliak Village	Second	Wade Hampton	106	92
Chicken	Fourth	Fairbanks	31	41
Chowhoctolik	Second	Wade Hampton	98	60
Circle Village	Fourth	Circle	82	98
College	Fourth	Fairbanks	124	234
Cutoff Village	Fourth	Nulato	65	---
Derby Tract	Fourth	Fairbanks	172	---
Eagle City	Fourth	Eagle	55	73
Emangak Village	Second	Wade Hampton	67	42
Eskimo Village	Fourth	Fairbanks	41	---
Ester Village	Fourth	Fairbanks	74	218
Fairbanks City	Fourth	Fairbanks	5771	3455
Flat Village	Fourth	Otter	95	146
Fort Yukon	Fourth	Circle	446	274
Fox Village	Fourth	Fairbanks	24	---
Galena	Fourth	Nulato	176	44
Garden Island	Fourth	Fairbanks	41	292
Graehl Village	Fourth	Fairbanks	476	102
Hamilton Village	Second	Wade Hampton	43	54
Hamilton Acres	Frouth	Fairbanks	214	---
Healy	Fourth	Nenana	102	46
Holikachuk Village	Fourth	Otter	98	77
Holy Cross	Fourth	Nulato	157	226
Hot Springs	Fourth	Hot Springs	29	39
Hughes Village	Fourth	Fort Gibson	49	32
Indian Village	Fourth	Eagle	45	---
Kaktovik Village	Fourth	Fairbanks	46	---
Kaltag Village	Fourth	Nulato	121	140
Kokrines Village	Fourth	Fort Gibson	68	47
Kotlik Village	Second	Wade Hampton	44	35

TABLE NO. 3 POPULATION OF THE YUKON BASIN
(Continued)

Name of Village	Judicial Division	Recording District	1950	1939
Koyukuk Village	Fourth	Nulato	79	106
Koyukuk River Village	Fourth	Nulato	48	---
Lemeta Tract Village	Fourth	Fairbanks	358	---
Livengood Village	Fourth	Tolovana	40	153
McKinley Park Village	Fourth	Nenana	59	11
Marshall Village	Second	Wade Hampton	95	91
Minto Village	Fourth	Fairbanks	152	135
Mountain Village	Second	Wade Hampton	221	128
Nenana City	Fourth	Nenana	242	231
New Hamilton	Second	Wade Hampton	27	25
New Knock Hock Village	Second	Wade Hampton	122	---
Northway-Nebesna	Fourth	Fairbanks	196	---
Nulato Village	Fourth	Nulato	176	113
Ohogamuit Village	Second	Wade Hampton	27	29
Ophir Village	Fourth	Innoko	68	84
Pilot Station Village	Second	Wade Hampton	52	39
Pitkas Point Village	Second	Wade Hampton	84	50
Rampart Village	Fourth	Rampart	94	106
Ruby Village	Fourth	Nulato	132	138
Russian Mission	Second	Wade Hampton	55	34
Scammon Bay	Second	Wade Hampton	103	88
Shageluk Village	Fourth	Otter	100	92
Sheldons Point	Second	Wade Hampton	43	---
Sleterville	Fourth	Fairbanks	611	---
South Fairbanks	Fourth	Fairbanks	63	93
Stevens Village	Fourth	Rampart	34	54
Suntrana	Fourth	Nenana	130	78
Takshak Village	Second	Wade Hampton	39	18
Tanacross	Fourth	Fairbanks	137	135
Tanana	Fourth	Fort Gibson	228	170
Tetlin Village	Fourth	Fairbanks	73	66
Tok Junction	Fourth	Fairbanks	104	---
Usibelli Village	Fourth	Nenana	28	---
Venetie Village	Fourth	Fairbanks	81	36
	Totals		14,116	8,784

11. The immense river system of the Yukon holds one of the most diverse and complex fishery populations to be found in Alaska. A basic understanding of resident and anadromous fishes is yet to be accomplished by ichthyologists. The distance of the commercial markets, sparse population with divergent languages, vagaries of weather, distances involved, and until recently, transportation and communication, have all contributed to the continual primitive knowledge of the fishery resources.

12. In 1955 the Office of River Basin Studies, due to the interest in potential water-development projects of the basin, initiated limited reconnaissance work in the Upper Yukon, primarily above Whitehorse, Y. T., Canada. In 1956 personnel of this branch initiated field investigations at the mouth of the River and from Eagle, near the Alaska-Canada border upstream nearly to Whitehorse. This section of the report summarizes the data gathered. Where possible, the 1956 information has been compared to earlier records. In most instances, it has not been analyzed for significance due to the limited time for analysis. It presents a record of what was obtained so that future comparisons may be possible. Additionally, the data gathered will assist future personnel in the formulation of field investigations.

13. Some of the fish known to occur in the Yukon River are:

Arctic Grayling	Thymallus signifer
Inconnu or Shee	Stenodus leucichthys
Pink Salmon	Oncorhynchus gorbuscha

King Salmon	Oncorhynchus tshawytscha
Silver Salmon	Oncorhynchus kisutch
Dog Salmon	Oncorhynchus keta
Red Salmon	Oncorhynchus nerka
Dolly Varden	Salvelinus alpinus malma
Lake Trout	Cristivomer namaycush
Northern Pike	Esox lucius
Sucker	Catostomus catostomus
Ling Cod	Lota lota leptura
Mottled Sculpin	Cottus cognatus
Lake Herring	Coregonus sardinella
Common Whitefish	Coregonus clupeaformis
Lamprey	Entosphenus sp.

Commercial Fishery

14. Most of the above species are utilized extensively by the natives along the Yukon for both personal and dog use. The king salmon is the only species consistently taken for commercial use, however, in 1956 about 8,000 chum were also processed. A 50,000 fish quota is assigned to the lower Yukon area (from mouth to the Anuk River), with a 10,000 quota in the middle district (from Anuk to the Anvik River) and finally an upper district fishery with a 5,000 quota. The upper district boundaries are the Anvik River to the Canadian border.

15. The lower district usually fills the quota and in 1956 four operators packed 10,674 cases, 111 one-half tierces, and 143.5 full tierces. The quota in the middle district was filled for the

first time in 1956 when three operators processed 2,159 cases and 118 one-half tierces. During the 1956 season the upper district packed only 110 cases, although an estimated 850 fish were taken by the two operators. Table 4 presents a statistical summary of the three Yukon districts for 1956. Table 5 compares the pack for the three districts from 1953 to 1956.

Personal Use Fishery

16. Throughout much of the Yukon drainage, fish provide a large part of the diet of the residents. Salmon, the most desired fish, are dried, smoked, or frozen for the winter's use and are consumed by both humans and dogs. (Fig. 2 and 3). It has been authoritatively reported that a ton of dried chum salmon is required to feed a seven-dog team through the winter. Most of the king salmon are used for human consumption. Other species of fish such as shee fish, whitefish, grayling, northern pike, ling cod, suckers and reds, pinks, and coho salmon are caught and utilized for food.

17. Both gill nets and fish wheels (Fig. 4) are used to capture the salmon. However, the number of fish wheels has dropped considerably during the last two decades. During the period 1931 to 1941, an average of 20[illegible] fish wheels were reported by Townsend for the Yukon area within Alaska, while in 1956 only 115 fish wheels were actually counted in this same area. The only fish wheels noted on the Canadian section of the Yukon were near Dawson and six were counted. A list of the fish wheels for each village and surrounding area is included in Table 6.

TABLE NO. 4 STATISTICAL SUMMARY, YUKON DISTRICTS, 1956 SALMON SEASON

Operator	No. Fish	No. Cases	No. Tierces	No. Fishermen	No. Fathoms	No. Fishwheels
LOWER DISTRICT:						
Yukon River Fishermen's Cooperative Alakanuk, Alaska	25,262	6,410	60 1/2s	35	2,165	0
Northern Commercial Company Sheldon Pt & Kwiguk	25,737	4,264	145.5 full	47	1,800	0
Ahlstrom Trading Co. Fish Village	1,130	0	51 1/2s	6	180	0
Sub Total	52,129	10,674	145.5 full 111 1/2s	88	4,145	0
MIDDLE DISTRICT:						
St. Mary's Mission Andreafski	4,412	1.268	0	14	2,300	2
Henry Bogler Pitkas Point	5,723	891	107 1/2s	28	1,120	3
Tom Heckman Pilot Station	344	0	11 1/2s	6	90	0
Sub Total	10,479	2,159	118 1/2s	48	3,510	5

TABLE NO. 4 STATISTICAL SUMMARY, YUKON DISTRICTS, 1956 SALMON SEASON
(Continued)

Operator	No. Fish	No. Cases	No. Tierces	No. Fishermen	No. Fathoms	No. Fishwheels
UPPER DISTRICT:						
Weisner Trading Co. Rampart	7,403 lbs	110		?	0	6
	3,271 lbs sold fresh in Fairbanks					
Northern Commercial Co. Fort Yukon	6,387 lbs frozen					11
Sub Total	17,061 lbs	110		?	0	17
Estimated Number	850 *					
GRAND TOTAL	63,458 *	12,943	145.5 full 229 1/2s	136	7,655	22

* Including estimated number for Upper District.
Note: In addition 744.5 cases of chums were packed from outside the mouth of the river by the Yukon River Fisherman's Cooperative.

TABLE NO. 5 COMMERCIAL PACK FOR THREE YUKON DISTRICTS, 1953-1956

Area	No. Fish	No. Cases	No. Tierces
LOWER DISTRICT:			
1956	52,129	10,674	300.5
1955	50,921	9,963	264.25
1954	50,655	10,414	148
1953	55,873	12,167	171
MIDDLE DISTRICT:			
1956	10,479	2,159	59.25
1955	5,003	965	175
1954	7,061	235	118
1953	5,484	205	146.5
UPPER DISTRICT:			
1956	17,061 lbs	110	
1955	5,032 lbs	80	
1954	6,423 lbs	130	
1953	6,540 lbs	86	

TABLE NO. 6 FISH WHEELS ON THE YUKON RIVER IN ALASKA DURING 1956

Location	No. of Fishwheels	Location	No. of Fishwheels
Eagle	3	Koyukuk	1
Circle	3	Koyukuk to Nulato	8
Fort Yukon	15	Nulato to Kaltag	13
Beaver	5	Anvik	6
Steven's Village	3	Paradise	4
Rampart	5	Holy Cross	3
Rampart to Tanana	4	Paimiut	6
Kallands	2	Russian Mission	1
Kokrines	1	Chogamuit	4
Ruby	3	Pilot Station	4
Ruby to Galena	5	Pitkas Point	6
Patsy's Cabin	1	Old Andreafski	4
Kwiguk	2	Mountain Village	3

18. Net useage has increased from the 1931 figure of 1,232 fathoms to 1941 in which 3,110 fathoms of salmon gill net were employed. In 1956, the total fathoms in the lower portion of the river from the junction of the Anvik downstream to the mouth was listed as 7,655, a noteworthy increase, especially for such a small portion of the river. Increases upstream were noted also.

19. During the 1956 field season, an effort was made to determine the take of all fish species in villages with other pertinent data such as the methods fish were captured and their useage. Additionally, populations of each village, noting both people and dogs, was to be listed. Only a portion of the area was "surveyed" during the period and results are tabulated in Table 7.

TABLE NO. 7 NUMBER OF FISH CAUGHT IN VARIOUS YUKON RIVER VILLAGES DURING 1956

	Human			Dog		
Village	Pop.	Fish	Average Fish Per Person	Pop.	Fish	Average Fish Per Dog
Kwigak	200	4400	22	400	15,300	38.25
Old Andreafski	9	1150	127.7	30	2,100	70.0
Mountain Village	114	1476	12.9	245	8,881	36.2
St. Marys	63	5300	24.1	97	6,785	69.9
Pitkas Point	21	986	46.9	49	2,870	58.5
Pilot Station	75	3470	46.2	225	10,630	47.2
Steven's Village	85	2750	32.3	106	2,750	25.9
Beaver	86	3210	37.3	65	9,990	153.7
Venetie	72	240	3.3	55	2,160	39.3
Eagle	61	569	9.3	40	804	20.1
Paimmit	10	422	42.2	10	5,590	55.9

20. According to Gilbert and O'Malley, the commercial pack by the Carslisle Packing Company was 58,000 kings and 155,000 chums in 1920. They estimated a personal-use fishery of 23,000 kings and one million chums in addition to the commercial pack. Townsend estimated an average of 27,467 king salmon were taken each year from 1931 through 1941, while the chum salmon averaged 537,070 each year for the same period.

21. During the summer of 1956, an accurate record of each

fish caught (primarily salmon) was kept by each fisherman on the Upper Yukon and the method of taking such fish. From Eagle to Carmacks and also the Pelly River Crossing area, 33 personal-use nets (or 256 fathoms) were used. Six fish wheels were found in the Dawson area and three in the Eagle area. Pertinent data for this area is shown in Table No. 8.

TABLE NO. 8 UPPER YUKON RIVER FISH CATCH - 1956

Village	King	Chum	Shee Fish	White-fish	Gray-Ling	Sucker	Pike	Cod	Salmon only Taken by Fish Wheel	Salmon only Taken by Gill Net
Moosehide	595	786	3	13	4	27			1381	
Dawson	3526	986	40	52	8	272	30	2	3932	580
Pelly	435	235		252			2		0	670
Fort Selkirk		600							0	600
Carmacks	345	552	2	2	10	500			585	312
Minto	17	255							272	0
Totals	4918	3414	45	319	22	799	32	2	6170	2162

General - Size of Fish

22. King and chum salmon were measured in length and weighed at the various mouths of the Lower Yukon River during the commercial fishing season. No significant differences were observed from any one area. Fish for measurement were selected at random from the collecting boats in groups of 50 samples with point of measurement

being from the back of the eye socket to the last body scale. Other measurements were taken from the center of the eye to the hyplural plate, in which a correction factor was obtained to standardize the length measurements. This factor was noted to be 0.03 feet (which would be subtracted from the back of the eye socket to last body scale measurement). All measurements were made in feet and tenths of feet with a standard tape measure.

23. A device was constructed from meter sticks with pointers to eliminate the body curvature. Thus, a straight line measurement was assured since the curve of the body was not measured. It was found that the difference was very minor and not considered to be significant.

24. Weights for the four sample areas varied slightly. The main conclusion to be drawn from the lengths and weights would be that size tends to diminish in both length and weight as the run progressed. Salient features of weights and lengths are presented in Tables 9 and 10.

TABLE NO. 9 MEAN KING SALMON LENGTHS, LOWER YUKON - 1956
(Lengths in feet and tenths of feet)

1956 Date	South Mouth	Middle-North Mouths	Kwiguk Slough	Sheldons Point	St. Marys Mission	Fish Village	Pitkas Point
JUNE							
7		2.60					
8	2.71						
9							
10		2.62					
11							
12	2.66	2.58					
13	2.66	2.51					
14	2.50	2.63	2.48	2.60			

TABLE NO. 9 MEAN KING SALMON LENGTHS, LOWER YUKON - 1956
(Continued) (Lengths in feet and tenths of feet)

Date 1956	South Mouth	Middle-North Mouths	Kwiguk Slough	Sheldons Point	St. Mary's Mission	Fish Village	Pitkas Point
JUNE							
15	2.55	2.55	2.42				
16	2.47	2.54	2.50				
17		2.59					
18							
19	2.51	2.64		2.40			
20	2.56		2.56	2.61		2.63	
21	2.59	2.55			2.48		2.40
22	2.55	2.55	2.52				
23		2.57	2.49	2.50			
24	2.55	2.69					
25							
26	2.57	2.56					
27							
28							2.61
29							
30	2.55		2.48				
JULY							
1							
2	2.55						
3	2.55						
4	2.56						
5	2.55						
6			2.53				
7	2.47		2.32				

TABLE NO. 10 MEAN KING SALMON WEIGHTS, LOWER YUKON - 1956
(Weights in pounds and tenths of pounds)

Date 1956	South Mouth	North & Middle Mouth	Kwiguk	Sheldons Point
June 22	22.7	22.57	21.9	
23				21.50
26	22.7	22.57		
30	22.05		20.97	
July 3	22.2			
7	20.9			

25. Chum salmon weights and lengths were also taken in the Lower Yukon at the south mouth and the Kwiguk Slough and are listed in Table No. 11.

TABLE NO. 11 MEAN WEIGHTS AND LENGTHS, CHUM SALMON, LOWER YUKON 1956
(Weights in pounds; Lengths in feet)

1956 Date	South Mouth Weight	South Mouth Length	Kwiguk Slough Weight	Kwiguk Slough Length
June 30	7.4	1.78		
July 1				
3	6.4	1.63		
4		1.81		
5	6.3	1.69		
6				1.67
7	6.5	1.64		1.82
8				1.72
12			6.68	1.70
17	6.16	1.68		
22	6.56	1.76		
27	7.71			
28	7.38	1.77		
30	7.30	1.78		

26. Lengths and weights of king salmon were taken on the Upper Yukon at Eagle, Dawson, and Pelly River Crossing, the latter two stations being in Yukon Territory. Data was taken in millimeters and measured from the center of the eye to the hyplural plate while weights are listed in pounds. Insufficient data was gathered at Dawson and Pelly River Crossing for valid comparisons with Eagle, regarding size differences.

TABLE NO. 12 MEAN WEIGHTS AND LENGTHS, KING SALMON, UPPER YUKON 1956

Date 1956	Lengths (mm)			Weights (pounds)		
	Eagle	Dawson	Pelly River	Eagle	Dawson	Pelly River
July 16	857			21.6		
17	799			17.4		
18	677			9.4		
19	689			9.89		
20	755			13.3		
21	721.6			12.0		
24	780.4			15.6		
25	785			12.6		
26	832			18.2		
31		707.8			11.3	
August 3			769.1			13.5

Age of Salmon

27. Nearly 2,000 scale samples were taken during the summer season of 1956. A random sample of 515 king salmon scales were read for gross age at the Fish and Wildlife Service laboratory in Seattle. The age data agrees very well with Townsend's and Gilbert's of 1919 and 1920, as to the preponderance of six year old fish. Table No. 13 shows the number and percentages of fish in each age group by sex and location.

TABLE NO. 13 AGE GROUPS OF A RANDOM SAMPLE OF KING SALMON - 1956

Location	Male		Female	
	Number	Percent	Number	Percent
LOWER YUKON:				
4 years	1	0.5	0	0
5 years	62	31.7	14	6.5
6 years	103	52.3	166	77.6
7 years	31	15.7	34	15.9
	197	100.00	214	100.00

TABLE NO. 13 AGE GROUPS OF A RANDOM SAMPLE OF KING SALMON - 1956
(Continued)

Location	Male		Female	
	Number	Percent	Number	Percent
UPPER YUKON:				
4 years	17	21.8	0	0
5 years	37	47.4	6	23.1
6 years	18	23.1	15	57.7
7 years	6	7.7	5	19.2
	78	100.0	26	100.0

Timing of Salmon Runs

28. At the mouth of the Yukon River the commercial operation started on the first of June 1956 and lasted through the 25th of June 1956, with the first fish caught by the Northern Commercial Company at Sheldon's Point. Just over 10,000 fish had been caught by the end of the second week with the large run of fish coming in the following week when nearly 40,000 fish were taken. Table No. 14 presents a daily and cumulative total of fish caught in the lower Yukon District during the 1956 season and depicts to some extent the timing of the runs at the mouth of the river.

TABLE NO. 14 DAILY CATCH OF KING SALMON, LOWER DISTRICT, YUKON RIVER - 1956

1956 Date	N.C. Co. Sheldons Point	Yukon River Fishermen Coop Alakanuk	N.C. Co. Kwiguk	Ahlstrom Trading Co. Fish Village	Daily Total	Cumulative Total
June						
1	1	0	0	0	1	1
2	6	16	0	0	22	23
3		C L O S E D	P E R I O D			

TABLE NO. 14 DAILY CATCH OF KING SALMON, LOWER DISTRICT, YUKON RIVER - 1956

1956 Date	N.C. Co. Sheldons Point	Yukon River Fishermen Coop Alakanuk	N.C. Co Kwiguk	Ahlstrom Trading Co. Fish Village	Daily Total	Cumulative Total
June						
4	10	104	3	5	122	145
5	15	162	61	7	245	390
6	62	142	46	5	255	645
7	254	358	161	7	780	1,425
8	460	285	74	5	824	2,249
9	244	246	104	13	607	2,856
10		CLOSED	PERIOD			
11	71	351	47	29	498	3,354
12	71	268	211	36	586	3,940
13	64	359	486	18	927	4,867
14	58	858	940	40	1,896	6,763
15	84	542	1,235	52	1,913	8,676
16	91	163	1,058	37	1,349	10,025
17		CLOSED	PERIOD			
18	935	5,814	2,475	188	9,412	19,437
19	633	3,194	2,328	295	6,450	25,887
20	834	2,522	1,487	159	5,002	30,889
21	1,215	3,573	1,497	21	6,306	37,195
22	1,609	3,352	3,057	24	8,042	45,237
23	1,016	1,101	1,817	137	4,071	49,308
24		CLOSED	PERIOD			
25	201	1,852	716	52	2,821	52,129
Total	7,934	25,262	17,803	1,130	52,129	52,129

29. An attempt was made to correlate the arrival of fish in the river with climatological data. Superficial analysis indicates a westerly wind may have some effect upon the daily abundance of fish in the river. It was also noted that the water had a temperature of 59° F. while the big run was taking place. Table No. 15 summarizes pertinent daily weather data with the abundance of fish during the 1956 season.

TABLE NO. 15 WEATHER DATA TAKEN AT KWIGUK, ALASKA - 1956

Date	Maximum Air Temp	Water Temp.	Wind Direction	Wind Velocity	Alakanuk Fish Catch
June 7	60		N	20 mph	358
8	67		NE	0-5 mph	285
9	74		SW	0-5 mph	246
10	66	53	SE	0-3 mph	Closed Period
11	62	55	S-SE	5-15 mph	351
12	66	56	S-SE	10 mph	268
13	63	57	S	0-5 mph	359
14	64	57	SE	5 mph	858
15	61	58	SE-NW	5 mph	542
16	68	58	W	0-5 mph	163
17	62	59	W-NW	4 mph	Closed Period
18	66	59	SW-W	5 mph	5,814
19	68	59	N-NW	5-10 mph	3,194
20	68	59.5	N	10-15 mph	2,522
21	65	60	W	15-20 mph	3,573
22	48	60	W-NW	5 mph	3,352
23	52	59.5	N	2-5 mph	1,101
24	59	59	NW	5-10 mph	Closed Period
25	55	59	W	5-10 mph	1,852

30. In 1920, Dr. C. H. Gilbert estimated the king salmon to travel at the high rate of speed of 57 miles per day between Pilot Station and Dawson in Canada. Their timing was based on a river distance of 1,504 miles. However, the Corps of Engineers considers this distance to be 1,356 miles. Intermediate distances are shown in Table No. 16.

TABLE NO. 16 MILEAGES ON THE YUKON RIVER FROM THE CORPS OF ENGINEERS 1956

Mile	Location	Mile	Location
0	Main Mouth (Opposite Nilak)	513.5	Koyukuk
	Location 62-36½° N lat.	716	Tanana
	164-47½° long.	756	Rampart damsite
		787	Rampart village
15	Kwiguk	1035	Fort Yukon
78.5	Mountain Village	1104	Circle City
94	Pitkas Point	1151	Woodchopper Creek damsite
285	Holy Cross	1256	Eagle
453.5	Kaltag damsite	1267	Boundary

In computing the rate of travel for 1956 and using the Corps of Engineers mileage figures and dates of first fish caught, the figure is 33.07 miles per day which is significantly less than the 1920 average rate.

31. By using the Corps of Engineers mileage and the time in days between the mouth and Eagle, the rates of travel are only two days different or an average rate of travel of 39.25 miles per day in 1956 and 44.85 miles per day in 1920.

32. Chum salmon traveled at a much lower rate of speed than did the king salmon. Their rate was 24.6 miles per day for the trip upstream to Eagle (again using the Corps of Engineers mileage).

The first chum salmon was noted at Alakanuk on June 5, 1956 and the first chum reported at Eagle was on July 26, 1956.

Spawning Stream Surveys

33. In the lower Yukon area, three rivers were checked to determine the species of salmon utilizing the particular river for spawning purposes as well as resident populations of other fish.

34. Mountain Village River. This stream has its source north of Mountain Village and enters the Yukon River two miles west of this town. It is a relatively small stream with two main branches which coalesce about five miles above the outlet. Only the west branch was surveyed.

35. The watershed was classed strictly as tundra with no spruce. The banks were lined with a heavy willow growth as well as grasses and sedges.

36. The river flows at variable rates of speed with the lower portion fairly slow. At the time of the survey, August 15 to August 18, the water was clear and had a temperature which averaged 55° F.

37. An estimated fifteen percent of the twenty miles of river surveyed contained suitable gravel for spawning. In the remaining portion, the bottom consisted of rubble which was too coarse for spawning. No tributaries found were large enough to contain spawning areas for salmon.

38. One gill net set was made on the stream. A 200-foot, variable-mesh experimental net was used and placed one mile above the forks directly below the first riffle on the river. The net was set at an

angle across the stream, being tied at both banks. The set revealed the following:

Set # 1 - 24 Hour Set

Species	Size	Sex	Weight
Silver Salmon	1.36 ft	M	7.9 lbs
Whitefish	14.5 in.	F	1.0 "
Northern Pike	26.5 "	F	5.3 "
Northern Pike	26.2 "	F	4.9 "
Northern Pike	24.3 "	M	3.1 "

39. Salmon were more abundant upstream to a point approximately 20 miles from the mouth. Many of the salmon had been dead for some time and thus were difficult to locate and identify. A total of 382 salmon were counted for an average of 19.1 salmon per mile of stream. This averaged 17.8 chum salmon, 0.5 king salmon, and 0.8 pink salmon per mile of stream. The total fish noted were as follows:

Species	Number Dead	Number Alive
Chum Salmon	343	13
King Salmon	6	3
Pink Salmon	3	14
	352	30

40. West Fork Andreafski River. The West Fork of the Andreafski parellels the East Fork of the same stream with the drainage oriented in a southwesterly direction. The village of Andreafski is about two miles below the confluence of the two forks of the river or four miles above its outlet into the Yukon River at Pitkas Point. Most of the watershed contains tundra; however, the draws and lower hillsides are

sparsely covered with spruce and alder. Willows, alder, cottonwood, various grasses, and sedges occur along the streambank proper.

41. The West Fork appeared to be more rapid in flow than did the East Fork with surrounding terrain being steeper and more "rugged" on the west branch. The water was from two to four feet above normal while the survey was in progress with the water very cloudy thus hindering salmon counts. The average water temperature was 46° F., while the air temperature averaged 58° F.

42. From August 20-25 about 75 miles were surveyed. The upper 65 miles contained many spawning areas with about 25 percent of the 65 miles containing good to excellent spawning gravel. The remaining portion was either too coarse or too sandy.

43. By boat, only 17 kings and chum salmon were counted. High water as a result of heavy rains had evidently removed most of the dead or dying salmon. Pike and grayling were also noted. On July 27, 1956 a section of 20 to 25 miles was counted from the air and 865 dead salmon and 550 live salmon were noted.

44. East Fork Andreafski River. This fork of the Andreafski River has its source northeast of the village of Andreafski. It flows a general southwest direction, joining the west fork about two miles upstream from Andreafski village.

45. The East Fork drains a rolling, hilly tundra area. Spruce and alder are found along the edges of the hills and draws. The bank vegetation is mainly willows, grass, sedges, alder, and some spruce.

46. A gradual gradient prevails with a series of long shallow pools connected by gentle riffles. The water at the time of the survey was clear and the temperature ranged from 54 to 56 degrees Fahrenheit. During the survey period from August 4 to 13, a total of 5,268 salmon were actually counted. Due to limited visibility and other factors, an estimate of 3.0% live king salmon, 2.7% live chum and pink salmon, and 94.3% dead chum and king salmon were counted. The stream was drifted for five miles with all fish being tabulated. A break in counting areas was made through which observations were not conducted. Listed below are actual numbers counted by this method.

5 mile Section	Dead Chum	Live Chum	Dead King	Live King	Live Pink	Total per Section
1	888	16	5	61	-	970
2	501	13	3	6	-	523
3	499	21	5	37	-	562
4	1339	26	8	28	-	1401
5	757	44	6	25	-	832
6	667	14	6	---	2	689
7	127	2	-	1	-	130
8	128	4	4	---	-	136
9	20	2	3	---	-	25
Total	4926	142	40	158	2	5268

47. This count extended over 45 miles of river, beginning 60 miles above the Andreafski and counting downstream. The lower 10 miles revealed very few salmon; the upper two-thirds being far superior in numbers of spawning fish. Number of fish per mile of stream was computed at 313.8 or 295.6 chums, 6.7 kings, and only 0.2 pinks per mile of stream.

48. At regular five-mile intervals, seine hauls were made with a 30 foot minnow seine. Generally, the shallow riffles were most productive.

49. Gill net sets were made at three locations and the results are as follows:

Set # 1 - 60 miles above Andreafski

Species	Size	Sex	Weight
Grayling	14.2 in.	F	-
Grayling	9.8 "	F	-
Grayling	8.6 "	M	-
Grayling	9.3 "	M	-
Grayling	8.5 "	F	-

Set # 2 - 50 miles above Andreafski

Species	Size	Sex	Weight
Chum Salmon	1.87 ft	M	11.0 lbs
Chum Salmon	1.82 "	M	9.1 "
Chum Salmon	1.73 "	M	7.8 "
Chum Salmon	1.71 "	M	6.8 "
Chum Salmon	1.61 "	F	5.8 "
Chum Salmon	1.48 "	F	4.2 "
Grayling	14.1 in.	F	.7 "
Grayling	13.5 "	F	.9 "
Grayling	11.5 "	F	-
Whitefish	18.2 "	F	2.9 "
Whitefish	17.7 "	M	2.6 "
Whitefish	13.2 "	M	1.1 "
Northern Pike	20.5 "	F	2.4 "
Northern Pike	18.5 "	F	1.5 "
Northern Pike	15.9 "	F	1.0 "
Northern Pike	15.0 "	M	.8 "

Set # 3 - 40 miles above Andreafski

Species	Size	Sex	Weight
Chum Salmon	1.48 ft.	F	4.5 lbs.

50. The following streams were surveyed from the air to determine the occurence of spawning: Nation River, Kandik River, Charley Creek, and Coal Creek, all between Eagle and Circle and were void of salmon. These tributaries all appeared to contain excellent spawning gravels. Both Mission and Eagle Creek were surveyed from a boat and again salmon were not found. One lone king salmon was noted on August 17, 1956 on Crooked Creek (tributary to the Stewart River) at the road crossing of the creek which is in Yukon Territory of Canada. This is about eight miles south of the Stewart River crossing by road. Two dead king salmon were noted on the Klondike River about 29 and 35 miles upstream from the town of Dawson on August 17, 1956.

51. King salmon are known to go up the Yukon to Teslin Lake. The large tributaries that support spawning kings are the Klondike River, Stewart River (and one fork called the McQuesten), Pelly River (and both forks of the MacMillan River), and Big Salmon River. Chum salmon seem to be confined to the main Yukon River up to the 61° north latitude mark on the Teslin River.

WILDLIFE

52. During 1956 an attempt was made to determine the extent of dependency on and utilization of fish and wildlife resources by the Yukon Basin residents. It has long been supposed and apparently is a fact that these native populations are largely dependent on such resources even though white man's dietetics have been made available to the natives. Unfortunately, economic opportunities are still limited; therefore the Eskimo and Indian must depend to a great extent on what may be gleaned from the sky, land and water (Fig. 5).

53. Near the Bering Coast, fishes and marine mammals play the most important role in the dietary habits of the villages. In villages further removed from the coastal areas, the diet seems to gradually change from an aquatic origin to more of a terrestrial makeup. Autochthonous wildlife such as moose, caribou, rabbits, ptarmigan, etc., eventually become the main "staff of life". It is interesting to note that in many villages which have a good supply of fish in the streams as well as fair herds of moose and/or caribou close by, depend much more on the latter two than on the fish. However, in some areas, because of the nomadic action of the caribou they become inaccessible during some years, the residents then turn to the streams for their food supply.

54. An attempt was made to determine the relative importance of the Yukon Basin wildlife to the total Alaska harvest of wildlife by species. From 1948 to 1952 the estimated total Alaska harvest of all wildlife species was recorded in 35 districts. The distribution of

take by the various districts for 1948 was based only on license take

take by the various districts for 1948 was based only on license take reports and did not reflect the true picture since the native take was not included. In 1949 and continuing through 1952, the Alaska Native Service school teachers reported game and fur taken by the native villages. It was assumed that this would result in more accurate data.

55. These reports and computations by districts also have an additional shortcoming in that too often the licensed hunter or trapper reported his take in the district where he purchased the license rather than in the district where the hunting or trapping was done. Listed below are the 35 districts with a brief description of the area each encompasses with those of the Yukon being underlined.

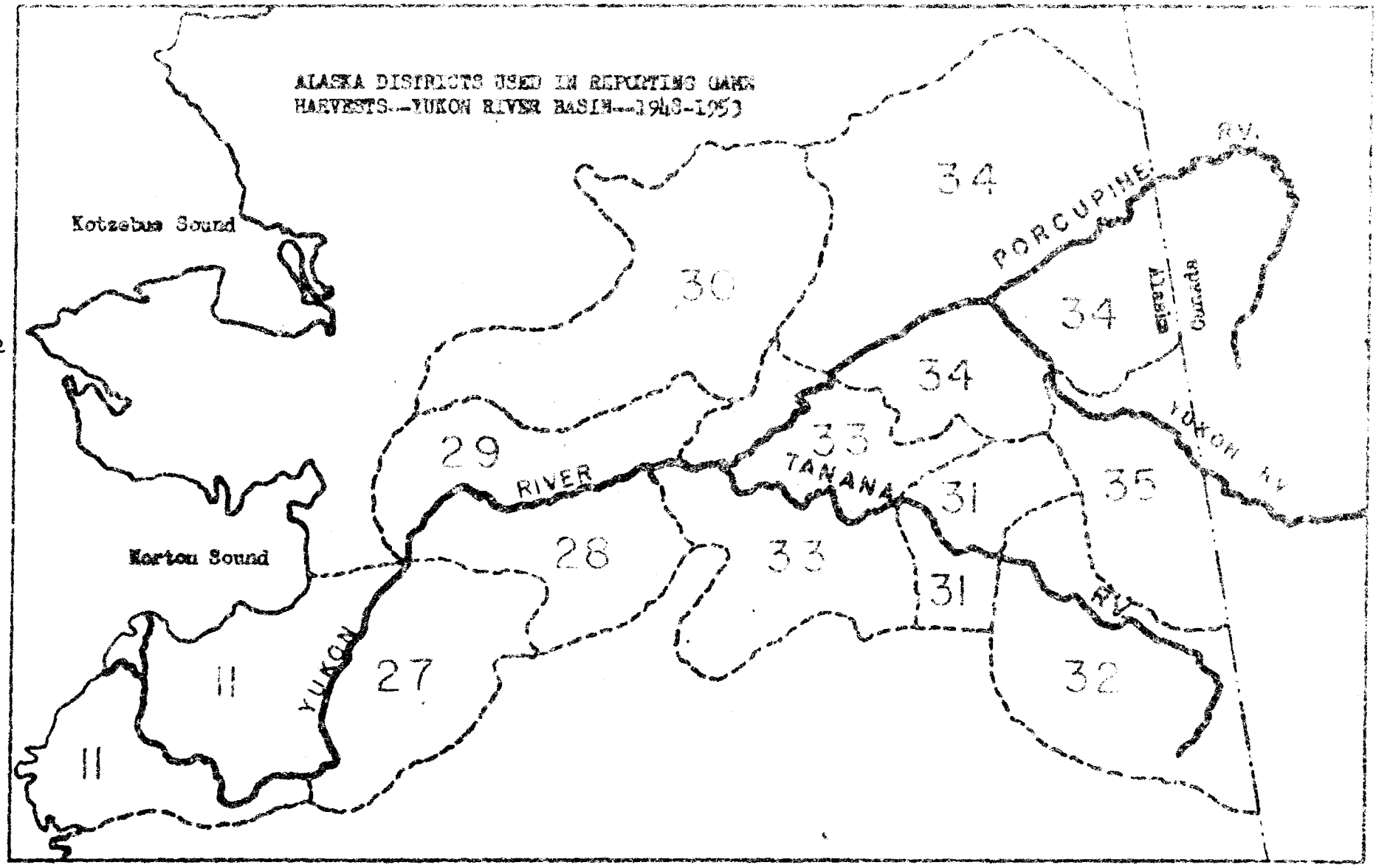
District Number	General Area
1.	Revillagigedo Island
2.	Mainland, from Alaska's southern border to Cape Fanshaw
3.	Prince of Wales Islands
4.	Kupreanof, Kuiu Islands
5.	Baranof Island
6.	Chichigof Island
7.	Admiralty Island
8.	Mainland, Yakutat to Cape Fanshaw
9.	Kunivak Island
10.	St. Lawrence Island
11.	West Coast, Unalakleet to Nasen Bay
12.	Seward Peninsula
13.	Noatak and Kobuk River drainages
14.	Arctic coast, north of Brooks Range
15.	Gulf of Alaska, Prince William Sound to Yakutat
16.	Copper River, Chitina, Gakona
17.	Kenai Peninsula
18.	Anchorage, Susitna and Matanuska Valley
19.	Skwentna River, Tyonek-west of Cook Inlet
20.	Kodiak and Afognak Islands
21.	Alaska Peninsula, False Pass to Pt. Heiden, Shelikof Strait to Illiamna

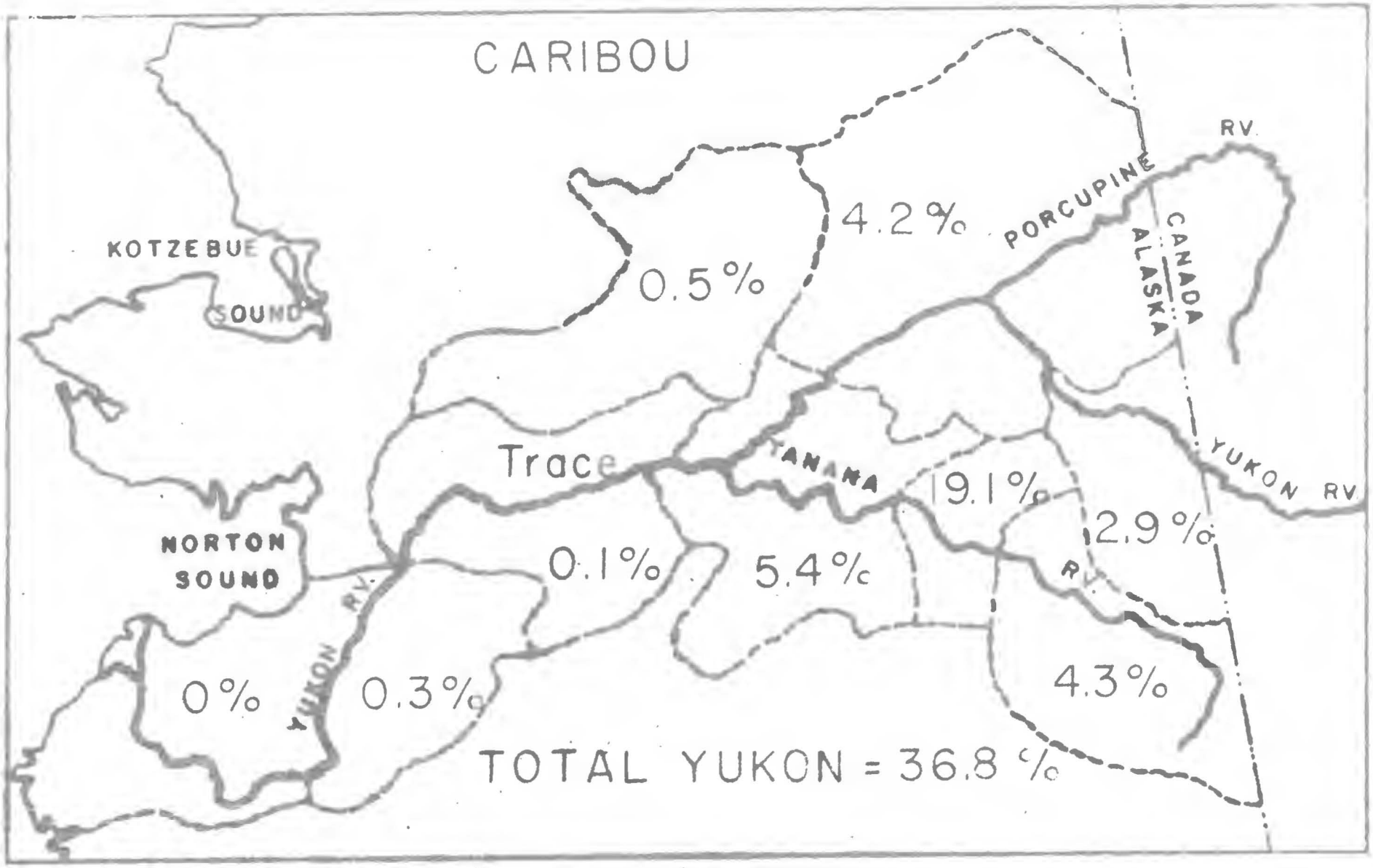
District Number	General Area
22.	Unimak Island and Aleutian Islands (Island of the Four Mountains west to Attu Islands)
23.	Lakes Clark, Illiamna, Becharof and Ugashak Lake
24.	Dillingham and Nushagok River
25.	Kuskokwim Delta-Platinum, Bethel, Kalskag, Tamunak
26.	Upper Kuskokwim River
27.	Innoko River, Yukon River, Iditarod
28.	Nowitna River, Poorman, Ruby, Long
29.	Koyukuk River, Koyukuk, Galena, Kokrines
30.	Headwaters of Koyukuk River, Wiseman, Bettles, Hughes, Allakaket
31.	Fairbanks south to Mt. McKinley, Chena Hot Springs, Denali
32.	Upper Tanana - Big Delta to boundary
33.	Mt. McKinley National Park, Kantishna River, Manley Hot Springs, Tanana, Nenana, Livengood
34.	Upper Yukon River, Stevens to Circle
35.	Upper Yukon River, Circle to Boundary

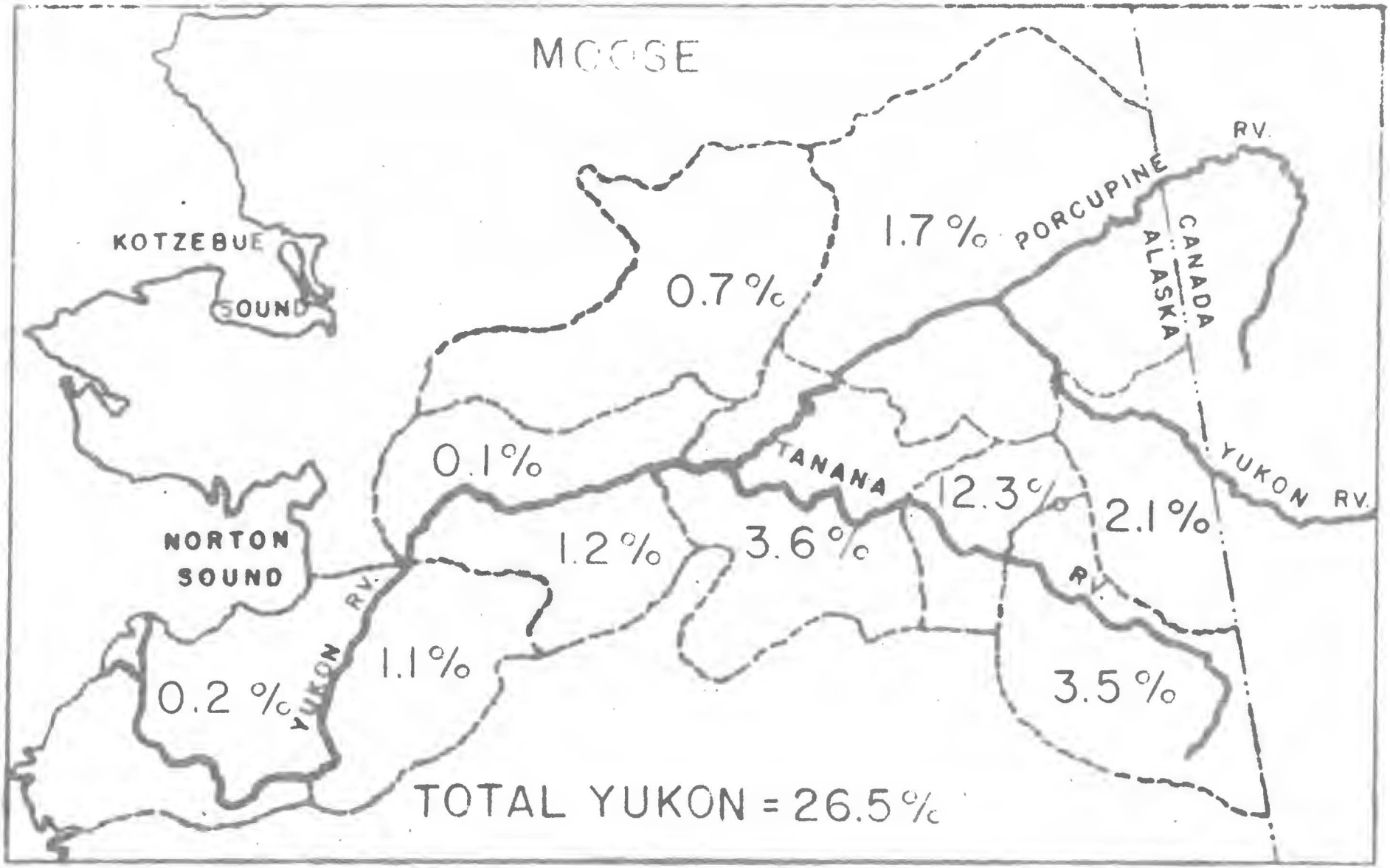
56. Maps have been prepared to depict the gross districts on a map of the Yukon River Basin while subsequent maps show the average percentage harvest of each species from the various Yukon Districts to the total Alaska harvest from the years 1948 to 1952. Table No. 17 shows the computed take for each district from July 1, 1944 to June 30, 1955 based on the 1948 to 1952 average.

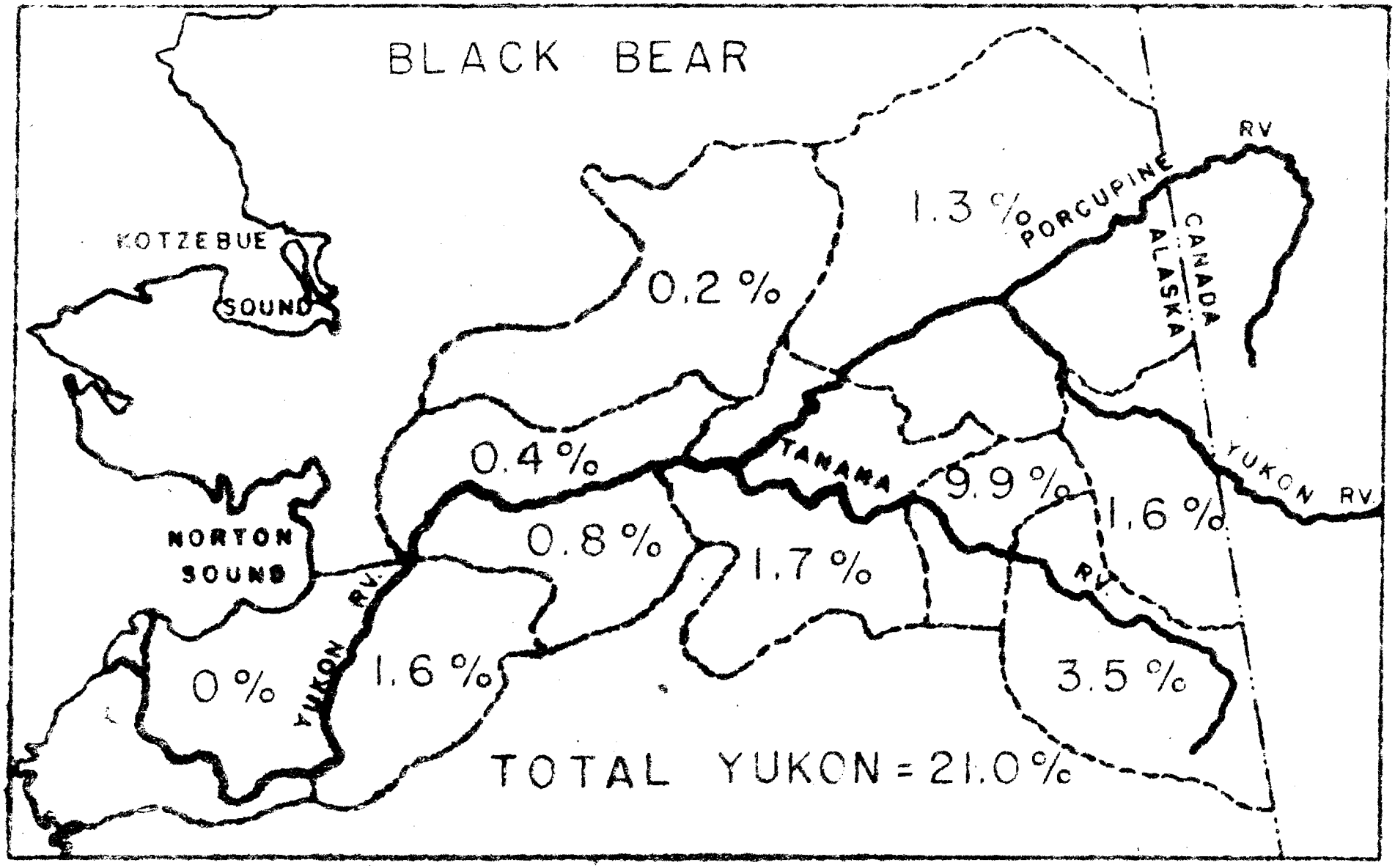
57. These "harvest maps" do not represent the final percentage figure for any one district or for the Yukon Basin but do present an approximation of relative take in the Basin to the Territory. As will be pointed out later, it is doubtful that the results gained in this tabulation of data are valid.

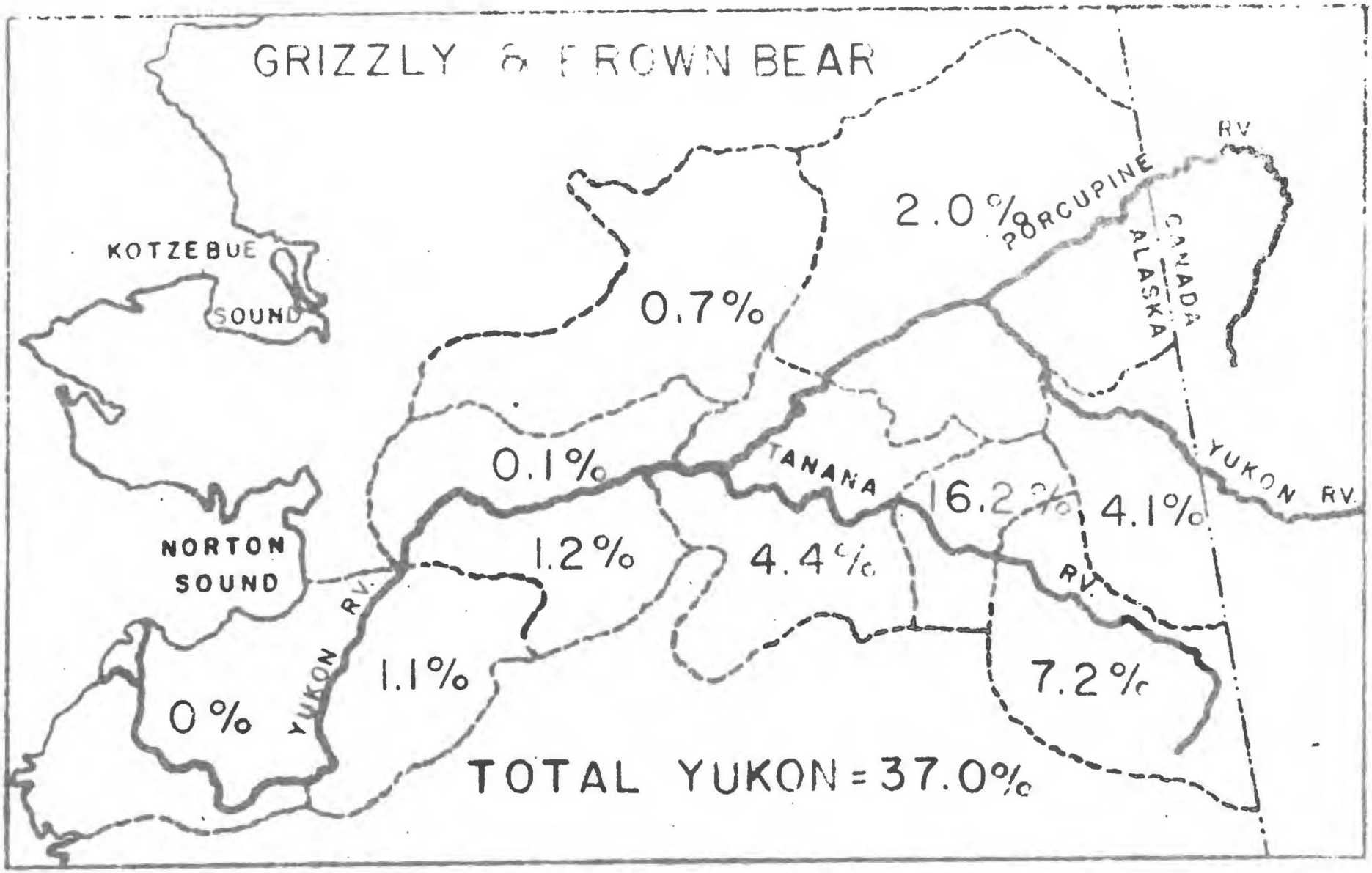
58. During 1956, a survey was conducted by the Fish and Wildlife Service as to the harvest of various wildlife species by native populations in Alaska. The survey was to be done in conjunction with

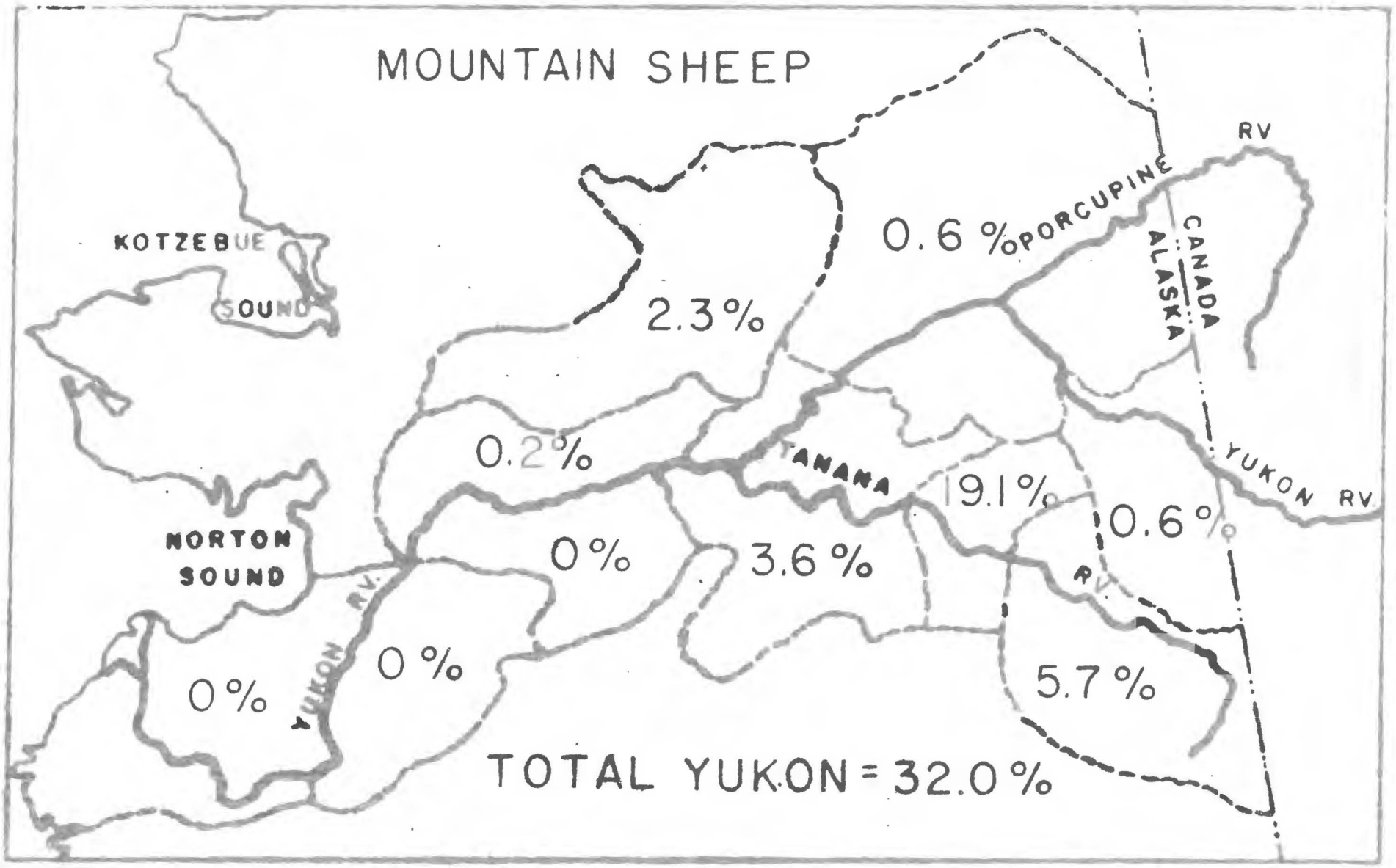

ALASKA DISTRICTS USED IN REPORTING GAME
HARVESTS--YUKON RIVER BASIN--1948-1953
Kotzebue Sound
Norton Sound
YUKON
RIVER
TANANA
PORCUPINE
RV.
YUKON
RV.
RV.
Canada
11
11
27
28
29
30
31
31
32
33
33
34
34
34
35

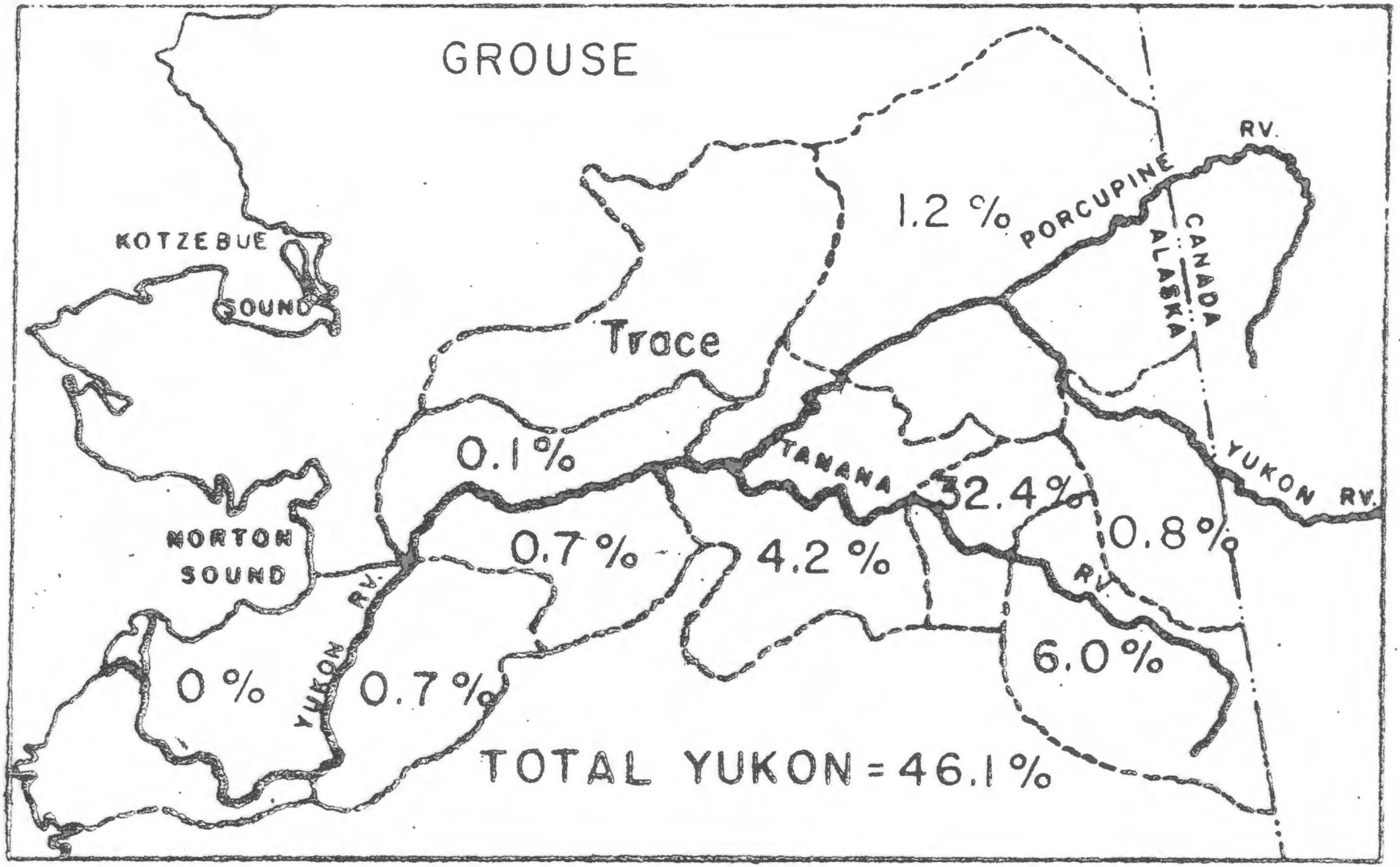

CARIBOU
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV.
CANADA
ALASKA
YUKON RV
TANANA
RV.
0.5%
4.2%
Trace
9.1%
2.9%
0.1%
5.4%
4.3%
0%
0.3%
TOTAL YUKON = 36.8 %

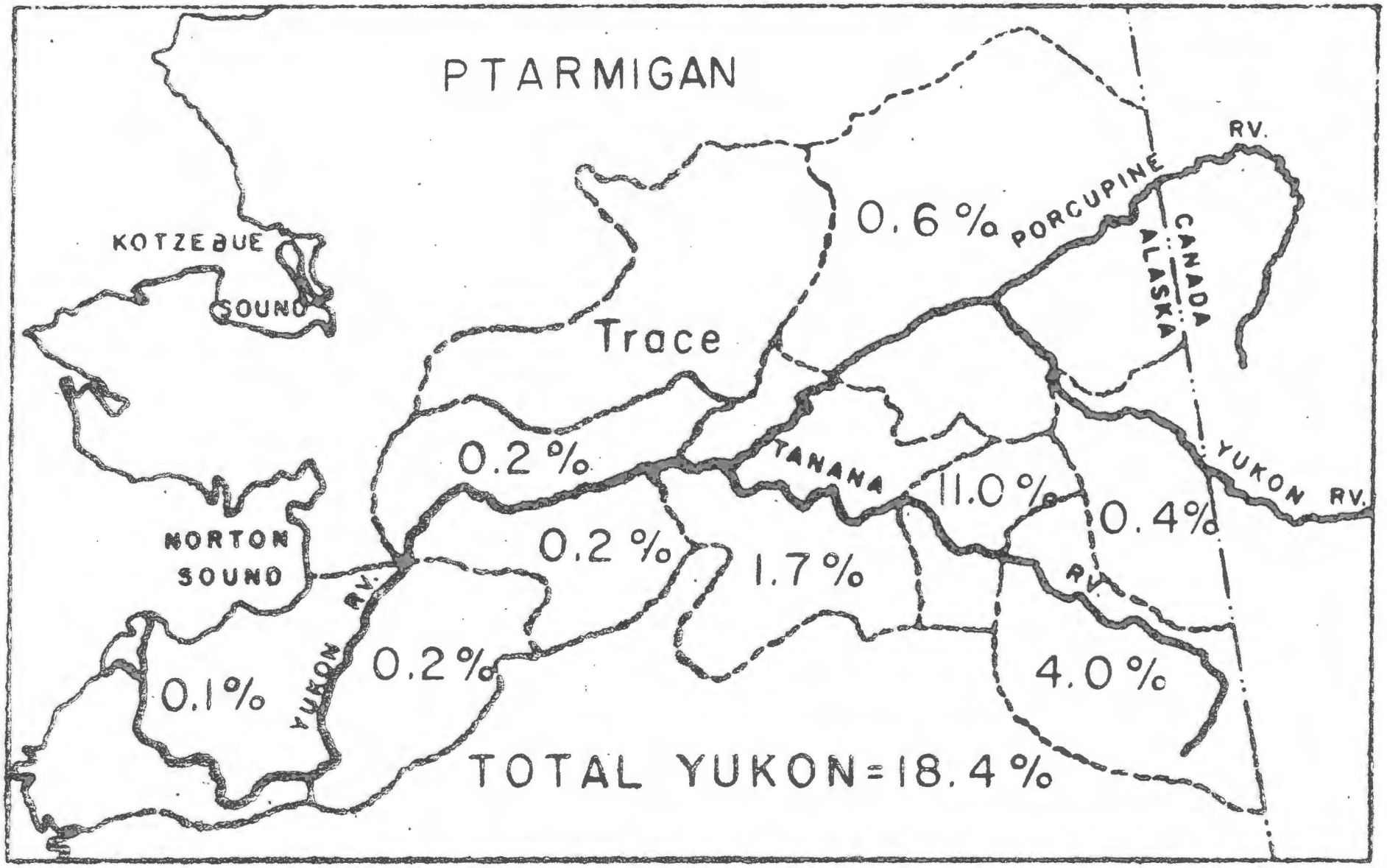

MOOSE
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV.
CANADA
ALASKA
TANANA
YUKON RV.
R.
0.7 %
1.7 %
0.1 %
1.2 %
3.6 %
12.3 %
2.1 %
1.1 %
0.2 %
3.5 %
TOTAL YUKON = 26.5 %

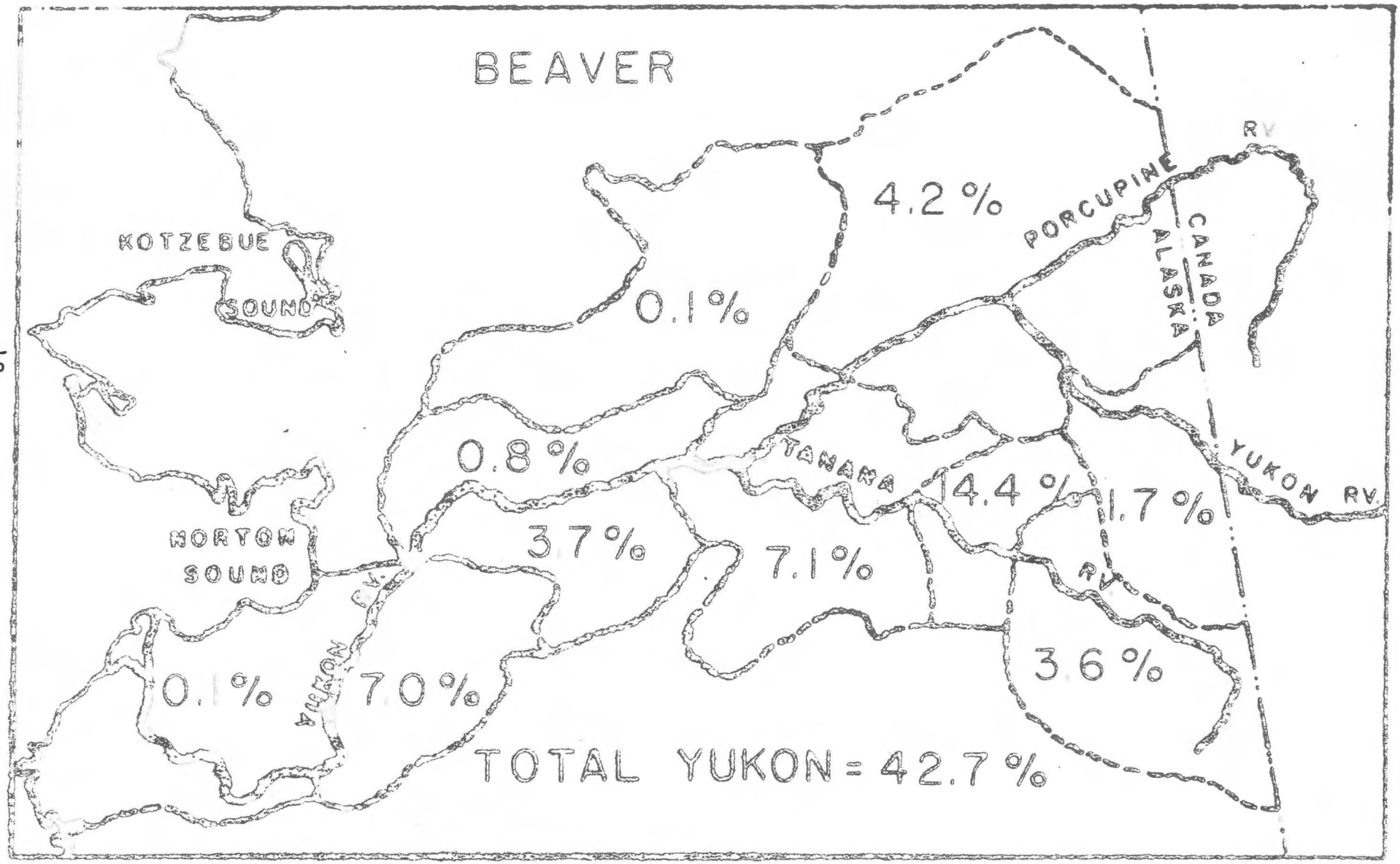

BLACK BEAR
KOTZEBUE SOUND
NORTON SOUND
YUKON RV.
0 %
1.6 %
0.4 %
0.8 %
0.2 %
1.7 %
1.3 %
PORCUPINE
RV
CANADA
ALASKA
TANANA
9.9 %
1.6 %
YUKON RV
RV
3.5 %
TOTAL YUKON = 21.0 %

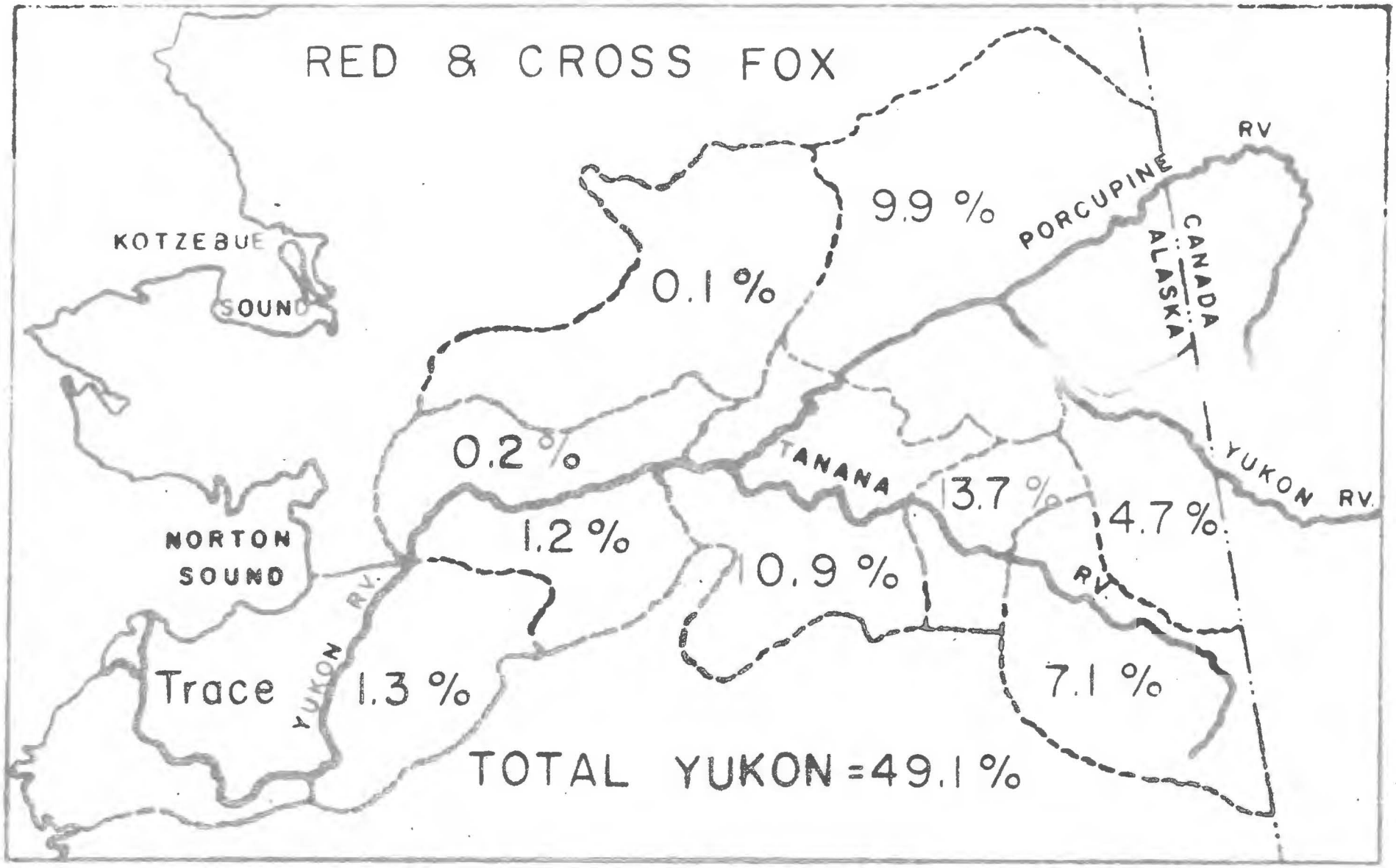

GRIZZLY & BROWN BEAR
KOTZEBUE SOUND
NORTON SOUND
YUKON RV.
YUKON RV.
YUKON RV.
PORCUPINE RV
CANADA
ALASKA
TANANA
0.7%
2.0%
0.1%
1.2%
1.1%
0%
4.4%
6.2%
4.1%
7.2%
TOTAL YUKON = 37.0%

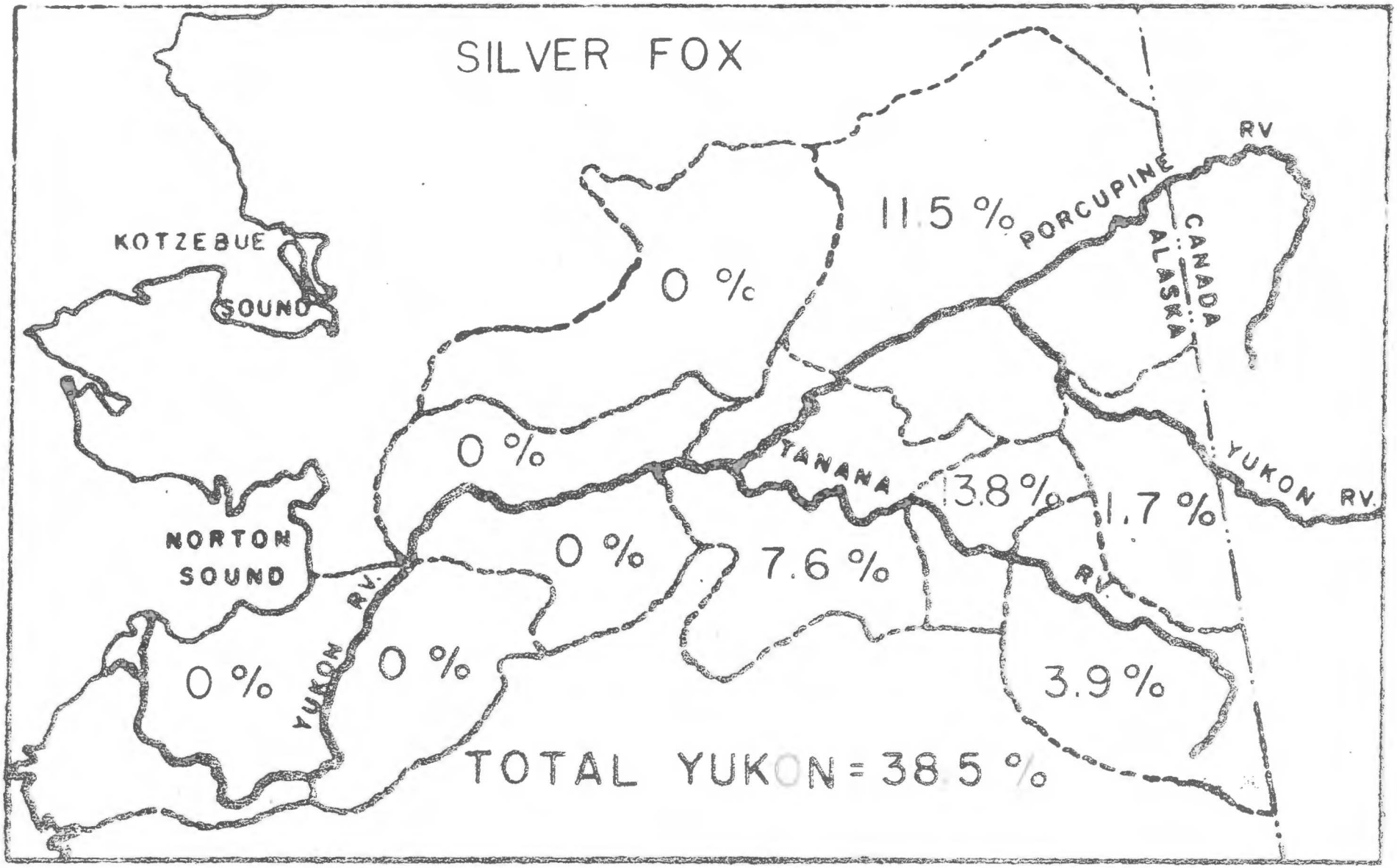

MOUNTAIN SHEEP
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV
CANADA
ALASKA
YUKON RV.
TANANA
RV.
2.3%
0.6 %
0.2%
0%
3.6 %
9.1%
0.6%
0 %
0%
5.7 %
TOTAL YUKON = 32.0 %

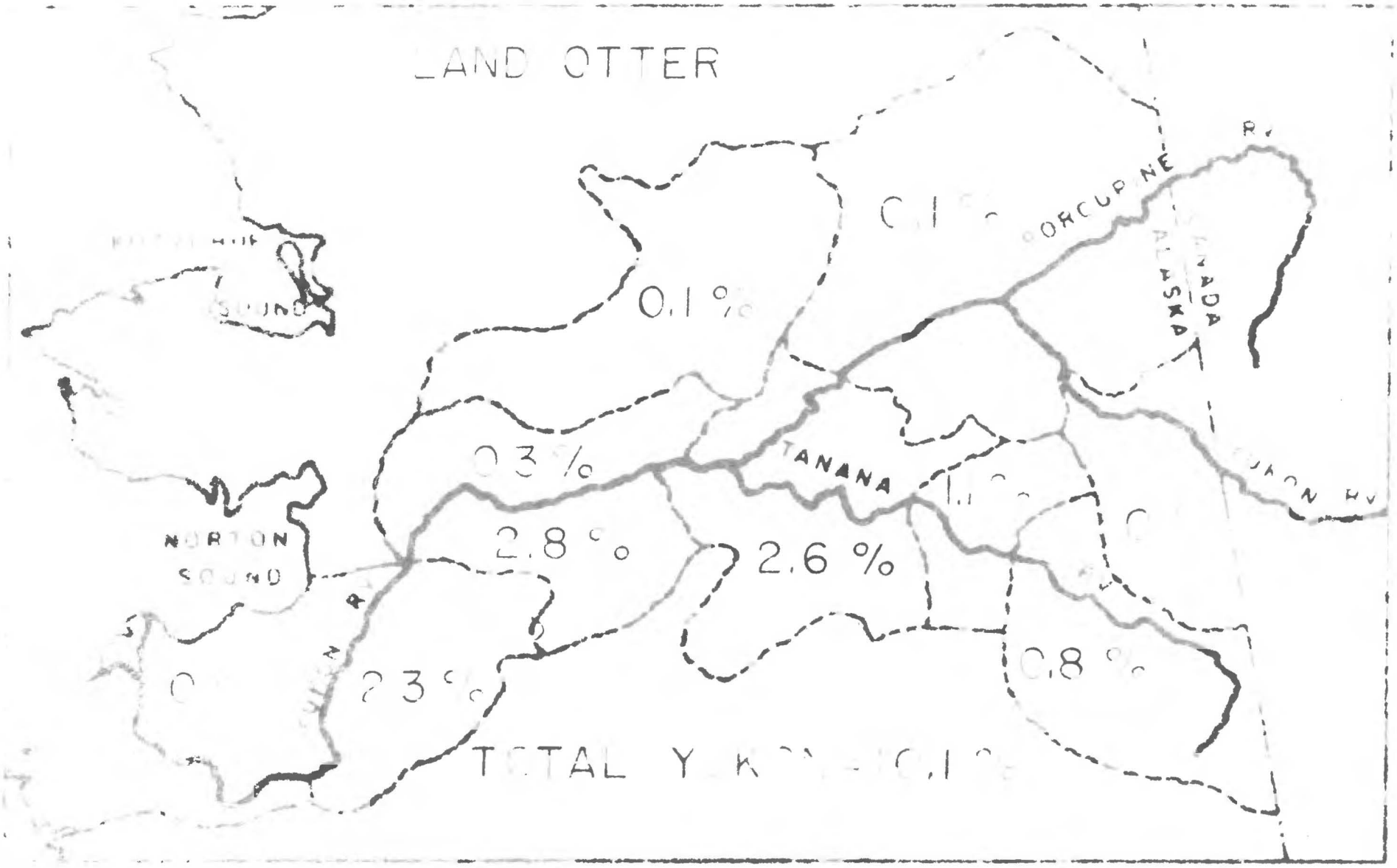

GROUSE
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV.
CANADA
ALASKA
TANANA
YUKON RV.
RV.
Trace
1.2 %
0.1 %
0.7 %
4.2 %
32.4 %
0.8 %
6.0 %
0 %
0.7 %
TOTAL YUKON = 46.1 %

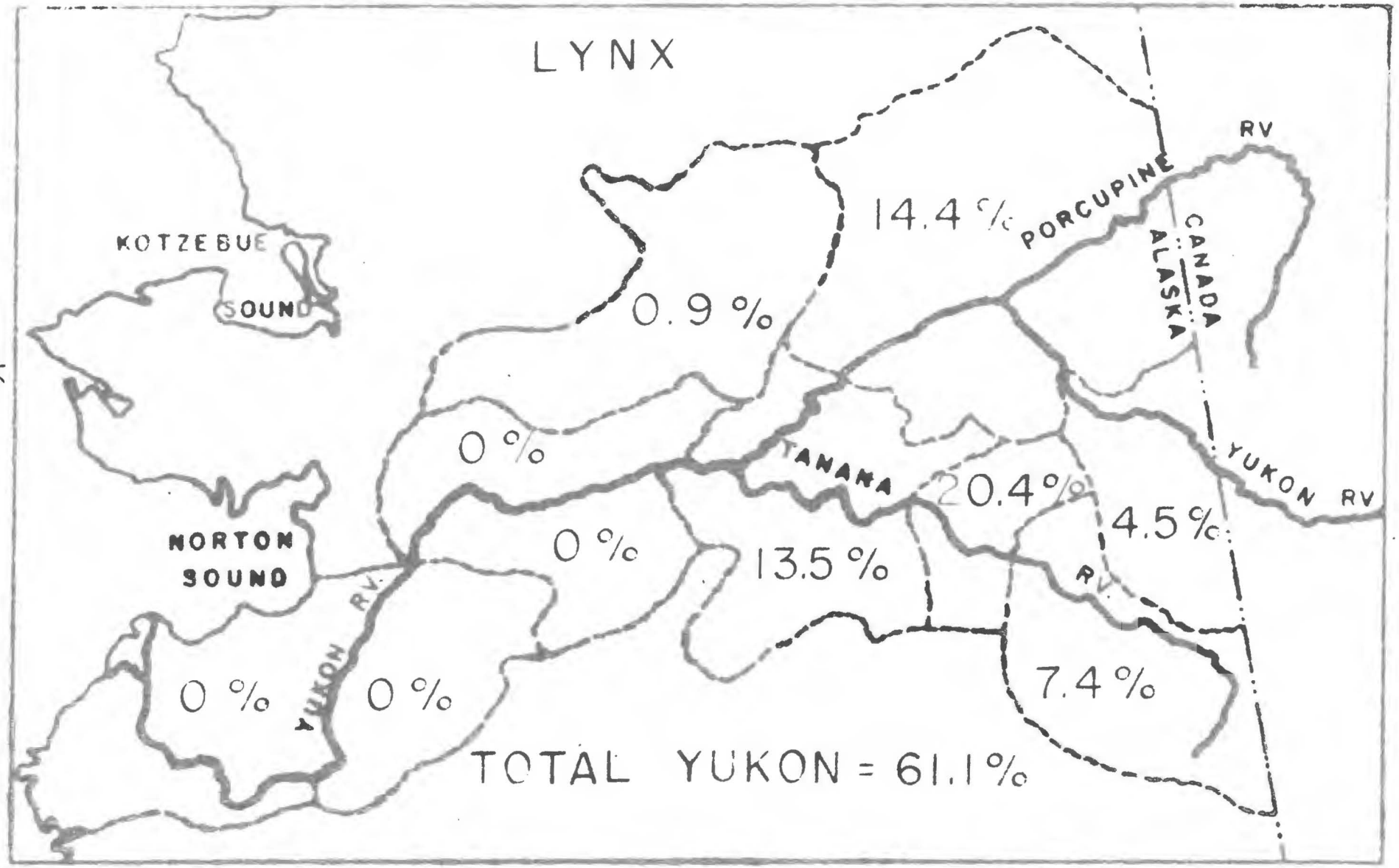

PTARMIGAN
KOTZEBUE SOUND
NORTON SOUND
YUKON RV.
PORCUPINE RV.
CANADA
ALASKA
YUKON RV.
TANANA RV.
Trace
0.6 %
0.2 %
0.2 %
0.2 %
0.1%
1.7 %
11.0 %
0.4%
4.0 %
TOTAL YUKON=18.4 %

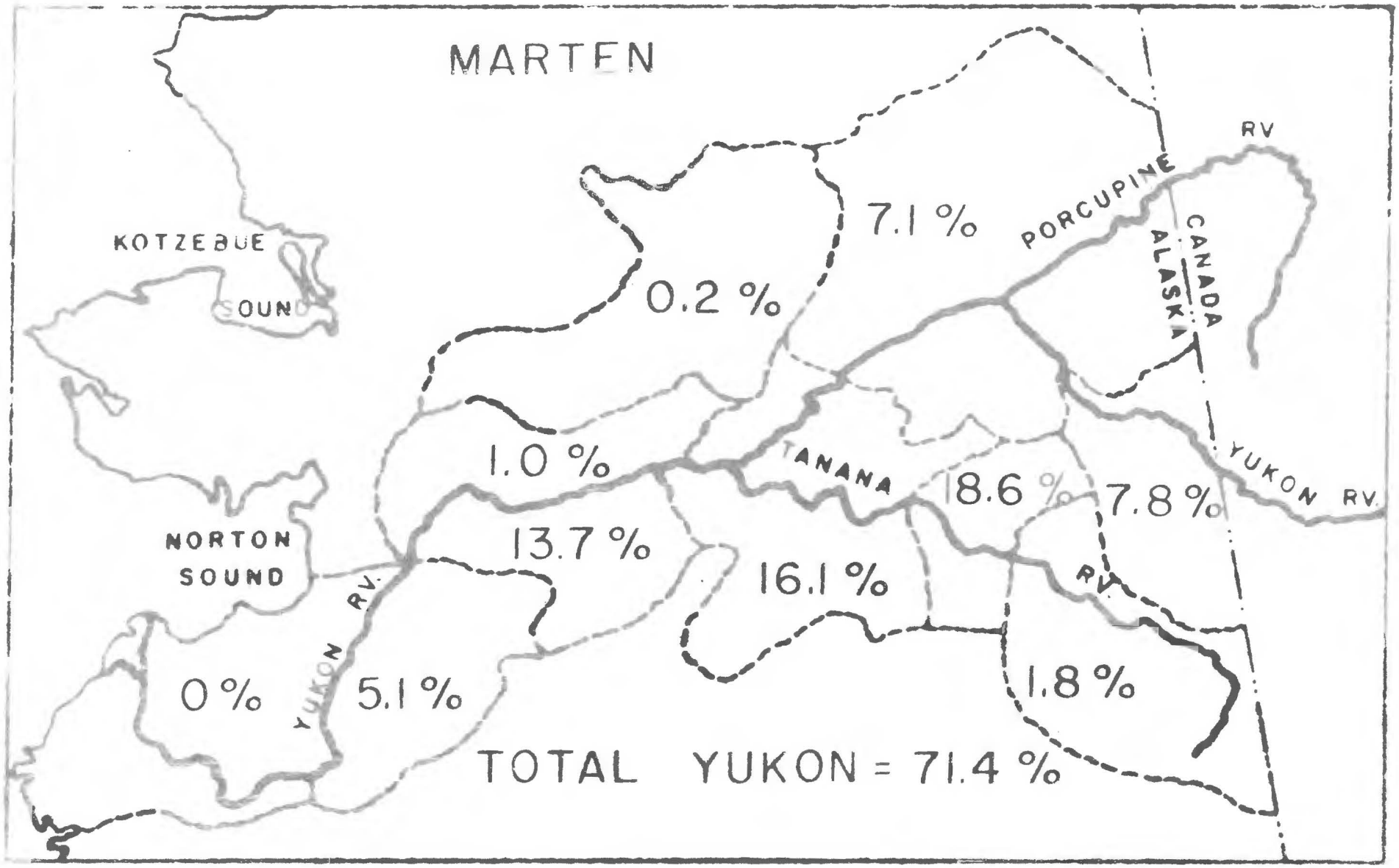

BEAVER
KOTZEBUE SOUND
NORTON SOUND
NORTON BY.
PORCUPINE
RV
CANADA
ALASKA
TANANA
YUKON RV.
RV
4.2 %
0.1 %
0.8 %
37 %
7.1 %
14.4 %
1.7 %
3.6 %
0.1 %
7.0 %
TOTAL YUKON = 42.7 %

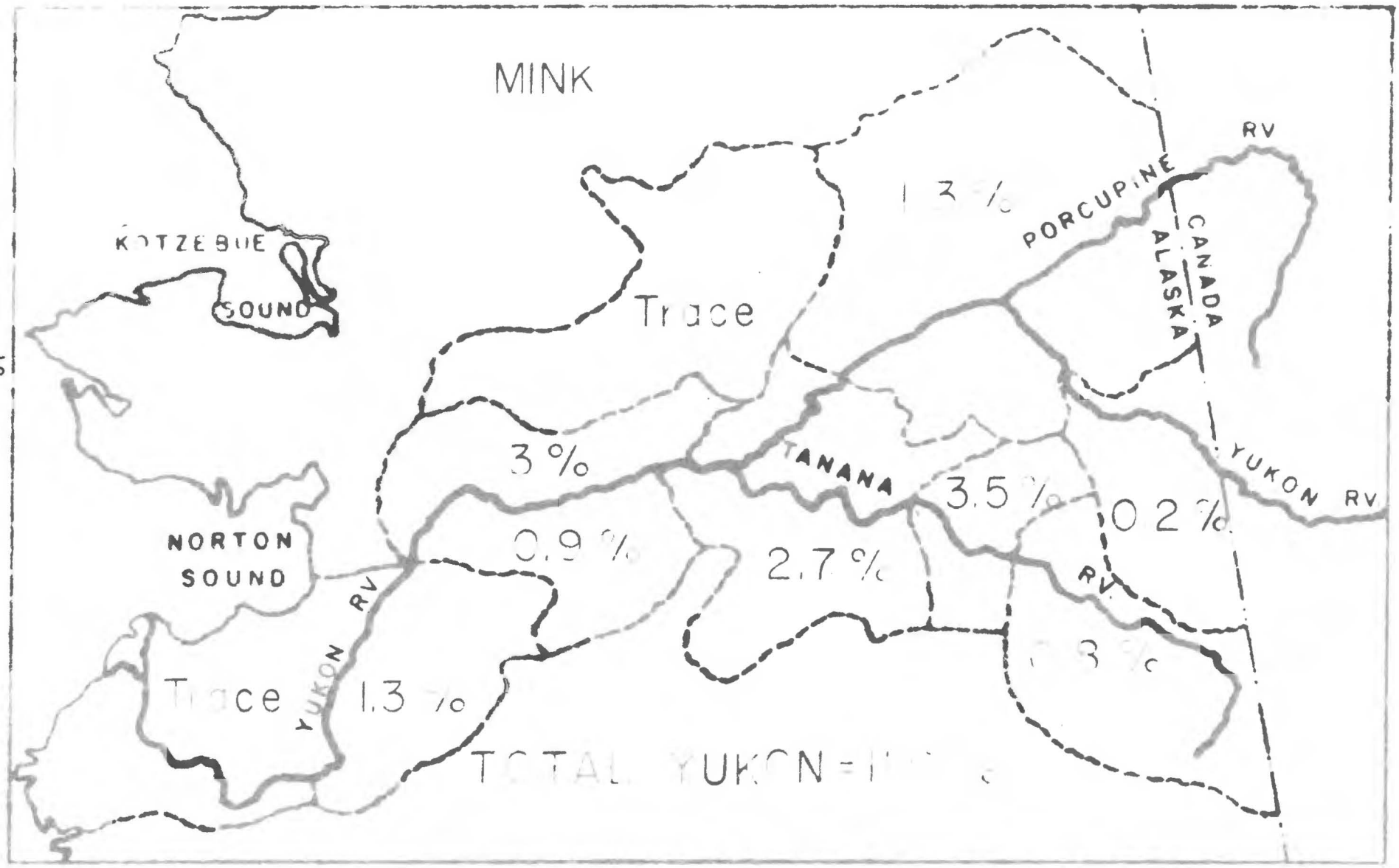

RED & CROSS FOX
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV
CANADA
ALASKA
YUKON RV.
TANANA
RV.
Trace
1.3 %
1.2 %
0.2 %
0.1 %
9.9 %
0.9 %
3.7 %
4.7 %
7.1 %
TOTAL YUKON = 49.1 %

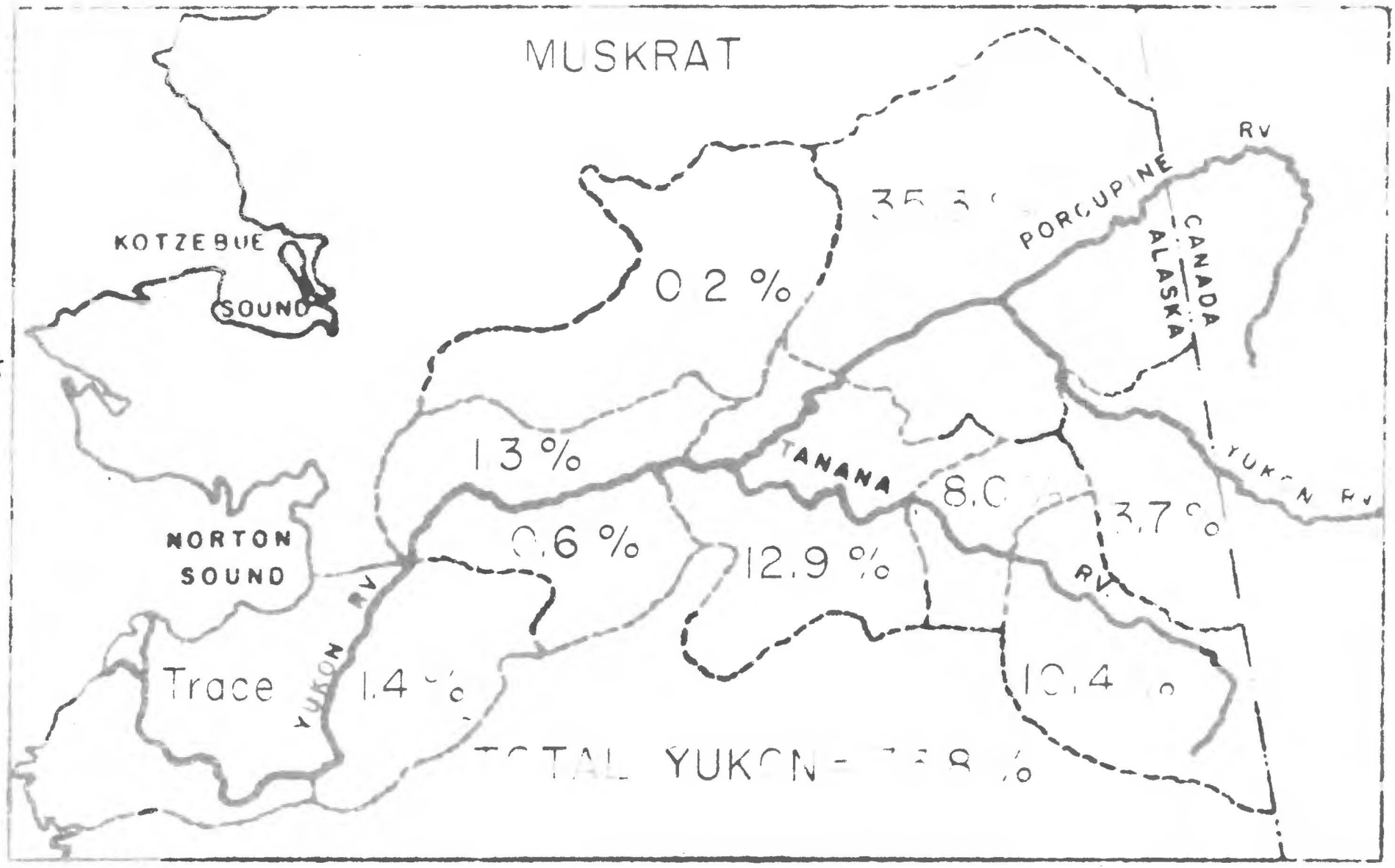

SILVER FOX
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
0 %
0 %
0 %
0 %
0 %
11.5 %
PORCUPINE
RV
CANADA
ALASKA
TANANA
3.8 %
1.7 %
7.6 %
3.9 %
YUKON RV.
RV.
TOTAL YUKON = 38.5 %

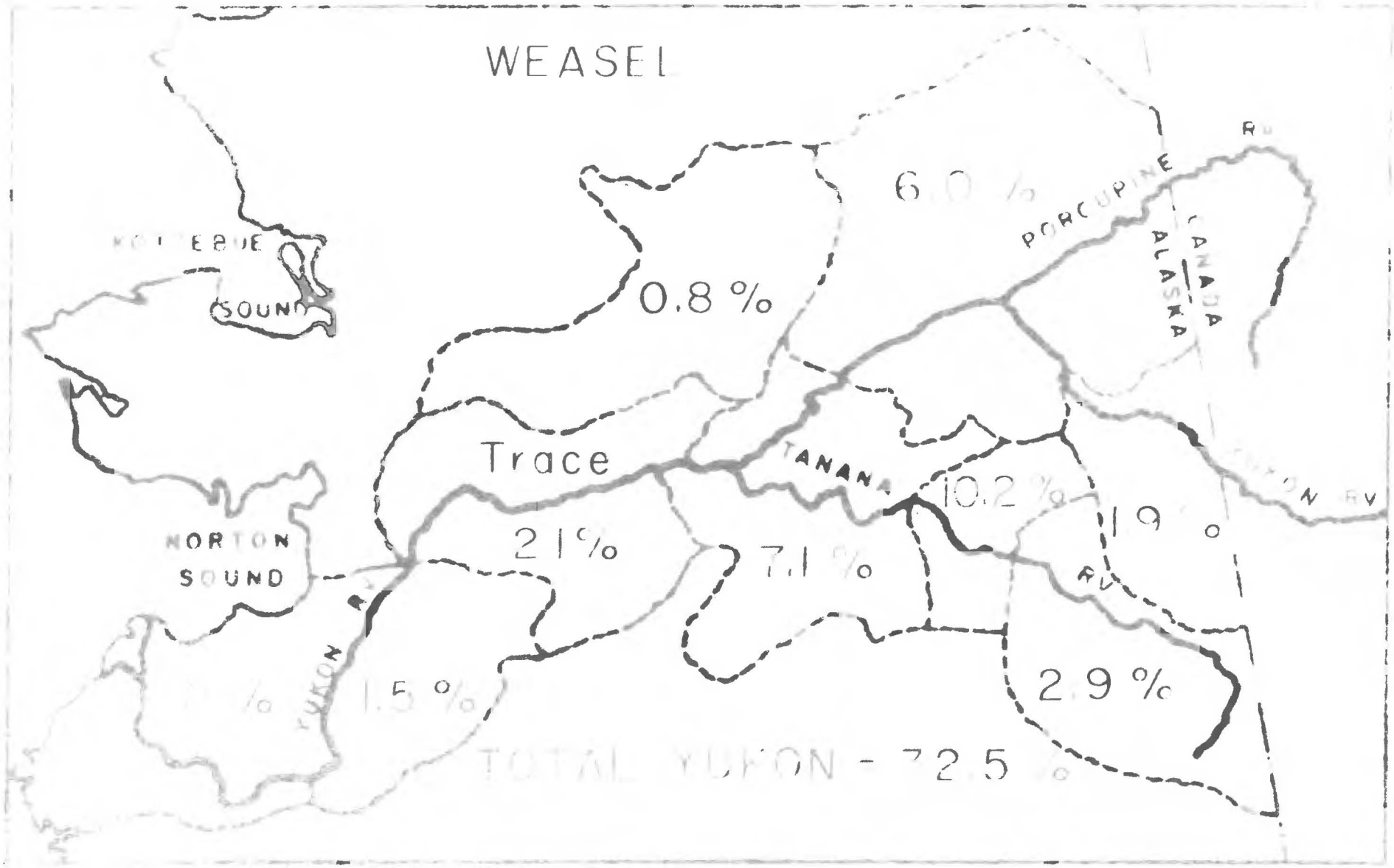

LAND OTTER
0.1 %
0.3 %
2.8 %
2.6 %
0.8 %
TANANA
NORTON SOUND
ALASKA

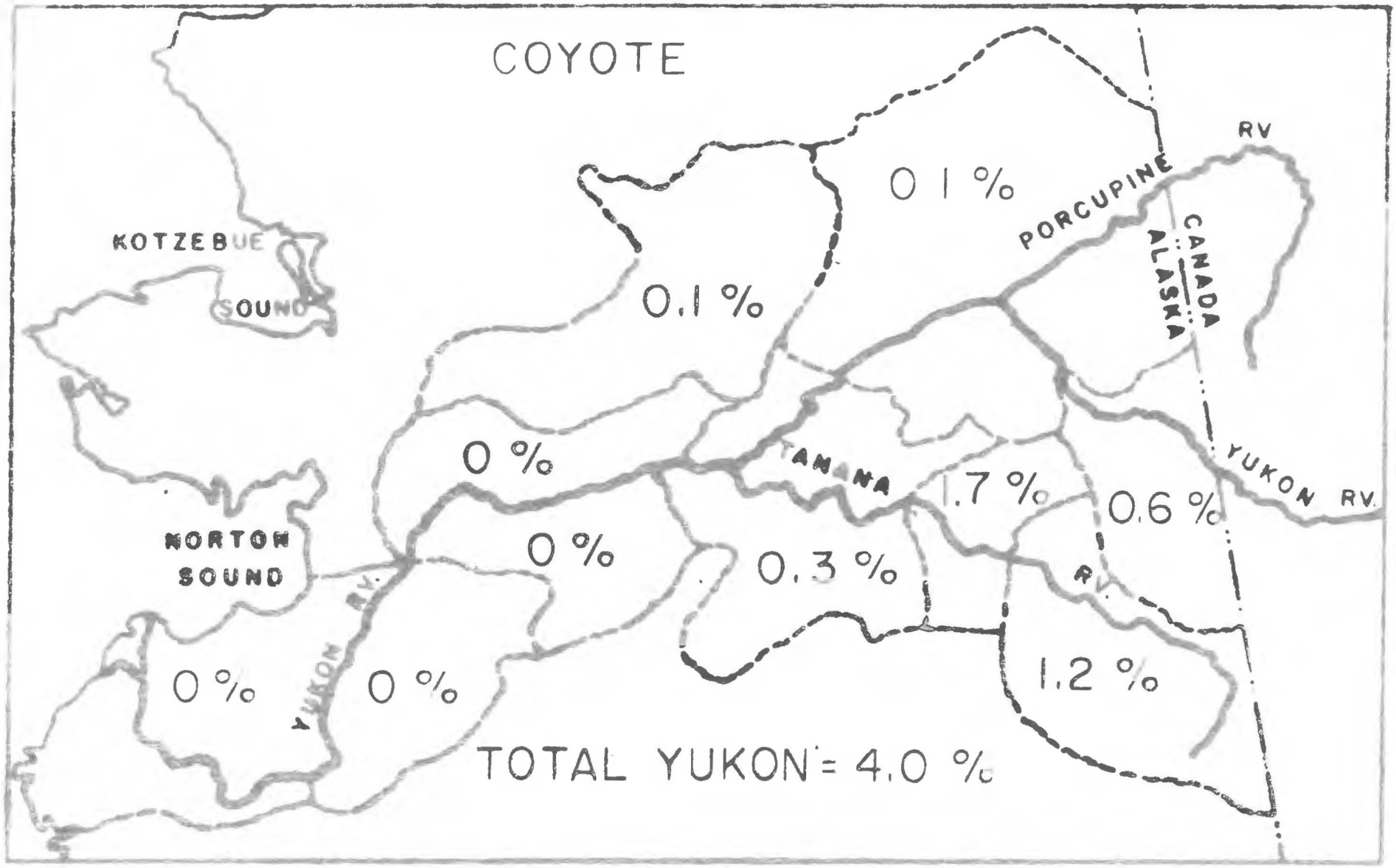

LYNX
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
0 %
0 %
0 %
0 %
0.9 %
14.4 %
PORCUPINE
RV
CANADA
ALASKA
TANANA
20.4 %
4.5 %
YUKON RV
RV.
13.5 %
7.4 %
TOTAL YUKON = 61.1 %

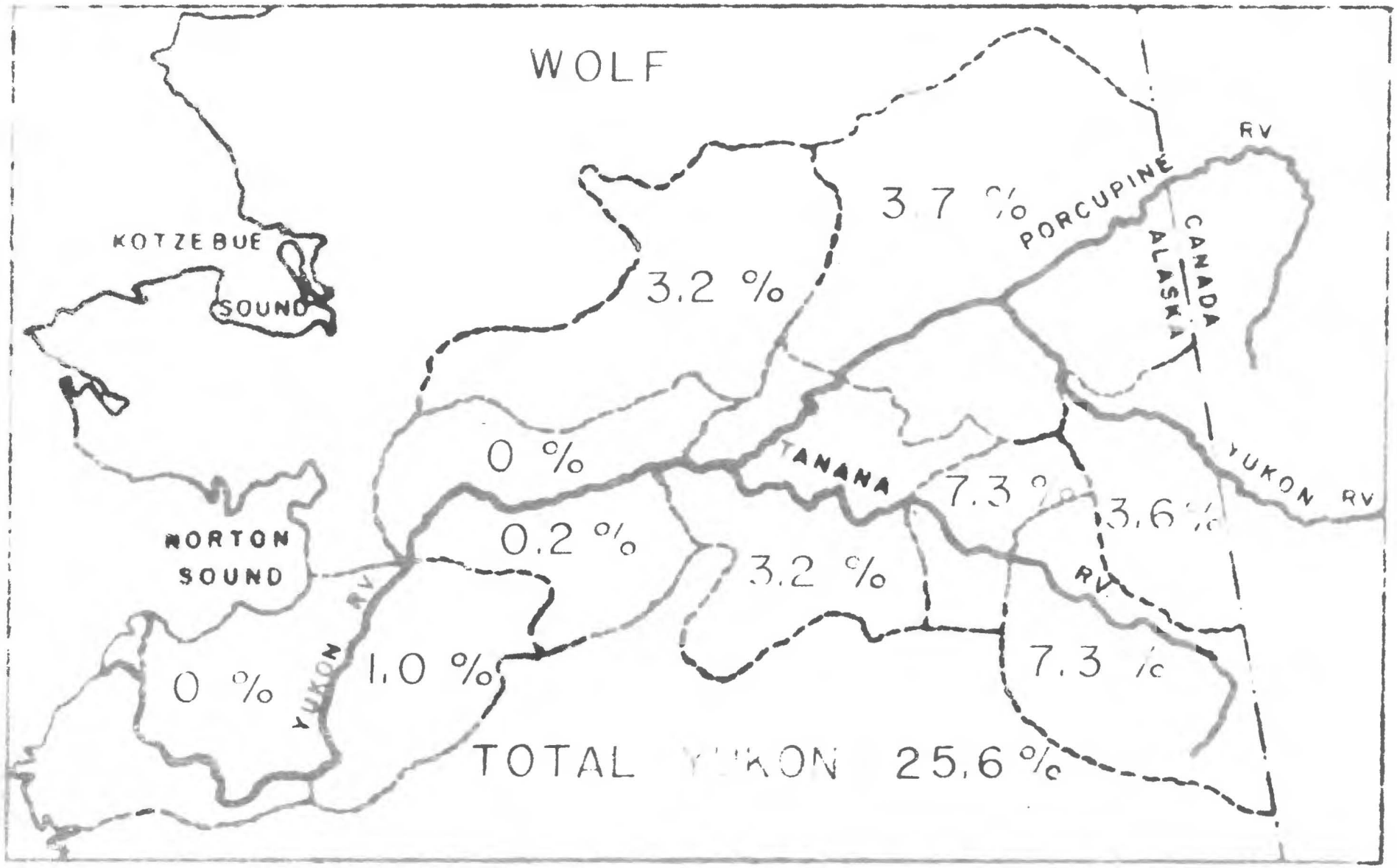

MARTEN
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV.
PORCUPINE
RV
CANADA
ALASKA
TANANA
YUKON RV.
RV.
7.1 %
0.2 %
1.0 %
13.7 %
16.1 %
8.6 %
7.8 %
1.8 %
0 %
5.1 %
TOTAL YUKON = 71.4 %

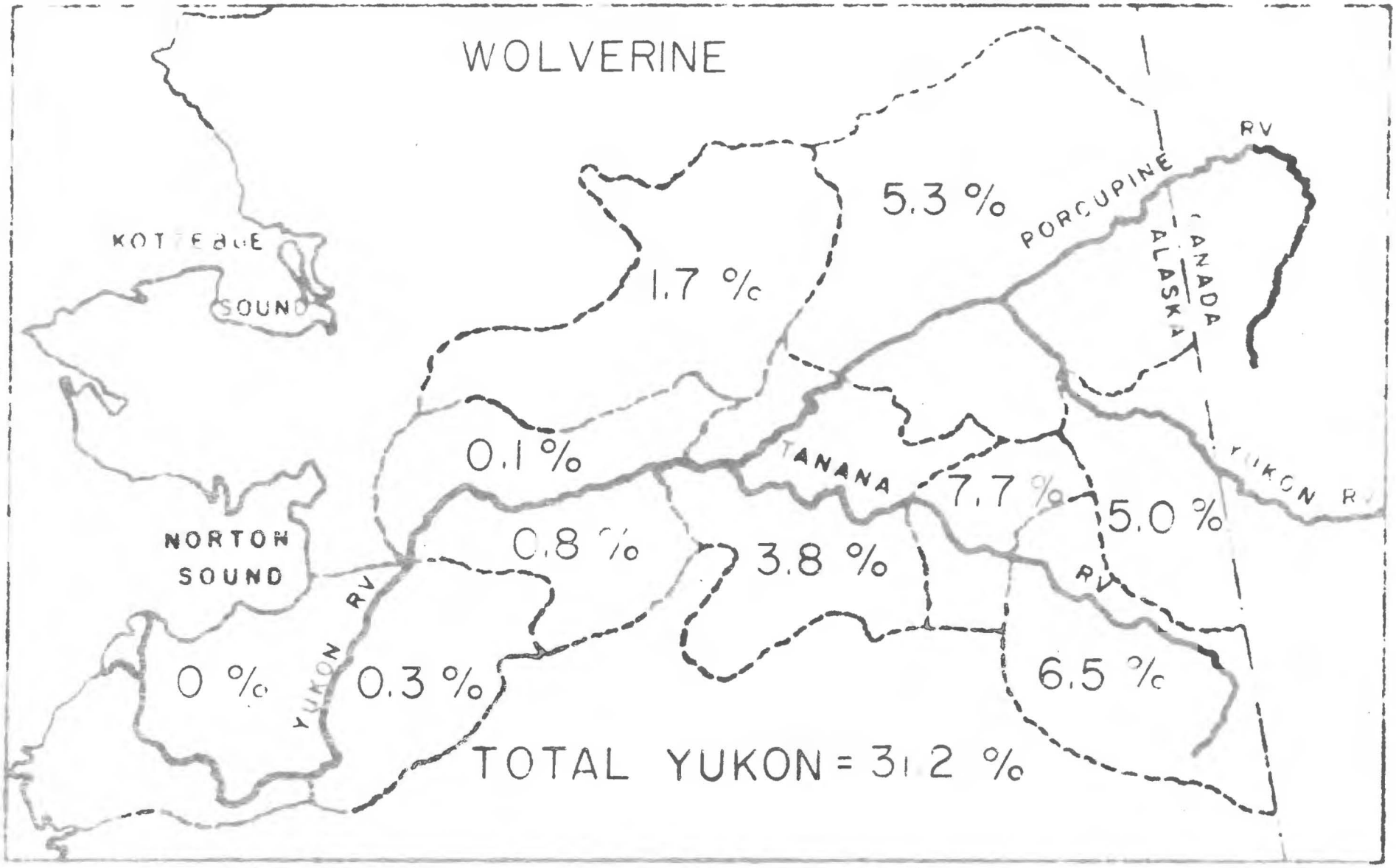

MINK
KOTZEBUE
SOUND
Trace
1.3 %
PORCUPINE
RV
CANADA
ALASKA
3 %
TANANA
3.5 %
0.2 %
YUKON RV
NORTON
SOUND
0.9 %
2.7 %
RV
YUKON RV
Trace
1.3 %
TOTAL YUKON

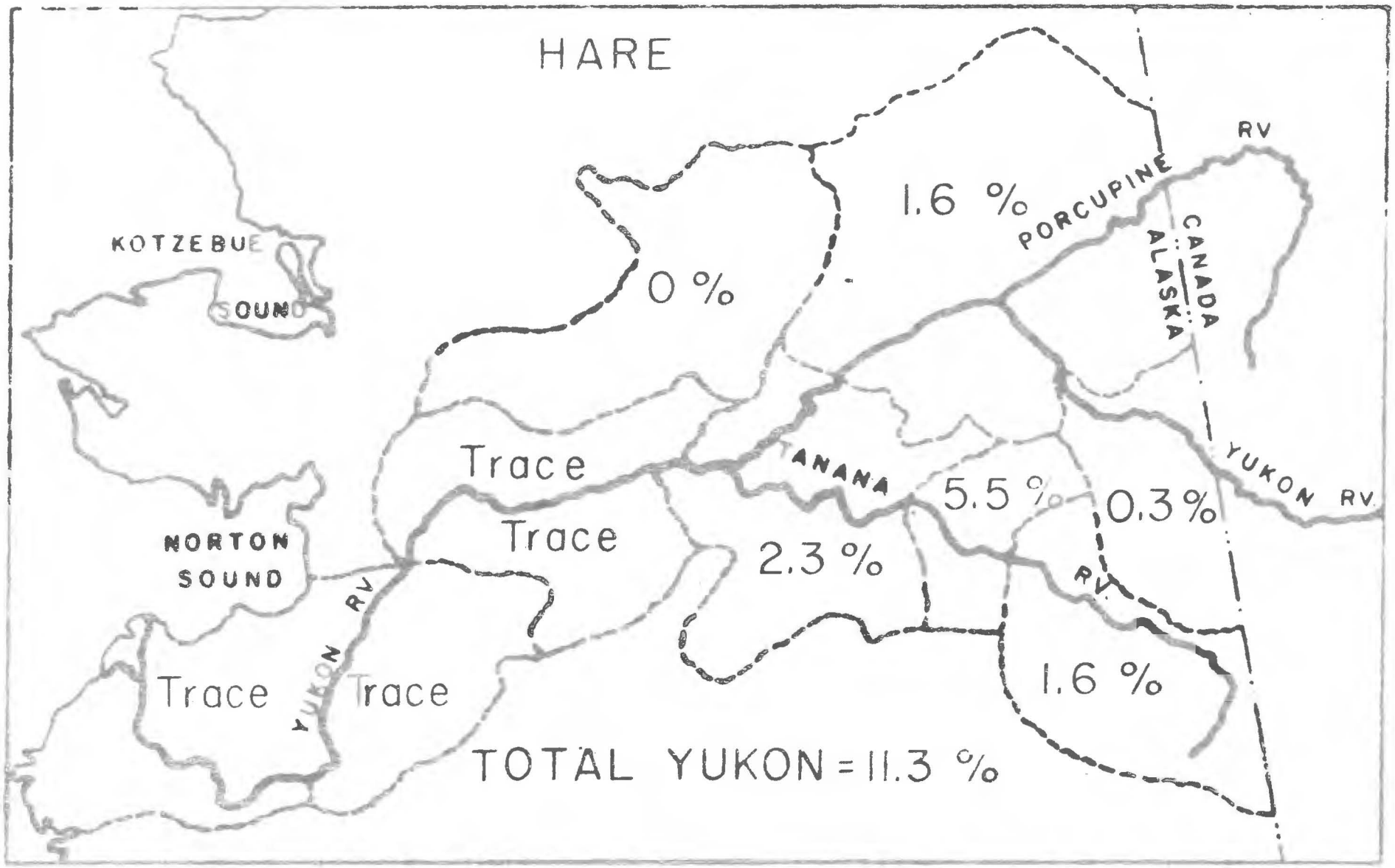

MUSKRAT
KOTZEBUE
SOUND
NORTON
SOUND
PORCUPINE
RV
CANADA
ALASKA
YUKON RV
TANANA
RV
YUKON RV
YUKON RV
0.2 %
1.3 %
0.6 %
12.9 %
8.0
3.7 %
10.4
Trace
1.4 %

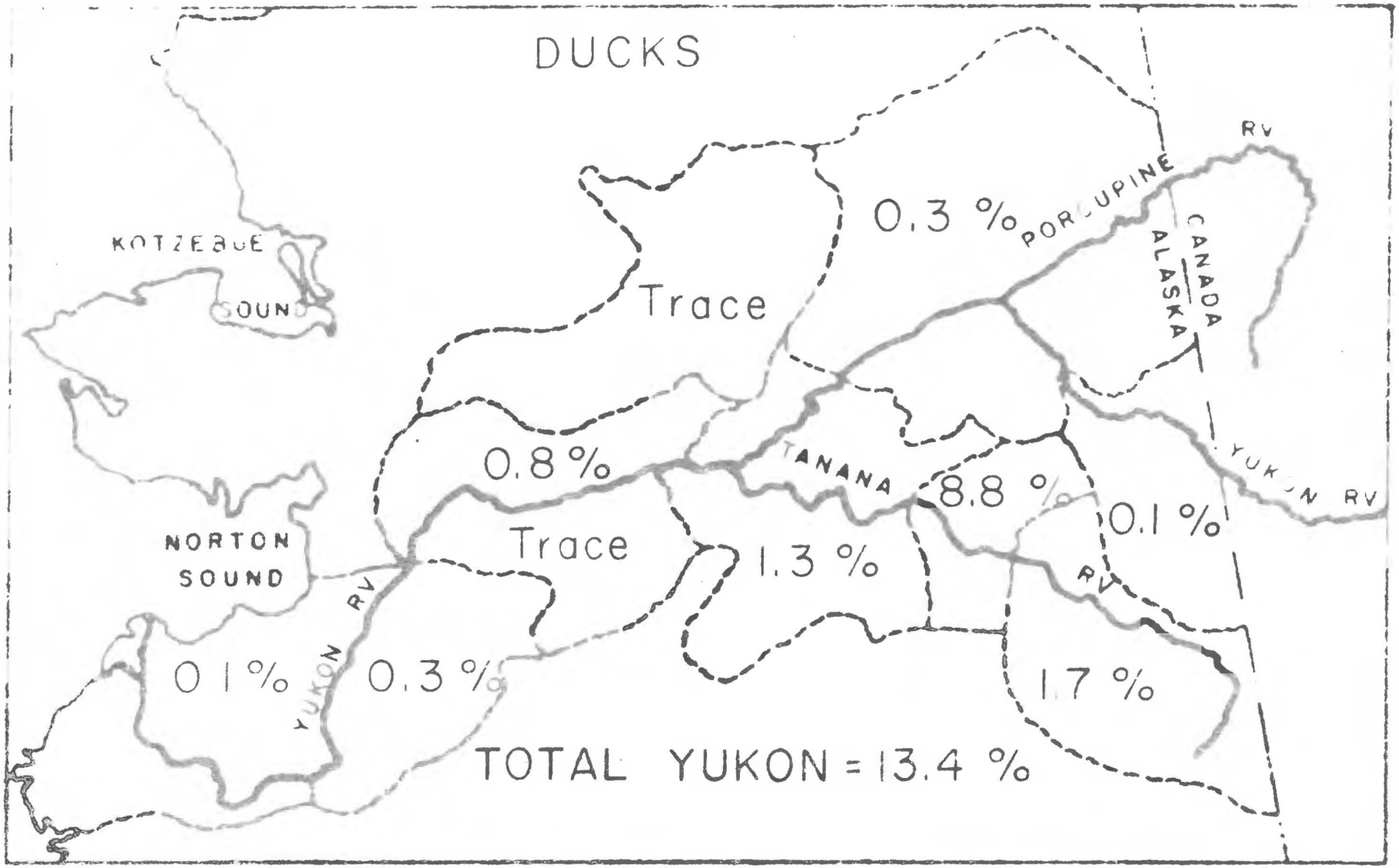

WEASEL
KOTZEBUE
SOUND
0.8 %
6.0 %
PORCUPINE
CANADA
ALASKA
Trace
TANANA
10.2 %
1.9 %
NORTON
SOUND
21 %
7.1 %
YUKON
1.5 %
2.9 %
TOTAL YUKON - 72.5 %


COYOTE
KOTZEBUE
SOUND
0.1 %
0 1 %
PORCUPINE
RV
CANADA
ALASKA
0 %
TANANA
1.7 %
0.6 %
YUKON RV.
NORTON
SOUND
0 %
0.3 %
RV.
YUKON RV.
0 %
0 %
1.2 %
TOTAL YUKON = 4.0 %


WOLF
KOTZEBUE
SOUND
3.2 %
3.7 %
PORCUPINE
RV
CANADA
ALASKA
0 %
TANANA
7.3 %
3.6 %
YUKON RV
NORTON
SOUND
0.2 %
3.2 %
RV
YUKON RV
0 %
1.0 %
7.3 %
TOTAL YUKON 25.6 %


WOLVERINE
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV
PORCUPINE
RV
CANADA
ALASKA
TANANA
YUKON R
RV
5.3 %
1.7 %
0.1 %
0.8 %
3.8 %
7.7 %
5.0 %
6.5 %
0 %
0.3 %
TOTAL YUKON = 31.2 %


HARE
KOTZEBUE
SOUND
0 %
1.6 %
PORCUPINE
RV
CANADA
ALASKA
Trace
Trace
ANANA
5.5 %
0.3 %
YUKON RV.
NORTON
SOUND
2.3 %
RV.
YUKON RV
Trace
Trace
1.6 %
TOTAL YUKON = 11.3 %


DUCKS
KOTZEBUE
SOUND
NORTON
SOUND
YUKON RV
0.1 %
0.3 %
Trace
0.8 %
Trace
0.3 %
PORCUPINE
RV
CANADA
ALASKA
TANANA
8.8 %
1.3 %
0.1 %
YUKON RV
RV
1.7 %
TOTAL YUKON = 13.4 %

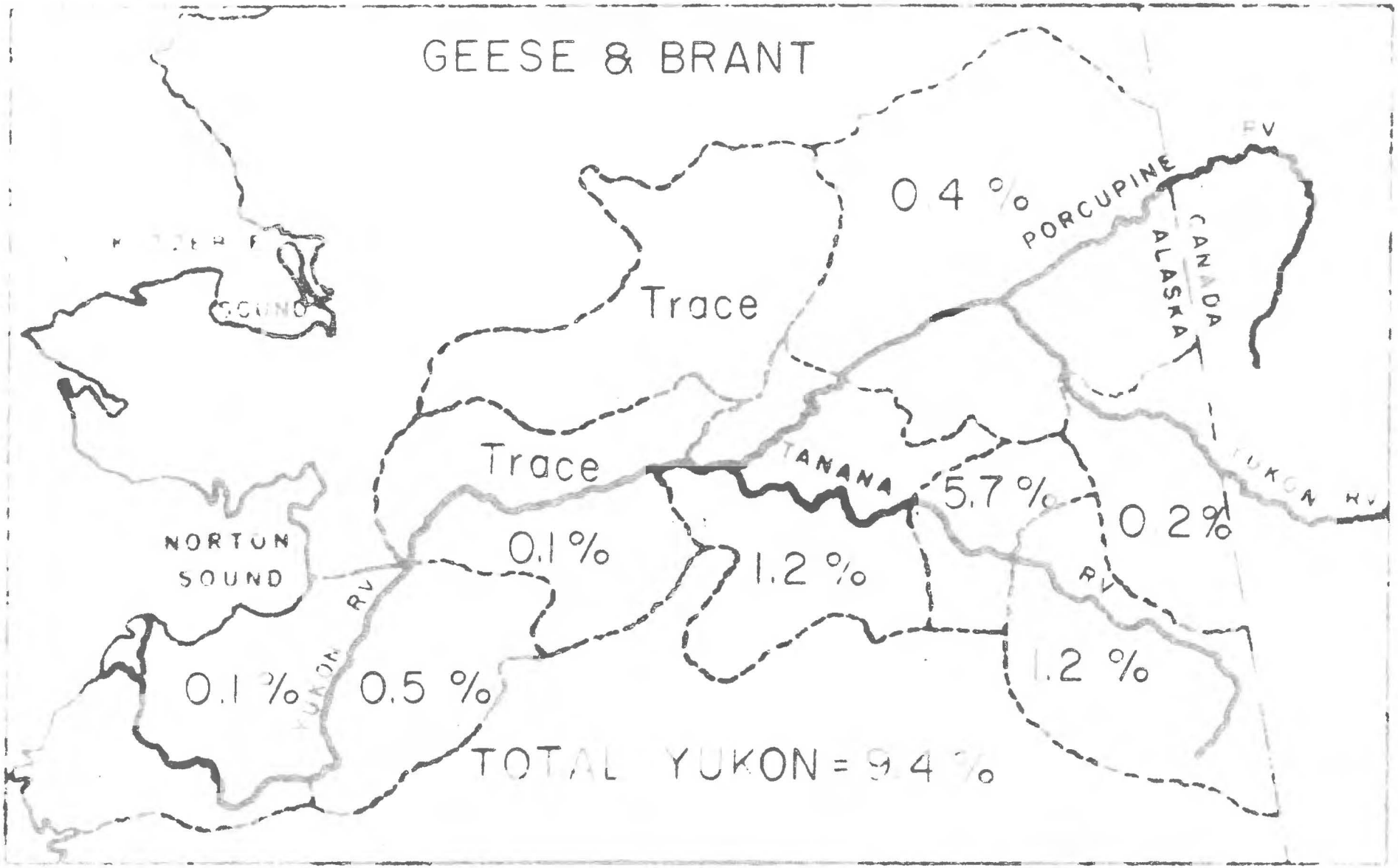

GEESE & BRANT
0.4 %
PORCUPINE
CANADA
ALASKA
Trace
Trace
TANANA
5.7 %
0.2 %
NORTON
SOUND
0.1 %
1.2 %
YUKON RV
0.1 %
0.5 %
1.2 %
TOTAL YUKON = 9.4 %

TABLE NO. 17

AVERAGE ANNUAL HARVEST OF GAME AND FUR SPECIES, YUKON BASIN
As Computed From Alaska Game and Fur Harvest Statistics
July 1, 1944 to June 30, 1955

Species	Computed Average Alaska Harvest	Computed Harvest by Districts										Computed Average Total Yukon Harvest
		#11	#27	#28	#29	#30	#31	#32	#33	#34	#35	
Bear, Brown & Grizzly	430	0	10	0	1	1	70	31	19	9	18	159
Bear, Black	1,598	0	26	13	6	3	158	56	27	21	26	336
Moose	3,114	6	35	38	3	22	387	110	113	53	66	833
Caribou	7,019	0	21	7	T	35	1,341	302	379	295	204	2,584
Mountain Sheep	469	0	0	0	1	11	90	27	17	3	2	151
Ptarmigan	64,214	64	128	128	128	T	7,064	2,569	1,092	385	257	11,815
Grouse	53,919	0	377	377	54	T	17,470	3,235	2,265	647	431	24,856
Beaver	18,200	18	1,274	673	146	18	2,621	655	1,292	764	309	7,770
Fox, Red & Cross	3,241	T	42	39	6	3	444	230	353	321	152	1,590
Fox, Silver	180	0	0	0	0	0	25	7	14	21	3	70
Lynx	1,205	0	0	0	0	11	246	89	163	174	54	737
Marten	7,391	0	377	1,013	74	15	1,375	133	1,190	525	576	5,278
Mink	36,499	T	474	328	109	T	1,277	292	985	474	73	4,012
Muskrat	160,293	T	2,244	962	2,083	321	12,823	16,670	20,678	56,583	5,931	118,295
Land Otter	2,735	0	63	77	8	3	30	22	71	3	0	277
Weasel	5,916	0	89	124	T	47	603	172	420	355	112	1,922
Wolf	936	0	9	2	0	30	68	32	29	35	34	239
Coyote	691	0	0	0	0	1	12	8	2	1	4	28
Wolverine	469	0	1	4	1	8	36	30	18	25	23	146
Hare	61,487	T	T	T	T	0	3,382	984	1,414	985	184	6,949
Ducks	141,070	141	423	T	1,129	T	12,414	2,398	1,840	423	141	18,909
Geese & Brants	30,330	30	152	30	T	T	1,729	364	364	121	61	2,851

T = Trace - too small to compute in total Alaska harvest.

other work of the personnel. At the time of this report the Territory-wide survey had not been completed; therefore, Territorial comparisons to the 1948 to 1952 method of reporting is impossible. River Basin personnel had the responsibility of contacting villages from Marshall downstream to the mouth of the Yukon River. After careful consideration based on discussions with teachers, traders, and missionaries in the area, it was concluded that six villages would be contacted: Kwiguk-Emmonak, Mountain Village, Old Andreafski, Pitkas Point, St. Mary-Andreafski, and Pilot Station. It was further decided that all interviews would be delayed until late in the field season - actually until the confidence of the people was obtained. River Basin personnel lived rather closely with the people of Kwiguk-Emmonak, St. Mary-Andreafski, and Mountain Village. Little contact was had with the people in the villages of Old Andreafski, Pitkas Point, and Pilot Station. Pertinent data obtained is shown in Table No. 18.

TABLE NO. 18 REPORTED TAKE OF WILDLIFE SPECIES BY FAMILIES IN SIX YUKON DELTA VILLAGES - 1956

Village	No. of Families Interviewed	DUCKS No Taken	DUCKS Take/Family	DUCKS EGGS No Taken	DUCKS EGGS Take/Family
Andreafski	16	1,175	73.0	80	5.0
Emmonak-Kwiguk	40	200	5.0	200	5.0
Mt. Village	22	265	12.0	0	Not available
Old Andreafski	2	70	35.0	0	Not available
Pilot Station	15	166	11.0	30	2.0
Pitkas Point	7	75	11.0	0	Not available
Total	102	1,951		310	
Average			19.1		4.4 71 families

NOTE: Average take by families interviewed unless otherwise noted.

TABLE NO. 18 (Continued) REPORTED TAKE OF WILDLIFE SPECIES BY FAMILIES IN SIX YUKON DELTA VILLAGES - 1956

Village	No of Families Interviewed	BRANT & CANADA GEESE No Taken	Take/Family	WHITE FRONT & SNOW GEESE No Taken	Take/Family
Andreafski	16	1,061	66.3	1,145	71.6
Emmonak-Kwiguk	40	500	12.5	800	20.0
Mt. Village	22	350	15.9	126	5.7
Old Andreafski	2	70	35.0	50	25.0
Pilot Station	15	241	16.0	102	6.8
Pitkas Point	7	110	15.7	90	12.9
Total	102	2,332		2,313	
Average			22.9		22.7

Village		GREEN GOOSE No Taken	Take/Family
Andreafski	16	92	5.8
Emmonak-Kwiguk	40	300	7.5
Mt. Village	22	0	0
Old Andreafski	2	0	0
Pilot Station	15	40	2.7
Pitkas Point	7	0	0
Total	102	432	
Average			6.1
			71 families

Village	No. of Families Interviewed	SWANS No Taken	Take/Family	CRANES No Taken	Take/Family
Andreafski	16	194	12	58	3.6
Emmonak-Kwiguk	40	400	10	500	12.5
Mt. Village	22	10	0.5	51	2.3
Old Andreafski	2	0	0	0	0
Pilot Station	15	0	0	2	Trace
Pitkas Point	7	3	0.4	15	2.1
Total	102	607		626	
Average			5.1		6.1

NOTE: Average take by families interviewed unless otherwise noted.

TABLE NO. 18 (Continued) REPORTED TAKE OF WILDLIFE SPECIES BY FAMILIES IN SIX YUKON DELTA VILLAGES - 1956

Village	No. of Families Interviewed	PTARMIGAN No Taken	PTARMIGAN Take/Family	GROUSE No Taken	GROUSE Take/Family
Andreafski	16	1,210	75.6	25	1.6
Emmonak-Kwiguk	40	400	10.0	Not available	
Mt. Village	22	575	26.1	Not available	
Old Andreafski	2	100	50.0	Not available	
Pilot Station	15	965	64.3	28	1.9
Pitkas Point	7	720	103.0	Not available	
Total	102	3,970		53	
Average			38.9		1.7
					31 families

		RABBITS No Taken	RABBITS Take/Family
Andreafski	16	* 780	260
Emmonak-Kwiguk	40	Not reported	
Mt. Village	22	745	34
Old Andreafski	2	90	45
Pilot Station	15	1,000	67
Pitkas Point	7	550	79
Total	102	3,165	
Average			64.6
		*by three families	49 families

Village	No. of Families Interviewed	SEALS No Taken	SEALS Take/Family	WHALES No Taken	WHALES Take/Family
Andreafski	16	1	Trace	Not available	
Emmonak-Kwiguk	40	800	20.0	500	12.5
Mt. Village	22	6	Trace	30	1.4
Old Andreafski	2	Not available		2	1.0
Pilot Station	15	Not available		Not available	
Pitkas Point	7	Not available		Not available	
Total	102	807		532	
Average			10.3		7.8
			78 families		68 families

NOTE: Average take by families interviewed unless otherwise noted.

59. It is significant to note that in each village where personnel were well known that "Take" figures are generally higher than in villages where personnel were essentially unknown. This is especially true for species which have no open season - swans and cranes.

60. To compare data gathered in 1956 with the Alaska Reporting District data as described earlier, it was necessary to compute the total take of an area based on the interviews. Population of all villages in the Yukon Drainage District No. 11 were obtained from either interviews or the 1950 census. The take for each village was then computed using either the average of the six villages interviewed or ecologically similiar villages. The results of this computation are shown in Table No. 19.

TABLE NO. 19 COMPUTED TOTAL TAKE OF WILDLIFE SPECIES (EXCEPT FUR) FOR YUKON DELTA - 1956

Village	No. of Families Computed	DUCKS		DUCKS EGGS	
		No Taken	Take/Family	No Taken	Take/Family
Akularak	39	745	19.1	195	5.0
Alakanuk	28	535	19.1	140	5.0
Andreafski	21	1,533	73.0	105	5.0
Chaneliak	21	401	19.1	105	5.0
Chowhootolik	20	382	19.1	100	5.0
Emmonak	40	200	5.0	200	5.0
Hamilton	9	172	19.1	45	5.0
Kotlik	9	172	19.1	45	5.0
Marshall	19	363	19.1	84	4.4
Mountain Village	38	456	12.0	Not available	
New Hamilton	5	96	19.1	25	5.0
New Hock Hock	24	458	19.1	120	5.0
Old Andreafski	21	105	35.0	Not available	
Pilot Station	25	275	11.0	50	2.0
Pitkas Point	7	77	11.0	Not available	
Scammon Bay	21	401	19.1	105	5.0
Sheldons Point	9	172	19.1	45	5.0
Total	338	6,543		1,364	
Average			19.4		4.7-290 families

NOTE: Average take by families interviewed unless otherwise noted.

TABLE NO. 19 (Continued) COMPUTED TOTAL TAKE OF WILDLIFE SPECIES (EXCEPT FUR) FOR YUKON DELTA - 1956

Village	No. of Families Computed	BRANT & CANADA GEESE No Taken	BRANT & CANADA GEESE Take/Family	WHITE FRONT & SNOW GEESE No Taken	WHITE FRONT & SNOW GEESE Take/Family
Akularak	39	893	22.9	885	22.7
Alakanuk	28	641	22.9	636	22.7
Andreafski	21	1,392	66.3	1,503	71.6
Chaneliak	21	481	22.9	477	22.7
Chewhoctolik	20	458	22.9	454	22.7
Emmonak	40	500	12.5	800	20.0
Hamilton	9	206	22.9	204	22.7
Kotlik	9	206	22.9	204	22.7
Marshall	19	435	22.9	431	22.7
Mountain Village	38	604	15.9	217	5.7
New Hamilton	5	115	22.9	113	22.7
New Nock Hock	24	550	22.9	549	22.7
Old Andreafski	21	105	35.0	75	25.0
Pilot Station	25	400	16.0	170	6.8
Pitkas Point	7	110	15.7	90	12.9
Scammon Bay	21	481	22.9	477	22.7
Sheldons Point	9	206	22.9	204	22.7
Total	338	7,783		7,489	
Average			23.0		22.2

		GEESE EGGS No Taken	GEESE EGGS Take/Family
Akularak	39	238	6.1
Alakanuk	28	171	6.1
Andreafski	21	122	5.8
Chaneliak	21	128	6.1
Chewhoctolik	20	122	6.1
Emmonak	40	300	7.5
Hamilton	9	55	6.1
Kotlik	9	55	6.1
Marshall	19	51	2.7
Mountain Village	38	Not available	
New Hamilton	5	31	6.1
New Nock Hock	24	146	6.1
Old Andreafski	21	Not available	
Pilot Station	25	40	2.7
Pitkas Point	7	Not available	
Scammon Bay	21	128	6.1
Sheldons Point	9	55	6.1
Total	338	1,642	
Average			5.7 - 290 families

NOTE: Average take by families interviewed unless otherwise noted.

TABLE NO. 19 (Continued) COMPUTED TOTAL TAKE OF WILDLIFE SPECIES (EXCEPT FUR) FOR YUKON DELTA - 1956

Village	No. of Families Computed	SWANS No Taken	SWANS Take/Family	CRANES No Taken	CRANES Take/Family
Akularak	39	199	5.1	240	6.1
Alakanuk	28	143	5.1	171	6.1
Andreafski	21	252	12.0	209	3.6
Chaneliak	21	107	5.1	128	6.1
Chowhoctolik	20	102	5.1	122	6.1
Emmonak	40	400	10.0	500	12.5
Hamilton	9	46	5.1	55	6.1
Kotlik	9	46	5.1	55	6.1
Marshall	19	97	5.1	116	6.1
Mountain Village	38	19	0.5	87	2.3
New Hamilton	5	26	5.1	31	6.1
New Nock Hock	24	122	5.1	146	6.1
Old Andreafski	21	0	0.0	0	0.0
Pilot Station	25	128	5.1	153	6.1
Pitkas Point	7	3	0.4	15	2.1
Scammon Bay	21	107	5.1	128	6.1
Sheldons Point	9	46	5.1	55	6.1
Total	338	1,843		2,211	
Average			5.5		6.5

		PTARMIGAN No Taken	PTARMIGAN Take/Family	GROUSE No Taken	GROUSE Take/Family
Akularak	39	390	10.0	Not available	
Alakanuk	28	280	10.0	"	"
Andreafski	21	1,588	75.6	33	1.6
Chaneliak	21	817	38.9	36	1.7
Chowhoctolik	20	200	10.0	Not available	
Emmonak	40	400	10.0	"	"
Hamilton	9	90	10.0	"	"
Kotlik	9	90	10.0	17	1.7
Marshall	19	739	38.9	17	1.7
Mountain Village	38	992	26.1	Not available	
New Hamilton	5	50	10.0	"	"
New Nock Hock	24	240	10.0	"	"
Old Andreafski	21	150	50.0	"	"
Pilot Station	25	1,607	64.3	28	1.9
Pitkas Point	7	721	103.0	Not available	
Scammon Bay	21	210	10.0	"	"
Sheldons Point	9	90	10.0	"	"
Total	338	8,654		131	
Average			25.6		1.5 - 85 families

NOTE: Average take by families interviewed unless otherwise noted.

TABLE NO. 19 (Continued) COMPUTED TOTAL TAKE OF WILDLIFE SPECIES (EXCEPT FUR) FOR YUKON DELTA - 1956

Village	No. of Families Computed	RABBITS No Taken	RABBITS Take/Family	SEALS No Taken	SEALS Take/Family
Akularak	39	2,519	64.6	402	10.3
Alakanuk	28	1,809	64.6	560	20.0
Andreafski	21	5,460	260.0	Not available	
Chaneliak	21	1,357	64.6	420	20.0
Chowhoctolik	20	1,292	64.6	Not available	
Emmonak	40	2,584	64.6	800	20.0
Hamilton	9	581	64.6	180	20.0
Kotlik	9	581	64.6	180	20.0
Marshall	19	1,227	64.6	Not available	
Mountain Village	38	1,292	34.0	9	0.4
New Hamilton	5	323	64.6	52	10.3
New Nock Hock	24	1,550	64.6	Not available	
Old Andreafski	21	135	45.0	"	"
Pilot Station	25	1,675	67.0	"	"
Pitkas Point	7	550	79.0	"	"
Scammon Bay	21	1,357	64.6	420	20.0
Sheldons Point	9	581	64.6	180	20.0
Total	338	24,863		3,203	
Average			73.6		14.6-219 families

Village	No. of Families Computed	WHALES No Taken	WHALES Take/Family
Akularak	39	488	12.5
Alakanuk	28	350	12.5
Andreafski	21	Not available	
Chaneliak	21	164	7.8
Chowhoctolik	20	Not available	
Emmonak	40	500	12.5
Hamilton	9	70	7.8
Kotlik	9	70	7.8
Marshall	19	Not available	
Mountain Village	38	53	1.4
New Hamilton	5	39	7.8
New Nock Hock	24	Not available	
Old Andreafski	21	3	1.0
Pilot Station	25	Not available	
Pitkas Point	7	Not available	
Scammon Bay	21	263	12.5
Sheldons Point	9	11	12.5
Total	338	2,011	
Average			9.1 - 222 families

NOTE: Average take by families interviewed unless otherwise noted.

61. The wide discrepancies between the two methods of gathering data is illustrated in Table No. 20.

TABLE NO. 20 COMPARISON OF RESULTS: FWS REPORTING DISTRICT AND RBS INTERVIEW - DISTRICT NO. 11

Species	F.W.S. Average	R.B.S. Average
Ducks	141	6,543
Geese and Brant	30	15,272
Swans	Not reported	1,843
Cranes	Not reported	2,211
Duck Eggs	Not reported	1,364
Geese Eggs	Not reported	1,642
Ptarmigan	64	8,654
Grouse	0	131
Rabbits	Trace	24,863
Seal	Not reported	3,203
Whales	Not reported	2,011
Moose	6	9 *
Bear, Black	6	3 *
Bear, Grizzly	0	3 *

* Reported in six interviewed villages. Not computed for total Delta area since populations are low.

62. Obviously one of the two systems is more in error than the other although neither may be presumed to be precisely accurate. Based on familiarity of the area, game conditions, and the residents, the most logical conclusion is that the River Basin Studies interview method resulted in more accurate information. The reasons for this conclusion are:

a. Common sense indicates a "resource dependent" population of some 338 families (about 1,690 individuals) would require substantially more food than 141 ducks, 40 geese, etc., annually would provide as reported in the annual Fish and Wildlife Service statistics.

b. In many instances, the Alaska Native Service teachers lacked either technical ability and/or adequate interest to properly report harvests in a factual manner. Often the teacher lacked the confidence of the people and therefore could not get realistic information as to what was being harvested.

c. It was apparent from RBS methods that living intimately with the Eskimo and gaining their confidence resulted in more factual data than could be gained by descending upon the population without their confidence. As evidence of this, RBS field crews were presented with waterfowl bands, some of which had been in the village since 1952--they were afraid to present it properly for fear of legal action. When these bands were presented, it was a sign they placed their confidence in the RBS personnel.

63. As a result of the 1956 method, it would appear as though past and present methods of obtaining reliable and accurate harvest data for both fish and wildlife species is lacking. To fulfill the basic precepts of River Basin investigation, additional techniques are needed. The most reliable method seems to be the interview method, which in itself is cumbersome and has many deficiencies.

a. The interviewer must become well acquainted with the people--a time consuming facet in itself.

b. Ethnologically, methods which may have worked well with one group may not be as successful with others.

c. Ecologically, the Yukon River Basin is so diverse that data obtained in one area may be completely unsatisfactory in other areas.

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Fig. 1. View looking downstream at Rampart canyon; locale of Rampart townsite.

Fig. 2. King salmon heads and backbones being dried for dog feed, Sheldon's Point, Alaska.

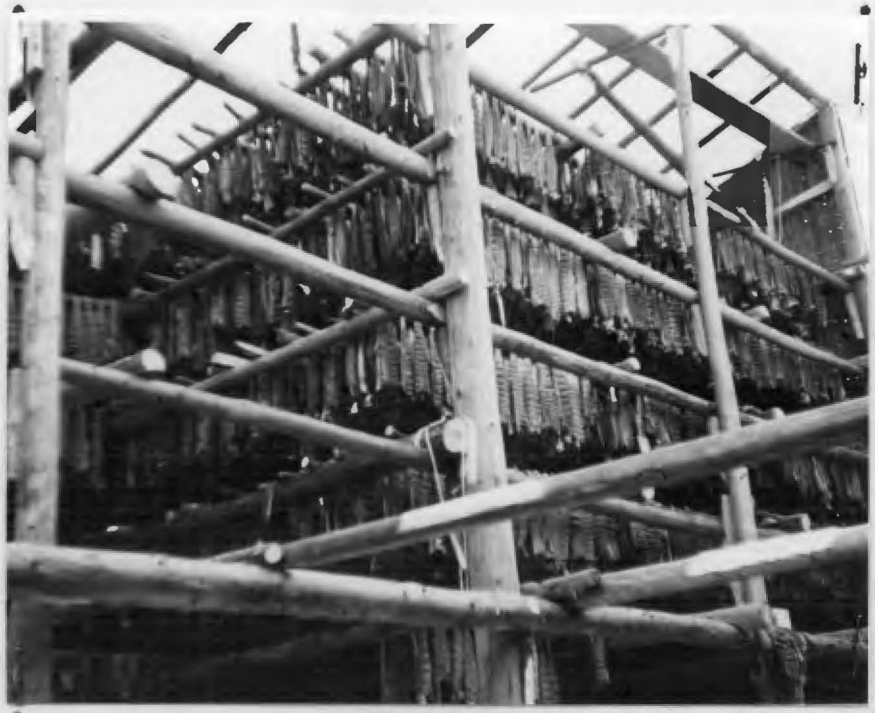

Fig. 3. Approximately 4,000 chum salmon in smoke house, Kwiguk, Alaska.

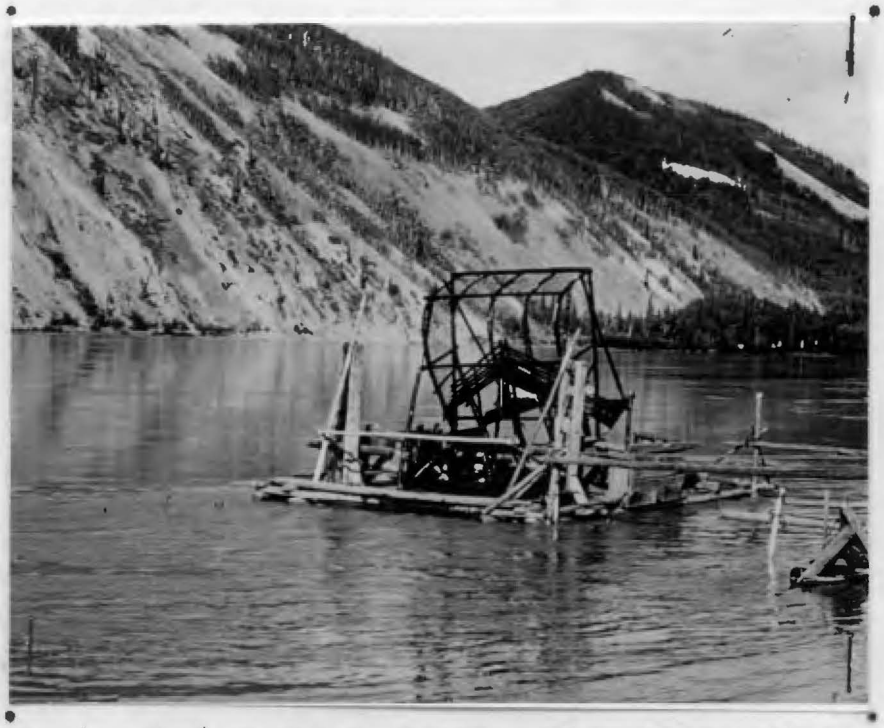

Fig. 4. Typical fishwheel, Yukon River, Eagle, Alaska.

Fig. 5. Community smokehouse and drying racks. This smokehouse has a capacity of 16,000 chum salmon. About 7,000 chum and king salmon drying on racks, Kwiguk, Alaska.

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Fig. 6. Beluga or white whale (actually a dolphin; Delphinapterus leucas) are used commonly for food along the Bering Sea Coast. Found as far as 600 miles upstream in the Yukon River. These marine mammals still taken with harpoon. Sheldon's Point, Alaska.