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ALASKA DEPARTMENT OF FISH AND GAME
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REPORT ON 1974 BROWN BEAR STUDIES

by
Leland P. Glenn

Volume XV
Project Progress Report
Federal Aid in Wildlife Restoration
Project W-17-6, Jobs 4.4R and 4.6R (2nd half)
Project W-17-7, Jobs 4.4R and 4.6R (1st half)

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JOB PROGRESS REPORT (RESEARCH)

State:	Alaska		
Cooperator:	Leland P. Glenn		
Project Nos.:	W-17-6 & W-17-7	Project Title:	Big Game Investigations
Job No.:	4.4R	Job Title:	Distribution and Movements of Alaska Peninsula Brown Bears
Period Covered:	January 1, 1974 through December 31, 1974		

SUMMARY

The Alaska Department of Fish & Game captured, marked and released 124 brown bears on the Black Lake Study area in 1974. Tagging began on June 8 and continued for 30 consecutive days. Forty-one percent (38 of 93) of the bears over one year of age had been marked in previous years. Excluding known mortality an estimated 200 marked bears remain on the study area.

Seasonal movements are discussed. Conclusions are provisional, based on information gathered from 443 captures of 336 bears and 363 resightings of previously marked bears. Movement histories of 16 marked bears are plotted on maps and presented in the appendix with a brief discussion of each bear.

The rate of population turnover was high; hunters killed 85 of 317 marked bears in the last four years (15 months of hunting effort). The population size and rate of turnover have not been determined. Data are accumulating and will be sufficient to provide a realistic estimate upon completion of the study.

Most (68 percent) of 443 bears captured were less than 5 years of age. The sex ratio of young, six months to 3.5 years of age, was nearly even whereas the ratio of males to females declined to 43:100 at age 4.5 years, 24:100 at age 5 to 10 years, and 10:100 at 11+ years of age.

A computer program was written to compare harvest characteristics by subunit. Results showed that during the past 14 years more bears were killed to the north (781 bears) and to the south (719 bears) than on the study area (617 bears). In general all three subunits showed a continuing trend towards a younger population.

CONTENTS

BACKGROUND

There is widespread nationwide interest and a wide range of conflicting views about brown/grizzly bear (*Ursus arctos*) management. These views range from total protection of bears and bear habitat to maximum utilization of the resource. The Alaska Department of Fish and Game is responsible for management of the state's brown/grizzly bear resource. Much of the effort by the Department to develop a management program has been directed toward assessment of hunter harvest and the gathering of abundance and composition data. Other studies are designed to test and improve the accuracy of the cementum age determination technique, to describe breeding biology and to determine growth rates, survival rates and seasonal bear movements. Research studies in progress in Southcentral Alaska are emphasizing these activities in order to provide information which can be used to improve bear management. In recent years the Department has designed studies to determine the effects of industrial activities which may conflict with the well-being of the species. These studies are being conducted in Southeastern Alaska on areas subject to logging (Wood 1973) and in the interior of Alaska where intensive oil exploration may disrupt bear habitat (Reynolds 1974). Information derived from these studies will be used to aid the development of progressive land classification programs vital to the welfare of the brown/grizzly bear resource.

This report is addressed to brown bear studies which are in progress in Southcentral Alaska. In 1969 the Alaska Department of Fish and Game chose the Black Lake area as the most suitable location to conduct brown bear research. The area is located on the Alaska Peninsula approximately 475 miles southwest of Anchorage. The background of this investigation has been reported previously (Glenn, 1971, 1972 and 1973). This study was designed to determine the seasonal distribution and movements of brown bears and to determine the effects of bear hunting on that population. Much life history information has been gathered incidental to this study and will be reported under this job.

OBJECTIVES

To determine the distribution and movement patterns of Alaska Peninsula brown bears and to test and evaluate new capturing and marking techniques.

PROCEDURES

Procedures for capturing and collecting data on brown bears were described by Glenn (1973).

Radio transmitters manufactured by Ocean Applied Research Corporation (San Diego, California) were attached to adult bears in June 1974. Movements of radioed bears were monitored from fixed-wing aircraft equipped with a portable receiver (AVM Instrument Co. Champaign, Illinois) and a high gain antenna attached to the wing strut.

Computer programs were written for the purpose of analyzing bear harvest data in relation to research findings. This data retrieval system will increase our understanding of the dynamics of the Alaska Peninsula brown bear population. To date 18 programs have been written and information contained on 10,200 bear sealing certificates has been key punched. All programs are operational.

FINDINGS

One hundred and twenty-four brown bears were immobilized, marked and released on the Black Lake study area between June 8 and July 8, 1974. Included were 38 bears which had been tagged in previous years. Additionally an attempt was made to capture and mark bears in late October. Field activities were suspended after five days. Only five bears were captured. Bears were difficult to observe on the dark-colored tundra and were scarce in open areas where they could be captured.

Spring Movements

By May 25 most bears had moved away from denning areas to lower elevations. In early June there was a noticeable increase in the number of bears observed on the coastal plain. This movement became apparent from daily observations made during spring tagging activities. The circulatory movements of the population during June were complex. Spring observations indicated that the population was dispersed and moving greater distances per unit of time than during other periods of the year. Search for food is believed to be the primary reason for this movement. Dead seals (*Phoca vitulina*), walruses (*Odobenus rosmarus*), whales and other marine mammals attracted bears to Bering Sea beaches. Traditional caribou (*Rangifer tarandus*) calving grounds were also utilized by bears feeding on new-born calves.

During June there was an interchange of animals between the coastal plain and inland valleys and mountains. Time spent on the plain varied with the individual. Some bears remained for less than a day, some moved back and forth between the foothills and coastal areas and some remained through the entire spring season. By mid-June the density of bears

utilizing the coastal plain reached a peak and remained high until about the last week of June, after which there was a gradual decrease.

Understanding of spring movements was difficult because bears captured in the spring did not represent the true sex and age composition of the population. Sows with cubs, for example, are seldom observed in lowland areas before the third week of June and males 8 years of age and older have never been captured on the coastal plain. Missing also are movement patterns of breeding sows. Observations suggest that a sow's reproductive status may influence her pattern of movement. Sows with 1-2- or 3-year-old young, for example, tended to be recaptured each spring in the same general area, while the same sows tended to be recaptured elsewhere in years when they were without young and were in breeding condition.

Summer Movements

By July 15 the previously dispersed population had moved to salmon spawning streams. From July 15 through August 15 bears concentrated along these streams feeding on red salmon (*Onchorhynchus nerka*). All population segments could be observed at this time. Movements were relatively simple during this 4-week period and involved moving up and down a stream to fish and moving off short distances to rest or sleep. Bears also moved to adjacent streams to fish, however, the frequency of these movements was not determined. Bears crossed from the Pacific to the Bering Sea side of the Aleutian Mountain Range to feed on salmon. One marked sow which did this remained until the first of October before moving back to the Pacific side.

Towards the end of August bears began moving to and from streams, feeding on a combination of fish and berries. Although berries are available near spawning streams, some bears prefered traveling to higher elevations to feed. Observations suggested, however, that most animals remained in daily contact with fishing areas.

Fall Movements

Salmon feeding areas continued to be the focal point for most bears during the month of September. Some bears were attracted by fresh salmon to streams on the Pacific side while others continued to feed on older fish along many of the upper tributaries on the Bering Sea side. Movements increased toward the end of September; and by early October the bear population was primarily located along the foothills at elevations between 200 and 1,200 feet. By mid-October there was a noticeable increase in the number of bears utilizing the coastal plain although their number was much less than that recorded in the spring.

Additional data must be accumulated before October and November bear movements are adequately defined. At this time it appears that salmon exert a strong influence on bear distribution. Aerial surveys in the fall showed that bears were numerous along streams that contained salmon and that silver salmon (*Oncorhynchus kisutch*) spawned in some streams into the month of December.

By mid-November some denning presumably had occurred, since fewer bears were usually observed. In general bears were found at higher elevations in mid-November and more bears seemed to be lying in digouts and were reluctant to move when flown over. Denning studies on the Alaska Peninsula (Lentfer et al.1970) have shown that the greatest proportion of dens occur at about 1,300 feet although some bears denned on the open tundra while others denned at elevations above 2,000 feet. Apparently females with young enter dens first while males stay out longer. Conditions which influence pre-denning movements and time of denning are unknown, however weather, availability of food and body condition are believed to exert a strong influence.

Population Size

The size of the Black Lake brown bear population has not been determined. Data will be sufficient next year to allow use of marked-unmarked ratios to estimate bear density. Calculations will be based on tagged-untagged ratios of animals captured, observed or killed.

An estimated 200 tagged bears are alive on the study area. The rate of recapture remained near 40 percent. For example, during the spring of 1971, 38 of 92 bears (41 percent) captured were tagged; during the spring of 1972, 41 of 112 bears (37 percent) captured were tagged and during the spring of 1974, 38 of 93 bears (41 percent) captured were tagged. Six-month-old cubs were not included in these calculations as they were not present the preceding year. Recapture rate becomes more meaningful each year that capture work is continued. For example, of 99 bears tagged in 1970 eight were shot by hunters and 36 (40 percent) of the remaining 91 bears were recaptured in 1971. The following year 10 bears were shot by hunters and 20 (25 percent) of the remaining 81 bears were recaptured. The following two years 18 bears were killed and 15 (24 percent) of the remaining 63 bears were captured. Recapture rates for bears tagged in 1970 through 1972 and 1974 are given in Table 1.

Sex and Age Structure

The age structure of the Black Lake bear population can be described using the percent of cubs observed during aerial stream surveys in August and the composition of bears captured in the past five years. Cubs made up 25 percent (43 cubs) of 172 bears observed on two aerial surveys flown in 1974 (Table 2). The age structure of the remaining bears was calculated from 419 captured bears. This structure follows: 1 year old-15 percent; 2 years old-14 percent, 3 years old-14 percent; 4 years old 6 percent, 5 years old-5 percent; 6 years old-4 percent; 7 years old-2 percent; 8 years old-3 percent; 9 years old-2 percent; 10 years old-3 percent and 11+ years old-8 percent. Most (68 percent) of 443 bears captured were less than 5 years of age. Two thirds of the sows (81) captured were with young (172).

The sex ratio of 443 bears captured was 59 males:100 females (Table 3). Although the sex ratio of young six months to 3.5 years of age was nearly even, the ratio of males to females declined to 43:100 for 4.5-year-old bears, 24:100 for 5-to 10-year-olds, and 10:100 for bears 11 years and older. Though sample size limited precise analysis there was a substantial reduction in the number of males as they become older.

Table 1. The number of marked bears of all ages on the Black Lake study area at the end of each year and the numbers recaptured in following years. The number known to have been killed through hunting or handling is deducted from the total.

Year Tagged	No. Tagged	No. Killed	Hunting Season	Total Adjusted	Year Recaptured	Recapture Success No.	Recapture Success Percent
1970	99	5	Fall 1970	91	1971	36	40
		3	Spring 1971				
		9	Fall 1971	81	1972	20	25
		1	Spring 1972				
		11	Fall 1972	67	1973	Did not tag	
		3	Spring 1973				
		3	Fall 1973	63	1974	15	24
		1	Spring 1974				
		3	Fall 1974	60			
1[illegible]	66	4	Fall 1971	59	1972	21	36
		3	Spring 1972				
		6	Fall 1972	50	1973	Did not tag	
		3	Spring 1973				
		7	Fall 1973	43	1974	7	16
		0	Spring 1974				
		2	Fall 1974	41			
1972	72	6	Fall 1972	63	1973	Did not tag	
		3	Spring 1973				
		4	Fall 1973	58	1974	16	28
		1	Spring 1974				
		5	Fall 1974	53			
1973	0				1973	Did not tag	
1974	80	6	Fall 1974	74			
Total	317	89		228			

Table 2. Composition of Brown Bears Observed During Aeiral Surveys of the Black Lake Study Area on 6 and 7 August 1974.

	No.	%
Females w/young -	39	22.7
Cubs -	43	25.0
young 1, 2 and 3 years old	46	26.7
Single Bears	44	25.6
Total	172	100%

Sows and Young	128	74.4%
Single bears	44	25.6%
Total	172	100 %

No. of bears observed per hour = 43

Table 3. Age and sex structure of all brown bears captured on the Black Lake study area including bears recaptured in subsequent years.

	Year Captured					Sex Ratio
	1970	1971	1972	1974	Total	Males: Females
Cubs						
M	1	6	2	3	12	100:100
F	1	6	1	4	12	
1.5 Yrs.						
M	10	0	17	13	40	91:100
F	17	8	8	11	44	
2.5 Yrs.						
M	11	11	8	13	43	116:100
F	8	11	5	13	37	
3.5 Yrs.						
M	4	8	12	13	37	88:100
F	11	9	16	6	42	
4.5 Yrs.						
M	2	3	4	1	10	43:100
F	1	11	6	5	23	
5.5 Yrs.						
M	2	2	1	1	6	
F	6	4	3	7	20	
6.5 Yrs.						
M	2	1	1	1	5	
F	3	4	4	4	15	
7.5 Yrs.						
M	0	2	0	0	2	24:100
F	2	2	6	1	11	
8.5 Yrs.						
M	0	0	2	1	3	
F	2	3	4	3	12	
9.5 Yrs.						
M	0	0	0	0	0	
F	3	1	1	4	9	
10.5 Yrs.						
M	2	1	0	0	3	
F	3	3	3	3	12	
11.+ Yrs.						
M	1	0	2	1	4	10:100
F	8	8	9	16	41	
Total	100	104	115	124	443	59:100

Hunting Pressure

Eighty-five (27 percent) of 317 marked bears have been killed by hunters. Of these bears 51 were males and 34 were females. Examination of Table 4 shows that in 22 weeks of hunting, 38 (38 percent) of 99 bears marked in 1970 were killed; in 18 weeks of hunting, 23 (35 percent) of 66 bears marked in 1971 were killed; in 12 weeks of hunting 18 (25 percent) of 72 bears marked in 1972 were killed and in 2 weeks of hunting 6 (8 percent) of 80 bears marked in 1974 were killed. These mortality rates are conservative since not all bears are legal to hunt. It was impossible to determine the exact number of legal bears available each season; however 70 to 75 percent of the bears observed on salmon spawning streams in mid-summer are sows with young and their young may not be legal to shoot during the October bear season. Additionally Table 4 does not consider loss from natural causes or the fact that some tagged bears may have emigrated from the area or been killed but not reported. These factors will be considered next year when calculating the rate of population turnover.

For management purposes it is important to compare harvest characteristics on this study area to those off the study area. To accomplish this the Alaska Peninsula was divided into four subunits. Fourteen years of harvest data were key punched and computer programs were written to allow comparison of harvest data by subunit, season, sex, age and total kill. Skull and hide size were also programed as an indicator of age since cementum ages are not reliable for bears harvested prior to 1969. Subunit 1, located north of Naknek River - Katmai National Monument, will not be discussed at this time because physiographic features which influence hunter success separate it from subunits located to the south. Harvest statistics for the southern three subunits and a map of the Alaska Peninsula showing subunit boundaries are presented in Appendix II Part 1 through 4C. Although detailed analysis of these data will follow in a subsequent report there are several important facts that should be mentioned at this time: 1) harvest data show that in the past 14 years more bears were killed in subunits 2 (781) and 4 (719) than in the study area (617); 2) all subunits show a downward trend in mean age of males with female ages remaining about the same; 3) since 1972 the fall male kill in each subunit has declined and 4) in general all three subunits show similar trends in sex and age composition.

Harvest characteristics indicate that the population is being managed on a maximum sustained yield basis and that this type of management will continue as long as the annual kill remains near 150 bears.

RECOMMENDATIONS

Specific management recommendations will be made next year after complete review of harvest data and research findings.

ACKNOWLEDGEMENTS

The following Alaska Department of Fish and Game personnel participated in scientific activities relevant to this report: Leo H. Miller, Charles A. Irvine and Karl B. Schneider.

Table 4. The number of tagged bears of all ages on the Black-Chignik Lakes study area at the end of each year and the known numbers harvested in following years. Five tagged bears killed during handling are not included. Natural loss from the population has not been quantified.

Year Tagged	Number Tagged	Number of Tagged Bears Killed							Total Hunter Harvest	Percent Mortality	Cumulative Mortality Period
		1968	1969	1970	1971	1972 1/	1973 2/	1974 3/			
1968	10	2	0	1	0	1	1	1	6	60	46 Weeks
1969	None		0	0	0	0	0	0	0	-	-
1970	99			5	11	12	6	4	38	38	22 Weeks
1971	66				4	9	8	2	23	35	18 Weeks
1972	72					6	7	5	18	25	12 Weeks
1973	None						0	0	0	-	6 Weeks
*1974	80							6	6	8	2 Weeks
Total	327	2	0	6	15	28	22	18	91	28	

1/ Four tagged bears were killed during the fall 1972 season and not identified to the year captured. The harvest is adjusted by entering one bear in each of the years 1968 and 1970 through 1972.

2/ Three tagged bears were killed during the 1973 season and not identified to the year captured. The harvest is adjusted by entering one bear in each year 1970 through 1973.

3/ Four tagged bears were killed during the fall 1974 season and not identified to the year captured. The harvest is adjusted by entering one bear in the year's 1970 through 1974.

* No spring season held in 1974.

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APPENDIX

Movement Histories of Marked Bears

Appendix I - Part 1A Male No. 786

1970 - Age 2 years

4 July -	Captured with his female litter mate No. 788 and his mother No. 785.
26 July -	Family group observed fishing on a small stream at point A.
25 August -	Family group observed at point B.
8 November -	At point C the family group was observed eating salmon.

1971 - Age 3 years

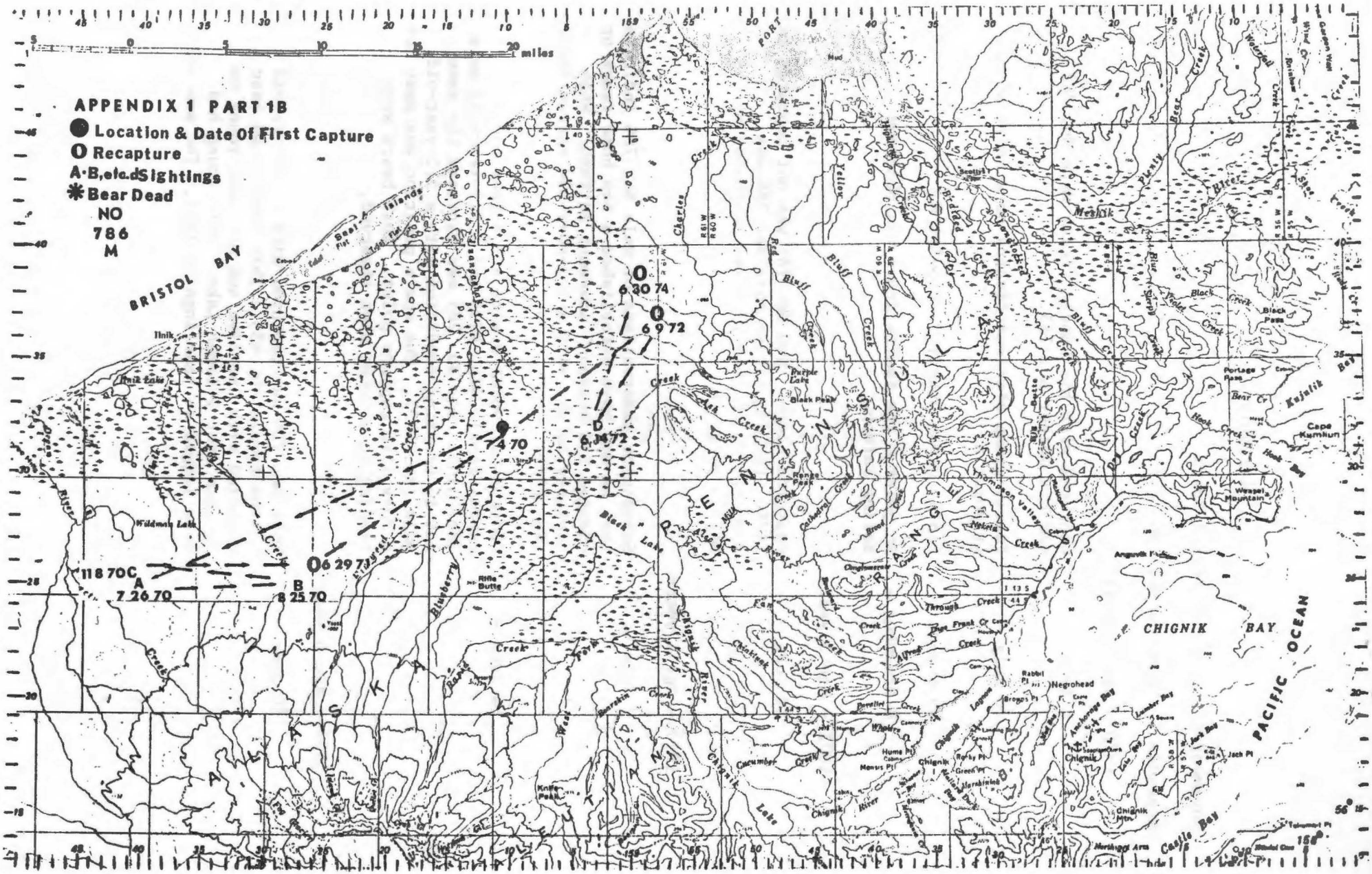
29 June -	Captured alone. Sow No. 785 was not captured in 1971. Sibling litter mate No. 788 was captured on 18 June 12 miles southwest of the male's position.

1972 - Age 4 years

9 June -	Subsequent observations of male No. 786 indicate that he may have established a new home range or changed his seasonal movement pattern. When captured he was with a 5.5-year-old estrus female (No. 843).
14 June -	Observed at point D with a 5.5-year-old estrus female (No. 823) and a 3.5-year-old male (No. 419). Sow No. 785 was captured the same day in breeding condition with a 5.5-year-old male (No. 832). The sow's position was near her 4 July 1970 capture point. Both bears were feeding on a moose when observed.

1974 - Age 6 years

30 June -	Male No. 786 was captured with a 14-year-old estrus female No. 433. This female had been captured with one live and one dead young on 15 June near Wildman Lake. Both young had been tagged as yearlings in 1972. The sow which



APPENDIX 1 PART 1B

● Location & Date Of First Capture

O Recapture

A-B,etc. Sightings

✱ Bear Dead

NO
786
M

was not in estrus apparently separated from her remaining young before moving north. Her surviving young was killed in October south of Wildman Lake.

Appendix I - Part 2A Male No. 702

1970 - Age 2 years

17 June -	Captured alone.
29 June -	Captured alone 17 miles west of the previous location point.
27 July -	Observed alone 49 miles south of original capture point.
1 October -	Killed four miles from original capture point and 51 miles from point A.

Appendix I - Part 3A Male No. 870

1970 - Age 3 years

20 June -	Captured alone.
24 June -	Observed at point A with two 3-year-old females Nos. 742 and 243. Both females were in estrus.
27 July -	Observed alone at point B.

1971 - Age 4 years

2 July -	Captured alone near the beach.
11 October -	Killed during the fall bear hunting season.

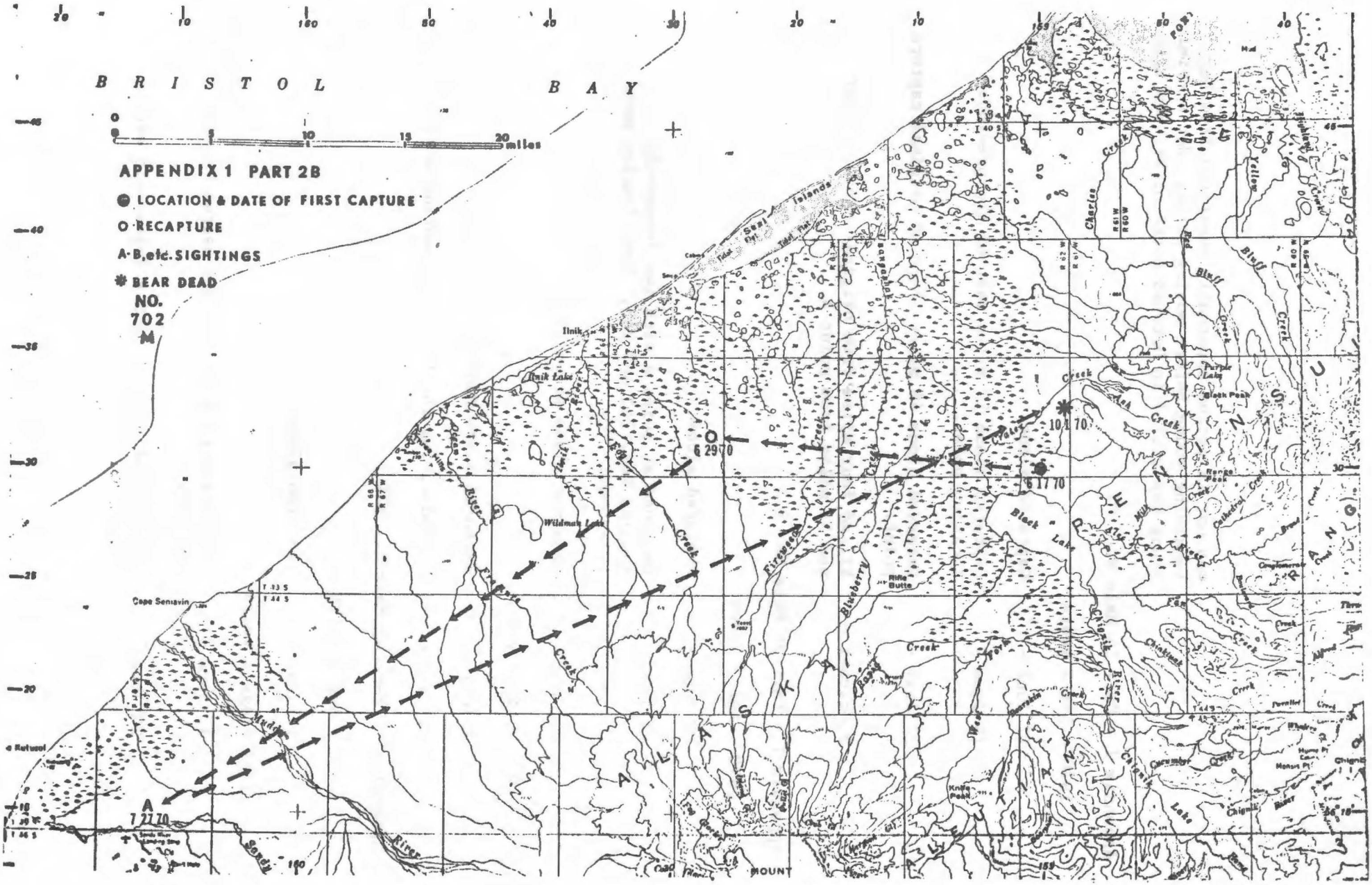
Appendix I - Part 4A Male No. 827

1971 - Age 3 years

17 June -	Captured alone.

1972 - Age 4 years

12 June -	Captured with a 14-year-old estrus female No. 409.
20 June -	Observed at point A with a 7-year-old estrus female No. 747.


BRISTOL BAY
0 5 10 15 20 miles
APPENDIX 1 PART 2B
LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A-B, etc. SIGHTINGS
BEAR DEAD
NO.
702
M
Cape Seniavin
Ilnik Lake
Wildmen Lake
Black Lake
Rifle Butte
Knife Peak
Black Peak
Purple Lake
Nanga Peak
Cathedral Creek
Chiakiak Lake
Sandy River
Muddy
Firesteel Creek
Blueberry
Chiakiak River
Cheesman Creek
Charles Creek
Red Bluff Creek
Yellow
Seal Cut
Tidal Flat
Islands
ALAGSKA
RANGE
MOUNT
A 7 27 70
O 6 29 70
6 17 70
10 1 70

APPENDIX 1 PART 3B

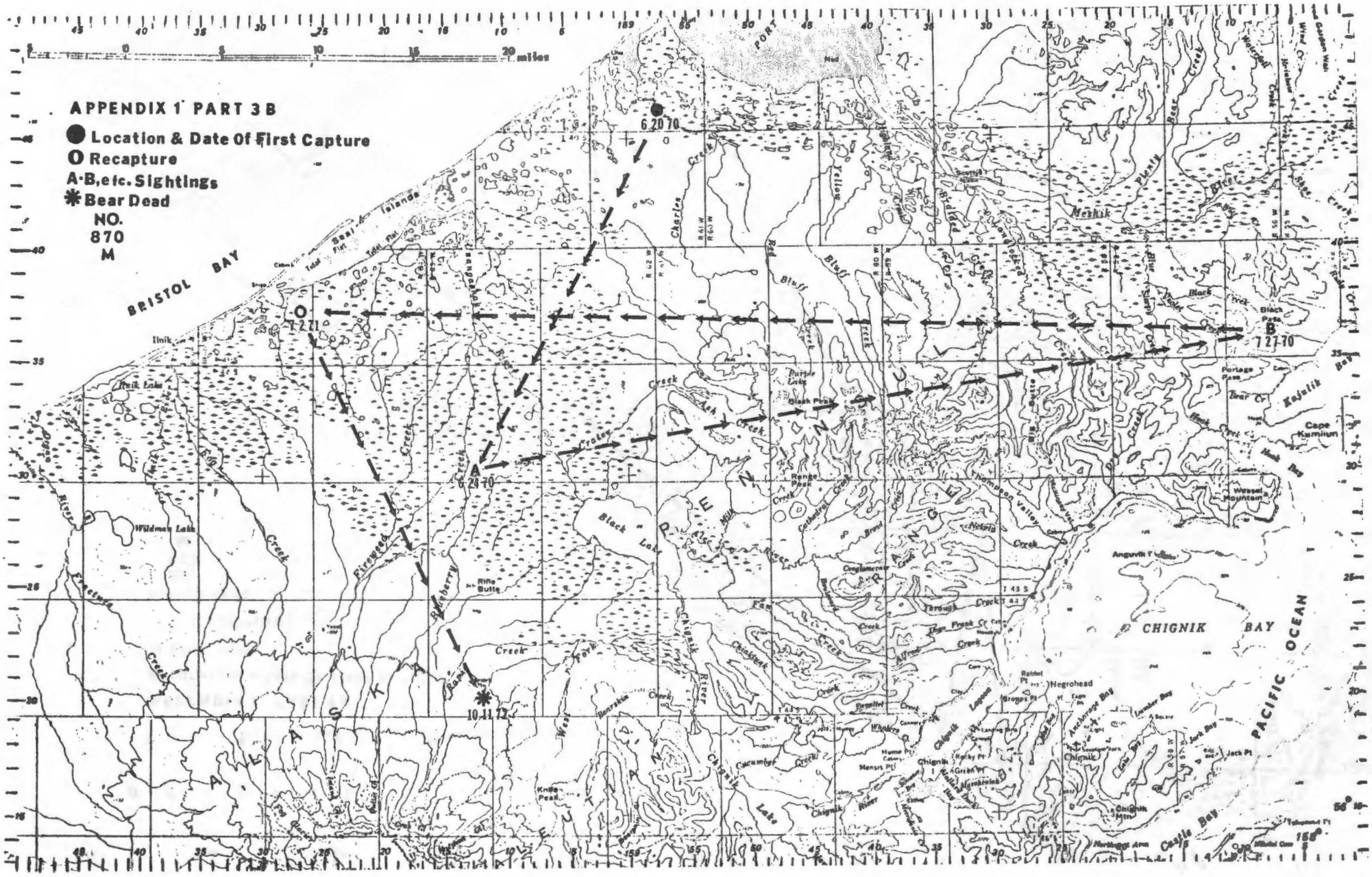
● Location & Date Of First Capture

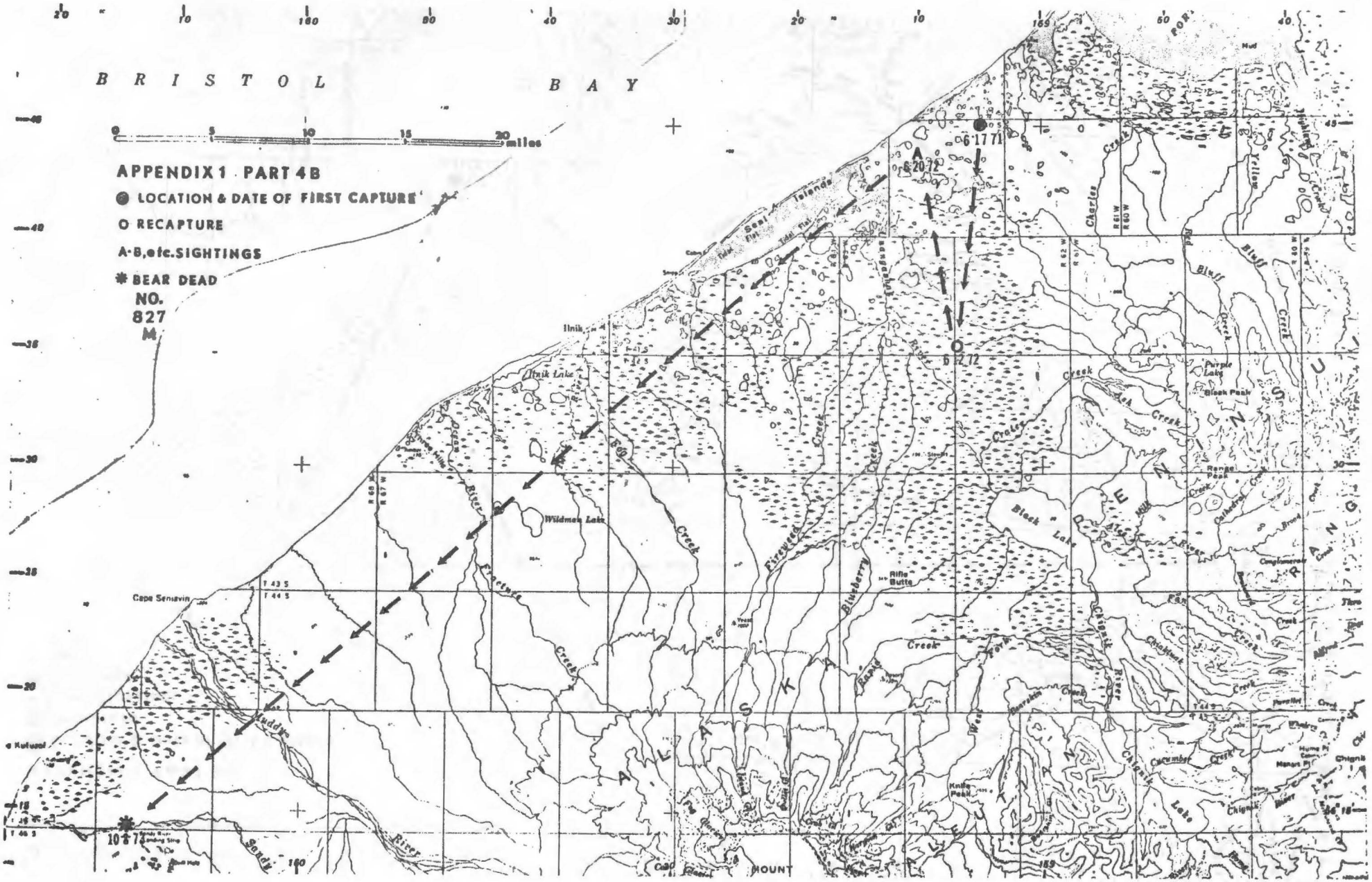
O Recapture

A·B, etc. Sightings

✱ Bear Dead

NO.
870
M




APPENDIX 1 PART 4B
LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A-B, etc. SIGHTINGS
BEAR DEAD
NO. 827 M
BRISTOL BAY
0 5 10 15 20 miles
A 6 20 72
6 17 71
O 6 2 72
10 7 72
Cape Seniavin
Ilnik Lake
Wildman Lake
Black Lake
Rifle Butte
Knife Peak
Purple Lake
Black Peak
Range Peak
Seal Islands
Sandy River
Muddy River
Fraction Creek
Blueberry Creek
Cinder Creek
Charles Creek
Bluff Creek
Chignik Lake
Chignik River
Cathedral Creek
Conglomerate Creek
Chignik Mt.
Hume Pt.
Menors Pt.
Cape Kekurnoi
Cape Menshikof
MOUNT
ALASKA PENINSULA
ALEUTIAN RANGE

1973 - Age 5 years

8 October - Killed by a hunter 57 miles south of the original capture point.

Appendix I - Part 5A Male No. 714

1970 - Age 6 years

19 June - Captured alone.

22 June - Observed at point A.

26 July - Captured alone 45 miles southwest of the previous location point.

1971 - Age 7 years

25 June - Captured with a 10-year-old estrus female No. 761.

1972 - Age 8 years

11 June - Captured alone.

25 June - Observed at point B with another adult bear.

1973 - Age 9 years

18 October - Killed by a hunter on the coastal plain.

Appendix I - Part 6A Male No. 762

1970 - Age 6 years

28 June - Captured alone near the beach.

7 July - Observed at point A, 12 miles east of the original capture point.

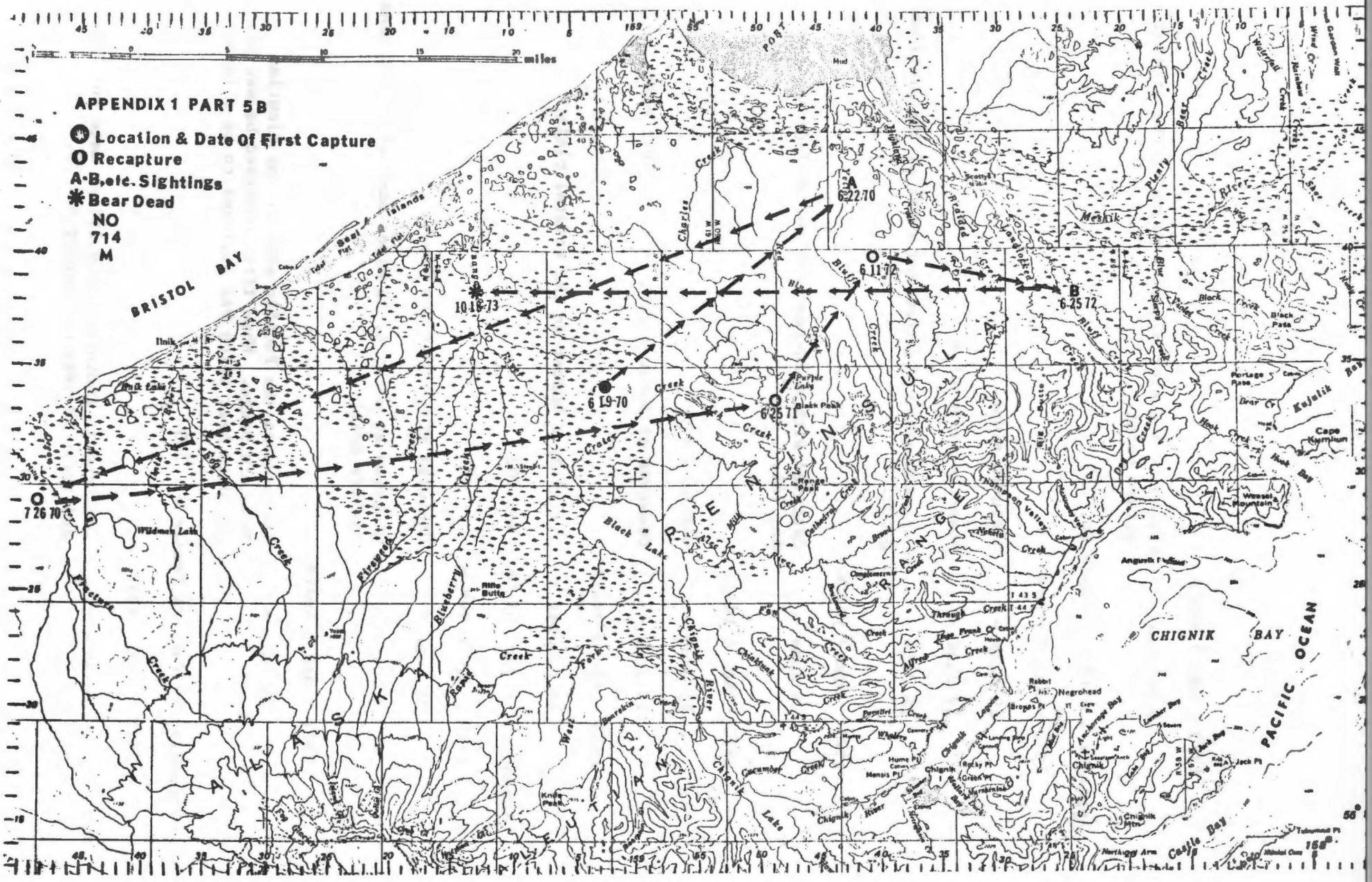
1972 - Age 8 years

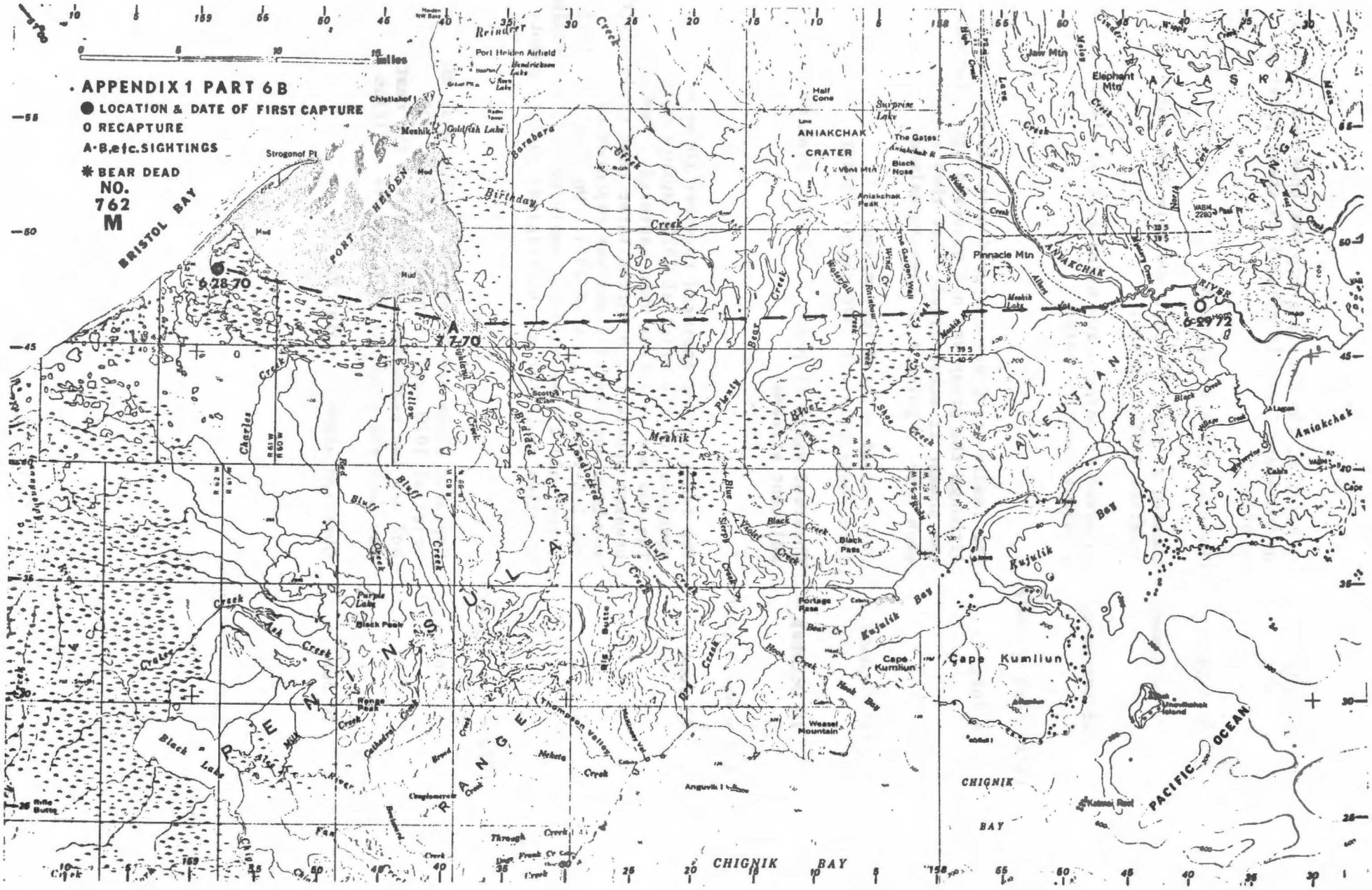
29 June - Captured on the Pacific side of the Aleutian Mountain Range. When first observed he was with an adult bear which was believed to be a female.

Appendix I - Part 7A Female No. 733

1970 - Age 1 year

22 June - Captured in foothills with litter mate No. 732 and their 12-year-old mother No. 73.


APPENDIX 1 PART 5B
Location & Date Of First Capture
Recapture
A-B,etc. Sightings
Bear Dead
NO
714
M
BRISTOL BAY
CHIGNIK BAY
PACIFIC OCEAN
A 6-22-70
O 6-11-72
B 6-25-72
10-18-73
6-19-70
O 6-25-71
O 7-26-70
miles


APPENDIX 1 PART 6B
LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A-B,etc.SIGHTINGS
BEAR DEAD
NO.
762
M
BRISTOL BAY
PORT HELDEN
Port Heiden Airfield
Meshik
Stroganof Pt
Chistiakof I
Goldfish Lake
Birthday
Creek
ANIAKCHAK
CRATER
Half Cone
Surprise Lake
The Gates
Black Nose
Aniakchak Peak
Pinnacle Mtn
ANIAKCHAK
RIVER
Elephant Mtn
Jaw Mtn
ALASKA
RANGE
ALEUTIAN
Meshik
River
Plenty
Bear
Creek
Black Pass
Portage Pass
Kujulik Bay
Cape Kumliun
Weasel Mountain
Aniakchak
Bay
Black Lake
Purple Lake
Black Peak
Range Peak
Thompson Valley
Nekete
Anguvik I
CHIGNIK
BAY
PACIFIC OCEAN
Through Creek
Miles

25 July - At point A, the family group was observed fishing on Boulevard Creek 18 miles from their previous location.

28 July - Observed again at point A.

14 September - Located at point B about one mile from their original capture point.

18 September - Observed at point C two miles east of their previous location point.

1971 - Age 2 years

4 July - The family group was captured near Black Lake. Although the group was not observed again during the summer it seems likely that they return each year to point A to feed on salmon.

25 September - Observed at point D four miles from their original 1970 capture point.

10 October - Observed again at point D. Salmon available in adjacent streams.

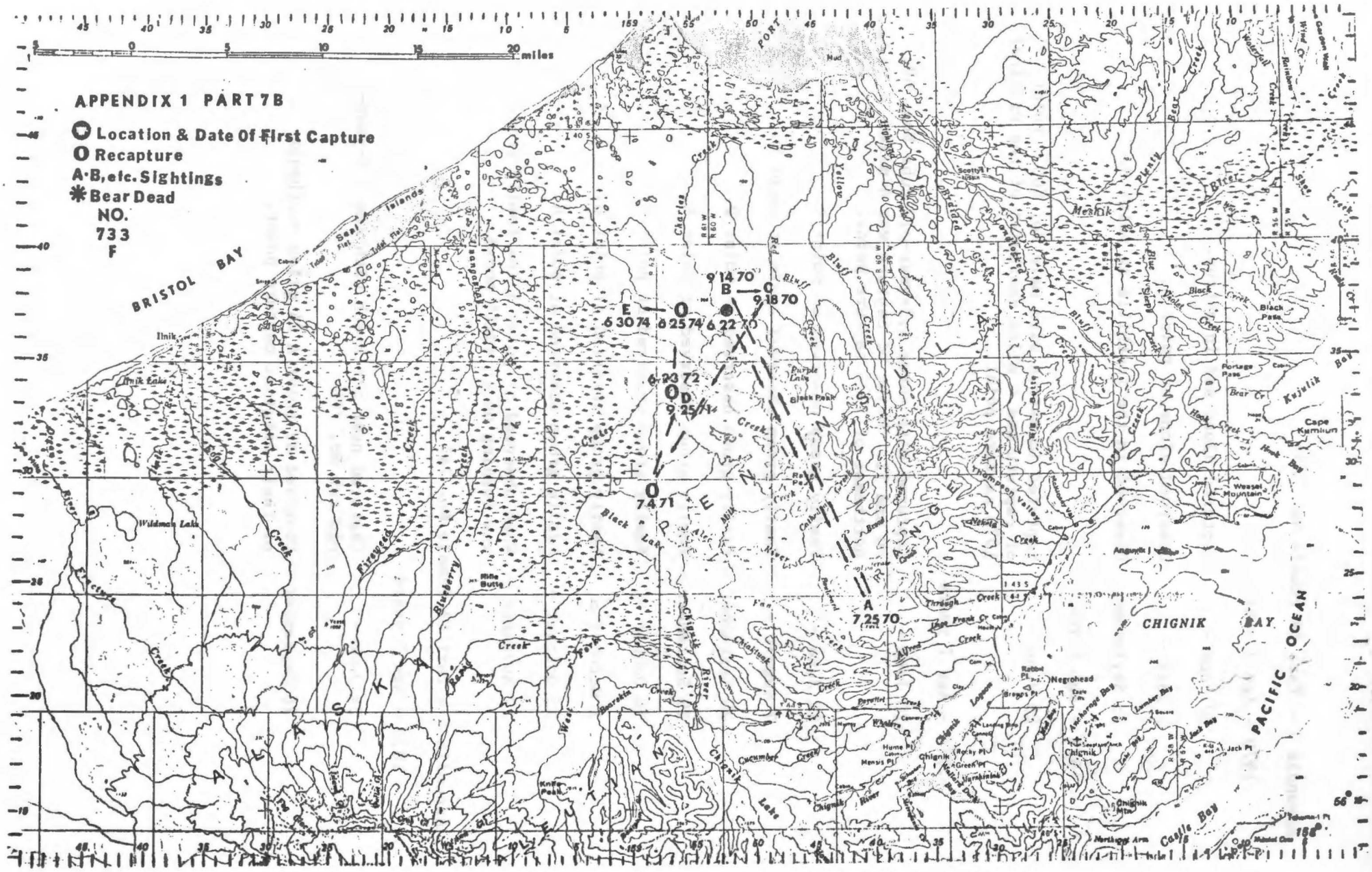
1972 - Age 3 years

23 June - The family group captured together three miles southwest of the original 1970 capture point. The sow was in estrus when captured. Family breakup apparently occurred later that spring as the sow bred successfully and was captured with two 1.5-year-old cubs in 1974. On 2 October 1972 the 3-year-old litter mate of female No. 733 was killed 25 miles southwest of the original capture point.

1974 - Age 5 years

25 June - Captured alone and in estrus 2 miles west of original 1970 capture point. Sow No. 731 and her two yearlings were captured the next day near the original 1970 capture position.

30 June - Observed alone at point E.


APPENDIX 1 PART 7B
Location & Date Of First Capture
Recapture
A·B, etc. Sightings
Bear Dead
NO.
733
F
BRISTOL BAY
PACIFIC OCEAN
CHIGNIK BAY
Chignik
Negrohead
Castle Bay
Cape Kumlium
Weasel Mountain
Black Pass
Portage Pass
Kujulik
Meshik
Ilnik
Ilnik Lake
Wildman Lake
Black Lake
Purple Lake
Mile Butte
Knife Peak
Chignik Mtn
Seal Islands
Mud
E
6 30 74
O
6 25 74
6 22 70
B
9 14 70
C
9 18 70
6 23 72
O
D
9 25 71
O
7 4 71
A
7 25 70

Appendix I - Part 8A Female No. 725A

1970 - Age 3 years

20 June -	Captured alone and in estrus.
1 July -	Observed alone at point A.
18 September -	Observed in the foothills at point B.

1971 - Age 4 years

25 June -	Captured in estrus with male No. 860. Point of capture was 4 miles southwest of the original 1970 capture point.

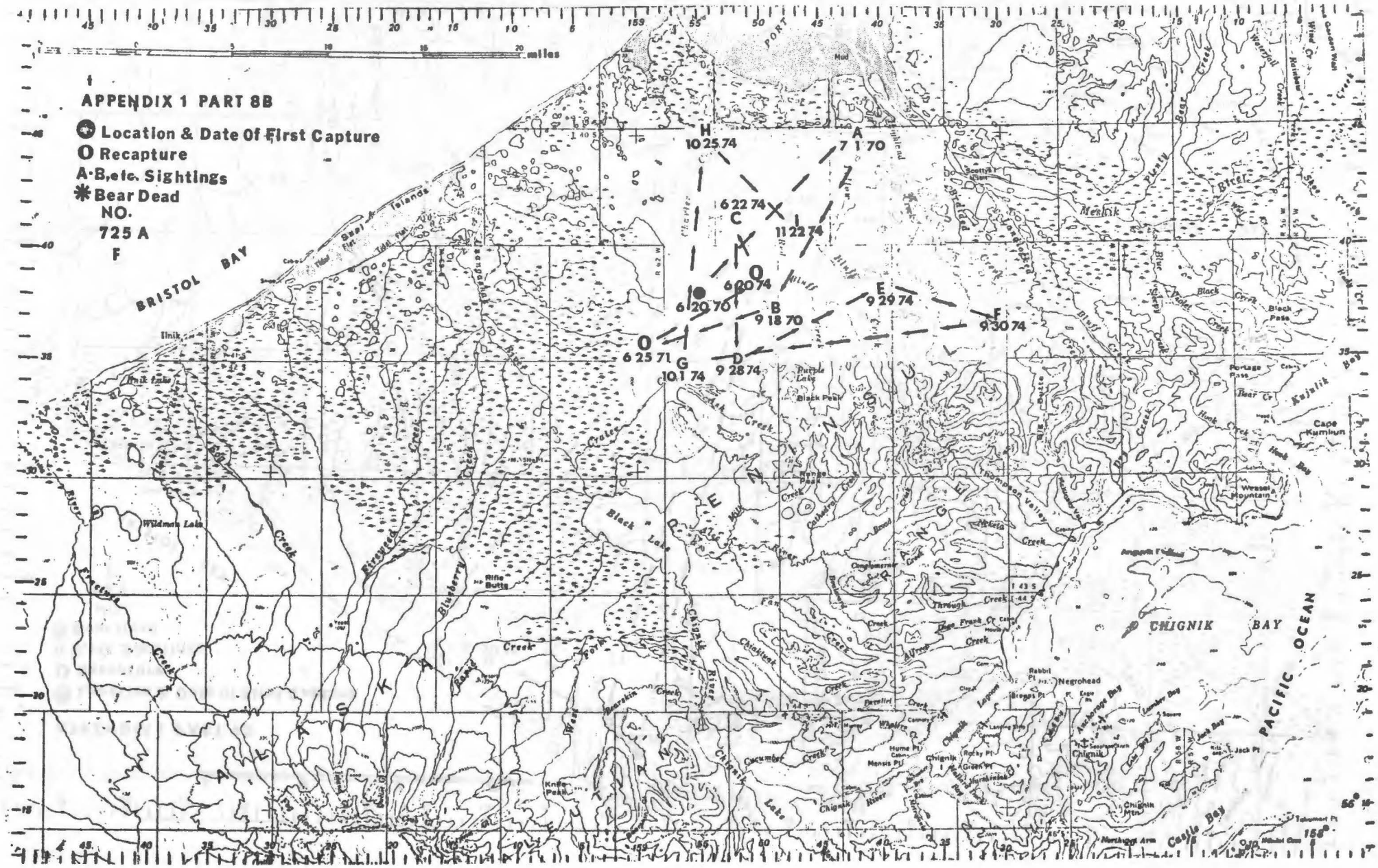
1974 - Age 7 years

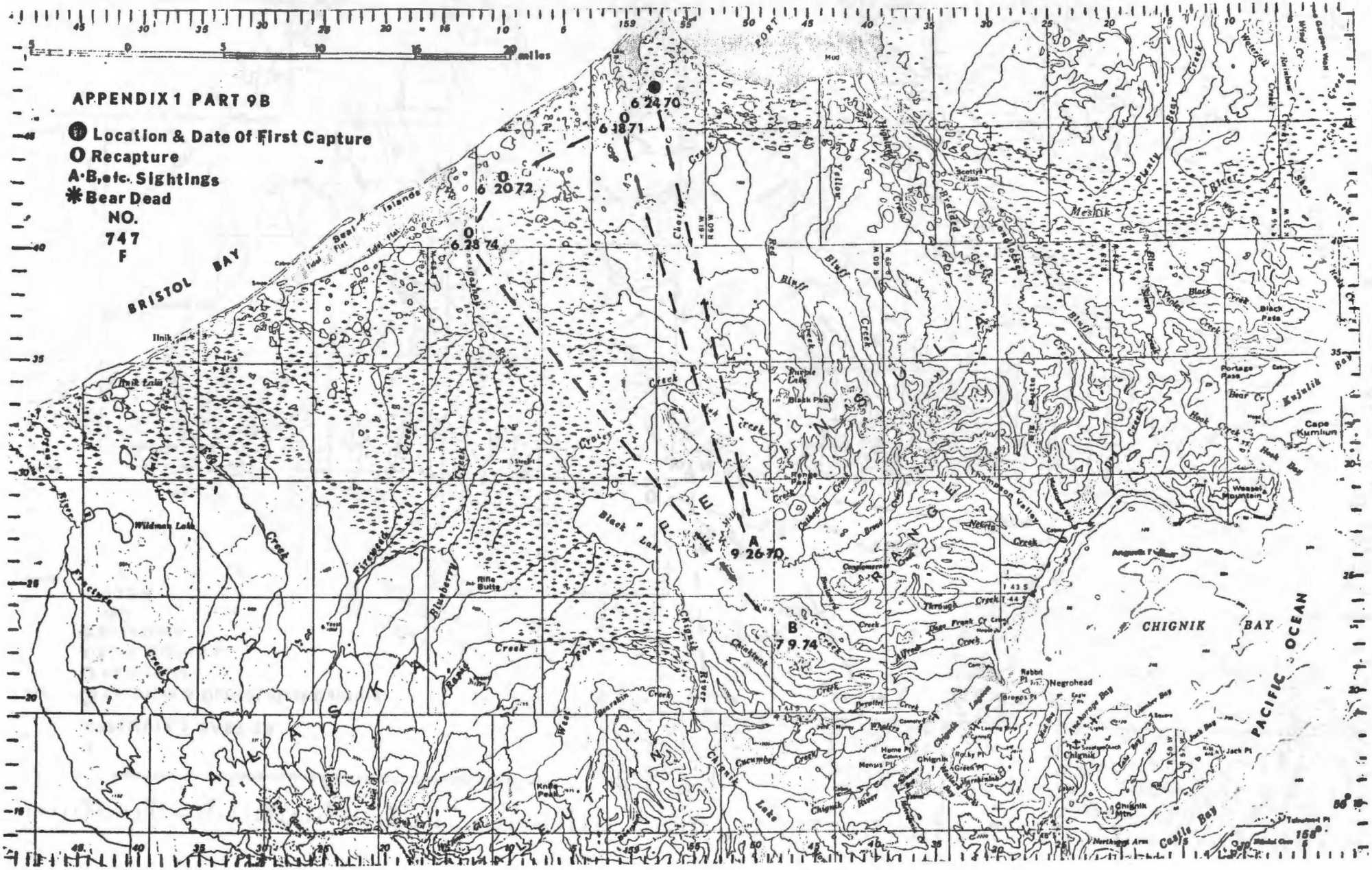
20 June -	Captured with three 1.5-year-old cubs Nos. 69, 70 and 71. Point of capture was 4 miles northeast of 1970 capture point.
22 June -	Family group observed at point C.
7 August -	Family group observed again at point C.
28 September -	Family group observed at point D.
29 September -	Family group observed at point E.
30 Ocober -	Family group observed at point F.
1 October -	Family group observed at point G.
25 October -	Family group observed at point H.
22 November -	When observed at point I the family group was feeding on an adult moose.

Appendix I - Part 9A Female No. 747

1970 - Age 5 years

24 June -	Captured near the beach with one 1.5-year-old cub No. 748.
26 September -	Observed at point A 24 miles southeast of their original capture point.

 APPENDIX 1 PART 8B
● Location & Date Of First Capture
O Recapture
A-B,etc. Sightings
✱ Bear Dead
NO.
725 A
F
miles
BRISTOL BAY
Seal Islands
Ilnik
Ilnik Lake
Wildman Lake
PORT
Mud
H 10 25 74
A 7 1 70
6 22 74 C
11 22 74
O 6 20 74
● 6 20 70
B 9 18 70
E 9 29 74
F 9 30 74
O 6 25 71
G 10 1 74
D 9 28 74
Meshik
Black Pass
Portage Pass
Bear Cr
Kujulik Bay
Cape Kumlium
Hook Bay
Wessel Mountain
Purple Lake
Black Peak
Aniakchak Crater
Black Lake
Alec River
Chignik River
Chignik Lake
Cucumber Creek
Knife Peak
Rifle Butte
Chiaktuak Creek
Conglomerate
Through Creek
CHIGNIK BAY
PACIFIC OCEAN
Rabbit Pt
Negrohead
Anchorage Bay
Chignik
Hume Pt
Mensis Pt
Chignik Lagoon
Chignik Mtn
Castle Bay
Jack Bay
Jack Pt
ALASKA
RANGE
ALEUTIAN RANGE
159
158
56°


APPENDIX 1 PART 9B
Location & Date Of First Capture
O Recapture
A·B,etc. Sightings
Bear Dead
NO.
747
F
6 24 70
O
6 18 71
O
6 20 72
O
6 28 74
A
9 26 70
B
7 9 74
BRISTOL BAY
CHIGNIK BAY
PACIFIC OCEAN
Cape Kumlium
Negrohead
Chignik
Mesnik
Black Lake
Wildman Lake
Ilnik
Castle Bay

1971 - Age 6 years

18 June -	Captured with her 2.5-year-old cub 2 miles south of the original 1970 capture point.

1972 - Age 7 years

20 June -	Captured alone and in estrus 9 miles south of the original 1970 capture point.

1974 - Age 9 years

28 June -	Captured with two 1.5-year-old cubs Nos. 98 and 99 twelve miles south of original 1970 capture point.
9 July -	Family group observed eating salmon at point B.

Appendix I - Part 10A Female No. 836

1971 - Age 5 years

21 June -	Captured without young and lactating.

1974 - Age 8 years

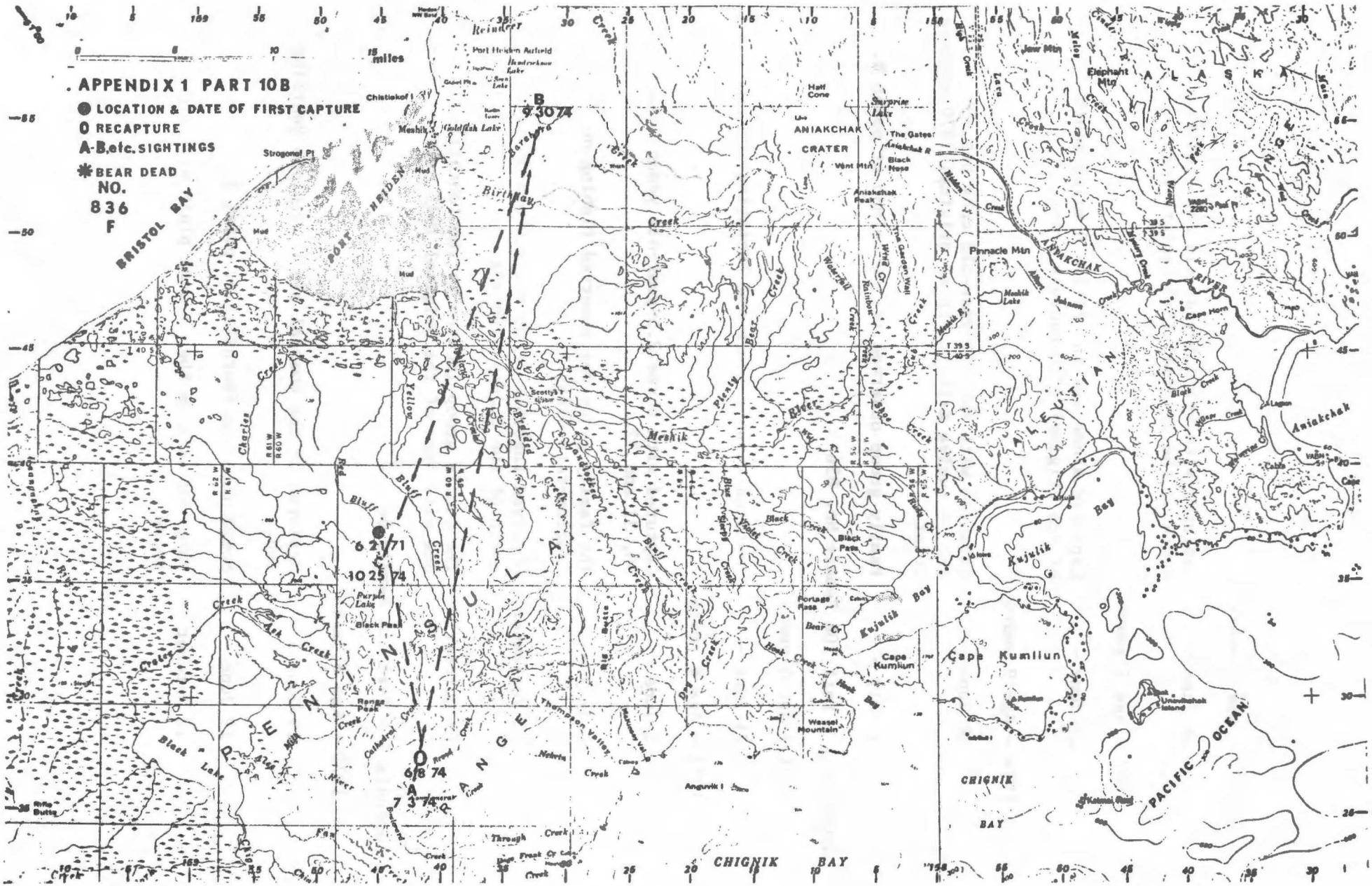
8 June -	Captured with three 2.5-year-old young Nos. 30, 31 and 32.
3 July -	The family group was observed fishing on Conglomerate Creek.
30 September -	Observed together on Barabara Creek 36 miles north of the 3 July sighting.
25 October -	The family group located in the foothills about one mile east of the original 1971 capture point.

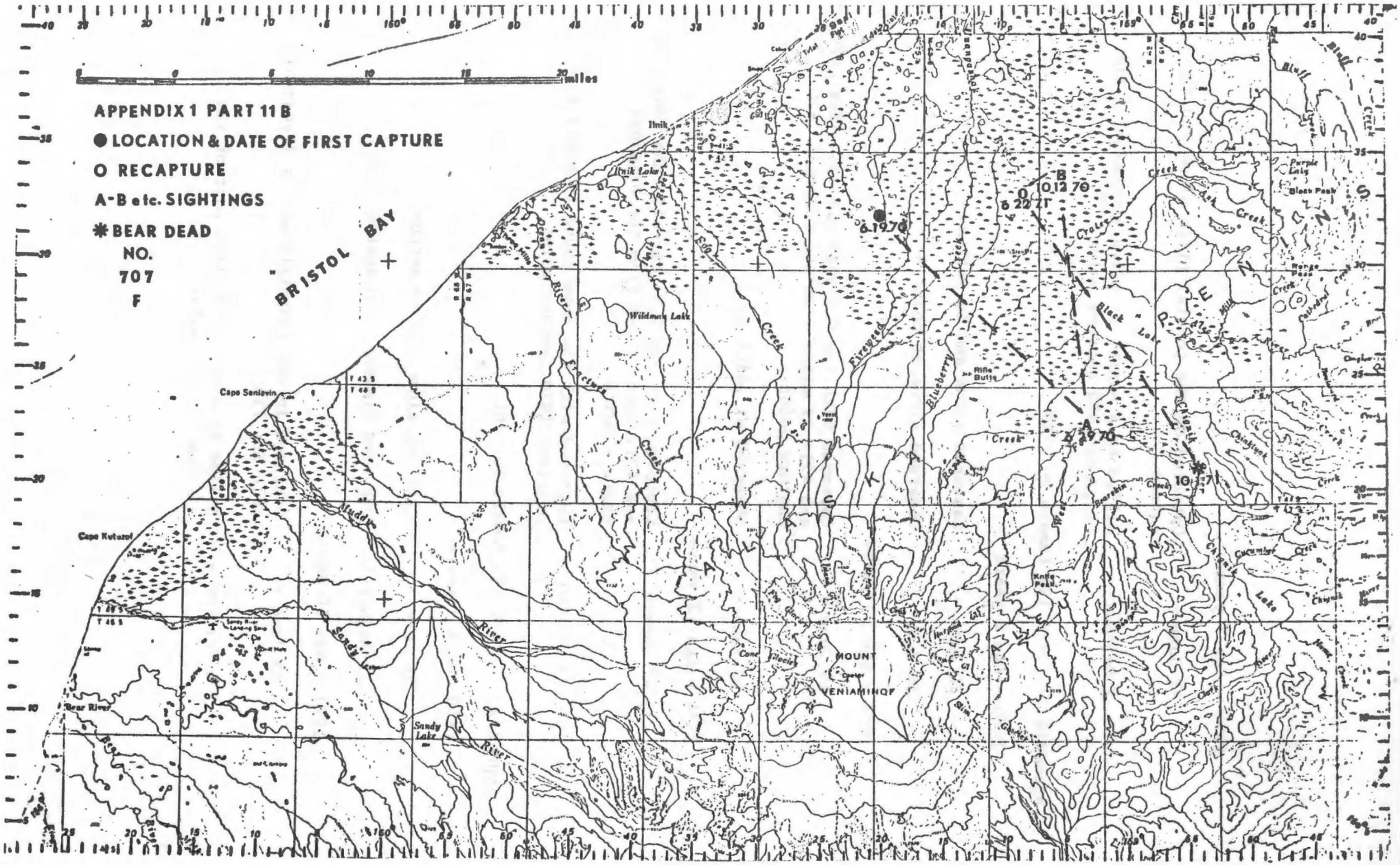
Appendix I - Part 11A Female No. 707

1970 - Age 6 years

19 June -	Captured on the coastal plain with one yearling cub.
29 June -	Moved into the foothills at point A.
12 October -	Observed back on the coastal plain with one young.

APPENDIX 1 PART 10B




APPENDIX 1 PART 11 B
● LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A-B etc. SIGHTINGS
✱ BEAR DEAD
NO.
707
F
BRISTOL BAY
Miles
Ilnik
Ilnik Lake
Wildmun Lake
Cape Seniavin
Cape Ketuzel
Sandy Lake
Bear River
MOUNT
VENIAMINOF
Black Lake
Rifle Butte
Knife Peak
Purple Lake
Bluff Peak
Range Peak
Chignik Lake
Cucumber Creek
Blueberry Creek
Firewood Creek
Sandy River
Buddy Creek
Big Creek
Crater Creek
Dark Creek
Bluff Creek
Chignik Creek
Cove Creek
Bear Creek
Cove Creek
Bear Creek
Cove Creek
B
10.12.70
O
6.22.71
6.19.70
A
6.19.70
10.7.71

1971 - Age 7 years

22 June - Captured on the coastal plain alone and in estrus.

1 October - Killed by a hunter 21 miles southeast of the original 1970 capture point.

Appendix I - Part 12A Female No. 719

1970 - Age 8 years

20 June - Captured alone and in estrus.

24 June - Observed alone at point A

1972 - Age 10 years

19 June - Captured with two 0.5-year-old cubs (Nos. 420 and 421) 12 miles from the original 1970 capture point.

20 June - Observed at point B.

1974 - Age 12 years

27 June - Captured with two 2.5-year-old cubs (Nos. 420 and 421) eight miles from the original 1970 capture point.

25 October - Captured with the same young 19 miles from the original 1970 capture point.

Appendix I - Part 13A Female No. 761

1970 - Age 9 years

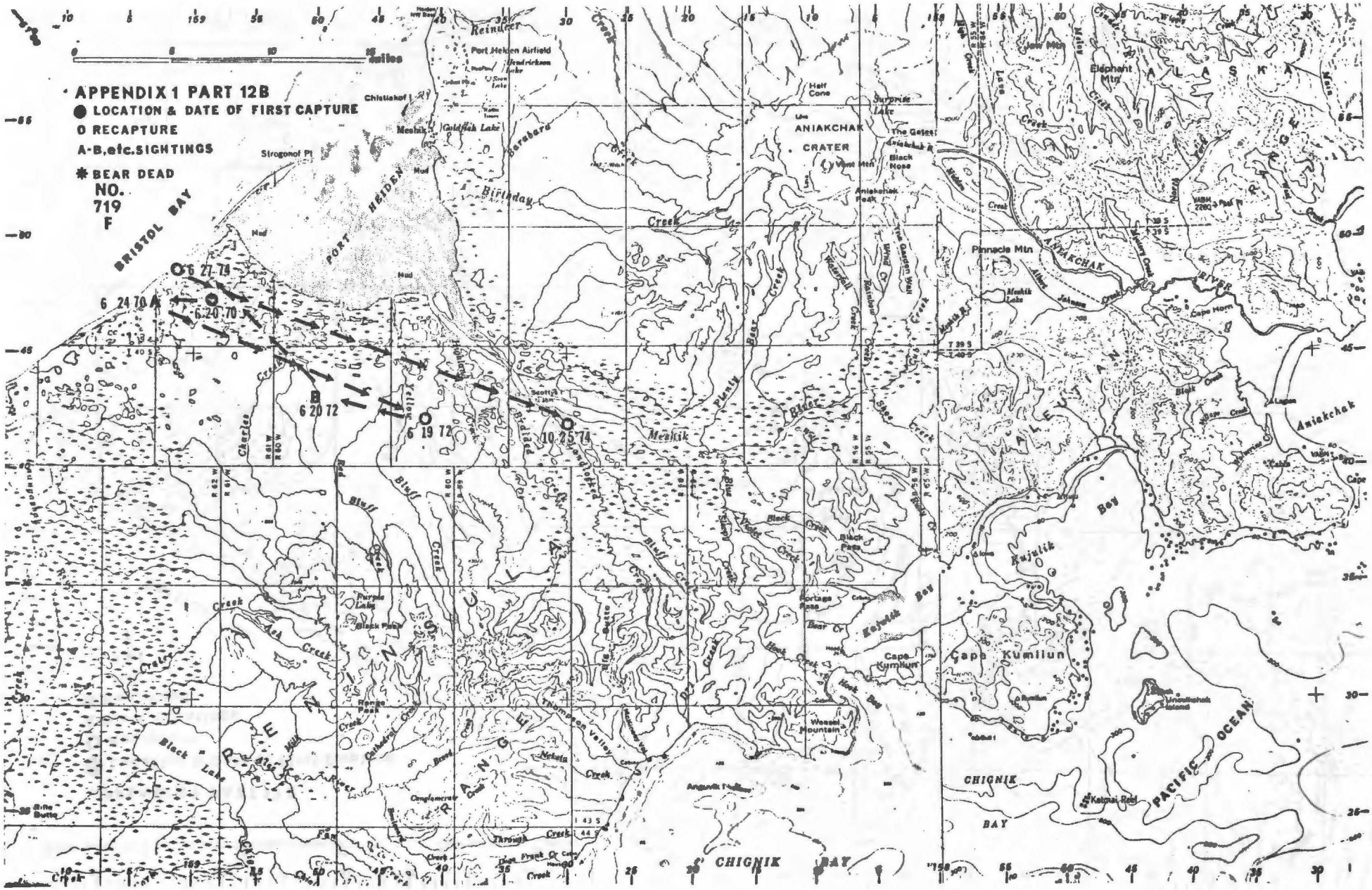
28 June - Captured alone and in estrus.

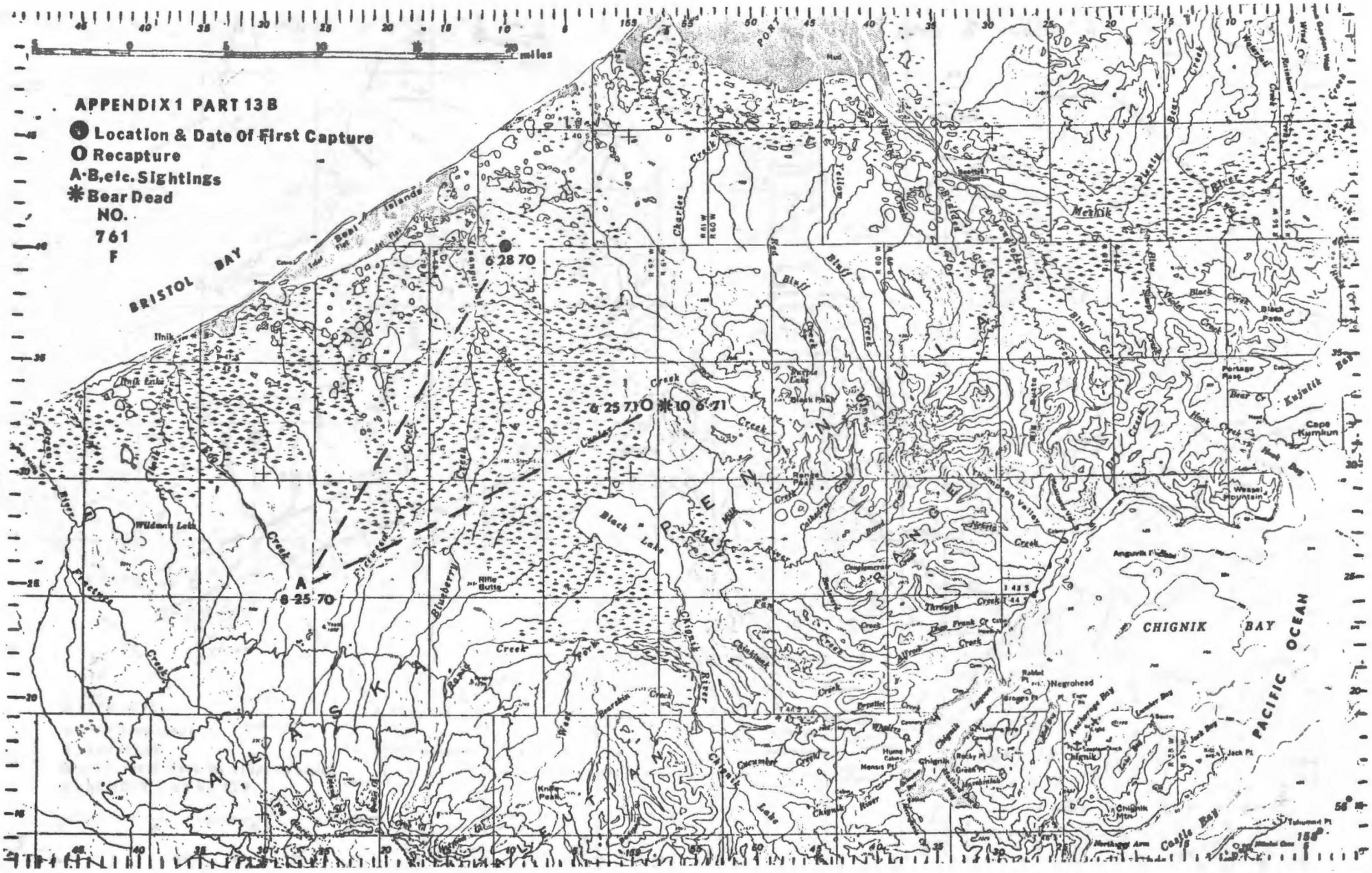
25 August - Observed fishing with another bear.

1971 - Age 10 years

25 June - Captured in the foothills with a 7-year-old male No. 714.

6 October - Killed by a hunter 2 miles east of the 25 June capture point.


APPENDIX 1 PART 12B
● LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A-B,etc.SIGHTINGS
✱ BEAR DEAD
NO.
719
F
BRISTOL BAY
PORT HEIDEN
Reindeer
Port Heiden Airfield
Chistiakof
Meshik
Strogonof Pt
Birthday
ANIAKCHAK
CRATER
Half Cone
Surprise Lake
The Gates
Black Nose
Aniakchak Peak
Pinnacle Mtn
Elephant Mtn
ANIAKCHAK
RIVER
Cape Horn
Aniakchak
Meshik
Bay
Kujulik
Bay
Cape Kumliun
Cape Kumliun
Wessels Mountain
CHIGNIK
BAY
CHIGNIK BAY
PACIFIC OCEAN
Black Lake
Black Peak
Purple Lake
Thompson Valley
Nelsta Creek
Angayik Falls
Ketnai Reef
6 27 74
6 24 70 A
6 20 70
B
6 20 72
6 19 72
10 25 74


APPENDIX 1 PART 13 B
Location & Date Of First Capture
O Recapture
A-B, etc. Sightings
Bear Dead
NO.
761
F
BRISTOL BAY
CHIGNIK BAY
PACIFIC OCEAN
6 28 70
6 25 71
O
10 6 71
A
8 25 70
Black Lake
Chignik Lake
Chignik
Negrohead
Cape Kumlun
Wildman Lake
Rifle Butte
Knife Peak
Metrik
Ihik
Ihik Lake
Beal Islands
Port
Mud
Black Peak
Range Peak
Cathedral Creek
Thompson Valley
Weasel Mountain
Angayik Ridge
Portage Pass
Kujulik Bay
Castle Bay
Northeast Arm
Tokumat Pt
Jack Pt
Rabbit Pt
Rogers Pt
Hume Pt
Meeks Pt
Rocky Pt
Green Pt
Chignik Mtn
Chignik River
Chignik Lake
Cucumber Creek
Blueberry Creek
Fractured Creek
Charles Creek
Red Bluff Creek
Yellow Creek
Bear Creek
Black Creek
Hook Creek
Through Creek
Alfred Creek
Tolstoi Creek
Bonanza Creek
Cobble Creek
Conglomerate Creek
Fan Creek
Pyramid Creek
Pebble Creek
Chignik River
Chignik Lake
Chignik Mtn
Chignik
Alaskan Bay
Lagoon
Jack Bay
Miles

Appendix I - Part 14A Female No. 728

1970 - Age 10 years

21 June -	Captured with two 1.5-year-old cubs Nos. 729 and 730.
3 July -	Family group observed at point A.
6 July -	Family group observed at point B.
15 October -	Observed at point C between Charles Creek and Unangashak River. Both tributaries contain spawning salmon.

1972 - Sow not observed

11 June -	Young No. 730 (3.5 years) captured along 7 miles from the original 1970 capture point.
8 October -	Young No. 730 killed 4 miles from the original 1970 capture point.

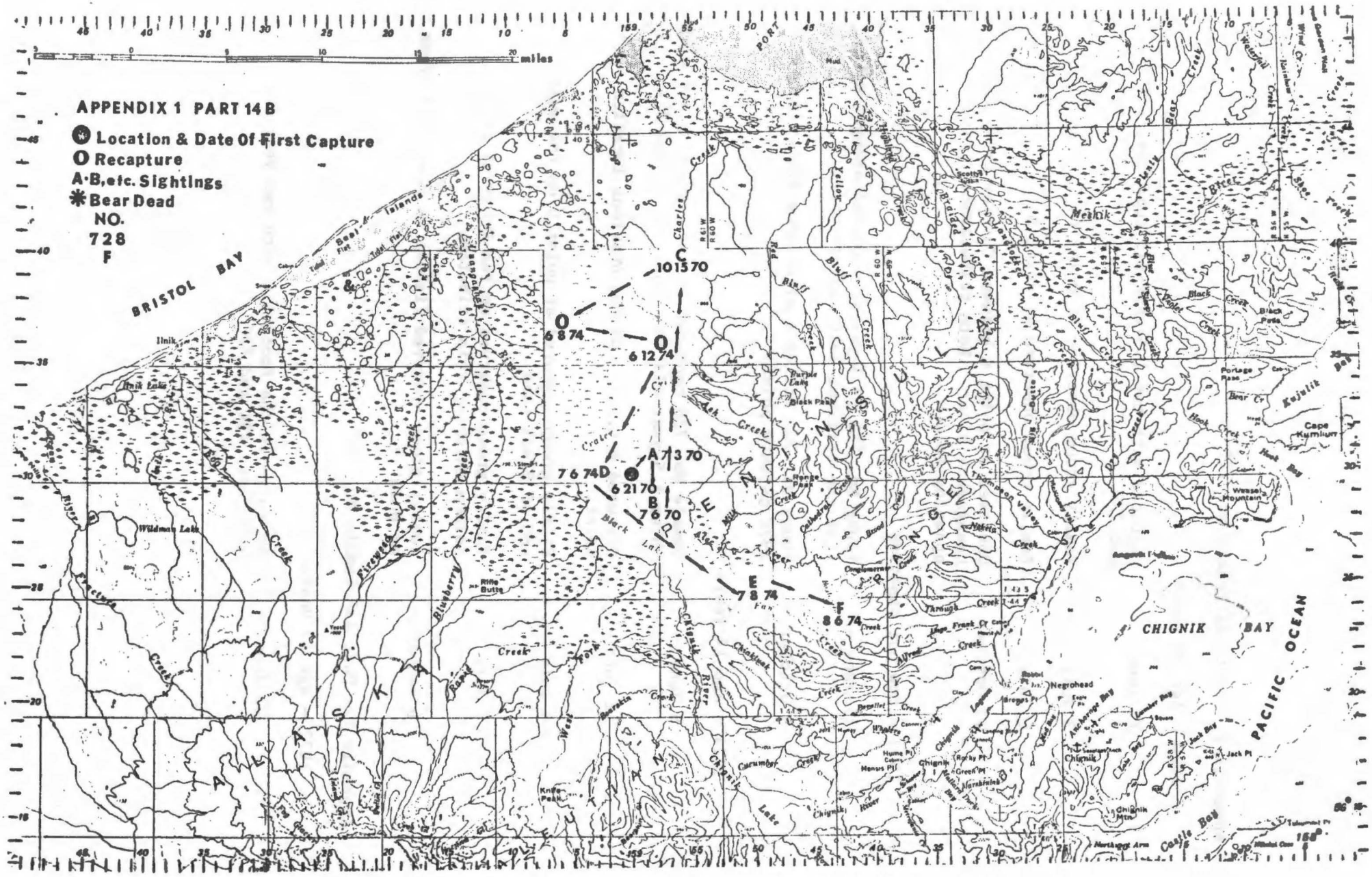
1974 - Age 14 years

8 June -	Female No. 728 captured on the coastal plain with three 1.5-year-old cubs Nos. 33, 34 and 35.
12 June -	Captured 6 miles from the previous location point.
6 July -	Family group captured at point D on the west end of Black Lake.
7 July -	Family group observed on Fan Creek at point E. Salmon entering this tributary.
6 August -	Family group observed fishing on Boulevard Creek at point F.

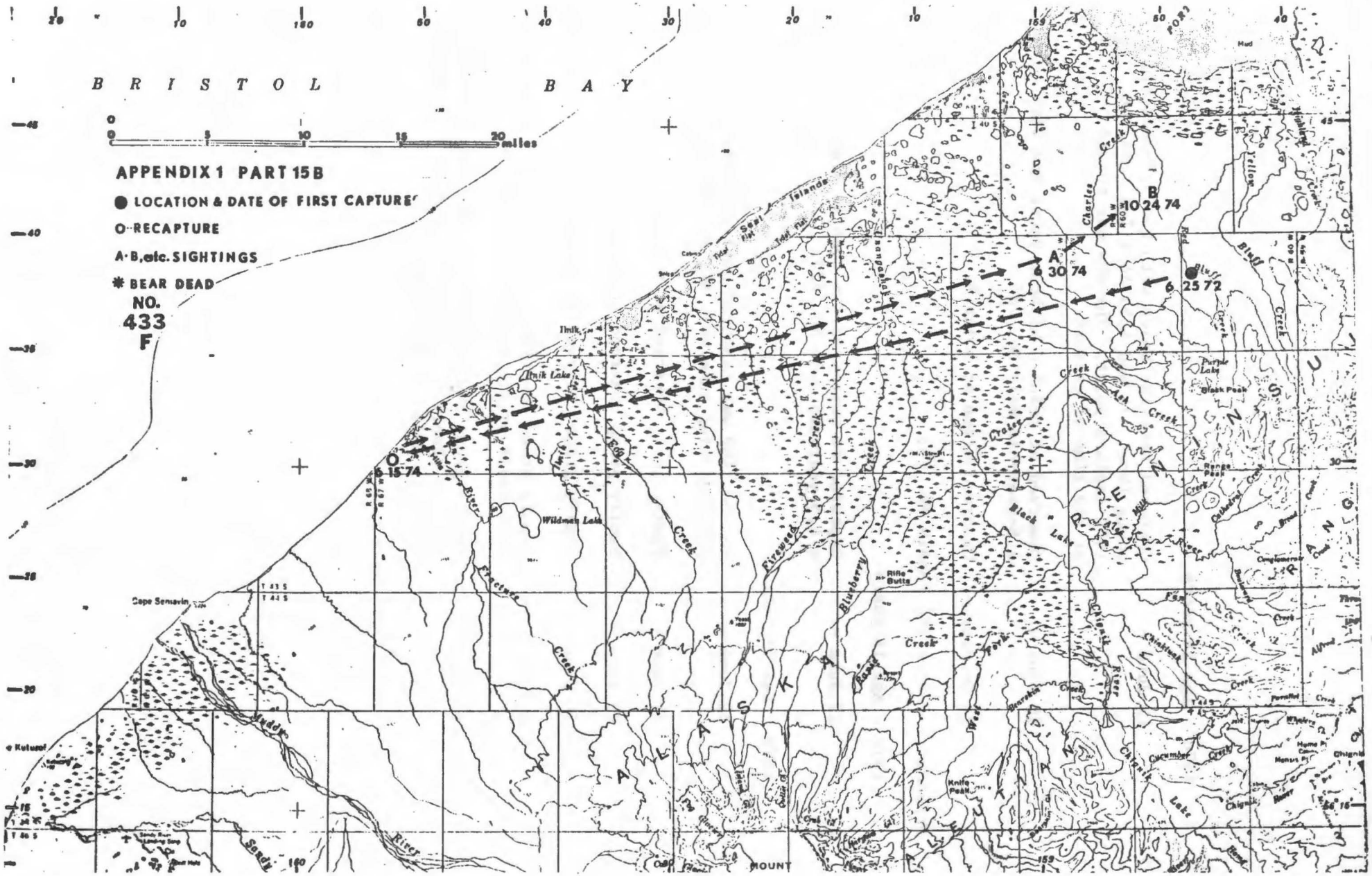
Appendix I - Part 15A Female No. 433

1972 - Age 12 years

25 June -	Captured in the foothills with two yearling cubs Nos. 434 and 435.



APPENDIX 1 PART 14B


BRISTOL BAY
0 5 10 15 20 miles
APPENDIX 1 PART 15B
● LOCATION & DATE OF FIRST CAPTURE
O-RECAPTURE
A-B, etc. SIGHTINGS
* BEAR DEAD
NO.
433
F
O 15 74
A 30 74
B 10 24 74
25 72
Ilnik Lake
Wildmen Lake
Cape Semavin
Black Lake
Rifle Butts
Knife Peak
Black Peak
Purple Lake
Cathedral Creek
Chignik Lake
Chignik River
Sandy River
Fireweed Creek
Blueberry Creek
Ash Creek
Charles Creek
Yellow Bluff Creek
Mud
Seal Islands
Tidal Flat
Cape Tidal Flat
Sand Spit
Cape Tidal Flat
Sand Spit
Ilnik
Ilnik Lake
Wildmen Lake
Cape Semavin
Kulusuk
Sandy River
Fireweed Creek
Blueberry Creek
Rifle Butts
Black Lake
Knife Peak
Chignik Lake
Chignik River
Cathedral Creek
Ash Creek
Charles Creek
Yellow Bluff Creek
Purple Lake
Black Peak
Range Peak
Cucumber Creek
Chignik River
Chignik Lake
Home Pt
Menses Pt
Chignik
Alfred
Mud
ALASKA
PENINSULA
MOUNTAINS
RANGE
SUTWIK
MOUNT

1974 - Age 14 years

15 June -	Captured near the beach with two 3.5-year-old young (Nos. 434 and 435) 44 miles from the 1972 capture point. The sow was turgid at the time of capture.
30 June -	Observed at point A without young and with a 6-year-old male No. 786.
24 October -	Observed alone at point B.

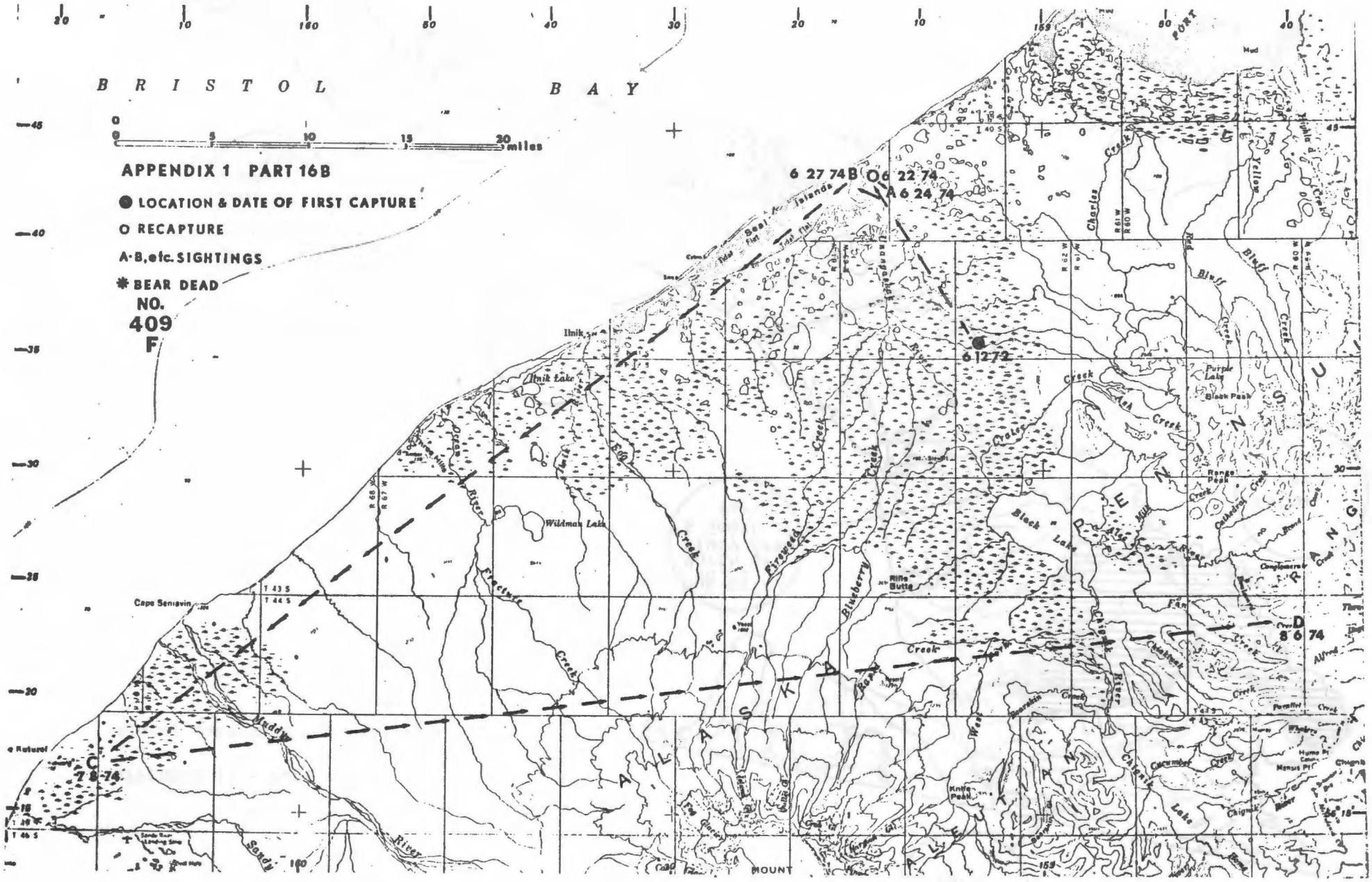
Appendix I - Part 16A Female No. 409

1972 - Age 14 years

12 June -	Captured in estrus on the coastal plain with a 4.5-year-old male No. 827.

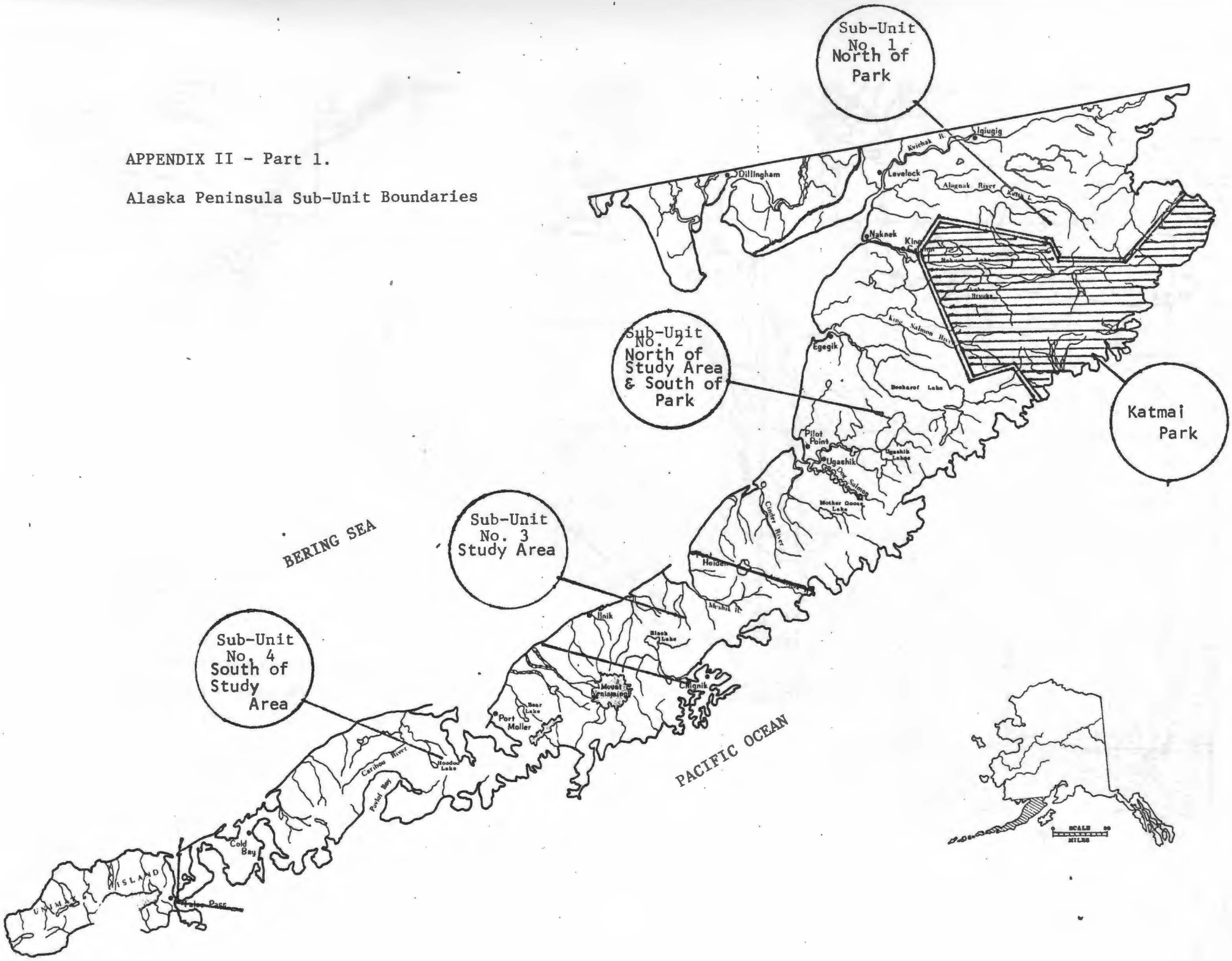
1974 - Age 16 years

22 June -	Sow No. 409 was captured near the beach with four yearling cubs Nos. 80, 81, 82 and 83.
24 June -	Family group observed at point A.
27 June -	Family group observed at point B.
30 June -	Family group observed at point B.
8 July -	Family group observed at point C, 50 miles from their previous location point.
6 August -	Family group radio-tracked to Boulevard Creek but not observed. Distance traveled from previous location point is 64 miles.


BRISTOL BAY
0 5 10 15 20 miles
APPENDIX 1 PART 16B
● LOCATION & DATE OF FIRST CAPTURE
O RECAPTURE
A·B, etc. SIGHTINGS
✱ BEAR DEAD
NO.
409
F
6 27 74 B
O 6 22 74
A 6 24 74
6 12 72
D 8 6 74
C 7 8 74
Ilnik
Ilnik Lake
Wildman Lake
Cape Seniavin
Muddy River
Sandy River
Fractwig Creek
Firweed Creek
Blueberry Creek
Rifle Butte
Black Lake
Cratter Creek
Red Bluff Creek
Purple Lake
Black Peak
Range Peak
Cathedral Creek
Conglomerate Creek
Chignik Lake
Knife Peak
Chignik River
Cucumber Creek
Chignik Bay
Nensus Pt
Port Mud
Charles Creek
Yellow Creek
Beal Islands
Beal Flat
Tidal Flat
Mount

APPENDIX II - Part 1.

Alaska Peninsula Sub-Unit Boundaries



Appendix II - Part 2A
Game Management Unit 09 Subunit 0002
Yearly Brown Bear Sport Harvest 1961 - 1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# Of Males	# Of Females	% Of Males	% Of Females	# Of Unknown	# By Nonres	% By Nonres.
1961	0036	026	008	076	024	002	018	50
1962	0052	035	017	067	033	000	036	69
1963	0034	024	010	071	029	000	028	82
1964	0047	029	015	066	034	003	039	83
1965	0076	044	029	060	040	003	055	72
1966	0081	056	022	072	028	003	068	84
1967	0075	050	023	068	032	002	064	85
1968	0049	034	013	072	028	002	047	96
1969	0027	018	008	069	031	001	022	81
1970	0053	029	023	056	044	001	045	85
1971	0065	042	020	068	032	003	048	74
1972	0086	048	037	056	044	001	071	83
1973	0056	028	026	052	048	002	045	80
1974	0044	024	020	055	045	000	033	75
Totals	0781	0487	0271	0064	0036	0023	0619	79

APPENDIX II - PART 2A (Con't.)
Game Management Unit 09 Subunit 0002
Yearly Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.>= 5Yr.		F.>= 5Yr.	
alendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	17.1	026	13.5	006	26.3	011	21.8	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.6	034	13.3	017	25.5	009	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	15.8	024	13.0	010	27.0	010	21.8	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.5	029	13.5	014	26.7	018	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	15.5	043	14.2	029	25.6	024	22.6	005	00.0	000	18.8	001	18.8	001	00.0	000	18.8	001
1966	15.2	056	13.7	022	25.5	017	22.2	008	00.0	000	12.8	002	12.8	002	00.0	000	22.8	001
1967	15.5	049	13.5	023	25.0	039	20.1	020	04.3	002	03.3	002	03.8	004	05.8	001	00.0	000
1968	15.3	034	13.4	013	23.9	031	21.2	011	03.7	009	05.8	002	04.1	011	06.4	002	05.8	002
1969	15.0	017	13.7	007	23.3	017	22.3	007	06.1	013	06.5	008	06.2	021	09.4	006	11.5	003
1970	14.8	028	14.1	023	22.6	028	21.7	023	06.4	026	07.3	019	06.8	045	10.0	013	10.3	010
1971	14.9	040	13.6	020	23.7	042	21.9	019	06.7	038	05.4	019	06.3	057	11.8	015	07.7	008
1972	14.0	048	13.3	037	22.9	048	21.3	037	06.3	046	07.8	037	07.0	083	10.6	018	10.7	022
1973	14.0	028	13.2	026	22.2	028	20.7	026	05.2	028	07.2	026	06.2	054	08.0	010	09.7	015
1974	14.3	024	13.8	020	21.1	023	21.8	019	05.8	023	09.0	020	07.3	043	10.2	008	12.0	013
OTALS	15.3	0480	13.6	0267	23.9	0345	21.4	180	06.0	185	07.4	136	06.6	321	10.0	073	10.5	075

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 2B
Game Management Unit 09 Subunit 0002
Spring Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0016	014	002	088	013	000	007	44
1962	0019	014	005	074	026	000	007	37
1963	0012	010	002	083	017	000	009	75
1964	0012	011	001	092	008	000	010	83
1965	0027	023	004	085	015	000	017	63
1966	0033	032	000	100	000	001	025	76
1967	0029	024	004	086	014	001	022	76
1968	0019	016	003	084	016	000	017	89
1969	0010	009	001	090	010	000	008	80
1970	0010	007	003	070	030	000	007	70
1971	0009	009	000	100	000	000	008	89
1972	0006	006	000	100	000	000	005	83
1973	0020	011	009	055	045	000	015	75
1974	0000	000	000	000	000	000	000	0
TOTALS	0222	0186	0034	0085	0015	0002	0157	71

APPENDIX II - PART 2B (Con't.)
Game Management Unit 09 Subunit 0002
Spring Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.>= 5Yr.		F.>= 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	17.2	014	13.7	002	27.5	009	21.8	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.5	014	12.7	005	25.6	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	16.7	010	12.6	002	27.3	007	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.7	011	13.7	001	27.4	010	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	16.7	023	13.1	004	26.5	016	22.3	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	15.7	032	00.0	000	26.2	011	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	15.8	024	13.0	004	26.6	015	23.4	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1968	16.6	016	13.5	003	25.6	016	21.7	003	04.7	004	00.0	000	04.7	004	06.4	002	00.0	000
1969	16.0	009	14.6	001	25.3	009	23.1	001	08.0	008	04.4	001	07.6	009	09.4	006	00.0	000
1970	15.2	007	12.8	003	24.3	007	22.2	003	06.3	007	05.7	003	06.1	010	07.6	005	06.4	002
1971	16.0	009	00.0	000	25.6	009	00.0	000	09.5	009	00.0	000	09.5	009	09.5	009	00.0	000
1972	14.6	006	00.0	000	24.7	006	00.0	000	10.9	006	00.0	000	10.9	006	12.4	005	00.0	000
1973	13.8	011	12.8	009	23.5	011	22.4	009	05.9	011	07.1	009	06.4	020	07.2	006	10.4	004
1974	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
TOTALS	16.0	0186	13.0	0034	25.9	0129	22.3	021	07.6	045	06.6	013	07.4	058	09.0	033	09.1	006

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 2C
Game Management Unit 09 Subunit 0002
Fall Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0020	012	006	067	033	002	011	55
1962	0033	021	012	064	036	000	029	88
1963	0022	014	008	064	036	000	019	86
1964	0035	018	014	056	044	003	029	83
1965	0049	021	025	046	054	003	038	78
1966	0048	024	022	052	048	002	043	90
1967	0046	026	019	058	042	001	042	91
1968	0030	018	010	064	036	002	030	100
1969	0017	009	007	056	044	001	014	82
1970	0043	022	020	052	048	001	038	88
1971	0056	033	020	062	038	003	040	71
1972	0080	042	037	053	047	001	066	83
1973	0036	017	017	050	050	002	030	83
1974	0044	024	020	055	045	000	033	75
TOTALS	0559	0301	0237	0056	0044	0021	0462	83

APPENDIX II - PART 2C (Con't.)
Game Management Unit 09 Subunit 0002
Fall Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.>= 5Yr.		F.>= 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	17.1	012	13.3	004	21.2	002	21.8	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.7	020	13.6	012	25.4	006	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	15.2	014	13.1	008	26.4	003	21.8	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.4	018	13.5	013	25.9	008	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	14.2	020	14.4	025	23.6	008	22.8	003	00.0	000	18.8	001	18.8	001	00.0	000	18.8	001
1966	14.7	024	13.7	022	24.2	006	22.2	008	00.0	000	12.8	002	12.8	002	00.0	000	22.8	001
1967	15.2	025	13.6	019	24.0	024	19.9	019	04.3	002	03.3	002	03.8	004	05.8	001	00.0	000
1968	14.1	018	13.3	010	22.0	015	21.1	008	03.0	005	05.8	002	03.8	007	00.0	000	05.8	002
1969	13.8	008	13.5	006	21.0	008	22.2	006	03.0	005	06.8	007	05.2	012	00.0	000	11.5	003
1970	14.7	021	14.3	020	22.0	021	21.7	020	06.4	019	07.6	016	06.9	035	11.4	008	11.3	008
1971	14.6	031	13.6	020	23.2	033	21.9	019	05.8	029	05.4	019	05.7	048	15.1	006	07.7	008
1972	13.9	042	13.3	037	22.6	042	21.3	037	05.7	040	07.8	037	06.7	077	10.0	013	10.7	022
1973	14.1	017	13.4	017	21.4	017	19.8	017	04.8	017	07.2	017	06.0	034	09.1	004	09.4	011
1974	14.3	024	13.8	020	21.1	023	21.8	019	05.8	023	09.0	020	07.3	043	10.2	008	12.0	013
TOTALS	14.8	0294	13.6	0233	22.8	0216	21.3	159	05.5	140	07.5	123	06.4	263	10.9	040	10.7	069

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 3A
Game Management Unit 09 Subunit 0003
Yearly Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0027	020	007	074	026	000	016	59
1962	0035	026	009	074	026	000	023	66
1963	0063	037	023	062	038	003	047	75
1964	0041	027	012	069	031	002	031	76
1965	0035	024	011	069	031	000	026	74
1966	0068	047	017	073	027	004	053	78
1967	0050	030	019	061	039	001	041	82
1968	0040	026	014	065	035	000	036	90
1969	0019	015	002	088	012	002	016	84
1970	0035	027	008	077	023	000	029	83
1971	0059	040	018	069	031	001	047	80
1972	0075	040	034	054	046	001	064	85
1973	0045	026	019	058	042	000	038	84
1974	0025	011	014	044	056	000	022	88
TOTALS	0617	0396	0207	0066	0034	0014	0489	79

APPENDIX II - PART 3A (Con't.)
Game Management Unit 09 Subunit 0003
Yearly Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.>= 5Yr.		F.>= 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	15.8	018	12.0	007	22.6	006	20.8	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.9	025	14.4	009	27.2	013	22.3	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	15.9	037	13.5	023	26.5	021	21.9	006	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.0	027	15.0	012	26.9	009	22.8	005	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	15.7	024	13.1	010	25.6	011	22.4	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	16.2	047	14.0	017	26.7	019	22.1	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	16.2	030	14.1	019	24.5	027	22.3	014	00.0	000	04.8	002	04.8	002	00.0	000	05.8	001
1968	15.8	026	14.3	014	24.4	026	21.5	013	07.3	013	03.9	007	06.1	020	10.1	008	08.8	001
1969	16.1	015	14.5	002	25.3	015	19.8	002	07.0	014	08.4	002	07.2	016	08.6	009	12.4	001
1970	15.4	026	13.9	008	24.4	027	21.8	007	06.4	026	05.7	007	06.3	033	08.8	015	11.6	002
1971	15.3	039	13.8	017	23.8	039	20.8	017	07.5	038	05.3	017	06.8	055	11.0	020	10.8	004
1972	14.8	039	14.0	034	23.5	039	22.4	033	05.5	038	07.9	032	06.6	070	08.5	016	11.2	018
1973	15.4	026	13.9	019	24.3	025	20.8	017	06.6	026	06.3	017	06.5	043	09.4	013	10.0	007
1974	14.5	011	13.1	013	22.3	011	19.5	014	04.0	011	06.6	014	05.4	025	05.8	001	09.2	008
TOTALS	15.7	0390	13.8	0204	24.7	0288	21.5	137	06.5	166	06.5	098	06.5	264	09.4	082	10.4	042

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 3B
Game Management Unit 09 Subunit 0003
Spring Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0020	016	004	080	020	000	014	70
1962	0027	023	004	085	015	000	017	63
1963	0031	022	006	079	021	003	020	65
1964	0019	016	003	084	016	000	014	74
1965	0013	009	004	069	031	000	008	62
1966	0033	027	006	082	018	000	026	79
1967	0026	019	007	073	027	000	019	73
1968	0018	014	004	078	022	000	016	89
1969	0012	010	002	083	017	000	011	92
1970	0014	011	003	079	021	000	013	93
1971	0026	022	003	088	012	001	022	85
1972	0021	014	006	070	030	001	020	95
1973	0019	014	005	074	026	000	017	89
1974	0000	000	000	000	000	000	000	0
TOTALS	0279	0217	0057	0079	0021	0005	0217	78

APPENDIX II - PART 3B (Con't.)
Game Management Unit 09 Subunit 0003
Spring Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M. >= 5Yr.		F. >= 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	16.3	014	13.1	004	22.6	006	20.8	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	17.0	022	13.5	004	27.2	012	22.3	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	17.5	022	12.7	006	26.9	016	19.3	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.3	016	14.5	003	27.1	007	21.5	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	15.9	009	12.7	004	26.1	005	21.1	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	16.4	027	13.7	006	26.6	015	21.4	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	16.8	019	13.7	007	25.0	016	22.8	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1968	16.4	014	12.6	004	25.2	014	21.1	004	10.2	005	02.7	003	07.4	008	10.2	005	00.0	000
1969	16.6	010	14.5	002	25.3	010	19.8	002	06.7	009	08.4	002	07.0	011	08.2	006	12.4	001
1970	16.3	010	13.4	003	26.2	011	22.0	002	08.2	010	04.4	002	07.6	012	08.6	009	06.4	001
1971	16.1	022	12.9	003	24.1	022	20.7	003	08.7	022	03.7	003	08.1	025	10.2	017	00.0	000
1972	15.6	014	14.4	006	25.4	014	22.9	005	07.6	014	05.6	005	07.1	019	09.2	010	06.7	003
1973	16.2	014	13.1	005	25.2	014	21.0	005	07.5	014	05.0	005	06.8	019	09.2	009	07.9	002
1974	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
TOTALS	16.5	0213	13.4	0057	25.6	0162	21.5	031	08.1	074	04.9	020	07.4	094	09.4	056	07.8	007

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 3C
Game Management Unit 09 Subunit 0003
Fall Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0007	004	003	057	043	000	002	29
1962	0008	003	005	038	063	000	006	75
1963	0032	015	017	047	053	000	027	84
1964	0022	011	009	055	045	002	017	77
1965	0022	015	007	068	032	000	018	82
1966	0035	020	011	065	035	004	027	77
1967	0024	011	012	048	052	001	022	92
1968	0022	012	010	055	045	000	020	91
1969	0007	005	000	100	000	002	005	71
1970	0021	016	005	076	024	000	016	76
1971	0033	018	015	055	045	000	025	76
1972	0054	026	028	048	052	000	044	81
1973	0026	012	014	046	054	000	021	81
1974	0025	011	014	044	056	000	022	88
TOTALS	0338	0179	0150	0054	0046	0009	0272	80

APPENDIX II - PART 3C (Con't.)
Game Management Unit 09 Subunit 0003
Fall Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M. >= 5Yr.		F. >= 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	14.0	004	10.6	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.0	003	15.0	005	27.5	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	13.6	015	13.8	017	25.3	005	22.4	005	22.4	005	00.0	000	00.0	000	00.0	000	00.0	000
1964	15.6	011	15.1	009	26.1	002	23.1	004	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	15.6	015	13.4	006	25.2	006	23.1	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	15.8	020	14.2	011	27.1	004	23.5	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	15.1	011	14.3	012	23.7	011	22.3	012	00.0	000	04.8	002	04.8	002	00.0	000	05.8	001
1968	15.1	012	15.0	010	23.4	012	21.7	009	05.6	008	04.8	004	05.3	012	09.8	003	08.8	001
1969	15.1	005	00.0	000	25.2	005	00.0	000	07.6	005	00.0	000	07.6	005	09.5	003	00.0	000
1970	14.9	016	14.1	005	23.1	016	21.7	005	05.3	016	06.2	005	05.5	021	09.1	006	16.8	001
1971	14.3	017	13.9	014	23.5	017	20.8	014	05.9	016	05.6	014	05.8	030	15.8	003	10.8	004
1972	14.4	025	13.9	028	22.4	025	22.4	028	04.3	024	08.3	027	06.4	051	07.3	006	12.1	015
1973	14.5	012	14.1	014	23.2	011	20.7	012	05.6	012	06.8	012	06.2	024	09.8	004	10.8	005
1974	14.5	011	13.1	013	22.3	011	19.5	014	04.0	011	06.6	014	05.4	025	05.8	001	09.2	008
TOTALS	14.9	0177	14.0	0147	23.5	0126	21.5	106	05.2	092	06.9	078	06.0	170	09.6	026	10.9	035

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 4A
Game Management Unit 09 Subunit 0004
Yearly Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0039	028	009	076	024	002	026	67
1962	0052	037	015	071	029	000	025	48
1963	0035	020	013	061	039	002	021	60
1964	0043	031	010	076	024	002	026	60
1965	0059	044	015	075	025	000	039	66
1966	0054	038	016	070	030	000	036	67
1967	0067	054	013	081	019	000	049	73
1968	0057	042	014	075	025	001	043	75
1969	0026	020	005	080	020	001	018	69
1970	0042	026	014	065	035	002	025	60
1971	0040	024	014	063	037	002	024	60
1972	0065	031	033	048	052	001	041	63
1973	0090	053	034	061	039	003	072	80
1974	0050	022	028	044	056	000	047	94
TOTALS	0719	0470	0233	0067	0033	0016	0492	68

APPENDIX II - PART 4A (Con't.)
Game Management Unit 09 Subunit 0004
Yearly Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.> = 5Yr.		F.> = 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	16.5	027	14.5	008	26.2	013	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.0	036	13.1	015	26.8	011	23.3	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	17.2	019	12.9	013	26.9	012	00.0	000	04.4	001	00.0	000	04.4	001	00.0	000	00.0	000
1964	16.2	031	13.6	010	26.4	008	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	16.5	044	12.9	013	26.4	027	21.1	005	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	16.3	038	13.5	016	25.8	022	24.0	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	15.8	054	14.2	013	24.4	041	21.0	008	05.6	006	00.0	000	05.6	006	10.8	002	00.0	000
1968	15.5	042	14.2	014	24.0	040	22.0	013	08.6	016	05.3	006	07.7	022	11.8	010	08.4	002
1969	15.7	020	13.5	005	24.9	020	20.9	005	07.7	020	04.0	004	07.1	024	10.3	012	05.4	001
1970	15.3	026	14.2	014	24.4	025	22.4	014	07.7	022	07.0	013	07.5	035	10.5	014	11.0	006
1971	15.5	024	13.3	014	24.1	023	21.3	014	05.5	020	05.6	014	05.5	034	07.5	011	09.2	005
1972	14.5	029	13.4	033	23.2	028	21.4	032	05.5	029	07.6	030	06.5	059	09.7	009	10.8	016
1973	14.9	053	13.3	034	23.3	053	20.8	033	05.3	050	06.5	034	05.8	084	06.8	027	10.8	013
1974	13.8	022	13.1	028	22.5	021	20.5	028	05.9	022	07.0	027	06.5	049	09.8	008	14.9	008
TOTALS	15.7	0465	13.5	0230	24.5	0344	21.2	155	06.3	186	06.7	128	06.4	314	09.0	093	11.1	051

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 4B
Game Management Unit 09 Subunit 0004
Spring Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0031	023	006	079	021	002	020	65
1962	0040	032	008	080	020	000	019	48
1963	0020	015	004	079	021	001	013	65
1964	0017	014	001	093	007	002	010	59
1965	0037	031	006	084	016	000	028	76
1966	0024	021	003	088	013	000	017	71
1967	0045	039	006	087	013	000	035	78
1968	0023	017	005	077	023	001	018	78
1969	0023	018	004	082	018	001	017	74
1970	0027	017	008	068	032	002	017	63
1971	0016	010	006	063	038	000	010	63
1972	0019	010	008	056	044	001	010	53
1973	0047	034	012	074	026	001	035	74
1974	0000	000	000	000	000	000	000	0
TOTALS	0369	0281	0077	0078	0022	0011	0249	67

APPENDIX II - PART 4B (Con't.)
Game Management Unit 09 Subunit 0004
Spring Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M.≥ 5Yr.		F.≥ 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	16.9	022	14.6	006	26.2	013	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	16.1	031	12.7	008	26.8	009	23.3	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	17.5	015	14.0	004	27.4	010	00.0	000	04.4	001	00.0	000	04.4	001	00.0	000	00.0	000
1964	16.3	014	13.0	001	26.4	004	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	17.8	031	13.1	005	27.0	023	21.1	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	17.9	021	13.2	003	26.6	017	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	16.1	039	13.4	006	25.9	026	23.3	001	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1968	15.7	017	13.9	005	24.9	017	21.7	005	08.3	014	05.6	005	07.6	019	11.1	009	08.4	002
1969	15.7	018	13.9	004	24.9	018	21.4	004	07.7	018	04.7	003	07.3	021	10.0	011	05.4	001
1970	16.2	017	13.6	008	25.5	017	22.4	008	08.8	015	07.8	007	08.5	022	10.3	012	10.9	004
1971	15.6	010	12.3	006	25.9	009	21.9	006	07.0	008	05.4	006	06.3	014	07.7	007	08.9	002
1972	14.5	010	13.5	008	23.3	010	22.5	007	05.2	010	09.8	007	07.1	017	12.4	002	14.2	004
1973	15.3	034	13.0	012	24.1	034	21.8	012	05.8	031	05.7	012	05.8	043	06.8	021	07.4	006
1974	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
TOTALS	16.3	0279	13.4	0076	25.6	0207	22.0	046	07.0	097	06.7	040	06.9	137	09.0	062	09.7	019

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

APPENDIX II - PART 4C
Game Management Unit 09 Subunit 0004
Fall Brown Bear Sport Harvest 1961-1974
Harvest Summary By Year, Sex of Bear, and Residency of Hunter

Calendar Year	Total Kill	# of Males	# of Females	% Of Males	% Of Females	# Of Unknown	# By NonRes	% By Nonres
1961	0008	005	003	063	038	000	006	75
1962	0012	005	007	042	058	000	006	50
1963	0015	005	009	036	064	001	008	53
1964	0026	017	009	065	035	000	016	62
1965	0022	013	009	059	041	000	011	50
1966	0030	017	013	057	043	000	019	63
1967	0022	015	007	068	032	000	014	64
1968	0034	025	009	074	026	000	025	74
1969	0003	002	001	067	033	000	001	33
1970	0015	009	006	060	040	000	008	53
1971	0024	014	008	064	036	002	014	58
1972	0046	021	025	046	054	000	031	67
1973	0043	019	022	046	054	002	037	86
1974	0050	022	028	044	056	000	047	94
TOTALS	0350	0189	0156	0055	0045	0005	0243	69

APPENDIX II - PART 4C (Con't.)
Game Management Unit 09 Subunit 0004
Fall Brown Bear Sport Harvest 1961-1974
Mean Ages, Skull and Hide Sizes of Bear Harvested

	Mean Hide Sizes				Mean Skull Sizes				MEAN AGES									
	Male		Female		Male		Female		All Males		All Females		All Sexes*		M. = 5Yr.		F. = 5Yr.	
Calendar Year	Hide Size	Samp Size	Hide Size	Samp Size	Skull Size	Samp Size	Skull Size	Samp Size	Age	Samp Size	Age	Samp Size	Age	Samp Size	Age	Size	Age	Samp Size
1961	15.2	005	14.2	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1962	15.3	005	13.5	007	26.6	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1963	16.3	004	12.4	009	24.7	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1964	16.2	017	13.6	009	26.5	004	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1965	13.4	013	12.8	008	23.2	004	21.1	003	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1966	14.4	017	13.6	013	22.9	005	24.0	002	00.0	000	00.0	000	00.0	000	00.0	000	00.0	000
1967	15.2	015	14.8	007	21.7	015	20.7	007	05.6	006	00.0	000	05.6	006	10.8	002	00.0	000
1968	15.4	025	14.4	009	23.3	023	22.2	008	10.8	002	03.8	001	08.5	003	18.8	001	00.0	000
1969	16.4	002	11.7	001	25.0	002	19.0	001	07.8	002	01.8	001	05.8	003	12.8	001	00.0	000
1970	13.6	009	15.0	006	22.0	008	22.3	006	05.4	007	06.1	006	05.7	013	11.3	002	11.3	002
1971	15.3	014	14.0	008	22.9	014	20.9	008	04.5	012	05.8	008	05.0	020	07.3	004	09.5	003
1972	14.5	019	13.4	025	23.1	018	21.0	025	05.6	019	06.9	023	06.3	042	08.9	007	09.7	012
1973	14.2	019	13.4	022	21.8	019	20.3	021	04.5	019	07.0	022	05.8	041	06.6	006	13.8	007
1974	13.8	022	13.1	028	22.5	021	20.5	028	05.9	022	07.0	027	06.5	049	09.8	008	14.9	008
TOTALS	14.7	0186	13.5	0154	22.8	0137	20.9	109	05.4	089	06.7	088	06.1	177	09.2	031	12.0	032

* 1961 and 1962 hide length measured from the base of the tail.
** 1963 to present hide length measured from anus.

JOB PROGRESS REPORT (RESEARCH)

State: Alaska

Cooperator: Leland P. Glenn

Project No.: W-17-6 & W-17-7 Project Title: Big Game Investigations

Job No.: 4.6R Job Title: Comparison of Brown/ Grizzly Bear Skulls by Size, Age, Sex and Geographic Location

Period Covered: January 1, 1974 through December 31, 1974

SUMMARY

Sixty-two brown/grizzly bear skulls were collected, measured, weighed and photographed. The skull collection now contains about 600 specimens. Computer programs were written for analysis of skull measurement data. Preliminary findings showed positive correlation between skull size, sex, age and geographic location.

CONTENTS

BACKGROUND

With the exception of work done by Rausch (1963) little information is available on growth characteristics of Alaska brown/grizzly bear (*Ursus arctos*) skulls. Because a need for this information exists, Game Division personnel began collecting brown/grizzly bear skulls in 1960. The collection remained small until 1967 when a regulation was passed requiring all hunters to present their skulls for sealing. The skull collection grew rapidly after adoption of this regulation. Most skulls were donated to the Department of Fish and Game by hunters and owners of local taxidermy shops who had no further use for these specimens. It wasn't until 1972, however, that the collection was of sufficient size to attempt analysis.

OBJECTIVES

1) To compare skull size by area, sex and age; 2) to establish the rate and duration of skull growth; 3) to investigate the latitude of deciduous and permanent tooth eruption and 4) to discover any physical characteristics which are common to bears within a specific area.

PROCEDURES

Sixty-two skulls were collected, aged, measured and photographed using procedures described by Glenn (1973).

The skull study incorporates information from three sources; the skull collection, from captured bears and from bear sealing documents. Data include skull measurements, time and location of kill, sex and age. Three computer programs were written for analysis of these data. These programs have been tested and are operational.

FINDINGS

Additional teeth were pulled from 90 skulls and processed. This was necessary because prior tooth sections were of inferior quality.

The additional work caused delays which made it impossible to analyze the data and complete the study on schedule.

Analysis of data was started. Preliminary findings showed positive correlation between skull size and sex, age and geographic location. Male skulls, as expected, were generally larger than female skulls of the same age. Both sexes showed rapid growth during the first 7 years of life. Above 7 years of age the rate of growth was reduced. Geographic location influenced mean skull size. For example, bear skulls from the middle and lower portion of the Alaska Peninsula were larger than those north of Naknek River - Katami National Monument. Also brown bear skulls from the Alaska Peninsula were significantly larger than those from Southeastern Alaska. Presented in Tables 1-8 are examples of programs written for this study. The mean skull size is shown by sex and age of bears killed on the Alaska Peninsula since 1971. Approximately 60 different such tables are under examination and will be used as a basis to determine the relationship of skull size to geographic location.

RECOMMENDATIONS

The study should be extended for one year for data analysis and final report writing.

ACKNOWLEDGEMENTS

Sincere thanks is given to Susan Metcalf for her time and effort in processing 62 brown/grizzly bear skulls.

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Table 1. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

	Male		
Age Classes	Mean Skull Width	Sample Size	Sample Range
1	6 And .42-In.	13	6 And .00-In to 6 And .88-In.
2	7 And .17-In.	68	6 And .19-In to 9 And .00-In.
3	7 And .66-In.	78	6 And .50-In to 9 And .00-In.
4	8 And .19-In.	59	6 And .75-In to 9 And .56-In.
5	8 And .48-In.	38	7 And .25-In to 9 And .63-In.
6	8 And .75-In.	27	7 And .75-In to 9 And .88-In.
7	9 And .29-In.	21	8 And .13-In to 10 And .25-In.
8	9 And .46-In.	12	9 And .00-In to 10 And .13-In.
9	9 And .58-In.	20	8 And .19-In to 10 And .50-In.
10	9 And .43-In.	8	7 and .00-In to 10 And .69-In.
11	10 And .10-In.	5	9 And .75-In to 10 And .38-In.
12	9 And .98-In.	7	9 And .44-In to 10 And .50-In.
13	9 And .46-In.	7	7 And .88-In to 10 And .75-In.
14	10 And .28-In.	4	9 And .63-In to 10 And .94-In.
15	9 And .85-In.	6	9 And .13-In to 10 And .63-In.
16	10 And .05-In.	5	9 And .63-In to 10 And .75-In.
17	10 And .94-In.	5	10 And .25-In to 11 And .50-In.
18	10 And .07-In.	4	9 And .75-In to 10 And .63-In.
19	10 And .07-In.	4	9 And .50-In to 10 And .63-In.
20	10 And .38-In.	2	10 And .25-In to 10 And .50-In.
21	9 And .88-In.	1	9 And .88-In to 9 And .88-In.

Table 2. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

	Female		
Age Classes	Mean Skull Width	Sample Size	Sample Range
1	6 And .47-In.	4	6 And .13-In to 6 And .75-In.
2	6 And .74-In.	38	5 And .69-In to 7 And .75-In.
3	7 And .34-In.	55	5 And .81-In to 9 And .25-In.
4	7 And .52-In.	43	6 And .13-In to 8 And .56-In.
5	7 And .89-In.	26	7 And .13-In to 9 And .00-In.
6	8 And .27-In.	14	7 And .25-In to 9 And .50-In.
7	8 And .25-In.	8	7 And .69-In to 8 And .75-In.
8	8 And .38-In.	15	7 And .50-In to 8 And .75-In.
9	8 And .39-In.	9	7 And .75-In to 9 And .13-In.
10	8 And .81-In.	10	8 And .31-In to 9 And .38-In.
11	8 And .52-In.	7	7 And .81-In to 9 And .00-In.
12	8 And .64-In.	8	8 And .38-In to 9 And .00-In.
13	8 And .68-In.	10	7 And .69-In to 9 And .25-In.
14	8 And .71-In.	7	8 And .25-In to 9 And .25-In.
15	9 And .07-In.	6	8 And .63-In to 10 And .13-In.
16	8 And .68-In.	4	8 And .38-In to 8 And .88-In.
17	8 And .73-In.	5	8 And .38-In to 9 And .25-In.
18	8 And .58-In.	4	8 And .31-In to 8 And .88-In.
19	8 And .75-In.	2	8 And .50-In to 8 And .94-In.
20	9 And .03-In.	2	8 And .50-In to 9 And .56-In.

Table 3. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

Male			
Age Classes	Mean Skull Length	Sample Size	Sample Range
1	12 And .16-In.	13	11 And .00-In to 12 And .94-In.
2	13 And .51-In.	68	11 And .75-In to 15 And .25-In.
3	14 And .49-In.	78	12 And .50-In to 16 And .25-In.
4	15 And .16-In.	59	12 And .75-In to 17 And .25-In.
5	15 And .71-In.	38	13 And .63-In to 17 And .13-In.
6	15 And .97-In.	27	14 And .38-In to 17 And .25-In.
7	16 And .47-In.	21	14 And .00-In to 18 And .00-In.
8	16 And .41-In.	12	15 And .25-In to 17 And .75-In.
9	16 And .56-In.	20	15 And .25-In to 17 And .75-In.
10	16 And .17-In.	8	12 And .75-In to 17 And .38-In.
11	16 And .73-In.	5	16 And .25-In to 17 And .25-In.
12	16 And .42-In.	7	14 And .69-In to 17 And .38-In.
13	16 And .23-In.	7	14 And .13-In to 17 And .75-In.
14	16 And .44-In.	4	15 And .38-In to 18 And .00-In.
15	16 And .69-In.	6	15 And .75-In to 17 And .50-In.
16	16 And .65-In.	5	15 And .75-In to 17 And .63-In.
17	17 And .01-In.	5	15 And .50-In to 18 And .19-In.
18	17 And .07-In.	4	16 And .63-In to 17 And .50-In.
19	16 And .36-In.	4	15 And .94-In to 17 And .00-In.
20	17 And .26-In.	2	16 And .38-In to 18 And .13-In.
21	16 And .00-In.	1	16 And .00-In to 16 And .00-In.

Table 4. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

	Female		
Age Classes	Mean Skull Length	Sample Size	Sample Range
1	12 And .22-In.	4	11 And .69-In to 12 And .50-In.
2	12 And .64-In.	38	10 And .31-In to 14 And .00-In.
3	13 And .56-In.	55	11 And .13-In to 15 And .25-In.
4	14 And .01-In.	43	12 And .75-In to 17 And .25-In.
5	14 And .24-In.	26	12 And .75-In to 15 And .50-In.
6	14 And .35-In.	14	13 And .50-In to 15 And .25-In.
7	14 And .51-In.	8	13 And .88-In to 15 And .25-In.
8	14 And .36-In.	15	13 And .25-In to 15 And .38-In.
9	14 And .48-In.	9	13 And .50-In to 15 And .94-In.
10	14 And .74-In.	10	13 And .63-In to 15 And .44-In.
11	14 And .39-In.	7	14 And .00-In to 14 And .75-In.
12	14 And .72-In.	8	14 And .00-In to 15 and .38-In.
13	14 And .65-In.	10	13 And .81-In to 15 And .50-In.
14	14 And .80-In.	7	14 And .13-In to 15 And .50-In.
15	14 And .84-In.	6	14 And .50-In to 15 And .50-In.
16	14 And .50-In.	4	14 And .25-In to 14 And .75-In.
17	14 And .74-In.	5	14 And .44-In to 15 And .00-In.
18	14 And .25-In.	4	13 And .63-In to 14 And .75-In.
19	14 And .53-In.	2	14 And .31-In to 14 And .75-In.
20	15 And .16-In.	2	15 And .06-In to 15 And .25-In.

Table 5. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

Male			
Age Classes	Mean Skull L + W	Sample Size	Sample Range
1	18 And .11-In.	13	17 And .00-In to 18 And .92-In.
2	20 And .26-In.	68	17 And .50-In to 23 And .25-In.
3	21 And .78-In.	78	18 And .75-In to 24 And .50-In.
4	22 And .91-In.	59	18 And .83-In to 25 And .67-In.
5	23 And .81-In.	38	20 And .50-In to 26 And .38-In.
6	24 And .39-In.	27	22 And .38-In to 26 And .25-In.
7	25 And .48-In.	21	22 And .13-In to 27 And .50-In.
8	25 And .53-In.	12	24 And .17-In to 27 And .75-In.
9	25 And .81-In.	20	24 And .17-In to 27 And .40-In.
10	25 And .31-In.	8	19 And .75-In to 27 And .60-In.
11	26 And .44-In.	5	25 And .50-In to 27 And .38-In.
12	25 And .96-In.	7	23 And .56-In to 27 And .40-In.
13	25 And .36-In.	7	22 And .25-In to 27 And .75-In.
14	26 And .52-In.	4	24 And .50-In to 28 and .94-In.
15	26 And .15-In.	6	24 And .67-In to 27 And .60-In.
16	26 And .21-In.	5	24 And .67-In to 27 And .67-In.
17	27 And .52-In.	5	26 And .11-In to 29 And .22-In.
18	26 And .68-In.	4	25 And .75-In to 27 And .60-In.
19	26 And .26-In.	4	24 And .89-In to 27 And .63-In.
20	27 And .27-In.	2	26 And .33-In to 28 And .20-In.
21	25 And .88-In.	1	25 And .88-In to 25 And .88-In.

Table 6. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

	Female		
Age Classes	Mean Skull L + W	Sample Size	Sample Range
1	18 And .23-In.	4	17 And .50-In to 18 And .60-In.
2	18 And .96-In.	38	15 And .50-In to 21 And .38-In.
3	20 And .53-In.	55	17 And .75-In to 24 And .25-In.
4	21 And .13-In.	43	19 And .09-In to 24 And .50-In.
5	21 And .80-In.	26	19 And .33-In to 24 And .31-In.
6	22 And .27-In.	14	20 And .50-In to 24 And .33-In.
7	22 And .49-In.	8	21 And .69-In to 23 And .50-In.
8	22 And .20-In.	15	20 And .88-In to 23 And .50-In.
9	22 And .37-In.	9	20 And .67-In to 24 And .11-In.
10	23 And .16-In.	10	21 And .42-In to 24 And .42-In.
11	22 And .60-In.	7	21 And .67-In to 23 And .69-In.
12	23 And .07-In.	8	22 And .17-In to 24 And .00-In.
13	22 And .86-In.	10	20 And .75-In to 24 And .33-In.
14	23 And .04-In.	7	22 And .17-In to 24 And .20-In.
15	23 And .50-In.	6	22 And .63-In to 24 And .20-In.
16	22 And .61-In.	4	22 And .33-In to 22 And .75-In.
17	23 And .08-In.	5	22 And .40-In to 24 And .25-In.
18	22 And .31-In.	4	21 And .60-In to 22 And .83-In.
19	22 And .67-In.	2	22 And .44-In to 22 And .90-In.
20	23 And .85-In.	2	23 And .38-In to 24 And .31-In.

Table 7. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

	Male		
Age Classes	Mean Skull Condylobasal	Sample Size	Sample Range
1	11 And .88-In.	13	11 And .00-In to 12 And .50-In.
2	13 And .11-In.	68	11 And .25-In to 17 And .88-In.
3	13 And .81-In.	78	11 And .75-In to 15 And .50-In.
4	14 And .25-In.	59	11 And .81-In to 15 And .94-In.
5	14 And .62-In.	38	12 And .19-In to 15 And .75-In.
6	14 And .92-In.	27	13 And .50-In to 16 And .38-In.
7	14 And .72-In.	21	10 And .38-In to 17 And .00-In.
8	15 And .19-In.	12	14 And .00-In to 16 And .75-In.
9	15 And .10-In.	20	14 And .00-In to 16 And .56-In.
10	14 And .82-In.	8	11 And .88-In to 15 And .88-In.
11	15 And .19-In.	5	14 And .50-In to 15 And .81-In.
12	14 And .92-In.	7	13 And .56-In to 15 And .50-In.
13	14 And .76-In.	7	13 And .06-In to 15 And .50-In.
14	15 And .16-In.	4	14 And .13-In to 16 And .44-In.
15	15 And .31-In.	6	14 And .63-In to 15 And .75-In.
16	15 And .53-In.	5	14 And .69-In to 16 And .50-In.
17	15 And .76-In.	5	13 And .50-In to 16 And .94-In.
18	15 And .58-In.	4	15 And .31-In to 16 And .00-In.
19	15 And .07-In.	4	14 And .50-In to 15 And .88-In.
20	15 And .13-In.	2	14 And .75-In to 15 And .50-In.
21	14 And .50-In.	1	14 And .50-In to 14 And .50-In.

Table 8. Alaska Peninsula Brown Bear Skull Measurements Derived From Sealing Documents 1971 to Date

Age Classes	Female Mean Skull Condylobasal	Sample Size	Sample Range
1	11 And .86-In.	4	11 And .50-In to 12 And .06-In.
2	12 And .12-In.	38	9 And .88-In to 13 And .50-In.
3	12 And .91-In.	55	10 And .88-In to 14 And .38-In.
4	13 And .19-In.	43	12 And .00-In to 14 And .31-In.
5	13 And .30-In.	26	12 And .38-In to 14 And .38-In.
6	13 And .44-In.	14	12 And .38-In to 14 And .50-In.
7	13 And .61-In.	8	12 And .75-In to 14 And .88-In.
8	13 And .36-In.	15	12 And .13-In to 14 And .50 In.
9	13 And .54-In.	9	12 And .63-In to 14 And .75-In.
10	13 And .58-In.	10	12 And .19-In to 14 And .06-In.
11	13 And .46-In.	7	13 And .06-In to 13 And .81-In.
12	13 And .75-In.	8	13 And .13-In to 14 And .50-In.
13	13 And .72-In.	10	13 And .13-In to 14 And .38-In.
14	14 And .00-In.	7	13 And .31-In to 14 And .56-In.
15	13 And .95-In.	6	13 And .44-In to 14 And .38-In.
16	13 And .49-In.	4	13 And .00-In to 13 And .88-In.
17	13 And .76-In.	5	13 And .50-In to 14 And .06-In.
18	13 And .33-In.	4	12 And .50-In to 14 And .00-In.
19	13 And .63-In.	2	13 And .25-In to 14 And .00-In.
20	14 And .00-In.	2	14 And .00-In to 14 And .00-In.