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POPULATION ECOLOGY OF THE KENAI PENINSULA BLACK BEAR

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PROGRESS REPORT (RESEARCH)

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Job Title: Population Ecology of the Kenai Peninsula Black Bear

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(Includes data collected through 31 December 1982)

SUMMARY

The 1st phase of research to compare black bear (*Ursus americanus*) densities in 2 different forest successional stages was begun in 1982. During May and June 1982, 19 black bears were captured, and 17 of these were radio-collared in the Finger Lakes study area on the Kenai Peninsula. An additional 5 bears were radio-collared in the existing long-term study area at the Moose Research Center.

Movements and home ranges were plotted through the denning period in early October. No data analyses were available for this report.

Key words: black bear; Kenai Peninsula, Alaska; population ecology; *Ursus americanus*.

CONTENTS

BACKGROUND

Black bear (Ursus americanus) studies were initiated on the Kenai Peninsula in 1977 (Franzmann and Schwartz 1979; Schwartz and Franzmann 1980, 1981; Schwartz et al. 1982; Schwartz et al. In Press) as part of a comprehensive predator-prey study. Work on bears from 1977-1981 was concentrated in the 1947 burn at the Moose Research Center (MRC). From this work, several hypotheses regarding black bear population density, food abundance, plant succession, black bear predation on moose (Alces alces), and potential habitat manipulation for moose management were developed. These hypotheses are best explained by examination of the major components of the Kenai Peninsula predator-prey system. The components are the following: (1) the vegetation, (2) the prey (moose), and (3) black bears.

Vegetation

The vegetative component of the Kenai Peninsula ecosystem is dynamic and probably the major controlling factor that ultimately determines moose and bear abundance. The Kenai Peninsula has a long history of fire (Viereck and Schandelmeier 1980). Fluctuation in moose numbers relative to fire history have been well documented (Spencer and Chatelain 1953, Peterson 1955, Spencer and Hakala 1964, Bailey 1978, Bailey and Bangs 1981, Bangs and Bailey 1981).

Fire is the primary force which sets back primary and secondary plant succession. The revegetation sequence following fire in the boreal forest has been studied for selected species in Alaska (Zasada 1971, Zasada et al. 1979). An excellent review of these and other works was presented by Viereck and Schandelmeier (1980). Succession in the taiga after fire is complex. It is related to a number of variables, which include preburn vegetation type and age, climate, fire severity, time of burn, parent material, presence and absence of permafrost, and the weather.

The Kenai Peninsula lowlands are a typical Interior forest, containing a mixture of white spruce (Picea glauca), black spruce (Picea mariana), poplar (Populus balsamifera), aspen (Populus tremuloides), and paper birch (Betula papyrifera). On dry upland sites, primarily south-facing slopes, the mature forest vegetation is white spruce, paper birch, aspen, or some combination of these species. The deciduous tree species represent successional stages of revegetation after fire (Fig. 1). The understory associated with these successional stages likewise follows a pattern of regeneration. Shortly after the fire, a lush herb layer is established, with fireweed (Epilobium angustifolium) and bluejoint (Calamagrostis canadensis) most common. Depending on the severity of the fire, shrub species (Salix, Ledum, and Vaccinium) reinvade 6-25 years following the burn. As the overstory component matures, many of the understory species are shaded out, leaving the more shade-tolerant forbs like low (Vaccinium vitis-idaea) and highbush (Viburnum edule) cranberry. Finally, when white spruce forest matures, the major understory species are mosses and lichens.

Moose

Moose evolved to utilize intermediate stages of vegetation succession. High densities of moose are most common where plant communities contain large quantities of available browse. On the Kenai, birch, willow, and aspen are the major browse species. Moose populations tend to peak 15-20 years following a burn (Spencer and Hakala 1964) and decline as the overstory changes to white-black spruce and/or the hardwood species grow out of reach of browsing moose.

Black Bears

Black bears are creatures of the forest (Herrero 1972, 1978) and are reluctant to venture far from trees (Herrero 1972; Schwartz and Franzmann, In Press; Erickson 1965). Changes in black bear density, as they relate to succession, are not documented in Alaska. However, certain generalizations can be made that relate bear densities to habitat.

Lowbush and highbush cranberry and devil's club (Oplopanax horridus) are 3 of the major foods of black bears on the Kenai lowlands (Schwartz and Franzmann 1980, 1981). Lowbush cranberry is a staple food and is consumed in both spring and fall.

Devil's club and highbush cranberry are fall foods. Both species are affected by fire. Lowbush cranberry has abundant brambled underground stems embedded about 2-3 cm in the humus. They are able to survive light fires but are generally killed by moderate-to-heavy fires (Uggla 1958). Lowbush cranberry is therefore eliminated from the understory in all but very light forest fires. Elimination of the lowbush cranberry would probably reduce the carrying capacity of an area for black bears. Likewise old-growth forests, which have a heavy moss layer on the forest floor, do not contain an abundance of lowbush cranberry and likewise have a lower carrying capacity for black bears.

Devil's club and highbush cranberry are generally absent from earlier stages of plant succession. They become more apparent in the later stages of succession when the hardwoods mature. These 2 species are important as fall bear foods but are not consumed at other times of the year. Therefore, old-growth forests can support a large number of black bears in the fall when these foods are abundant (Schwartz and Franzmann 1980, 1981) but cannot carry large numbers of bears on an annual basis.

Although we can only speculate, it appears that early stages of plant succession (6-25 years) have a low carrying capacity for bears due to a lack of abundant food resources. However, at this time, these same areas have a high propensity to support moose. As succession continues (25-50 years), the overstory hardwoods begin to form a canopy, and lowbush cranberry begins to increase in density. The carrying capacity for black bears begins to increase, while the carrying capacity for moose peaks and actually starts to decline (Fig. 1). Once the forest reaches the mature hardwood stage (50-100 years), the carrying capacity for bears is at its highest, while that for moose is low. As the mature hardwood forest changes to a mature spruce-moss stage (100-250 years), the carrying capacity for black bears also declines due to the loss of the food-producing species in the understory. In addition, moose carrying capacity is near zero.

The Problem

If black bear densities are keyed to plant succession following a fire in the manner we have just discussed, then management programs directed at black bears, moose, or vegetation manipulation should be keyed to this succession. Knowing the interrelationships of moose and bear and their habitat, we should be able to more meaningfully establish management programs and priorities regarding these 2 game species. For example, it may be impractical to manage moose in later stages of succession when the habitat is actually more suitable for black bears than moose. This fact has been demonstrated in the 1947 burn where bear densities are high (Schwartz and Franzmann 1980, 1981), bear predation rates on moose are high (Franzmann and Schwartz 1978, 1979; Franzmann et al. 1980) and the moose population is declining (Spraker 1980).

If we know at what stage habitat becomes more suitable for bears than moose, then we will know at what time (i.e., successional stage) habitat manipulation will be necessary to maintain a high population of moose in the area. These studies, in conjunction with the proposed moose calf mortality study, will also enable us to more fully understand the dynamics of the Kenai Peninsula predator-prey system. Moose calf mortality studies conducted in the 1947 burn indicated that 34% of all calf deaths were caused by black bears. This fact has been abused, used out of context, and otherwise used to "point the finger" at black bears as the causative agent responsible for moose population declines in the 1947 burn. If our hypotheses are true, then moose population declines in the 1947 burn are inevitable unless vegetation manipulation is undertaken.

OBJECTIVES

To determine, compare, and contrast the population density, age structure, productivity, and survival of the black bear populations in the Moose Research Center and Swanson River-Finger Lakes study area.

To evaluate seasonal, temporal, and spatial aspects of bear movements as they relate to food abundance within the 2 study areas.

PROCEDURES

Methods used to capture, radio-collar, monitor movements, and estimate bear density will follow Schwartz et al. In Press.

STUDY AREAS

The Moose Research Center study area is located on the Kenai National Wildlife Refuge (KNWR) on the northwestern Kenai Peninsula lowlands (Fig. 2). A detailed description of the area appears in Schwartz et al. In Press.

The 2nd study area, also on the KNWR, is located on the northcentral Kenai Peninsula lowlands in the 1969 burn (Fig. 2). A large fire in 1969 burned 35,200 ha of upland forest and bog. The dominant vegetation is birch, aspen, and willow with a grass understory. Because the 1969 burn was a much "hotter" fire than the 1947 burn, the area was almost completely burned and few islands of unburned timber remain.

RESULTS AND DISCUSSION

Capture and Handling

Tagging operations were initiated on 12 May 1982 and continued through 10 July 1982. During this period, 19 bears were tagged in the Finger Lakes area (Table 1) of which 17 were radio-collared. Five new bears were also captured in the MRC study area during routine trapping; 2 additional bears were marked during winter in their den (Table 2). Trapping operations were initiated on 2 June 1982 and continued through 10 July 1982. During this period, we captured 15 bears in 674 trap-days (45 days/bear caught). Trapping success was down from 1981 (29 days/bear caught) and from 1980 (18 days/bear caught) (Schwartz and Franzmann, In Press).

Of the 15 bears captured, 11 were different individuals, with 3 bears being captured more than 1 time. Of the 11 different individuals, 4 were unmarked bears and the remaining 7 had been marked previously.

The 1982 trapping season reflects a continued decline in catch success when compared to previous years. This decline was associated with a marked increase in "misses" at most trap sites. It appears that the resident bear population within the MRC study area is learning to steal bait from traps without getting caught. On 2 occasions, bears were observed entering traps and exiting with the bait while the trap remained unsprung. On numerous occasions, traps were moved from the area where they were originally set. They normally were lying on their side or damaged, with the bait missing. We made an attempt to cable traps to the ground in a effort to eliminate the possibility of bears pushing traps around until the bait fell out. On 2 traps, we drove 4 1.2 m fence posts into the ground to a depth of 1 m at the front and rear of the traps on both sides. To these posts, we attached 3/16-inch cable to anchor the trap to the ground. These traps were also vandalized by bears as the fence posts had been torn out of the ground. We plan to modify existing traps as per Kohn's (1982) suggestions to alleviate this problem.

Morphometric, Blood, and Hair Data

No attempt was made to assess the morphometric data collected during this report period (Tables 3, 4); data were recorded on a computer file for future analyses. Blood chemistry, protein, electro protein, and hematological data were not complete for this report.

Current Status, Movements, and Home Range

Currently, we are monitoring 12 black bears (Table 5) in the Finger Lakes study area and 21 bears (Table 6) in the MRC study area. Movement and home range data have been entered onto computer input forms, but analyses are not complete for this report.

Recommendations

Data collection should continue for a minimum of 2 more years. Information presented by Schwartz et al. (1983) indicated that a minimum of 2 years is required to mark all individuals within a study area. Tagging operations in 1983 should enable us to capture any individuals missed last year in the Finger Lakes study area. Once this objective is complete, density estimates and comparison of basic biological parameters can be initiated between the 2 study areas.

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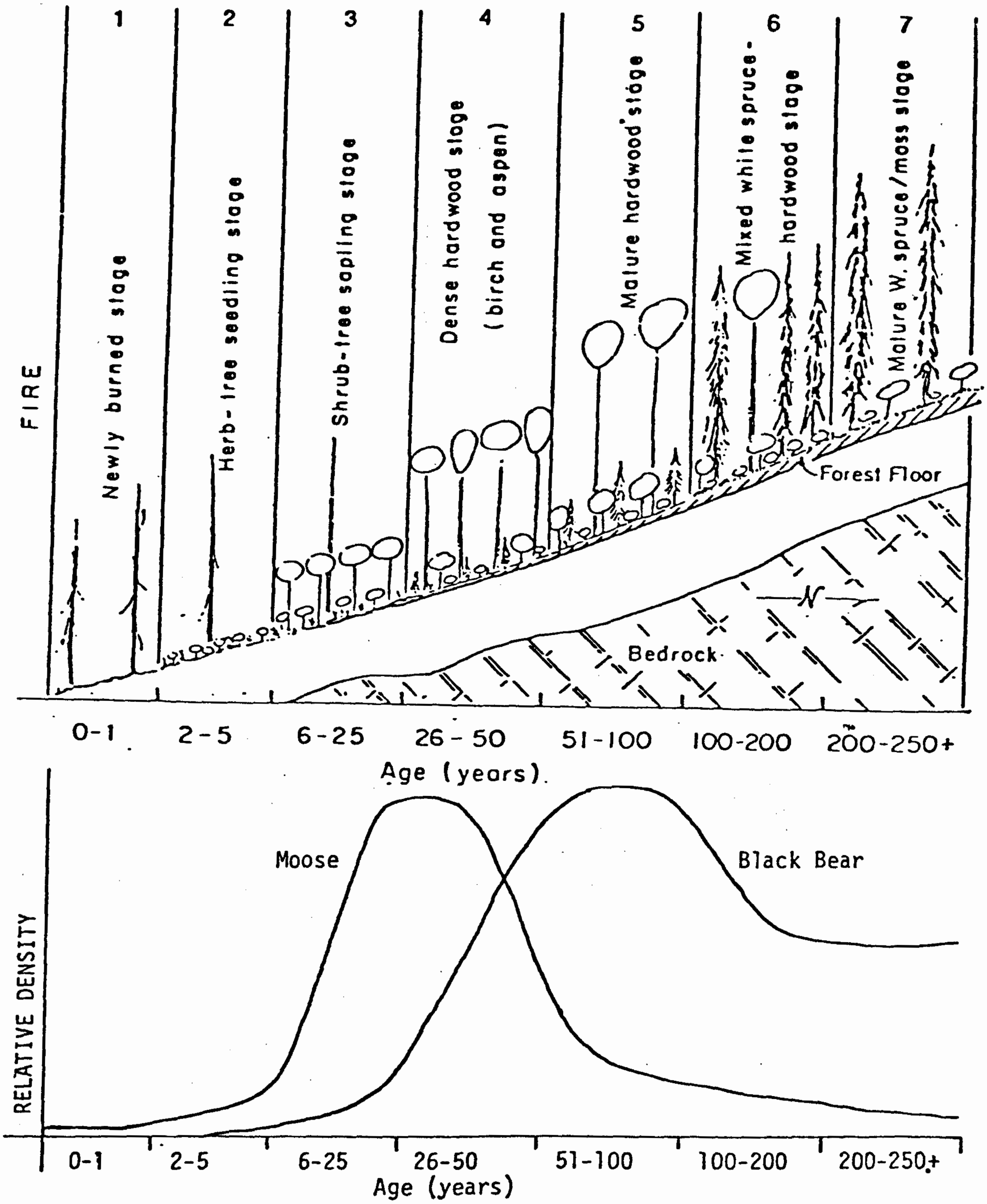

Fig. 1. Theoretical changes in moose and black bear populations as they relate to plant succession. See Viereck and Schandelmeier 1980 for the top graph.

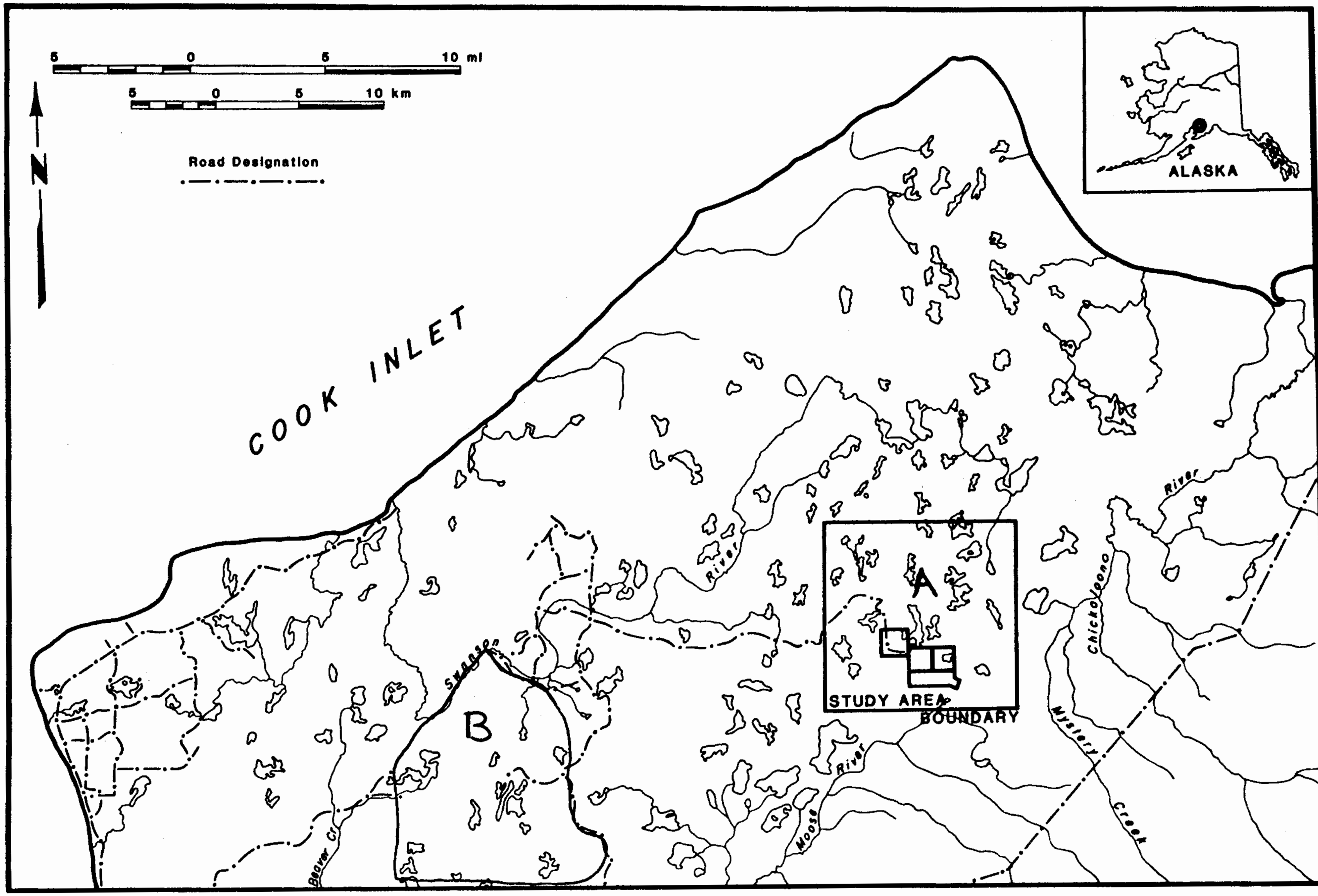

Fig. 2. Moose Research Center Study Area (A), Finger Lakes Study Area (B), Kenai Peninusla, Alaska.

Table 1. Capture and marking information for 19 newly captured black bears within the Finger Lakes study area, Kenai Peninsula, Alaska, 1982.

Bear No.	Sex	Capture Date	Capture Location	Transmitter frequency (Mhz)	Ear Tag No. Right	Ear Tag No. Left
C1	M	5/12/82	Cisca Lake	148.740	430	431
C2	F	5/12/82	Finger Lakes	148.830	439	438
C3	M	5/12/82	Finger Lakes	148.710	448	447
C4	F	5/12/82	Finger Lakes	149.591	449	450
C5	M	5/12/82	Finger Lakes	149.341	440	441
C6	F	5/14/82	S. Beaver Lake	148.760	342	341
C7	M	5/14/82	S. Beaver Lake	149.330	340	339
C8	F	5/14/82	S. Beaver Lake	148.920	432	433
C9	F	5/18/82	Doroshin Lake	CAPTURE MORTALITY		
C10	F	5/18/82	S. Finger Lake	165.100	331	332
C11	M	5/18/82	Quake Lake	164.991	334	333
C12	F	5/18/82	Beaver Lake	164.230	343	344
C13	F	5/18/82	E. Beaver Lake	149.550	350	349
C14	F	5/24/82	S. Finger Lakes	164.111	335	336
C15	M	5/24/82	Finger Lakes	None	337	338
C16	M	5/28/82	NE Beaver Lake	149.520	346	348
C17	F	5/29/82	Mink Creek Lake	164.391	361	362
C18	F	6/4/82	Beaver Lake	148.997	716	711
C19	F	6/11/82	W. Mink Creek Lake	149.010	1	8

Table 2. Capture and marking information for 5 newly captured black bears within the Moose Research Center study area, Kenai Peninsula, Alaska, 1982.

Bear No.	Sex	Capture Date	Capture Location	Transmitter frequency (Mhz)	Ear Tag No. Right	Ear Tag No. Left
B48	F	5/11/82	E. Franzmann Lake	164.932	428	429
B49[a]	M	6/8/82	Trap 25	None	02	08
B50[a]	F	6/8/82	Trap 25	None	--	10
B51	F	6/10/82	Trap 31	164.312	369	370
B52	M	6/12/82	Trap 9	None	12	11
B53[b]	M	12/21/82	E. Franzmann Lake	165.137	363	364
B54[b]	F	12/21/82	E. Franzmann Lake	164.481	345	381

[a] Cubs of B2.
[b] Cubs of B12.

Table 3. Morphometric data[a] for 17 black bears captured in the Moose Research Center study area, Kenai Peninsula, Alaska, 1982.

Bear No.	Wt. (kg)	Age (yr)	Total length	Circum. Chest	Circum. Neck	Hnd Ft Lgth	Hnd Ft Wdth	Skull Lgth	Skull Wdth	Left canine[b] Upper L	Upper A-P	Upper L-L	Lower L	Lower A-P	Lower L-L
B1	52.2	8	124	81.0	51.0	17.5	8.5	25.5	14.4	2.9	1.8	1.2	2.3	1.4	1.1
B2	54.4	7	160	80.3	44.5	16.0	8.7	--	15.7	--	--	--	--	--	--
B2A	65.8	7	--	--	--	--	--	27.1	15.6	--	--	--	--	--	--
B3	86.2	7	182.7	92.2	50.3	18.7	10.5	29.2	19.0	3.0	1.9	1.2	2.6	1.7	1.2
B12	79.4	7	--	--	--	--	--	--	--	--	--	--	--	--	--
B15	47.6	6	140.0	70.0	44.0	16.6	10.0	25.0	14.6	2.4	1.7	1.1	2.4	1.4	1.0
B15A	49.9	6	156.0	72.0	40.5	16.0	8.5	27.0	14.9	2.3	1.5	0.9	2.2	1.6	0.9
B15B	61.2	6	159.0	87.3	46.6	12.0	8.4	27.0	16.3	2.4	1.4	1.0	2.2	1.6	0.9
B25	113.4	7	182.0	114.0	74.5	19.3	12.0	29.4	18.2	3.0	2.1	1.4	3.0	1.9	1.7
B27	81.6	5	172.0	91.0	55.5	19.0	10.0	28.2	17.9	2.8	1.9	1.1	2.7	1.8	1.0
B38	38.6	3	151.0	74.5	39.5	16.0	9.0	24.8	14.0	2.3	1.2	0.9	2.3	1.0	0.9
B41	38.6	2	135.5	70.2	39.5	16.2	9.0	23.1	13.6	2.6	1.6	0.9	2.6	1.5	0.9
B42	29.5	2	124.0	63.0	34.5	13.7	7.8	22.2	13.0	2.4	1.2	0.8	2.4	1.4	1.0
B42A	34.0	2	134.6	70.0	37.8	14.8	8.0	22.3	13.2	2.4	1.4	1.0	2.3	1.4	1.0
B48	57.6	5	157.0	80.5	51.0	17.0	8.9	23.7	16.0	2.4	1.4	1.1	2.0	1.5	1.0
B49	18.1	1	--	--	--	--	--	--	--	--	--	--	--	--	--
B50	--	<1	--	--	--	--	--	--	--	--	--	--	--	--	--
B50	20.4	1	--	--	--	--	--	18.8	10.6	--	--	--	--	--	--
B51	48.5	5	161.5	74.5	45.5	16.0	8.5	26.0	14.7	2.4	1.5	1.0	2.2	1.5	0.9
B52	78.0	5	167.0	94.3	53.0	19.5	9.6	28.2	17.1	2.6	1.6	1.0	2.4	1.8	0.9
B53	22.7	1	--	--	--	--	--	18.0	10.8	--	--	--	--	--	--
B54	13.6	1	--	--	--	--	--	--	--	--	--	--	--	--	--

[a] Measurements are in centimeters.
[b] L = Length; A-P = Anterior-Posterior; L-L = Labial-Lingual.

Table 4. Morphometric data[a] for 19 black bears captured in the Finger Lakes study area, Kenai Peninsula, Alaska, 1982.

Bear No.	Wt. (kg)	Age (yr)	Total length	Circum. Chest	Circum. Neck	Hnd Ft Lgth	Hnd Ft Wdth	Skull Lgth	Skull Wdth	Left canine[b] Upper L	Left canine[b] Upper A-P	Left canine[b] Upper L-L	Left canine[b] Lower L	Left canine[b] Lower A-P	Left canine[b] Lower L-L
C1	--	10	205.0	136.0	82.0	19.0	12.5	30.0	21.3	3.2	1.6	1.3	2.6	1.7	1.2
C2	52.2	9	164.0	83.0	49.5	17.0	9.2	26.5	15.2	2.6	1.5	1.1	2.3	1.5	1.0
C3	158.8	11	179.0	142.0	80.5	22.5	12.3	29.5	21.4	3.7	2.0	1.3	3.5	2.0	1.3
C4	46.7	3	137.0	74.0	18.2	18.0	9.1	21.5	14.0	2.6	1.3	0.9	2.2	1.6	1.0
C5	42.2	2	136.0	75.0	44.5	17.0	9.3	22.0	14.3	2.5	1.5	1.0	2.6	1.6	1.1
C6	65.8	9	118.0	85.0	50.0	18.1	9.2	26.6	16.0	2.8	1.8	1.2	2.6	1.0	1.7
C7	22.7	2	106.0	66.0	--	13.8	8.2	19.9	12.0	1.5	0.9	0.8	1.7	1.0	0.8
C8	61.2	5	133.0	--	50.5	16.8	8.9	24.0	15.5	2.8	1.8	1.2	2.7	1.8	1.4
C9	86.2	14	164.0	105.0	58.7	16.5	10.3	24.9	16.7	2.7	1.7	1.1	1.3	1.6	1.1
C10	56.7	7	134.0	85.5	52.0	15.8	10.0	24.5	14.8	2.5	1.6	0.9	2.2	1.5	0.9
C11	32.7	2	131.0	66.0	41.5	17.0	9.5	22.6	13.0	2.2	1.6	1.0	2.2	1.2	1.0
C12	58.1	4	149.0	83.0	49.0	17.6	9.9	25.2	15.2	2.9	1.8	1.3	2.5	1.8	1.2
C13	33.6	2	115.5	76.5	45.0	16.3	8.5	21.3	12.7	2.6	1.2	1.0	2.5	1.3	1.0
C14	57.8	5	148.0	73.0	44.5	17.0	10.0	24.3	15.5	2.7	1.4	1.0	2.2	1.6	0.9
C15	43.1	3	126.5	66.0	40.0	16.0	9.5	23.7	13.3	2.4	1.2	1.0	2.4	1.4	1.0
C16	86.2	5	168.0	116.0	62.0	21.5	11.1	27.5	18.5	2.9	1.7	1.0	2.8	1.9	1.2
C17	70.3	6	146.0	89.0	49.0	17.3	10.1	24.4	15.5	2.6	1.5	1.0	2.4	1.5	1.0
C18	63.5	6	--	--	--	--	--	--	--	--	--	--	--	--	--
C19	68.0	5	149.5	87.9	--	16.5	8.9	26.7	15.6	2.9	--	--	3.3	--	--

[a] Measurements are in centimeters.
[b] L = Length; A-P = Anterior-Posterior; L-L = Labial-Lingual.

Table 5. Aerial tracking data for 1982 and current status of all black bears captured at the Finger Lakes study area, Kenai Peninsula, Alaska, 1982.

Bear No.	Sex	Times located, 1982	Last observed	Current status
C1	M	18	15 Oct 1982	Active
C2	F	20	15 Oct 1982	Active
C3	M	23	25 Oct 1982	Active
C4	F	1	12 May 1982	Dead 14 May 1982
C5	M	3	5 Aug 1982	Dead 13 Aug 1982
C6	F	22	15 Oct 1982	Active
C7	M	15	15 Oct 1982	Active
C8	F	16	27 Aug 1982	Dead 27 Aug 1982
C9	F	1	18 May 1982	Dead 18 May 1982
C10	F	23	25 Oct 1982	Active
C11	M	7	3 Nov 1982	Active
C12	F	16	15 Oct 1982	Active
C13	M	5	22 Jun 1982	Status unknown
C14	F	17	15 Oct 1982	Active
C15	M	1	24 May 1982	Status unknown
C16	M	17	25 Oct 1982	Active
C17	F	19	25 Oct 1982	Active
C18	F	16	15 Oct 1982	Active
C19	F	16	15 Oct 1982	Active
B39	M	15	1 Oct 1982	Active
B40	M	--	12 Jun 1980	Dead 21 May 1981
B41	M	19	25 Oct 1982	Active
B42	F	25	15 Oct 1982	Active
B43	M	--	13 May 1981	Dead 13 May 1981
B44	F	--	13 May 1981	Dead 14 Jul 1981
B45	M	--	11 Jun 1981	Dead 11 Jun 1981
B46	F	--	13 May 1981	Dead 11 Jun 1981
B47	M	5	11 May 1982	Status unknown
B48	F	10	25 Oct 1982	Active
B49	M	2	21 Dec 1982	Active
B50	F	2	21 Dec 1982	Active
B51	F	16	15 Oct 1982	Active
B52	M	1	30 Jun 1982	Dead 1 Jul 1982
B53	M	1	21 Dec 1982	Active
B54	F	1	21 Dec 1982	Active

Table 6. Aerial tracking data for 1982 and current status of all black bears captured at the Moose Research Center study area, Kenai Peninsula, Alaska, 1978-1982.

Bear No.	Sex	Times located, 1982	Last observed	Current status
B1	F	26	15 Oct 1982	Active
B2	F	24	15 Oct 1982	Active
B3	M	1	17 Jun 1982	Status unknown
B4	M	--	2 May 1978	Dead 2 May 1978
B5	M	--	3 Oct 1978	Status unknown
B6	M	--	24 Jun 1978	Dead 1 Sep 1978
B7	F	--	9 May 1978	Dead 9 May 1978
B8	M	--	25 Apr 1979	Dead 25 Apr 1979
B9	M	--	7 May 1981	Status unknown
B10	M	18	15 Oct 1982	Active
B11	M	23	15 Oct 1982	Active
B12	F	24	15 Oct 1982	Active
B13	F	--	26 Aug 1980	Dead 4 Sep 1980
B14	F	24	15 Oct 1982	Active
B15	F	26	15 Oct 1982	Active
B16	M	23	25 Oct 1982	Active
B17	M	--	8 Nov 1978	Dead 14 Sep 1981
B18	F	--	16 Oct 1980	Status unknown
B19	M	--	1 Aug 1979	Dead 18 Sep 1981
B20	F	13	14 Jul 1982	Status unknown
B21	F	--	26 Aug 1980	Status unknown
B22	M	--	20 Jun 1980	Status unknown
B23	F	--	14 Mar 1980	Status unknown
B24	F	25	15 Oct 1982	Active
B25	M	10	17 Sep 1982	Status unknown
B26	M	--	26 Jun 1979	Dead 24 May 1980
B27	M	14	17 Aug 1982	Status unknown
B28	M	--	20 Jun 1979	Dead 18 May 1980
B29	M	--	6 Jun 1980	Dead 25 Sep 1980
B30	F	--	8 Jun 1980	Dead 3 Sep 1980
B31	F	--	18 May 1981	Dead 20 May 1981
B32	M	--	11 Jun 1980	Dead 21 Jun 1980
B33	M	--	25 Oct 1982	Active
B34	M	12	17 Aug 1982	Dead 28 Aug 1982
B35	F	26	15 Oct 1982	Active
B36	F	--	28 May 1980	Status unknown
B37	M	--	17 Sep 1980	Status unknown
B38	F	23	15 Oct 1982	Active
B39	M	15	1 Oct 1982	Active
B40	M	--	12 Jun 1980	Dead 21 May 1981
B41	M	19	25 Oct 1982	Active
B42	F	25	15 Oct 1982	Active
B43	M	--	13 May 1981	Dead 13 May 1981
B44	F	--	13 May 1981	Dead 14 Jul 1981
B45	M	--	11 Jun 1981	Dead 11 Jun 1981

Table 6. Continued.

Bear No.	Sex	Times located, 1982	Last observed	Current status
B46	F	--	13 May 1981	Dead 11 Jun 1981
B47	M	5	11 May 1982	Status unknown
B48	F	10	25 Oct 1982	Active
B49	M	2	21 Dec 1982	Active
B50	F	2	21 Dec 1982	Active
B51	F	16	15 Oct 1982	Active
B52	M	1	30 Jun 1982	Dead 1 Jul 1982
B53	M	1	21 Dec 1982	Active
B54	F	1	21 Dec 1982	Active