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POPULATION ECOLOGY OF THE KENAI PENINSULA BLACK BEAR

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PROGRESS REPORT (RESEARCH)

State: Alaska

Cooperator: Ted Spraker, ADF&G; and the U. S. Fish and Wildlife Service

Project No.: W-22-2 Project Title: Big Game Investigations

Job No.: 17.5R Job Title: Population Ecology of the Kenai Peninsula Black Bear

Period Covered: 1 July 1982 through 30 June 1983
(Includes data collected through 31 December 1983)

SUMMARY

Capture information as well as morphometric and blood physiology data are presented for black bears (Ursus americanus) captured during the 1983 field season in both the Moose Research Center (MRC) and Finger Lakes study areas on the Kenai Peninsula. Preliminary estimates of density indicated there were fewer female bears (7.06/100 km^2) in the Finger Lakes study area than the MRC study area (11.23/100 km^2), while total bear estimates were quite similar (18.9 vs. 19.0/100 km^2). Reasons for these differences are discussed. Den dimensions from 25 winter dens are also listed.

Key words: black bear, Kenai Peninsula, 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, 1983a) 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 original 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 were presented in Schwartz et al. (1983b).

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, age, radio-collar, monitor movements, and estimate bear density were described by Schwartz et al. (1983a).

STUDY AREAS

The Moose Research Center study area is located on the Kenai National Wildlife Refuge (KNWR) on the northwestern Kenai Peninsula lowlands (Fig. 1). A detailed description of the area appears in Schwartz et al. (1983a).

Also on the KNWR, the 2nd study area (Finger Lakes) is located on the northcentral Kenai Peninsula lowlands in the 1969 burn (Fig. 1). 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. A detailed description can be found in Smith (1984).

RESULTS AND DISCUSSION

Capture and Handling

Twelve yearlings were radio-collared and ear-tagged in February and March 1983 while in their dens; 4 were from the MRC area (Table 1) and 8 were from the Finger Lakes area (Table 2). Sixteen additional bears were captured via helicopter in the Finger Lakes area between 12 May and 27 May 1983 (Table 2). Of these 16 bears, 13 were fitted with radio collars and ear tags, 2 were ear-tagged only, and one died of capture complications.

Trapping operations were initiated at the MRC study area on 31 May 1983 and continued through 1 July 1983. During this period, we captured 41 bears during 811 trap-days. Trapping success was 19.8 days per bear caught and much higher than the 45 days per bear caught in 1982. This increased trap success was a direct result of modifying the barrel traps as per suggestions of Kohn (1982).

Of these 41 bear captures, 21 were different individuals of which 10 were new captures (Table 1) and 11 were previously marked. It is interesting to note that of the 10 newly captured individuals, 8 were males and 2 were females; 7 of the 8 males were adults (>3 yrs); and 1 captured bear was a cub. This was the largest number of adult males captured at the MRC study area in a single year of trapping and confirms our earlier suspicions that our old trap design was inadequate to catch males efficiently. Lengthening the traps and altering the trigger mechanism proved effective for capturing adult males.

Morphometric, Blood, and Hair Data

No attempt was made to assess the morphometric (Tables 3, 4) or blood data (Tables 5, 6, 7, 8) collected during this report period. Data have been entered on computer input forms and will be analyzed for the final report.

Current Status, Movements, and Home Range

We are currently monitoring 22 black bears in the MRC study area. B10's radio collar failed sometime in late winter of 1982-83; B60, B62, and B66 all shed their collars during summer 1983 (Table 9). Two bears from the MRC area also died. B41 was harvested on 12 October 1983 by a hunter, and B51 was killed and eaten by adult male B25 between 13 and 16 May 1983. B51 was last observed alive on 13 May 1983. She had at least 2 cubs-of-the-year and was sighted less than 100 m from her den in the top of a mature aspen tree feeding on buds. On 16 May 1983, B25 was observed feeding on the carcass of B51. Close examination of the carcass reveals that most of the muscle tissue and all of the soft internal tissues had been consumed. All that remained were the head, radio collar, hide, major bones (spinal column and long bones), feet, and claws. Long bones from 3 of the 4 legs were present, intact and unbroken. The bones of 1 front leg were missing. Although we did not witness the actual predation, we strongly suspect B25 killed B51. The kill was located on the shore of Lure Lake some 200 m west of the aspen grove where she was last sighted. The vegetation between the grove and the lake was very dense spruce-paper birch regrowth. We examined the aspen grove for signs of a kill/struggle, but found none. We also examined the trees to ascertain if B51 had possibly fallen from the trees and sustained injuries/death. Several small branches (diameter <40 mm) were broken, but there was no sign or indication that the bear had fallen from the tree. In addition, there was no sign of the cubs, and no carcasses were located.

We are currently monitoring 20 black bears (Table 10) in the 1969 burn. Three (C11, C29, C33) bears were harvested by hunters; 1 bear (C43) died during capture; and 1 bear (C38) probably died from capture-related complications. Bear C38 was tagged on 23 May 1983 and fitted with a radio collar. The bear recovered from the drug and moved 300 m east by the following day, but was found dead on 31 May 1983 very close to where it had been the day following capture. Examination of the carcass was difficult because it was decomposed and full of maggots, indicating the animal had been dead for several days. Although we had no proof, we suspect our tagging was probably related to this mortality. This bear was judged to be in fair physical condition at the time of tagging. It weight 15.2 kg and was determined to be a yearling based on tooth development. We experienced similar capture mortality with yearlings (Schwartz et al. 1983a) of this small size during 1981.

Home range estimates were calculated for individuals in both study areas following methods described by Schwartz (1983a). No attempt was made to analyze these data (Tables 11, 12) for this report. Data will be summarized in the final report. Density estimates for the MRC study area for 1982 (Table 13) and 1983 (Table 14) were similar to those for past years (Schwartz et al. 1983a). In 1983, cub density (which reflects production) was the 2nd lowest since estimates began. Most females produced cubs in 1982 and were accompanied by yearlings in 1983.

Density

Procedures for describing density estimates were detailed in Schwartz et al. (1983a:17-20) for the MRC area (Fig. 2). Density estimates were calculated for 1982 and 1983 (Tables 13, 14, and 15) and the Finger Lakes area (Fig. 3) and reflect a somewhat lower density of females (7.06/100 km^2 vs. 11.23/100 km^2 bears/2.59 km^2 for Finger Lakes and MRC, respectively) in the Finger Lakes study area. Total bear density (18.9 vs. 19.0/100 km^2 bears for Finger Lakes and MRC, respectively) were the same. Estimates for the females are probably the most accurate comparison between the 2 areas because (1) females have smaller home ranges and are easier to capture in the study area; (2) some males in the MRC area were not radio-collared or lost their radio collars, which precluded home range estimates; and (3) males in the 1969 burn/Finger Lakes area were probably marked at a higher rate because of visibility in the burn area and method of marking (helicopter vs. trapping). Although the confidence limits for the female estimate of density overlap between areas, no density estimate for the MRC area has ever gone below 0.219 bears/2.59 km^2 since 1979 when estimates were began. It is difficult with only 1 year of data to prove or disapprove our original hypothesis; however, based on these estimates, it appears there are fewer bears in the 1969 burn.

Denning Ecology

Dimensions of 25 black bear dens were recorded during this report period; 14 dens were from the MRC study area (Table 16) and 11 dens were from the Finger Lakes area (Table 17). Data on slope, aspect, and vegetation type plus geometric data have been entered on a computer input file and will be analyzed for the final report.

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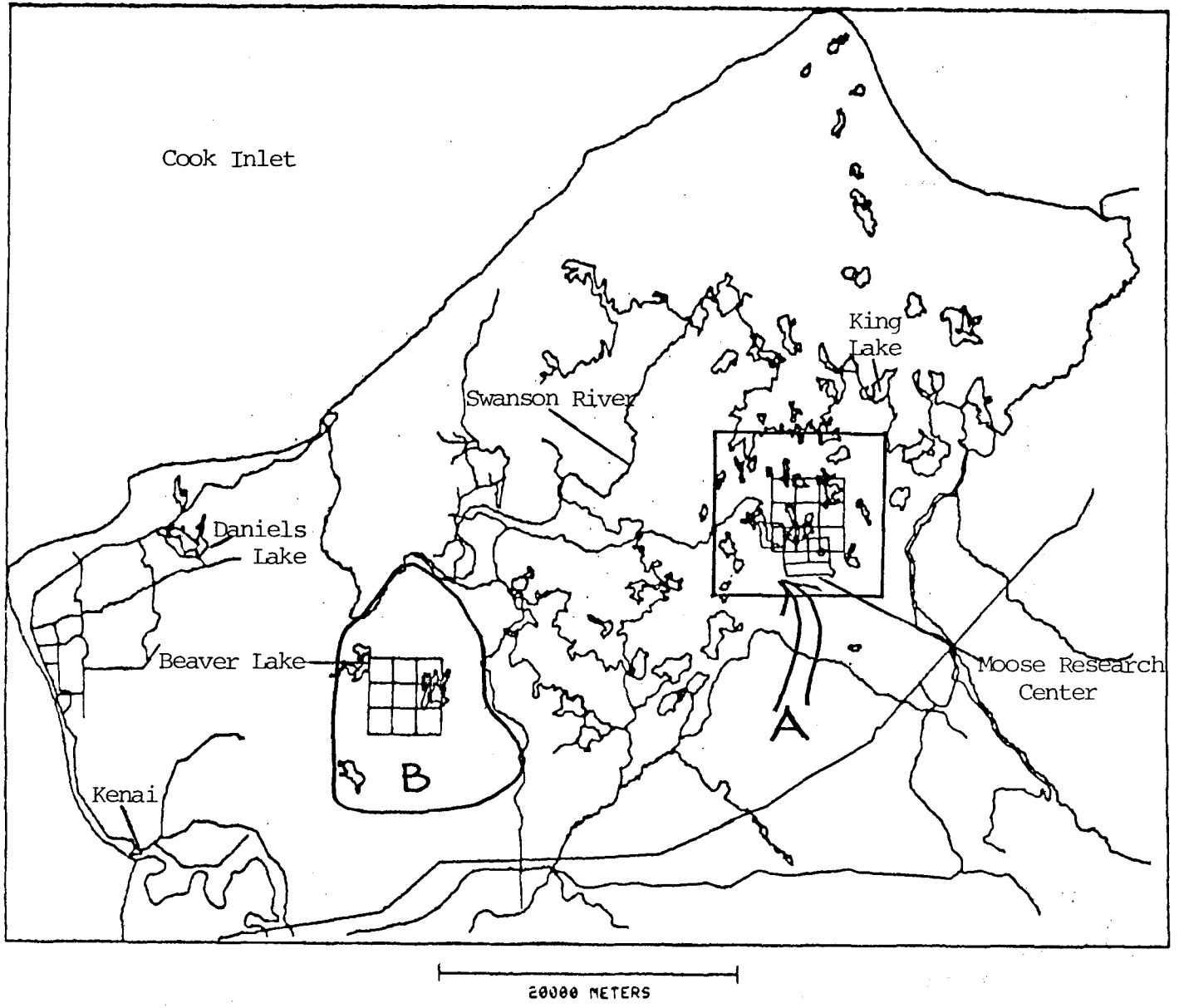

Fig. 1. Moose Research Center study area (A), Finger Lakes study area (B), Kenai Peninsula. Blocks within each study area represent the 9, 1-mi^2 areas used to estimate density.

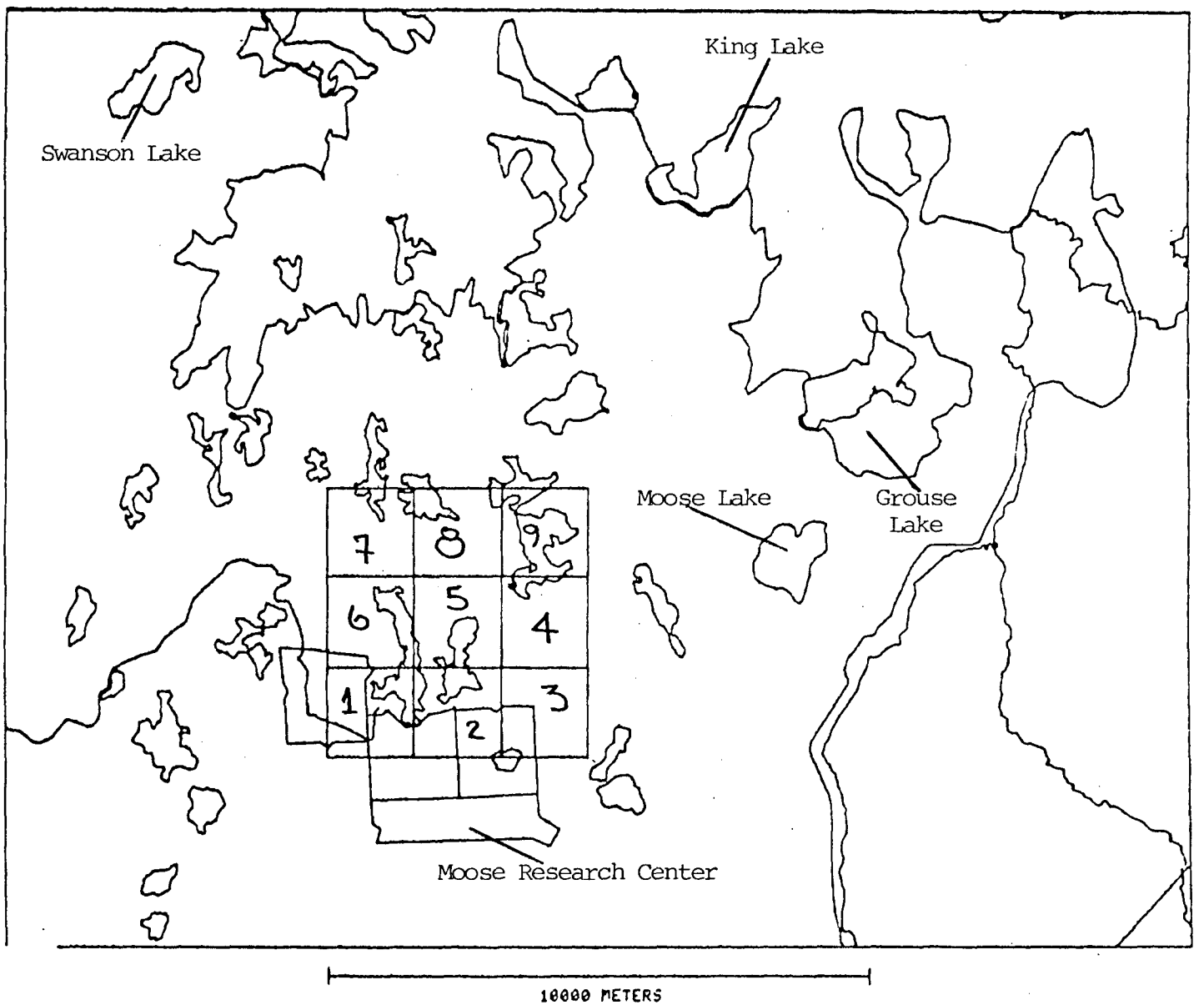

Fig. 2. Location of 9, 1-mi^2 subunits used to estimate black bear density in the Moose Research Center study area. Numbers represent subunit identification labels.

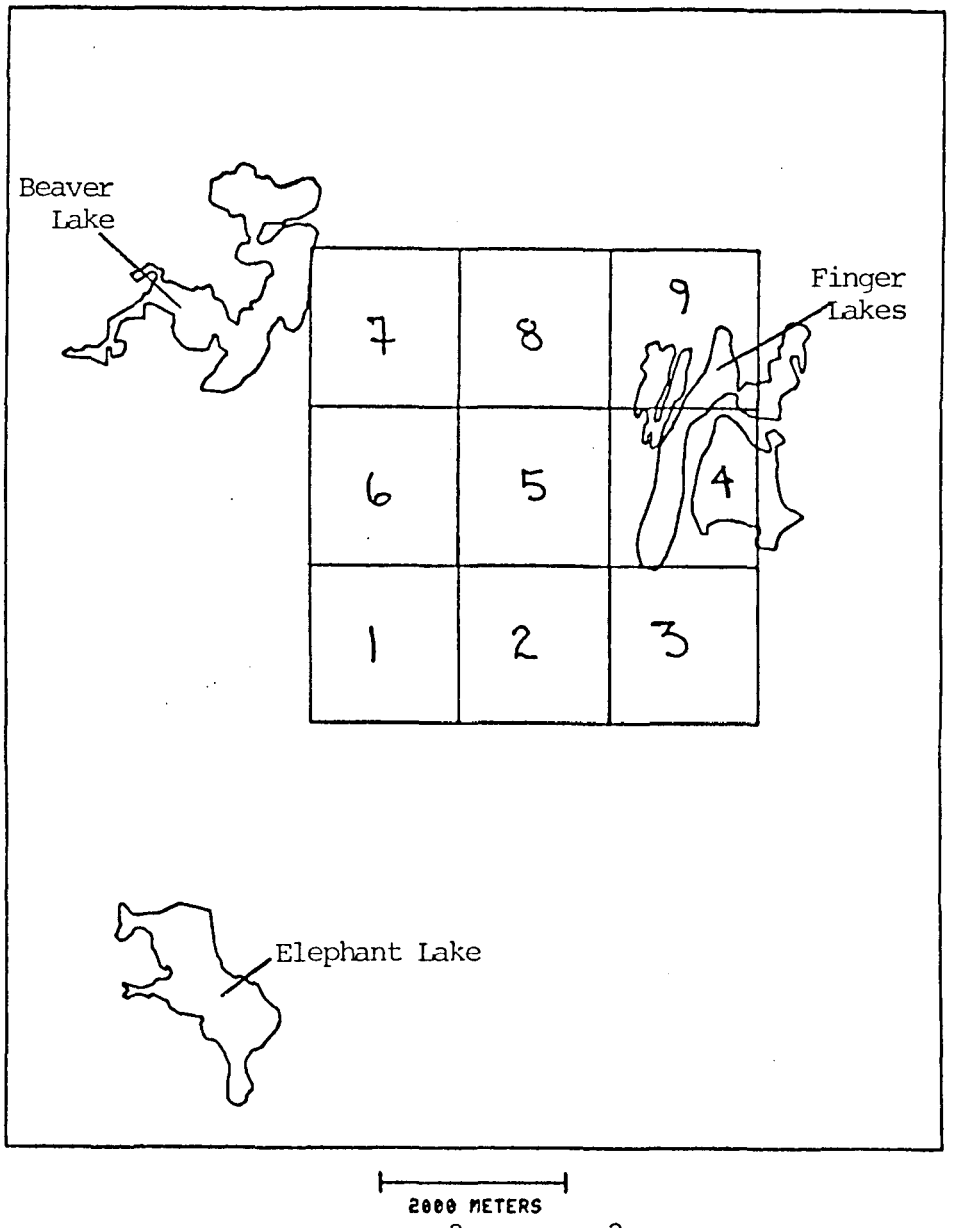

Fig. 3. Location of 9, 1-mi^2 (2.59 km^2) subunits used to estimate black bear density at the Finger Lakes study area. Numbers represent subunit identification labels.

Table 1. Capture and marking information for 14 newly captured black bears within the Moose Research Center study area, Kenai Peninsula, 1983.

Bear No.	Sex	Capture		Ear tags	
		Date	Location	Right	Left
B55[a]	F	2/3/83	Den N Del Frate Lake	380	379
B56[b]	F	2/2/83	Den W of Snowshoe Lake	366	365
B57[a]	F	2/3/83	Den N Del Frate Lake	377	378
B58[a]	F	2/3/83	Den N Del Frate Lake	371	372
B59	F	6/1/83	Trap No. 8	373	367
B60	M	6/2/83	Trap No. 29	375	374
B61	M	6/3/83	Trap No. 11	17	19
B62	M	6/4/83	Trap No. 18	1	2
B63	M	6/6/83	Trap No. 28	14	15
B64[c]	M	6/6/83	Trap No. 5	--	--
B65	M	6/16/83	Trap No. 2	12	16
B66	F	6/16/83	Trap No. 19	--	--
B67	M	6/17/83	Trap No. 13	7	3
B68	M	6/28/83	Trap No. 18	8	6

[a] 1982 cub of B35.
[b] 1982 cub of B24.
[c] 1983 cub of B15.

Table 2. Capture and marking information for 24 newly captured black bears within the Finger Lakes study area, Kenai Peninsula, 1983.

Bear No.	Sex	Capture		Ear tag No.	
		Date	Location	Right	Left
C20[a]	F	2/16/83	Forest Lake den	517	516
C21[a]	M	2/16/83	Forest Lake den	521	514
C22[b]	F	2/28/83	SE Beaver Lake den	513	518
C23[c]	M	3/1/83	Donkey Lake den	525	510
C24[c]	F	3/1/83	Donkey Lake den	527	519
C25[d]	F	3/1/83	Beaver Lake den	529	540
C26[d]	F	3/1/83	Beaver Lake den	509	508
C27[d]	F	3/1/83	Beaver Lake den	512	515
C28	M	5/12/83	S Beaver Lake	554	553
C29	F	5/12/83	S Beaver Lake	560	559
C30	M	5/16/83	E Beaver Lake	555	556
C31	F	5/15/83	S Beaver Lake	563	562
C32	F	5/16/83	E Mink Creek Lake	524	537
C33	M	5/16/83	E Mink Creek Lake	520	576
C34	F	5/16/83	E Mink Creek Lake	--	--
C35	M	5/16/83	E Mink Creek Lake	557	558
C36	M	5/23/83	Donkey Lake	49	48
C37	M	5/23/83	W Donkey Lake	47	46
C38	M	5/23/83	Sunken Island Lake	572	571
C39	M	5/27/83	SW Finger Lakes	507	506
C40	F	5/27/83	SW Finger Lakes	523	522
C41	F	5/28/83	NE Mink Creek Lake	552	502
C42	M	5/28/83	NW Mink Creek Lake	504	505
C43[e]	F	5/27/83			

[a] 1982 cub of C17.
[b] 1982 cub of C6.
[c] 1983 cub of C10.
[d] 1982 cub of C18.
[e] Capture mortality.

Table 3. Morphometric data (cm) for 21 black bears captured in the Moose Research Center study area, Kenai Peninsula, 1983.

Bear No.	Wt (kg)	Age (yr)	Total length	Circum.		Hnd Ft		Skull	
				Chest	Neck	Lgth	Wdth	Lgth	Wdth
B9	350[a]	9	--	--	--	18.5	11.0	29.1	20.5
B9A	290	9	180.3	111.2	63.4	19.6	11.4	29.0	20.5
B11	225	13	178.5	102.0	58.5	18.8	10.8	28.5	18.2
B24	155	13-14	--	--	--	--	--	25.7	15.9
B25	280	10	184.3	103.0	61.4	20.5	11.3	30.8	19.8
B27	225	6	163.3	96.1	56.8	18.6	10.8	29.2	18.8
B35	--	10	--	--	--	--	--	--	--
B42	97	3	136.0	75.8	41.2	16.2	8.2	24.0	13.8
B55	27	1	--	--	--	--	--	17.0	9.9
B56	40	1	--	--	--	--	--	17.3	10.0
B57	13	1	--	--	--	--	--	18.4	10.6
B58	14	1	--	--	--	--	--	17.7	10.1
B59	39	3	135.5	68.0	41.5	15.7	13.5	24.1	13.3
B60	220	14	180.0	101.6	60.9	22.2	11.5	31.5	20.4
B61	117	3	159.0	80.0	46.8	16.8	9.7	25.4	14.7
B62	300[a]	16+	191.0	111.0	72.2	19.0	11.0	32.0	21.1
B63	125	4	148.0	93.0	48.0	18.0	9.2	25.2	15.4
B64	--	0.3	--	--	--	--	--	--	--
B65	145	3	153.5	77.0	46.4	17.8	10.0	25.9	15.0
B66	145	15	164.3	84.8	51.1	17.8	9.3	--	--
B67	140	3-4	--	--	--	18.4	9.5	--	15.2

[a] Estimated weight.

Table 4. Morphometric data (cm) for 27 black bears captured in the Finger Lakes study area, Kenai Peninsula, 1983.

Bear No.	Wt (kg)	Age (yr)	Total length	Circum.		Hnd Ft		Skull	
				Chest	Neck	Lgth	Wdth	Lgth	Wdth
C12	140	5	159.0	85.8	45.0	--	--	25.5	15.8
C17	170	7	--	--	--	--	--	25.5	15.7
C17A	160	7	--	--	--	--	--	--	--
C20	50	1	--	--	--	--	--	20.2	11.2
C21	55	1	--	--	--	--	--	18.2	11.5
C22	50	1	--	--	--	--	--	17.7	10.8
C23	57	1	--	--	--	--	--	19.2	11.5
C24	--	1	--	--	--	--	--	19.5	10.4
C25	32	1	--	--	--	--	--	16.3	10.1
C26	31	1	--	--	--	--	--	17.0	9.6
C27	30	1	--	--	--	--	--	17.8	10.3
C28	310[a]	11-12	195.0	121.0	65.0	21.5	11.0	--	19.4
C29	138	15-16	151.0	87.0	47.5	17.0	8.5	23.8	15.5
C30	170	3	176.0	93.5	51.7	19.0	10.8	27.0	16.4
C31	145	16-18	168.0	91.0	47.5	18.3	9.2	25.6	16.5
C32	137	12	163.0	87.5	45.4	17.2	8.7	--	16.5
C33	48	1	112.0	61.0	--	--	--	18.6	11.5
C34	38	1	106.0	49.8	--	--	--	18.2	10.3
C35	52	1	107.0	58.0	--	--	--	19.3	11.5
C36	105[b]	2	143.0	87.0	41.0	17.0	8.5	23.5	14.3
C37	33	1	108.0	47.0	26.5	--	--	18.0	10.5
C38	33.5	1	96.5	48.0	29.5	13.0	6.5	17.0	10.0
C39	170	7	156.0	89.0	48.0	14.0	10.5	26.6	15.7
C40	155	4	147.0	--	47.0	--	9.5	--	--
C41	128	3	123.5	85.0	46.0	17.7	9.8	21.8	14.5
C42	300[a]	10-11	168.0	126.0	71.0	19.5	10.0	25.5	18.5
C43[c]									

[a] Estimated weight.
[b] Wet weight.
[c] Capture mortality.

Table 5. Black bear blood chemical data collected on the Kenai Peninsula, 1-28 June 1983.

Bear No.	Date	Age (yr)	Sex	Glucose mg/dl	Cholesterol mg/dl	Triglyceride mg/dl	LDH U/L	SGOT U/L	SGPT U/L	Alkaline phosphatase mg/dl	P mg/dl	Ca mg/dl	Ca/P ratio	Na mEq/L	K mEq/L	Cl mEq/L	CO_2 mEq/L	BUN mg/dl	Creat. mg/dl	Bilirubin mg/dl	Uric acid mg/dl
B9[a]	6/5/83	9	M	95	313	236	609	113	33	47	3.7	9.2	2.42	138	4	13	21	12	1.1	0.1	1.3
B9	6/21/83	9	M	74	234	264	738	238	61	63	4.5	9.3	2.07	140	4	103	21	16	1.3	0.2	1.1
B11	6/20/83	13	M	64	228	305	837	218	54	87	4.2	8.4	2.00	138	4	105	19	11	0.8	0.1	1.6
B25	6/21/83	10	M	85	209	278	684	129	28	22	5.3	8.8	1.66	140	4	107	18	16	1.3	0.1	1.7
B27	6/16/83	6	M	73	284	280	762	147	53	47	4.5	9.2	2.04	139	4	101	21	19	0.9	0.1	1.6
B42	6/3/83	3	F	82	293	334	929	157	42	47	5.7	9.2	1.61	141	5	104	20	23	0.7	0.1	1.9
B59	6/1/83	3	F	80	231	231	669	87	28	66	6.8	8.7	1.28	140	5	105	17	16	0.8	0.1	1.7
B60	6/2/83	14	M	74	337	543	981	150	25	10	4.8	8.4	1.75	138	4	104	17	6	0.9	0.1	1.6
B61	6/3/83	3	M	86	292	323	986	200	56	39	4.1	8.8	2.15	140	4	105	22	12	0.8	0.1	1.5
B62	6/4/83	16+	M	102	193	164	679	106	34	33	3.8	8.7	2.29	139	4	104	21	9	1.1	0.0	1.2
B63	6/6/83	4	M	77	378	425	--	--	--	47	5.5	6.4	1.16	147	5	100	19	13	1.0	0.1	2.0
B65	6/16/83	3	M	255	270	368	948	130	29	59	5.4	9.3	1.72	138	4	101	20	29	0.6	0.1	2.0
B66	6/16/83	15	F	99	214	237	853	161	46	61	2.9	7.8	2.69	137	4	103	19	9	0.8	0.1	1.7
B67	6/17/83	3-4	M	85	272	395	614	142	47	68	4.6	9.1	1.98	141	4	104	20	16	0.8	0.1	1.9
B68	6/28/83	--	M	76	260	482	883	121	35	39	6.2	9.2	1.48	135	5	96	20	22	0.7	0.2	2.4

[a] Bear No. B9 was captured and sampled twice.

Table 6. Black bear blood protein, electrophoresis, and hematologic data collected on the Kenai Peninsula, 1-28 June 1983.

Bear No.	Date	Age (yr)	Sex	Total protein g/dl	Albumin g/dl	Globulin g/dl	Alpha 1 g/dl	Alpha 2 g/dl	Beta g/dl	Gamma g/dl	A/G ratio	Hb g/dl	PCV %
B9[a]	6/5/83	9	M	8.3	3.6	4.7	0.8	0.7	1.3	2.0	0.8	18.0	47
B9	6/21/83	9	M	8.8	4.1	4.7	0.6	0.6	1.3	2.2	0.9	18.0	47
B11	6/20/83	13	M	8.2	3.2	5.0	0.6	0.7	1.1	2.5	0.6	15.0	47
B25	6/21/83	10	M	6.6	3.0	3.6	0.7	0.7	1.2	0.9	0.9	09.0	27
B27	6/16/83	6	M	7.3	3.7	3.6	1.2	0.3	1.0	1.2	1.0	17.0	44
B42	6/3/83	3	F	6.6	3.2	3.4	1.0	0.5	0.9	1.1	0.9	17.0	44
B59	6/1/83	3	F	6.1	3.5	2.6	0.7	0.5	0.8	0.7	1.3	17.0	47
B60	6/2/83	14	M	7.4	2.7	4.7	0.6	1.2	1.3	1.6	0.6	12.0	33
B61	6/3/83	3	M	6.4	3.2	3.2	1.0	0.4	0.9	0.9	1.0	13.0	35
B62	6/4/83	16+	M	7.4	3.3	4.1	0.6	0.6	1.4	1.6	0.8	14.0	40
B63	6/6/83	4	M	8.4	3.5	4.9	1.2	0.9	2.1	0.7	0.7	16.0	44
B65	6/16/83	3	M	7.2	3.2	4.0	0.8	0.6	1.1	1.5	0.8	15.0	43
B66	6/16/83	15	F	7.2	3.3	4.2	1.2	0.3	1.1	1.6	0.7	14.0	37
B67	6/17/83	3-4	F	6.9	3.5	3.4	0.2	0.7	1.6	0.9	1.0	16.5	45
B68	6/28/83	--	M	7.6	3.4	4.2	1.0	0.5	1.2	1.5	0.8	--	--

[a] Bear No. B9 was captured and sampled twice.

Table 7. Black bear blood chemical data collected on the Kenai Peninsula, 12-28 May 1983.

Bear No.	Date	Age (yr)	Sex	Glucose mg/dl	Cholesterol mg/dl	Triglyceride mg/dl	LDH U/L	SGOT U/L	SGPT U/L	Alkaline phosphotase mg/dl	P mg/dl	Ca mg/dl	Ca/P ratio	Na mEq/L	K mEq/L	Cl mEq/L	CO_2 mEq/L	BUN mg/dl	Creat. mg/dl	Bilirubin mg/dl	Uric acid mg/dl
C12	5/23/83	5	F	81	240	80	594	92	17	17	4.6	9.0	1.96	136	5	103	14	7	1.5	0.2	1.8
C17	5/28/83	7	F	121	229	129	617	157	43	37	4.5	9.3	2.07	137	4	103	18	4	1.2	0.0	1.6
C28	5/12/83	11-12	M	87	239	164	616	103	26	16	3.2	9.3	2.91	137	5	107	14	10	1.5	0.1	1.7
C29	5/12/83	15-16	F	93	193	153	716	172	30	22	4.9	9.6	1.96	138	4	103	18	10	1.4	0.0	7.2
C30	5/16/83	3	M	52	226	169	588	132	14	49	6.1	9.3	1.52	139	5	98	18	28	1.2	0.1	2.7
C31	5/16/83	16-18	F	93	103	135	538	85	13	11	4.5	8.9	1.98	137	4	103	20	11	0.9	0.1	1.3
C33	5/15/83	1	M	68	263	204	759	96	17	71	8.0	9.2	1.15	136	4	99	19	2	0.9	0.1	2.3
C36	5/23/83	2	M	121	247	300	922	157	40	71	7.9	10.4	1.32	137	4	101	9	2	0.9	0.1	1.5
C37	5/23/83	1	M	74	272	253	--	--	181	33	6.0	8.2	1.37	140	5	103	20	7	1.0	0.4	1.5
C40	5/27/83	4	F	100	218	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
C42	5/27/83	10-11	M	93	240	197	749	130	32	46	4.0	8.2	1.95	140	4	104	17	26	1.1	0.1	1.6
C41	5/28/83	3	F	84	218	201	892	250	48	22	3.8	8.9	2.34	137	5	104	14	6	0.9	0.0	2.0

Table 8. Black bear blood protein, electrophoresis, and hematologic data collected on the Kenai Peninsula, 12-28 May 1983.

Bear No.	Date	Age (yr)	Sex	Total protein g/dl	Albumin g/dl	Globulin g/dl	Alpha 1 g/dl	Alpha 2 g/dl	Beta g/dl	Gamma g/dl	A/G ratio	Hb g/dl	PCV %
C12	5/23/83	5	F	6.4	3.3	3.1	0.3	0.6	0.4	1.8	1.1	12.8	--
C17	5/28/83	7	F	7.5	3.7	3.8	0.7	0.5	1.4	1.2	1.0	14.8	44
C28	5/12/83	11-12	M	7.1	3.1	4.0	0.4	0.8	1.4	1.4	0.8	15.8	48
C29	5/12/83	15-16	F	7.2	3.5	9.9	0.9	0.5	1.1	1.1	1.0	14.4	43
C30	5/16/83	3	M	6.8	3.5	3.3	0.3	0.7	0.4	1.9	1.0	13.6	43
C31	5/16/83	16-18	F	5.5	2.4	3.1	0.9	0.5	0.8	1.0	0.8	11.4	33
C33	5/16/83	1	M	5.2	2.8	2.4	0.3	0.8	0.2	1.1	1.2	12.3	37
C36	5/23/83	2	M	6.7	3.7	3.0	0.3	0.7	0.5	1.5	1.3	16.8	--
C37	5/23/83	1	M	7.4	3.3	4.1	1.0	0.7	1.0	1.4	0.8	--	--
C40	5/27/83	4	F	--	--	--	--	--	--	--	--	17.2	52
C42	5/27/83	10-11	M	7.6	4.0	3.6	0.8	0.6	1.2	1.0	1.1	14.0	42
C41	5/28/83	3	F	7.1	3.2	3.9	0.9	0.5	1.1	1.4	0.8	13.7	42

Table 9. Aerial tracking data for 1983 and current status of all black bears captured at the Moose Research Center study area, Kenai Peninsula, 1978-1983.

Bear No.	Sex	Times located	Last observed	Current status
B1	F	25	26 Oct 1983	Active
B2	F	25	26 Oct 1983	Active
B3	M	--	17 Jun 1983	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 1978
B9	M	11	26 Oct 1983	Active
B10	M	--	Feb 1983	Status unknown (radio collar failed)
B11	M	25	26 Oct 1983	Active
B12	F	25	26 Oct 1983	Active
B13	F	--	26 Aug 1980	Dead 4 Sep 1980
B14	F	25	26 Oct 1983	Active
B15	F	25	26 Oct 1983	Active
B16	M	25	26 Oct 1983	Active
B17	F	--	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 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	26 Oct 1983	Active
B25	M	19	26 Oct 1983	Active
B26	M	--	26 Jun 1979	Dead May 1980
B27	M	13	26 Oct 1983	Active
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	Status unknown
B34	M	--	17 Aug 1982	Dead 28 Aug 1982
B35	F	25	26 Oct 1983	Active
B36	F	--	28 May 1980	Status unknown
B37	M	--	17 Sep 1980	Status unknown
B38	F	25	26 Oct 1983	Active
B39	M	--	1 Oct 1982	Status unknown
B40	M	--	12 Jun 1980	Dead 21 May 1981
B41	M	7	29 Aug 1983	Dead 12 Oct 1983 (Hunter kill)
B42	F	24	26 Oct 1983	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 9. Continued.

Bear No.	Sex	Times located	Last observed	Current status
B46	F	--	13 May 1981	Dead 11 Jun 1981
B47	M	--	11 May 1982	Status unknown
B48	F	19	26 Oct 1983	Active
B49	M	22	26 Oct 1983	Active
B50	F	25	26 Oct 1983	Active
B51	F	6	16 May 1983	Dead 16 May 1983 (black bear predation)
B52	M	--	30 Jun 1982	Dead 1 Jul 1982
B53	M	27	11 Nov 1983	Active
B54	F	27	11 Nov 1983	Active
B55	F	15	20 Jul 1983	Status unknown
B56	F	25	26 Oct 1983	Active
B57	F	11	16 Jun 1983	Status unknown
B58	F	27	11 Nov 1983	Active
B59	F	16	26 Oct 1983	Active
B60	M	9	17 Aug 1983	Status unknown (shed collar)
B61	M	--	3 Jun 1983	Status unknown
B62	M	8	4 Aug 1983	Status unknown (shed collar)
B63	M	--	6 Jun 1983	Status unknown
B64	M	--	6 Jun 1983	Status unknown
B65	M	--	16 Jun 1983	Status unknown
B66	F	4	6 Aug 1983	Status unknown (shed collar)
B67	M	--	17 Jun 1983	Status unknown
B68	M	--	28 Jun 1983	Status unknown

Table 10. Aerial tracking data for 1983 and current status of all black bears captured at the Finger Lakes study area, Kenai Peninsula, 1978-1983.

Bear No.	Sex	Times located, 1983	Last observed	Current status
C1	M	25	26 Oct 1982	Active
C2	F	27	26 Oct 1983	Active
C3	M	21	20 Oct 1983	Active
C4	F	0	12 May 1982	Dead 14 May 1982
C5	M	0	5 Aug 1982	Dead 13 Aug 1982
C6	F	26	26 Oct 1983	Active
C7	M	0	15 Oct 1982	Status unknown
C8	F	0	27 Aug 1982	Dead 27 Aug 1982
C9	F	0	18 May 1982	Dead 18 May 1982
C10	F	27	26 Oct 1983	Active
C11	M	5	6 May 1983	Dead 15 Sep 1983 (hunter harvest)
C12	F	28	3 Nov 1983	Active
C13	M	0	22 Jun 1982	Status unknown
C14	F	28	11 Nov 1983	Active
C15	M	0	24 May 1982	Status unknown
C16	M	7	10 May 1983	Status unknown
C17	F	28	26 Oct 1983	Active
C18	F	26	26 Oct 1093	Active
C19	F	27	3 Nov 1983	Active
C20	F	16	22 Jul 1983	Status unknown
C21	M	27	11 Nov 1983	Active
C22	F	22	4 Oct 1983	Status unknown
C23	M	18	4 Aug 1983	Status unknown
C24	F	17	29 Jul 1983	Status unknown
C25	F	24	26 Oct 1983	Active
C26	F	27	3 Nov 1983	Active
C27	F	10	7 Jun 1983	Status unknown
C28	M	21	26 Oct 1983	Active
C29	F	14	4 Aug 1983	Dead 12 Aug 1983 (hunter harvest)
C30	M	4	31 May 1983	Status unknown
C31	F	21	26 Oct 1983	Active
C32	F	21	26 Oct 1983	Active
C33	M	15	26 Aug 1983	Dead 26 Aug 1983 (hunter kill)
C34	F	21	26 Oct 1983	Active
C35	M	17	26 Oct 1983	Active
C36	M	0	23 May 1983	Status unknown
C37	M	0	23 May 1983	Status unknown
C38	F	2	31 May 1983	Dead 31 May 1983 (capture mortality)
C39	M	18	26 Oct 1983	Active
C40	F	19	26 Oct 1983	Active
C41	F	10	29 Jul 1983	Status unknown
C42	M	14	12 Sep 1983	Status unknown
C43	F	0	27 May 1983	Dead 27 May 1983 (capture mortality)

Table 11. Home range area (km^2) for black bears in the Moose Research Center study area, Kenai Peninsula, 1978-83.

Bear No.	Sex	Year					
		1978	1979	1980	1981	1982	1983
B1	F	14	28	--	--	17	13
B2	F	19	4	15	22	7	21
B3	M	191	--	--	--	--	--
B5	M	340	--	--	--	--	--
B6	M	101	--	--	--	--	--
B8	M	78	--	--	--	--	--
B9	M	--	88	40	--	--	--
B10	M	170	297	114	115	147	--
B11	M	--	--	165	64	342	291
B12	F	31	11	25	11	8	17
B13	F	18	21	33	--	--	--
B14	F	26	35	11	18	22	8
B15	F	--	31	14	27	28	25
B16	M	69	87	95	56	69	81
B17	M	179	--	--	--	--	--
B18	F	37	10	--	--	--	--
B19	M	224	219	--	--	--	--
B20	F	--	45	42	26	--	--
B21	F	--	30	--	--	--	--
B23	F	--	77	--	--	--	--
B24	F	--	23	20	15	33	34
B25	M	--	170	118	120	41	100
B27	M	--	--	--	83	124	115
B29	M	--	--	11	--	--	--
B30	F	--	12	21	--	--	--
B31	F	--	15	18	--	--	--
B35	F	--	--	--	13	15	24
B37	M	--	--	6	--	--	--
B38	F	--	--	8	5	16	24
B39	M	--	--	10	--	155	--
B41	M	--	--	--	20	321	127
B42	F	--	--	--	20	23	25

Table 11. Continued.

Bear No.	Sex	Year					
		1978	1979	1980	1981	1982	1983
B48	F	--	--	--	--	16	12
B49	M	--	--	--	--	--	4
B50	F	--	--	--	--	--	10
B51	F	--	--	--	--	19	12
B53	M	--	--	--	--	--	26
B54	M	--	--	--	--	--	10
B55	F	--	--	--	--	--	11
B56	F	--	--	--	--	--	17
B57	F	--	--	--	--	--	6
B58	F	--	--	--	--	--	16
B59	F	--	--	--	--	--	5

Table 12. Home range area (km^2) for black bears in the Finger Lakes study area, Kenai Peninsula, 1982-1983.

Bear No.	Sex	Year 1982	Year 1983
C1	M	159	335
C2	F	35	12
C3	M	240	178
C6	F	11	23
C8	F	11	--
C10	F	38	35
C12	F	8	5
C14	F	16	28
C16	M	29	--
C17	F	13	27
C18	F	8	15
C19	F	19	18
C20	F	--	14
C21	M	--	239
C22	F	--	104
C23	M	--	24
C24	F	--	24
C25	F	--	18
C26	F	--	31
C28	M	--	560
C29	F	--	19
C31	F	--	10
C32	F	--	22
C33	M	--	15
C34	F	--	49
C35	M	--	172
C40	F	--	19
C41	F	--	7
C42	M	--	93

Table 13. Density estimates for black bears in the Moose Research Center study area, Kenai Peninsula, 1982.[a]

Bear No.	Sex	Subunit[b] 1	2	3	4	5	6	7	8	9	Mean ± SD
B2	F	0.054	0.256	0.313	--	--	--	--	--	--	--
B2[c]	F	0.054	0.256	0.313	--	--	--	--	--	--	--
B2[c]	M	0.054	0.256	0.313	--	--	--	--	--	--	--
B14	F	--	--	0.068	0.116	0.021	--	--	0.080	0.058	--
B15	F	0.031	--	--	--	--	0.033	0.036	--	--	--
B35[d]	F	--	--	--	--	--	--	0.002	0.070	0.006	--
B35[d]	F	--	--	--	--	--	--	0.002	0.070	0.006	--
B35[d]	F	--	--	--	--	--	--	0.002	0.070	0.006	--
B35[d]	F	--	--	--	--	--	--	0.002	0.070	0.006	--
B38	F	0.157	0.155	0.088	--	0.003	0.088	--	--	--	--
B42	F	0.014	--	--	--	0.001	0.084	0.103	0.006	--	--
All females		0.256	0.411	0.469	0.116	0.025	0.205	0.141	0.226	0.064	0.213 ± 0.149
All cubs		0.108	0.506	0.626	--	--	--	0.006	0.210	0.018	0.164 ± 0.240
Females and cubs		0.364	0.917	1.095	0.116	0.025	0.205	0.147	0.436	0.082	--
B11	M	--	--	--	--	--	--	0.002	0.002	0.003	--
B16	M	--	--	--	--	--	0.002	0.036	0.011	--	--
B25	M	--	--	--	--	--	--	0.018	0.022	0.024	
B39	M	0.002	0.005	--	--	0.014	--	--	0.015	0.007	--
B41	M	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	--
Males		0.010	0.013	0.008	0.008	0.008	0.010	0.064	0.058	0.042	0.024 ± 0.023
All bears		0.374	0.930	1.103	0.124	0.023	0.215	0.211	0.494	0.124	0.400 ± 0.380

[a] See Schwartz et al. 1983a:17-20 for the method of density calculation. Density represents bears per 2.59 km^2 (1 mi^2).

[b] Subunit numbers, representing specific areas for research purposes, are listed in Fig. 2 and are different than Subunits of Game Management Units.

[c] B2 cub.

[d] B35 cub.

Table 14. Density estimates for black bears in the Moose Research Center study area, Kenai Peninsula, 1983.[a]

Bear No.	Sex	Subunit[b] 1	2	3	4	5	6	7	8	9	Mean ± SD
B2	F	0.071	0.122	0.106	0.019	0.068	0.014	--	--	--	--
B12	F	0.096	0.066	0.002	--	--	0.008	--	--	--	--
B14	F	--	--	0.094	0.160	0.024	--	--	--	--	--
B14[c]		--	--	0.094	0.160	0.024	--	--	--	--	--
B14[c]		--	--	0.094	0.160	0.024	--	--	--	--	--
B15		--	--	--	--	--	0.046	0.141	--	--	--
B15[d]	M	--	--	--	--	--	0.046	0.141	--	--	--
B24	F	--	--	--	0.004	--	--	--	0.024	0.075	--
B35	F	--	--	--	--	0.005	--	0.033	0.099	0.023	--
B38	F	0.108	0.100	0.034	--	0.012	0.073	--	--	--	--
B42	F	--	--	--	--	--	0.037	0.068	--	--	--
B50	F	0.010	0.249	0.216	0.164	0.191	0.014	--	--	--	--
B54	F	--	0.012	0.020	--	--	--	--	--	--	--
B55	F	--	--	--	--	--	--	--	0.013	--	--
All females		0.285	0.549	0.472	0.347	0.300	0.192	0.242	0.136	0.098	0.291 ± 0.148
All cubs		0.0	0.0	0.188	0.320	0.048	0.046	0.141	0.0	0.0	0.083 ± 0.112
Females and cubs		0.285	0.549	0.660	0.348	0.238	0.383	0.136	0.098	--	--
B25	M	0.001	0.015	0.025	0.026	0.026	0.022	0.026	0.026	0.026	--
B49	M	0.012	0.045	0.246	0.079	0.058	--	--	--	--	--
B53	M	--	--	0.006	--	--	--	--	--	--	--
All males		0.013	0.467	0.277	0.105	0.084	0.022	0.026	0.026	0.026	0.116 ± 0.156
All bears		0.298	1.016	0.937	0.772	0.432	0.260	0.409	0.162	0.124	0.490 ± 0.335

[a] See Schwartz et al. 1983a:17-20 for the method of density calculation. Density represents bears per 2.59 km^2 (1 mi^2).

[b] Subunit numbers, representing specific areas for research purposes, are listed in Fig. 2 and are different than Subunits of Game Management Units.

[c] B14 cub.

[d] B15 cub.

Table 15. Density estimates for black bears in the Finger Lakes study area, Kenai Peninsula, 1983.[a]

Bear No.	Sex	Subunit[b] 1	2	3	4	5	6	7	8	9	Mean ± SD
C2	F	--	--	0.097	0.062	--	--	--	--	0.007	--
C2[c]		--	--	0.097	0.062	--	--	--	--	0.007	--
C2[c]		--	--	0.097	0.062	--	--	--	--	0.007	--
C2[c]		--	--	0.097	0.062	--	--	--	--	0.007	--
C6	F	0.052	--	--	--	0.012	0.106	0.111	0.039	--	--
C10	F	0.003	0.054	0.073	0.048	0.002	--	--	--	0.005	--
C12	F	--	--	--	0.006	0.099	--	0.098	0.424	0.003	--
C12[d]		--	--	--	0.006	0.099	--	0.098	0.424	0.003	--
C12[d]		--	--	--	0.006	0.099	--	0.098	0.424	0.003	--
C17	F	--	--	--	--	--	--	--	--	0.004	--
C22	F	--	--	--	--	--	0.007	0.015	--	--	--
C24	F	0.004	0.046	0.087	--	--	--	--	--	--	--
C40	F	--	0.032	0.014	0.132	0.052	--	--	0.009	0.130	--
C41	F	--	--	--	--	--	--	--	--	0.058	--
All females		0.059	0.132	0.271	0.248	0.165	0.113	0.224	0.472	0.207	0.183 ± 0.131
All cubs		0.0	0.0	0.291	0.198	0.198	0.0	0.196	0.848	0.027	0.195 ± 0.269
Females and cubs		0.059	0.132	0.562	0.446	0.363	0.113	0.420	1.320	0.234	
C1	M	0.008	0.006	--	0.001	0.007	0.007	0.007	0.007	0.007	--
C3	M	--	--	0.001	0.012	0.002	--	0.002	0.013	0.014	--
C20	M	--	--	--	--	--	--	0.151	0.108	0.066	--
C23	M	0.004	0.045	0.086	--	--	--	--	--	--	--
C28	M	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005	--
C33	M	--	--	--	--	--	--	0.004	--	--	--
C34	M	0.015	0.006	--	--	0.006	0.015	0.015	0.004	--	--
C39	M	--	0.007	--	0.024	0.026	--	--	0.008	0.063	--
All males		0.032	0.069	0.092	0.042	0.046	0.027	0.184	0.145	0.155	0.090 ± 0.060
All bears		0.091	0.277	0.654	0.448	0.409	0.140	0.604	1.465	0.389	0.492 ± 0.411

[a] See Schwartz et al. 1983a:17-20 for the method of density calculation. Density represents bears per 2.59 km^2 (1 mi^2).

[b] Subunit numbers, representing specific areas for research purposes, are listed in Fig. 2 and are different than Subunits of Game Management Units.

[c] C2 cub.

[d] C12 cub.

Table 16. Dimensions (cm) of 14 black bear dens in the Moose Research Center study area, Kenai Peninsula, 1983.

Bear No.	Entrance			Tunnel length	Chamber			Approx. volume (m^3)
	Width	Height	Area (m^2)		Length	Width	Height	
B15	66	33	0.22	221	114	120	75	1.03
B42	43	39	0.16	137	85	124	60	0.63
B1	46	30	0.14	158	82	119	45	0.44
B12	50	40	0.20	159	103	124	50	0.64
B2	56	50	0.28	139	80	111	102	0.91
B51	40	43	0.17	106	80	100	76	0.61
B38	42	30	0.13	145	70	88	58	0.36
B10[a]	49	45	0.22	175	112	139	96	1.49
B35[a]	53	36	0.19	145	--	104	--	--
B24	42	39	0.16	146	98	78	59	0.45
B11	50	49	0.25	186	121	119	96	1.38
B14	62	30	0.19	117	90	86	61	0.47
B48	43	42	0.18	216	97	108	63	0.66
B16[a]	42	39	0.16	139	119	134	95	1.51

[a] Den caved in before measured.

Table 17. Dimensions (cm) of 14 black bear dens on the Finger Lakes study area, Kenai Peninsula, 1983.

Bear No.	Entrance			Tunnel length	Chamber			Approx. volume (m^3)
	Width	Height	Area (m^2)		Length	Width	Height	
C17[a]	66	44	0.29	83	--	90	76	--
C2	66	34	0.22	103	84	107	86	0.77
C19	89	38	0.34	147	115	99	48	0.55
C1	56	57	0.32	205	106	129	74	1.01
C11	68	39	0.27	220	127	131	81	1.35
C10	73	36	0.26	158	91	89	68	0.55
C3	81	52	0.42	246	110	126	117	1.62
C18[b]	64	44	0.28	166	100	109	66	0.72
C16[b]	36	33	0.12	323	158	79	54	0.67
C12	54	47	0.25	110	82	114	69	0.65
C6	47	33	0.15	209	95	91	88	0.76

[a] Caved-in den.
[b] Natural cavity.