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Effects of Harvest on Grizzly Bear Population Dynamics in the Northcentral Alaska Range

by
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SUMMARY

During 1995 the third phase in a long-term investigation of the effects of harvest on grizzly bear (*Ursus arctos horribilis*) population dynamics continued in a 3160 km^2 area of the northcentral Alaska Range. The total population size declined during the first 2 phases and the adult female segment of the population was stable at 21-23 from 1981 to 1989, but declined to 14 by 1993. During the third phase, the recovery rate will be determined for both the total population and the productive female segment of the population. During 1995, 25 bears were captured and 23 were radiocollared, primarily to maintain the sample of radiocollared adult females. Transmitters of 13 bears contained special mortality sensors; all bears survived during the monitoring period. Eighteen adult females were present in the area, compared with 11 in 1992, 14 in 1993, and 15 in 1994. If present patterns continue and mortality of 5-year-olds is negligible, the adult female segment could recover to pre-1990 levels by spring 1996.

Key words: grizzly bear, harvest rates, Interior Alaska, mortality, population dynamics, recovery rates, reproductive biology, *Ursus arctos.*

CONTENTS

BACKGROUND

An understanding of the effects of different levels of hunter harvest on grizzly bear (*Ursus arctos horribilis*) population density, structure, and dynamics is necessary for effective management. In addition, rates of recovery and mechanisms of response to high levels of harvest must be included in analyses for management models to reflect real-life situations. Although recent studies have increased our knowledge on some of these aspects of population dynamics, additional information is necessary to clarify the extent and direction of population response to, and recovery from, high harvest levels. Further, as demands on grizzly bear habitat and populations increase, more intensive management will be required using models based on observed harvest and recovery rates of specific segments of the population.

To determine sustainable harvest levels for grizzly bears, it is crucial to be able to document responses in population numbers or density to various harvest rates (Miller et al. 1987, Reynolds et al. 1987, Miller 1990*a*, 1990*b*, 1990*c*, 1993). It is equally important to understand the mechanisms of population responses to harvest (such as compensatory production or survival) through long-term observation of individuals (Reynolds et al. 1987, Schwartz and Franzmann 1991, Reynolds and Boudreau 1992). Use of harvest data alone is inadequate for timely determination of population trend or calculation of sustainable harvest rates (Harris and Metzgar 1987).

Documentation of population response to exploitation is necessary to fully realize the benefits from this long-term study. Additional data on population production, survival, compensatory behavior, and emigration rates will make assessment of future direction of

these investigations more effective. Because of characteristics of production and survival, grizzly bear populations respond very slowly to forces that may change population status. For instance, because Alaska Range grizzly bears do not usually produce surviving young until they reach 7 years of age, and the mean interval between litters is 4.1 years (Reynolds 1990, Reynolds and Boudreau 1990), the effects of compensatory production or survival cannot be documented until additional litters are weaned and provide potential recruitment to the population, approximately 7 years.

This study was initiated in 1981 as a 3-phase study. It has been conducted in a 3160-km^2 study area of representative northern Alaska Range habitat in Unit 20A. The study area is large enough to include the entire home ranges of 66% of females under observation for at least 5 years, and 17% of males.

Phase I was completed in 1985; it emphasized the gathering of baseline information on the population biology (Reynolds 1982; Reynolds and Hechtel 1983, 1984, 1985, 1986, 1988; Reynolds et al. 1987). Harvest level during the years 1965 through 1980 was generally moderate (i.e., 5.6% of the estimated population); however, from 1981 to 1985 it increased to about 12%. By 1985, at the end of Phase I, the population had already begun to decline.

Initially, study design called for low to moderate levels of harvest to occur during Phase I while baseline data were collected. This was to be followed by higher harvest levels during Phase II, while data were collected on individuals and on population response to increased harvest. However, grizzly bear harvest by hunters, supplemented in part by capture mortality, resulted in the 12% harvest level during Phase I. Even though this harvest was higher than indicated in the study design, this circumstance strengthened rather than detracted from the investigation. The early high harvest level allowed monitoring of reproductive responses over a longer period of time.

Phase II, which continued from 1986 through 1991, was designed to measure grizzly bear population response to human-caused mortality. Throughout this period, mean annual harvest rates continued at 11% (Reynolds 1989, 1990; Reynolds and Boudreau 1992). Alaska Department of Fish and Game (ADF&G) staff monitored changes in estimated population size and productivity. During 1986 a mark-recapture density estimate was conducted (Reynolds et al. 1987). Changes in reproductive performance of adult females and survival rates of young bears showed nonconclusive evidence for compensatory production and survival; additional data from subsequent years will be necessary to substantiate any trends.

Following the completion of Phase II, a second mark-recapture density estimate was conducted in 1992 (Reynolds 1993*a*) for comparison with the 1986 estimate (Reynolds et al. 1987). No changes in density could be detected between the 2 time periods because the estimates displayed wide confidence intervals, primarily because of low density within the search areas. However, annual direct count estimates, based on intensive capture and presence of individual bears within home ranges in the area, indicated that by 1992 the population of bears $\geq$ 2 years of age had declined by 20% since 1981.

Patterns of movement or fidelity to maternal or established home ranges indicated that all females remained in the vicinity of their maternal home ranges and none emigrated from the study area. All males weaned or captured as 2- or 3-year-olds emigrated from their maternal or established home ranges within 2 years. Males ≥ 4 years of age apparently left their maternal home ranges to immigrate to the study area; none of these later emigrated from the study area although some had home ranges that extended beyond the study area boundaries.

Several other intensive studies have documented declining populations (Craighead et al. 1974; Knight and Eberhardt 1984, 1985; McLellan 1989*a*, 1989*b*, 1989*c*). Harvest models that have been developed are complex and illustrate the difficulty of using harvest data to predict population changes (Tait 1983, Harris and Metzgar 1987, Miller and Miller 1990, Miller 1993). Miller (1990*a*) estimated a sustainable harvest rate of 8% in Unit 13 in Alaska but concluded a number of potential biases remained to be investigated. Other studies have addressed aspects of population biology or density of grizzly bears in Interior Alaska (Dean 1976; Murie 1981; Ballard et al. 1982; Miller and Ballard 1982; Miller 1984, 1987, 1990*a*,*b*, 1993).

Before the effects of various harvest rates can be assessed, the following information should be available: 1) population density or size, 2) population structure, 3) movement patterns, 4) home range size, 5) mortality and survival rates, and 6) reproductive potential including age at first breeding, litter size, and interval between litters (Craighead et al. 1974; Reynolds 1974, 1976, 1978, 1980; Bunnell and Tait 1980, 1981; McLellan 1989*a*; Miller 1990*c*; Miller and Miller 1990). The approach taken in this study is to monitor these characteristics annually so that harvest can be related to potential population responses.

OBJECTIVE

Following reductions in human-caused mortality rates, determine the rate and length of time necessary for recovery of the female segment of a grizzly bear population which had declined by 32% from 1981-1988 levels; specifically, determine the recovery responses in the dynamics of the population, including female population size, total population size, and production and survival of offspring.

STUDY AREA

The 3160-km^2 (1220-mi^2) study area is located in the mountains and foothills of the northcentral Alaska Range within Unit 20A. The study area boundaries did not include mountainous areas above 1800 m (6000 ft), glaciers, or heavily forested portions of the Tanana Flats where searches were not attempted and few observations were made. The boundaries are the Gold King Creek and Wood River drainages downstream from Virginia Creek to the west, the crest of the Alaska Range to the south, the Delta Creek drainage to the east, and the southern edge of the Tanana Flats (approx. 64°07'N) to the north. It includes portions of 2 US Army reservations, Fort Wainwright and Fort Greely.

Elevation in the area ranges from 500 to 3700 m (1500-12,000 ft). Most rivers flow northerly through U-shaped, glacially formed valleys and are fed by active glaciers. Tree line is at approximately 900 m (3000 ft). Dense patches of willow (*Salix* spp.) or alder (*Almus crispa*), which bears use for cover, may be present up to an elevation of approximately 1200 m (4000 ft).

METHODS

Methods used to capture bears and measure population variables have been described in previous reports (Reynolds 1982, 1993*b*, 1994; Reynolds and Hechtel 1983, 1984, 1985, 1986, 1988; Reynolds et al. 1987, Taylor et al. 1989, Reynolds and Boudreau 1992). Standardized weight and measurement data were collected (Kingsley et al. 1988).

RESULTS AND DISCUSSION

The primary emphasis of the work accomplished during 1993, 1994, and 1995 was to monitor the presence of all adult females living within the study area. As funding allowed, I also replaced radiocollars on adult females and those 2- to 5-year old females that will enter the adult cohorts if they survive. In addition, I monitored measures of reproductive status, reproductive performance, and possible compensatory changes in population dynamics.

BEARS CAPTURED AND RADIOCOLLARED

During 1995, 25 bears were captured; 23 of these were radiocollared (Table 1). Four bears were captured twice. Captures included 20 females and 5 males: 17 (16 females, 1 male) were recaptured to replace radiocollars and 8 had not been captured previously. Of those not previously captured, 2 were cubs of radiocollared female no. 1623, 2 were 2-year-old offspring of female no. 1308; 1 was a female, with 2 yearling offspring, that lives in the Yanert River drainage outside the study area; 1 was a 2-year-old weaned female that lives in the upper Wood River drainage; and 2 were 4- or 5-year-old males. Transmitters on 13 bears contained special mortality sensors; all 13 bears survived through the monitoring period.

No capture mortalities occurred for the eighth consecutive year with 172 captures; this is in part due to the use of Telazol® (tiletamine HCL and zolazepam HCL, Fort Dodge Lab., Fort Dodge, IA) as an immobilizing drug (Taylor et al. 1989) and to experience gained in avoiding other hazards related to immobilization (Reynolds 1992). During 1994 the manufacturer of Telazol® reportedly changed the inert ingredients that serve as a carrier for the drug. This resulted in an inability to maintain the drug in solution beyond concentrations of 250 mg/ml. In the past, concentrations of 400 mg/ml were used to reduce the volume of drug used so that only 1 7- or 10-cc dart was necessary to immobilize adult males larger than 220 kg (489 lb). Unfortunately, this manufacturer change will adversely affect the utility of this drug for large carnivores.

One hundred and forty-seven individual bears were captured in the study area from 1981 through 1995 (Table 1). In addition, 144 bears were recaptured to replace radiocollars. From 1981 to 1983, initial captures were made of bears of all sex and age classes. Since 1983, most initial captures were of offspring of previously captured bears. Radiocollars have been placed on 131 bears; 48 on young-age males (≤ 5 years), 20 on adult males (≥ 6 years), 38 on young-age females, and 25 on adult females. Radiocollars were not placed on 15 bears because they were cubs or yearlings (10), capture-related mortalities (4), or captured outside the boundaries of the study area (1).

Shed collars of 13 bears were retrieved during 1995. No evidence of mortality was observed at any of the sites. Collars had been shed by the following bears: 1375, 1392, 1602, 1606 (2), 1613, 1616, 1625, 1629 (2), 1630, 1633, 1638, 1639, and 1647. Collars located but not retrieved included those from bear no. 1375, which was buried deep in a gravel bar of Kansas Creek and from bear no. 1392, for which there was no accessible landing site. Shed collars from bear nos. 1601, 1603 (2), 1622, and 1627 had been located but stopped transmitting before an attempt was made to retrieve them.

FEMALES PRESENT IN THE POPULATION

By May 1995 18 adult females (≥ 6 years of age) were assumed present in the population, compared with 21-23 during 1982 through spring 1989 (Reynolds 1993*a*,*b*). Adult females assumed present in the population included 7 observed with cubs, 5 observed with yearlings, 1 observed with 2-year-olds, 1 observed unaccompanied by offspring, and 4 assumed to be alive whose collars have failed. Each of the latter females met the criteria for inclusion in the estimated population as described in Reynolds (1994).

For comparison, the minimum numbers of adult females present in the study area were 11 in 1992, 14 in 1993, and 15 in 1994 (Reynolds 1993*a*, 1994). These increases could be due to a combination of factors including: 1) a decline in human-caused mortality; 2) the production of strong cohorts in 1988 and 1989; and 3) high survival rates in both young-aged and adult female segments of the population since 1993. Moreover, the number of adult females observed in 1995 does not include 4 5-year-olds that produced cubs for the first time during 1995 or 1 that did not.

Adult bears are defined as those ≥ 6 years of age (Reynolds and Hechtel 1983, Reynolds et al. 1987). Prior to 1994, only 2 of 23 (9%) study area females produced their first litters of cubs at age 5 years. However, during 1994 and 1995, 6 of 12 first-time mothers produced a litter at age 5, 2 at age 6, 3 at age 7, and 1 at age 8. Whether the ages of first production of cubs show significant differences between the 1981-1989 and 1990-1996 periods will be tested following collection of additional data. If differences do exist, they may be related to compensatory changes following a reduction in total population size since 1981 (Reynolds 1993*a*).

Four females (nos. 1345, 1362, 1397, and 1608) were not observed during 1995 but were assumed present in the population (Reynolds 1994). An intensive search effort is planned in the home ranges of each of these females in 1996 to determine their presence. A female

accompanied by 2 yearlings was observed several times near the divide between Dry and Sheep creeks within the home range of no. 1362, but the bear was not captured to determine its identity. Similarly, the observed presence of 2 recently weaned 2-year-old females within the historic home range of female no. 1345 indicates she may be present as well. Four other females (nos. 1348, 1391, 1607, and 1612) that had shed their collars or that carried nonfunctional collars were located during similar intensive searches of home ranges during 1995.

These annual differences are primarily due to the presence or absence of strong cohorts within the 2- to 5-year-old age classes in any specific year. For instance, during 1993 potential female recruits included strong cohorts from 1988, 1990, and 1991, and the weak cohort of 1989. Similarly, potential 2- to 5-year-old female recruits during 1992 included the strong cohorts of 1988 and 1990, the moderate cohort of 1987, and the weak cohort of 1989. The moderate number of recruits available in 1994 was due to inclusion of the strong cohorts of 1990 and 1991 with the weak cohorts of 1989 and 1992. If the strong cohort of 1990 maintains its high survival rate and other adult females survive as well, the adult female segment of the population will recover to its 1981-1989 level in spring 1996. Such projected recovery will depend on hunter kills and natural mortality.

STATUS OF PRODUCTIVE FEMALES

Eleven females produced an observed total of 23 cubs during 1995. Female nos. 1607 and 1636 each produced 3 cubs, nos. 1348, 1385, 1391, 1394, 1603, 1623, 1624, and 1627 each produced 2 cubs, and no. 1631 produced 1 cub. This is the highest total production of cubs by the population that has been observed since the study began (Table 2).

During 1995, 5-year-old female nos. 1623, 1624, 1627, and 1636 produced cubs, but no. 1617 did not. Female nos. 1603 and 1631 produced their first litters at age 7.

I observed 6 females consorting with males during the 1995 breeding season. For comparison, during the previous 6 years, the mean annual number of females breeding was 7.8 (range = 4-11). During 1990 through 1995, a minimum of 79 cubs were produced and 31 offspring were weaned; the annual mean was 13.1 cubs (range = 2-23) and 5.2 offspring, respectively (Table 2).

MORTALITY

Between June 1994 and July 1995, hunter kills accounted for the mortality of only 2 bears in the study area. Both bears were young males: a 6-year-old was taken on 12 May 1995 near the junction of the East and West Forks of the Little Delta River, and a 2-year-old was killed on 17 September 1994 near Slide Creek on the West Fork of the Little Delta River. In addition, a 2-year-old female was shot in defense of life or property at the Denali Wilderness Lodge in the upper Wood River drainage on 9 June 1995. This bear may be a sibling of bear no. 1646, a 2-year-old female captured in the same vicinity. Genetic fingerprint analysis will be conducted on these bears to determine any familial relationship.

Another 5-year-old male grizzly was killed by a hunter in the Yanert River drainage on 10 September 1994 near the southwestern boundary of the study area. This bear had been marked during an ongoing ADF&G research program conducted in the Susitna River drainage south of the Alaska Range.

Five natural mortalities were recorded during 1995. Male no. 1633, a 3-year-old male captured on the western edge of Trident Glacier in 1994, was killed by another bear near O'Brien Creek during May 1995. The disappearance and presumed deaths of 2 cubs of female no. 1391, the single cub of female no. 1631, and the single yearling of female no. 1612 were also documented during 1995.

From 1990 through spring 1995, of the 47 cubs observed for at least a year, 37 survived (79%). Of the 23 cubs observed during spring 1995, 20 (87%) survived through August 1995.

CHANGES IN HARVEST PATTERNS

The population within the study area, adjusted for closure, declined from 72 bears during 1981 to 53 during 1992 (Reynolds 1993*a*). The time necessary for the population to recover or stabilize will depend upon the levels of both recruitment and mortality. Compensatory recruitment by heavily-harvested grizzly bear populations has not been documented (Reynolds and Boudreau 1992, Miller 1993) so mortality will have to be reduced, especially of females, for population stability or recovery.

Whether high cub production and survival, decline in the age at first cub production, and high survival of subadult females are significantly different since 1990 will be tested after 1996 data are collected. Any of these factors could be mechanisms for compensatory response to reduced population size; however, differences in weather patterns or vegetative food availability between the 2 periods could also provide alternative hypotheses.

Hunter kills of no more than 3% of adult females, and 6% to 8% of bears $\geq$ 2 years of age were recommended to allow recovery of this population (Reynolds 1993*a*). These goals were met for the 1994-1995 period. Grizzly bear mortality from hunting and defense of life or property during fall 1994, and spring 1995 was low.

Most grizzlies killed by hunters in this area are taken incidentally to moose or caribou hunts. However, the caribou hunting season has been closed since spring 1991. Also, beginning fall 1994, the first 10 days of the grizzly bear season were closed. This period overlapped with the first 10 days of moose season in the area. In addition, educating the public on methods and the necessity of harvesting males rather than females has begun and may reduce the need for any further restrictive management to accomplish recovery goals. Public presentations, newspaper articles, and video programs describing these conservation goals were used in this educational effort.

CONCLUSIONS AND RECOMMENDATIONS

This is the third year of the third phase in a study to evaluate effects of harvest on grizzly bear population dynamics. The primary objective during this phase is to monitor the recovery or stabilization of the population and to document the accompanying changes in productive capacity.

Using radiotelemetry, we consider it especially important to monitor the number and status of all adult females in the study area. Besides maintaining transmitters on females presently carrying collars, it will be essential to recollar those females whose collars have failed or shed. Intensive aerial searches of their established home ranges, coupled with radiocollaring and monitoring adult males to locate breeding females, will be necessary. Female offspring of marked females should also be radiocollared to monitor their presence in the population and the rate at which they serve as recruits to the adult female cohort.

Hunter harvest should continue to be closely monitored and the take of females discouraged. ADF&G staff should explore the effectiveness of other methods besides season and bag limit management in reducing harvest of females.

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Table 1 Capture and marking characteristics of 147 bears captured in the northcentral Alaska Range, 1981-1995

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1301 M	6	5/18/81	120(265)	Buchanan Creek	1.8/1.2 H	373/374	G/G
1302 F	3	5/19/81	75(165)	East Fork Delta	1.0/1.0 M	368/367	R/G
	8	6/12/86	114(250)	East Fork Delta	2.2 TEL M	280/281	O/lB
	11	5/12/89	109(241)	Buchanan Creek	4.5 TEL M	339/340	O/lB
1303 F	2	6/17/81	57(125)	Mystic Mountain	1.4/1.4 M	524/523	R/R
	4	6/27/83	82(180)	Hearst Creek	5.0 M99 M	3227/3214	R/R
	6	6/14/85	73(160)	Upper Gold King	2.0/2.0 M	486/487	R/R
	12	5/31/91	95(210)	Upper Moose Creek	1.0 TEL L	104/104	Y/W
1304 M	5	6/19/81	136(300)	West Fork Delta	2.4/2.0 M	451/452	lB/R
	11	5/21/87	255(560)	Threemile Creek	8.1 TEL M	430/431	W/mG
	13	6/7/89	245(540)	Slate Creek	7.0 TEL M	778/--	W/--
	15	6/1/91	272(600)	West Fork Delta	9.6 TEL M	136/137	W/mG
1305 F	24	6/19/81	114(250)	Slate Creek	A M	453/454	O/R
1306 M	2	5/24/82	44(97)	West Fork Delta	1.0/1.0 L	3151/3086	G/lB
1307 M	2	5/24/82	44(98)	West Fork Delta	1.0/1.0 H	3087/3152	lB/G
	5	6/17/85	114(250)[d]	Sheep Creek	2.4/2.6 L	3087/3152	lB/G
1308 F	6	5/25/82	111(245)	Dry Creek	-[e]	3001/3154	O/Pp
	8	6/20/84	120(265)	Dry Creek	5.0 M99 M	3001/471	O/Pp
	11	6/8/87	123(270)	Dry Creek	3.3 TEL M	528/529	O/Pp
	15	5/6/91	125(275)	Dry Creek	6.0 TEL M	150/149	W/R
	18	5/30/94	129(285)	Dry Creek	6.0 TEL M	332/333	W/R
	19	6/6/95	129(285)	Dry Creek	7.2 TEL M	332/333	W/R
1309 M	8	5/25/82	318(700)[d]	Dry Creek	A L	3153/3101	dB/Bk
1310 M	13	5/25/82	250(550)[d]	Buchanan Creek	2.0/2.0 M	No tags	
	15	6/20/84	241(530)	Molybdenum Ridge	4.0/2.0 M	467/473	O/W
	18	5/21/87	264(580)	Buchanan Creek	9.0 TEL M	414/413	Y/W

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1311 F	12	5/26/82	120(265)	Molybdenum Ridge	1.9/2.1 M	3106/3107	W/W
	14	6/21/84	116(255)	Molybdenum Ridge	2.0/2.2 M	466/455	W/W
	17	6/8/87	123(270)[d]	Molybdenum Ridge	3.4 TEL M	571/570	W/W
	21	6/3/91	125(275)	Molybdenum Ridge	5.5 TEL M	139/140	W/W
	22	5/10/92	121(267)	Molybdenum Ridge	5.0 TEL M	249/250	W/W
	25	6/11/95	118(260)	Molybdenum Ridge	7.0 TEL M	--	--
1312 F	Cub	5/26/82	12(26)	Molybdenum Ridge	0.1/0.1 M	3104/3155	O/W[f]
1313 F	Cub	5/26/82	12(27)	Molybdenum Ridge	0.08/0.13 M	3156/3105	W/O[f]
1314 M	6	5/27/82	116(255)	Iowa Ridge	2.1/1.9 H	3088/3002	dB/lB
1315 M	13	6/4/82	272(600)	Buchanan Creek	1.9/2.1 L	3102/3157	Bk/O
	15	5/17/84	295(650)	Hayes Creek	A H	3322/none	Bk/-
1316 M	11	6/7/82	236(520)	West Fork Delta	3.8/0.0 H	3089/3090	O/lB
1317 F	3	6/8/82	36(80)	Forgotten Creek	1.2/1.8 L	3091/3003	lB/O
	5	5/16/84	55(122)	Upper West Fork	A L	3486/3239	lB/O
	6	5/23/85	59(130)	Upper Wood River	7.0 M99 M	497/498	lB/O
1318 F	13	6/8/82	104(230)	Buchanan Creek	A L	3004/3103	W/G
	15	6/22/84	118(260)[d]	Slate Creek	A M	458/472	W/G
	18	6/2/87	105(230)[d]	Slate Creek	3.3 TEL M	--	--
1319 M	Cub	6/8/82	12(26)	Buchanan Creek	0.15/0 L	3005/3092	R/Y[f]
1320 F	17	6/8/82	102(225)	Trident Glacier	A M	3158/3093	G/B
	19	6/25/84	139(305)	East Hayes Creek	5.0 M99 M	463/461	G/B
	22	6/12/87	114(250)	Hayes Glacier	4.0 TEL M	517/518	mG/dB
1321 F	16	6/9/82	141(310)	Snow Mountain Gulch	2.1/1.9 M	3028/3108	G/W
	17	5/17/83	127(280)	Dry Creek	1.8/2.2 M	3028/3427	G/W
	19	7/22/85	218(480)	North VABM Wood	2.6/1.0 L	399/398	G/W
	23	6/6/89	170(375)	Dry Creek	---- TEL M	788/789	lG/W
1322 F	8	6/9/82	91(200)	Sheep Creek	1.9/2.1 M	3051/3159	W/lB

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1323 F	11	6/10/82	95(210)	Mystic Mountain	1.9/2.1 M	3160/3030	G/G
	13	6/29/84	132(290)	VABM Wood	A M	579/582	G/G
1324 F	Cub	6/10/82	12(26)	Mystic Mountain	0.12/0 M	3027/3162	R/W[f]
	6	5/26/88	111(245)	Coal Creek	3.6 TEL L	159/160	Bk/W
	10	5/26/92	129(285)	Dry Creek	5.5 TEL L	121/122	Bk/W
	12	5/27/94	125(275)	Mystic Mountain	6.0 TEL M	121/122	Bk/W
	13	6/6/95	--	Wood River Bluffs	7.2 TEL M	121/122	Bk/W
1325 M	Cub	6/10/82	12(27)	Mystic Mountain	0.10/0 M	3161/3031	W/R[f]
	2	5/15/84	67(148)	Mystic Creek	1.0 M99 M	3233/3394	R/W
1326 F	4	6/18/82	93(205)	Buchanan Creek	2.2/1.8 M	3008/3163	W/R
	6	6/21/84	109(240)	Buchanan Creek	1.8/2.2 M	468/462	W/R
	7	6/27/85	111(245)	Slate Creek	2.4/1.6 L	426/427	W/W
1327 F	16	7/8/82	127(280)	Whistler Creek	2.2/1.8 M	3134/3192	G/R
	18	6/23/84	125(275)	Whistler Creek	A H	458/192	G/R
1328 F	1	7/8/82	43(95)	Whistler Creek	0.9/1.1 M	3115/3014	dB/G
1329 F	13	7/9/82	120(265)	Buchanan Creek	2.4/1.6 M	3026/3111	W/R
1330 M	1	7/9/82	48(106)	Buchanan Creek	-- M	--/--	R/W
	3	6/28/84	102(225)	East Fork Delta	2.6/3.0 M	597/598	R/W
1331 F	4	7/10/82	77(170)	Trident Glacier	2.4/1.6 M	3120/3194	Bk/O
	9	5/20/87	114(250)[d]	East Hayes Creek	3.0 TEL M	519/520	Bk/Y
	12	5/15/90	111(245)	Trident Glacier	6.0 TEL H	196/197	Bk/Y
1332 F	5	7/12/82	104(230)	Gillam Glacier	2.4/1.6 M	394/190	R/dB
1333 F	16	7/13/82	141(310)	Buchanan Creek	A M	474/469	G/R
1334 M	1	7/13/82	49(108)	Buchanan Creek	1.0/1.0 M	395/392	Y/G
	3	6/27/84	107(235)	McGinnis Creek	A M	585/583	O/G
1335 F	1	7/13/82	38(84)	Buchanan Creek	1.0/1.0 M	32/456	G/Y
	3	6/25/84	80(175)	Gillam Glacier	1.5/3.0 M	465/464	dB/G

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1336 F	2	5/16/83	48(105)	Kansas Creek	1.0/1.0 M	3201/3204	Bk/mG
	3	6/26/84	89(195)	Copper Creek	2.0/3.0 M	470/595	Bk/mG
	4	6/17/85	102(224)	Wood River	A L	470/595	Bk/mG
	6	5/15/87	109(240)	Rogers Creek	2.2/2.0 M	521/522	Bk/mG
	8	5/17/89	145(320)	Upper Wood River	4.5 TEL M	330/329	Bk/mG
	11	5/7/92	116(255)	Wood River	6.0 TEL M	330/329	Bk/mG
1337 M	20	5/18/83	293(645)	Sheep Creek	3.5/3.5 L	3209/3205	R/O
	25	6/15/88	277(610)	Sheep Creek	A TEL H	364/363	O/R
1338 M	6	5/20/83	111(245)	Molybdenum Ridge	A M	3203/3202	O/Bk
1339 M	6	5/23/83	120(265)	Trident Glacier	-- M	3286/3351	lB/W
	7	5/17/84	168(370)	East Fork Delta	6.0 M99 H	3254/3398	lB/W
1340 F	3	5/23/83	71(157)	Hayes Creek	1.2/0.8 H	3277/3208	G/O
	4	5/19/84	91(200)[d]	Molybdenum Ridge	4.0 M99 M	3277/3208	mG/O
	5	6/27/85	100(220)	West Hayes Creek	2.4/1.6 L	590/596	mG/mG
1341 F	10	5/23/83	107(235)	NE Portage	1.5/1.5 H	3210/3428	R/dB
	12	6/13/85	107(235)[d]	East Fork Delta	2.0/2.0 M	442/none	O/-
	15	6/14/88	164(360)	East Fork Delta	7.0 TEL M	356/355	dkB/
1342 M	2	5/24/83	49(108)	Threemile Creek	0.6/1.2 M	3354/3207	W/dB
1343 M	2	5/24/83	43(95)	Threemile Creek	0.6/1.2 M	3426/3285	R/B
1344 M	2	5/24/83	56(123)	Threemile Creek	0.6/1.2 M	3361/3433	lB/Bk
	3	6/23/84	123(270)	Hayes Creek	2.2/3.2 M	475/460	lB/Bk
1345 F	8	5/24/83	--	Upper West Fork	1.2/1.8 L	3206/3352	O/O
	10	5/23/85	105(230)[d]	Upper West Fork	7.0 M99 M	499/500	O/O
	14	5/13/89	118(260)	Upper Wood River	4.5 TEL M	445/446	O/O
1346 M	5	5/25/83	114(250)	Hayes Glacier	A M	3359/3356	lB/lB
	12	5/14/90	--	Trident Glacier	10.5 TEL M	192/193	mG/mG
	13	6/1/91	249(550)	Buchanan Creek	11.0 TEL M	192/193	mG/mG

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
	16	5/28/94	254(560)	Delta Creek	7.6 TEL M	192/193	None
1347 M	6	5/31/83	189(415)	Coal Creek	3.5 M99	None	Dead
1348 F	12	5/31/83	123(270)[d]	Mystic Mountain	A M	3363/3372	W/O
	15	5/16/86	116(255)	Wood River	2.4/1.6 M	235/236	W/O
	19	5/12/90	141(310)	Gold King	6.0 TEL M	117/118	W/O
	20	5/9/91	120(265)	SW Gold King	11.0 TEL H	117/118	W/O
	21	5/9/92	107(235)	Wood River	5.5 TEL M	117/118	W/O
1349 M	18	6/2/83	264(580)	O'Brien Creek	3.8/1.2 L	3364/3292	R/lB
1350 M	8	6/2/83	202(445)	Ptarmigan Creek	3.0/2.0 L	3432/3430	dB/R
	11	6/12/86	205(450)[d]	East Fork Delta	3.5 TEL L	273/272	dB/R
1351 F	14	6/23/83	114(250)[d]	Dry Creek	4.0 M99 M	3217/3390	dB/W
	16	6/10/85	111(245)	Little Delta River	2.0/2.0 M	477/436	dB/W
	18	5/19/87	130(285)	Dry Creek	A M	503/504	dB/W
1352 F	14	6/27/83	111(245)	West Fork Delta	--	3215/3316	O/W
1353 M	1	6/27/83	27(60)	West Fork Delta	--	3310/none	O/-
1354 F	1	6/27/83	12(27)	West Fork Delta	--	None/3314	-/O
1355 M	3	6/30/83	60(133)	East Fork Delta	4.0 M99 H	3232/3473	O/Bk
	5	6/3/85	70(155)	Whistler Creek	2.2/1.8 H	586/587	O/Bk
1356 M	2	6/30/83	50(110)	Little Delta River	2.0 M99 H	3234/3392	Bk/O
1357 M	2	5/15/84	63(138)	Dry Creek	1.1 M99 M	3323/3235	W/Bk
	3	6/24/85	93(205)	Dry Creek	1.5/1.5 M	447/448	W/Bk
1358 M	13	5/18/84	205(450)	Hayes Creek	A L	3318/3447	lB/dB
	15	5/20/86	236(520)	Trident Glacier	3.4/2.0 L	297/296	lB/dB
1359 M	3	5/28/85	61(134)	Snow Mountain Gulch	4.0 M99 M	489/488	dB/O
1360 F	10	5/28/85	95(210)	Snow Mountain Gulch	7.0 M99 H	None	None
1361 F	3	5/28/85	63(138)	Dry Creek	4.0 M99 M	482/483	mG/R
	4	5/19/86	100(220)	Rogers Creek	1.7/2.0 L	274/275	G/Bk

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1362 F	6	6/5/85	--	Glacier Creek	2.0/2.0 L	None	None
	6	6/24/85	114(250)	Threemile Creek	2.2/1.8 L	443/490	dB/dB
	9	5/15/88	--	Sheep Creek	5.0 TEL H	197/198	O/Y
1363 M	3	6/5/85	55(120)	Slide Creek	1.0/2.0 M	592/593	dB/lB
1364 M	Cub	6/14/85	7(15)	Gold King Creek	0.7/- M	None	None
1365 M	5	6/19/85	118(260)	Wood River	A M	476/441	lB/G
1366 M	8	7/22/85	234(515)	Tatlanika River	3.2/1.0 M	390/391	mG/R
1367 M	2	5/19/86	61(134)	Threemile Creek	1.4/2.0 M	400/241	lB/W
1368 F	2	5/19/86	48(106)	Threemile Creek	1.4/2.0 M	257/256	lB/lB
1369 M	2	5/19/86	68(150)	Threemile Creek	1.4/2.0 L	247/246	W/dB
1370 F	2	5/20/86	47(103)	Buchanan Creek	1.4/2.0 H	253/252	dB/Bk
	3	5/20/87	69(151)	Buchanan Creek	1.5/1.5	--	--
1371 M	2	5/20/86	57(126)	Buchanan Creek	1.4/2.0 M	269/268	Bk/dB
1372 M	2	5/20/86	72(158)	Ptarmigan Creek	1.4/2.0 M	387/386	lB/O
	5	5/17/89	186(410)	Chute Creek	7.0 TEL M	310/309	lB/O
1373 M	7	5/21/86	193(425)	Delta Creek	4.0/2.0 M	295/294	lB/R
1374 F	6	5/21/86	106(233)	Delta Creek	2.0/2.0 M	249/248	R/G
	9	6/9/89	147(325)	Delta River	6.0 TEL M	320/319	lG/lB
1375 M	6	6/13/86	186(410)	Sheep Creek	4.5 TEL L	276/277	Y/W
	9	5/13/89	281(620)	Mystic Creek	9.0 TEL L	439/440	O/W
	11	5/31/91	295(650)	Threemile Creek	14.0 TEL H	146/440	O/W
1376 F	14	6/13/86	130(285)	Hayes Creek	3.0 TEL M	279/278	G/O
1377 M	2	8/28/86	132(290)	Iowa Ridge	4.0 TEL L	505/507	Bk/R
1378 F[g]	2	5/20/86	59(130)[d]	Ptarmigan Creek	--	None	None
1379 F	2	5/15/87	67(148)	Sheep Creek	2.2/2.0 L	334/335	W/W
	4	6/6/89	102(225)	Dry Creek	3.5 TEL L	777/776	W/W
1380 M	2	5/18/87	65(142)	West Fork Delta	2.2 TEL H	513/514	W/R

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
	3	5/17/88	109(240)	Buchanan Creek	3.2 TEL	175/174	W/R
1381 M	2	5/21/87	73(160)	Dry Creek	3.0 TEL M	481/480	lB/Bk
1382 F	3	5/15/88	68(150)	West Fork Delta	3.2 TEL M	169/170	R/Y
	4	6/7/89	84(185)	Buchanan Creek	4.0 TEL M	169/170	R/Y
1383 M	2[d]	6/12/87	77(170)	Coal Creek	A M	389/390	mG/dB
1384 M	7[d]	5/15/88	191(420)	Chute Creek	7.0 TEL M	960/959	W/Y
1385 F	2	5/15/88	68(150)	Upper Wood River	2.2 TEL H	168/167	lB/Y
	3	5/13/89	82(180)	Wood River	3.4 TEL M	--	lB/Y
	4	5/11/90	95(210)	Upper Wood River	A TEL H	--	--
	5	6/2/91	118(260)	West Fork Delta	5.5 TEL M	108/107	lB/Y
	7	5/9/93	86(190)	West Fork Delta	4.0 TEL M	108/107	lB/Y
	9	6/9/95	125(275)	Upper Wood River	4.0 TEL M	258/259	lB/Y
1386 M	2	5/15/88	73(160)	Upper Wood River	2.2 TEL M	181/180	Bk/Y
	3	5/13/89	91(200)	Upper Wood River	3.4 TEL M	181/180	Bk/Y
	4	6/7/90	120(265)	Upper Wood River	7.0 TEL H[h]	790/791	Bk/Y
	5	5/31/91	156(345)	West Fork Delta	6.0 TEL H[h]	790/791	Bk/Y
1387 F	2	5/23/88	55(120)	Dry Creek	A TEL M	179/178	Y/R
	3	5/12/89	77(170)	Rogers Creek	3.4 TEL M	337/338	Y/R
	4	5/15/90	84(185)	Sheep Creek	A TEL M	190/191	--
1388 M	2	5/25/88	68(150)	Dry Creek	2.5 TEL M	153/154	Y/lB
1389 M	3	5/13/89	84(185)	Mystic Creek	4.5 TEL H	343/344	W/dB
1390 F	3	5/13/89	77(170)	Mystic Creek	3.4 TEL H	345/346	Y/Y
1391 F	2	5/13/89	68(150)	Dry Creek	2.8 TEL L	333/334	O/mG
	3	5/12/90	95(210)	Dry Creek	3.8 TEL M	333/334	O/mG
	4	5/7/91	109(240)	Forgotten Creek	5.5 TEL H	109/110	O/mG
	8	6/7/95	123(270)	Slate Creek	7.0 TEL M	336/337	O/mG
	5	5/23/92	111(245)	Dry Creek	5.0 TEL L	109/898	O/mG

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1392 M	2	5/13/89	89(195)	Dry Creek	2.8 TEL M	341/342	lG/O
	5	5/26/92	229(505)	Dry Creek	13.0 TEL L	881/882	mG/R
1393 M	2	5/17/89	66(145)	Molybdenum Ridge	3.5 TEL H	326/325	Bk/lB
	3	5/14/90	100(220)	Trident Glacier	4.4 TEL M	326/325	Bk/lB
1394 F	2	5/17/89	59(130)	Molybdenum Ridge	3.5 TEL -	331/332	lB/Bk
	6	5/10/93	94(207)	Molybdenum Ridge	3.4 TEL M	165/166	lB/Bk
	7	5/28/94	125(275)	Molybdenum Ridge	6.0 TEL M	165/166	lB/Bk
1395 M	2	5/17/89	86(190)	Molybdenum Ridge	3.1 TEL M	302/301	dkB/W
1396 M	13[d]	5/18/89	295(650)	Molybdenum Ridge	7.0 TEL M[h]	327/328	Y/O
1397 F	2	5/18/89	61(135)	Delta Creek	3.2 TEL M	314/313	O/O
	5	5/25/92	116(255)	East Fork Delta	5.5 TEL M	793/792	O/O
1398 F	8[d]	5/18/89	127(280)	Delta Creek	4.5 TEL M	315/316	W/Y
	13	5/8/94	147(325)	Trident Glacier	5.6 TEL L	-/316	-/Y
1399 M	2	5/18/89	66(145)	Delta Creek	3.2 TEL M	303/304	R/R
1400 M	8[d]	6/8/89	239(525)	Trident Glacier	7.0 TEL M[h]	425/426	R/lB
1601 M	9	6/9/89	193(425)	Whistler Creek	6.5 TEL M[h]	782/785	Gr/Y
	11	5/7/91	245(540)	Slate Creek	13.0 TEL L	125/126	Gr/Y
	12	10/4/92	340(750)[d]	Buchanan Creek	A TEL M	179/180	dB/W
1602 M	7	5/13/90	166(365)	Molybdenum Ridge	A TEL M	122/121	lB/Gr
	9	5/25/92	200(440)	East Fork Delta	7.0 TEL M	980/981	lB/Gr
	11	5/28/94	238(525)	East Fork Delta	10.5 TEL L	338/339	lB/mG
1603 F	2	5/13/90	55(120)	Hayes Creek	3.6 TEL H	141/142	lB/dB
	3	5/8/91	70(155)	Whistler Creek	3.6 TEL M	128/127	lB/dB
	4	5/24/92	102(225)	West Hayes Creek	6.0 TEL M	214/213	lB/dB
	6	5/30/94	113(250)	West Hayes Creek	5.6 TEL M	348/349	lB/dB
1604 F	2	5/13/90	48(105)	Buchanan Creek	3.4 TEL M	119/120	lB/R
	3	5/7/91	59(130)	Buchanan Creek	4.0 TEL H	101/120	lB/R

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
	4	5/25/92	95(210)	West Fork Delta	6.0 TEL M	101/889	lB/R
	5	5/8/93	82(180)	Buchanan Creek	5.0 TEL M	889/101	R/lB
	5	5/10/93	--	East Fork Delta	5.0 TEL M	889/101	R/lB
1605 F	2	5/13/90	59(130)	Buchanan Creek	3.6 TEL M	213/150	mG/lB
	3	5/8/91	68(150)	East Fork Delta	3.6 TEL M	213/293	mG/lB
	4	5/25/92	102(225)	Buchanan Creek	4.0 TEL M	213/293	mG/lB
	5	5/10/93	102(225)	East Fork Delta	3.2 TEL M	195/196	mG/lB
	7	5/3/95	98(215)?	Gillam Glacier	6.0 TEL H	195/196	mG/lB
1606 M	2	5/13/90	50(110)	Buchanan Creek	A TEL M	143/144	R/dB
	3	5/8/91	70(155)	Gillam Glacier	3.6 TEL M	143/144	R/dB
	5	5/8/93	105(230)	West Hayes Creek	5.4 TEL M	396/397	R/dB
1607 F	8	5/14/90	141(310)	Glacier Creek	5.5 TEL M	188/189	W/lB
	13	6/7/95	143(315)	Glacier Creek	7.2 TEL M	330/331	lG/W
1608 F	15	5/14/90	136(300)	Trident Glacier	5.5 TEL M	184/-	lG/-
	19	5/30/94	127(280)	Trident Glacier	5.6 TEL M	172/-	lG/-
1609 F	2	5/14/90	61(135)	Trident Glacier	3.2 TEL M	103/104	dB/mG
	3	5/7/91	77(170)	Trident Glacier	4.0 TEL M	103/102	dB/mG
	4	5/25/92	93(205)	Ptarmigan Creek	A TEL M	103/102	dB/mG
	5	6/29/93	107(235)	E. Hayes Creek	6.2 TEL M	103/102	dB/mG
1610 F	2	5/6/91	70(155)	Threemile Creek	3.4 TEL M	116/115	O/R
1611 M	2	5/6/91	91(200)	Threemile Creek	3.4 TEL M	106/105	Gr/O
1612 F	2	5/6/91	73(160)	Threemile Creek	3.4 TEL M	131/132	Y/mG
	6	5/3/95	125(275)	Lower Sheep Creek	6.0 TEL M	16/22	R/lG
	6	6/8/95	127(280)	Snow Mtn. Gulch	7.2 TEL M	16/22	R/lG
1613 M	7	6/2/91	177(390)	Wood River	12.0 TEL M	131/130	R/O
	11	5/29/95	211(465)	West Fork Delta	12.9 TEL H	10/9	W/dB
	11	6/7/95	--	West Fork Delta	14.0 TEL M	10/9	W/dB

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
1614 M	4	6/1/91	109(240)	Hayes Creek	12.0 TEL H	144/145	lG/lG
1615 M	4[d]	6/3/91	125(275)	Hayes Creek	5.5 TEL H	112/111	R/W
1616 M	5	5/7/92	169(370)	Mystic Creek	14.0 TEL H	239/240	Y/R
1617 F	2	5/7/92	54(120)	Wood River	3.6 TEL M	847/848	R/lG
	3	5/9/93	43(95)	Wood River	3.6 TEL M	848/847	lG/R
	4	5/27/94	84(185)	Wood River	3.6 TEL M	848/847	lG/R
	5	6/9/95	105(230)	Kansas Creek	7.0 TEL M	374/118	lG/R
1618 F	2	5/7/92	54(120)	Wood River	3.6 TEL M	209/210	lB/lG
	3	5/9/93	49(107)	Virginia Creek	3.6 TEL M	209/210	lB/lG
1619 F	2	5/7/92	68(150)	Bonnefield Creek	3.6 TEL L	201/202	R/R
1620 M	2	5/7/92	75(165)	Bonnefield Creek	3.6 TEL M	229/230	lB/lB
1621 M	2	5/7/92	82(180)	Bonnefield Creek	3.6 TEL L	147/148	mG/Y
1622 M	2[d]	5/9/92	100(220)	Wood River	3.6 TEL M	143/236	Y/Y
1623 F	2[d]	5/9/92	95(210)	Wood River	3.4 TEL M	127/126	O/dB
	3	5/9/93	93(205)	Wood River	3.6 TEL M	191/192	O/dB
	5	6/6/95	107(235)	VAMB Mystic	7.2 TEL M	191/192	O/dB
1624 F	2	5/10/92	70(155)	Molybdenum Ridge	3.6 TEL M	245/246	dB/lB
	3	5/8/93	57(125)	Molybdenum Ridge	3.4 TEL M	245/246	dB/lB
	4	5/28/94	98(215)	Molybdenum Ridge	6.0 TEL M	245/217	dB/lB
1625 M	2	5/10/92	84(185)	Molybdenum Ridge	3.6 TEL M	243/244	R/Y
1626 F	16	5/23/92	109(240)	Dry Creek	6.0 TEL L	150/233	W/lB
1627 F	3	5/7/93	73(160)	Dry Creek	3.6 TEL M	997/998	Y/lB
	5	5/29/95	109(240)	Slide Creek	6.0 TEL H	378/379	Y/lB
1628 F	2	5/7/93	45(100)	Dry Creek	3.6 TEL M	173/174	lG/R
	3	5/8/94	64(140)	West Fork Delta	3.6 TEL M	173/174	lG/R
	4	5/3/95	84(185)	Buchanan Creek	4.5 TEL L	173/174	lG/R
1629 F	2	5/7/93	41(90)	Dry Creek	3.6 TEL M	230/231	R/mG

Table 1 Continued

Bear no./sex	Cem. age (yr)	Date of capture	Weight kg (lb)	Location	Drug dosage[a]	Ear tags[b]	Markers[c]
	3	5/8/94	59(125)	West Fork Delta	3.6 TEL M	231/230	mG/R
1630 F	3[d]	5/7/93	59(125)	Wood River	3.6 TEL M	168/167	dB/lG
1631 F	5[d]	5/9/93	89(195)	Virginia Creek	5.6 TEL M	169/170	mG/O
	7[d]	6/10/95	127(280)	Upper Wood River	7.2 TEL M	169/375	mG/O
1632 M	10[d]	5/10/93	277(610)	Tatlanika Creek	12.2 TEL M	161/162	lG/mG
	11	5/30/94	281(620)	Mystic Creek	13.4 TEL M	372/373	lG/mG
1633 M	3[d]	5/8/94	66(145)	Trident Glacier	6.4 TEL H	238/239	Gy/lB
1634 F	Cub	5/27/94	8(18)	Mystic Mountain	0.25 TEL L	-/988	-/-
	1	6/6/95	52(115)	Wood River Bluffs	4.7 TEL M	7/8	Bk/lB
1635 F	Cub	5/27/94	6(14)	Mystic Mountain	0.25 TEL L	157/-	-/-
	1	6/6/95	52(115)	Wood River Bluffs	4.7 TEL M	19/20	W/Y
1636 F	4[d]	5/27/94	129(285)	Mystic Mountain	6.0 TEL M	382/383	dB/Y
	5[d]	6/5/95	111(245)	Coal Creek	7.2 TEL M	383/382	Y/dB
1637 M	4[d]	5/27/94	188(415)	Mystic Mountain	7.0 TEL M	992/993	mG/W
1638 M	1	5/28/94	54(120)	Delta Creek	3.6 TEL M	358/359	Y/mG
1639 M	4[d]	5/29/94	220(485)	East Fork Delta	10.5 TEL M	354/355	Bk/R
1640 M	2	5/2/95	80(175)	Dry Creek	4.5 TEL M	13/14	W/mG
	2	6/8/95	64(140)	Dry Creek	6.0 TEL M	13/14	W/mG
1641 F	2	5/2/95	57(125)	Dry Creek	4.5 TEL M	23/24	R/W
	2	6/7/95	61(135)	Dry Creek	5.5 TEL M	23/24	R/W
1642 F	6[d]	5/2/95	125(275)	Healy Creek	6.0 TEL M	4/3	lB/R
1643 M	Cub	6/6/95	13(29)	VAMB Mystic	0.5 TEL H	17/-	-/-
1644 M	Cub	6/6/95	11(24)	VAMB Mystic	0.5 TEL ?	-/18	-/-
1645 M	4[d]	6/7/95	120(265)	Forgotten Creek	7.2 TEL ?	5/6	lB/W
1646 F	2[d]	6/7/95	61(135)	Upper West Fork	7.2 TEL M	328/329	O/R
1647 M	5[d]	6/9/95	270(595)	Virginia Creek	13.2 TEL L	11/12	lB/W

Table 1 Continued

[a] Dosage in ml. No designation indicates use of phencyclidine hydrochloride/acepromazine maleate at 100 mg/ml concentration; use of M-99 is designated M99 at 1 mg/ml concentration; use of Telazol® at 200 mg/ml concentrations is designated TEL; A denotes multiple injections with unknown effective dosage. Drug effects were as follows: L = light, M = optimum, H = heavy.

[b] Ear tag numbers, left/right.

[c] Marking designations:

Colors: R, red; G, light green; mG, medium green; Gr, gray; O, orange; lB, light blue; dB, dark blue; W, white; Bk, black; Pp, purple; Y, yellow.

Marker types: One or 2 color combinations were used for ear flags, e.g., O/W is orange in left ear, white in right ear; -/G is no flag, left; green, right.

[d] Estimated.

[e] Data collected but not recorded.

[f] Ear tags only and not ear-flagging material were used to mark cubs of the year; therefore, for these bears only, marker colors indicate ear tags and not ear flags.

[g] Bear No. 1378, an offspring of No. 1311, was darted but not immobilized on 20 May 1986. We left her with her mother to recover from the darting chase, but she was killed by hunters before we returned. We include her in this table for ease of data analysis.

[h] Dosages of Telazol® administered at a concentration of 300 mg/ml, instead of the usual 200 mg/ml.

Table 2 Reproductive status and litter sizes of potentially mature females in the northcentral Alaska Range, 1981-1995

Bear No./Age[a]	Offspring no.	Reproductive status[b]															Reproductive history[b]
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	
1302/14	1604, 1605, 1606, 1UM	NB	UN	UN	UN	UN	B	B	3c	3yl	3 2y/B	1c	1yl/D				No offsp prior 1986; killed by 1601 9/30/92
1303/16	1364, 1UM, 2UM	NB	NB	B?	B	2c/B	UN	UN	UN	UN	UN/B	2c	1yl	2yr/B	UN	UN	No offsp prior 1981; lost 2 c 1985, lost 1 c 1991
1305/25	1306, 1307	2yl	2 2y/B/D														Hunter kill fall 1982
1308/18	2UM, 1391, 1392, 1UM, 1640, 1641		?/B	B	2c	2yl	1 2y/B	2c	2yl	2 2y/B	3c	2yl	2 2y/B	3c	2yl	2 2y/B	Offsp 1982 or before; lost 1 yl 1985; lost 1 c 1990; lost 1 c 1993
1311/25	1312, 1313, 1372, 1378, 1UM, 1395, 1624, 1625	UN/B	2c	B	2c	2yl	2 2y/B	2c	2yl	2 2y/B	2c	2yl	2 2y/B	?c/B	3c	2yl	Lost 2 c Aug 1982; lost UM 2yr? spring 1989; lost 1 c 1994
1317/6			NB	NB?	NB	NB/D											Illegal kill 1985
1318/20	1319, 1380, 1382, 2UM	UN/B	1c/B	B	B	2c	2yl	2 2y	2 3y/B	2c/D							Lost 1 c 1982; dead Aug 1990
1320/24	1UM, 3UM, 2UM		?/B	1c/B?	B	3c	B	2c	1yl	B/D							Weaned or lost offsp 1982; lost 1 c 1983; lost 3 c 1985; lost 1 c 1987; lost 1 yl 1988; dead, fall 1989
1321/23	1342, 1343, 1344, 1UM, 1379c, 1381c, 3UM	UN/3+ c	3yl	3 2y	2 3y/B	3c	3yl	2 2y/B	3c	B/D							1342 killed illegally fall 1983; lost 1 yl 1983; lost 3 c 1988
1322/17	1336	UN/1+ c	1yl	1 2y	1 3y/B	UN	UN	UN	UN	UN	UN	B?/D					Hunter kill fall 1991
1323/18	1324, 1325, 2UM	UN/B	2c	2yl	2 2y/B	UN	UN/B	2+c	2+yl	2 2y/D							DLP kill[b] fall 1989

Table 2 Continued

Bear No./Age[a]	Offspring no.	Reproductive status[b]															Reproductive history[b]
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	
1324/13	1389, 1390, 1622, 1623, 3UM, 1634, 1635		NB	NB	NB	UN/NB ?	UN/B	2+c	2yl	2 2y/B	2c	2yl	2 2y/B	3c/B	2c	2yl	Lost 3 c 1993
1326/8	1UM		NB	B	B	1c	B/D										No offsp prior 1982; lost 1 c 1985; hunter kill 1986
1327/18	1328, 1UM, 3UM	UN/2+ c	2yl	B	3c/D												1UM yl capture mortality; lost 1328 in 1982; 1327 capture mortality? 1984
1329/14	1330	UN/1+ c	1yl	1 2y/D													Killed by male May 1983
1331/12	1UM, (1603)?		NB	B	UN	UN/B	1+c	1yl/B	1+c	1yl	1 2y/B/D						No offsp prior 1982; lost yl 1987
1332/6			NB?	D													No offsp prior 1982; died in den 1983
1333/18	1334, 1335	UN/2+ c	2yl	2 2y	2 3y/B/D												Hunter kill 1984
1336/11	2UM, 1UM, 1617, 1618			NB	NB	B	B	2c	2yl	B	3c	2yl	2 2y/D				No offsp prior 1983; lost 2 yl 1988; lost 1 c 1990
1340/11				NB	NB	B	UN	UN	UN	UN	UN	UN					No offsp prior 1983
1341/16	1UM, 1370, 1371, 2UM, 2UM		UN/1+ c	1yl/B	2c	2yl	2 2y/B	B	2c/B	2c/D							Lost yl 1983; lost 2 c 1988; dead fall 1989
1345/20	2UM, 1385, 1386, 3UM			B	2c	1yl/B	2c	2yl	2 2y	2 3y/B	3c	3yl	UN	UN	UN	UN	Lost 1 c 1984; lost 1yl 1985
1348/24	1367, 1368, 1369, 2UM, 1UM, 1619, 1620, 1621			7/B	3c	3yl	3 2y/B	2c	2yl/B	1 c/B	3c	3yl	3 2y	13yr/B	?c	2c	Probably weaned or lost offsp 1983; lost 2 yl 1988; lost 1 c 1989
1351/18	1357, 1361, 1UM, 3UM	UN/B	3+c	3yl	3 2y	2 3yr/B	3+c	3yl/D									Lost 1UM offsp 1984; hunter kill 1987, 3UM yl orphaned?
1352/15	1353, 1354	UN/B	2+c	2yl	2 2y/D												Hunter kill 1984; 1353 hunter kill 1984

Table 2 Continued

Bear No./Age[a]	Offspring no.	Reproductive status[b]															Reproductive history[b]
		1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	
1360/10	1359, 1363	UN/B	2+c	2+yl	2+ 2y	2 3y/D											Capture mortality 1985
1361/9	1+UM				NB	NB	NB	UN	UN/B	1+c	1+yl	1 2y/D					No offsp prior 1985; both 1361 and 2 yr hunter kills 1991
1362/16	1387, 1388				UN	B	2c	2yl	2 2y/B	B	UN	UN	UN	UN	UN	UN	No offsp prior 1985
1374/14	2UM, 2UM, 3UM				UN/B	2+c	2yl	?/B	2+c	2yl	2 2y/B	3c	UN	3c	3yl/B/D		1374 and 3 yl killed defense of life 1994
1376/18	1393, 1394					UN	?/B	2c	2yl	2 2y	2 3y/D						Offsp prior 1986; dead spring 1990
1379/6									NB	B	UN	UN	D				Dropped collar spring 1990; hunter kill 1992
1385/9	2UM										NB	B	1c	1yl/B	c?/B	2c	Lost 1 yl 1993?
1391/8	2UM										NB	B	1c	1yl	B	2c	
1394/8	1UM, 2UM												B	1c	1yl/B	2c	Weaned 1 yl and bred 1994
1397/8												UN	B	B	UN	UN	
1398/14	1397, 1399, 2UM						?/B	2+c	2+yl	2 2y/B	UN/B	2c	2yl	UN?/B	2c	1yl	Lost 1 c 1994
1603/7	2UM										NB	B	B	B	B	2c	
1605/7	2UM													B	2c	2yl/D	Dead by 5/22/95
1607/14	1610, 1611, 1612, 3UM								?/B	3+c	3yl	3 2y/B	UN	UN	B	3c	
1608/20	1609?, UM, 1633?							UN/B?	1+c?	1+yl?	1+ 2y?/B	2c	2yl	2 2yr/B	2c	UN	Assumed 1609 was offsp from strong circumstantial evidence
1609/7																NB	
1612/6	1UM													B	1+c	1yl	Lost 1 yl and bred 1995
1617/5															NB	B	
1623/5	1643, 1644													NB	B	2c	
1624/5	2UM													NB	B	2c	
1626/17	2UM										UN/B	2+c	2yl/D				Probably killed by hunter in defense of life
1627/5	2UM														B	2c	
1631/7	1UM													B	B	1c	Lost 1 c 1995 (capture ?)

Table 2 Continued

Bear No./Age[a]	Offspring no.	Reproductive status[b] 1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	Reproductive history[b]
1636/5	3UM														B	3c	
1642/6?	2UM													B	2+c	2yl	

[a] Age in 1995 or last year in which bear was alive.

[b] Designations: B, in breeding condition; NB, observed in nonbreeding condition; c, cub of year; yl, yearling; 2y, 2-year-old; D, dead; DLP, killed in defense of life or property; UM, unmarked; UN, not observed in that year; ?, status unknown; +, not observed in that year but offspring first observed in subsequent year ; therefore, litter size may have been larger; offsp, offspring.

[c] Siblings 1379 and 1381 were captured separately after weaning within 1321's home range and were sighted together once during the summer. We assume the siblings were those recently weaned by 1321.