INUVIALUIT WILDLIFE STUDIES

GRIZZLY BEAR RESEARCH

PROGRESS REPORT

1989-91

PETER CLARKSON

AND

ILME LIEPINS

DEPARTMENT OF RENEWABLE RESOURCES

GOVERNMENT OF THE NORTHWEST TERRITORIES

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ABSTRACT

A general summary is provided on the results obtained during the third year (1989) of the mark-recapture study and the third (1989) and fourth years (1990) of the female productivity and cub survival study in the Anderson-Horton rivers area.

A total of 86 bears was captured during June and August, 1989. Twelve adult bears (10 females, 2 males) were recaptured from previous years. In June 1990, 11 bears (5 adult females, 3 adult males, 1 yearling male and 2 male cubs of the year (COY's)) were captured. Collars were replaced on the five adult females and 1 adult male. No new bears were collared. Since 1987, 154 bears (56 males, 98 females) have been captured and marked.

Radio-collared bears (n=28) were monitored to determine female productivity, young survival, population distribution and seasonal habitat use. Female productivity and cub of the year (COY) survival were intensively monitored from 20 May - 10 June 1989. Ten adult females with COY's were monitored to determine COY mortality. One female lost her COY's during this time period. By the end of July 1989, 6 more females had lost their entire litters of COY's and 1 female lost 1 of her 2 COY's. Only 2 females (G51 and G86) successfully raised all of their observed COY's to the denning period in the fall of 1989. We will continue to monitor female productivity and COY survival until 1993-94.

Nine bears (8 males, 1 female) were reported to have been harvested by hunters from Tuktoyaktuk (7 bears) and Paulatuk (2 bears). No radio-collared bears were known to have died of natural causes.

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INTRODUCTION

The third and final year of the grizzly bear mark-recapture research project was completed in 1989-90. In addition, we continued to monitor radio-collared females to obtain information on reproductive rates (minimum age of first reproduction, litter size, litter frequency and survival of young). A detailed description of the goals, objectives and background of the project is presented in Clarkson and Liepins (1989 a and b). This report provides a summary of work completed from April 1989 to March 1991. More detailed reports are being prepared on specific aspects of the grizzly bear research.

Specific objectives included:

1. to conduct the third and final year of the mark-recapture program (1989) to obtain estimates of grizzly bear population numbers and density;

2. to continue to monitor radio-collared bears to determine seasonal movements, habitat use, reproductive rates, and survival of young; and

3. to monitor intensively radio-collared adult female grizzly bears with cubs of the year (COY's) during the first part of the breeding season to determine rates and causes of COY mortality.

STUDY AREA

The 15,500 km^2 study area is centred around the Anderson and Horton rivers and falls within the Inuvialuit Settlement Area (The Western Arctic Claim, The Inuvialuit Final Agreement, 1984) (Figure 1). Clarkson and Liepins (1989 a and b) provide a detailed description of the climatic and phytogeographic characteristics of the area.

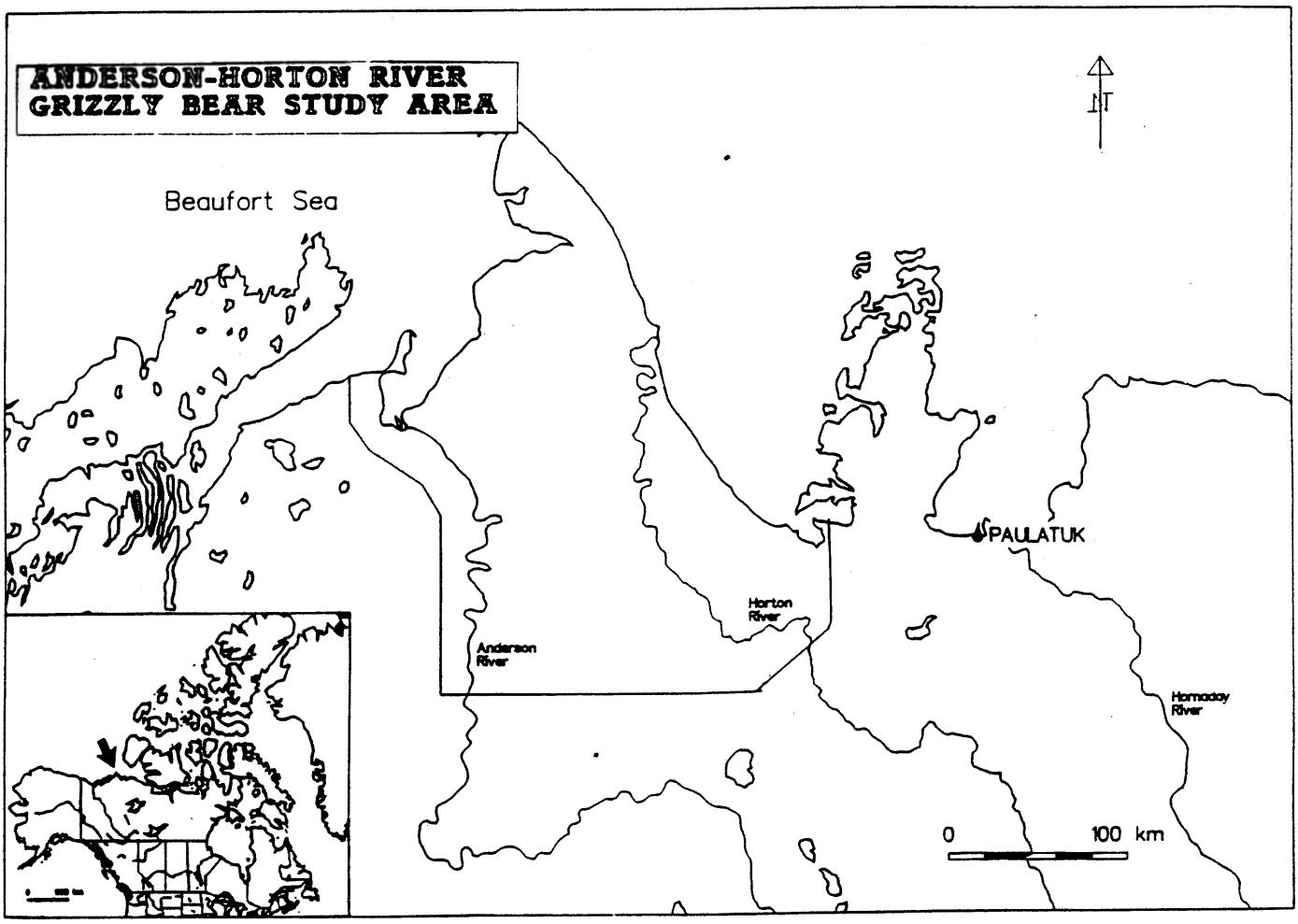

Figure 1. Anderson-Horton rivers grizzly bear study area, 1987-89.

METHODS

In 1989 the study area was divided into 19 zones. Zone size was limited to an area that could be searched at 100% coverage in one day. For ease of navigation, zones were delineated using topographical features such as rivers, creeks and ridges. All zones were systematically searched to locate resident bears. Two aircraft were used, a Pipercub PA12 fixed-wing aircraft and a Bell 206 helicopter. We searched along drainages and followed transects in areas of higher and flatter ground. Transects were spaced at intervals of .5 km to 1.0 km depending on vegetation cover and topography. Each zone was searched once during the capture program. After a zone was covered, the aircraft would move to an adjacent zone and begin searching for bears. We made a low level pass over each bear located to determine if it had previously been equipped with ear-flags or a radio-collar. All bear observations, locations, identities, dates and times were recorded. Unmarked bears were captured and marked (Clarkson and Liepins 1989a and b).

A premolar was removed from all new bears captured and an age was determined by reading cementum layers (Matson's Lab, Milltown, MT.). Matson's Lab estimated ages in years and provided a certainty code (A, B, or C) which identified the reliability of the estimates.

Radio-collars were replaced on adult female grizzly bears captured in 1987 and 1988. In 1989, 2 previously unmarked adult females were equipped with radio-collars. No new bears were collared in 1990. Radio-telemetry surveys were conducted on a monthly basis from May to October, 1989 and 1990. Visual observations were obtained. The location, number of associated young, habitat use and activity of each female located was recorded. Adult females with COY's were located daily from the 20 May to 10 June 1989 to identify areas and habitats used and to determine COY survival.

Mark-recapture data obtained during 1987-89 were used to derive population estimates for 1988 and 1989 for bears > 2 years old (i.e., cubs that were 2 years old are included as they would be 2.4 years old). The location and time of observation of each marked bear was recorded to minimize the chance of a duplicate observation of the same bear during the search effort. The area used to calculate the density estimates was determined by the area searched during capture work and subsequent movements of radio-collared bears. Population estimates were calculated using a modified Lincoln-Peterson equation, with a 95% confidence interval (Pollock et al. 1990) of the form:

$$Nc = \frac{(n1 + 1)(n2 + 1)}{(m2 + 1)} - 1$$

where Nc = population estimate; n1 = number of animals caught, marked, and released during the first sample; n2 = number of animals caught, marked and released and previously marked animals

observed during the second sample; and m_2 = number of marked animals caught or observed in n_2. The precision for the population estimate was expressed as 1-a = .95 C.I. (Seber 1982). Population estimates were derived for spring 1988 and 1989.

COY survival was estimated using the Kaplan-Meier procedure (Pollock et al. 1989).

RESULTS AND DISCUSSION

Capture Data

A total of 85 bears (70 unmarked, 15 marked) was captured during June (78) and August (7), 1989 (Table 1, Appendix 1). Fifteen adult bears (2 male, 13 female) were recaptured from previous years. Radio-collars were placed on 1 previously uncollared adult female, replaced on 12 adult females and 1 adult male, and removed from 1 adult male. In June 1990, 11 bears (5 adult females, 3 adult males, 1 yearling male and 2 male COY's) were captured. Collars were replaced on the five adult females and 1 adult male. No new bears were collared.

A total of 156 grizzly bears (all age classes) was captured during 1987-90. The overall sex ratio of 58 males to 98 females or approximately 1 male to 2 females, is strongly skewed toward females (Table 1). The lower number of adult males in the population is possibly a result of past harvest strategy which selects for males. Grizzly bears are hunted in the spring (April, May) when only the males and females without cubs have emerged from their dens. Males are also selected by hunters because of their larger size. Other factors such as adult male intolerance of other adult males may also contribute to the low male ratio in the population. The sex ratio of COY's approached the expected 1 male to 1 female (Table 1). Table 1 does not include 2 COY's caught in 1990. The large discrepancy between the number of COY's (n=34),

yearlings (n=3) and 2 yr. olds (n=15) captured is probably a result of low cub survival.

Population Estimate

The mark-recapture program was completed in June 1989. The grizzly bear population was estimated to be 137 bears (> 2 yrs. old) (±19, 95% C.I., Precision of 14%) (Table 2), giving a density of 8.8 bears/1000 km^2, or 1 bear/113 km^2 in the study area.

Telemetry Monitoring

Twenty-eight bears were potentially available for radio tracking from May to October 1989; however, not all bears were located. Some bears may have dispersed from the study area or their radio-collars were no longer transmitting. In 1990, 15 radio-collared bears (14 adult female, 1 adult male) were monitored. Table 3 summarizes the status of all collared bears.

Reproductive Rates

During 1989, 21 adult females were monitored. Contact with 7 bears was lost during the year and over the winter hibernating period. Regular monitoring of 14 adult females continued in 1990 (Table 3). Preliminary results show a minimum known successful breeding age of 5.5 years and a maximum known successful breeding

age of 16.5 years. The average observed COY litter size is 2.14 bears (Table 4).

During the intensive monitoring period of 20 May - 10 June 1989, 1 female (G69) lost her 2 COY's. The cause of death was not determined. Subsequently, by the end of July, six other females had lost their COY litters and one female had lost 1 of her 2 COY's (Table 4). Two females, G51 and G86, successfully raised all of their observed COY's to the denning period in the fall of 1989. Only 6 of 21 COY's observed with 10 radio-collared females in 1989, survived to June 1990, giving a survival rate of 29 percent (± 10%, 95% C.I.). Table 4 lists the observed reproductive histories of radio-collared adult females.

Mortality

During 1989 hunters from Paulatuk and Tuktoyaktuk reported a total kill of 9 bears from the study area (7 from the Tuktoyaktuk hunting area, 2 from the Paulatuk area). Four of the bears were tagged (G62, G83, G88, G114). Eight of the bears were reported to be adult males and 1 an adult female. In 1990, 3 bears (males) were taken by hunters (G131, G145, and one unmarked bear). Table 5 lists all of the marked and unmarked bears that were found dead or taken by hunters in the study area from 1987 to 1990. Bear skulls and other harvest information were collected from General Hunting License Holders (GHL) and sport hunters that reported they had killed grizzly bears in the area. Thirteen of the 14 bears

taken by hunters were aged (cementum). The average age of 7 bears taken by GHL holders was 6.14 years, while that for 6 bears taken by sport hunters was 12.5 years. The combined mean age for 13 bears harvested was 9.08 years. All sport hunters were guided by a local hunter's and trapper's committee member.

CONCLUSIONS

Grizzly bear research in the Anderson-Horton rivers area from 1987 to 1990 has provided biological information necessary for bear management in the Inuvialuit Settlement Region. The population estimate completed in 1989 is assisting managers to determine an appropriate harvest quota for the area. The preliminary population estimate of grizzly bears in the study area indicates that the population is large enough to support the existing quota of 5 bears east of the Anderson River. The observations obtained through telemetry monitoring have provided valuable insights into reproductive rates. Monitoring the bear harvest and natural mortality of collared bears is providing information on adult survival. With this information, we can start to understand the ecological parameters that influence the bear population in the area and begin implementing management strategies that will allow for a local harvest of bears without causing long term adverse effects on the bear population.

FUTURE RESEARCH

During the next two years (1991-93) we will continue to monitor grizzly bears to determine reproductive rates and cub survival in the Anderson-Horton rivers area. Collared bears will be located early each spring to determine whether or not they are with COY's or other young, and then monitored later in the year to determine cub survival. We will continue to monitor as many adult females as possible to obtain good information on reproductive rates. If possible the number of bears (14) presently being monitored will be increased by searching for previously radio-collared adult females and equipping them with functional radio-collars.

Table 1. Sex and age classes of unmarked grizzly bears captured in 1987, 1988 and 1989.

Age Class	Female (%)*			Male (%)			Total		
	1987	1988	1989	1987	1988	1989	1987	1988	1989
Adult	21(43)	14(39)	26(37)	10(20)	11(31)	8(11)	31(63)	25(69)	34(49)
SubAd.	2(4)	3(8)	3(4)	1(2)	1(3)	1(1)	3(6)	4(11)	4(6)
2 Yr.	1(2)	1(3)	9(13)	3(6)	2(6)	2(3)	4(8)	3(9)	11(16)
Yearl.	3(6)	1(3)	0	0	0	0	3(6)	1(3)	0
COY	5(10)	0	9(13)	3(6)	3(8)	12(17)	8(16)	3(8)	21(30)
TOTAL	32(65)	19(53)	47(67)	17(35)	17(48)	23(32)	49(99)	36(100)	70(101)

* Percent of entire capture for that year rounded to the nearest whole number and may not always equal 100.

Table 2. Mark-recapture population estimates of grizzly bears (> 2 years) in the Anderson-Horton rivers area, 1987-89.

Year	Total Bears Observed	Marked Bears	Unmarked Bears	Mortality	Population Estimate (95% C.I.)	Precision	Bear Density Bears/1000 sq.^{2}
1987	38	0	39 (25F/14M)	2	0		
1988	44	12	32 (18F/14M)	6	131 ± 47	.36	8.5
1989	87	38	49 (38F/11M)	0	137 ± 19	.14	8.8

Table 3. Status of radio-collared bears monitored in the Anderson-Horton rivers area, September 1990.

Bear No.	Last Cub Count	Cub Age Estimate	Date Initially Collared	Last Location (Month/Year)
G29	0	NA	08/89	05/90
G50	0	NA	09/88	09/90
G51	3	YRLNG	05/87	09/90
G52	0	NA	06/89	06/89
G54[1]	NA	NA	06/87	06/90 - SC
G55	3	YRLNG	05/87	06/89
G64	2	COY	05/87	09/90
G69	0	NA	06/87	09/90
G71	0	NA	06/87	09/90
G72	0	NA	06/87	09/88
G76	3	YRLNG	06/87	09/89
G79	0	NA	06/87	09/90
G85	0	NA	06/87	09/90
G86	2	YRLNG	06/87	09/90
G90[1]	NA	NA	08/87	09/88
G91[1]	NA	NA	08/87	09/89 - SC
G92	0	NA	08/87	06/89
G100	1	YRLNG	06/89	08/90
G104	0	NA	05/88	09/90
G105	0	NA	06/88	09/89
G110	0	NA	05/88	09/90
G112	0	NA	06/88	09/88
G113	0	NA	09/88	06/90 - SC
G115	0	NA	06/89	09/90
G121	1	YRLNG	06/89	09/89
G132	0	NA	06/88	09/89
G135[1]	NA	NA	09/88	05/89
G138	0	NA	06/89	08/90

[1] - male bear,
SC - slipped collar
NA - not applicable

COY - cub of the year
YRLNG - yearling

Table 4. Reproductive histories of radio-collared female grizzly bears, 1987-90.

Age	Bear Number (First Year of Capture) G50 (1987)	G51 (1987)	G63 (1987)	G64 (1987)
0.5	-	-	-	-
1.5	-	-	-	-
2.5	-	-	-	-
3.5	C-NC	-	-	-
4.5	O-NC/C-NC	-	-	-
5.5	O-NC	-	-	-
6.5	O-NC	-	-	C-NC,E
7.5	-	-	-	O,1COY
8.5	-	C-2-2yr	-	O,NC
9.5	-	O-2-3yr,WC	-	O-2COY
10.5	-	O-3COY,C-3-COY	-	-
11.5	-	O-3-1yr	-	-
12.5	-	-	-	-
13.5	-	-	C-WM,NC	-
14.5	-	-	O-M,PCOY	-
15.5	-	-	-	-
16.5	-	-	-	-
17.5	-	-	-	-
18.5	-	-	-	-
19.5	-	-	-	-
20.5	-	-	-	-

Abbreviations:

C - capture	O - observed
COY - cub of the year	P - possible
SC - slipped collar	WC - weaned
E - in estrus	WM - with male
M - mortality	1yr - yearling
NC - no cubs	2yr - 2 year old cub
NE - not in estrus	NO - not observed

Table 4. Reproductive histories of radio-collared female grizzly bears, 1987-90. (continued)

Age	Bear Number (First Year of Capture) G65 (1987)	G67 (1987)	G76 (1987)	G79 (1987)
0.5	-	-	-	-
1.5	-	-	-	-
2.5	-	-	-	-
3.5	-	-	-	-
4.5	-	-	-	-
5.5	-	-	-	-
6.5	-	-	-	-
7.5	-	-	-	-
8.5	-	-	-	-
9.5	-	-	-	-
10.5	-	-	C-NC,E,O-WM	-
11.5	-	-	O-3COY	-
12.5	C-E,NC,WM	-	O-3-1yr,C-3-1yr	-
13.5	O-MCOY	C-E,NC,WM	NO	-
14.5	-	O-3COY,M	-	C-3COY,O-2COY
15.5	-	-	-	O-2-1yr
16.5	-	-	-	O-2-2yr
17.5	-	-	-	-
18.5	-	-	-	-
19.5	-	-	-	-
20.5	-	-	-	-

Abbreviations:

C - capture	O - observed
COY - cub of the year	P - possible
SC - slipped collar	WC - weaned cub
E - in estrus	WM - with male
M - mortality	1yr - yearling
NC - no cubs	2yr - 2 year old cub
NE - not in estrus	NO - not observed

Table 4. Reproductive histories of radio-collared female grizzly bears, 1987-90. (continued)

Age	Bear Number (First Year of Capture) G85 (1987)	G86 (1987)	G92 (1987)	G100 (1988)
			(zygo age)	
0.5	-	-	-	-
2.5	-	-	-	-
3.5	-	-	-	-
4.5	-	-	-	-
5.5	-	-	-	-
6.5	-	-	-	-
7.5	-	-	-	-
8.5	-	-	-	-
9.5	C-NC,E	-	-	-
10.5	NO	-	C-NC	-
11.5	C-NC	-	0-NC,WM	-
12.5	0-NC	-	0-3COY,0-NC	-
13.5	-	-	NO	-
14.5	-	-	-	-
15.5	-	C-1-2yr,E	-	-
16.5	-	0-1-3yr,0-WM,WC	-	C-NC,E
17.5	-	C-2COY	-	C-2COY,0-1COY
18.5	-	0-2-1yr	-	0,C-1-1YR
19.5	-	-	-	-
20.5	-	-	-	-

Abbreviations:

C - capture	0 - observed
COY - cub of the year	P - possible
SC - slipped collar	WC - weaned cub
E - in estrus	WM - with male
M - mortality	1yr - yearling
NC - no cubs	2yr - 2 year old cub
NE - not in estrus	NO - not observed

Table 4. Reproductive histories of radio-collared female grizzly bears, 1987-90. (continued)

	Bear Number (First Year of Capture)			
Age	G104 (1988)	G105 (1988)	G115 (1988)	G121 (1988)
0.5	-	-	-	-
1.5	-	-	-	-
2.5	-	-	-	-
3.5	-	-	-	-
4.5	-	-	-	-
5.5	-	-	-	-
6.5	C-NC,E,O-WM	-	-	-
7.5	O-NC,WM	-	-	-
8.5	-	-	-	-
9.5	-	-	-	C-3COY
10.5	-	-	-	O-2-1yr,1-1yr
11.5	-	-	C-2-5yr,E,NC	NO
12.5	-	-	C-1COY,NC	-
13.5	-	-	C-2COY	-
14.5	-	C-3-2yr	-	-
15.5	-	O-WC,WM	-	-
16.5	-	NO	-	-
17.5	-	-	-	-
18.5	-	-	-	-
19.5	-	-	-	-
20.5	-	-	-	-

Abbreviations:

C - capture
COY - cub of the year
SC - slipped collar
E - in estrus
M - mortality
NC - no cubs
NE - not in estrus
O - observed
P - possible
WC - weaned cub
WM - with male
1yr - yearling
2yr - 2 year old cub
NO - not observed

Table 4. Reproductive histories of radio-collared female grizzly bears, 1987-90. (continued)

Age	Bear Number (First Year of Capture) G132 (1988)	G133 (1989)	G138 (1989)
0.5	-	-	-
1.5	-	-	-
2.5	-	-	-
3.5	-	-	-
4.5	-	-	-
5.5	-	-	-
6.5	C-NC,E	-	-
7.5	O-NC,WM	-	-
8.5	NO	-	-
9.5	-	-	-
10.5	-	-	-
11.5	-	-	-
12.5	-	-	-
13.5	-	-	-
14.5	-	-	-
15.5	-	-	
16.5	-	-	-
17.5	-	-	C-3COY,NC
18.5	-	C-1-1yr,SC	O-NC,WM
19.5	-	-	-
20.5	-	-	-

Abbreviations:

C - capture	O - observed
COY - cub of the year	P - possible
SC - slipped collar	WC - weaned cub
E - in estrus	WM - with male
M - mortality	1yr - yearling
NC - no cubs	2yr - 2 year old cub
NE - not in estrus	NO - not observed

Table 5. Known grizzly bear mortalities (2 years and older) in the study area, 1987-89.

Bear	Age	Sex	Cause	Location	Date Month/Year
UM	5	F	Problem/GHL	Rendezvous Lake	10/87
UM	5	M	Sport	Rendezvous Lake	5/88
G63	14	F	Natural	Anderson River	6/88
G65	12	F	Natural	Anderson River	6/88
G67	18	F	Natural	Anderson River	6/88
G87	3	F	Natural	Horton River	7/88
UM	Ad	M	GHL	Whale Bluff	4/89
UM	4	M	GHL	Stantons	4/89
G62	14	M	GHL	Anderson River	5/89
UM	5	F	GHL	Anderson River	5/89
UM	8	M	Sport	Rendezvous Lake	5/89
G88	20	M	Sport	West River	5/89
G83	14	M	Sport	Langton Bay	5/89
G114	16	M	Sport	Langton Bay	5/89
UM	2	M	GHL	Anderson River	9/89
UM	5	M	GHL	Anderson River	4/90
G145	8	M	GHL	Anderson River	5/90
G131	12	M	Sport	Horton River	5/90

Abbreviations:
F - female
M - male
Ad - adult
Sport - guided sport hunter
UM - unmarked bear
Problem - problem bear
Natural - natural mortality
GHL - General hunting license holder

ACKNOWLEDGEMENTS

The work accomplished and success achieved during the third year of bear research is due to the assistance and cooperation received from many people. We are grateful to everyone who contributed to the project and look forward to working with them in the future. Members of the Wildlife Management Advisory Council, NWT, Inuvialuit Game Council, and Hunter's and Trapper's Committees of Tuktoyaktuk, Paulatuk and Inuvik, have contributed to the research with their interest, cooperation and input.

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Appendix 1. Grizzly bears captured in the Anderson-Horton rivers area from 1987 to 1990.

Bear No.	Sex	Cementum Age (Field Age Est.)	Bear Tag/ Tattoo	Ear Flag Colour	Location
G29	F	11	G29	RY-RY	M.R
G30	F	5	G30	RW-RW	H.R
G31	F	9	G31	RY-RY	H.R
G32	F	2	G32	YR-YR	H.R
G34	F	2	G34	YR-YR	H.R
G35	F	9	G35	RY-RY	H.R
G40	F	17	G40	YR-YR	H.R
G41	M	2	G41	RB-RB	W.R
G42	F	(2)	G42	RY-YR	W.R
G43	F	2	G43	RY-YR	W.R
G44	F	19	G44	RY-RY	M.R
G45	F	(2)	G45	Y-R	M.R
G46	F	(2)	G46	R-Y	M.R
G47	F	6	G47	RY-RY	H.R
G48	F	10	G48	RY-RY	H.R
G49	F	2	G49	YR-YR	H.R
G50	F	3	G50/8701	W-W	A.R
G51	F	8	G51/8702	R-R	A.R
G52	F	2	G52/8703	Y-Y	A.R
G53	M	(2)	G53/8704	B-B	A.R
G54	M	8	G54/8754	W-B	A.R
G55	F	8	G55/8755	W-R	A.R
G56	F	0	G56/8756	-R	A.R
G57	F	0	G57/8757	Y-	A.R
G58	F	0	G58/8758	-W	A.R
G59	F	14	G59/8759	B-W	A.R
G60	M	0	G60/8760	B-	A.R
G61	F	0	G61/8761	-W	A.R
G62	M	10	G62/8762	Y-B	A.R
G63	F	13	G63/8763	G-W	A.R
G64	F	6	G64/8764	G-B	A.R
G65	F	11	G65/8765	R-G	A.R
G66	M	3	G66/8766	R-Y	A.R
G67	F	17	G67/8767	G-G	A.R
G68	F	5	G68/8768	Y-W	A.R
G69	F	5	G69/9768	Y-G	A.R
G70	M	2	G70/8770	B-R	W.R
G71	F	15	G71/8771	Y-R	W.R
G72	F	4	G72/8772	W-Y	H.R
G73	F	(1)	G73	W-R	H.R
G74	F	4	G74/8774	B-Y	H.R
G75	F	3	G75/8775	W-G	H.R
G76	F	10	G76/8776	R-B	H.R
G77	M	12	G77/8777	B-G	H.R
G78	F	5	G78/8778	G-R	H.R
G79	F	14	G79/8779	G-Y	C.C

Ad. - Adult (5 yrs. and older) based on tooth eruption and wear as bear was not aged.
F - female
M - male
Ear Flag Colours - R - red, Y - yellow, W - white, B - blue, G - green
Location Abbreviations:
A.B - Argo Bay
A.R - Anderson River
B.L - Bakere Lake
C.C - Coal Creek
H.R - Horton River
M.R - Mason River
W.R - West River
S.H - Smoking Hills

Appendix 1. Grizzly bears captured in the Anderson-Horton rivers area from 1987 to 1990. (continued)

Bear No.	Sex	Cementum Age (Field Age Est.)	Bear Tag/ Tattoo	Ear Flag Colour	Location
G80	F	0	G80/8780	-R	C.C
G81	M	0	G81/8781	-R	C.C
G82	F	0	G82/8782	-G	C.C
G83	M	14	G83/8783	R-R	H.R
G84	M	13	G84/8784	W-W	H.R
G85	F	9	G85/8785	R-Y	H.R
G86	F	15	G86/8786	W-Y	H.R
G87	F	1	G87/8787	G-G	H.R
G88	M	20	G88/8788	Y-Y	A.R
G89	M	18	G89/8789	W-R	A.R
G90	M	9	G90/8790	R-R	A.R
G91	M	9	G91/8791	B-B	S.H
G92	F	2	G92/8792	RW-RW	S.H
G93	F	9	G93	BW-BW	S.H
G94	F	(1)	G94	GW-GW	S.H
G95	M	17	G95/8795	YW-YW	S.H
G96	F	11	G96/8796	BY-BY	S.H
G97	F	(Ad)	G97/8797	GR-GR	S.H
G98	M	(2)	G98/9798	GY-GY	S.H
G100	F	16	G100/8800	Y-Y	A.R
G101	F	3	G101/8801	Y-W	W.R
G102	M	8	G102/8802	G-G	W.R
G103	M	6	G103/8803	W-W	W.R
G104	F	6	G104/8804	Y-Y	W.R
G105	F	14	G105/8805	Y-Y	H.R
G106	F	(2)	G106/8806	Y-Y	H.R
G107	M	2	G107/8807	G-W	H.R
G108	M	(2)	G108/8808	G-R	H.R
G109	M	15	G109/8809	B-B	H.R
G110	F	8	G110/8810	Y-Y	H.R
G111	M	10	G111/8811	G-G	S.H
G112	F	7	G112/8812	Y-Y	C.C
G113	M	18	G113/8813	G-G	C.C
G114	M	16	G114/8814	G-G	S.H
G115	F	11	G115/8815	Y-Y	H.R
G116	F	5	G116/8816	Y-W	H.R
G117	F	5	G117/8817	W-Y	H.R
G118	F	11	G118/8818	Y-Y	H.R
G119	F	3	G119/8819	Y-W	H.R
G120	F	3	G120/8820	W-Y	H.R
G121	F	9	G121/8821	Y-Y	H.R
G122	M	0	G122/8822	---	H.R
G123	M	0	G123/8823	---	H.R
G124	M	0	G124/8824	---	H.R
G125	F	5	G125/8825	Y-Y	H.R
G126	F	8	G126/8826	Y-Y	S.H

Ad. - Adult (5 yrs. and older based on tooth eruption and wear as bear was not aged.
F - female
M - male
Ear Flag Colours - R - red, Y - yellow, W - white, B - blue, G - green

Location Abbreviations:
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Appendix 1. Grizzly bears captured in the Anderson-Horton rivers area from 1987 to 1990. (continued)

Bear No.	Sex	Cementum Age (Field Age Est.)	Bear Tag/ Tattoo	Ear Flag Colour	Location
G127	M	23	G127/8827	G-G	W.R
G128	M	10	G128/8828	G-G	A.R
G129	M	3	G129/8829	G-W	W.R
G130	M	15	G130/8831	G-G	A.R
G131	M	10	G131/8831a	G-G	H.R
G132	F	6	G132/8832	Y-Y	A.R
G133	F	(Ad)	G133/8833	Y-Y	S.H
G134	F	(1)	G134/8834	Y-W	S.H
G135	M	(Ad)	G135/8835	G-R	S.H
G136	F	7	G136/8936	W-W	A.R
G137	M	11	G137/8937	WB-WB	A.R
G138	F	15	G138/8938	RW-RW	S.H
G139	M	0	G139	-R	S.H
G140	M	0	G140	R-	S.H
G141	F	0	G141	-Y	S.H
G142	M	0	G142	-Y	H.R
G143	M	0	G143	-W	H.R
G144	F	10	G144	Y-	H.R
G145	M	7	G145/8945	BW-BW	H.R
G146	F	3	G146	RW-RW	H.R
G147	F	11	G147/8947	RW-RW	H.R
G148	M	13	G148	BR-BR	H.R
G149	F	9	G149	RW-RW	H.R
G150	F	13	G150	YW-YW	H.R
G151	F	0	G151	Y-	H.R
G152	M	0	G152	R-	H.R
G153	F	7	G153	RY-RY	H.R
G154	M	10	G154	BW-BW	H.R
G155	M	10	G155	WB-WB	H.R
G156	F	2	G156	RW-RW	W.R
G157	F	4	G157	RW-RW	H.R
G158	F	12	G158	RW-RW	H.R
G159	M	0	G159	G-	H.R
G160	F	0	G160	R-	H.R
G161	F	0	G161	-Y	H.R
G162	F	8	G162	RW-RW	H.R
G163	M	0	G163	-R	H.R
G164	F	0	G164	Y-	H.R
G165	F	14	G165	RW-RW	C.C
G166	F	(2)	G166	W-RW	C.C
G167	F	12	G167	RW-BW	W.R
G168	F	6	G168	RW-RW	W.R
G169	F	12	G169	RW-RW	H.R
G170	M	8	G170	B-	H.R
G171	M	0	G171	-B	H.R
G172	M	0	G172	-B	H.R
G173	F	0	G173	RW-RW	H.R

Ad. - Adult (5 yrs. and older based on tooth eruption and wear as bear was not aged
F - female
M - male
Ear Flag Colour - R - red, Y - yellow, W - white, B - blue
G - green
Location Abbreviations:
A.B - Argo Bay
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H.R - Horton River
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A.R - Anderson River
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Appendix 1. Grizzly bears captured in the Anderson-Horton rivers area from 1987 to 1990. (continued)

Bear No.	Sex	Cementum Age (Field Age Est.)	Bear Tag/ Tattoo	Ear Flag Colour	Location
G174	F	15	G174	RW-RY	C.C
G175	M	3	G175	BW-BW	C.C
G176	M	12	G176	BW-BW	M.R
G177	F	6	G177	RW-RW	B.L
G178	M	5	G178	BW-BW	B.L
G179	M	8	G179	BW-BW	H.R
G180	F	(2)	G139/140	RY-RW	H.R
G181	F	0	G141	-W	H.R
G182	M	0	G142	W-	H.R
G183	F	13	G143/144	WR-WR	H.R
G184	M	0	G151	G-	H.R
G185	F	8	G160/161	RW-RW	H.R
G186	F	0	G162	-Y	H.R
G187	F	0	G163	Y-	H.R
G188	F	(2)	G170/171	YR-YR	H.R
G190	M	0	G181	-B	H.R
G191	M	0	G180	B-	H.R

Ad. - Adult (5 yrs. and older) based on tooth eruption and wear as bear was not aged.
F - female
M - male
Ear Flag Colour - R - red, Y - yellow, W - white, B - blue, G - green

Location Abbreviations:
A.B - Argo Bay
A.R - Anderson River
B.L - Bakere Lake
C.C - Coal Creek
H.R - Horton River
M.R - Mason River
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