

AN ECOLOGICAL STUDY OF THE GRIZZLY BEAR

Fifth Annual Report
Summary of Work Accomplished
1959 - 1963

NOT FOR PUBLICATION

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INTRODUCTION

A six year ecological study of the grizzly bear (Ursus arctos horribilis) was initiated in 1959 and has been coordinated through the Montana Cooperative Wildlife Research Unit at Montana State University.

Grizzly bears have disappeared from much of their former range in the United States. There is need for detailed ecological studies of this large carnivore if it is to be preserved and intelligently managed. This has been recognized for some time, but formidable obstacles have prevented intensive research. Some of these problems have been:

1. Overcoming the tremendous physical task of gathering data and supplying an operation over thousands of square miles of wilderness grizzly habitat.
2. Locating a grizzly bear population sufficiently large and localized that quantitative data could be obtained.
3. Adapting and improving methods of immobilizing wild bears for detailed inspection and measurement.
4. Developing a method or methods of marking grizzlies so individuals and known-age animals could be observed in the field.

After much fruitless searching in Montana for a suitable study site, Yellowstone National Park was investigated and found to have a relatively large population of grizzlies sufficiently free of artificiality that fundamental biological data could be obtained on a quantitative basis. Advantages of the Yellowstone area are that grizzlies are numerous, readily observed, and can be studied both in the vicinity of man and in the back country - a situation that has yielded basic ecological data as well as information on the interrelations of this large carnivore with man. The National Park Service indicated interest in a proposal for research and offered to cooperate in the study.

During the past five years field work has begun the last of May and terminated in early November. Quarterly and annual reports of the Montana Cooperative Wildlife Research Unit have reported on previous work accomplished. This report is primarily a compilation of data with no attempt at this time to fully interpret the data or to arrange it for eventual publication. Some findings and conclusions have been presented in technical papers as the study progressed. The gross results of the investigations from 1959 through 1963 are here summarized for the benefit of financial supporters and the research team. The findings presented are tentative and cannot be considered as final conclusions.

GENERAL RESEARCH METHODS AND TECHNIQUES

Capturing and Marking

Methods of Capture:

Two hundred nineteen grizzlies have been captured in culvert traps and 53 have been shot free-ranging in the field with a CO₂ gun using drug-laden propulsive syringes. Methods of capture for the five years are summarized in Table I.

Trapping Success:

Trapping success (for culvert traps) for all five years is presented in Table II. An increase in trapping success occurred this year over that of 1962 (Table II). It was partially explained by the number of young bears, mainly yearlings, present in the population and subsequently captured (Table IX).

Number of Bears Captured:

One hundred and sixty-five different individuals have been captured and marked since field work began in 1959.

Twenty-four new individuals were trapped during the 1963 season, immobilized, individually marked, weighed, measured, and released. Of the 24 bears captured, 12 were males and 12 were females. Seven cubs and nine yearlings were among those captured.

Table I

Summary, Method of Capture 1959-1963

Year	Total No. Bears Handled (Initial Capture and Recaptures)	Total No. Trapped	Total Number Shot Free Ranging
1959	33	27	6
1960	64	56	8
1961	95	74	21
1962	35	29	6
1963	55	33	22
Totals	282	219	63

Table II

Trapping Success (Culvert Traps) 1959-1963

Year	Trap Nights	Successful Trap Nights	Percent Trapping Success
1959	21	14	66.7
1960	71	51	71.8
1961	77	46	59.7
1962	75	24	32.0
1963	68	28	41.2

A summary of the number of bears captured and marked since the start of the study is presented in Table III. Table III also shows the number of marked bears known to be dead and those considered dead (or unmarked). Thus, out of 165 marked bears, 81 were theoretically in the population during the summer of 1963, of which 67 were observed one or more times.

Table III

Marked Grizzlies and the Number of Marked Bears
Theoretically in the Population in 1963

Year	No. Marked	No. Known Dead	No. Considered Dead or Unmarked*	No. of Marked Bears Theoretically in 1963 Population	No. Observed in 1963	No. not Observed in 1963
1959	31	11	9	11	9	2
1960	47	14	19	14	12	2
1961	44	9	17	18	12	6
1962	19	4		15	11	4
1963	<u>24</u>	<u>1</u>	<u>—</u>	<u>23</u>	<u>23</u>	<u>—</u>
Totals	165	39	45	81	67	14

*Bears that have not been observed or retrapped for two or more years are considered to have lost their markings or to have died - they are not considered in population figures.

Marking:

At the inception of the study it was recognized that any single marking technique would not prove entirely effective. Accordingly two separate systems were used with the assumption that where one might fail the other would remain intact and vice versa. This assumption has proved correct and to date practically all bears that have been marked and subsequently observed have been individually identifiable by either colored markers, colored ear tags, or a combination of both.

Varying the placement of the colored aluminum ear tags has proved even more useful than was originally anticipated for identifying bears that have lost all other markers. Retention of these metal tags has been excellent - very few properly placed tags have been lost. Some have been worn by the bears for more than 48 months.

Polyvinyl tape, the first material used experimentally as a color marker, has been placed on 67 bears. Retention of this material is recorded in Table IV. Unfortunately, this highly visible tape is not so durable as some other materials.

The use of Herculite, a nylon-impregnated fabric, was discontinued in 1962 after one year of use because this material was not so visible as other materials in use. Durability, however, was reasonably good. Twenty-two bears were marked in one or both ears with 31 Herculite markers in 1961. The 22 bears observed in 1962 still retained 23 Herculite markers, only eight having been lost (Table IV). The following year, however, only one of nine markers remained intact.

Polyethylene braided rope (1/4" size) has proved to be the most durable color-marker material used to date. Since 1960, 59 bears have been marked with this material. Although the observability of this material is not so good as polyvinyl tape, it is sufficiently visible for most field conditions and the relative loss of observability is more than compensated for by its excellent wearing qualities. To improve visibility one to two inch "flags" of polyvinyl tape were attached to the rope marker. This combination has proved to be the best marking method used to date. Polyethylene rope collars were used experimentally on several bears. These were retained over a year until removed. A similar collar using Saf-T-Flag streamers was used on elk and has proved extremely effective.

Adult male bears were not color marked but were marked with metal ear tags and were tattooed.

An evaluation of the durability of the different materials used for marking grizzlies appears in Table IV. This table evaluates only those markers worn by bears observed in the field or those recaptured. The column "Number of Markers" refers only to those markers observed on bears the year after they were marked - it does not include markers on bears that were not observed or recaptured in succeeding years. The possibility exists that some bears lost all their markers and were not identified. It is believed, however, that this possibility is slight.

TABLE IV

EVALUATION OF DURABILITY OF COLOR-MARKING
MATERIALS FROM OBSERVATIONS OF COLOR-MARKED BEARS
1959-1963

Marking Material	No. of Bears With Markers	No. of Markers	Markers Intact		Markers Broken But Visible		Markers Lost	
			Number	Per Cent	Number	Per Cent	Number	Per Cent
<u>POLY-VINYL TAPE</u>								
One Year	67	116	40	34.5	30	25.9	46	39.7
Two Years	35	65	19	29.2	8	12.3	38	58.5
Three Years	17	33	0	0.0	7	21.2	26	78.8
Four Years	4	7	0	0.0	0	0.0	7	100.0
<u>POLYETHYLENE ROPE</u>								
One Year	27	32	32	100.0	0	0.0	0	0.0
Two Years	7	8	8	100.0	0	0.0	0	0.0
Three Years	1	2	2	100.0	0	0.0	0	0.0
<u>HERCULITE</u>								
One Year	22	31	23	74.2	0	0.0	8	25.8
Two Years	7	9	1	11.1	0	0.0	8	88.9

Table IV shows that 39.7 percent of the polyvinyl tape markers were lost after one year. This figure increased to 58.5 percent at the end of two years and to 78.8 percent after three years. All polyvinyl markers (100 percent) were lost within four years. This loss of color plastic markers did not present a serious problem in making individual field identifications of bears. The colored ear tags were retained and by using the alternate system of colored metal ear tags, those that had lost color markers were all readily identified.

To date, none of the polyethylene rope markers have been lost; some have been worn for more than three years. Eight, or 25.8 percent, of the 31 Herculite markers were lost after one year, and after two years, only one of nine markers remained intact.

A detailed evaluation of the durability of color-marking materials, by specific years, is presented in the Appendix.

Tattoo:

Except for a few individuals, all bears were tattooed in the upper lip or behind the foreleg. This permanent mark has proved very helpful in identifying bears that have been shot by hunters and the hides turned in to taxidermists. Two bears killed by hunters outside the Park, No. 32 in 1961 and No. 69 in 1962, were positively identified by the tattoo alone. Tattoos properly placed four years ago are still easily readable - they are expected to remain identifiable for the life of the bear.

Recaptures:

Table V shows the number of individual bears recaptured and the total number of recaptures from 1959 through 1963. The 115 recaptures have yielded valuable data on growth rates, fat deposition, dentition development, and movement on 83 individual grizzlies. Both the number of individuals recaptured and the total number of recaptures reached a peak in 1961. During 1963, 24 grizzlies were recaptured; of these, two were marked in 1959, nine in 1960, two in 1961, five in 1962, and six in 1963.

Table V

Summary of the Number of Bears Recaptured, 1959-1963

Year	No. Individuals Recaptured	Total No. of Recaptures
1959	3	3
1960		
Bears marked in 1959	6	7
Bears marked in 1960	7	10
1961		
Bears marked in 1959	8	10
Bears marked in 1960	12	25
Bears marked in 1961	10	15
1962		
Bears marked in 1959	1	2
Bears marked in 1960	4	5
Bears marked in 1961	6	6
Bears marked in 1962	2	3
1963		
Bears marked in 1959	2	3
Bears marked in 1960	9	11
Bears marked in 1961	2	3
Bears marked in 1962	5	5
Bears marked in 1963	<u>6</u>	<u>7</u>
Total	83	115

Immobilizing and Anesthetizing

The techniques of immobilizing and anesthetizing have gradually been improved and perfected. Succinylcholine chloride (brand name - "Sucostrin") may be administered singly for brief immobilization or in combination with pentobarbital sodium for anesthetization. Table VI shows dosages by age groups for immobilization only or immobilization followed by anesthetization. Briefly, the latter procedure consists of estimating the bear's weight, computing a dosage of succinylcholine chloride at about 1 mg. (100 mg. per cc solution) for every six pounds of body weight (Table VI). The succinylcholine chloride is administered intramuscularly and when the effects have begun to "wear off" pentobarbital sodium is administered by intra-pulmonary injection. The dosage of pentobarbital sodium (250 mg. per cc. solution) is also calculated on a basis of body weight and averages about

cc for every 16 pounds of body weight (Table VI). Individuals vary considerably in their reaction to these drugs and tolerance may be affected by age, physical condition, stress and other factors.

Data concerning average dosages administered to different age classes and the number of individuals handled in each age class for all five years also appear in Table VI. Twenty-eight dosages of succinylcholine chloride only and 34 dosages of succinylcholine chloride followed by pentobarbital sodium were administered in 1963. This brings the five-year total of successful druggings of grizzlies of all ages and sizes to 310.

Table VII compares the dosages of succinylcholine chloride administered to free-ranging bears and those administered to bears captured in culvert traps. Trapped bears have consistently required lighter doses than free-ranging bears. This is believed to be related to stress.

"Sernylan", a fast-acting tranquilizer, was administered experimentally to two black bears and two grizzlies. Dosages were established for this drug and its capabilities for future application were explored.

One death in 1963 was caused by an overdose of drugs. No. 75, an old female, prematurely recovered from an initial dose of succinylcholine chloride and jeopardized the research team. Of necessity she was injected a second time, became immobilized and died 43 minutes later. The observers believe that this bear's age, combined with an accumulation of drugs beyond the tolerance level, caused her death.

No. doses administered	28	34
Avg. dosage, mg. per lb. body wt.	1:4.9	1:7.5
Totals:		
No. doses administered	59	149
Avg. dosage, mg. per lb. body wt.	1:5.0	1:7.0

Table VI

Average Drug Dosages Administered to Different Age Grizzly Bears 1959 - 1963

Succinylcholine Chloride Only*

Succinylcholine Chloride Followed by
Pentobarbital Sodium**

Age	No. Doses Admin.	Avg. Dosage, Mg. per Lb. Body Wt.	No. Doses Admin.	Avg. Dosage, Succinylcholine Mg. per Lb. Body Wt.	Avg. Dosage, Pentobarbital cc per Lb. Body Wt.
Cubs	28	1:4.6	32	1:6.5	1:16.3
Yearlings	20	1:4.4	32	1:6.1	1:15.8
Two yr. olds	17	1:5.5	22	1:6.5	1:16.5
Three yr. olds	9	1:6.1	12	1:6.9	1:17.2
Four yr. olds	3	1:4.9	4	1:5.5	1:13.9
Young adults	11	1:5.2	18	1:7.1	1:17.4
Adults	<u>58</u>	1:4.9	<u>44</u>	1:6.4	1:16.6
	146		164		

*Succinylcholine Chloride: 100 mg. per cc solution

**Pentobarbital Sodium : 250 mg. per cc solution

Table VII

Comparison of Dosages of Succinylcholine Chloride Administered to Free-Ranging Bears and Trapped Bears (All Age Classes), 1961-1963

	Free-Ranging Bears	Trapped Bears
1961		
No. doses administered	25	85
Avg. Dosage, mg. per lb. body wt.	1:4.0	1:6.4
1962		
No. doses administered	6	30
Avg. dosage, mg. per lb. body wt.	1:6.1	1:7.0
1963		
No. doses administered	28	34
Avg. dosage, mg. per lb. body wt.	1:4.9	1:7.5
Totals:		
No. doses administered	59	149
Avg. dosage, mg. per lb. body wt.	1:5.0	1:7.0

Concentration and Dispersal

Grizzlies in Yellowstone move long distances to major summer ranges or summering areas. This movement begins in May and early June, reaching a peak about the first of July. The movement is in response to "artificial" food at garbage dumps and to an abundance of natural food on the summer ranges. The latter appears to be the basic attraction bringing numbers of grizzlies to the extensive summer range areas and the former tends to concentrate them within these areas. There now seems to be little doubt but that Hayden Valley and other ecologically similar areas in Yellowstone would support large summering populations of grizzlies whether "artificial" food at garbage dumps was available or not.

As in 1962, heavy and frequent precipitation throughout early summer produced lush vegetation. The abundance and the luxuriant growth of many of the choice plants used by grizzlies was thought to be an important factor in keeping them relatively dispersed throughout the summer range during 1962. A similar condition, however, did not appear to disperse the bears during the summer of 1963. More information is needed to better define the relations between availability of natural foods and the distribution of grizzlies, particularly during the summer months.

The Yellowstone area experienced an unusually mild autumn season in 1963. Dispersal began in mid-August and by mid-October very few bears were frequenting the Trout Creek area. White-bark pine nuts, so abundant in the fall of 1962, were practically non-existent in the fall of 1963. There were, however, near-plague populations of meadow voles (Microtus sp) throughout the Park. Examination of droppings during the fall showed that grizzlies were utilizing this food source to a large extent. Corms of Melica spectabilis were also utilized heavily during September and October. The abundance of major food items has varied from one fall season to the next. The grizzlies readily adapt to take advantage of food sources and their diets strikingly reflect their versatility as foragers. In October, 1962,

Grizzlies were found on the high ridges between 8,000 and 9,000 feet, feeding exclusively on pine nuts. In the fall of 1963 they were observed feeding almost entirely in meadows and in lower open areas where meadow voles and tuberous plants were abundant. They remained in these areas until heavy snow fell the first week in November.

Enumeration of the Population

Direct counts at the concentration sites and in other areas of the Park were again used to determine minimum population figures. Censuses for all five years are presented in Table VIII. In 1963 a total of 177 different individuals was recorded - a slight increase over the 1959 through 1962 average of 161. This increase occurred entirely in the Trout Creek segment of the population - 116 grizzlies were recorded in 1963 as compared to a four-year average of 98. This increase in numbers may be explained, at least in part, by the greater survival of yearlings (cubs in 1962). Among 26 cubs present in 1962, 21 were accounted for as yearlings in 1963. This constitutes a survival rate of 81 percent as compared with 50 percent for the three preceding years. Twenty-seven cubs were tallied which also represents a new high for the Trout Creek area.

Classified Counts

Classified counts have been made since the start of the study. Cubs of the year (5-9 months), yearlings (17-21 months), two-year-olds (29-33 months), three- or four-year-olds or young adults (41-45 and 53-57 months) and adults (65 months and over) have been recognized in the field. Early in the study some difficulty was experienced in classifying bears in the middle age classes. During the past three years, however, aging criteria obtained from known-age marked bears have been used to separate the two-, three-, and four-year-olds.

TABLE VIII
CENSUS OF GRIZZLY BEARS
1959-1963

Site	1959		1960		1961		1962		1963	
	No. Counts	No. Bears	No. Counts	No. Bears	No. Counts	No. Bears	No. Counts	No. Bears	No. Counts	No. Bears
Trout Creek	17	96	24	98	31	98	31	98	26	116
Rabbit Creek	2	22	6	40	7	31	5	29	3	31
W. Yellowstone	2	27	3	16	4	19	2	7	3	13
Gardiner	2	9	2	9	2	10	2	11	1	10
Thumb Area	-	-	2	4	1	4	1	8	1	5
Pelican Cr. Area*	-	-	-	2	-	4	-	2	-	2
Totals:	23	154	37	169	45	166	41	155	34	177

*No counts made; bears trapped.

Age structure of the population throughout Yellowstone National Park for the years 1959-1963, is presented in Table IX. The age classification at the different concentration sites for the past three years is presented in Table X.

Age and sex of all bears marked since 1959 are presented in Table XI. These data show a sex ratio of 1:1 and an age classification quite similar to that obtained from the classified counts of all bears (Table IX). This would indicate that the average age structure of the population has been accurately determined. These data will be subjected to statistical analysis when the study has terminated. A comparison of the age composition of marked bears to that of the average total population is made in Table XII.

Table XIII shows the number of bears in each age class and the percent of the total population comprised by each age class during 1963. This is based on a total population of 177, the number of bears actually observed. Theoretically, 81 or 45.9 percent of the 1963 population were marked; of these, 67 or 82.7 percent of marked bears theoretically in the population were actually observed.

Productivity

The number of females with cub or yearling litters recorded throughout Yellowstone for the past five years are presented in Table XIV.

During 1963, sixteen females were recorded with 40 cubs. This constitutes an average litter size of 2.5, the highest yet recorded. Five-year totals show a ratio of 77 females to 170 cubs for an average litter size of 2.21. Of 17 females with cubs in 1962, only seven of these females were observed with their yearlings in 1963. During the five years of study only 29 females with 66 yearlings (average litter size of 2.28) have been observed. (This, however, does not include those offspring weaned as yearlings). Five-year totals show that 170 cubs have been observed and recorded, but only 95 yearlings (Table XV). Table XV includes weaned yearlings. We have evidence that mortality and dispersal account for a large number of young bears in their second year of life, particularly those weaned as yearlings.

TABLE IX

AGE STRUCTURE OF THE POPULATION THROUGHOUT
YELLOWSTONE NATIONAL PARK, 1959-1963

Age	No. of Indiv. 1959	Percent of Total	No. of Indiv. 1960	Percent of Total	No. of Indiv. 1961	Percent of Total	No. of Indiv. 1962	Percent of Total	No. of Indiv. 1963	Percent of Total	Average Percent for 5-year period*
Cubs	26	16.9	35	20.8	30	18.1	39	25.2	40	22.1	20.1
Yearlings	23	14.9	15	8.9	17	10.2	13	8.4	29	16.5	11.3
Two Years	17	11.0	5	2.9	17	10.2	9	5.8	11	6.3	7.1
Young Adults	--	----	12	7.2	23	13.9	35	22.6	25	14.2	14.2
Adults	88	57.2	102	60.3	79	47.6	59	38.0	72	40.9	47.3
	—	—	—	—	—	—	—	—	—	—	—
	154	100.0	169	100.0	166	100.0	155	100.0	177	100.0	100.0

*Computed from average total population of 169 (see Table XII).

TABLE X

RESULTS OF CLASSIFICATION COUNTS
BY AREAS
1961-1963

Site	Cubs			1 year			2 years			3, 4, 5 years			Adults			Total		
	'61	'62	'63	'61	'62	'63	'61	'62	'63	'61	'62	'63	'61	'62	'63	'61	'62	'63
Trout Creek	18	25	27	9	12	21	11	3	8	14	19	14	46	39	46	98	98	116
Rabbit Creek	6	8	8	--	1	2	3	--	3	4	7	6	18	13	12	31	29	31
West Yellow-stone	6	--	5	--	--	--	3	--	--	--	4	--	10	3	8	19	7	13
Gardiner	--	3	--	4	--	3	--	3	--	4	2	5	2	3	2	10	11	10
Thumb Area	--	3	--	2	--	3	--	2	--	--	2	--	2	1	2	4	8	5
Pelican Cr. Area	--	--	--	2	--	--	--	1	--	1	1	--	1	--	2	4	2	2
	30	39	40	17	13	29	17	9	11	23	35	25	79	59	72	166	155	177

TABLE XI
AGE AND SEX DESIGNATION OF MARKED BEARS
1959-1963

Age	1959		1960		1961		1962		1963		4- Yr. Totals 1962	5- Yr. Totals 1963	Percent of Total	
	Tot.	M F U**	Tot.	M F	Tot.	M F	Tot.	M F	Tot.	M F			4th Yr. 1962	5th Yr. 1963
Cubs	5	2 2 1	6	4 2	13	6 7	9	7 2	7	6 1	33	40	23.4	24.2
Yearlings	3	0 3 0	5	4 1	5	3 2	1	1 0	9	2 7	14	23	9.9	13.9
2 years	4	1 3 0	4	2 2	7	3 4	1	1 0	0	0 0	16	16	11.3	9.8
3 or 4 years*	0	0 0 0	9	4 5	8	2 6	1	1 0	2	2 0	18	20	12.8	12.1
Adults	18	11 7 0	23	10 13	12	6 6	7	1 6	6	2 4	60	66	42.6	40.0
	30	14 15 1	47	24 23	45	20 25	19	11 8	24	12 12	141	165	100.0	100.0

*Not classified in 1959.

Totals, 1963: 165 individuals

**Sex of one individual not determined

81 males

83 females

1 undetermined

Table XII

COMPARISON OF THE AGE SAMPLE OF ALL MARKED BEARS
AT AGE OF INITIAL MARKING
TO THE AVERAGE AGE STRUCTURE OF THE POPULATION
1959 - 1963

Age	<u>Age Sample of Marked Bears Only</u>		<u>Average Age Status of Total Population</u>	
	No. Bears	Percent of Total Marked Bears	No. of Bears in Population*	Percent of Total Population
Cubs	40	24.2	34	20.1
Yearlings	23	13.9	19	11.3
Two years	16	9.8	12	7.1
Young adults	20	12.1	24	14.2
Adults	<u>66</u>	<u>40.0</u>	<u>80</u>	<u>47.3</u>
Totals	165	100.0	169	100.0

*Figures in this column represent average numbers for each age class obtained over a five-year period (1959-1963).

TABLE XIII

RELATION OF THE NUMBER OF MARKED BEARS IN THE POPULATION*
TO THE TOTAL NUMBER OF BEARS IN THE POPULATION
1963

Age Class	Number of Bears in Population In 1963 (census)	Number of Marked Bears Theoretically in Population In 1963	Number of Marked Bears Actually Observed In 1963	Per Cent of Total Population By Age Class	Per Cent of Total Population of Marked Bears By Age Class	Per Cent of Total Marked Bears Actually Observed in Each Age Class	Per Cent of Each Age Class Actually Observed By Means of Marked Bears
Cubs	40	7	7	22.6	4.0	100.0	17.5
One Year	29	17	15	16.4	9.6	88.2	51.7
Two Years	11	7	5	6.2	4.0	71.4	45.5
Three Years	6	4	3	3.4	2.3	75.0	50.0
Four and Five Years	19	9	7	10.7	5.1	77.8	36.8
Adults	72	37	30	40.7	20.9	81.1	71.7
	—	—	—	—	—	—	—
	177	81	67	100.0	45.9	—	—

*Bears marked from 1959 through 1963.

Table XIV

FEMALES WITH CUB OR YEARLING LITTERS,
YELLOWSTONE NATIONAL PARK, 1959-1963

	Litter Size				No. Females with Litters	No. Cubs and/or Yearlings with Females	Average Litter Size
	One	Two	Three	Four			
1959							
Females with cubs	4	8	2	-	14	26	1.86
Females with Yearlings	2	3	1	1	7	15	2.14
1960							
Females with Cubs	4	8	5	-	17	35	2.06
Females with Yearlings	1	3	2	-	5	10	2.00
1961							
Females with Cubs	2	5	6	-	13	30	2.30
Females with Yearlings	1	3	1	-	5	10	2.00
1962							
Females with Cubs	3	7	6	1	17	39	2.30
Females with Yearlings	-	2	3	-	5	13	2.60
1963							
Females with Cubs	-	8	8	-	16	40	2.50
Females with Yearlings	-	3	4	-	7	18	2.57
Totals:							
Females with Cubs						77	
Number of Cubs						170	
Avg. Litter Size						2.21	
Females with Yearlings						29	
Number of Yearlings						66	
Avg. Litter Size						2.28	

Note: Weaned yearlings are not included in this table.

Table XV

CUB AND YEARLING COUNTS, 1959 - 1963

	1959	1960	1961	1962	1963	Total
Cubs	26	35	30	39	40	170
Yearlings	23	13	17	13	29	95
Total bears 6 mo. to 1½ years old	49	48	47	52	69	

The number of females with cub or yearling litters expressed as a percent of the total adult female population appears in Table XVI. The number of adult females is considered to be one-half the total adult population - this is based on a 1:1 sex ratio (Table XI). The percent of adult females with cubs of the year has varied only from 25.5 to 36.2 with an average of about 33 percent, or one-third of the total adult female population. The percentage of adult females with yearling litters has also been quite consistent during the five years, varying from 9.8 to 15.9 and averaging 13 percent of total females.

Table XVI

Number of Females with Cubs or Yearlings Expressed as Percent of Total Adult Female Population 1959-1963

	Computed Adult Female Pop.*	Number Females With Cubs	Percent of Adult Female Pop. with Cubs	No. Females With Yearlings	Percent of Adult Female Pop. with Yearlings
1959	44	14	31.8	7	15.9
1960	57	17	29.9	6	10.5
1961	51	13	25.5	5	9.8
1962	47	17	36.2	5	10.6
1963	49	16	32.7	7	14.3

*Based on sex ratio of 1:1 (See Table XI).

Complete histories have been kept on a number of marked families - age when offspring are weaned, breeding interval of individual females, interval between litters for individual females, age when offspring reach maturity and breed, etc. These studies are contributing materially to an understanding of the population dynamics. While there are sufficient data to establish productivity levels for the Yellowstone population, we believe these data can be much better interpreted when more information is acquired on the marked families and geneology can be traced through several additional years.

Mortality

Fifteen mortalities were recorded in 1963. These included three cubs, two three-year-olds, three four-year-olds, and seven adults. Of these 15, six were killed by hunters outside Yellowstone and six were accounted for as a control measure by the National Park Service (two killed, four shipped to zoos). Since 1959 these two factors have accounted for the bulk of the recorded mortality in the population (Table XVII). During the five years of the study, 81 mortalities have been recorded. Hunters have killed 34, or 42 percent, and the National Park Service has accounted for 23, or 28.4 percent, through direct control measures and capturing and shipping to zoos (15 killed, 8 shipped to zoos). Eleven have died as a result of an overdose of drugs, often administered to immobilize troublesome or dangerous individuals, three have been sacrificed for study, and ten have died of miscellaneous or unknown causes.

Tables XVIII and XIX show the observed survival and mortality of 130 grizzly cubs through one and one-half years of life. Of the original 130 cubs:

1. Seventy-one, or 54.6 percent, lived through one and one-half years;
51 were observed with their mothers during their second year; four of 12 orphans survived through their second year;
2. Fourteen, or 10.8 percent, were known to have died; six were killed as cubs, eight as yearlings;
3. Forty-five, or 34.6 percent, were not observed or accounted for after their first year of life.

Final conclusions concerning mortality of the younger age classes, as well as overall mortality within the population, are reserved until more data are available and until all factors can be more completely evaluated. From the foregoing data, however, it does appear that many young bears do not live two years, and that this may be the most important single factor in keeping population numbers stable.

TABLE XVII

GRIZZLY BEAR MORTALITY, 1959-1963

Year	Hunters Outside Yellowstone		NPS, as Control Measure		Drug Overdose		Sacrificed for Study		Misc. Causes Inc. Bears Shipped to Zoos		Per Cent of Total Population Respective Year
	Marked	Un- marked	Marked	Un- marked	Marked	Un- marked	Marked	Un- marked	Marked	Un- marked	
1959	1	3	2	2	3	-	-	-	-	1	7.8
1960	1	10	1	2	3	1	-	-	1	-	11.2
1961	5	3	-	1	2	-	3	-	2	4	12.0
1962	2	3	1	4	1	-	-	-	3	1	9.7
1963	2	4	2	-	1	-	-	-	2	4	8.5
	-	-	-	-	-	-	-	-	-	-	
Total	11	23	6	9	10	1	3	-	8	10	81
Grand Total	34		15		11		3		18		81

TABLE XVIII

OBSERVED SURVIVAL AND MORTALITY OF 130 GRIZZLY CUBS THROUGH ONE AND ONE-HALF YEARS OF LIFE

Year	No. of Females With Cubs	No. of Cubs	No. of Cubs Killed	No. of Cubs Orphaned	No. of Cubs Theo- reti- cally in Pop. as Yrls. the Follow- ing Yr.	No. of Yrls. With Females Follow- ing Yr.	No. of Orphans Known to Survive	No. of Yrls. Known Weaned	No. of Yrls. Known Killed	No. of Yrls. Not Observed or Account- ed For	Per Cent Yrls. Not Observed or Account- ed For
1959	14	26	1	2	25	10	1	2	2	10	40.0
1960	17	35	2	7	33	10	3	4	3	13	39.4
1961	13	30	2	3	28	13	1 ¹	3 ²	3 ²	12	42.9
1962	17	39	1	-	38	18	-	11 ³	-	10	26.3
	—	—	—	—	—	—	—	—	—	—	
Total	61	130	6	12	124	51	5	20	8	45	

¹Recaptured early following spring, not observed later in season; included under "not observed or accounted for."

²Three yearlings known weaned, later were killed (two unmarked littermates at Old Faithful killed by NPS and No. 92 shot by hunter).

³One weaned yearling adopted by female with yearlings; included under "No. of Yrls. with Females Following Year."

Table XIX

Fate of 130 Grizzly Cubs

Total No. of Cubs	130
Number known living through one and one-half years.	71
Percent of total.	54.6
Number known to have died	14
Percent of total.	10.8
No. not observed or accounted for after first year of life.	45
Percent of total.	34.6

Breeding Age and Behavior

Breeding Age

It was anticipated that in the summer of 1963 considerable data would be obtained on breeding age of known-age animals. We did not acquire as much information as we had hoped; however some very valuable and interesting observations were made. Marked known-age females (3 to 5 year year age classes) in the population did not appear with cubs and, furthermore, were not observed breeding during the season. This does not, however, rule out the possibility that they were actually bred. One established-age five-year-old female, No. 15, appeared with cubs. This female was observed copulating in both 1961 and 1962; however, she had no cubs in 1962.

No. 51, a known-age four-year-old male, was observed copulating on two different occasions. This is the first mating activity recorded for a known-age male. No. 76, an established-age five-year-old, also mated with females on two different occasions.

We have considerable evidence that some females opulate but fail to become pregnant. In 1961, both No. 15, a three-year-old, and No. 39, a rather old

female, were observed copulating but neither had cubs the following spring (1962). Both, however, had cubs in 1963.) In 1962, No. 6, a three-year-old, and No. 81, an established-age five-year-old, mated but did not produce young. The same year, No. 29 and No. 86, three-year-olds, were not actually observed in copulation but both displayed characteristic breeding behavior. No. 86 was killed in the fall of 1962; No. 29 had no cubs in 1963. With the exception of No. 39, a rather old animal, all were young sows and probably breeding for the first time. It is possible that estrus is of short duration in these young females and they fail to become fertilized. This may also explain the seemingly prolonged estrus period in the more mature sows, their acceptance of several different males, and the frequency of copulation - these may all be necessary for the female to become impregnated.

Activity and Movement

Sight records and returns from marked animals killed outside Yellowstone have shown over the years that grizzlies make seasonal migrations to areas of food abundance. We have also considerable evidence that individuals return in the fall to areas where they were observed in early spring. We have obtained sight records on 27 different individuals in at least two widely separated areas both within and outside the borders of Yellowstone. Induced movements have been recorded from 20 different bears trapped in one area and released in another. Many of these bears exhibited strong homing tendencies, returning to the area where originally trapped.

Additional data are showing the movement of particular segments of the population, such as the movement habits of certain age classes. Also the differences in movement of the sexes is proving to be quite pronounced. For example, the average adult male travels much farther than does the adult female. The Yellowstone population appears to consist of a nucleus of mature females, most of which spend their entire lives within the borders of the Park. Males, particularly young males, often travel far beyond the confines of Yellowstone. Movement of these young males

cannot be attributed entirely to food seeking; population density, or some as yet undetermined factor, appears to dictate movement patterns of the younger age classes. Females in the one- to four-year-age bracket, however, do not ordinarily travel great distances.

Aging Techniques

Eighty-four known-age and established-age bears have been individually marked in the past five years. These include 40 cubs, 23 yearlings, and 16 two-year-olds. From the majority of these, impressions have been made of the dentition and forepaws. Casts made from the impressions have proved invaluable in establishing the age of other bears from the age of six to 57 months. A total of 110 dental casts and 53 foot casts have been made since 1960. Several bears have been captured in successive years and casts made of their dentition and fore feet. Two bears, No. 6 and No. 37, have been recaptured for three successive years and casts obtained; others have been captured in alternate years. These casts not only show annual growth changes in individuals but, collectively, show striking growth changes among the different age classes. The data on growth changes are being prepared for statistical analysis.

In arriving at reliable aging criteria, weights and measurements of all known-age bears have been carefully considered. While a correlation does exist between age and weight, it is not considered reliable. A number of factors determine bear weights. These include genetic differences governing size, rate of fat deposition in individuals, age at which bears are weaned, degree of parasitism, food habits and preferences, and season of year when the bear is weighed. The growth and development of the teeth and jaws are also affected by some of the above factors, but there appears to be a significant correlation between tooth development and age and between foot size and age up to three and four years.

Physiology, Pathology, and Hematology

Physiology and Pathology

Complete autopsies were performed on three grizzlies and one black bear, bringing the total for the past three years to seven grizzlies and five black bears. Organs, tissues, and internal parasites were collected and preserved for future study. The circulatory system again received particular attention.

Post-mortem studies of adult grizzly bears showed that they were free or almost free of the vascular disease, arteriosclerosis, of the type commonly found in humans. Serum cholesterol values were consistently higher in grizzly bears than is normal in man with the range from 325 to 425 mgm. percent compared to normal human values of from 150 to 250 mgm. percent. Protein bound iodine determinations also consistently indicated low values for bears with the range of 1.3 to 3.2 mcgm. percent compared to normal human values of 3.5 to 7.5 mcgm. percent. Humans with hypercholesterolemia and/or hypothyroidism are susceptible to arteriosclerotic disease; however, it appears that grizzly bears with high cholesterol levels and low levels of circulating thyroid hormone are not susceptible to the disease.

Hematology

Blood specimens were obtained from 35 grizzlies and two black bears. The blood was centrifuged at the field laboratory, and the serum frozen and air-mailed to Dr. Berthrong. Specimens were collected from early June through late October - only the "hibernating" period is now lacking from the blood chemistry picture. (Specimens have been obtained from hibernating black bears, however.) A mature female, No. 164, has been located in her winter den; this was accomplished by use of the radiotracking equipment. Plans call for immobilizing this bear in the winter and collecting a blood specimen.

Table XX shows the number of specimens obtained over a five-year period and the age class breakdown. One hundred four specimens have been obtained from 98 different individuals.

Table XXI presents the analysis of the blood chemistry of eleven grizzlies and one black bear.

TABLE XX

BLOOD SPECIMENS, 1959-1963

Age Class	No. Different Bears From Which Specimens Obtained	Total No. Specimens Obtained	Number Specimens Obtained, by Month				
			June	July	August	September	October
Cubs	16	17	0	6	10	1	0
Yearlings	22	23	6	5	11	0	1
Two Years	9	9	0	4	5	0	0
Three Years	7	8	1	4	2	0	1
Four Years	14	15	0	4	11	0	0
Five Years	3	3	0	2	1	0	0
Adults	27	29	0	13	8	6	2
	—	—	—	—	—	—	—
Totals	98	104	7	38	48	7	4

TABLE XXI

BLOOD CHEMISTRY

Bear No.	Sex	Age, Years	Weight	Date Specimen Obtained	PBI	Cholesterol	Uric Acid
127	M	3	275	8-2-62	3.2	410	1.6
92	M	1	140	8-4-62	1.7	358	1.2
121	F	1	140	10-17-61	2.8	325	0.6
		2	130	8-6-62	2.5	425	1.4
51	M	3	275	8-7-62	3.2	383	1.3
37	M	3	315	9-12-61	1.7	351	1.0
		4	440	10-4-62	1.3	--	--
135	M	1/2	65	8-8-62	3.1	413	1.9
136	M	1/2	65	8-8-62	--	--	--
133	M	1/2	70	7-27-62	3.1	400	1.7
131	F	5 (est.)	320	7-27-62	2.1	358	1.2
132	F	1/2	60	7-27-62	3.2	368	1.9
140	F	? adult	375	9-21-62	1.5	373	1.3
Black Bear	F	? adult	200 (est.)	1-31-63	0.7	463	--
Human Limits, normal					3.5 - 7.5	150 - 250	2.6 mgms %
					microgms %	mgms %	
Human Mean					5	180 - 200	4.5 - 5

Chemical Analysis of Milk

Over the past five years a number of milk samples have been taken from lactating grizzlies and sent to research scientists throughout the country. Milk samples were obtained by immobilizing lactating sows with succinylcholine chloride and in some cases this was followed with an intra-pulmonary injection of pentobarbital sodium. Oxytocin was administered intramuscularly and the milk sample collected in glass vials. The samples were then refrigerated and shipped airmail to the various destinations.

Three samples of grizzly bear milk and three samples of black bear milk were sent to Dr. Robert Jenness, Department of Agricultural Biochemistry, University of Minnesota, for analysis.

Gross analysis of the samples appears in Table XXI and the vitamin content of the milks as determined by Dr. Margaret E. Gregory appear in Table XXII.

The composition of the bear milks are somewhat variable, although certain general characteristics are apparent. It appears probable that some of the variation is due to the state of lactation, age of the young, and perhaps general physical condition of the animal.

Both black and grizzly bear milk have high contents of fat and total solids and have the very peculiar feature that most of the carbohydrates consist of oligosaccharides of low reducing power. They contain amounts of B vitamins roughly comparable to cow milk and generous quantities of fat-soluble vitamins A and E.

From the analyses made to date, it would appear bear milks are distinctive in that they have a very low lactose content; the principal carbohydrate is most probably a trisaccharide, and a number of oligosaccharides are present.

A new comparison of the milk proteins by the technique of electrophoresis in acrylamide gel has been initiated and Dr. Jenness will provide data on this when the experiments are completed.

TABLE XXII

SUMMARY OF GROSS ANALYSES OF BEAR MILK SAMPLES

	Grizzly Bear			Black Bear			Polar Bear (Baker, et al.)
	I	II	III	I	II	III	
Date Collected	Sept. '60	8/15/61	8/29/61	8/1/61	8/4/61	8/13/61	
Vol. (ml)	44	32	19	12	19	32	
pH	6.2	5.9	6.4	6.6	6.6	6.4	
Condition	thick viscous	Cheesy rancid	not rancid	cheesy rancid	cheesy rancid dirty	not rancid lumpy	
Constituents (%)							
Total Solids	38.6	44.4	about 45.	45.0	50.5	about 45.	44.1
Fat	19.8	25.8	- - - - -	23.4	26.5	23.3	31.1
Casein	8.0	4.7	- - - - -	8.3	7.6	5.2	) 10.2
Whey Protein	5.4	3.9	- - - - -	5.9	5.9	5.7	
Ash	1.3	1.0	- - - - -	2.1	2.0	1.4	
Crude Carbohydrate ¹	4.1	9.0	- - - - -	5.3	8.5	about 9.4	1.2
Apparent Lactose ²	0.7	- - -	- - - - -	- - -	- - -	- - -	1.6
Non-Protein N	.05	.14	- - - - -	.13	.13	.20	0.5
Calcium	- - -	.18	- - - - -	.51	.42	.20	
Phosphorus	- - -	.13	- - - - -	.36	.33	.14	

¹ Crude Carbohydrate = Total solids - (fat + casein + whey protein + ash).

² Apparent lactose = Lactose equivalent of reducing power (picric acid method).

Analysis of the bear milks made by Dr. Robert Jenness, University of Minnesota.

TABLE XXIII
VITAMIN CONTENT OF BEAR MILKS

		Vitamins as Milligrams per Liter	
		Grizzly Bear Composite of Equal Parts Specimens II and III	Black Bear Composite of Equal Parts Specimens I, II and III
	Cow Milk		
Biotin	.015	.0054	.0094
Nicotinic acid	1.0	5.0	5.4
Ca Pantotherate	3.5	about 0.22	about 0.27
Riboflavin	1.5	1.3	1.8
Thiamine	0.45	0.63	0.58
Vitamin B ₆	0.35	0.09	0.11
Vitamin B ₁₂	0.003	0.010	0.009
Vitamin A	0.3	0.73	1.0
Vitamin E	1.0	3.9	3.4

Analysis of the bear milks made by Dr. Margaret E. Gregory,
National Institute for Research in Dairying, Reading, England.

GRIZZLY PROJECT

TABULATED DATA

1959 - 1963

5th Annual Report

NOT FOR PUBLICATION

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MARKED GRIZZLIES, 1959 - 1963

No.	Date	Sex	Age	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
			When Marked				R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
2*	6/27	M	A	300	Thumb		None		G-15	G-16	Rd. Alum.	Rd. Alum.
5*	7/4	F	1	110	Tr. Cr.		Red	Red	00-342	00-345	Rd. Red upper outside	Rd. Red upper outside
6	7/4	F	Cub	50	Tr. Cr.		Blue-White rope		00-177	G-98	Rd. Yellow upper outside	Rd. Green upper outside
7	7/4	F	A	300	Tr. Cr.		Green rope Green flag	Green	00-190	00-189	Rd. Green upper outside	Rd. Green upper outside
10	7/19	F	2	140	Tr. Cr.		Blue	Blue	00-170	G-74	Rd. Blue upper outside	Rd. Alum. upper outside
12	7/21	M	A	620	Fishing Bridge				(gone)	(gone)		
14	7/27	M	A	520	Tr. Cr.			None	00-193		Rd. Alum. upper outside	
15	7/27	F	2	150	Tr. Cr.				00-328	00-388	Rd. Red	Rd. Yellow
21	8/5	F	A	300	Gardiner		Green	Green	00-274	00-275	Rd. Green upper outside	Rd. Green upper outside
29	8/28	F	Cub	92	Tr. Cr.		White-Green Herculite	Same	00-380	G-20	Rd. Yellow upper outside	Rd. Alum. upper outside
30	9/10	M	A	710	Tr. Cr.				00-289	00-288	Rd. Alum. upper outside	Rd. Alum. upper outside

*Not observed in 1963.

No.	Date	Sex	Age When Marked	Place Captured	Neck Marker		Color Marker		Ear Tag		Tag Color & Placement	
					R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
33	6/25	M	A	425 Tr. Cr.					00-281	00-290	Rd. Alum.	Rd. Alum
34	6/25	F	A	260 Tr. Cr.			Yellow rope orange flag	None	00-228	00-297	Square Blue upper outside	Square Alum. upper outside
39	6/29	F	A	350 Tr. Cr. (est)			Green-white rope, pink flag	None	G-420	G-212	upper outside Rd. Blue	upper outside Rd. Yellow
40	7/1	F	A	175 Tr. Cr.			White rope, yellow flag		00-253	00-258	Square Yellow upper outside	Square Yellow upper outside
41	7/5	M	A	550 Tr. Cr.					00-259	00-257	Rd. Yellow upper outside	Rd. Yellow upper outside
42	7/5	F	A	250 Tr. Cr.			Red-white rope Yellow flag		00-260	G-274	Square Yellow upper outside	Square Yellow upper outside
44	7/11	F	A	300 Tr. Cr.			Blue-white rope		00-218	00-219	Red Round upper outside	None
45	7/13	F	3-4	185 Tr. Cr.			White-pink	White-pink	H-1587	00-271	Square Alum.	Square Green
48	7/26	F	A	350 Tr. Cr.			Green-white rope		H-1522	G-60	Square Alum. upper outside	Lg. Rd. Alum. upper outside
51	7/29	M	1	150 Tr. Cr.			Red-white rope, Gr. flag	Same		H-1519	Square Blue upper outside	Square Alum. upper outside
64*	8/17	F	A	495 Tr. Cr.			Pink	Pink	H-1549	H-1531	Square Alum.	Square Alum.

*Not observed in 1963.

MARKED GRIZZLIES, 1960
(Continued)

No.	Date	Sex	Age When Marked	Wt.	Place Captured	Neck Marker		Color Marker		Ear Tag		Tag Color & Placement	
						R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
65	8/22	F	A	435	Tr. Cr.			Blue-white rope white flag	Same	H-1533	H-1532	Square Alum. upper outside	Square Alum. upper outside
74*	9/25	M	2-3	200	Tr. Cr.					H-1512	G-19	Square Alum. lower inside	Rd. Alum. upper outside
76	9/28	M	3-4	350 (est)	Tr. Cr.					G-54	G-92	Rd. Alum. lower inside	Rd. Alum. upper inside

*Not observed in 1963.

MARKED GRIZZLIES, 1961

No.	Date	Sex	Age	Wt.	Place When Marked	Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
								R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
81	7/5	F	YA	220	Tr.	Cr.				G-7	G-8	Alum. Rd.	Rd. Alum.
82*	7/5	F	Cub	25	Tr.	Cr.			Red-white H.	G-5	00-227	Alum. Rd.	Square Blue
83*	7/5	M	Cub	25	Tr.	Cr.		Yellow-H red (Gray)		00-386	G-4	Yellow Rd.	Alum. Rd.
84	7/5	F	A	235	Tr.	Cr.				G-22	H-1546	Alum. Rd.	Alum. Square
88	7/18	M	A	500	Tr.	Cr.				G-9	G-12	Alum. Rd. lower inside	Alum. Rd. lower inside
96	7/27	F	3-4	270	Tr.	Cr.		Yellow rope pink flag	Black- yellow rope pink flag	G-99	H-1596	Alum. Rd. upper outside	Alum. Square upper outside
97	7/28	M	Cub	65	Tr.	Cr.			Yellow rope	H-1594	00-330	Alum. Square upper outside near end	Rd. Red upper outside near end
100	8/3	M	Cub	60	Tr.	Cr.			White rope	00-348	00-136	Red Rd. upper outside	Green Rd. upper outside
101	8/3	F	YA	285	Tr.	Cr.				H-1590	H-1578	Alum. Square upper inside	Alum. Square upper outside
107*	8/10	F	A	275 (est)	Canyon					00-347	G-75	Rd. Red upper outside	Rd. Alum. upper outside
108*	8/12	F	A	300	Tr.	Cr.		Green (blue gray) H.	Same	G-73	00-334	Alum. Rd. upper outside	Rd. Red upper inside

*Not observed in 1963.

MARKED GRIZZLIES, 1961
(Continued)

No.	Date	Sex	Age	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
			When Marked				R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
109	8/14	F	Cub	75	Tr. Cr.			Yellow rope	00-337	00-336	Red Rd. upper outside	Rd. Yellow upper inside
110	8/14	F	Cub	75	Tr. Cr.		Yellow rope	Blue-yellow H.	00-400	Re- moved	Yellow-Rd. upper outside	Removed, mgh.
111*	8/14	M	A	530 (est)	Tr. Cr.				G-51			Alum. Rd. in end of ear, inside
112	8/15	F	A	355	Tr. Cr.			Red-white rope	H-1588	00-399	Alum. Square upper inside	Yellow-Rd. upper outside
116*	8/24	M	1	205	Fishing Bridge		Red flag white rope	White rope green flag	00-341	G-97	Red-Rd. upper outside	Alum. Rd. upper outside
121	9/4	F	A	325 (est)	Tr. Cr.		Yellow rope		00-339	H-1583	Red Rd. upper outside	Alum. Square upper inside

*Not observed in 1963.

MARKED GRIZZLIES, 1962

No.	Date	Sex	Age	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
			When Marked				R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
123	6/26	F	A	285 (est)	Tr. Cr.		Yellow rope red flag		H-3097	00-229	Alum. Square upper outside	Blue Square lower outside near end
124*	7/5	M	Cub	25	Tr. Cr.				00-104	00-261	Red Rd. lower outside	Blue Square lower outside
125	7/8	F	A	275- 300-(est)	Tr. Cr.		Blue tape		00-16	00-273	Blue Rd. upper outside	Green Square in end out- side
127*	7/14	M	3-4	250	Lake				00-346	H-3079	Red Rd. upper outside	Alum. Square lower outside
128	7/16	F	A	300 (est)	Tr. Cr.			Blue-white rope red flag	G-55	G-300	Alum. Rd. upper inside near end	Yellow Square upper outside
129*	7/18	F	A	405	Tr. Cr.		Pink tape		G-57	G-152	Alum. Rd. lower inside	Red Square upper outside
130	7/18	M	1	150	Tr. Cr.		Yellow rope green flag		00-223	H-1581	Blue Square upper inside	Alum. Square upper inside
132	7/27	F	Cub	60	Tr. Cr.		White rope blue flag		00-240	G-201	Blue Square upper inside	Yellow Rd. upper outside
133	7/27	M	Cub	70	Tr. Cr.		Orange tape		G-101	G-299	Red Rd. lower outside (rear end)	Yellow Square lower outside near end
135	8/8	M	Cub	65	Tr. Cr.			Yellow rope green flag	G-203	G-151	Yellow Rd. lower outside	Red Square upper outside

*Not observed in 1963.

MARKED GRIZZLIES, 1962
(Continued)

No.	Date	Sex	Age When Marked	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
							R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
136	8/8	M	Cub	65	Tr. Cr.		Yellow rope green flag		00-232	G-204	Blue Square upper outside	Yellow Rd. lower outside
137	8/20	M	Cub	110	Tr. Cr.			Blue-white rope orange flag	G-205	00-231	Yellow Rd. lower outside	Blue Square upper outside
138*	8/20	M	Cub	110	Tr. Cr.		Blue-white rope orange flag		G-425	G-252	Blue Rd. upper inside	Yellow Square upper outside
139	8/28	F	Cub	100	Tr. Cr.		Blue-white rope green flag		G-200	G-376	Red Square upper outside	Green Square lower outside
140	9/21	F	A	375	Tr. Cr.				G-104	G-199	Rd. Red upper outside (near end)	Square Red upper outside (near end)

*Not observed in 1963.

MARKED GRIZZLIES, 1963

No.	Date	Sex	Age	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
			When Marked				R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
141	6/19	F	1	115	Tr. Cr.		Green-white rope orange flag	None	G-102	H-3090	Red Rd. upper inside	Alum. Square lower outside
142	6/19	F	1	110	Tr. Cr.		None	Green-white rope orange flag	G-59	H-3077	Lg. Rd. Alum. outside	Square Alum. upper outside
143	6/25	F	1	130	Tr. Cr.		Yellow rope white flag	None	G-103	G-399	Rd. Red upper inside	Square Green lower outside
144	6/25	F	1	120	Tr. Cr.		None	Yellow-rope white flag	00-236	G-424	Blue upper outside	Rd. Blue upper outside
145	6/26	M	1	155	Tr. Cr.		None	Blue-white rope green flag	G-70	G-477	Lg. Rd. Alum. lower outside	Square Blue upper inside
146	7/1	M	3	255	Tr. Cr.		None	Blue-white rope blue flag	G-301	G-202	Green Rd. lower inside	Rd. Green upper inside
147	7/2	M	1	100	Tr. Cr.		White rope green flag	None	G-400	G-476	Green upper inside	Square Blue upper inside
148	7/11	F	A	355	Tr. Cr.		None	Yellow rope red flag	00-318	00-323	Rd. Red upper outside	Red Rd. upper outside
149	7/15	M	3	220	Canyon camp G.		None	None	G-303	00-237	Rd. Green lower inside	Square Blue lower inside
150	7/16	F	A	285 (est)	Tr. Cr.		Red-white rope	None	00-322	G-124	Rd. Red upper outside	Rd. Red lower outside

MARKED GRIZZLIES, 1963
(Continued)

No.	Date	Sex	Age	Wt.	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
			When Marked				R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
151	7/17	F	1	155	Tr. Cr.		None	Green-white rope yellow flag	G-209	G-304	Rd. Yellow lower outside	Rd. Green upper outside
152	7/19	M	Cub	80	Tr. Cr.		None	Red-white rope red flag	G-173	G-211	Square Red lower outside	Rd. Yellow
153	7/19	M	Cub	70	Tr. Cr.		Red-white rope red flag	None	G-272	00-327	Square Yellow upper outside	Rd. Red lower outside
154	7/19	M	Cub	45	Tr. Cr.		None	Blue-white rope yellow flag	00-320	G-422	Rd. Red lower outside	Rd. Blue upper outside
155	7/22	M	A	660	Pelican Creek		None	None	G-61	M-50	Lg. Rd. Alum. upper inside	Lg. Rd. Alum. upper inside
156	7/24	F	Cub	48	Tr. Cr.		None	Yellow rope red flag	G-208	G-207	Yellow Rd. upper inside	Rd. Yellow upper inside
157	7/30	M	Cub	65	Tr. Cr.		Red-white rope blue flag	None	G-127	G-171	Red Rd. upper outside	Square Rd. lower inside
158	7/30	M	Cub	58	Tr. Cr.		None	Red-white rope blue flag	G-198	G-125	Square Red lower outside	Rd. Red upper outside
159	8/8	M	A	640	Tr. Cr.		Red-white rope yellow flag	None	G-170	G-271	Square Red upper inside	Square Yellow upper outside

MARKED GRIZZLIES, 1963
(Continued)

No.	Date	Sex	Age When Marked	Place Captured	Neck Marker	Color Marker		Ear Tag		Tag Color & Placement	
						R. Ear	L. Ear	R. Ear	L. Ear	R. Ear	L. Ear
160	8/9	F	A	360 Tr. Cr. (est)		Green-white rope	None	G-419	00-238	Rd. Blue upper outside	Square Blue upper outside
161	8/19	M	Cub	80 Tr. Cr.		None	Green-white rope pink flag	G-306	G-307	Rd. Green upper outside	Green upper outside
162	8/21	F	1	130 Tr. Cr.		None	Green-white rope yellow flag	G-168	G-269	Square Red upper outside	Square Yellow upper inside
163	8/27	F	1	125 Canyon		Blue-white rope brown flag	None	G-308	G-379	Rd. Green upper inside	Square Green lower inside
164	10/26	F	A	410 Rabbit Creek		None	Blue-white rope	G-175	G-214	Square Red upper inside	Rd. Yellow upper inside

MARKED FAMILIES,* 1959 - 1963

Family No.	Year Family Estab.	Marked Bear No. Sow	Offspring	Sex	Age When Family Estab.	Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
1	1959	U.M.	5	F	1	1	3**	1962	**No. 5 adopted by sow with single cub in 1959.
				F	A			1960	Trio together through 1960 season. No. 5 along
			U.M. Cub	?	Cub			1960	in 1961 and 1962, not observed in 1963.
2 A	1959	7	6	F	A			1963	No. 7's first family, weaned at 2-year olds;
			51	F	Cub	6 mo.	2	1963	No. 6 and No. 51 still in Trout Creek area.
			115	M	Cub	1	2	1963	No. 6 bred in 1963
				F	Cub	2	2	1961	
B	1962	7	U.M. Cub	F	A			1963	No. 7's second family; neither cub marked.
			U.M. Cub	M	Cub		1	1963	Radio attached to No. 7, 1963. Weaned year-
				F	Cub		1	1963	lings shortly thereafter (instrumented July 26.)
3	1959		10	F	2	2	?	1963	Three 2-year old bears, ran together in 1959,
			35	M	2	3	?	1961	loose association in 1960, alone in 1961. No.
			U.M. L.M.	?	2		?	1960	10 only member still in population.
4 A	1959		15	F	1	1	2	1963	Trio summered at Trout Creek, 1959. Only iden-
			U.M. L.M.	?	1		2	1959	tifiable member, No. 15, summered at Trout
		U.M.		F	A			1959	Creek every season since 1959.
B	1963	15	2 U.M. Cubs	F	A			1963	No. 15, 5-year old female appeared with cubs.
				?	Cubs			1963	Spent summer in Trout Creek area.
5	1960	17	U.M. Cub	F	A	A		1961	Family at Rabbit Creek, not observed after
				?	Cub			1961	1961. Fate unknown.
6	1960	16	3 U.M. Cubs	F	A	A		1960	Family at Rabbit Creek; fate unknown.
				?	Cubs			1960	
7	1960	8	3 U.M. Cubs	F	A	A		1960	Sow marked at Thumb in 1959. Appeared at
				?	Cubs			1960	Rabbit Creek in 1960 with 3 cubs. Fate un-
									known.

*U.M. : Unmarked
L.M. : Littermate

MARKED FAMILIES, * 1959 - 1963

Family No.	Year Family Estab.	Marked Bear No.		Sex	Age When Family Estab.	Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
8	1960	21		F	A	A		1963	Sow marked in 1959, had 2 cubs in 1960. Weaned cubs in spring of 1962. All three still in Gardiner area, summer of 1963.
			2 U.M. Cubs	?	Cubs		2	1963	
9	1959		25	?	Cub	6 mo.		1959	Cub marked in 1959, at Trout Creek. Fate of entire family unknown.
		U.M.		F	A			1959	
			U.M. L.M.	?	Cub			1959	
10	1959		26	M	Cub	6 mo.	2	1961	Family observed at Trout Creek in summer and Elk Park in early spring. Weaned at 2-year olds. No. 26 and No. 95 not observed for two or more consecutive years. (Also sow); No. 77 died from drug in 1961.
			77	F	Cub	1	2	1961	
			95	M	Cub	2	2	1961	
		U.M.		F	A			1960	
11	1959		29	F	Cub	6 mo.	2	1963	Family established at Trout Creek in 1959. Marked No. 36 in 1960, never observed again. Sow weaned No. 29 in spring, 1961. Sow unidentifiable, No. 29 still in Trout Creek area.
			36	M	Cub	1	2	1960	
		U.M.		F	A			1961	
12	1959		32	M	2	3		1961	Two-year old littermates, weaned, together at Trout Creek in 1959. Distinct Collars. No. 32 shot by hunter in 1961; No. 131 died from drug overdose in 1962.
			131	F	2	5		1962	
13 A	1960		37	M	1	1	1	1962	Family marked at Trout Creek 1960. Offspring yearlings weaned as yearlings. No. 38 believed killed outside Cooke City in 1961; No. 37 shot by hunter in Wyoming. Sow No. 39 remained in area.
			38	M	1	1	1	1961	
		39		F	A	A		1963	
B	1963	39		F	A	A		1963	No. 39's second family, two cubs, both unmarked summered in Trout Creek area.
			2 U.M. Cubs	?	Cubs			1963	

*U.M. : Unmarked
L.M. : Littermate

MARKED FAMILIES,* 1959-1963

Family No.	Year Family Estab.	Marked Bear No.		Sex	Age When Family Estab.	Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
14	1960		40	F	1	1	2	1963	Family summered at Trout Creek, 1960. No. 40 and littermate weaned in 1961, associated loosely season 1961. No. 40 still in area.
			U.M. L.M.	M	1		2	1961	
			U.M.	F	A			1960	
15 A	1960		43	M	Cub	Cub	1	1961	Family at Trout Creek, 1960. Cubs weaned when 1 year olds. No. 52 shot outside Park, No. 43 not observed for two or more years.
			52	M	Cub	Cub	1	1961	
		65		F	A	A		1963	
B	1962	65		F	A	A		1963	No. 65's second family. Originally four cubs-one killed accidentally while being marked in 1962. Other three yearlings weaned in spring, 1963. No. 65 bred in 1963. All summered at Trout Creek.
			143	F	Cub	1	1	1963	
			144	F	Cub	1	1	1963	
			145	M	Cub	1	1	1963	
16 A	1960	48		F	A	A		1963	No. 48, old female, abandoned No. 49, female cub. Cub not observed after 1960.
			49	F	Cub	Cub	Cub	1960	
B	1962	48		F	A	A		1963	No. 48 appeared with single cub in 1962, abandoned it as she did in 1960. Cub, No. 124, not observed after 1962.
			124	M	Cub	Cub	Cub	1962	
C	1963	48		F	A	A		1963	Third family for No. 48, 3 unmarked cubs, summered in Trout Creek area. Last observed Oct. 7, 1963. One of orphaned cubs of No. 148 was with group.
			3 U.M. Cubs	?	Cubs			1963	
17	1960		53	M	Cub	Cub	1	1961	Family at Trout Creek, 1960. Weaned as yearlings, 1961. Sow unidentifiable. Both No. 53 and 114 sacrificed for study specimens, 1961.
			114	M	Cub	1	1	1961	
		U.M.		F	A			1960	
18	1960		56	M	1	1	2	1961?	Rabbit Creek family, summered there in 1960. Offspring weaned as 2-year olds. Sighted No. 57 or 56, could not tell which one at Rabbit Creek in 1961. No. 58 not observed since 1960.
			57	M	1	1	2	1961?	
		58		F	A	A		1960	

*U.M. : Unmarked
L.M. : Littermate

MARKED FAMILIES,* 1959 - 1963

Family No.	Year Family Estab.	Marked Bear No.		Sex	Age When Family Estab.	Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
19	1960	59		F	A	A		1960	Pelican Creek family, not observed since marking. Fate unknown.
			U.M. Cub	?	Cub			1960	
20	1960		70	F	Cub	Cub		1960	Trout Creek family. Not observed since 1960.
		72		F	A	A		1960	Fate unknown.
21	1961		82	F	Cub	Cub	2	1962	Trout Creek family, summered together 1961.
			83	M	Cub	Cub	2	1962	In 1962, Nos. 82, 83, 84 together, but un-
			U.M. L.M.	?	Cub		2	1962	marked member solitary. Did not observe Nos.
		84		F	A	A		1963	82 and 83 in 1963. No. 84 summered at Trout Creek, 1963.
22 A	1961	34		F	A	A		1963	Trout Creek family. Offspring weaned as year-
			92	M	Cub	Cub	1	1962	lings in 1962. No. 93 not observed since 1961;
			93	F	Cub	Cub	1	1962	No. 92 shot by hunter south of Cooke City. No. 34 summered at Trout Creek, 1962.
B	1963	34		F	A	A		1963	No. 34's second family, summered at Trout
			2 U.M. Cubs	?	Cubs			1963	Creek, 1963.
23	1961		94	M	Cub	Cub		1961	Family (Trout Creek) not observed (recognized?)
			U.M. L.M.	?				1961	after 1961. Fate unknown.
			U.M.	F				1961	
24 A	1959		96	F	1	3	2	1963	Trout Creek family, weaned as 2-year olds in
			76	M	1	2	2	1963	1960. Sow unidentifiable. Nos. 96 and 76
			U.M.	F	A			1959	observed each year at Trout Creek.
	1963	96		F	A	3		1963	No. 96's first family. Appeared with two cubs
			2 U.M. Cubs	?	Cubs			1963	but was later observed with only one.

*U.M. : Unmarked
L.M. : Littermate

Family No.	Year Family Estab.	Marked Bear No.		Sex	Age When Family Estab.		Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
		Sow	Offspring		Estab.	Marked				
25	1961	112	97 100 U.M. L.M.	M M F ?	Cub Cub A ?	Cub Cub A ?	2 2 A ?	1963 1963 1963 1962	Trout Creek family. Offspring weaned as 2-year olds, 1963. All summered in Trout Creek (could not be sure of identification of unmarked member).	
26 A	1960	U.M.	98 U.M. L.M.	M ?	Cub Cub A	1 Cub A	2 A ?	1962 1962 1963	Trout Creek family. Female called "Mae West" - characteristic conformation. Weaned offspring as 2-year olds in 1962. All summered at Trout Creek, 1962.	
26 B	1963	U.M.	2 U.M. Cubs	F ?	A Cubs			1963 1963	"Mae West's" second family. Unmarked, but certain of correct identification. All summered at Trout Creek, 1963.	
27	1961	119	99 U.M. L.M.	F F ?	Cub A Cub	Cub A ?		1961 1961 1961	Trout Creek family. Not observed after 1961. Fate unknown.	
28	1961		91 U.M. L.M. U.M. L.M.	F ? ?	2 2 2	2		1962 1961 1961	Rabbit Creek, apparently weaned as 2-year olds. No. 91 shot by NPS in 1962. Others unaccounted for, fate unknown after 1961.	
29	1961	U.M.	109 110 130 U.M.	F F M F	Cub Cub Cub A	Cub Cub 1 A	2 2 2	1963 1963 1963 1962	Trout Creek family. Offspring weaned as 2-year olds in 1963. Sow unidentifiable, 1963. All three 2-year olds summered in Trout Creek area, 1963.	
30	1961	U.M.	117	F F	Cub A	Cub		1961 1961	Trout Creek family. Not observed after 1961. Fate unknown.	
31	1961	120	2 U.M. Cubs	F ?	A Cubs	A	2	1963 1962	Trout Creek family. Offspring weaned as 2-yr. olds, 1963. Offspring unmarked - could not positively identify. No. 120 summered at Trout Creek, 1963.	

*U.M. : Unmarked
L.M. : Littermate

MARKED FAMILIES,* 1959 - 1963

Family No.	Year Family Etab.	Marked Bear No.	Age When Family Etab.	Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
32	1961	116 U.M. L.M. U.M.	M ? F	1 1 A	2 2	1962 1961 1961	Pelican Creek campground family (captured there) in 1961. No. 116 recaptured there in 1962, not observed since. Sow and littermate not observed since 1961.
33	1962	123 137 138	F M M	A Cub Cub	A Cub Cub	1963 1963 1962	Trout Creek family. Offspring weaned as yearlings, 1963. No. 137 summered at Trout Creek. No. 138 not observed in 1963. No. 123 summered at Trout Creek.
34	1962	125 141 142	F F F	A Cub Cub	A 1 1	1963 1963 1963	Trout Creek family. Sow and yearlings summered at Trout Creek, 1963.
35	1962	128 3 U.M. Cubs	F ?	A Cubs	A	1963 1963	Trout Creek family. Sow and only two yearlings summered at Trout Creek, 1963 -- one yearling missing.
36	1962	132 133 U.M.	F M F	Cub Cub A	Cub Cub	1963 1963 1963	Trout Creek family. Sow and yearlings summered at Trout Creek, 1963. No. 139, yearling belonging to Sow No. 42, ran with this family entire summer.
37	1962	75 135 136	F M M	A Cub Cub	A Cub Cub	1963 1963 1963	Trout Creek family. Sow and yearlings summered at Trout Creek, 1963. Sow, No. 75, died from overdose of drugs, Sept. '63, yearlings orphaned.
38	1962	42 139 U.M. L.M.	F F ?	A Cub Cub	A Cub	1963 1963 1962	Trout Creek family. No. 42 alone in 1963. No. 139 ran with Family No. 36 entire season. Unmarked member not observed.

*U.M. : Unmarked
L.M. : Littermate
**Orphaned

Family No.	Year Family Estab.	Marked Bear No.		Sex	Age When Family Estab.		Age When Marked	Age When Weaned	Last Year Observed (Ident.)	Remarks
		Sow	Offspring		Family	When				
39	1963	150	3 U.M. Cubs	F	A	A	A		1963 1963	Family summered in Trout Creek area, 1963.
40	1963	160	2 U.M. Cubs	F	A	A	A		1963 1963	Family summered in Trout Creek area, 1963.
41	1963	148	2 U.M. Cubs	F	A	A	A		1963 1963	Family summered at Trout Creek, 1963. No. 148 killed when struck by pickup truck, 1963; cubs orphaned. One cub observed Oct. 7, 1963, with No. 48 and her three cubs (Family No. 16C).

MARKED GRIZZLIES OBSERVED IN
1962 BUT NOT IN 1963

Bear Number

2

5

64

74

82

83

107

108

111

116

124

127

129

138

MARKED GRIZZLIES KNOWN DEAD OR NOT OBSERVED FOR TWO OR MORE CONSECUTIVE YEARS
(Complete Through 1963)

<u>Bear No.</u>	<u>Fate</u>	<u>Bear No.</u>	<u>Fate</u>	<u>Bear No.</u>	<u>Fate</u>	<u>Bear No.</u>	<u>Fate</u>
1	dead	32	dead	63	not obs.	93	not obs.
3	dead	35	not obs.	66	not obs.	94	not obs.
4	dead	36	not obs.	67	not obs.	95	not obs.
8	not obs.	37	dead	68	dead	99	not obs.
9	not obs.	38	dead	69	dead	102	not obs.
11	dead	43	not obs.	70	not obs.	103	dead
13	dead	46	not obs.	71	dead	104	not obs.
16	not obs.	47	dead	72	not obs.	105	not obs.
17	not obs.	49	not obs.	73	not obs.	106	not obs.
18A	zoo	50	dead	75	dead	113	not obs.
18	zoo	52	dead	77	dead	114	dead
19	dead	53	dead	78	not obs.	115	not obs.
20	not obs.	54	not obs.	79	dead	117	not obs.
22	dead	55	not obs.	80	dead	118	dead
23	dead	56	not obs.	85	not obs.	119	not obs.
24	dead	57	not obs.	86	dead	121	dead
25	not obs.	58	not obs.	87	not obs.	122	dead
26	not obs.	59	not obs.	89	not obs.	126	dead
27	not obs.	60	not obs.	90	not obs.	131	dead
28	not obs.	61	dead	91	dead	134	dead
31	dead	62	not obs.	92	dead		

RELATION OF THE NUMBER OF MARKED BEARS IN THE POPULATION*
TO THE TOTAL NUMBER OF BEARS IN THE POPULATION

1961

Age Class	No. of Bears in Population in 1961(census)	Number of Marked Bears Theoretically in Population in 1961	Number of Marked Bears Actually Observed in 1961	Per Cent of Total Population by Age Class	Per Cent of Total Population of Marked Bear by Age Class	Per Cent of Total Marked Bears Actually Observed in Each Age Class	Per Cent of Each Age Class Actually Observed by Means of Marked Bears
Cubs	30	13	13	18.1	7.8	100.0	43.3
One Year	17	10	8	10.2	6.0	80.0	47.1
Two Years	17	19	16	10.2	11.4	84.2	94.1
3 or 4 Years	23	17	15	13.9	10.2	88.2	65.2
Adults	79	49	34	47.6	29.5	69.4	43.0
	—	—	—	—	—	—	—
Totals	166	108	86	100.0	64.9		

*Bears marked from 1959 through 1961.

RELATION OF THE NUMBER OF MARKED BEARS IN THE POPULATION*
TO THE TOTAL NUMBER OF BEARS IN THE POPULATION

1962

Age Class	No. of Bears in Population in 1962(census)	Number of Marked Bears Theoretically in Population in 1962	Number of Marked Bears Actually Observed in 1962	Per Cent of Total Population by Age Class	Per Cent of Total Population of Marked Bears by Age Class	Per Cent of Total Marked Bears Actually Observed in Each Age Class	Per Cent of Each Age Class Actually Observed by Means of Marked Bears
Cubs	39	8	8	25.2	5.2	100.0	20.5
One Year	13	13	8	8.4	8.4	61.5	61.5
Two Years	9	6	5	5.8	3.9	83.3	55.6
Three Years	7	13	6	4.5	8.4	46.2	85.7
4 and 5 Years	28	17	9	18.1	11.0	52.9	32.1
Adults	59	44	33	38.0	28.4	75.0	55.9
	—	—	—	—	—	—	—
Totals	155	101	69	100.0	65.3		

*Bears marked from 1959 through 1962.

RELATION OF THE NUMBER OF MARKED BEARS IN THE POPULATION*
TO THE TOTAL NUMBER OF BEARS IN THE POPULATION

1963

Age Class	No. of Bears in Population in 1963(census)	Number of Marked Bears Theoretically in Population in 1963	Number of Marked Bears Actually Observed in 1963	Per Cent of Total Population by Age Class	Per Cent of Total Population of Marked Bears by Age Class	Per Cent of Total Marked Bears Actually Observed in Each Age Class	Per Cent of Each Age Class Actually Observed by Means of Marked Bears
Cubs	40	7	7	22.6	4.0	100.0	17.5
One Year	29	17	15	16.4	9.6	88.2	51.7
Two Years	11	7	5	6.2	4.0	71.4	45.5
Three Years	6	4	3	3.4	2.3	75.0	50.0
4 and 5 Years	19	9	7	10.7	5.1	77.8	36.8
Adults	72	37	30	40.7	20.9	81.1	71.7
	—	—	—	—	—		
Totals	177	81	67	100.0	45.9		

*Bears marked from 1959 through 1963.

FREQUENCY OF OCCURRENCE OF 181 MARKED RECOGNIZABLE GRIZZLIES
AT THE TROUT CREEK DUMP
FROM JUNE, 1960, THROUGH SEPTEMBER 15, 1963

Year	Tot. No. Marked Obsv. Periods	Tot. No.* Marked Bears Observed	Specific Individuals			Specific Individuals			Specific Individuals			Specific Individuals		
			Observed	Per Cent of Total Per cent of Total Obs. Periods	Marked Bears Observed	Observed	Per Cent of Total Per Cent of Total Obs. Periods	Marked Bears Observed	Observed	Per Cent of Total Per Cent of Total Obs. Periods	Marked Bears Observed	Observed	Per Cent of Total Per Cent of Total Obs. Periods	Marked Bears Observed
1960	36	32	6	18.7		19	59.4		7	21.9		0	0.0	
1961	33	53	4	7.5		19	35.8		20	37.8		10	18.9	
1962	32	48	4	8.4		16	33.3		12	25.0		16	33.3	
1963	25	48	2	18.8		17	35.4		15	31.3		7	14.5	
Totals	126	181	23	12.7		71	39.3		54	29.8		33	18.2	

*Observation periods (1 to 5 hours duration) - average approximately 4 hours.

BREEDING INTERVAL, AGE OFFSPRING WEANED, AND
TOTAL NUMBER OF OFFSPRING PRODUCED BY SIX MARKED OR
RECOGNIZABLE FEMALE GRIZZLIES

Female No.	Number of Litters	Breeding Interval, Years		Age Offspring Weaned			Number of Offspring		
		Between First and Second Litters	Between Second and Third Litters	First Litter	Second Litter	Third Litter	First Litter	Second Litter	Third Litter
48	3	1	2	cub	cub	-	1	1	3
34	2	2	-	1 year	-	-	2	2	4
65	2	2	-	1 year	1 year	-	2	4	6
7	2	3	-	2 years	1 year	-	3	2	5
39	2	4	-	1 year	-	-	2	3	5
Mae West	2	3	-	2 years	-	-	2	2	4

BREEDING INTERVAL OF SEVEN MARKED OR RECOGNIZABLE FEMALE GRIZZLIES

<u>Breeding Interval</u>	<u>Female Number</u>	<u>Years Female Appeared With Offspring (Cubs)</u>				
		<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
One Year	48				x	x
Two Years	34			x		x
	48		x		x	
	65		x		x	
Three Years	7	x			x	
	Mae West		x			x
Four Years	39	x				x

RELATION OF CUBS BORN TO YEARLINGS SURVIVING

1959 - 1963

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
Cubs Born	26	35	30	39	40
Cubs Surviving to Following Year (Yearlings)	13	17	13	29	--
Number of Yearlings Unaccounted For	13	18	17	10	--
Per Cent Yearlings Unaccounted For	50.0	51.4	56.7	25.6	--

Note: Yearlings "unaccounted for" probably represent mortalities. Evidence indicates heavy mortality does occur in this age class, but such mortality has not yet been conclusively proved.

WEANING AGE (OFFSPRING OF 27 GRIZZLY FEMALES)
YELLOWSTONE PARK

1959 - 1963

Number of Sows Weaning Offspring As:

<u>Year</u>	<u>Cubs</u>	<u>Yearlings</u>	<u>Two-Year Olds</u>
1959			2
1960	1	1	2
1961		2	6
1962	1	1	3
1963	—	4	4
	—	—	—
Totals	2	8	17

NUMBER OF CUBS ORPHANED, CIRCUMSTANCES, AND OBSERVED SURVIVAL
1959 - 1963

<u>Year</u>	<u>No. of Cubs (in each litter) Orphaned</u>	<u>Circumstances of Orphaning</u>	<u>No. Orphans Known Surviving One and One-Half Years</u>	<u>No. Orphans Known Not Surviving One and One-Half Years</u>	<u>No. of Orphans Not Accounted For</u>
1959	2	Sow No. 23 killed by overdose of drugs	1	-	1
1960	3	Unmarked sow shot near Gardiner	3	-	-
	3	Sow No. 31 killed by overdose of drugs	-	1	2
	1	Sow No. 48 abandoned her only cub	-	-	1
1961	3	Sow No. 18 shipped to zoo	2*	1*	-
1962	0	No orphaning observed			
1963	3	Old Faithful sow shipped to zoo - all three cubs captured and shipped to zoo	-	-	-
	2	Sow No. 148 killed by truck	-	-	-
			6**	2**	4**

* One cub died, one survived, one shipped to zoo.

** 1963 orphans not included since their fate is not yet known.

BONA FIDE ADOPTIONS

1959 - 1963

Family Sow No.	Number	Litter Size	Offspring No.	Adopted Member		Original Family of Adopted Member		Remarks
				Sex	No.	Sex	No.	
1	Unmarked	1	Unmarked	?	5	F	?	No. 5, yearling in 1959, weaned or orphaned. Adopted by sow with single cub of year. Trio together 1959 and 1960. No. 5 alone 1961 and 1962, not observed in 1963. Other members not recognizable since 1960.
36	Unmarked	2	132 133	F M	139	F	38 42	Family 36, unmarked sow with cubs 132 and 133 in 1962. Family No. 36, sow No. 42, cub 139 and unmarked littermate in 1962. No. 42 observed alone in 1963. No. 139 ran with Family No. 36 entire summer of 1963, littermate of No. 139 not observed

SHORT-TERM OR APPARENT ADOPTIONS

-31-

Family No.	Marked Bear Number		Sex	Remarks
	Sow	Offspring		
16 C	48	3 - 1963 cubs all unmarked	?	No. 48 had 3 cubs in 1963. Observed Oct. 7, 1963, with one additional cub, an orphan of No. 148. (No. 148, mother of two 1963 cubs, killed Sept. 5, 1963.)
		1 - 1963 cub unmarked	?	
39	150	3 - 1963 cubs all unmarked	?	No. 150 had 3 cubs in 1963. One of two orphaned cubs of No. 148 observed with this family for approximately one week in Sept., 1963. Later, family observed without orphaned cub -- cub not observed rest of season.
		1 - 1963 cub unmarked	?	
17	U.M. 53 114		M	Unmarked sow had two male cubs in 1960. No. 49, female cub of sow No. 48, abandoned by No. 48. No. 49 ran with this family from July 29 on through 1960 season. Nos. 53 and 114, weaned, observed in 1961; No. 49 not observed or accounted for.
			M	
			F	

49

NUMBER OF MARKED BEARS IN COHORTS
1957 THROUGH 1963

1957 Cohort

Bears Marked as:

<u>Age Two Years in 1959</u>	<u>Age Three Years in 1960</u>	<u>Age Four Years in 1961</u>
3*	32*	54*
9*	35*	55*
10	45	62*
19*	47*	67*
	50*	68*
		7 ¹ / ₄

Total - 17

1958 Cohort

Bears Marked as:

<u>Age One Year in 1960</u>	<u>Age Two Years in 1961</u>	<u>Age Three Years in 1962</u>	<u>Age Four Years in 1963</u>
5	61*	96	127
11	66*	103*	
15	76		

Total - 9

1959 Cohort

Bears Marked as:

<u>Age Cubs in 1959</u>	<u>Age One Year in 1960</u>	<u>Age Two Years in 1961</u>	<u>Age Three Years in 1962</u>	<u>Age Four Years in 1963</u>
6	36*	80*	0	0
24*	37*	86*		
25*	38*	91*		
26*	40	95*		
29	51	106*		
	56*	115*		
	57*	118*		
	77*			

Total - 20

*Dead

Note: (Bears over 4 years of age cannot be accurately aged. Thus no cohorts contain marked bear aged beyond 4 years.) For example, in the 1957 Cohort 4 bears were captured as 2-year olds and marked, 11 were captured as 3-year olds and marked, 2 were captured as 4-year olds and marked and none were captured, aged and marked as 5-year olds since presently-used aging criteria are not valid beyond 4 years.

1960 Cohort

Bears Marked as:

<u>Age Cubs in 1960</u>	<u>Age One Year in 1961</u>	<u>Age Two Years in 1962</u>	<u>Age Three Years in 1963</u>
43*	79*	122*	146
49*	98		149
52*	114*		
53*	116		
70*	121*		
71*			

Total - 14

1961 Cohort

Bears Marked as:

<u>Age Cubs in 1961</u>	<u>Age One Year in 1962</u>	<u>Age Two Years in 1963</u>
18A*	130	0
78*		
82		
83		
92*		
93*		
94*		
97		
99*		
100		
109		
110		
117*		

Total - 14

1962 Cohort

Bears Marked as:

<u>Age Cubs in 1962</u>	<u>Age One Year in 1963</u>
124	141
132	142
133	143
134*	144
135	145
136	147
138	151
139	162
137	163

Total - 18

*Dead

Bears Marked as:

1963 Cohort

Age Cubs in 1963

152
153
154
156
157
158
161

Total - 7

SURVIVAL OF 1957 COHORT (GENERATION)
AS OF 1963

A. Two-Year Olds Captured in 1959
Established-Age Bears

Bear No.	Sex	Date	Recapture Dates	Last Sighting Date	Dental Casts	Observed Longevity
10	F	7/19/59	8/12/61	8/19/63	No Yes	77 months*

B. Three-Year Olds Captured in 1960
Established-Age Bears

45	F	7/13/60	8/16/61	7/3/63	Yes Yes	77 months*
74	M	9/25/60	7/14/61	7/17/62	No No	66 months*

C. Four-Year Olds Captured in 1961
Established-Age Bears

81	F	7/5/61		7/3/63	Yes	76 months*
101	F	8/3/61		7/9/63	No	77 months*

Total Number of Grizzlies in 1957 Cohort (sample size)	17
Number of Mortalities through 1963	12
Number of Survivors through 1963	5
Per cent of Cohort surviving through 1963	29.4
Per cent of Cohort dying through 1963	70.6

*Observed but not recaptured in 1963.

Note: Bears not sighted for two consecutive years are considered as no longer belonging to the population and have been listed as mortalities. This criteria may change as the study progresses.

SURVIVAL OF 1958 COHORT (GENERATION)
AS OF 1963

A. Yearlings Captured in 1959
Established-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
5	F	7/4/59	9/2/60 9/19/61	7/30/62	No No No	54 months
15	F	7/27/59	7/13/61	7/9/63	Yes No	66 months*

B. Two-Year Olds Captured in 1960
Established-Age Bears

76	M	9/28/60	7/20/62 7/26/63	7/26/63	No Yes No	66 months
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C. Three-Year Olds Captured in 1961
Established-Age Bears

96	F	7/27/61	8/17/62 7/12/63	7/29/63	Yes No No	67 months
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D. Four-Year Olds Captured in 1962
Established-Age Bears

127	M	7/14/62	8/2/62 8/27/62	8/27/62	No No No	55 months
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Total Number of Grizzlies in 1958 Cohort (sample size)	9
Number of Mortalities through 1963	4
Number of Survivors through 1963	5
Per cent Cohort surviving through 1963	55.6
Per cent Cohort dying through 1963	44.4

*Observed but not recaptured in 1963.

SURVIVAL OF 1959 COHORT (GENERATION)
AS OF 1963

A. Cubs Captured in 1959
Known-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
6	F	7/4/59	7/29/60 8/19/60 8/2/61 7/19/62 8/23/62		No No Yes Yes Yes No	
				8/19/63		55 months*
29	F	8/28/59	7/14/61	7/9/63	No Yes	54 months*

B. Yearlings Captured in 1960
Established-Age Bears

40	F	7/1/60	10/24/60 9/22/61 9/8/62 8/7/63		No No Yes Yes Yes	
				8/19/63		55 months
51	M	7/29/60	8/7/62 8/2/63	7/9/63	Yes Yes Yes	54 months

C. Two-Year Olds Captured in 1961

None

D. Three-Year Olds Captured in 1962

None

Total Number of Grizzlies in 1959 Cohort (sample size)	20
Number of Mortalities through 1963	16
Number of Survivors through 1963	4
Per cent Cohort surviving through 1963	20.0
Per cent Cohort dying through 1963	80.0

*Observed but not recaptured in 1963.

SURVIVAL OF 1960 COHORT (GENERATION)
AS OF 1963

A. Cubs Captured in 1960
Known-Age Bears

None

B. Yearlings Captured in 1961
Established-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
98	M	7/28/61		6/14/63	Yes	41 months
116	M	8/24/61	7/11/62	7/11/62	Yes Yes	29 months

C. Two-Year Olds Captured in 1962

None

D. Three-Year Olds Captured in 1963
Established-Age Bears

146	M	7/1/63		7/2/63	Yes	42 months
149	M	7/15/63		7/15/63	Yes	42 months

Total Number of Grizzlies in 1960 Cohort (sample size)	14
Number of Mortalities through 1963	10
Number of Survivors through 1963	4
Per cent Cohort surviving through 1963	28.6
Per cent Cohort dying through 1963	71.4

SURVIVAL OF 1961 COHORT (GENERATION)
AS OF 1963

A. Cubs Captured in 1961
Known-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
82	F	7/5/61			No	
83	M	7/5/61		7/28/62	Yes	18 months*
97	M	7/28/61		7/28/62	Yes	18 months*
			7/23/63		No	
100	M	8/3/61		7/23/63	Yes	30 months
			7/22/63		No	
109	F	8/14/61		7/22/63	Yes	30 months
110	F	8/14/61		7/9/63	Yes	30 months
			8/17/62		Yes	
				7/9/63		30 months**

B. Yearlings Captured in 1962
Known-Age Bears

130	M	7/18/62		7/9/63	Yes	30 months**
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C. Two-Year Olds Captured in 1963

None

Total Number of Grizzlies in 1961 Cohort (sample size)	14
Number of Mortalities through 1963	7
Number of Survivors through 1963	7
Per cent Cohort surviving through 1963	50.0
Per cent Cohort dying through 1963	50.0

*Observed but not recaptured in 1962.

**Observed but not recaptured in 1963.

SURVIVAL OF 1962 COHORT (GENERATION)
AS OF 1963

A. Cubs Captured in 1962
Known-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
124	M	7/5/62		7/5/62	Yes	6 months
132	F	7/27/62		7/9/63	Yes	18 months
133	M	7/27/62	6/23/63	7/9/63	Yes Yes	18 months
135	M	8/8/62	9/3/63	9/3/63	Yes No	19 months
136	M	8/8/62		8/19/63	Yes	19 months*
137	M	8/20/62		7/9/63	Yes	18 months
138	M	8/20/62		8/20/62	Yes	7 months
139	F	8/28/62		7/9/63	Yes	18 months

*Observed but not recaptured in 1963.

B. Yearlings Captured in 1963
Known-Age Bears

141	F	6/19/63	7/22/63	7/9/63	No No	18 months
142	F	6/19/63		7/9/63	Yes	18 months
143	F	6/25/63	7/10/63 8/14/63	8/19/63	Yes No Yes	19 months
144	F	6/25/63		8/19/63	Yes	19 months
145	M	6/26/63	7/29/63	8/19/63	Yes Yes	19 months
147	M	7/2/63		7/2/63	Yes	18 months
151	F	7/17/63		7/17/63	Yes	18 months

1962 Cohort (cont.)

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
162	F	8/21/63			Yes	
163	F	8/27/63		8/26/63	No	19 months
				10/1/63		21 months

Total Number of Grizzlies in 1962 Cohort (sample size) 18

Number of Mortalities through 1963 1

Number of Survivors through 1963 17

Per cent of Cohort surviving through 1963 94.4

Per cent of Cohort dying through 1963 5.6

SURVIVAL OF 1963 COHORT (GENERATION)
AS OF 1963

A. Cubs Captured in 1963
Known-Age Bears

<u>Bear No.</u>	<u>Sex</u>	<u>Date</u>	<u>Recapture Dates</u>	<u>Last Sighting Date</u>	<u>Dental Casts</u>	<u>Observed Longevity</u>
152	M	7/19/63			No	6 months
153	M	7/19/63			No	6 months
154	M	7/19/63			No	6 months
156	F	7/24/63			No	6 months
157	M	7/30/63			No	6 months
158	M	7/30/63			No	6 months
159	M	8/19/63			No	7 months

Total Mortality = 12

Total Mortality = 4

Mortality (cont.)

Cohort:	Bear No.	Sex	Age at Death	Weight Lbs.	Specimens Obtained		Fate
					Skull	Skeleton	
1959 Cohort: (20)	24	M	cub	70	X		Died from overdose of drug
	77	F	1	145	X	X	Died from overdose of drug
	118	F	1	145	X	X	Sacrificed at request of NPS
	25	Unk.	?	?			Not observed for two or more consecutive years
	38	M	?	?			" "
	26	M	?	?			" "
	106	M	?	?			" "
	115	F	?	?			" "
	36	M	1	145			" "
	80	M	4	?	X		Killed by NPS as control measure
	86	F	3	?	X		Killed by automobile
	95	M	?	?			Not observed for two or more consecutive years
	91	F	3	250	X	X	Killed by NPS as control measure
	37	M	4	?			Killed by hunter
	56	M	?	?			Not observed for two or more consecutive years
	57	M	?	?			" "

Total Mortality = 16

Mortality (cont.)

Cohort:	Bear	Sex	Age at	Weight	Specimens Obtained		Fate
	No.		Death	Lbs.	Skull	Skeleton	
1960							
Cohort: (14)	43	M	?	?			Not observed for two or more consecutive years
	53	M	1	90	X	X	Sacrificed for study
	114	M	1	95	X	X	" "
	71	M	cub	85	X	X	Died from overdose of drug
	52	M	1	?			Shot by rancher
	49	F	2	?			Not observed for two or more consecutive years
	70	F	2	?			" "
	79	F	2	?	X	X	Apparently killed by another bear
	121	F	3	240	X	X	Sacrificed at request of NPS
	122	M	3	205			Shipped to zoo by NPS
Total Mortality = 10							
1961							
Cohort: (14)	18A	F	cub	30			Sent to zoo
	92	M	1	140			Shot by hunter
	78	M	?	?			Not observed for two or more consecutive years
	94	M	?	?			" "
	93	F	?	?			" "
	99	F	?	?			" "
	117	F	?	?			" "
Total Mortality = 7							
1962							
Cohort: (18)	134	M	cub	70	X	X	Killed by accident in handling
Total Mortality = 1							

SUMMARY OF COHORT DATA THROUGHOUT
YELLOWSTONE
COMPLETE THROUGH 1963

	<u>1957 Cohort</u>	<u>1958 Cohort</u>	<u>1959 Cohort</u>	<u>1960 Cohort</u>	<u>1961 Cohort</u>	<u>1962 Cohort</u>	<u>1963 Cohort</u>
Size of each generation (total cub count)	34*	34*	26	35	30	39	40
Size of each marked sample	17	9	20	14	14	18	7
Per cent sample	50.0*	26.5*	76.9	40.0	46.7	46.2	
No. of mortalities in each marked sample	12	4	16	10	7	1	
No. of survivors in each marked sample	5	5	4	4	7	17	
Per cent of each marked sample surviving through 1963	29.4	55.6	20.0	28.6	50.0	94.4	
Per cent of each marked sample dying through 1963	70.6	44.4	80.0	71.4	50.0	5.6	

*Average size of generation computed from averaging the sizes of 1959 through 1963 generation size.

SIZE OF EACH GENERATION AND MARKED SAMPLE
THROUGHOUT YELLOWSTONE NATIONAL PARK,
COMPLETE THROUGH 1963

Year	Size of Generation	Number of Generation Marked as:						Per Cent of Generation Marked as:				Total Per Cent of Each Generation Marked	
		Cubs 1 yr. 2 yrs. 3 yrs. 4 yrs. Total						Cubs 1 yr. 2 yrs. 3 yrs. 4 yrs.					
		Cubs	1 yr.	2 yrs.	3 yrs.	4 yrs.	Total	Cubs	1 yr.	2 yrs.	3 yrs.		4 yrs.
1957	34*	--	--	4	11	2	17	--	--	11.8	32.3	5.9	50.0
1958	34*	--	3	3	2	1	9	--	8.8	8.8	5.9	2.9	26.4
1959	26	5	8	7	0	0	20	19.2	30.8	26.9	0.0	0.0	76.9
1960	35	6	5	1	2	--	14	17.1	14.3	2.9	5.7	--	40.0
1961	30	13	1	0	--	--	14	43.3	3.3	0.0	--	--	46.6
1962	39	9	9	--	--	--	18	23.1	23.1	--	--	--	46.2
1963	40	7	--	--	--	--	7	17.5	--	--	--	--	17.5

99

*Average size of generation computed from averaging the sizes of 1959 through 1963 generations.

MOVEMENT DETERMINED FROM OBSERVATION
OR RECAPTURE OF MARKED BEARS
1959-1963

Bear No.	Sex	Age When Captured or Observed	Area Marked	Date Marked or Observed	Area Observed	Date Reobserved	Distance From Area Where Marked or Obs. (airline miles)
2	M	Adult	Trout Creek	6/27/59	Rabbit Creek	8/3/60 6/23/61	19.5
22	M	Adult	Trout Creek	8/7/59	N. of Cody, Wyo.	10/29/59	50
26	M	1 Year	Trout Creek	8/21/59	Elk Park Trout Creek	5/7/60 6/21/60	14 14
00	M	Adult	Rabbit Creek	8/6/60	Hawk's Rest, Wyo.	9/--/60	50
65	F	Adult	Trout Creek	8/22/60	Cascade Lake	10/15/60	11
52	M	Cub		7/30/60			
43	M	Cub		7/9/60			
29	F	1 Year	Trout Creek	8/28/59	Norris cutoff	10/29/60	7
50	M	Adult	Trout Creek	7/28/60	Thorofare Range, Wyo.	10/--/60	48
32	M	3-4 Years	Trout Creek	6/24/60	Lamar Valley Pelican Creek Mary Lake 5 Mi. S. Cooke City	5/2/61 7/13/61 7/28/61 10/--/61	24 24 14 54
46	M	Adult	Trout Creek	7/14/60	Lamar Valley Hayden Valley	5/2/61 6/17/61	24 24
67	M	3-4 Years	Gardiner	8/26/60	Lamar Valley Gardiner	5/2/61 7/19/61	29 29
68	M	3-4 Years	Gardiner	8/30/60	Lamar Valley Upper Slough Creek	5/2/61 10/--/61	29 14
77	F	1 Year	Trout Creek	9/30/60	Norris Jct.	6/10/61	14

MOVEMENT, 1959 - 1963

Bear No.	Sex	Age When Captured or Observed	Area Marked	Date Marked or Observed	Area Observed	Date Observed	Distance From Area Where Marked or Obs. (airline miles)
60	M	Adult	W. Yellowstone	8/10/60	Trout Creek W. Yellowstone	6/22/61 8/14/61	28 28
98	M	1 Year	Trout Creek	7/28/61	Sylvan Lake	9/6/61	19
94	M	Cub	Trout Creek	7/27/61	Cascade Lake	10/2/61	9
112	F	Adult	Trout Creek	8/15/61	Cascade Lake	10/18/61	9
61	F	2 Years	W. Yellowstone	8/12/60	S. E. Hebgen Lake	10/--/61	8
Scarneck	M	Adult	Rabbit Creek	Season-- 1959	E. of Yellowstone River near Sulphur Mountain Rabbit Creek Trout Creek area Trout Creek Rabbit Creek	6/9, 11, 16/61 6/23/61 Season '62 7/9/63 7/15/63	21 21 21
96	F	Young Adult	Trout Creek	Season-- 1961	Cache Creek	6/30/63	35-40
92	M	1 Year	Trout Creek	7/21/61	Cooke City area	8/4/62	50
86	F	3 Years	Trout Creek	7/12/61	Elk Park	9/28/62	15
69	M	Adult	Gardiner	8/30/60	Hellroaring-Buffalo Plateau area	9/20/62	30
37	M	3 Years	Trout Creek	6/29/60	Rabbit Creek Polecat Creek S. of Park	10/4/62 6/22/63	15 30-35
80	M	2 Years	Cougar Creek	8/28/61	Shoshone Lake	6/19/63	30
126	M	Adult	Trout Creek	7/11/62	N.Fork, Shoshone River	Spring '63	50

INDUCED MOVEMENT DETERMINED FROM OBSERVATION OR
RECAPTURE OF MARKED BEARS
1959-1963

Bear No.	Sex	Age When Captured	Area Captured	Area Released	Date Released	Area Observed	Date Observed	Distance Traveled (airline miles)
2	M	Adult	Thumb	Trout Creek	6/27/59	Thumb	7/2/59	15
			Thumb	Carnellian Creek	7/6/59	Trout Creek	7/8/59	17
4	M	Adult	Thumb	Trout Creek	7/2/59	Thumb	7/5/59	15
			Thumb	Carnellian Creek	7/11/59	Trout Creek	7/14/59	15
			Pelican Creek	Trout Creek	7/25/60	Pelican Creek	7/27/60	10
			Pelican Creek	Rabbit Creek	7/27/60	Pelican Creek	8/2/60	18
11	F	1 Year	Canyon	Crystal Creek	7/19/59	Fishing Bridge	7/28/59	25
12	M	Adult	Fishing Bridge	Crystal Creek	7/21/59	Trout Creek	7/24/59	21
8	F	Adult	Thumb	Trout Creek	7/8/59	Rabbit Creek	7/24/59	18
9	F	Adult	Thumb	Trout Creek	7/9/59	Thumb	8/16/60	15
47	F	3-4 Yrs.	Thumb	Trout Creek	7/23/60	Shoshone Lake	8/18/60	18
1	M	Adult	Thumb	Trout Creek	6/26/59	Old Faithful	9/1/60	18
43	M	1 Year	Canyon	Mary Lake	8/2/61	Fishing Bridge	8/15/61	14
80	M	2 Years	Canyon	Trout Creek	7/2/61	Canyon	8/4/61	8.5
			Mary Lake	Mary Lake	8/4/61	Indian Creek	8/15/61	9
			Hayden Valley	Hayden Valley	8/15/61	Canyon	8/27/61	11
			Cougar Creek	Cougar Creek	8/28/61	Shoshone Lake	6/19/63	30
18	F	Adult	Old Faithful	Trout Creek	6/8/61	Clearwater Sp.	6/12/61	16
78	M	Cub				Alum Creek	6/14/61	14
						Bridge Bay	6/15/61	11

INDUCED MOVEMENT AND DISTANCE TRAVELED, 1959 - 1963

Bear No.	Sex	Age When Captured	Area Captured	Date		Area Observed	Date Observed	Distance Traveled (airline miles)
				Area Released	Released			
78	M	Cub	Bridge Bay Sulphur Mtn. Grand View	Trout Creek Hayden Valley Promontory Pt.	6/16/61 6/18/61 6/25/61	Sulphur Mtn. Grand View Steamboat Pt.	6/18/61 6/24/61 7/2/61	2 6 27
37	M	2 Years	Thumb	Trout Creek	6/26/61	Wolf Point Thumb	7/8/61 7/15/61 7/28/61	26 9 15
52	M	1 Year	Canyon	Blacktail Deer Creek Mary Lake	6/23/61	Canyon	6/25/61	14
79	F	1 Year	Gardiner Pelican Creek	Trout Creek Hayden Valley	8/1/61	Moran, Wyo.	8/20/61	55
38	M	2 Years	Pelican Creek Pelican Creek Pelican Creek	Trout Creek Promontory Pt. Gardiner	6/16/61 7/4/61 7/10/61 7/18/61 7/24/61	Pelican Creek Pelican Creek Pelican Creek Indian Creek	7/3/61 8/21/61 7/14/61 7/21/61 8/6/61	10 15 11 31 12
107	F	Adult	Canyon	Trout Creek	8/10/61	Canyon	9/12/61	9
116	M	1 Year	Fishing Bridge	Trout Creek	8/24/61	Fishing Bridge	8/29/61	9
127	M	3-4 Yrs.	Lake	Crystal Creek	8/2/62	Fishing Bridge	8/27/62	25

SUMMARY OF RECAPTURES
OF KNOWN-AGE GRIZZLY BEARS
1959 - 1963

	<u>Number Individuals</u>	<u>Total No. Times Bears Weighed and Measured</u>	<u>Maximum No. of Successive Annual Growth and Weight Records Obtained for One Individual</u>	<u>Maximum No. of Growth and Weight Records Obtained for One Individual</u>	<u>Max. Age Recorded, in Months</u>
Males	14	38	3	5	67
Females	11	33	4	7	54
	—	—	—	—	—
Totals	25	71			

BEARS TO BE RECAPTURED, 1964

Bear No.	Age 1964	Specimens to be Obtained				Entire Skeleton and Internal Organs
		Tooth Casts	Foot Casts	Blood	Milk	
5	6	X	X	X		
6	5	X	X	X		
10	7	X	X	X		
12	Old Adult			X		
15	6	X	X	X	X	
29	5	X	X	X		
40	5	X	X	X		
45	7	X	X	X		
48	Aged Adult			X	X	
51	5	X	X	X		
76	6	X	X	X		
82	3	X	X			
83	3	X	X			
96	6	X	X	X	X	
97	3	X	X			
109	3	X	X			
110	3	X	X			
130	3	X	X			
Old Mose	Aged Adult			X	X	X

Two unmarked yearlings of No. 34

Three unmarked yearlings of No. 48

All two-year olds X

GROWTH AND DEVELOPMENT OF KNOWN-AGE MALE GRIZZLY BEARS
1959 - 1963

Bear No.	Fate	Dates Captured	Age When Captured*	Wt.	Total Length	Ear Length	Nose to Eye
37	Dead	June 29, 1960	17 mos.	145	57		
		Aug. 22, 1960	20 mos.	245	59	4 3/4	5 3/4
		June 27, 1961	29 mos.	215	65	4 1/2	6
		Sept. 12, 1961	32 mos.	315	67 1/2	4 3/4	6 7/8
		Oct. 4, 1962	45 mos.	440	73	5	7 1/4
38	Dead	June 29, 1960	17 mos.	140	57		5 1/2
		July 11, 1961	29 mos.	185	58	5	6 1/4
		Aug. 7, 1961	30 mos.	205			
51	Alive	July 29, 1960	18 mos.	150	50 1/2	4 1/8	5 1/4
		Aug. 7, 1962	42 mos.	275	69 1/2	4 5/8	6 3/4
		Aug. 31, 1962	43 mos.	290	68	4 3/4	6 3/4
		Aug. 2, 1963	55 mos.	343	69	4 3/4	6 1/2
52	Dead	July 30, 1960	6 mos.	100	42	4	4
		Aug. 22, 1960	7 mos.	120			
		June 22, 1961	17 mos.	140	52	4 1/2	5 1/2
		Aug. 1, 1961	18 mos.	182	52 1/2	4 1/2	5 3/4
43	Dead	July 9, 1960	5 mos.	70	41		4 1/2
		Aug. 2, 1961	18 mos.	185	54	4 1/2	5 3/8
92	Dead	July 21, 1961	6 mos.	55	36	3 1/4	3 5/8
		Aug. 22, 1961	7 mos.	80	42	3 1/4	3 5/8
		Aug. 4, 1962	18 mos.	140	50 1/2	4 1/2	5 1/2
78	Dead	June 8, 1961	4 mos.	20	29	2 7/8	3
		Sept. 30, 1961	8 mos.	80	38	3 3/4	4
		May 13, 1962	16 mos.	40	40	4	4 1/2
116	Alive	Aug. 24, 1961	19 mos.	205	54 3/4	4 5/8	5 1/4
		July 11, 1962	29 mos.	250	63	5	6 1/4
95	Not observed for two consec. yrs.	July 27, 1961	30 mos.	278	64	5	5 7/8
		Sept. 20, 1961	32 mos.	360	64 1/4	5	6
26	" "	Aug. 21, 1959	7 mos.	90			
		July 14, 1960	29 mos.	145	55		
133	Alive	July 27, 1962	6 mos.	70	41	3 1/2	4
		June 25, 1963	17 mos.	150	52	4 3/4	5 1/2
76	Alive	July 20, 1962	54 mos.	350	70 3/4	5	7
		Aug. 26, 1963	67 mos.	465	71	4 3/4	6 3/4

*Based on birthdate of Feb. 1.

Note: Weight in pounds; measurements in inches.

GROWTH AND DEVELOPMENT OF KNOWN-AGE MALE GRIZZLY BEARS
1959 - 1963
(continued)

Bear No.	Fate	Dates Captured	Age When Captured*	Wt.	Total Length	Ear Length	Nose to Eye
97	Alive	July 28, 1961	6 mos.	65	39	3 1/2	3 3/4
		July 23, 1963	30 mos.	285	60 1/2	4 1/4	5 1/2
122	Dead	June 16, 1962	29 mos.	140	55 3/4	5	6 1/4
		June 19, 1963	41 mos.	205	60	4 1/2	6 1/2

*Based on birthdate of Feb. 1.

GROWTH AND DEVELOPMENT OF KNOWN-AGE FEMALE GRIZZLY BEARS
1959 - 1963

Bear No.	Fate	Dates Captured	Age When Captured*	Wt.	Total Length	Ear Length	Nose to Eye
6	Alive	July 4, 1959	5 mos.	45			
		June 29, 1960	17 mos.	105	51 1/2		
		Aug. 19, 1960	19 mos.	160	52	4	
		Aug. 2, 1961	30 mos.	210	59 1/2	3 7/8	5 3/8
		Sept. 20, 1961	32 mos.	260			
		July 19, 1962	42 mos.	250	65 1/2	4 3/4	5 7/8
		Aug. 23, 1962	43 mos.	295			
29	Alive	Aug. 28, 1959	7 mos.	92			
		July 14, 1961	29 mos.	165	57 1/2	4 1/2	5 1/4
		Sept. 8, 1961	31 mos.	252	58 1/4	4 1/2	5 3/4
5	Alive	July 4, 1959	14 mos.	110			
		Sept. 2, 1960	31 mos.	240	56		
		Sept. 19, 1961	43 mos.	300	63 1/2	3 1/2	5 3/4
77	Dead	Sept. 28, 1960	20 mos.	205	55	4 1/2	5 1/4
		June 10, 1961	28 mos.	145	58 1/2	4 1/2	5 1/2
9	Not observed for two consec. yrs.	July 9, 1959	29 mos.	160			
		Aug. 16, 1960	42 mos.	280	67 1/2	5	6 1/2
10	Alive	July 19, 1959	30 mos.	140			
		Aug. 12, 1961	54 mos.	260	63 1/2	4 1/2	6
15	Alive	July 27, 1959	30 mos.	150			
		July 13, 1961	53 mos.	212	66	4 7/8	6 1/2
91	Dead	July 20, 1961	30 mos.	150	53	4 1/2	4 3/4
		Aug. 7, 1962	42 mos.	250			
40	Alive	July 1, 1960	17 mos.	175	55 1/2		5
		Oct. 24, 1960	21 mos.	230			
		Sept. 22, 1961	32 mos.	300	63	4 3/4	5 3/4
		Sept. 8, 1962	42 mos.	340	64 3/4	5	5 3/4
		Aug. 7, 1963	51 mos.	270	59	4 3/4	5 1/2
110	Alive	Aug. 14, 1961	7 mos.	75	36	3 1/4	4
		Aug. 17, 1962	19 mos.	185	54	4 1/4	5 1/2
121	Dead	Sept. 19, 1961	20 mos.	115	52 1/2	4	5 5/8
		Aug. 6, 1962	31 mos.	130	54	4 1/4	5 1/4
		July 11, 1963	42 mos.	240	58 1/2	4 1/2	5 1/2

*Based on birthdate of Feb. 1.

Note: Weight in pounds; measurements in inches.

INDIVIDUAL IDENTIFICATION OF TOOTH CASTS
OBTAINED FROM KNOWN AND ESTABLISHED-AGE MALE BEARS
(Complete Through 1963)

<u>Cubs</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years and Over</u>
43	26	37	37	32	73
52	36	38	51	51	76
53	37	80	122		85
78	38	95	146		105
83	43	106	149		
92	51	116			
94	52				
97	53				
100	56				
124	57				
135	78				
136	92				
137	98				
138	114				
	116				
	130				
	133				
	144				
	145				
	147				

Total number of Tooth Casts = 51.

INDIVIDUAL IDENTIFICATION OF TOOTH CASTS
OBTAINED FROM KNOWN AND ESTABLISHED-AGE FEMALE BEARS
(Complete Through 1963)

<u>Cubs</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years and Over</u>
18A	6	6	6	10	131
49	77	29	5	15	
70	79	61	96	40	
93	110	66	121	45	
99	121	77		81	
109	141	86			
110	142	91			
117	143	115			
132	151	118			
139	162	121			

Total number of Tooth Casts = 40.

LISTING OF KNOWN AND ESTABLISHED-AGE BEARS STILL ALIVE
FROM WHICH TOOTH CASTS HAVE BEEN OBTAINED
(Complete Through 1963)

<u>Bear No.</u>	<u>Age in 1964</u>	<u>Males</u>					
		<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years</u>
51			X		X	X	
76							X
83	3	X					
97	4	X					
130	4		X				
133	2		X				
135	2	X					
136	2	X					
137	2	X					
138	2	X					
144	2		X				
145	2		X				
147	2		X				

LISTING OF KNOWN AND ESTABLISHED-AGE BEARS STILL ALIVE
FROM WHICH TOOTH CASTS HAVE BEEN OBTAINED
(Complete Through 1963)

<u>Bear No.</u>	<u>Age in 1964</u>	<u>Females</u>					
		<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years</u>
5	6				X		
6	5		X	X	X		
10	7					X	
15	6					X	
29	5			X			
40	5					X	
45	7					X	
109	3	X					
110	3	X	X				
132	2	X					
139	2	X					
141	2		X				
142	2		X				
143	2		X				
151	2		X				
162	2		X				

LISTING OF TOOTH CASTS OBTAINED FROM KNOWN AND ESTABLISHED-AGE MALE BEARS
CASTS OBTAINED IN CONSECUTIVE YEARS ON INDIVIDUAL BEARS
(Complete Through 1963)

<u>Bear No.</u>	<u>Age When Cast Obtained</u>				
	<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>
37		X	X	X	
38		X	X		
43	X	X			
51		X		X	X
52	X	X			
53	X	X			
78	X	X			
92	X	X			
116		X	X		

LISTING OF TOOTH CASTS OBTAINED FROM KNOWN AND ESTABLISHED-AGE FEMALE BEARS
CASTS OBTAINED IN CONSECUTIVE YEARS ON INDIVIDUAL BEARS
(Complete Through 1963)

<u>Bear No.</u>	<u>Age When Cast Obtained</u>				
	<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>
6		X	X	X	
77		X	X		
110	X	X			
121		X	X	X	

INDIVIDUAL IDENTIFICATION OF FOOT CASTS OBTAINED
FROM KNOWN AND ESTABLISHED-AGE MALE AND FEMALE BEARS
(Complete Through 1963)

<u>Cubs</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years and Over</u>
18A	43	6	5	10	76
52	52	37	6	40	
78	53	38	37	51	
92	77	80	51		
93	79	95	146		
94	92	106			
97	98	115			
99	110	116			
100	114	118			
109	116				
110	121				
117	130				
132	143				
133	144				
136	145				
137	147				
138	162				
139					

INDIVIDUAL IDENTIFICATION OF FOOT CASTS OBTAINED
FROM KNOWN AND ESTABLISHED-AGE MALE GRIZZLIES
(Complete Through 1963)

<u>Cubs</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years</u>
52	43	37	37	51	76
78	52	38	51		
94	53	80	146		
97	98	95			
100	114	116			
133	116				
136	130				
137	145				
138	147				

INDIVIDUAL IDENTIFICATION OF FOOT CASTS OBTAINED
FROM KNOWN AND ESTABLISHED-AGE FEMALE GRIZZLIES
(Complete Through 1963)

<u>Cubs</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years</u>
18A	77	6	5	10	
92	79	106	6	40	
93	92	115			
99	110	118			
109	121				
110	143				
117	144				
132	162				
139					

LISTING OF FOOT CASTS OBTAINED FROM KNOWN
AND ESTABLISHED-AGE MALE GRIZZLIES

CASTS OBTAINED IN CONSECUTIVE YEARS ON INDIVIDUAL BEARS
(Complete Through 1963)

<u>Bear No.</u>	<u>Age When Cast Obtained</u>				
	<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>
37			X	X	
52	X	X			
92	X	X			
116		X	X		

LISTING OF FOOT CASTS OBTAINED FROM KNOWN
AND ESTABLISHED-AGE FEMALE GRIZZLIES

CASTS OBTAINED IN CONSECUTIVE YEARS ON INDIVIDUAL BEARS
(Complete Through 1963)

<u>Bear No.</u>	<u>Age When Cast Obtained</u>				
	<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>

6			X	X	
---	--	--	---	---	--

110	X	X			
-----	---	---	--	--	--

LISTING OF KNOWN AND ESTABLISHED-AGE BEARS STILL ALIVE
FROM WHICH FOOT CASTS HAVE BEEN OBTAINED
(Complete Through 1963)

<u>Bear No.</u>	<u>Age in 1964</u>	<u>Cub</u>	<u>One Year</u>	<u>Two Years</u>	<u>Three Years</u>	<u>Four Years</u>	<u>Five Years</u>
5	6				X		
6	5			X	X		
10	7					X	
40	5					X	
51	5				X	X	
76	6						X
97	3	X					
109	3	X					
110	3	X	X				
130	3		X				
132	2	X					
133	2	X					
136	2	X					
137	2	X					
138	2	X					
139	2	X					
143	2		X				
144	2		X				
145	2		X				
147	2		X				
162	2		X				

AVERAGE WEIGHTS AND MEASUREMENTS OF FEMALE GRIZZLIES BY AGE CLASS, YEAR AND SEASON
(COMPUTED FROM DATA ON 54 KNOWN-AGE FEMALES)

Age Class	Total Number Different Individuals Weighed and Measured	Spring (June - July)					Fall (August, September, October)				
		No. Bears*	Wt. Lbs.	Per Cent Increase From Previous Year	Total Length, Inches	Per Cent Increase From Previous Year	No. Bears*	Wt. Lbs.	Per Cent Increase From Previous Year	Total Length, Inches	Per Cent Increase From Previous Year
Cubs	14	8	49.1	--	36.0	--	7	86.4	--	40.3	--
Yearlings	14	11	123.2	150.9	47.4	31.7	7	164.3	90.2	54.0	34.0
Two Years	16	8	146.9	19.2	54.5	15.0	10	218.7	33.1	58.4	8.1
Three Years	10	4	253.8	72.8	62.4	14.5	7	273.6	25.1	62.3	6.7
	—	—					—				
	54	31					31				

*Several different individuals were weighed and measured more than one time.

Note: All "spring" weights and measurements were obtained during June and July; "Fall" data were obtained in August, September, and October.

AVERAGE TOTAL LENGTH AND SEASONAL WEIGHTS OF 55 DIFFERENT ADULT GRIZZLIES

Spring (June - July)				Fall (August, September, October)			
Number Different Bears	No. of		Number of Total Length Ave. Total Measurements Length, in Inches	Number Different Bears	No. of		Number of Total Length Ave. Total Measurements Length, in Inches
	Weights				Weights		
	Obtained	Pounds			Obtained	Pounds	
16	21	315	9	16	18	383	12
							70

Note: All bears over 5 years are considered adults. All "spring" weights and measurements were obtained in June and July; "Fall" data were obtained in August, September, and October.

MAXIMUM AND MINIMUM WEIGHTS AND TOTAL LENGTH MEASUREMENTS OBTAINED FROM 55 ADULT GRIZZLIES

		Spring (June - July)				Fall (August, September, October)					
		Max.		Min.		Max.		Min.			
		Total	Length	Total	Length	Total	Length	Total	Length		
		<u>Differences</u>		<u>Differences</u>		<u>Differences</u>		<u>Differences</u>			
Max.	Min.	Wt.	Length	Wt.	Length	Wt.	Length	Wt.	Length		
Females	435	225	210	78	67	495	300	195	74.5	66	8.5
Males	645	310	335	91	69	780	345	435	85	73	12

Note: All bears over 5 years old are considered adults. For data on number of weights and number of total length measurements see Table, page 90.

All "spring" weights and measurements were obtained in June and July; "Fall" data were obtained in August, September, and October.

LISTING OF GRIZZLY SPECIMENS
SKULLS, SKELETONS, AND HIDES

Marked Bears - Yellowstone National Park

Bear No.	Sex	Age	Specimens Obtained			Mont. State University Museum Number	Mont. State College Number	Where Stored
			Skull	Skeletal Bones	Hide			
1	M	A	X		X	6273	176417	MSU Museum
4	M	A	X			6991		WRU, MSU
13	M	A	X	X		6280		MSU Museum
23	F	A	X		X	6248		" "
24	M	Cub	X			6994		" "
31	F	A	X			6992		WRU, MSU
47	F	3	X			6990		MSU Museum
53	M	1	X	X	X	6881	176379	" "
71	M	Cub	X	X		6993	176356	" "
75	F	A	X		X	8659		MSU Museum (skull in bug colony)
77	F	2	X		X	6877		MSU Museum
79	F	2	X	X			176410	" "
91	F	3	X	X	X	8197	176411	" "
103	F	3	X	X	X	6883	176376	" "
114	M	1	X	X	X	6880	176380	" "
118	F	1	X	X	X	6882	176381	" "
								(hide in WRU, MSU)
121	F	3	X	X	X	8656		MSU Museum
131	F	A	X	X	X	8196	176412	" "
134	M	Cub	X	X	X	8195	176413	" "
148	F	A	X		X	8658		" "
								(skull in bug colony)
80	M	4	X					MSU Museum
11	F	1	X					" "

Unmarked Bears

F	1	X	X			6995	176344	WRU, MSU
M	A	X	X			6876	176416	MSU Museum
F	?	X	X				176374	WRU, MSU
M	1	X	X			6879	176375	MSU Museum
M	A	X	X				176335	WRU, MSU
M	A	X	X		X		176424	" "
M	?	X	X				176330	" "
M	A	X			X	6249		MSU Museum

Black Bears

M	A	X	X				176423	MSU MUSEUM
								WRU, MSU
F	A	X	X				176378	WRU, MSU
?	?	X					176371	" "

LISTING OF GRIZZLY SPECIMENS
STORED IN WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY
ORGANS AND TISSUES

<u>Bear No.</u>	<u>Sex</u>	<u>Age</u>	<u>Area Collected</u>	<u>Date Collected</u>
3	F	2	Yellowstone	July 4, 1959
11	F	1	"	July 31, 1959
24	M	Cub	"	Aug. 11, 1959
1	M	A	"	Sept. 2, 1960
4	M	A	"	Aug. 3, 1960
31	F	A	"	June 20, 1960
71	M	Cub	"	Sept. 2, 1960
Unmarked	M	A	"	July 28, 1960
Unmarked	M	?	?	May 25, 1960
Unmarked	F	?	?	May 25, 1960
18B	M	Cub	Yellowstone	June 18, 1961
53	M	1	"	Aug. 24, 1961
77	F	2	"	June 10, 1961
103	F	3	"	Aug. 9, 1961
114	M	1	"	Aug. 24, 1961
118	F	2	"	Aug. 30, 1961
91	F	3	"	Aug. 7, 1962
134	M	Cub	"	Aug. 8, 1962
121	F	3	"	July 9, 1963
148	F	A	"	July 6, 1963
75	F	A	"	Sept. 28, 1963
Unmarked	M	A	Woodworth, Montana	April 8, 1963

LISTING OF GRIZZLY SPECIMENS
STORED IN WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY
REPRODUCTIVE TRACTS

<u>Bear No.</u>	<u>Sex</u>	<u>Age</u>	<u>Area Collected</u>	<u>Date Collected</u>
3	F	2	Yellowstone	July 4, 1959
24	M	Cub	Yellowstone	Aug. 11, 1959
11	F	1	Yellowstone	July 31, 1959
13	M	A	Yellowstone	July 24, 1959
23	F	A	Yellowstone	Aug. 12, 1959
Unmarked	M	A	Yellowstone	June 23, 1959
Unmarked	F	A	Glacier National Park	? 1959
4	M	A	Yellowstone	Aug. 3, 1960
31	F	A	Yellowstone	June 20, 1960
Unmarked	M	A	Yellowstone	July 28, 1960
Unmarked	F	?	Near Ronan, Montana	Aug. 1, 1960
Unmarked	M	?	Near Ronan, Montana	Aug. 1, 1960
Unmarked	F	A	Near Ronan, Montana	Aug. 3, 1960
77	F	2	Yellowstone	June 10, 1961
103	F	3	Yellowstone	Aug. 9, 1961
114	M	1	Yellowstone	Aug. 24, 1961
118	F	2	Yellowstone	Sept. 1, 1961
Unmarked	F	?	Near Ronan, Montana	Sept. 15, 1961
Unmarked	M	?	?	Sept. 15, 1961
53	M	1	Yellowstone	Aug. 24, 1961
91	F	3	Yellowstone	Aug. 7, 1962
134	M	Cub	Yellowstone	Aug. 8, 1962
121	F	3	Yellowstone	July 9, 1963
148	F	A	Yellowstone	July 6, 1963
75	F	A	Yellowstone	Sept. 28, 1963

LISTING OF GRIZZLY SPECIMENS
STORED IN WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY
HEARTS

<u>Bear No.</u>	<u>Sex</u>	<u>Age</u>	<u>Area Collected</u>	<u>Date Collected</u>
24	M	Cub	Yellowstone	Aug. 11, 1959
31	F	A	"	June 20, 1960
Unmarked	M	A	"	July 28, 1960
4	M	A	"	Aug. 3, 1960
1	M	A	"	Sept. 2, 1960
77	F	2	"	June 10, 1961
18B	M	Cub	"	June 18, 1961
118	F	2	"	Aug. 30, 1961
91	F	3	"	July 6, 1962
134	M	Cub	"	July 8, 1962
148	F	A	"	July 6, 1963
121	F	3	"	July 9, 1963
75	F	A	"	Sept. 28, 1963
Unmarked	?	?	Glacier National Park	?

LISTING OF BLACK BEAR SPECIMENS
STORED IN WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY
ORGANS AND TISSUES

<u>Bear No.</u>	<u>Sex</u>	<u>Age</u>	<u>Area Collected</u>	<u>Date Collected</u>
	M	?	Yellowstone	Aug. 11, 1961
	F	Cub	"	July 2, 1961
	M	?	"	July 24, 1961
	F	Cub	"	Aug. 4, 1961
	M	?	"	Sept. 4, 1962
	M	?	"	July 9, 1963

REPRODUCTIVE TRACTS

F	Cub	Yellowstone	July 2, 1961
F	Cub	"	Aug. 4, 1961
M	?	"	July 24, 1961
F	?	"	Sept. 19, 1959
F	?	"	July 4, 1962
F	?	"	July 30, 1962
M	?	"	Sept. 4, 1962

LISTING OF BLACK BEAR SPECIMENS
STORED IN WILDLIFE RESEARCH UNIT, MONTANA STATE UNIVERSITY
HEARTS

<u>Sex</u>	<u>Age</u>	<u>Area Collected</u>	<u>Date Collected</u>
?	?	Yellowstone	July 2, 1961
M	?	"	July 24, 1961
?	?	"	Aug. 4, 1961
M	?	"	Aug. 11, 1961
F	?	"	July 4, 1962
M	Cub	"	July 30, 1962
M	Cub	"	July 30, 1962
F	Adult	"	July 30, 1962
M	?	"	Aug. 4, 1962
M	?	"	July 9, 1962

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**LBS. OF BODY WEIGHT PER CUBIC CENTIMETER OF PENTA BARBITOL SODIUM, STRENGTH 250 MG. PER CC. SOLUTION.

DRUG DOSAGES FOR GRIZZLY BEARS

1959 - 1963

(CONTINUED)

AGE CLASSES

DATE	CUBS			YEARLINGS			TWO YEARS			THREE YEARS			FOUR YEARS			YOUNG ADULTS			ADULTS		
	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.
1964	6.0	6.0	15.0	4.64	4.80	16.2	15.5	8.0	15.3												
	3.33	7.86	25.0	5.83	4.3	11.8	4.64	7.0	15.0												
	2.5	4.0	13.75	3.26	7.0	15.5	4.4	8.86	19.4												
	3.0	12.0	13.33		6.0	15.2	4.83	7.73	12.89												
	6.2	4.4	20.0		3.47	16.3	4.63	3.44	10.3												
	6.87	4.58	13.8		4.4	18.5	6.16	6.2	15.4												
	6.0	4.33	18.3		5.5	15.7	3.7	5.57	16.4												
	2.75	5.0	10.0		6.34	15.83	5.42														
	4.33	5.46	18.8		13.4	13.4	4.55	4.7	13.8												
	3.0	5.0	17.4		5.9	13.66	5.12														
	2.73	5.0	15.0		4.6	10.5	3.23	7.2	18.0												
	3.25	4.64	18.75		5.75	14.37	8.66	7.5	15.0												
	3.33	6.2	16.25				3.22	6.62	18.5												
	3.0							9.0	18.0												
	5.6							4.7	17.5												
	4.0							7.28	18.2												
								6.71	16.0												
								4.14	14.5												
AVG.	4.12	5.71	16.55	4.58	5.91	14.72	5.65	6.54	15.89												
1962	5.80	8.3	21.0		4.0	18.75	7.0	7.0	20.0	6.6	7.4	20.8									
		10.0	30.0		5.6	20.0		7.4	22.7												
		11.7	23.3		8.0	9.0		5.2	16.25												
		10.8	20.2																		
		7.2	16.25																		
		9.0	22.0																		
		9.0	18.3																		
		6.7	20.0																		
AVG.	5.80	9.09	21.38		5.87	15.92	7.0	6.43	19.65	6.6	7.38	21.83									

*LBS. OF BODY WEIGHT PER MILLIGRAM OF SUCCINYLCHOLINE CHLORIDE, STRENGTH 100 MG. PER CC. SOLUTION.

**LBS. OF BODY WEIGHT PER CUBIC CENTIMETER OF PENTA BARBITOL SODIUM, STRENGTH 250 MG. PER CC. SOLUTION.

DRUG DOSSAGES FOR GRIZZLY BEARS

1959 - 1963

(CONTINUED)

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AGE CLASSES

DATE	CUBS			YEARLINGS			TWO YEARS			THREE YEARS			FOUR YEARS			YOUNG ADULTS			ADULTS		
	SUC. ONLY	COMBINED**	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.	SUC. ONLY	COMBINED	PENT.
1963	5.7	10.0	4.3	6.5	18.6		9.5	19.0		7.3	15.9		5.7	8.6	22.8				4.2	7.7	11.5
	7.0	11.7	9.0							9.0	11.0		3.9	4.5	13.5				3.7		
	3.8			8.4	16.8					7.9											
	5.3	8.0	4.0	6.0	12.0														5.2	8.9	17.5
	7.2	9.3	5.2	7.0	14.0														4.2		
	6.3	6.7		9.0	18.3														5.8	8.4	22.3
	5.3	11.4		5.8	18.8														6.1		
				6.7	14.3																
				9.7	15.5														4.3	5.5	14.7
				5.2	10.8														4.0	6.2	15.5
			3.7																	6.2	15.4
				6.0	15.7														4.4	8.9	12.7
			7.5	6.4	16.4														4.4		
																			4.5		
																			4.0	5.6	14.2
																			4.5		
																			6.0		
																			3.4	7.6	19.0
																			4.8	6.3	18.8
																			4.2	2.6	16.6
																				5.2	15.5
																			3.8		
																				8.2	20.5
																				6.6	16.5
AVG.	3.8	6.13	9.52	5.62	6.97	15.56	9.5	19.0	7.9	8.77	14.63	4.8	6.55	18.15		4.53	7.22	16.48			

*LBS. OF BODY WEIGHT PER MILLIGRAM OF SUCCINYLCHOLINE CHLORIDE, STRENGTH 100 MG. PER CC. SOLUTION.

**LBS. OF BODY WEIGHT PER CUBIC CENTIMETER OF PENTA BARBITOL SODIUM, STRENGTH 250 MG. PER CC. SOLUTION.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

CUBS

Females

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
<u>Bear No.</u>	<u>Spring Weight</u>	<u>Total Length (inches)</u>	<u>Bear No.</u>	<u>Fall Weight</u>	<u>Total Length</u>
<u>6</u>	50		29	92	
49	60	41	70	105	43
18A	25	30 3/4	93	83	40 3/4
82	25	28 1/2	99	75	41 1/4
93	60	39 1/2	110	75	36
117	65	39 1/4	109	75	36
132	60	37	139	100	45
156	48	36			
—	—	—	—	—	—
Sample size	8	7		7	6
Avg.	49.1 lbs.	36 in.		86.4 lbs.	40.3 in.

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

CUBS

Males

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
Bear No.	Spring Weight	Total Length (inches)	Bear No.	Fall Weight	Total Length
43	70	41	26	90	
52	100	42	24	70	
78	18	29	53	90	42
92	55	36	52	120	
83	25		71	85	42
94	55	41 3/4	78	80	38
97	65	39	92	80	42
133	70	41	100	60	39
124	25	31	134	75	
152	80	40	135	65	40
153	70		136	65	37
154	45	31 1/2	137	110	49
157	65	35 1/2	138	110	49 1/2
158	58	36	161	80	40
Sample size	14	12		14	10
Avg.	57.2 lbs.	37.0 in.		84.3 lbs.	41.9 in.

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

YEARLINGS

Females

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
Bear No.	Spring Weight	Total Length (inches)	Bear No.	Fall Weight	Total Length
11	120		6	160	52
5	110		77	205	55
6	105		40	230	60
40	175	55 1/2	121	115	52 1/2
79	65	42	143	185	50 1/2
141	115	49	162	130	55 3/4
	150		163	125	52 1/2
142	110	43 3/4			
143	130	44 1/2			
144	120	45			
<u>151</u>	<u>155</u>	<u>52</u>	<u>—</u>	<u>—</u>	<u>—</u>
Sample size	11	7		7	7
Avg.	123.2	47.4		164.3	54.0

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

YEARLINGS

Males

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
<u>Bear No.</u>	<u>Spring Weight</u>	<u>Total Length (inches)</u>	<u>Bear No.</u>	<u>Fall Weight</u>	<u>Total Length</u>
26	145	55	43	185	54
52	140	52	53	110	47 3/4
133	150	52	52	182	52 1/2
51	150	50 1/2	92	140	50 1/2
37	145	57	110	185	54
38	140	57	56	150	50 1/2
36	130	57	57	160	51 1/2
98	163	54	114	95	46
130	150	53	116	205	54 3/4
145	155	56			
	220	59 1/2			
<u>147</u>	<u>100</u>	<u>44</u>			
Sample size	12	12		9	9
Avg.	149	53.9		156.9	51.3

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

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Females

TWO YEARS

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
Bear No.	Spring Weight	Total Length (inches)	Bear No.	Fall Weight	Total Length
29	165	57 1/2	6	210	59 1/2
77	145	58 1/2	29	252	58 1/4
15	150	55 1/2	5	240	56
3	150		40	300	63
9	160		121	130	54
10	140		61	185	55 1/2
86	115	48	66	225	62
91	150	53	115	240	63
			118	145	54
Sample size	8	5		10	9
Avg.	146.9	54.5		218.7	58.4

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES

1959 - 1963

TWO YEARS

Males

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
Bear No.	Spring Weight	Total Length (inches)	Bear No.	Fall Weight	Total Length
97	285	60 1/2	37	245	59
38	185	58	38	205	
116	250	63	76	350	
19	235	56	80	145	
80	116			185	
95	278	64	95	360	64 1/4
122	140	55 3/4	106	255	66
Sample size	7	6		7	3
Avg.	212.7	59.5		249.3	63.1

¹All "spring" weights and measurements were obtained during June and July.²"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

1959 - 1963

THREE YEARS

Females

¹All "spring" weights and measurements were obtained during June and July.

2"Fall" data were obtained in August, September, and October.

WEIGHTS AND MEASUREMENTS OF INDIVIDUAL GRIZZLIES
1959 - 1963

THREE YEARS

Males

SPRING ¹ (June - July)			FALL ² (Aug. - Sept. - Oct.)		
Bear No.	Spring Weight	Total Length (inches)	Bear No.	Fall Weight	Total Length
37	215	65	51	275	69 1/2
122	205	60		290	68
32	220		37	315	67 1/2
35	265	69	74	200	
149	220	62			
Sample size		4			3
Avg.		225.0			270.0
		64.0			68.3

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

WEIGHTS AND TOTAL LENGTH MEASUREMENTS, ADULTS

<u>Females</u>						<u>Males</u>					
Spring (June - July) ¹			Fall (Aug.-Sept.-Oct.) ²			Spring (June - July) ¹			Fall (Aug.-Sept.-Oct.) ²		
Bear No.	Wt., Lbs.	Total Length	Bear No.	Wt., Lbs.	Total Length	Bear No.	Wt., Lbs.	Total Length	Bear No.	Wt., Lbs.	Total Length
7	300		7	450		2	510		1	520	77
	415		21	300	71.5	12	620		27	505	85
8	260		23	370		13	645		28	500	
16	300	72	65	435	71	14	520		30	710	
17	435	78	64	495	74.5	46	355	77	63	560	79
18	380	68	59	325	70	41	550	91	60	600	80
	225		58	470	70.5	33	425	76	69	580	76.5
	380		34	425	68	89	635	80.5	73	780	76.5
48	350	67	72	385	69	88	500	77	113	345	73
44	300	74	75	350		87	450	74	159	640	76
42	250	70	112	355	68	85	465	75.5			
39	350		108	300		126	310	69			
	340		140	375	66	155	660	76			
31	260		148	355							
	225		160	360							
84	235			405							
107	250	68.5	150	355	71						
131	320		164	410	72						
129	405	70.5									
148	355	68									
150	285	71									
Sample size	21	10		18	11		13	9		10	8
Avg.	315.2	70.7		384.4	70.1		511.2	77.3		574.0	77.9

¹All "spring" weights and measurements were obtained during June and July.

²"Fall" data were obtained in August, September, and October.

MALE GRIZZLY BEAR DENTITION DATA

UPPER JAW

1960 - 1963

-91-

AGE CLASS	MEASUREMENT CATEGORY (SEE FORM SHEETS)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
<u>5-9 MONTHS</u>													
SAMPLE SIZE	13	11	14	16	18	18	14	16	16	16	18	16	17
RANGE	123-143	87.5-111	35-46	37-47	18-30.5	7.5-11	16-25.5	24.5-35	14-21	27-41	9-14	25-39	13-19.5
AVERAGE	133.81	100.00	41.11	42.22	20.61	9.25	22.14	29.19	17.25	34.75	11.36	33.94	17.18
<u>17-21 MONTHS</u>													
SAMPLE SIZE	7	7	8	8	8	8	8	8	8	7	8	7	7
RANGE	138.5-147.5	98-115.5	41-51	41.5-47	20-27	7.5-10.5	20-32	46-59	26-33	51-57	15-19	34-36.5	16-20
AVERAGE	143.29	102.64	45.19	44.38	21.81	8.75	25.56	52.44	30.31	54.36	17.88	35.64	18.29
<u>29-33 MONTHS</u>													
SAMPLE SIZE	5	5	5	5	5	5	5	5	4	5	5	5	5
RANGE	144-155.5	103-116.5	42.5-52	42.5-47	20-23.5	7-10.5	22-36.5	55-60.5	32-33	50-58	17-21.5	36-40.5	16-22
AVERAGE	148.00	112.00	47.10	44.60	21.10	8.90	29.10	57.30	32.50	53.60	18.70	37.10	18.10
<u>53-57 MONTHS</u>													
SAMPLE SIZE	2	2	2	2	2	2	2	2	2	2	2	2	2
RANGE	147-148.5	107.5-115.5	45-47	43.5-44	21.5-22	8.5-9	31-32.5	59-68	31-36	54.5-58	19-20	36-38	18-18
AVERAGE	147.75	111.50	46.00	43.75	21.75	8.75	31.75	63.50	33.50	56.25	19.50	37.00	18.00
<u>65 AND OVER</u>													
SAMPLE SIZE	3	3	3	4	4	4	3	4	4	4	4	4	4
RANGE	147.5-152	106-115	48-55	43-51	20-23	8-11	30-37.5	62-72.5	34-37	59-65	20.5-23	34-37	15.5-17.5
AVERAGE	149.83	110.83	52.33	47.88	21.75	9.63	33.50	68.88	35.75	63.13	22.13	35.38	16.75

MALE GRIZZLY BEAR DENTITION DATA

LOWER JAW
1960 - 1963

AGE CLASS	1	2	3	4	5	6	7	8	9	10	11	12	13
MEASUREMENT CATEGORY (SEE FORM SHEETS)													
<u>5-9 MONTHS</u>													
SAMPLE SIZE													
RANGE													
AVERAGE													
<u>17-21 MONTHS</u>													
SAMPLE SIZE	10	12	10	22	22	21	16	20	22	18	22	12	15
RANGE	121-141.5	94-117	28-47	23-31.5	9.5-13	1-4.5	19-29	18-45	11.5-24	27-50	8-16	12.5-22	13-19
AVERAGE	134.30	109.54	38.85	27.27	11.27	2.71	25.13	29.70	16.95	35.92	11.48	17.96	15.80
<u>29-33 MONTHS</u>													
SAMPLE SIZE	7	8	7	8	8	8	8	8	8	7	8	8	8
RANGE	139.5-148	111-119	35-49	25.5-29	9.5-12	1.0-2.5	24.5-36	47-51	28-35	58-65	18-23.5	18.5-21	14-18
AVERAGE	144.69	113.63	43.36	26.31	10.75	1.81	29.19	54.94	30.69	61.93	21.00	20.25	15.75
<u>41-45 MONTHS</u>													
SAMPLE SIZE	4	5	4	5	5	4	5	5	5	4	5	5	5
RANGE	144-155.5	115-126	41.5-45	24.5-28	9-10.5	0.5-2.0	24.5-42	53-58	29-32	56-64	19.5-23	20-21	15-16.5
AVERAGE	147.50	119.60	43.50	26.10	9.60	1.25	33.80	55.40	30.60	59.75	20.90	20.60	15.88
<u>53-57 MONTHS</u>													
SAMPLE SIZE	2	2	2	2	2	2	2	2	2	2	2	2	2
RANGE	148.5-150	121-121.5	43.5-44	24-26	8-8.5	0.0-0.5	36-38	54-61	32.5-32.5	58-62	20-21	21.5-22	15.5-17
AVERAGE	149.25	121.25	43.75	25.00	8.25	0.25	37.00	57.50	32.50	60.00	20.50	21.75	16.25
<u>65 AND OVER</u>													
SAMPLE SIZE	3	3	2	4	4	3	3	4	4	4	4	4	4
RANGE	147-155	120.5-127	46-51	24-31	8.5-9	1.0-1.5	34.5-44	57-65	31-34	59-68	20-23.5	19.5-21	15.5-16
AVERAGE	151.00	123.50	48.50	27.25	8.88	1.17	38.83	62.25	32.50	64.88	22.0	20.23	15.75

FEMALE GRIZZLY BEAR DENTITION DATA

UPPER JAW

1960 - 1963

AGE CLASS	MEASUREMENT CATEGORY (SEE FORM SHEETS)												
	1	2	3	4	5	6	7	8	9	10	11	12	13
<u>5-9 MONTHS</u>													
SAMPLE SIZE	6	6	6	9	9	9	9	9	9	9	9	7	9
RANGE	118.5-139	88-101	38.5-41	36.5-43.5	16.5-19.5	6.5-8.5	22-25.5	26-52	15.5-27	29-47	9.5-16	29-37.5	13-19
AVERAGE	128.00	93.50	39.92	39.61	17.83	7.28	23.33	38.11	21.28	38.06	12.78	32.29	17.00
<u>17-21 MONTHS</u>													
SAMPLE SIZE	8	8	8	11	11	11	9	11	11	11	11	9	10
RANGE	122.5-139	89-99	38-45	37-41	16.5-22	6.5-10.5	23-29	41-51.5	22-30	40-53	13-17	30-35.5	15-19.5
AVERAGE	130.31	94.38	42.19	39.64	18.36	7.55	25.89	48.23	26.50	45.73	15.09	32.72	16.85
<u>29-33 MONTHS</u>													
SAMPLE SIZE	5	5	5	5	5	5	5	5	5	5	5	5	4
RANGE	136.5-142	98-108	42-49	41-44.5	18.5-19.5	7-9	28-34.5	49.5-53.5	26-29	47-49	16-16.5	33-35	16-19
AVERAGE	139.10	102.60	45.20	42.10	19.10	8.30	30.80	51.80	27.60	48.10	16.20	33.80	17.25
<u>41-45 MONTHS</u>													
SAMPLE SIZE	4	4	4	4	4	4	4	4	4	3	4	4	4
RANGE	132-143	97.5-101	46.5-50	40-42	17.5-18.5	7-7.5	28-30	50-56	26.5-29	44-49	15-19	33-35	16-17
AVERAGE	137.50	99.50	47.88	41.13	18.13	7.13	29.25	53.00	28.13	47.17	16.63	33.88	16.50
<u>53-57 MONTHS</u>													
SAMPLE SIZE	1	1	1	1	1	1	1	1	1	1	1	1	1
RANGE													
AVERAGE	143.00	105.00	50.00	44.00	20.00	8.00	31.50	56.50	30.00	51.00	17.00	35.00	17.00
<u>65 AND OVER</u>													
SAMPLE SIZE	1	1	1	1	1	1	1	1	1	1	1	1	1
RANGE													
AVERAGE	143.00	105.00	50.00	44.00	20.00	8.00	31.50	56.50	30.00	51.00	17.00	35.00	17.00

FEMALE GRIZZLY BEAR DENTITION DATA
LOWER JAW
1960 - 1963

AGE CLASS	1	2	3	4	5	6	7	8	9	10	11	12	13
MEASUREMENT CATEGORY (SEE FORM SHEETS)													
<u>5-9 MONTHS</u>													
SAMPLE SIZE	5	5	5	9	9	9	7	8	8	8	9	7	9
RANGE	121-135	101-114	35-41	23-28.5	9-11	0.0-2.5	24-30.5	24.5-48	15-25	28.5-53	9.5-17	12.5-18	13-16
AVERAGE	127.9	107.80	38.30	25.44	9.89	1.44	26.86	35.56	20.06	37.88	13.00	16.29	13.98
<u>17-21 MONTHS</u>													
SAMPLE SIZE	8	8	8	11	11	10	9	11	10	7	11	9	9
RANGE	129.5-137	102-113	34-46	22-25.5	8-9.5	0.0-2.0	25-33.5	43-51	24.5-28	44.5-52	15-18	16.5-20	14-15.5
AVERAGE	131.69	107.13	40.81	23.64	8.82	1.05	30.77	47.86	25.80	47.86	16.82	18.06	14.30
<u>29-33 MONTHS</u>													
SAMPLE SIZE	4	4	3	5	5	5	5	5	5	3	5	5	4
RANGE	137-145	112-117.5	43-47	23-26.5	8-9	1.0-1.0	33-37	50-53	25-28	49-53	18-18.5	19-20	14-16
AVERAGE	139.75	113.88	45.67	25.30	8.80	1.00	34.80	51.50	26.80	50.67	18.20	19.40	15.00
<u>53-57 MONTHS</u>													
SAMPLE SIZE	4	4	4	4	4	2	4	4	4	3	4	4	4
RANGE	134-137.5	108-114	36-47	22.5-25	8-8.5	1.0-1.0	32-37	48-51.5	24-28	44-55	15.5-18.5	18-20	15-15
AVERAGE	135.50	110.88	43.63	23.88	8.25	1.00	34.25	49.88	25.88	49.33	16.88	18.88	15.00
<u>65 AND OVER</u>													
SAMPLE SIZE	1	1	1	1	1	1	1	1	1	1	1	1	1
RANGE													
AVERAGE	145.00	120.00	46.00	26.00	8.00	0.50	36.50	53.00	28.00	56.00	18.00	20.00	16.00

FORM SHEET

Age _____

GRIZZLY BEAR DENTITION
GROWTH AND DEVELOPMENT

Sex _____

Upper Jaw

No. _____

Sex _____

Age in Mo. _____

Date of Impression _____

Measurements from right side and in millimeters

Measurement Category

Total length of denture (distal surface of M^2 to mesial surface of I^1	1
Distance from distal surface of canine to distal surface of M^2	2
Inter-palatine distance between the 2nd molars at the 2nd cusp.....	3
Inter-palatine distance between canines.....	4
Distance between mesial surface of I^3 and mesial surface of canine.....	5
Diastema between distal surface of I^3 and mesial surface of canine.....	6
Diastema between distal surface of canine and mesial surface of PM^4	7
Measurement of canine from gum line on distal surface over crown to gum line on mesial surface.....	8
Height of canine from gum line (on buccal surface) to apex.....	9
Maximum circumference of canine at gum line.....	10
Maximum anterior-posterior diameter of canine at gum line.....	11
Length of M^2	12
Width of M^2 at 2nd cusp.....	13

FORM SHEET

Age _____

GRIZZLY BEAR DENTITION
GROWTH AND DEVELOPMENT

Sex _____

Lower Jaw

No. _____

Sex _____

Age in Mo. _____

Date of Impression _____

Measurements from right side and in millimeters

Measurement Category

Total length of denture (distal surface of M_3 to mesial surface of I_1).....	1
Distance from Distal surface of canine to distal surface of M_3	2
Inter-lingual distance between the 3rd molars.....	3
Inter-lingual distance between canines.....	4
Distance between mesial surface of I_3 and mesial surface of canine.....	5
Diastema between distal surface of I_3 and mesial surface of canine.....	6
Diastema between distal surface of canine and mesial surface of PM_4	7
Measurement of canine from gum line on distal surface over crown to gum line on mesial surface.....	8
Height of canine from gum line (on buccal surface) to apex.....	9
Maximum circumference of canine at gum line.....	10
Maximum anterior-posterior diameter of canine at gum line.....	11
Length of M_3	12
Width of M_3	13

FIELD MEASUREMENTS
GRIZZLY FOOT INDICES
(Length X Width)

Sex	Age Class	Foot Areas (Sq. in.)			
		Right Front	Left Front	Right Rear	Left Rear
<u>MALES</u>					
	Under 9 months	10.89	10.84	19.01	18.54
	17-21 months	19.30	19.21	32.62	31.95
	29-33 months	22.52	22.95	39.40	39.38
	41-45 months	25.51	25.33	46.55	47.40
	53-57 months	25.96	26.75	47.40	45.80
	65+ months	32.29	31.81	56.78	55.06
<u>FEMALES</u>					
	Under 9 months	9.16	10.32	17.13	17.16
	17-21 months	16.46	16.35	28.50	28.27
	29-33 months	19.93	19.70	34.67	34.62
	41-45 months	22.14	21.92	38.62	37.68
	53-57 months	22.77	22.62	38.77	36.48
	65+ months	25.06	25.20	42.22	42.10
<u>COMPARISONS</u>					
(a) Males: Differences in areas of right and left feet					
	Under 9 months	+0.05		+0.47	
	17-21 months	+0.09		+0.67	
	29-33 months		+0.43	+0.02	
	41-45 months	+0.19			+0.85
	53-57 months		+0.79	+1.60	
	65+ months	+0.48		+1.72	

(b) Females (cont'd)

FIELD MEASUREMENTS
GRIZZLY FOOT INDICES
(Length X Width)

Sex	Age Class	Right Front	Left Front	Right Rear	Left Rear
-----	-----------	-------------	------------	------------	-----------

COMPARISONS

(b) Females: Differences in areas of right and left feet.

Under 9 months			+1.16		+0.03
17-21 months	+0.11			+0.23	
29-33 months	+0.23			+0.05	
41-45 months	+0.22			+0.94	
53-57 months	+0.15			+2.29	
65+ months			+0.14	+0.12	

(c) Differences between foot pad areas of males over females

Under 9 months	+1.73	+0.52	+1.88	+1.38
17-21 months	+2.84	+2.86	+4.12	+3.68
29-33 months	+2.59	+3.25	+4.73	+4.76
41-45 months	+3.37	+3.41	+7.93	+9.72
53-57 months	+3.19	+4.13	+8.63	+9.32
65+ months	+7.23	+6.61	+14.56	+12.96

FOOT CAST MEASUREMENTS
MALES
(Measurements in Millimeters)

	<u>No.</u>	<u>Total Length</u>	<u>Pad Length</u>	<u>Pad Width</u>
CUBS				
	78	64	32	68
	92	78	35	83
		86	44	91
	100	76	35	85
	94	79	37	84
		76	36	83
	97	73	36	86
		74	36	84
	132	89	44	95
	136	86	40	93
	137	92	48	101
	138	92	46	92
YEARLINGS				
	43	104	51	121
	52	99	49	114
		102	50	114
	53	94	48	108
	92	102	52	113
	98	104	49	113
		109	50	114
	116	106	50	121
	114	93	44	101
		90	43	102
	130	109	55	116
	145	106	50	117
	147	94	47	101
	133	102	55	107
TWO-YEAR OLDS				
	37	112	57	126
		115	57	129
	38	112	53	120
	95	123	64	132
		125	63	133
	106	113	59	127
	80	103	48	111
	116	125	65	128
THREE-YEAR OLDS				
	37	126	66	137
	51	123	62	134
	146	115	58	128
FIVE-YEAR OLDS				
	76	132	69	143
ADULTS				
	87	123	72	139

FOOT CAST MEASUREMENTS
FEMALES
(Measurements in Millimeters)

	<u>No.</u>	<u>Total Length</u>	<u>Pad Length</u>	<u>Pad Width</u>
CUBS				
	18A	59	26	64
		62	27	66
		64	28	64
		61	26	65
		71	32	72
	93	84	40	85
		82	39	96
	99	79	34	89
		83	39	88
	109	78	39	89
	110	78	40	87
	132	81	41	83
	139	83	41	95
YEARLINGS				
	110	100	46	111
	77	102	51	103
	79	81	40	89
	121	100	40	104
	143	90	41	97
	144	90	44	96
	162	97	47	105
TWO-YEAR OLDS				
	6	104	53	116
		102	52	116
	118	104	47	118
		99	46	108
THREE-YEAR OLDS				
	6	114	57	126
	5	110	61	117
FOUR-YEAR OLDS				
	10	107	56	110
FIVE-YEAR OLDS				
	131	108	54	121

AVERAGE FOOT CAST MEASUREMENTS OF GRIZZLY BEARS

Age	Sample Size	Total Length of Foot		Pad Length		Pad Width		Foot Index (Foot Length x Pad Width)	
		Millimeters	Inches	Millimeters	Inches	Millimeters	Inches	Square Millimeters	Square Inches
Males:									
Cubs	(12)	80.42	3.17	39.08	1.54	87.08	3.43	3403.09	10.87
Yearlings	(14)	101.00	3.98	49.50	1.95	111.57	4.39	5522.72	17.47
Two-Years	(8)	116.00	4.57	58.25	2.29	125.75	4.95	7324.94	22.62
Three-Years	(3)	121.33	4.78	62.00	2.44	133.00	5.24	8246.00	25.05
Four-Years	(0)								
Five-Years	(1)	132.00	5.20	69.00	2.72	143.00	5.63	9867.00	29.28
Adults	(1)	123.00	4.84	72.00	2.83	139.00	5.47	10008.00	26.47
Females:									
Cubs	(13)	74.23	2.92	34.77	1.37	80.23	3.16	2789.60	9.23
Yearlings	(7)	94.29	3.71	44.14	1.74	100.71	3.97	4445.34	14.73
Two-Years	(4)	102.25	4.03	49.50	1.95	114.50	4.51	5667.75	18.18
Three-Years	(2)	112.00	4.41	59.00	2.32	121.50	4.78	7168.50	21.08
Four-Years	(1)	107.00	4.21	56.00	2.20	110.00	4.33	6160.00	18.23
Five-Years	(1)	108.00	4.25	54.00	2.13	121.00	4.76	6534.00	20.23
Adults	(0)								

AVERAGE WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

SEX AND AGES	FOOT DIMENSIONS (INCHES)						TOTAL LENGTH (IN.)	CLAW BASE (MM.)		CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)	
	WEIGHT (LBS.)	RIGHT FRONT		RIGHT REAR		LEFT REAR		LEFT	RIGHT					
MALES														
UNDER 9 MONTHS	(30) 71.70	(27) 3.12x3.49	(26) 3.17x3.42	(26) 5.71x3.33	(27) 5.67x3.27	(27) 5.67x3.27	(25) 39.30	(23) 14.30	(23) 14.4	(23) 15.4	(26) 2.57	(26) 3.93	(24) 3.51	
17-21 MONTHS	(22) 147.30	(22) 4.16x4.64	(22) 4.14x4.64	(22) 7.55x4.32	(22) 7.43x4.30	(22) 7.43x4.30	(22) 54.20	(18) 18.40	(18) 18.7	(19) 19.97	(19) 3.05	(20) 5.62	(18) 4.50	
29-33 MONTHS	(12) 228.25	(10) 4.55x4.95	(10) 4.58x5.01	(10) 8.40x4.69	(10) 8.36x4.71	(10) 8.36x4.71	(8) 61.31	(8) 18.43	(8) 18.50	(9) 24.0	(9) 3.33	(9) 6.03	(9) 4.75	
41-45 MONTHS	(11) 260.50	(7) 4.75x5.37	(7) 4.64x5.46	(7) 9.11x5.11	(7) 8.96x5.29	(7) 8.96x5.29	(7) 65.90	(5) 20.20	(5) 20.4	(5) 25.0	(6) 3.83	(6) 6.48	(6) 4.69	
53-57 MONTHS	(5) 336.60	(5) 4.72x5.50	(5) 4.90x5.46	(5) 9.35x5.07	(5) 9.07x5.05	(5) 9.07x5.05	(5) 69.75	(5) 21.10	(5) 21.2	(5) 27.3	(5) 3.65	(5) 6.65	(5) 4.92	
65 + MONTHS	(29) 573.10	(22) 5.40x5.98	(22) 5.40x5.89	(25) 9.84x5.77	(25) 9.71x5.67	(25) 9.71x5.67	(21) 76.88	(15) 22.90	(15) 23.1	(16) 33.08	(15) 4.25	(16) 6.97	(16) 5.12	
FEMALES														
UNDER 9 MONTHS	(15) 59.0	(15) 2.90x3.16	(15) 3.09x3.34	(15) 5.42x3.16	(15) 5.43x3.16	(15) 5.43x3.16	(14) 37.30	(13) 13.88	(13) 13.73	(13) 15.17	(13) 2.48	(13) 3.81	(13) 3.58	
17-21 MONTHS	(16) 131.2	(15) 3.91x4.21	(15) 3.93x4.16	(15) 7.16x3.98	(15) 7.12x3.97	(15) 7.12x3.97	(12) 50.04	(12) 17.5	(12) 17.6	(12) 19.65	(12) 2.91	(12) 4.95	(12) 4.15	
29-33 MONTHS	(19) 182.5	(17) 4.37x4.56	(17) 4.32x4.56	(17) 7.79x4.45	(17) 7.85x4.41	(17) 7.85x4.41	(14) 56.77	(11) 17.5	(12) 17.33	(11) 22.53	(11) 3.42	(12) 5.34	(11) 4.28	
41-45 MONTHS	(7) 276.4	(6) 4.50x4.92	(6) 4.35x5.04	(6) 8.27x4.67	(6) 8.21x4.59	(6) 8.21x4.59	(6) 63.83	(5) 19.0	(5) 19.4	(6) 25.0	(6) 3.42	(6) 5.94	(6) 4.10	
53-57 MONTHS	(4) 291.9	(4) 4.50x5.06	(4) 4.47x5.06	(4) 8.06x4.81	(4) 8.00x4.56	(4) 8.00x4.56	(4) 65.50	(3) 18.8	(3) 18.5	(4) 26.25	(4) 3.56	(4) 5.94	(4) 4.72	
65 + MONTHS	(58) 338.9	(29) 4.81x5.21	(29) 4.81x5.24	(32) 8.67x4.87	(32) 8.61x4.89	(32) 8.61x4.89	(28) 69.57	(19) 20.48	(19) 20.48	(21) 28.28	(22) 3.66	(23) 6.10	(21) 4.85	

PARENTHESES SAMPLE SIZE FOR EACH CATEGORY.

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

-103-

MALES -- UNDER NINE MONTHS

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
26	90	3 1/2x3 1/2				6 1/2x3 1/2						
29	92	3 3/4x3 1/2				6 1/4x3 1/2						
24	70		3 3/4x3 1/2	6	x3 1/4							
52	100	3 1/2x3 3/4	3 1/2x3 3/4	6	1/2x3 1/2	6 3/4x3 3/4	42	20	18	2 3/4	4	4
52	120											
53	90	3 3/4x4	3 3/4x4	3	1/2x4 1/8	6 1/4x4	42	15	18	3 1/4	4 1/4	
43	70	3 x3 3/4	3 x3 3/4	6	1/8x3 1/2	6 x3 1/2	41	15	17	2 3/4	4 1/2	4
43							46					
71	85	3 1/4x3 3/4	3 1/4x3 3/4	6	x3 1/2	6 x3 1/2	42	15	16	2 3/4	4	3 1/2
78	20	2 3/4x2 3/4	2 3/4x2 3/4	4	3/4x2 3/4	4 1/2x2 5/8	29	11	11 1/2	2 1/8	3	2 7/8
78	80	3 1/16x3 1/2	3 1/16x3 1/2	5	7/8x3 1/8	5 5/8x2 7/8	38	12	16 3/4	2 1/2	4	3 3/4
92	55	3 1/8x3 1/2	3 1/8x3 1/2	5	3/4x3 1/8	5 1/2x3 1/4	36	16	14 1/2	2 1/4	3 5/8	3 1/4
92	80	3 1/2x3 3/8	3 1/2x3 3/8	6	x3 1/2	6 x3 3/8	42	14	17	2 3/4	4 1/8	3 1/2
83	25	2 5/8x2 3/4	2 5/8x2 3/4	4	13/16x2 3/4	5 x2 3/4		12	12	2	3	2 1/2
94	55	3 x3 5/8	3 x3 5/8	5	7/8x3 3/8	6 x3 3/8	41 3/4	15	13 1/2	2 7/8	4 7/8	3 3/8
97	65	3 1/8x3 1/2	3 1/8x3 1/2	5	1/2x3 1/4	5 1/2x3 1/4	39	12	15	2 5/8	3 3/4	3 1/2
100	60	3 x3 1/4	3 x3 1/4	5	7/8x3 3/8	5 3/4x3 3/8	39	13	15	2 7/8	4	3 1/2
110	75	3 x3 1/2	3 x3 1/2	5	7/8x3 1/2	5 3/4x3 1/2	36	13.5	16	2	4	3 1/4
133	70	3 x3 3/4	3 x3 3/4	5	1/2x3 1/2	5 3/8x3 3/8	41	14	16	2 3/8	4	3 1/2
124	25	2 5/8x3 1/8	2 5/8x3 1/8	4	1/2x2 5/8	4 1/2x2 5/8	31	12.5	12 1/2	2	3 3/8	3 1/4
134	75											
135	65	2 3/4x3 3/4	2 3/4x3 3/4	5	1/2x3 1/8	5 1/2x3 1/8	40	12.5	15	2 1/2	3 3/4	3 3/4
136	65	2 3/4x3 1/2	2 3/4x3 1/2	5	3/4x3 1/2	5 1/2x3 3/8	37		15	2 3/4	3 3/4	3 1/2
137	110	3 1/2x3 3/4	3 1/2x3 3/4	6	x3 1/2	6 x3 1/2	49	14		2 3/4	4 1/2	4
138	110	3 1/2x3 3/4	3 1/2x3 3/4	6	1/2x3 1/2	6 1/4x3 1/2	49 1/2	14		2 3/4	4 1/4	4
153	70	3 1/2x3 3/4	3 1/2x3 3/4	5	3/4x3 1/4	5 1/2x3	38	17	15	2 1/4	3 1/2	3 1/2
154	45	2 1/4x3	2 1/4x3	4	7/8x3 7/8	5 x3	31 1/2		12 1/2	2 5/8	3 5/8	3 1/4
157	65	2 3/4x3 1/4	2 3/4x3 1/4	5	3/4x2 7/8	5 1/4x2 3/4	35 1/2	13.5	14	2 1/2	3 1/2	3 1/2
158	58	2 3/4x3 1/4	2 3/4x3 1/4	5	x3	5 x3	36	13.5	14	2 1/2	3 3/4	3 1/2
161	80	3 1/8x3 1/2	3 1/8x3 1/2	5	3/4x3 1/4	5 1/2x3 1/4	40	17	15 1/2	2 1/2	4 7/8	3 3/4
152	80	3 3/4x3 3/4	3 3/4x3 3/4	6	x3 3/4	6 x3 3/4	40	18	16	2 3/4	4 1/4	3 3/4
AVG.	71.7	3.12 x 3.49	3.17 x 3.42	5.71 x 3.33	5.67 x 3.27		39.3	14.3	15.4	2.57	3.93	3.51

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

FEMALES -- UNDER NINE MONTHS

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
6	45	3	x2 7/8	3	x2 7/8	5	x2 7/8	16	15	2 1/2	4 1/4	4 1/8
49	60	3	1/2x3 5/8	3	1/2x3 1/2	5	x3 1/8	16	15	2 1/2	4 1/4	4 1/8
70	105	3	1/2x4 1/4	3	1/2x4	6	3/4x4	18	19	3	4 1/2	4
18A	25	2	3/8x2 1/2	2	1/2x2 1/2	4	1/2x2 3/8	13	10 3/4	1 7/8	2 7/8	3 1/4
18A	34	3	5/8x3	2	3/4x3	4	3/4x2 5/8	13	13	2 1/2	3 3/4	3 1/2
18A	30	2	3/4x3	2	3/4x3	4	7/8x2 5/8	13	13	2 1/2	2 3/4	2 1/2
82	25	2	13/16x2 7/8	2	11/16x2 15/16	4	7/16x2 3/4	12	12	2 1/2	2 3/4	2 1/2
93	60	3	1/2x3 3/4	3	1/4x3 5/8	5	7/8x3 3/8	13	15	2 5/8	4 1/4	4
93	83	3	1/2x3 3/4	3	1/2x3 3/4	6	x3 1/2	14	17	2 1/2	4	3 1/2
99	75	3	1/8x3 5/8	3	1/8x3 1/2	6	1/8x3 1/2	14	17	2 5/8	4	3 3/8
109	75	3	1/8x3 1/2	3	1/4x3 1/2	5	5/8x3 1/2	13	15	2	3 7/8	4 1/4
117	65	3	1/8x3 1/2	3	1/8x3 1/2	5	1/2x3 1/4	13	16 1/4	2 5/8	4	3 3/4
132	60	3	x3 3/8	3	x3 3/8	5	1/2x3 1/8	13	16	2 3/8	3 3/4	3 3/4
139	100	3	1/2x3 7/8	3	5/8x3 3/4	5	7/8x3 5/8	15	18	3	4 1/4	4
156	48	3	x3	2	3/4x3 1/4	5	x3	13.5	13 1/4	2 1/4	3 1/4	3 1/2
Avg.	59.0	2.90 x 3.16	3.09 x 3.34	5.42 x 3.16	5.43 x 3.16	37.3	13.88	13.73	15.17	2.48	3.81	3.58

MALES -- 17-21 MONTHS

No.	WT.	PADS (IN.)		R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)		CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
		R. F.	L. F.				LEFT	RIGHT				
26	145	4 1/8x4 1/2	4 1/2x4 5/8	8 1/2x4 5/8	7 3/4x4 1/2	55	18	18	21	2 7/8	4 1/2	
52	140	4 x4 7/8	4 1/2x5	8 x4 1/2	7 1/4x4 3/4	52	18	18	20	2 7/8	5 1/4	4 1/2
52	182	4 5/8x5	4 1/2x5 1/4	8 1/4x4 7/8	8 1/2x5	52 1/2	18	18	21	3	5 3/4	4 1/2
53	110	4 x4 3/4	3 5/8x4	6 3/4x3 7/8	6 5/8x3 7/8	47 3/4	18	18	19	2 3/4	5 3/4	4 3/4
43	185	4 5/8x5 1/8	4 3/8x5	7 1/8x4 3/8	7 7/8x4 1/2	54	18	18	23 3/4	3 1/2	5 3/4	4 1/2
78	40	7 1/2x3 7/8	3 1/8x3 7/8	6 1/2x3 1/2	6 1/2x3 1/2	40	20	20	17	2 5/8	4 1/2	4
92	140	4 1/2x4 3/4	4 5/8x4 3/4	8 x4 1/2	7 3/8x4 1/2	50 1/2	18	18	19	3	5 1/2	4 1/2
110	185	4 3/8x4 3/4	4 1/2x4 3/4	8 x4 3/4	7 1/2x4 1/4	54	18	18	22	3 1/8	5 1/2	4 1/4
133	150	4 x4 3/4	4 x5	7 1/2x4 1/2	7 1/4x4 1/4	52	23	23	19	2 3/4	5 1/2	4 3/4
51	150	4 x4	4 x4 1/2	7 1/2x4 1/2	7 1/4x4 1/4	50 1/2	16	17	20	2 3/4	5 1/4	4 1/8
37	145	4 x4 3/4	3 3/4x4 1/2	7 1/2x4 1/2	7 1/4x4 3/4	57					5 1/2	
38	140	4 x4	4 x4 1/2	7 1/4x4 1/4	7 1/4x4 1/4	57						
56	150	4 x4 1/2	4 x4 1/2	7 1/4x4 1/4	7 1/4x4 1/4	50 1/2	18	18	20 1/2	3 1/2	5 1/2	4 3/4
57	160	4 x4 1/2	4 x4 1/2	7 1/2x4 1/4	7 3/4x4 1/4	51 1/2	18	18	20 1/2	3 1/2	5 1/4	4 7/8
36	130	4 1/2x4 1/2	4 1/2x4 1/2	7 3/4x4 1/4	7 3/4x4	57						
114	95	4 x4 1/4	4 x4 1/4	6 5/8x3 3/4	7 x3 3/4	46	16.5	18	16	3	5 1/4	4 1/4
98	163	4 1/2x4 3/4	4 1/2x4 3/4	8 x4 1/2	8 1/4x4 3/8	54			20 1/2	3 5/8	5 1/2	4 1/2
116	205	4 7/8x5 1/2	4 5/8x5 1/4	8 1/4x4 7/8	8 1/4x4 7/8	54 3/4	18	18	21 3/4	3 1/4	5 1/4	4 5/8
130	150	4 x4 3/4	4 1/4x4 5/8	6 5/8x4 5/8	6 5/8x4 3/8	53	18	17	20 1/2	3 1/2	5	4 1/2
147	100	3 1/2x4	3 1/2x4	6 1/2x3 1/2	6 1/2x3 1/2	44	12.5	15	17 1/2	2 1/4	5	4
145	155	4 1/4x5	4 1/4x4 3/4	7 3/4x4 1/4	7 1/4x4 1/4	56	24	25	19	2 3/4	5 1/4	5
145	220	4 1/4x5 1/8	4 x5 1/8	8 x4 3/4	8 1/4x4 1/4	59 1/2	21	22	21 1/2	3 1/4	6 1/2	4 3/4
AVG.	147.3	4.16 x 4.64	4.14 x 4.64	7.55 x 4.32	7.43 x 4.30	54.2	18.4	18.7	19.97	3.05	5.62	4.50

FEMALES -- 17-21 MONTHS

6	105	3 3/4x4	3 3/4x3 3/4	7 x3 3/4	7 x3 3/4	51 1/2	16	16	23	2 1/2	5	4
6	160	4 1/2x4 3/4	4 3/4x4 1/4	8 3/4x4 1/4	7 1/2x4 1/4	52						
11	120	4 3/4x4 1/2	4 1/2x4 1/2	7 1/2x4 1/4	7 1/2x4 3/4							
5	110	4 x4	4 x4	6 3/4x3 3/4	7 x3 3/4							
77	205	4 1/4x4 1/2	4 1/2x4 3/4	8 1/8x4 5/8	8 1/2x4 3/8	55	18	18	23 3/4	3	5 1/4	4 1/2
79	65	3 1/2x3 1/2	3 3/4x3 1/2	6 x3 1/4	6 1/8x3 3/8	42	14	14	16	3	4 1/2	4
121	115	4 1/8x4 3/4	4 x4 1/2	7 1/4x4 1/4	7 1/2x4	52 1/2	17	17	19	3 5/8	5 5/8	4
144	120	3 1/2x3 3/4	3 1/2x3 3/4	6 3/4x3 3/4	6 3/4x3 3/4	45	20.5	20.5	18	2 3/4	4 3/4	4
141	115	4 1/8x4 1/4	4 x4 1/8	7 1/2x4	7 x3 3/4	49	11.5	11.5	18 1/4	2 1/2	4 3/4	4
141	150											
142	110	3 3/4x4 1/4	3 3/4x4	7 x4	7 x4		12	13	18	2 3/4	4 1/2	3 3/4
143	130	3 1/2x4	3 1/4x4 1/4	7 x4	6 3/4x4	44 1/2	21	20	19 3/4	2 1/2	4 1/2	4
143	185	3 1/2x4 1/4	3 3/4x4	7 x3 3/4	6 7/8x4	50 1/2	19	20	22	3 1/4	4 1/2	4 1/4
151	155	4 x4 1/4	4 x4 1/2	6 3/4x4	7 x3 3/4	52	21	20	20	2 3/4	5	4
162	130	3 1/2x3 7/8	3 1/2x4	6 3/4x3 7/8	6 3/4x4	55 3/4	16	17	19	3 1/8	5 1/2	4 1/2
163	125	4 x4 1/2	4 x4 1/2	7 1/4x4 1/8	7 1/2x4	52 1/2	24	23	19 1/8	3 1/8	5 1/2	4 3/4
AVG.	131.2	3.91 x 4.21	3.93 x 4.16	7.16 x 3.98	7.12 x 3.97	50.04	17.5	17.6	19.65	2.91	4.95	4.15

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

MALES -- 29-33 MONTHS

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)		CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
								LEFT	RIGHT				
97	285	4 1/4x5	4 1/2x5	9	x4 3/4	8 1/4x4 3/4	60 1/2	14	15	23 3/4	3	5 1/2	4 1/4
37	245	4 3/4x5 1/4	4 1/4x4 3/4	8	1/2x4 1/4	8 1/4x4 3/4	59	16	17	25	3 1/8	5 3/4	4 3/4
38	185	4 1/2x5 1/8	4 1/2x5 1/8	8	1/4x4 7/8	8 x5	58	19	19	24	3 7/8	6 1/4	5
38	205												
116	250	5 x5 1/4	4 7/8x5 3/8	8	1/2x5 1/4	8 1/2x5 1/2	63	20	20	24	3	6 1/4	5
79	235	4 3/4x4 1/4	5 x4 1/2	8	1/4x4 1/4	8 1/2x4							
80	116	4 1/4x4 1/8	4 1/8x4 1/4	7	3/4x4	8 1/4x4 1/4		19	19	19	2 3/4	5	4
80	185												
95	278	4 3/4x5 1/2	5 x5 1/2	9	x5	9 x5	64			25	3 1/4	5 7/8	5
95	360	5 x5	4 7/8x5 1/2	8	1/2x5	8 3/4x4 7/8	64 1/2	20	19	28 1/2	3 3/4	6	5
106	255	4 1/4x5	4 1/8x5 1/8	8	1/4x4 3/4	8 1/8x4 3/4	66	21.5	21	25	3 1/2	6 3/8	4 3/4
122	140	4 x5	4 1/2x5 1/4	8	x4 3/4	8 x4 1/4	55 3/4	18	18	22 1/2	3 3/4	6 1/4	5
Ave.	228.25	4.55 x 4.95	4.58 x 5.01	8.40	x 4.69	8.36 x 4.71	61.31	18.43	18.50	24.0	3.33	6.03	4.75

FEMALES -- 29-33 MONTHS

6	210	4 3/4x5	4 7/8x5	8 3/4x4 3/4	8 7/8x4 3/4	17	18	23 1/8	3 1/8	5 3/8	3 7/8
6	260										
29	165	4 x4	4 x4 1/4	7 1/8x4	7 1/8x3 7/8	18	17	21 1/2	3 3/4	5 1/4	4 1/2
29	252	4 3/4x4 1/2	4 5/8x4 5/8	8 x4 3/8	8 x4 1/2	17	18	25	3 1/4	5 3/4	4 1/2
5	240	4 3/4x5 1/4	4 3/4x5 1/4	8 1/4x5 1/4	8 x5						
77	145	4 x4 1/2	4 x4 2/3	8 x4 1/2	8 x4 1/2	18	18	22	3 1/2	5 1/2	4 1/2
121	130	4 1/4x5	3 7/8x4 1/2	7 3/4x4 1/4	7 3/4x4 1/4	18	17	20 1/2	3	5 1/4	4 1/4
15	150	4 x3 3/4	4 1/4x4	7 x4	7 1/4x4						
3	150	4 1/4x4 1/4	4 1/4x4 1/2	7 1/2x4 3/8	7 1/2x4 1/4						
9	160	5 x5	5 x5								
10	140	4 3/4x4 1/2	5 x4 1/4	7 1/2x4 1/2	8 x4 1/2						
61	185	4 1/4x4	4 x4	7 3/4x4 1/4	7 3/4x4 1/2	19	19	24 3/4	3	5 1/2	4 1/2
66	225	4 3/4x5	4 3/4x5	7 3/4x4 3/4	7 3/4x4 3/4	17.5	17.5	24	3 1/2	5 3/4	4 1/2
40	175			8 x4 1/4	8 x4 1/4						
40	230	4 3/4x4 3/4	4 1/2x4 3/4	8 1/4x4 3/4	8 1/4x4 3/4		17.5			5	
86	115	4 x4 1/4	3 7/8x4 1/2	7 1/8x3 3/4	7 1/2x3 3/4	17	16	19 1/2	2 7/8	4 3/4	3 3/4
91	150	4 x4 1/4	4 x4 1/4	7 1/2x3 3/4	7 5/8x4 1/8	16	16	22 1/2	3 1/8	4 3/8	4 1/2
115	240	4 x4 7/8	4 x4 3/8	8 3/8x4 7/8	8 1/4x5	18	17	25	3 1/2	6	4 1/2
118	145	4 x4 5/8	4 1/4x4 5/8	7 3/4x4 1/4	7 1/2x4 1/8	17	17	20	3	5 1/4	4
Avg.	182.5	4.37 x 4.56	4.32 x 4.56	7.79 x 4.45	7.85 x 4.41	17.50	17.33	22.53	3.42	5.34	4.28

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

MALES --- 41-45 MONTHS

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
51	275	4 3/4x6	5 1/4x6 1/4	9 1/2x5 1/2	9 1/4x5 3/4	69 1/2	20	20	26 1/2	3 3/4	6 3/4	4 5/8
51	290	5 1/4x5 3/4	5 x6	9 1/4x5 1/2	9 1/2x5 1/2	68	20	20	24	4	6 3/4	4 3/8
37	215	4 1/2x5 1/4	4 1/2x5 1/8	9 x5	9 x5	65	18	19	24	3 1/2	6	4 1/2
37	315	4 3/4x5 1/8	4 1/2x5 3/8	9 x5	9 1/2x5 1/4	67 1/2			26	4	6 7/8	4 3/4
37	310											
122	205	4 1/2x5	4 1/2x5	9 x4 3/4	8 1/2x4 1/2	60	19	19	24 1/2	4 3/4	6 1/2	4 1/2
149	220	4 3/4x5 1/4	4 1/2x5	8 1/2x5	8 1/4x5	62	24	24	24	3	6	5
76	350											
32	220											
35	265	4 3/4x5 1/4	4 1/4x5 1/2	9 1/2x5	8 3/4x5	69						
74	200											
Avg.	260.5	4.75 x 5.37	4.64 x 5.46	9.11 x 5.11	8.96 x 5.29	65.9	20.2	20.4	25.0	3.83	6.48	4.69

FEMALES 41-45 MONTHS

6	250	4 1/2x4 7/8	4 1/2x4 7/8	8 x4 1/2	7 7/8x4 1/2	65 1/2	19	19	25 1/2	3	5 7/8	2 3/8
6	295											
5	300	4 1/2x5 1/2	4 5/8x4 5/8	8 1/2x5	8 3/8x4 3/4	63 1/2			26	3 1/2	5 3/4	3 1/2
121	240	4 1/2x4 3/4	4 x5	8 1/2x4 1/4	8 1/4x4	58 1/2	21	22	23	2 3/4	5 1/2	4 1/2
9	280	4 x4 1/2	4 x4 1/2	8 x4 3/4	8 x4 3/4	67 1/2	19	19	25	4	6 1/2	5
40	300	4 1/4x4 5/8	4 1/2x5	8 x4 1/2	7 5/8x4 1/2	63	18	18	26	3 1/2	5 3/4	4 3/4
96	270	5 1/4x5 1/4	4 3/4x5 1/4	9 x5	9 1/8x5	65 1/2	18	19	24 1/2	3 3/4	6 1/4	4 1/2
Avg.	276.4	4.50 x 4.92	4.35 x 5.04	8.27 x 4.67	8.21 x 4.59	63.83	19.0	19.4	25.0	3.42	5.94	4.10

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

MALES -- 53-57 MONTHS

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
51	343	4 3/4 x 5 3/4	5 x 5 1/2	9 1/2 x 5 1/4	9 x 5	24	69	24	26	3	6 1/2	4 3/4
37	440	4 3/4 x 5 3/4	5 1/4 x 6	10 x 5 1/2	9 7/8 x 5 1/2	20	73	21	29	4	7 1/4	5
76	350	4 1/2 x 5 7/8	4 3/4 x 5 3/4	9 1/2 x 5 1/2	8 3/4 x 5 1/2	21	70 3/4	20.5	30 1/2	4	7	5
32	300	4 7/8 x 5 1/2	4 3/4 x 5 3/8	9 5/8 x 4 7/8	9 1/2 x 5	19.5	70 1/2	19.5	26 1/2	3 7/8	6 1/2	4 7/8
74	250	4 3/4 x 4 5/8	4 3/4 x 4 3/4	8 1/8 x 4 1/4	8 1/4 x 4 1/4	21	65 1/2	21	24 1/2	3 3/8	6	5
Avg.	336.6	4.72 x 5.50	4.90 x 5.46	9.35 x 5.07	9.07 x 5.05	21.1	69.75	21.2	27.3	3.65	6.65	4.92

FEMALES -- 53-57 MONTHS

15	212	4 1/4 x 4 1/2	4 1/4 x 4 1/2	7 3/4 x 4 1/8	7 5/8 x 4 1/4	19	66	18.5	23 1/2	3 1/4	6 1/2	4 7/8
10	260	4 1/2 x 5	4 1/2 x 5	7 3/4 x 5 1/8	7 7/8 x 4 1/2	18.5	63 1/2	18	25 1/2	3 1/2	6	4 1/2
40	340	4 1/2 x 5 1/4	4 1/2 x 5 1/4	7 3/4 x 4 3/4	7 1/2 x 4 1/2	19	64 3/4	19	28	3 1/2	5 3/4	5
96	355	4 3/4 x 5 1/2	4 5/8 x 5 1/2	9 x 5 1/4	9 x 5	28	67 3/4	28	28	4	5 1/2	4 1/2
Avg.	291.9	4.50 x 5.06	4.47 x 5.06	8.06 x 4.81	8.00 x 4.56	18.8	65.50	18.5	26.25	3.56	5.94	4.72

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

MALES -- YOUNG ADULTS (3-5 YEARS)

No.	WT.	PADS (IN.)				CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)		
		R. F.	L. F.	R. R.	L. R.							
51	275	4 3/4x6	5 1/5x6 1/4	9 1/2x5 1/2	9 1/4x5 3/4	69 1/2	20	20	26 1/2	3 3/4	6 3/4	4 5/8
51	290	5 1/4x5 3/4	5 x6	9 1/4x5 1/2	9 1/2x5 1/2	68	20	20		4	6 3/4	4 3/4
51	343	4 3/4x5 3/4	5 x5 1/2	9 1/2x5 1/4	9 x5	69	24	24	26	3	6 1/2	4 3/4
37	215	4 1/2x5 1/4	4 1/2x5 1/4	9 x5	9 x5	65	17.5	19	24	3 1/2	6	4 1/2
37	315	4 3/8x5 1/8	4 1/2x5 3/8	9 x5	9 1/2x5 1/4	67 1/2			26	4	6 7/8	4 3/4
37	310											
37	440	4 3/4x5 3/4	5 1/4x6	10 x5 1/2	9 7/8x5 1/2	72	20	21	29	4	7 1/4	5
122	205	4 1/2x5	4 1/2x5	9 x4 3/4	8 1/2x4 1/2	60	19	19	24 1/2	3 3/4	6 1/2	4 1/2
32	220											
32	300	4 7/8x5 1/2	4 3/4x5 3/8	9 5/8x4 7/8	9 1/2x5	70 1/2	19.5	19.5	26 1/2	3 7/8	6 1/2	4 7/8
35	265	4 3/4x5 1/4	4 1/4x5 1/2	9 1/2x5	8 3/4x5	69						
74	200											
74	250	4 3/4x4 5/8	4 3/4x4 3/4	8 1/8x4 1/4	8 1/4x4 1/4	65 1/2	21	21	24 1/2	3 3/8	6	5
67	275	5 1/2x5 1/2	5 1/2x5 1/2	9 1/2x5 1/4	9 1/2x5 1/4	69	21	21	25	3 3/4	6 1/2	5
50	270	5 x5	4 3/4x5	8 3/4x4 3/4	9 x5	60 1/2	21.5	21.5	26	3 1/4	6 1/4	5
68	255	5 x5 3/4	5 x5 3/4	9 3/4x5 1/4	9 3/4x5 1/4	64	19	19	27	4	6 1/2	5
76	350											
76	350	4 1/2x5 7/8	4 3/4x5 3/4	9 1/2x5 1/2	8 3/4x5 1/2	70 3/4	21	20.5	30 1/2	4	7	5
76	465	4 3/4x6	4 3/4x5 3/4	9 3/4x5 1/2	9 x5 1/4	71	25.5	25.5	30	4	6 3/4	4 3/4
90	260	5 x5 1/4	5 x5 1/4	9 1/8x4 7/8	9 1/8x4 7/8	66	19.5	19.5	26 1/2	3 1/2	6 1/4	5
105	315	5 1/8x5 1/2	5 x5 1/4	9 x5	9 x5	72	20	21	26 1/2	4	6 3/4	5
127	250											
127	285											
127	275											
149	220	4 3/4x5 1/4	4 1/2x5	8 1/2x5	8 1/4x5	62	24	24	24	3	6	5
146	255	4 1/2x4 3/4	4 1/2x5	9 1/2x4 3/4	8 x4 1/2	60	25	25	23 1/2	3	5	4 1/2
4	240	5 x5 1/2	5 x5 3/8	9 x5 1/4	9 x5							
4	265	5 1/2x4 1/2	6 x4 1/2	9 1/2x5 1/4	9 1/4x5							
22	260	4 3/4x5 1/2	5 1/2x5 3/4	8 1/2x5	8 1/2x5							
126	310	4 3/4x5 1/2	4 3/4x5 1/2	9 x4 7/8	9 x4 3/4	69	21	22	26	3 1/2	7	5
Avg.	284.3	4.86 x 5.39	4.90 x 5.39	9.21 x 5.08	9.01 x 5.05	67.13	21.1	21.3	24.9	3.69	6.49	4.83

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

FEMALES -- YOUNG ADULTS (3-5 YEARS)

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
6	250	4 1/2x4 7/8	4 1/2x4 7/8	8	x4 1/2	7 7/8x4 1/2	65 1/2	19	25 1/2	3	5 7/8	4 3/4
6	295											
121	240	4 1/4x4 3/4	4 x5	8	1/2x4 1/4	8 1/4x4	58 1/2	23	23	2 3/4	5 1/2	4 1/2
15	212	4 1/4x4 1/2	4 1/4x4 1/2	7	3/4x4 1/8	7 5/8x4 1/4	66	19	23 1/2	3 1/4	6 1/2	4 7/8
9	280	4 x4 1/2	4 x4 1/2	8	x4 3/4	8 x4 3/4	67 1/2	19	25	4	6 1/2	5
10	260	4 1/2x5	4 1/2x5	7	3/4x5 1/8	7 7/8x4 1/2	63 1/2	18.5	25 1/2	3 1/2	6	4 1/2
40	300	4 1/4x4 5/8	4 1/4x5	8	x4 1/2	7 5/8x4 1/2	63	18	26	3 1/2	5 3/4	4 3/4
40	340	4 1/2x5 1/4	4 1/2x5 1/4	7	3/4x4 3/4	7 1/2x4 1/2	64 3/4	19	28	3 1/2	5 3/4	5
40	270	4 1/4x4 1/2	4 x4 1/2	7	1/2x4 1/4	7 x4	59	19	25	3 1/2	5 1/2	4 3/4
45	185	5 x4 3/4	4 3/4x4 1/2	8	x4 3/8	8 x4 1/2	65	15	26	3 1/4	6	5 1/2
45	255	4 x5 1/4	4 1/4x5	8	1/4x4 1/2	8 x4 1/2	63	19	24	3 1/4	6	5
47	190	4 1/2x4 3/4	4 1/2x4 3/4	8	x4 1/2	7 3/4x4 3/4	63	19	26	3 1/4	6	4 1/4
54	225	4 1/4x4 3/4	4 1/4x4 1/2	8	x4 1/2	8 1/4x4 3/8	58	19	26	3 1/2	5 7/8	4 3/4
62	230	4 x4 1/2	4 x4 1/2	7	1/4x4 3/8	7 1/4x4 3/8	57 3/4	17.5	25	3 1/2	5 3/4	4 3/4
55	200	4 1/2x4 5/8	4 1/2x4 1/2	8	x4 3/8	8 1/4x4 1/4	60	19	24 1/2	3 1/2	5 3/4	4 1/2
96	270	5 1/4x5 1/4	4 3/4x5 1/4	9	x5	9 1/8x5	65 1/2	18	24	3 3/4	6 1/4	4 1/2
96	355	4 3/4x5 1/2	4 5/8x5 1/2	9	x5 1/4	9 x5	67 3/4	20	28	4	5 1/2	4 1/2
96	230	4 x4 3/4	4 1/4x5	8	1/2x4 1/2	8 1/2x4 1/2	65 1/4	20	24	3 3/4	6	4 1/2
(w/cubs)												
96	260											
81	220	4 x5 1/4	4 1/2x5	8	x5	8 x4 5/8	60	19	25	3 1/2	5 3/4	4 1/4
101	285	4 1/2x5	4 3/4x5	8	x4 3/4	8 1/4x4 7/8	66	18.5	25 1/2	3 3/4	6 1/4	4 1/2
103	270	4 3/8x5	4 1/4x4 3/4	8	1/4x4 5/8	8 1/2x4 5/8	60 1/2	19.5	25	3 3/4	6	4 1/2
102	260	4 3/4x5 3/4	4 3/4x5 1/2	9	x5 1/2	8 3/4x5 1/2	61 1/2	19	25	3 1/2	6	5
42	250	5 x5	5 x5	9	x5	9 1/4x5	70	19	25 1/2			5 1/4
108	300	4 1/2x5 3/4	4 5/8x5 1/4	9	x5 1/4	9 1/4x5 1/4	67	19.5	26	3 3/4	6 1/8	4 1/4
5(?)	320	4 1/2x5	4 1/2x5	8	x4 3/4	8 3/4x4 7/8	68 1/2		27	3	6	4 7/8

Ave. 258.65 4.43 x 4.91 4.43 x 4.90 8.19 x 4.69 8.19 x 4.63 63.60 18.9 19.0 25.3 3.49 5.94 4.71

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

MALES -- 65 MONTHS AND OVER

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
12	620	6 1/4x5 1/4	6 1/2x5	10	x6	11	x6	83				
12	875											
2	510	5 3/4x5 3/8	5 7/8x6 1/4	10	1/4x5 3/4	10	1/8x5 7/8	79 1/2	23	23	32 3/4	5
4	240	5 x5 1/2	5 x5 3/8	9	x5 1/4	9	x5			4	7 1/4	5
4	265	5 1/2x4 1/2	6 x4 1/4	9	1/2x5 1/4	9	1/4x5	22	22		6 3/4	4 1/2
13	645	5 1/2x6 1/2	5 1/2x6 3/4	11	x6	11	x5 1/4					
14	520											
20	280	5 1/4x5 3/4	5 1/2x5 3/4	9	1/2x5 1/2	9	1/4x5 1/4	67 1/2				
21	300	4 1/2x4 3/4	5 x5	8	1/4x4 1/2	8	x4 3/4	71 1/2				
27	505			9	x6	8	1/4x5	85				
28	500			11	x6 1/4	11	x6					
30	710											
63	560	5 x5 1/2	4 3/4x5 1/2	8	3/4x5 1/4	9	x5 1/4	79	22	22	33	5 1/4
60	600	5 1/2x5	5 1/2x6	9	3/4x5 1/2	9	1/2x5 1/2	80	25.5	25.5	36	5 1/2
46	355	5 1/4x6 1/2	5 1/4x6 1/4	9	3/4x6 1/4	9	1/4x6 1/4	77	17	17	27 1/2	5 3/4
41	550	5 3/4x5 3/4	5 1/4x6 1/4	10	1/2x6	10	1/2x6	91			36	6
33	425			10	1/4x6	10	x5 3/4	76				
69	580	6 x6 1/2	6 x6 1/2	10	1/2x6 1/2	10	1/2x6 1/4	76 1/2	22	22	33	5 1/4
73	780	6 x6 3/4	5 3/4x6 3/4	10	1/2x5 1/2	10	1/2x6 1/2	76 1/2				
113	345	5 1/4x6 1/4	5 1/2x5 1/4	9	1/4x5 3/4	9	1/4x5 3/4	73	22	22	39	5 1/2
111	530											
89	635	5 3/4x6 1/4	5 1/4x6	10	1/4x6	10	1/4x5 7/8	80 1/2	23.5	23.5	36 1/2	5 1/2
88	500	5 3/4x6 1/4	5 3/8x6	10	x6	9	7/8x5 3/4	77	22	23	33	5
87	450	5 x6 1/2	4 3/4x6 1/4	9	3/4x5 7/8	9	1/4x5 3/4	74	21.5	22	34 1/2	4 1/4
85	465	5 3/8x5 5/8	5 5/8x6	9	3/8x6	9	1/2x6 3/16	75 1/2	21	21	33 1/2	5 1/4
126	310	4 3/4x5 1/2	4 3/4x5 1/2	9	x4 7/8	9	x4 3/4	69	21	22	26	5
155	660	5 1/2x6	5 1/4x6	10	x5 1/2	9	1/4x5 1/2	76	23	23	36 1/2	5 1/4
159	640	5 1/2x6 1/2	5 1/2x6 1/4	11	x6 1/8	11	1/4x6 1/8	76	23	23	36	4 1/2
76	465	4 3/4x6	4 3/4x6	9	3/4x5 1/2	9	x5 1/2	71	25.5	25.5	30	4 3/4
Avg.	573.1	5.40 x 5.98	5.40 x 5.89	9.84 x 5.77	9.71 x 5.67	76.88	22.9	23.1	33.08	4.25	6.97	5.12

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

FEMALES -- 65 MONTHS AND OVER

No.	WT.	R. F.	PADS (IN.)		R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)		CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)	
			L. F.	R. R.				LEFT	RIGHT					
40	270	4 1/4x4 1/2	4	x4 1/2	7 1/2x4 1/4	7	x4	59	19	20	25	3 1/2	5 1/2	4 3/4
7	300													
7	450													
7	340	4 7/8x5 1/4	4	7/8x4 3/4	8 3/4x5	8	x4 3/4	67 1/2	19	19	29	3 3/4	6	4 1/2
7	415													
8	260	5 x5 1/4	5	x5 1/4										
16	300	4 3/4x5	5	x5	9 x4 3/4	8 3/4x4 3/4	72							
17	435	5 x5 1/4	5	1/4x5 1/2	9 x5	9 1/2x5	78							
18	380	5 x5 1/2	5	x5 3/4	8 3/4x4 3/4	9 x5	68							
18	225						63							
22	260	4 3/4x5 1/2	5	1/2x5 3/4	8 1/2x5	8 1/2x5								
23	370													
75	365	5 1/2x5 1/2	5	1/2x5 1/2	9 x5 1/2	9 x5 1/2	68	19	19	29	4 1/4	6 1/2	4 3/4	
75	380	4 1/2x5	4	1/2x5 1/2	8 1/4x5	8 x5	63 3/4	21.5	22	27	3 1/4	6	4 3/4	
48	350	5 1/2x5 1/2	5	1/2x5 3/4	8 3/4x5	8 3/4x4 3/4	67	21	21	30	3 3/4	6	5 1/8	
48	400													
44	300	5 1/4x5	5	1/4x5 1/4	9 1/4x4 3/4	9 1/4x4 3/4	74	16.5	14	29	3 3/4	6 1/2	5 3/4	
44	325													
34	260						77							
34	425	5 1/4x5 3/4	5	1/4x5 1/2	8 1/2x5	9 x4 1/2	68	21	21	31	3 3/4	5 3/4	4 1/2	
34	350													
39	350	4 1/4x5	4	1/4x5 1/4	9 3/4x4 3/4	8 1/2x5	81					6		
39	340													
39	350													
42	250	5 x5	5	x5	9 x5	9 1/4x5	70					3 3/4	6	
42	355	4 1/2x5 1/8	4	5/8x5 3/8	8 1/2x4 3/8	8 1/2x5	67 1/2	21	20	27	3 3/4	5 3/4	4 1/4	
65	435	5 3/4x5 3/4	5	1/4x6	9 1/4x5 1/2	8 3/4x5 1/4	71	21	21	32	4	6 1/4	5 3/8	
65	380													
64	495	4 1/2x5 1/2	4	1/2x5 1/2	8 1/4x5 1/4	8 1/4x5 3/4	74 1/2	21	21	31	3 3/4	6 1/2	5	
59	325	4 3/4x5	5	x5	8 3/4x5	8 1/2x5	70	19	19	28	3 1/2	6 1/4	4 1/2	
58	470	4 3/4x5	4	3/4x5	8 3/4x5	8 1/2x5	70 1/2	21	21	32	4 1/4	6 3/4	5 1/8	
31	225													
72	385	5 1/4x5 1/4	5	3/4x5 1/4	9 x4 1/2	9 1/4x4 1/4	69	19	19	29	3 3/4	5 3/4	4 1/2	
31	225													
120	325													
119	325													
104	375													
84	235													
108	300	4 1/2x5 3/4	4	5/8x5 1/4	9 x4 3/4	8 3/4x5		19.5	20	26	3 3/4	6 1/8	4 1/4	
107	275													
107	250													

WEIGHTS AND MEASUREMENTS OF GRIZZLY BEARS

FEMALES --- 65 MONTHS AND OVER (CONTINUED)

No.	WT.	R. F.	L. F.	PADS (IN.)	R. R.	L. R.	TOTAL LENGTH (IN.)	CLAW BASE (MM)	CIRCUM. OF NECK (IN.)	INTER OCULAR (IN.)	NOSE TO EYE (IN.)	EAR LENGTH (IN.)
128	300	4 1/2x4 3/4	4 3/4x4 3/4	9	x4 1/2	8 1/2x4 1/2	66					
128	360											
123	285											
123	330											
140	375											
125	300											
129	405	4 3/4x5 1/4	4 7/8x5 1/4	8 5/8x4 5/8	8 1/2x4 7/8	8 1/2x4 7/8	70 1/2		29 1/4	3 3/4	6 5/8	5
131	320	4 1/2x5	4 1/2x5	8	x4 3/4	8 3/4x4 7/8	68 1/2		27	3	6	4 7/8
150	285											
150	335	4 3/4x5 1/4	4 3/8x5	8	x5	8 x4 3/4	71	25.5	27 1/2	3 1/2	6 1/4	5
148	355	4 3/4x5	4 1/2x4 3/4	8 1/4x4 1/2	8 1/2x4 3/4		68	19	28	3 1/4	6	5 1/2
148	415											
160	360											
160	405											
164	410	4 7/8x5 3/8	4 5/8x5 1/4	8 3/8x4 1/2	8 1/8x4 3/4		72	22	28	3 3/4	6 1/8	5
96	230	4 x4 3/4	4 1/4x5	8 1/2x4 1/2	8 1/2x4 1/2		65 1/4	20	24	3 3/4	6	4 1/2
112	355	4 1/2x5 1/4	4 5/8x5 3/8	9	x4 7/8	8 3/8x5 1/8	68	19	26 1/2	3 1/2	5 3/4	4 3/4
Avg.	338.9	4.81 x 5.21	4.81 x 5.24	8.67 x 4.87	8.61 x 4.89		69.57	20.48	28.28	3.66	6.10	4.85

WEANING AGE (OFFSPRING OF 27 GRIZZLY FEMALES)
YELLOWSTONE PARK

1959 - 1963

Number of Sows Weaning Offspring As:

<u>Year</u>	<u>Cubs</u>	<u>Yearlings</u>	<u>Two-Year Olds</u>
1959			2
1960	1	1	2
1961		2	6
1962	1	1	3
1963	—	4	4
	—	—	—
Totals	2	8	17