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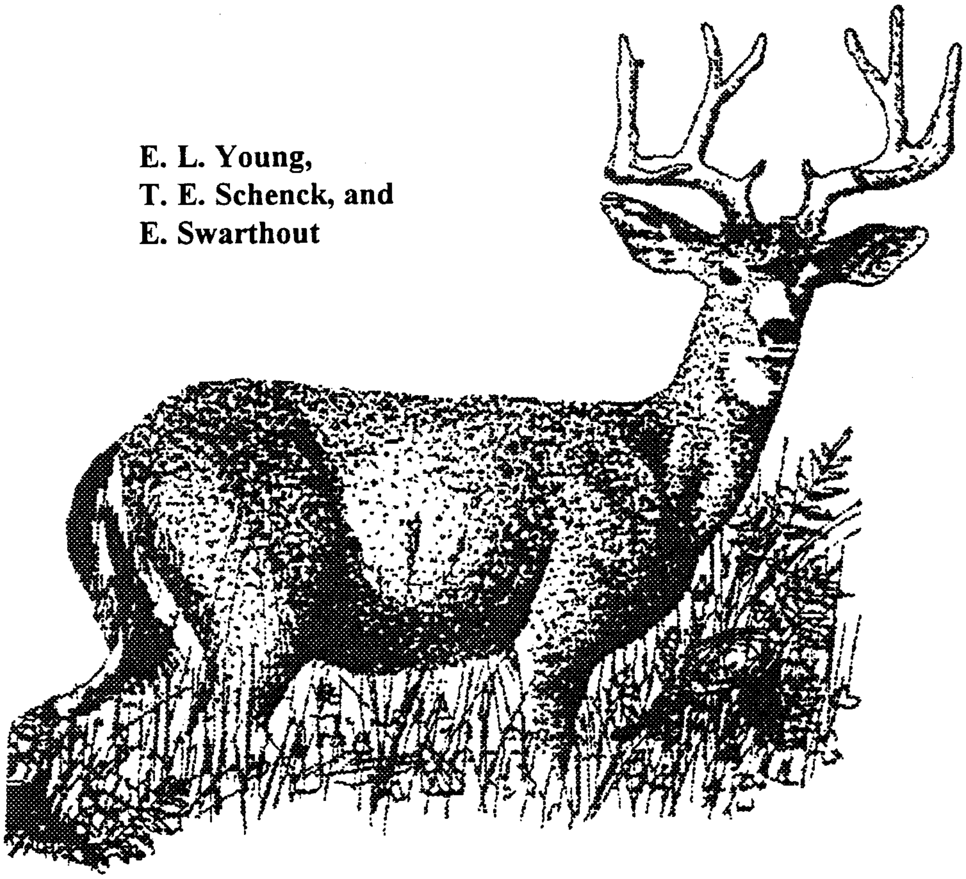
Sex and Age Parameters of Sitka Black-tailed Deer



E. L. Young,
T. E. Schenck, and
E. Swarthout

Report on a Contract Between
U.S.D.A. Forest Service and Alaska Department of Fish and Game

May 1993

Sex and Age Parameters of Sitka Black-tailed Deer

E. L. Young[1], T. E. Schenck[2], and E. Swarthout[3]

Background: The Alaska Department of Fish and Game (ADF&G) has collected deer pellet group information in Southeast Alaska since the 1980's (Kirchhoff and Pitcher 1988) and has used hunter mail questionnaires to collect deer harvest information (Thomas and Clark 1990, Thomas 1989, Clark 1991). ADF&G has also collected deer mortality information through spring beach mortality transects and surveyed deer on the beach in winter (Young 1991). Deer jaws were collected from hunters by U.S. Fish and Wildlife Service or ADF&G biologists to provide age structure information (Klein and Olson 1960) from the 1950's through the 1970's. Johnson (1987) reported on Unit 4 deer ages and reproductive capability by age class from deer collected on the beach.

Federal assumption of subsistence wildlife management in 1991 authorized the Federal Subsistence Board to set deer seasons on federal lands (Schenck and Young 1991). Federal regulations restricted non-subsistence hunters and superseded state deer regulations on federal lands in 1992-93. Federal lands and adjacent state or private lands had different regulations which caused management problems (Schenck et al in press).

In 1992, the U.S.D.A. Forest Service (USFS) contracted with ADF&G to obtain Sitka black-tailed deer (*Odocoileus hemionus sitkensis*) sex and age information in Game Management Unit 4 (GMU 4). The new responsibility of USFS to provide sound management recommendations to the Federal Subsistence Board requires knowledge of deer population parameters as a supplement to deer pellet group transects and mortality surveys conducted by ADF&G and USFS. Increased information on deer herds should allow federal and state biologists to provide for the needs of user groups and provide a better data base for developing regulations on state and federal lands.

The terms of USFS Contract Order Number 43-0109-2-0635 were: **Produce a report with age and sex structure estimates of Sitka black-tailed deer in GMU 4 based upon analysis of samples collected during the period September 1992 through January 1993. A minimum of 200 samples from hunter-killed deer will be collected. A minimum of 50 samples will be from the Sitka Sound/Peril Strait area and 50 from the northeast Chichagof Area.**

Unit 4 consists of Admiralty, Baranof, Chichagof, Kruzof, and adjacent islands in southeastern Alaska. The unit provides the bulk of deer hunting opportunity in Southeast Alaska, accounting for 52% of the region's hunter effort and 73% of the deer harvest in the 1990-91 season (Clark 1991). Deer numbers declined from severe winters and in 1991-92 the unit provided 47% of the effort and 60% of the deer killed in Southeast Alaska (Young in press).

[1]Alaska Dept. of Fish and Game, 304 Lake, Sitka AK 99835
[2]USDA Forest Service, 204 Siginaka Way, Sitka, AK 99835
[3]c/o Prescott College, 220 Grove Avenue, Prescott AZ 86301

Game Management Unit 4 deer seasons were "bucks-only" until 1955, when the first antlerless deer hunt occurred (Klein and Olson 1960). Deer in Game Management Units 1, 2, and 3 experience wolf (*Canis lupus*) predation as a contributing factor to population losses (Merriam 1966, Smith et al. 1986), but wolves are absent or very rare in GMU 4. Although brown bears (*Ursus arctos*) are numerous, bear predation has little impact.

Deer population peaks and declines occur periodically in GMU 4. Declines have been attributed to severe winter weather and associated deep snow conditions (Merriam 1970, Olson 1979). Populations were low in the late 1940's, following years of heavy winter losses. By 1956 deer exceeded carrying capacity (Klein and Olson 1960).

Sex ratios and percentages can be affected by hunting in accessible areas and sex structure may reveal management problems such as overharvest. Deer ages can be indicative of herd reproductive capability and a cross section of harvested deer can reveal missing cohorts. In white-tailed deer (*O. virginianus*), the yearling age class is an important gauge of herd nutrition and welfare (Ramsey and Shult 1990). A disproportionate number of yearling males taken compared to older bucks (4+) indicates a heavy buck harvest.

Ramsey and Shult (1990) indicated that heavy hunting pressure resulted in white-tailed deer population ratios in the range of >50% yearlings to <10% mature. Klein and Olson (1960) felt that black-tailed deer populations were growing in the Petersburg-Wrangell area with 54% of the animals in the young age classes and less than 2% over 5 years old. They described the range as good. In the Alaska study, it is unlikely that hunting pressure was heavy. It is possible that the populations were recovering from winter losses in the 1940's (Klein and Olson 1960) and exhibited a response similar to heavy hunting pressure. Fuller (1990) said that samples from hunter-killed deer are not necessarily representative of the sex or age structure of a population. While we agree that hunter biases distort sex structure data, we contend that hunter-killed deer provide a cross section of herd age structure for deer older than fawns.

Objective: To determine the percentage by sex and age class of harvested deer.

Methods: We contacted hunters to obtain jawbones or middle incisors from harvested deer. We issued news releases (Appendix A) and placed posters requesting jaws in strategic areas in Sitka (such as boat docks, grocery stores, sporting goods retailers, and government offices). We rewarded hunters with a free Project Safeguard coffee cup if they submitted more than one sample. We held a monthly award drawing to encourage participation. Hunter response was enthusiastic and the number of jaws obtained exceeded the minimum desired.

We collected both middle incisors, cleaned them of excess tissue, and placed them in paper envelopes to dry. The hunter's name, deer sex, deer kill location and date were recorded, and the sample assigned an accession number. Wildlife Analysis Area (WAA) codes were assigned after consulting a map (Appendix B). Accession numbers were noted on the record sheet and the tooth envelope. An independent laboratory (Matson Laboratories, Milltown, Montana) counted cementum annuli (Appendix C).

Results and Discussion: We collected 347 sets of deer teeth from hunter-killed deer for analysis. We eliminated samples where sex was questionable, which left 338 known-sex samples. For purposes of sampling, we combined WAAs (Appendix B) into zones called Management Areas (MA) (Appendix B). Table 1 displays the number sampled by sex by Management Area. There were 2.5 male samples submitted for each female sample provided.

Table 1.

Management Area	Males	Females	Total
A-1 Southeast Admiralty	3	0	3
A-2 Southwest Admiralty	5	2	7
A-3 Angoon	2	0	2
A-4 West Admiralty	6	2	8
A-5 SCCA	0	0	0
A-6 Seymour	1	0	1
A-7 North Admiralty	11	2	13
B-1 NE Baranof	0	1	1
B-2 NW Baranof	34	15	49
B-3 SW Baranof	56	20	76
B-4 SE Baranof	4	0	4
C-1 NECCUA	38	15	53
C-2 West Frederick	0	0	0
C-3 Idaho-Lisianski	0	0	0
C-4 Yakobi-Elfin	0	0	0
C-5 West Chichagof	9	6	15
C-6 West Hoonah Sound	3	3	6
C-7 East Hoonah Sound	4	0	4
C-8 South Tenakee	10	8	18
C-9 Pleasant	0	0	0
K-1 Kruzof	34	19	53
Unclassified	22	3	25

Unit 4 hunters have traditionally shown a preference for taking antlered deer (ADF&G files). Most hunters attempt to avoid killing fawns, so low numbers in the sample do little to indicate fawn percentages in the population. Most hunters can probably distinguish fawns from adults. Johnson and Larsen (1986) had no difficulty in recognizing fawns during deer collection. McCullough et al. (1990), however, reported problems recognizing Columbia black-tailed deer (*O. h. columbianus*) fawns in the field. The fawn age class is most affected by winters, often making up over half of the dead deer observed on mortality transects (Young 1992).

Sample Distribution

Samples were obtained from all four major islands in GMU 4. Although there were active samplers in Juneau (a major source of Unit 4 hunters) and a tooth collection team visited Angoon during a weekend, we collected the fewest samples from Admiralty Island (Figure 1).

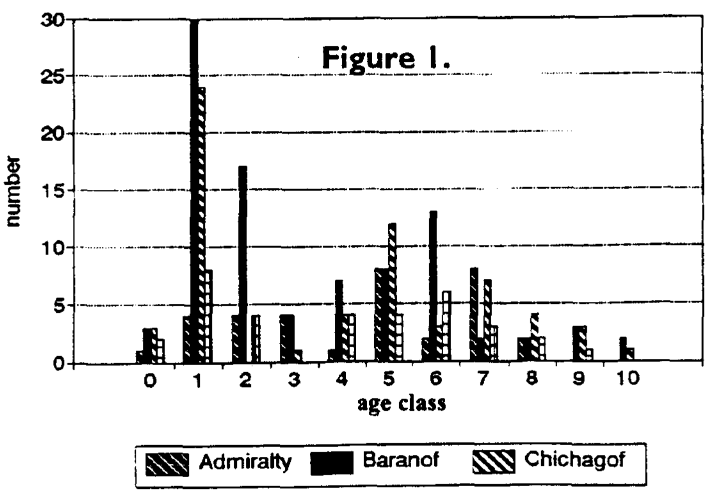


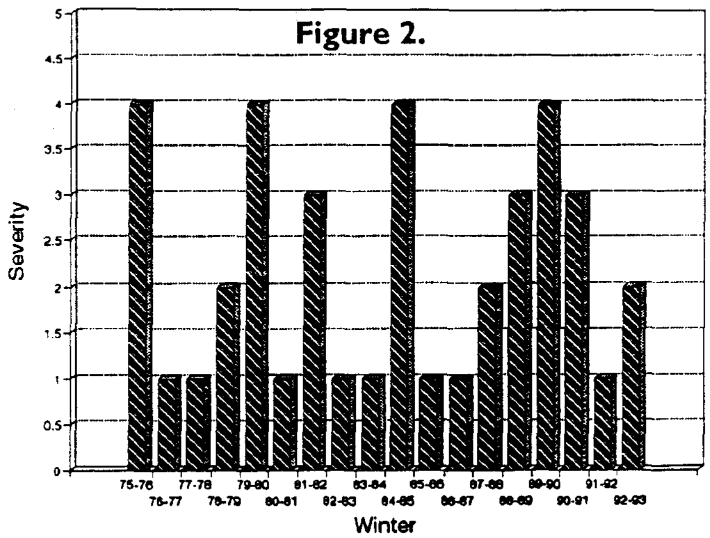
Figure 1.

See Appendix D for sample data by Management Area and WAA .

Winter Severity Index

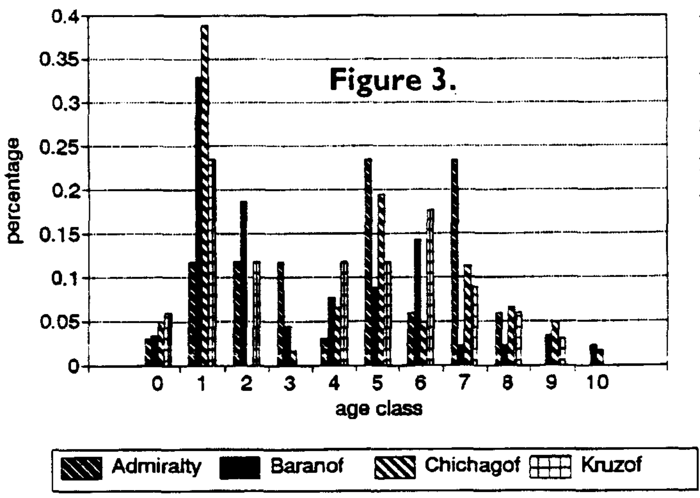
Winter severity fluctuated in GMU 4 from the mid-1970's through the early 1990's. There were years with excellent deer survival through the winter and others when there were significant losses. Most winters in GMU 4 were mild from the mid-1970's through 1987, allowing excellent overwinter survival of deer. During the winters of 1988-89 and 1989-90, persistent snow caused significant deer mortality (Young 1991). Winter 1990-91 broke records for snow persistence (M. Kirchhoff pers comm). The winter of 1991-92 was very mild with little snow and no evidence of winter deer mortality (Young in press.)

Figure 2.



Prior to data analysis, we assigned a winter severity index of 1 through 5 to the birth year of each cohort: 1 equals a warm winter with little snow and no winter related deer mortality, and 5 equals a severe winter with persistent deep snow and major deer losses. We researched ADF&G files and reports for references to winter severity. Figure 2 shows the severity of winters for 17 seasons in GMU 4.

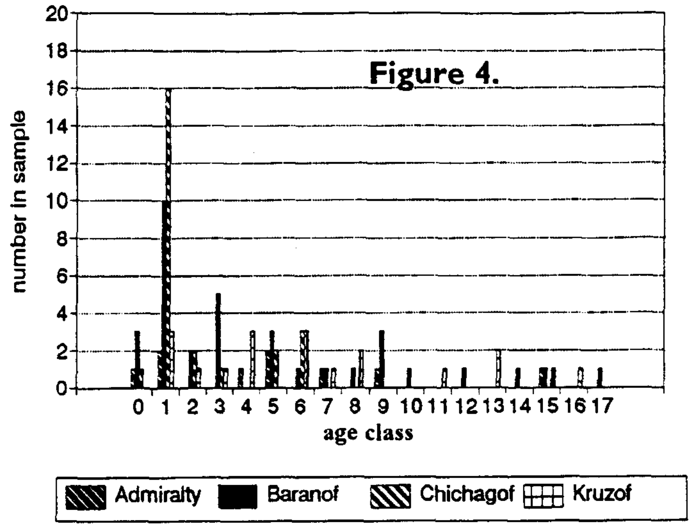
Figure 3.



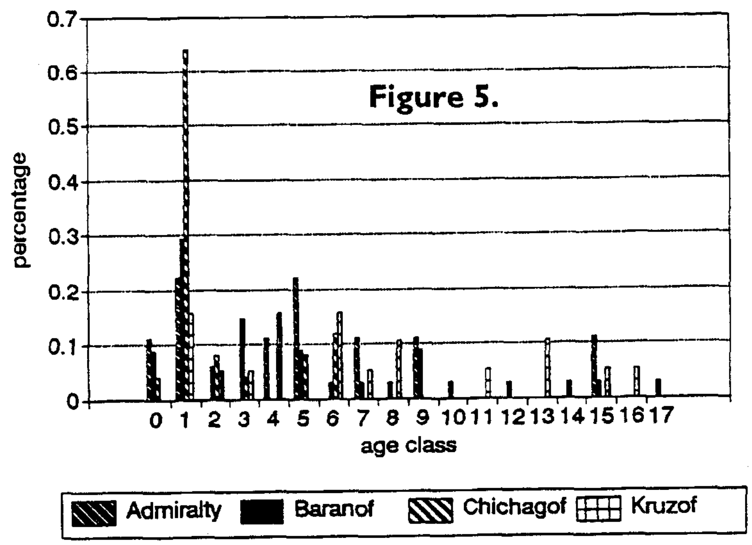
Age Classes

We calculated male percentages by age class by dividing the total number of males by the number in the particular age class (Figure 3).

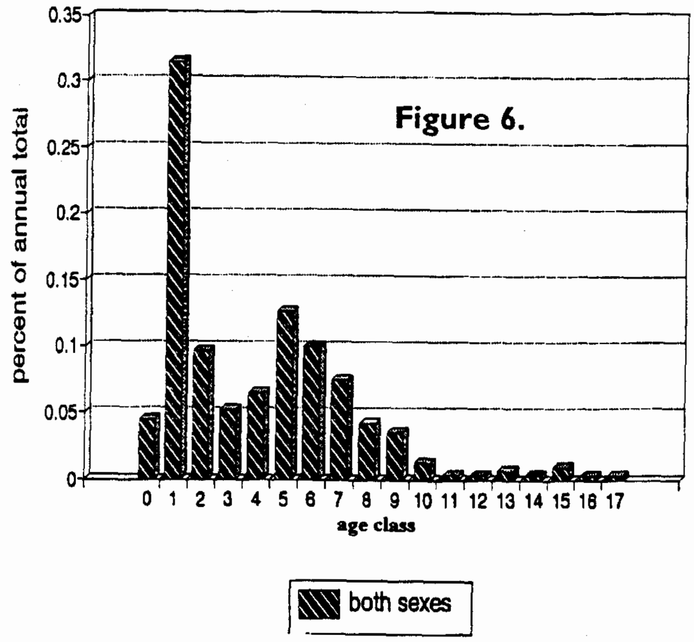
The number of known-age females collected (n=87) was relatively low and the small sample size (Figure 4) makes interpretation difficult for individual islands.



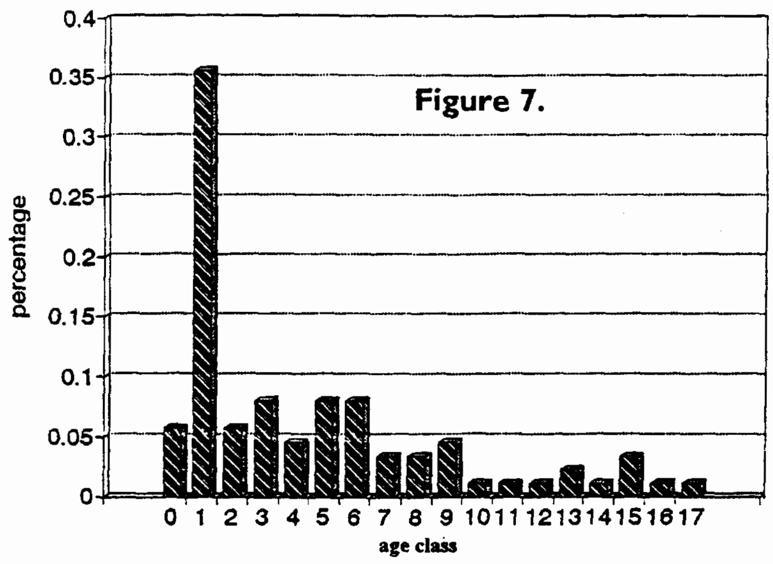
The percentage of does by age class was obtained by dividing the total number of females by the number in the particular age class (Figure 5).



Combining the male and female sample provides a larger sample size and indicates the underrepresentation in age classes 2-4 (Figure 6).



The small female sample size alone does not show expected distribution (Figure 7).



Sitka Sound-Peril Strait

Klein and Olson (1960) examined teeth from hunter-killed deer in the Sitka Sound-Peril Strait area in 1956. They indicated that young animals (1 1/2 and 2 1/2 years old) represented 16% of the sample taken from deer harvested by hunters. Deer over 5 years old accounted for 23% of the sample (Klein and Olson 1960). The Sitka Sound-Peril Strait range was described as overstocked. This includes Management Areas (MA) K-1, B-1, B-2, B-3, C-6, and C-7 (Table 1). Samples sizes and ages are shown in Table 2. We analyzed ages in the three areas having a sample size of >20.

Management Area K-1 is the area most accessible from Sitka. Fifty-three samples were collected (34 males and 19 females). The average age of adult male deer in the MA was 2.4 years, and the average age of adult females was 3.2 years (Table 2). There appears to be an inverse relationship between harvest pressure and average age. Yearlings made up 25% of the sample.

Management Area B-3 is also accessible from Sitka, where males averaged 3.3 years and does, 4.5 years (Table 2) . The sample size was 74 (54 males and 20 females). Of the males, 39% were yearlings. Of the females, 28% were yearlings.

Management Area B-2 is the least accessible of the three. There were 49 samples collected, and the average age of the adult males was 3.7 years, and the average females age was 6.5 years (Table 2). Of the males, 27% were yearlings, and of the females, 31% were yearlings.

Hoonah Peninsula

The use of motorized land vehicles along the road system on the Hoonah Peninsula undoubtedly helps increase the deer harvest in that area (Young 1988). The convenient Alaska Marine Highway schedule and the extensive logging road system attract many hunters from the Juneau area.

Management Area C-1 is the single MA on the Hoonah Peninsula. Fifty-two samples were collected. Adult male deer averaged 4.1 years, and females averaged 3.1 years (Table 2). The average age for females was the lowest for any MA with a sample size of >20. Of the males, 38% were yearlings, and of the females, 67% were yearlings.

Table 2. Deer sex and age by management area.

Mgmt Area	Fawn Males	Yearling Males	Adult Males (<1)	Average Age	Unknown Age[1]	Total Males	Fawn Females	Yearling Females	Adult Females (<1)	Average Age	Unknown Age	Total Females
A-1	0	1	2	3.3	—	3	—	—	—	—	—	—
A-2	1	0	4	4.8	—	5	0	0	2	8.0	—	2
A-3	0	0	2	5.5	—	2	—	—	—	—	—	—
A-4	0	2	4	3.0	—	6	0	1	1	8.0	—	2
A-5	—	—	—	—	—	—	—	—	—	—	—	—
A-6	0	0	1	3.0	—	1	—	—	—	—	—	—
A-7	0	1	6	3.9	4	11	0	0	2	5.0	—	2
B-1	—	—	—	—	—	—	0	1	0	1.0	—	1
B-2	1	9	24	3.7	—	34	1	4	8	6.5	2	15
B-3	2	20	32	3.3	2	56	2	5	13	4.5	—	20
B-4	0	1	3	3.5	—	4	—	—	—	—	—	—
C-1	2	13	22	4.1	1	38	1	8	4	3.1	2	15
C-2	—	—	—	—	—	—	—	—	—	—	—	—
C-3	—	—	—	—	—	—	—	—	—	—	—	—
C-4	—	—	—	—	—	—	—	—	—	—	—	—
C-5	1	3	5	4.4	—	9	0	2	4	3.0	—	6
C-6	0	1	2	6.3	—	3	0	2	1	1.3	—	3
C-7	0	2	2	3.0	—	4	—	—	—	—	—	—
C-8	0	5	4	3.3	1	10	0	3	3	5.7	2	8
C-9	—	—	—	—	—	—	—	—	—	—	—	—
K-1	2	8	32	2.4	—	34	0	3	16	3.2	—	19

[1]Unreadable samples and samples from unknown locations not included in average age calculations.

<u>All of Unit 4</u>

In an earlier study in Unit 4 (Johnson 1987, Johnson and Larsen 1987), 54 doe and 8 buck age samples were collected by shooting deer on the beach in February. This 1985 study showed a low number of yearlings present during February. The authors speculated that either low fawn recruitment or high fawn mortality in 1983-84 accounted for the low number of yearlings in 1984-85. Our 1992 age samples had a strong showing in the 7-year-old age class (those which were yearlings in 1984-85) indicating the dearth of yearlings in 1985 may have been restricted to the collection area. Our winter index for 1984 was 1, which would lead us to expect low fawn mortality. Snow accumulation and persistence varies widely in GMU 4, and it is quite likely that the Hoonah Sound collection area could have experienced severe mortality while most of the unit was experiencing little or no mortality.

1992 data for GMU 4 shows a strong pulse in the yearling age class. This indicates good fawn survival which was probably in response to favorable conditions during the 1991 birth year (Figure 6).

The 2-, 3-, and 4-year-old age classes for both sexes are underrepresented (Figure 6). The low numbers in these age classes will continue and could hamper herd growth during the period when does of these cohorts should be at the peak of reproductive potential. The effects of moderate to moderately severe winters on fawn survival are clearly shown in this instance.

Does which were 2 years old were underrepresented in the 1992 sample (Figure 1). This may be attributed in part to the bad winter they experienced as fawns. However, McCullough et al. (1990) noted a low 2-year-old doe cohort in Columbia black-tailed deer and speculated that does of that age class are behaviorally subordinate. They may have been forced into less favorable habitat and were less vulnerable to hunting pressure. Johnson and Larsen (1986) reported a strong representation of 2-year-old does in their Alaska sample. Their experience does not negate McCullough's theory. Deer in the Alaska study were killed on the beach when forced there by deep snow.

Acknowledgements: Matt Robus and Dennis Lemond of ADF&G coordinated tooth collection efforts in Juneau. Forest Service biologists Brett Light, Bill Lorenz, Kris Rutledge, and Keith Carpenter assisted with field activities. Linda Bergdoll-Schmidt was an asset throughout the project, assisting with computer data storage and retrieval, hunter contacts, poster production, and report layout and publication. We gratefully acknowledge the efforts of these individuals and of the many hunters who cooperated.

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APPENDIX A

Carl L. Rosier, Commissioner
Dave Kelleyhouse, Director, Division of Wildlife Conservation

Dave Anderson, Region I Supervisor
Division of Wildlife Conservation
Box 240020
Douglas, AK 99824-0020
(907)465-4265

Contact: E. L. Young, Area Management Biologist
Division of Wildlife Conservation
304 Lake Street, Room 103
Sitka, AK 99835
(907)747-5449

Alaska Department of Fish & Game

NEWS

October 20, 1992

Radio Spot

SITKA--Deer hunters are asked to save the front teeth of deer they kill this season. Area Biologist Butch Young says the Alaska Department of Fish and Game and the U.S. Forest Service are collecting teeth to study the age of deer.

Hunters submitting deer teeth will be eligible for several drawing prizes. First prize will be a "20° below" sleeping bag. Contact the Division of Wildlife Conservation in the Municipal Building for details.

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Douglas, AK 99824-0020
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Hunters submitting deer teeth will be eligible for several drawing prizes. First prize will be a "20^{o} below" sleeping bag. Hunters submitting teeth from two or more deer will receive a coffee cup with the emblem of the Fish and Wildlife Safeguard project.

Contact the Division of Wildlife Conservation in the Municipal Building for details.

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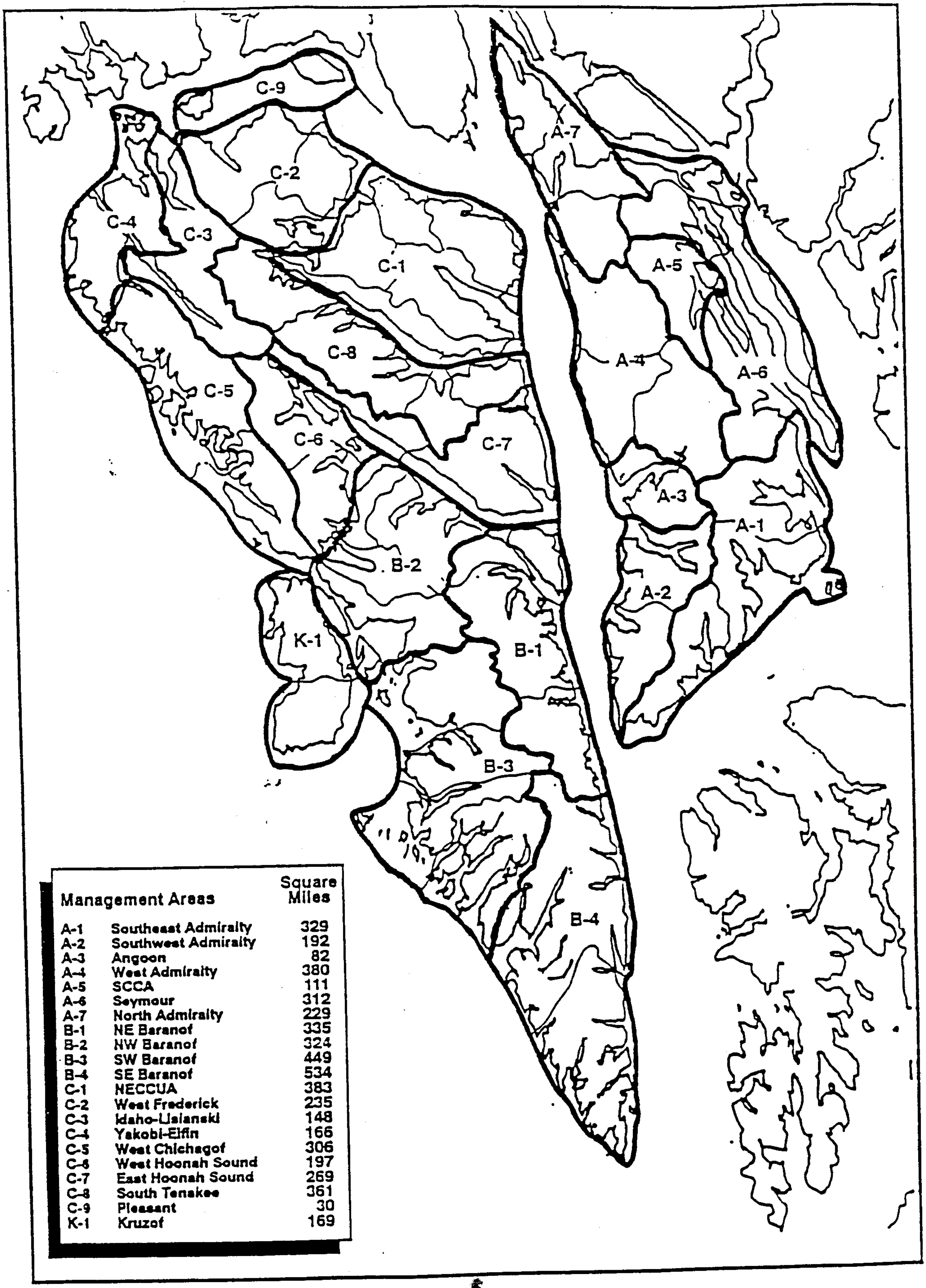
APPENDIX B


C-9
C-2
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C-3
C-1
C-8
C-5
C-6
C-7
B-2
K-1
B-1
B-3
B-4
A-7
A-5
A-4
A-6
A-3
A-1
A-2
Management Areas
Square Miles
A-1 Southeast Admiralty 329
A-2 Southwest Admiralty 192
A-3 Angoon 82
A-4 West Admiralty 380
A-5 SCCA 111
A-6 Seymour 312
A-7 North Admiralty 229
B-1 NE Baranof 335
B-2 NW Baranof 324
B-3 SW Baranof 449
B-4 SE Baranof 534
C-1 NECCUA 383
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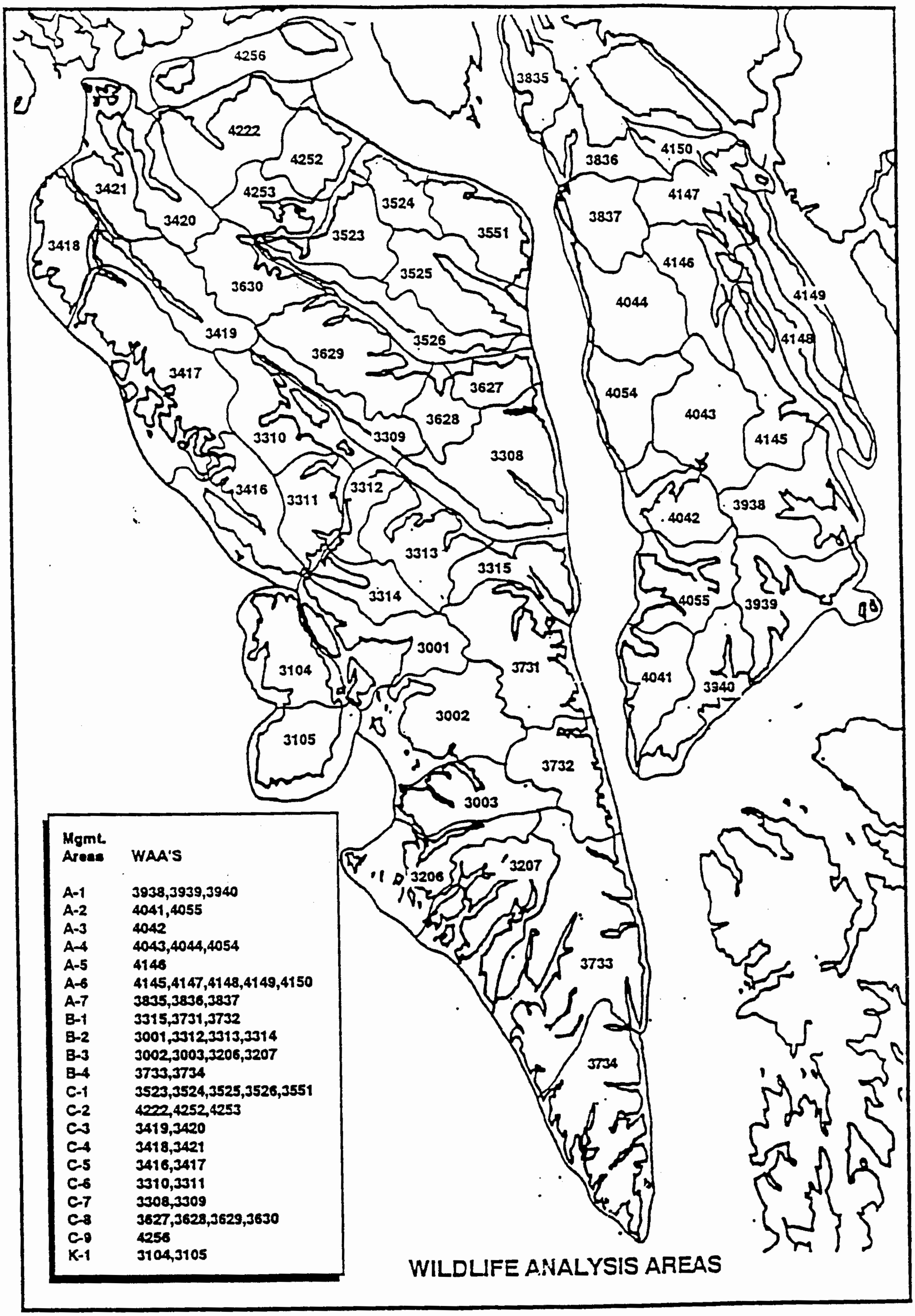
C-3 Idaho-Lisianski 148
C-4 Yakobi-Elfin 166
C-5 West Chichagof 306
C-6 West Hoonah Sound 197
C-7 East Hoonah Sound 269
C-8 South Tenakee 361
C-9 Pleasant 30
K-1 Kruzof 169



WILDLIFE ANALYSIS AREAS

APPENDIX C

AGE REPORT

By: Gary Matson
Matson's, Box 308, Milltown MT 59851
Phone: (406) 258-6286

Tooth type: I1

Prepared for: E. L. Young
Alaska Department of Fish and Game
Sitka
Process code: y
Filename: AY040793-178
Date: 7 April 1993

Season of collection: October - January

Species: BT deer

Notes:

"B" RELIABILITY CEMENTUM AGES: THERE IS HISTOLOGICAL EVIDENCE TO SUPPORT THE REPORTED CEMENTUM AGE. IF ERROR IS PRESENT, IT WOULD BE LIKELY WITHIN THE RANGE GIVEN UNDER "NOTES".

"C" RELIABILITY CEMENTUM AGES: THERE IS LITTLE HISTOLOGICAL EVIDENCE TO SUPPORT THE REPORTED CEMENTUM AGE, WHICH MIGHT BE WITHIN THE RANGE GIVEN.

THE CEMENTUM AGING MODEL USED FOR THIS SAMPLE IS STANDARDIZED FOR THE MIDDLE INCISOR TOOTH (I1). IF UNIDENTIFIED "LATERAL INCISORS" (I2, I3, C) ARE PRESENT, THEY MAY BE UNDER-AGED BY 1 YEAR BECAUSE OF DIFFERENCES IN THE LOCATION OF THE FIRST ANNULUS AMONG THE 4 INCISIFORM TEETH.

HISTOLOGICAL CONDITION OF THE TEETH WAS VERY GOOD. INTACT PERIODONTAL MEMBRANE CONFIRMS THAT NO CEMENTUM IS MISSING FROM THE PERIPHER OF THE ROOT. DIFFERENTIAL STAINING BETWEEN ANNULI AND LIGHT CEMENTUM IS VERY GOOD. THE FACTOR THAT APPEARS TO BE MOST RESPONSIBLE FC GOOD HISTOLOGICAL CONDITION IS THE ABSENCE OF EXPOSURE TO: BOILING TEMPERATURES, CHEMICALS, AND ABRASIVES.

GENERAL INFORMATION

MATSON'S LABORATORY CEMENTUM AGE ANALYSIS. General Information..

CERTAINTY CODES: A, B, C. A letter suffix is a reliability indicator or "certainty code" for a determined age. Some tooth sections have a distinct annulus pattern and the result of age analysis is nearly certain. The result of the analysis of other tooth sections is less certain because of indistinct or irregular annuli or because portions of the tooth root may have been missing.

A = result nearly certain. B = some error possible. C = error likely.

The judgement about whether a determined age could be in error is subjective. Criteria for certainty code assignment are as follows:

1. Distinctness of cementum band staining.
2. Regularity of cementum band pattern.
3. Relative amount and location of cementum and dentine.
4. Histological characteristics of cementum.

We have no evidence supporting any relationship between our certainty code and accuracy, but generally relate the most accurate results to the "A" certainty code.

Accuracy limits have been established as outlined below. For example , if I think that a 9-year-old mammal could be a year older or younger because of an unclear cementum pattern, it would be given a certainty code of "A" along with the determined age of 9 years. I I think that a 6-year-old mammal could be a year younger or older, the certainty code of "B" would be given.

	Certainty Code		
Determined Age	A	B	C
1-7 years	+/- 0 years	+/- 1	+/- 2
8-15	+/- 1	+/- 2	+/- 3
16+	+/- 2	+/- 3	+/- 4+

THE REPORT GIVES AGE AT THE LAST BIRTHDAY, in the same style as human age is given. The dates below are the standardized "birthdays" we use for each species.

1 February - black bear, grizzly bear.
1 April - bobcat, lynx, gray fox, kit fox, red fox, river otter, mink, marten, fisher, badger, wolverine.
1 May - pronghorn, arctic fox, coyote, wolf, striped skunk, raccoon.
1 June - deer, elk, moose, caribou, goat, sheep, bison.

EXPLANATION OF CODES USED IN "NOTES" SECTION: AH - abnormal histology; BR - broken root, cementum missing and no accurate age determination possible; CD - cementum damaged; IN - age determined by inspection, without sectioning; LI - lateral incisor (not standard I1); NE - no envelope with this I.D. number; NP - not processed; NS - not a standard tooth type for age analysis method, accuracy of result uncertain; NTR - no tooth received in envelope; PF - process failure; PR - processed.

JUVENILE AGE CLASS: Identified by "0" in the age column.

ABBREVIATIONS USED FOR SPECIES IDENTIFICATION:

BA badger	CA caribou	GB grizzly bear	MI mink	RO river otter
BB black bear	CO coyote	GO mountain goat	ML mountain lion	SH mountain sheep
BO bobcat	EL elk	MA marten	MO moose	WO wolf
BT black-tailed deer	FI fisher	MD mule deer	PR pronghorn antelope	WT white-tailed deer
	FO fox		RA raccoon	WV wolverine

DATA

Lab ID	Agency ID	Age	CC	Notes	Lab ID	Agency ID	Age	CC	Notes
1	S-210	2	A		50	S-259	14	A	13-15
2	S-211	3	A		51	S-260	6	A	
3	S-212	3	A		52	S-261	2	A	
4	S-213	9	A		53	S-262	13	A	
5	S-214	2	A		54	S-263	6	A	
6	S-215	2	A		55	S-264	7	A	
7	S-216	6	A		56	S-265	7	A	
8	S-217	2	C	BR;1-3	57	S-266	5	A	
9	S-218	5	A		58	S-267	6	A	
10	S-219	0	A	IN	59	S-268	4	A	
11	S-220	1	A		60	S-269	4	A	
12	S-221	9	A		61	S-270	0	A	IN
13	S-222	8	A		62	S-271	1	A	
14	S-223	3	A		63	S-272	9	A	
15	S-224	8	A		64	S-273	6	A	
16	S-225	7	C	BR;6-10	65	S-274	2	A	
17	S-226	2	A		66	S-275	6	C	BR;6-8
18	S-227	4	A		67	S-276	9	A	
19	S-228	4	A		68	S-277	4	A	
20	S-229	1	A		69	S-278	1	A	
21	S-230	1	A		70	S-279	1	A	
22	S-231	3	A		71	S-280	3	A	
23	S-232	6	B	5-6	72	S-281A	16	A	15-16
24	S-233	5	A		73	S-282	9	A	
25	S-234	1	A		74	S-283	7	A	
26	S-235	0	A	IN	75	S-284	1	A	
27	S-236	1	B	AH;1-2	76	S-285	1	A	
28	S-237	3	B	2-3	77	S-286	2	A	
29	S-238	1	A		78	S-287	2	A	
30	S-239	X	X	BR,PR	79	S-288	8	A	
31	S-240	3	A		80	S-289A	1	A	
32	S-241	6	A		81	S-289B	1	A	
33	S-242	2	A		82	S-290	5	A	LI
34	S-243	13	A		83	S-291	1	B	1-2
35	S-244	9	A	LI	84	S-292	5	A	LI
36	S-245	4	A		85	S-293	7	A	
37	S-246	6	A		86	S-294	1	A	
38	S-247	8	A	8-9	87	S-295	12	A	LI
39	S-248A	1	A	SEE ALSO LAB ID# 138	88	S-296	11	A	LI;11-12
40	S-249	15	A		89	S-297	1	A	LI-HOLLOW ROOT
41	S-250	6	A		90	S-298	0	A	IN
42	S-251	12	A	LI;11-12	91	S-299	5	A	
43	S-252	1	A		92	S-300	10	A	
44	S-253	6	A		93	S-301	8	A	
45	S-254	6	A		94	S-302	1	A	
46	S-255	2	A		95	S-303	X	X	NTR
47	S-256	3	A		96	S-304	1	A	
48	S-257	9	A		97	S-305	1	A	
49	S-258	1	A		98	S-306	1	A	LI

99	S-307	1 A	
100	S-308	1 A	
101	S-309	1 A	
102	S-310	1 A	
103	S-311	1 A	LI
104	S-312	X X	NTR
105	S-313	X X	NTR
106	S-314	X X	NTR
107	S-315	X X	NTR
108	S-316	X X	NTR
109	S-317	1 A	
110	S-318	6 A	
111	S-319	1 A	
112	S-320	9 A	LI
113	S-321	1 A	
114	S-322	1 A	
115	S-323	1 A	
116	S-324	3 A	
117	S-325	2 A	
118	S-326	X X	NTR
119	S-327	1 A	
120	S-328	4 A	
121	S-329	5 A	
122	S-330	1 A	
123	S-331	2 A	
124	S-332	X X	BR,PR
125	S-333	3 A	
126	S-334	5 A	
127	S-335	5 A	
128	S-336	7 A	
129	S-337	5 A	
130	S-338	X X	NTR
131	S-339	3 A	
132	S-340	1 A	
133	S-341	X X	NTR
134	S-342	X X	NTR
135	S-343	X X	NTR
136	S-344	7 B	LI;6-7
137	S-345	5 A	
138	S-248B	4 A	
139	S-281B	3 A	

289B - 1A.

GENERAL INFORMATION

MATSON'S LABORATORY CEMENTUM AGE ANALYSIS. General Information..

CERTAINTY CODES: A, B, C. A letter suffix is a reliability indicator or "certainty code" for a determined age. Some tooth sections have a distinct annulus pattern and the result of age analysis is nearly certain. The result of the analysis of other tooth sections is less certain because of indistinct or irregular annuli or because portions of the tooth root may have been missing.

A = result nearly certain. B = some error possible. C = error likely.

The judgement about whether a determined age could be in error is subjective. Criteria for certainty code assignment are as follows:

1. Distinctness of cementum band staining.
2. Regularity of cementum band pattern.
3. Relative amount and location of cementum and dentine.
4. Histological characteristics of cementum.

We have no evidence supporting any relationship between our certainty code and accuracy, but generally relate the most accurate results to the "A" certainty code.

Accuracy limits have been established as outlined below. For example , if I think that a 9-year-old mammal could be a year older or younger because of an unclear cementum pattern, it would be given a certainty code of "A" along with the determined age of 9 years. If I think that a 6-year-old mammal could be a year younger or older, the certainty code of "B" would be given.

	Certainty Code		
Determined Age	A	B	C
1-7 years	+/- 0 years	+/- 1	+/- 2
8-15	+/- 1	+/- 2	+/- 3
16+	+/- 2	+/- 3	+/- 4+

THE REPORT GIVES AGE AT THE LAST BIRTHDAY, in the same style as human age is given. The dates below are the standardized "birthdays" we use for each species.

1 February - black bear, grizzly bear.
1 April - bobcat, lynx, gray fox, kit fox, red fox, river otter, mink, marten, fisher, badger, wolverine.
1 May - pronghorn, arctic fox, coyote, wolf, striped skunk, raccoon.
1 June - deer, elk, moose, caribou, goat, sheep, bison.

EXPLANATION OF CODES USED IN "NOTES" SECTION: AH - abnormal histology; BR - broken root, cementum missing and no accurate age determination possible; CD - cementum damaged; IN - age determined by inspection, without sectioning; LI - lateral incisor (not standard I1); NE - no envelope with this I.D. number; NP - not processed; NS - not a standard tooth type for age analysis method, accuracy of result uncertain; NTR - no tooth received in envelope; PF - process failure; PR - processed.

JUVENILE AGE CLASS: Identified by "0" in the age column.

ABBREVIATIONS USED FOR SPECIES IDENTIFICATION:

BA	badger	CA	caribou	GB	grizzly bear	MI	mink	RO	river otter
BB	black bear	CO	coyote	GO	mountain goat	ML	mountain lion	SH	mountain sheep
BO	bobcat	EL	elk	MA	marten	MO	moose	WO	wolf
BT	black-tailed deer	FI	fisher	MD	mule deer	PR	pronghorn antelope	WT	white-tailed deer
		FO	fox			RA	raccoon	WV	wolverine

AGE AS DETERMINED BY CEMENTUM ANALYSIS
Robert Chadwick
Process code: e,b
8 February 1993

DATA

Lab ID	Agency ID	Age	CC	Notes	Lab ID	Agency ID	Age	CC	Notes
1	S92-1	1	A		50	S92-50	10	A	10-11
2	S92-2	1	A		51	S92-51	5	A	
3	S92-3	1	A		52	S92-52	1	A	
4	S92-4	2	A		53	S92-53	6	A	LI
5	S92-5	2	A		54	S92-54	1	A	
6	S92-6	6	A		55	S92-55	0	A	IN
7	S92-7	1	A		56	S92-56	6	A	PM2
8	S92-8	0	A	IN	57	S92-57	8	A	
9	S92-9	1	A		58	S92-58	6	A	LI
10	S92-10	1	A		59	S92-59	1	A	
11	S92-11	9	A		60	S92-60	2	A	
12	S92-12	5	A		61	S92-61	6	B	BR;6-7
13	S92-13	1	A		62	S92-62	1	A	
14	S92-14	1	A		63	S92-63	5	A	
15	S92-15	0	A	IN	64	S92-64	4	B	3-4
16	S92-16	6	A		65	S92-65	3	A	
17	S92-17	0	A	IN	66	S92-66	5	A	
18	S92-18	1	A		67	S92-67	0	A	IN
19	S92-19	1	A		68	S92-68	5	A	
20	S92-20	1	A		69	S92-69	1	A	
21	S92-21	0	A	IN	70	S92-70	5	A	
22	S92-22	2	A		71	S92-71	8	A	
23	S92-23	1	A		72	S92-72	1	A	
24	S92-24	5	A		73	S92-73	7	A	
25	S92-25	3	A		74	S92-74	6	A	
26	S92-26	10	A	10-11	75	S92-75	1	A	
27	S92-27	6	A		76	S92-76	6	A	
28	S92-28	1	A		77	S92-77	2	A	
29	S92-29	1	A		78	S92-78	1	A	
30	S92-30	5	A		79	S92-79	6	A	
31	S92-31	1	A		80	S92-80	5	A	
32	S92-32	5	A		81	S92-81	11	A	
33	S92-33	3	A		82	S92-82	1	A	
34	S92-34	1	A		83	S92-83	0	A	IN
35	S92-35	2	A		84	S92-84	2	A	
36	S92-36	17	A	LI;17-18	85	S92-85	1	A	
37	S92-37	2	A		86	S92-86	5	A	
38	S92-38	1	A		87	S92-87	1	A	
39	S92-39	1	A		88	S92-88	3	A	
40	S92-40	2	B	2-3	89	S92-89	X	X	NTR
41	S92-41	6	A		90	S92-90	2	A	
42	S92-42	X	X	BR,NP	91	S92-91	5	A	
43	S92-43	1	A		92	S92-92	5	A	
44	S92-44	9	A		93	S92-93	1	A	
45	S92-45	4	A		94	S92-94	3	A	
46	S92-46	7	A		95	S92-95	1	A	
47	S92-47	2	A		96	S92-96	3	A	
48	S92-48	2	A		97	S92-97	2	A	
49	S92-49	1	A		98	S92-98	4	A	

AGE AS DETERMINED BY CEMENTUM ANALYSIS
Robert Chadwick
Process code: e,b
8 February 1993

99	S92-99	5 A	
100	S92-100	5 A	
101	S92-101	9 A	
102	S92-102	1 A	
103	S92-103	0 A	IN
104	S92-104	6 A	
105	S92-105	1 A	
106	S92-106	3 A	
107	S92-107	6 A	
108	S92-108	7 A	
109	S92-109	5 A	
110	S92-110	1 A	
111	S92-111	X X	BR,PR
112	S92-112	5 A	
113	S92-113	6 A	
114	S92-114	1 A	
115	S92-115	1[illegible] A	
116	S92-116	7 A	
117	S92-117	11 A	
118	S92-118	3 B	2-3
119	S92-119	1 A	
120	S92-120	5 A	
121	S92-121	1 A	
122	S92-122	7 A	
123	S92-123	5 A	
124	S92-124	5 A	
125	S92-125	8 A	
126	S92-126	7 B	BR;7-8
127	S92-127	4 B	3-4
128	S92-128	1 A	
129	S92-129	2 A	
130	S92-130	1 A	
131	S92-131	2 A	
132	S92-132	2 A	
133	S92-133	6 A	
134	S92-134	6 A	
135	S92-135	1 A	
136	S92-136	6 A	
137	S92-137	1 A	
138	S92-138	1 A	
139	S92-139	7 A	
140	S92-140	4 A	
141	S92-141	8 A	
142	S92-142	4 A	
143	S92-143	1 A	
144	S92-144	4 A	
145	S92-145	1 A	
146	S92-146	5 A	
147	S92-147	4 A	
148	S92-148	5 A	
149	S92-149	15 A	
150	S92-150	4 A	
151	S92-151	1 A	
152	S92-152	0 A	IN
153	S92-153	1 A	
154	S92-154	1 A	
155	S92-155	1 A	
156	S92-156	4 A	
157	S92-157	1 A	
158	S92-158	5 A	
159	S92-159	1 A	
160	S92-160	7 A	
161	S92-161	5 A	
162	S92-162	1 A	
163	S92-163	1 A	
164	S92-164	8 A	LI
165	S92-165	1 A	
166	S92-166	1 A	
167	S92-167	5 A	
168	S92-168	7 A	
169	S92-169	1 A	
170	S92-170	5 A	
171	S92-171	7 A	LI
172	S92-172	5 A	
173	S92-173	5 A	
174	S92-174	7 A	
175	S92-175	7 A	
176	S92-176	1 A	IN
177	S92-177	10 A	
178	S92-178	1 A	LI
179	S92-179	1 A	IN
180	S92-180	8 A	
181	S92-181	6 A	
182	S92-182	1 A	LI
183	S92-183	1 A	
184	S92-184	5 A	
185	S92-185	8 A	
186	S92-186	1 A	
187	S92-187	5 A	
188	S92-188	6 A	
189	S92-189	4 A	
190	S92-190	7 A	
191	S92-191	4 A	
192	S92-192	4 A	
193	S92-193	3 A	
194	S92-194	5 A	
195	S92-195	2 A	
196	S92-196	7 B	LI2;7-8
197	S92-197	1 A	IN
198	S92-198	9 A	
199	S92-199	10 A	LI2
200	S92-200	6 A	LI2
201	S92-201	3 A	
202	S92-202	6 A	
203	S92-203	5 A	
204	S92-204	4 A	

205	S92-205	0 A	IN
206	S92-206	7 A	
207	S92-207	15 A	LI
208	S92-208	1 A	
209	S92-209	1 A	

APPENDIX D

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

Unit 4
Females
5/14/93

waa age number

** MGMTAREA A-2

* waa 4055
4055 7 1
4055 9 1
* Subsubtotal *
2
** Subtotal **
2

** MGMTAREA A-4

* waa 4044
4044 1 1
* Subsubtotal *
1

* waa 4054
4054 15 1
* Subsubtotal *
1
** Subtotal **
2

** MGMTAREA A-7

* waa 3835
3835 5 1
3835 5 1
* Subsubtotal *
2
** Subtotal **
2

** MGMTAREA B-1

* waa 3315
3315 1 1
* Subsubtotal *
1
** Subtotal **
1

** MGMTAREA B-2

* waa 3001
3001 1 1
3001 0 1
3001 1

05/14/93

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa age number

3001 7 1
3001 5 1
3001 9 1
3001 1 1
3001 3 1
3001 15 1
3001 12 1
3001 1 1
3001 14 1
3001 1 1
* Subsubtotal *
13

* waa 3313
3313 1
* Subsubtotal *
1

* waa 3314
3314 9 1
* Subsubtotal *
1
** Subtotal **
15

** MGMTAREA B-3

* waa 3002
3002 9 1
3002 1 1
3002 0 1
3002 2 1
3002 3 1
3002 3 1
3002 17 1
3002 2 1
3002 5 1
3002 1 1
3002 8 1
3002 1 1
3002 3 1
3002 3 1
3002 6 1
3002 1 1
* Subsubtotal *
16

* waa 3003
3003 10 1

05/14/93

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa	age	number
3003	5	1
3003	0	1
* Subsubtotal *		
		3
* waa 3207		
3207	1	1
* Subsubtotal *		
		1
** Subtotal **		
		20
** MGMTAREA C-1		
* waa		
	1	1
		1
	6	1
* Subsubtotal *		
		3
* waa 3523		
3523	1	1
3523	1	1
3523	0	1
3523	6	1
3523	1	1
* Subsubtotal *		
		5
* waa 3526		
3526	12	1
3526	1	1
3526		1
* Subsubtotal *		
		3
* waa 3551		
3551	1	1
3551	5	1
3551	1	1
3551	1	1
* Subsubtotal *		
		4
** Subtotal **		
		15

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa age number

** MGMTAREA C-5

* waa 3416
3416 3 1
3416 5 1
3416 1 1
3416 2 1
* Subsubtotal *
4

* waa 3417
3417 6 1
3417 1 1
* Subsubtotal *
2
** Subtotal **
6

** MGMTAREA C-6

* waa 3310
3310 1 1
* Subsubtotal *
1

* waa 3311
3311 2 1
3311 1 1
* Subsubtotal *
2
** Subtotal **
3

** MGMTAREA C-8

* waa 3629
3629 1
* Subsubtotal *
1

* waa 3630
3630 1 1
3630 1 1
3630 11 1
3630 10 1
3630 1 1
3630 1
3630 9 1

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa	age	number
* Subsubtotal *		
		7
** Subtotal **		
		8
** MGMTAREA K-1		
* waa 3104		
3104	1	1
3104	15	1
3104	1	1
3104	4	1
3104	4	1
3104	6	1
3104	4	1
3104	16	1
3104	2	1
3104	8	1
* Subsubtotal *		
		10
* waa 3105		
3105	7	1
3105	11	1
3105	3	1
3105	1	1
3105	13	1
3105	8	1
3105	6	1
3105	6	1
3105	13	1
* Subsubtotal *		
		9
** Subtotal **		
		19
** MGMTAREA S-1		
* waa		
	1	1
	6	1
	7	1
* Subsubtotal *		
		3
** Subtotal **		
		3
*** Total ***		
		96

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

Unit 4
Males
5/14/93

waa	age	number
** MGMTAREA A-1		
* waa 3938		
3938	1	1
* Subsubtotal *		
		1
* waa 3940		
3940	7	1
3940	2	1
* Subsubtotal *		
		2
** Subtotal **		
		3
** MGMTAREA A-2		
* waa 4055		
4055	5	1
4055	4	1
4055	0	1
4055	7	1
4055	3	1
* Subsubtotal *		
		5
** Subtotal **		
		5
** MGMTAREA A-3		
* waa 4042		
4042	6	1
4042	5	1
* Subsubtotal *		
		2
** Subtotal **		
		2
** MGMTAREA A-4		
* waa 4044		
4044	5	1
4044	6	1
4044	3	1
4044	2	1
* Subsubtotal *		
		4

05/14/93

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa	age	number
* waa 4054		
4054	1	1
4054	1	1
* Subsubtotal *		
		2
** Subtotal **		
		6
** MGMTAREA A-6		
* waa		
	3	1
* Subsubtotal *		
		1
** Subtotal **		
		1
** MGMTAREA A-7		
* waa 3835		
3835	2	1
3835	7	1
3835	2	1
3835		1
3835	3	1
3835	7	1
3835	5	1
* Subsubtotal *		
		7
* waa 3836		
3836	1	1
3836		1
3836		1
3836		1
* Subsubtotal *		
		4
** Subtotal **		
		11
** MGMTAREA B-2		
* waa 3001		
3001	1	1
3001	5	1
3001	5	1
3001	2	1
3001	2	1
3001	6	1

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa	age	number
3001	6	1
3001	1	1
3001	8	1
3001	1	1
3001	5	1
3001	6	1
3001	2	1
3001	1	1
3001	2	1
3001	1	1
3001	7	1
3001	4	1
3001	1	1
3001	1	1
3001	4	1
3001	0	1
3001	1	1
3001	6	1
3001	9	1
3001	3	1
3001	1	1
3001	3	1
3001	9	1
* Subsubtotal *		
		29
* waa 3312		
3312	2	1
* Subsubtotal *		
		1
* waa 3313		
3313	6	1
3313	5	1
3313	6	1
* Subsubtotal *		
		3
* waa 3314		
3314	5	1
* Subsubtotal *		
		1
** Subtotal **		
		34

Management Area, WAA, Deer Sex,
Deer Teeth Research Project
1993

waa	age	number
** MGMTAREA B-3		
* waa 3002		
3002	0	1
3002	10	1
3002	5	1
3002	2	1
3002	1	1
3002	1	1
3002		1
3002	1	1
3002	6	1
3002	0	1
3002	1	1
3002	1	1
3002	1	1
3002	3	1
3002		1
3002	2	1
3002	4	1
3002	1	1
3002	5	1
3002	1	1
3002	4	1
3002	5	1
3002	1	1
3002	4	1
3002	1	1
3002	1	1
3002	10	1
3002	2	1
3002	2	1
3002	1	1
3002	1	1
* Subsubtotal *		
		31
* waa 3003		
3003	1	1
3003	1	1
3003	11	1
3003	1	1
3003	1	1
3003	1	1
3003	6	1
3003	4	1
3003	9	1

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waa	age	number
* Subsubtotal *		
		9
* waa 3206		
3206	2	1
3206	2	1
3206	2	1
* Subsubtotal *		
		3
* waa 3207		
3207	6	1
3207	6	1
3207	6	1
3207	4	1
3207	1	1
3207	2	1
3207	2	1
3207	2	1
3207	6	1
3207	6	1
3207	1	1
3207	7	1
3207	2	1
* Subsubtotal *		
		13
** Subtotal **		
		56
** MGMTAREA B-4		
* waa 3733		
3733	8	1
3733	1	1
3733	2	1
3733	3	1
* Subsubtotal *		
		4
** Subtotal **		
		4
** MGMTAREA C-1		
* waa		
	0	1
	1	1
* Subsubtotal *		
		2

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waa	age	number
* waa 3523		
3523	0	1
3523	1	1
3523	8	1
3523	6	1
3523	4	1
* Subsubtotal *		
		5
* waa 3524		
3524	1	1
* Subsubtotal *		
		1
* waa 3525		
3525	5	1
3525	1	1
3525	5	1
3525	1	1
3525	7	1
3525	4	1
3525	5	1
3525	1	1
* Subsubtotal *		
		8
* waa 3526		
3526	1	1
3526	1	1
3526	1	1
3526		1
* Subsubtotal *		
		4
* waa 3551		
3551	1	1
3551	1	1
3551	5	1
3551	7	1
3551	7	1
3551	5	1
3551	7	1
3551	7	1
3551	10	1
3551	1	1
3551	8	1
3551	6	1
3551	1	1
3551	5	1

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waa	age	number
3551	8	1
3551	5	1
3551	4	1
3551	3	1
* Subsubtotal *		
		18
** Subtotal **		
		38
** MGMTAREA C-5		
* waa 3416		
3416	1	1
3416	5	1
3416	6	1
3416	7	1
* Subsubtotal *		
		4
* waa 3417		
3417	1	1
3417	9	1
3417	1	1
3417	0	1
3417	4	1
* Subsubtotal *		
		5
** Subtotal **		
		9
** MGMTAREA C-6		
* waa 3310		
3310	9	1
3310	9	1
* Subsubtotal *		
		2
* waa 3311		
3311	1	1
* Subsubtotal *		
		1
** Subtotal **		
		3

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waa	age	number
** MGMTAREA C-7		
* waa 3308		
3308	1	1
3308	5	1
* Subsubtotal *		
		2
* waa 3309		
3309	5	1
3309	1	1
* Subsubtotal *		
		2
** Subtotal **		
		4
** MGMTAREA C-8		
* waa 3627		
3627	1	1
* Subsubtotal *		
		1
* waa 3629		
3629	5	1
3629	1	1
3629	1	1
3629	1	1
* Subsubtotal *		
		4
* waa 3630		
3630	5	1
3630	7	1
3630	8	1
3630	1	1
3630		1
* Subsubtotal *		
		5
** Subtotal **		
		10
** MGMTAREA J-1		
* waa		
	1	1
* Subsubtotal *		
		1

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waa	age	number
** Subtotal **		
		1
** MGMTAREA K-1		
* waa 3104		
3104	1	1
3104	4	1
3104	5	1
3104	1	1
3104	5	1
3104	1	1
3104	6	1
3104	4	1
3104	8	1
3104	6	1
3104	0	1
3104	1	1
3104	4	1
3104	7	1
3104	1	1
3104	1	1
3104	2	1
* Subsubtotal *		
		17
* waa 3105		
3105	5	1
3105	2	1
3105	5	1
3105	1	1
3105	8	1
3105	1	1
3105	0	1
3105	4	1
3105	6	1
3105	2	1
3105	6	1
3105	7	1
3105	7	1
3105	6	1
3105	2	1
3105	6	1
3105	9	1
* Subsubtotal *		
		17
** Subtotal **		
		34

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waa	age	number
** MGMTAREA P-1		
* waa		
	7	1
	5	1
	5	1
	8	1
	7	1
* Subsubtotal *		
		5
** Subtotal **		
		5
** MGMTAREA S-1		
* waa		
	1	1
	6	1
	1	1
	4	1
	3	1
	0	1
	5	1
	5	1
	3	1
	1	1
	3	1
	5	1
	6	1
	3	1
	5	1
	5	1
* Subsubtotal *		
		16
** Subtotal **		
		16
*** Total ***		
		242

Males

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Number of Deer Taken From Each Management Area by Sex

Sex Number

** Management Areas A-1

* Sex M
* Subsubtotal *
3
** Subtotal **
3

** Management Areas A-2

* Sex M
* Subsubtotal *
5
** Subtotal **
5

** Management Areas A-3

* Sex M
* Subsubtotal *
2
** Subtotal **
2

** Management Areas A-4

* Sex M
* Subsubtotal *
6
** Subtotal **
6

** Management Areas A-6

* Sex M
• Subsubtotal *
1
** Subtotal **
1

** Management Areas A-7

* Sex M
* Subsubtotal *
11
** Subtotal **
11

Number of Deer Taken From Each Management Area by Sex

Sex Number

** Management Areas B-2

* Sex M
* Subsubtotal *
34
** Subtotal **
34

** Management Areas B-3

* Sex M
* Subsubtotal *
56
** Subtotal **
56

** Management Areas B-4

* Sex M
* Subsubtotal *
4
** Subtotal **
4

** Management Areas C-1

* Sex M
* Subsubtotal *
38
** Subtotal **
38

** Management Areas C-5

* Sex M
* Subsubtotal *
9
** Subtotal **
9

** Management Areas C-6

* Sex M
* Subsubtotal *
3
** Subtotal **
3

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Number of Deer Taken From Each Management Area by Sex

Sex Number

** Management Areas C-7

* Sex M
* Subsubtotal *
4
** Subtotal **
4

** Management Areas C-8

* Sex M
* Subsubtotal *
10
** Subtotal **
10

** Management Areas J-1

* Sex M
* Subsubtotal *
1
** Subtotal **
1

** Management Areas K-1

* Sex M
* Subsubtotal *
34
** Subtotal **
34

** Management Areas P-1

* Sex M
* Subsubtotal *
5
** Subtotal **
5

** Management Areas S-1

* Sex M
* Subsubtotal *
16
** Subtotal **
16
*** Total ***
242

Females

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Number of Deer Taken From Each Management Area by Sex

Sex Number

** Management Areas A-2

* Sex F
* Subsubtotal *
2
** Subtotal **
2

** Management Areas A-4

* Sex F
* Subsubtotal *
2
** Subtotal **
2

** Management Areas A-7

* Sex F
* Subsubtotal *
2
** Subtotal **
2

** Management Areas B-1

* Sex F
* Subsubtotal *
1
** Subtotal **
1

** Management Areas B-2

* Sex F
* Subsubtotal *
15
** Subtotal **
15

** Management Areas B-3

* Sex F
* Subsubtotal *
20
** Subtotal **
20

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Number of Deer Taken From Each Management Area by Sex

Sex Number

** Management Areas C-1

* Sex F

* Subsubtotal *

15

** Subtotal **

15

** Management Areas C-5

* Sex F

* Subsubtotal *

6

** Subtotal **

6

** Management Areas C-6

* Sex F

* Subsubtotal *

3

** Subtotal **

3

** Management Areas C-8

* Sex F

* Subsubtotal *

8

** Subtotal **

8

** Management Areas K-1

* Sex F

* Subsubtotal *

19

** Subtotal **

19

** Management Areas S-1

* Sex F

* Subsubtotal *

3

** Subtotal **

3

*** Total ***

96