

STATE OF MICHIGAN
DEPARTMENT OF NATURAL RESOURCES
WILDLIFE DIVISION
LANSING, MICHIGAN 48909

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DOE PRODUCTIVITY AND PHYSICAL CONDITION:
1981 SPRING SURVEY RESULTS

by

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Necropsies of female white-tailed deer (*Odocoileus virginianus*) that died from various causes between 9 March and 1 June 1981 were conducted throughout Michigan by Department of Natural Resources personnel. Embryo counts were made and the deer were aged to the nearest full year. Most of the deer examined were highway mortalities (96%). The remainder included illegal kills (1%) and deer which died from other accidents (3%) such as drownings or collisions with obstructions.

Productivity and age structure data are summarized and compared to 1980 data in this report (Table 1). Traditional data tables have been added in the Appendix to provide year-to-year consistency in the reporting of survey results.

The proportion of one-year-old does examined (number per 100 females examined) declined in Region I from 32/100 in 1980 to 25/100 in 1981, while increasing from 30/100 to 40/100 in Region II and from 44/100 to 49/100 in Region III. The proportion of two-year-old does examined in Region I increased from 17/100 in 1980 to 25/100 in 1981. This proportion also increased from 21/100 to 30/100 in Region II while declining from 31/100 to 27/100 in Region III. The proportion of adult does examined declined in Region II from 49/100 in 1980 to 30/100 in 1981. In the other two regions this proportion was relatively unchanged, from 51/100 to 50/100 in Region I and from 25/100 to 24/100 in Region III.

Fetal rates (defined as the average number of embryos per pregnant doe) declined for two-year-olds in all three regions and for adults in Regions II and III. In Region I, the fetal rate for adults increased slightly.

Total gross productivity (defined as the number of fetuses per 100 females in the sample including one-year-olds) in 1981 averaged 135, 112, and 131 fetuses/100 does examined in Regions I, II, and III respectively, compared to 127, 130, and 145 in 1980. The decrease of 18 fetuses/100 does in Region II was a reflection of the larger proportions of less productive one- and two-year-olds in the sample, while the decrease of 14 fetuses/100 does in Region III resulted from both an increase in the proportion of one-year-olds and a decline in productivity in all three age classes. The smaller proportion of less productive one-year-olds in Region I resulted in an increase of total gross productivity of 8 fetuses/100 does.

MANDIBULAR FAT ANALYSIS

Ether extractable fat levels in the mandibular cavity tissues were estimated by calculation from the wet and dry weights of marrow (Friedrich and Burgoyne 1980) for one-year-olds and adults (two years and older) in 1981 and were compared to 1980 data (Table 2). The mean percent fat levels for both age classes in all three regions were remarkably similar to 1980 levels. The decrease in adult fat levels in Region II from 61% in 1980 to 57% in 1981 was marginally significant ($P \leq 0.025$) with some overlap in the 95% confidence intervals. The relatively high fat levels in Regions I and II one-year-olds suggest that antler beam diameters for yearling bucks will again be above average this year.

ACKNOWLEDGEMENTS

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LITERATURE CITED

- Friedrich, P.D. and G.E. Burgoyne, Jr. 1980. Correlation of wet weight, dry weight and fat levels in bone marrow from white-tailed deer. Mich. Dept. Nat. Res. Wildl. Div. Report No. 2856. 4 pp.

Table 2. Comparison of 1980 and 1981 levels of estimated ether extractable mandibular cavity tissue fat (MCTF) for shot or accidentally killed does collected from Michigan's Regions I, II and III during the spring survey period (9 March - 1 June)

REGION	AGE GROUP***	STATISTIC	MCTF%		t STATISTIC
			1980	1981	
I	1-Year	mean	31	33	0.19**
		95% confidence interval	25-39	23-42	
	Adult	mean	49	49	0.04**
		95% confidence interval	44-54	43-54	
II	1-Year	mean	42	47	1.23**
		95% confidence interval	35-49	43-52	
	Adult	mean	61	57	2.41*
		95% confidence interval	59-64	54-60	
III	1-Year	mean	55	51	1.75**
		95% confidence interval	52-58	48-55	
	Adult	mean	62	63	0.69**
		95% confidence interval	59-65	61-65	

* $P \leq 0.025$

**No significant difference

***Adult = 2 years and older

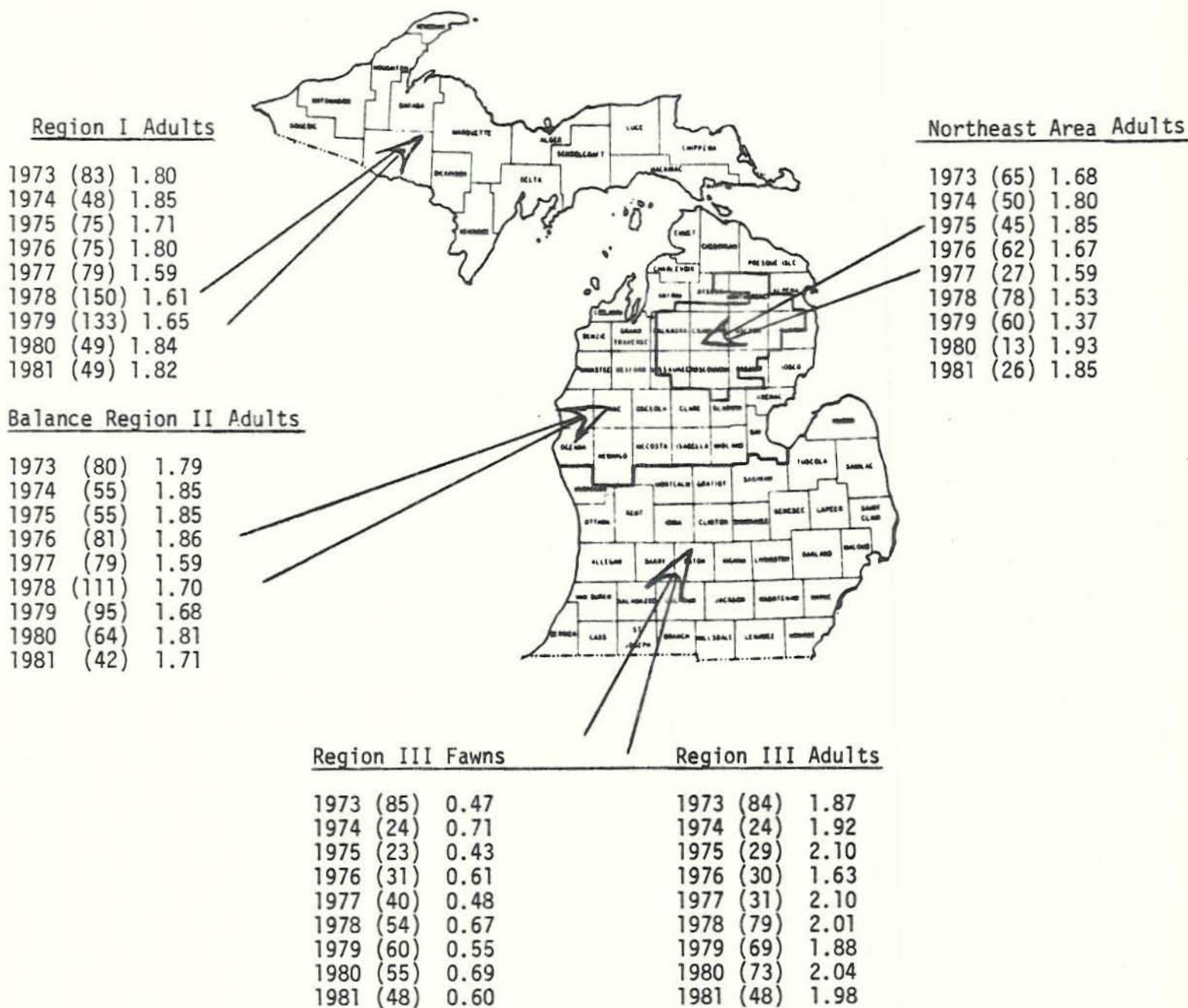
Table 1. Comparison of 1980 and 1981 gross productivity rates for shot or accidentally killed does collected from Michigan's Regions I, II and III during the spring survey period (9 March - 1 June)

AGE GROUP		REGION I		REGION II		REGION III	
		1980	1981	1980	1981	1980	1981
1-Year	No. of 1-year per 100 females (A)	32	25	30	40	44	49
	Percentage of 1-year pregnant (B)	8%	6%	8%	12%	60%	53%
	Fetal rate of pregnant 1-year (C)	1.00	1.00	1.00	1.20	1.19	1.16
	Gross productivity (AxBxC)	3	1	2	6	31	30
2-Year	No. of 2-year per 100 females (A)	17	25	21	30	31	27
	Percentage of 2-year pregnant (B)	100%	100%	96%	97%	98%	100%
	Fetal rate of pregnant 2-year (C)	1.55	1.33	1.86	1.65	2.05	1.96
	Gross productivity (AxBxC)	26	33	37	48	62	53
Adult*	No. of adults per 100 females (A)	51	50	49	30	25	24
	Percentage of adults pregnant (B)	100%	100%	93%	100%	94%	96%
	Fetal rate of pregnant adults (C)	1.92	2.03	2.00	1.94	2.22	2.10
	Gross productivity (AxBxC)	98	101	91	58	52	48
Total Gross Productivity Rate (Fetuses/100 females in the sample)		127	135	130	112	145	131

*Adult = 3 years and older

PRODUCTIVITY RATES OF SHOT AND ACCIDENTALLY KILLED
DOES AS DETERMINED FROM EMBRYO COUNTS

1973 - 1981



Adult does are 2 years and older

Numbers of does examined shown in parentheses

TABLE A
DOE PRODUCTIVITY
9 March - 1 June 1981
Shot or Accidentally Killed Does

Region I								
Age of Doe	Total No. Does	No. of Embryos per Doe					Total No. Embryos	Productivity Rate
		0	1	2	3	4		
1	17	16	1	0	0	0	1	0.06
2	15	0	10	5	0	0	20	1.33
3	15	0	1	13	1	0	30	2.00
4	6	0	0	6	0	0	12	2.00
5	6	0	1	2	3	0	14	2.33
6	1	0	0	0	1	0	3	3.00
7	2	0	1	1	0	0	3	1.50
9	1	0	0	1	0	0	2	2.00
9+	3	0	1	2	0	0	5	1.67
Totals*	49	0	14	30	5	0	89	1.82

Region II Northeast Food Shortage Area								
1	13	13	0	0	0	0	0	0.00
2	14	0	5	9	0	0	23	1.64
3	3	0	0	3	0	0	6	2.00
4	7	0	0	6	1	0	15	2.14
5	<u>2</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>0</u>	<u>0</u>	<u>4</u>	<u>2.00</u>
Totals*	26	0	5	20	1	0	48	1.85

Balance of Region II								
1	35	30	4	1	0	0	6	0.17
2	21	1	7	13	0	0	33	1.57
3	10	0	3	7	0	0	17	1.70
4	6	0	0	6	0	0	12	2.00
5	2	0	0	2	0	0	4	2.00
7	1	0	0	1	0	0	2	2.00
9	1	0	0	1	0	0	2	2.00
9+	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>2.00</u>
Totals*	42	1	10	31	0	0	72	1.71

*One-year-olds not included in totals

TABLE A (Continued)

Region III

Age of Doe	Total No. Does	No. of Embryos per Doe					Total No. Embryos	Productivity Rate
		0	1	2	3	4		
1	48	23	21	4	0	0	29	0.60
2	26	0	4	19	3	0	51	1.96
3	12	0	0	10	2	0	26	2.17
4	4	0	0	4	0	0	8	2.00
5	4	1	0	3	0	0	6	1.50
6	1	0	0	1	0	0	2	2.00
9+	<u>1</u>	<u>0</u>	<u>0</u>	<u>1</u>	<u>0</u>	<u>0</u>	<u>2</u>	<u>2.00</u>
Totals*	48	1	4	38	5	0	95	1.98

*One-year-olds not included in totals

TABLE B

Doe Productivity, 9 March - 1 June 1981
Shot or Accidentally Killed Does

Thirty-One Year Accumulative Record, 1951-1981

Region I

Age of Doe	Total No. Does	No. of Embryos per Doe					Total No. Embryos	Productivity Rate
		0	1	2	3	4		
1	541	507	32	2	0	0	36	0.07
2	652	56	373	222	1	0	820	1.26
3	708	20	183	483	22	0	1215	1.72
4	534	12	93	404	22	3	979	1.83
5	328	5	64	248	11	0	593	1.81
6	202	8	35	145	13	1	368	1.82
7	165	6	38	108	13	0	293	1.78
8	140	6	32	90	11	1	249	1.78
9	89	7	17	64	1	0	148	1.66
9+	180	20	55	100	5	0	270	1.50
"Adult"	76	3	16	56	1	0	131	1.72
Totals*	3074	143	906	1920	100	5	5066	1.65

Region II
Northeast Food Shortage Area

1	615	561	52	2	0	0	56	0.09
2	564	74	255	233	2	0	727	1.29
3	466	18	129	312	7	0	774	1.66
4	277	11	44	209	13	0	501	1.81
5	120	1	32	85	2	0	208	1.73
6	80	5	16	57	2	0	136	1.70
7	41	3	12	25	1	0	65	1.59
8	51	3	13	33	2	0	85	1.67
9	22	1	10	11	0	0	32	1.45
9+	50	7	13	29	1	0	74	1.48
"Adult"	40	1	18	19	2	0	62	1.55
Totals*	1711	124	542	1013	32	0	2664	1.56

Balance of Region II

1	975	822	141	12	0	0	165	0.17
2	870	50	330	483	7	0	1317	1.51
3	766	20	119	596	30	1	1405	1.83
4	349	7	34	286	21	1	673	1.93
5	182	5	34	134	9	0	329	1.81
6	98	3	12	75	8	0	186	1.90
7	54	1	9	41	3	0	100	1.85
8	48	0	13	30	5	0	88	1.83
9	29	3	5	19	2	0	49	1.69
9+	40	7	7	24	2	0	61	1.53
"Adult"	58	4	15	37	2	0	95	1.64
Totals*	2494	100	578	1725	89	2	4303	1.73

TABLE B (Continued)

Twenty-Six Year Accumulative Record
1952-57, 1959-69, 1973-80

Region III

Age of Doe	Total No. Does	No. of Embryos per Doe					Total No. Embryos	Productivity Rate
		0	1	2	3	4		
1	1069	512	425	132	0	0	689	0.64
2	477	17	77	342	40	1	885	1.86
3	394	13	44	289	45	3	769	1.95
4	176	4	21	126	25	0	348	1.98
5	62	3	5	43	10	1	125	2.02
6	16	1	3	8	4	0	31	1.94
7	7	0	2	2	3	0	15	2.14
8	2	2	0	0	0	0	0	0.00
9	4	1	1	2	0	0	5	1.25
9+	3	1	0	2	0	0	4	1.33
"Adult"	<u>57</u>	<u>3</u>	<u>8</u>	<u>40</u>	<u>6</u>	<u>0</u>	<u>106</u>	<u>1.86</u>
Totals*	1198	45	161	854	133	5	2288	1.91

*One-year-olds not included in totals

TABLE C

Doe Physical Condition, 9 March - 1 June 1981
 Shot or Accidentally Killed Does Mandibular Fat Analyses

District	Age Class*	Number of Samples	Average % Mandible Fat
1	1-year	--	--
	Adult	6	47.0
	Totals	6	47.0
2	1-year	9	32.5
	Adult	14	56.3
	Totals	23	47.0
3	1-year	4	29.3
	Adult	15	55.8
	Totals	19	50.2
4	1-year	4	36.1
	Adult	19	38.2
	Totals	23	37.8
REGION I	1-year	17	32.6
	Adult	54	48.7
	Totals	71	44.8
5	1-year	6	43.2
	Adult	20	53.7
	Totals	26	51.3
6	1-year	9	43.0
	Adult	16	57.2
	Totals	25	52.1
7	1-year	14	46.5
	Adult	18	56.8
	Totals	32	52.3
8	1-year	17	52.1
	Adult	18	59.9
	Totals	35	56.1
REGION II	1-year	46	47.4
	Adult	72	56.8
	Totals	118	53.1

*Adult = 2 years and older

TABLE C (Continued)

District	Age Class*	Number of Samples	Average % Mandible Fat
9	1-year	12	45.4
	Adult	11	64.3
	Totals	23	54.4
11	1-year	--	--
	Adult	1	65.1
	Totals	1	65.1
12	1-year	8	52.6
	Adult	12	60.3
	Totals	20	57.2
13	1-year	30	53.4
	Adult	29	64.1
	Totals	59	58.7
14	1-year	--	--
	Adult	--	--
	Totals	--	--
REGION III	1-year	50	51.4
	Adult	53	63.3
	Totals	103	57.5

*Adult = 2 years and older