Status of Wildlife Populations, Fall 1987 and 1979-1986 Hunting and Trapping Harvest Statistics

compiled by

Blair Joselyn and Roger Lake

Section of Wildlife
Minnesota Department of Natural Resources
St. Paul, Minnesota

This report should be cited as follows:

Joselyn, B. and R. Lake, compilers. 1987. Status of wildlife populations, fall 1987 and 1979-1986 hunting and trapping harvest statistics. Unpub. Rep., Section of Wildlife, Minn. Dept. Nat. Res., St. Paul,

Note: Data in this report may change as a result of future more comprehensive analysis and verification being undertaken.

Status of Wildlife Populations, Fall 1987

and

1979-1986 Hunting and Trapping Harvest Statistics

Since this booklet was first published by the Wildlife Populations and Research Unit in 1977, the amount of material presented has increased considerably. That first edition 11 years ago was 29 pages in length (compared to 118 pages this year) and contained relatively limited information on only a few of the primary game species. Over the years we have covered more species and significantly expanded the amount of data presented on other species (e.g., deer and bear). Not only is the publication now a repository for annual population and harvest data on approximately 60 animals, but it has also become an archives of long-term population trend information for some species such as the 33 years of August roadside count data on pheasants, gray partridge, cottontail and jack rabbits and mourning doves.

For farmland and forest wildlife, most of the field work associated with collection of census and survey data is carried out by wildlife managers (conservation officers also participate in pheasant counts). The Farmland and Forest Wildlife Population and Research groups coordinate these activities, analyze and interpret data, and prepare recommendations for season setting meetings. For wetland species, much of the census and survey work is done by personnel in the Wetland Wildlife Populations and Research Group. Harvest statistics are calculated primarily by personnel in the St. Paul Office.

Blair Joselyn
9 October 1987

Index

FARMLAND WILDLIFE POPULATIONS AND CENSUSES

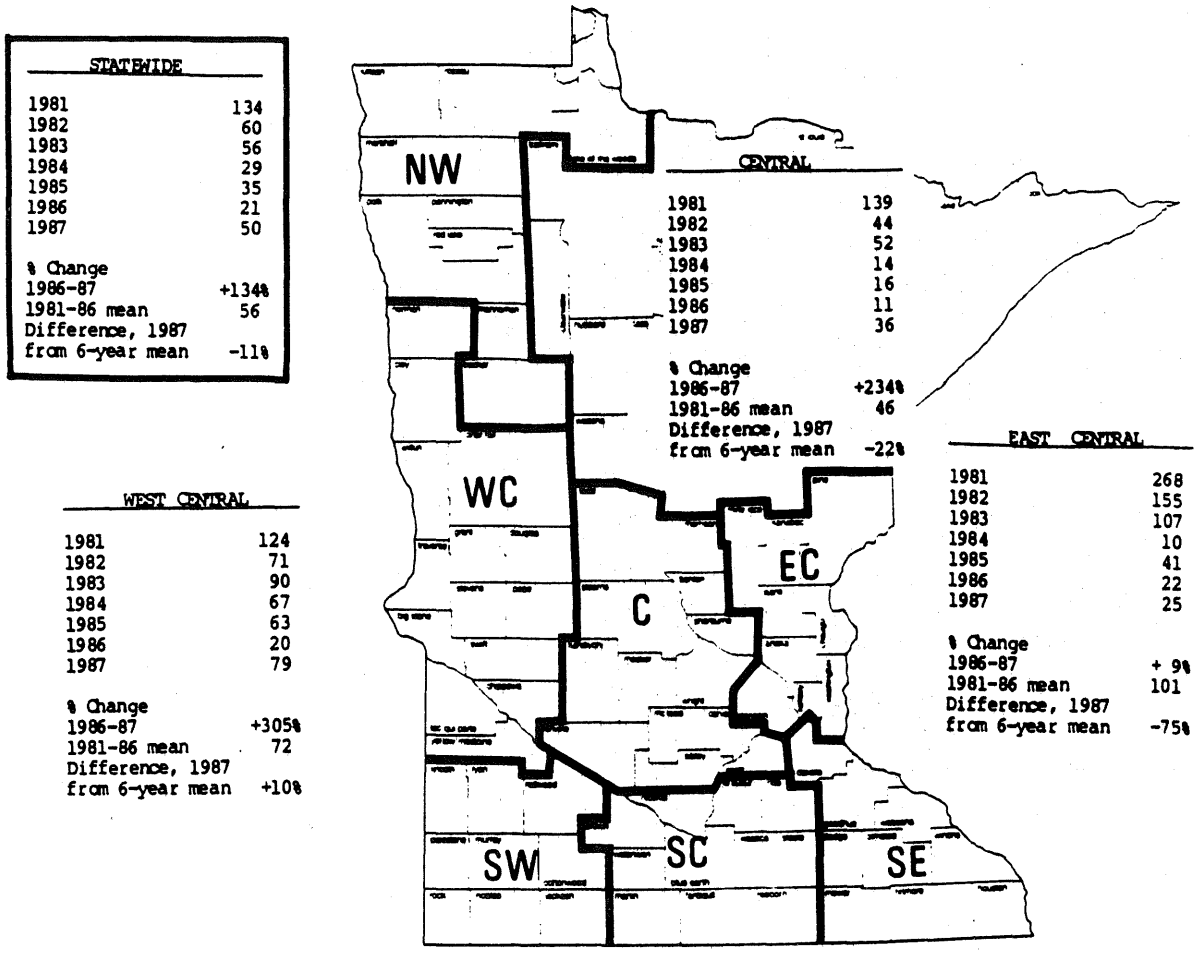

Figure 1. August roadside survey regional boundaries and pheasants observed per 100 miles of route, 1981-87, and percent change 1986-87 for miles censused both years.

Table 1. County, regional, and statewide August ring-necked pheasant survey results, 1982-87.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
West Central	925	70.8	89.7	66.5	62.9	19.6	79.4	61.9	305%
Big Stone	75	187	340	257	283	21	339		
Chippewa	50	54	52	60	38	26	116		
Clay	75	19	43	25	1	0	0		
Douglas	50	126	32	16	2	2	14		
Grant	50	46	0	30	12	10	2		
Lac qui Parle	75	204	212	137	40	24	107		
Norman	50	0	0	0	0	0	0		
Ottertail	50	100	56	124	106	52	140		
Pope	75	107	148	63	97	40	67		
Stevens	75	73	188	84	61	33	113		
Swift	75	21	59	39	111	17	63		
Traverse	75	3	7	57	36	23	69		
Wilkin	75	29	3	3	3	1	0		
Yellow Medicine	75	13	15	1	39	21	40		
Central	700	43.7	51.5	13.6	16.3	10.7	36.4	27.2	234%
Benton	50	74	82	10	60	8	104		
Carver	50	22	22	18	4	0	26		
Kandiyohi	75	40	83	9	25	3	8		
McLeod	50	--	28	0	16	14	--		
Meeker	75	83	19	28	8	5	21		
Morrison	50	44	12	0	0	22	8		
Renville	50	0	2	0	0	0	0		
Scott	50	120	168	6	38	14	72		
Sherburne	50	20	24	0	0	0	48		
Sibley	75	27	44	17	20	19	44		
Stearns	100	26	44	20	19	3	11		
Todd	50	62	110	30	0	44	26		
Wright	50	54	40	18	16	18	100		
East Central	425	155.1	107.3	10.1	41.3	22.4	24.5	67.2	9%
Anoka	50	28	4	2	32	0	4		
Chisago	75	280	265	20	72	25	43		
Hennepin	25	16	60	0	--	0	4		
Isanti	75	171	139	12	27	23	9		
Kanabec	50	142	128	10	32	38	26		
Mille Lacs	50	202	60	26	52	70	42		
Pine	50	122	58	0	66	6	30		
Washington	50	140	26	0	0	4	26		

Table 1. Continued.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
Southwest	475	26.1	10.1	8.4	14.3	19.8	60.2	15.7	204%
Cottonwood	50	32	2	10	46	0	48		
Jackson	50	68	24	10	18	10	16		
Lincoln	50	2	4	0	4	4	76		
Lyon	50	50	0	0	0	16	22		
Murray	50	60	54	0	6	26	98		
Nobles	75	5	1	0	15	29	41		
Pipestone	50	2	6	28	18	20	46		
Redwood	50	2	0	28	6	16	6		
Rock	50	24	4	4	16	52	198		
South Central	775	49.1	24.9	25.8	29.6	23.5	41.7	30.6	82%
Blue Earth	75	5	29	7	8	1	29		
Brown	75	55	7	33	24	28	24		
Fairbault	75	35	24	8	24	12	49		
Freeborn	75	24	0	25	51	35	72		
LeSueur	75	115	65	40	80	24	83		
Martin	50	104	21	65	15	50	74		
Nicollet	75	39	11	1	12	0	43		
Rice	75	57	25	1	0	16	12		
Steele	50	50	24	98	2	2	68		
Waseca	75	0	32	4	23	81	3		
Watonwan	75	24	35	17	59	11	21		
Southeast	500	28.9	51.4	20.6	31.6	37.4	39.0	34.0	4%
Dakota	50	92	98	4	--	62	4		
Dodge	50	40	96	20	56	12	66		
Fillmore	50	26	24	38	2	32	14		
Goodhue	50	0	4	0	2	0	4		
Houston	50	6	4	0	0	2	14		
Mower	75	55	55	45	64	72	71		
Olmsted	75	53	109	29	49	60	41		
Wabasha	50	4	16	0	16	54	6		
Winona	50	6	0	32	38	14	114		
Statewide	3,800	60.2	56.2	28.7	34.6	21.2	49.9	40.2	134%

[a] Percent change 1986-87 for miles surveyed both years only.

Table 2. Statewide pheasant population parameters calculated from August survey results, 1982-87.

Population Parameter	1982	1983	1984	1985	1986	1987	1982-86 mean	Percent[a] change 1986-87
Cocks/100 miles driven	4.5	5.2	2.5	3.2	2.6	3.6	3.6	+ 38%
Hens/100 miles driven	8.2	7.1	3.6	4.5	2.5	4.9	5.2	+ 96%
Broods/100 miles driven	8.5	7.4	4.3	4.8	3.6	7.0	5.8	+ 94%
Mean Brood Size	5.6	5.9	5.3	5.6	4.5	5.9	5.4	+ 31%

[a] Statewide means include the Northwest region.

Table 3. August 1987 roadside survey results for selected farmland wildlife species by agricultural region.

		Animals seen per 100 miles driven				
Region	Miles surveyed	Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	375	4.5	0.8	0.5	193.9	21.3
WC	925	14.6	5.8	1.2	440.6	6.5
C	700	15.1	7.0	0.3	222.0	1.9
EC	425	0.0	11.5	0.0	104.7	1.9
SW	475	99.4	8.2	0.6	257.3	7.8
SC	775	47.2	6.6	1.0	206.8	1.2
SE	500	66.6	10.6	1.0	255.0	1.8
Statewide[a]	4,175	34.2	7.1	0.7	261.2	5.2

[a] Statewide means include the Northwest region.

Table 4. August 1986 roadside survey results for selected farmland wildlife species by agricultural region.

Region	Miles surveyed	Animals seen per 100 miles driven: Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	400	3.5	0.3	1.0	176.8	10.3
WC	925	10.1	1.5	0.4	325.0	6.5
C	775	4.6	4.8	0.4	180.1	1.4
EC	425	0.0	5.9	0.0	115.1	0.7
SW	475	59.6	6.3	0.6	204.0	4.8
SC	775	45.3	5.3	0.9	160.5	2.3
SE	500	20.8	4.8	0.0	180.4	2.2
Statewide[a]	4,275	20.6	4.0	0.5	204.1	3.9

[a] Statewide means include the Northwest region.

Table 5. Statewide August roadside survey results for selected farmland wildlife species, 1983-87.

Species	Animals per 100 miles driven[a]: 1983	1984	1985	1986	1987	Percent[b] change 1986-1987
Ring-necked pheasant[c]	56.2	28.7	34.6	21.6	49.9	+134%
Gray partridge (Hun)	23.4	20.0	37.0	20.6	34.2	+58%
Mourning dove	286.6	279.2	270.1	204.1	261.2	+34%
Eastern cottontail	6.7	2.9	4.4	4.0	7.1	+69%
White-tailed jack rabbit	1.0	0.8	1.2	0.5	0.7	+60%
White-tailed deer	5.1	4.9	5.4	3.9	5.2	+30%
Sharp-tailed grouse	0.02	0.12	0.13	0.00	0.00	0%
Greater prairie-chicken	0.00	0.23	0.00	0.00	0.00	0%
Sandhill crane	1.22	1.14	1.84	1.33	3.28	+141%
Badger	0.00	0.00	0.00	0.00	0.05	NA
Gray & fox squirrels	1.03	1.84	0.86	1.29	1.22	-8%
Gray & red foxes	0.24	0.28	0.23	0.42	0.26	-39%
Striped & spotted skunks	0.22	0.49	0.48	0.42	0.31	-34%

[a] The mean number of animals per 100 miles are calculated using total miles surveyed and are not corrected for only miles surveyed both years.

[b] Percent change 1986-87 calculated using only those routes surveyed both years.

[c] Pheasant means do not include the Northwest region.

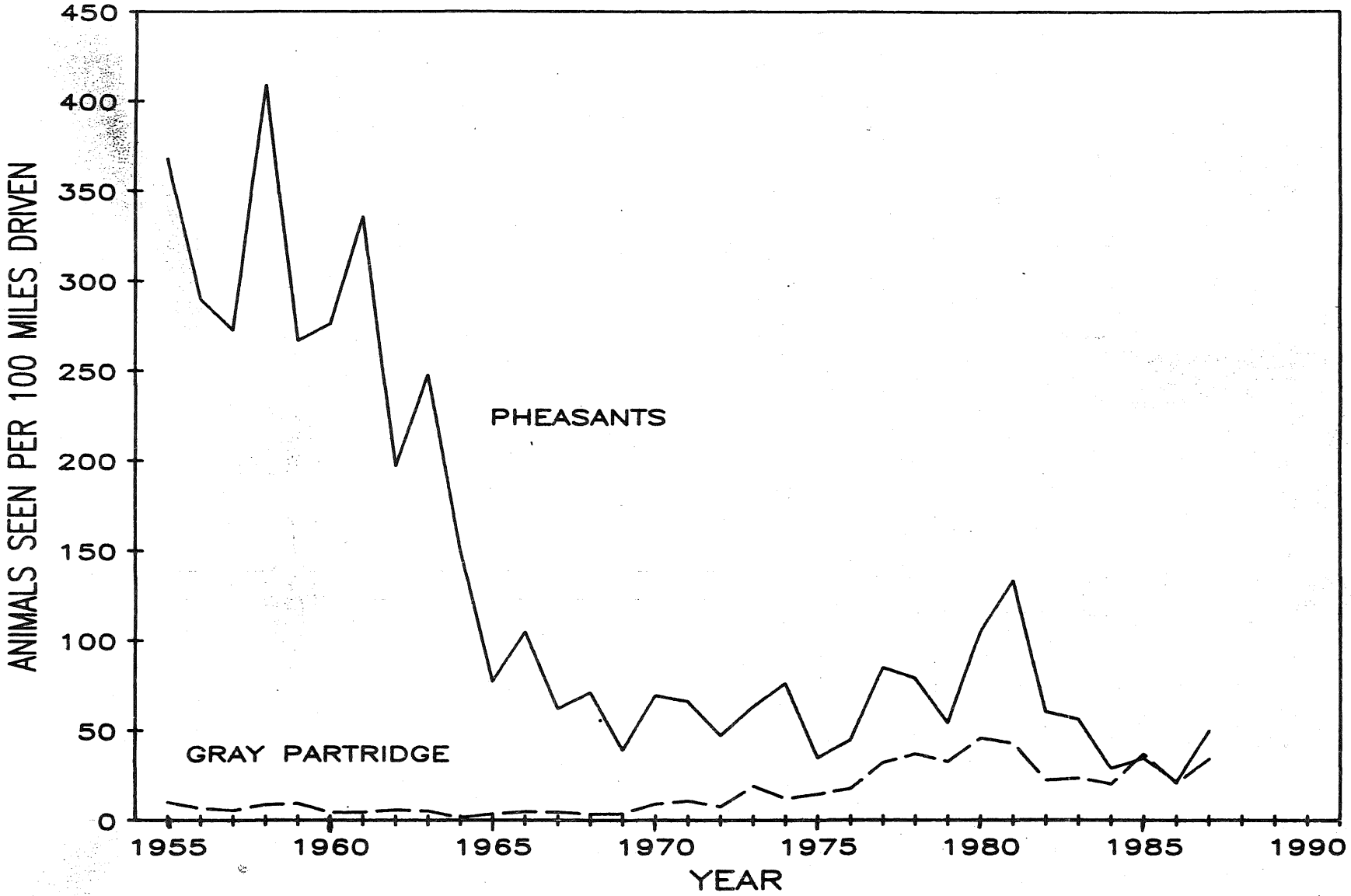

Figure 2. August roadside census indices (animals observed/100 mi.) of pheasants and gray partridge, 1955-87.

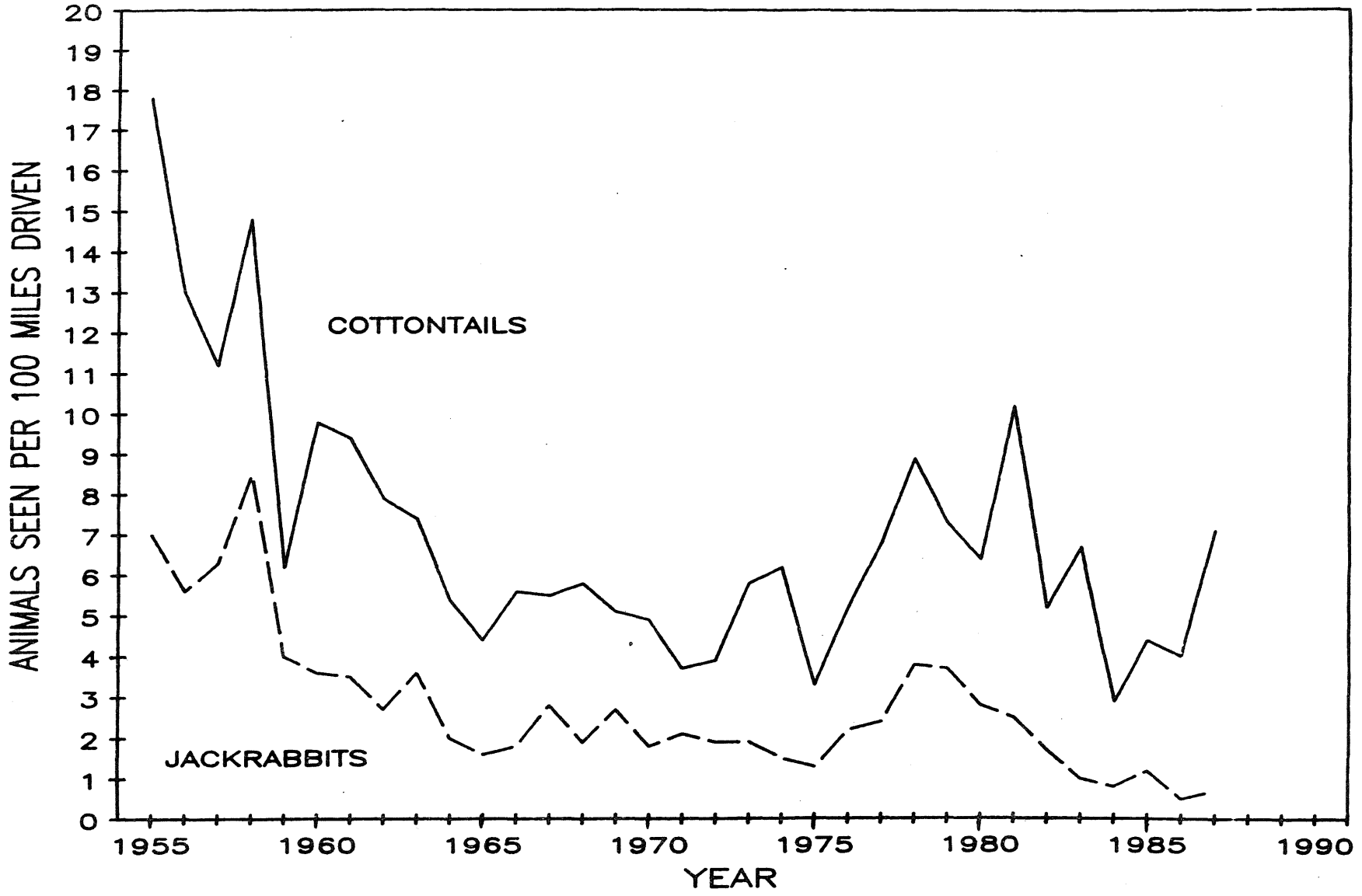

Figure 3. August roadside indices (animals observed/100 mi.) of eastern cottontail and white-tailed jackrabbits, 1955-87.

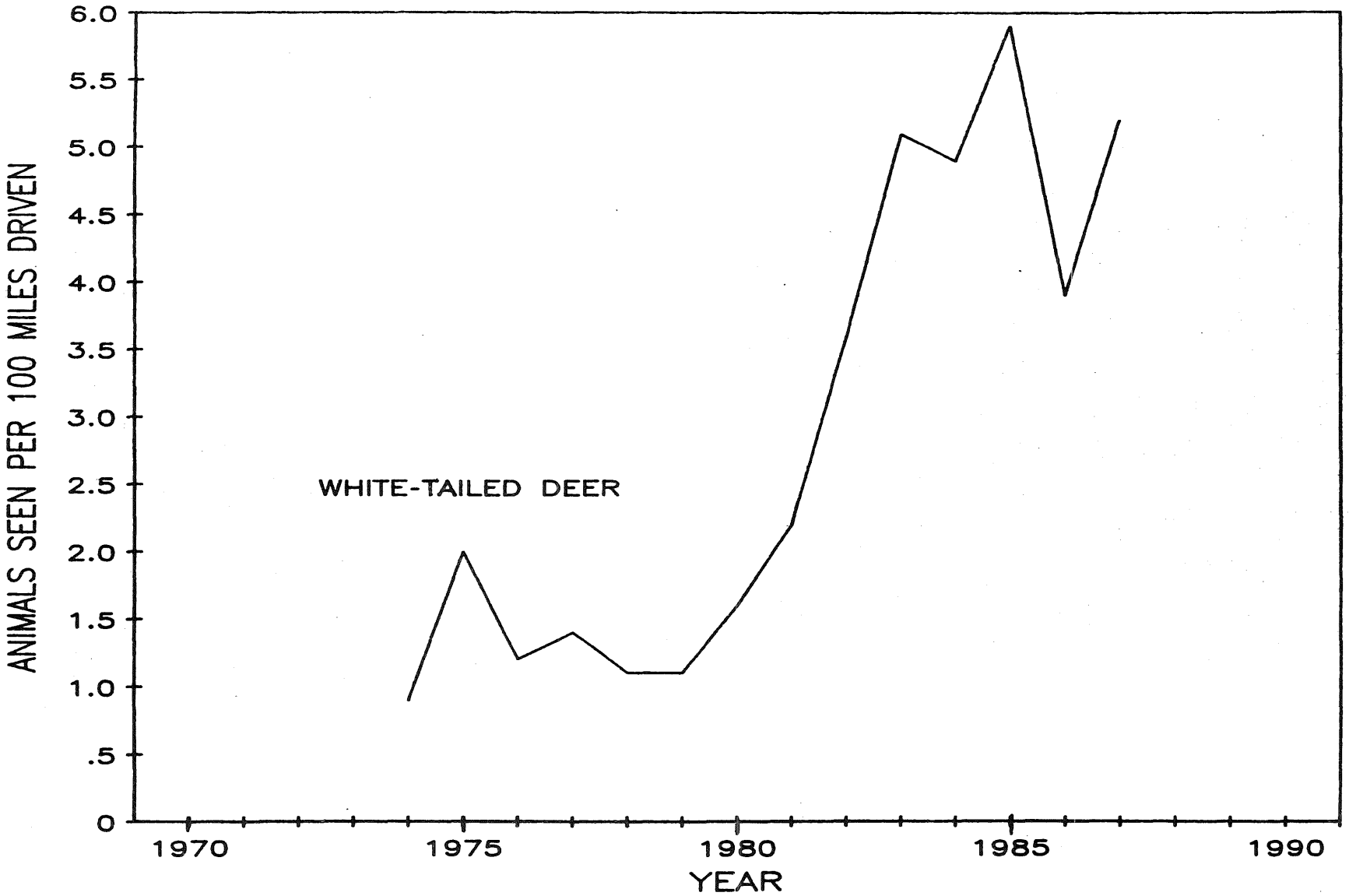

Figure 4. August roadside census indices (animals observed/100 mi.) of white-tailed deer, 1974-87.

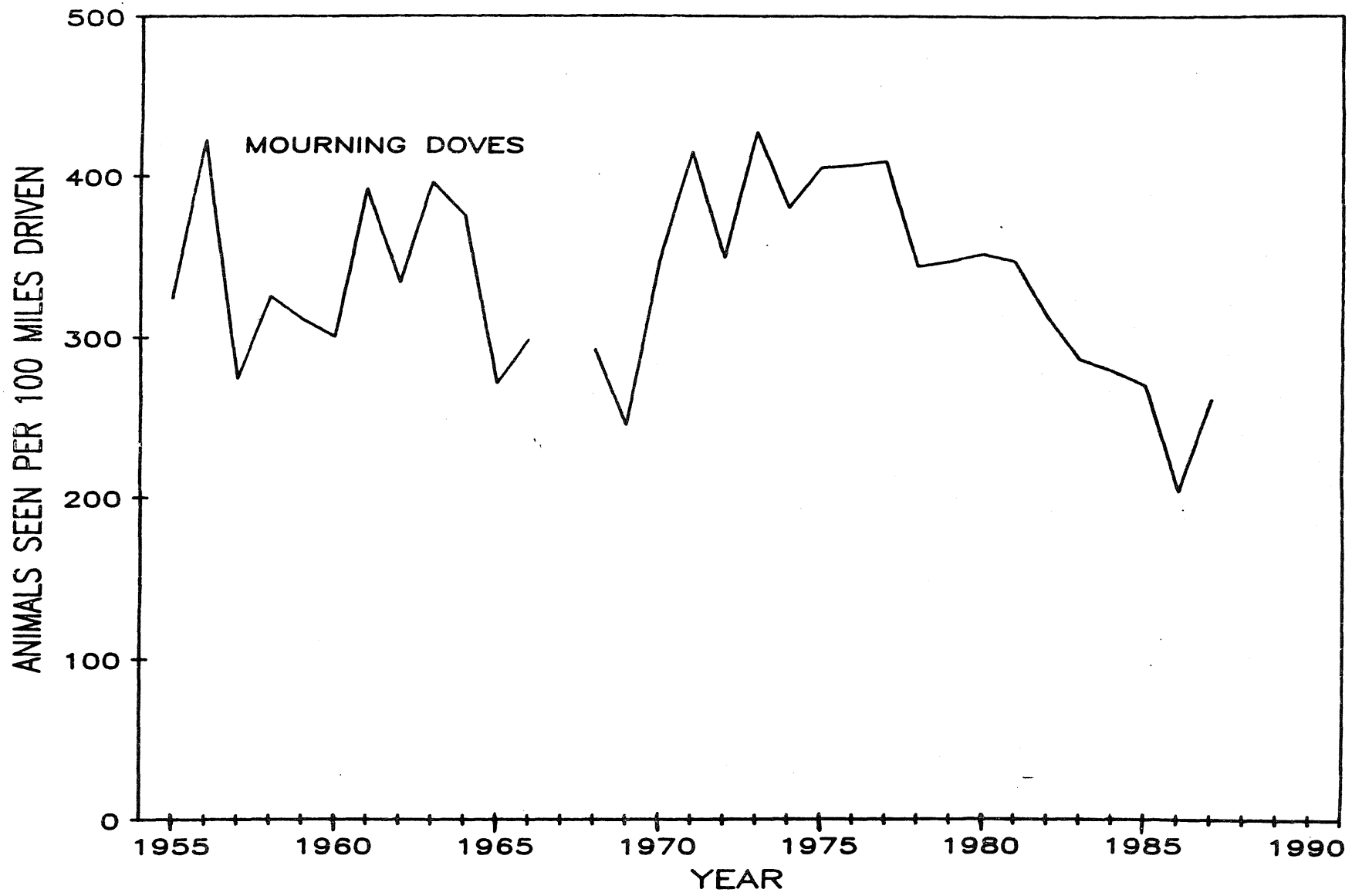

Figure 5. August roadside census indices (animals observed/100 mi.) of mourning doves, 1955-87.

August Roadside Survey Historical Summaries

Table 6. August roadside survey results for 5 species, 1955-87.

Year	Animals seen per 100 miles driven				
	Pheasants[a]	Gray partridge	Cottontails	Jack rabbits	Mourning doves
1955	368.1	9.9	17.8	7.0	324.5
1956	290.0	6.6	13.0	5.6	422.6
1957	272.6	5.5	11.2	6.3	274.5
1958	409.1	8.7	14.8	8.5	326.0
1959	266.8	9.3	6.2	4.0	311.4
1960	276.4	4.4	9.8	3.6	300.8
1961	336.0	4.5	9.4	3.5	392.4
1962	197.2	5.8	7.9	2.7	334.6
1963	248.1	5.1	7.4	3.6	396.5
1964	149.8	1.6	5.4	2.0	375.9
1965	77.2	3.6	4.4	1.6	271.6
1966	105.0	4.9	5.6	1.8	299.6
1967	62.2	4.6	5.5	2.8	
1968	71.4	3.5	5.8	1.9	293.5
1969	39.2	3.7	5.1	2.7	245.6
1970	69.6	9.1	4.9	1.8	348.3
1971	66.1	10.8	3.7	2.1	415.4
1972	47.3	7.5	3.9	1.9	349.8
1973	63.3	19.1	5.8	1.9	428.2
1974	76.3	12.0	6.2	1.5	380.8
1975	34.8	14.6	3.3	1.3	405.8
1976	44.8	17.6	5.2	2.2	407.4
1977	85.0	32.1	6.8	2.4	409.8
1978	79.0	37.0	8.9	3.8	344.5
1979	54.2	32.6	7.3	3.7	347.9
1980	104.9	46.0	6.4	2.8	352.2
1981	133.5	42.9	10.2	2.5	347.6
1982[b]	60.2	22.2	5.2	1.7	313.6
1983	56.2	23.4	6.7	1.0	286.6
1984	28.7	20.0	2.9	0.8	279.2
1985	34.6	37.0	4.4	1.2	270.1
1986	21.2	20.6	4.0	0.5	204.1
1987	49.9	34.2	7.1	0.7	261.2

[a] Pheasants seen per 100 miles driven do not include the northwest agricultural region.

[b] Eight counties in the northwest agricultural region added to survey for all species except pheasants, 1982-87.

Table 7. Pheasants seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	163	140	581	620	212	No	368
1956	249	208	175	357	478	169	Survey	290
1957	260	130	135	337	522	180		273
1958	490	262	300	473	593	126		409
1959	307	187	73	510	413	55		267
1960	367	243	203	294	357	38		276
1961	494	267	255	366	381	115		336
1962	264	140	144	215	239	114		197
1963	444	192	157	252	227	135		248
1964	225	83	26	185	211	84		150
1965	121	38	9	90	98	69		77
1966	110	67	26	109	176	102		105
1967	56	30	10	54	126	81		62
1968	65	40	17	78	125	94		71
1969	13	22	20	33	68	102		39
1970	20	27	9	55	109	194		70
1971	40	44	12	59	77	175		66
1972	20	28	44	37	67	105		47
1973	38	35	53	36	75	168		63
1974	51	73	85	60	93	108		76
1975	13	34	75	7	25	79		35
1976	12	28	68	2	83	81		45
1977	46	85	101	6	145	126		85
1978	36	80	178	23	106	77		79
1979	45	62	101	13	53	55		54
1980	79	117	221	20	110	85		105
1981	124	139	268	76	126	95		134
1982	71	44	155	26	49	29	0	60
1983	90	52	107	10	25	51	0	56
1984	67	14	10	8	26	21	0	29
1985	63	16	41	14	30	32	3	35
1986	20	11	22	20	24	37	0	21
1987	79	36	25	60	42	39	0	50

[a] Statewide totals do not include the northwest agricultural region.

Table 8. Gray partridge seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	16	8	0	11	10	9	No	10
1956	3	8	0	15	6	8	Survey	7
1957	6	5	0	12	7	0		6
1958	20	9	0	10	0	6		9
1959	13	17	0	20	5	0		9
1960	4	7	0	12	1	5		4
1961	6	13	0	2	1	0		5
1962	3	10	0	3	0	22		6
1963	3	11	0	11	1	5		5
1964	1	3	0	2	2	2		2
1965	5	3	0	7	2	4		4
1966	2	4	0	18	0	11		5
1967	3	2	0	8	14	0		5
1968	4	3	0	10	0	5		4
1969	5	3	0	11	0	5		4
1970	7	8	0	33	4	4		9
1971	13	4	0	29	7	10		11
1972	7	3	0	18	2	18		8
1973	8	8	0	67	12	26		19
1974	7	10	0	27	8	20		12
1975	11	2	0	68	9	6		15
1976	11	9	0	59	15	22		18
1977	16	33	0	93	31	32		32
1978	26	23	0	144	31	15		37
1979	43	24	0	80	35	12		33
1980	58	49	0	99	41	28		46
1981	38	27	1	139	44	19		43
1982	24	23	1	70	17	16	4	22
1983	29	19	0	65	23	8	15	23
1984	18	17	0	50	27	16	10	20
1985	31	18	0	95	63	42	2	37
1986	10	5	0	60	45	21	4	21
1987	15	15	0	99	47	67	5	34

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 9. Cottontail rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	8	15	15	20	20	32	No	18
1956	10	16	12	16	13	13	Survey	13
1957	7	10	8	18	14	14		11
1958	13	14	16	22	17	7		15
1959	5	16	6	7	5	2		6
1960	6	14	6	16	12	5		10
1961	6	12	6	14	11	6		9
1962	6	7	4	13	10	8		8
1963	7	4	5	12	9	9		7
1964	5	3	1	12	7	5		5
1965	4	4	1	5	6	6		4
1966	5	3	2	10	8	6		6
1967	6	5	2	7	9	3		6
1968	5	3	4	9	9	6		6
1969	4	4	1	10	8	5		5
1970	4	5	2	7	6	6		5
1971	5	3	2	7	3	2		4
1972	4	5	4	5	4	4		4
1973	5	9	6	7	5	4		6
1974	3	7	14	7	6	6		6
1975	2	4	8	2	2	3		3
1976	4	6	7	2	6	8		5
1977	5	7	13	6	5	8		7
1978	5	9	21	12	7	5		9
1979	5	8	8	13	8	4		7
1980	4	7	10	7	7	4		6
1981	7	10	18	10	8	12		10
1982	5	7	8	3	7	5	2	5
1983	7	6	13	6	4	12	2	7
1984	2	2	4	4	4	5	0	3
1985	2	4	5	7	6	8	0	4
1986	2	5	6	6	5	5	0	4
1987	6	7	12	8	7	11	1	7

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 10. Jack rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	9	3	2	13	11	2	No	7
1956	6	4	2	10	8	2	Survey	6
1957	5	5	1	20	6	1		6
1958	7	6	1	20	12	1		9
1959	1	1	0	15	8	1		4
1960	4	5	0	10	3	0		4
1961	4	5	0	7	4	0		4
1962	4	2	0	5	3	1		3
1963	10	2	0	2	3	1		4
1964	3	1	0	4	2	1		2
1965	2	2	0	4	1	0		2
1966	2	2	0	5	1	1		2
1967	5	1	0	4	4	0		3
1968	2	1	0	7	2	1		2
1969	3	1	1	10	2	1		3
1970	4	2	0	2	1	0		2
1971	5	2	0	3	1	0		2
1972	4	1	0	2	2	1		2
1973	4	0	0	3	2	0		2
1974	4	2	0	2	1	0		2
1975	3	1	0	2	0	0		1
1976	4	1	0	5	2	1		2
1977	4	3	0	5	2	1		2
1978	3	3	1	13	3	1		4
1979	5	5	1	6	3	1		4
1980	4	1	1	8	2	3		3
1981	2	2	0	7	2	3		3
1982	3	1	1	5	1	1	2	2
1983	2	1	0	0	1	1	1	1
1984	2	1	0	2	0	1	0	1
1985	2	0	0	3	2	1	1	1
1986	0	0	0	1	1	0	1	1
1987	1	0	0	1	1	1	1	1

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 11. Mourning doves seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

	Agricultural Region							
Year	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	275	116	539	396	197	No	325
1956	347	553	278	592	461	286	Survey	423
1957	303	246	168	243	383	200		275
1958	350	297	192	270	456	293		326
1959	377	307	221	358	447	94		311
1960	274	334	122	337	430	187		301
1961	377	373	136	481	563	317		392
1962	338	338	215	313	396	314		335
1963	636	273	212	506	435	313		397
1964	681	257	167	400	395	217		376
1965	312	245	185	460	217	271		272
1966	363	210	152	505	311	229		300
1967								
1968	411	208	125	261	254	385		294
1969	268	280	125	477	132	195		246
1970	601	218	113	527	204	274		348
1971	580	257	182	366	259	752		415
1972	600	234	169	308	230	314		350
1973	602	280	288	480	392	329		428
1974	588	321	242	352	269	382		381
1975	654	303	153	546	338	260		406
1976	600	373	224	536	367	282		407
1977	699	308	168	680	282	224		410
1978	502	326	174	431	276	282		345
1979	601	406	138	380	198	213		348
1980	696	302	140	422	235	182		352
1981	634	285	153	514	213	179		348
1982	557	243	175	304	278	213	225	314
1983	517	289	131	278	214	193	189	287
1984	531	233	129	267	183	269	176	279
1985	501	245	93	243	213	151	234	270
1986	325	180	115	204	161	180	177	204
1987	441	222	105	257	207	255	194	261

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 12. Greater prairie-chicken spring booming ground counts for 14 northwestern counties, 1978-87 (counts coordinated and summarized by AWM Terry Wolfe, Crookston).

County	No. of booming males (No. of booming grounds)									
	1978	1979	1980	1981	1982	1983	1984[b]	1985	1986	1987
Becker	26 (4)	102 (9)[a]	156 (16)[a]	159 (16)[a]	133 (13)[a]	174 (17)	96 (9)[a]	41 (3)	99 (11)	53 (7)
Cass	9 (1)	14 (2)[a]	17 (6)[a]	63 (15)[a]	68 (16)[a]	65 (15)	54 (15)[a]	58 (14)	52 (14)	60 (15)
Chippewa	8 (1)	2 (1)	2 (1)	2 (1)	0	2 (1)	0	0	0	0
Clay	261 (21)	205 (17)[a]	186 (17)[a]	196 (16)[a]	216 (12)[a]	161 (15)	110 (7)	127 (7)[a]	86 (9)[a]	87 (9)
Hubbard	0	0	0	4 (1)	3 (1)	3 (1)	5 (1)	16 (6)[a]	16 (4)	22 (5)
Mahnomen	71 (4)	81 (7)	203 (21)	223 (20)	294 (22)	316 (22)	149 (19)	134 (15)	102 (17)	63 (9)
Marshall	0	0	0	3 (1)	7 (2)	3 (1)[a]	2 (2)	0	0	0
Norman	130 (9)	213 (13)	230 (9)	210 (9)	273 (15)	194 (11)[a]	119 (8)	86 (7)	128[a](10)	87 (9)
Ottertail	8 (2)	19 (5)	13 (2)	9 (2)	12 (1)	10 (3)	7 (1)	5 (1)	0[a]	0
Pennington	0	8 (1)[a]	0	2 (1)	6 (1)	5 (1)	4 (1)[a]	3 (1)	0	0
Polk	140 (16)	192 (18)[a]	269 (27)	254 (26)	283 (29)	232 (26)	146 (22)[a]	162 (18)	96 (17)[a]	72 (8)
Red Lake	7 (1)	8 (1)	8 (1)	19 (2)	19 (2)	14 (2)	12 (2)	2 (1)	0	0
Wadena	0 (10)[a]	27 (3)[a]	10 (3)	60 (12)[a]	64 (11)	18 (6)	19 (2)	34 (9)[a]	17 (7)[a]	105 (20)
Wilkin	180 (14)	77 (4)	164 (14)	206 (23)[a]	269 (20)	223 (18)	60 (6)	149 (15)[a]	81 (9)[a]	99 (8)
Total	841 (74)	948 (81)	1,258(117)	1,410(144)	1,648(146)	1,420(139)	783 (95	817 (97)	677 (98)	648 (90)
Avg. no. males/ground	11.4	11.7	10.8	9.8	11.2	10.2	8.2	8.4	6.9	7.2

[a] Data include only grounds on which counts were conducted. In several counties booming grounds were located but counts were not made, they are not included in the data presented.

[b] Part of the reason for the low number of chickens is incomplete counts of known grounds. This was the case for Polk County and a few others. However, even after allowing for uncounted grounds, chicken numbers were down.

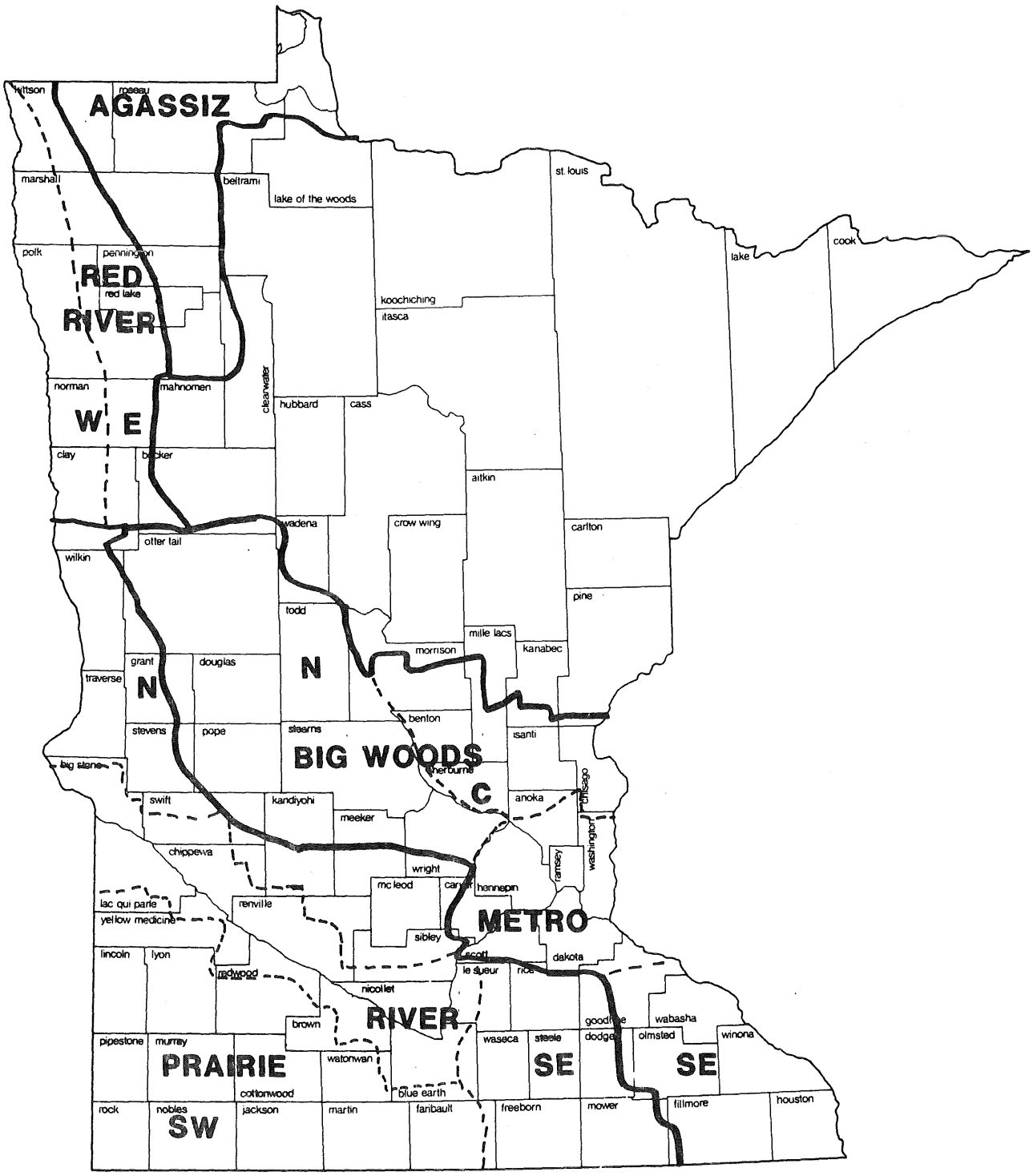

Figure 6. Deer management units and sub-units in the Farmland Zone.

Table 13. Number of car-killed deer confiscated in the Deer Management Units and sub-units of Minnesota's farmland zone, 1980-86. Data are adjusted for miles driven to the base year of 1972.

DMU Sub-DMU	1980	1981	1982	1983	1984	1985	1986	$\bar{X}$ 1980's	% Chg. 1985-86
RED RIVER	206	281	344	333	323	339	366	313	+ 8.0%
AGASSIZ	172	272	287	335	261	281	246	265	-12.5%
BIG WOODS	3,431	4,186	4,612	4,939	5,469	4,958	5,507	4,729	+11.1%
North	1,133	1,399	1,565	1,715	1,610	1,502	1,637	1,509	+ 9.0%
Central	661	893	885	904	1,065	934	961	900	+ 2.9%
Metro	1,126	1,219	1,296	1,391	1,803	1,692	1,961	1,498	+15.9%
SE	511	676	866	929	990	830	948	822	+14.2%
PRAIRIE	2,577	2,666	2,990	3,078	3,268	2,809	3,133	2,932	+11.5%
North	392	392	394	469	349	400	440	405	+10.0%
River	764	842	864	947	1,021	829	857	875	+ 3.4%
SW	833	871	992	967	1,009	851	913	919	+ 7.3%
SE	589	561	740	695	890	729	923	732	+26.6%
FARMLAND[a] ZONE	6,387	7,405	8,232	8,684	9,321	8,387	9,252	8,238	+10.3%
FOREST[b] ZONE	1,698	3,574	2,591	3,071	3,270	3,180	3,739	3,018	+17.6%
MISC	469	572	791	358	539	447	543	531	+21.5%
STATEWIDE[c]	8,554	11,551	11,614	12,113	13,130	12,014	13,534	11,787	+12.3%

[a] Farmland subtotals from regional enforcement summaries.

[b] Forest subtotals = Statewide - (Farmland + Misc.).

[c] Statewide data from summaries distributed by Division of Enforcement in St. Paul.

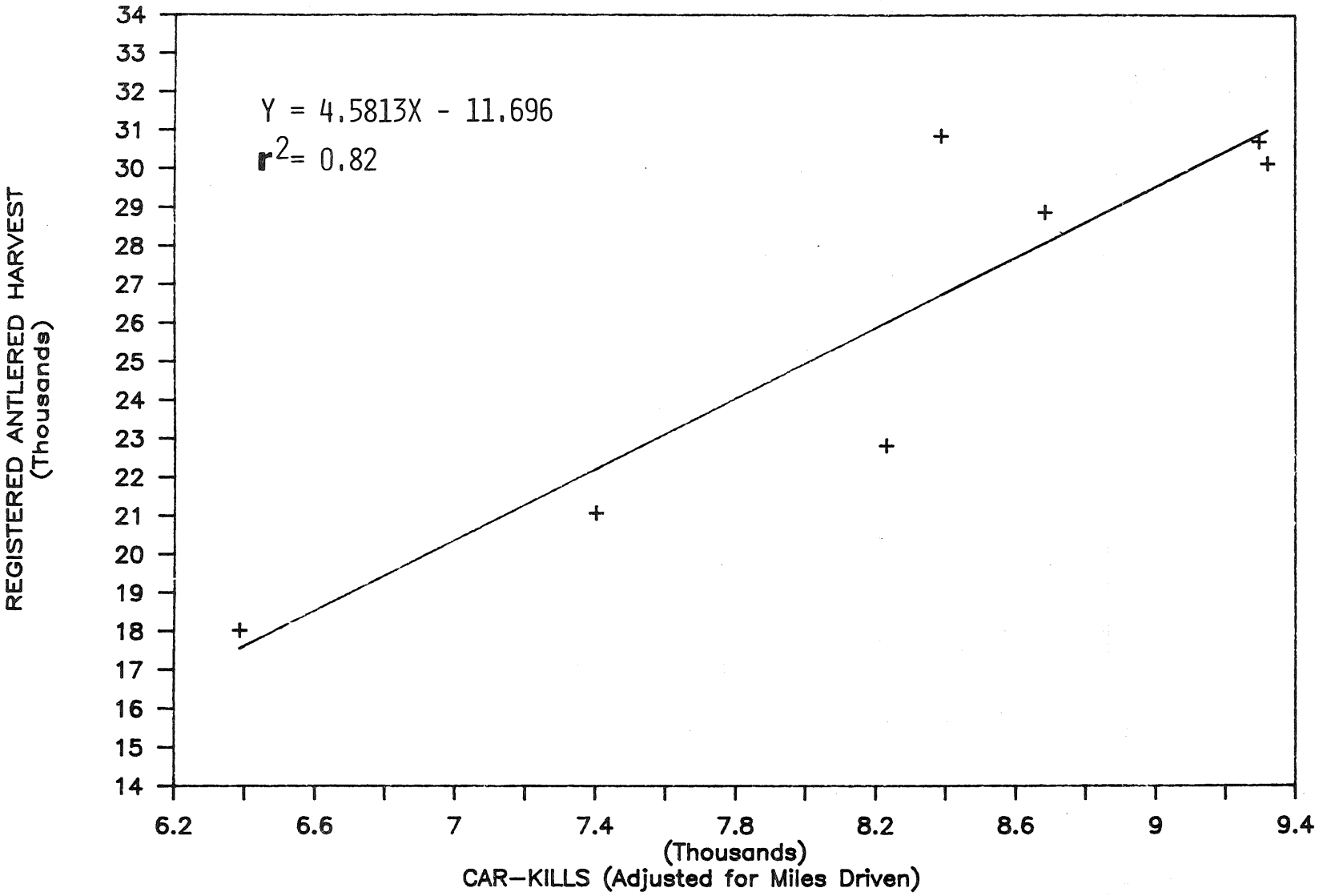

Figure 7. Relationship between annual vehicle kills and registered antlered deer harvest in the Farmland Zone, 1980-86.

Table 14. Productivity of deer in the Big Woods and Prairie Deer Management Units (DMU), 1981-87.

	Age class	Pregnancy rate	Fetuses per pregnancy	Proportion of population	Gross productivity[a]
BIG WOODS					
1987	Fawn	46%	1.05	35%	
(N=162)	Yearling	95%	1.72	23%	
	Adult	94%	1.97	42%	1.32 fawns/doe
1986	Fawn	37%	1.10	35%	
(N=173)	Yearling	82%	1.82	23%	
	Adult	91%	1.92	42%	1.22 fawns/doe
1985	Fawn	50%	1.13	35%	
(N=140)	Yearling	100%	1.72	23%	
	Adult	95%	1.90	42%	1.35 fawns/doe
1984	Fawn	22%	1.24	35%	
(N=174)	Yearling	95%	1.67	23%	
	Adult	95%	1.79	42%	1.17 fawns/doe
1983	Fawn	55%	1.20	35%	
(N=182)	Yearling	94%	1.89	23%	
	Adult	94%	1.88	42%	1.38 fawns/doe
1982	Fawn	43%	1.17	35%	
(N=253)	Yearling	91%	1.75	23%	
	Adult	96%	1.90	42%	1.31 fawns/doe
1981	Fawn	65%	1.08	35%	
(N=169)	Yearling	94%	1.70	23%	
	Adult	94%	2.02	42%	1.41 fawns/doe
PRAIRIE					
1987	Fawn	54%	1.07	35%	
(N=70)	Yearling	100%	1.94	23%	
	Adult	85%	2.00	42%	1.36 fawns/doe
1986	Fawn	42%	1.13	35%	
(N= 73)	Yearling	85%	1.84	23%	
	Adult	92%	1.88	42%	1.25 fawns/doe
1985	Fawn	38%	1.00	35%	
(N= 66)	Yearling	92%	1.58	23%	
	Adult	94%	1.97	42%	1.24 fawns/doe
1984	Fawn	23%	1.14	35%	
(N= 89)	Yearling	91%	1.90	23%	
	Adult	86%	1.87	42%	1.17 fawns/doe
1983	Fawn	61%	1.38	35%	
(N= 92)	Yearling	91%	2.00	23%	
	Adult	100%	2.07	42%	1.58 fawns/doe
1982	Fawn	43%	1.22	35%	
(N=132)	Yearling	77%	1.80	23%	
	Adult	98%	2.02	42%	1.33 fawns/doe
1981	Fawn	44%	1.08	35%	
(N=132)	Yearling	94%	1.88	23%	
	Adult	97%	1.91	42%	1.35 fawns/doe

[a] Gross productivity calculated as pregnancy rate x fetuses/pregnancy weighted by the proportion of each age class in the population.

Table 15. Spring deer densities estimated from population modeling in DMU's of Minnesota's farmland zone, 1980-87.[a]

DMU	Deer per square mile								Goal	1987 Percent of goal[b]
	1980	1981	1982	1983	1984	1985	1986	1987		
Red River	1.8	2.7	3.2	3.3	3.2	3.1	2.6	2.5	2.0	125%
Agassiz	3.6	5.3	6.2	6.6	6.5	6.2	5.7	5.0	5.4	92%
Big Woods										
North	3.3	4.2	5.0	5.4	5.3	5.0	4.7	4.2	4.2	100%
Central	4.3	5.4	6.2	6.7	7.0	7.0	6.8	6.0	6.5	92%
Metro	1.5	1.7	1.9	2.1	2.3	2.5	2.4	2.4	2.5	96%
SE	5.2	7.0	8.3	9.2	9.2	8.4	8.4	8.4	7.4	114%
Prairie										
North	1.6	1.7	1.9	2.0	1.9	1.9	1.7	1.7	1.7	100%
River	2.5	2.7	3.0	3.1	3.0	3.0	2.6	2.3	2.6	88%
SW	1.6	1.8	2.1	2.2	2.1	2.1	2.0	1.9	2.0	95%
SE	1.7	1.9	2.1	2.2	2.1	2.1	2.1	1.9	2.0	95%
Farmland Zone	2.6	3.4	3.8	4.0	4.0	3.9	3.7	3.4	3.4	100%

[a] Historical density figures may differ from those previously published due to periodic recalculation as more accurate modeling information is available.

[b] Percent = (1987/Goal) x 100.

Predator Scent Post Survey

(Note: this survey is organized and coordinated by the Forest Wildlife Populations and Research Group, Grand Rapids. Results are presented at this location in the book because of the statewide nature of the data)

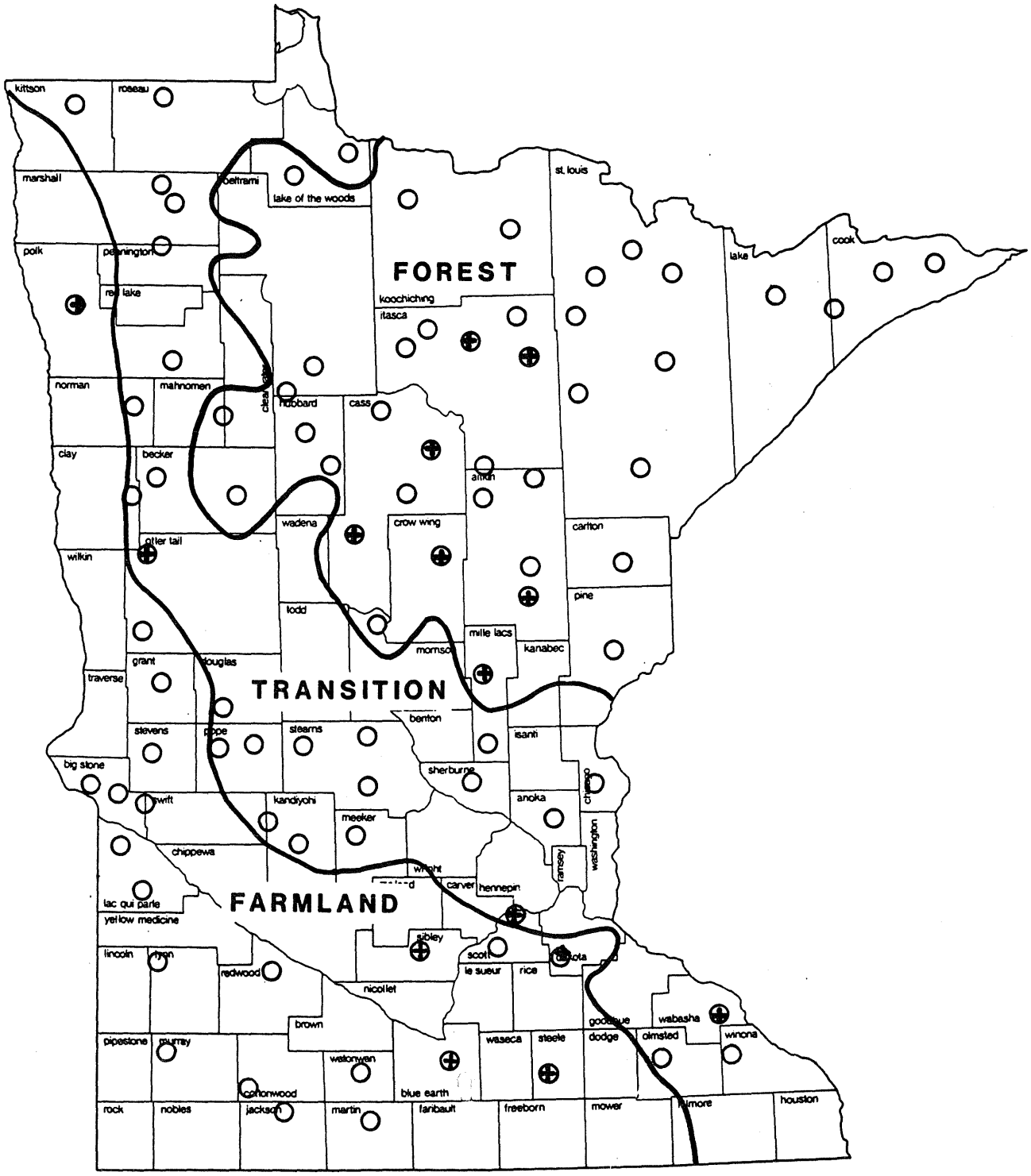

Figure 8. General locations of scent post routes in the Forest Transition, and Farmland survey zones, 1986. Routes indicated by ⊗ were not run in 1986.

Table 16. Mean predator scent post indices (Ind) and annual percent changes in indices (PC) for nine species in the Farmland and Transition Zones, 1977-86.

Species	Year 1977	1978		1979		1980		1981		1982		1983		1984		1985		1986	
	Ind	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC
Coyote																			
Farmland	3	0	-100	10	+100	3	-70	9	+200	4	-56	5	+25	9	+80	3	-67	13	+333
Transition	0	8	+100	32	+300	12	-63	9	-25	17	+89	17	0	15	-12	8	-47	8	0
Forest	38	25	-34	27	+8	33	+22	50	+52	29	-42	26	-10	34	+31	24	-29	25	+4
Red Fox																			
Farmland	67	18	-73	44	+144	60	+36	64	+7	118	+84	142	+20	142	0	103	-27	154	+50
Transition	38	49	+29	83	+69	98	+18	113	+15	104	-8	92	-12	109	+18	70	-36	112	+60
Forest	38	38	0	69	+82	49	-29	67	+37	69	+3	85	+23	58	-32	49	-16	57	+16
Skunk																			
Farmland	35	26	-26	55	+112	26	-53	17	-35	42	+147	42	0	58	+38	95	+64	98	+3
Transition	117	65	-44	57	-12	83	+46	90	+8	58	-36	58	0	74	+28	98	+32	111	+13
Forest	63	26	-59	61	+135	87	+43	84	-3	73	-13	89	+22	95	+7	91	-4	84	-8
Raccoon																			
Farmland	24	8	-67	27	+238	18	-33	5	-72	42	+740	65	+55	41	-37	33	-20	51	+54
Transition	57	41	-28	39	-5	53	+36	62	+17	71	+15	44	-38	45	+2	53	+18	68	+28
Forest	17	8	-53	11	+38	18	+64	20	+11	9	-55	28	+211	23	-18	25	+9	18	-28
Dog																			
Farmland	47	18	-62	40	+122	30	-25	41	+37	52	+27	42	-19	67	+60	83	+24	51	-38
Transition	77	46	-40	31	-33	52	+68	50	-4	63	+26	68	+8	125	+84	109	-13	83	-24
Forest	9	17	+89	16	-6	17	+6	15	-12	17	+13	13	-24	25	+29	22	-12	19	-14
House Cat																			
Farmland	76	40	-47	56	+40	91	+63	58	-36	58	0	72	+24	119	+65	109	- 8	115	+6
Transition	43	19	-56	13	-32	51	+292	39	-24	42	+8	81	+93	76	-6	107	+41	97	- 9
Forest	19	17	-11	11	-35	19	+73	16	-16	12	-25	19	+58	18	-5	19	+6	24	+26
Wolf																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	0	0	0	0	0	0	0	0	4	+100	2	-50	0	-100
Forest	4	24	+500	14	-42	15	+7	8	-47	6	-25	11	+83	10	-9	12	+20	19	+58
Bobcat																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	6	3	-50	0	-100	1	+100	1	0	0	-100	0	0	1	+100	2	+100	1	-50
Forest	8	6	-25	5	-17	2	-60	14	+600	14	0	3	-79	12	+300	5	-58	8	+60
Bear																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	2	+100	1	-50	2	+100	3	+50	5	+67	3	-40	2	-33
Forest	13	7	-46	13	+86	20	+84	9	-55	11	+22	20	+82	11	-45	16	+45	23	+44

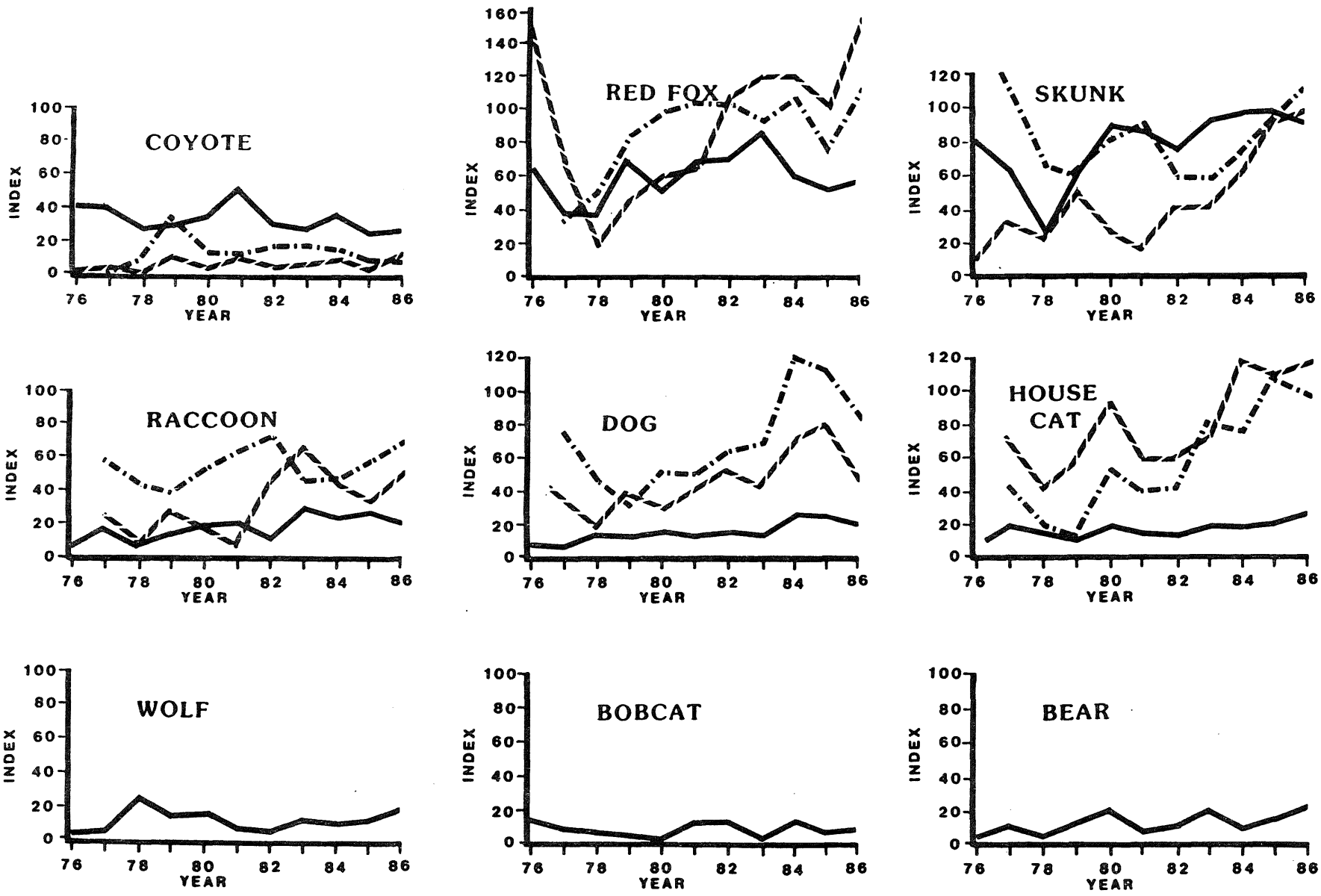

Figure 9. Mean scent post indices for major predator-furbearer species in the Forest, Transition, and Farm Survey Zones, 1976-1986.

FOREST WILDLIFE POPULATIONS AND CENSUSES

Table 17. Mean number of ruffed grouse drums per stop by census zone, 1964-87.

Year	Census Zone					
	Northwest	North	Northeast	Central hardwoods	Southeast	Range-wide mean
1964	0.4	0.7	0.9	0.3	1.3	0.6
1965	1.2	1.2	0.7	0.5	1.4	1.0
1966	1.4	1.4	0.6	0.7	1.9	1.0
1967	2.4	1.8	1.2	1.0	1.0	1.7
1968	3.2	2.3	1.6	1.0	1.3	2.0
1969	3.1	2.5	1.4	1.4	2.3	2.2
1970	1.9	3.1	0.9	1.6	2.1	2.2
1971	1.4	3.5	1.2	1.6	3.7	2.4
1972	2.1	3.7	1.0	2.0	3.1	2.6
1973	0.3	1.5	1.0	0.9	3.6	1.2
1974	0.8	1.1	0.6	0.7	3.0	1.0
1975	1.3	1.4	0.8	0.8	2.0	1.2
1976	0.8	1.5	0.4	0.9	1.8	1.1
1977	0.9	1.6	0.5	0.9	2.4	1.1
1978	2.0	2.4	0.8	1.4	2.5	1.8
1979	1.7	2.2	0.7	1.3	2.1	1.6
1980	1.9	2.2	0.7	1.9	2.7	1.7
1981	1.2	1.7	0.8	1.8	2.3	1.4
1982	0.9	1.1	0.3	0.9	1.1	0.8
1983	0.6	1.1	0.6	0.8	1.4	0.9
1984	1.0	1.1	0.6	0.5	1.4	0.8
1985	0.7	1.2	0.6	0.6	1.5	0.9
1986	1.7	1.1	0.5	0.6	2.5	1.0
1987	1.6	1.6	0.7	0.8	1.0	1.2

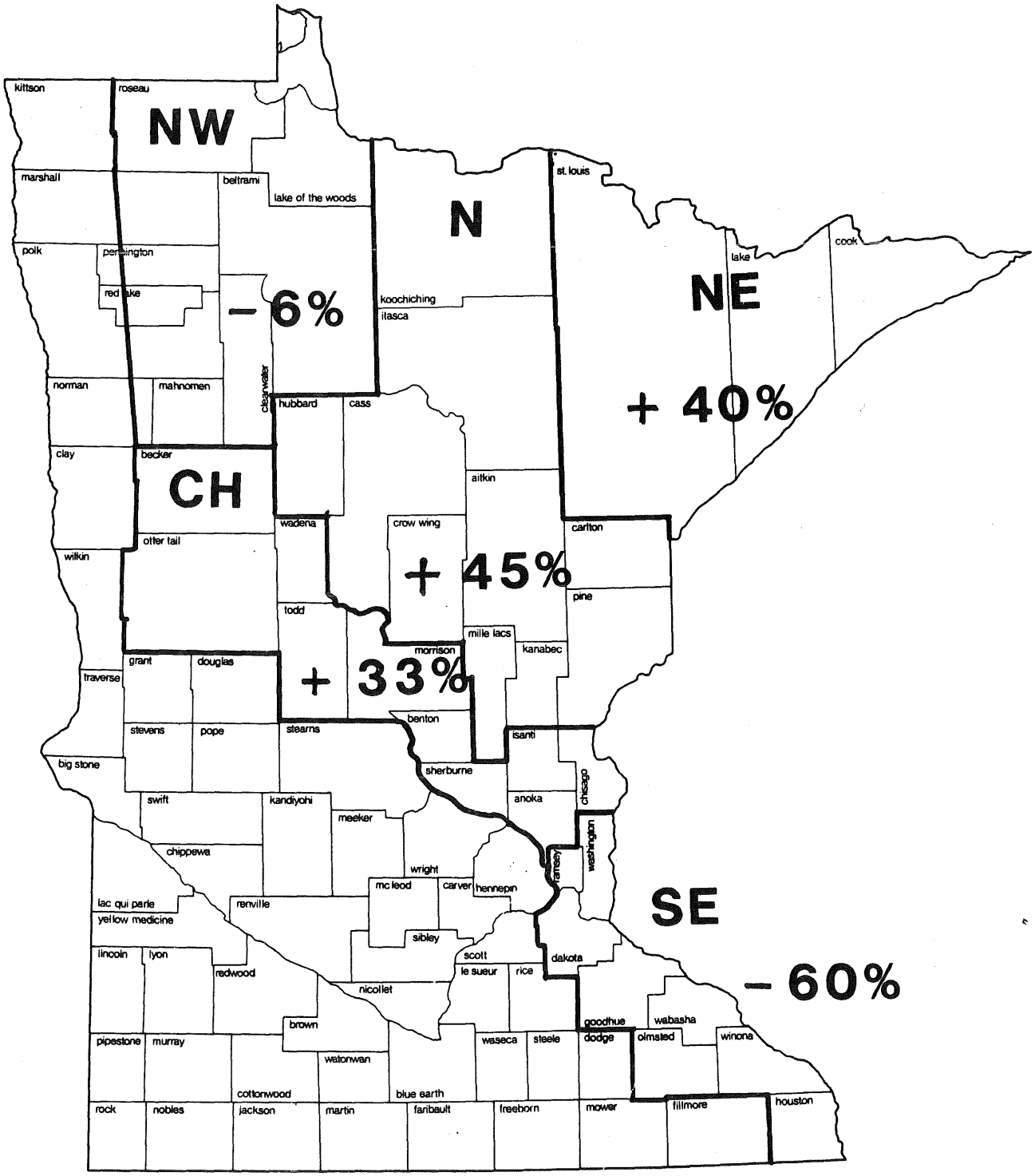

Figure 10. Changes from 1986-87 in average numbers of ruffed grouse drums per stop on roadside counts.

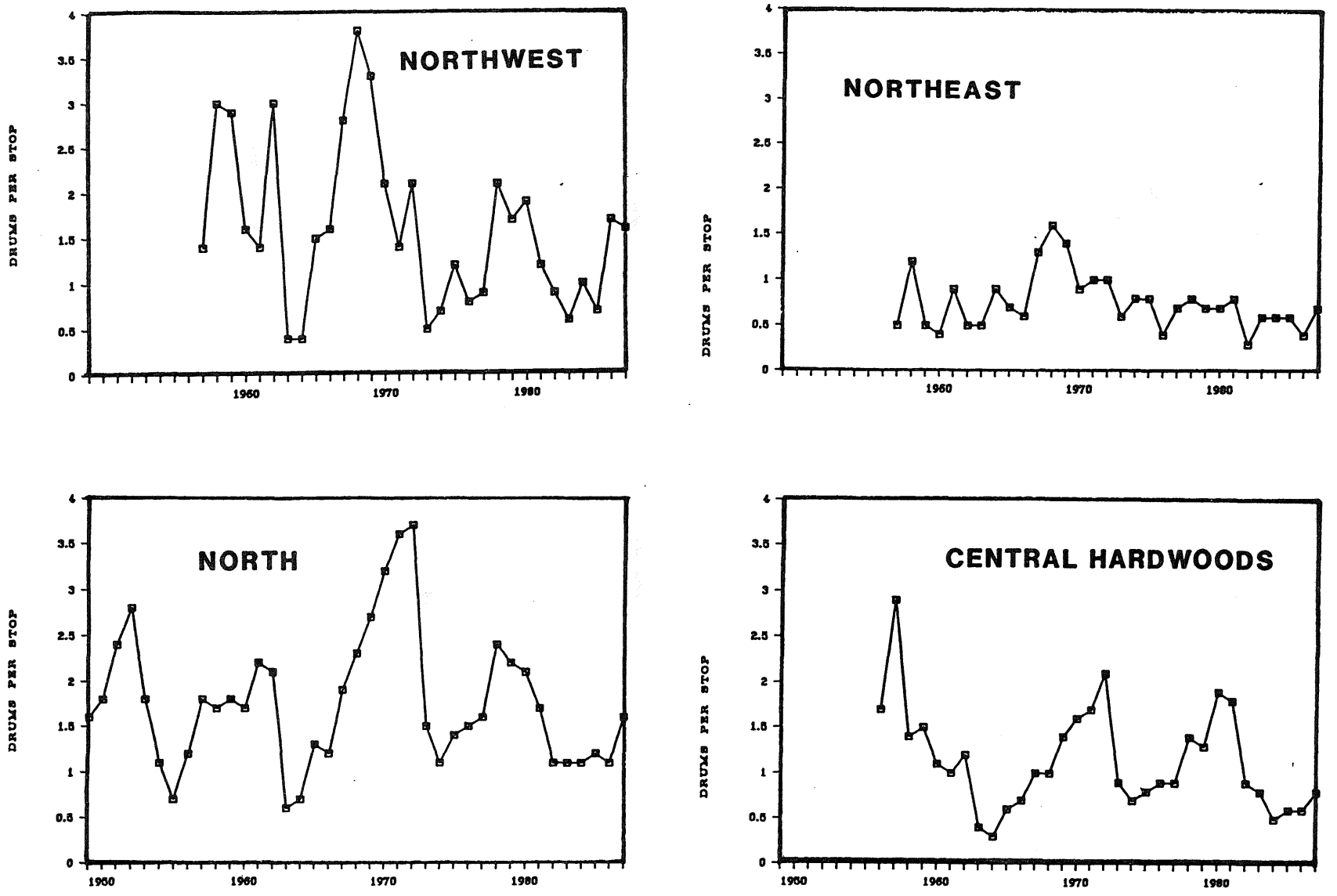

Figure 11. Ruffed grouse drumming trends in the Northwest, Northeast, North, and Central Hardwoods Survey Zones, through 1987.

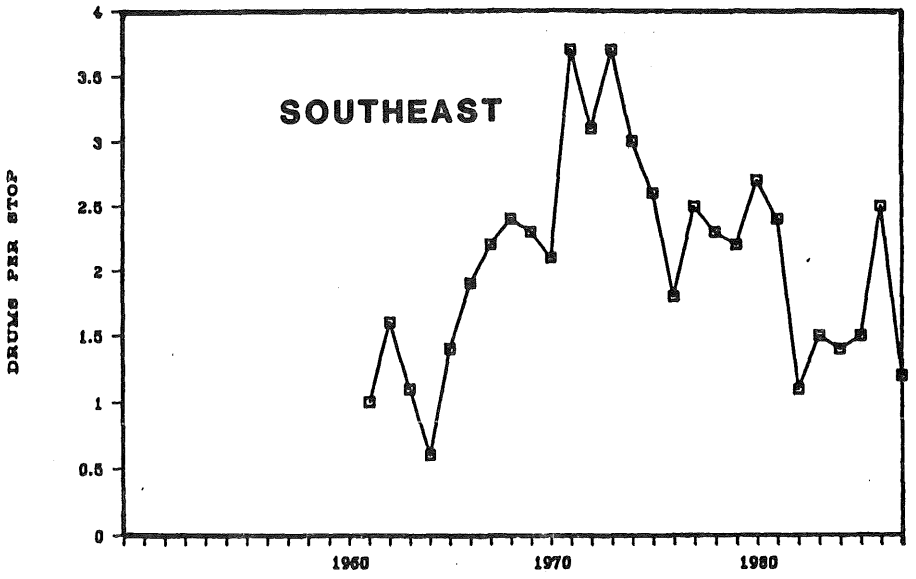

Figure 12. Ruffed grouse drumming trends in southeastern Minnesota, 1961-1987.

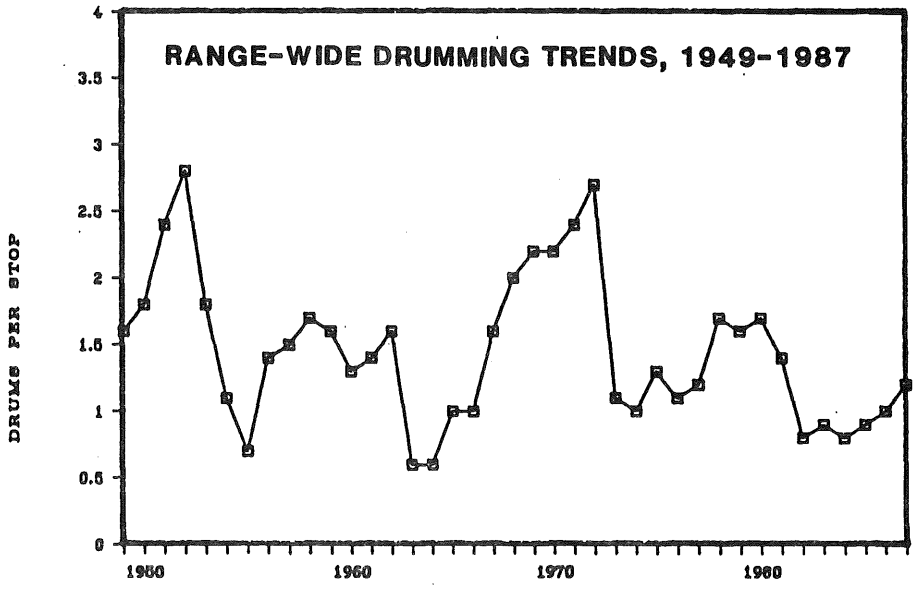

Figure 13. Ruffed grouse drumming trends range-wide, 1949-87.

Table 18. Number of snowshoe hares seen per 100 km of ruffed grouse drumming route in the North, Northwest, and Northeast survey zones, 1974-87.

Year	Hares seen per 100 km
1974	0.4
1975	0.0
1976	2.0
1977	2.8
1978	9.0
1979	8.8
1980	14.1
1981	9.8
1982	1.8
1983	0.7
1984	0.2
1985	0.3
1986	0.2
1987	0.5

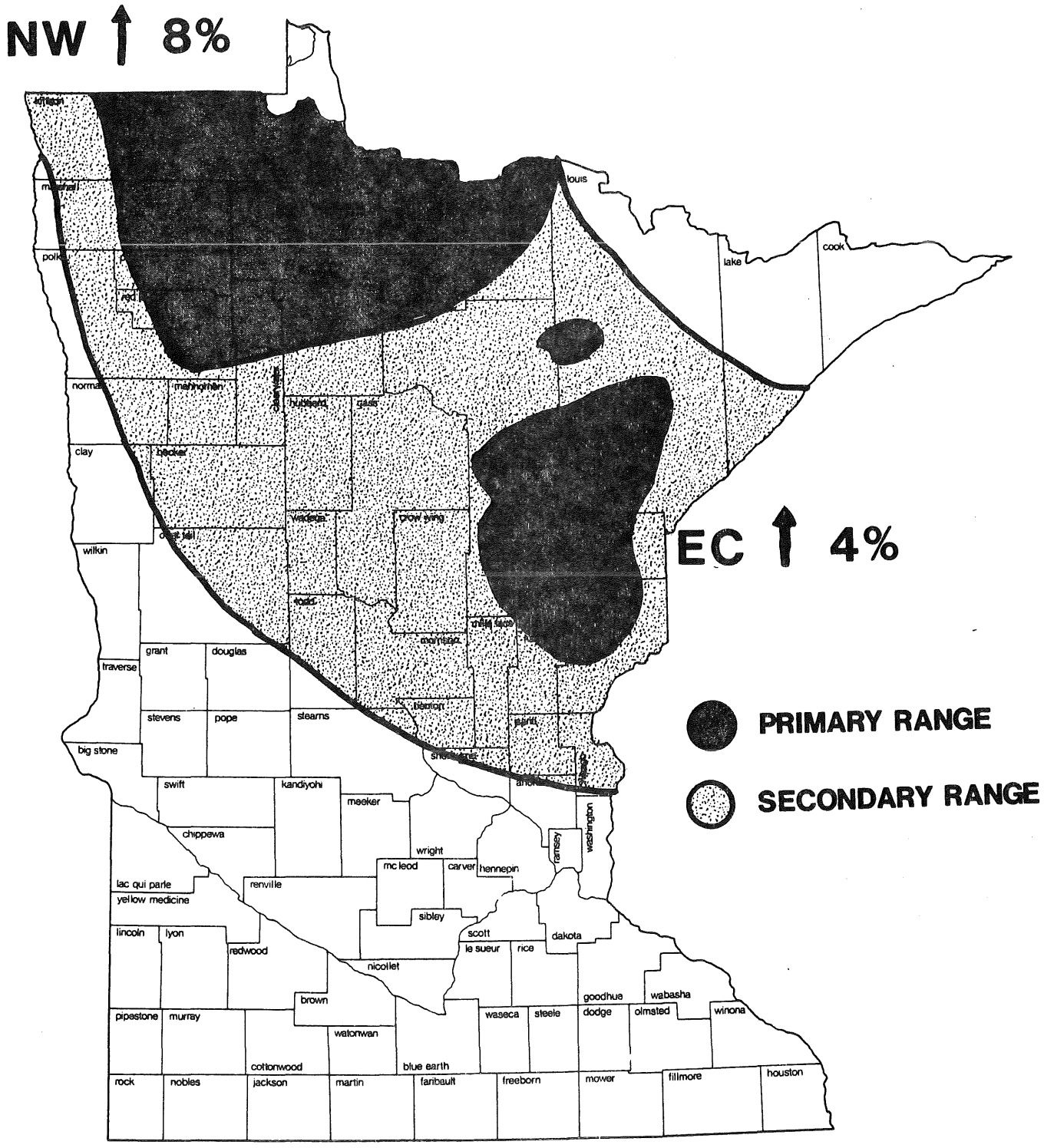

Figure 14. Changes in numbers of dancing male Sharp-tailed grouse on survey areas, 1986-1987.

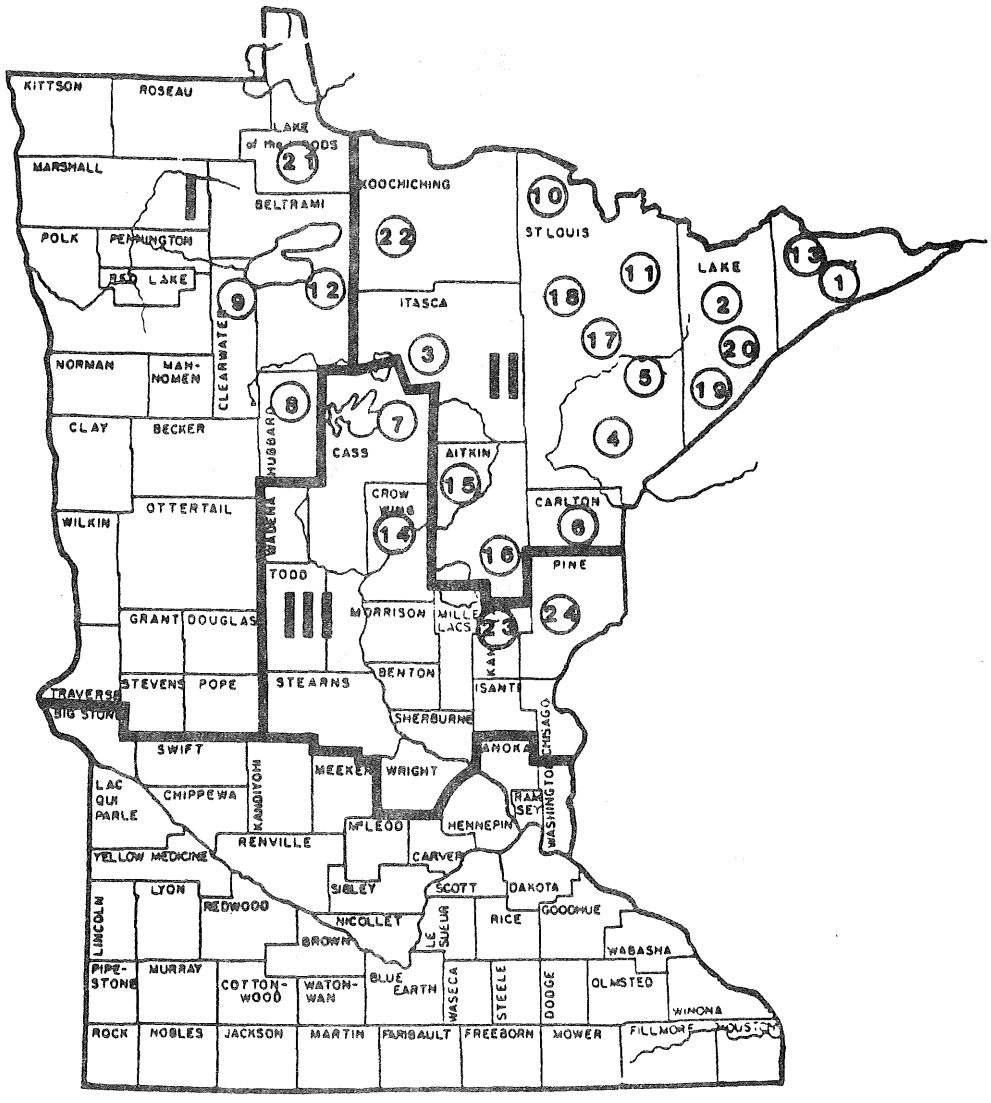

Figure 15. Approximate location of 24 aerial beaver census routes, within DNR Regions I-III.

Table 19. Live beaver colonies per mile of census route in northern Minnesota, 1975-86. Twenty routes were not flown in 1986 due to budget constraints.

Number	Route name	Year											
		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1	Cascade	1.12	0.52	0.39	1.07	-	0.42	0.43	0.40	0.35	0.44	0.46	-
2	Kawishiwi	0.95	-	0.73	0.97	0.68	0.75	0.50	0.72	0.65	0.70	0.78	-
3	Itasca	0.80	0.60	0.74	1.04	0.66	0.63	0.48	0.43	0.57	0.51	0.67	-
4	South St. Louis	0.74	0.63	0.76	0.99	-	0.64	0.74	-	0.58	0.57	0.33	-
5	Central St. Louis	1.23	-	-	1.02	0.95	0.90	0.95	0.65	0.79	0.57	1.05	-
6	Carlton & Pine	0.56	0.26	0.69	0.89	0.60	0.83	0.67	0.22	0.56	0.65	0.45	-
7	Cass	0.80	0.57	0.83	1.03	1.00	0.95	0.53	0.63	0.89	0.99	1.23	-
8	Balsam-Hennepin	0.40	0.28	0.51	0.39	0.55	0.44	0.43	0.60	0.58	0.54	-	-
9	Pinewood-Mississippi	0.32	0.33	0.55	0.32	-	0.38	0.39	0.49	0.48	-	-	-
10	Kabetogama Peninsula	2.21	2.39	2.14	2.91	3.05	2.52	3.55	2.66	2.89	3.30	2.93	2.92
11	Ely-Finger Lakes	1.85	-	1.41	1.59	1.26	1.06	0.98	1.17	1.32	1.02	1.28	-
12	Hay Creek-Kelliher	0.48	0.46	0.68	0.44	-	0.43	0.48	0.70	0.55	-	-	-
13	Cook County Transect	0.57	0.36	0.30	0.49	-	0.23	0.40	0.33	0.48	0.35	0.31	-
14	Cass-Crow Wing	0.67	0.43	0.59	0.70	0.68	0.78	0.61	0.74	0.68	0.76	0.87	0.69
15	Little Willow-Aitkin	0.35	-	0.42	0.45	0.47	0.44	0.38	0.40	0.40	0.31	0.59	-
16	East Aitkin County	0.62	0.47	0.89	1.14	0.96	0.72	0.52	0.86	0.82	0.81	0.90	-
17	West Vermilion	0.93	0.54	1.03	1.25	1.12	0.96	1.05	0.86	0.34	1.07	0.73	0.95
18	Blackduck	1.41	0.97	1.24	1.54	1.31	1.09	1.22	0.91	0.71	1.21	1.53	-
19	Splitrock	1.45	1.21	1.14	1.45	-	1.07	-	-	0.55	0.65	0.56	-
20	Isabella	0.80	0.73	0.66	0.66	0.68	0.60	0.65	-	0.15	-	-	-
21	Red Lake-Pine Island	0.51	0.44	0.63	0.44	0.73	0.40	0.41	0.50	0.39	-	-	-
22	Northome	0.61	0.53	0.75	0.75	0.85	0.86	0.91	0.97	1.06	1.37	0.95	0.80
23	Kanabec County	0.61	0.65	0.84	0.59	0.55	0.70	0.48	0.55	0.65	0.53	0.76	-
24	Southern Pine	0.91	0.88	0.85	0.74	0.88	0.93	0.58	0.76	0.69	0.72	0.86	-
	DNR Region I	0.43	0.38	0.59	0.40	0.64	0.41	0.43	0.57	0.50	0.54	-	-
	DNR Region II	1.01	0.77	0.89	1.14	1.05	0.86	0.90	0.81	0.76	0.90	0.90	-
	DNR Region III	0.75	0.63	0.78	0.77	0.78	0.84	0.55	0.67	0.73	0.75	0.93	-

Registered furbearer population data

The following 4 tables and 4 figures are summaries of data compiled and analyzed by Bill Berg and Dave Kuehn on the four registered furbearers. This information was utilized by the Furbearer Management Committee in setting the 1987-88 seasons on these species.

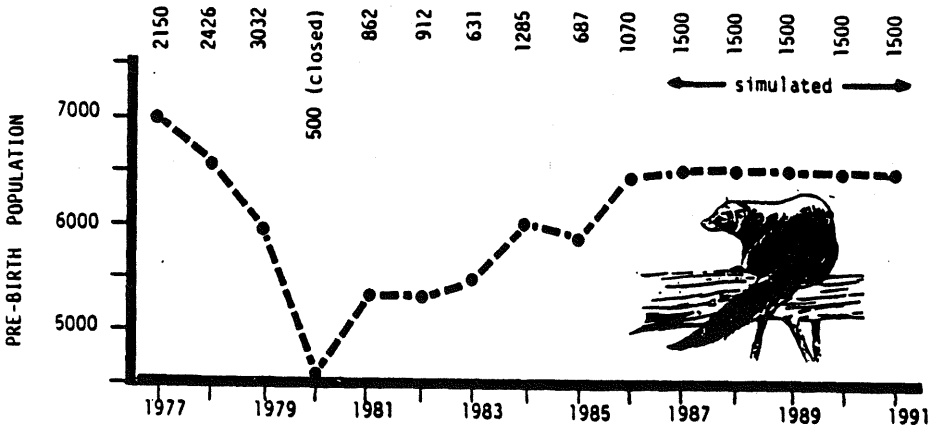

Figure 16. Fisher population model, 1977-1991, with registered harvests until 1986, and simulated registered harvests of 1500 after 1986. Non-harvest mortality is 30% summer, 25% winter for juvs.; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 5-10% in summer and winter, 1983-1987, to compensate for decreased prey availability. Harvest mortality was increased 25% over registration totals to compensate for unregistered and confiscated fisher.

FISHER, 1986-87

During the Nov. 29-Dec. 14 1986 fisher season 1068 fisher were registered. This total was 58% above 1985, and 22% above the 1981-85 mean harvest of 874 (Fig. 16).

A total of 1186 fisher carcasses were examined; the increase over the registered total was due to carcasses received from legal Leech Lake Indian Reservation Harvests, and confiscations by Division of Enforcement.

Juveniles comprised 59% of the harvest, the lowest since carcass examinations began in 1977, and below the 1977-85 mean of 66%. Yearlings and adults were 24% and 18%, respectively, of the harvest. Sex ratios were 48% males in the juvenile cohort (1977-85 $\bar{x}$ = 49%), and 44% males in the $\geq$1.7 year old cohort (1977-85 $\bar{x}$ = 40%). The number of juveniles per adult female ($\geq$2.7 year) remain low (5.3:1), similar to 1985 (5.4:1) and 1979-80 (5.6:1).

The 1986 registered harvest took 11% of the available fall population, compared to 8-15% in 1985-85, and 21-33% in 1977-79. Based on 1987 modeling, the population will stabilize at simulated post-1986 harvests of 1500, and increase about 10% annually with harvests approximating 1200 (Fig. 16).

Table 20. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1977 to 1986. Fisher taken in 1980-81 were on Indian Reservations.

	1977-78	1978-79	1979-80	1980-81	1981	1982	1983	1984	1985	1986
Season	12/1-1/31	12/1-1/31	12/1-1/31	closed	12/1-10	12/1-10	12/1-11	12/1-16	11/30-12/15	11/29-12/14
Limit	3	3	3	---	1	1	1	1	1	1
Registered take	2150	2426	3032	(423)	862	912	631	1289	678	1068
% of available population harvested[a]	24%	28%	39%	8%	15%	14%	9-10%	17-19%	9-12%	10-12%
No. carcasses examined	562	577	467	---	843	1073	662	1270	712	1186
% juveniles	69.2	69.8	64.8	---	66.2	66.4	68.9	62.9	62.8	58.8
% 1.7 yr.	16.4	16.5	14.6	---	23.8	18.9	18.0	19.8	19.6	23.5
% $\geq$ 2.7 yrs.	14.4	13.7	20.6	---	10.0	14.6	13.1	17.2	17.5	17.7
Juv:ad. female ratio	8.4:1	7.1:1	5.6:1	---	10.5:1	9.4:1	8.8:1	7.2:1	5.4:1	5.3:1
% male juveniles	53.5	43.7	53.5	---	48.0	46.0	45.2	51.9	45.8	47.8
% male 1.7 yrs.	28.2	34.7	45.6	---	42.7	40.9	39.5	45.6	40.3	50.4
% male $\geq$ 2.7 yrs.	43.2	27.8	43.8	---	36.9	51.6	40.2	44.7	33.8	36.7
Pelt price: males	$71	$132	$108	$90	$94	$70	$71	$70	$74	$84
females		$147	$128	$104	$110	$99	$121	$122	$130	$162
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Estimated from population model.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming route during the spring after fisher season.

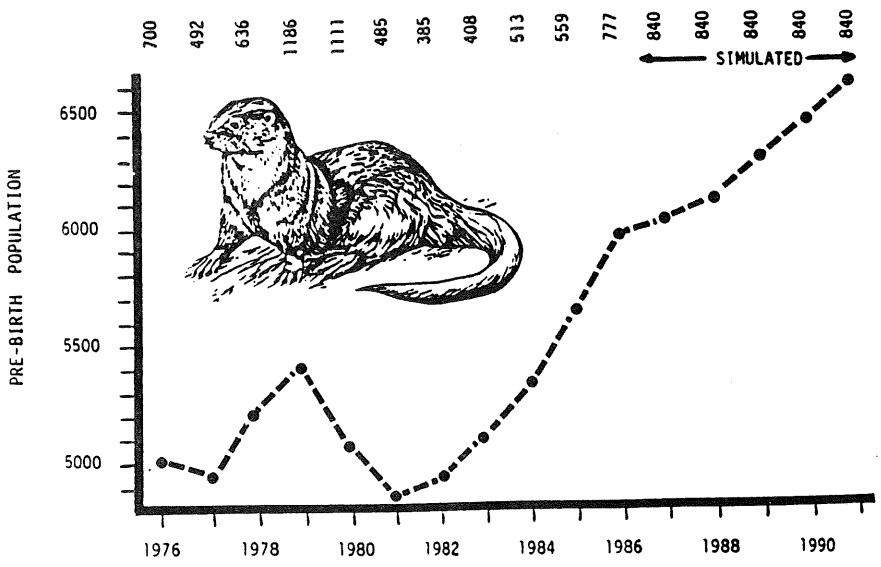

Figure 17. Otter population model, 1976-1991. Actual trapping harvests (top) until 1986 are followed by simulated projected harvests, 1987-1991. Non-harvest mortality for juveniles is 25% summer, 15% winter; for yearlings 10% summer, 10% winter; and for adults 6% summer, 6% winter. Harvest mortality was increased 20% over registration totals to compensate for accidentally trapped and confiscated fisher.

OTTER, 1986-87

During the November 1-30 otter trapping season, 777 otter were registered, up 40% from 1985. The increase was only slightly influenced by the increased otter trapping area (see harvest distribution map).

A total of 745 otter carcasses were aged. Juveniles comprised 45% (1981-85 $\bar{x}$ = 48%), yearlings (1-2 yr.) 23% (1981-85 $\bar{x}$ - 24%), and adults (> 2 yr.) 31% (1985-85 $\bar{x}$ = 21%). The proportions of otters in the juvenile, yearling, and adult age classes approximated their respective percent increases in the overall harvest (50%, 24%, 26%, respectively). The proportion of males in each harvested cohort was 6-9% lower than the 1985-85 means; the overall sex ratio was 48% males (1985-85 $\bar{x}$ - 54% males).

The modeled proportion of the available population harvested in 1986 was 13%, compared to a range of 9%-21% during 1976-85. Registered harvests of 840 annually after 1986 will allow the modeled otter population to increase 1%-3% annually (Fig. 17). If 1050 otters are registered yearly, the modeled population decreases 1%-2% annually after 1987.

Table 21. Otter harvest and sex-age data in Minnesota, 1978-86.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Season dates	12/1-5	11/15-29	11/15-29	11/14-28	11/13-27	11/12-26	11/17-12/1	11/16-12/15	11/1-11/30
Registered harvest	636	1186	1111	485	385	408	529	559	777
% of autumn population harvested[a]	11%	20%	20%	14%	12%	11%	10%	10%	13%
No. carcasses examined	49	36	88	471	389	433	549	572	745
% juveniles	61.2	69.4	54.5	55.0	50.6	42.3	47.9	43.4	45.2
% yearlings	26.5	19.4	14.7	19.7	25.6	30.9	23.3	22.9	23.3
% male juveniles	59.4	72.0	39.6	55.6	56.7	55.7	47.1	53.3	45.1
% males $\geq$ 1.7 yrs.	47.1	36.4	57.5	53.3	65.1	56.8	50.0	50.0	48.4
Mean pelt price:									
otter	$59	$63	$33	$30	$26	$25	$22	$21	$24
beaver (fall)	$18	$33	$18	$14	$11	$12	$12	$15	$20

[a] From population modeling; includes an additional 20% accidental harvest above carcass total. (See Fig. 17).

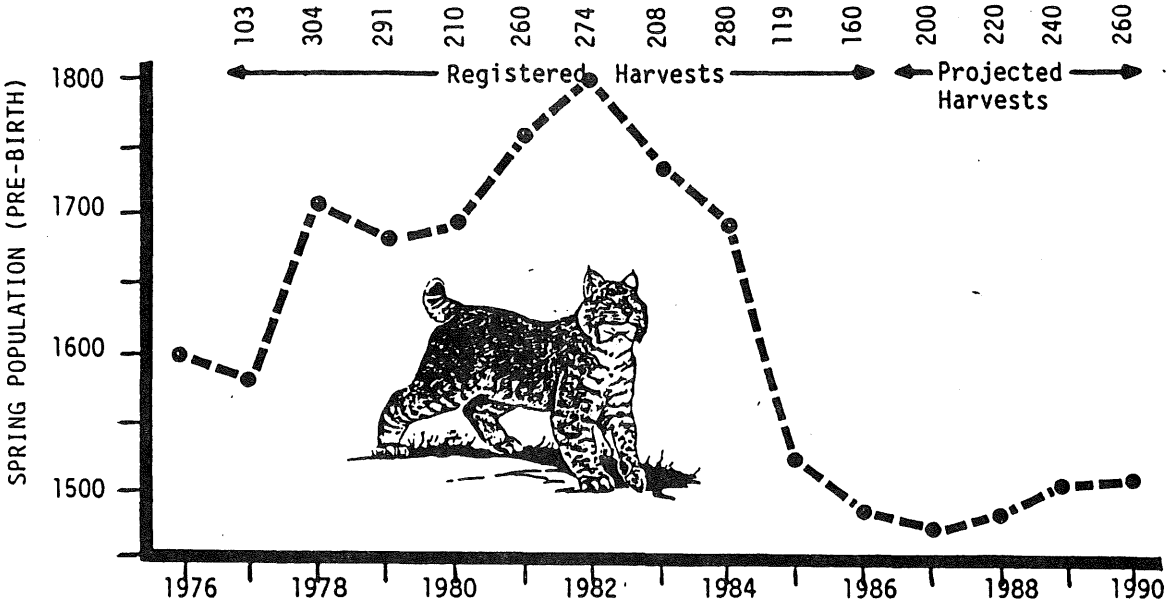

Figure 18. Bobcat population model, 1976-1990, with registered harvests until 1986, and projected harvests thereafter. Non-harvest mortality is 30% summer, 25% winter for juveniles; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 10-30% in summer and winter, 1982-1987, to compensate for decreased prey availability. Registered harvests were increased 10% to compensate for unregistered and confiscated bobcats.

BOBCATS, 1986-87

A total of 160 bobcats were registered during the Nov. 29, 1986 to Jan. 3, 1987 trapping and hunting season, an increase of 34% over 1985-86 but below the 1977-78 to 1984-85 mean of 241 (Fig. 18).

Of a total of 132 carcasses examined, 26% were juveniles ($\leq$1 yr.), 17% were yearlings (1-2 yr.), and 58% were adults ($\geq$2 yr.). The proportion of juveniles was the lowest (range 31-54%), and the proportion of adults ($\geq$2 yr.) was the highest (range 35-52%), since carcass collections began in 1977. Seventy-seven percent of the increase in the 1986-87 bobcat harvest was explained by an increase in the adult cohort harvest. Sex ratios in the juvenile and adult cohorts were unchanged from previous years; the yearling ratio (32% males) was the lowest since collections began ($\bar{x}$ = 56% males).

The 1986-87 harvest took an estimated 9% of the available population. As predicted from the 1985-86 model, this harvest rate stabilized the earlier population decline, and a harvest of approximately 200 in 1987-88 will permit a slight increase (Fig. 18).

Table 22. Bobcat harvest, carcass examination, scent post survey[a], and snowshoe hare index[b] data, 1977-78 to 1986-87.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Season dates	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/23	12/1-1/23	12/1-1/22	12/1-1/20	11/30-1/19	11/29-1/3
Registered take	103	304	291	210	260	274	208	280	119	160
Mean pelt price	$74	$164	$118	$79	$73	$66	$61	$76	$70	$120
No. carcasses	34	113	75	48	230	261	205	288	99	132
% juveniles	35	54	37	31	37	35	37	37	33	26
% 1.7 yrs old	18	15	12	33	23	15	18	13	19	17
% ≥ 2.7 yrs.	47	31	52	35	40	50	37	50	48	58
% male juveniles	50	61	54	80	59	47	56	52	41	53
% male 1.7 yrs.	33	53	44	69	63	49	56	66	41	32
% male ≥ 2.7 yrs.	41	60	53	56	55	47	51	44	43	51
% of autumn population harvested	5	14	14	10	12	14	11	15	7	9
Scent post index[a]	8	6	5	2	14	14	3	12	5	8
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Derived from scent post surveys run the previous autumn in the Forest Zone.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming routes run in spring after the bobcat season.

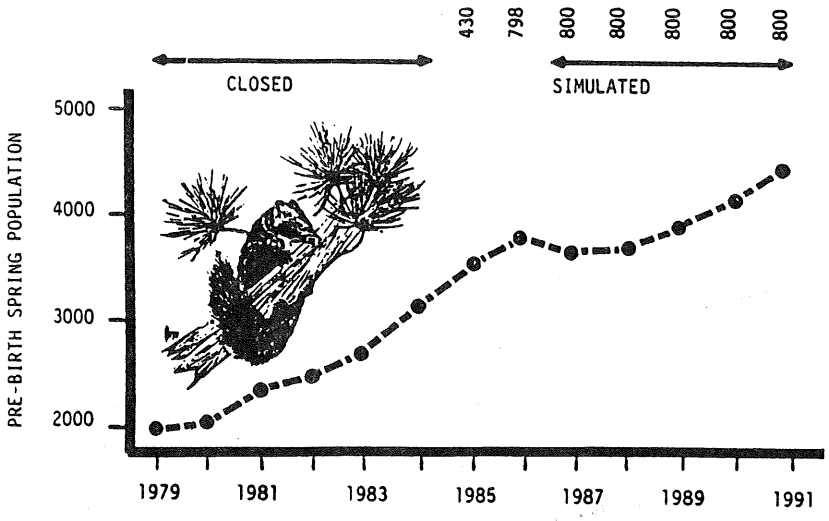

Figure 19. Pine marten population model, 1979 to 1991. Registered harvests are shown at top for 1985 and 1986, followed by projected harvests of 800 after 1986. Respective non-harvest summer-winter mortality for juveniles is 40% and 20%; for yearlings 10% and 10%; and for adults 10% and 10%. For modeling purposes the registered harvest was increased by an additional 50% to account for accidental take.

Table 23. Pine marten harvest and carcass examination data for martens accidentally taken during 1978-84 (combined), and during the 1985 and 1986 seasons.

	1978-84 (combined)	1985	1986
Season dates	----	11/30-12/15	11/29-12/14
Registered take	----	430	798
Carcasses examined	227	507	884
% juveniles	60	73	64
% 1.7 years old	30	18	21
% ≥ 2.7 years old	10	9	15
% male juveniles	68	69	65
% male 1.7 years old	71	68	71
% male ≥ 2.7 years old	91	82	81
Juv/≥ 2.7 year old female	68	45	24
% of autumn population tagged (derived from modeling)	----	18	22

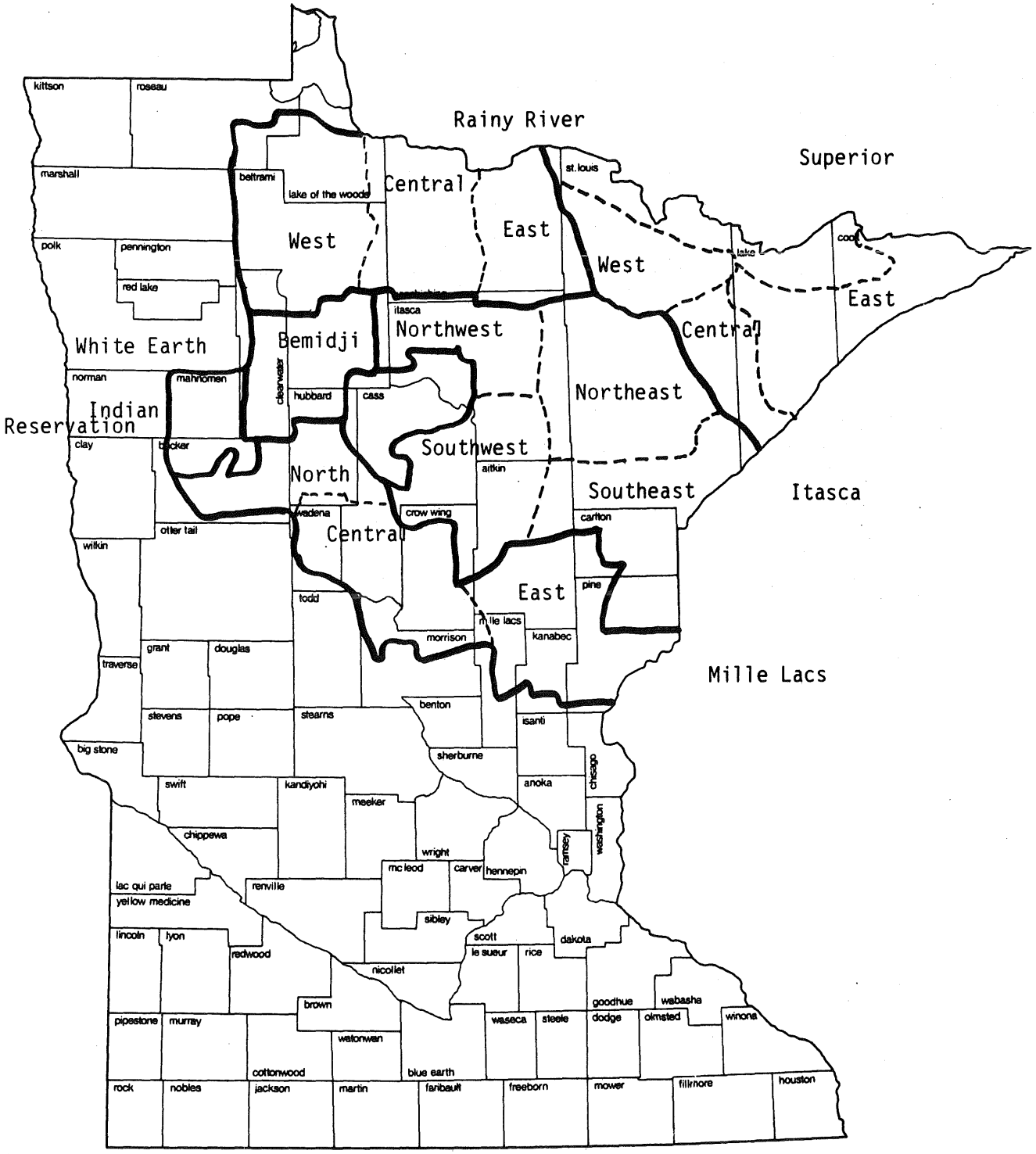

Figure 20. Deer management units and subunits in the Forest Zone.

Table 24. Estimated pre-fawning deer density (deer/sq. mile) as determined by pellet counts, 1980-87. Numbers in parentheses represent 95% confidence intervals.

Area	Year															
	1980		1981		1982		1983		1984		1985		1986		1987	
Itasca DMU																
NW	17.0	(3.9)	22.9	(4.3)	22.4	(4.5)	-------		20.8	(4.2)	29.6	(5.9)	12.4	(2.9)	14.5	(4.5)
SW	14.5	(4.1)	16.9	(4.7)	17.6	(4.7)	21.0	(6.2)	17.0	(3.8)	19.1	(5.0)	12.9	(3.7)	16.1	(4.8)
NE	14.9	(3.6)	16.7	(3.8)	14.1	(3.5)	14.2	(3.6)	11.5	(3.6)	15.8	(3.4)	15.4	(4.5)	18.0	(5.0)
SE	12.0	(5.2)	18.1	(5.3)	10.8	(4.2)	15.4	(4.9)	12.8	(4.0)	18.6	(5.2)	14.0	(3.8)	20.0	(4.2)
Rainy River DMU																
West	10.9	(3.7)	-------		13.9	(5.9)	-------		12.8	(4.2)	-------		7.8	(3.7)	17.4	(5.5)
Central	8.2	(2.6)	-------		11.4	(6.0)	-------		10.7	(6.3)	10.8	(5.3)	13.2	(5.1)	-------	
East	21.8	(6.9)	19.1	(5.1)	9.2	(3.3)	21.8	(6.9)	15.1	(4.1)	16.9	(4.8)	15.6	(5.2)	13.5	(3.8)
Mille Lacs DMU																
West	12.4	(3.3)	17.8	(4.7)	18.0	(5.2)	-------		12.3	(2.7)	18.8	(4.4)	15.2	(4.0)	10.9	(4.5)
Central	7.6	(2.4)	11.3	(4.1)	17.4	(4.7)	16.1	(4.7)	17.2	(4.5)	15.5	(3.7)	13.9	(4.0)	13.2	(4.1)
East	9.4	(2.5)	14.1	(2.8)	14.1	(3.7)	15.8	(3.2)	12.8	(3.2)	10.9	(2.7)	9.8	(2.7)	12.3	(2.9)
Superior DMU[a]																
West	15.1	(3.4)	21.4	(5.0)	15.4	(2.9)	-------		18.2	(7.1)	24.4	(4.0)	21.8	(5.4)	16.6	(3.7)
Central	10.2	(3.3)	15.2	(5.6)	16.2	(10.2)	-------		14.1	(5.2)	15.0	(3.2)	13.3	(6.0)	17.0	(5.5)
East	4.8	(1.7)	-------		-------		-------		-------		-------		-------		-------	
Bemidji DMU	-------		11.4	(3.5)	17.7	(5.4)	20.1	(6.9)	14.9	(3.8)	12.9	(4.0)	11.8	(3.3)	13.0	(3.7)
Agassiz NWR	12.4	(6.7)	21.3	(6.7)	24.4	(8.8)	25.6	(8.4)	-------		-------		-------		-------	
Aitkin County	19.5	(5.7)	15.9	(4.0)	23.0	(7.5)	26.3	(6.2)	19.2	(5.8)	21.1	(6.0)	18.4	(6.0)	19.1	(4.2)
Aitkin SE1/4 T44, R22	-------		19.6	(5.8)	-------		24.8	(7.0)	10.2	(3.7)	10.3	(2.7)	30.3	(8.8)	-------	
Bearville Study Area	31.2	(9.5)	39.4	(6.9)	39.5	(8.7)	38.0	(5.8)	15.6	(4.3)	42.9	(7.2)	21.1	(4.4)	-------	
Camp Ripley	17.0	(5.1)	19.2	(5.2)	31.0	(8.2)	31.6	(7.1)	47.0	(12.4)	39.3	(9.7)	30.5	(9.7)	38.7	(11.8)
Chippewa NF	-------		-------		15.8	(4.2)	17.6	(3.9)	15.9	(3.5)	19.1	(3.4)	12.5	(2.2)	13.7	(2.1)
Elephant Lake	31.3	(6.5)	36.9	(6.2)	-------		34.0	(8.0)	39.0	(13.0)	-------		-------		-------	
Garden Lake Deer Yard	-------		-------		-------		-------		-------		30.6	(7.5)	13.2	(4.0)	-------	
Itasca County	-------		-------		-------		-------		18.7	(3.2)	23.6	(3.9)	12.6	(2.4)	-------	
Leech Lake IR	-------		-------		13.3	(3.6)	14.1	(3.7)	11.8	(3.8)	11.9	(2.9)	8.6	(2.4)	8.6	(2.0)
Mille Lacs WMA	24.9	(6.6)	30.5	(11.2)	35.7	(11.7)	24.2	(6.6)	17.5	(4.5)	10.0	(3.7)	15.6	(7.4)	16.9	(4.5)
St. Croix State Park	45.0	(21.2)	39.6	(9.6)	53.3	(14.7)	41.6	(9.5)	49.8	(11.9)	-------		-------		34.7	(9.2)
Tamarac NWR	-------		70.7	(13.5)	69.1	(25.3)	62.5	(14.7)	46.7	(14.0)	36.5	(11.0)	40.1	(12.0)	26.7	(8.2)
White Earth IR	6.3	(2.9)	4.1	(1.9)	10.1	(5.8)	11.4	(4.3)	10.2	(4.9)	17.3	(5.6)	8.9	(3.8)	9.9	(3.8)

[a] No pellet counts were conducted in the Boundary Waters Canoe Area or the Voyageurs National Park.

Table 25. Spring deer densities estimated from population modeling in DMU's of Minnesota's Forest zone, 1982-87.

DMU	Deer per square mile						Goal
	1982	1983	1984	1985	1986	1987	
Itasca							
Northwest	22.3	21.9	20.2	18.4	16.2	14.7	15-20
Southwest	18.1	17.9	17.3	16.6	15.5	15.0	15-20
Northeast	14.9	15.2	15.3	15.7	15.8	15.8	15-20
Southeast	15.9	16.4	16.2	16.3	16.3	16.1	10-15
Bemidji	20.0	19.6	17.8	15.2	13.4	11.8	10-15
Leech Lake I.R.	13.3	12.6	11.4	10.5	9.6	8.4	10-15
Mille Lacs							
West	18.0	17.8	16.6	14.9	13.4	12.5	10-15
Central	17.5	18.4	17.7	15.6	13.9	12.0	10-15
East	13.2	13.0	12.3	11.5	11.2	11.2	10-15
White Earth I.R.	10.1	10.3	10.3	10.3	10.2	10.1	10-15
Rainy River							
West	14.0	13.8	13.1	12.1	11.3	11.5	10-15
Central	11.4	11.6	11.0	10.7	10.8	10.9	10-15
East	15.9	16.3	16.0	15.9	15.7	15.6	15-20
Superior							
West	18.6	19.3	19.5	19.6	19.3	18.8	15-20
Central	13.7	14.2	14.3	14.6	14.6	14.5	10-15

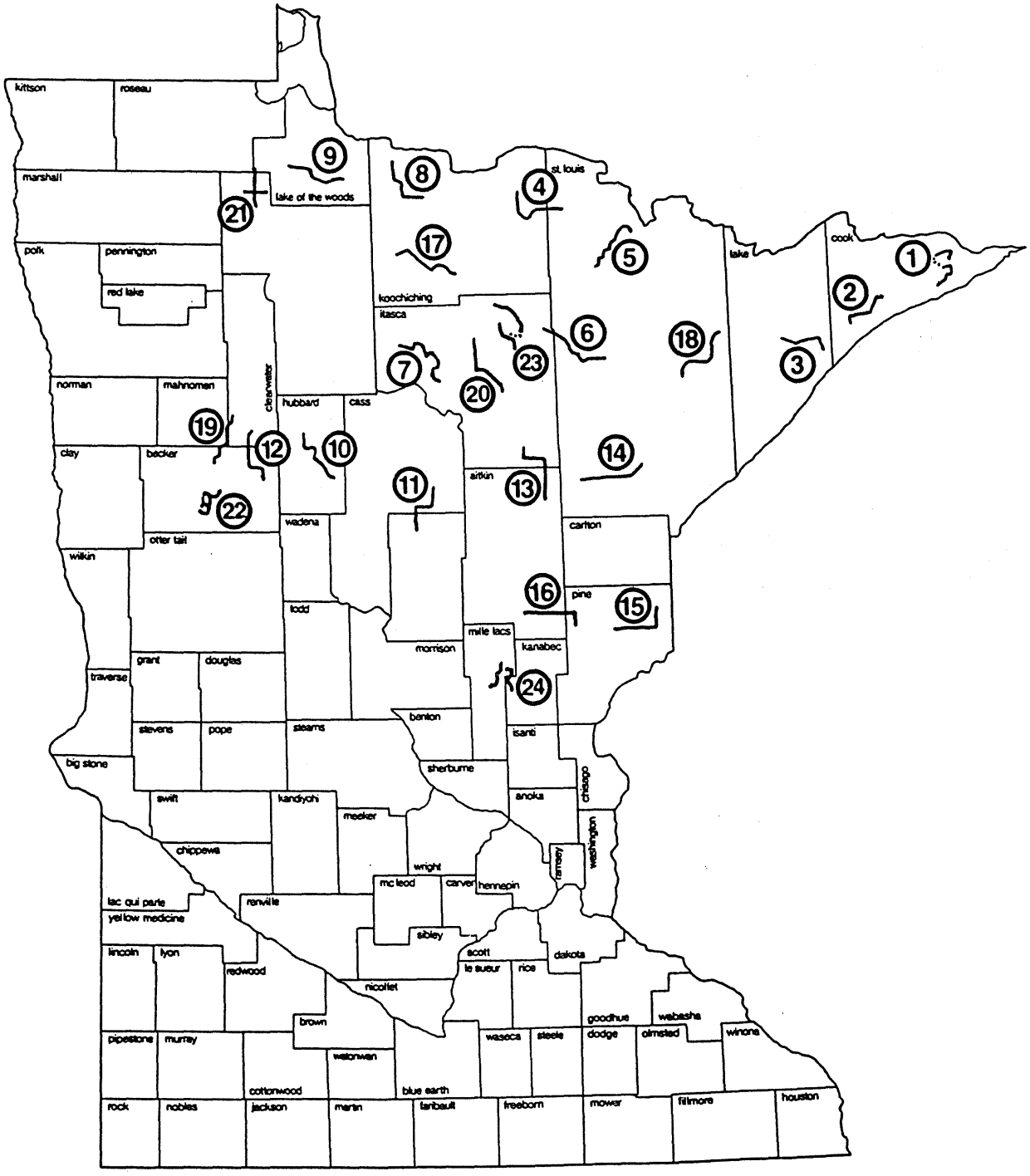

Figure 21. Location of 24 bear bait routes.

Table 26. Percentage of baits on each bait route taken by bears. All baits (50 per route) except those entirely removed by other animals were considered available to bears. Location of routes is shown in Fig. 21.

Route No.	1980[a]	1981	1982	1983	1984	1985	1986	1987
1	16	33	22	41	38	22	10	17
2	32	22	14	15	10	30	22	38
3	10	2	37	44	14	26	38	38
4	24	60	22	54	33	47	45	49
5	26	54	31	44	28	29	45	28
6	21	27	17	18	30	44	37	26
7	23	45	19	43	18	26	47	22
8	16	14	8	10	44	46	69	41
9	20	40	16	27	20	30	15	10
10	6	23	26	44	24	31	22	15
11	4	22	12	31	21	39	38	22
12	11	44	22	65	37	27	21	21
13	12	40	24	40	30	33	34	26
14	10	4	16	14	4	18	11	27
15	6	36	24	22	24	35	30	34
16				36	24	19	38	23
17				19	49	66	24[b]	28
18				8	20	42	20	43
19				28	10	18	25	15
20		48	69	66	35	45	40	20
21					6	6	2	19
22					20	8	14	11
23						28	40	36
24						20	35	54
Mean of all routes	16	32	24	33	24	31	30	28
Mean of routes 1-15 & 20		32	24	36	26	33	33	27

[a] 1980 data may not be directly comparable to other years because a different type of bait was used, and all routes except #1, 2, 3, 6 & 14 were conducted after July 14.

[b] Vehicle breakdown; only 29 baits set.

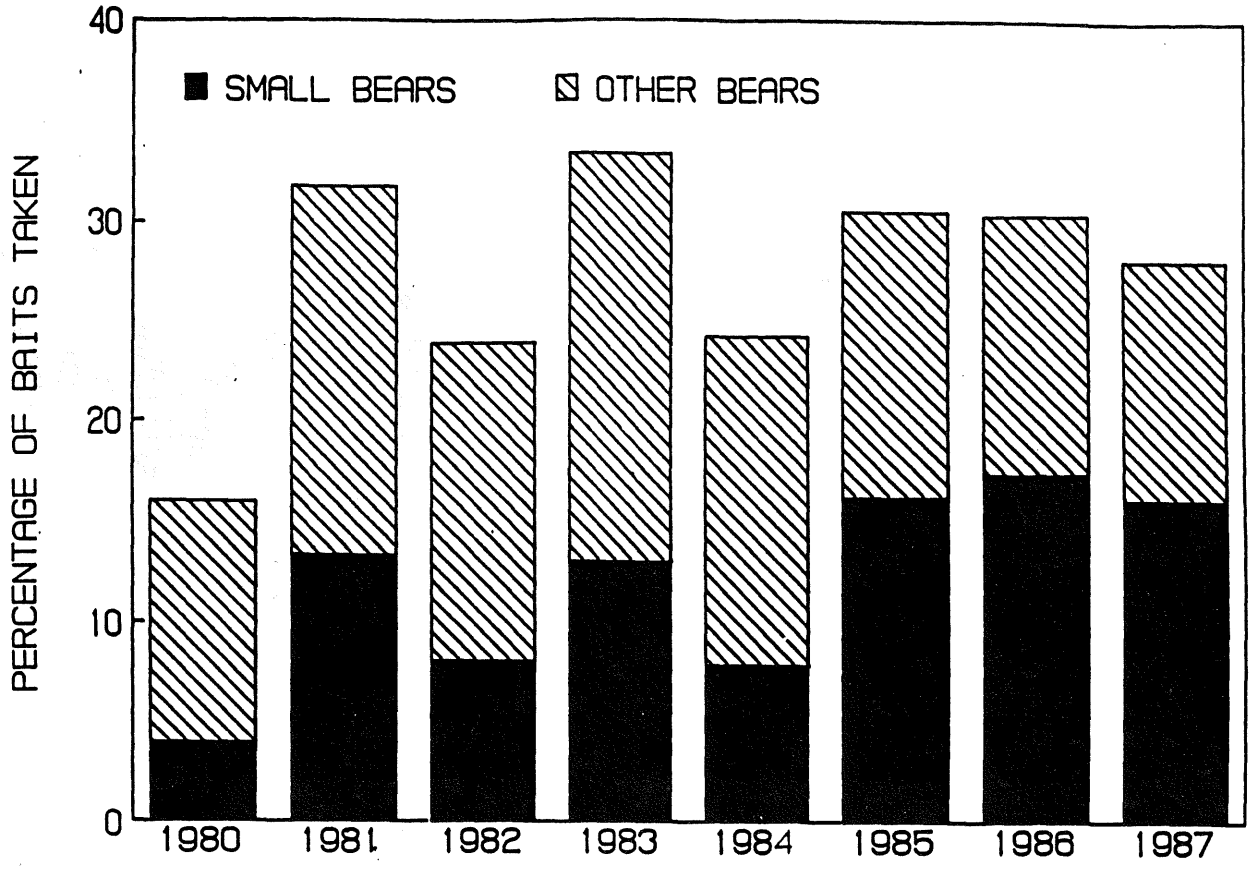

Figure 22. Percentage of baits taken by bears during bait-station survey in early July, 1980-87. Bear visitation typically was indicated by claw marks on the bait tree. Small bears were identified by claw marks low on the tree, where the hind feet were used to enable the bear to reach the bait. Data from 1980 may not be comparable to other years because a different type of bait was used and most of the routes were run 2-3 weeks later than in other years.

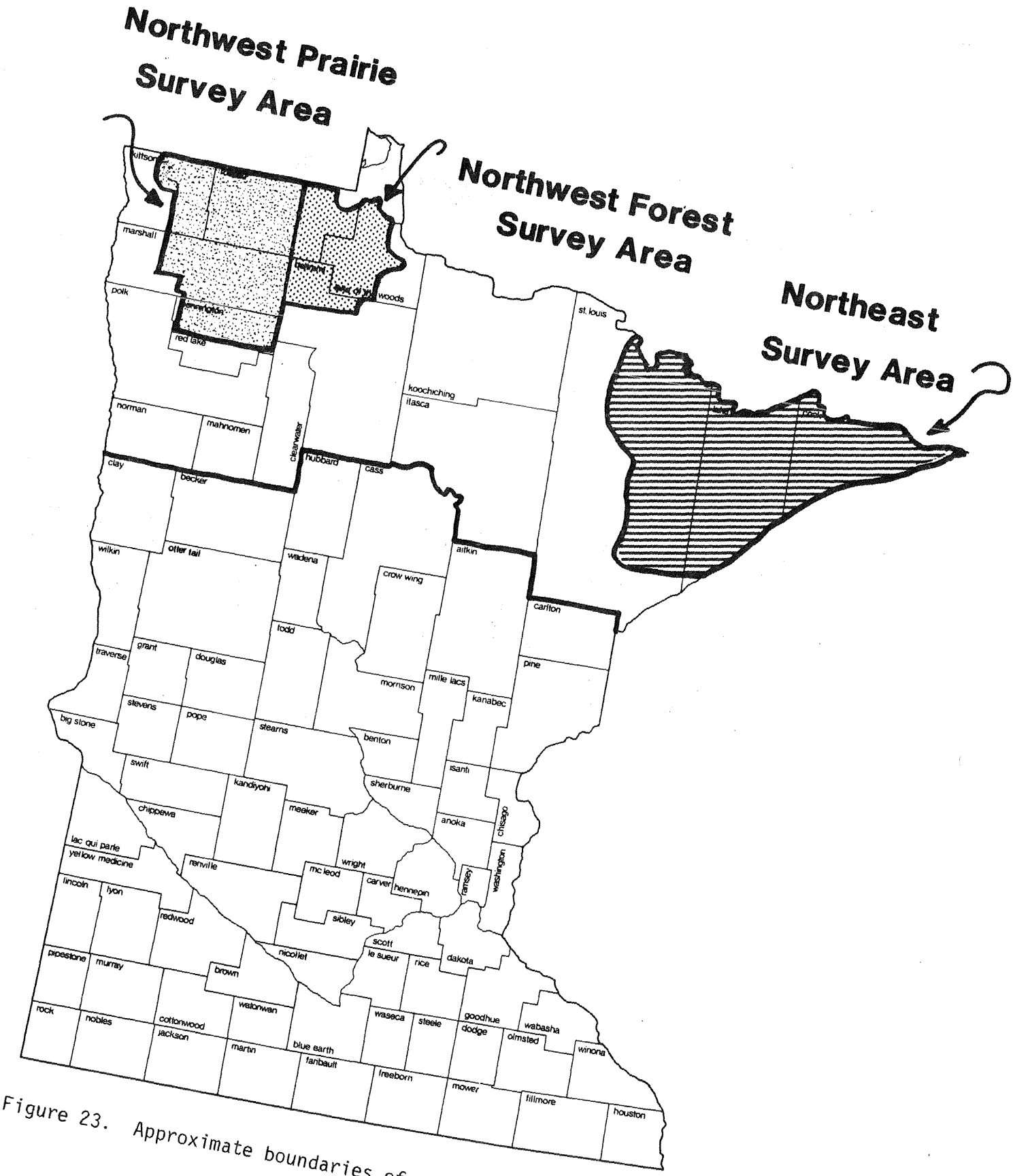

Figure 23. Approximate boundaries of aerial moose survey.

Table 27. Moose population estimates from aerial moose survey in Minnesota (± 90% Confidence Interval).

Area	Sq. miles[a]	1982-83	1983-84	1984-85	1985-86	1986-87	% change 1985-86 to 1986-87
Northeast	4809	4877 (999)	4274 (925)	5518 (1494)	4955 (1034)	6120 (1438)	+23.5
Northwest Forest	1779	370 (124)	446 (139)	578 (148)	433 (100)	307 (83)	-29.1
Northwest Prairie	2126	3772 (930)	2784 (567)	4086 (518)	3415 (412)	3740 (747)	+ 9.5

[a] Total land area within survey zone excluding agricultural areas. Does not include area of lakes more than 10 acres.

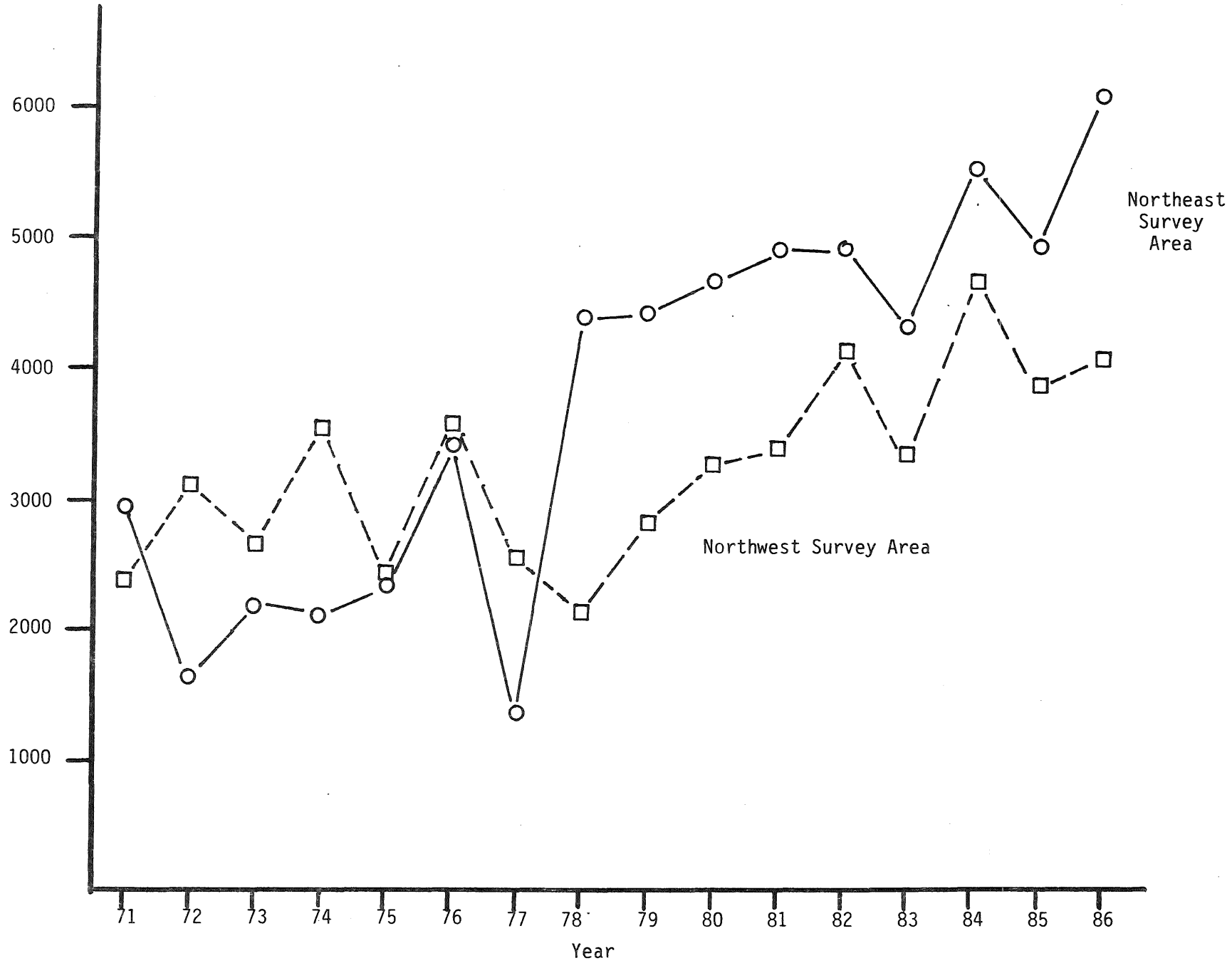

Figure 24. Moose population estimates in the two survey areas, 1971-1986. (Northwest prairie and Northwest forest areas combined in Northwest Survey Area).

MIGRATORY BIRD POPULATIONS AND CENSUSES

Table 28. Estimated number of breeding ducks in Minnesota Strata I, II and III (1968-1987).

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Mallard	1968	45,005	2.04	92,000
	1969	53,167	1.67	89,000
	1970	67,463	1.72	116,000
	1971	48,807	1.64	80,000
	1972	49,137	1.27	62,000
	1973	64,954	1.32	85,000
	1974	52,917	1.67	88,000
	1975	55,666	1.60	89,000
	1976	70,362	1.81	127,000
	1977	60,755	2.27	138,000
	1978	56,152	2.70	152,000
	1979	63,516	2.70	171,000
	1980	83,775	1.99	167,000
	1981	80,110	2.19	175,000
	1982	51,655	2.66	137,000
	1983	74,995	2.04	153,000
	1984	94,514	2.22	210,000
	1985	96,045	2.32	223,000
	1986	108,328	2.16	234,000
	1987	165,881	1.16	192,000
Blue-winged teal	1968	64,431	2.44	157,000
	1969	45,180	3.70	167,000
	1970	31,682	5.00	158,000
	1971	43,464	3.45	150,000
	1972	49,926	1.96	98,000
	1973	127,398	2.17	276,000
	1974	46,941	2.70	128,000
	1975	45,727	3.20	146,000
	1976	90,023	4.16	374,000
	1977	37,532	5.26	197,000
	1978	28,491	8.33	237,000
	1979	46,825	4.54	213,000
	1980	51,185	6.25	320,000
	1981	64,546	4.17	269,000
	1982	42,167	6.45	272,000
	1983	44,028	2.24	99,000
	1984	89,897	2.93	263,000
	1985	90,453	3.23	292,000
	1986	68,234	2.69	184,000
	1987	102,479	1.99	204,000

Table 28. Continued.

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Other ducks[b]	1968	57,790	2.06	119,000
	1969	44,324	2.27	101,000
	1970	42,927	2.25	97,000
	1971	35,986	2.22	80,000
	1972	45,927	1.67	77,000
	1973	101,671	1.96	199,000
	1974	84,460	2.44	206,000
	1975	43,894	3.60	141,000
	1976	62,205	2.41	148,000
	1977	21,650	4.34	94,000
	1978	43,071	4.16	150,000
	1979	39,749	3.70	147,000
	1980	55,372	2.77	153,000
	1981	50,792	3.37	171,000
	1982	54,018	5.18	280,000
	1983	42,649	3.74	160,000
	1984	56,008	1.84	103,000
	1985	42,428	2.06	87,000
	1986	45,147	2.59	117,000
	1987	87,052	2.51	219,000
All ducks	1968	167,226	--	368,000
	1969	142,671	--	357,000
	1970	142,072	--	371,000
	1971	128,257	--	310,000
	1972	144,990	--	237,000
	1973	294,023	--	561,000
	1974	184,318	--	422,000
	1975	145,287	--	376,000
	1976	222,590	--	649,000
	1977	119,937	--	429,000
	1978	121,451	--	539,000
	1979	150,090	--	531,000
	1980	194,883	--	640,000
	1981	195,448	--	615,000
	1982	147,840	--	689,000
	1983	161,672	--	412,000
	1984	240,419	--	576,000
	1985	228,926	--	602,000
	1986	221,709	--	534,000
	1987	355,412	--	615,000

[a] Visibility factors for all ducks are calculated without mallards and blue-winged teal. The 1981 values for mallards and blue-winged teal are unweighted.

[b] 1979 excludes 156,000 lesser scaup and 1982 includes 120,000 lesser scaup.

Table 29. Winter population estimates (post hunting season) of the Canada goose eastern prairie flock, 1963-86 (taken from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp).

Year	Population
1963	110,000
1964	103,000
1965	104,000
1966	121,000
1967	145,000
1968	134,000
1969	107,000
1970	121,000
1971	152,000
1972	177,000
1973	187,000
1974	188,000
1975	199,000
1976	254,000
1977	270,000
1978	207,000
1979	172,000
1980	151,000
1981	175,000[a]
1982	210,000
1983	163,000[b]
1984	168,000
1985	169,000
1986	183,000

[a] In 1983, U.S.F.W.S. revised a previously published estimate (145,000) due to supplemental information.

[b] Supplemental information suggests that the 1983 population was 170,000 - 190,000 birds.

Table 30. Summary of the number of May ponds (adjusted for visibility) in Prairie Canada (portions of Alberta, Saskatchewan and Manitoba) 1961-87 and north-central U.S. (North Dakota, South Dakota and Montana) 1974-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service, 1987. 1987 Status of waterfowl and fall flight forecast. July 1987. 40pp).

Year	Ponds (thousands)	
	Prairie Canada	North Central U.S.[a]
1961	2,006	--
1962	2,531	--
1963	2,499	--
1964	3,445	--
1965	4,415	--
1966	4,672	--
1967	4,732	--
1968	1,938	--
1969	3,530	--
1970	4,957	--
1971	4,096	--
1972	4,065	--
1973	2,937	--
1974	6,693	1,509
1975	6,267	1,911
1976	5,057	1,392
1977	2,278	771
1978	3,622	1,590
1979	4,859	1,522
1980	2,141	761
1981	1,443	683
1982	3,185	1,458
1983	3,906	1,259
1984	2,458	1,766
1985	4,283	1,327
1986	4,025	1,735
Average	3,694	1,360
1987	2,598	1,348
% Change in 1987 from:		
1986	-35	-22
Average	-30	- 1

[a] No comparable survey data available for the north-central U.S. during 1961-73.

Table 31. North American breeding population estimates for 10 species of ducks, 1955-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp). In thousands.[a]

Year	Mallard	Gadwall	American wigeon	Green-winged teal	Blue-winged teal	Northern shoveler	Northern Pintail	Redhead	Canvasback	Scaup
1955	10,345	1,106	3,333	2,076	6,436	1,965	9,251	733	595	7,100
1956	11,711	1,202	3,712	1,898	6,267	2,084	10,124	928	692	6,595
1957	10,946	1,102	3,208	1,293	5,449	1,744	6,856	684	600	6,535
1958	12,904	687	3,372	1,618	5,799	1,515	6,889	524	713	6,040
1959	10,292	683	3,779	3,153	5,300	1,649	7,228	641	481	8,220
1960	8,206	873	3,165	1,630	4,303	1,859	5,769	542	575	5,566
1961	8,290	1,422	3,219	2,216	4,833	1,625	4,860	437	396	6,764
1962	6,144	1,610	2,721	1,119	3,890	1,633	4,299	664	385	6,398
1963	7,360	1,578	2,209	1,754	4,587	1,435	4,361	396	523	6,564
1964	6,974	1,223	2,630	2,051	4,943	1,685	4,111	560	658	6,326
1965	5,948	1,692	2,695	1,526	4,628	1,607	4,301	568	505	5,383
1966	7,401	1,976	2,901	2,219	5,616	2,272	5,777	747	683	5,421
1967	8,205	1,638	2,637	1,944	4,715	2,244	5,870	846	556	5,877
1968	7,586	2,098	2,783	1,805	3,697	1,811	4,225	502	557	5,971
1969	8,065	1,837	3,192	1,991	4,514	2,150	6,390	759	530	6,338
1970	10,379	1,698	3,752	2,259	5,633	2,269	7,004	834	601	6,930
1971	9,843	1,733	3,425	2,352	5,426	2,052	6,291	693	441	6,149
1972	9,867	1,776	3,428	2,407	5,673	2,505	7,875	489	429	9,527
1973	8,781	1,198	3,665	2,444	4,866	1,657	5,114	754	696	7,535
1974	7,392	1,562	3,003	2,221	5,437	2,060	7,165	613	493	7,045
1975	8,109	1,672	2,862	2,038	6,441	1,994	6,387	974	706	7,846
1976	8,637	1,478	2,699	1,844	5,023	1,818	6,045	946	686	6,973
1977	8,226	1,546	2,678	1,952	4,626	1,616	4,971	688	702	7,490
1978	7,695	1,593	3,808	2,978	4,497	2,162	5,664	833	423	7,125
1979	8,444	1,889	3,388	2,920	5,278	2,555	6,070	774	606	9,135
1980	8,003	1,459	3,857	2,925	4,903	2,050	5,420	1,146	688	7,690
1981	6,757	1,479	3,555	2,515	4,076	2,403	4,227	825	594	7,253
1982	6,684	1,690	3,159	2,247	3,879	2,540	4,112	674	543	6,549
1983	7,107	1,536	2,923	2,574	3,381	2,237	4,086	866	528	8,788
1984	5,974	1,799	3,979	1,804	3,870	2,222	3,664	849	569	8,402
1985	5,475	1,410	2,506	1,873	3,756	1,925	2,935	701	411	6,235
1986	6,303	1,590	2,446	2,588	4,664	2,403	3,201	956	442	6,252
1987	6,691	1,705	2,734	3,041	3,618	2,229	3,137	767	478	6,261
Goals[b]	8,700	1,600	3,300	2,300	5,300	2,100	6,300	760	580	7,600
1955-86 Ave.	8,252	1,495	3,147	2,132	4,888	1,992	5,642	723	563	6,938
Percent Change in 1987 From:										
1986	+ 6	+ 7	+12	+18	-22	- 7	- 2	-20	+ 8	NC
1955-86 Ave.	-19	+14	-13	+43	-26	+12	-44	+ 6	-15	-10

[a] All duck indexes adjusted for visibility bias.

[b] Breeding duck population goals, from North American Waterfowl Management Plan (FWS-CWS 1986).

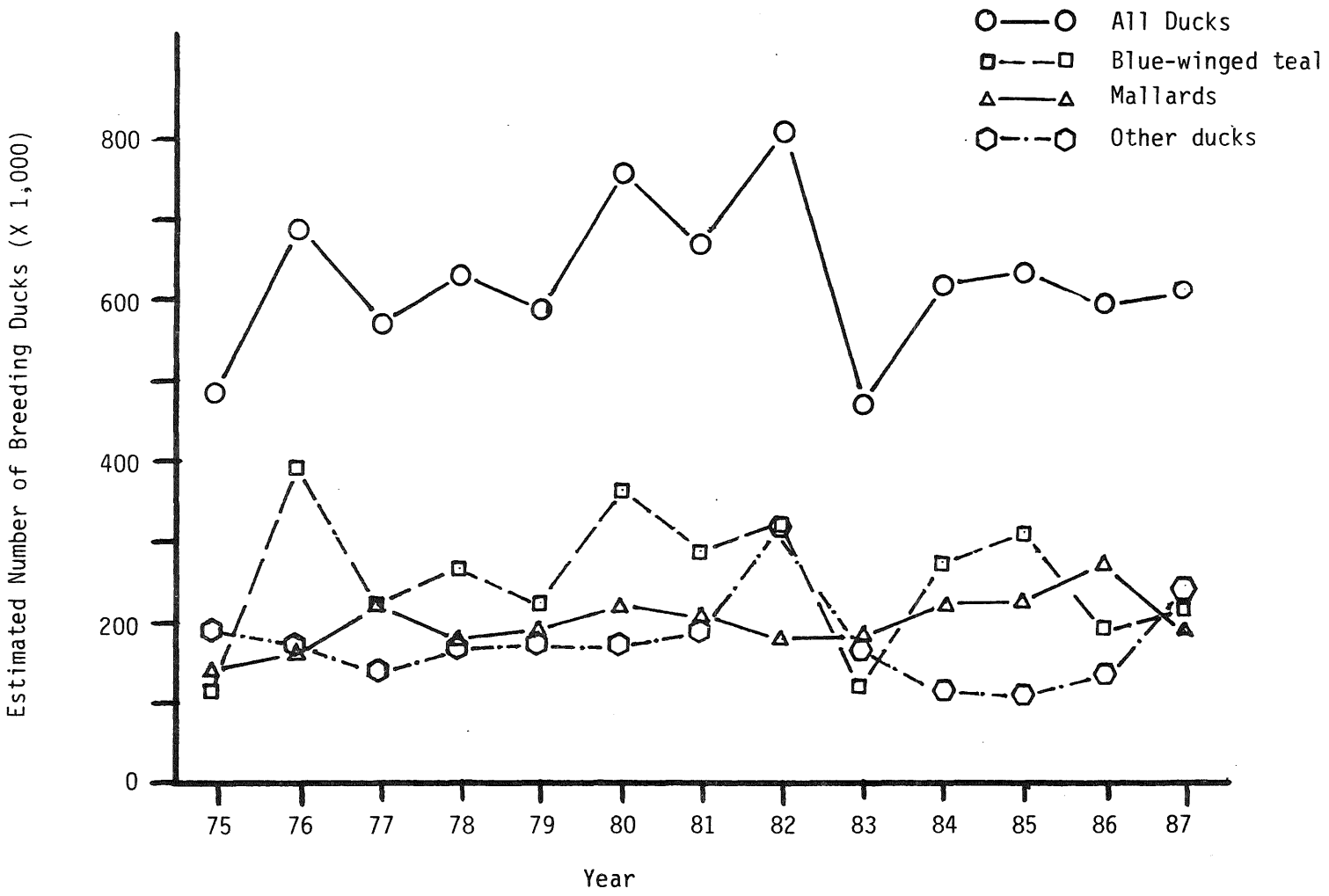

Figure 25. Estimated number of ducks breeding in Minnesota, 1975-87.

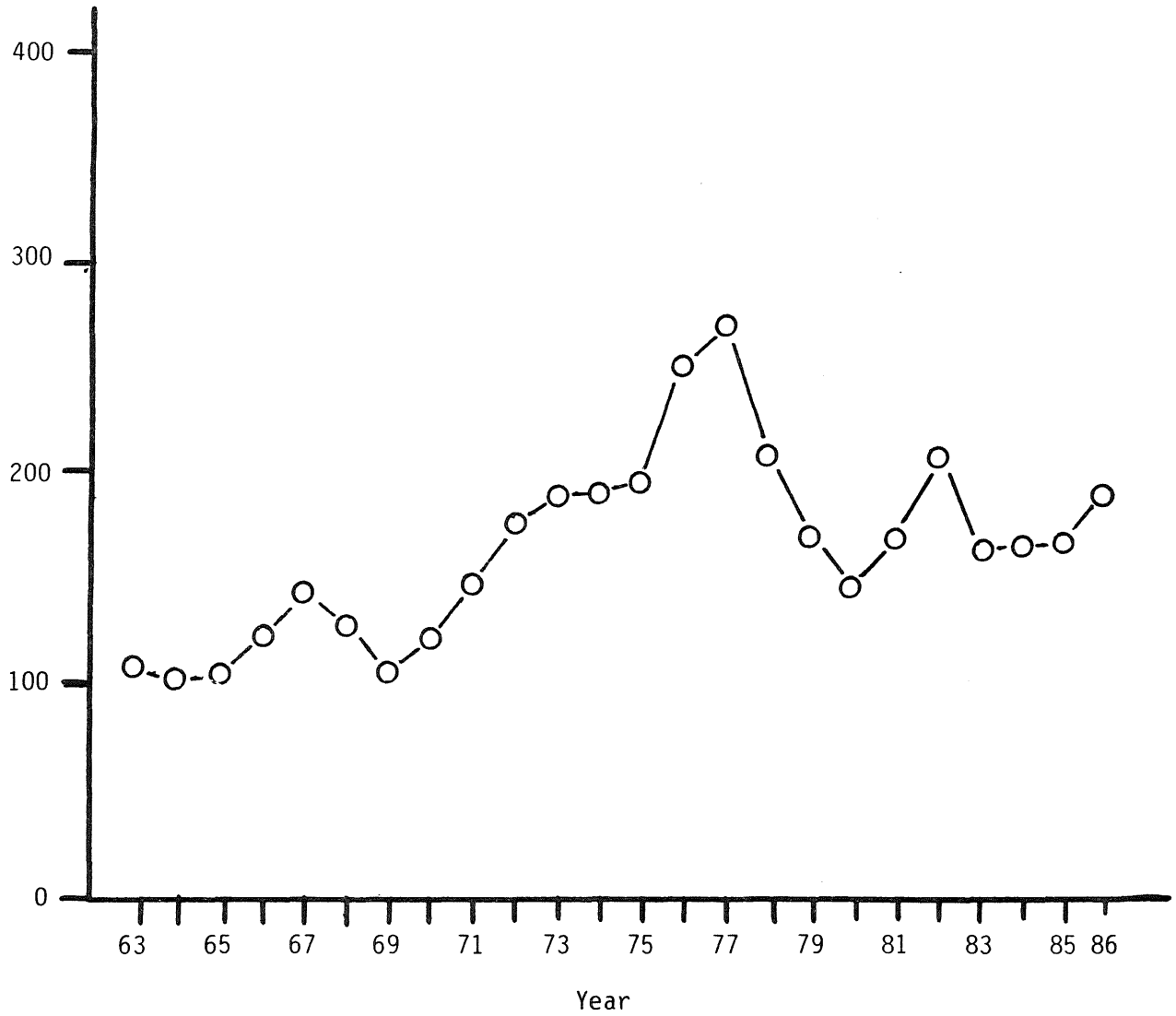

Figure 26. Winter population estimates of the Eastern Prairie Population of Canada geese, 1963-86. (data from U.S. Fish and Wildlife Service/Canadian Wildlife Service reports on status of waterfowl and fall flight forecasts).

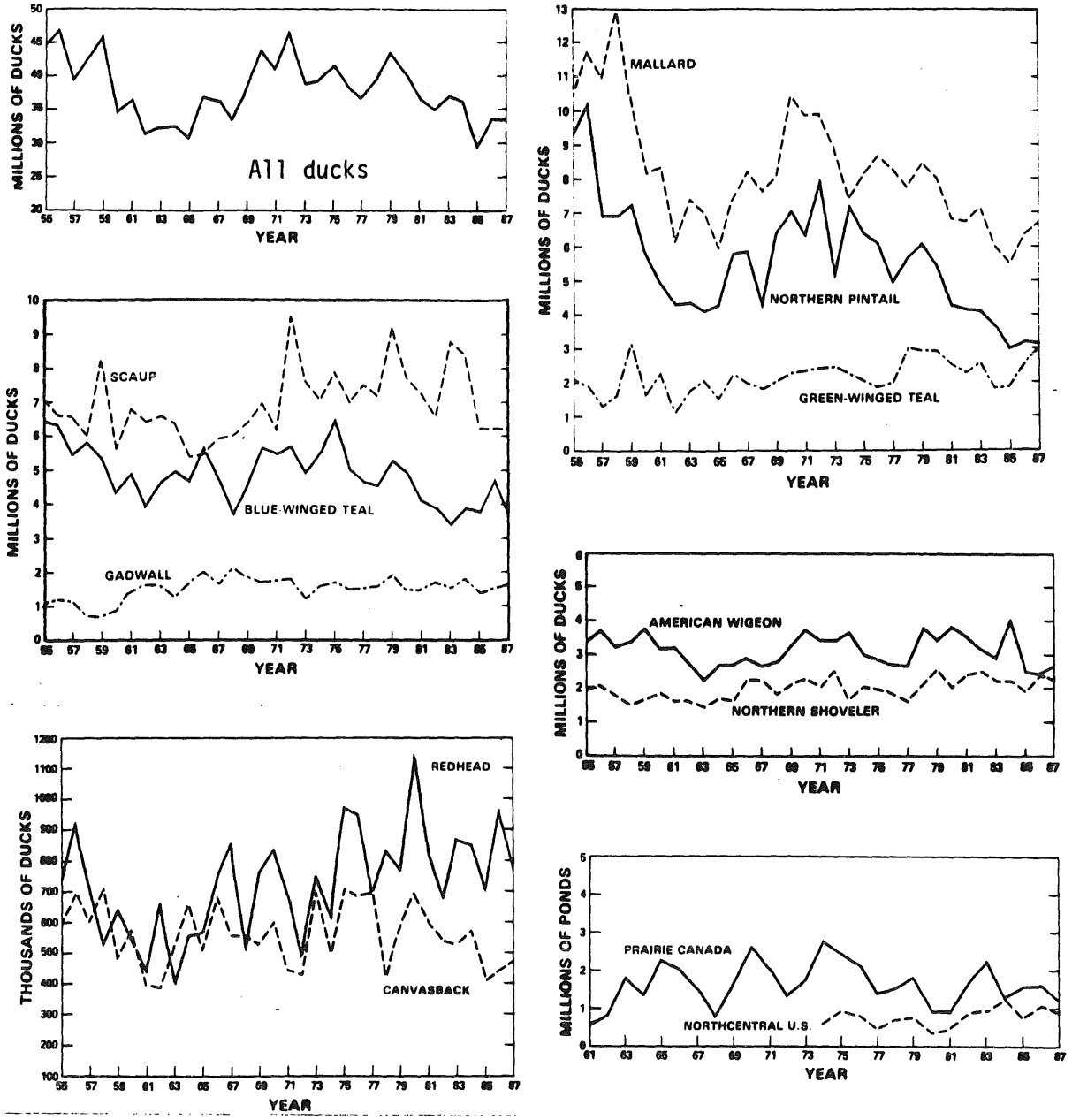

Figure 27. Estimates of North American breeding populations of selected ducks, and winter population estimates for black ducks. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987. 40pp).

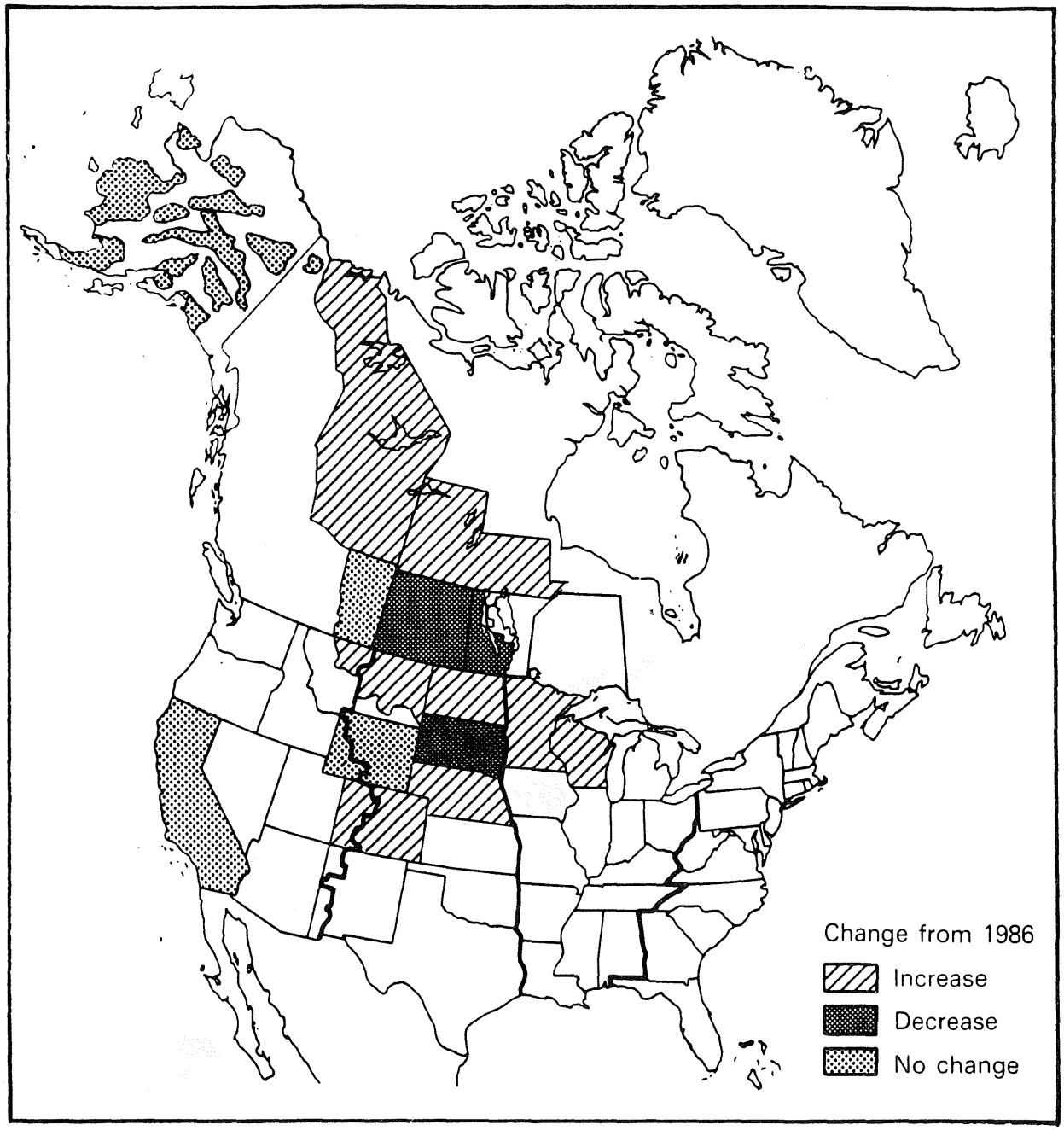

Figure 28. Fall 1987 duck flight forecast for Canada and the U.S., change from 1986; forecast: increase. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

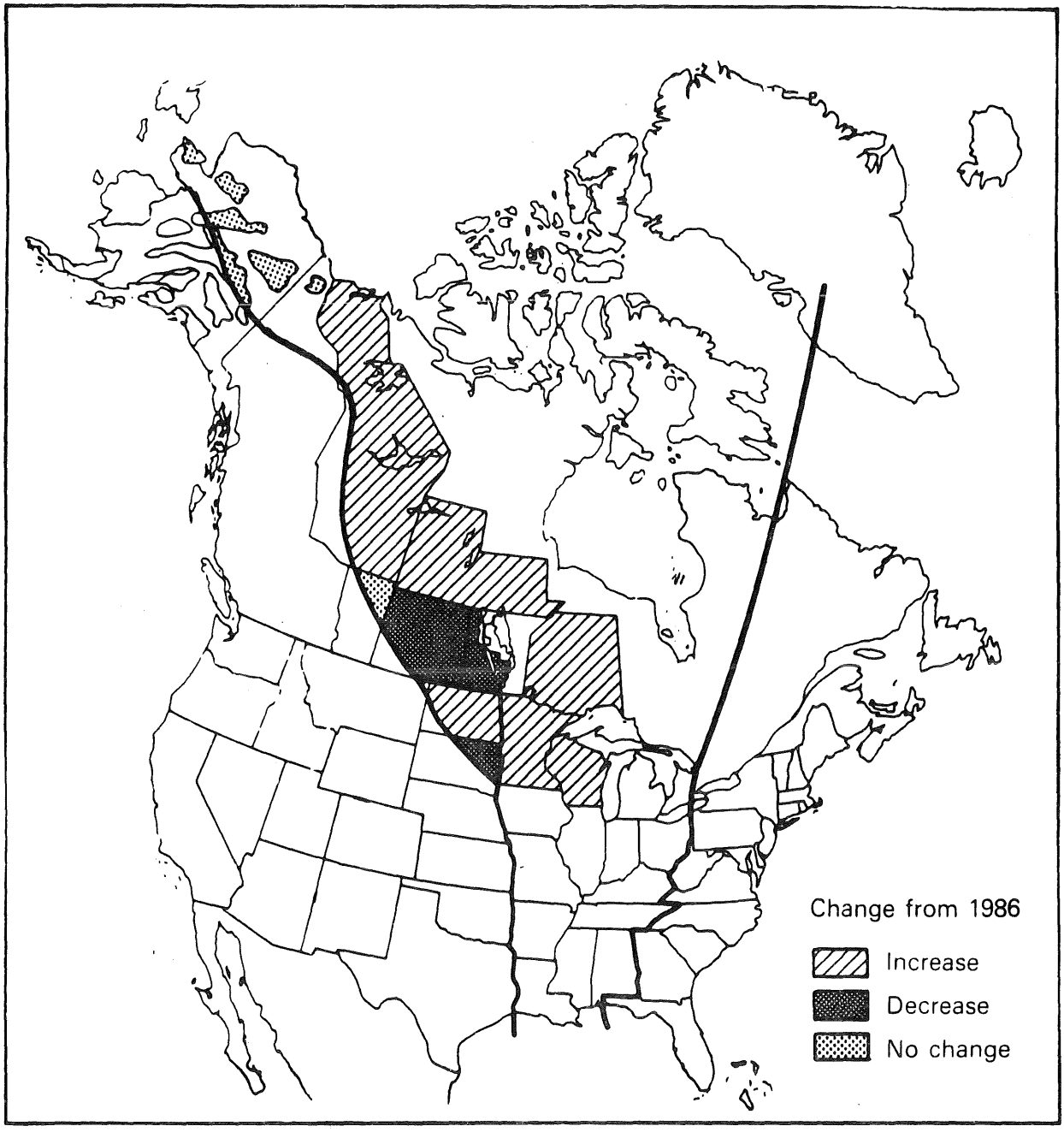

Figure 29. Fall 1987 duck flight forecast for the Mississippi Flyway, change from 1986; forecast: no change. (from U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

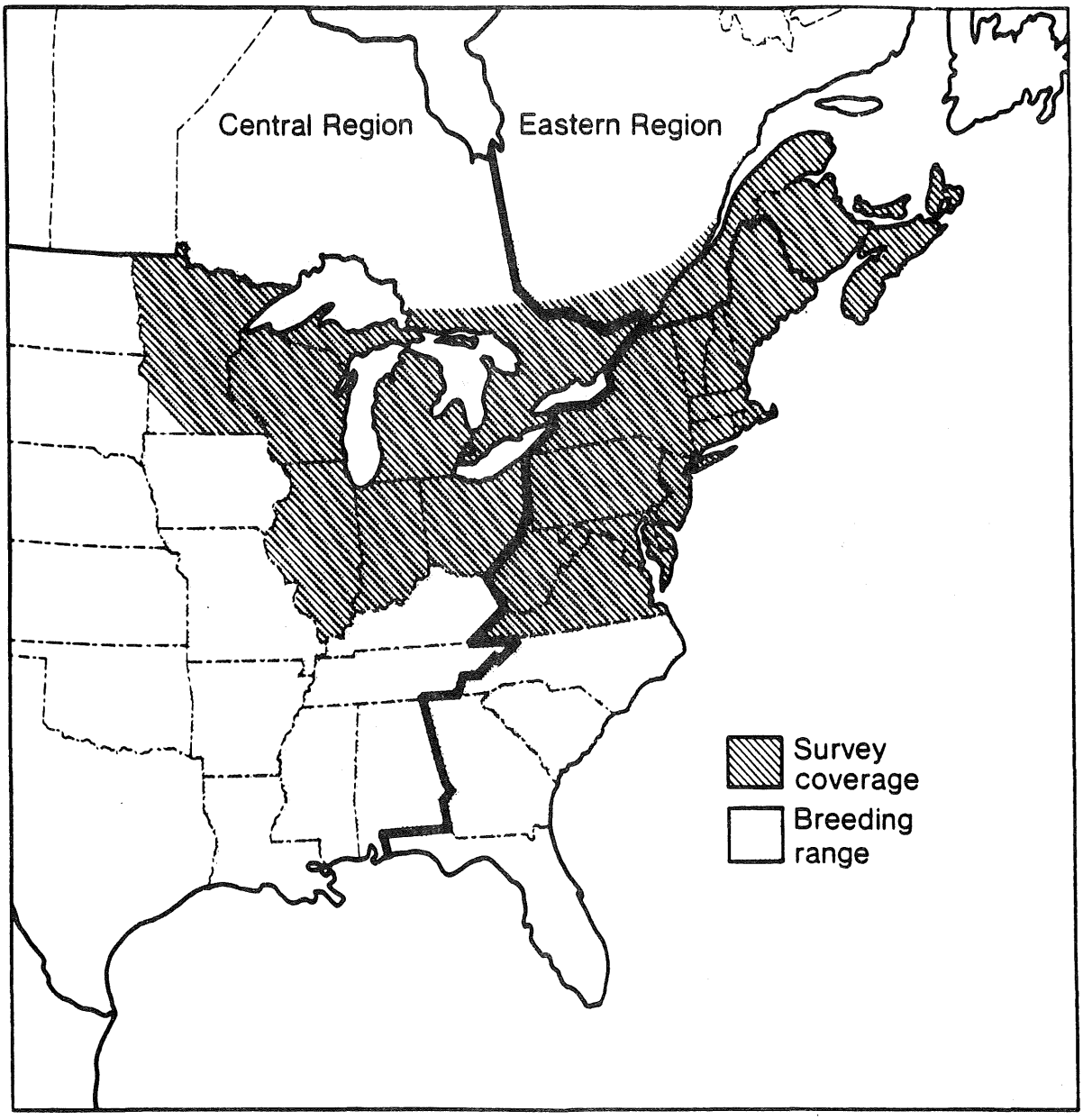

Figure 30. Approximate woodcock breeding range and states covered in singing ground survey. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

Table 32. Woodcock breeding population indices in the U.S. Central Region as indicated by singing-ground surveys in 1986 and 1987 (from: Bortner, J.B. 1987. American woodcock harvest and breeding status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 11pp).

State or Province	Number of routes conducted 1986	1987	Comparable routes[a]	Woodcock heard per comparable route 1986	1987	Percent change
IL	11	7	98	0.04	0.04	0.0
IN	17	14	61	0.48	0.57	20.8
MI	99	115	109	4.84	4.54	-6.3
MN	73	77	99	2.84	2.81	-1.1
OH	27	31	78	0.59	0.68	15.1
ON	100	98	89	6.16	6.00	-2.2
WI	72	77	106	2.85	3.00	6.0
Totals	399	419	640			
			Weighted Averages[b]	3.59	3.54	-1.4

[a] Includes routes carried as constant zero routes.

[b] Computed for States or Provinces where one comparable route represents less than 2,000 sq. mi. (5,180 sq. km.) and more than 0.5 birds were heard per route. Data from Delaware, Connecticut, Illinois, Indiana, Maryland, Rhode Island, Virginia and Quebec did not meet these criteria.

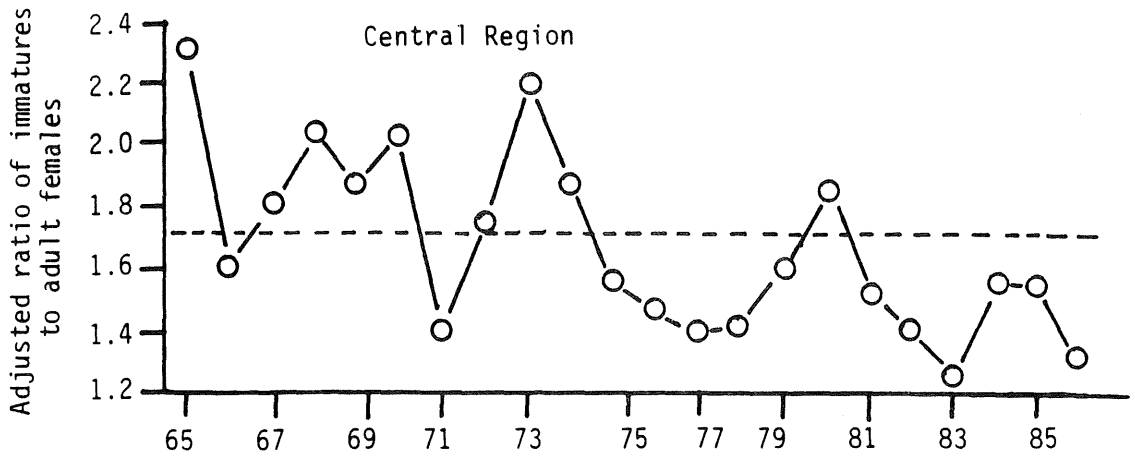

Figure 31. Adjusted index of American woodcock recruitment, 1965-1986, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

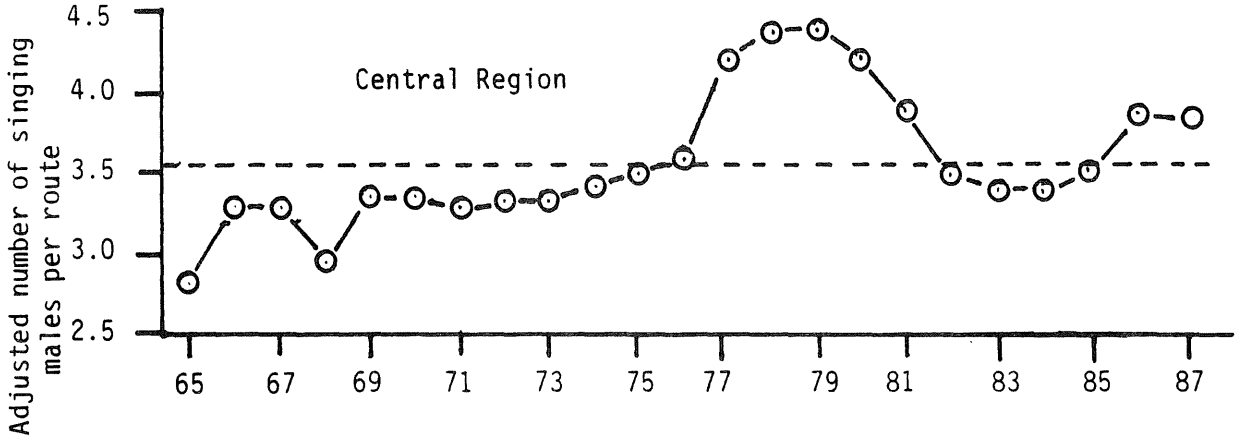

Figure 32. Adjusted index of American woodcock breeding population, 1968-1986, base year 1970. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

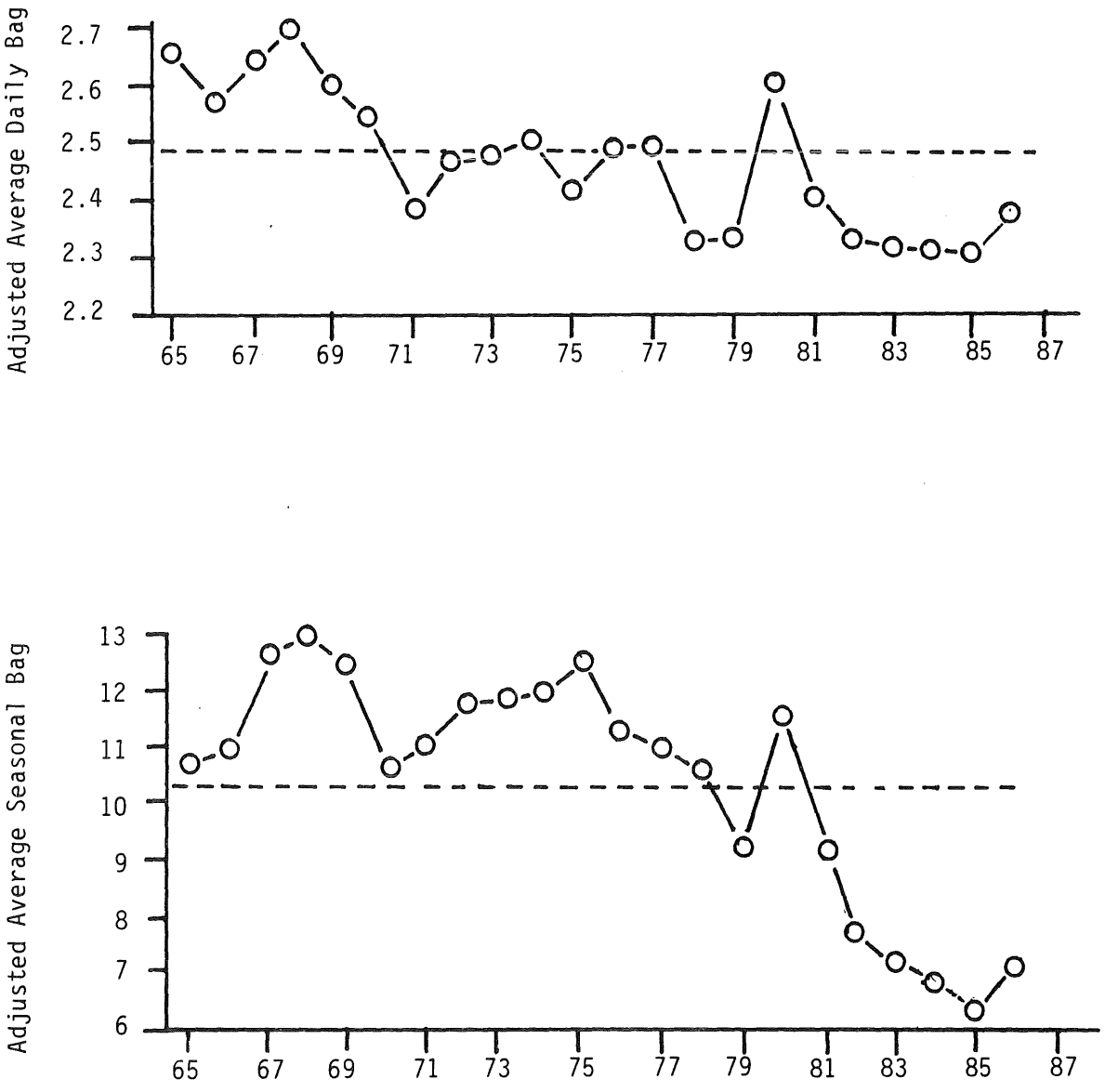

Figure 33. Adjusted indices of daily and seasonal hunting success of American woodcock, 1965-1985, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

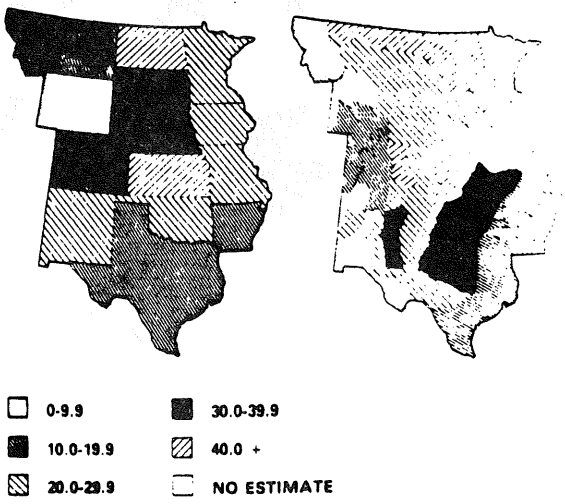

Figure 34. Mean number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1987. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

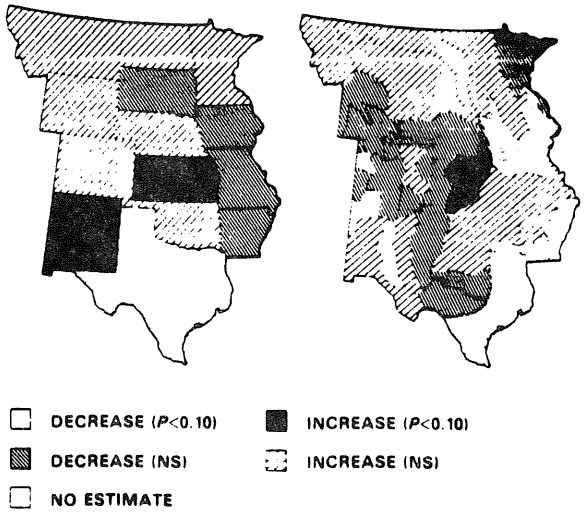

Figure 35. Changes in the number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

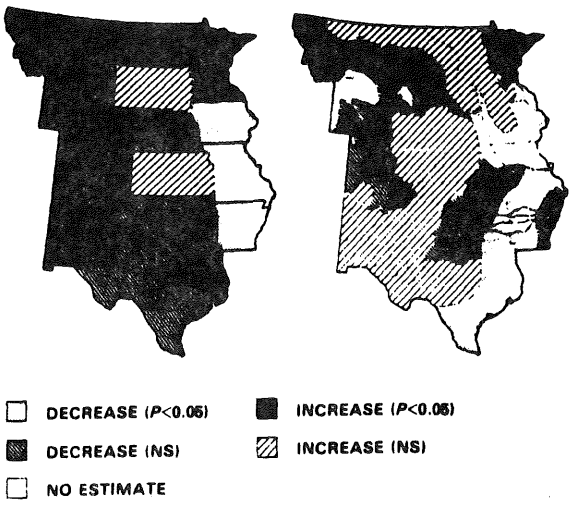

Figure 36. Trends in number of mourning doves heard per route by state and by physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

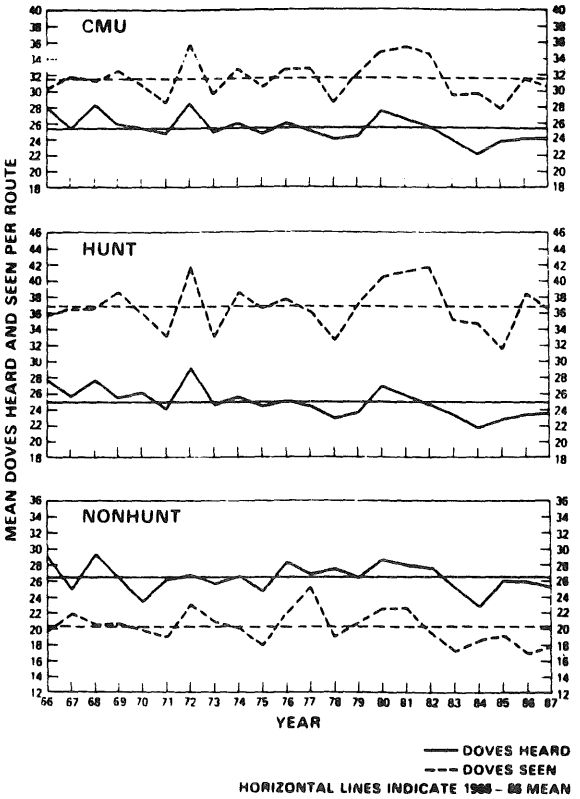

Figure 37. Population indices of breeding mourning doves in the Central Management Unit, 1966-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

HUNTING

HARVEST STATISTICS

Table 33. Resident small game hunter[a] response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	5,696	443	4,504	85.7
1980-81	6,434	385	4,963	82.0
1981-82	6,656	399	5,419	86.6
1982-83	5,963	266	4,792	84.1
1983-84	4,551	269	3,325	77.7[b]
1984-85	4,096	127	3,280	82.6
1985-86	3,370	157	2,574	80.1
1986-87	4,668	208	3,623	81.2

[a] Includes individual and combination sportsman, regular small game, and senior licensees, and excludes duplicate licenses.

[b] Includes only those survey returns received by 25 April 1984.

Table 34. Use of resident small game hunter licenses[a], 1979-80 through 1986-87.

	Returns from mail survey	Projections from license sales
1979-80		
Hunted	3,964 (88.0%)	296,766
Did not hunt	540 (12.0%)	40,468
	4,504 (100.0%)	337,234
1980-81		
Hunted	4,288 (86.4%)	311,717
Did not hunt	675 (13.6%)	49,066
	4,963 (100.0%)	360,783
1981-82		
Hunted	4,461 (82.3%)	306,843
Did not hunt	958 (17.7%)	65,992
	5,419 (100.0%)	372,835
1982-83		
Hunted	3,908 (81.6%)	257,546
Did not hunt	884 (18.4%)	58,258
	4,792 (100.0%)	315,804
1983-84		
Hunted	2,805 (84.4%)	232,973
Did not hunt	520 (15.6%)	43,061
	3,325 (100.0%)	276,034
1984-85		
Hunted	2,663 (81.2%)	211,740
Did not hunt	617 (18.8%)	49,024
	3,280 (100.0%)	260,764
1985-86		
Hunted	2,132 (82.8%)	213,883
Did not hunt	442 (17.2%)	44,342
	2,574 (100.0%)	258,225
1986-87		
Hunted	3,006 (83.0%)	217,504
Did not hunt	617 (17.0%)	44,549
	3,623 (100.0%)	262,053

[a] Includes individual and combination sportsman, regular small game, and senior licenses.

Table 35. Estimated number of hunters and estimated take per hunter for various species, 1979-80 through 1986-87.

Species	Estimated number of hunters (thousands)								Estimated take per hunter							
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Ducks	155	128	138	134	117	134	122	132	9.4	9.3	8.4	8.1	10.6	10.8	9.1	9.0
Canada goose	57	51	47	52	41	51	55	58	1.5	1.4	1.4	1.6	1.6	1.6	1.9	1.8
Other geese	*	27	15	11	10	9	9	7	*	1.2	1.0	0.7	0.7	0.8	1.2	0.5
American coot	24	19	13	11	12	9	11	11	5.0	3.1	4.0	4.3	4.7	4.9	4.4	5.3
Common snipe	8	12	7	4	6	5	5	5	2.4	1.9	2.9	3.2	2.8	4.0	3.2	3.9
Rails/gallinules	2	*	1	1	2	1	1	1	2.9	*	1.6	3.1	1.2	1.4	2.3	1.1
American woodcock	22	25	23	20	16	17	19	21	2.8	2.7	2.8	2.7	3.9	4.3	4.3	4.3
Ring-necked pheasant	143	147	173	125	86	65	72	62	2.3	3.2	3.3	2.1	3.5	2.3	3.0	2.6
Ruffed grouse	151	150	145	115	78	87	94	107	4.7	6.3	3.9	2.6	2.4	3.7	3.8	4.2
Spruce grouse	18	25	15	13	9	12	12	12	1.5	1.3	1.7	1.1	1.1	1.7	2.1	1.7
Sharp-tailed grouse	24	27	16	14	9	9	10	9	2.3	2.1	2.2	1.2	1.1	0.8	1.9	1.5
Gray partridge (Hun)	33	38	32	21	21	15	20	17	3.3	2.7	3.4	2.5	3.6	2.1	4.3	3.3
Gray squirrel[a]	80	78	70	53	38	39	38	41	5.1	6.6	5.9	5.1	5.3	5.3	5.2	5.7
Fox squirrel[a]			48	39	28	26	29	29			4.6	4.2	4.5	4.1	5.0	5.1
Eastern cottontail	50	56	60	36	29	22	22		3.8	4.4	4.4	3.8	3.4	2.8	3.8	4.2
White-tailed jack rabbit	18	22	17	11	7	6	6	4	2.5	2.4	2.7	2.6	1.9	1.9	3.0	3.4
Snowshoe hare	28	37	25	15	9	7	7	8	4.9	7.8	4.4	4.2	2.3	2.3	2.3	3.2
Raccoon	16	20	19	13	11	12	10	11	6.0	4.4	7.0	6.3	8.0	9.4	9.4	10.9
Red fox	13	17	19	12	11	11	12	11	1.6	1.7	1.9	1.5	2.0	2.3	4.2	1.5
Gray fox	4	8	4	3	2	3	2	2	1.1	0.4	1.0	0.9	0.9	1.4	2.0	0.8
Coyote	3	8	4	3	3	3	5	4	1.1	0.5	0.9	0.8	0.8	1.8	3.1	1.6
Badger	*	7	1	1	1	1	1	<1	*	0.7	1.1	1.9	0.3	3.9	1.8	1.0

* No estimate made.

[a] Estimates for gray and fox squirrels prior to 1981 are for both species combined.

Table 36. Resident small game hunting license sales and estimated hunter harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Small game license sales[a]	337,234	360,783	372,835	314,477	276,034	260,764	258,225	262,053
Federal duck stamp sales	159,068	158,311	142,345	134,803	138,161	138,820	134,594	142,011
State duck stamp sales[b]	145,832	144,256	129,546	123,834	125,212	131,394	125,559	146,747
Pheasant stamp sales[b]	-	-	-	-	114,189	81,587	85,252	81,027
Estimated harvest[c] (thousands)								
Ducks[e]	1,462	1,199	1,167	1,071	1,235	1,443	1,029	1,172
Canada geese[e]	85	72	71	81	62	82	86	101
Other geese[e]	*	33	16	7	8	8	9	3
American coot[e]	123	58	49	49	55	48	41	59
Common snipe	19	23	21	14	17	20	16	21
Rails/gallinules	7	*	2	3	2	1	2	1
American woodcock	60	67	63	54	58	70	70	87
Ring-necked pheasant	328	466	573	265	299	148	179	159
Ruffed grouse	709	941	576	302	183	320	315	442
Spruce grouse	27	34	24	14	10	21	21	20
Sharp-tailed grouse	54	56	34	17	10	7	14	13
Gray partridge (hun)	108	101	110	52	74	31	77	54
Gray squirrel[d]	403	514	409	271	199	208	186	235
Fox squirrel[d]			216	162	126	107	140	145
Eastern cottontail	188	249	263	135	98	61	75	102
White-tailed jack rabbit	45	52	45	27	13	11	17	14
Snowshoe hare	136	286	109	61	21	16	12	25
Raccoon	97	88	136	80	87	114	85	122
Red fox	21	28	37	19	21	26	44	15
Gray fox	4	3	4	2	2	4	4	2
Coyote (brush wolf)	3	4	4	2	3	5	11	7
Badger	No season	5	2	2	<1	2	2	<1

Harvest estimates in this table, and the number of hunters and mean take per hunter in Table 35, are calculated from different questions on the survey form. The sample used in calculations differs from one estimator to the next. This is because some respondents give specific answers to one question but not to a related one. A formula is used to calculate the total estimated take for each species which appears in this table. In most years the formula produces results rather close to those obtained by multiplying the average take per hunter times the number of hunters. However, in other years (e.g., 1985) results of the two methods are quite divergent, perhaps as a result of an unusual sample. This is being investigated further, and as a result, numbers may change somewhat in future reports. The most current report of survey findings will have the best data available at that time.

* No estimate made.

[a] Duplicate licenses not included.

[b] Excluding stamps sold with an issuing fee, many of which probably were purchased by collectors.

[c] Estimates based upon response of hunters to questionnaires.

[d] Harvest estimates for gray and fox squirrels prior to 1981 are for both species combined.

[e] U.S. Fish and Wildlife Service harvest estimates for 1986 are:

Ducks	789,234	Other geese	0
Canada geese	68,808	American coot	27,375

Table 37. Mail survey results of nonresident small game hunters, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Nonresident licenses issued[a]	3,902	3,981	4,271	3,187	2,911	3,060	3,271	3,078
Questionnaires								
Number mailed	622	222	280	361	384	237	338	406
Number not delivered	74	85	21	21	25	13	25	42
Number (percent) returned	491 (89.6)	117 (85.4)	214 (82.6)	281 (82.6)	280 (78.0)[b]	192 (86.0)	246 (78.6)	290 (79.7)
Total nonresidents and percent (in parens) of all nonresidents hunting:								
Ducks	2,100 (54)	2,000 (50)	2,055 (48)	1,840 (58)	1,500 (52)	2,090 (68)	1,900 (58)	1,810 (64)
Canada goose	700 (18)	600 (15)	718 (17)	830 (26)	580 (20)	820 (27)	800 (24)	850 (30)
Ruffed grouse	1,500 (38)	2,000 (50)	1,656 (39)	960 (30)	620 (21)	1,000 (33)	1,090 (33)	1,000 (35)
Ring-necked pheasant	800 (21)	800 (20)	1,436 (34)	680 (21)	500 (17)	390 (13)	720 (22)	510 (18)
Raccoon[c]	400 (10)	200 (5)	125 (3)	100 (3)	170 (6)	130 (4)	70 (2)	85 (3)
Total nonresident take:								
Ducks	20,000	17,000	19,000	15,000	17,500	24,000	14,400	14,600
Canada goose	1,000	1,000	2,000	1,500	1,300	1,300	1,400	1,400
Ruffed grouse	9,000	16,000	7,000	3,000	1,700	4,200	3,500	3,800
Ring-necked pheasant	2,000	2,000	5,000	1,500	2,200	1,500	1,900	1,100
Raccoon	3,000	1,000	1,000	700	1,400	1,100	1,400	600

[a] Excludes duplicate licenses and nonresident shooting preserve licenses.

[b] Includes only those survey returns received by 25 April 1984.

[c] Nonresident raccoon hunters were required to purchase a nonresident raccoon hunting license for the first time in 1979 in addition to the nonresident small game license. The initial season bag limit of 8 was increased to 12 in 1983 and to 20 in 1985.

	Raccoon take per hunter		
	Resident	Nonresident	Number of nonresident raccoon licenses
1978	6	14	0
1979	6	6	404
1980	4	5	93
1981	7	7	121
1982	6	7	95
1983	8	8	102
1984	9	8	111
1985	9	20	108
1986	11	7	86

Table 38. Species composition of the Minnesota waterfowl harvest, 1985 and 1986 (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep., Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

Species	1985 Harvest	1985 Pct of harvest	1986 Harvest	1986 Pct of harvest	Percent change
Mallard	179,100	27.96	234,900	29.77	+31
Domestic mallard	1,200	0.18	0	0.00	-100
American black duck	1,900	0.30	600	0.07	-68
Black x mallard	200	0.03	0	0.00	-100
Gadwall	12,700	1.98	11,200	1.42	-12
American wigeon	19,300	3.02	30,800	3.91	+60
Green-winged teal	43,200	6.75	43,600	5.53	+1
Blue-winged/cinnamon teal	26,100	4.08	61,100	7.74	+134
Northern shoveler	5,200	0.81	8,000	1.02	+54
Northern pintail	8,400	1.31	4,500	0.57	-46
Wood duck	81,800	12.77	135,000	17.17	+66
Redhead	16,300	2.55	20,300	2.57	+24
Canvasback	10,000	1.54	0	0.00	-100
Greater scaup	6,000	0.93	2,600	0.33	-57
Lesser scaup	70,200	10.96	75,400	9.55	+7
Ring-necked duck	121,800	19.02	130,000	16.47	+7
Goldeneyes	5,800	0.90	5,400	0.69	-7
Bufflehead	22,700	3.54	14,700	1.87	-35
Ruddy duck	3,300	0.52	1,600	0.20	-52
Scoters	900	0.14	600	0.07	-33
Hooded merganser	3,700	0.57	8,400	1.06	+27
Other mergansers	800	0.13	0	0.00	-100
Other ducks	0	0.00	0	0.00	0
Total	640,600	99.99	789,200	100.00	-38

Table 39. Top 10 states in number of adult waterfowl hunters, 1986, and number of hunter-days and retrieved duck kill, in each (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep. Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

State	Number of adult waterfowl hunters	Number of hunter-days	Retrieved duck kill	Ducks retrieved per hunter-day
Minnesota	124,732	933,024	789,234	0.84
Louisiana	86,326	862,801	1,235,595	1.43
Wisconsin	79,925	605,721	362,068	0.60
California	71,425	678,789	965,092	1.42
Texas	61,536	447,432	491,983	1.10
Michigan	45,206	389,494	227,502	0.58
Pennsylvania	44,839	327,714	106,035	0.32
Illinois	44,780	440,233	279,467	0.63
New York	42,941	301,159	194,118	0.64
Washington	36,019	307,641	353,436	1.15
Mississippi Flyway	566,672	5,028,211	4,248,943	0.84
United States	1,321,866	11,066,713	9,373,926	0.85

Table 40. Turkey hunting summary, 1978-87.

Year	Area of open hunt zone (mi^2)	Number of permit applicants	Number of permits available	Odds of drawing a permit[a]	Number of permits given	Number of persons hunting[b]	Registered turkey harvest	% success[c]
1978	389	10,740	420	25.6:1	411	398	94	23.6
1979	673	11,116	840	13.2:1	827	794	116	14.6
1980	858	9,613	1,200	8.0:1	1,191	1,072	98	9.1
1981	1,242	8,398	1,500	5.6:1	1,556	1,292	113	8.7
1982	1,490	7,223	2,000	3.6:1	1,992	1,625	106	6.5
1983	1,807	8,153	2,100	3.9:1	2,079	1,663	116	7.0
1984	2,061	7,123	3,000	2.4:1	2,837	2,270	178	7.8
1985	2,118	5,662	2,750	2.1:1	2,449	1,959	323	16.5
1986	1,897	5,715	2,500	2.3:1	2,251	1,801	333	18.5
1987	1,747	6,361	2,700	2.4:1	2,520	2,016	520	25.8

[a] Calculated with total permits available to be given, and not adjusting for undersubscribed zones and time periods.

[b] For 1978-82, based on a post-hunt mail survey. Number actually hunting in 1983-87 was estimated at 80% (from last year the survey was run).

[c] Registered turkey harvest divided by number actually hunting, expressed as %.

Table 41. Deer hunting license sales, 1957-86*.

Year	Firearms License Sales			Archery Licenses			Grand Total
	Resident	Non-resident	Total	Resident	Non-resident	Total	
1957	180,028	488	180,516	10,033	119	10,152	190,668
1958	203,430	552	203,982	10,968	118	11,086	215,068
1959	200,102	530	200,632	11,768	101	11,869	212,501
1960	233,593	621	234,214	11,834	122	11,956	246,170
1961	250,031	632	250,663	13,229	141	13,370	264,033
1962	244,166	676	244,842	11,776	150	11,926	256,768
1963	257,333	771	258,104	11,724	165	11,889	269,993
1964	278,032	1,021	279,053	13,472	193	13,665	292,718
1965	289,918	1,128	291,046	15,628	265	15,893	306,939
1966	284,195	1,287	285,482	17,203	277	17,480	302,962
1967	305,717	1,311	307,028	18,405	289	18,694	325,722
1968	302,216	1,442	303,658	20,188	292	20,480	324,138
1969	253,891	1,168	255,059	15,658	256	15,914	270,973
1970	188,166	334	188,500	12,277	220	12,497	200,997
1971	no firearms season			17,360	111	17,471	17,471
1972	257,998	959	258,957	21,985	326	22,311	281,268
1973	294,349	1,342	295,691	29,169	545	29,714	325,405
1974	296,248	1,747	297,995	30,701	644	31,345	329,340
1975	327,596	1,921	329,517	31,836	804	32,640	362,157
1976	263,868	1,029	264,897	21,773	263	22,036	286,933
1977	287,271	1,430	288,701	29,404	402	29,806	318,507
1978	307,910	1,776	309,686	32,546	476	33,022	342,708
1979	312,754	1,910	314,664	35,657	447	36,104	350,768
1980	344,516	2,378	346,894	41,328	634	41.962	388,856
1981	369,425	2,973	372,398	50,063	906	50,969	423,367
1982	369,018	3,038	372,056	54,084	848	54,932	426,988
1983	391,099	3,611	394,710	55,822	478	56,300	451,010
1984	396,074	4,307	400,381	61,576	583	62,159	462,540
1985[a]	416,464	4,984	421,448	66,716	589	67,305	480,312
1986[a]	413,542	4,476	418,018	68,689	547	69,236	487,254

* Duplicate licenses not included. Leech Lake licenses are included during years they were issued.

[a] Numbers include the following bonus deer licenses:

	1985	1986
Resident firearms (regular quota areas)	8,418	1,192
Resident firearms (state parks)	-	271
Non-resident firearms (regular quota area)	23	3
Resident archery (state parks)	-	27
Resident archery (metro)	-	917
Totals	8,441	2,410

Table 42. Registered deer harvest and success rates, 1974-86.

	Registered harvest				Percent success	
	Regular firearms	Archery	Special Muzzleloader season	Total	Regular firearms and special muzzleloader seasons	Archery
1974	64,997	2,176	-	67,173	21.9	6.9
1975	63,604	2,265	-	65,869	19.3	6.9
1976	28,613	1,167	-	29,780	10.8	5.3
1977	45,918	2,609	32*	48,559	15.9	8.8
1978	47,372	2,608	346	50,326	15.4	7.9
1979	44,340	2,577	318	47,235	14.2	7.1
1980	68,539	3,641	294	72,474	19.8	8.7
1981	93,027	5,535	385	98,947	25.1	10.8
1982	93,045	5,566	441	99,052	25.1	10.1
1983	132,457	5,977	652	139,086	33.7	10.6
1984	132,042	6,390	532	138,964	33.1	10.3
1985	138,065	7,575	563	146,203	32.9	11.2
1986	129,770	7,610	593	137,973	31.2	11.0

* No special muzzleloader seasons were held before 1977.

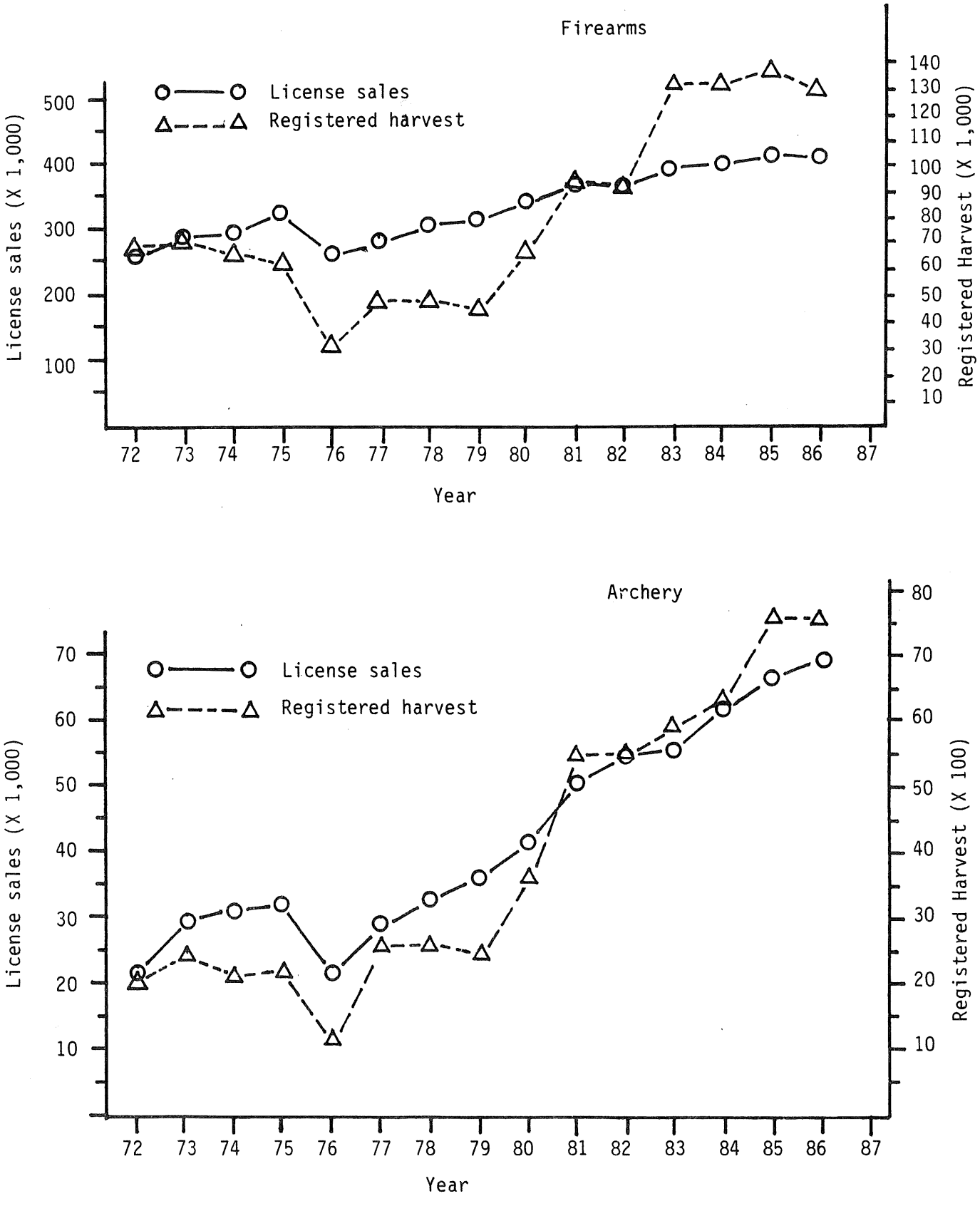

Figure 38. Resident and nonresident firearms (above) and archery (below) deer hunting license sales and registered harvest, 1972-86.

Table 43. Harvest and success rates by DMU and Sub-DMU, 1986.

Unit	Permits Issued[a]	Antlerless Registered	Permit Success[a]	Bucks Registered	Total Reg. Kill
Red River W	948	477	50.3%	381	858
Red River E	7,436	3,994	53.7%	2,053	6,047
Red River Total	8,384	4,471	53.3%	2,434	6,905
Agassiz Total	11,561	5,160	44.6%	3,161	8,321
Rainy River W	511	293	57.3%	1,006	1,299
Rainy River C	1,042	661	63.4%	1,032	1,693
Rainy River E	1,910	981	51.4%	1,205	2,186
Rainy River Total	3,463	1,935	55.9%	3,228	5,163
Superior W	3,052	1,280	41.9%	1,247	2,527
Superior C	853	481	56.4%	943	1,424
Superior E	0	7	-	558	561
Superior Wild.	0	4	-	46	50
Superior IR	0	0	-	4	4
Superior Total	3,905	1,772	45.4%	2,794	4,566
Itasca NW	3,477	2,099	60.4%	2,437	4,536
Itasca SW	3,233	2,041	63.1%	3,105	5,046
Itasca NE	3,413	1,631	47.8%	2,445	4,076
Itasca SE	5,567	2,594	46.6%	2,456	5,050
LLIR	1,098	479	43.6%	687	1,166
Bemidji	4,341	2,611	60.1%	2,849	5,460
Itasca Total	20,929	11,455	54.7%	13,979	25,434
Mille Lacs W	4,771	2,769	58.0%	2,324	5,093
Mille Lacs C	8,682	5,143	59.2%	3,422	8,565
Mille Lacs E	2,138	1,485	69.5%	3,722	5,207
WEIR	436	300	68.8%	658	958
Mille Lacs Total	16,027	9,697	60.3%	10,126	19,821
Big Woods N	21,152	10,606	50.1%	6,779	17,385
Big Woods C	7,540	3,198	42.4%	2,509	5,707
Big Woods Metro	3,382	1,251	37.0%	1,109	2,360
Big Woods SE	14,736	8,127	55.2%	5,771	13,898
Big Woods Total	46,810	23,182	49.5%	16,168	39,350
Prairie N	4,317	2,160	50.0%	1,823	3,983
Prairie River	4,969	2,667	53.7%	2,178	4,845
Prairie SW	6,007	3,900	69.9%	3,415	7,315
Prairie SE	3,849	1,816	47.2%	1,393	3,209
Prairie Total	19,142	10,543	55.1%	8,809	19,352
Unknown	-	575	-	283	858
Total	130,519	68,790	52.7%	60,980	129,770

[a] Bonus licenses not included.

Table 44. Archery deer harvest by county, 1977-86.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Aitkin	24	30	34	68	110	107	94	88	140	130
Anoka	31	45	74	105	169	147	156	168	258	247
Becker	19	14	10	33	46	52	65	63	67	62
Beltrami	50	35	29	63	97	130	109	108	126	101
Benton	3	1	6	7	18	28	29	25	35	36
Big Stone	32	9	10	25	38	38	42	56	49	39
Blue Earth	34	48	35	73	80	78	116	94	116	95
Brown	23	25	27	36	46	48	47	50	38	66
Carlton	8	6	6	24	30	31	20	30	45	22
Carver	12	6	9	24	30	34	49	50	65	53
Cass	5	17	30	48	108	131	118	147	141	151
Chippewa	108	76	71	114	138	78	92	90	92	82
Chisago	19	26	31	38	68	78	95	103	142	135
Clay	49	21	19	44	75	84	94	123	111	132
Clearwater	12	8	3	17	21	21	27	20	22	29
Cook	1	2	0	1	12	7	5	9	29	12
Cottonwood	93	79	60	71	87	73	99	54	90	75
Crow Wing	5	19	32	47	123	105	99	156	177	159
Dakota	13	13	21	20	46	51	64	99	124	167
Dodge	21	14	17	19	26	22	45	76	52	63
Douglas	34	40	31	32	64	53	77	68	86	79
Faribault	20	30	31	51	46	49	57	47	58	73
Fillmore	21	49	22	46	50	64	75	81	108	83
Freeborn	28	40	38	37	47	34	69	60	61	67
Goodhue	32	37	34	57	63	69	71	69	113	112
Grant	6	8	10	19	18	22	27	27	33	26
Hennepin	11	19	35	78	69	44	97	78	105	156
Houston	20	36	25	46	55	70	58	67	79	75
Hubbard	26	32	42	56	97	130	102	98	126	138
Isanti	20	25	32	46	83	83	82	83	97	102
Itasca	59	59	36	98	171	146	113	127	155	169
Jackson	34	28	34	26	47	44	46	42	59	54
Kanabec	4	13	7	11	35	66	51	49	76	61
Kandiyohi	26	57	41	41	95	96	111	116	108	141
Kittson	11	13	1	8	12	10	28	32	24	23
Koochiching	15	19	23	28	33	18	21	29	20	29
Lac Qui Parle	54	28	38	53	87	82	78	108	141	107
Lake	7	8	8	18	40	46	30	39	50	40
Lake of the Woods	11	6	9	12	13	13	14	22	24	22
LeSueur	12	9	13	27	38	31	39	52	37	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Lincoln	69	32	57	50	72	56	74	35	68	54
Lyon	57	57	36	84	94	74	110	72	104	104
McLeod	6	15	63	32	40	28	2	33	35	55
Mahnomen	3	0	1	5	4	7	5	6	9	8
Marshall	31	15	18	38	39	45	66	82	79	75
Martin	26	36	25	40	35	38	56	33	41	55
Meeker	29	25	37	43	44	43	37	54	59	61
Mille Lacs	12	10	8	21	40	57	35	63	51	40
Morrison[a]	4	18	19	30	66	158	127	108	114	66
Mower	43	35	27	46	55	42	80	64	113	121
Murray	63	48	49	81	130	83	61	39	90	71
Nicollet	28	28	40	61	80	67	65	52	64	88
Nobles	27	51	34	43	79	33	54	18	43	48
Norman	11	10	11	15	20	34	35	45	43	39
Olmsted	17	20	25	24	55	51	85	84	86	108
Ottertail	58	54	60	98	133	153	175	178	234	223
Pennington	3	1	3	9	12	18	15	19	12	19
Pine	36	45	73	123	166	171	134	166	229	186
Pipestone	7	21	34	32	40	30	67	1	42	53
Polk	24	24	32	42	50	78	70	102	98	102
Pope	32	24	31	49	49	64	57	56	63	70
Ramsey	0	3	0	1	2	1	0	21	14	33
Red Lake	5	0	4	2	1	3	4	13	8	6
Redwood	43	38	38	50	81	63	82	63	72	68
Renville	29	20	20	35	55	63	59	32	62	60
Rice	22	19	31	38	45	51	39	54	56	59
Rock	6	34	16	14	38	31	14	22	51	39
Roseau	35	22	32	62	77	90	112	98	94	86
St. Louis	66	77	42	87	180	149	120	127	180	209
Scott	22	15	41	44	50	37	50	72	87	136
Sherburne	24	47	60	89	128	116	113	115	131	128
Sibley	14	15	22	33	41	30	32	43	43	44
Stearns	58	52	49	81	134	143	122	159	241	239
Steele	16	20	7	14	19	27	29	30	41	41
Stevens	1	10	13	9	11	21	27	26	25	20
Swift	45	25	23	42	67	49	67	59	68	67
Todd	29	33	45	52	95	109	103	126	169	141
Traverse	16	9	7	12	21	13	21	32	22	19
Wabasha	28	19	20	15	18	30	61	57	50	61
Wadena	9	10	14	21	45	69	70	64	43	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Waseca	20	21	20	26	46	35	55	42	27	36
Washington	16	20	15	39	75	91	88	154	174	196
Watonwan	16	16	16	31	34	30	35	20	39	39
Wilkin	2	2	2	15	26	34	39	34	34	32
Winona	43	76	72	96	116	138	117	151	234	196
Wright	8	26	29	45	71	78	83	95	92	115
Yellow Medicine	49	32	34	35	47	38	54	47	47	44
Unknown	61	10	40	20	25	63	23	34	37	70
Camp Ripley	327	190	148	b	153	129	237	387	278	257
St. Croix St. Pk.	b	128	b	b	b	b	b	b	b	b
Totals	2,609	2,608	2,577	3,641	5,535	5,566	5,977	6,390	7,575	7,610

[a] Camp Ripley not included.

[b] No archery hunt.

Table 45. 1986 deer harvest in Special Muzzleloader Season Bonus licenses.

	Adult		Fawn		Total	
	Male	Female	Male	Female	#	%
Carlos Avery WMA	7	21	6	7	41	6.9%
Carlos Avery WMA[a] (Sanctuary)[a]	2	2	1	1	6	1.0%
Chengwatana SF	0	4	1	0	5	1.0%
Cloquet Valley SF	0	0	0	0	0	0.0%
Danvers WMA[a]	1	2	2	4	9	1.5%
Elm Lake & Eckvoll WMA	0	1	0	1	2	0.0%
George Washington SF	1	12	1	3	17	2.9%
Glacial Lakes SP[a]	0	11	2	1	14	2.4%
Gores Pool WMA	0	1	1	0	2	0.0%
Helmer Myre SP[a]	12	5	5	4	26	4.4%
Lac qui Parle WMA and Big Stone NWR[a]	12	65	37	32	146	24.6%
Lake Louise SP[a]	4	6	2	2	36	6.1%
Lake Shetek SP[a]	7	12	4	5	28	4.7%
McCarthy Lake WMA	0	2	0	0	2	0.0%
Meadowbrook WMA	0	1	0	0	1	0.0%
Mille Lacs WMA	1	4	3	5	13	2.2%
Nemadji SF	1	2	0	0	3	0.5%
Paul Bunyan Game Refuge	8	10	5	5	28	4.7%
Red Lake WMA and Beltrami Island SF	7	12	6	2	27	4.6%
R. J. Dorer Memorial SF	0	0	1	1	2	0.0%
Roseau River WMA	0	2	0	2	4	0.7%
Rum River SF	2	0	3	0	5	0.8%
Savanna SF	0	4	1	1	6	1.0%
Talcot Lake WMA[a]	1	5	7	6	19	3.2%
Thief Lake WMA	0	1	0	1	2	0.0%
Whitewater	24	54	33	32	143	24.1%
Walnut Lake WMA[a]	0	5	1	0	6	1.0%
Total	90	257	125	121	593	
Percent	15.2%	43.3%	21.1%	20.4%		

[a] Special Permit Areas - See Table 46.

Table 46. Special Muzzleloader Season Harvests, 1981-86.

	1981	1982	1983	1984	1985	1986
Carlos Avery WMA	53	31	57	22	23	41
Carlos Avery WMA (Sanctuary)	--	--	--	--	16	6
Chengwatana SF	--	--	1	1	4	5
Cloquet Valley SF	--	--	--	2	1	0
Danvers WMA	--	3	1	7	7	9
Elm Lake & Eckvoll WMA	--	4	--	0	--	2
Frontenac SP	--	--	--	--	3	--
George Washington SF	--	--	5	14	16	17
Glacial Lakes SP	--	9	--	--	--	14
Gores Pool WMA	--	--	5	5	1	2
Helmer Myre SP	--	--	--	--	18	26
Lac qui Parle WMA and Big Stone NWR	91	130	168	151	199	146
Lake Louise SP	--	--	--	--	--	36
Lake Shetek SP	19	36	35	30	25	28
McCarthy Lake WMA	1	0	1	0	0	2
Meadowbrook WMA	3	4	11	6	6	1
Mille Lacs WMA	54	25	5	14	13	13
Moose-Willow WMA	16	5	--	--	--	--
Nemadji SF	--	--	1	1	0	3
Nerstrand Woods SP/GR	--	--	--	--	13	--
Paul Bunyan Game Refuge	--	--	19	33	27	28
Red Lake WMA and Beltrami Island SF	14	14	29	11	21	27
R. J. Dorer Memorial SF	7	32	10	6	1	2
Roseau River WMA	4	1	3	5	3	4
Rum River SF	--	--	3	1	7	5
Savanna SF	--	--	2	2	6	6
Talcot Lake WMA	16	61	137	13	43	19
Thief Lake WMA	12	6	5	7	8	2
Whitewater WMA	90	80	150	139	97	143
Whitewater Sanctuary	--	--	--	45	--	--
Walnut Lake WMA	5	0	4	6	5	6
Totals	385	441	652	532	563	593

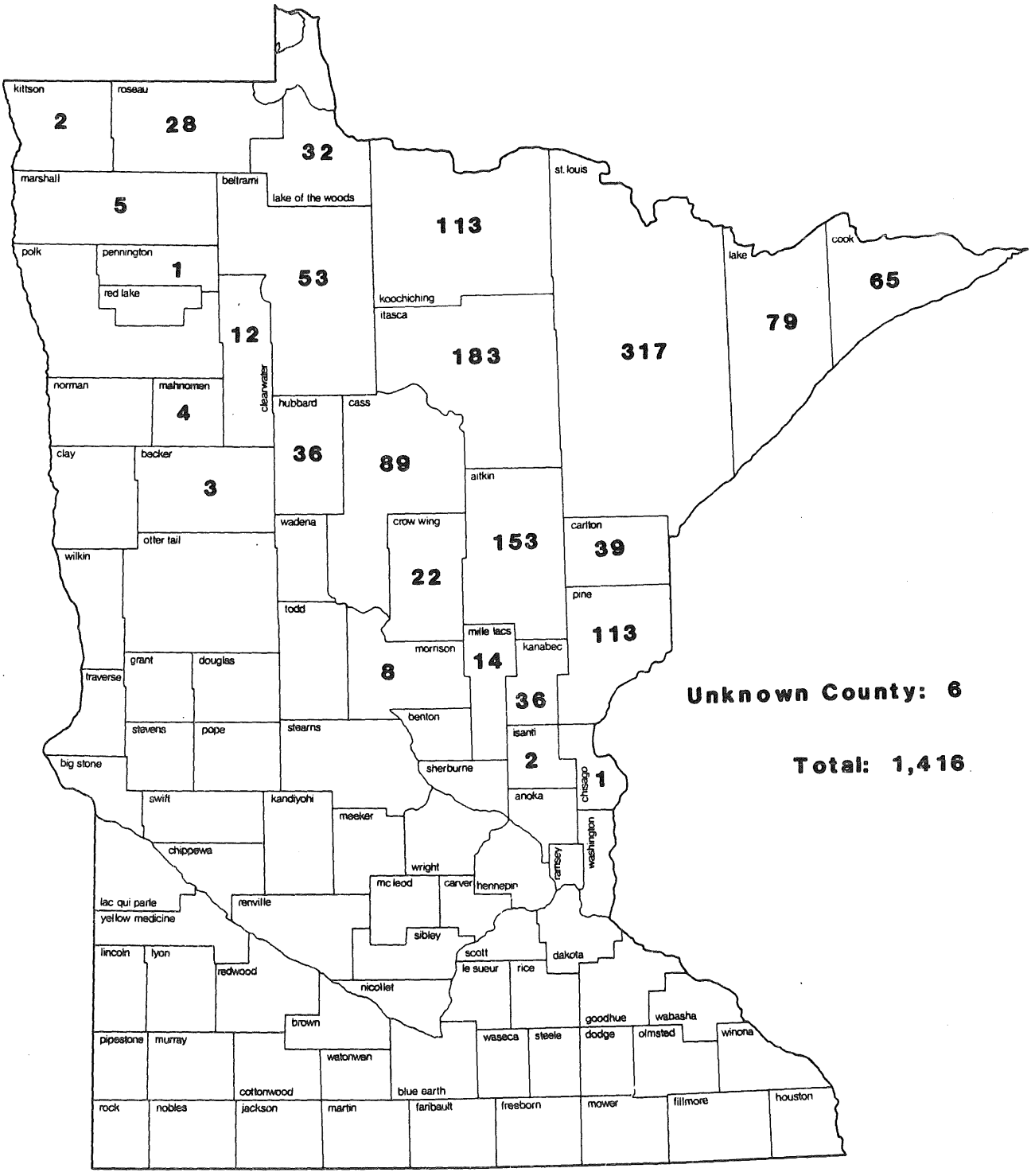

Figure 39. Black bear registered harvest by county, 1986 season.

Table 47. Registered bear harvest by county, 1976-1986.

County	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	Total
Aitkin	29	65	103	55	92	128	39	102	96	118	153	980
Becker	2	8	12	13	7	9	1	14	9	10	3	88
Beltrami	15	36	44	42	28	79	24	78	60	58	53	517
Carlton	8	12	14	7	17	18	3	9	19	34	39	180
Cass	28	56	51	57	69	110	29	93	73	114	89	769
Chisago	0	1	0	0	0	1	0	0	0	0	1	3
Clearwater	3	4	2	12	3	18	4	8	7	17	12	90
Cook	26	72	98	72	148	79	7	46	30	62	65	705
Crow Wing	6	7	9	12	9	33	8	26	21	36	22	189
Hubbard	5	8	23	16	15	19	11	25	45	41	36	243
Isanti	0	0	0	0	1	3	0	0	0	1	2	7
Itasca	80	134	158	108	212	172	50	121	128	170	183	1,516
Kanabec	10	20	28	10	12	18	8	19	19	18	36	198
Kittson	4	0	0	1	0	0	0	1	8	0	2	16
Koochiching	29	41	91	89	137	149	66	105	89	95	113	1,004
Lake	31	50	78	40	74	80	17	42	28	60	79	579
Lake of the Woods	2	8	16	12	30	43	25	32	41	29	32	270
Mahnomen	0	1	3	0	0	1	2	2	5	1	4	19
Marshall	0	1	0	1	2	3	1	9	17	12	5	51
Mille Lacs	1	10	7	5	5	12	3	11	11	28	14	107
Morrison	0	0	4	3	1	1	1	10	5	4	8	37
Norman	0	0	1	0	0	0	0	0	0	0	0	1
Pennington	0	0	0	0	0	1	0	3	2	1	1	8
Pine	21	36	58	31	62	73	20	55	52	98	113	619
Polk	0	0	0	0	1	0	0	0	0	1	0	2
Red Lake	0	0	0	0	3	2	0	0	0	0	0	5
Roseau	16	4	8	4	18	18	7	23	32	19	28	177
St. Louis	91	124	210	148	289	284	64	197	122	302	317	2,148
Wadena	0	0	1	0	0	1	0	0	0	0	0	2
Wilkin	0	0	0	1	0	0	0	0	0	0	0	1
Unknown	12	3	9	4	13	4	22	7	0	11	6	71
Total	419	701	1,028	743	1,247	1,359	392	1,038	919	1,340	1,416	10,602

Table 48. Estimates of registration compliance, and harvest estimates of Minnesota black bears corrected for compliance.[a]

	1980	1981	1982	1983	1984	1985	1986
Compliance estimated from hunting success[b]	83%	75%	92%	95%	95%	92%	92%
Compliance calculated directly[c]	d	d	d	98%	99%	97%	99%
Registered harvest	1,247	1,359	392	1,038	919	1,340	1,416
Harvest estimate	1,502	1,812	426	1,055	932	1,376	1,436

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] $$\text{Compliance rate} = \frac{\text{Registered harvest}}{\text{(estimated hunting success) x (number of hunters)}} \times 100.$$

[c] $$\text{Compliance rate} = \frac{\text{Number of bears registered by survey respondents}}{\text{Number of bears taken by survey respondents}} \times 100.$$

[d] Direct comparisons not made.

Table 49. Percent hunting success of those Minnesota bear hunters that hunted.

Area/Group		1980	1981	1982	1983	1984	1985	1986
11		21	14	11	45	50	22	42
12	NW	11	20	14	34	48	34	24
13		19	27	30	29	30	46	35
21	NC	24	22	34	42	28	43	46
22	BWCAW	42	19	44	36	25	13	18
31	NE	23	16	33	44	20	52	46
40	WC	13	11	16	31	34	37	36
50	EC	13	16	27	29	30	38	40
All residents		17	16	23	34	31	39	39
All non-residents		33	24	48	53	39	55	58
All		18	17	24	35	31	40	40

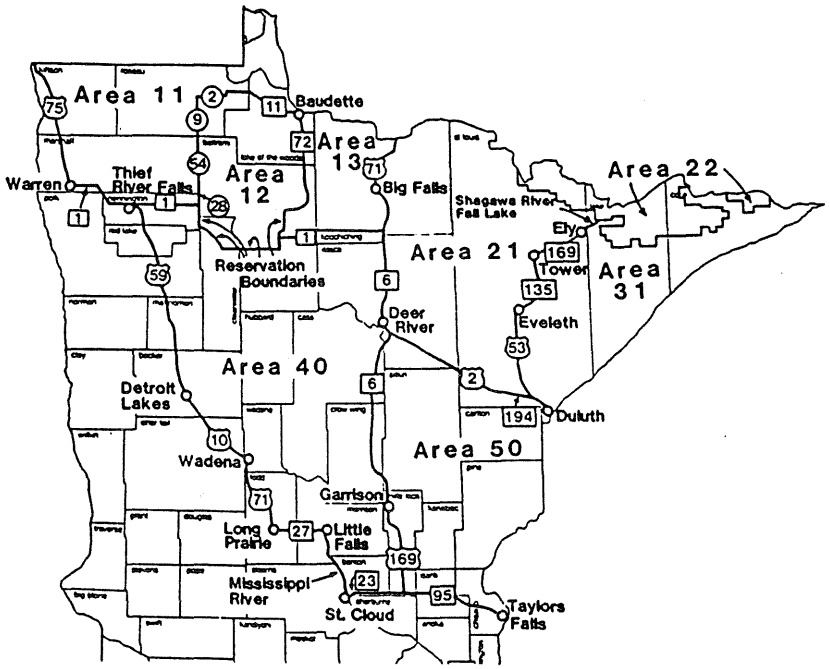

Figure 40. Boundaries of bear management units, 1986.

Table 50. Percent of Minnesota bear hunters using bows, baits, and guides, with the estimated number of hunters using guides shown parenthetically.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Bow	b	18	14	20	21	16	19
Bait	b	53	56	62	61	66	67
Guide	5	7	6	5	6	5	6
	(430)	(724)	(110)	(170)	(182)	(183)	(235)

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] Not recorded in this survey.

Table 51. Percent hunting success of Minnesota bear hunters by method of hunt.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Firearm		15	23	35	32	39	41
Bow only		22	18	33	27	44	31
Bait		21	25	37	33	42	42
No bait		11	21	31	26	35	33
Guide	49	18	32	45	52	41	47
No guide	17	16	23	34	30	39	39

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

Table 52. Moose hunt quota statistics 1971-87, and harvest data, 1971-85.

Year	Area	Number of 4-person licenses issued	Number of 4-person license applications	Chances for permit	Harvest	Party Success (%)	Sex of Moose M	Sex of Moose F
1971	NW	250	9,264	1:23	240	96.0	159 (66%)	81 (34%)
	NE	150			134	89.3	87 (65%)	47 (35%)
1973	NW	335	13,560	1:26	306	91.3	213 (76%)	91 (24%)
	NE	185			159	86.0	131 (83%)	24 (13%)
1975	NW	475	15,792	1:20	449	94.5	259 (58%)	188 (42%)
	NE	275			227	82.5	147 (65%)	80 (35%)
1977	NW	630	16,586	1:18	598	94.9	348 (58%)	250 (42%)
	NE	300			243	81.0	172 (71%)	71 (29%)
1979	NW	395	19,023	1:28	330	83.5	196 (59%)	134 (41%)
	NE	290			236	81.4	158 (67%)	78 (33%)
1981	NW	505	20,521	1:23	455	90.1	283 (62%)	172 (38%)
	NE	375			309	82.4	218 (71%)	91 (29%)
1983	NW	780	17,754	1:14	737	94.5	493 (67%)	244 (33%)
	NE	523			442	84.5	273 (62%)	169 (38%)
1985	NW	768	20,553	1:19	718	93.5	419 (58%)	299 (42%)
	NE	300			250	83.3	165 (66%)	85 (34%)
1987	NW	772	17,087	1:13	-	-	-	-
	NE	528			-	-	-	-

TRAPPING

HARVEST STATISTICS

Table 53. Trapper response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	1,011	29	888	90.4
1980-81	1,345	110	1,072	86.8
1981-82	1,345	36	1,167	89.2
1982-83	925	28	794	88.5
1983-84	770	10	663[a]	87.2[a]
1984-85	556	9	495	90.5
1985-86	581	13	506	89.1
1986-87	582	8	514	89.5

[a] Includes only those surveys returned by 25 April 1984.

Table 54. Use of trapper licenses, 1979-80 through 1986-87.

		Return from mail survey	Projections from license sales
1979-80			
	Trapped	760 (85.6%)	15,512
	Did not trap	128 (14.4%)	2,609
		888 (100.0%)	18,121
1980-81			
	Trapped	918 (85.6%)	20,548
	Did not trap	154 (14.4%)	3,457
		1,072 (100.0%)	24,005
1981-82			
	Trapped	972 (83.3%)	19,725
	Did not trap	195 (16.7%)	3,954
		1,167 (100.0%)	23,679
1982-83			
	Trapped	688 (86.6%)	17,526
	Did not trap	106 (13.4%)	2,700
		794 (100.0%)	20,226
1983-84			
	Trapped	549 (82.8%)	13,862
	Did not trap	114 (17.2%)	2,879
		663 (100.0%)	16,741
1984-85			
	Trapped	445 (89.9%)	15,136
	Did not trap	50 (10.1%)	1,700
		495 (100.0%)	16,836
1985-86			
	Trapped	420 (83.0%)	12,201
	Did not trap	86 (17.0%)	2,498
		506 (100.0%)	14,699
1986-87			
	Trapped	442 (86.0%)	13,240
	Did not trap	72 (14.0%)	2,155
		514 (100.0%)	15,395

Table 55. Estimated number of trappers and estimated take per trapper of various furbearers, 1979–80 through 1986–87.

	Estimated number of trappers (thousands)								Estimated take per trapper reporting that species							
	1979–80	1980–81	1981–82	1982–83	1983–84	1984–85	1985–86	1986–87	1979–80	1980–81	1981–82	1982–83	1983–84	1984–85	1985–86	1986–87
Muskrat	13	19	16	12	11	13	9	11	55.5	75.7	62.5	48.4	75.8	75.1	51.8	72.9
Mink	10	15	13	10	8	9	8	9	6.5	6.5	5.7	5.6	6.8	8.0	7.6	8.7
Ermine	2	2	1[a]	1	<1	1	<1	1	3.7	3.1	3.2	2.2	4.6	3.5	2.6	4.2
Long-tailed weasel	1	1	1	1	<1	1	<1	1	2.3	2.9	2.8	1.6	4.0	2.1	2.0	5.2
Racoon	10	11	12	9	9	9	8	8	6.6	5.4	6.2	6.4	7.8	8.3	11.3	11.4
Striped skunk	6	8	7	5	4	5	4	4	7.6	7.0	8.1	6.4	8.5	9.4	10.3	10.2
Eastern spotted skunk (civet)	<1	<1	<1	<1	2	<1	<1	<1	2.0	7.1	1.6	6.7	2.5	1.4	2.5	2.5
Badger	2	2	2	1	1	1	1	1	1.6	1.6	1.8	1.7	2.1	1.6	2.1	1.7
Opossum	1	<1	<1	<1	<1	<1	1	1	2.0	1.7	2.1	1.8	3.1	2.8	8.7	13.8
Red fox	6	7	8	6	6	6	5	5	6.5	6.3	6.8	6.3	6.9	9.2	6.1	7.5
Gray fox	1	2	2	2	2	2	2	2	2.5	2.8	2.7	2.7	2.5	2.9	3.5	2.9
Coyote (brush wolf)	1	1	1	2	2	2	1	2	3.4	3.6	2.4	3.2	4.8	5.3	4.5	3.8
Beaver (fall)	4	6	4	2	4	5	4	6	12.4	9.2	7.5	4.4	7.3	10.0	9.8	11.5
Beaver (spring)	1	1	1	3	4	3	4	-	14.4	14.5	12.6	25.5	25.4	30.3	21.7	-

[a] 1 is any number which rounds to 1.
<1 is <0.5.

Table 56. Minnesota trapper license sales and estimated annual harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Trapper license sales[a]	18,121	24,005	23,679	20,196	16,741	16,836	14,699	15,395
Beaver license sales[b]	6,692	8,503	6,602	1,971	-	-	-	-
Estimated harvest[c] (thousands)								
Muskrat	707	1,419	989	570	865	963	477	826
Mink	66	96	76	57	58	75	57	77
Ermine	7	7	3	1[e]	2	3	1	3
Long-tailed weasel	3	3	4	1	1	1	1	3
Raccoon	65	61	72	60	69	78	89	95
Striped skunk	47	53	54	34	36	47	41	42
Eastern spotted skunk (civet)	<1	1	<1	1	<1	<1	<1	<1
Badger	3	3	3	2	2	2	2	2
Opossum	1	<1	1	<1	2	1	7	14
Red fox	39	42	53	41	42	58	29	40
Gray fox	4	5	5	5	5	5	6	6
Coyote (brush wolf)	5	4	3	5	9	10	7	7
Beaver (fall season)	22	16	10	76	101	103	92	-
Beaver (spring season)	54	51	30	24	30	51	43	71
Registered harvest								
Otter	1,186	1,111	485	385	408	529	559	777
Lynx[d]	42	16	17	28	9	closed	closed	closed
Bobcat[d]	291	210	260	274	208	280	119	160
Fisher	3,032	closed	862	912	631	1,289	678	1,067
Marten	closed	closed	closed	closed	closed	closed	430	798

[a] Separate licenses were issued for juveniles (13-17 years old) and adults (18 and older), beginning in 1982. Of 15,395 trapping licenses sold in 1986, 2,699 (17.5%) were juvenile licenses and 12,706 (82.5%) were adult licenses. Duplicate licenses excluded.

[b] Beginning in fall 1982, beaver could be trapped with only a general trapping license; the separate beaver trapping license was dropped.

[c] Based upon trappers' responses to mail surveys.

[d] Registered harvest for lynx and bobcat includes animals taken by hunting.

[e] 1 is any number which rounds to 1.
<1 is <0.5.

Table 57. Average price per pelt paid to hunters and trappers in Minnesota, 1975-76 through 1986-87.

Species	Average pelt prices paid hunters and trappers in Minnesota (dollars)											
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Muskrat	3.00	4.03	4.25	4.56	5.90	5.62	3.47	2.19	2.24	2.81	1.85	2.89
Mink[a] (male)	(13.00)	27.40	22.15	36.69	42.83	37.55	34.35	24.43	30.33	28.40	25.29	35.75
Mink[a] (female)		10.07	8.86	14.80	18.61	16.04	17.22	10.63	14.55	14.04	13.37	18.43
Ermine (S.T. Weasel)	0.75	0.41	0.44	0.47	0.56	0.64	0.59	0.56	0.56	0.77	0.98	0.98
L.T. Weasel	0.75	0.87	0.85	1.01	0.94	0.84	0.96	0.80	0.93	1.10	1.06	1.28
Racoon	21.00	23.54	22.30	45.83	36.42	27.44	32.35	17.95	12.66	19.91	15.51	21.81
Striped Skunk	2.50	2.95	2.78	4.13	4.14	4.74	3.46	2.58	2.77	2.74	1.58	2.06
Eastern Spotted Skunk	2.50	5.02	5.42	7.37	3.48	6.06	2.58	1.75	N.A.	3.00	6.17	N.A.
Badger	18.00	18.66	21.07	39.55	24.02	18.39	18.14	9.04	10.96	9.18	6.45	5.43
Opossum	1.50	1.72	2.11	2.10	2.12	2.52	1.58	0.87	0.71	1.14	0.62	0.97
Red Fox	50.00	49.52	52.97	72.21	55.43	50.81	51.48	31.10	32.81	29.07	17.51	22.07
Gray Fox	19.00	24.75	25.51	45.44	42.51	37.87	26.74	23.48	22.95	21.58	15.00	22.60
Coyote	29.00	41.32	34.03	56.62	39.76	31.37	41.28	25.41	18.79	19.06	18.19	22.03
Lynx	162.00	183.00	137.86	269.44	199.19	94.91	180.33	94.17	125.00	-	-	-
Bobcat	80.00	78.77	73.98	163.76	117.74	78.55	73.35	66.40	61.40	75.81	70.00	120.15
Beaver[a] (fall-winter)	12.25	15.79	13.45	17.64	32.74	17.88	14.48	10.69	9.52	12.51	15.03	20.32
Beaver (spring)	15.79	13.45	17.64	28.71	19.58	16.52	12.55	11.60	12.24	16.11	17.90	-
Otter	32.50	36.99	41.23	58.85	63.37	32.78	29.80	25.65	24.79	21.56	20.81	24.15
Fisher[a] (male)	No Open Season (71.23)			131.89	107.67	89.51	94.42	69.91	70.59	70.26	73.55	84.32
Fisher[a] (female)				147.23	127.79	104.29	110.08	99.08	121.08	121.76	130.47	162.29
Marten (male)	No Open Season										30.29	35.68
Marten (female)											27.61	26.58

[a] Differences in pelt prices were not calculated before 1975 for mink, 1979 for beaver, and 1978 for fisher.

Table 57. Average price per pelt paid to hunters and trappers in Minnesota, 1975-76 through 1986-87.

Species	Average pelt prices paid hunters and trappers in Minnesota (dollars)											
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Muskrat	3.00	4.03	4.25	4.56	5.90	5.62	3.47	2.19	2.24	2.81	1.85	2.89
Mink[a] (male)	(13.00)	27.40	22.15	36.69	42.83	37.55	34.35	24.43	30.33	28.40	25.29	35.75
Mink[a] (female)		10.07	8.86	14.80	18.61	16.04	17.22	10.63	14.55	14.04	13.37	18.43
Ermine (S.T. Weasel)	0.75	0.41	0.44	0.47	0.56	0.64	0.59	0.56	0.56	0.77	0.98	0.98
L.T. Weasel	0.75	0.87	0.85	1.01	0.94	0.84	0.96	0.80	0.93	1.10	1.06	1.28
Raccoon	21.00	23.54	22.30	45.83	36.42	27.44	32.35	17.95	12.66	19.91	15.51	21.81
Striped Skunk	2.50	2.95	2.78	4.13	4.14	4.74	3.46	2.58	2.77	2.74	1.58	2.06
Eastern Spotted Skunk	2.50	5.02	5.42	7.37	3.48	6.06	2.58	1.75	N.A.	3.00	6.17	N.A.
Badger	18.00	18.66	21.07	39.55	24.02	18.39	18.14	9.04	10.96	9.18	6.45	5.43
Opossum	1.50	1.72	2.11	2.10	2.12	2.52	1.58	0.87	0.71	1.14	0.62	0.97
Red Fox	50.00	49.52	52.97	72.21	55.43	50.81	51.48	31.10	32.81	29.07	17.51	22.07
Gray Fox	19.00	24.75	25.51	45.44	42.51	37.87	26.74	23.48	22.95	21.58	15.00	22.60
Coyote	29.00	41.32	34.03	56.62	39.76	31.37	41.28	25.41	18.79	19.06	18.19	22.03
Lynx	162.00	183.00	137.86	269.44	199.19	94.91	180.33	94.17	125.00	-	-	-
Bobcat	80.00	78.77	73.98	163.76	117.74	78.55	73.35	66.40	61.40	75.81	70.00	120.15
Beaver[a] (fall-winter)	12.25	15.79	13.45	17.64	32.74	17.88	14.48	10.69	9.52	12.51	15.03	20.32
Beaver (spring)	15.79	13.45	17.64	28.71	19.58	16.52	12.55	11.60	12.24	16.11	17.90	-
Otter	32.50	36.99	41.23	58.85	63.37	32.78	29.80	25.65	24.79	21.56	20.81	24.15
Fisher[a] (male)	No Open Season (71.23)			131.89	107.67	89.51	94.42	69.91	70.59	70.26	73.55	84.32
Fisher[a] (female)				147.23	127.79	104.29	110.08	99.08	121.08	121.76	130.47	162.29
Marten (male)	No Open Season										30.29	35.68
Marten (female)											27.61	26.58

[a] Differences in pelt prices were not calculated before 1975 for mink, 1979 for beaver, and 1978 for fisher.

FURBEARER REGISTRATION STATISTICS

Table 58. Total registered fur harvests and tag requests, 1984-85 through 1986-87.

Species	1984-85		1985-86		1986-87	
	Permits[a]	Harvest	Permits	Harvest	Permits	Harvest
Bobcat	--	280	--	119	--	160
Fisher	--	1,289	--	678	3,302	1,067
Otter	--	529	--	559	3,198	777
Pine Marten	--	closed	746	430	2,171	798

[a] Prior request possession tags and permits were required beginning in 1985 for marten and in 1986 for fisher and otter.

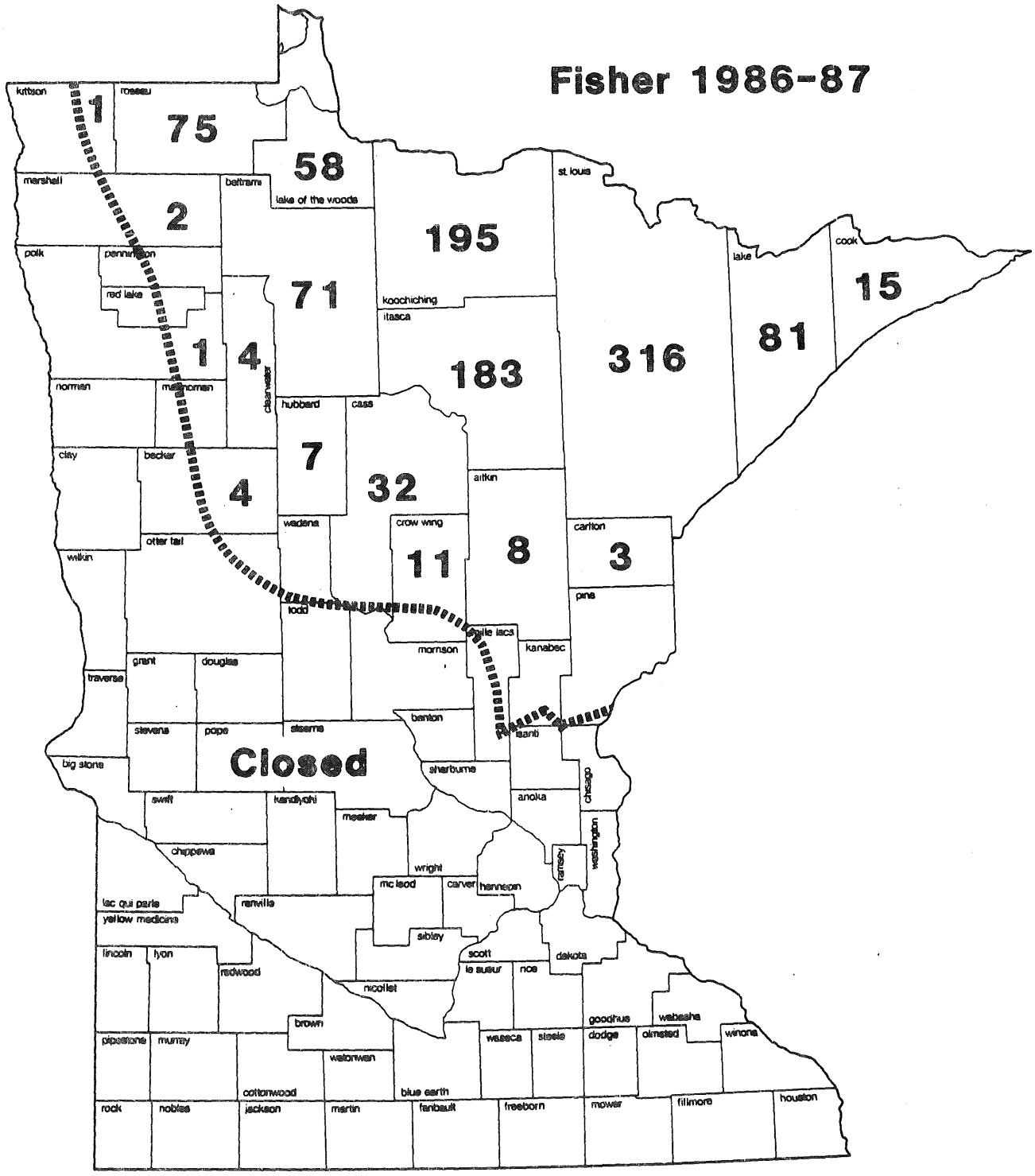

Figure 41. Fisher harvest by county, 1986-87.

Table 59. Fisher harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known total	Cumulative percent
	Male	Female	Unknown			
11/29	2	1	0	3	0.3	0.3
11/30	15	25	0	40	3.8	4.1
12/01	37	36	0	73	6.9	11.0
12/02	22	40	0	62	5.9	16.9
12/03	25	59	1	85	8.1	25.0
12/04	37	37	0	74	7.0	32.0
12/05	30	33	0	63	6.0	38.0
12/06	44	61	0	105	10.0	48.0
12/07	57	64	0	121	11.5	59.5
12/08	40	33	0	73	6.9	66.4
12/09	30	23	0	53	5.0	71.4
12/10	27	43	0	70	6.6	78.0
12/11	32	19	0	51	4.9	82.9
12/12	18	18	0	36	3.4	86.3
12/13	47	34	0	81	7.7	94.0
12/14	27	36	0	63	6.0	100.0
Unknown	2	7	6	15	-	-
Total	492	569	7	1,068	100.0	100.0

Table 60. Fisher harvest by county and sex, 1986 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	4	4	0	8
Becker	4	0	0	4
Beltrami	33	38	0	71
Carlton	3	0	0	3
Cass	24	8	0	32
Clearwater	2	2	0	4
Cook	4	11	0	15
Crow Wing	5	6	0	11
Hubbard	4	3	0	7
Itasca	93	89	1	183
Kittson	1	0	0	1
Koochiching	94	101	0	195
Lake	28	52	1	81
Lake of the Woods	24	34	0	58
Marshall	2	0	0	2
Norman	0	1	0	1
Polk	1	0	0	1
Roseau	30	45	0	75
St. Louis	139	177	0	316
Total	495	571	2	1,068

Table 61. Comparison of fisher harvest by county, 1982-86.

County	1982	1983	1984	1985	1986
Aitkin	15	5	10	8	8
Becker	2	4	3	1	4
Beltrami	41	25	96	27	71
Carlton	4	4	3	0	3
Cass	6	3	19	17	32
Clearwater	1	3	6	4	4
Cook	21	18	16	9	15
Crow Wing	6	2	11	6	11
Hubbard	0	0	7	1	7
Itasca	139	72	228	84	183
Kittson	0	6	2	1	1
Koochiching	182	123	255	157	195
Lake	115	37	80	49	81
Lake of the Woods	52	32	85	46	58
Marshall	6	13	10	5	2
Norman	0	0	0	0	1
Pine	0	1	1	0	0
Polk	0	0	0	0	1
Roseau	36	86	111	68	75
St. Louis	286	197	345	195	316
Unknown	0	0	1	0	0
Total	912	631	1,289	678	1,068

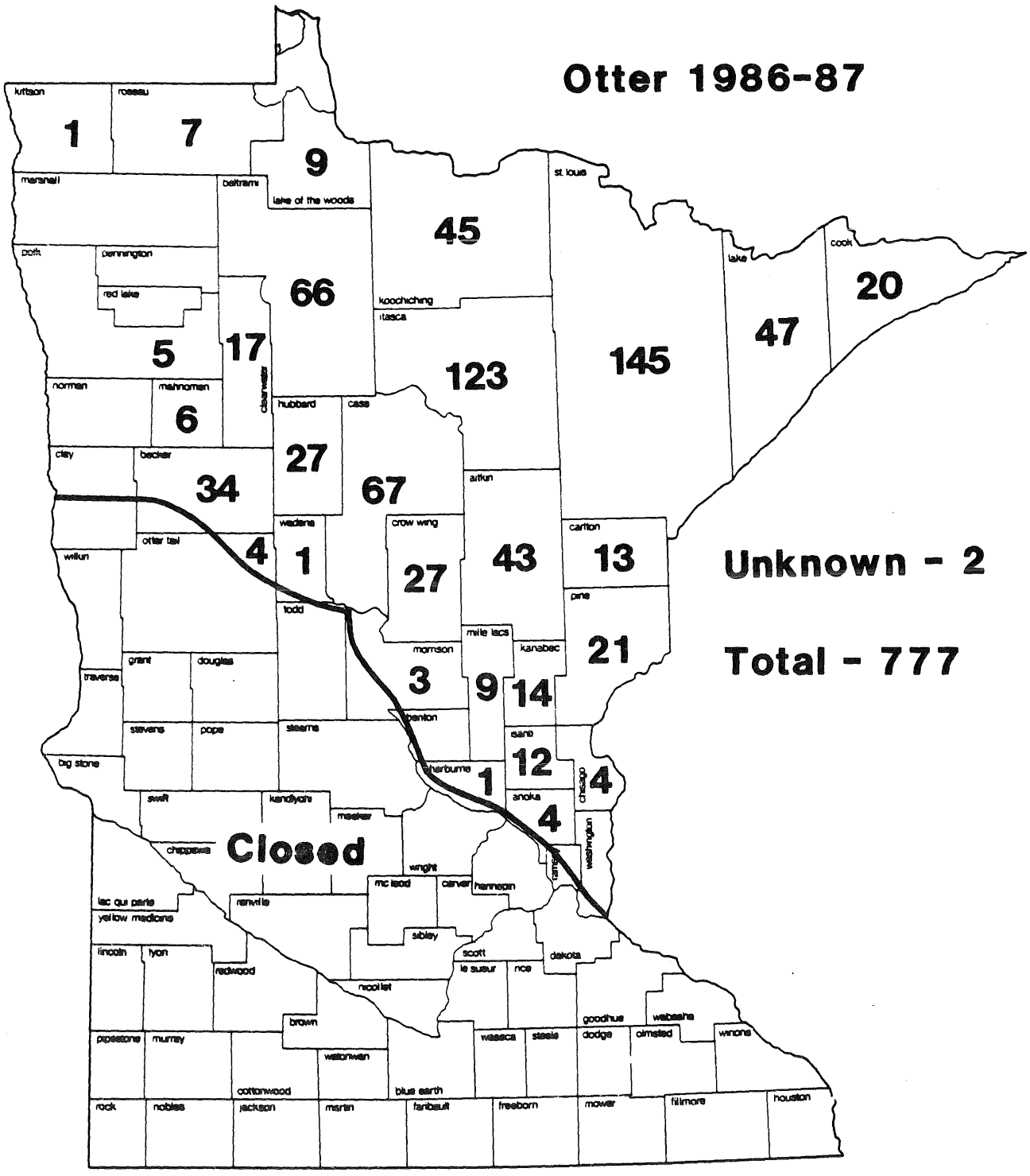

Figure 42. Otter harvest by county, 1986-87.

Table 62. Comparison of otter harvest by county, 1982-86.

County	11/13-11/27 1982	11/12-11/26 1983	11/17-12/01 1984	11/16-12/15 1985	11/01-11/30 1986
Aitkin	20	25	34	17	43
Anoka	0	0	0	0	4
Becker	8	15	18	24	34
Beltrami	39	23	33	46	66
Carlton	4	5	13	10	13
Cass	36	33	49	59	67
Chisago	0	0	0	0	4
Clearwater	9	6	11	6	17
Cook	17	4	16	5	20
Crow Wing	15	13	15	26	27
Hubbard	21	15	22	25	27
Isanti	0	0	0	0	12
Itasca	56	69	94	96	123
Kanabec	4	9	9	4	14
Kittson	0	0	0	0	1
Koochiching	23	26	34	38	45
Lake	15	20	18	25	47
Lake of the Woods	9	11	13	5	9
Mahnomen	2	2	3	14	6
Marshall	0	2	0	1	0
Mille Lacs	2	7	7	4	9
Morrison	0	0	0	0	3
Ottertail	1	1	1	1	4
Pennington	0	0	0	1	0
Pine	21	14	29	20	21
Polk	3	4	5	6	5
Red Lake	3	0	0	0	0
Roseau	3	3	5	5	7
St. Louis	69	96	96	119	145
Sherburne	0	0	0	0	1
Wadena	4	4	2	2	1
Unknown	1	1	2	0	2
Total	385	408	529	559	777

Table 63. Otter harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known Total	Cumulative percent
	Male	Female	Unknown			
11/01	3	6	0	9	1.2	1.2
11/02	19	15	0	34	4.4	5.6
11/03	39	18	0	57	7.5	13.1
11/04	24	20	0	44	5.7	18.8
11/05	20	20	0	40	5.2	24.0
11/06	21	13	1	35	4.6	28.6
11/07	30	17	0	47	6.1	34.7
11/08	16	18	0	34	4.5	39.2
11/09	17	10	0	27	3.5	42.7
11/10	25	13	0	38	5.0	47.7
11/11	10	7	0	17	2.2	49.9
11/12	15	7	0	22	2.9	52.8
11/13	2	11	0	13	1.7	54.5
11/14	8	15	0	23	3.0	57.5
11/15	28	26	0	54	7.1	64.6
11/16	15	14	0	29	3.8	68.4
11/17	11	6	0	17	2.2	70.6
11/18	10	6	0	16	2.1	72.7
11/19	4	5	0	9	1.2	73.9
11/20	21	15	1	37	4.8	78.7
11/21	6	6	0	12	1.6	80.3
11/22	11	9	0	20	2.6	82.9
11/23	4	8	0	12	1.6	84.5
11/24	15	1	0	16	2.1	86.6
11/25	10	2	0	12	1.6	88.2
11/26	15	8	0	23	3.0	91.2
11/27	6	9	0	15	2.0	93.2
11/28	11	7	0	18	2.4	95.6
11/29	7	6	0	13	1.7	97.3
11/30	11	10	0	21	2.7	100.0
Unknown	0	1	12	13	--	--
Total	434	329	14	777	100.0	100.0

Table 64. Otter harvest by county and sex, 1986-87 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	25	17	1	43
Anoka	3	1	0	4
Becker	22	12	0	34
Beltrami	37	29	0	66
Carlton	8	5	0	13
Cass	41	26	0	67
Chisago	2	2	0	4
Clearwater	11	6	0	17
Cook	8	12	0	20
Crow Wing	20	7	0	27
Hubbard	15	12	0	27
Isanti	6	6	0	12
Itasca	68	55	0	123
Kanabec	9	5	0	14
Kittson	1	0	0	1
Koochiching	25	20	0	45
Lake	26	21	0	47
Lake of the Woods	3	6	0	9
Mahnomen	3	3	0	6
Mille Lacs	7	2	0	9
Morrison	3	0	0	3
Ottertail	1	1	2	4
Pine	12	9	0	21
Polk	2	3	0	5
Roseau	4	3	0	7
St. Louis	77	67	1	145
Sherburne	0	1	0	1
Wadena	0	1	0	1
Unknown	0	0	2	2
Total	439	332	6	777

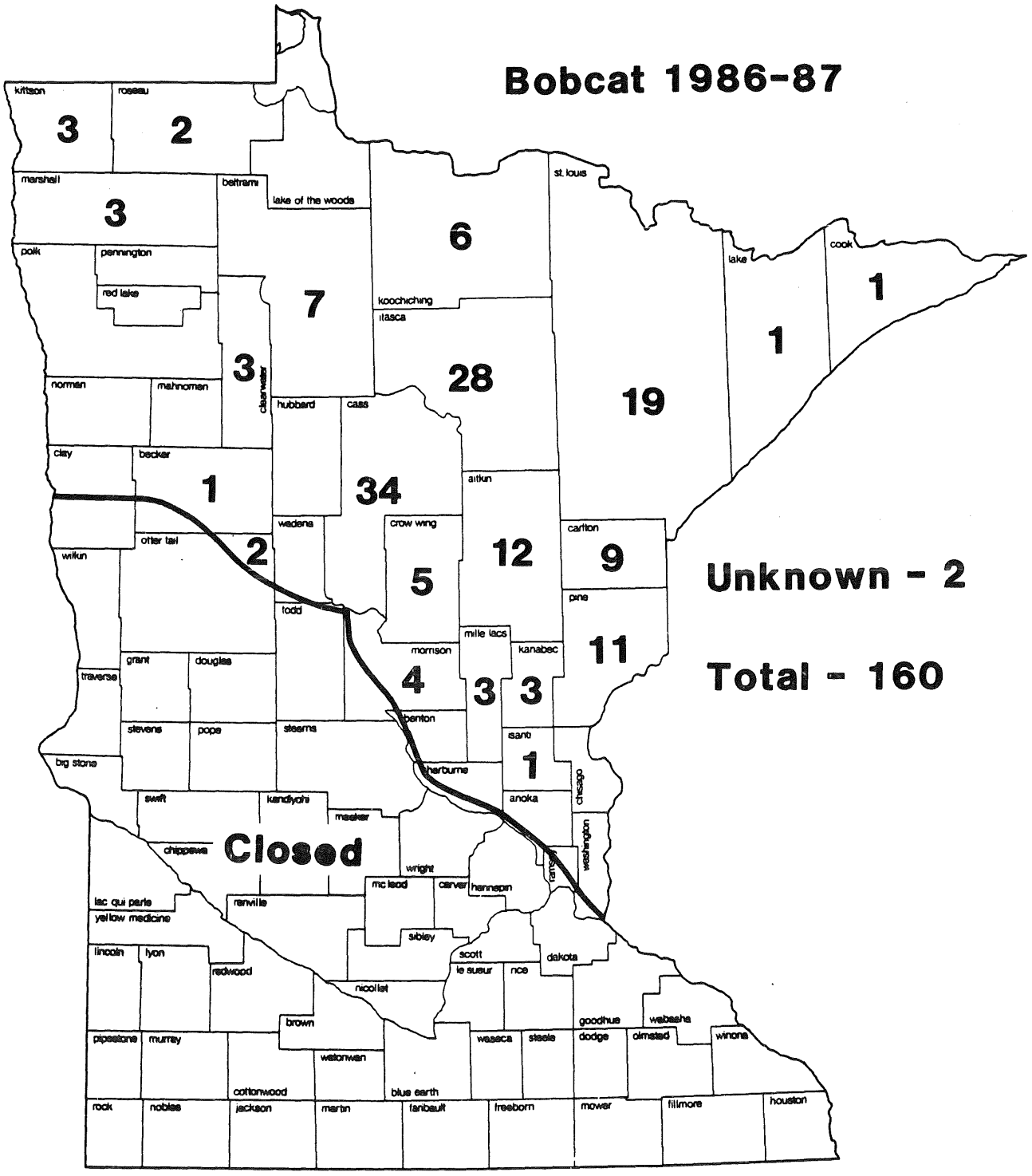

Figure 43. Bobcat harvest by county, 1986-87.

Table 65. Distribution of bobcat harvest among takers, 1979-80 through 1986-87.

Number Taken	Number of Takers: 1979-80 #	(%)	1980-81 #	(%)	1981-82 #	(%)	1982-83 #	(%)	1983-84 #	(%)	1984-85 #	(%)	1985-86 #	(%)	1986-87 #	(%)	Total (79-87) #	(%)
1	88	(61.1)	51	(55.4)	123	(71.1)	111	(65.3)	108	(72.0)	116	(65.2)	70	(78.7)	92	(76.7)	759	(68.0)
2	34	(23.6)	21	(22.8)	29	(16.8)	30	(17.6)	32	(21.3)	39	(21.9)	11	(12.4)	18	(15.0)	214	(19.2)
3	9	(6.2)	6	(6.5)	10	(5.8)	16	(9.4)	6	(4.0)	13	(7.3)	6	(6.7)	9	(7.5)	75	(6.7)
4	4	(2.8)	4	(4.3)	5	(2.9)	10	(5.9)	4	(2.7)	9	(5.1)	1	(1.1)	0	(0.0)	37	(3.3)
5	9	(6.3)	10	(10.9)	6	(3.5)	3	(1.8)	0	(0.0)	1	(0.5)	1	(1.1)	1	(0.8)	31	(2.8)
Total	144		92		173		170		150		178		89		120		1,116	

Table 66. Time distribution of bobcat harvest by 5-day increments, 1986-87 season.

Interval	Sex			Total	% of Total	Cumulative Percent
	M	F	U			
Nov. 29-Dec 3.	3	6	0	9	5.9	5.9
Dec. 4-8	11	16	0	27	17.8	23.7
Dec. 9-13	10	18	0	28	18.4	42.1
Dec. 14-18	13	15	0	28	18.4	60.5
Dec. 19-23	5	9	0	14	9.2	69.7
Dec. 24-28	8	13	0	21	13.8	83.5
Dec. 29-Jan. 2	9	9	0	18	11.9	95.4
Jan. 3[a]	3	4	0	7	4.6	100.0
Unknown	0	2	6	8		
Total	62	92	6	160	100.0	100.0

[a] 1-day interval

Table 67. Comparison of bobcat harvest by county, 1982-83 through 1986-87.

County	1982-83	1983-84	1984-85	1985-86	1986-87
Aitkin	28	20	25	14	12
Becker	6	8	9	1	1
Beltrami	18	17	24	5	7
Carlton	15	4	20	6	9
Cass	30	13	42	20	34
Chisago	1	0	0	1	0
Clearwater	1	1	0	0	3
Cook	2	0	1	0	1
Crow Wing	4	4	5	6	5
Hubbard	4	1	1	0	0
Isanti	0	0	0	0	1
Itasca	46	36	50	15	28
Kanabec	2	2	6	2	3
Kittson	5	3	0	0	3
Koochiching	3	12	8	8	6
Lake	8	3	1	1	1
Lake of the Woods	3	1	1	1	0
Marshall	2	3	1	1	3
Mille Lacs	0	6	0	4	3
Morrison	5	7	5	4	4
Ottertail	2	1	1	3	2
Pine	20	24	20	14	11
Polk	0	0	1	0	0
Red Lake	0	0	0	1	0
Renville	0	0	1	0	0
Roseau	9	9	14	2	2
St. Louis	59	32	43	8	19
Wadena	0	1	1	2	0
Unknown	1	0	1	0	2
Total	274	208	280	119	160

Table 68. Bobcat harvest by method of take, 1979-1986.

Year	Total Harvest	Trapping				Hunting			
		Harvest	(% of Total)	Takers	Ave. Take	Harvest	(% of Total)	Takers	Ave. Take
1979	291	253	(86.9)	--	--	38	(13.1)	--	--
1980	210	177	(84.3)	68	2.6	33	(15.7)	24	1.4
1981	260	219	(84.2)	143	1.5	41	(15.8)	30	1.4
1982	274	239	(87.2)	147	1.6	35	(12.8)	23	1.5
1983	208	168	(80.8)	118	1.4	40	(19.2)	32	1.3
1984	280	252	(90.0)	156	1.6	28	(10.0)	22	1.3
1985	119	83	(69.7)	62	1.3	36	(30.3)	27	1.3
1986	160	119	(74.4)	89	1.3	41	(25.6)	31	1.3

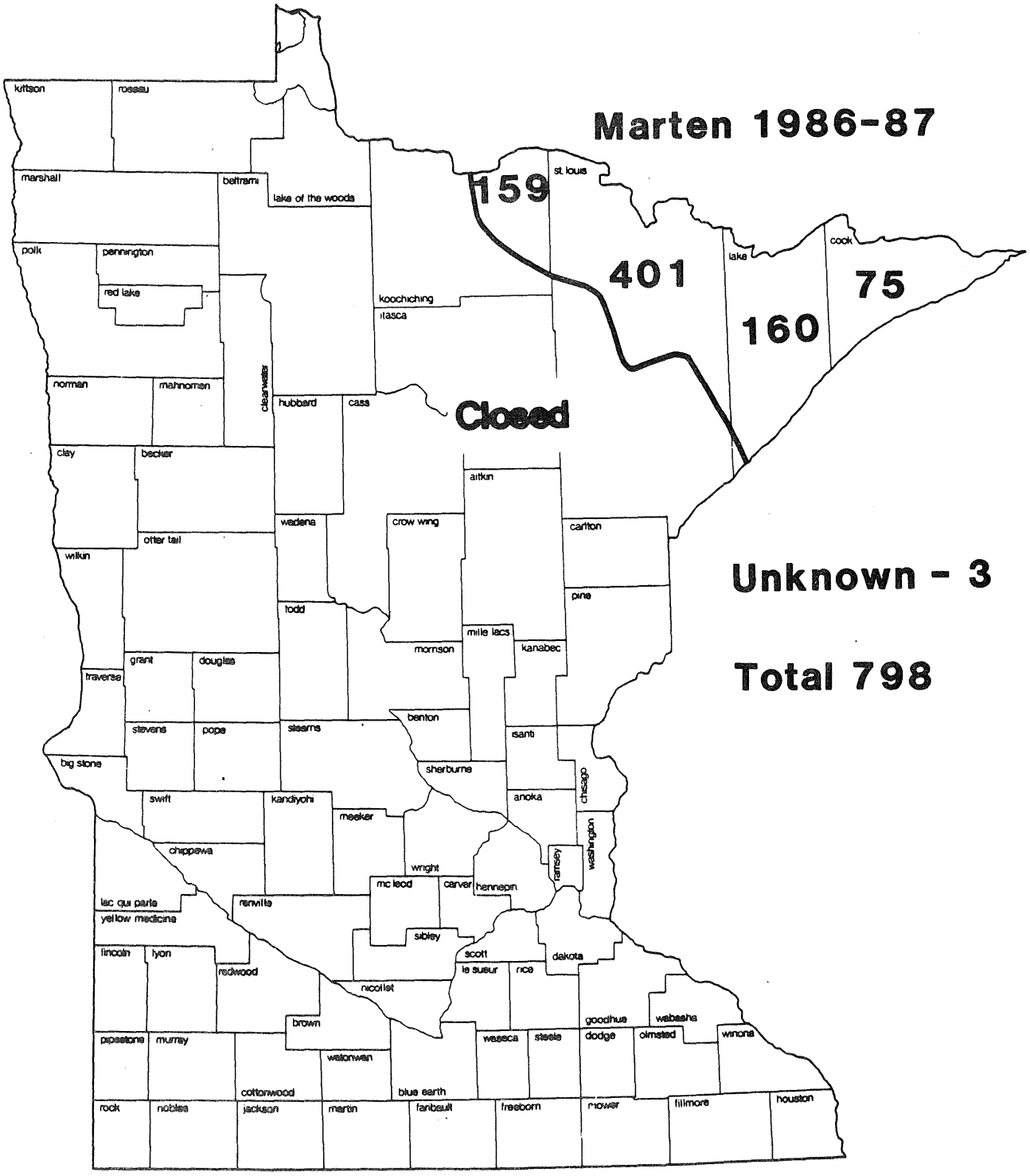

Figure 44. Marten harvest by county, 1986-87.

Table 69. Marten harvest by county and sex, 1986-87.

County	Sex			Total
	Male	Female	Unknown	
Cook	61	14	0	75
Koochiching	109	50	0	159
Lake	121	38	1	160
St. Louis	265	133	0	401
Unknown	1	2	0	3
Total	557	237	4	798

Table 70. Comparison of marten harvest by county, 1985-86.

County	1985	1986
Cook	51	75
Koochiching	72	159
Lake	119	160
St. Louis	188	401
Unknown	0	3
Total	430	798

Table 71. Marten harvest by date and sex, 1986-87.

Date	Male	Female	Unknown	Total	% of Total	Cumulative Percent
11/29	1	1	0	2	0.5	0.5
11/30	47	25	0	72	9.1	9.6
12/01	43	13	0	56	7.1	16.7
12/02	28	6	1	35	4.4	21.1
12/03	55	25	1	81	10.2	31.3
12/04	31	14	0	45	5.7	37.0
12/05	34	20	0	54	6.8	43.8
12/06	61	24	0	85	10.7	54.5
12/07	60	31	2	93	11.7	66.2
12/08	38	17	0	55	6.9	73.1
12/09	31	7	0	38	4.8	77.9
12/10	40	15	0	55	7.0	84.9
12/11	23	9	0	32	4.1	89.0
12/12	21	10	0	31	3.9	92.9
12/13	24	14	0	38	4.8	97.7
12/14	14	4	0	18	2.3	100.0
Unknown	4	2	0	6	--	--
Total	557	237	4	798	100.0	100.0

Status of Wildlife Populations, Fall 1987 and 1979-1986 Hunting and Trapping Harvest Statistics

compiled by

Blair Joselyn and Roger Lake

Section of Wildlife
Minnesota Department of Natural Resources
St. Paul, Minnesota

This report should be cited as follows:

Joselyn, B. and R. Lake, compilers. 1987. Status of wildlife populations, fall 1987 and 1979-1986 hunting and trapping harvest statistics. Unpub. Rep., Section of Wildlife, Minn. Dept. Nat. Res., St. Paul,

Note: Data in this report may change as a result of future more comprehensive analysis and verification being undertaken.

Status of Wildlife Populations, Fall 1987

and

1979-1986 Hunting and Trapping Harvest Statistics

Since this booklet was first published by the Wildlife Populations and Research Unit in 1977, the amount of material presented has increased considerably. That first edition 11 years ago was 29 pages in length (compared to 118 pages this year) and contained relatively limited information on only a few of the primary game species. Over the years we have covered more species and significantly expanded the amount of data presented on other species (e.g., deer and bear). Not only is the publication now a repository for annual population and harvest data on approximately 60 animals, but it has also become an archives of long-term population trend information for some species such as the 33 years of August roadside count data on pheasants, gray partridge, cottontail and jack rabbits and mourning doves.

For farmland and forest wildlife, most of the field work associated with collection of census and survey data is carried out by wildlife managers (conservation officers also participate in pheasant counts). The Farmland and Forest Wildlife Population and Research groups coordinate these activities, analyze and interpret data, and prepare recommendations for season setting meetings. For wetland species, much of the census and survey work is done by personnel in the Wetland Wildlife Populations and Research Group. Harvest statistics are calculated primarily by personnel in the St. Paul Office.

Blair Joselyn
9 October 1987

Index

FARMLAND WILDLIFE POPULATIONS

AND CENSUSES

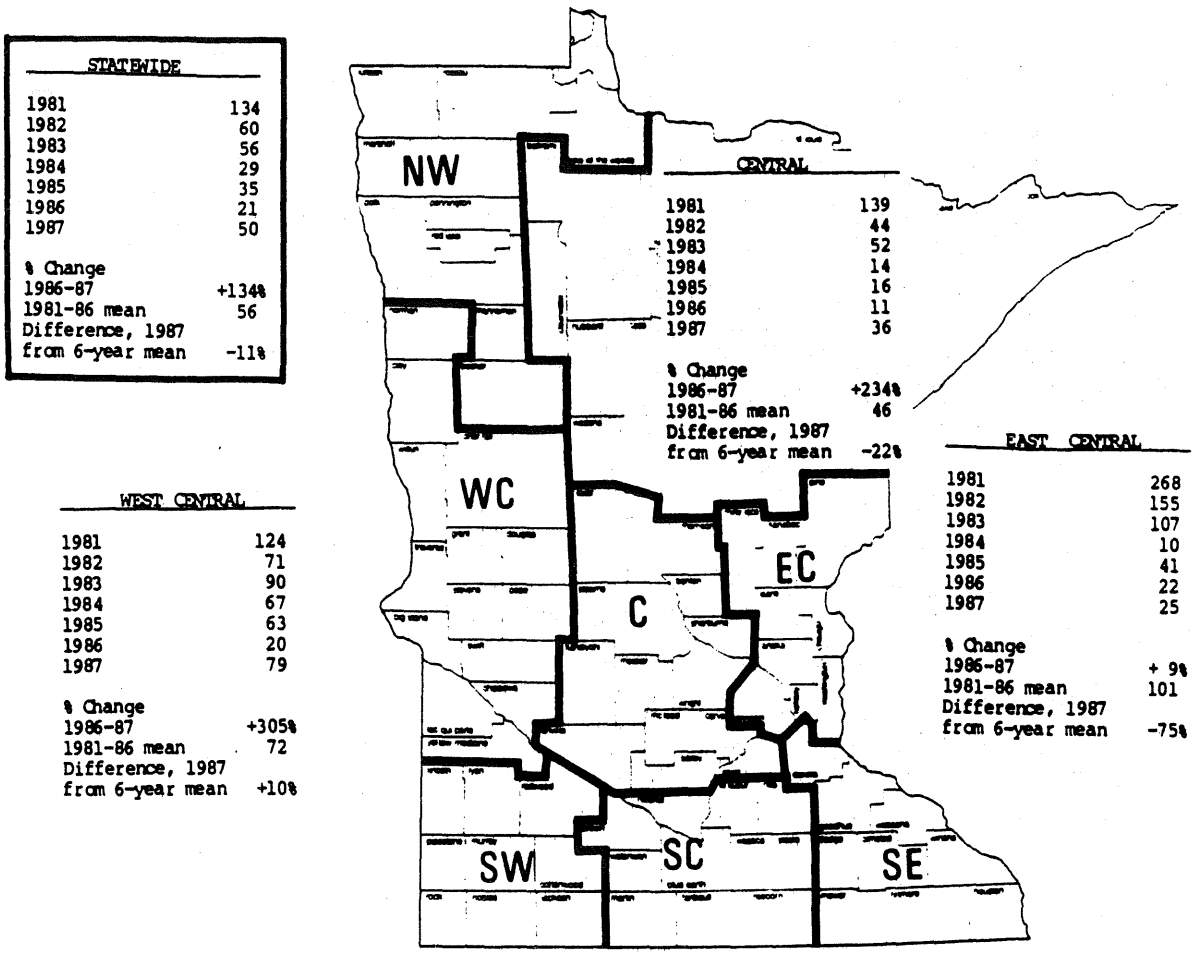

Figure 1. August roadside survey regional boundaries and pheasants observed per 100 miles of route, 1981-87, and percent change 1986-87 for miles censused both years.

Table 1. County, regional, and statewide August ring-necked pheasant survey results, 1982-87.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
West Central	925	70.8	89.7	66.5	62.9	19.6	79.4	61.9	305%
Big Stone	75	187	340	257	283	21	339		
Chippewa	50	54	52	60	38	26	116		
Clay	75	19	43	25	1	0	0		
Douglas	50	126	32	16	2	2	14		
Grant	50	46	0	30	12	10	2		
Lac qui Parle	75	204	212	137	40	24	107		
Norman	50	0	0	0	0	0	0		
Ottertail	50	100	56	124	106	52	140		
Pope	75	107	148	63	97	40	67		
Stevens	75	73	188	84	61	33	113		
Swift	75	21	59	39	111	17	63		
Traverse	75	3	7	57	36	23	69		
Wilkin	75	29	3	3	3	1	0		
Yellow Medicine	75	13	15	1	39	21	40		
Central	700	43.7	51.5	13.6	16.3	10.7	36.4	27.2	234%
Benton	50	74	82	10	60	8	104		
Carver	50	22	22	18	4	0	26		
Kandiyohi	75	40	83	9	25	3	8		
McLeod	50	--	28	0	16	14	--		
Meeker	75	83	19	28	8	5	21		
Morrison	50	44	12	0	0	22	8		
Renville	50	0	2	0	0	0	0		
Scott	50	120	168	6	38	14	72		
Sherburne	50	20	24	0	0	0	48		
Sibley	75	27	44	17	20	19	44		
Stearns	100	26	44	20	19	3	11		
Todd	50	62	110	30	0	44	26		
Wright	50	54	40	18	16	18	100		
East Central	425	155.1	107.3	10.1	41.3	22.4	24.5	67.2	9%
Anoka	50	28	4	2	32	0	4		
Chisago	75	280	265	20	72	25	43		
Hennepin	25	16	60	0	--	0	4		
Isanti	75	171	139	12	27	23	9		
Kanabec	50	142	128	10	32	38	26		
Mille Lacs	50	202	60	26	52	70	42		
Pine	50	122	58	0	66	6	30		
Washington	50	140	26	0	0	4	26		

Table 1. Continued.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
Southwest	475	26.1	10.1	8.4	14.3	19.8	60.2	15.7	204%
Cottonwood	50	32	2	10	46	0	48		
Jackson	50	68	24	10	18	10	16		
Lincoln	50	2	4	0	4	4	76		
Lyon	50	50	0	0	0	16	22		
Murray	50	60	54	0	6	26	98		
Nobles	75	5	1	0	15	29	41		
Pipestone	50	2	6	28	18	20	46		
Redwood	50	2	0	28	6	16	6		
Rock	50	24	4	4	16	52	198		
South Central	775	49.1	24.9	25.8	29.6	23.5	41.7	30.6	82%
Blue Earth	75	5	29	7	8	1	29		
Brown	75	55	7	33	24	28	24		
Fairbault	75	35	24	8	24	12	49		
Freeborn	75	24	0	25	51	35	72		
LeSueur	75	115	65	40	80	24	83		
Martin	50	104	21	65	15	50	74		
Nicollet	75	39	11	1	12	0	43		
Rice	75	57	25	1	0	16	12		
Steele	50	50	24	98	2	2	68		
Waseca	75	0	32	4	23	81	3		
Watonwan	75	24	35	17	59	11	21		
Southeast	500	28.9	51.4	20.6	31.6	37.4	39.0	34.0	4%
Dakota	50	92	98	4	--	62	4		
Dodge	50	40	96	20	56	12	66		
Fillmore	50	26	24	38	2	32	14		
Goodhue	50	0	4	0	2	0	4		
Houston	50	6	4	0	0	2	14		
Mower	75	55	55	45	64	72	71		
Olmsted	75	53	109	29	49	60	41		
Wabasha	50	4	16	0	16	54	6		
Winona	50	6	0	32	38	14	114		
Statewide	3,800	60.2	56.2	28.7	34.6	21.2	49.9	40.2	134%

[a] Percent change 1986-87 for miles surveyed both years only.

Table 2. Statewide pheasant population parameters calculated from August survey results, 1982-87.

Population Parameter	1982	1983	1984	1985	1986	1987	1982-86 mean	Percent[a] change 1986-87
Cocks/100 miles driven	4.5	5.2	2.5	3.2	2.6	3.6	3.6	+ 38%
Hens/100 miles driven	8.2	7.1	3.6	4.5	2.5	4.9	5.2	+ 96%
Broods/100 miles driven	8.5	7.4	4.3	4.8	3.6	7.0	5.8	+ 94%
Mean Brood Size	5.6	5.9	5.3	5.6	4.5	5.9	5.4	+ 31%

[a] Statewide means include the Northwest region.

Table 3. August 1987 roadside survey results for selected farmland wildlife species by agricultural region.

		Animals seen per 100 miles driven				
Region	Miles surveyed	Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	375	4.5	0.8	0.5	193.9	21.3
WC	925	14.6	5.8	1.2	440.6	6.5
C	700	15.1	7.0	0.3	222.0	1.9
EC	425	0.0	11.5	0.0	104.7	1.9
SW	475	99.4	8.2	0.6	257.3	7.8
SC	775	47.2	6.6	1.0	206.8	1.2
SE	500	66.6	10.6	1.0	255.0	1.8
Statewide[a]	4,175	34.2	7.1	0.7	261.2	5.2

[a] Statewide means include the Northwest region.

Table 4. August 1986 roadside survey results for selected farmland wildlife species by agricultural region.

Region	Miles surveyed	Animals seen per 100 miles driven: Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	400	3.5	0.3	1.0	176.8	10.3
WC	925	10.1	1.5	0.4	325.0	6.5
C	775	4.6	4.8	0.4	180.1	1.4
EC	425	0.0	5.9	0.0	115.1	0.7
SW	475	59.6	6.3	0.6	204.0	4.8
SC	775	45.3	5.3	0.9	160.5	2.3
SE	500	20.8	4.8	0.0	180.4	2.2
Statewide[a]	4,275	20.6	4.0	0.5	204.1	3.9

[a] Statewide means include the Northwest region.

Table 5. Statewide August roadside survey results for selected farmland wildlife species, 1983-87.

Species	Animals per 100 miles driven[a]: 1983	1984	1985	1986	1987	Percent[b] change 1986-1987
Ring-necked pheasant[c]	56.2	28.7	34.6	21.6	49.9	+134%
Gray partridge (Hun)	23.4	20.0	37.0	20.6	34.2	+58%
Mourning dove	286.6	279.2	270.1	204.1	261.2	+34%
Eastern cottontail	6.7	2.9	4.4	4.0	7.1	+69%
White-tailed jack rabbit	1.0	0.8	1.2	0.5	0.7	+60%
White-tailed deer	5.1	4.9	5.4	3.9	5.2	+30%
Sharp-tailed grouse	0.02	0.12	0.13	0.00	0.00	0%
Greater prairie-chicken	0.00	0.23	0.00	0.00	0.00	0%
Sandhill crane	1.22	1.14	1.84	1.33	3.28	+141%
Badger	0.00	0.00	0.00	0.00	0.05	NA
Gray & fox squirrels	1.03	1.84	0.86	1.29	1.22	-8%
Gray & red foxes	0.24	0.28	0.23	0.42	0.26	-39%
Striped & spotted skunks	0.22	0.49	0.48	0.42	0.31	-34%

[a] The mean number of animals per 100 miles are calculated using total miles surveyed and are not corrected for only miles surveyed both years.

[b] Percent change 1986-87 calculated using only those routes surveyed both years.

[c] Pheasant means do not include the Northwest region.

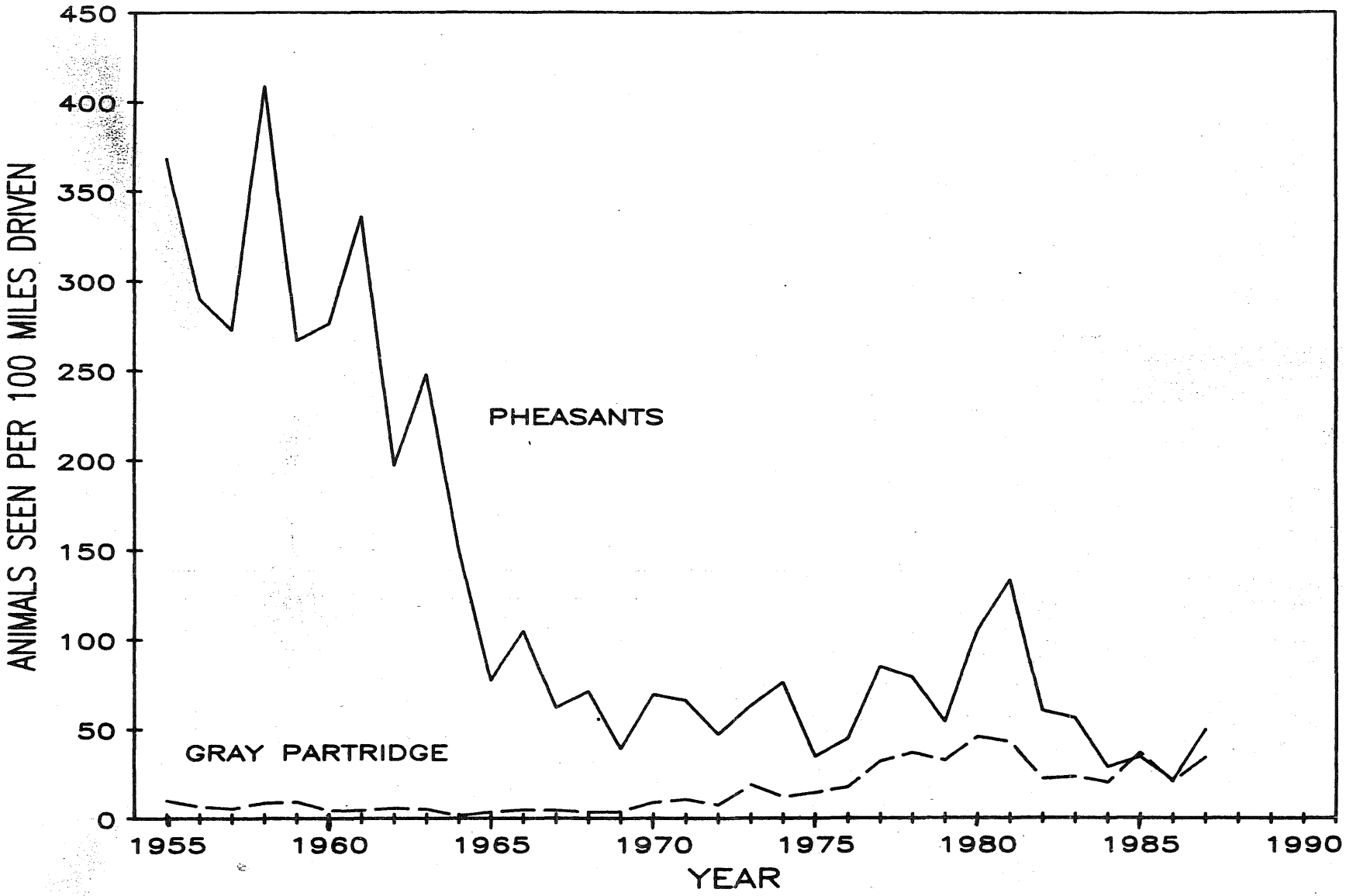

Figure 2. August roadside census indices (animals observed/100 mi.) of pheasants and gray partridge, 1955-87.

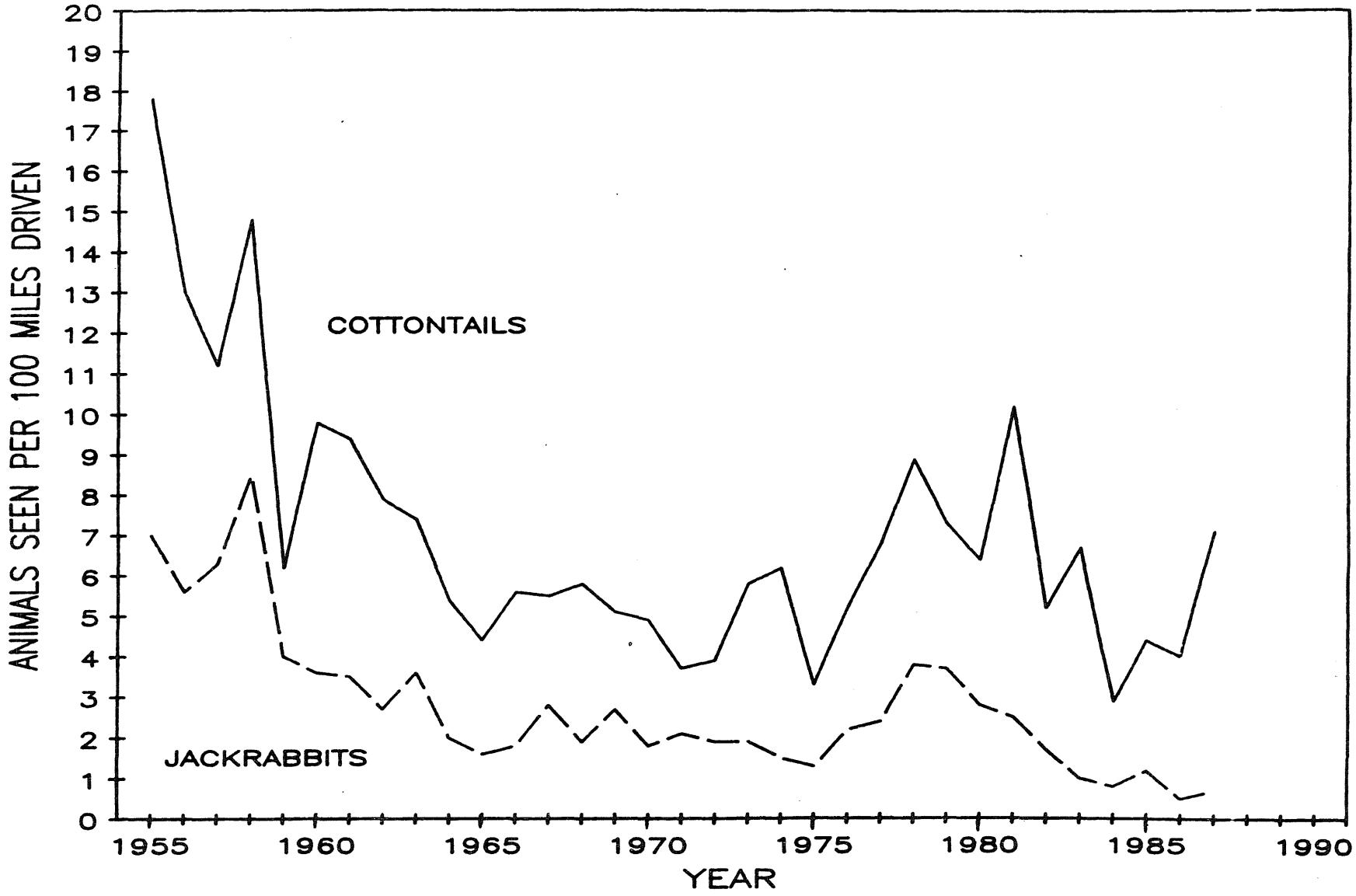

Figure 3. August roadside indices (animals observed/100 mi.) of eastern cottontail and white-tailed jackrabbits, 1955-87.

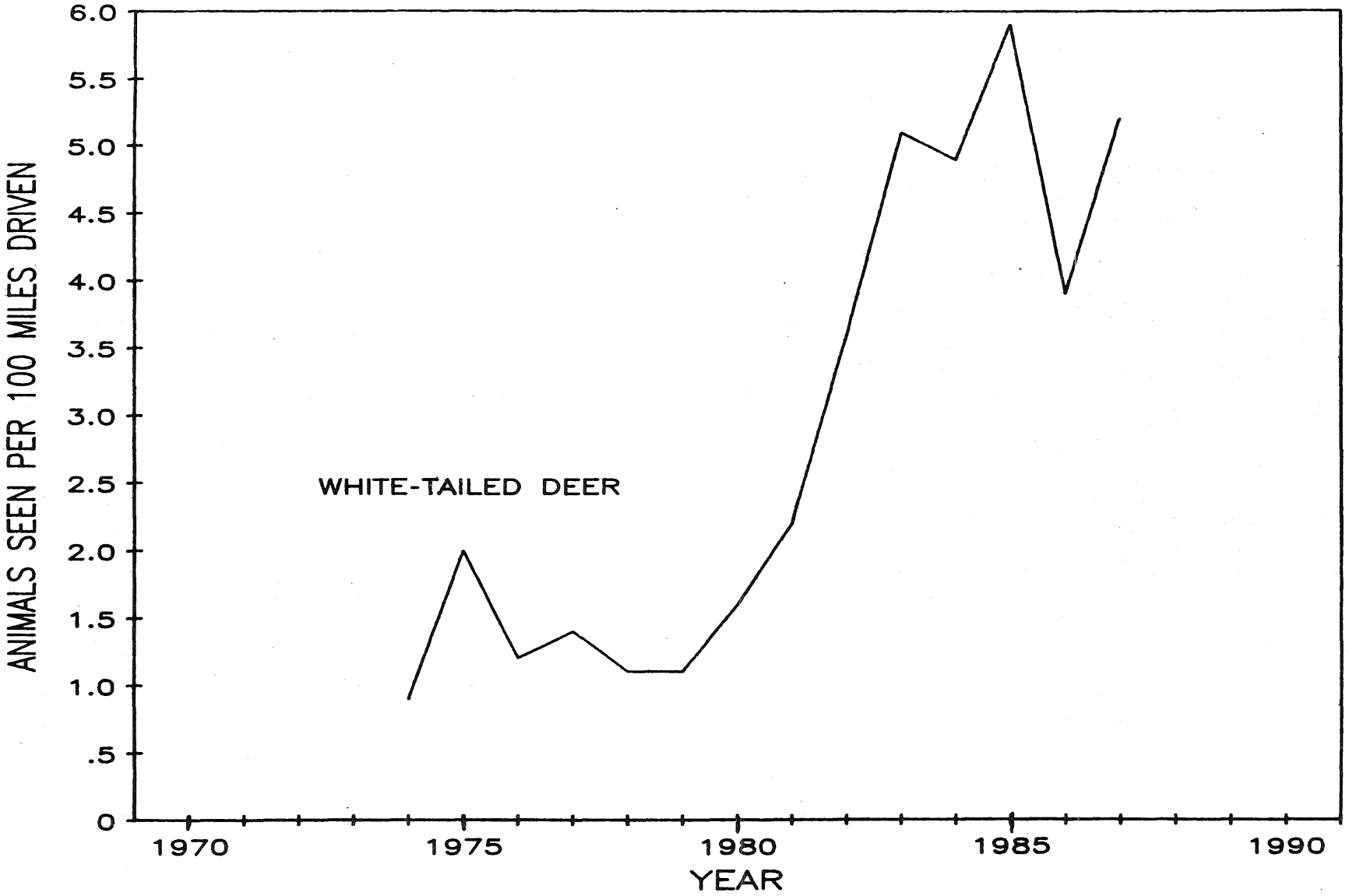

Figure 4. August roadside census indices (animals observed/100 mi.) of white-tailed deer, 1974-87.

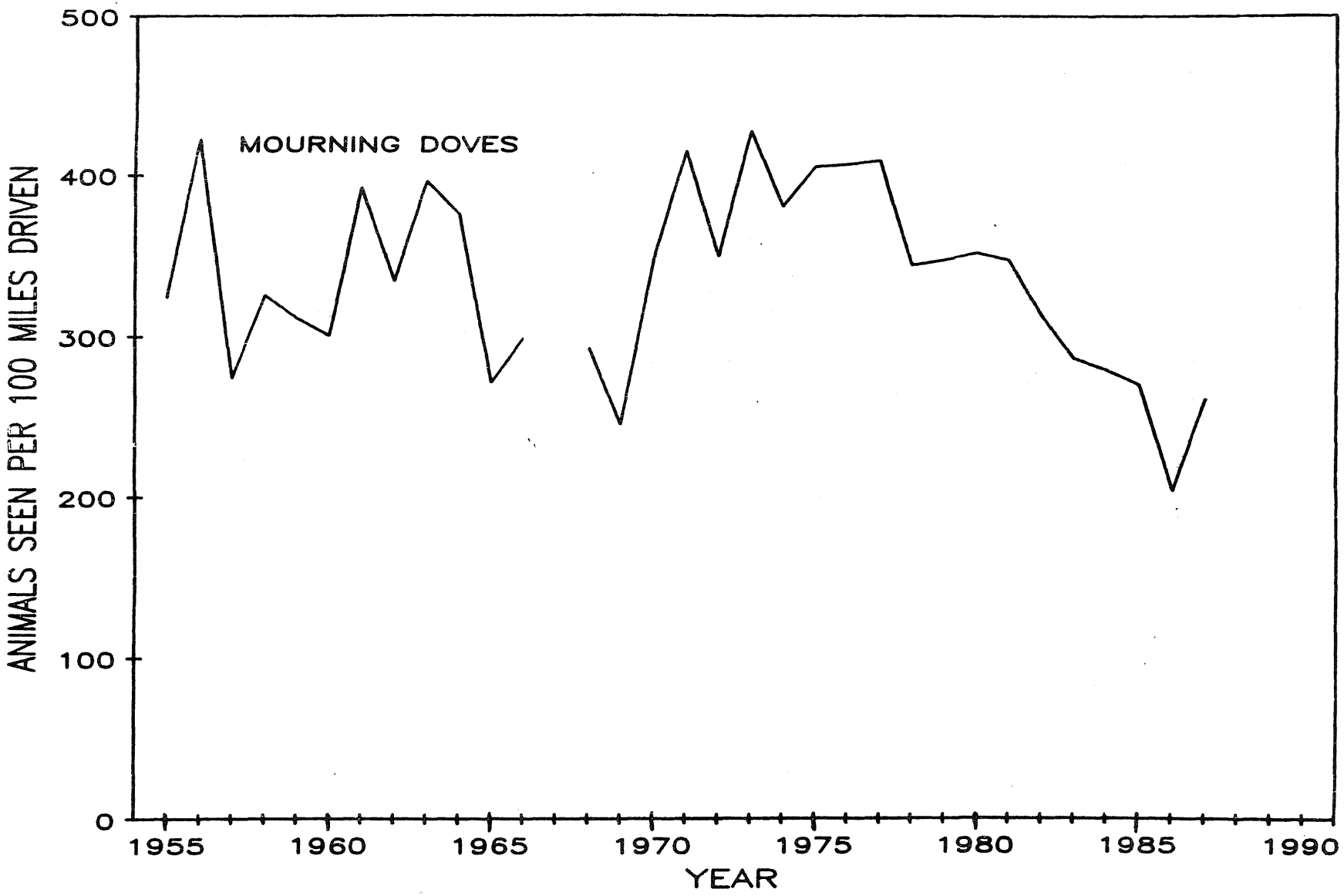

Figure 5. August roadside census indices (animals observed/100 mi.) of mourning doves, 1955-87.

August Roadside Survey Historical Summaries

Table 6. August roadside survey results for 5 species, 1955-87.

Year	Animals seen per 100 miles driven				
	Pheasants[a]	Gray partridge	Cottontails	Jack rabbits	Mourning doves
1955	368.1	9.9	17.8	7.0	324.5
1956	290.0	6.6	13.0	5.6	422.6
1957	272.6	5.5	11.2	6.3	274.5
1958	409.1	8.7	14.8	8.5	326.0
1959	266.8	9.3	6.2	4.0	311.4
1960	276.4	4.4	9.8	3.6	300.8
1961	336.0	4.5	9.4	3.5	392.4
1962	197.2	5.8	7.9	2.7	334.6
1963	248.1	5.1	7.4	3.6	396.5
1964	149.8	1.6	5.4	2.0	375.9
1965	77.2	3.6	4.4	1.6	271.6
1966	105.0	4.9	5.6	1.8	299.6
1967	62.2	4.6	5.5	2.8	
1968	71.4	3.5	5.8	1.9	293.5
1969	39.2	3.7	5.1	2.7	245.6
1970	69.6	9.1	4.9	1.8	348.3
1971	66.1	10.8	3.7	2.1	415.4
1972	47.3	7.5	3.9	1.9	349.8
1973	63.3	19.1	5.8	1.9	428.2
1974	76.3	12.0	6.2	1.5	380.8
1975	34.8	14.6	3.3	1.3	405.8
1976	44.8	17.6	5.2	2.2	407.4
1977	85.0	32.1	6.8	2.4	409.8
1978	79.0	37.0	8.9	3.8	344.5
1979	54.2	32.6	7.3	3.7	347.9
1980	104.9	46.0	6.4	2.8	352.2
1981[b]	133.5	42.9	10.2	2.5	347.6
1982[b]	60.2	22.2	5.2	1.7	313.6
1983	56.2	23.4	6.7	1.0	286.6
1984	28.7	20.0	2.9	0.8	279.2
1985	34.6	37.0	4.4	1.2	270.1
1986	21.2	20.6	4.0	0.5	204.1
1987	49.9	34.2	7.1	0.7	261.2

[a] Pheasants seen per 100 miles driven do not include the northwest agricultural region.

[b] Eight counties in the northwest agricultural region added to survey for all species except pheasants, 1982-87.

Table 7. Pheasants seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	163	140	581	620	212	No	368
1956	249	208	175	357	478	169	Survey	290
1957	260	130	135	337	522	180		273
1958	490	262	300	473	593	126		409
1959	307	187	73	510	413	55		267
1960	367	243	203	294	357	38		276
1961	494	267	255	366	381	115		336
1962	264	140	144	215	239	114		197
1963	444	192	157	252	227	135		248
1964	225	83	26	185	211	84		150
1965	121	38	9	90	98	69		77
1966	110	67	26	109	176	102		105
1967	56	30	10	54	126	81		62
1968	65	40	17	78	125	94		71
1969	13	22	20	33	68	102		39
1970	20	27	9	55	109	194		70
1971	40	44	12	59	77	175		66
1972	20	28	44	37	67	105		47
1973	38	35	53	36	75	168		63
1974	51	73	85	60	93	108		76
1975	13	34	75	7	25	79		35
1976	12	28	68	2	83	81		45
1977	46	85	101	6	145	126		85
1978	36	80	178	23	106	77		79
1979	45	62	101	13	53	55		54
1980	79	117	221	20	110	85		105
1981	124	139	268	76	126	95		134
1982	71	44	155	26	49	29	0	60
1983	90	52	107	10	25	51	0	56
1984	67	14	10	8	26	21	0	29
1985	63	16	41	14	30	32	3	35
1986	20	11	22	20	24	37	0	21
1987	79	36	25	60	42	39	0	50

[a] Statewide totals do not include the northwest agricultural region.

Table 8. Gray partridge seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	16	8	0	11	10	9	No	10
1956	3	8	0	15	6	8	Survey	7
1957	6	5	0	12	7	0		6
1958	20	9	0	10	0	6		9
1959	13	17	0	20	5	0		9
1960	4	7	0	12	1	5		4
1961	6	13	0	2	1	0		5
1962	3	10	0	3	0	22		6
1963	3	11	0	11	1	5		5
1964	1	3	0	2	2	2		2
1965	5	3	0	7	2	4		4
1966	2	4	0	18	0	11		5
1967	3	2	0	8	14	0		5
1968	4	3	0	10	0	5		4
1969	5	3	0	11	0	5		4
1970	7	8	0	33	4	4		9
1971	13	4	0	29	7	10		11
1972	7	3	0	18	2	18		8
1973	8	8	0	67	12	26		19
1974	7	10	0	27	8	20		12
1975	11	2	0	68	9	6		15
1976	11	9	0	59	15	22		18
1977	16	33	0	93	31	32		32
1978	26	23	0	144	31	15		37
1979	43	24	0	80	35	12		33
1980	58	49	0	99	41	28		46
1981	38	27	1	139	44	19		43
1982	24	23	1	70	17	16	4	22
1983	29	19	0	65	23	8	15	23
1984	18	17	0	50	27	16	10	20
1985	31	18	0	95	63	42	2	37
1986	10	5	0	60	45	21	4	21
1987	15	15	0	99	47	67	5	34

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 9. Cottontail rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	8	15	15	20	20	32	No	18
1956	10	16	12	16	13	13	Survey	13
1957	7	10	8	18	14	14		11
1958	13	14	16	22	17	7		15
1959	5	16	6	7	5	2		6
1960	6	14	6	16	12	5		10
1961	6	12	6	14	11	6		9
1962	6	7	4	13	10	8		8
1963	7	4	5	12	9	9		7
1964	5	3	1	12	7	5		5
1965	4	4	1	5	6	6		4
1966	5	3	2	10	8	6		6
1967	6	5	2	7	9	3		6
1968	5	3	4	9	9	6		6
1969	4	4	1	10	8	5		5
1970	4	5	2	7	6	6		5
1971	5	3	2	7	3	2		4
1972	4	5	4	5	4	4		4
1973	5	9	6	7	5	4		6
1974	3	7	14	7	6	6		6
1975	2	4	8	2	2	3		3
1976	4	6	7	2	6	8		5
1977	5	7	13	6	5	8		7
1978	5	9	21	12	7	5		9
1979	5	8	8	13	8	4		7
1980	4	7	10	7	7	4		6
1981	7	10	18	10	8	12		10
1982	5	7	8	3	7	5	2	5
1983	7	6	13	6	4	12	2	7
1984	2	2	4	4	4	5	0	3
1985	2	4	5	7	6	8	0	4
1986	2	5	6	6	5	5	0	4
1987	6	7	12	8	7	11	1	7

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 10. Jack rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	9	3	2	13	11	2	No	7
1956	6	4	2	10	8	2	Survey	6
1957	5	5	1	20	6	1		6
1958	7	6	1	20	12	1		9
1959	1	1	0	15	8	1		4
1960	4	5	0	10	3	0		4
1961	4	5	0	7	4	0		4
1962	4	2	0	5	3	1		3
1963	10	2	0	2	3	1		4
1964	3	1	0	4	2	1		2
1965	2	2	0	4	1	0		2
1966	2	2	0	5	1	1		2
1967	5	1	0	4	4	0		3
1968	2	1	0	7	2	1		2
1969	3	1	1	10	2	1		3
1970	4	2	0	2	1	0		2
1971	5	2	0	3	1	0		2
1972	4	1	0	2	2	1		2
1973	4	0	0	3	2	0		2
1974	4	2	0	2	1	0		2
1975	3	1	0	2	0	0		1
1976	4	1	0	5	2	1		2
1977	4	3	0	5	2	1		2
1978	3	3	1	13	3	1		4
1979	5	5	1	6	3	1		4
1980	4	1	1	8	2	3		3
1981	2	2	0	7	2	3		3
1982	3	1	1	5	1	1	2	2
1983	2	1	0	0	1	1	1	1
1984	2	1	0	2	0	1	0	1
1985	2	0	0	3	2	1	1	1
1986	0	0	0	1	1	0	1	1
1987	1	0	0	1	1	1	1	1

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 11. Mourning doves seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	275	116	539	396	197	No	325
1956	347	553	278	592	461	286	Survey	423
1957	303	246	168	243	383	200		275
1958	350	297	192	270	456	293		326
1959	377	307	221	358	447	94		311
1960	274	334	122	337	430	187		301
1961	377	373	136	481	563	317		392
1962	338	338	215	313	396	314		335
1963	636	273	212	506	435	313		397
1964	681	257	167	400	395	217		376
1965	312	245	185	460	217	271		272
1966	363	210	152	505	311	229		300
1967								
1968	411	208	125	261	254	385		294
1969	268	280	125	477	132	195		246
1970	601	218	113	527	204	274		348
1971	580	257	182	366	259	752		415
1972	600	234	169	308	230	314		350
1973	602	280	288	480	392	329		428
1974	588	321	242	352	269	382		381
1975	654	303	153	546	338	260		406
1976	600	373	224	536	367	282		407
1977	699	308	168	680	282	224		410
1978	502	326	174	431	276	282		345
1979	601	406	138	380	198	213		348
1980	696	302	140	422	235	182		352
1981	634	285	153	514	213	179		348
1982	557	243	175	304	278	213	225	314
1983	517	289	131	278	214	193	189	287
1984	531	233	129	267	183	269	176	279
1985	501	245	93	243	213	151	234	270
1986	325	180	115	204	161	180	177	204
1987	441	222	105	257	207	255	194	261

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 12. Greater prairie-chicken spring booming ground counts for 14 northwestern counties, 1978-87 (counts coordinated and summarized by AWM Terry Wolfe, Crookston).

County	No. of booming males (No. of booming grounds)									
	1978	1979	1980	1981	1982	1983	1984[b]	1985	1986	1987
Becker	26 (4)	102 (9)[a]	156 (16)[a]	159 (16)[a]	133 (13)[a]	174 (17)	96 (9)[a]	41 (3)	99 (11)	53 (7)
Cass	9 (1)	14 (2)[a]	17 (6)[a]	63 (15)[a]	68 (16)[a]	65 (15)	54 (15)[a]	58 (14)	52 (14)	60 (15)
Chippewa	8 (1)	2 (1)	2 (1)	2 (1)	0	2 (1)	0	0	0	0
Clay	261 (21)	205 (17)[a]	186 (17)[a]	196 (16)[a]	216 (12)[a]	161 (15)	110 (7)	127 (7)[a]	86 (9)[a]	87 (9)
Hubbard	0	0	0	4 (1)	3 (1)	3 (1)	5 (1)	16 (6)[a]	16 (4)	22 (5)
Mahnomen	71 (4)	81 (7)	203 (21)	223 (20)	294 (22)	316 (22)	149 (19)	134 (15)	102 (17)	63 (9)
Marshall	0	0	0	3 (1)	7 (2)	3 (1)[a]	2 (2)	0	0	0
Norman	130 (9)	213 (13)	230 (9)	210 (9)	273 (15)	194 (11)[a]	119 (8)	86 (7)	128[a] (10)	87 (9)
Ottertail	8 (2)	19 (5)	13 (2)	9 (2)	12 (1)	10 (3)	7 (1)	5 (1)	0[a]	0
Pennington	0	8 (1)[a]	0	2 (1)	6 (1)	5 (1)	4 (1)[a]	3 (1)	0	0
Polk	140 (16)	192 (18)[a]	269 (27)	254 (26)	283 (29)	232 (26)	146 (22)[a]	162 (18)	96 (17)[a]	72 (8)
Red Lake	7 (1)	8 (1)	8 (1)	19 (2)	19 (2)	14 (2)	12 (2)	2 (1)	0	0
Wadena	0 (10)[a]	27 (3)[a]	10 (3)	60 (12)[a]	64 (11)	18 (6)	19 (2)	34 (9)[a]	17 (7)[a]	105 (20)
Wilkin	180 (14)	77 (4)	164 (14)	206 (23)[a]	269 (20)	223 (18)	60 (6)	149 (15)[a]	81 (9)[a]	99 (8)
Total	841 (74)	948 (81)	1,258(117)	1,410(144)	1,648(146)	1,420(139)	783 (95	817 (97)	677 (98)	648 (90)
Avg. no. males/ground	11.4	11.7	10.8	9.8	11.2	10.2	8.2	8.4	6.9	7.2

[a] Data include only grounds on which counts were conducted. In several counties booming grounds were located but counts were not made, they are not included in the data presented.

[b] Part of the reason for the low number of chickens is incomplete counts of known grounds. This was the case for Polk County and a few others. However, even after allowing for uncounted grounds, chicken numbers were down.

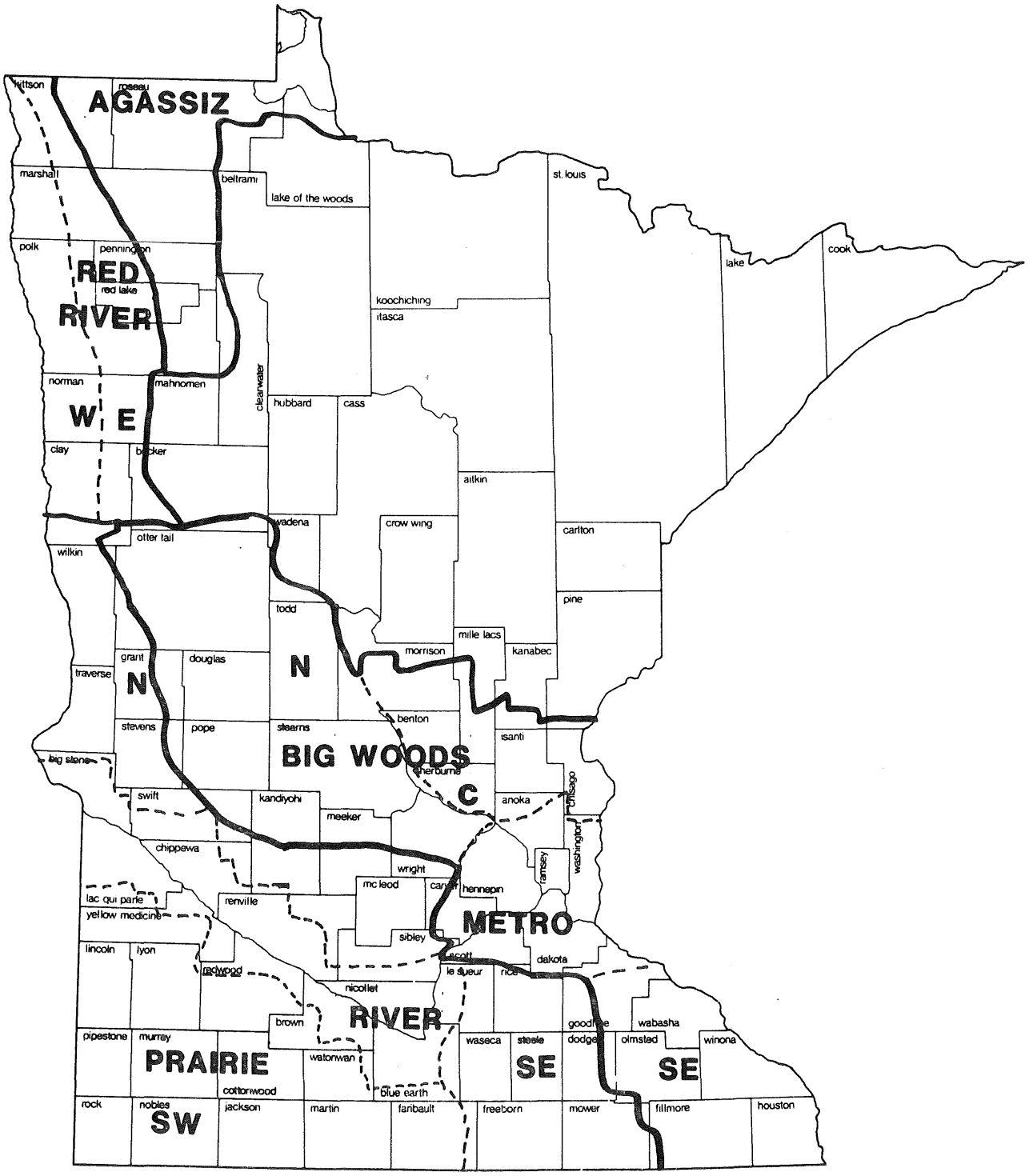

Figure 6. Deer management units and sub-units in the Farmland Zone.

Table 13. Number of car-killed deer confiscated in the Deer Management Units and sub-units of Minnesota's farmland zone, 1980-86. Data are adjusted for miles driven to the base year of 1972.

DMU Sub-DMU	1980	1981	1982	1983	1984	1985	1986	$\bar{X}$ 1980's	% Chg. 1985-86
RED RIVER	206	281	344	333	323	339	366	313	+ 8.0%
AGASSIZ	172	272	287	335	261	281	246	265	-12.5%
BIG WOODS	3,431	4,186	4,612	4,939	5,469	4,958	5,507	4,729	+11.1%
North	1,133	1,399	1,565	1,715	1,610	1,502	1,637	1,509	+ 9.0%
Central	661	893	885	904	1,065	934	961	900	+ 2.9%
Metro	1,126	1,219	1,296	1,391	1,803	1,692	1,961	1,498	+15.9%
SE	511	676	866	929	990	830	948	822	+14.2%
PRAIRIE	2,577	2,666	2,990	3,078	3,268	2,809	3,133	2,932	+11.5%
North	392	392	394	469	349	400	440	405	+10.0%
River	764	842	864	947	1,021	829	857	875	+ 3.4%
SW	833	871	992	967	1,009	851	913	919	+ 7.3%
SE	589	561	740	695	890	729	923	732	+26.6%
FARMLAND[a] ZONE	6,387	7,405	8,232	8,684	9,321	8,387	9,252	8,238	+10.3%
FOREST[b] ZONE	1,698	3,574	2,591	3,071	3,270	3,180	3,739	3,018	+17.6%
MISC	469	572	791	358	539	447	543	531	+21.5%
STATEWIDE[c]	8,554	11,551	11,614	12,113	13,130	12,014	13,534	11,787	+12.3%

[a] Farmland subtotals from regional enforcement summaries.

[b] Forest subtotals = Statewide - (Farmland + Misc.).

[c] Statewide data from summaries distributed by Division of Enforcement in St. Paul.

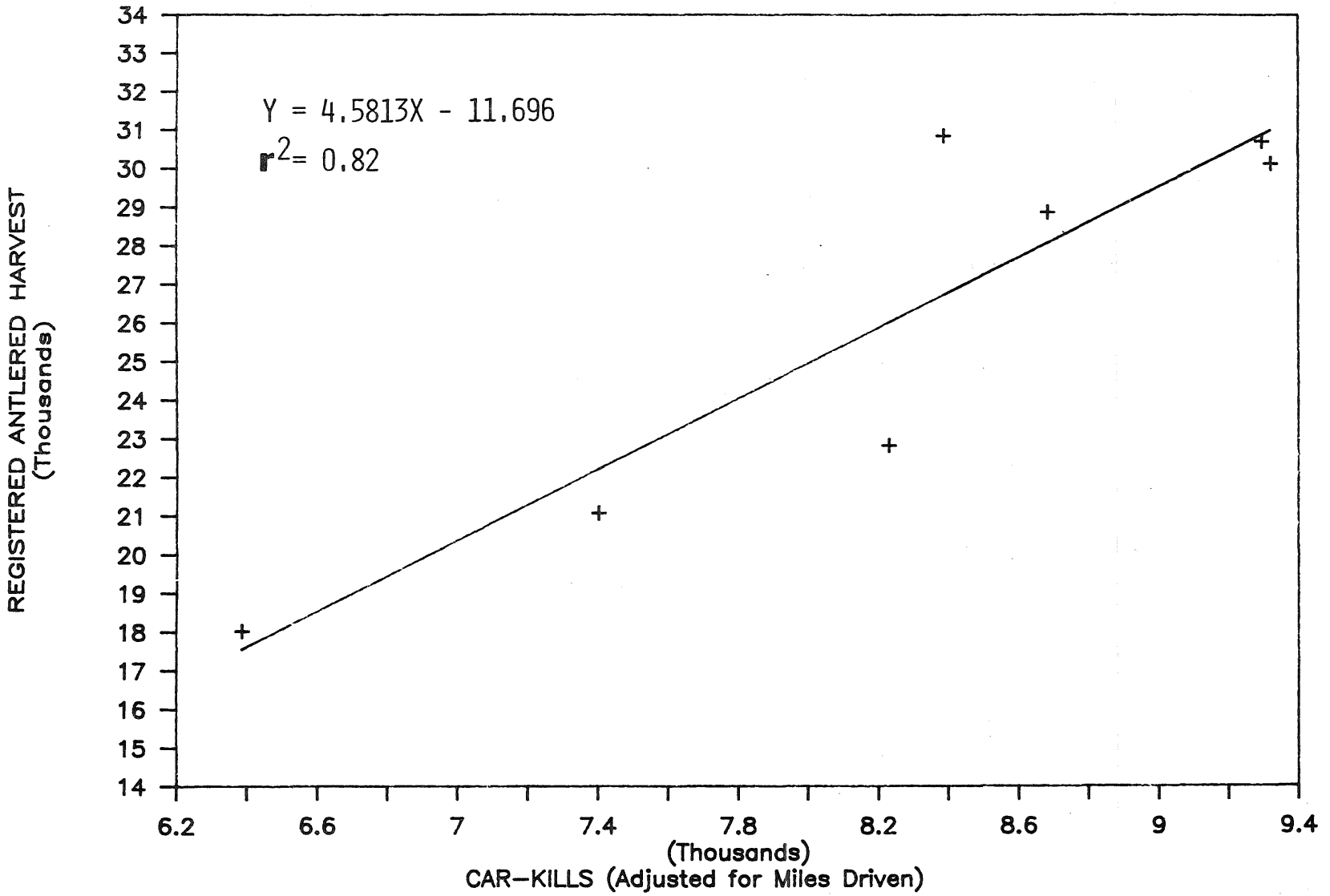

Figure 7. Relationship between annual vehicle kills and registered antlered deer harvest in the Farmland Zone, 1980-86.

Table 14. Productivity of deer in the Big Woods and Prairie Deer Management Units (DMU), 1981-87.

	Age class	Pregnancy rate	Fetuses per pregnancy	Proportion of population	Gross productivity[a]
BIG WOODS					
1987	Fawn	46%	1.05	35%	
(N=162)	Yearling	95%	1.72	23%	
	Adult	94%	1.97	42%	1.32 fawns/doe
1986	Fawn	37%	1.10	35%	
(N=173)	Yearling	82%	1.82	23%	
	Adult	91%	1.92	42%	1.22 fawns/doe
1985	Fawn	50%	1.13	35%	
(N=140)	Yearling	100%	1.72	23%	
	Adult	95%	1.90	42%	1.35 fawns/doe
1984	Fawn	22%	1.24	35%	
(N=174)	Yearling	95%	1.67	23%	
	Adult	95%	1.79	42%	1.17 fawns/doe
1983	Fawn	55%	1.20	35%	
(N=182)	Yearling	94%	1.89	23%	
	Adult	94%	1.88	42%	1.38 fawns/doe
1982	Fawn	43%	1.17	35%	
(N=253)	Yearling	91%	1.75	23%	
	Adult	96%	1.90	42%	1.31 fawns/doe
1981	Fawn	65%	1.08	35%	
(N=169)	Yearling	94%	1.70	23%	
	Adult	94%	2.02	42%	1.41 fawns/doe
PRAIRIE					
1987	Fawn	54%	1.07	35%	
(N=70)	Yearling	100%	1.94	23%	
	Adult	85%	2.00	42%	1.36 fawns/doe
1986	Fawn	42%	1.13	35%	
(N= 73)	Yearling	85%	1.84	23%	
	Adult	92%	1.88	42%	1.25 fawns/doe
1985	Fawn	38%	1.00	35%	
(N= 66)	Yearling	92%	1.58	23%	
	Adult	94%	1.97	42%	1.24 fawns/doe
1984	Fawn	23%	1.14	35%	
(N= 89)	Yearling	91%	1.90	23%	
	Adult	86%	1.87	42%	1.17 fawns/doe
1983	Fawn	61%	1.38	35%	
(N= 92)	Yearling	91%	2.00	23%	
	Adult	100%	2.07	42%	1.58 fawns/doe
1982	Fawn	43%	1.22	35%	
(N=132)	Yearling	77%	1.80	23%	
	Adult	98%	2.02	42%	1.33 fawns/doe
1981	Fawn	44%	1.08	35%	
(N=132)	Yearling	94%	1.88	23%	
	Adult	97%	1.91	42%	1.35 fawns/doe

[a] Gross productivity calculated as pregnancy rate x fetuses/pregnancy weighted by the proportion of each age class in the population.

Table 15. Spring deer densities estimated from population modeling in DMU's of Minnesota's farmland zone, 1980-87.[a]

DMU	Deer per square mile								Goal	1987 Percent of goal[b]
	1980	1981	1982	1983	1984	1985	1986	1987		
Red River	1.8	2.7	3.2	3.3	3.2	3.1	2.6	2.5	2.0	125%
Agassiz	3.6	5.3	6.2	6.6	6.5	6.2	5.7	5.0	5.4	92%
Big Woods										
North	3.3	4.2	5.0	5.4	5.3	5.0	4.7	4.2	4.2	100%
Central	4.3	5.4	6.2	6.7	7.0	7.0	6.8	6.0	6.5	92%
Metro	1.5	1.7	1.9	2.1	2.3	2.5	2.4	2.4	2.5	96%
SE	5.2	7.0	8.3	9.2	9.2	8.4	8.4	8.4	7.4	114%
Prairie										
North	1.6	1.7	1.9	2.0	1.9	1.9	1.7	1.7	1.7	100%
River	2.5	2.7	3.0	3.1	3.0	3.0	2.6	2.3	2.6	88%
SW	1.6	1.8	2.1	2.2	2.1	2.1	2.0	1.9	2.0	95%
SE	1.7	1.9	2.1	2.2	2.1	2.1	2.1	1.9	2.0	95%
Farmland Zone	2.6	3.4	3.8	4.0	4.0	3.9	3.7	3.4	3.4	100%

[a] Historical density figures may differ from those previously published due to periodic recalculation as more accurate modeling information is available.

[b] Percent = (1987/Goal) x 100.

Predator Scent Post Survey

(Note: this survey is organized and coordinated by the Forest Wildlife Populations and Research Group, Grand Rapids. Results are presented at this location in the book because of the statewide nature of the data)

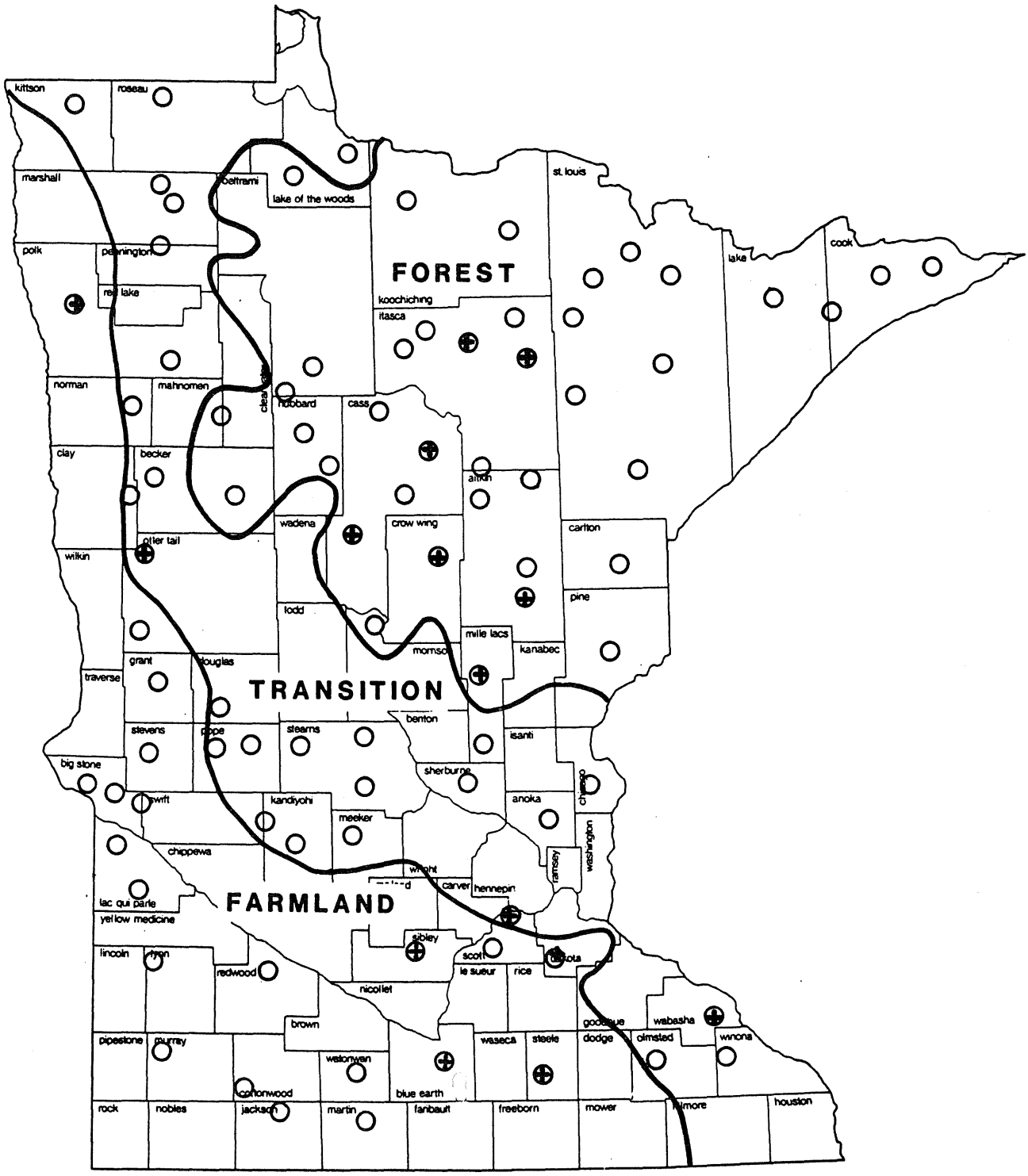

Figure 8. General locations of scent post routes in the Forest Transition, and Farmland survey zones, 1986. Routes indicated by ⊗ were not run in 1986.

Table 16. Mean predator scent post indices (Ind) and annual percent changes in indices (PC) for nine species in the Farmland and Transition Zones, 1977-86.

Species	Year 1977	1978		1979		1980		1981		1982		1983		1984		1985		1986	
	Ind	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC
Coyote																			
Farmland	3	0	-100	10	+100	3	-70	9	+200	4	-56	5	+25	9	+80	3	-67	13	+333
Transition	0	8	+100	32	+300	12	-63	9	-25	17	+89	17	0	15	-12	8	-47	8	0
Forest	38	25	-34	27	+8	33	+22	50	+52	29	-42	26	-10	34	+31	24	-29	25	+4
Red Fox																			
Farmland	67	18	-73	44	+144	60	+36	64	+7	118	+84	142	+20	142	0	103	-27	154	+50
Transition	38	49	+29	83	+69	98	+18	113	+15	104	-8	92	-12	109	+18	70	-36	112	+60
Forest	38	38	0	69	+82	49	-29	67	+37	69	+3	85	+23	58	-32	49	-16	57	+16
Skunk																			
Farmland	35	26	-26	55	+112	26	-53	17	-35	42	+147	42	0	58	+38	95	+64	98	+3
Transition	117	65	-44	57	-12	83	+46	90	+8	58	-36	58	0	74	+28	98	+32	111	+13
Forest	63	26	-59	61	+135	87	+43	84	-3	73	-13	89	+22	95	+7	91	-4	84	-8
Racoon																			
Farmland	24	8	-67	27	+238	18	-33	5	-72	42	+740	65	+55	41	-37	33	-20	51	+54
Transition	57	41	-28	39	-5	53	+36	62	+17	71	+15	44	-38	45	+2	53	+18	68	+28
Forest	17	8	-53	11	+38	18	+64	20	+11	9	-55	28	+211	23	-18	25	+9	18	-28
Dog																			
Farmland	47	18	-62	40	+122	30	-25	41	+37	52	+27	42	-19	67	+60	83	+24	51	-38
Transition	77	46	-40	31	-33	52	+68	50	-4	63	+26	68	+8	125	+84	109	-13	83	-24
Forest	9	17	+89	16	-6	17	+6	15	-12	17	+13	13	-24	25	+29	22	-12	19	-14
House Cat																			
Farmland	76	40	-47	56	+40	91	+63	58	-36	58	0	72	+24	119	+65	109	- 8	115	+6
Transition	43	19	-56	13	-32	51	+292	39	-24	42	+8	81	+93	76	-6	107	+41	97	- 9
Forest	19	17	-11	11	-35	19	+73	16	-16	12	-25	19	+58	18	-5	19	+6	24	+26
Wolf																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	0	0	0	0	0	0	0	0	4	+100	2	-50	0	-100
Forest	4	24	+500	14	-42	15	+7	8	-47	6	-25	11	+83	10	-9	12	+20	19	+58
Bobcat																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	6	3	-50	0	-100	1	+100	1	0	0	-100	0	0	1	+100	2	+100	1	-50
Forest	8	6	-25	5	-17	2	-60	14	+600	14	0	3	-79	12	+300	5	-58	8	+60
Bear																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	2	+100	1	-50	2	+100	3	+50	5	+67	3	-40	2	-33
Forest	13	7	-46	13	+86	20	+84	9	-55	11	+22	20	+82	11	-45	16	+45	23	+44

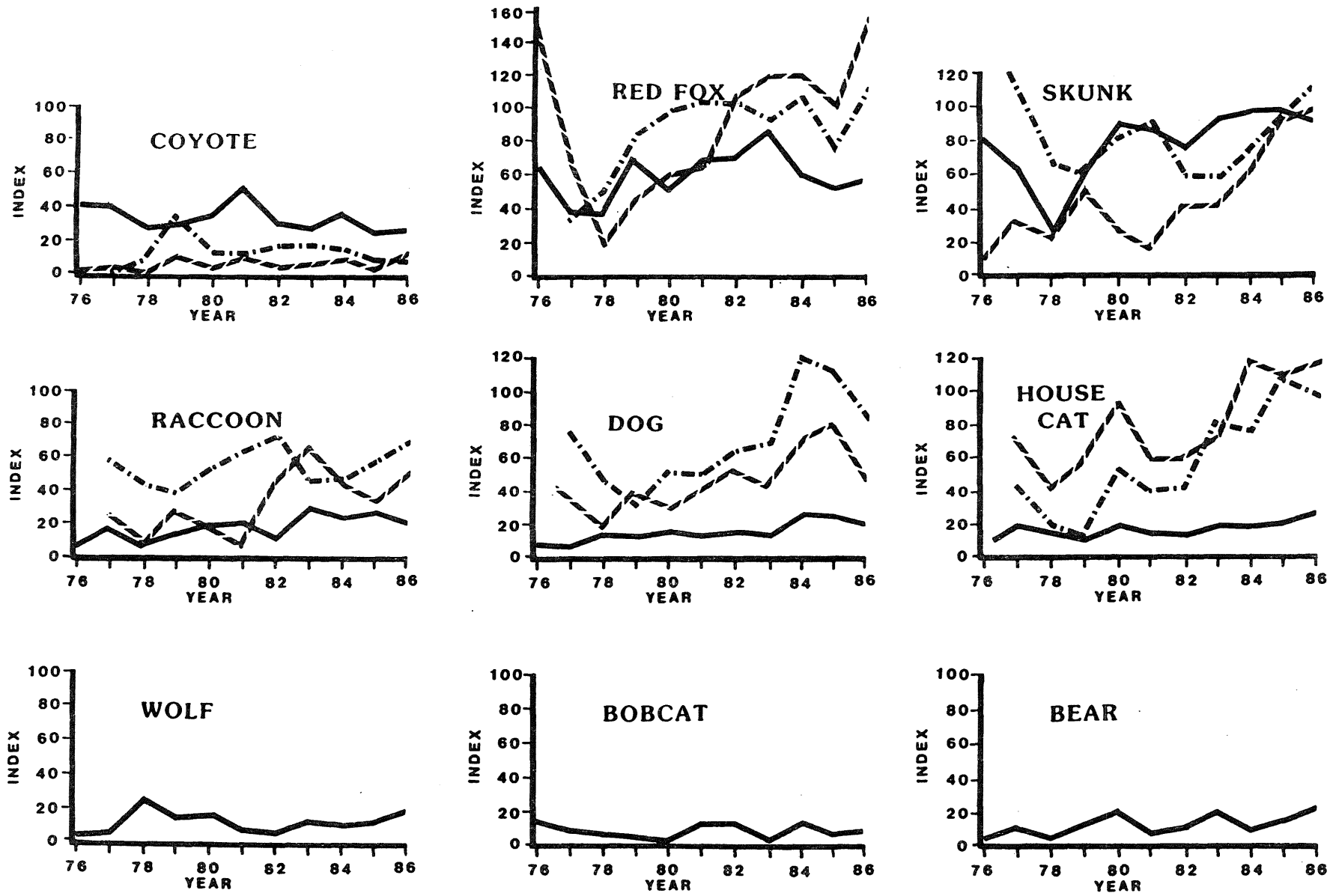

Figure 9. Mean scent post indices for major predator-furbearer species in the Forest, Transition, and Farm Survey Zones, 1976-1986.

FOREST WILDLIFE POPULATIONS AND CENSUSES

Table 17. Mean number of ruffed grouse drums per stop by census zone, 1964-87.

Year	Census Zone					
	Northwest	North	Northeast	Central hardwoods	Southeast	Range-wide mean
1964	0.4	0.7	0.9	0.3	1.3	0.6
1965	1.2	1.2	0.7	0.5	1.4	1.0
1966	1.4	1.4	0.6	0.7	1.9	1.0
1967	2.4	1.8	1.2	1.0	1.0	1.7
1968	3.2	2.3	1.6	1.0	1.3	2.0
1969	3.1	2.5	1.4	1.4	2.3	2.2
1970	1.9	3.1	0.9	1.6	2.1	2.2
1971	1.4	3.5	1.2	1.6	3.7	2.4
1972	2.1	3.7	1.0	2.0	3.1	2.6
1973	0.3	1.5	1.0	0.9	3.6	1.2
1974	0.8	1.1	0.6	0.7	3.0	1.0
1975	1.3	1.4	0.8	0.8	2.0	1.2
1976	0.8	1.5	0.4	0.9	1.8	1.1
1977	0.9	1.6	0.5	0.9	2.4	1.1
1978	2.0	2.4	0.8	1.4	2.5	1.8
1979	1.7	2.2	0.7	1.3	2.1	1.6
1980	1.9	2.2	0.7	1.9	2.7	1.7
1981	1.2	1.7	0.8	1.8	2.3	1.4
1982	0.9	1.1	0.3	0.9	1.1	0.8
1983	0.6	1.1	0.6	0.8	1.4	0.9
1984	1.0	1.1	0.6	0.5	1.4	0.8
1985	0.7	1.2	0.6	0.6	1.5	0.9
1986	1.7	1.1	0.5	0.6	2.5	1.0
1987	1.6	1.6	0.7	0.8	1.0	1.2

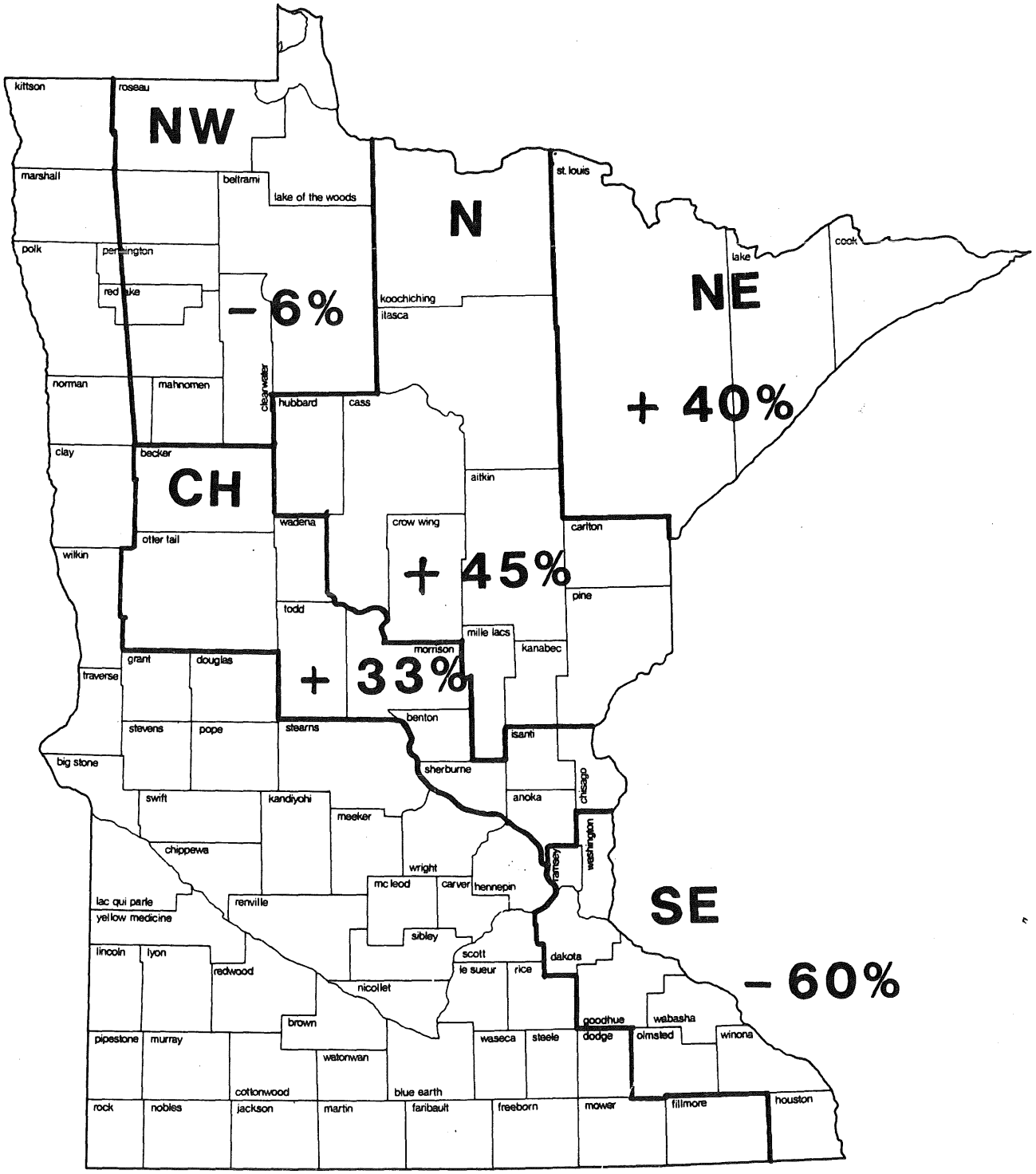

Figure 10. Changes from 1986-87 in average numbers of ruffed grouse drums per stop on roadside counts.

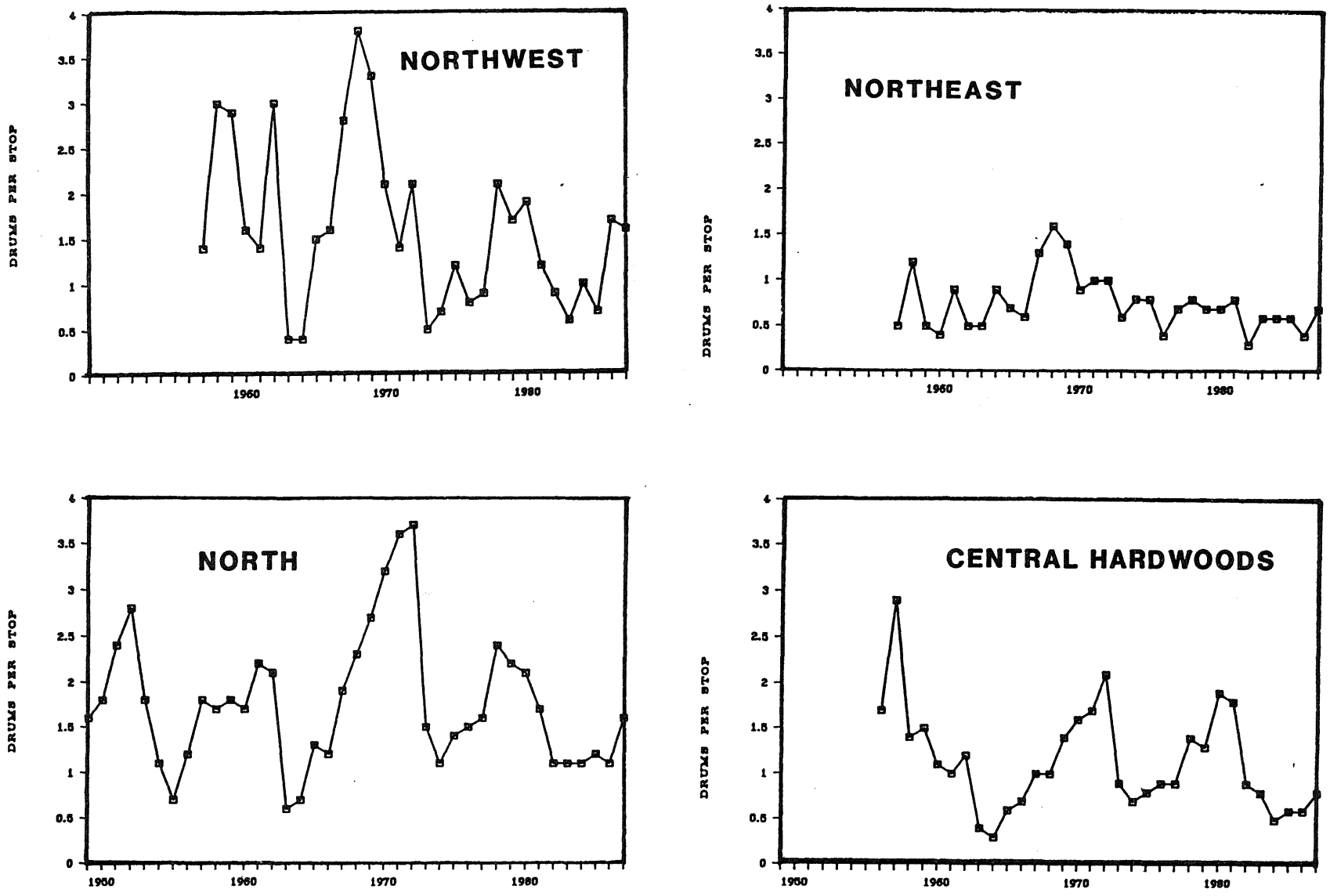

Figure 11. Ruffed grouse drumming trends in the Northwest, Northeast, North, and Central Hardwoods Survey Zones, through 1987.

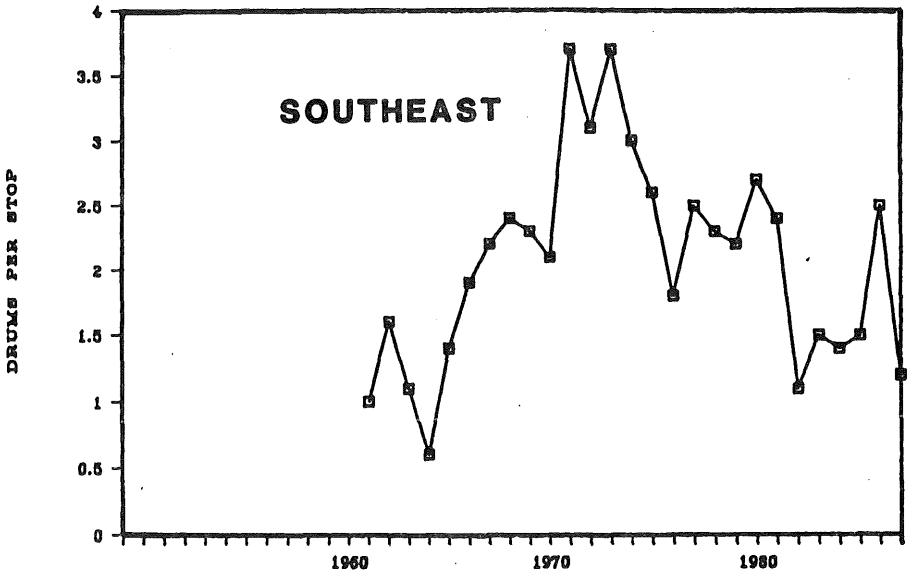

Figure 12. Ruffed grouse drumming trends in southeastern Minnesota, 1961-1987.

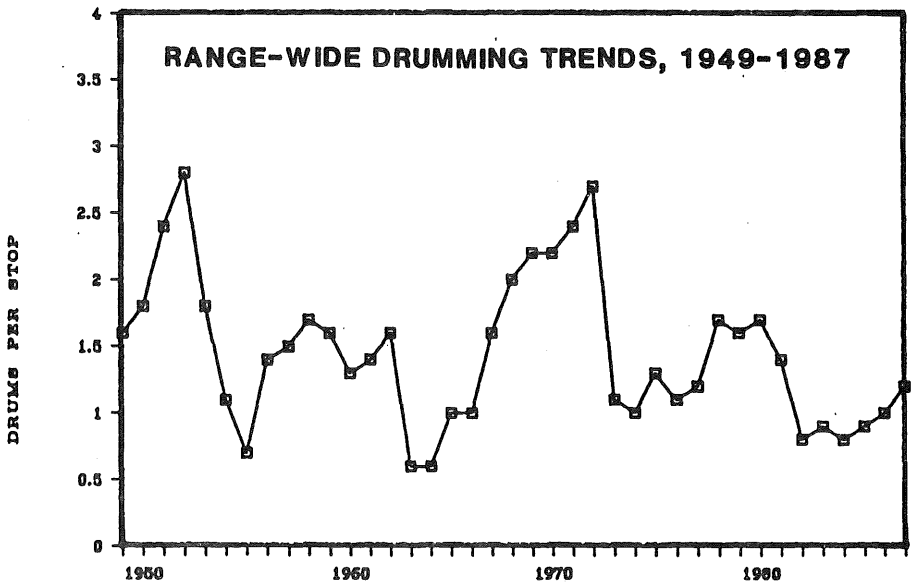

Figure 13. Ruffed grouse drumming trends range-wide, 1949-87.

Table 18. Number of snowshoe hares seen per 100 km of ruffed grouse drumming route in the North, Northwest, and Northeast survey zones, 1974-87.

Year	Hares seen per 100 km
1974	0.4
1975	0.0
1976	2.0
1977	2.8
1978	9.0
1979	8.8
1980	14.1
1981	9.8
1982	1.8
1983	0.7
1984	0.2
1985	0.3
1986	0.2
1987	0.5

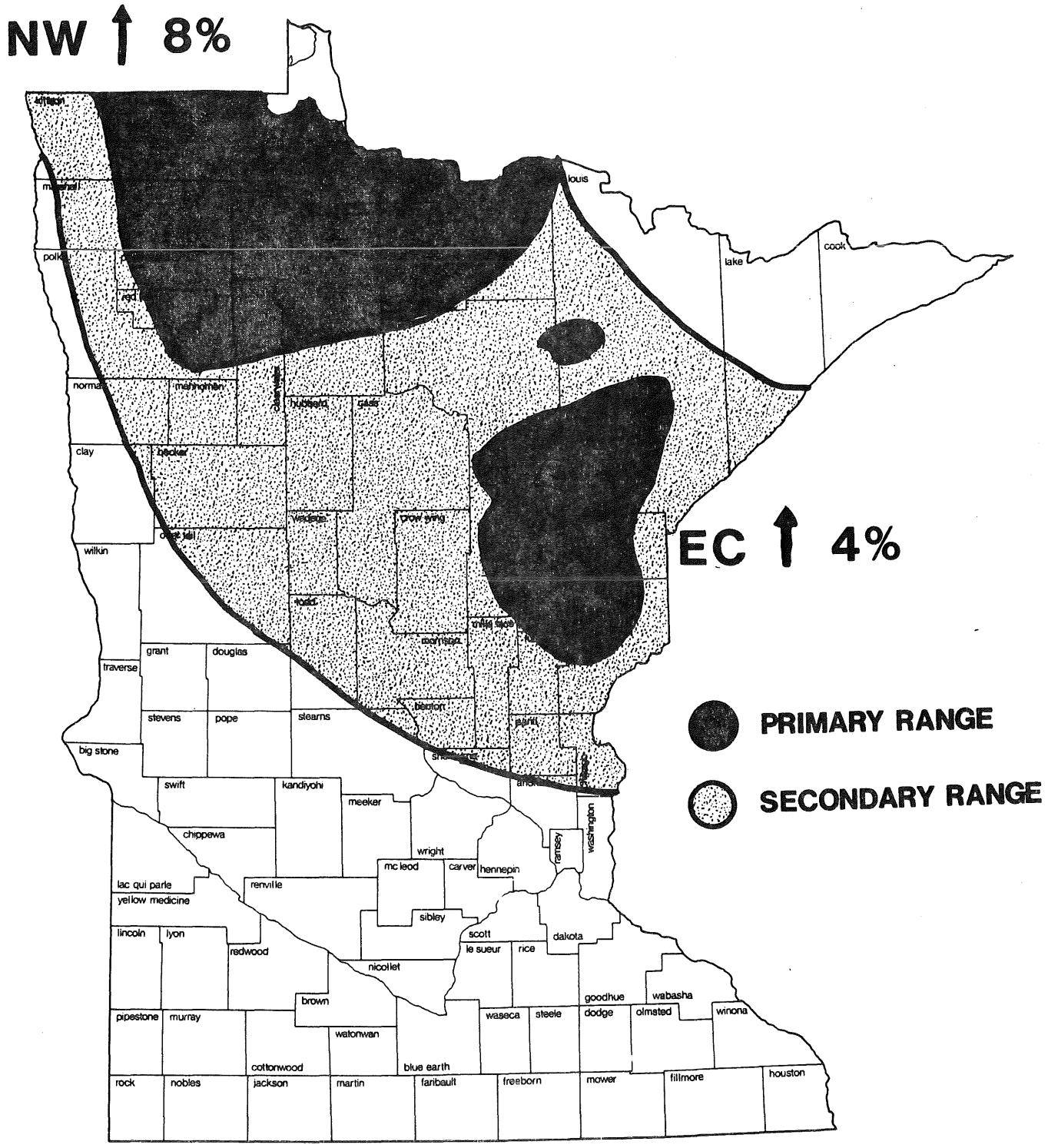

Figure 14. Changes in numbers of dancing male Sharp-tailed grouse on survey areas, 1986-1987.

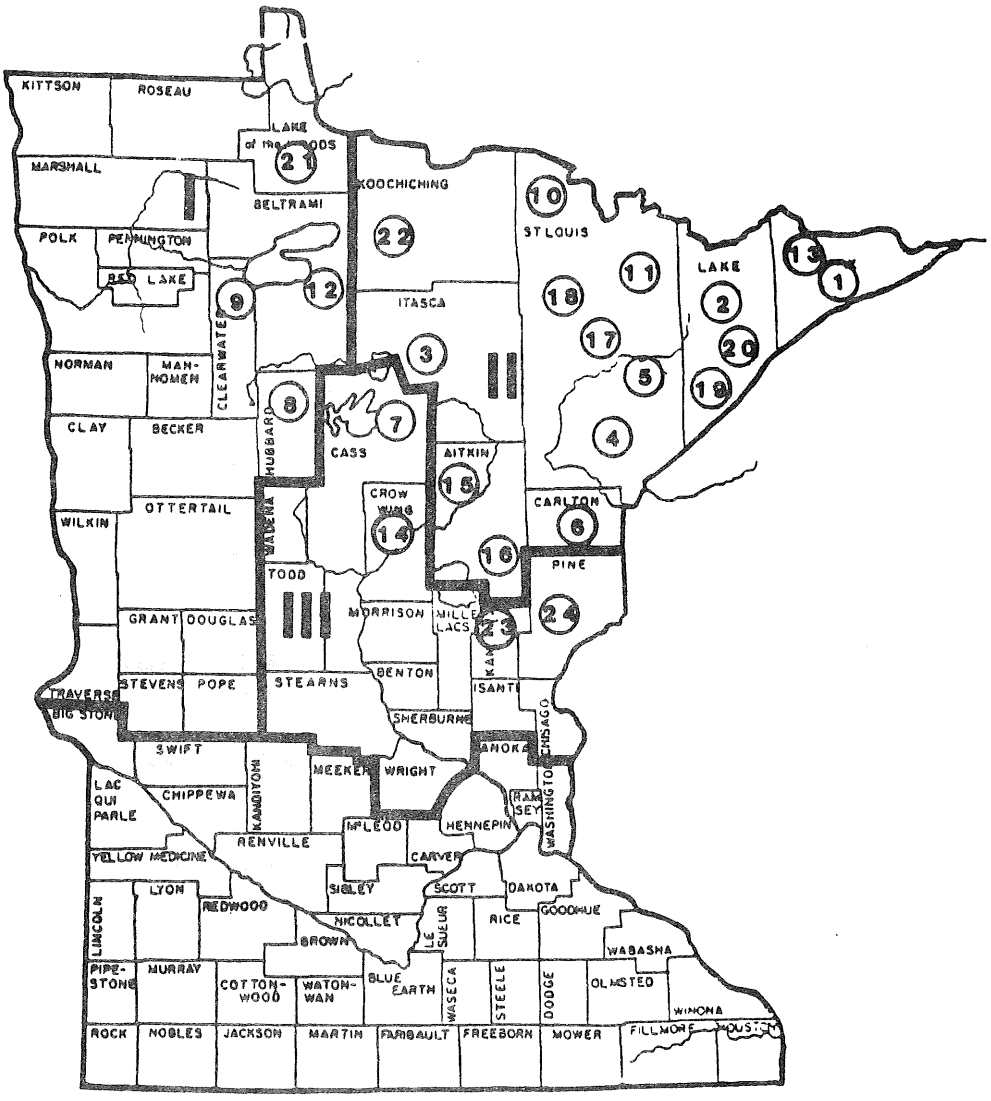

Figure 15. Approximate location of 24 aerial beaver census routes, within DNR Regions I-III.

Table 19. Live beaver colonies per mile of census route in northern Minnesota, 1975-86. Twenty routes were not flown in 1986 due to budget constraints.

Number	Route name	Year											
		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1	Cascade	1.12	0.52	0.39	1.07	-	0.42	0.43	0.40	0.35	0.44	0.46	-
2	Kawishiwi	0.95	-	0.73	0.97	0.68	0.75	0.50	0.72	0.65	0.70	0.78	-
3	Itasca	0.80	0.60	0.74	1.04	0.66	0.63	0.48	0.43	0.57	0.51	0.67	-
4	South St. Louis	0.74	0.63	0.76	0.99	-	0.64	0.74	-	0.58	0.57	0.33	-
5	Central St. Louis	1.23	-	-	1.02	0.95	0.90	0.95	0.65	0.79	0.57	1.05	-
6	Carlton & Pine	0.56	0.26	0.69	0.89	0.60	0.83	0.67	0.22	0.56	0.65	0.45	-
7	Cass	0.80	0.57	0.83	1.03	1.00	0.95	0.53	0.63	0.89	0.99	1.23	-
8	Balsam-Hennepin	0.40	0.28	0.51	0.39	0.55	0.44	0.43	0.60	0.58	0.54	-	-
9	Pinewood-Mississippi	0.32	0.33	0.55	0.32	-	0.38	0.39	0.49	0.48	-	-	-
10	Kabetogama Peninsula	2.21	2.39	2.14	2.91	3.05	2.52	3.55	2.66	2.89	3.30	2.93	2.92
11	Ely-Finger Lakes	1.85	-	1.41	1.59	1.26	1.06	0.98	1.17	1.32	1.02	1.28	-
12	Hay Creek-Kelliher	0.48	0.46	0.68	0.44	-	0.43	0.48	0.70	0.55	-	-	-
13	Cook County Transect	0.57	0.36	0.30	0.49	-	0.23	0.40	0.33	0.48	0.35	0.31	-
14	Cass-Crow Wing	0.67	0.43	0.59	0.70	0.68	0.78	0.61	0.74	0.68	0.76	0.87	0.69
15	Little Willow-Aitkin	0.35	-	0.42	0.45	0.47	0.44	0.38	0.40	0.40	0.31	0.59	-
16	East Aitkin County	0.62	0.47	0.89	1.14	0.96	0.72	0.52	0.86	0.82	0.81	0.90	-
17	West Vermilion	0.93	0.54	1.03	1.25	1.12	0.96	1.05	0.86	0.34	1.07	0.73	0.95
18	Blackduck	1.41	0.97	1.24	1.54	1.31	1.09	1.22	0.91	0.71	1.21	1.53	-
19	Splitrock	1.45	1.21	1.14	1.45	-	1.07	-	-	0.55	0.65	0.56	-
20	Isabella	0.80	0.73	0.66	0.66	0.68	0.60	0.65	-	0.15	-	-	-
21	Red Lake-Pine Island	0.51	0.44	0.63	0.44	0.73	0.40	0.41	0.50	0.39	-	-	-
22	Northome	0.61	0.53	0.75	0.75	0.85	0.86	0.91	0.97	1.06	1.37	0.95	0.80
23	Kanabec County	0.61	0.65	0.84	0.59	0.55	0.70	0.48	0.55	0.65	0.53	0.76	-
24	Southern Pine	0.91	0.88	0.85	0.74	0.88	0.93	0.58	0.76	0.69	0.72	0.86	-
	DNR Region I	0.43	0.38	0.59	0.40	0.64	0.41	0.43	0.57	0.50	0.54	-	-
	DNR Region II	1.01	0.77	0.89	1.14	1.05	0.86	0.90	0.81	0.76	0.90	0.90	-
	DNR Region III	0.75	0.63	0.78	0.77	0.78	0.84	0.55	0.67	0.73	0.75	0.93	-

Registered furbearer population data

The following 4 tables and 4 figures are summaries of data compiled and analyzed by Bill Berg and Dave Kuehn on the four registered furbearers. This information was utilized by the Furbearer Management Committee in setting the 1987-88 seasons on these species.

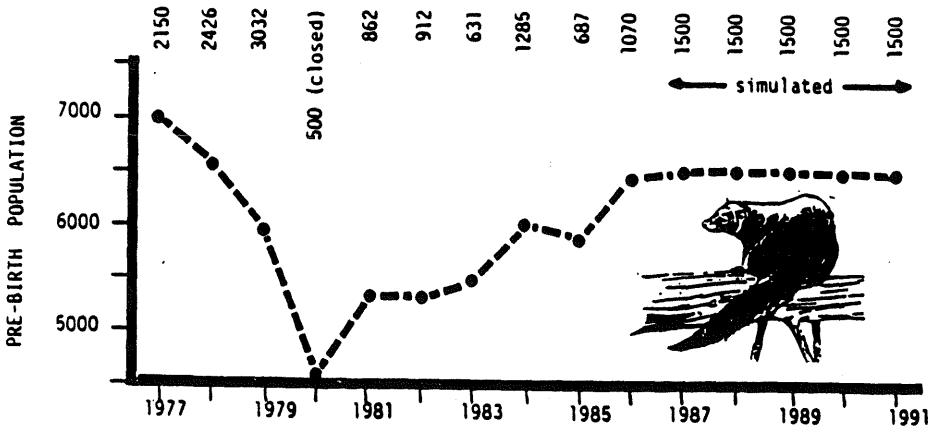

Figure 16. Fisher population model, 1977-1991, with registered harvests until 1986, and simulated registered harvests of 1500 after 1986. Non-harvest mortality is 30% summer, 25% winter for juvs.; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 5-10% in summer and winter, 1983-1987, to compensate for decreased prey availability. Harvest mortality was increased 25% over registration totals to compensate for unregistered and confiscated fisher.

FISHER, 1986-87

During the Nov. 29-Dec. 14 1986 fisher season 1068 fisher were registered. This total was 58% above 1985, and 22% above the 1981-85 mean harvest of 874 (Fig. 16).

A total of 1186 fisher carcasses were examined; the increase over the registered total was due to carcasses received from legal Leech Lake Indian Reservation Harvests, and confiscations by Division of Enforcement.

Juveniles comprised 59% of the harvest, the lowest since carcass examinations began in 1977, and below the 1977-85 mean of 66%. Yearlings and adults were 24% and 18%, respectively, of the harvest. Sex ratios were 48% males in the juvenile cohort (1977-85 $\bar{x}$ = 49%), and 44% males in the $\geq$1.7 year old cohort (1977-85 $\bar{x}$ = 40%). The number of juveniles per adult female ($\geq$2.7 year) remain low (5.3:1), similar to 1985 (5.4:1) and 1979-80 (5.6:1).

The 1986 registered harvest took 11% of the available fall population, compared to 8-15% in 1985-85, and 21-33% in 1977-79. Based on 1987 modeling, the population will stabilize at simulated post-1986 harvests of 1500, and increase about 10% annually with harvests approximating 1200 (Fig. 16).

Table 20. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1977 to 1986. Fisher taken in 1980-81 were on Indian Reservations.

	1977-78	1978-79	1979-80	1980-81	1981	1982	1983	1984	1985	1986
Season	12/1-1/31	12/1-1/31	12/1-1/31	closed	12/1-10	12/1-10	12/1-11	12/1-16	11/30-12/15	11/29-12/14
Limit	3	3	3	---	1	1	1	1	1	1
Registered take	2150	2426	3032	(423)	862	912	631	1289	678	1068
% of available population harvested[a]	24%	28%	39%	8%	15%	14%	9-10%	17-19%	9-12%	10-12%
No. carcasses examined	562	577	467	---	843	1073	662	1270	712	1186
% juveniles	69.2	69.8	64.8	---	66.2	66.4	68.9	62.9	62.8	58.8
% 1.7 yr.	16.4	16.5	14.6	---	23.8	18.9	18.0	19.8	19.6	23.5
% $\geq$ 2.7 yrs.	14.4	13.7	20.6	---	10.0	14.6	13.1	17.2	17.5	17.7
Juv:ad. female ratio	8.4:1	7.1:1	5.6:1	---	10.5:1	9.4:1	8.8:1	7.2:1	5.4:1	5.3:1
% male juveniles	53.5	43.7	53.5	---	48.0	46.0	45.2	51.9	45.8	47.8
% male 1.7 yrs.	28.2	34.7	45.6	---	42.7	40.9	39.5	45.6	40.3	50.4
% male $\geq$ 2.7 yrs.	43.2	27.8	43.8	---	36.9	51.6	40.2	44.7	33.8	36.7
Pelt price: males	$71	$132	$108	$90	$94	$70	$71	$70	$74	$84
females		$147	$128	$104	$110	$99	$121	$122	$130	$162
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Estimated from population model.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming route during the spring after fisher season.

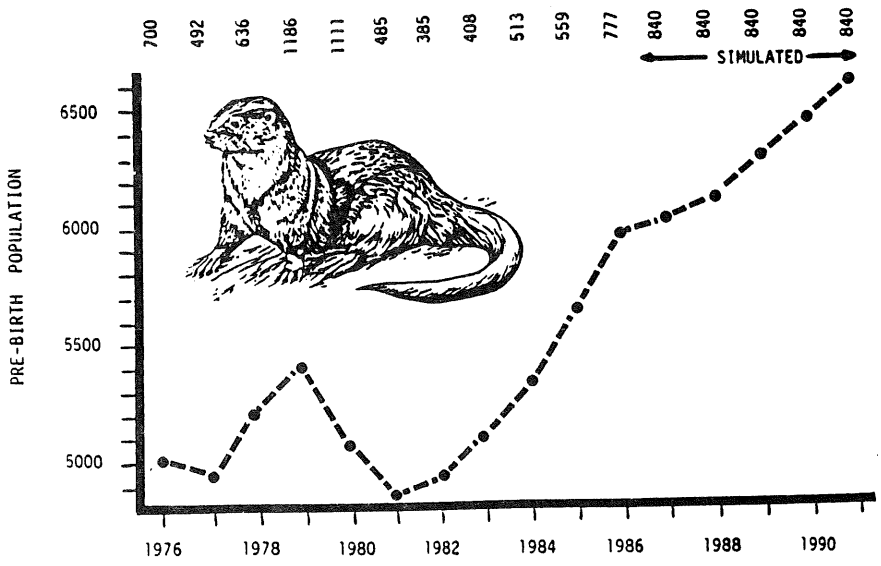

Figure 17. Otter population model, 1976-1991. Actual trapping harvests (top) until 1986 are followed by simulated projected harvests, 1987-1991. Non-harvest mortality for juveniles is 25% summer, 15% winter; for yearlings 10% summer, 10% winter; and for adults 6% summer, 6% winter. Harvest mortality was increased 20% over registration totals to compensate for accidentally trapped and confiscated fisher.

OTTER, 1986-87

During the November 1-30 otter trapping season, 777 otter were registered, up 40% from 1985. The increase was only slightly influenced by the increased otter trapping area (see harvest distribution map).

A total of 745 otter carcasses were aged. Juveniles comprised 45% (1981-85 $\bar{x}$ = 48%), yearlings (1-2 yr.) 23% (1981-85 $\bar{x}$ - 24%), and adults (> 2 yr.) 31% (1985-85 $\bar{x}$ = 21%). The proportions of otters in the juvenile, yearling, and adult age classes approximated their respective percent increases in the overall harvest (50%, 24%, 26%, respectively). The proportion of males in each harvested cohort was 6-9% lower than the 1985-85 means; the overall sex ratio was 48% males (1985-85 $\bar{x}$ - 54% males).

The modeled proportion of the available population harvested in 1986 was 13%, compared to a range of 9%-21% during 1976-85. Registered harvests of 840 annually after 1986 will allow the modeled otter population to increase 1%-3% annually (Fig. 17). If 1050 otters are registered yearly, the modeled population decreases 1%-2% annually after 1987.

Table 21. Otter harvest and sex-age data in Minnesota, 1978-86.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Season dates	12/1-5	11/15-29	11/15-29	11/14-28	11/13-27	11/12-26	11/17-12/1	11/16-12/15	11/1-11/30
Registered harvest	636	1186	1111	485	385	408	529	559	777
% of autumn population harvested[a]	11%	20%	20%	14%	12%	11%	10%	10%	13%
No. carcasses examined	49	36	88	471	389	433	549	572	745
% juveniles	61.2	69.4	54.5	55.0	50.6	42.3	47.9	43.4	45.2
% yearlings	26.5	19.4	14.7	19.7	25.6	30.9	23.3	22.9	23.3
% male juveniles	59.4	72.0	39.6	55.6	56.7	55.7	47.1	53.3	45.1
% males $\geq$ 1.7 yrs.	47.1	36.4	57.5	53.3	65.1	56.8	50.0	50.0	48.4
Mean pelt price:									
otter	$59	$63	$33	$30	$26	$25	$22	$21	$24
beaver (fall)	$18	$33	$18	$14	$11	$12	$12	$15	$20

[a] From population modeling; includes an additional 20% accidental harvest above carcass total. (See Fig. 17).

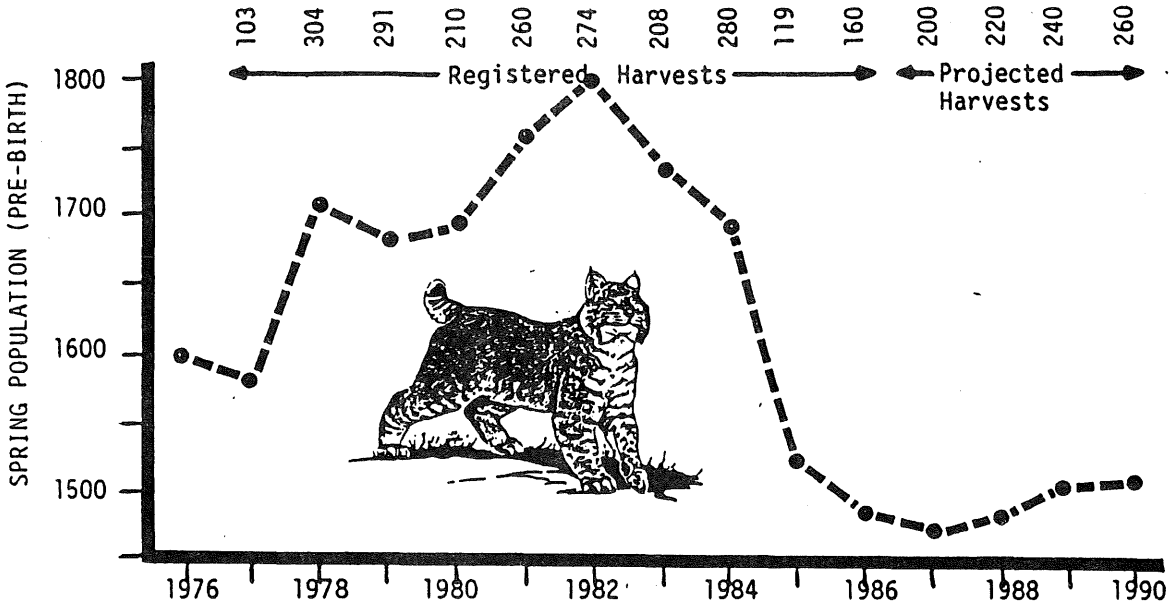

Figure 18. Bobcat population model, 1976-1990, with registered harvests until 1986, and projected harvests thereafter. Non-harvest mortality is 30% summer, 25% winter for juveniles; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 10-30% in summer and winter, 1982-1987, to compensate for decreased prey availability. Registered harvests were increased 10% to compensate for unregistered and confiscated bobcats.

BOBCATS, 1986-87

A total of 160 bobcats were registered during the Nov. 29, 1986 to Jan. 3, 1987 trapping and hunting season, an increase of 34% over 1985-86 but below the 1977-78 to 1984-85 mean of 241 (Fig. 18).

Of a total of 132 carcasses examined, 26% were juveniles ($\leq$1 yr.), 17% were yearlings (1-2 yr.), and 58% were adults ($\geq$2 yr.). The proportion of juveniles was the lowest (range 31-54%), and the proportion of adults ($\geq$2 yr.) was the highest (range 35-52%), since carcass collections began in 1977. Seventy-seven percent of the increase in the 1986-87 bobcat harvest was explained by an increase in the adult cohort harvest. Sex ratios in the juvenile and adult cohorts were unchanged from previous years; the yearling ratio (32% males) was the lowest since collections began ($\bar{x}$ = 56% males).

The 1986-87 harvest took an estimated 9% of the available population. As predicted from the 1985-86 model, this harvest rate stabilized the earlier population decline, and a harvest of approximately 200 in 1987-88 will permit a slight increase (Fig. 18).

Table 22. Bobcat harvest, carcass examination, scent post survey[a], and snowshoe hare index[b] data, 1977-78 to 1986-87.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Season dates	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/23	12/1-1/23	12/1-1/22	12/1-1/20	11/30-1/19	11/29-1/3
Registered take	103	304	291	210	260	274	208	280	119	160
Mean pelt price	$74	$164	$118	$79	$73	$66	$61	$76	$70	$120
No. carcasses	34	113	75	48	230	261	205	288	99	132
% juveniles	35	54	37	31	37	35	37	37	33	26
% 1.7 yrs old	18	15	12	33	23	15	18	13	19	17
% ≥ 2.7 yrs.	47	31	52	35	40	50	37	50	48	58
% male juveniles	50	61	54	80	59	47	56	52	41	53
% male 1.7 yrs.	33	53	44	69	63	49	56	66	41	32
% male ≥ 2.7 yrs.	41	60	53	56	55	47	51	44	43	51
% of autumn population harvested	5	14	14	10	12	14	11	15	7	9
Scent post index[a]	8	6	5	2	14	14	3	12	5	8
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Derived from scent post surveys run the previous autumn in the Forest Zone.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming routes run in spring after the bobcat season.

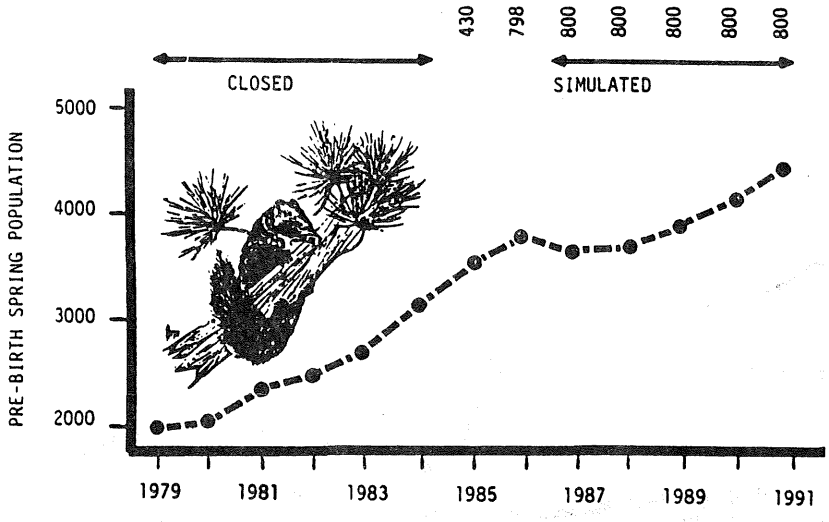

Figure 19. Pine marten population model, 1979 to 1991. Registered harvests are shown at top for 1985 and 1986, followed by projected harvests of 800 after 1986. Respective non-harvest summer-winter mortality for juveniles is 40% and 20%; for yearlings 10% and 10%; and for adults 10% and 10%. For modeling purposes the registered harvest was increased by an additional 50% to account for accidental take.

Table 23. Pine marten harvest and carcass examination data for martens accidentally taken during 1978-84 (combined), and during the 1985 and 1986 seasons.

	1978-84 (combined)	1985	1986
Season dates	----	11/30-12/15	11/29-12/14
Registered take	----	430	798
Carcasses examined	227	507	884
% juveniles	60	73	64
% 1.7 years old	30	18	21
% $\geq$ 2.7 years old	10	9	15
% male juveniles	68	69	65
% male 1.7 years old	71	68	71
% male $\geq$ 2.7 years old	91	82	81
Juv/$\geq$ 2.7 year old female	68	45	24
% of autumn population tagged (derived from modeling)	----	18	22

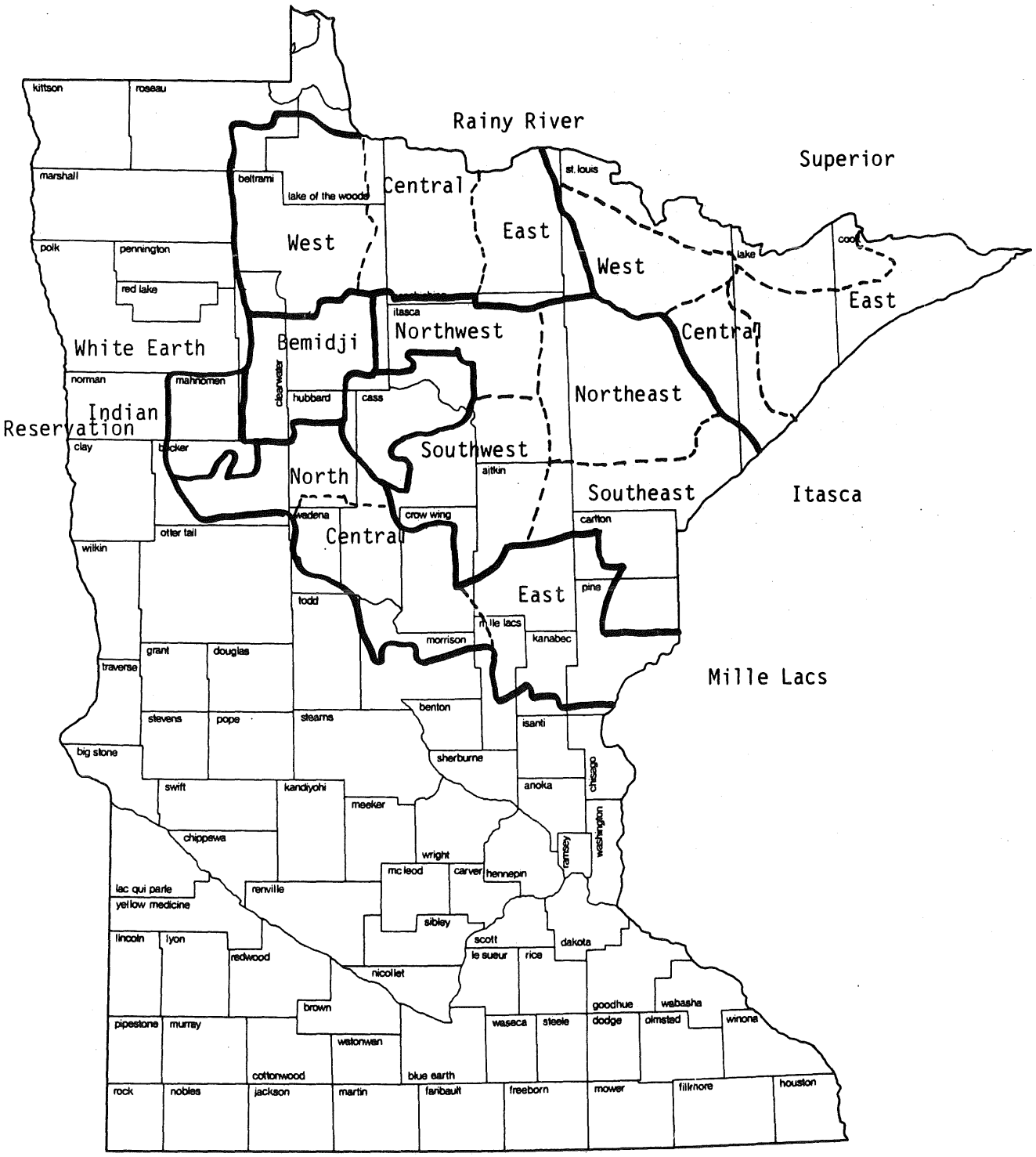

Figure 20. Deer management units and subunits in the Forest Zone.

Table 24. Estimated pre-fawning deer density (deer/sq. mile) as determined by pellet counts, 1980-87. Numbers in parentheses represent 95% confidence intervals.

Area	Year							
	1980	1981	1982	1983	1984	1985	1986	1987
Itasca DMU								
NW	17.0 (3.9)	22.9 (4.3)	22.4 (4.5)	-------	20.8 (4.2)	29.6 (5.9)	12.4 (2.9)	14.5 (4.5)
SW	14.5 (4.1)	16.9 (4.7)	17.6 (4.7)	21.0 (6.2)	17.0 (3.8)	19.1 (5.0)	12.9 (3.7)	16.1 (4.8)
NE	14.9 (3.6)	16.7 (3.8)	14.1 (3.5)	14.2 (3.6)	11.5 (3.6)	15.8 (3.4)	15.4 (4.5)	18.0 (5.0)
SE	12.0 (5.2)	18.1 (5.3)	10.8 (4.2)	15.4 (4.9)	12.8 (4.0)	18.6 (5.2)	14.0 (3.8)	20.0 (4.2)
Rainy River DMU								
West	10.9 (3.7)	-------	13.9 (5.9)	-------	12.8 (4.2)	-------	7.8 (3.7)	17.4 (5.5)
Central	8.2 (2.6)	-------	11.4 (6.0)	-------	10.7 (6.3)	10.8 (5.3)	13.2 (5.1)	-------
East	21.8 (6.9)	19.1 (5.1)	9.2 (3.3)	21.8 (6.9)	15.1 (4.1)	16.9 (4.8)	15.6 (5.2)	13.5 (3.8)
Mille Lacs DMU								
West	12.4 (3.3)	17.8 (4.7)	18.0 (5.2)	-------	12.3 (2.7)	18.8 (4.4)	15.2 (4.0)	10.9 (4.5)
Central	7.6 (2.4)	11.3 (4.1)	17.4 (4.7)	16.1 (4.7)	17.2 (4.5)	15.5 (3.7)	13.9 (4.0)	13.2 (4.1)
East	9.4 (2.5)	14.1 (2.8)	14.1 (3.7)	15.8 (3.2)	12.8 (3.2)	10.9 (2.7)	9.8 (2.7)	12.3 (2.9)
Superior DMU[a]								
West	15.1 (3.4)	21.4 (5.0)	15.4 (2.9)	-------	18.2 (7.1)	24.4 (4.0)	21.8 (5.4)	16.6 (3.7)
Central	10.2 (3.3)	15.2 (5.6)	16.2 (10.2)	-------	14.1 (5.2)	15.0 (3.2)	13.3 (6.0)	17.0 (5.5)
East	4.8 (1.7)	-------	-------	-------	-------	-------	-------	-------
Bemidji DMU	-------	11.4 (3.5)	17.7 (5.4)	20.1 (6.9)	14.9 (3.8)	12.9 (4.0)	11.8 (3.3)	13.0 (3.7)
Agassiz NWR	12.4 (6.7)	21.3 (6.7)	24.4 (8.8)	25.6 (8.4)	-------	-------	-------	-------
Aitkin County	19.5 (5.7)	15.9 (4.0)	23.0 (7.5)	26.3 (6.2)	19.2 (5.8)	21.1 (6.0)	18.4 (6.0)	19.1 (4.2)
Aitkin SE1/4 T44, R22	-------	19.6 (5.8)	-------	24.8 (7.0)	10.2 (3.7)	10.3 (2.7)	30.3 (8.8)	-------
Bearville Study Area	31.2 (9.5)	39.4 (6.9)	39.5 (8.7)	38.0 (5.8)	15.6 (4.3)	42.9 (7.2)	21.1 (4.4)	-------
Camp Ripley	17.0 (5.1)	19.2 (5.2)	31.0 (8.2)	31.6 (7.1)	47.0 (12.4)	39.3 (9.7)	30.5 (9.7)	38.7 (11.8)
Chippewa NF	-------	-------	15.8 (4.2)	17.6 (3.9)	15.9 (3.5)	19.1 (3.4)	12.5 (2.2)	13.7 (2.1)
Elephant Lake	31.3 (6.5)	36.9 (6.2)	-------	34.0 (8.0)	39.0 (13.0)	-------	-------	-------
Garden Lake Deer Yard	-------	-------	-------	-------	-------	30.6 (7.5)	13.2 (4.0)	-------
Itasca County	-------	-------	-------	-------	18.7 (3.2)	23.6 (3.9)	12.6 (2.4)	-------
Leech Lake IR	-------	-------	13.3 (3.6)	14.1 (3.7)	11.8 (3.8)	11.9 (2.9)	8.6 (2.4)	8.6 (2.0)
Mille Lacs WMA	24.9 (6.6)	30.5 (11.2)	35.7 (11.7)	24.2 (6.6)	17.5 (4.5)	10.0 (3.7)	15.6 (7.4)	16.9 (4.5)
St. Croix State Park	45.0 (21.2)	39.6 (9.6)	53.3 (14.7)	41.6 (9.5)	49.8 (11.9)	-------	-------	34.7 (9.2)
Tamarac NWR	-------	70.7 (13.5)	69.1 (25.3)	62.5 (14.7)	46.7 (14.0)	36.5 (11.0)	40.1 (12.0)	26.7 (8.2)
White Earth IR	6.3 (2.9)	4.1 (1.9)	10.1 (5.8)	11.4 (4.3)	10.2 (4.9)	17.3 (5.6)	8.9 (3.8)	9.9 (3.8)

[a] No pellet counts were conducted in the Boundary Waters Canoe Area or the Voyageurs National Park.

Table 25. Spring deer densities estimated from population modeling in DMU's of Minnesota's Forest zone, 1982-87.

DMU	Deer per square mile						Goal
	1982	1983	1984	1985	1986	1987	
Itasca							
Northwest	22.3	21.9	20.2	18.4	16.2	14.7	15-20
Southwest	18.1	17.9	17.3	16.6	15.5	15.0	15-20
Northeast	14.9	15.2	15.3	15.7	15.8	15.8	15-20
Southeast	15.9	16.4	16.2	16.3	16.3	16.1	10-15
Bemidji	20.0	19.6	17.8	15.2	13.4	11.8	10-15
Leech Lake I.R.	13.3	12.6	11.4	10.5	9.6	8.4	10-15
Mille Lacs							
West	18.0	17.8	16.6	14.9	13.4	12.5	10-15
Central	17.5	18.4	17.7	15.6	13.9	12.0	10-15
East	13.2	13.0	12.3	11.5	11.2	11.2	10-15
White Earth I.R.	10.1	10.3	10.3	10.3	10.2	10.1	10-15
Rainy River							
West	14.0	13.8	13.1	12.1	11.3	11.5	10-15
Central	11.4	11.6	11.0	10.7	10.8	10.9	10-15
East	15.9	16.3	16.0	15.9	15.7	15.6	15-20
Superior							
West	18.6	19.3	19.5	19.6	19.3	18.8	15-20
Central	13.7	14.2	14.3	14.6	14.6	14.5	10-15

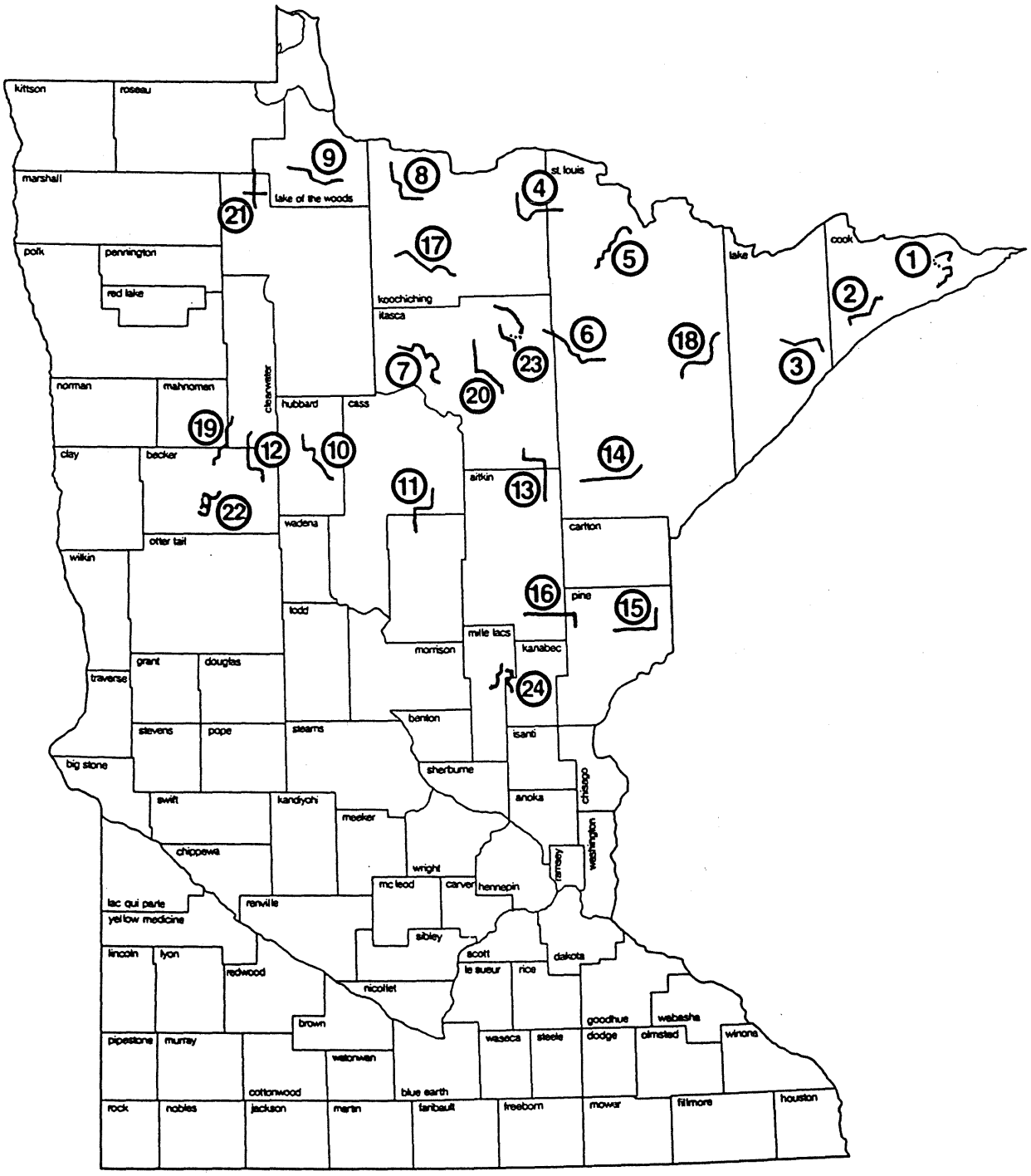

Figure 21. Location of 24 bear bait routes.

Table 26. Percentage of baits on each bait route taken by bears. All baits (50 per route) except those entirely removed by other animals were considered available to bears. Location of routes is shown in Fig. 21.

Route No.	1980[a]	1981	1982	1983	1984	1985	1986	1987
1	16	33	22	41	38	22	10	17
2	32	22	14	15	10	30	22	38
3	10	2	37	44	14	26	38	38
4	24	60	22	54	33	47	45	49
5	26	54	31	44	28	29	45	28
6	21	27	17	18	30	44	37	26
7	23	45	19	43	18	26	47	22
8	16	14	8	10	44	46	69	41
9	20	40	16	27	20	30	15	10
10	6	23	26	44	24	31	22	15
11	4	22	12	31	21	39	38	22
12	11	44	22	65	37	27	21	21
13	12	40	24	40	30	33	34	26
14	10	4	16	14	4	18	11	27
15	6	36	24	22	24	35	30	34
16				36	24	19	38	23
17				19	49	66	24[b]	28
18				8	20	42	20	43
19				28	10	18	25	15
20		48	69	66	35	45	40	20
21					6	6	2	19
22					20	8	14	11
23						28	40	36
24						20	35	54
Mean of all routes	16	32	24	33	24	31	30	28
Mean of routes 1-15 & 20		32	24	36	26	33	33	27

[a] 1980 data may not be directly comparable to other years because a different type of bait was used, and all routes except #1, 2, 3, 6 & 14 were conducted after July 14.

[b] Vehicle breakdown; only 29 baits set.

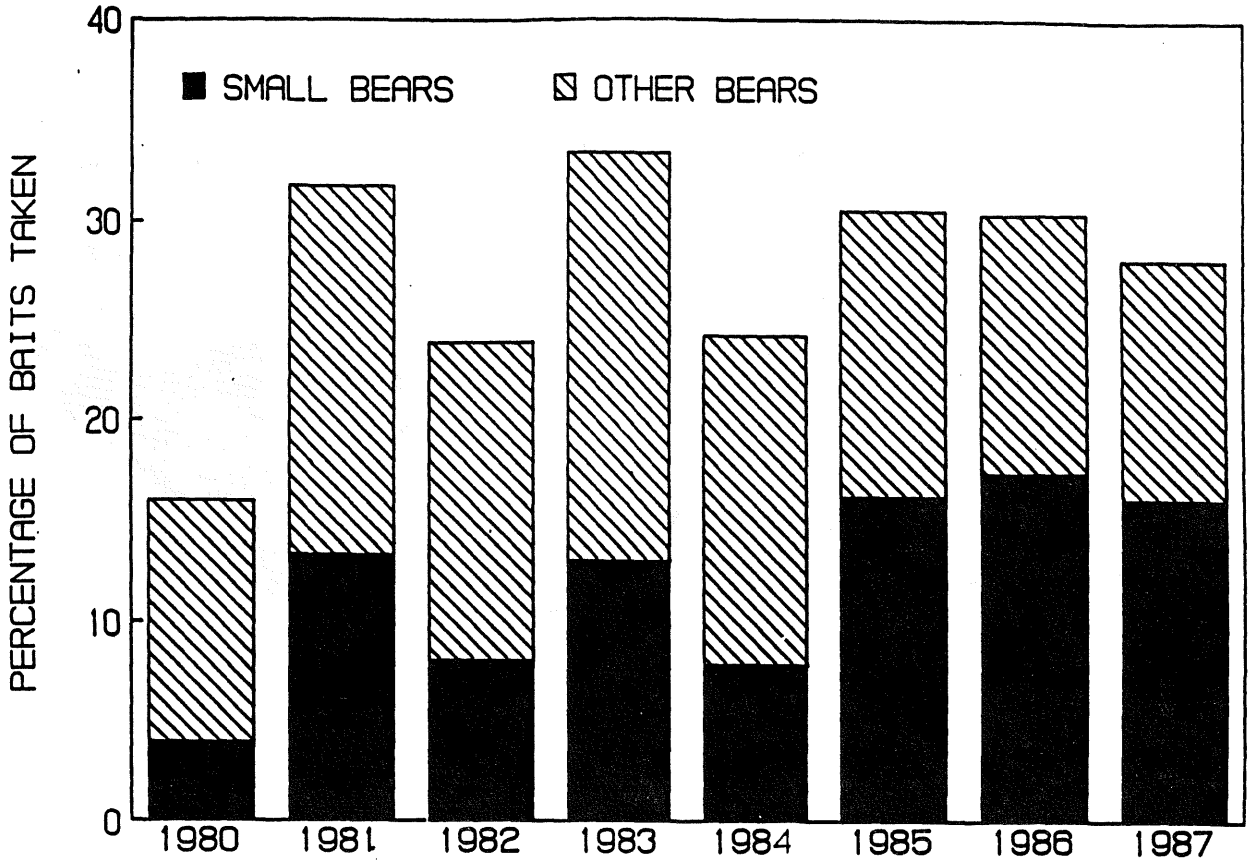

Figure 22. Percentage of baits taken by bears during bait-station survey in early July, 1980-87. Bear visitation typically was indicated by claw marks on the bait tree. Small bears were identified by claw marks low on the tree, where the hind feet were used to enable the bear to reach the bait. Data from 1980 may not be comparable to other years because a different type of bait was used and most of the routes were run 2-3 weeks later than in other years.

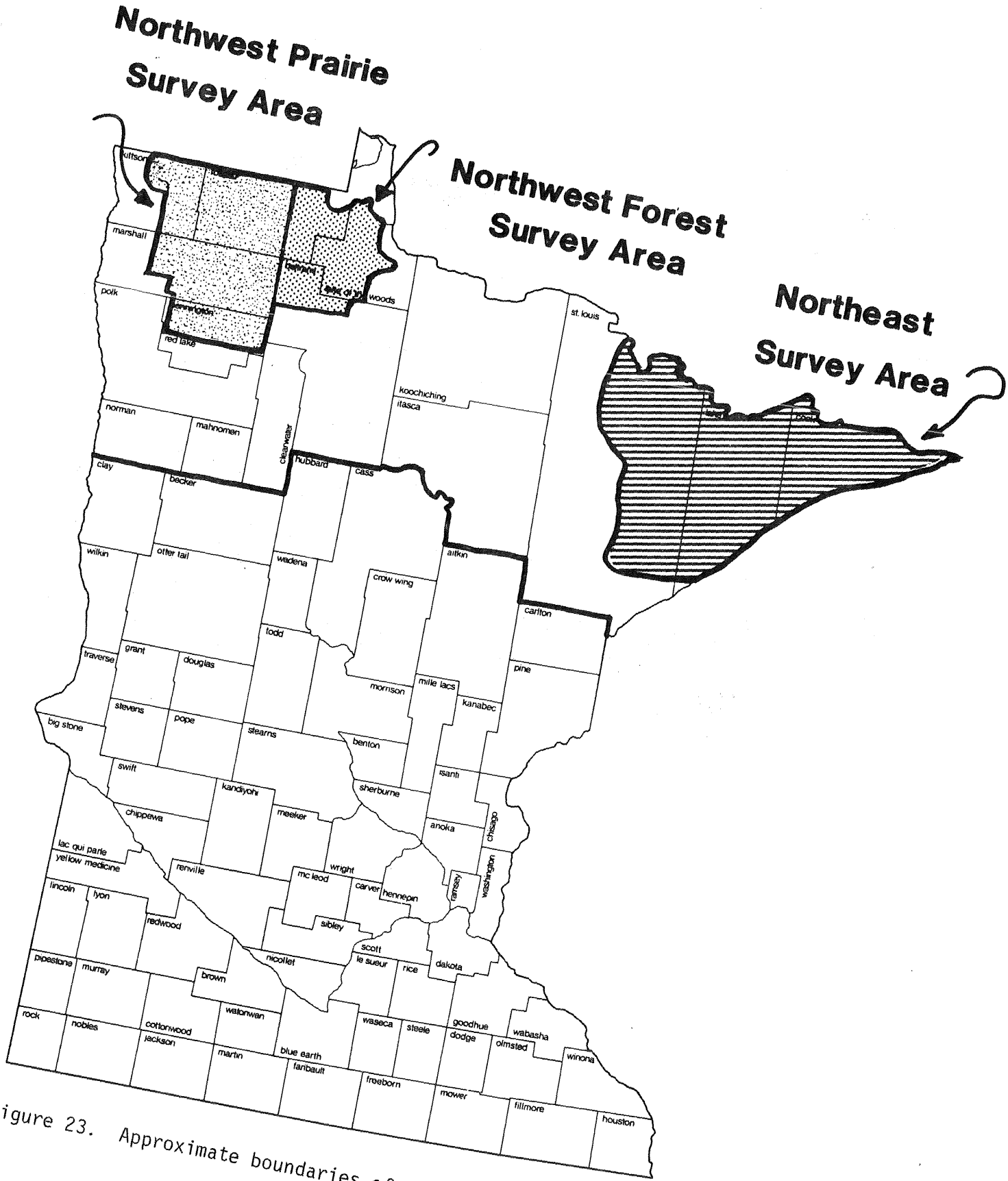

Figure 23. Approximate boundaries of aerial moose survey.

Table 27. Moose population estimates from aerial moose survey in Minnesota (± 90% Confidence Interval).

Area	Sq. miles[a]	1982-83	1983-84	1984-85	1985-86	1986-87	% change 1985-86 to 1986-87
Northeast	4809	4877 (999)	4274 (925)	5518 (1494)	4955 (1034)	6120 (1438)	+23.5
Northwest Forest	1779	370 (124)	446 (139)	578 (148)	433 (100)	307 (83)	-29.1
Northwest Prairie	2126	3772 (930)	2784 (567)	4086 (518)	3415 (412)	3740 (747)	+ 9.5

[a] Total land area within survey zone excluding agricultural areas. Does not include area of lakes more than 10 acres.

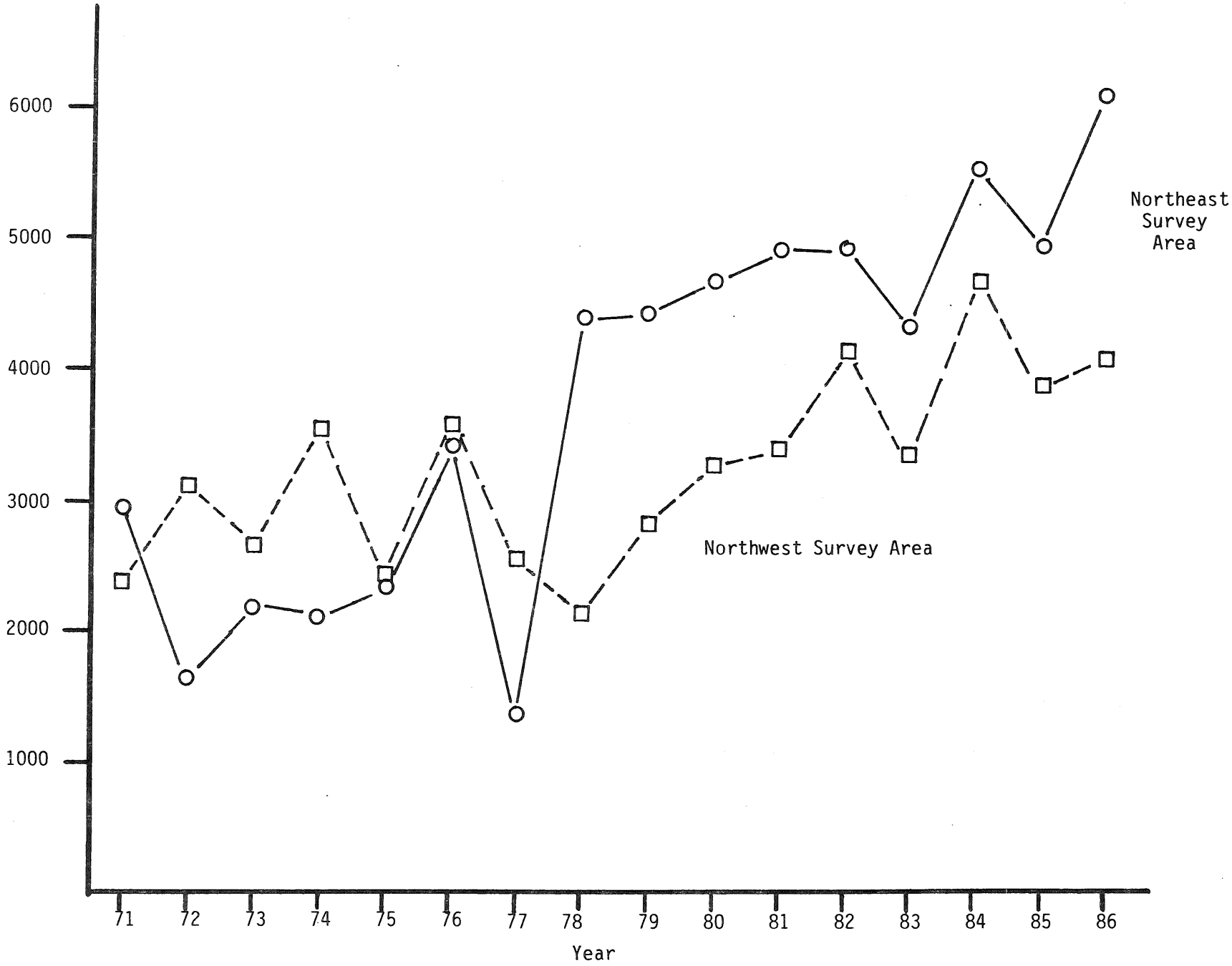

Figure 24. Moose population estimates in the two survey areas, 1971-1986. (Northwest prairie and Northwest forest areas combined in Northwest Survey Area).

MIGRATORY BIRD POPULATIONS

AND CENSUSES

Table 28. Estimated number of breeding ducks in Minnesota Strata I, II and III (1968-1987).

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Mallard	1968	45,005	2.04	92,000
	1969	53,167	1.67	89,000
	1970	67,463	1.72	116,000
	1971	48,807	1.64	80,000
	1972	49,137	1.27	62,000
	1973	64,954	1.32	85,000
	1974	52,917	1.67	88,000
	1975	55,666	1.60	89,000
	1976	70,362	1.81	127,000
	1977	60,755	2.27	138,000
	1978	56,152	2.70	152,000
	1979	63,516	2.70	171,000
	1980	83,775	1.99	167,000
	1981	80,110	2.19	175,000
	1982	51,655	2.66	137,000
	1983	74,995	2.04	153,000
	1984	94,514	2.22	210,000
	1985	96,045	2.32	223,000
	1986	108,328	2.16	234,000
	1987	165,881	1.16	192,000
Blue-winged teal	1968	64,431	2.44	157,000
	1969	45,180	3.70	167,000
	1970	31,682	5.00	158,000
	1971	43,464	3.45	150,000
	1972	49,926	1.96	98,000
	1973	127,398	2.17	276,000
	1974	46,941	2.70	128,000
	1975	45,727	3.20	146,000
	1976	90,023	4.16	374,000
	1977	37,532	5.26	197,000
	1978	28,491	8.33	237,000
	1979	46,825	4.54	213,000
	1980	51,185	6.25	320,000
	1981	64,546	4.17	269,000
	1982	42,167	6.45	272,000
	1983	44,028	2.24	99,000
	1984	89,897	2.93	263,000
	1985	90,453	3.23	292,000
	1986	68,234	2.69	184,000
	1987	102,479	1.99	204,000

Table 28. Continued.

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Other ducks[b]	1968	57,790	2.06	119,000
	1969	44,324	2.27	101,000
	1970	42,927	2.25	97,000
	1971	35,986	2.22	80,000
	1972	45,927	1.67	77,000
	1973	101,671	1.96	199,000
	1974	84,460	2.44	206,000
	1975	43,894	3.60	141,000
	1976	62,205	2.41	148,000
	1977	21,650	4.34	94,000
	1978	43,071	4.16	150,000
	1979	39,749	3.70	147,000
	1980	55,372	2.77	153,000
	1981	50,792	3.37	171,000
	1982	54,018	5.18	280,000
	1983	42,649	3.74	160,000
	1984	56,008	1.84	103,000
	1985	42,428	2.06	87,000
	1986	45,147	2.59	117,000
	1987	87,052	2.51	219,000
All ducks	1968	167,226	--	368,000
	1969	142,671	--	357,000
	1970	142,072	--	371,000
	1971	128,257	--	310,000
	1972	144,990	--	237,000
	1973	294,023	--	561,000
	1974	184,318	--	422,000
	1975	145,287	--	376,000
	1976	222,590	--	649,000
	1977	119,937	--	429,000
	1978	121,451	--	539,000
	1979	150,090	--	531,000
	1980	194,883	--	640,000
	1981	195,448	--	615,000
	1982	147,840	--	689,000
	1983	161,672	--	412,000
	1984	240,419	--	576,000
	1985	228,926	--	602,000
	1986	221,709	--	534,000
	1987	355,412	--	615,000

[a] Visibility factors for all ducks are calculated without mallards and blue-winged teal. The 1981 values for mallards and blue-winged teal are unweighted.

[b] 1979 excludes 156,000 lesser scaup and 1982 includes 120,000 lesser scaup.

Table 29. Winter population estimates (post hunting season) of the Canada goose eastern prairie flock, 1963-86 (taken from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp).

Year	Population
1963	110,000
1964	103,000
1965	104,000
1966	121,000
1967	145,000
1968	134,000
1969	107,000
1970	121,000
1971	152,000
1972	177,000
1973	187,000
1974	188,000
1975	199,000
1976	254,000
1977	270,000
1978	207,000
1979	172,000
1980	151,000
1981	175,000[a]
1982	210,000
1983	163,000[b]
1984	168,000
1985	169,000
1986	183,000

[a] In 1983, U.S.F.W.S. revised a previously published estimate (145,000) due to supplemental information.

[b] Supplemental information suggests that the 1983 population was 170,000 - 190,000 birds.

Table 30. Summary of the number of May ponds (adjusted for visibility) in Prairie Canada (portions of Alberta, Saskatchewan and Manitoba) 1961-87 and north-central U.S. (North Dakota, South Dakota and Montana) 1974-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service, 1987. 1987 Status of waterfowl and fall flight forecast. July 1987. 40pp).

Year	Ponds (thousands)	
	Prairie Canada	North Central U.S.[a]
1961	2,006	--
1962	2,531	--
1963	2,499	--
1964	3,445	--
1965	4,415	--
1966	4,672	--
1967	4,732	--
1968	1,938	--
1969	3,530	--
1970	4,957	--
1971	4,096	--
1972	4,065	--
1973	2,937	--
1974	6,693	1,509
1975	6,267	1,911
1976	5,057	1,392
1977	2,278	771
1978	3,622	1,590
1979	4,859	1,522
1980	2,141	761
1981	1,443	683
1982	3,185	1,458
1983	3,906	1,259
1984	2,458	1,766
1985	4,283	1,327
1986	4,025	1,735
Average	3,694	1,360
1987	2,598	1,348
% Change in 1987 from:		
1986	-35	-22
Average	-30	- 1

[a] No comparable survey data available for the north-central U.S. during 1961-73.

Table 31. North American breeding population estimates for 10 species of ducks, 1955-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp). In thousands.[a]

Year	Mallard	Gadwall	American wigeon	Green-winged teal	Blue-winged teal	Northern shoveler	Northern Pintail	Redhead	Canvasback	Scaup
1955	10,345	1,106	3,333	2,076	6,436	1,965	9,251	733	595	7,100
1956	11,711	1,202	3,712	1,898	6,267	2,084	10,124	928	692	6,595
1957	10,946	1,102	3,208	1,293	5,449	1,744	6,856	684	600	6,535
1958	12,904	687	3,372	1,618	5,799	1,515	6,889	524	713	6,040
1959	10,292	683	3,779	3,153	5,300	1,649	7,228	641	481	8,220
1960	8,206	873	3,165	1,630	4,303	1,859	5,769	542	575	5,566
1961	8,290	1,422	3,219	2,216	4,833	1,625	4,860	437	396	6,764
1962	6,144	1,610	2,721	1,119	3,890	1,633	4,299	664	385	6,398
1963	7,360	1,578	2,209	1,754	4,587	1,435	4,361	396	523	6,564
1964	6,974	1,223	2,630	2,051	4,943	1,685	4,111	560	658	6,326
1965	5,948	1,692	2,695	1,526	4,628	1,607	4,301	568	505	5,383
1966	7,401	1,976	2,901	2,219	5,616	2,272	5,777	747	683	5,421
1967	8,205	1,638	2,637	1,944	4,715	2,244	5,870	846	556	5,877
1968	7,586	2,098	2,783	1,805	3,697	1,811	4,225	502	557	5,971
1969	8,065	1,837	3,192	1,991	4,514	2,150	6,390	759	530	6,338
1970	10,379	1,698	3,752	2,259	5,633	2,269	7,004	834	601	6,930
1971	9,843	1,733	3,425	2,352	5,426	2,052	6,291	693	441	6,149
1972	9,867	1,776	3,428	2,407	5,673	2,505	7,875	489	429	9,527
1973	8,781	1,198	3,665	2,444	4,866	1,657	5,114	754	696	7,535
1974	7,392	1,562	3,003	2,221	5,437	2,060	7,165	613	493	7,045
1975	8,109	1,672	2,862	2,038	6,441	1,994	6,387	974	706	7,846
1976	8,637	1,478	2,699	1,844	5,023	1,818	6,045	946	686	6,973
1977	8,226	1,546	2,678	1,952	4,626	1,616	4,971	688	702	7,490
1978	7,695	1,593	3,808	2,978	4,497	2,162	5,664	833	423	7,125
1979	8,444	1,889	3,388	2,920	5,278	2,555	6,070	774	606	9,135
1980	8,003	1,459	3,857	2,925	4,903	2,050	5,420	1,146	688	7,690
1981	6,757	1,479	3,555	2,515	4,076	2,403	4,227	825	594	7,253
1982	6,684	1,690	3,159	2,247	3,879	2,540	4,112	674	543	6,549
1983	7,107	1,536	2,923	2,574	3,381	2,237	4,086	866	528	8,788
1984	5,974	1,799	3,979	1,804	3,870	2,222	3,664	849	569	8,402
1985	5,475	1,410	2,506	1,873	3,756	1,925	2,935	701	411	6,235
1986	6,303	1,590	2,446	2,588	4,664	2,403	3,201	956	442	6,252
1987	6,691	1,705	2,734	3,041	3,618	2,229	3,137	767	478	6,261
Goals[b]	8,700	1,600	3,300	2,300	5,300	2,100	6,300	760	580	7,600
1955-86 Ave.	8,252	1,495	3,147	2,132	4,888	1,992	5,642	723	563	6,938
Percent Change in 1987 From:										
1986	+ 6	+ 7	+12	+18	-22	- 7	- 2	-20	+ 8	NC
1955-86 Ave.	-19	+14	-13	+43	-26	+12	-44	+ 6	-15	-10

[a] All duck indexes adjusted for visibility bias.

[b] Breeding duck population goals, from North American Waterfowl Management Plan (FWS-CWS 1986).

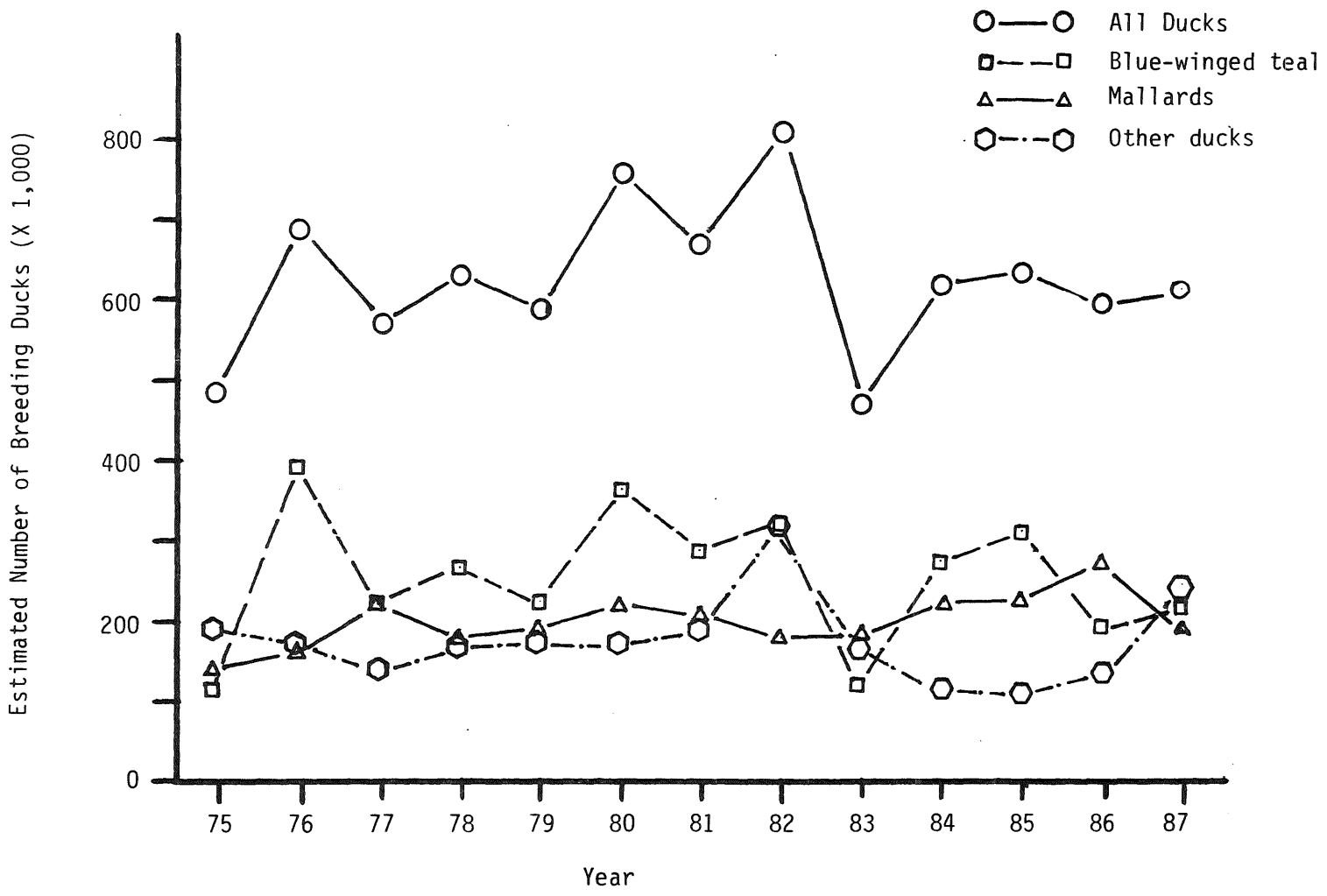

Figure 25. Estimated number of ducks breeding in Minnesota, 1975-87.

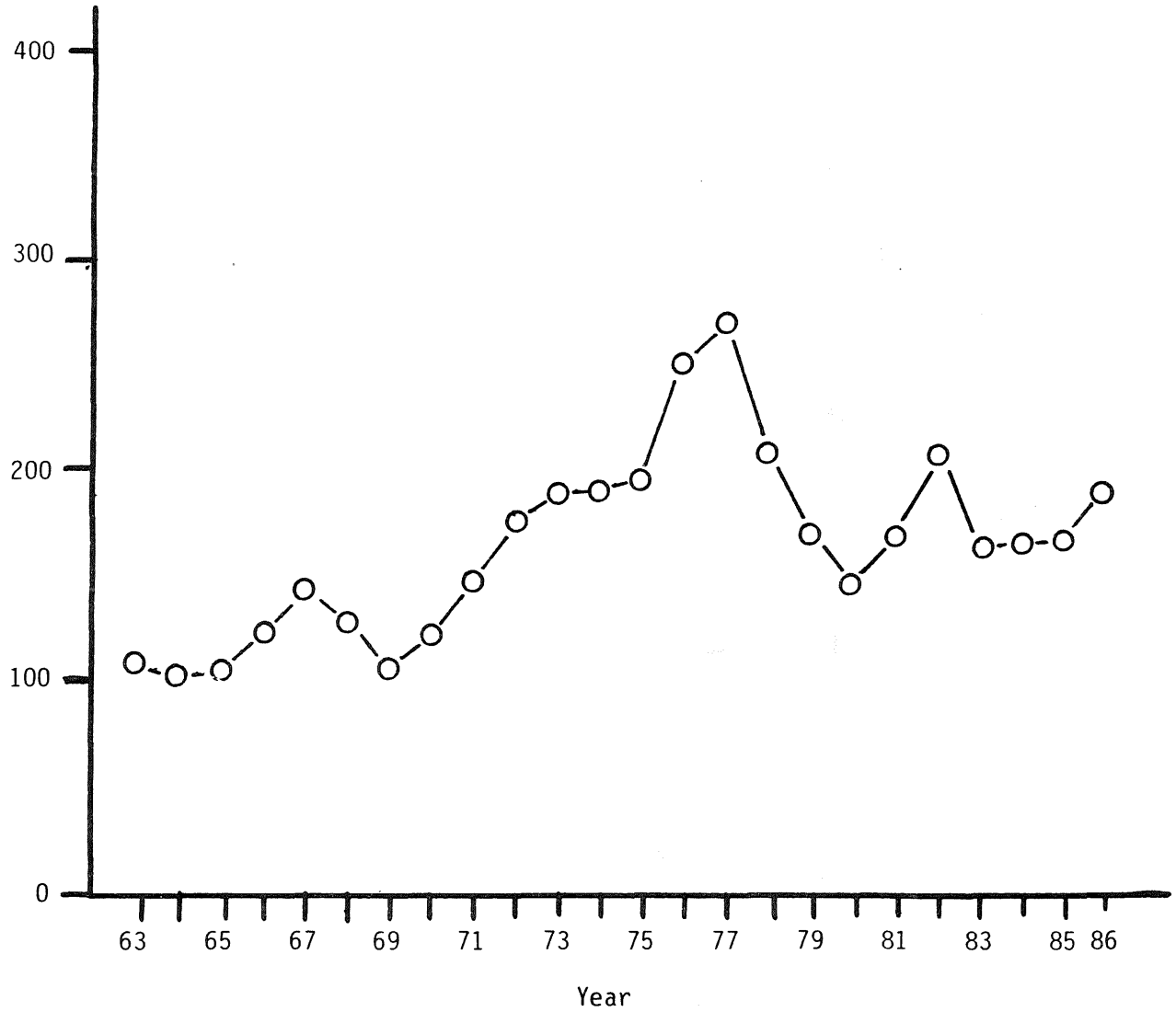

Figure 26. Winter population estimates of the Eastern Prairie Population of Canada geese, 1963-86. (data from U.S. Fish and Wildlife Service/Canadian Wildlife Service reports on status of waterfowl and fall flight forecasts).

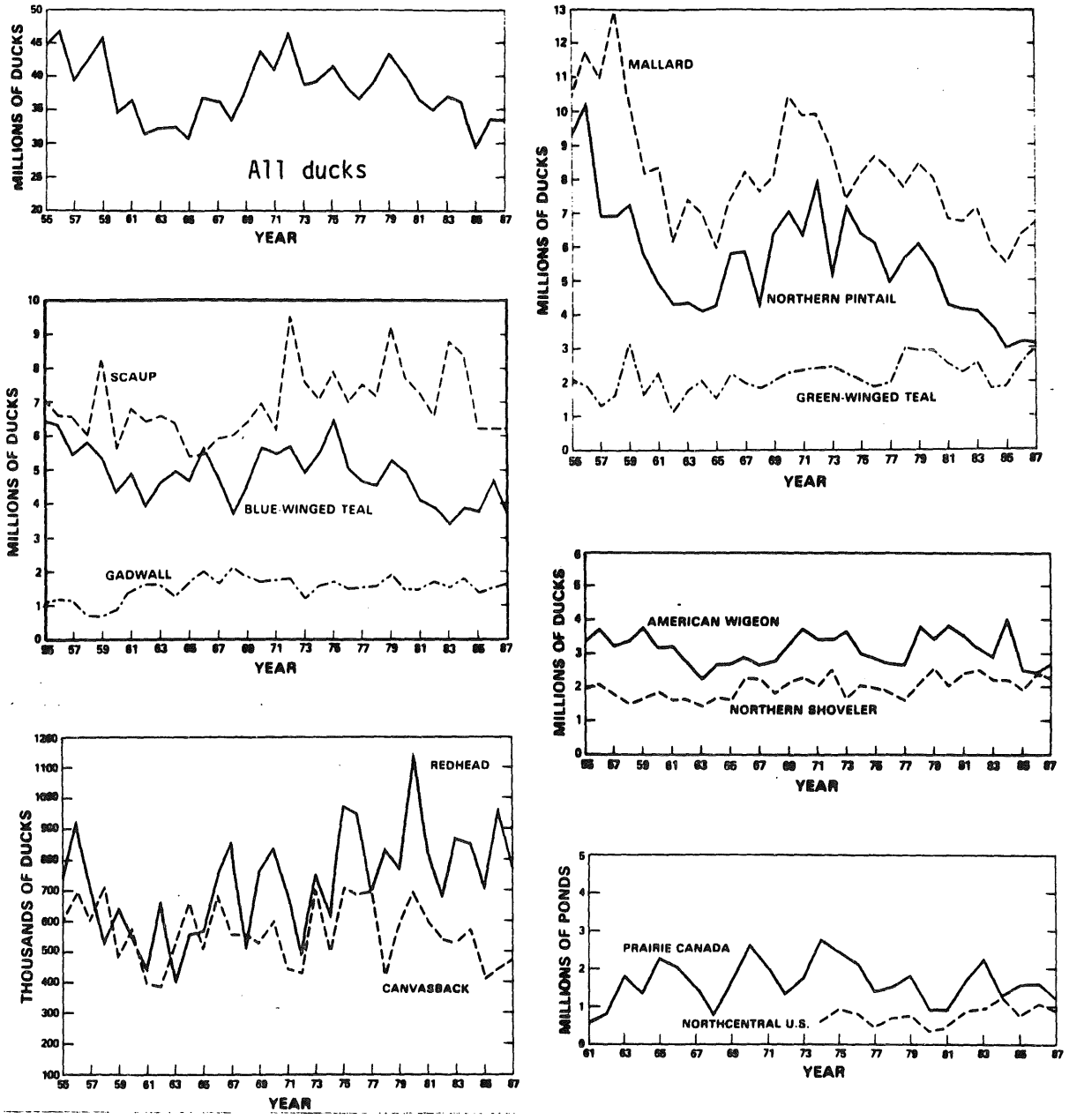

Figure 27. Estimates of North American breeding populations of selected ducks, and winter population estimates for black ducks. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987. 40pp).

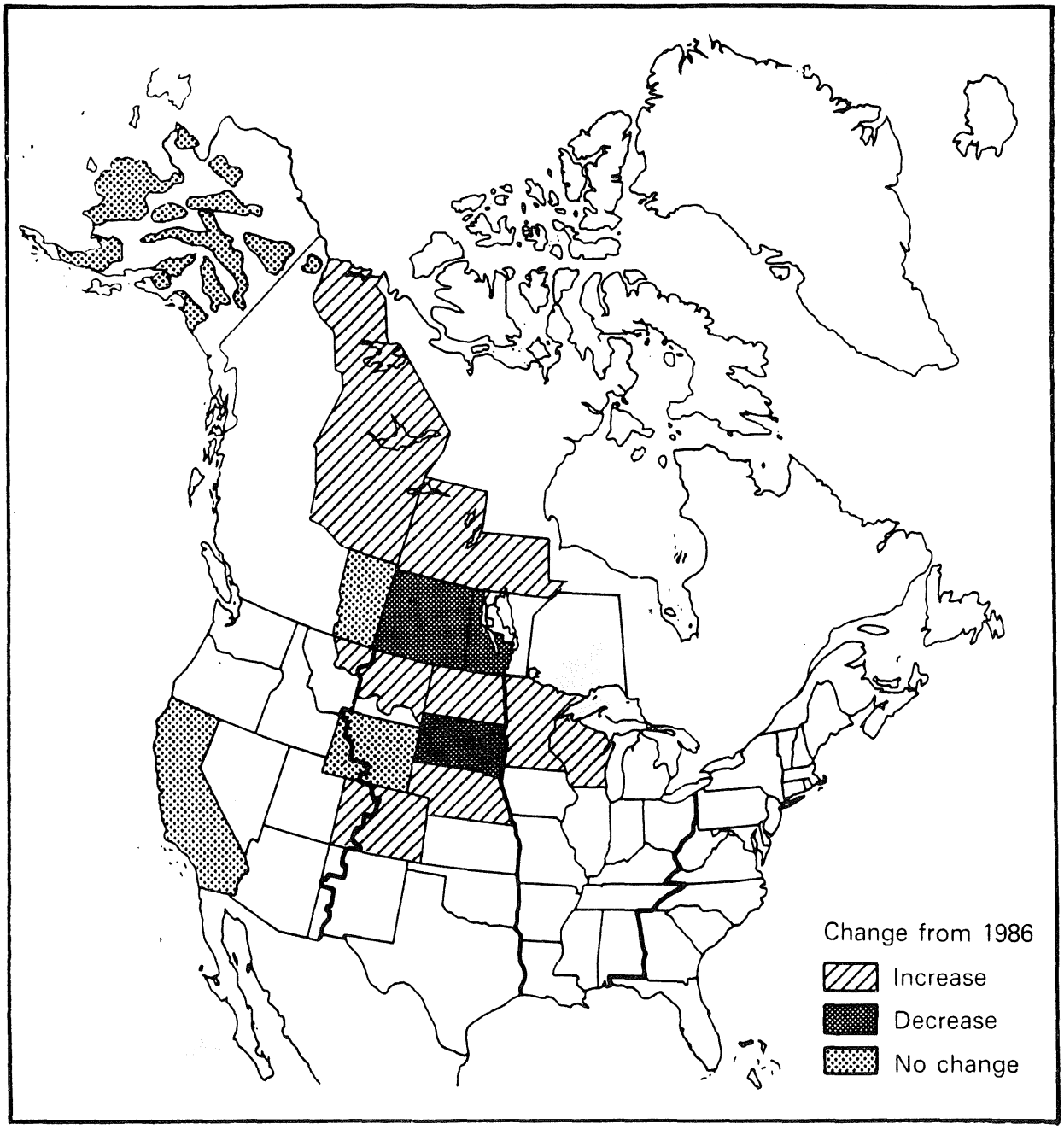

Figure 28. Fall 1987 duck flight forecast for Canada and the U.S., change from 1986; forecast: increase. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

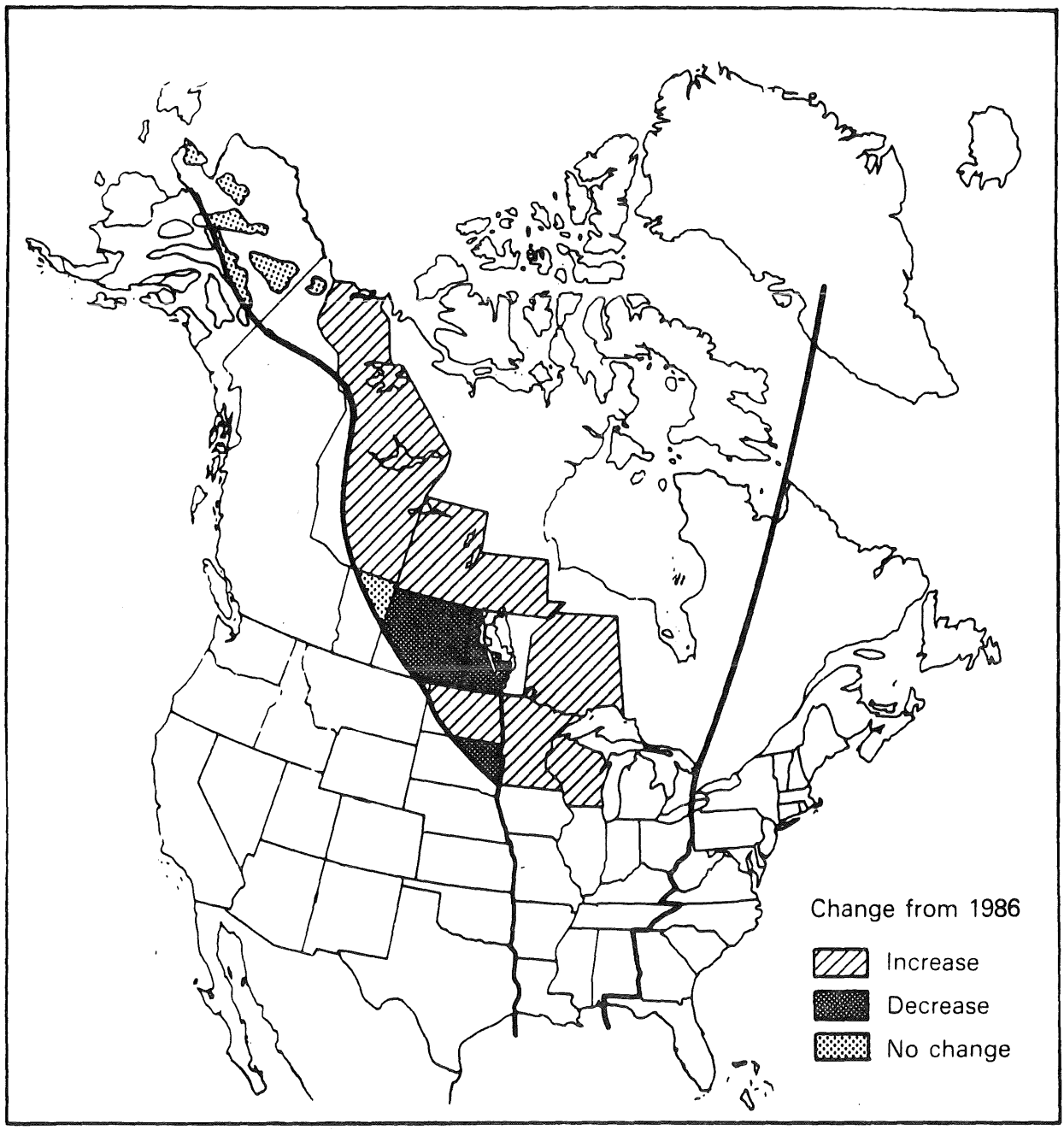

Figure 29. Fall 1987 duck flight forecast for the Mississippi Flyway, change from 1986; forecast: no change. (from U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

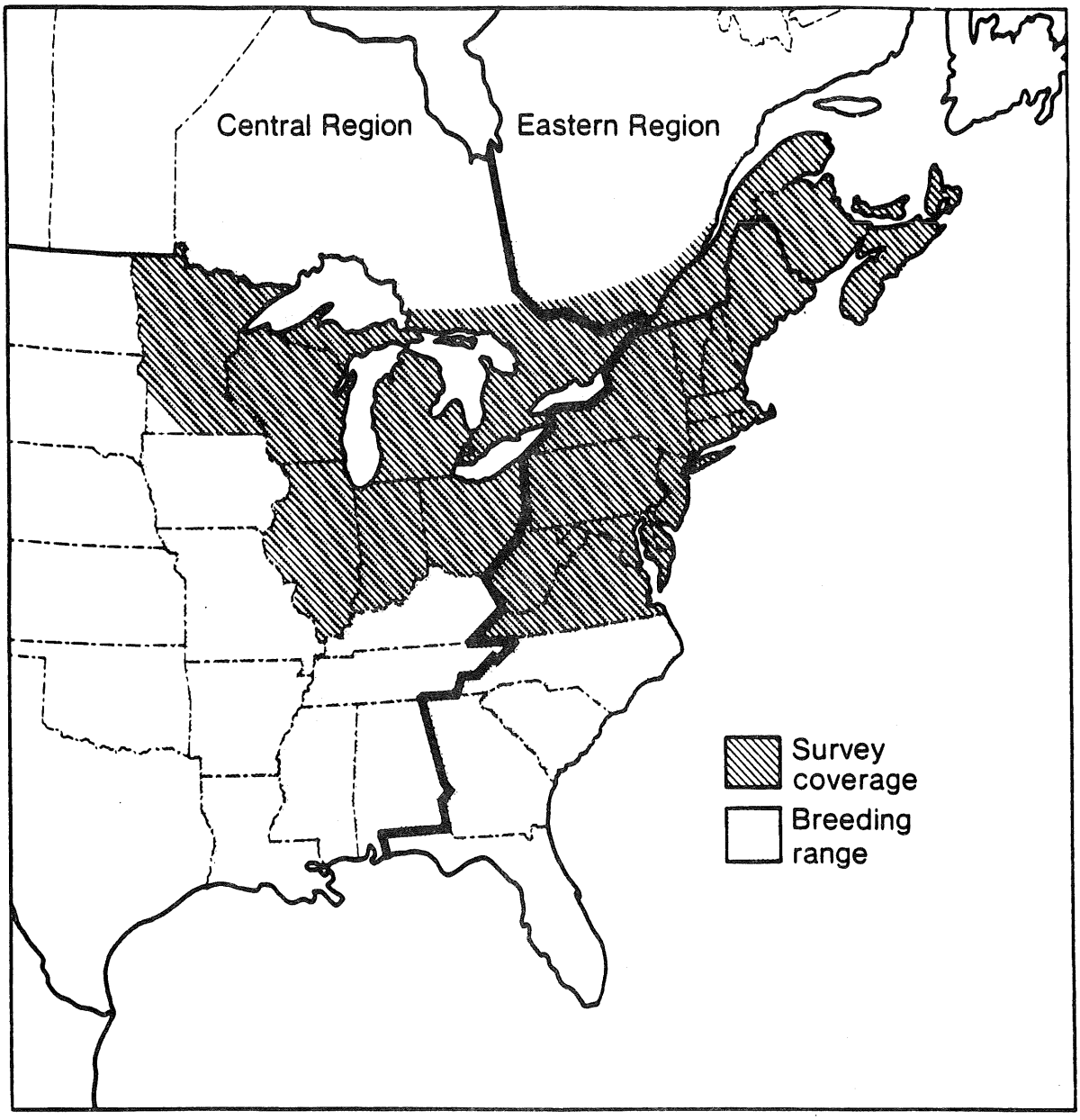

Figure 30. Approximate woodcock breeding range and states covered in singing ground survey. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

Table 32. Woodcock breeding population indices in the U.S. Central Region as indicated by singing-ground surveys in 1986 and 1987 (from: Bortner, J.B. 1987. American woodcock harvest and breeding status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 11pp).

State or Province	Number of routes conducted 1986	Number of routes conducted 1987	Comparable routes[a]	Woodcock heard per comparable route 1986	Woodcock heard per comparable route 1987	Percent change
IL	11	7	98	0.04	0.04	0.0
IN	17	14	61	0.48	0.57	20.8
MI	99	115	109	4.84	4.54	-6.3
MN	73	77	99	2.84	2.81	-1.1
OH	27	31	78	0.59	0.68	15.1
ON	100	98	89	6.16	6.00	-2.2
WI	72	77	106	2.85	3.00	6.0
Totals	399	419	640			
			Weighted Averages[b]	3.59	3.54	-1.4

[a] Includes routes carried as constant zero routes.

[b] Computed for States or Provinces where one comparable route represents less than 2,000 sq. mi. (5,180 sq. km.) and more than 0.5 birds were heard per route. Data from Delaware, Connecticut, Illinois, Indiana, Maryland, Rhode Island, Virginia and Quebec did not meet these criteria.

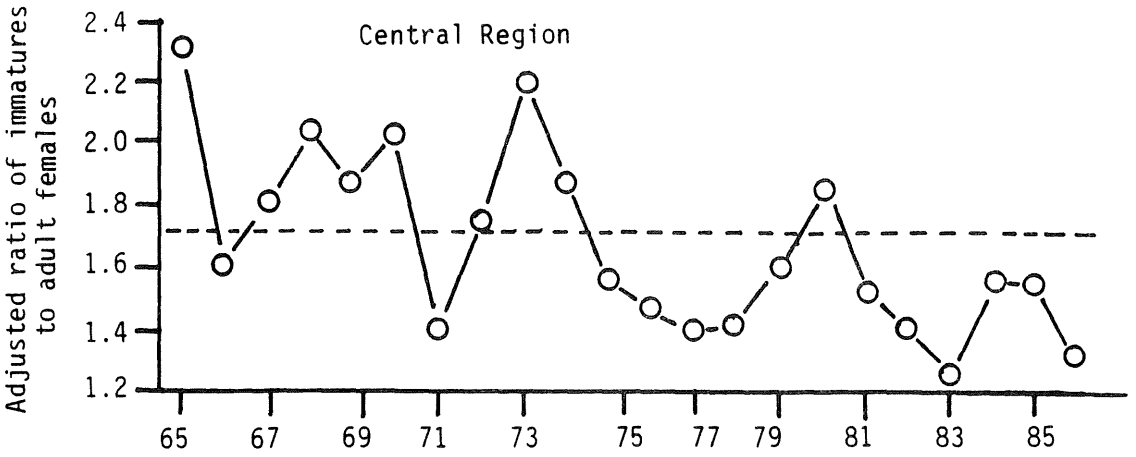

Figure 31. Adjusted index of American woodcock recruitment, 1965-1986, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

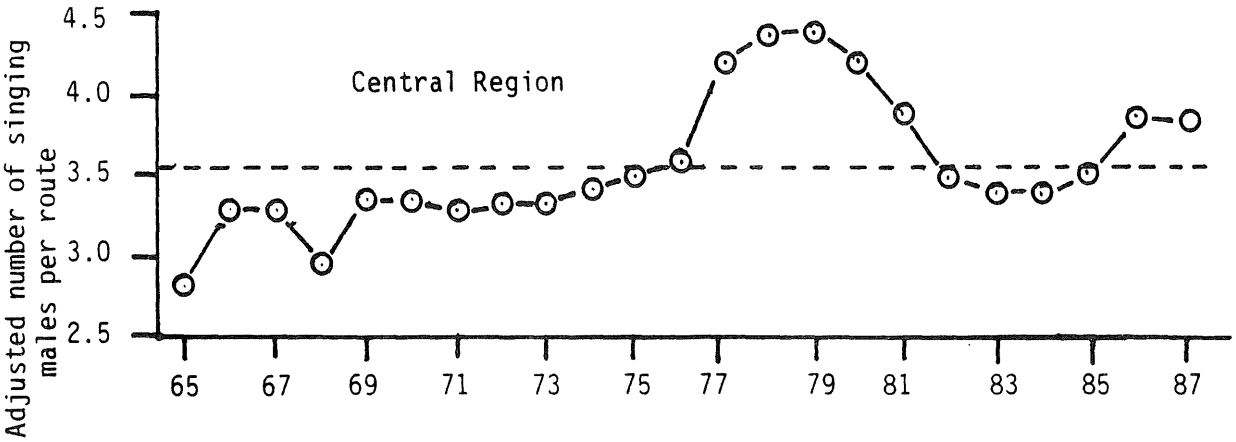

Figure 32. Adjusted index of American woodcock breeding population, 1968-1986, base year 1970. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

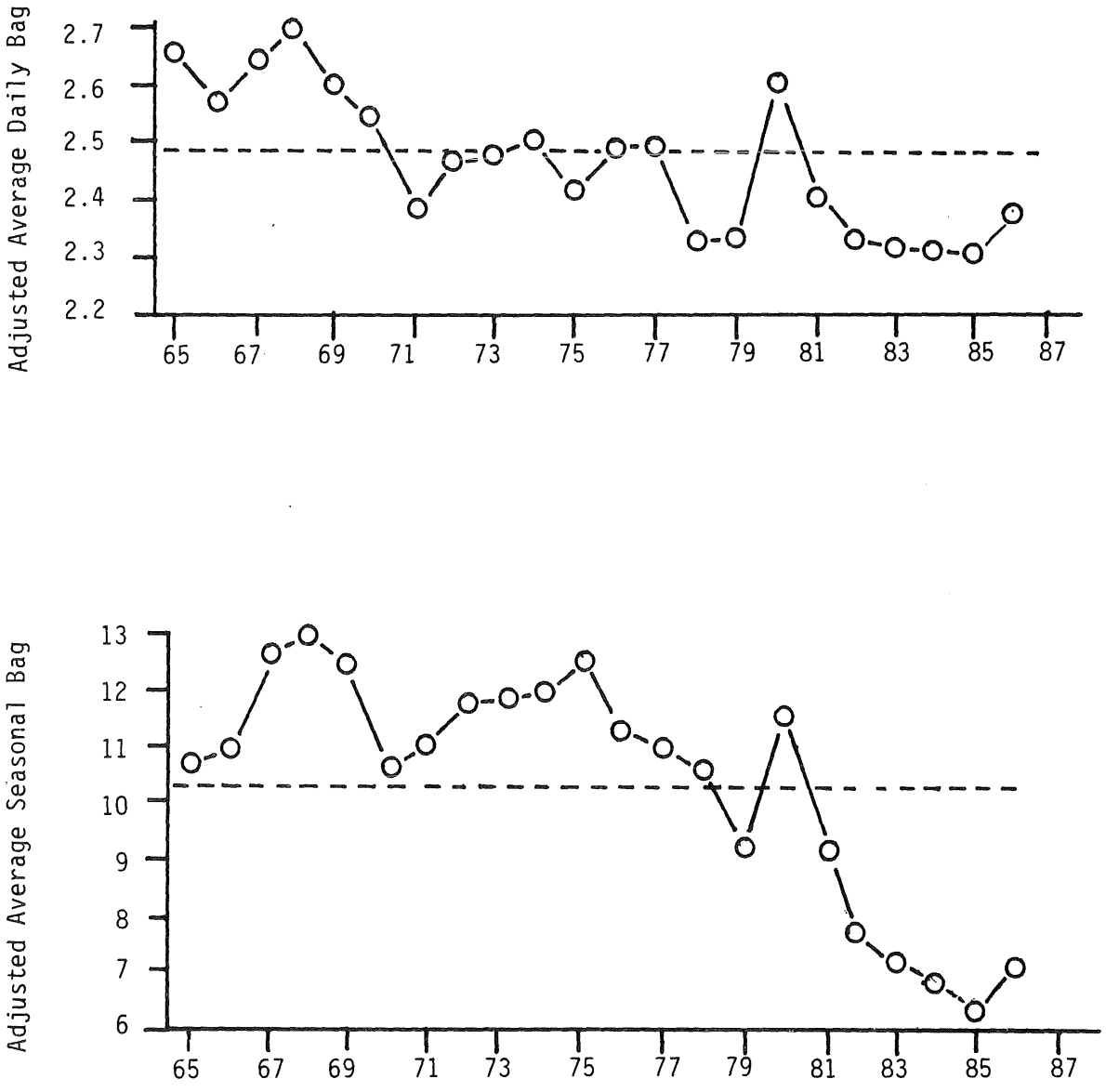

Figure 33. Adjusted indices of daily and seasonal hunting success of American woodcock, 1965-1985, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

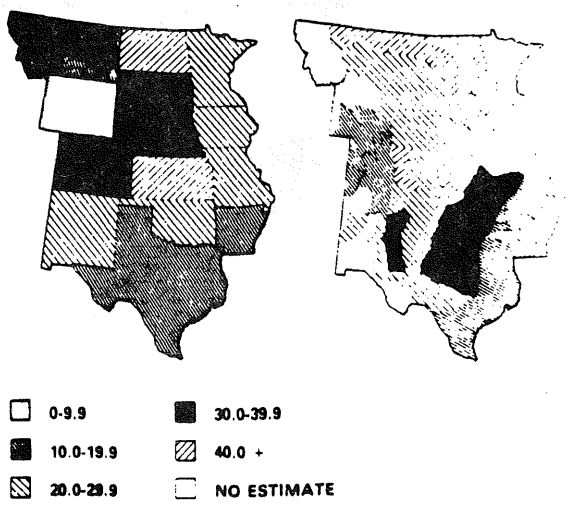

Figure 34. Mean number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1987. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

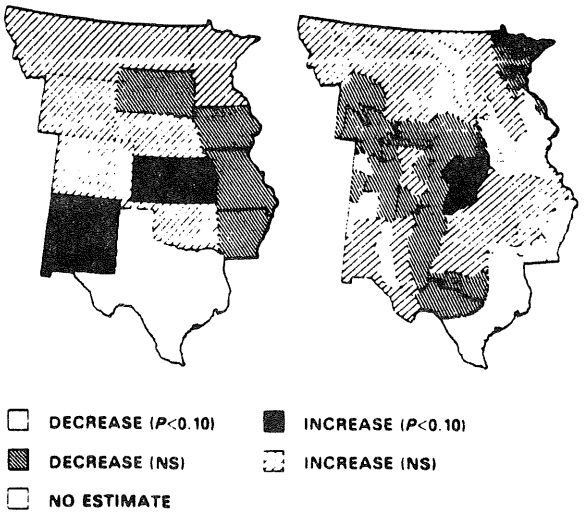

Figure 35. Changes in the number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

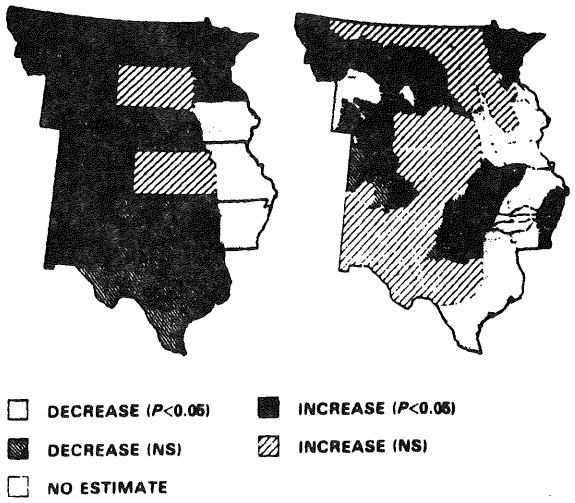

Figure 36. Trends in number of mourning doves heard per route by state and by physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

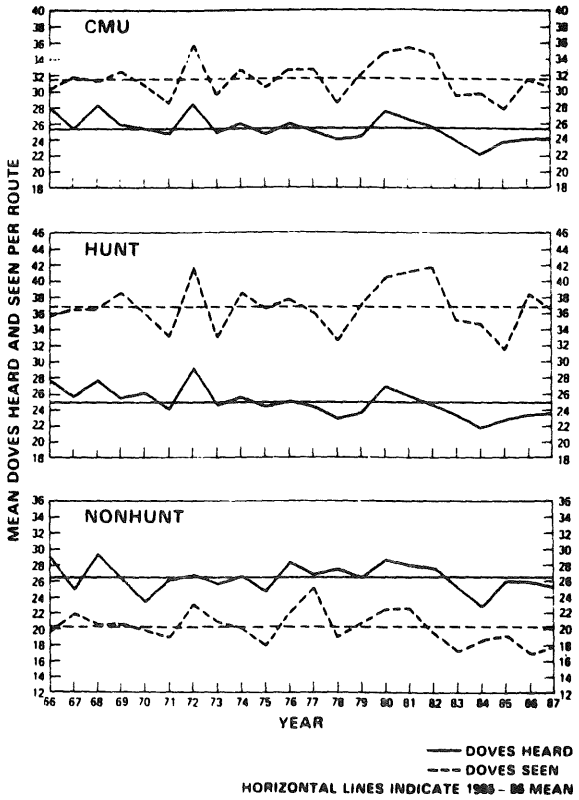

Figure 37. Population indices of breeding mourning doves in the Central Management Unit, 1966-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

HUNTING

HARVEST STATISTICS

Table 33. Resident small game hunter[a] response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	5,696	443	4,504	85.7
1980-81	6,434	385	4,963	82.0
1981-82	6,656	399	5,419	86.6
1982-83	5,963	266	4,792	84.1
1983-84	4,551	269	3,325	77.7[b]
1984-85	4,096	127	3,280	82.6
1985-86	3,370	157	2,574	80.1
1986-87	4,668	208	3,623	81.2

[a] Includes individual and combination sportsman, regular small game, and senior licensees, and excludes duplicate licenses.

[b] Includes only those survey returns received by 25 April 1984.

Table 34. Use of resident small game hunter licenses[a], 1979-80 through 1986-87.

	Returns from mail survey	Projections from license sales
1979-80		
Hunted	3,964 (88.0%)	296,766
Did not hunt	540 (12.0%)	40,468
	4,504 (100.0%)	337,234
1980-81		
Hunted	4,288 (86.4%)	311,717
Did not hunt	675 (13.6%)	49,066
	4,963 (100.0%)	360,783
1981-82		
Hunted	4,461 (82.3%)	306,843
Did not hunt	958 (17.7%)	65,992
	5,419 (100.0%)	372,835
1982-83		
Hunted	3,908 (81.6%)	257,546
Did not hunt	884 (18.4%)	58,258
	4,792 (100.0%)	315,804
1983-84		
Hunted	2,805 (84.4%)	232,973
Did not hunt	520 (15.6%)	43,061
	3,325 (100.0%)	276,034
1984-85		
Hunted	2,663 (81.2%)	211,740
Did not hunt	617 (18.8%)	49,024
	3,280 (100.0%)	260,764
1985-86		
Hunted	2,132 (82.8%)	213,883
Did not hunt	442 (17.2%)	44,342
	2,574 (100.0%)	258,225
1986-87		
Hunted	3,006 (83.0%)	217,504
Did not hunt	617 (17.0%)	44,549
	3,623 (100.0%)	262,053

[a] Includes individual and combination sportsman, regular small game, and senior licenses.

Table 35. Estimated number of hunters and estimated take per hunter for various species, 1979-80 through 1986-87.

Species	Estimated number of hunters (thousands)								Estimated take per hunter							
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Ducks	155	128	138	134	117	134	122	132	9.4	9.3	8.4	8.1	10.6	10.8	9.1	9.0
Canada goose	57	51	47	52	41	51	55	58	1.5	1.4	1.4	1.6	1.6	1.6	1.9	1.8
Other geese	*	27	15	11	10	9	9	7	*	1.2	1.0	0.7	0.7	0.8	1.2	0.5
American coot	24	19	13	11	12	9	11	11	5.0	3.1	4.0	4.3	4.7	4.9	4.4	5.3
Common snipe	8	12	7	4	6	5	5	5	2.4	1.9	2.9	3.2	2.8	4.0	3.2	3.9
Rails/gallinules	2	*	1	1	2	1	1	1	2.9	*	1.6	3.1	1.2	1.4	2.3	1.1
American woodcock	22	25	23	20	16	17	19	21	2.8	2.7	2.8	2.7	3.9	4.3	4.3	4.3
Ring-necked pheasant	143	147	173	125	86	65	72	62	2.3	3.2	3.3	2.1	3.5	2.3	3.0	2.6
Ruffed grouse	151	150	145	115	78	87	94	107	4.7	6.3	3.9	2.6	2.4	3.7	3.8	4.2
Spruce grouse	18	25	15	13	9	12	12	12	1.5	1.3	1.7	1.1	1.1	1.7	2.1	1.7
Sharp-tailed grouse	24	27	16	14	9	9	10	9	2.3	2.1	2.2	1.2	1.1	0.8	1.9	1.5
Gray partridge (Hun)	33	38	32	21	21	15	20	17	3.3	2.7	3.4	2.5	3.6	2.1	4.3	3.3
Gray squirrel[a]	80	78	70	53	38	39	38	41	5.1	6.6	5.9	5.1	5.3	5.3	5.2	5.7
Fox squirrel[a]			48	39	28	26	29	29			4.6	4.2	4.5	4.1	5.0	5.1
Eastern cottontail	50	56	60	36	29	22	22		3.8	4.4	4.4	3.8	3.4	2.8	3.8	4.2
White-tailed jack rabbit	18	22	17	11	7	6	6	4	2.5	2.4	2.7	2.6	1.9	1.9	3.0	3.4
Snowshoe hare	28	37	25	15	9	7	7	8	4.9	7.8	4.4	4.2	2.3	2.3	2.3	3.2
Raccoon	16	20	19	13	11	12	10	11	6.0	4.4	7.0	6.3	8.0	9.4	9.4	10.9
Red fox	13	17	19	12	11	11	12	11	1.6	1.7	1.9	1.5	2.0	2.3	4.2	1.5
Gray fox	4	8	4	3	2	3	2	2	1.1	0.4	1.0	0.9	0.9	1.4	2.0	0.8
Coyote	3	8	4	3	3	3	5	4	1.1	0.5	0.9	0.8	0.8	1.8	3.1	1.6
Badger	*	7	1	1	1	1	1	<1	*	0.7	1.1	1.9	0.3	3.9	1.8	1.0

* No estimate made.

[a] Estimates for gray and fox squirrels prior to 1981 are for both species combined.

Table 36. Resident small game hunting license sales and estimated hunter harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Small game license sales[a]	337,234	360,783	372,835	314,477	276,034	260,764	258,225	262,053
Federal duck stamp sales	159,068	158,311	142,345	134,803	138,161	138,820	134,594	142,011
State duck stamp sales[b]	145,832	144,256	129,546	123,834	125,212	131,394	125,559	146,747
Pheasant stamp sales[b]	-	-	-	-	114,189	81,587	85,252	81,027
Estimated harvest[c] (thousands)								
Ducks[e]	1,462	1,199	1,167	1,071	1,235	1,443	1,029	1,172
Canada geese[e]	85	72	71	81	62	82	86	101
Other geese[e]	*	33	16	7	8	8	9	3
American coot[e]	123	58	49	49	55	48	41	59
Common snipe	19	23	21	14	17	20	16	21
Rails/gallinules	7	*	2	3	2	1	2	1
American woodcock	60	67	63	54	58	70	70	87
Ring-necked pheasant	328	466	573	265	299	148	179	159
Ruffed grouse	709	941	576	302	183	320	315	442
Spruce grouse	27	34	24	14	10	21	21	20
Sharp-tailed grouse	54	56	34	17	10	7	14	13
Gray partridge (hun)	108	101	110	52	74	31	77	54
Gray squirrel[d]	403	514	409	271	199	208	186	235
Fox squirrel[d]			216	162	126	107	140	145
Eastern cottontail	188	249	263	135	98	61	75	102
White-tailed jack rabbit	45	52	45	27	13	11	17	14
Snowshoe hare	136	286	109	61	21	16	12	25
Raccoon	97	88	136	80	87	114	85	122
Red fox	21	28	37	19	21	26	44	15
Gray fox	4	3	4	2	2	4	4	2
Coyote (brush wolf)	3	4	4	2	3	5	11	7
Badger	No season	5	2	2	<1	2	2	<1

Harvest estimates in this table, and the number of hunters and mean take per hunter in Table 35, are calculated from different questions on the survey form. The sample used in calculations differs from one estimator to the next. This is because some respondents give specific answers to one question but not to a related one. A formula is used to calculate the total estimated take for each species which appears in this table. In most years the formula produces results rather close to those obtained by multiplying the average take per hunter times the number of hunters. However, in other years (e.g., 1985) results of the two methods are quite divergent, perhaps as a result of an unusual sample. This is being investigated further, and as a result, numbers may change somewhat in future reports. The most current report of survey findings will have the best data available at that time.

* No estimate made.

[a] Duplicate licenses not included.

[b] Excluding stamps sold with an issuing fee, many of which probably were purchased by collectors.

[c] Estimates based upon response of hunters to questionnaires.

[d] Harvest estimates for gray and fox squirrels prior to 1981 are for both species combined.

[e] U.S. Fish and Wildlife Service harvest estimates for 1986 are:

Ducks	789,234	Other geese	0
Canada geese	68,808	American coot	27,375

Table 37. Mail survey results of nonresident small game hunters, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Nonresident licenses issued[a]	3,902	3,981	4,271	3,187	2,911	3,060	3,271	3,078
Questionnaires								
Number mailed	622	222	280	361	384	237	338	406
Number not delivered	74	85	21	21	25	13	25	42
Number (percent) returned	491 (89.6)	117 (85.4)	214 (82.6)	281 (82.6)	280 (78.0)[b]	192 (86.0)	246 (78.6)	290 (79.7)
Total nonresidents and percent (in parens) of all nonresidents hunting:								
Ducks	2,100 (54)	2,000 (50)	2,055 (48)	1,840 (58)	1,500 (52)	2,090 (68)	1,900 (58)	1,810 (64)
Canada goose	700 (18)	600 (15)	718 (17)	830 (26)	580 (20)	820 (27)	800 (24)	850 (30)
Ruffed grouse	1,500 (38)	2,000 (50)	1,656 (39)	960 (30)	620 (21)	1,000 (33)	1,090 (33)	1,000 (35)
Ring-necked pheasant	800 (21)	800 (20)	1,436 (34)	680 (21)	500 (17)	390 (13)	720 (22)	510 (18)
Racoon[c]	400 (10)	200 (5)	125 (3)	100 (3)	170 (6)	130 (4)	70 (2)	85 (3)
Total nonresident take:								
Ducks	20,000	17,000	19,000	15,000	17,500	24,000	14,400	14,600
Canada goose	1,000	1,000	2,000	1,500	1,300	1,300	1,400	1,400
Ruffed grouse	9,000	16,000	7,000	3,000	1,700	4,200	3,500	3,800
Ring-necked pheasant	2,000	2,000	5,000	1,500	2,200	1,500	1,900	1,100
Racoon	3,000	1,000	1,000	700	1,400	1,100	1,400	600

[a] Excludes duplicate licenses and nonresident shooting preserve licenses.

[b] Includes only those survey returns received by 25 April 1984.

[c] Nonresident raccoon hunters were required to purchase a nonresident raccoon hunting license for the first time in 1979 in addition to the nonresident small game license. The initial season bag limit of 8 was increased to 12 in 1983 and to 20 in 1985.

	Raccoon take per hunter		
	Resident	Nonresident	Number of nonresident raccoon licenses
1978	6	14	0
1979	6	6	404
1980	4	5	93
1981	7	7	121
1982	6	7	95
1983	8	8	102
1984	9	8	111
1985	9	20	108
1986	11	7	86

Table 38. Species composition of the Minnesota waterfowl harvest, 1985 and 1986 (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep., Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

Species	1985 Harvest	1985 Pct of harvest	1986 Harvest	1986 Pct of harvest	Percent change
Mallard	179,100	27.96	234,900	29.77	+31
Domestic mallard	1,200	0.18	0	0.00	-100
American black duck	1,900	0.30	600	0.07	-68
Black x mallard	200	0.03	0	0.00	-100
Gadwall	12,700	1.98	11,200	1.42	-12
American wigeon	19,300	3.02	30,800	3.91	+60
Green-winged teal	43,200	6.75	43,600	5.53	+1
Blue-winged/cinnamon teal	26,100	4.08	61,100	7.74	+134
Northern shoveler	5,200	0.81	8,000	1.02	+54
Northern pintail	8,400	1.31	4,500	0.57	-46
Wood duck	81,800	12.77	135,000	17.17	+66
Redhead	16,300	2.55	20,300	2.57	+24
Canvasback	10,000	1.54	0	0.00	-100
Greater scaup	6,000	0.93	2,600	0.33	-57
Lesser scaup	70,200	10.96	75,400	9.55	+7
Ring-necked duck	121,800	19.02	130,000	16.47	+7
Goldeneyes	5,800	0.90	5,400	0.69	-7
Bufflehead	22,700	3.54	14,700	1.87	-35
Ruddy duck	3,300	0.52	1,600	0.20	-52
Scoters	900	0.14	600	0.07	-33
Hooded merganser	3,700	0.57	8,400	1.06	+27
Other mergansers	800	0.13	0	0.00	-100
Other ducks	0	0.00	0	0.00	0
Total	640,600	99.99	789,200	100.00	-38

Table 39. Top 10 states in number of adult waterfowl hunters, 1986, and number of hunter-days and retrieved duck kill, in each (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep. Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

State	Number of adult waterfowl hunters	Number of hunter-days	Retrieved duck kill	Ducks retrieved per hunter-day
Minnesota	124,732	933,024	789,234	0.84
Louisiana	86,326	862,801	1,235,595	1.43
Wisconsin	79,925	605,721	362,068	0.60
California	71,425	678,789	965,092	1.42
Texas	61,536	447,432	491,983	1.10
Michigan	45,206	389,494	227,502	0.58
Pennsylvania	44,839	327,714	106,035	0.32
Illinois	44,780	440,233	279,467	0.63
New York	42,941	301,159	194,118	0.64
Washington	36,019	307,641	353,436	1.15
Mississippi Flyway	566,672	5,028,211	4,248,943	0.84
United States	1,321,866	11,066,713	9,373,926	0.85

Table 40. Turkey hunting summary, 1978-87.

Year	Area of open hunt zone (mi^2)	Number of permit applicants	Number of permits available	Odds of drawing a permit[a]	Number of permits given	Number of persons hunting[b]	Registered turkey harvest	% success[c]
1978	389	10,740	420	25.6:1	411	398	94	23.6
1979	673	11,116	840	13.2:1	827	794	116	14.6
1980	858	9,613	1,200	8.0:1	1,191	1,072	98	9.1
1981	1,242	8,398	1,500	5.6:1	1,556	1,292	113	8.7
1982	1,490	7,223	2,000	3.6:1	1,992	1,625	106	6.5
1983	1,807	8,153	2,100	3.9:1	2,079	1,663	116	7.0
1984	2,061	7,123	3,000	2.4:1	2,837	2,270	178	7.8
1985	2,118	5,662	2,750	2.1:1	2,449	1,959	323	16.5
1986	1,897	5,715	2,500	2.3:1	2,251	1,801	333	18.5
1987	1,747	6,361	2,700	2.4:1	2,520	2,016	520	25.8

[a] Calculated with total permits available to be given, and not adjusting for undersubscribed zones and time periods.

[b] For 1978-82, based on a post-hunt mail survey. Number actually hunting in 1983-87 was estimated at 80% (from last year the survey was run).

[c] Registered turkey harvest divided by number actually hunting, expressed as %.

Table 41. Deer hunting license sales, 1957-86*.

Year	Firearms License Sales			Archery Licenses			Grand Total
	Resident	Non-resident	Total	Resident	Non-resident	Total	
1957	180,028	488	180,516	10,033	119	10,152	190,668
1958	203,430	552	203,982	10,968	118	11,086	215,068
1959	200,102	530	200,632	11,768	101	11,869	212,501
1960	233,593	621	234,214	11,834	122	11,956	246,170
1961	250,031	632	250,663	13,229	141	13,370	264,033
1962	244,166	676	244,842	11,776	150	11,926	256,768
1963	257,333	771	258,104	11,724	165	11,889	269,993
1964	278,032	1,021	279,053	13,472	193	13,665	292,718
1965	289,918	1,128	291,046	15,628	265	15,893	306,939
1966	284,195	1,287	285,482	17,203	277	17,480	302,962
1967	305,717	1,311	307,028	18,405	289	18,694	325,722
1968	302,216	1,442	303,658	20,188	292	20,480	324,138
1969	253,891	1,168	255,059	15,658	256	15,914	270,973
1970	188,166	334	188,500	12,277	220	12,497	200,997
1971	no firearms season			17,360	111	17,471	17,471
1972	257,998	959	258,957	21,985	326	22,311	281,268
1973	294,349	1,342	295,691	29,169	545	29,714	325,405
1974	296,248	1,747	297,995	30,701	644	31,345	329,340
1975	327,596	1,921	329,517	31,836	804	32,640	362,157
1976	263,868	1,029	264,897	21,773	263	22,036	286,933
1977	287,271	1,430	288,701	29,404	402	29,806	318,507
1978	307,910	1,776	309,686	32,546	476	33,022	342,708
1979	312,754	1,910	314,664	35,657	447	36,104	350,768
1980	344,516	2,378	346,894	41,328	634	41.962	388,856
1981	369,425	2,973	372,398	50,063	906	50,969	423,367
1982	369,018	3,038	372,056	54,084	848	54,932	426,988
1983	391,099	3,611	394,710	55,822	478	56,300	451,010
1984	396,074	4,307	400,381	61,576	583	62,159	462,540
1985[a]	416,464	4,984	421,448	66,716	589	67,305	480,312
1986[a]	413,542	4,476	418,018	68,689	547	69,236	487,254

* Duplicate licenses not included. Leech Lake licenses are included during years they were issued.

[a] Numbers include the following bonus deer licenses:

	1985	1986
Resident firearms (regular quota areas)	8,418	1,192
Resident firearms (state parks)	-	271
Non-resident firearms (regular quota area)	23	3
Resident archery (state parks)	-	27
Resident archery (metro)	-	917
Totals	8,441	2,410

Table 42. Registered deer harvest and success rates, 1974-86.

	Registered harvest				Percent success	
	Regular firearms	Archery	Special Muzzleloader season	Total	Regular firearms and special muzzleloader seasons	Archery
1974	64,997	2,176	-	67,173	21.9	6.9
1975	63,604	2,265	-	65,869	19.3	6.9
1976	28,613	1,167	-	29,780	10.8	5.3
1977	45,918	2,609	32*	48,559	15.9	8.8
1978	47,372	2,608	346	50,326	15.4	7.9
1979	44,340	2,577	318	47,235	14.2	7.1
1980	68,539	3,641	294	72,474	19.8	8.7
1981	93,027	5,535	385	98,947	25.1	10.8
1982	93,045	5,566	441	99,052	25.1	10.1
1983	132,457	5,977	652	139,086	33.7	10.6
1984	132,042	6,390	532	138,964	33.1	10.3
1985	138,065	7,575	563	146,203	32.9	11.2
1986	129,770	7,610	593	137,973	31.2	11.0

* No special muzzleloader seasons were held before 1977.

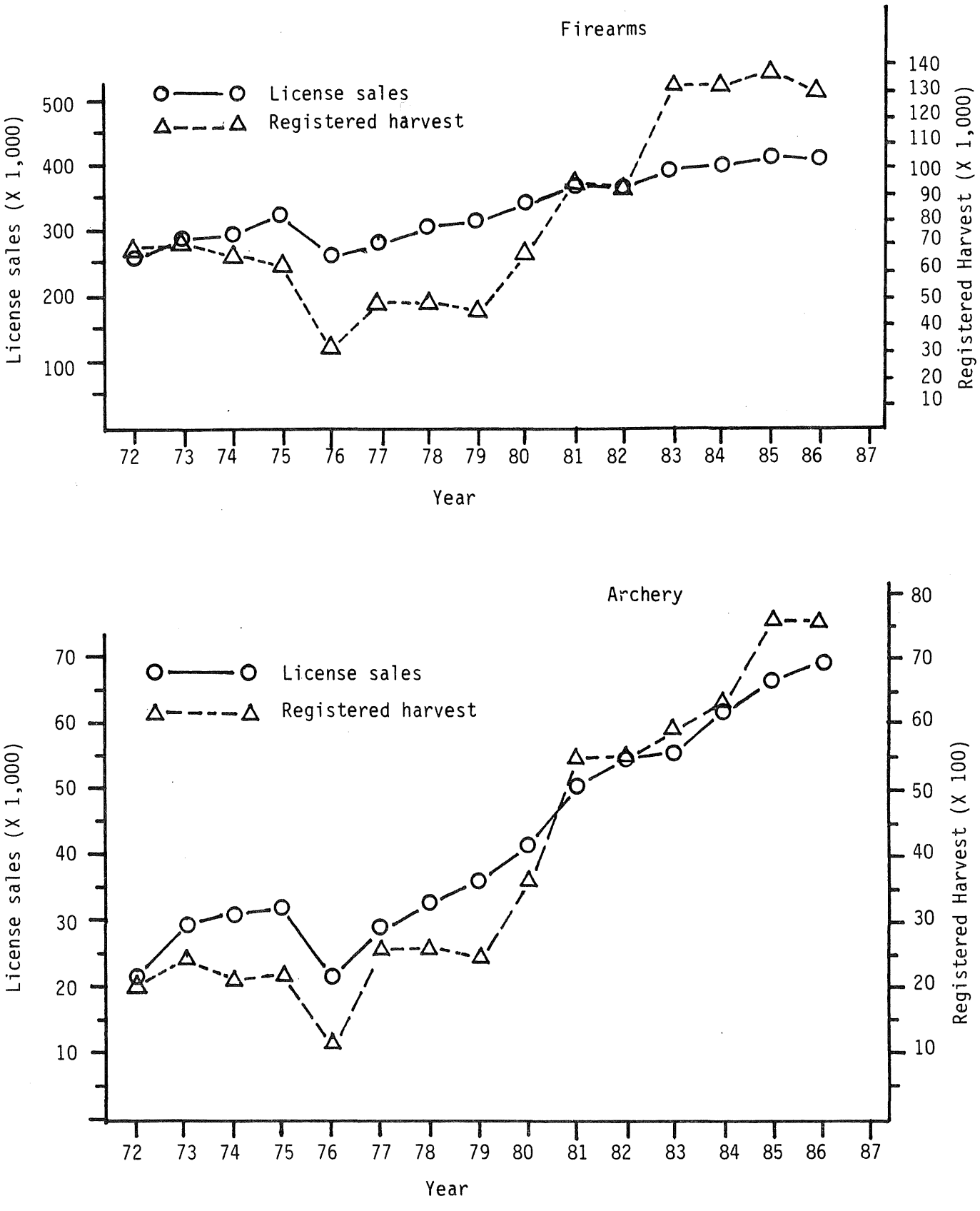

Figure 38. Resident and nonresident firearms (above) and archery (below) deer hunting license sales and registered harvest, 1972-86.

Table 43. Harvest and success rates by DMU and Sub-DMU, 1986.

Unit	Permits Issued[a]	Antlerless Registered	Permit Success[a]	Bucks Registered	Total Reg. Kill
Red River W	948	477	50.3%	381	858
Red River E	7,436	3,994	53.7%	2,053	6,047
Red River Total	8,384	4,471	53.3%	2,434	6,905
Agassiz Total	11,561	5,160	44.6%	3,161	8,321
Rainy River W	511	293	57.3%	1,006	1,299
Rainy River C	1,042	661	63.4%	1,032	1,693
Rainy River E	1,910	981	51.4%	1,205	2,186
Rainy River Total	3,463	1,935	55.9%	3,228	5,163
Superior W	3,052	1,280	41.9%	1,247	2,527
Superior C	853	481	56.4%	943	1,424
Superior E	0	7	-	558	561
Superior Wild.	0	4	-	46	50
Superior IR	0	0	-	4	4
Superior Total	3,905	1,772	45.4%	2,794	4,566
Itasca NW	3,477	2,099	60.4%	2,437	4,536
Itasca SW	3,233	2,041	63.1%	3,105	5,046
Itasca NE	3,413	1,631	47.8%	2,445	4,076
Itasca SE	5,567	2,594	46.6%	2,456	5,050
LLIR	1,098	479	43.6%	687	1,166
Bemidji	4,341	2,611	60.1%	2,849	5,460
Itasca Total	20,929	11,455	54.7%	13,979	25,434
Mille Lacs W	4,771	2,769	58.0%	2,324	5,093
Mille Lacs C	8,682	5,143	59.2%	3,422	8,565
Mille Lacs E	2,138	1,485	69.5%	3,722	5,207
WEIR	436	300	68.8%	658	958
Mille Lacs Total	16,027	9,697	60.3%	10,126	19,821
Big Woods N	21,152	10,606	50.1%	6,779	17,385
Big Woods C	7,540	3,198	42.4%	2,509	5,707
Big Woods Metro	3,382	1,251	37.0%	1,109	2,360
Big Woods SE	14,736	8,127	55.2%	5,771	13,898
Big Woods Total	46,810	23,182	49.5%	16,168	39,350
Prairie N	4,317	2,160	50.0%	1,823	3,983
Prairie River	4,969	2,667	53.7%	2,178	4,845
Prairie SW	6,007	3,900	69.9%	3,415	7,315
Prairie SE	3,849	1,816	47.2%	1,393	3,209
Prairie Total	19,142	10,543	55.1%	8,809	19,352
Unknown	-	575	-	283	858
Total	130,519	68,790	52.7%	60,980	129,770

[a] Bonus licenses not included.

Table 44. Archery deer harvest by county, 1977-86.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Aitkin	24	30	34	68	110	107	94	88	140	130
Anoka	31	45	74	105	169	147	156	168	258	247
Becker	19	14	10	33	46	52	65	63	67	62
Beltrami	50	35	29	63	97	130	109	108	126	101
Benton	3	1	6	7	18	28	29	25	35	36
Big Stone	32	9	10	25	38	38	42	56	49	39
Blue Earth	34	48	35	73	80	78	116	94	116	95
Brown	23	25	27	36	46	48	47	50	38	66
Carlton	8	6	6	24	30	31	20	30	45	22
Carver	12	6	9	24	30	34	49	50	65	53
Cass	5	17	30	48	108	131	118	147	141	151
Chippewa	108	76	71	114	138	78	92	90	92	82
Chisago	19	26	31	38	68	78	95	103	142	135
Clay	49	21	19	44	75	84	94	123	111	132
Clearwater	12	8	3	17	21	21	27	20	22	29
Cook	1	2	0	1	12	7	5	9	29	12
Cottonwood	93	79	60	71	87	73	99	54	90	75
Crow Wing	5	19	32	47	123	105	99	156	177	159
Dakota	13	13	21	20	46	51	64	99	124	167
Dodge	21	14	17	19	26	22	45	76	52	63
Douglas	34	40	31	32	64	53	77	68	86	79
Faribault	20	30	31	51	46	49	57	47	58	73
Fillmore	21	49	22	46	50	64	75	81	108	83
Freeborn	28	40	38	37	47	34	69	60	61	67
Goodhue	32	37	34	57	63	69	71	69	113	112
Grant	6	8	10	19	18	22	27	27	33	26
Hennepin	11	19	35	78	69	44	97	78	105	156
Houston	20	36	25	46	55	70	58	67	79	75
Hubbard	26	32	42	56	97	130	102	98	126	138
Isanti	20	25	32	46	83	83	82	83	97	102
Itasca	59	59	36	98	171	146	113	127	155	169
Jackson	34	28	34	26	47	44	46	42	59	54
Kanabec	4	13	7	11	35	66	51	49	76	61
Kandiyohi	26	57	41	41	95	96	111	116	108	141
Kittson	11	13	1	8	12	10	28	32	24	23
Koochiching	15	19	23	28	33	18	21	29	20	29
Lac Qui Parle	54	28	38	53	87	82	78	108	141	107
Lake	7	8	8	18	40	46	30	39	50	40
Lake of the Woods	11	6	9	12	13	13	14	22	24	22
LeSueur	12	9	13	27	38	31	39	52	37	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Lincoln	69	32	57	50	72	56	74	35	68	54
Lyon	57	57	36	84	94	74	110	72	104	104
McLeod	6	15	63	32	40	28	2	33	35	55
Mahnomen	3	0	1	5	4	7	5	6	9	8
Marshall	31	15	18	38	39	45	66	82	79	75
Martin	26	36	25	40	35	38	56	33	41	55
Meeker	29	25	37	43	44	43	37	54	59	61
Mille Lacs	12	10	8	21	40	57	35	63	51	40
Morrison[a]	4	18	19	30	66	158	127	108	114	66
Mower	43	35	27	46	55	42	80	64	113	121
Murray	63	48	49	81	130	83	61	39	90	71
Nicollet	28	28	40	61	80	67	65	52	64	88
Nobles	27	51	34	43	79	33	54	18	43	48
Norman	11	10	11	15	20	34	35	45	43	39
Olmsted	17	20	25	24	55	51	85	84	86	108
Ottertail	58	54	60	98	133	153	175	178	234	223
Pennington	3	1	3	9	12	18	15	19	12	19
Pine	36	45	73	123	166	171	134	166	229	186
Pipestone	7	21	34	32	40	30	67	1	42	53
Polk	24	24	32	42	50	78	70	102	98	102
Pope	32	24	31	49	49	64	57	56	63	70
Ramsey	0	3	0	1	2	1	0	21	14	33
Red Lake	5	0	4	2	1	3	4	13	8	6
Redwood	43	38	38	50	81	63	82	63	72	68
Renville	29	20	20	35	55	63	59	32	62	60
Rice	22	19	31	38	45	51	39	54	56	59
Rock	6	34	16	14	38	31	14	22	51	39
Roseau	35	22	32	62	77	90	112	98	94	86
St. Louis	66	77	42	87	180	149	120	127	180	209
Scott	22	15	41	44	50	37	50	72	87	136
Sherburne	24	47	60	89	128	116	113	115	131	128
Sibley	14	15	22	33	41	30	32	43	43	44
Stearns	58	52	49	81	134	143	122	159	241	239
Steele	16	20	7	14	19	27	29	30	41	41
Stevens	1	10	13	9	11	21	27	26	25	20
Swift	45	25	23	42	67	49	67	59	68	67
Todd	29	33	45	52	95	109	103	126	169	141
Traverse	16	9	7	12	21	13	21	32	22	19
Wabasha	28	19	20	15	18	30	61	57	50	61
Wadena	9	10	14	21	45	69	70	64	43	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Waseca	20	21	20	26	46	35	55	42	27	36
Washington	16	20	15	39	75	91	88	154	174	196
Watonwan	16	16	16	31	34	30	35	20	39	39
Wilkin	2	2	2	15	26	34	39	34	34	32
Winona	43	76	72	96	116	138	117	151	234	196
Wright	8	26	29	45	71	78	83	95	92	115
Yellow Medicine	49	32	34	35	47	38	54	47	47	44
Unknown	61	10	40	20	25	63	23	34	37	70
Camp Ripley	327	190	148	b	153	129	237	387	278	257
St. Croix St. Pk.	b	128	b	b	b	b	b	b	b	b
Totals	2,609	2,608	2,577	3,641	5,535	5,566	5,977	6,390	7,575	7,610

[a] Camp Ripley not included.

[b] No archery hunt.

Table 45. 1986 deer harvest in Special Muzzleloader Season Bonus licenses.

	Adult		Fawn		Total	
	Male	Female	Male	Female	#	%
Carlos Avery WMA	7	21	6	7	41	6.9%
Carlos Avery WMA[a] (Sanctuary)[a]	2	2	1	1	6	1.0%
Chengwatana SF	0	4	1	0	5	1.0%
Cloquet Valley SF	0	0	0	0	0	0.0%
Danvers WMA[a]	1	2	2	4	9	1.5%
Elm Lake & Eckvoll WMA	0	1	0	1	2	0.0%
George Washington SF	1	12	1	3	17	2.9%
Glacial Lakes SP[a]	0	11	2	1	14	2.4%
Gores Pool WMA	0	1	1	0	2	0.0%
Helmer Myre SP[a]	12	5	5	4	26	4.4%
Lac qui Parle WMA and Big Stone NWR[a]	12	65	37	32	146	24.6%
Lake Louise SP[a]	4	6	2	2	36	6.1%
Lake Shetek SP[a]	7	12	4	5	28	4.7%
McCarthy Lake WMA	0	2	0	0	2	0.0%
Meadowbrook WMA	0	1	0	0	1	0.0%
Mille Lacs WMA	1	4	3	5	13	2.2%
Nemadji SF	1	2	0	0	3	0.5%
Paul Bunyan Game Refuge	8	10	5	5	28	4.7%
Red Lake WMA and Beltrami Island SF	7	12	6	2	27	4.6%
R. J. Dorer Memorial SF	0	0	1	1	2	0.0%
Roseau River WMA	0	2	0	2	4	0.7%
Rum River SF	2	0	3	0	5	0.8%
Savanna SF	0	4	1	1	6	1.0%
Talcot Lake WMA[a]	1	5	7	6	19	3.2%
Thief Lake WMA	0	1	0	1	2	0.0%
Whitewater	24	54	33	32	143	24.1%
Walnut Lake WMA[a]	0	5	1	0	6	1.0%
Total	90	257	125	121	593	
Percent	15.2%	43.3%	21.1%	20.4%		

[a] Special Permit Areas - See Table 46.

Table 46. Special Muzzleloader Season Harvests, 1981-86.

	1981	1982	1983	1984	1985	1986
Carlos Avery WMA	53	31	57	22	23	41
Carlos Avery WMA (Sanctuary)	--	--	--	--	16	6
Chengwatana SF	--	--	1	1	4	5
Cloquet Valley SF	--	--	--	2	1	0
Danvers WMA	--	3	1	7	7	9
Elm Lake & Eckvoll WMA	--	4	--	0	--	2
Frontenac SP	--	--	--	--	3	--
George Washington SF	--	--	5	14	16	17
Glacial Lakes SP	--	9	--	--	--	14
Gores Pool WMA	--	--	5	5	1	2
Helmer Myre SP	--	--	--	--	18	26
Lac qui Parle WMA and Big Stone NWR	91	130	168	151	199	146
Lake Louise SP	--	--	--	--	--	36
Lake Shetek SP	19	36	35	30	25	28
McCarthy Lake WMA	1	0	1	0	0	2
Meadowbrook WMA	3	4	11	6	6	1
Mille Lacs WMA	54	25	5	14	13	13
Moose-Willow WMA	16	5	--	--	--	--
Nemadji SF	--	--	1	1	0	3
Nerstrand Woods SP/GR	--	--	--	--	13	--
Paul Bunyan Game Refuge	--	--	19	33	27	28
Red Lake WMA and Beltrami Island SF	14	14	29	11	21	27
R. J. Dorer Memorial SF	7	32	10	6	1	2
Roseau River WMA	4	1	3	5	3	4
Rum River SF	--	--	3	1	7	5
Savanna SF	--	--	2	2	6	6
Talcot Lake WMA	16	61	137	13	43	19
Thief Lake WMA	12	6	5	7	8	2
Whitewater WMA	90	80	150	139	97	143
Whitewater Sanctuary	--	--	--	45	--	--
Walnut Lake WMA	5	0	4	6	5	6
Totals	385	441	652	532	563	593

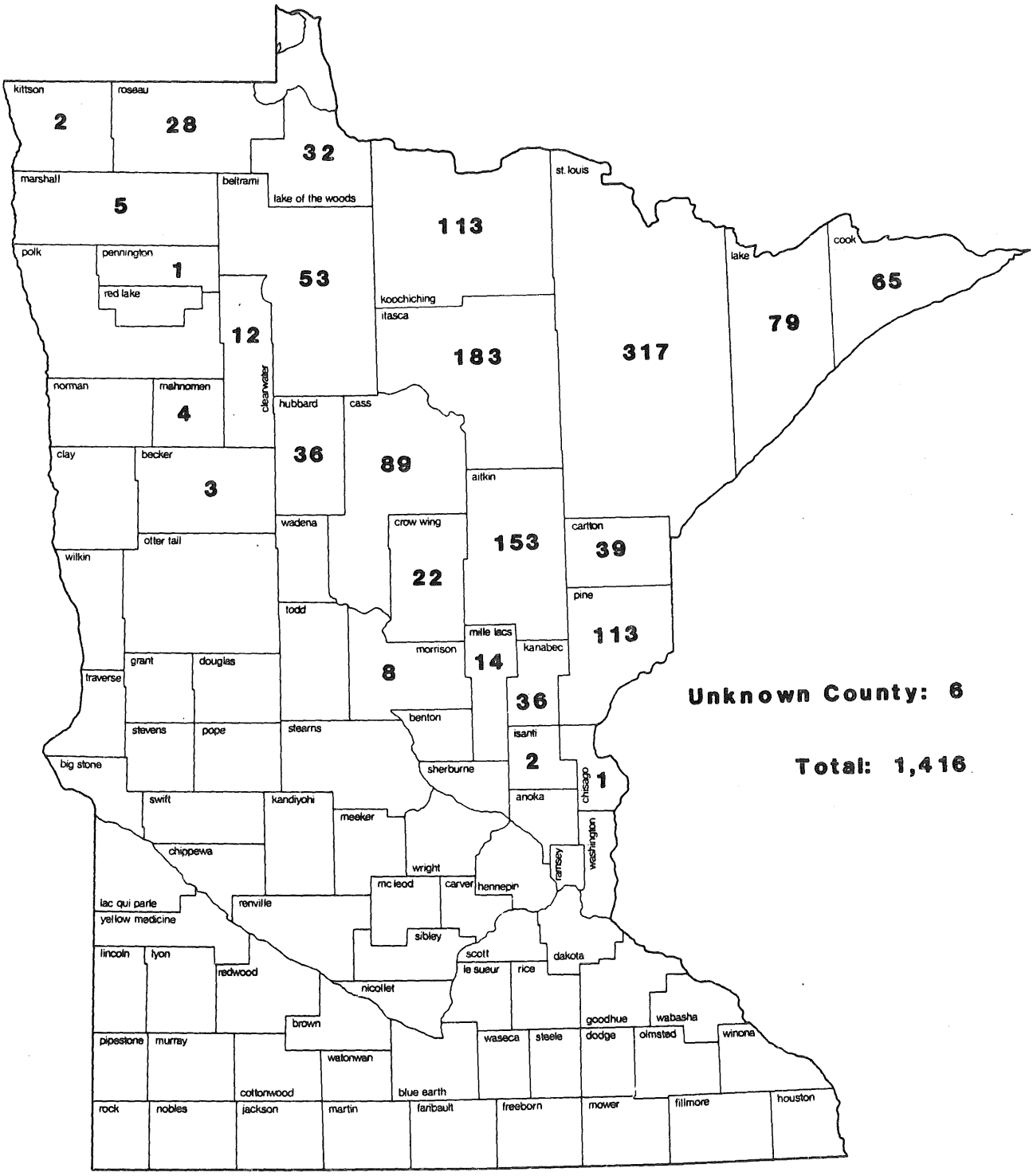

Figure 39. Black bear registered harvest by county, 1986 season.

Table 47. Registered bear harvest by county, 1976-1986.

County	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	Total
Aitkin	29	65	103	55	92	128	39	102	96	118	153	980
Becker	2	8	12	13	7	9	1	14	9	10	3	88
Beltrami	15	36	44	42	28	79	24	78	60	58	53	517
Carlton	8	12	14	7	17	18	3	9	19	34	39	180
Cass	28	56	51	57	69	110	29	93	73	114	89	769
Chisago	0	1	0	0	0	1	0	0	0	0	1	3
Clearwater	3	4	2	12	3	18	4	8	7	17	12	90
Cook	26	72	98	72	148	79	7	46	30	62	65	705
Crow Wing	6	7	9	12	9	33	8	26	21	36	22	189
Hubbard	5	8	23	16	15	19	11	25	45	41	36	243
Isanti	0	0	0	0	1	3	0	0	0	1	2	7
Itasca	80	134	158	108	212	172	50	121	128	170	183	1,516
Kanabec	10	20	28	10	12	18	8	19	19	18	36	198
Kittson	4	0	0	1	0	0	0	1	8	0	2	16
Koochiching	29	41	91	89	137	149	66	105	89	95	113	1,004
Lake	31	50	78	40	74	80	17	42	28	60	79	579
Lake of the Woods	2	8	16	12	30	43	25	32	41	29	32	270
Mahnomen	0	1	3	0	0	1	2	2	5	1	4	19
Marshall	0	1	0	1	2	3	1	9	17	12	5	51
Mille Lacs	1	10	7	5	5	12	3	11	11	28	14	107
Morrison	0	0	4	3	1	1	1	10	5	4	8	37
Norman	0	0	1	0	0	0	0	0	0	0	0	1
Pennington	0	0	0	0	0	1	0	3	2	1	1	8
Pine	21	36	58	31	62	73	20	55	52	98	113	619
Polk	0	0	0	0	1	0	0	0	0	1	0	2
Red Lake	0	0	0	0	3	2	0	0	0	0	0	5
Roseau	16	4	8	4	18	18	7	23	32	19	28	177
St. Louis	91	124	210	148	289	284	64	197	122	302	317	2,148
Wadena	0	0	1	0	0	1	0	0	0	0	0	2
Wilkin	0	0	0	1	0	0	0	0	0	0	0	1
Unknown	12	3	9	4	13	4	22	7	0	11	6	71
Total	419	701	1,028	743	1,247	1,359	392	1,038	919	1,340	1,416	10,602

Table 48. Estimates of registration compliance[a], and harvest estimates of Minnesota black bears corrected for compliance.

	1980	1981	1982	1983	1984	1985	1986
Compliance estimated from hunting success[b]	83%	75%	92%	95%	95%	92%	92%
Compliance calculated directly[c]	d	d	d	98%	99%	97%	99%
Registered harvest	1,247	1,359	392	1,038	919	1,340	1,416
Harvest estimate	1,502	1,812	426	1,055	932	1,376	1,436

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] $$\text{Compliance rate} = \frac{\text{Registered harvest}}{(\text{estimated hunting success}) \times (\text{number of hunters})} \times 100.$$

[c] $$\text{Compliance rate} = \frac{\text{Number of bears registered by survey respondents}}{\text{Number of bears taken by survey respondents}} \times 100.$$

[d] Direct comparisons not made.

Table 49. Percent hunting success of those Minnesota bear hunters that hunted.

Area/Group		1980	1981	1982	1983	1984	1985	1986
11		21	14	11	45	50	22	42
12	NW	11	20	14	34	48	34	24
13		19	27	30	29	30	46	35
21	NC	24	22	34	42	28	43	46
22	BWCAW	42	19	44	36	25	13	18
31	NE	23	16	33	44	20	52	46
40	WC	13	11	16	31	34	37	36
50	EC	13	16	27	29	30	38	40
All residents		17	16	23	34	31	39	39
All non-residents		33	24	48	53	39	55	58
All		18	17	24	35	31	40	40

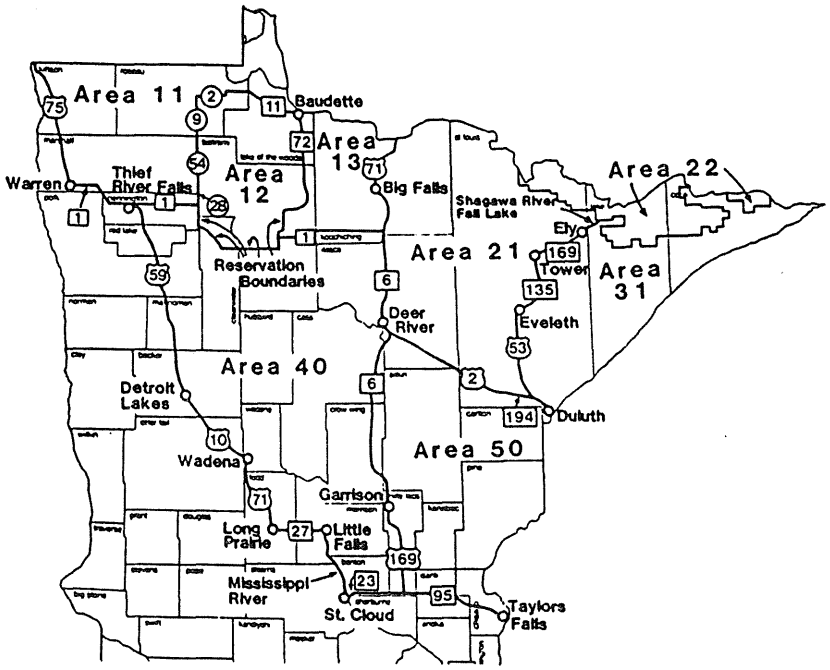

Figure 40. Boundaries of bear management units, 1986.

Table 50. Percent of Minnesota bear hunters using bows, baits, and guides, with the estimated number of hunters using guides shown parenthetically.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Bow	b	18	14	20	21	16	19
Bait	b	53	56	62	61	66	67
Guide	5	7	6	5	6	5	6
	(430)	(724)	(110)	(170)	(182)	(183)	(235)

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] Not recorded in this survey.

Table 51. Percent hunting success of Minnesota bear hunters by method of hunt.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Firearm		15	23	35	32	39	41
Bow only		22	18	33	27	44	31
Bait		21	25	37	33	42	42
No bait		11	21	31	26	35	33
Guide	49	18	32	45	52	41	47
No guide	17	16	23	34	30	39	39

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

Table 52. Moose hunt quota statistics 1971-87, and harvest data, 1971-85.

Year	Area	Number of 4-person licenses issued	Number of 4-person license applications	Chances for permit	Harvest	Party Success (%)	Sex of Moose M	Sex of Moose F
1971	NW	250	9,264	1:23	240	96.0	159 (66%)	81 (34%)
	NE	150			134	89.3	87 (65%)	47 (35%)
1973	NW	335	13,560	1:26	306	91.3	213 (76%)	91 (24%)
	NE	185			159	86.0	131 (83%)	24 (13%)
1975	NW	475	15,792	1:20	449	94.5	259 (58%)	188 (42%)
	NE	275			227	82.5	147 (65%)	80 (35%)
1977	NW	630	16,586	1:18	598	94.9	348 (58%)	250 (42%)
	NE	300			243	81.0	172 (71%)	71 (29%)
1979	NW	395	19,023	1:28	330	83.5	196 (59%)	134 (41%)
	NE	290			236	81.4	158 (67%)	78 (33%)
1981	NW	505	20,521	1:23	455	90.1	283 (62%)	172 (38%)
	NE	375			309	82.4	218 (71%)	91 (29%)
1983	NW	780	17,754	1:14	737	94.5	493 (67%)	244 (33%)
	NE	523			442	84.5	273 (62%)	169 (38%)
1985	NW	768	20,553	1:19	718	93.5	419 (58%)	299 (42%)
	NE	300			250	83.3	165 (66%)	85 (34%)
1987	NW	772	17,087	1:13	-	-	-	-
	NE	528			-	-	-	-

TRAPPING

HARVEST STATISTICS

Table 53. Trapper response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	1,011	29	888	90.4
1980-81	1,345	110	1,072	86.8
1981-82	1,345	36	1,167	89.2
1982-83	925	28	794	88.5
1983-84	770	10	663[a]	87.2[a]
1984-85	556	9	495	90.5
1985-86	581	13	506	89.1
1986-87	582	8	514	89.5

[a] Includes only those surveys returned by 25 April 1984.

Table 54. Use of trapper licenses, 1979-80 through 1986-87.

		Return from mail survey	Projections from license sales
1979-80			
	Trapped	760 (85.6%)	15,512
	Did not trap	128 (14.4%)	2,609
		888 (100.0%)	18,121
1980-81			
	Trapped	918 (85.6%)	20,548
	Did not trap	154 (14.4%)	3,457
		1,072 (100.0%)	24,005
1981-82			
	Trapped	972 (83.3%)	19,725
	Did not trap	195 (16.7%)	3,954
		1,167 (100.0%)	23,679
1982-83			
	Trapped	688 (86.6%)	17,526
	Did not trap	106 (13.4%)	2,700
		794 (100.0%)	20,226
1983-84			
	Trapped	549 (82.8%)	13,862
	Did not trap	114 (17.2%)	2,879
		663 (100.0%)	16,741
1984-85			
	Trapped	445 (89.9%)	15,136
	Did not trap	50 (10.1%)	1,700
		495 (100.0%)	16,836
1985-86			
	Trapped	420 (83.0%)	12,201
	Did not trap	86 (17.0%)	2,498
		506 (100.0%)	14,699
1986-87			
	Trapped	442 (86.0%)	13,240
	Did not trap	72 (14.0%)	2,155
		514 (100.0%)	15,395

Table 55. Estimated number of trappers and estimated take per trapper of various furbearers, 1979-80 through 1986-87.

	Estimated number of trappers (thousands)								Estimated take per trapper reporting that species							
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Muskrat	13	19	16	12	11	13	9	11	55.5	75.7	62.5	48.4	75.8	75.1	51.8	72.9
Mink	10	15	13	10	8	9	8	9	6.5	6.5	5.7	5.6	6.8	8.0	7.6	8.7
Ermine	2	2	1[a]	1	<1	1	<1	1	3.7	3.1	3.2	2.2	4.6	3.5	2.6	4.2
Long-tailed weasel	1	1	1	1	<1	1	<1	1	2.3	2.9	2.8	1.6	4.0	2.1	2.0	5.2
Raccoon	10	11	12	9	9	9	8	8	6.6	5.4	6.2	6.4	7.8	8.3	11.3	11.4
Striped skunk	6	8	7	5	4	5	4	4	7.6	7.0	8.1	6.4	8.5	9.4	10.3	10.2
Eastern spotted skunk (civet)	<1	<1	<1	<1	2	<1	<1	<1	2.0	7.1	1.6	6.7	2.5	1.4	2.5	2.5
Badger	2	2	2	1	1	1	1	1	1.6	1.6	1.8	1.7	2.1	1.6	2.1	1.7
Opossum	1	<1	<1	<1	<1	<1	1	1	2.0	1.7	2.1	1.8	3.1	2.8	8.7	13.8
Red fox	6	7	8	6	6	6	5	5	6.5	6.3	6.8	6.3	6.9	9.2	6.1	7.5
Gray fox	1	2	2	2	2	2	2	2	2.5	2.8	2.7	2.7	2.5	2.9	3.5	2.9
Coyote (brush wolf)	1	1	1	2	2	2	1	2	3.4	3.6	2.4	3.2	4.8	5.3	4.5	3.8
Beaver (fall)	4	6	4	2	4	5	4	6	12.4	9.2	7.5	4.4	7.3	10.0	9.8	11.5
Beaver (spring)	1	1	1	3	4	3	4	-	14.4	14.5	12.6	25.5	25.4	30.3	21.7	-

[a] 1 is any number which rounds to 1.
<1 is <0.5.

Table 56. Minnesota trapper license sales and estimated annual harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Trapper license sales[a]	18,121	24,005	23,679	20,196	16,741	16,836	14,699	15,395
Beaver license sales[b]	6,692	8,503	6,602	1,971	-	-	-	-
Estimated harvest[c] (thousands)								
Muskrat	707	1,419	989	570	865	963	477	826
Mink	66	96	76	57	58	75	57	77
Ermine	7	7	3	1[e]	2	3	1	3
Long-tailed weasel	3	3	4	1	1	1	1	3
Raccoon	65	61	72	60	69	78	89	95
Striped skunk	47	53	54	34	36	47	41	42
Eastern spotted skunk (civet)	<1	1	<1	1	<1	<1	<1	<1
Badger	3	3	3	2	2	2	2	2
Opossum	1	<1	1	<1	2	1	7	14
Red fox	39	42	53	41	42	58	29	40
Gray fox	4	5	5	5	5	5	6	6
Coyote (brush wolf)	5	4	3	5	9	10	7	7
Beaver (fall season)	22	16	10	76	101	103	92	-
Beaver (spring season)	54	51	30	24	30	51	43	71
Registered harvest								
Otter	1,186	1,111	485	385	408	529	559	777
Lynx[d]	42	16	17	28	9	closed	closed	closed
Bobcat[d]	291	210	260	274	208	280	119	160
Fisher	3,032	closed	862	912	631	1,289	678	1,067
Marten	closed	closed	closed	closed	closed	closed	430	798

[a] Separate licenses were issued for juveniles (13-17 years old) and adults (18 and older), beginning in 1982. Of 15,395 trapping licenses sold in 1986, 2,699 (17.5%) were juvenile licenses and 12,706 (82.5%) were adult licenses. Duplicate licenses excluded.

[b] Beginning in fall 1982, beaver could be trapped with only a general trapping license; the separate beaver trapping license was dropped.

[c] Based upon trappers' responses to mail surveys.

[d] Registered harvest for lynx and bobcat includes animals taken by hunting.

[e] 1 is any number which rounds to 1.
<1 is <0.5.

Table 57. Average price per pelt paid to hunters and trappers in Minnesota, 1975-76 through 1986-87.

Species	Average pelt prices paid hunters and trappers in Minnesota (dollars)											
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Muskrat	3.00	4.03	4.25	4.56	5.90	5.62	3.47	2.19	2.24	2.81	1.85	2.89
Mink[a] (male)	(13.00)	27.40	22.15	36.69	42.83	37.55	34.35	24.43	30.33	28.40	25.29	35.75
Mink[a] (female)		10.07	8.86	14.80	18.61	16.04	17.22	10.63	14.55	14.04	13.37	18.43
Ermine (S.T. Weasel)	0.75	0.41	0.44	0.47	0.56	0.64	0.59	0.56	0.56	0.77	0.98	0.98
L.T. Weasel	0.75	0.87	0.85	1.01	0.94	0.84	0.96	0.80	0.93	1.10	1.06	1.28
Raccoon	21.00	23.54	22.30	45.83	36.42	27.44	32.35	17.95	12.66	19.91	15.51	21.81
Striped Skunk	2.50	2.95	2.78	4.13	4.14	4.74	3.46	2.58	2.77	2.74	1.58	2.06
Eastern Spotted Skunk	2.50	5.02	5.42	7.37	3.48	6.06	2.58	1.75	N.A.	3.00	6.17	N.A.
Badger	18.00	18.66	21.07	39.55	24.02	18.39	18.14	9.04	10.96	9.18	6.45	5.43
Opossum	1.50	1.72	2.11	2.10	2.12	2.52	1.58	0.87	0.71	1.14	0.62	0.97
Red Fox	50.00	49.52	52.97	72.21	55.43	50.81	51.48	31.10	32.81	29.07	17.51	22.07
Gray Fox	19.00	24.75	25.51	45.44	42.51	37.87	26.74	23.48	22.95	21.58	15.00	22.60
Coyote	29.00	41.32	34.03	56.62	39.76	31.37	41.28	25.41	18.79	19.06	18.19	22.03
Lynx	162.00	183.00	137.86	269.44	199.19	94.91	180.33	94.17	125.00	-	-	-
Bobcat	80.00	78.77	73.98	163.76	117.74	78.55	73.35	66.40	61.40	75.81	70.00	120.15
Beaver[a] (fall-winter)	12.25	15.79	13.45	17.64	32.74	17.88	14.48	10.69	9.52	12.51	15.03	20.32
Beaver (spring)	15.79	13.45	17.64	28.71	19.58	16.52	12.55	11.60	12.24	16.11	17.90	-
Otter	32.50	36.99	41.23	58.85	63.37	32.78	29.80	25.65	24.79	21.56	20.81	24.15
Fisher[a] (male)	No Open Season (71.23)			131.89	107.67	89.51	94.42	69.91	70.59	70.26	73.55	84.32
Fisher[a] (female)				147.23	127.79	104.29	110.08	99.08	121.08	121.76	130.47	162.29
Marten (male)	No Open Season										30.29	35.68
Marten (female)											27.61	26.58

[a] Differences in pelt prices were not calculated before 1975 for mink, 1979 for beaver, and 1978 for fisher.

FURBEARER REGISTRATION STATISTICS

Table 58. Total registered fur harvests and tag requests, 1984-85 through 1986-87.

Species	1984-85		1985-86		1986-87	
	Permits[a]	Harvest	Permits	Harvest	Permits	Harvest
Bobcat	--	280	--	119	--	160
Fisher	--	1,289	--	678	3,302	1,067
Otter	--	529	--	559	3,198	777
Pine Marten	--	closed	746	430	2,171	798

[a] Prior request possession tags and permits were required beginning in 1985 for marten and in 1986 for fisher and otter.

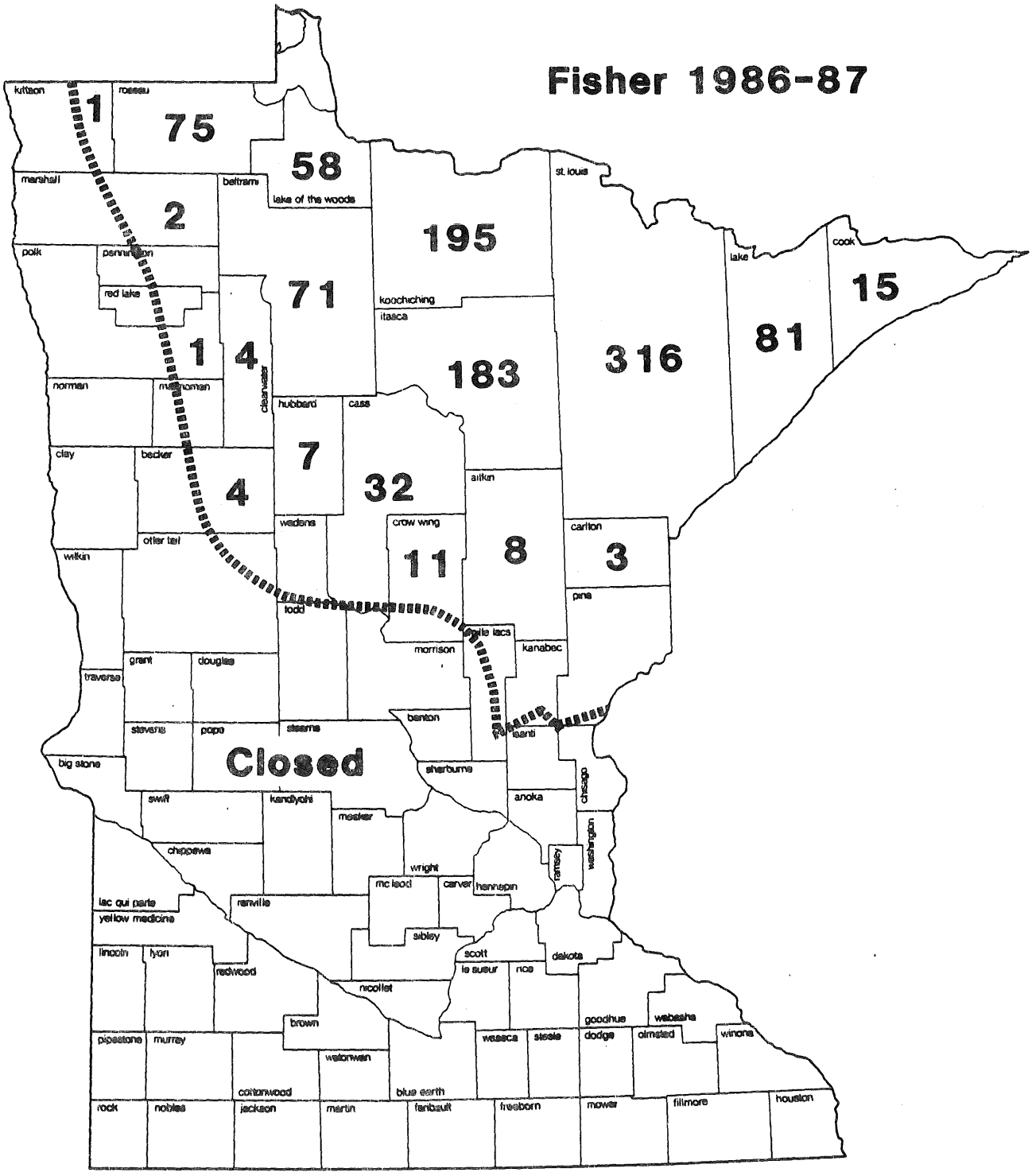

Figure 41. Fisher harvest by county, 1986-87.

Table 59. Fisher harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known total	Cumulative percent
	Male	Female	Unknown			
11/29	2	1	0	3	0.3	0.3
11/30	15	25	0	40	3.8	4.1
12/01	37	36	0	73	6.9	11.0
12/02	22	40	0	62	5.9	16.9
12/03	25	59	1	85	8.1	25.0
12/04	37	37	0	74	7.0	32.0
12/05	30	33	0	63	6.0	38.0
12/06	44	61	0	105	10.0	48.0
12/07	57	64	0	121	11.5	59.5
12/08	40	33	0	73	6.9	66.4
12/09	30	23	0	53	5.0	71.4
12/10	27	43	0	70	6.6	78.0
12/11	32	19	0	51	4.9	82.9
12/12	18	18	0	36	3.4	86.3
12/13	47	34	0	81	7.7	94.0
12/14	27	36	0	63	6.0	100.0
Unknown	2	7	6	15	-	-
Total	492	569	7	1,068	100.0	100.0

Table 60. Fisher harvest by county and sex, 1986 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	4	4	0	8
Becker	4	0	0	4
Beltrami	33	38	0	71
Carlton	3	0	0	3
Cass	24	8	0	32
Clearwater	2	2	0	4
Cook	4	11	0	15
Crow Wing	5	6	0	11
Hubbard	4	3	0	7
Itasca	93	89	1	183
Kittson	1	0	0	1
Koochiching	94	101	0	195
Lake	28	52	1	81
Lake of the Woods	24	34	0	58
Marshall	2	0	0	2
Norman	0	1	0	1
Polk	1	0	0	1
Roseau	30	45	0	75
St. Louis	139	177	0	316
Total	495	571	2	1,068

Table 61. Comparison of fisher harvest by county, 1982-86.

County	1982	1983	1984	1985	1986
Aitkin	15	5	10	8	8
Becker	2	4	3	1	4
Beltrami	41	25	96	27	71
Carlton	4	4	3	0	3
Cass	6	3	19	17	32
Clearwater	1	3	6	4	4
Cook	21	18	16	9	15
Crow Wing	6	2	11	6	11
Hubbard	0	0	7	1	7
Itasca	139	72	228	84	183
Kittson	0	6	2	1	1
Koochiching	182	123	255	157	195
Lake	115	37	80	49	81
Lake of the Woods	52	32	85	46	58
Marshall	6	13	10	5	2
Norman	0	0	0	0	1
Pine	0	1	1	0	0
Polk	0	0	0	0	1
Roseau	36	86	111	68	75
St. Louis	286	197	345	195	316
Unknown	0	0	1	0	0
Total	912	631	1,289	678	1,068

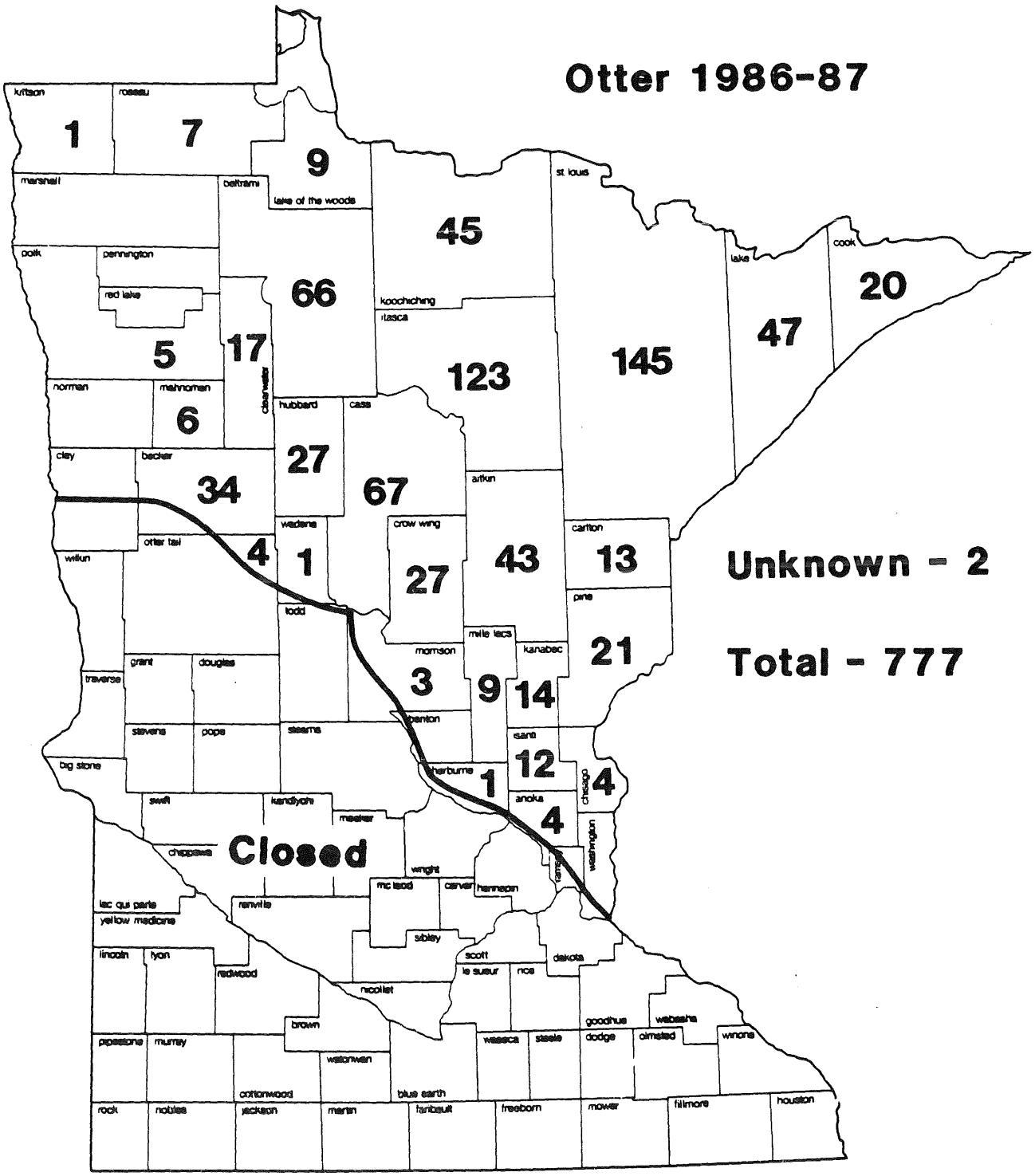

Figure 42. Otter harvest by county, 1986-87.

Table 62. Comparison of otter harvest by county, 1982-86.

County	11/13-11/27 1982	11/12-11/26 1983	11/17-12/01 1984	11/16-12/15 1985	11/01-11/30 1986
Aitkin	20	25	34	17	43
Anoka	0	0	0	0	4
Becker	8	15	18	24	34
Beltrami	39	23	33	46	66
Carlton	4	5	13	10	13
Cass	36	33	49	59	67
Chisago	0	0	0	0	4
Clearwater	9	6	11	6	17
Cook	17	4	16	5	20
Crow Wing	15	13	15	26	27
Hubbard	21	15	22	25	27
Isanti	0	0	0	0	12
Itasca	56	69	94	96	123
Kanabec	4	9	9	4	14
Kittson	0	0	0	0	1
Koochiching	23	26	34	38	45
Lake	15	20	18	25	47
Lake of the Woods	9	11	13	5	9
Mahnomen	2	2	3	14	6
Marshall	0	2	0	1	0
Mille Lacs	2	7	7	4	9
Morrison	0	0	0	0	3
Ottertail	1	1	1	1	4
Pennington	0	0	0	1	0
Pine	21	14	29	20	21
Polk	3	4	5	6	5
Red Lake	3	0	0	0	0
Roseau	3	3	5	5	7
St. Louis	69	96	96	119	145
Sherburne	0	0	0	0	1
Wadena	4	4	2	2	1
Unknown	1	1	2	0	2
Total	385	408	529	559	777

Table 63. Otter harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known Total	Cumulative percent
	Male	Female	Unknown			
11/01	3	6	0	9	1.2	1.2
11/02	19	15	0	34	4.4	5.6
11/03	39	18	0	57	7.5	13.1
11/04	24	20	0	44	5.7	18.8
11/05	20	20	0	40	5.2	24.0
11/06	21	13	1	35	4.6	28.6
11/07	30	17	0	47	6.1	34.7
11/08	16	18	0	34	4.5	39.2
11/09	17	10	0	27	3.5	42.7
11/10	25	13	0	38	5.0	47.7
11/11	10	7	0	17	2.2	49.9
11/12	15	7	0	22	2.9	52.8
11/13	2	11	0	13	1.7	54.5
11/14	8	15	0	23	3.0	57.5
11/15	28	26	0	54	7.1	64.6
11/16	15	14	0	29	3.8	68.4
11/17	11	6	0	17	2.2	70.6
11/18	10	6	0	16	2.1	72.7
11/19	4	5	0	9	1.2	73.9
11/20	21	15	1	37	4.8	78.7
11/21	6	6	0	12	1.6	80.3
11/22	11	9	0	20	2.6	82.9
11/23	4	8	0	12	1.6	84.5
11/24	15	1	0	16	2.1	86.6
11/25	10	2	0	12	1.6	88.2
11/26	15	8	0	23	3.0	91.2
11/27	6	9	0	15	2.0	93.2
11/28	11	7	0	18	2.4	95.6
11/29	7	6	0	13	1.7	97.3
11/30	11	10	0	21	2.7	100.0
Unknown	0	1	12	13	--	--
Total	434	329	14	777	100.0	100.0

Table 64. Otter harvest by county and sex, 1986-87 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	25	17	1	43
Anoka	3	1	0	4
Becker	22	12	0	34
Beltrami	37	29	0	66
Carlton	8	5	0	13
Cass	41	26	0	67
Chisago	2	2	0	4
Clearwater	11	6	0	17
Cook	8	12	0	20
Crow Wing	20	7	0	27
Hubbard	15	12	0	27
Isanti	6	6	0	12
Itasca	68	55	0	123
Kanabec	9	5	0	14
Kittson	1	0	0	1
Koochiching	25	20	0	45
Lake	26	21	0	47
Lake of the Woods	3	6	0	9
Mahnomen	3	3	0	6
Mille Lacs	7	2	0	9
Morrison	3	0	0	3
Ottertail	1	1	2	4
Pine	12	9	0	21
Polk	2	3	0	5
Roseau	4	3	0	7
St. Louis	77	67	1	145
Sherburne	0	1	0	1
Wadena	0	1	0	1
Unknown	0	0	2	2
Total	439	332	6	777

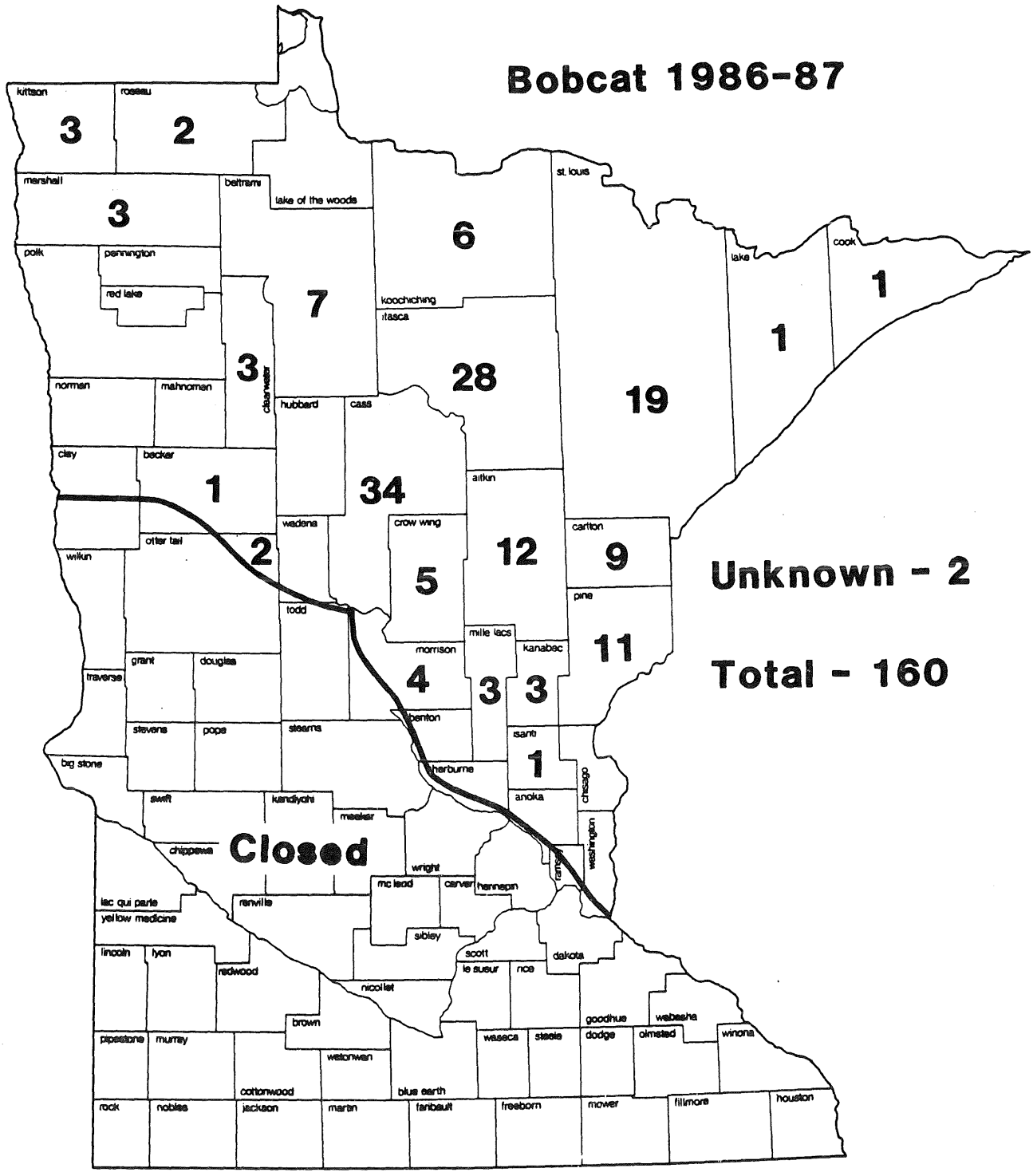

Figure 43. Bobcat harvest by county, 1986-87.

Table 65. Distribution of bobcat harvest among takers, 1979–80 through 1986–87.

Number Taken	Number of Takers																	
	1979–80		1980–81		1981–82		1982–83		1983–84		1984–85		1985–86		1986–87		Total (79–87)	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
1	88	(61.1)	51	(55.4)	123	(71.1)	111	(65.3)	108	(72.0)	116	(65.2)	70	(78.7)	92	(76.7)	759	(68.0)
2	34	(23.6)	21	(22.8)	29	(16.8)	30	(17.6)	32	(21.3)	39	(21.9)	11	(12.4)	18	(15.0)	214	(19.2)
3	9	(6.2)	6	(6.5)	10	(5.8)	16	(9.4)	6	(4.0)	13	(7.3)	6	(6.7)	9	(7.5)	75	(6.7)
4	4	(2.8)	4	(4.3)	5	(2.9)	10	(5.9)	4	(2.7)	9	(5.1)	I	(1.1)	0	(0.0)	37	(3.3)
5	9	(6.3)	10	(10.9)	6	(3.5)	3	(1.8)	0	(0.0)	1	(0.5)	1	(1.1)	1	(0.8)	31	(2.8)
Total	144		92		173		170		150		178		89		120		1,116	

Table 66. Time distribution of bobcat harvest by 5-day increments, 1986-87 season.

Interval	Sex			Total	% of Total	Cumulative Percent
	M	F	U			
Nov. 29-Dec 3.	3	6	0	9	5.9	5.9
Dec. 4-8	11	16	0	27	17.8	23.7
Dec. 9-13	10	18	0	28	18.4	42.1
Dec. 14-18	13	15	0	28	18.4	60.5
Dec. 19-23	5	9	0	14	9.2	69.7
Dec. 24-28	8	13	0	21	13.8	83.5
Dec. 29-Jan. 2	9	9	0	18	11.9	95.4
Jan. 3[a]	3	4	0	7	4.6	100.0
Unknown	0	2	6	8		
Total	62	92	6	160	100.0	100.0

[a] 1-day interval

Table 67. Comparison of bobcat harvest by county, 1982-83 through 1986-87.

County	1982-83	1983-84	1984-85	1985-86	1986-87
Aitkin	28	20	25	14	12
Becker	6	8	9	1	1
Beltrami	18	17	24	5	7
Carlton	15	4	20	6	9
Cass	30	13	42	20	34
Chisago	1	0	0	1	0
Clearwater	1	1	0	0	3
Cook	2	0	1	0	1
Crow Wing	4	4	5	6	5
Hubbard	4	1	1	0	0
Isanti	0	0	0	0	1
Itasca	46	36	50	15	28
Kanabec	2	2	6	2	3
Kittson	5	3	0	0	3
Koochiching	3	12	8	8	6
Lake	8	3	1	1	1
Lake of the Woods	3	1	1	1	0
Marshall	2	3	1	1	3
Mille Lacs	0	6	0	4	3
Morrison	5	7	5	4	4
Ottertail	2	1	1	3	2
Pine	20	24	20	14	11
Polk	0	0	1	0	0
Red Lake	0	0	0	1	0
Renville	0	0	1	0	0
Roseau	9	9	14	2	2
St. Louis	59	32	43	8	19
Wadena	0	1	1	2	0
Unknown	1	0	1	0	2
Total	274	208	280	119	160

Table 68. Bobcat harvest by method of take, 1979-1986.

Year	Total Harvest	Trapping				Hunting			
		Harvest	(% of Total)	Takers	Ave. Take	Harvest	(% of Total)	Takers	Ave. Take
1979	291	253	(86.9)	--	--	38	(13.1)	--	--
1980	210	177	(84.3)	68	2.6	33	(15.7)	24	1.4
1981	260	219	(84.2)	143	1.5	41	(15.8)	30	1.4
1982	274	239	(87.2)	147	1.6	35	(12.8)	23	1.5
1983	208	168	(80.8)	118	1.4	40	(19.2)	32	1.3
1984	280	252	(90.0)	156	1.6	28	(10.0)	22	1.3
1985	119	83	(69.7)	62	1.3	36	(30.3)	27	1.3
1986	160	119	(74.4)	89	1.3	41	(25.6)	31	1.3

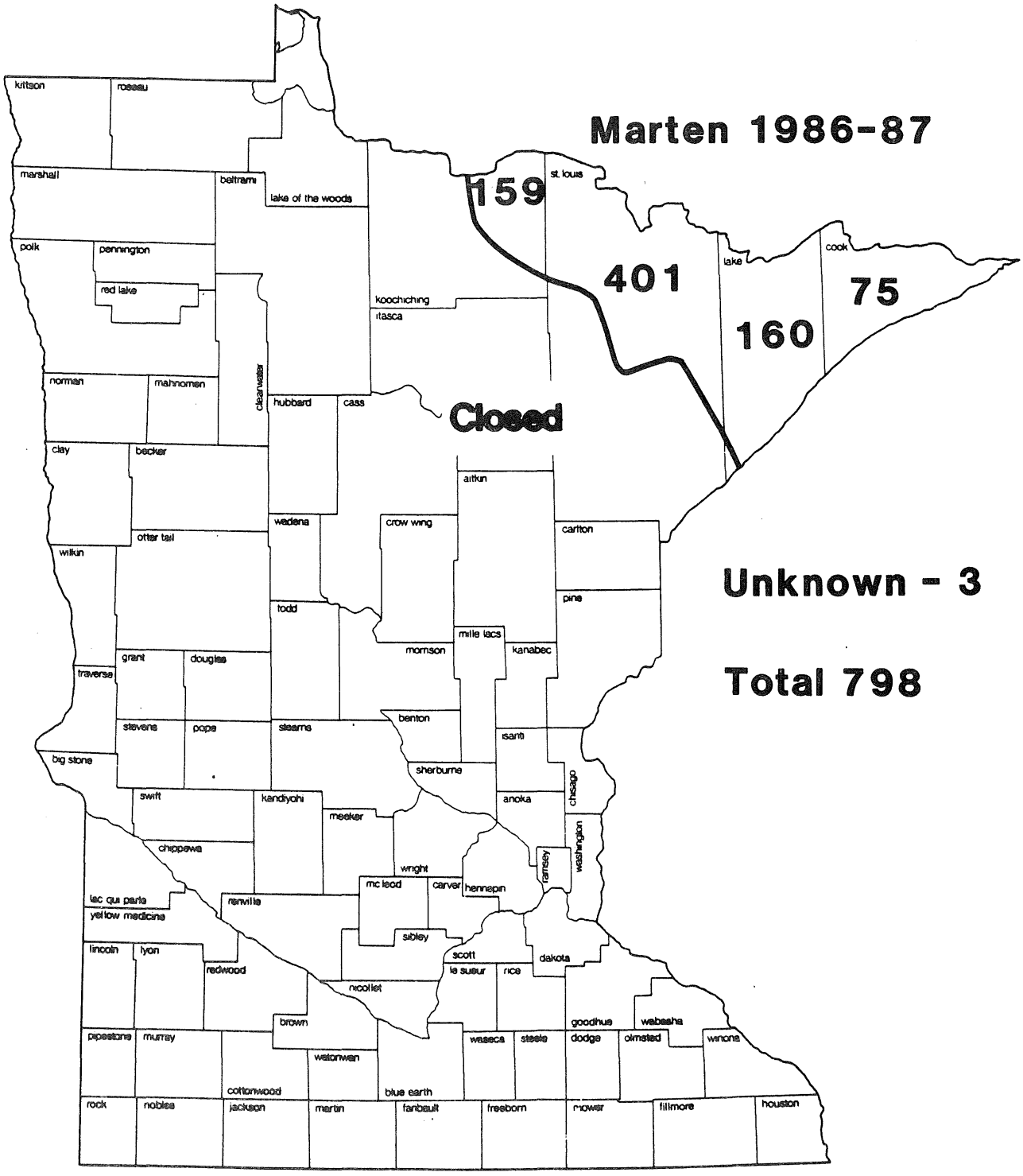

Figure 44. Marten harvest by county, 1986-87.

Table 69. Marten harvest by county and sex, 1986-87.

County	Sex			Total
	Male	Female	Unknown	
Cook	61	14	0	75
Koochiching	109	50	0	159
Lake	121	38	1	160
St. Louis	265	133	0	401
Unknown	1	2	0	3
Total	557	237	4	798

Table 70. Comparison of marten harvest by county, 1985-86.

County	1985	1986
Cook	51	75
Koochiching	72	159
Lake	119	160
St. Louis	188	401
Unknown	0	3
Total	430	798

Table 71. Marten harvest by date and sex, 1986-87.

Date	Male	Female	Unknown	Total	% of Total	Cumulative Percent
11/29	1	1	0	2	0.5	0.5
11/30	47	25	0	72	9.1	9.6
12/01	43	13	0	56	7.1	16.7
12/02	28	6	1	35	4.4	21.1
12/03	55	25	1	81	10.2	31.3
12/04	31	14	0	45	5.7	37.0
12/05	34	20	0	54	6.8	43.8
12/06	61	24	0	85	10.7	54.5
12/07	60	31	2	93	11.7	66.2
12/08	38	17	0	55	6.9	73.1
12/09	31	7	0	38	4.8	77.9
12/10	40	15	0	55	7.0	84.9
12/11	23	9	0	32	4.1	89.0
12/12	21	10	0	31	3.9	92.9
12/13	24	14	0	38	4.8	97.7
12/14	14	4	0	18	2.3	100.0
Unknown	4	2	0	6	--	--
Total	557	237	4	798	100.0	100.0

Status of Wildlife Populations, Fall 1987 and 1979-1986 Hunting and Trapping Harvest Statistics

compiled by

Blair Joselyn and Roger Lake

Section of Wildlife
Minnesota Department of Natural Resources
St. Paul, Minnesota

This report should be cited as follows:

Joselyn, B. and R. Lake, compilers. 1987. Status of wildlife populations, fall 1987 and 1979-1986 hunting and trapping harvest statistics. Unpub. Rep., Section of Wildlife, Minn. Dept. Nat. Res., St. Paul,

Note: Data in this report may change as a result of future more comprehensive analysis and verification being undertaken.

Status of Wildlife Populations, Fall 1987

and

1979-1986 Hunting and Trapping Harvest Statistics

Since this booklet was first published by the Wildlife Populations and Research Unit in 1977, the amount of material presented has increased considerably. That first edition 11 years ago was 29 pages in length (compared to 118 pages this year) and contained relatively limited information on only a few of the primary game species. Over the years we have covered more species and significantly expanded the amount of data presented on other species (e.g., deer and bear). Not only is the publication now a repository for annual population and harvest data on approximately 60 animals, but it has also become an archives of long-term population trend information for some species such as the 33 years of August roadside count data on pheasants, gray partridge, cottontail and jack rabbits and mourning doves.

For farmland and forest wildlife, most of the field work associated with collection of census and survey data is carried out by wildlife managers (conservation officers also participate in pheasant counts). The Farmland and Forest Wildlife Population and Research groups coordinate these activities, analyze and interpret data, and prepare recommendations for season setting meetings. For wetland species, much of the census and survey work is done by personnel in the Wetland Wildlife Populations and Research Group. Harvest statistics are calculated primarily by personnel in the St. Paul Office.

Blair Joselyn
9 October 1987

Index

FARMLAND WILDLIFE POPULATIONS

AND CENSUSES

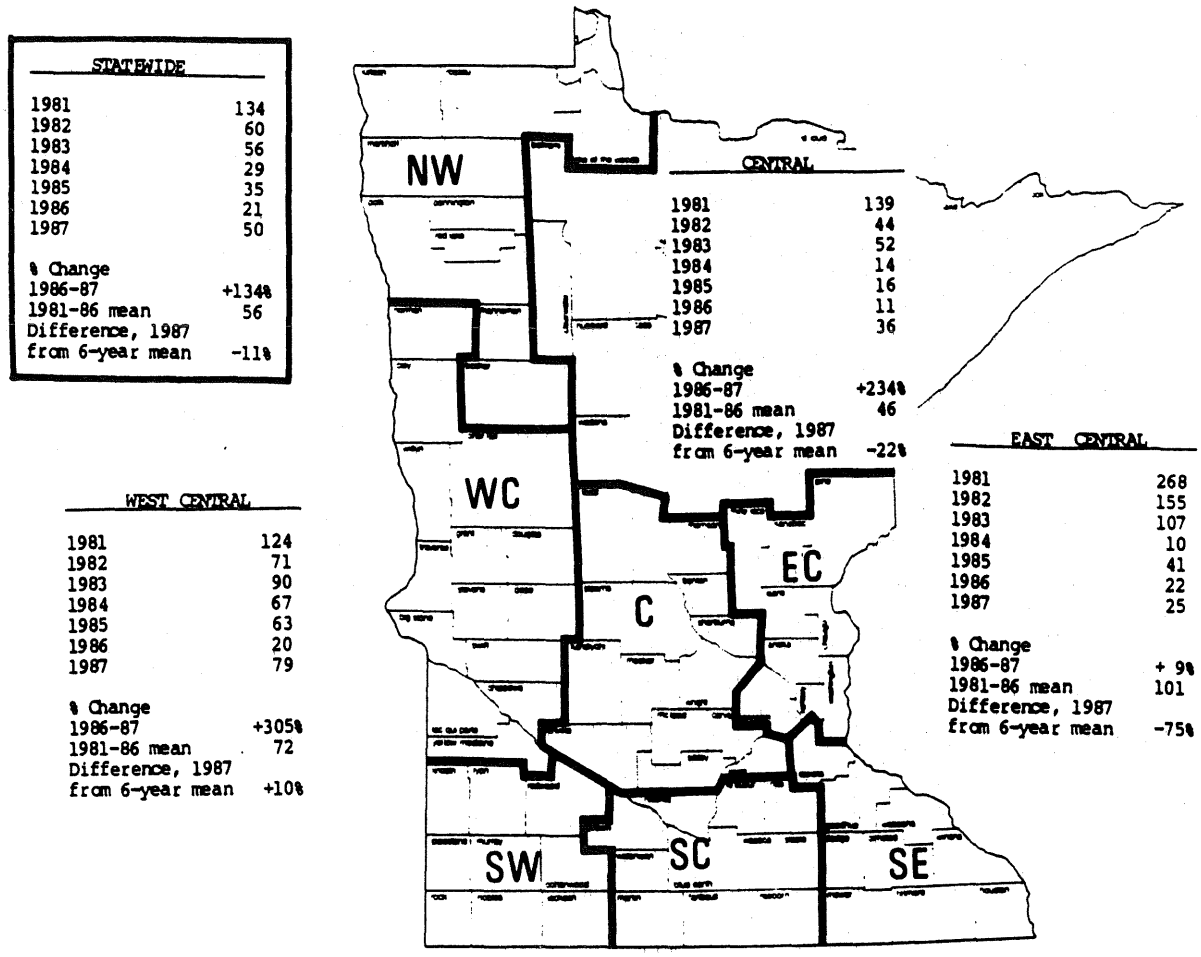

Figure 1. August roadside survey regional boundaries and pheasants observed per 100 miles of route, 1981-87, and percent change 1986-87 for miles censused both years.

Table 1. County, regional, and statewide August ring-necked pheasant survey results, 1982-87.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
West Central	925	70.8	89.7	66.5	62.9	19.6	79.4	61.9	305%
Big Stone	75	187	340	257	283	21	339		
Chippewa	50	54	52	60	38	26	116		
Clay	75	19	43	25	1	0	0		
Douglas	50	126	32	16	2	2	14		
Grant	50	46	0	30	12	10	2		
Lac qui Parle	75	204	212	137	40	24	107		
Norman	50	0	0	0	0	0	0		
Ottertail	50	100	56	124	106	52	140		
Pope	75	107	148	63	97	40	67		
Stevens	75	73	188	84	61	33	113		
Swift	75	21	59	39	111	17	63		
Traverse	75	3	7	57	36	23	69		
Wilkin	75	29	3	3	3	1	0		
Yellow Medicine	75	13	15	1	39	21	40		
Central	700	43.7	51.5	13.6	16.3	10.7	36.4	27.2	234%
Benton	50	74	82	10	60	8	104		
Carver	50	22	22	18	4	0	26		
Kandiyohi	75	40	83	9	25	3	8		
McLeod	50	--	28	0	16	14	--		
Meeker	75	83	19	28	8	5	21		
Morrison	50	44	12	0	0	22	8		
Renville	50	0	2	0	0	0	0		
Scott	50	120	168	6	38	14	72		
Sherburne	50	20	24	0	0	0	48		
Sibley	75	27	44	17	20	19	44		
Stearns	100	26	44	20	19	3	11		
Todd	50	62	110	30	0	44	26		
Wright	50	54	40	18	16	18	100		
East Central	425	155.1	107.3	10.1	41.3	22.4	24.5	67.2	9%
Anoka	50	28	4	2	32	0	4		
Chisago	75	280	265	20	72	25	43		
Hennepin	25	16	60	0	--	0	4		
Isanti	75	171	139	12	27	23	9		
Kanabec	50	142	128	10	32	38	26		
Mille Lacs	50	202	60	26	52	70	42		
Pine	50	122	58	0	66	6	30		
Washington	50	140	26	0	0	4	26		

Table 1. Continued.

Region and County	Miles surveyed 1987	Pheasants observed per 100 miles							Percent[a] change 1986-87
		1982	1983	1984	1985	1986	1987	1982-86 mean	
Southwest	475	26.1	10.1	8.4	14.3	19.8	60.2	15.7	204%
Cottonwood	50	32	2	10	46	0	48		
Jackson	50	68	24	10	18	10	16		
Lincoln	50	2	4	0	4	4	76		
Lyon	50	50	0	0	0	16	22		
Murray	50	60	54	0	6	26	98		
Nobles	75	5	1	0	15	29	41		
Pipestone	50	2	6	28	18	20	46		
Redwood	50	2	0	28	6	16	6		
Rock	50	24	4	4	16	52	198		
South Central	775	49.1	24.9	25.8	29.6	23.5	41.7	30.6	82%
Blue Earth	75	5	29	7	8	1	29		
Brown	75	55	7	33	24	28	24		
Fairbault	75	35	24	8	24	12	49		
Freeborn	75	24	0	25	51	35	72		
LeSueur	75	115	65	40	80	24	83		
Martin	50	104	21	65	15	50	74		
Nicollet	75	39	11	1	12	0	43		
Rice	75	57	25	1	0	16	12		
Steele	50	50	24	98	2	2	68		
Waseca	75	0	32	4	23	81	3		
Watonwan	75	24	35	17	59	11	21		
Southeast	500	28.9	51.4	20.6	31.6	37.4	39.0	34.0	4%
Dakota	50	92	98	4	--	62	4		
Dodge	50	40	96	20	56	12	66		
Fillmore	50	26	24	38	2	32	14		
Goodhue	50	0	4	0	2	0	4		
Houston	50	6	4	0	0	2	14		
Mower	75	55	55	45	64	72	71		
Olmsted	75	53	109	29	49	60	41		
Wabasha	50	4	16	0	16	54	6		
Winona	50	6	0	32	38	14	114		
Statewide	3,800	60.2	56.2	28.7	34.6	21.2	49.9	40.2	134%

[a] Percent change 1986-87 for miles surveyed both years only.

Table 2. Statewide pheasant population parameters calculated from August survey results, 1982-87.

Population Parameter	1982	1983	1984	1985	1986	1987	1982-86 mean	Percent[a] change 1986-87
Cocks/100 miles driven	4.5	5.2	2.5	3.2	2.6	3.6	3.6	+ 38%
Hens/100 miles driven	8.2	7.1	3.6	4.5	2.5	4.9	5.2	+ 96%
Broods/100 miles driven	8.5	7.4	4.3	4.8	3.6	7.0	5.8	+ 94%
Mean Brood Size	5.6	5.9	5.3	5.6	4.5	5.9	5.4	+ 31%

[a] Statewide means include the Northwest region.

Table 3. August 1987 roadside survey results for selected farmland wildlife species by agricultural region.

Region	Miles surveyed	Animals seen per 100 miles driven: Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	375	4.5	0.8	0.5	193.9	21.3
WC	925	14.6	5.8	1.2	440.6	6.5
C	700	15.1	7.0	0.3	222.0	1.9
EC	425	0.0	11.5	0.0	104.7	1.9
SW	475	99.4	8.2	0.6	257.3	7.8
SC	775	47.2	6.6	1.0	206.8	1.2
SE	500	66.6	10.6	1.0	255.0	1.8
Statewide[a]	4,175	34.2	7.1	0.7	261.2	5.2

[a] Statewide means include the Northwest region.

Table 4. August 1986 roadside survey results for selected farmland wildlife species by agricultural region.

Region	Miles surveyed	Animals seen per 100 miles driven: Gray partridge (Hun)	Eastern cottontail	W.t. jack rabbit	Mourning dove	W.t. deer
NW	400	3.5	0.3	1.0	176.8	10.3
WC	925	10.1	1.5	0.4	325.0	6.5
C	775	4.6	4.8	0.4	180.1	1.4
EC	425	0.0	5.9	0.0	115.1	0.7
SW	475	59.6	6.3	0.6	204.0	4.8
SC	775	45.3	5.3	0.9	160.5	2.3
SE	500	20.8	4.8	0.0	180.4	2.2
Statewide[a]	4,275	20.6	4.0	0.5	204.1	3.9

[a] Statewide means include the Northwest region.

Table 5. Statewide August roadside survey results for selected farmland wildlife species, 1983-87.

Species	Animals per 100 miles driven[a]: 1983	1984	1985	1986	1987	Percent[b] change 1986-1987
Ring-necked pheasant[c]	56.2	28.7	34.6	21.6	49.9	+134%
Gray partridge (Hun)	23.4	20.0	37.0	20.6	34.2	+58%
Mourning dove	286.6	279.2	270.1	204.1	261.2	+34%
Eastern cottontail	6.7	2.9	4.4	4.0	7.1	+69%
White-tailed jack rabbit	1.0	0.8	1.2	0.5	0.7	+60%
White-tailed deer	5.1	4.9	5.4	3.9	5.2	+30%
Sharp-tailed grouse	0.02	0.12	0.13	0.00	0.00	0%
Greater prairie-chicken	0.00	0.23	0.00	0.00	0.00	0%
Sandhill crane	1.22	1.14	1.84	1.33	3.28	+141%
Badger	0.00	0.00	0.00	0.00	0.05	NA
Gray & fox squirrels	1.03	1.84	0.86	1.29	1.22	-8%
Gray & red foxes	0.24	0.28	0.23	0.42	0.26	-39%
Striped & spotted skunks	0.22	0.49	0.48	0.42	0.31	-34%

[a] The mean number of animals per 100 miles are calculated using total miles surveyed and are not corrected for only miles surveyed both years.

[b] Percent change 1986-87 calculated using only those routes surveyed both years.

[c] Pheasant means do not include the Northwest region.

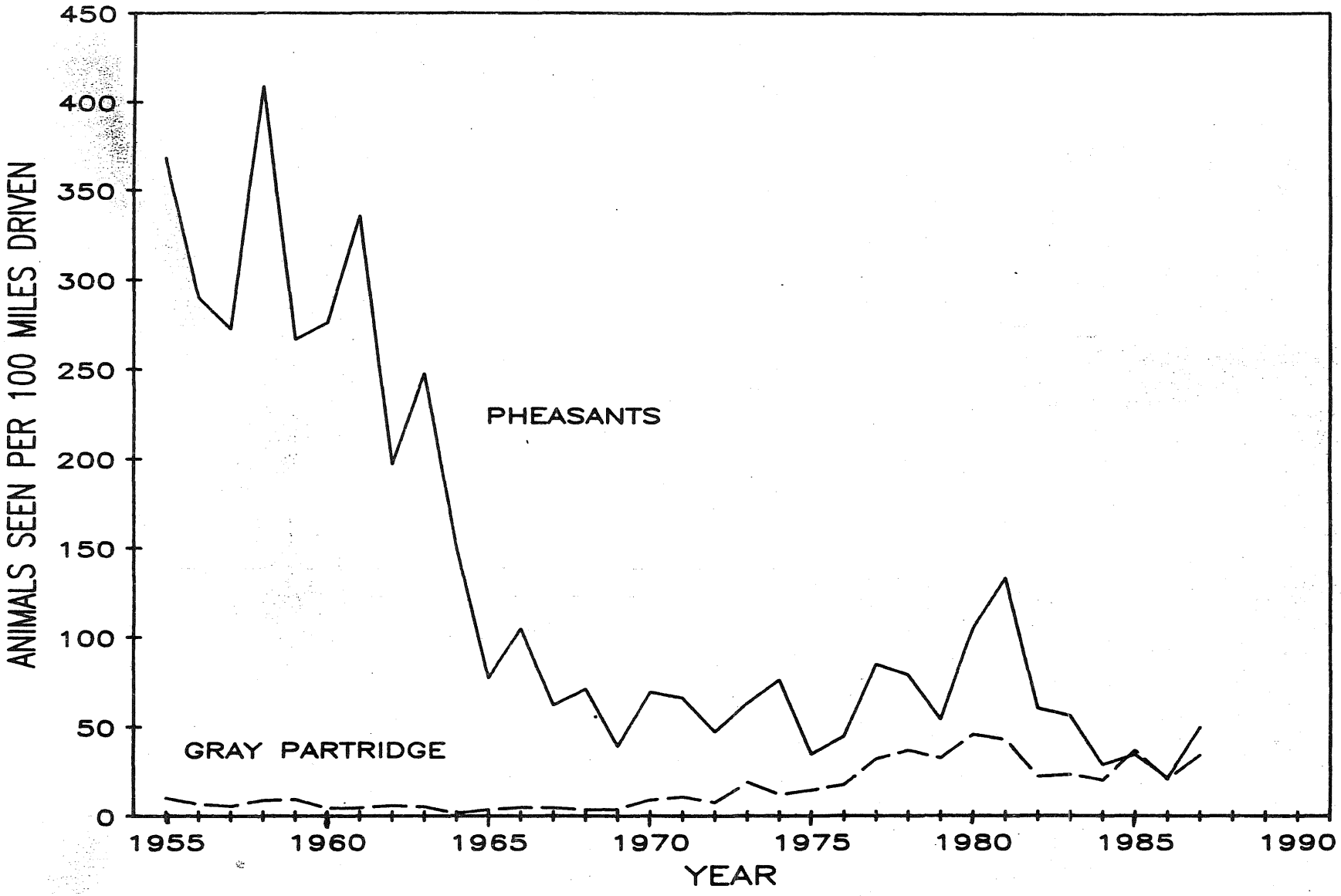

Figure 2. August roadside census indices (animals observed/100 mi.) of pheasants and gray partridge, 1955-87.

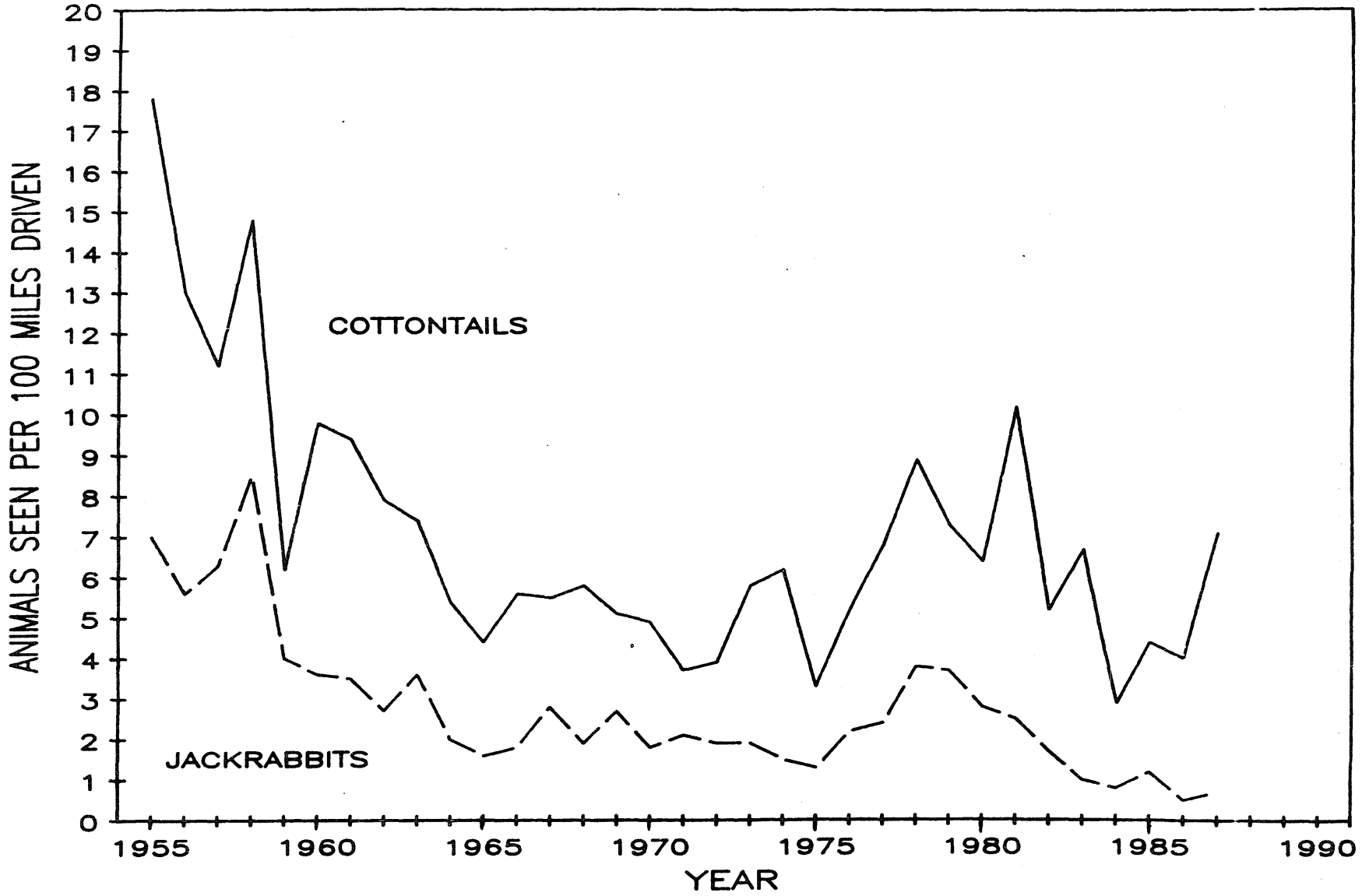

Figure 3. August roadside indices (animals observed/100 mi.) of eastern cottontail and white-tailed jackrabbits, 1955-87.

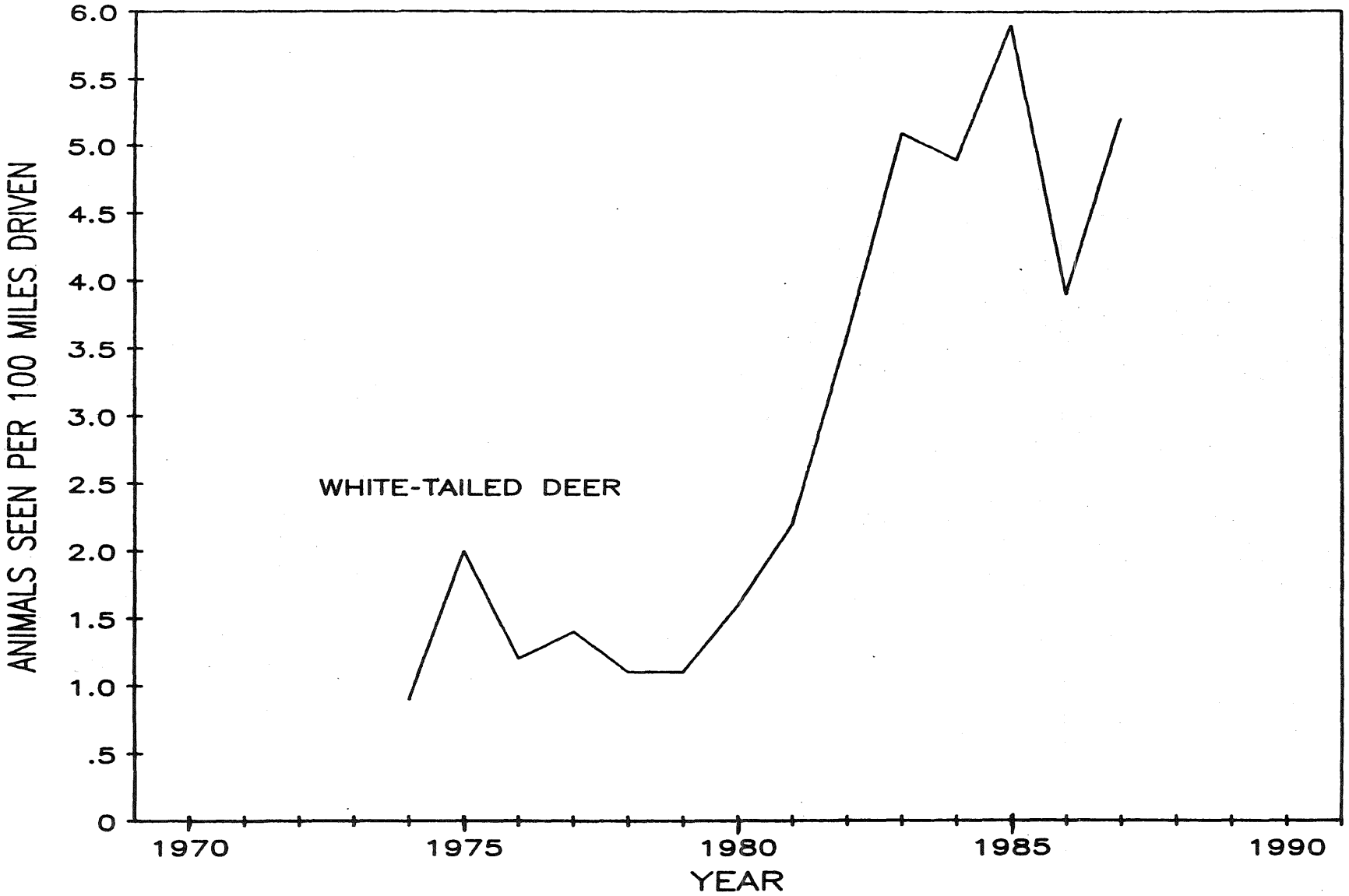

Figure 4. August roadside census indices (animals observed/100 mi.) of white-tailed deer, 1974-87.

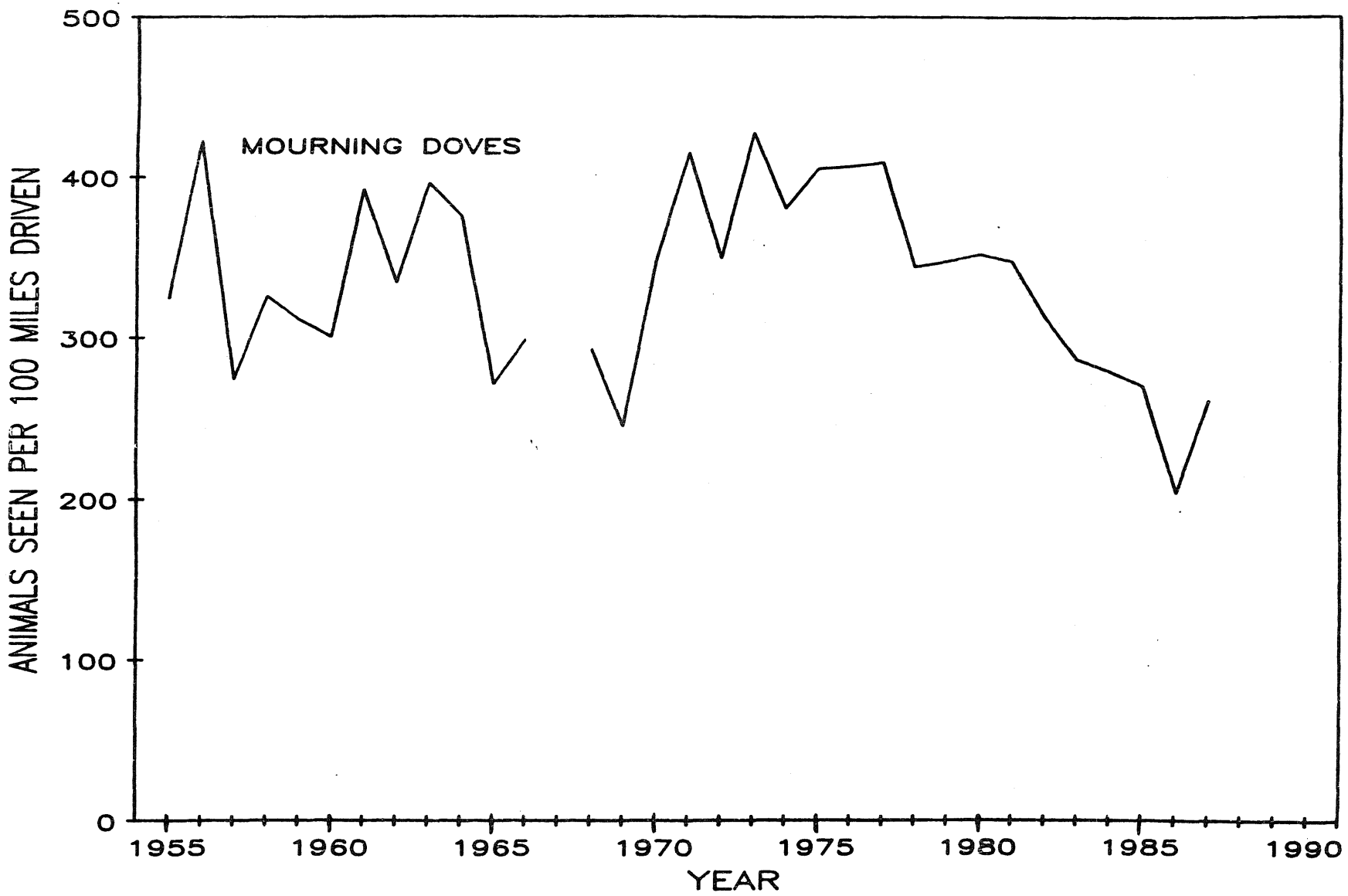

Figure 5. August roadside census indices (animals observed/100 mi.) of mourning doves, 1955-87.

Table 8. Gray partridge seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	16	8	0	11	10	9	No	10
1956	3	8	0	15	6	8	Survey	7
1957	6	5	0	12	7	0		6
1958	20	9	0	10	0	6		9
1959	13	17	0	20	5	0		9
1960	4	7	0	12	1	5		4
1961	6	13	0	2	1	0		5
1962	3	10	0	3	0	22		6
1963	3	11	0	11	1	5		5
1964	1	3	0	2	2	2		2
1965	5	3	0	7	2	4		4
1966	2	4	0	18	0	11		5
1967	3	2	0	8	14	0		5
1968	4	3	0	10	0	5		4
1969	5	3	0	11	0	5		4
1970	7	8	0	33	4	4		9
1971	13	4	0	29	7	10		11
1972	7	3	0	18	2	18		8
1973	8	8	0	67	12	26		19
1974	7	10	0	27	8	20		12
1975	11	2	0	68	9	6		15
1976	11	9	0	59	15	22		18
1977	16	33	0	93	31	32		32
1978	26	23	0	144	31	15		37
1979	43	24	0	80	35	12		33
1980	58	49	0	99	41	28		46
1981	38	27	1	139	44	19		43
1982	24	23	1	70	17	16	4	22
1983	29	19	0	65	23	8	15	23
1984	18	17	0	50	27	16	10	20
1985	31	18	0	95	63	42	2	37
1986	10	5	0	60	45	21	4	21
1987	15	15	0	99	47	67	5	34

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 9. Cottontail rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	8	15	15	20	20	32	No	18
1956	10	16	12	16	13	13	Survey	13
1957	7	10	8	18	14	14		11
1958	13	14	16	22	17	7		15
1959	5	16	6	7	5	2		6
1960	6	14	6	16	12	5		10
1961	6	12	6	14	11	6		9
1962	6	7	4	13	10	8		8
1963	7	4	5	12	9	9		7
1964	5	3	1	12	7	5		5
1965	4	4	1	5	6	6		4
1966	5	3	2	10	8	6		6
1967	6	5	2	7	9	3		6
1968	5	3	4	9	9	6		6
1969	4	4	1	10	8	5		5
1970	4	5	2	7	6	6		5
1971	5	3	2	7	3	2		4
1972	4	5	4	5	4	4		4
1973	5	9	6	7	5	4		6
1974	3	7	14	7	6	6		6
1975	2	4	8	2	2	3		3
1976	4	6	7	2	6	8		5
1977	5	7	13	6	5	8		7
1978	5	9	21	12	7	5		9
1979	5	8	8	13	8	4		7
1980	4	7	10	7	7	4		6
1981	7	10	18	10	8	12		10
1982	5	7	8	3	7	5	2	5
1983	7	6	13	6	4	12	2	7
1984	2	2	4	4	4	5	0	3
1985	2	4	5	7	6	8	0	4
1986	2	5	6	6	5	5	0	4
1987	6	7	12	8	7	11	1	7

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 6. August roadside survey results for 5 species, 1955-87.

Year	Animals seen per 100 miles driven				
	Pheasants[a]	Gray partridge	Cottontails	Jack rabbits	Mourning doves
1955	368.1	9.9	17.8	7.0	324.5
1956	290.0	6.6	13.0	5.6	422.6
1957	272.6	5.5	11.2	6.3	274.5
1958	409.1	8.7	14.8	8.5	326.0
1959	266.8	9.3	6.2	4.0	311.4
1960	276.4	4.4	9.8	3.6	300.8
1961	336.0	4.5	9.4	3.5	392.4
1962	197.2	5.8	7.9	2.7	334.6
1963	248.1	5.1	7.4	3.6	396.5
1964	149.8	1.6	5.4	2.0	375.9
1965	77.2	3.6	4.4	1.6	271.6
1966	105.0	4.9	5.6	1.8	299.6
1967	62.2	4.6	5.5	2.8	
1968	71.4	3.5	5.8	1.9	293.5
1969	39.2	3.7	5.1	2.7	245.6
1970	69.6	9.1	4.9	1.8	348.3
1971	66.1	10.8	3.7	2.1	415.4
1972	47.3	7.5	3.9	1.9	349.8
1973	63.3	19.1	5.8	1.9	428.2
1974	76.3	12.0	6.2	1.5	380.8
1975	34.8	14.6	3.3	1.3	405.8
1976	44.8	17.6	5.2	2.2	407.4
1977	85.0	32.1	6.8	2.4	409.8
1978	79.0	37.0	8.9	3.8	344.5
1979	54.2	32.6	7.3	3.7	347.9
1980	104.9	46.0	6.4	2.8	352.2
1981	133.5	42.9	10.2	2.5	347.6
1982[b]	60.2	22.2	5.2	1.7	313.6
1983	56.2	23.4	6.7	1.0	286.6
1984	28.7	20.0	2.9	0.8	279.2
1985	34.6	37.0	4.4	1.2	270.1
1986	21.2	20.6	4.0	0.5	204.1
1987	49.9	34.2	7.1	0.7	261.2

[a] Pheasants seen per 100 miles driven do not include the northwest agricultural region.

[b] Eight counties in the northwest agricultural region added to survey for all species except pheasants, 1982-87.

Table 7. Pheasants seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

	Agricultural Region							
Year	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	163	140	581	620	212	No	368
1956	249	208	175	357	478	169	Survey	290
1957	260	130	135	337	522	180		273
1958	490	262	300	473	593	126		409
1959	307	187	73	510	413	55		267
1960	367	243	203	294	357	38		276
1961	494	267	255	366	381	115		336
1962	264	140	144	215	239	114		197
1963	444	192	157	252	227	135		248
1964	225	83	26	185	211	84		150
1965	121	38	9	90	98	69		77
1966	110	67	26	109	176	102		105
1967	56	30	10	54	126	81		62
1968	65	40	17	78	125	94		71
1969	13	22	20	33	68	102		39
1970	20	27	9	55	109	194		70
1971	40	44	12	59	77	175		66
1972	20	28	44	37	67	105		47
1973	38	35	53	36	75	168		63
1974	51	73	85	60	93	108		76
1975	13	34	75	7	25	79		35
1976	12	28	68	2	83	81		45
1977	46	85	101	6	145	126		85
1978	36	80	178	23	106	77		79
1979	45	62	101	13	53	55		54
1980	79	117	221	20	110	85		105
1981	124	139	268	76	126	95		134
1982	71	44	155	26	49	29	0	60
1983	90	52	107	10	25	51	0	56
1984	67	14	10	8	26	21	0	29
1985	63	16	41	14	30	32	3	35
1986	20	11	22	20	24	37	0	21
1987	79	36	25	60	42	39	0	50

[a] Statewide totals do not include the northwest agricultural region.

Table 10. Jack rabbits seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	9	3	2	13	11	2	No	7
1956	6	4	2	10	8	2	Survey	6
1957	5	5	1	20	6	1		6
1958	7	6	1	20	12	1		9
1959	1	1	0	15	8	1		4
1960	4	5	0	10	3	0		4
1961	4	5	0	7	4	0		4
1962	4	2	0	5	3	1		3
1963	10	2	0	2	3	1		4
1964	3	1	0	4	2	1		2
1965	2	2	0	4	1	0		2
1966	2	2	0	5	1	1		2
1967	5	1	0	4	4	0		3
1968	2	1	0	7	2	1		2
1969	3	1	1	10	2	1		3
1970	4	2	0	2	1	0		2
1971	5	2	0	3	1	0		2
1972	4	1	0	2	2	1		2
1973	4	0	0	3	2	0		2
1974	4	2	0	2	1	0		2
1975	3	1	0	2	0	0		1
1976	4	1	0	5	2	1		2
1977	4	3	0	5	2	1		2
1978	3	3	1	13	3	1		4
1979	5	5	1	6	3	1		4
1980	4	1	1	8	2	3		3
1981	2	2	0	7	2	3		3
1982	3	1	1	5	1	1	2	2
1983	2	1	0	0	1	1	1	1
1984	2	1	0	2	0	1	0	1
1985	2	0	0	3	2	1	1	1
1986	0	0	0	1	1	0	1	1
1987	1	0	0	1	1	1	1	1

[a] Statewide totals include the northwest agricultural region from 1982 on.

Table 11. Mourning doves seen per 100 miles of August roadside survey, summarized by agricultural region, 1955-87.

Year	Agricultural Region							
	WC	C	EC	SW	SC	SE	NW	Statewide[a]
1955	335	275	116	539	396	197	No	325
1956	347	553	278	592	461	286	Survey	423
1957	303	246	168	243	383	200		275
1958	350	297	192	270	456	293		326
1959	377	307	221	358	447	94		311
1960	274	334	122	337	430	187		301
1961	377	373	136	481	563	317		392
1962	338	338	215	313	396	314		335
1963	636	273	212	506	435	313		397
1964	681	257	167	400	395	217		376
1965	312	245	185	460	217	271		272
1966	363	210	152	505	311	229		300
1967								
1968	411	208	125	261	254	385		294
1969	268	280	125	477	132	195		246
1970	601	218	113	527	204	274		348
1971	580	257	182	366	259	752		415
1972	600	234	169	308	230	314		350
1973	602	280	288	480	392	329		428
1974	588	321	242	352	269	382		381
1975	654	303	153	546	338	260		406
1976	600	373	224	536	367	282		407
1977	699	308	168	680	282	224		410
1978	502	326	174	431	276	282		345
1979	601	406	138	380	198	213		348
1980	696	302	140	422	235	182		352
1981	634	285	153	514	213	179		348
1982	557	243	175	304	278	213	225	314
1983	517	289	131	278	214	193	189	287
1984	531	233	129	267	183	269	176	279
1985	501	245	93	243	213	151	234	270
1986	325	180	115	204	161	180	177	204
1987	441	222	105	257	207	255	194	261

[a] Statewide totals include the northwest agricultural region from 1982 on.

August Roadside Survey Historical Summaries

Table 12. Greater prairie-chicken spring booming ground counts for 14 northwestern counties, 1978-87 (counts coordinated and summarized by AWM Terry Wolfe, Crookston).

County	No. of booming males (No. of booming grounds)									
	1978	1979	1980	1981	1982	1983	1984[b]	1985	1986	1987
Becker	26 (4)	102 (9)[a]	156 (16)[a]	159 (16)[a]	133 (13)[a]	174 (17)	96 (9)[a]	41 (3)	99 (11)	53 (7)
Cass	9 (1)	14 (2)[a]	17 (6)[a]	63 (15)[a]	68 (16)[a]	65 (15)	54 (15)[a]	58 (14)	52 (14)	60 (15)
Chippewa	8 (1)	2 (1)	2 (1)	2 (1)	0	2 (1)	0	0	0	0
Clay	261 (21)	205 (17)[a]	186 (17)[a]	196 (16)[a]	216 (12)[a]	161 (15)	110 (7)	127 (7)[a]	86 (9)[a]	87 (9)
Hubbard	0	0	0	4 (1)	3 (1)	3 (1)	5 (1)	16 (6)[a]	16 (4)	22 (5)
Mahnomen	71 (4)	81 (7)	203 (21)	223 (20)	294 (22)	316 (22)	149 (19)	134 (15)	102 (17)	63 (9)
Marshall	0	0	0	3 (1)	7 (2)	3 (1)[a]	2 (2)	0	0	0
Norman	130 (9)	213 (13)	230 (9)	210 (9)	273 (15)	194 (11)[a]	119 (8)	86 (7)	128 (10)[a]	87 (9)
Ottertail	8 (2)	19 (5)	13 (2)	9 (2)	12 (1)	10 (3)	7 (1)	5 (1)	0	0
Pennington	0	8 (1)[a]	0	2 (1)	6 (1)	5 (1)	4 (1)[a]	3 (1)	0	0
Polk	140 (16)	192 (18)[a]	269 (27)	254 (26)	283 (29)	232 (26)	146 (22)[a]	162 (18)	96 (17)[a]	72 (8)
Red Lake	7 (1)	8 (1)	8 (1)	19 (2)	19 (2)	14 (2)	12 (2)	2 (1)	0	0
Wadena	0 (10)[a]	27 (3)[a]	10 (3)	60 (12)[a]	64 (11)	18 (6)	19 (2)	34 (9)[a]	17 (7)[a]	105 (20)
Wilkin	180 (14)	77 (4)	164 (14)	206 (23)[a]	269 (20)	223 (18)	60 (6)	149 (15)[a]	81 (9)[a]	99 (8)
Total	841 (74)	948 (81)	1,258(117)	1,410(144)	1,648(146)	1,420(139)	783 (95	817 (97)	677 (98)	648 (90)
Avg. no. males/ground	11.4	11.7	10.8	9.8	11.2	10.2	8.2	8.4	6.9	7.2

[a] Data include only grounds on which counts were conducted. In several counties booming grounds were located but counts were not made, they are not included in the data presented.

[b] Part of the reason for the low number of chickens is incomplete counts of known grounds. This was the case for Polk County and a few others. However, even after allowing for uncounted grounds, chicken numbers were down.

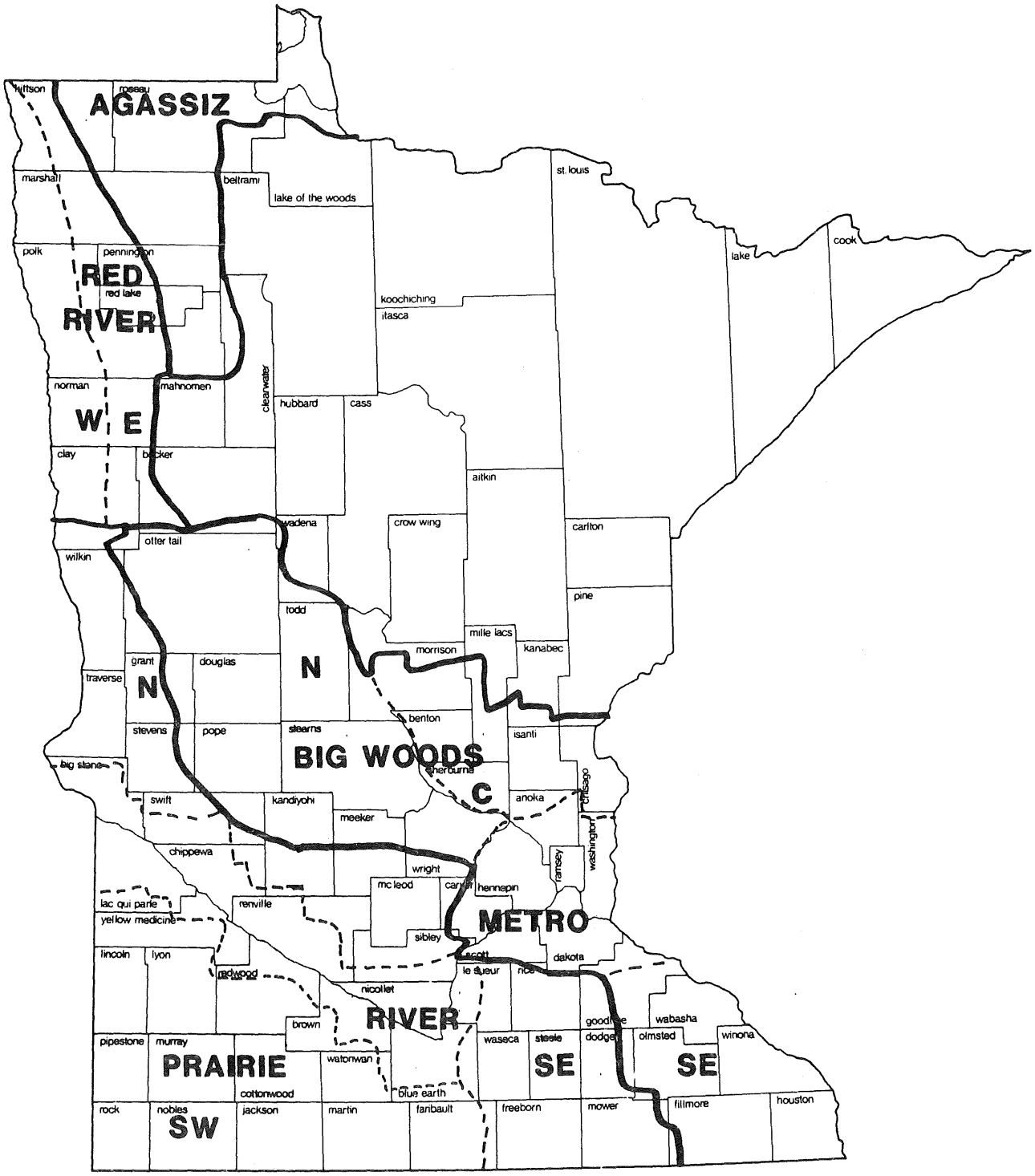

Figure 6. Deer management units and sub-units in the Farmland Zone.

Table 13. Number of car-killed deer confiscated in the Deer Management Units and sub-units of Minnesota's farmland zone, 1980-86. Data are adjusted for miles driven to the base year of 1972.

DMU Sub-DMU	1980	1981	1982	1983	1984	1985	1986	$\bar{X}$ 1980's	% Chg. 1985-86
RED RIVER	206	281	344	333	323	339	366	313	+ 8.0%
AGASSIZ	172	272	287	335	261	281	246	265	-12.5%
BIG WOODS	3,431	4,186	4,612	4,939	5,469	4,958	5,507	4,729	+11.1%
North	1,133	1,399	1,565	1,715	1,610	1,502	1,637	1,509	+ 9.0%
Central	661	893	885	904	1,065	934	961	900	+ 2.9%
Metro	1,126	1,219	1,296	1,391	1,803	1,692	1,961	1,498	+15.9%
SE	511	676	866	929	990	830	948	822	+14.2%
PRAIRIE	2,577	2,666	2,990	3,078	3,268	2,809	3,133	2,932	+11.5%
North	392	392	394	469	349	400	440	405	+10.0%
River	764	842	864	947	1,021	829	857	875	+ 3.4%
SW	833	871	992	967	1,009	851	913	919	+ 7.3%
SE	589	561	740	695	890	729	923	732	+26.6%
FARMLAND[a] ZONE	6,387	7,405	8,232	8,684	9,321	8,387	9,252	8,238	+10.3%
FOREST[b] ZONE	1,698	3,574	2,591	3,071	3,270	3,180	3,739	3,018	+17.6%
MISC	469	572	791	358	539	447	543	531	+21.5%
STATEWIDE[c]	8,554	11,551	11,614	12,113	13,130	12,014	13,534	11,787	+12.3%

[a] Farmland subtotals from regional enforcement summaries.

[b] Forest subtotals = Statewide - (Farmland + Misc.).

[c] Statewide data from summaries distributed by Division of Enforcement in St. Paul.

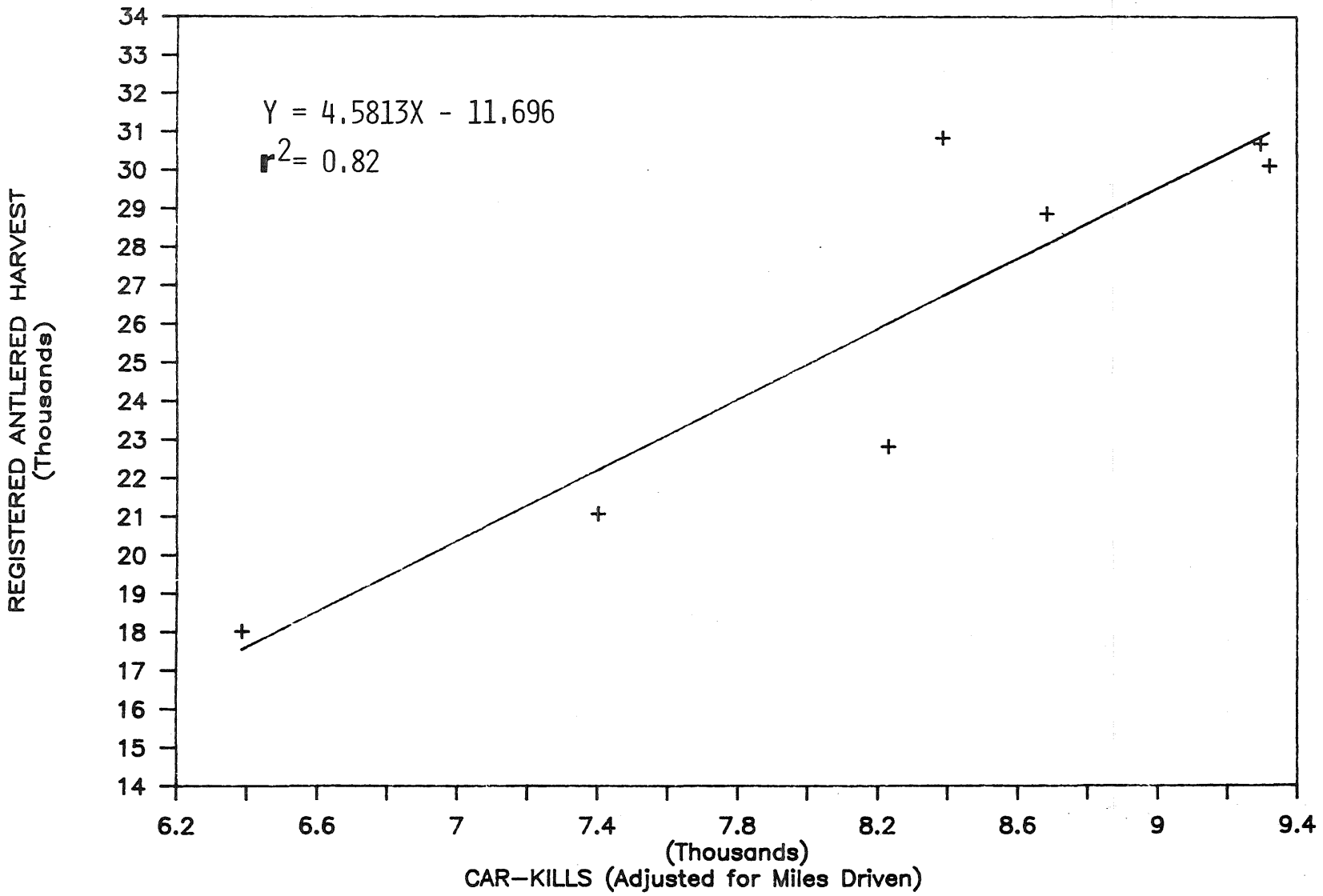

Figure 7. Relationship between annual vehicle kills and registered antlered deer harvest in the Farmland Zone, 1980-86.

Table 14. Productivity of deer in the Big Woods and Prairie Deer Management Units (DMU), 1981-87.

	Age class	Pregnancy rate	Fetuses per pregnancy	Proportion of population	Gross productivity[a]
BIG WOODS					
1987	Fawn	46%	1.05	35%	
(N=162)	Yearling	95%	1.72	23%	
	Adult	94%	1.97	42%	1.32 fawns/doe
1986	Fawn	37%	1.10	35%	
(N=173)	Yearling	82%	1.82	23%	
	Adult	91%	1.92	42%	1.22 fawns/doe
1985	Fawn	50%	1.13	35%	
(N=140)	Yearling	100%	1.72	23%	
	Adult	95%	1.90	42%	1.35 fawns/doe
1984	Fawn	22%	1.24	35%	
(N=174)	Yearling	95%	1.67	23%	
	Adult	95%	1.79	42%	1.17 fawns/doe
1983	Fawn	55%	1.20	35%	
(N=182)	Yearling	94%	1.89	23%	
	Adult	94%	1.88	42%	1.38 fawns/doe
1982	Fawn	43%	1.17	35%	
(N=253)	Yearling	91%	1.75	23%	
	Adult	96%	1.90	42%	1.31 fawns/doe
1981	Fawn	65%	1.08	35%	
(N=169)	Yearling	94%	1.70	23%	
	Adult	94%	2.02	42%	1.41 fawns/doe
PRAIRIE					
1987	Fawn	54%	1.07	35%	
(N=70)	Yearling	100%	1.94	23%	
	Adult	85%	2.00	42%	1.36 fawns/doe
1986	Fawn	42%	1.13	35%	
(N= 73)	Yearling	85%	1.84	23%	
	Adult	92%	1.88	42%	1.25 fawns/doe
1985	Fawn	38%	1.00	35%	
(N= 66)	Yearling	92%	1.58	23%	
	Adult	94%	1.97	42%	1.24 fawns/doe
1984	Fawn	23%	1.14	35%	
(N= 89)	Yearling	91%	1.90	23%	
	Adult	86%	1.87	42%	1.17 fawns/doe
1983	Fawn	61%	1.38	35%	
(N= 92)	Yearling	91%	2.00	23%	
	Adult	100%	2.07	42%	1.58 fawns/doe
1982	Fawn	43%	1.22	35%	
(N=132)	Yearling	77%	1.80	23%	
	Adult	98%	2.02	42%	1.33 fawns/doe
1981	Fawn	44%	1.08	35%	
(N=132)	Yearling	94%	1.88	23%	
	Adult	97%	1.91	42%	1.35 fawns/doe

[a] Gross productivity calculated as pregnancy rate x fetuses/pregnancy weighted by the proportion of each age class in the population.

Table 15. Spring deer densities estimated from population modeling in DMU's of Minnesota's farmland zone, 1980-87.[a]

DMU	Deer per square mile								Goal	1987 Percent of goal[b]
	1980	1981	1982	1983	1984	1985	1986	1987		
Red River	1.8	2.7	3.2	3.3	3.2	3.1	2.6	2.5	2.0	125%
Agassiz	3.6	5.3	6.2	6.6	6.5	6.2	5.7	5.0	5.4	92%
Big Woods										
North	3.3	4.2	5.0	5.4	5.3	5.0	4.7	4.2	4.2	100%
Central	4.3	5.4	6.2	6.7	7.0	7.0	6.8	6.0	6.5	92%
Metro	1.5	1.7	1.9	2.1	2.3	2.5	2.4	2.4	2.5	96%
SE	5.2	7.0	8.3	9.2	9.2	8.4	8.4	8.4	7.4	114%
Prairie										
North	1.6	1.7	1.9	2.0	1.9	1.9	1.7	1.7	1.7	100%
River	2.5	2.7	3.0	3.1	3.0	3.0	2.6	2.3	2.6	88%
SW	1.6	1.8	2.1	2.2	2.1	2.1	2.0	1.9	2.0	95%
SE	1.7	1.9	2.1	2.2	2.1	2.1	2.1	1.9	2.0	95%
Farmland Zone	2.6	3.4	3.8	4.0	4.0	3.9	3.7	3.4	3.4	100%

[a] Historical density figures may differ from those previously published due to periodic recalculation as more accurate modeling information is available.

[b] Percent = (1987/Goal) x 100.

Predator Scent Post Survey

(Note: this survey is organized and coordinated by the Forest Wildlife Populations and Research Group, Grand Rapids. Results are presented at this location in the book because of the statewide nature of the data)

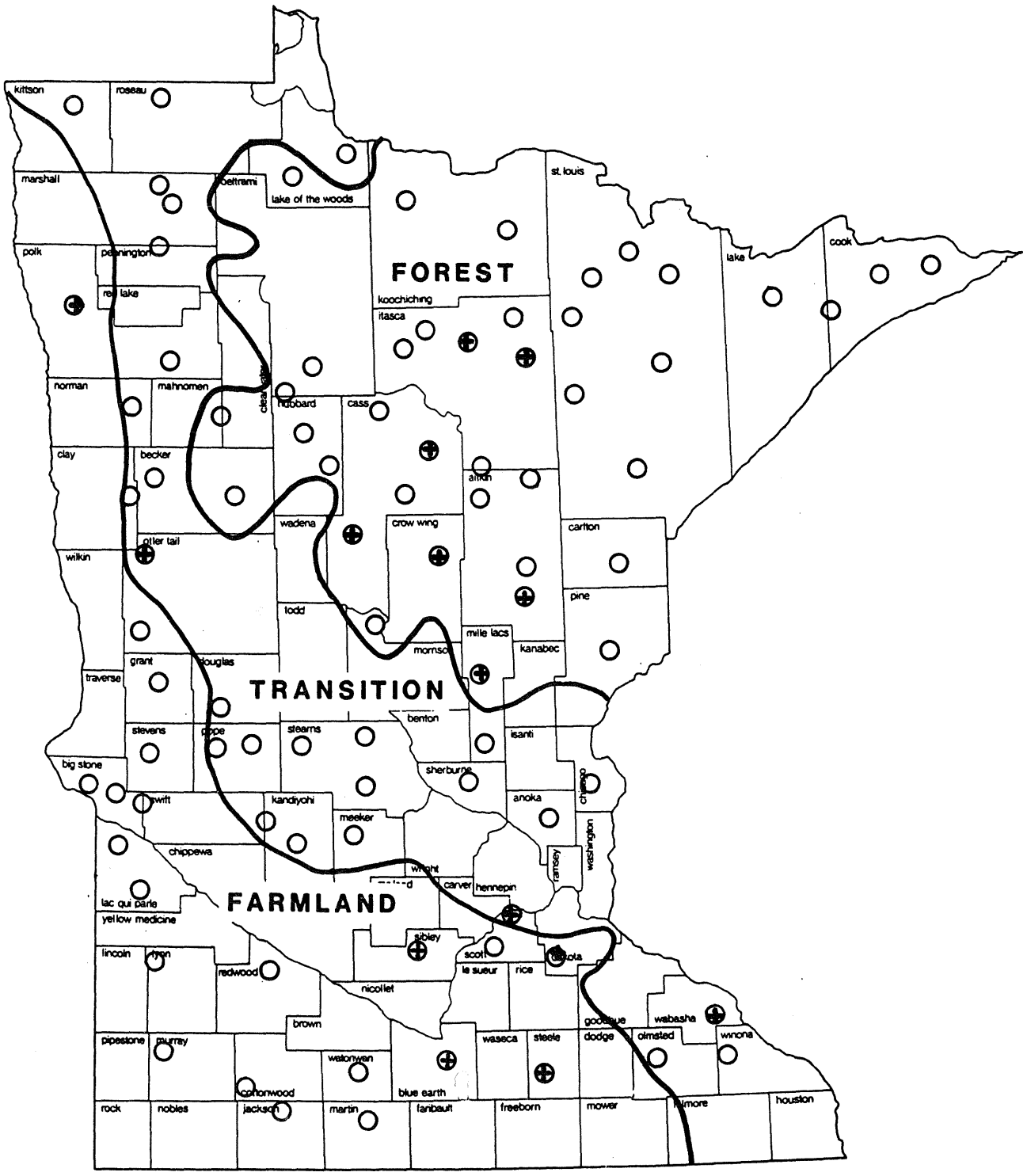

Figure 8. General locations of scent post routes in the Forest Transition, and Farmland survey zones, 1986. Routes indicated by ⊗ were not run in 1986.

Table 16. Mean predator scent post indices (Ind) and annual percent changes in indices (PC) for nine species in the Farmland and Transition Zones, 1977-86.

Species	Year 1977	1978		1979		1980		1981		1982		1983		1984		1985		1986	
	Ind	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC	Ind	PC
Coyote																			
Farmland	3	0	-100	10	+100	3	-70	9	+200	4	-56	5	+25	9	+80	3	-67	13	+333
Transition	0	8	+100	32	+300	12	-63	9	-25	17	+89	17	0	15	-12	8	-47	8	0
Forest	38	25	-34	27	+8	33	+22	50	+52	29	-42	26	-10	34	+31	24	-29	25	+4
Red Fox																			
Farmland	67	18	-73	44	+144	60	+36	64	+7	118	+84	142	+20	142	0	103	-27	154	+50
Transition	38	49	+29	83	+69	98	+18	113	+15	104	-8	92	-12	109	+18	70	-36	112	+60
Forest	38	38	0	69	+82	49	-29	67	+37	69	+3	85	+23	58	-32	49	-16	57	+16
Skunk																			
Farmland	35	26	-26	55	+112	26	-53	17	-35	42	+147	42	0	58	+38	95	+64	98	+3
Transition	117	65	-44	57	-12	83	+46	90	+8	58	-36	58	0	74	+28	98	+32	111	+13
Forest	63	26	-59	61	+135	87	+43	84	-3	73	-13	89	+22	95	+7	91	-4	84	-8
Raccoon																			
Farmland	24	8	-67	27	+238	18	-33	5	-72	42	+740	65	+55	41	-37	33	-20	51	+54
Transition	57	41	-28	39	-5	53	+36	62	+17	71	+15	44	-38	45	+2	53	+18	68	+28
Forest	17	8	-53	11	+38	18	+64	20	+11	9	-55	28	+211	23	-18	25	+9	18	-28
Dog																			
Farmland	47	18	-62	40	+122	30	-25	41	+37	52	+27	42	-19	67	+60	83	+24	51	-38
Transition	77	46	-40	31	-33	52	+68	50	-4	63	+26	68	+8	125	+84	109	-13	83	-24
Forest	9	17	+89	16	-6	17	+6	15	-12	17	+13	13	-24	25	+29	22	-12	19	-14
House Cat																			
Farmland	76	40	-47	56	+40	91	+63	58	-36	58	0	72	+24	119	+65	109	- 8	115	+6
Transition	43	19	-56	13	-32	51	+292	39	-24	42	+8	81	+93	76	-6	107	+41	97	- 9
Forest	19	17	-11	11	-35	19	+73	16	-16	12	-25	19	+58	18	-5	19	+6	24	+26
Wolf																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	0	0	0	0	0	0	0	0	4	+100	2	-50	0	-100
Forest	4	24	+500	14	-42	15	+7	8	-47	6	-25	11	+83	10	-9	12	+20	19	+58
Bobcat																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	6	3	-50	0	-100	1	+100	1	0	0	-100	0	0	1	+100	2	+100	1	-50
Forest	8	6	-25	5	-17	2	-60	14	+600	14	0	3	-79	12	+300	5	-58	8	+60
Bear																			
Farmland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Transition	0	0	0	0	0	2	+100	1	-50	2	+100	3	+50	5	+67	3	-40	2	-33
Forest	13	7	-46	13	+86	20	+84	9	-55	11	+22	20	+82	11	-45	16	+45	23	+44

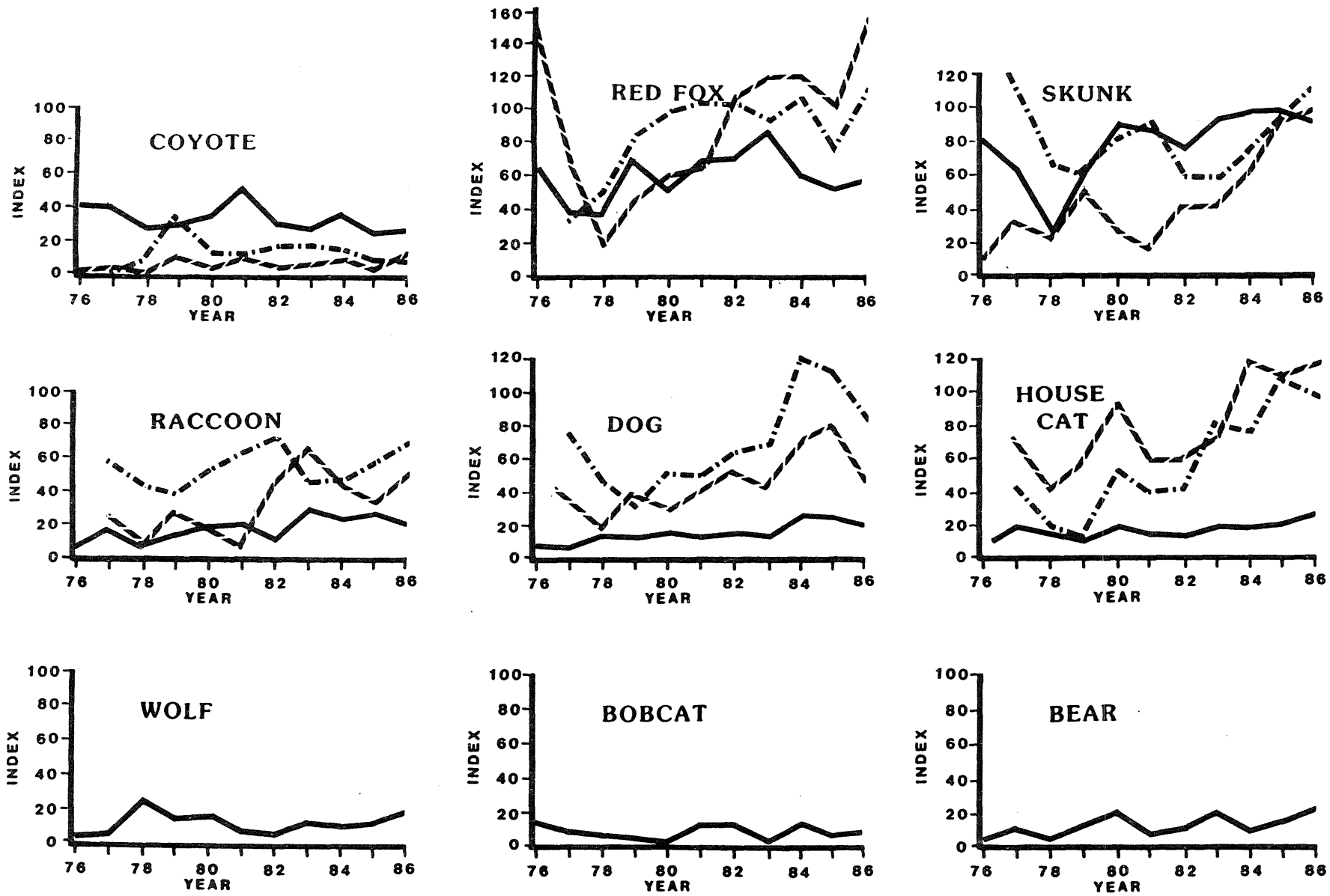

Figure 9. Mean scent post indices for major predator-furbearer species in the Forest, Transition, and Farm Survey Zones, 1976-1986.

FOREST WILDLIFE POPULATIONS AND CENSUSES

Table 17. Mean number of ruffed grouse drums per stop by census zone, 1964-87.

Year	Census Zone					
	Northwest	North	Northeast	Central hardwoods	Southeast	Range-wide mean
1964	0.4	0.7	0.9	0.3	1.3	0.6
1965	1.2	1.2	0.7	0.5	1.4	1.0
1966	1.4	1.4	0.6	0.7	1.9	1.0
1967	2.4	1.8	1.2	1.0	1.0	1.7
1968	3.2	2.3	1.6	1.0	1.3	2.0
1969	3.1	2.5	1.4	1.4	2.3	2.2
1970	1.9	3.1	0.9	1.6	2.1	2.2
1971	1.4	3.5	1.2	1.6	3.7	2.4
1972	2.1	3.7	1.0	2.0	3.1	2.6
1973	0.3	1.5	1.0	0.9	3.6	1.2
1974	0.8	1.1	0.6	0.7	3.0	1.0
1975	1.3	1.4	0.8	0.8	2.0	1.2
1976	0.8	1.5	0.4	0.9	1.8	1.1
1977	0.9	1.6	0.5	0.9	2.4	1.1
1978	2.0	2.4	0.8	1.4	2.5	1.8
1979	1.7	2.2	0.7	1.3	2.1	1.6
1980	1.9	2.2	0.7	1.9	2.7	1.7
1981	1.2	1.7	0.8	1.8	2.3	1.4
1982	0.9	1.1	0.3	0.9	1.1	0.8
1983	0.6	1.1	0.6	0.8	1.4	0.9
1984	1.0	1.1	0.6	0.5	1.4	0.8
1985	0.7	1.2	0.6	0.6	1.5	0.9
1986	1.7	1.1	0.5	0.6	2.5	1.0
1987	1.6	1.6	0.7	0.8	1.0	1.2

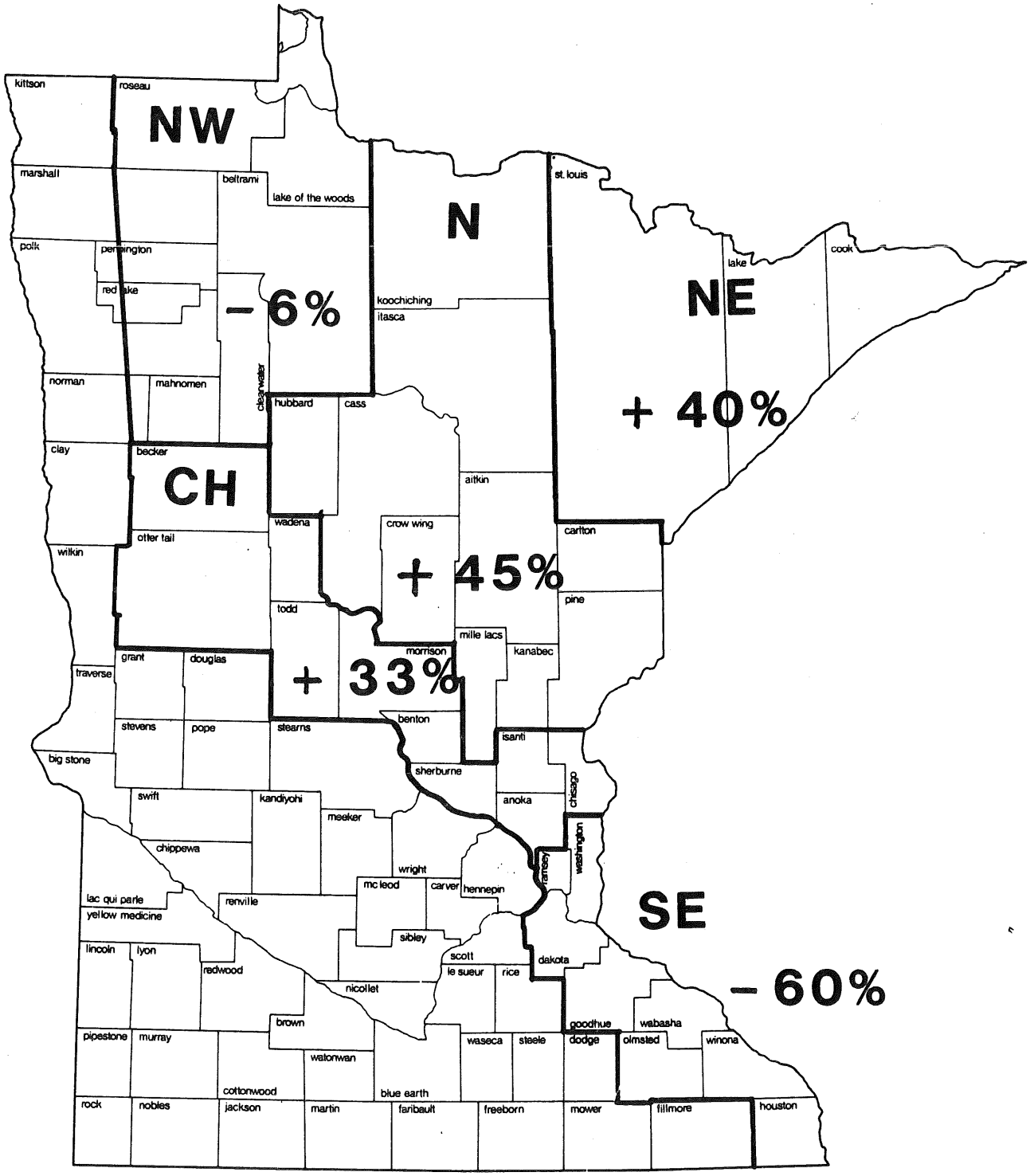

Figure 10. Changes from 1986-87 in average numbers of ruffed grouse drums per stop on roadside counts.

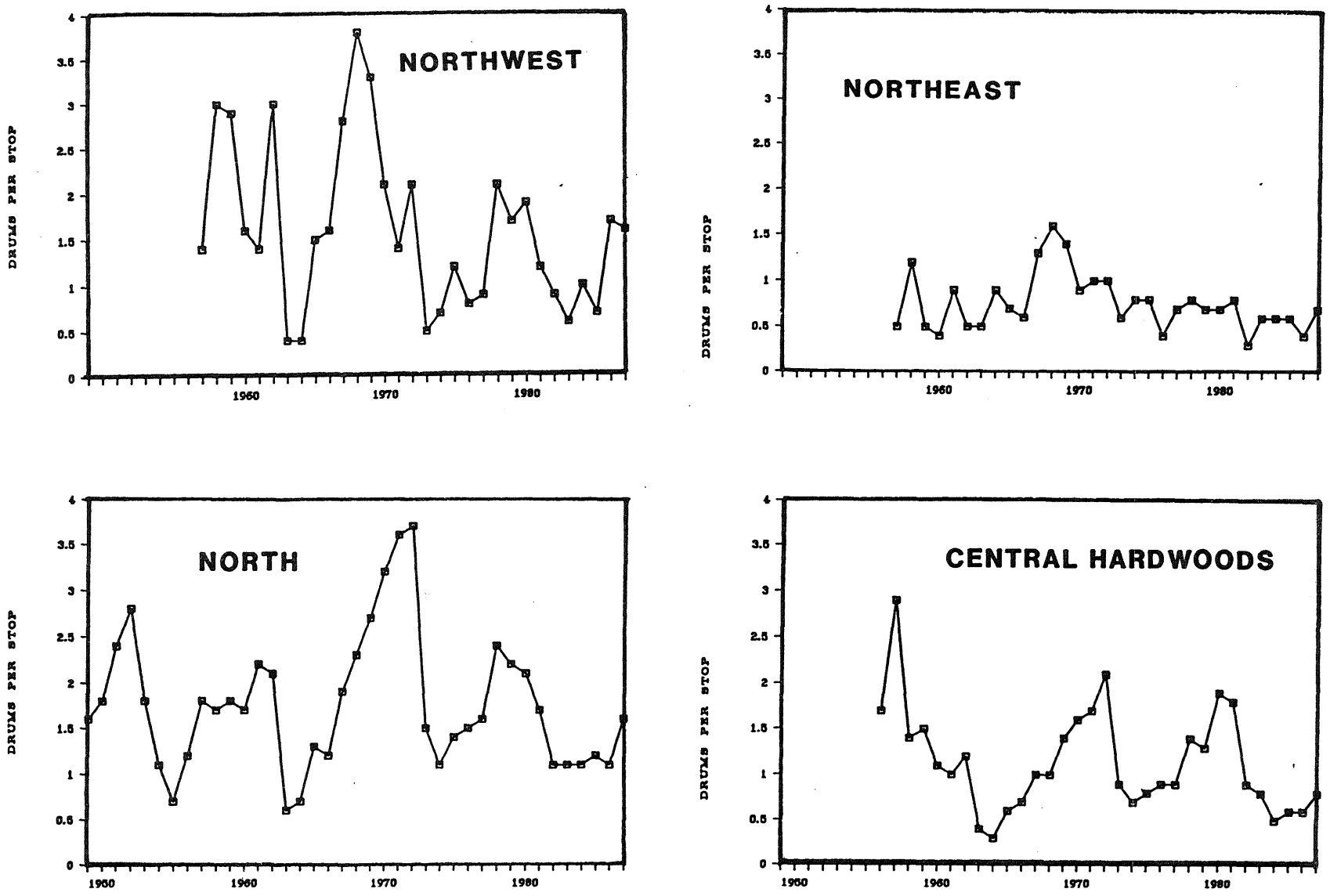

Figure 11. Ruffed grouse drumming trends in the Northwest, Northeast, North, and Central Hardwoods Survey Zones, through 1987.

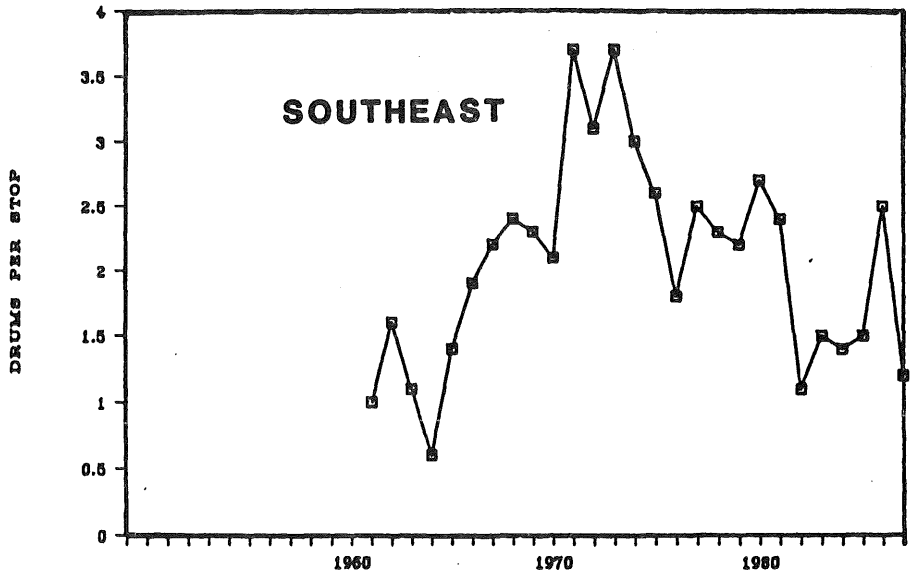

Figure 12. Ruffed grouse drumming trends in southeastern Minnesota, 1961-1987.

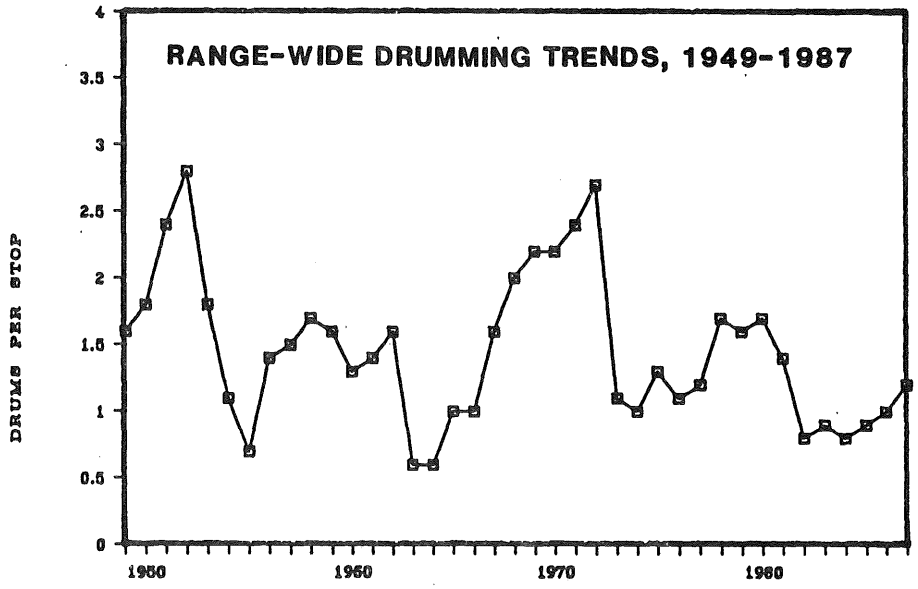

Figure 13. Ruffed grouse drumming trends range-wide, 1949-87.

Table 18. Number of snowshoe hares seen per 100 km of ruffed grouse drumming route in the North, Northwest, and Northeast survey zones, 1974-87.

Year	Hares seen per 100 km
1974	0.4
1975	0.0
1976	2.0
1977	2.8
1978	9.0
1979	8.8
1980	14.1
1981	9.8
1982	1.8
1983	0.7
1984	0.2
1985	0.3
1986	0.2
1987	0.5

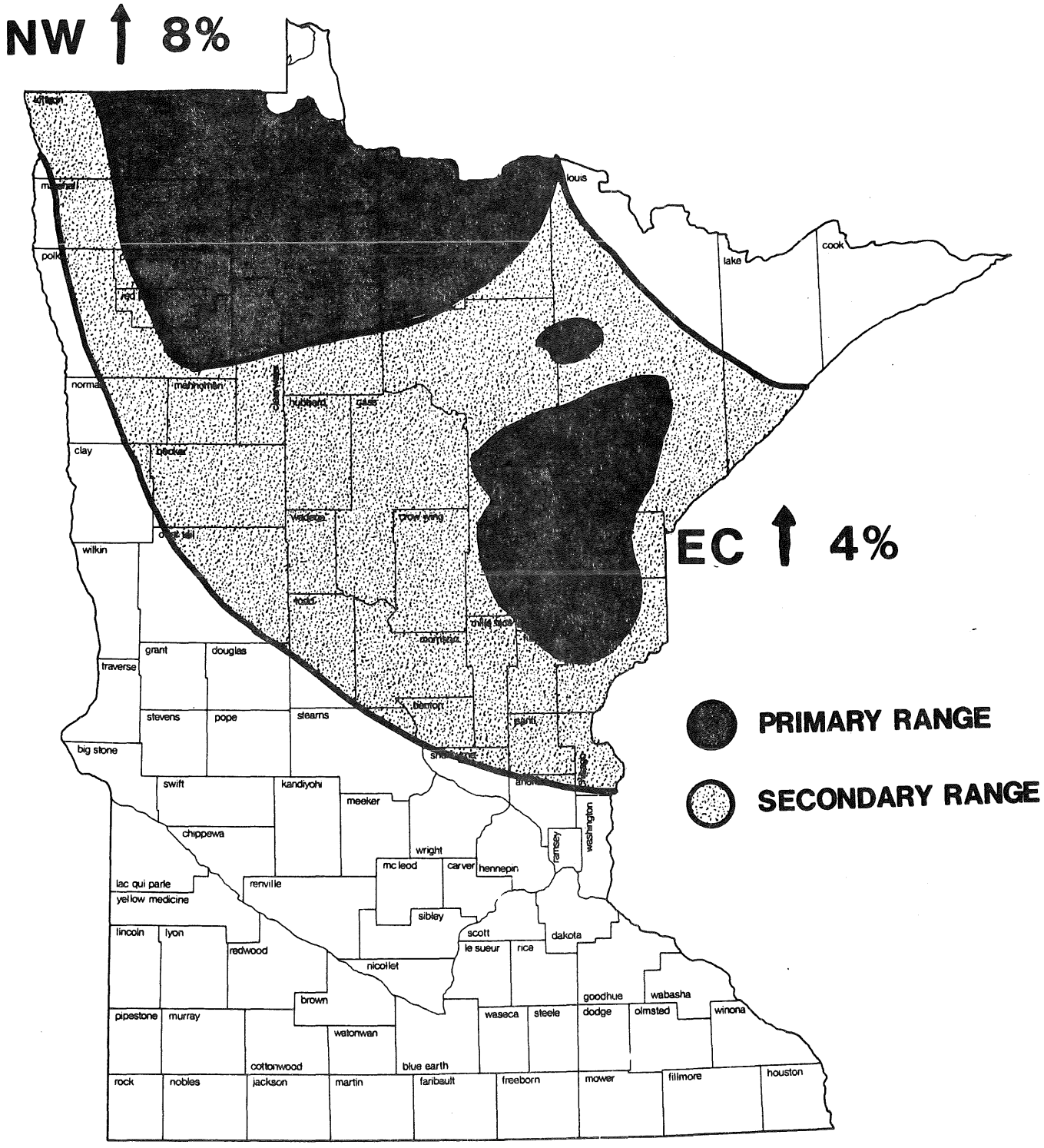

Figure 14. Changes in numbers of dancing male Sharp-tailed grouse on survey areas, 1986-1987.

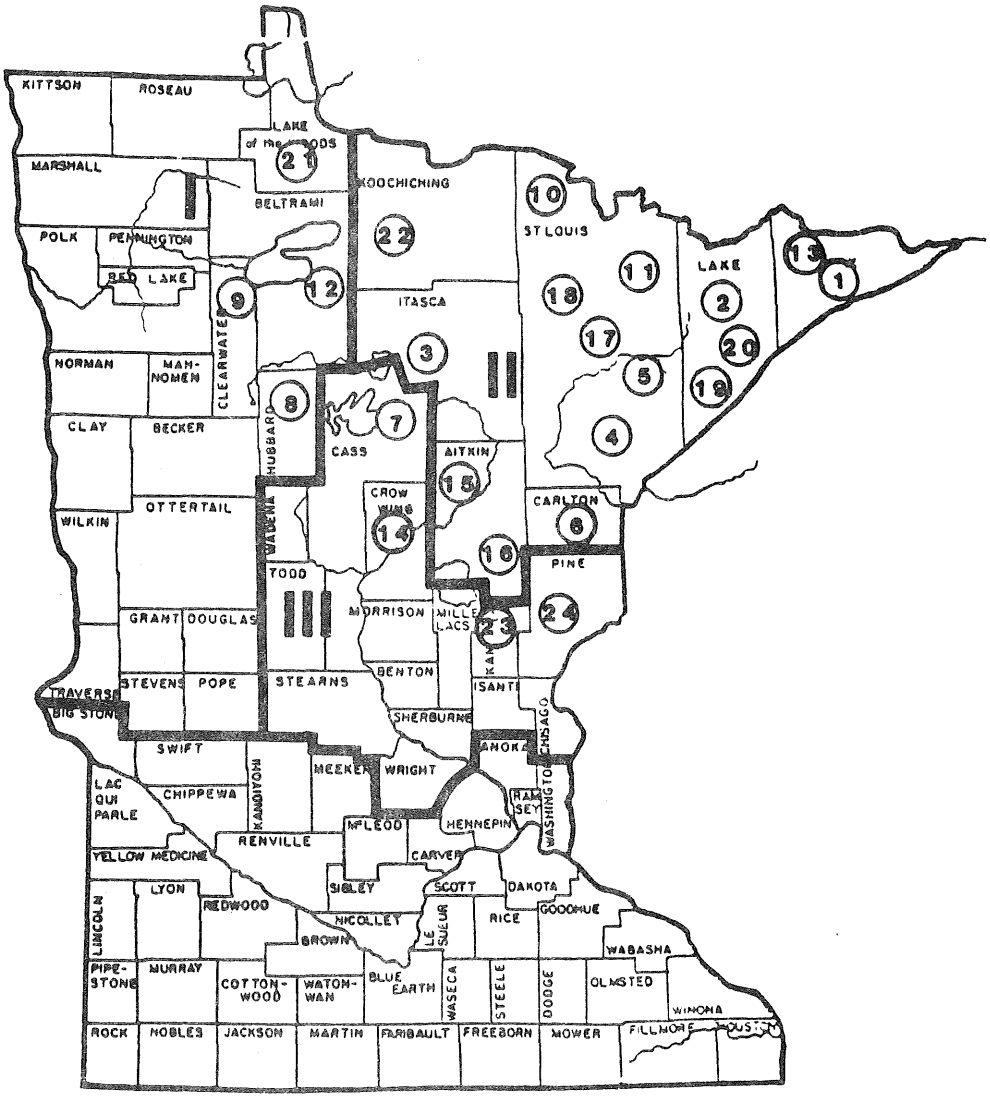

Figure 15. Approximate location of 24 aerial beaver census routes, within DNR Regions I-III.

Table 19. Live beaver colonies per mile of census route in northern Minnesota, 1975-86. Twenty routes were not flown in 1986 due to budget constraints.

Number	Route name	Year											
		1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
1	Cascade	1.12	0.52	0.39	1.07	-	0.42	0.43	0.40	0.35	0.44	0.46	-
2	Kawishiwi	0.95	-	0.73	0.97	0.68	0.75	0.50	0.72	0.65	0.70	0.78	-
3	Itasca	0.80	0.60	0.74	1.04	0.66	0.63	0.48	0.43	0.57	0.51	0.67	-
4	South St. Louis	0.74	0.63	0.76	0.99	-	0.64	0.74	-	0.58	0.57	0.33	-
5	Central St. Louis	1.23	-	-	1.02	0.95	0.90	0.95	0.65	0.79	0.57	1.05	-
6	Carlton & Pine	0.56	0.26	0.69	0.89	0.60	0.83	0.67	0.22	0.56	0.65	0.45	-
7	Cass	0.80	0.57	0.83	1.03	1.00	0.95	0.53	0.63	0.89	0.99	1.23	-
8	Balsam-Hennepin	0.40	0.28	0.51	0.39	0.55	0.44	0.43	0.60	0.58	0.54	-	-
9	Pinewood-Mississippi	0.32	0.33	0.55	0.32	-	0.38	0.39	0.49	0.48	-	-	-
10	Kabetogama Peninsula	2.21	2.39	2.14	2.91	3.05	2.52	3.55	2.66	2.89	3.30	2.93	2.92
11	Ely-Finger Lakes	1.85	-	1.41	1.59	1.26	1.06	0.98	1.17	1.32	1.02	1.28	-
12	Hay Creek-Kelliher	0.48	0.46	0.68	0.44	-	0.43	0.48	0.70	0.55	-	-	-
13	Cook County Transect	0.57	0.36	0.30	0.49	-	0.23	0.40	0.33	0.48	0.35	0.31	-
14	Cass-Crow Wing	0.67	0.43	0.59	0.70	0.68	0.78	0.61	0.74	0.68	0.76	0.87	0.69
15	Little Willow-Aitkin	0.35	-	0.42	0.45	0.47	0.44	0.38	0.40	0.40	0.31	0.59	-
16	East Aitkin County	0.62	0.47	0.89	1.14	0.96	0.72	0.52	0.86	0.82	0.81	0.90	-
17	West Vermilion	0.93	0.54	1.03	1.25	1.12	0.96	1.05	0.86	0.34	1.07	0.73	0.95
18	Blackduck	1.41	0.97	1.24	1.54	1.31	1.09	1.22	0.91	0.71	1.21	1.53	-
19	Splitrock	1.45	1.21	1.14	1.45	-	1.07	-	-	0.55	0.65	0.56	-
20	Isabella	0.80	0.73	0.66	0.66	0.68	0.60	0.65	-	0.15	-	-	-
21	Red Lake-Pine Island	0.51	0.44	0.63	0.44	0.73	0.40	0.41	0.50	0.39	-	-	-
22	Northome	0.61	0.53	0.75	0.75	0.85	0.86	0.91	0.97	1.06	1.37	0.95	0.80
23	Kanabec County	0.61	0.65	0.84	0.59	0.55	0.70	0.48	0.55	0.65	0.53	0.76	-
24	Southern Pine	0.91	0.88	0.85	0.74	0.88	0.93	0.58	0.76	0.69	0.72	0.86	-
	DNR Region I	0.43	0.38	0.59	0.40	0.64	0.41	0.43	0.57	0.50	0.54	-	-
	DNR Region II	1.01	0.77	0.89	1.14	1.05	0.86	0.90	0.81	0.76	0.90	0.90	-
	DNR Region III	0.75	0.63	0.78	0.77	0.78	0.84	0.55	0.67	0.73	0.75	0.93	-

Registered furbearer population data

The following 4 tables and 4 figures are summaries of data compiled and analyzed by Bill Berg and Dave Kuehn on the four registered furbearers. This information was utilized by the Furbearer Management Committee in setting the 1987-88 seasons on these species.

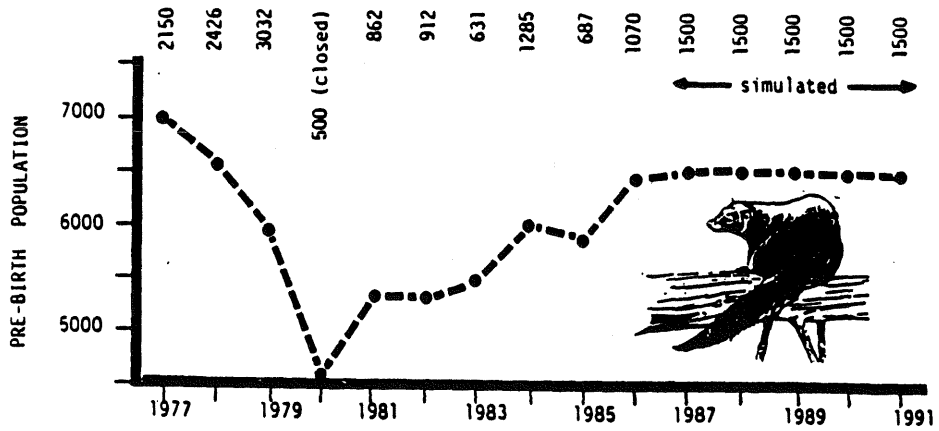

Figure 16. Fisher population model, 1977-1991, with registered harvests until 1986, and simulated registered harvests of 1500 after 1986. Non-harvest mortality is 30% summer, 25% winter for juvs.; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 5-10% in summer and winter, 1983-1987, to compensate for decreased prey availability. Harvest mortality was increased 25% over registration totals to compensate for unregistered and confiscated fisher.

FISHER, 1986-87

During the Nov. 29-Dec. 14 1986 fisher season 1068 fisher were registered. This total was 58% above 1985, and 22% above the 1981-85 mean harvest of 874 (Fig. 16).

A total of 1186 fisher carcasses were examined; the increase over the registered total was due to carcasses received from legal Leech Lake Indian Reservation Harvests, and confiscations by Division of Enforcement.

Juveniles comprised 59% of the harvest, the lowest since carcass examinations began in 1977, and below the 1977-85 mean of 66%. Yearlings and adults were 24% and 18%, respectively, of the harvest. Sex ratios were 48% males in the juvenile cohort (1977-85 $\bar{x}$ = 49%), and 44% males in the $\geq$1.7 year old cohort (1977-85 $\bar{x}$ = 40%). The number of juveniles per adult female ($\geq$2.7 year) remain low (5.3:1), similar to 1985 (5.4:1) and 1979-80 (5.6:1).

The 1986 registered harvest took 11% of the available fall population, compared to 8-15% in 1985-85, and 21-33% in 1977-79. Based on 1987 modeling, the population will stabilize at simulated post-1986 harvests of 1500, and increase about 10% annually with harvests approximating 1200 (Fig. 16).

Table 20. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1977 to 1986. Fisher taken in 1980-81 were on Indian Reservations.

	1977-78	1978-79	1979-80	1980-81	1981	1982	1983	1984	1985	1986
Season	12/1-1/31	12/1-1/31	12/1-1/31	closed	12/1-10	12/1-10	12/1-11	12/1-16	11/30-12/15	11/29-12/14
Limit	3	3	3	---	1	1	1	1	1	1
Registered take	2150	2426	3032	(423)	862	912	631	1289	678	1068
% of available population harvested[a]	24%	28%	39%	8%	15%	14%	9-10%	17-19%	9-12%	10-12%
No. carcasses examined	562	577	467	---	843	1073	662	1270	712	1186
% juveniles	69.2	69.8	64.8	---	66.2	66.4	68.9	62.9	62.8	58.8
% 1.7 yr.	16.4	16.5	14.6	---	23.8	18.9	18.0	19.8	19.6	23.5
% $\geq$ 2.7 yrs.	14.4	13.7	20.6	---	10.0	14.6	13.1	17.2	17.5	17.7
Juv:ad. female ratio	8.4:1	7.1:1	5.6:1	---	10.5:1	9.4:1	8.8:1	7.2:1	5.4:1	5.3:1
% male juveniles	53.5	43.7	53.5	---	48.0	46.0	45.2	51.9	45.8	47.8
% male 1.7 yrs.	28.2	34.7	45.6	---	42.7	40.9	39.5	45.6	40.3	50.4
% male $\geq$ 2.7 yrs.	43.2	27.8	43.8	---	36.9	51.6	40.2	44.7	33.8	36.7
Pelt price: males	$71	$132	$108	$90	$94	$70	$71	$70	$74	$84
females		$147	$128	$104	$110	$99	$121	$122	$130	$162
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Estimated from population model.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming route during the spring after fisher season.

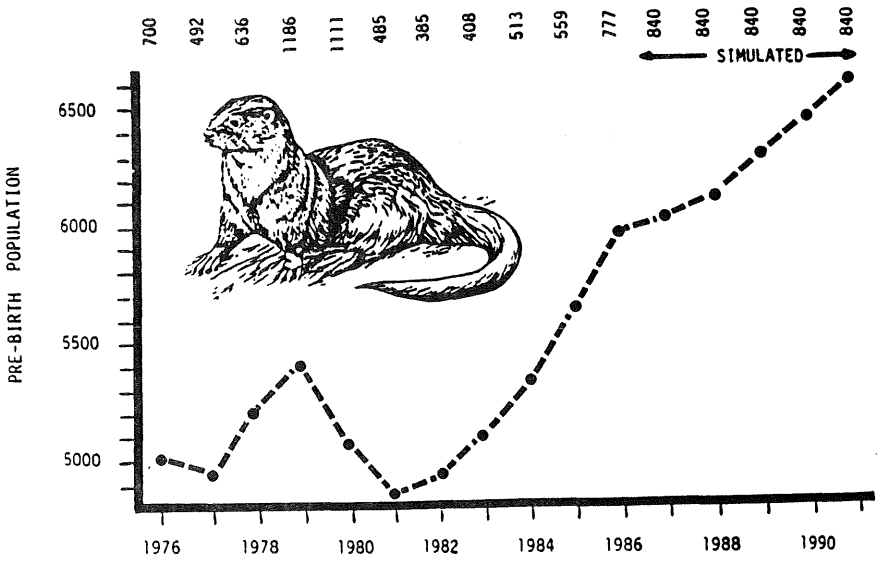

Figure 17. Otter population model, 1976-1991. Actual trapping harvests (top) until 1986 are followed by simulated projected harvests, 1987-1991. Non-harvest mortality for juveniles is 25% summer, 15% winter; for yearlings 10% summer, 10% winter; and for adults 6% summer, 6% winter. Harvest mortality was increased 20% over registration totals to compensate for accidentally trapped and confiscated fisher.

OTTER, 1986-87

During the November 1-30 otter trapping season, 777 otter were registered, up 40% from 1985. The increase was only slightly influenced by the increased otter trapping area (see harvest distribution map).

A total of 745 otter carcasses were aged. Juveniles comprised 45% (1981-85 $\bar{x}$ = 48%), yearlings (1-2 yr.) 23% (1981-85 $\bar{x}$ - 24%), and adults (> 2 yr.) 31% (1985-85 $\bar{x}$ = 21%). The proportions of otters in the juvenile, yearling, and adult age classes approximated their respective percent increases in the overall harvest (50%, 24%, 26%, respectively). The proportion of males in each harvested cohort was 6-9% lower than the 1985-85 means; the overall sex ratio was 48% males (1985-85 $\bar{x}$ - 54% males).

The modeled proportion of the available population harvested in 1986 was 13%, compared to a range of 9%-21% during 1976-85. Registered harvests of 840 annually after 1986 will allow the modeled otter population to increase 1%-3% annually (Fig. 17). If 1050 otters are registered yearly, the modeled population decreases 1%-2% annually after 1987.

Table 21. Otter harvest and sex-age data in Minnesota, 1978-86.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Season dates	12/1-5	11/15-29	11/15-29	11/14-28	11/13-27	11/12-26	11/17-12/1	11/16-12/15	11/1-11/30
Registered harvest	636	1186	1111	485	385	408	529	559	777
% of autumn population harvested[a]	11%	20%	20%	14%	12%	11%	10%	10%	13%
No. carcasses examined	49	36	88	471	389	433	549	572	745
% juveniles	61.2	69.4	54.5	55.0	50.6	42.3	47.9	43.4	45.2
% yearlings	26.5	19.4	14.7	19.7	25.6	30.9	23.3	22.9	23.3
% male juveniles	59.4	72.0	39.6	55.6	56.7	55.7	47.1	53.3	45.1
% males $\geq$ 1.7 yrs.	47.1	36.4	57.5	53.3	65.1	56.8	50.0	50.0	48.4
Mean pelt price:									
otter	$59	$63	$33	$30	$26	$25	$22	$21	$24
beaver (fall)	$18	$33	$18	$14	$11	$12	$12	$15	$20

[a] From population modeling; includes an additional 20% accidental harvest above carcass total. (See Fig. 17).

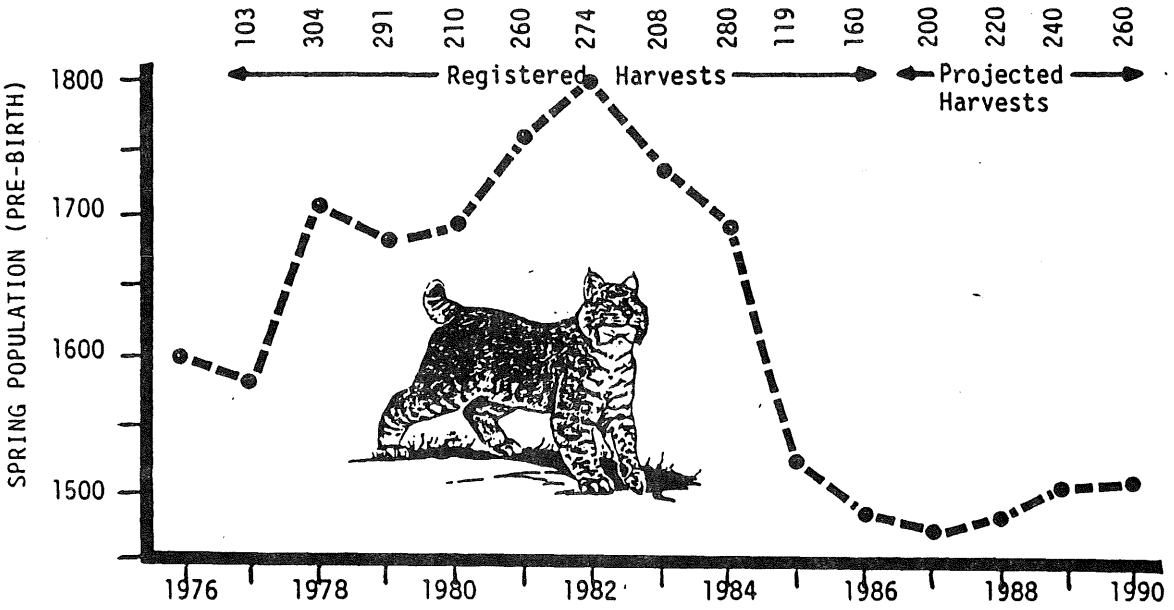

Figure 18. Bobcat population model, 1976-1990, with registered harvests until 1986, and projected harvests thereafter. Non-harvest mortality is 30% summer, 25% winter for juveniles; and 10% summer, 10% winter for yearlings and adults. Juvenile non-harvest mortality was increased 10-30% in summer and winter, 1982-1987, to compensate for decreased prey availability. Registered harvests were increased 10% to compensate for unregistered and confiscated bobcats.

BOBCATS, 1986-87

A total of 160 bobcats were registered during the Nov. 29, 1986 to Jan. 3, 1987 trapping and hunting season, an increase of 34% over 1985-86 but below the 1977-78 to 1984-85 mean of 241 (Fig. 18).

Of a total of 132 carcasses examined, 26% were juveniles ($\leq$1 yr.), 17% were yearlings (1-2 yr.), and 58% were adults ($\geq$2 yr.). The proportion of juveniles was the lowest (range 31-54%), and the proportion of adults ($\geq$2 yr.) was the highest (range 35-52%), since carcass collections began in 1977. Seventy-seven percent of the increase in the 1986-87 bobcat harvest was explained by an increase in the adult cohort harvest. Sex ratios in the juvenile and adult cohorts were unchanged from previous years; the yearling ratio (32% males) was the lowest since collections began ($\bar{x}$ = 56% males).

The 1986-87 harvest took an estimated 9% of the available population. As predicted from the 1985-86 model, this harvest rate stabilized the earlier population decline, and a harvest of approximately 200 in 1987-88 will permit a slight increase (Fig. 18).

Table 22. Bobcat harvest, carcass examination, scent post survey[a], and snowshoe hare index[b] data, 1977-78 to 1986-87.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Season dates	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/31	12/1-1/23	12/1-1/23	12/1-1/22	12/1-1/20	11/30-1/19	11/29-1/3
Registered take	103	304	291	210	260	274	208	280	119	160
Mean pelt price	$74	$164	$118	$79	$73	$66	$61	$76	$70	$120
No. carcasses	34	113	75	48	230	261	205	288	99	132
% juveniles	35	54	37	31	37	35	37	37	33	26
% 1.7 yrs old	18	15	12	33	23	15	18	13	19	17
% ≥ 2.7 yrs.	47	31	52	35	40	50	37	50	48	58
% male juveniles	50	61	54	80	59	47	56	52	41	53
% male 1.7 yrs.	33	53	44	69	63	49	56	66	41	32
% male ≥ 2.7 yrs.	41	60	53	56	55	47	51	44	43	51
% of autumn population harvested	5	14	14	10	12	14	11	15	7	9
Scent post index[a]	8	6	5	2	14	14	3	12	5	8
Snowshoe hare index[b]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5

[a] Derived from scent post surveys run the previous autumn in the Forest Zone.

[b] Number of snowshoe hares seen per 100 km of ruffed grouse drumming routes run in spring after the bobcat season.

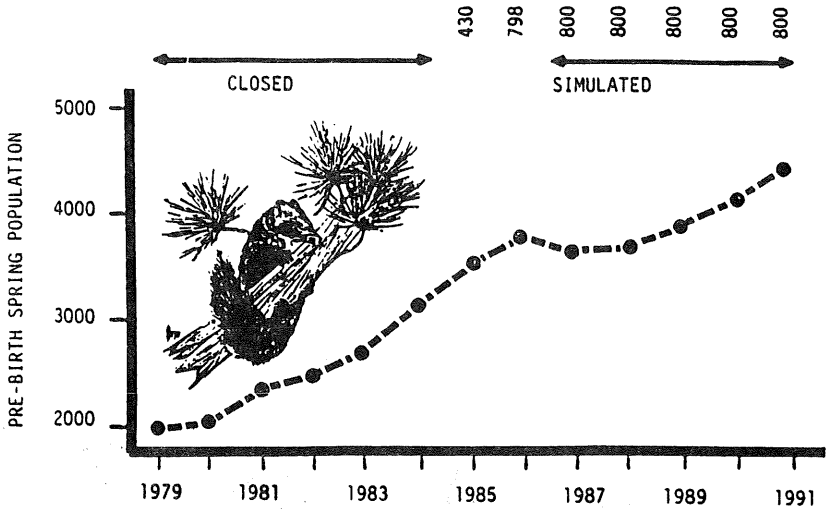

Figure 19. Pine marten population model, 1979 to 1991. Registered harvests are shown at top for 1985 and 1986, followed by projected harvests of 800 after 1986. Respective non-harvest summer-winter mortality for juveniles is 40% and 20%; for yearlings 10% and 10%; and for adults 10% and 10%. For modeling purposes the registered harvest was increased by an additional 50% to account for accidental take.

Table 23. Pine marten harvest and carcass examination data for martens accidentally taken during 1978-84 (combined), and during the 1985 and 1986 seasons.

	1978-84 (combined)	1985	1986
Season dates	----	11/30-12/15	11/29-12/14
Registered take	----	430	798
Carcasses examined	227	507	884
% juveniles	60	73	64
% 1.7 years old	30	18	21
% ≥ 2.7 years old	10	9	15
% male juveniles	68	69	65
% male 1.7 years old	71	68	71
% male ≥ 2.7 years old	91	82	81
Juv/≥ 2.7 year old female	68	45	24
% of autumn population tagged (derived from modeling)	----	18	22

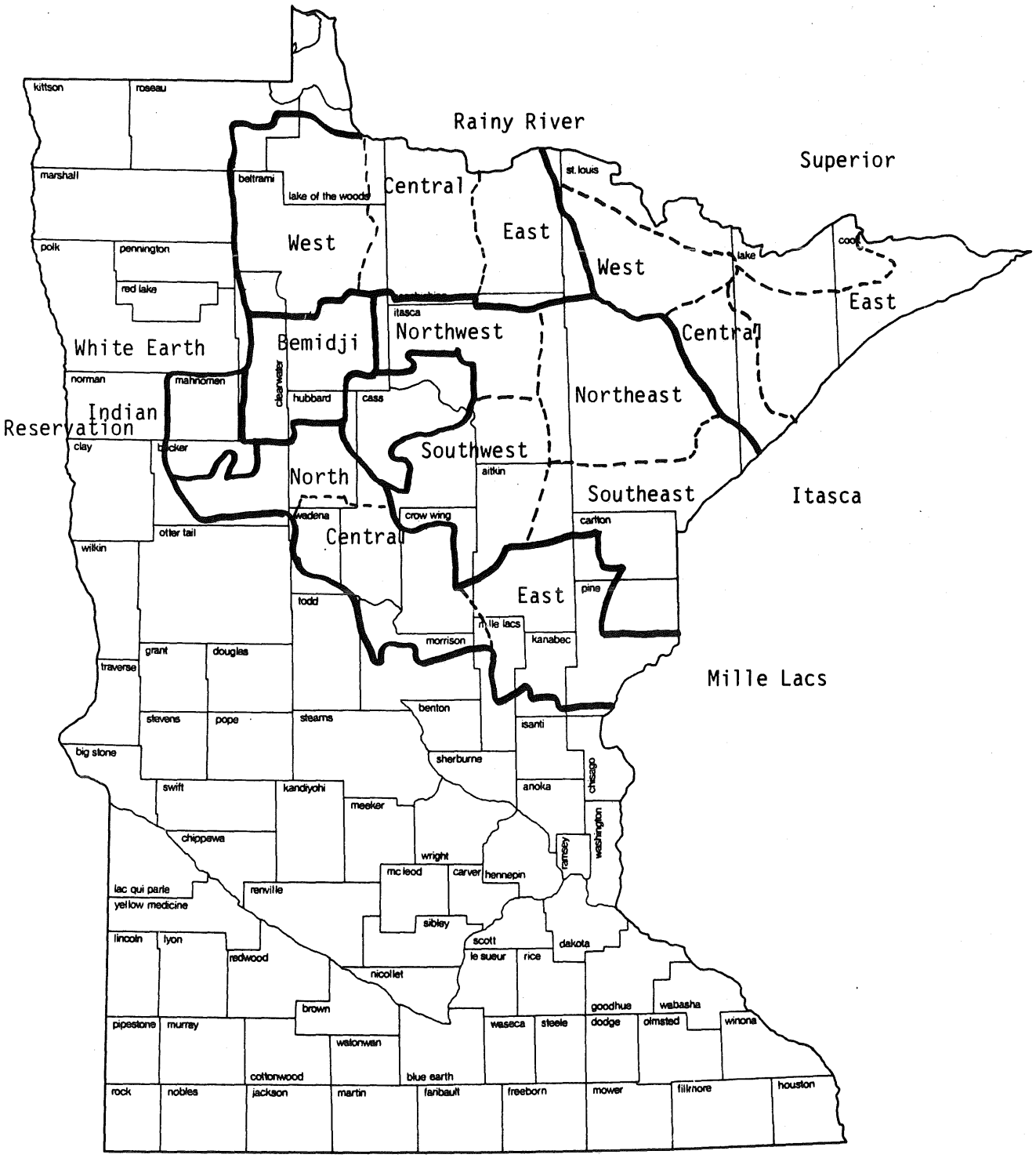

Figure 20. Deer management units and subunits in the Forest Zone.

Table 24. Estimated pre-fawning deer density (deer/sq. mile) as determined by pellet counts, 1980-87. Numbers in parentheses represent 95% confidence intervals.

Area	Year													
	1980		1981		1982		1983		1984		1985		1986		1987	
Itasca DMU																
NW	17.0	(3.9)	22.9	(4.3)	22.4	(4.5)	-------		20.8	(4.2)	29.6	(5.9)	12.4	(2.9)	14.5	(4.5)
SW	14.5	(4.1)	16.9	(4.7)	17.6	(4.7)	21.0	(6.2)	17.0	(3.8)	19.1	(5.0)	12.9	(3.7)	16.1	(4.8)
NE	14.9	(3.6)	16.7	(3.8)	14.1	(3.5)	14.2	(3.6)	11.5	(3.6)	15.8	(3.4)	15.4	(4.5)	18.0	(5.0)
SE	12.0	(5.2)	18.1	(5.3)	10.8	(4.2)	15.4	(4.9)	12.8	(4.0)	18.6	(5.2)	14.0	(3.8)	20.0	(4.2)
Rainy River DMU																
West	10.9	(3.7)	-------		13.9	(5.9)	-------		12.8	(4.2)	-------		7.8	(3.7)	17.4	(5.5)
Central	8.2	(2.6)	-------		11.4	(6.0)	-------		10.7	(6.3)	10.8	(5.3)	13.2	(5.1)	-------	
East	21.8	(6.9)	19.1	(5.1)	9.2	(3.3)	21.8	(6.9)	15.1	(4.1)	16.9	(4.8)	15.6	(5.2)	13.5	(3.8)
Mille Lacs DMU																
West	12.4	(3.3)	17.8	(4.7)	18.0	(5.2)	-------		12.3	(2.7)	18.8	(4.4)	15.2	(4.0)	10.9	(4.5)
Central	7.6	(2.4)	11.3	(4.1)	17.4	(4.7)	16.1	(4.7)	17.2	(4.5)	15.5	(3.7)	13.9	(4.0)	13.2	(4.1)
East	9.4	(2.5)	14.1	(2.8)	14.1	(3.7)	15.8	(3.2)	12.8	(3.2)	10.9	(2.7)	9.8	(2.7)	12.3	(2.9)
Superior DMU[a]																
West	15.1	(3.4)	21.4	(5.0)	15.4	(2.9)	-------		18.2	(7.1)	24.4	(4.0)	21.8	(5.4)	16.6	(3.7)
Central	10.2	(3.3)	15.2	(5.6)	16.2	(10.2)	-------		14.1	(5.2)	15.0	(3.2)	13.3	(6.0)	17.0	(5.5)
East	4.8	(1.7)	-------		-------		-------		-------		-------		-------		-------	
Bemidji DMU	-------		11.4	(3.5)	17.7	(5.4)	20.1	(6.9)	14.9	(3.8)	12.9	(4.0)	11.8	(3.3)	13.0	(3.7)
Agassiz NWR	12.4	(6.7)	21.3	(6.7)	24.4	(8.8)	25.6	(8.4)	-------		-------		-------		-------	
Aitkin County	19.5	(5.7)	15.9	(4.0)	23.0	(7.5)	26.3	(6.2)	19.2	(5.8)	21.1	(6.0)	18.4	(6.0)	19.1	(4.2)
Aitkin SE1/4 T44, R22	-------		19.6	(5.8)	-------		24.8	(7.0)	10.2	(3.7)	10.3	(2.7)	30.3	(8.8)	-------	
Bearville Study Area	31.2	(9.5)	39.4	(6.9)	39.5	(8.7)	38.0	(5.8)	15.6	(4.3)	42.9	(7.2)	21.1	(4.4)	-------	
Camp Ripley	17.0	(5.1)	19.2	(5.2)	31.0	(8.2)	31.6	(7.1)	47.0	(12.4)	39.3	(9.7)	30.5	(9.7)	38.7	(11.8)
Chippewa NF	-------		-------		15.8	(4.2)	17.6	(3.9)	15.9	(3.5)	19.1	(3.4)	12.5	(2.2)	13.7	(2.1)
Elephant Lake	31.3	(6.5)	36.9	(6.2)	-------		34.0	(8.0)	39.0	(13.0)	-------		-------		-------	
Garden Lake Deer Yard	-------		-------		-------		-------		-------		30.6	(7.5)	13.2	(4.0)	-------	
Itasca County	-------		-------		-------		-------		18.7	(3.2)	23.6	(3.9)	12.6	(2.4)	-------	
Leech Lake IR	-------		-------		13.3	(3.6)	14.1	(3.7)	11.8	(3.8)	11.9	(2.9)	8.6	(2.4)	8.6	(2.0)
Mille Lacs WMA	24.9	(6.6)	30.5	(11.2)	35.7	(11.7)	24.2	(6.6)	17.5	(4.5)	10.0	(3.7)	15.6	(7.4)	16.9	(4.5)
St. Croix State Park	45.0	(21.2)	39.6	(9.6)	53.3	(14.7)	41.6	(9.5)	49.8	(11.9)	-------		-------		34.7	(9.2)
Tamarac NWR	-------		70.7	(13.5)	69.1	(25.3)	62.5	(14.7)	46.7	(14.0)	36.5	(11.0)	40.1	(12.0)	26.7	(8.2)
White Earth IR	6.3	(2.9)	4.1	(1.9)	10.1	(5.8)	11.4	(4.3)	10.2	(4.9)	17.3	(5.6)	8.9	(3.8)	9.9	(3.8)

[a] No pellet counts were conducted in the Boundary Waters Canoe Area or the Voyageurs National Park.

Table 25. Spring deer densities estimated from population modeling in DMU's of Minnesota's Forest zone, 1982-87.

DMU	Deer per square mile						Goal
	1982	1983	1984	1985	1986	1987	
Itasca							
Northwest	22.3	21.9	20.2	18.4	16.2	14.7	15-20
Southwest	18.1	17.9	17.3	16.6	15.5	15.0	15-20
Northeast	14.9	15.2	15.3	15.7	15.8	15.8	15-20
Southeast	15.9	16.4	16.2	16.3	16.3	16.1	10-15
Bemidji	20.0	19.6	17.8	15.2	13.4	11.8	10-15
Leech Lake I.R.	13.3	12.6	11.4	10.5	9.6	8.4	10-15
Mille Lacs							
West	18.0	17.8	16.6	14.9	13.4	12.5	10-15
Central	17.5	18.4	17.7	15.6	13.9	12.0	10-15
East	13.2	13.0	12.3	11.5	11.2	11.2	10-15
White Earth I.R.	10.1	10.3	10.3	10.3	10.2	10.1	10-15
Rainy River							
West	14.0	13.8	13.1	12.1	11.3	11.5	10-15
Central	11.4	11.6	11.0	10.7	10.8	10.9	10-15
East	15.9	16.3	16.0	15.9	15.7	15.6	15-20
Superior							
West	18.6	19.3	19.5	19.6	19.3	18.8	15-20
Central	13.7	14.2	14.3	14.6	14.6	14.5	10-15

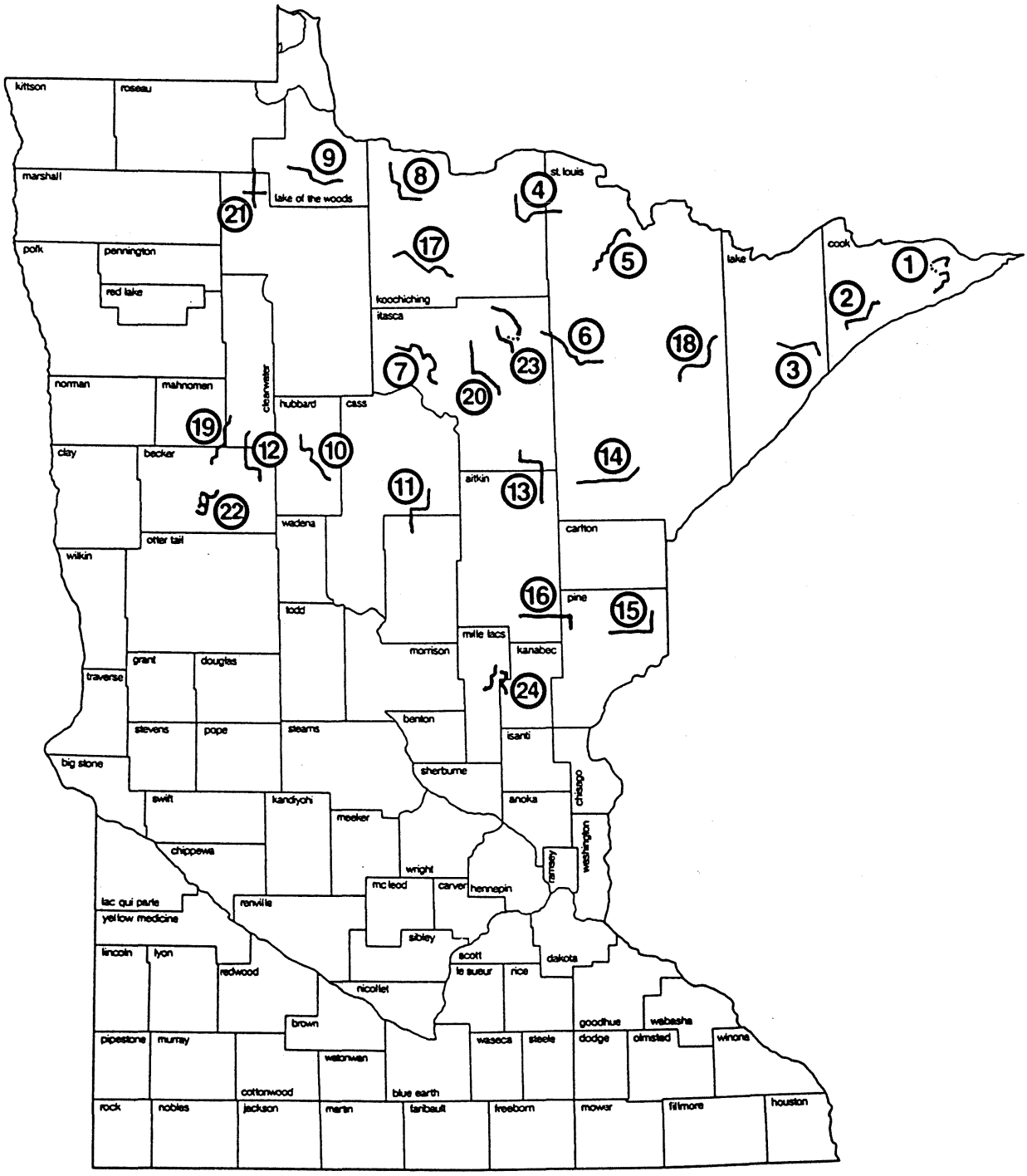

Figure 21. Location of 24 bear bait routes.

Table 26. Percentage of baits on each bait route taken by bears. All baits (50 per route) except those entirely removed by other animals were considered available to bears. Location of routes is shown in Fig. 21.

Route No.	1980[a]	1981	1982	1983	1984	1985	1986	1987
1	16	33	22	41	38	22	10	17
2	32	22	14	15	10	30	22	38
3	10	2	37	44	14	26	38	38
4	24	60	22	54	33	47	45	49
5	26	54	31	44	28	29	45	28
6	21	27	17	18	30	44	37	26
7	23	45	19	43	18	26	47	22
8	16	14	8	10	44	46	69	41
9	20	40	16	27	20	30	15	10
10	6	23	26	44	24	31	22	15
11	4	22	12	31	21	39	38	22
12	11	44	22	65	37	27	21	21
13	12	40	24	40	30	33	34	26
14	10	4	16	14	4	18	11	27
15	6	36	24	22	24	35	30	34
16				36	24	19	38	23
17				19	49	66	24[b]	28
18				8	20	42	20	43
19				28	10	18	25	15
20		48	69	66	35	45	40	20
21					6	6	2	19
22					20	8	14	11
23						28	40	36
24						20	35	54
Mean of all routes	16	32	24	33	24	31	30	28
Mean of routes 1-15 & 20		32	24	36	26	33	33	27

[a] 1980 data may not be directly comparable to other years because a different type of bait was used, and all routes except #1, 2, 3, 6 & 14 were conducted after July 14.

[b] Vehicle breakdown; only 29 baits set.

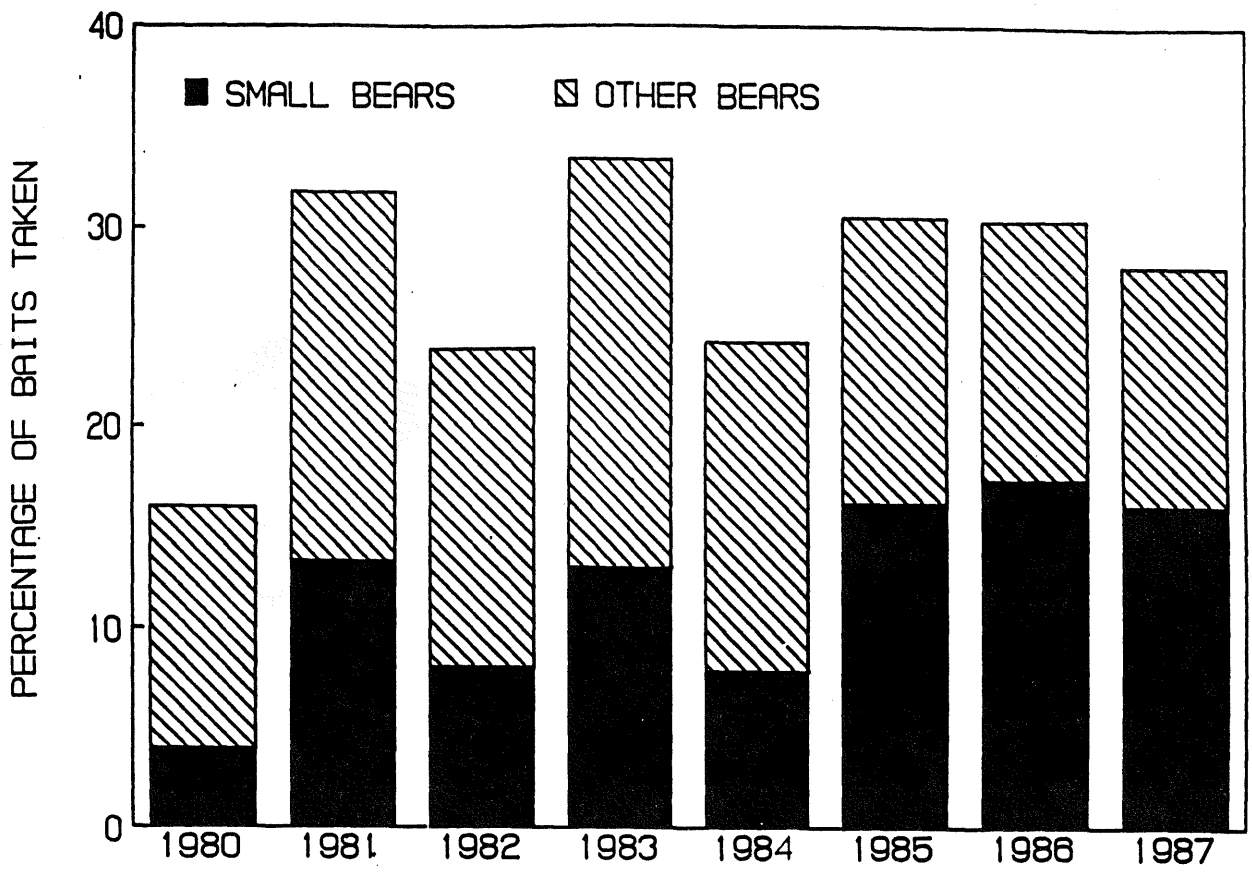

Figure 22. Percentage of baits taken by bears during bait-station survey in early July, 1980-87. Bear visitation typically was indicated by claw marks on the bait tree. Small bears were identified by claw marks low on the tree, where the hind feet were used to enable the bear to reach the bait. Data from 1980 may not be comparable to other years because a different type of bait was used and most of the routes were run 2-3 weeks later than in other years.

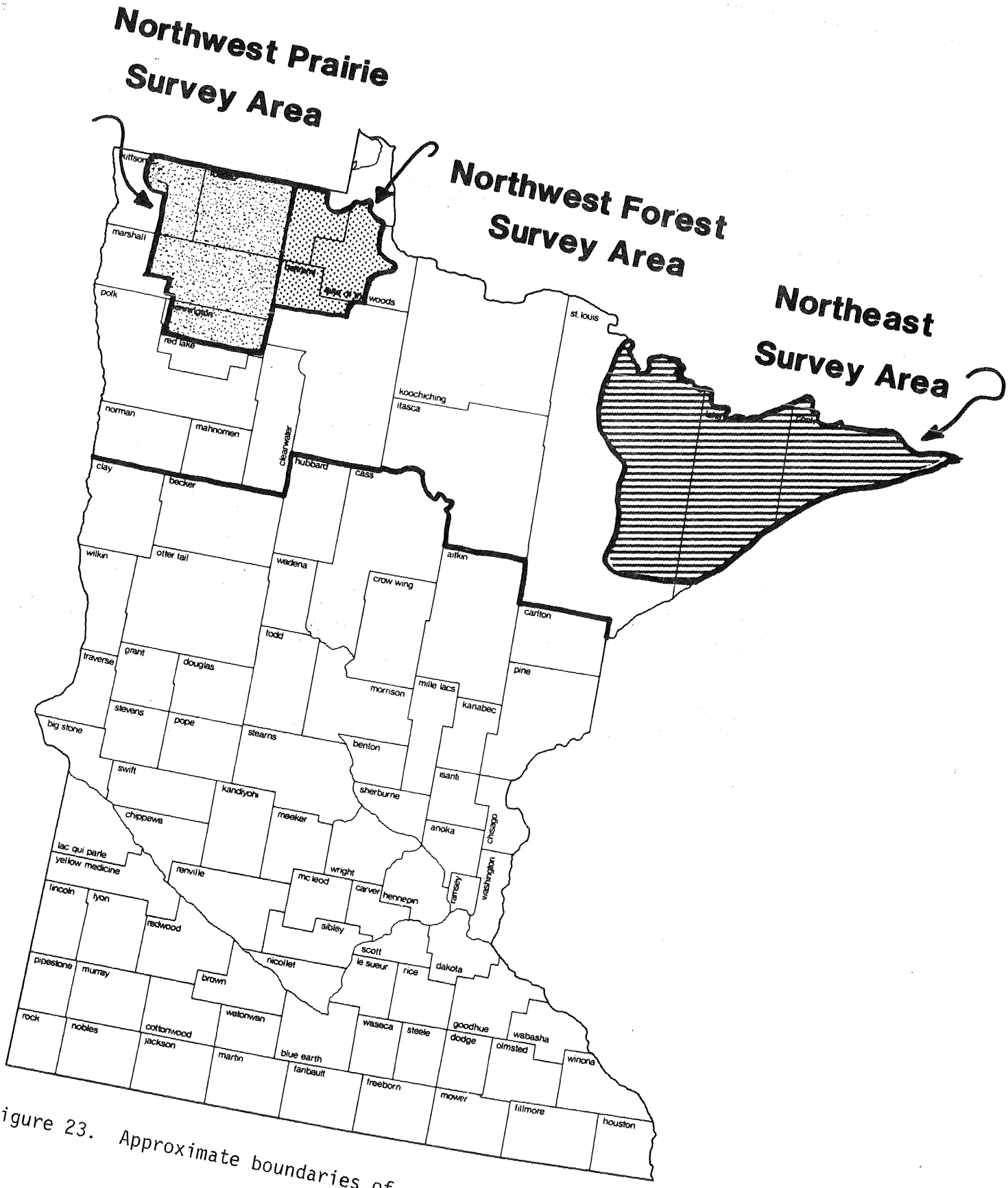

Figure 23. Approximate boundaries of aerial moose survey.

Table 27. Moose population estimates from aerial moose survey in Minnesota (± 90% Confidence Interval).

Area	Sq. miles[a]	1982-83	1983-84	1984-85	1985-86	1986-87	% change 1985-86 to 1986-87
Northeast	4809	4877 (999)	4274 (925)	5518 (1494)	4955 (1034)	6120 (1438)	+23.5
Northwest Forest	1779	370 (124)	446 (139)	578 (148)	433 (100)	307 (83)	-29.1
Northwest Prairie	2126	3772 (930)	2784 (567)	4086 (518)	3415 (412)	3740 (747)	+ 9.5

[a] Total land area within survey zone excluding agricultural areas. Does not include area of lakes more than 10 acres.

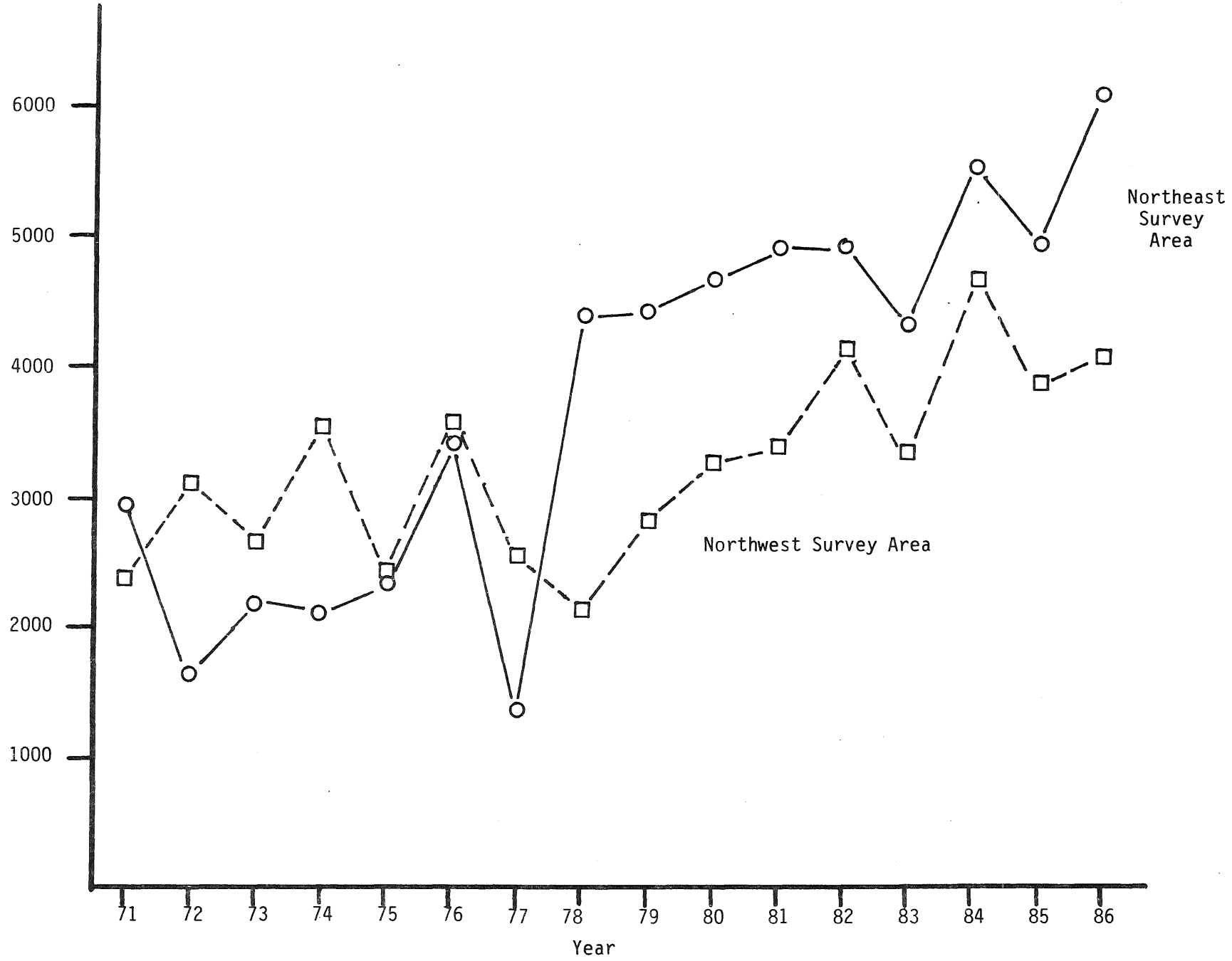

Figure 24. Moose population estimates in the two survey areas, 1971-1986. (Northwest prairie and Northwest forest areas combined in Northwest Survey Area).

MIGRATORY BIRD POPULATIONS

AND CENSUSES

Table 28. Estimated number of breeding ducks in Minnesota Strata I, II and III (1968-1987).

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Mallard	1968	45,005	2.04	92,000
	1969	53,167	1.67	89,000
	1970	67,463	1.72	116,000
	1971	48,807	1.64	80,000
	1972	49,137	1.27	62,000
	1973	64,954	1.32	85,000
	1974	52,917	1.67	88,000
	1975	55,666	1.60	89,000
	1976	70,362	1.81	127,000
	1977	60,755	2.27	138,000
	1978	56,152	2.70	152,000
	1979	63,516	2.70	171,000
	1980	83,775	1.99	167,000
	1981	80,110	2.19	175,000
	1982	51,655	2.66	137,000
	1983	74,995	2.04	153,000
	1984	94,514	2.22	210,000
	1985	96,045	2.32	223,000
	1986	108,328	2.16	234,000
	1987	165,881	1.16	192,000
Blue-winged teal	1968	64,431	2.44	157,000
	1969	45,180	3.70	167,000
	1970	31,682	5.00	158,000
	1971	43,464	3.45	150,000
	1972	49,926	1.96	98,000
	1973	127,398	2.17	276,000
	1974	46,941	2.70	128,000
	1975	45,727	3.20	146,000
	1976	90,023	4.16	374,000
	1977	37,532	5.26	197,000
	1978	28,491	8.33	237,000
	1979	46,825	4.54	213,000
	1980	51,185	6.25	320,000
	1981	64,546	4.17	269,000
	1982	42,167	6.45	272,000
	1983	44,028	2.24	99,000
	1984	89,897	2.93	263,000
	1985	90,453	3.23	292,000
	1986	68,234	2.69	184,000
	1987	102,479	1.99	204,000

Table 28. Continued.

Species	Year	Unadjusted population index	Visibility factor[a]	Adjusted population estimate[b]
Other ducks[b]	1968	57,790	2.06	119,000
	1969	44,324	2.27	101,000
	1970	42,927	2.25	97,000
	1971	35,986	2.22	80,000
	1972	45,927	1.67	77,000
	1973	101,671	1.96	199,000
	1974	84,460	2.44	206,000
	1975	43,894	3.60	141,000
	1976	62,205	2.41	148,000
	1977	21,650	4.34	94,000
	1978	43,071	4.16	150,000
	1979	39,749	3.70	147,000
	1980	55,372	2.77	153,000
	1981	50,792	3.37	171,000
	1982	54,018	5.18	280,000
	1983	42,649	3.74	160,000
	1984	56,008	1.84	103,000
	1985	42,428	2.06	87,000
	1986	45,147	2.59	117,000
	1987	87,052	2.51	219,000
All ducks	1968	167,226	--	368,000
	1969	142,671	--	357,000
	1970	142,072	--	371,000
	1971	128,257	--	310,000
	1972	144,990	--	237,000
	1973	294,023	--	561,000
	1974	184,318	--	422,000
	1975	145,287	--	376,000
	1976	222,590	--	649,000
	1977	119,937	--	429,000
	1978	121,451	--	539,000
	1979	150,090	--	531,000
	1980	194,883	--	640,000
	1981	195,448	--	615,000
	1982	147,840	--	689,000
	1983	161,672	--	412,000
	1984	240,419	--	576,000
	1985	228,926	--	602,000
	1986	221,709	--	534,000
	1987	355,412	--	615,000

[a] Visibility factors for all ducks are calculated without mallards and blue-winged teal. The 1981 values for mallards and blue-winged teal are unweighted.

[b] 1979 excludes 156,000 lesser scaup and 1982 includes 120,000 lesser scaup.

Table 29. Winter population estimates (post hunting season) of the Canada goose eastern prairie flock, 1963-86 (taken from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp).

Year	Population
1963	110,000
1964	103,000
1965	104,000
1966	121,000
1967	145,000
1968	134,000
1969	107,000
1970	121,000
1971	152,000
1972	177,000
1973	187,000
1974	188,000
1975	199,000
1976	254,000
1977	270,000
1978	207,000
1979	172,000
1980	151,000
1981	175,000[a]
1982	210,000
1983	163,000[b]
1984	168,000
1985	169,000
1986	183,000

[a] In 1983, U.S.F.W.S. revised a previously published estimate (145,000) due to supplemental information.

[b] Supplemental information suggests that the 1983 population was 170,000 - 190,000 birds.

Table 30. Summary of the number of May ponds (adjusted for visibility) in Prairie Canada (portions of Alberta, Saskatchewan and Manitoba) 1961-87 and north-central U.S. (North Dakota, South Dakota and Montana) 1974-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service, 1987. 1987 Status of waterfowl and fall flight forecast. July 1987. 40pp).

Year	Ponds (thousands)	
	Prairie Canada	North Central U.S.[a]
1961	2,006	--
1962	2,531	--
1963	2,499	--
1964	3,445	--
1965	4,415	--
1966	4,672	--
1967	4,732	--
1968	1,938	--
1969	3,530	--
1970	4,957	--
1971	4,096	--
1972	4,065	--
1973	2,937	--
1974	6,693	1,509
1975	6,267	1,911
1976	5,057	1,392
1977	2,278	771
1978	3,622	1,590
1979	4,859	1,522
1980	2,141	761
1981	1,443	683
1982	3,185	1,458
1983	3,906	1,259
1984	2,458	1,766
1985	4,283	1,327
1986	4,025	1,735
Average	3,694	1,360
1987	2,598	1,348
% Change in 1987 from:		
1986	-35	-22
Average	-30	- 1

[a] No comparable survey data available for the north-central U.S. during 1961-73.

Table 31. North American breeding population estimates for 10 species of ducks, 1955-87. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1987. 1987 Status of waterfowl and fall flight forecast; July 1987. 40pp). In thousands.[a]

Year	Mallard	Gadwall	American wigeon	Green-winged teal	Blue-winged teal	Northern shoveler	Northern Pintail	Redhead	Canvasback	Scaup
1955	10,345	1,106	3,333	2,076	6,436	1,965	9,251	733	595	7,100
1956	11,711	1,202	3,712	1,898	6,267	2,084	10,124	928	692	6,595
1957	10,946	1,102	3,208	1,293	5,449	1,744	6,856	684	600	6,535
1958	12,904	687	3,372	1,618	5,799	1,515	6,889	524	713	6,040
1959	10,292	683	3,779	3,153	5,300	1,649	7,228	641	481	8,220
1960	8,206	873	3,165	1,630	4,303	1,859	5,769	542	575	5,566
1961	8,290	1,422	3,219	2,216	4,833	1,625	4,860	437	396	6,764
1962	6,144	1,610	2,721	1,119	3,890	1,633	4,299	664	385	6,398
1963	7,360	1,578	2,209	1,754	4,587	1,435	4,361	396	523	6,564
1964	6,974	1,223	2,630	2,051	4,943	1,685	4,111	560	658	6,326
1965	5,948	1,692	2,695	1,526	4,628	1,607	4,301	568	505	5,383
1966	7,401	1,976	2,901	2,219	5,616	2,272	5,777	747	683	5,421
1967	8,205	1,638	2,637	1,944	4,715	2,244	5,870	846	556	5,877
1968	7,586	2,098	2,783	1,805	3,697	1,811	4,225	502	557	5,971
1969	8,065	1,837	3,192	1,991	4,514	2,150	6,390	759	530	6,338
1970	10,379	1,698	3,752	2,259	5,633	2,269	7,004	834	601	6,930
1971	9,843	1,733	3,425	2,352	5,426	2,052	6,291	693	441	6,149
1972	9,867	1,776	3,428	2,407	5,673	2,505	7,875	489	429	9,527
1973	8,781	1,198	3,665	2,444	4,866	1,657	5,114	754	696	7,535
1974	7,392	1,562	3,003	2,221	5,437	2,060	7,165	613	493	7,045
1975	8,109	1,672	2,862	2,038	6,441	1,994	6,387	974	706	7,846
1976	8,637	1,478	2,699	1,844	5,023	1,818	6,045	946	686	6,973
1977	8,226	1,546	2,678	1,952	4,626	1,616	4,971	688	702	7,490
1978	7,695	1,593	3,808	2,978	4,497	2,162	5,664	833	423	7,125
1979	8,444	1,889	3,388	2,920	5,278	2,555	6,070	774	606	9,135
1980	8,003	1,459	3,857	2,925	4,903	2,050	5,420	1,146	688	7,690
1981	6,757	1,479	3,555	2,515	4,076	2,403	4,227	825	594	7,253
1982	6,684	1,690	3,159	2,247	3,879	2,540	4,112	674	543	6,549
1983	7,107	1,536	2,923	2,574	3,381	2,237	4,086	866	528	8,788
1984	5,974	1,799	3,979	1,804	3,870	2,222	3,664	849	569	8,402
1985	5,475	1,410	2,506	1,873	3,756	1,925	2,935	701	411	6,235
1986	6,303	1,590	2,446	2,588	4,664	2,403	3,201	956	442	6,252
1987	6,691	1,705	2,734	3,041	3,618	2,229	3,137	767	478	6,261
Goals[b]	8,700	1,600	3,300	2,300	5,300	2,100	6,300	760	580	7,600
1955-86 Ave.	8,252	1,495	3,147	2,132	4,888	1,992	5,642	723	563	6,938
Percent Change in 1987 From:										
1986	+ 6	+ 7	+12	+18	-22	- 7	- 2	-20	+ 8	NC
1955-86 Ave.	-19	+14	-13	+43	-26	+12	-44	+ 6	-15	-10

[a] All duck indexes adjusted for visibility bias.

[b] Breeding duck population goals, from North American Waterfowl Management Plan (FWS-CWS 1986).

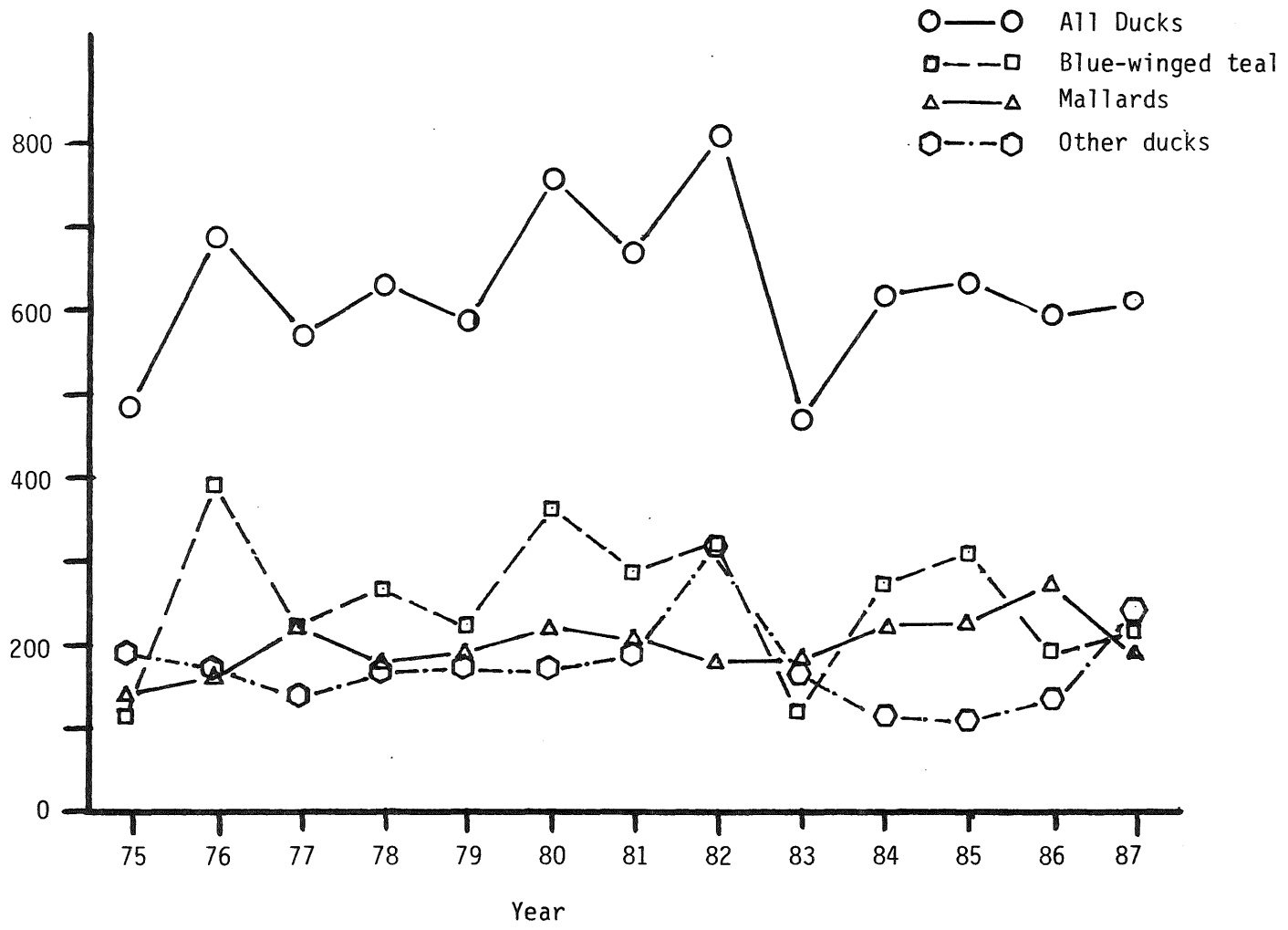

Figure 25. Estimated number of ducks breeding in Minnesota, 1975-87.

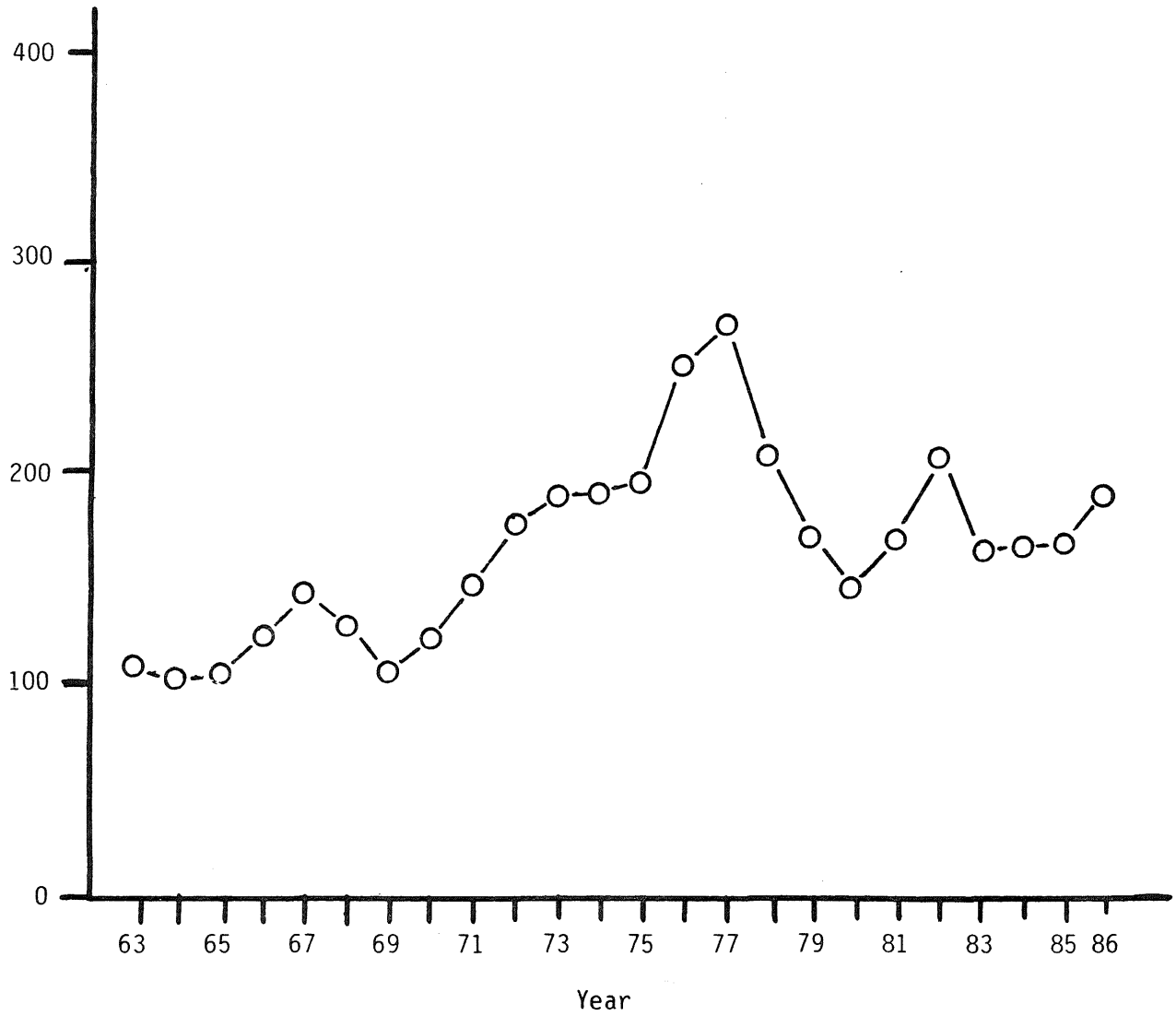

Figure 26. Winter population estimates of the Eastern Prairie Population of Canada geese, 1963-86. (data from U.S. Fish and Wildlife Service/Canadian Wildlife Service reports on status of waterfowl and fall flight forecasts).

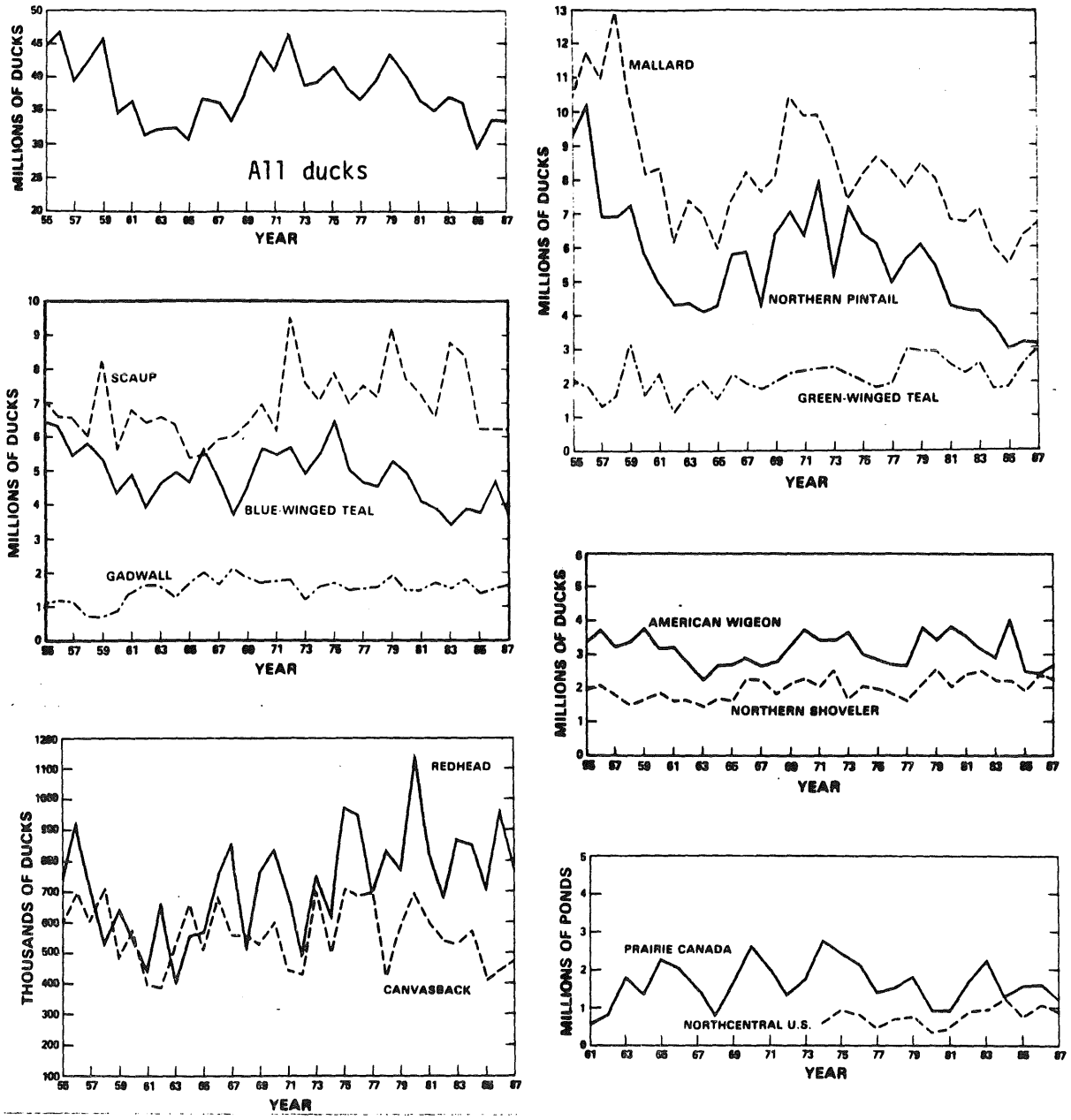

Figure 27. Estimates of North American breeding populations of selected ducks, and winter population estimates for black ducks. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987. 40pp).

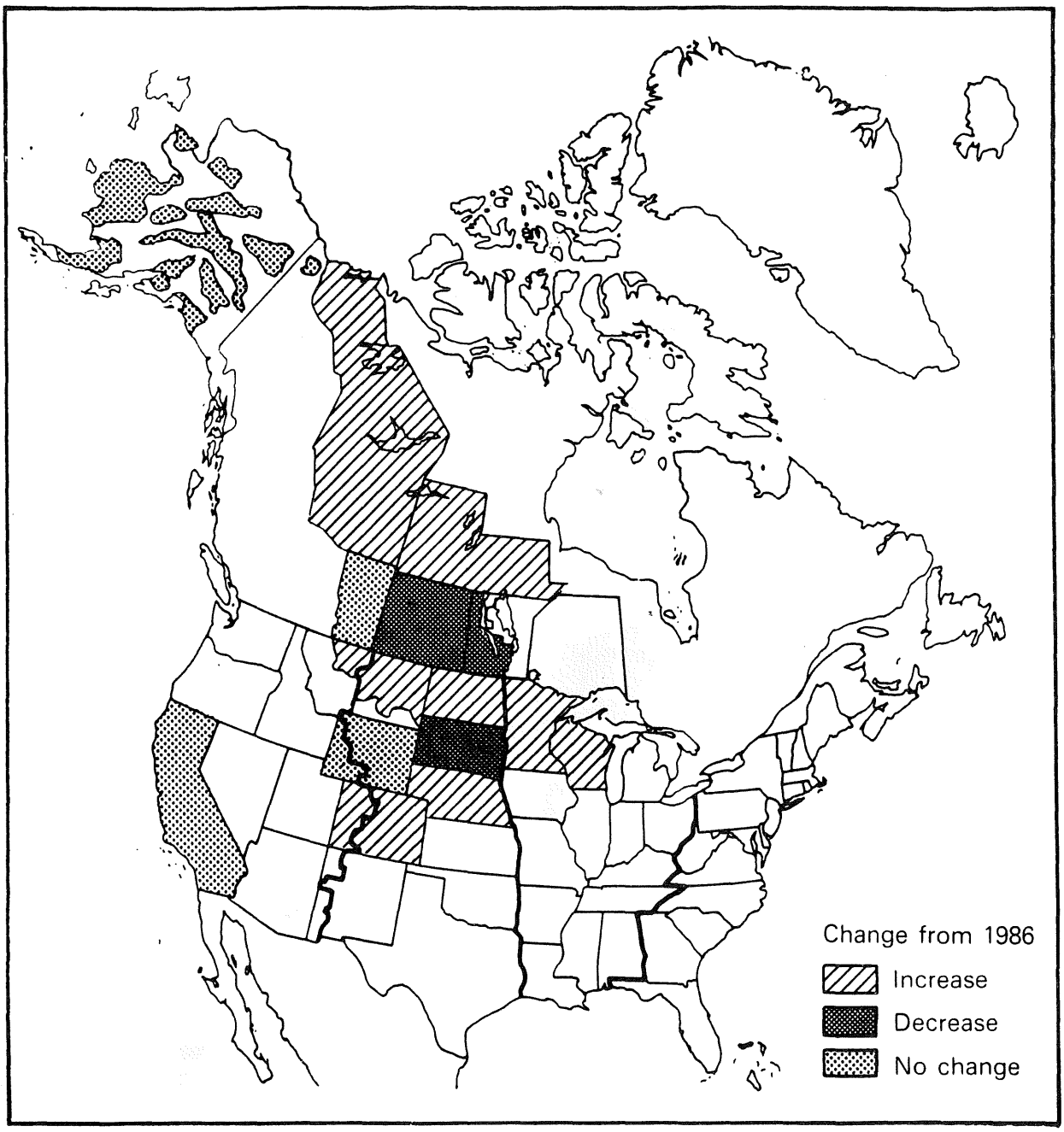

Figure 28. Fall 1987 duck flight forecast for Canada and the U.S., change from 1986; forecast: increase. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

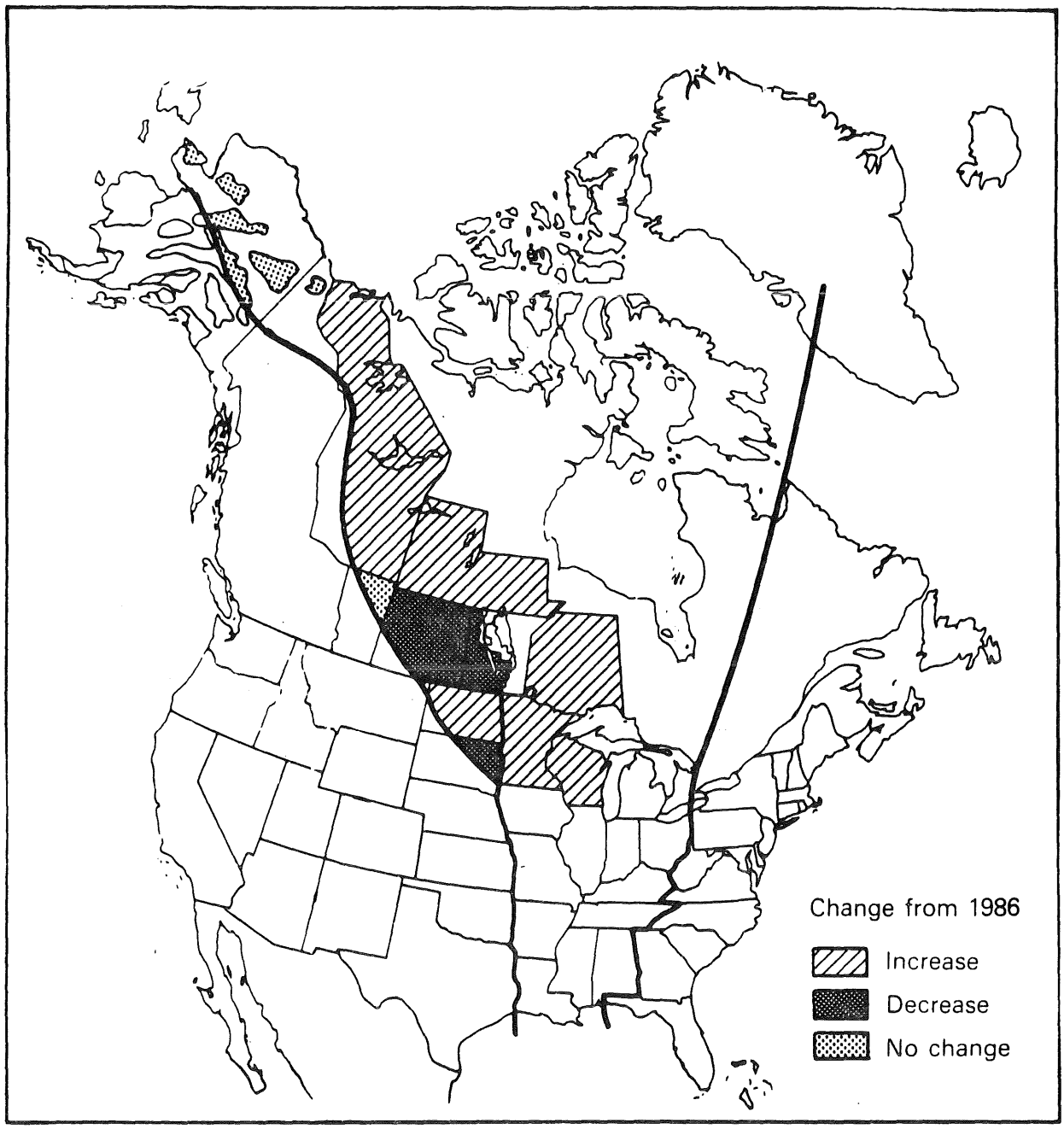

Figure 29. Fall 1987 duck flight forecast for the Mississippi Flyway, change from 1986; forecast: no change. (from U.S. Fish and Wildlife Service/Canadian Wildlife Service 1987. 1987 Status of waterfowl and fall flight forecasts. July 25, 1987).

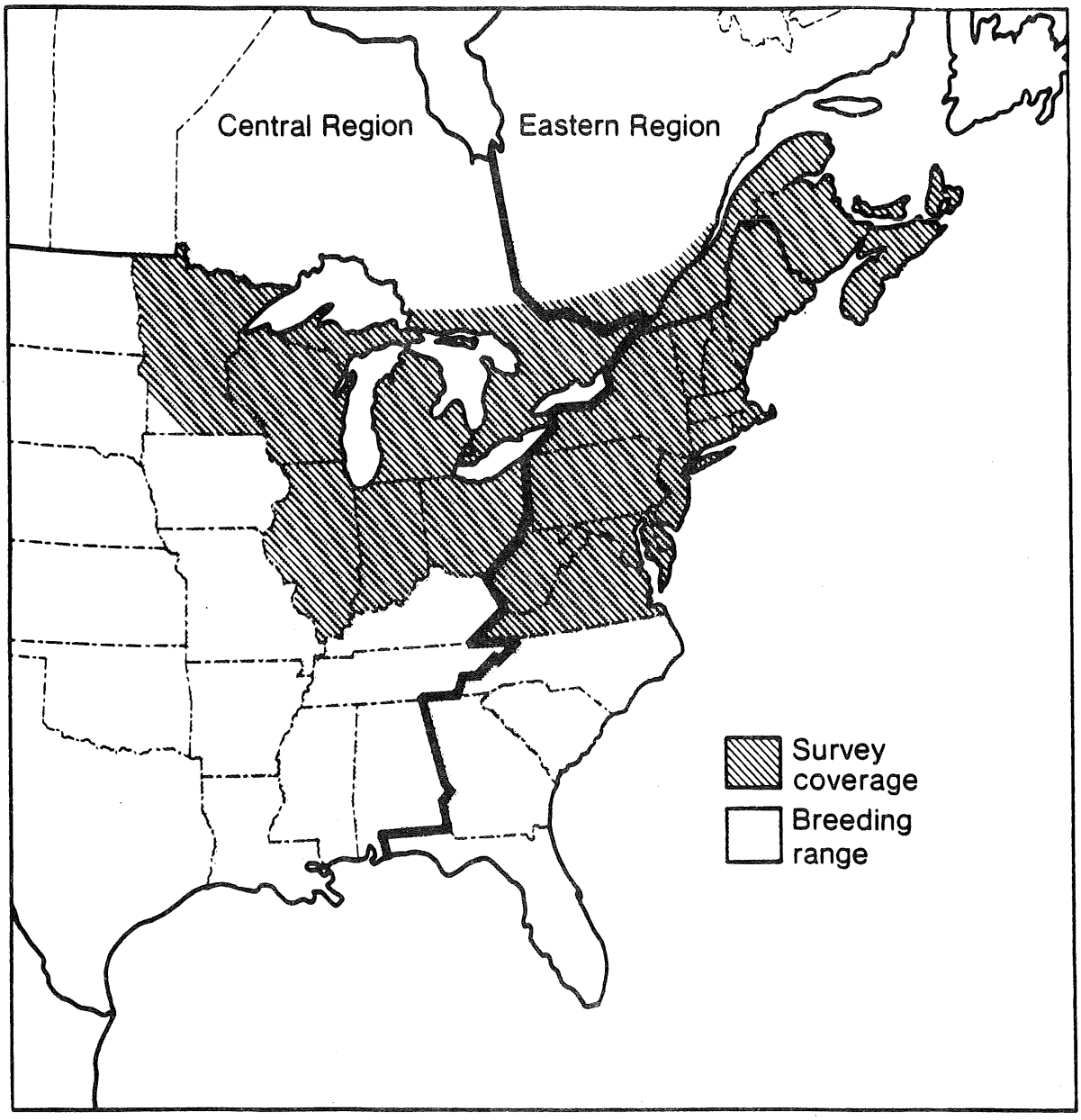

Figure 30. Approximate woodcock breeding range and states covered in singing ground survey. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

Table 32. Woodcock breeding population indices in the U.S. Central Region as indicated by singing-ground surveys in 1986 and 1987 (from: Bortner, J.B. 1987. American woodcock harvest and breeding status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 11pp).

State or Province	Number of routes conducted 1986	1987	Comparable routes[a]	Woodcock heard per comparable route 1986	1987	Percent change
IL	11	7	98	0.04	0.04	0.0
IN	17	14	61	0.48	0.57	20.8
MI	99	115	109	4.84	4.54	-6.3
MN	73	77	99	2.84	2.81	-1.1
OH	27	31	78	0.59	0.68	15.1
ON	100	98	89	6.16	6.00	-2.2
WI	72	77	106	2.85	3.00	6.0
Totals	399	419	640			
			Weighted Averages[b]	3.59	3.54	-1.4

[a] Includes routes carried as constant zero routes.

[b] Computed for States or Provinces where one comparable route represents less than 2,000 sq. mi. (5,180 sq. km.) and more than 0.5 birds were heard per route. Data from Delaware, Connecticut, Illinois, Indiana, Maryland, Rhode Island, Virginia and Quebec did not meet these criteria.

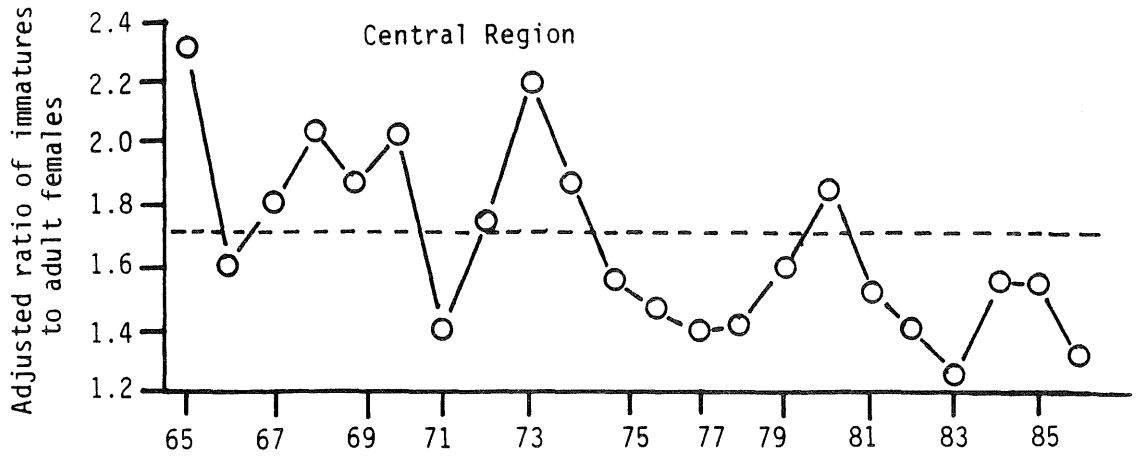

Figure 31. Adjusted index of American woodcock recruitment, 1965-1986, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

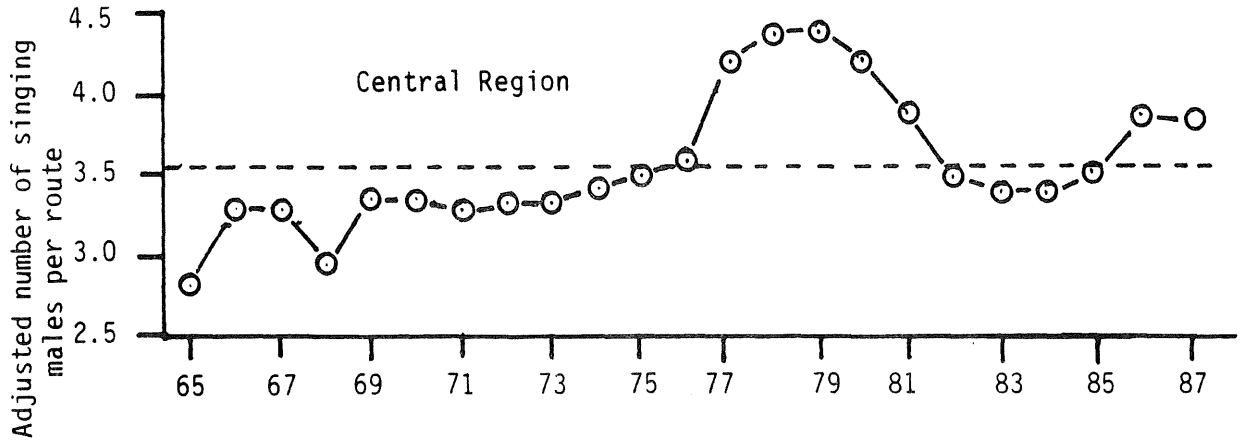

Figure 32. Adjusted index of American woodcock breeding population, 1968-1986, base year 1970. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

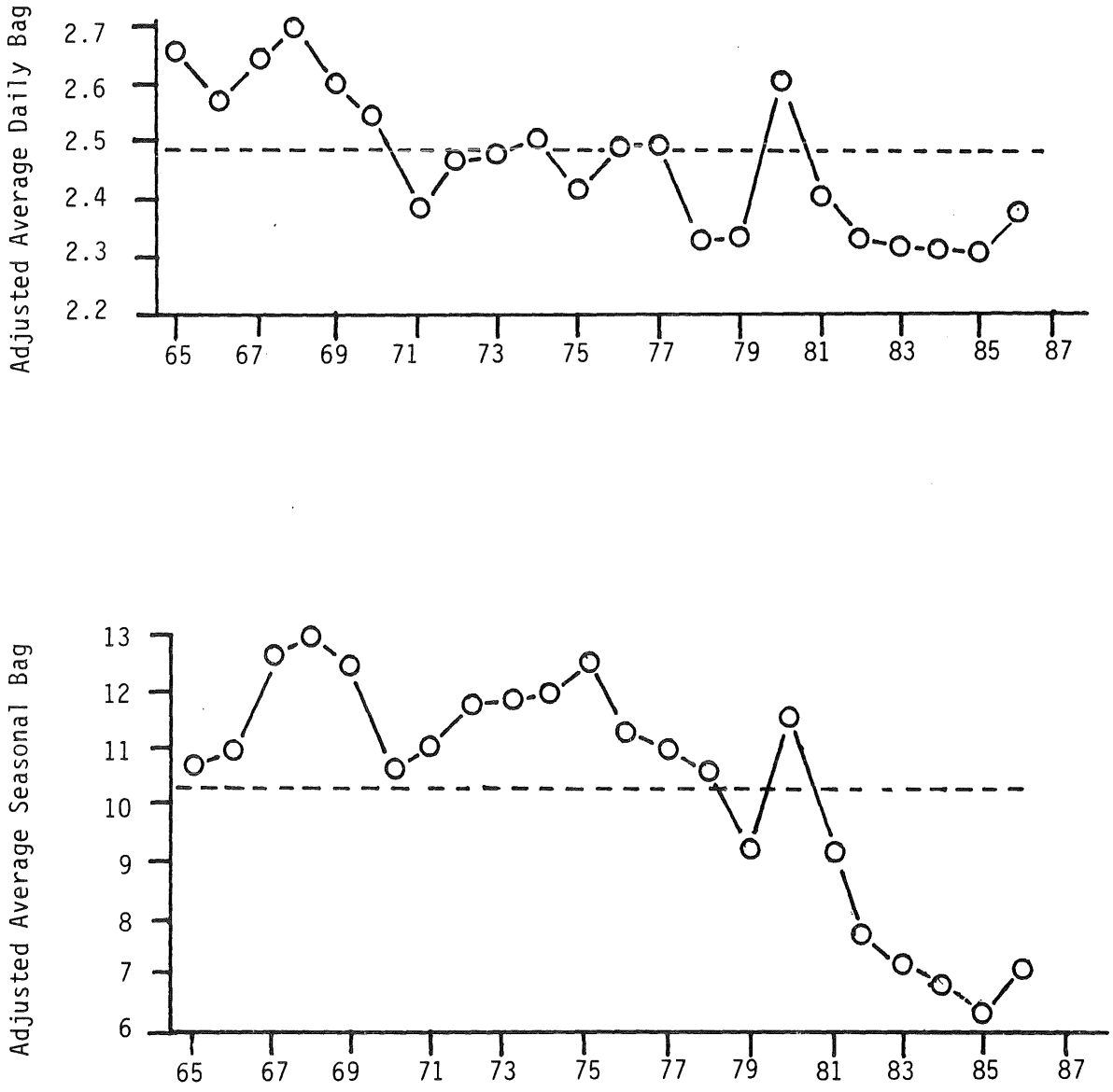

Figure 33. Adjusted indices of daily and seasonal hunting success of American woodcock, 1965-1985, base year 1969. (from: Bortner, James S. 1987. American woodcock harvest and breeding population status, 1987. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 10pp).

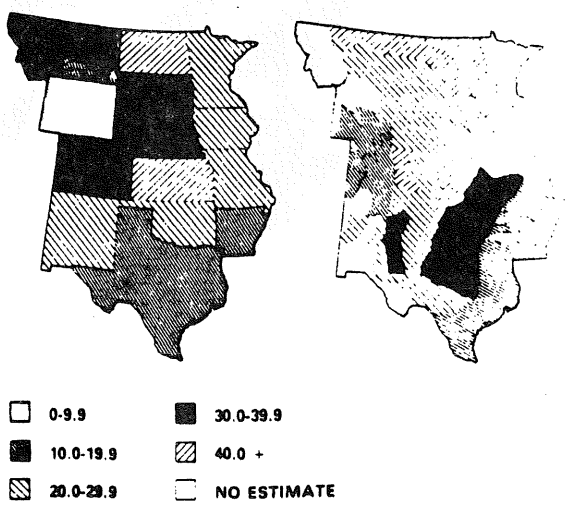

Figure 34. Mean number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1987. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

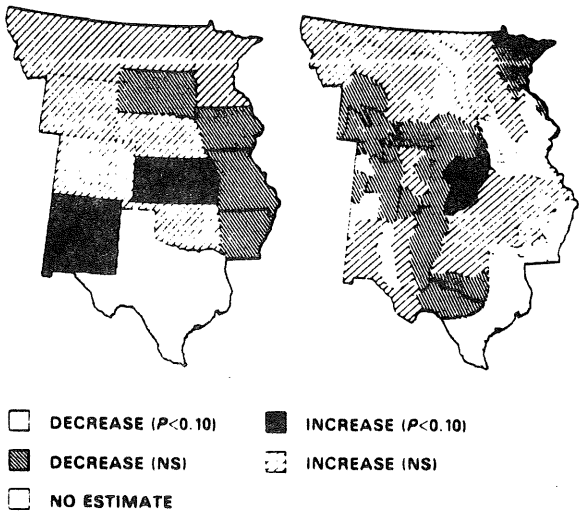

Figure 35. Changes in the number of mourning doves heard per route by state and physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

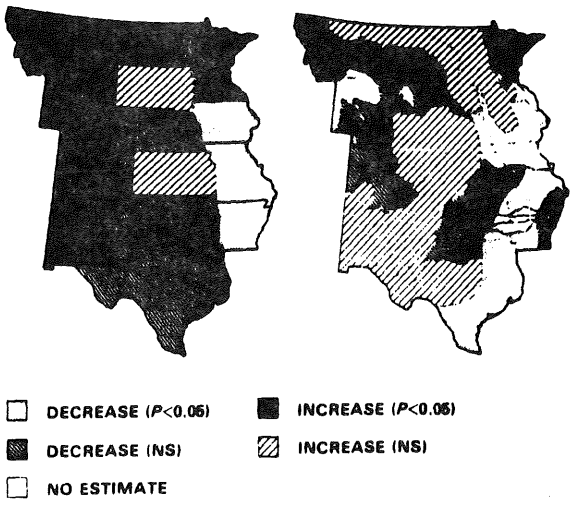

Figure 36. Trends in number of mourning doves heard per route by state and by physiographic region in the Central Management Unit, 1986-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

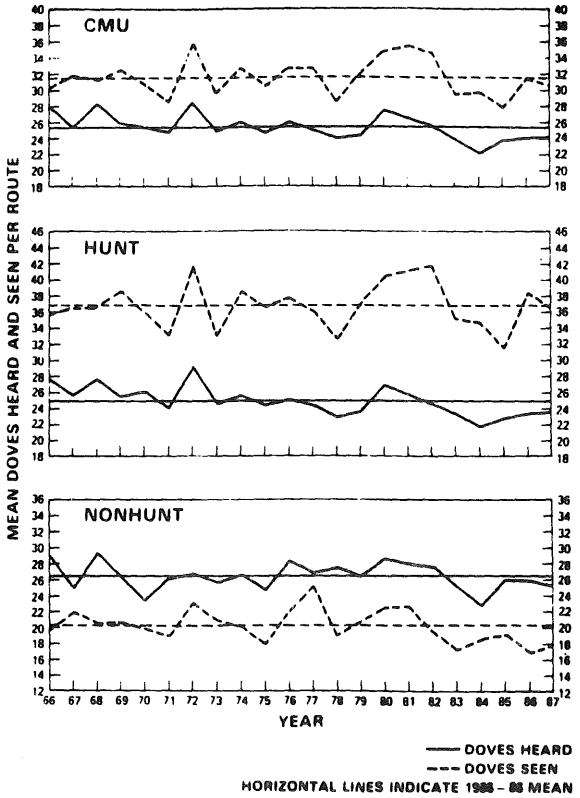

Figure 37. Population indices of breeding mourning doves in the Central Management Unit, 1966-87. (from: Dalton, David D. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

HUNTING

HARVEST STATISTICS

Table 33. Resident small game hunter[a] response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	5,696	443	4,504	85.7
1980-81	6,434	385	4,963	82.0
1981-82	6,656	399	5,419	86.6
1982-83	5,963	266	4,792	84.1
1983-84	4,551	269	3,325	77.7[b]
1984-85	4,096	127	3,280	82.6
1985-86	3,370	157	2,574	80.1
1986-87	4,668	208	3,623	81.2

[a] Includes individual and combination sportsman, regular small game, and senior licensees, and excludes duplicate licenses.

[b] Includes only those survey returns received by 25 April 1984.

Table 34. Use of resident small game hunter licenses[a], 1979-80 through 1986-87.

	Returns from mail survey	Projections from license sales
1979-80		
Hunted	3,964 (88.0%)	296,766
Did not hunt	540 (12.0%)	40,468
	4,504 (100.0%)	337,234
1980-81		
Hunted	4,288 (86.4%)	311,717
Did not hunt	675 (13.6%)	49,066
	4,963 (100.0%)	360,783
1981-82		
Hunted	4,461 (82.3%)	306,843
Did not hunt	958 (17.7%)	65,992
	5,419 (100.0%)	372,835
1982-83		
Hunted	3,908 (81.6%)	257,546
Did not hunt	884 (18.4%)	58,258
	4,792 (100.0%)	315,804
1983-84		
Hunted	2,805 (84.4%)	232,973
Did not hunt	520 (15.6%)	43,061
	3,325 (100.0%)	276,034
1984-85		
Hunted	2,663 (81.2%)	211,740
Did not hunt	617 (18.8%)	49,024
	3,280 (100.0%)	260,764
1985-86		
Hunted	2,132 (82.8%)	213,883
Did not hunt	442 (17.2%)	44,342
	2,574 (100.0%)	258,225
1986-87		
Hunted	3,006 (83.0%)	217,504
Did not hunt	617 (17.0%)	44,549
	3,623 (100.0%)	262,053

[a] Includes individual and combination sportsman, regular small game, and senior licenses.

Table 35. Estimated number of hunters and estimated take per hunter for various species, 1979-80 through 1986-87.

Species	Estimated number of hunters (thousands)								Estimated take per hunter							
	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Ducks	155	128	138	134	117	134	122	132	9.4	9.3	8.4	8.1	10.6	10.8	9.1	9.0
Canada goose	57	51	47	52	41	51	55	58	1.5	1.4	1.4	1.6	1.6	1.6	1.9	1.8
Other geese	*	27	15	11	10	9	9	7	*	1.2	1.0	0.7	0.7	0.8	1.2	0.5
American coot	24	19	13	11	12	9	11	11	5.0	3.1	4.0	4.3	4.7	4.9	4.4	5.3
Common snipe	8	12	7	4	6	5	5	5	2.4	1.9	2.9	3.2	2.8	4.0	3.2	3.9
Rails/gallinules	2	*	1	1	2	1	1	1	2.9	*	1.6	3.1	1.2	1.4	2.3	1.1
American woodcock	22	25	23	20	16	17	19	21	2.8	2.7	2.8	2.7	3.9	4.3	4.3	4.3
Ring-necked pheasant	143	147	173	125	86	65	72	62	2.3	3.2	3.3	2.1	3.5	2.3	3.0	2.6
Ruffed grouse	151	150	145	115	78	87	94	107	4.7	6.3	3.9	2.6	2.4	3.7	3.8	4.2
Spruce grouse	18	25	15	13	9	12	12	12	1.5	1.3	1.7	1.1	1.1	1.7	2.1	1.7
Sharp-tailed grouse	24	27	16	14	9	9	10	9	2.3	2.1	2.2	1.2	1.1	0.8	1.9	1.5
Gray partridge (Hun)	33	38	32	21	21	15	20	17	3.3	2.7	3.4	2.5	3.6	2.1	4.3	3.3
Gray squirrel[a]	80	78	70	53	38	39	38	41	5.1	6.6	5.9	5.1	5.3	5.3	5.2	5.7
Fox squirrel[a]			48	39	28	26	29	29			4.6	4.2	4.5	4.1	5.0	5.1
Eastern cottontail	50	56	60	36	29	22	22		3.8	4.4	4.4	3.8	3.4	2.8	3.8	4.2
White-tailed jack rabbit	18	22	17	11	7	6	6	4	2.5	2.4	2.7	2.6	1.9	1.9	3.0	3.4
Snowshoe hare	28	37	25	15	9	7	7	8	4.9	7.8	4.4	4.2	2.3	2.3	2.3	3.2
Raccoon	16	20	19	13	11	12	10	11	6.0	4.4	7.0	6.3	8.0	9.4	9.4	10.9
Red fox	13	17	19	12	11	11	12	11	1.6	1.7	1.9	1.5	2.0	2.3	4.2	1.5
Gray fox	4	8	4	3	2	3	2	2	1.1	0.4	1.0	0.9	0.9	1.4	2.0	0.8
Coyote	3	8	4	3	3	3	5	4	1.1	0.5	0.9	0.8	0.8	1.8	3.1	1.6
Badger	*	7	1	1	1	1	1	<1	*	0.7	1.1	1.9	0.3	3.9	1.8	1.0

* No estimate made.

[a] Estimates for gray and fox squirrels prior to 1981 are for both species combined.

Table 36. Resident small game hunting license sales and estimated hunter harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Small game license sales[a]	337,234	360,783	372,835	314,477	276,034	260,764	258,225	262,053
Federal duck stamp sales	159,068	158,311	142,345	134,803	138,161	138,820	134,594	142,011
State duck stamp sales[b]	145,832	144,256	129,546	123,834	125,212	131,394	125,559	146,747
Pheasant stamp sales[b]	-	-	-	-	114,189	81,587	85,252	81,027
Estimated harvest[c] (thousands)								
Ducks[e]	1,462	1,199	1,167	1,071	1,235	1,443	1,029	1,172
Canada geese[e]	85	72	71	81	62	82	86	101
Other geese[e]	*	33	16	7	8	8	9	3
American coot[e]	123	58	49	49	55	48	41	59
Common snipe	19	23	21	14	17	20	16	21
Rails/gallinules	7	*	2	3	2	1	2	1
American woodcock	60	67	63	54	58	70	70	87
Ring-necked pheasant	328	466	573	265	299	148	179	159
Ruffed grouse	709	941	576	302	183	320	315	442
Spruce grouse	27	34	24	14	10	21	21	20
Sharp-tailed grouse	54	56	34	17	10	7	14	13
Gray partridge (hun)	108	101	110	52	74	31	77	54
Gray squirrel[d]	403	514	409	271	199	208	186	235
Fox squirrel[d]			216	162	126	107	140	145
Eastern cottontail	188	249	263	135	98	61	75	102
White-tailed jack rabbit	45	52	45	27	13	11	17	14
Snowshoe hare	136	286	109	61	21	16	12	25
Raccoon	97	88	136	80	87	114	85	122
Red fox	21	28	37	19	21	26	44	15
Gray fox	4	3	4	2	2	4	4	2
Coyote (brush wolf)	3	4	4	2	3	5	11	7
Badger	No season	5	2	2	<1	2	2	<1

Harvest estimates in this table, and the number of hunters and mean take per hunter in Table 35, are calculated from different questions on the survey form. The sample used in calculations differs from one estimator to the next. This is because some respondents give specific answers to one question but not to a related one. A formula is used to calculate the total estimated take for each species which appears in this table. In most years the formula produces results rather close to those obtained by multiplying the average take per hunter times the number of hunters. However, in other years (e.g., 1985) results of the two methods are quite divergent, perhaps as a result of an unusual sample. This is being investigated further, and as a result, numbers may change somewhat in future reports. The most current report of survey findings will have the best data available at that time.

* No estimate made.

[a] Duplicate licenses not included.

[b] Excluding stamps sold with an issuing fee, many of which probably were purchased by collectors.

[c] Estimates based upon response of hunters to questionnaires.

[d] Harvest estimates for gray and fox squirrels prior to 1981 are for both species combined.

[e] U.S. Fish and Wildlife Service harvest estimates for 1986 are:

Ducks	789,234	Other geese	0
Canada geese	68,808	American coot	27,375

Table 37. Mail survey results of nonresident small game hunters, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Nonresident licenses issued[a]	3,902	3,981	4,271	3,187	2,911	3,060	3,271	3,078
Questionnaires								
Number mailed	622	222	280	361	384	237	338	406
Number not delivered	74	85	21	21	25	13	25	42
Number (percent) returned	491 (89.6)	117 (85.4)	214 (82.6)	281 (82.6)	280 (78.0)[b]	192 (86.0)	246 (78.6)	290 (79.7)
Total nonresidents and percent (in parens) of all nonresidents hunting:								
Ducks	2,100 (54)	2,000 (50)	2,055 (48)	1,840 (58)	1,500 (52)	2,090 (68)	1,900 (58)	1,810 (64)
Canada goose	700 (18)	600 (15)	718 (17)	830 (26)	580 (20)	820 (27)	800 (24)	850 (30)
Ruffed grouse	1,500 (38)	2,000 (50)	1,656 (39)	960 (30)	620 (21)	1,000 (33)	1,090 (33)	1,000 (35)
Ring-necked pheasant	800 (21)	800 (20)	1,436 (34)	680 (21)	500 (17)	390 (13)	720 (22)	510 (18)
Raccoon[c]	400 (10)	200 (5)	125 (3)	100 (3)	170 (6)	130 (4)	70 (2)	85 (3)
Total nonresident take:								
Ducks	20,000	17,000	19,000	15,000	17,500	24,000	14,400	14,600
Canada goose	1,000	1,000	2,000	1,500	1,300	1,300	1,400	1,400
Ruffed grouse	9,000	16,000	7,000	3,000	1,700	4,200	3,500	3,800
Ring-necked pheasant	2,000	2,000	5,000	1,500	2,200	1,500	1,900	1,100
Raccoon	3,000	1,000	1,000	700	1,400	1,100	1,400	600

[a] Excludes duplicate licenses and nonresident shooting preserve licenses.

[b] Includes only those survey returns received by 25 April 1984.

[c] Nonresident raccoon hunters were required to purchase a nonresident raccoon hunting license for the first time in 1979 in addition to the nonresident small game license. The initial season bag limit of 8 was increased to 12 in 1983 and to 20 in 1985.

	Raccoon take per hunter		
	Resident	Nonresident	Number of nonresident raccoon licenses
1978	6	14	0
1979	6	6	404
1980	4	5	93
1981	7	7	121
1982	6	7	95
1983	8	8	102
1984	9	8	111
1985	9	20	108
1986	11	7	86

Table 38. Species composition of the Minnesota waterfowl harvest, 1985 and 1986 (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep., Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

Species	1985 Harvest	1985 Pct of harvest	1986 Harvest	1986 Pct of harvest	Percent change
Mallard	179,100	27.96	234,900	29.77	+31
Domestic mallard	1,200	0.18	0	0.00	-100
American black duck	1,900	0.30	600	0.07	-68
Black x mallard	200	0.03	0	0.00	-100
Gadwall	12,700	1.98	11,200	1.42	-12
American wigeon	19,300	3.02	30,800	3.91	+60
Green-winged teal	43,200	6.75	43,600	5.53	+1
Blue-winged/cinnamon teal	26,100	4.08	61,100	7.74	+134
Northern shoveler	5,200	0.81	8,000	1.02	+54
Northern pintail	8,400	1.31	4,500	0.57	-46
Wood duck	81,800	12.77	135,000	17.17	+66
Redhead	16,300	2.55	20,300	2.57	+24
Canvasback	10,000	1.54	0	0.00	-100
Greater scaup	6,000	0.93	2,600	0.33	-57
Lesser scaup	70,200	10.96	75,400	9.55	+7
Ring-necked duck	121,800	19.02	130,000	16.47	+7
Goldeneyes	5,800	0.90	5,400	0.69	-7
Bufflehead	22,700	3.54	14,700	1.87	-35
Ruddy duck	3,300	0.52	1,600	0.20	-52
Scoters	900	0.14	600	0.07	-33
Hooded merganser	3,700	0.57	8,400	1.06	+27
Other mergansers	800	0.13	0	0.00	-100
Other ducks	0	0.00	0	0.00	0
Total	640,600	99.99	789,200	100.00	-38

Table 39. Top 10 states in number of adult waterfowl hunters, 1986, and number of hunter-days and retrieved duck kill, in each (taken from: Carney, S.M., M.F. Sorenson, and E.M. Martin. 1987. Waterfowl harvest and hunter activity in the United States during the 1986 hunting season. U.S. Fish and Wildlife Service Adm. Rep. Office of Migratory Bird Management, Laurel, Maryland. 27 pp.).

State	Number of adult waterfowl hunters	Number of hunter-days	Retrieved duck kill	Ducks retrieved per hunter-day
Minnesota	124,732	933,024	789,234	0.84
Louisiana	86,326	862,801	1,235,595	1.43
Wisconsin	79,925	605,721	362,068	0.60
California	71,425	678,789	965,092	1.42
Texas	61,536	447,432	491,983	1.10
Michigan	45,206	389,494	227,502	0.58
Pennsylvania	44,839	327,714	106,035	0.32
Illinois	44,780	440,233	279,467	0.63
New York	42,941	301,159	194,118	0.64
Washington	36,019	307,641	353,436	1.15
Mississippi Flyway	566,672	5,028,211	4,248,943	0.84
United States	1,321,866	11,066,713	9,373,926	0.85

Table 40. Turkey hunting summary, 1978-87.

Year	Area of open hunt zone (mi^2)	Number of permit applicants	Number of permits available	Odds of drawing a permit[a]	Number of permits given	Number of persons hunting[b]	Registered turkey harvest	% success[c]
1978	389	10,740	420	25.6:1	411	398	94	23.6
1979	673	11,116	840	13.2:1	827	794	116	14.6
1980	858	9,613	1,200	8.0:1	1,191	1,072	98	9.1
1981	1,242	8,398	1,500	5.6:1	1,556	1,292	113	8.7
1982	1,490	7,223	2,000	3.6:1	1,992	1,625	106	6.5
1983	1,807	8,153	2,100	3.9:1	2,079	1,663	116	7.0
1984	2,061	7,123	3,000	2.4:1	2,837	2,270	178	7.8
1985	2,118	5,662	2,750	2.1:1	2,449	1,959	323	16.5
1986	1,897	5,715	2,500	2.3:1	2,251	1,801	333	18.5
1987	1,747	6,361	2,700	2.4:1	2,520	2,016	520	25.8

[a] Calculated with total permits available to be given, and not adjusting for undersubscribed zones and time periods.

[b] For 1978-82, based on a post-hunt mail survey. Number actually hunting in 1983-87 was estimated at 80% (from last year the survey was run).

[c] Registered turkey harvest divided by number actually hunting, expressed as %.

Table 41. Deer hunting license sales, 1957-86*.

Year	Firearms License Sales			Archery Licenses			Grand Total
	Resident	Non-resident	Total	Resident	Non-resident	Total	
1957	180,028	488	180,516	10,033	119	10,152	190,668
1958	203,430	552	203,982	10,968	118	11,086	215,068
1959	200,102	530	200,632	11,768	101	11,869	212,501
1960	233,593	621	234,214	11,834	122	11,956	246,170
1961	250,031	632	250,663	13,229	141	13,370	264,033
1962	244,166	676	244,842	11,776	150	11,926	256,768
1963	257,333	771	258,104	11,724	165	11,889	269,993
1964	278,032	1,021	279,053	13,472	193	13,665	292,718
1965	289,918	1,128	291,046	15,628	265	15,893	306,939
1966	284,195	1,287	285,482	17,203	277	17,480	302,962
1967	305,717	1,311	307,028	18,405	289	18,694	325,722
1968	302,216	1,442	303,658	20,188	292	20,480	324,138
1969	253,891	1,168	255,059	15,658	256	15,914	270,973
1970	188,166	334	188,500	12,277	220	12,497	200,997
1971	no firearms season			17,360	111	17,471	17,471
1972	257,998	959	258,957	21,985	326	22,311	281,268
1973	294,349	1,342	295,691	29,169	545	29,714	325,405
1974	296,248	1,747	297,995	30,701	644	31,345	329,340
1975	327,596	1,921	329,517	31,836	804	32,640	362,157
1976	263,868	1,029	264,897	21,773	263	22,036	286,933
1977	287,271	1,430	288,701	29,404	402	29,806	318,507
1978	307,910	1,776	309,686	32,546	476	33,022	342,708
1979	312,754	1,910	314,664	35,657	447	36,104	350,768
1980	344,516	2,378	346,894	41,328	634	41.962	388,856
1981	369,425	2,973	372,398	50,063	906	50,969	423,367
1982	369,018	3,038	372,056	54,084	848	54,932	426,988
1983	391,099	3,611	394,710	55,822	478	56,300	451,010
1984	396,074	4,307	400,381	61,576	583	62,159	462,540
1985[a]	416,464	4,984	421,448	66,716	589	67,305	480,312
1986[a]	413,542	4,476	418,018	68,689	547	69,236	487,254

* Duplicate licenses not included. Leech Lake licenses are included during years they were issued.

[a] Numbers include the following bonus deer licenses:

	1985	1986
Resident firearms (regular quota areas)	8,418	1,192
Resident firearms (state parks)	-	271
Non-resident firearms (regular quota area)	23	3
Resident archery (state parks)	-	27
Resident archery (metro)	-	917
Totals	8,441	2,410

Table 42. Registered deer harvest and success rates, 1974-86.

	Registered harvest				Percent success	
	Regular firearms	Archery	Special Muzzleloader season	Total	Regular firearms and special muzzleloader seasons	Archery
1974	64,997	2,176	-	67,173	21.9	6.9
1975	63,604	2,265	-	65,869	19.3	6.9
1976	28,613	1,167	-	29,780	10.8	5.3
1977	45,918	2,609	32*	48,559	15.9	8.8
1978	47,372	2,608	346	50,326	15.4	7.9
1979	44,340	2,577	318	47,235	14.2	7.1
1980	68,539	3,641	294	72,474	19.8	8.7
1981	93,027	5,535	385	98,947	25.1	10.8
1982	93,045	5,566	441	99,052	25.1	10.1
1983	132,457	5,977	652	139,086	33.7	10.6
1984	132,042	6,390	532	138,964	33.1	10.3
1985	138,065	7,575	563	146,203	32.9	11.2
1986	129,770	7,610	593	137,973	31.2	11.0

* No special muzzleloader seasons were held before 1977.

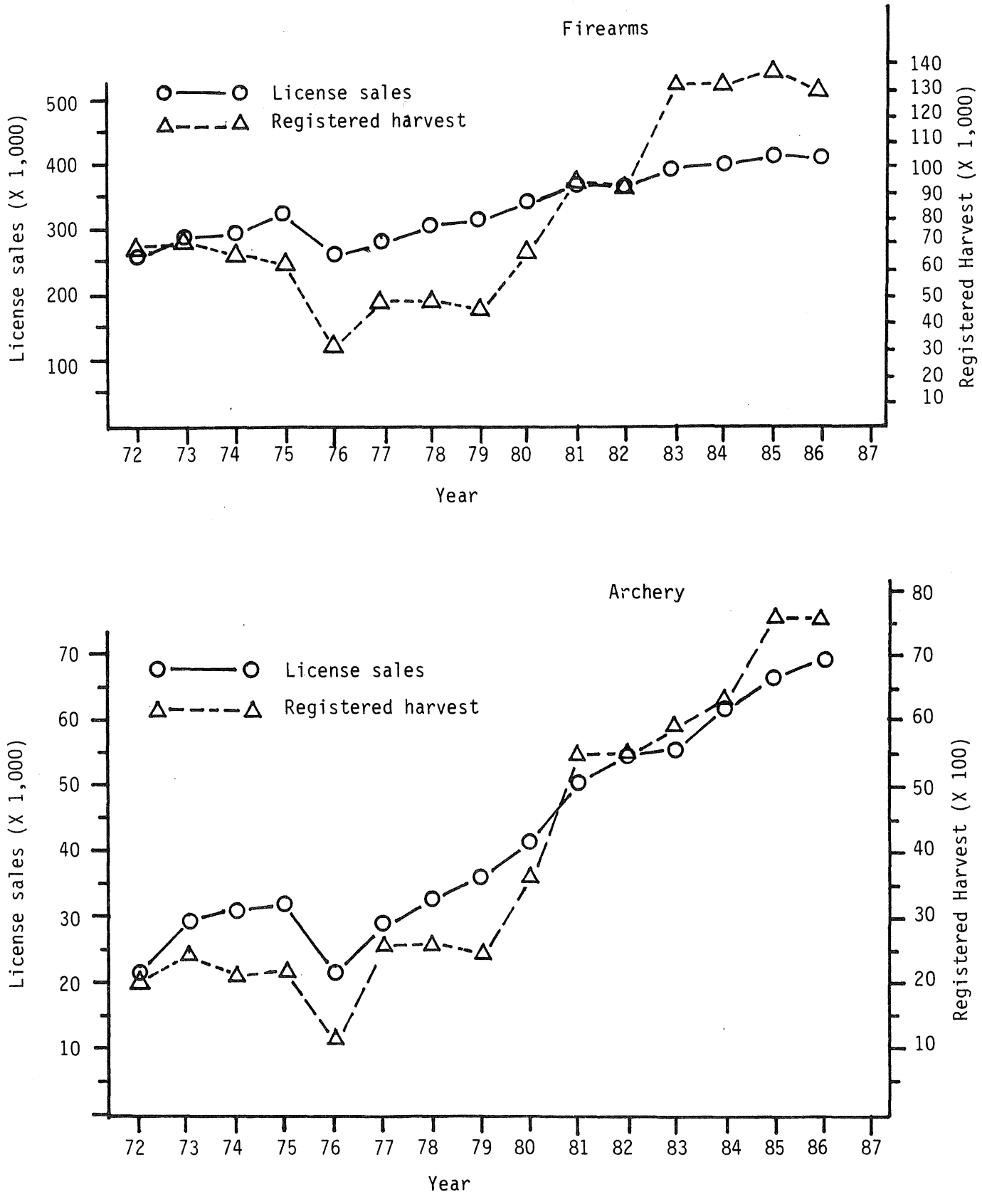

Figure 38. Resident and nonresident firearms (above) and archery (below) deer hunting license sales and registered harvest, 1972-86.

Table 43. Harvest and success rates by DMU and Sub-DMU, 1986.

Unit	Permits Issued[a]	Antlerless Registered	Permit Success[a]	Bucks Registered	Total Reg. Kill
Red River W	948	477	50.3%	381	858
Red River E	7,436	3,994	53.7%	2,053	6,047
Red River Total	8,384	4,471	53.3%	2,434	6,905
Agassiz Total	11,561	5,160	44.6%	3,161	8,321
Rainy River W	511	293	57.3%	1,006	1,299
Rainy River C	1,042	661	63.4%	1,032	1,693
Rainy River E	1,910	981	51.4%	1,205	2,186
Rainy River Total	3,463	1,935	55.9%	3,228	5,163
Superior W	3,052	1,280	41.9%	1,247	2,527
Superior C	853	481	56.4%	943	1,424
Superior E	0	7	-	558	561
Superior Wild.	0	4	-	46	50
Superior IR	0	0	-	4	4
Superior Total	3,905	1,772	45.4%	2,794	4,566
Itasca NW	3,477	2,099	60.4%	2,437	4,536
Itasca SW	3,233	2,041	63.1%	3,105	5,046
Itasca NE	3,413	1,631	47.8%	2,445	4,076
Itasca SE	5,567	2,594	46.6%	2,456	5,050
LLIR	1,098	479	43.6%	687	1,166
Bemidji	4,341	2,611	60.1%	2,849	5,460
Itasca Total	20,929	11,455	54.7%	13,979	25,434
Mille Lacs W	4,771	2,769	58.0%	2,324	5,093
Mille Lacs C	8,682	5,143	59.2%	3,422	8,565
Mille Lacs E	2,138	1,485	69.5%	3,722	5,207
WEIR	436	300	68.8%	658	958
Mille Lacs Total	16,027	9,697	60.3%	10,126	19,821
Big Woods N	21,152	10,606	50.1%	6,779	17,385
Big Woods C	7,540	3,198	42.4%	2,509	5,707
Big Woods Metro	3,382	1,251	37.0%	1,109	2,360
Big Woods SE	14,736	8,127	55.2%	5,771	13,898
Big Woods Total	46,810	23,182	49.5%	16,168	39,350
Prairie N	4,317	2,160	50.0%	1,823	3,983
Prairie River	4,969	2,667	53.7%	2,178	4,845
Prairie SW	6,007	3,900	69.9%	3,415	7,315
Prairie SE	3,849	1,816	47.2%	1,393	3,209
Prairie Total	19,142	10,543	55.1%	8,809	19,352
Unknown	-	575	-	283	858
Total	130,519	68,790	52.7%	60,980	129,770

[a] Bonus licenses not included.

Table 44. Archery deer harvest by county, 1977-86.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Aitkin	24	30	34	68	110	107	94	88	140	130
Anoka	31	45	74	105	169	147	156	168	258	247
Becker	19	14	10	33	46	52	65	63	67	62
Beltrami	50	35	29	63	97	130	109	108	126	101
Benton	3	1	6	7	18	28	29	25	35	36
Big Stone	32	9	10	25	38	38	42	56	49	39
Blue Earth	34	48	35	73	80	78	116	94	116	95
Brown	23	25	27	36	46	48	47	50	38	66
Carlton	8	6	6	24	30	31	20	30	45	22
Carver	12	6	9	24	30	34	49	50	65	53
Cass	5	17	30	48	108	131	118	147	141	151
Chippewa	108	76	71	114	138	78	92	90	92	82
Chisago	19	26	31	38	68	78	95	103	142	135
Clay	49	21	19	44	75	84	94	123	111	132
Clearwater	12	8	3	17	21	21	27	20	22	29
Cook	1	2	0	1	12	7	5	9	29	12
Cottonwood	93	79	60	71	87	73	99	54	90	75
Crow Wing	5	19	32	47	123	105	99	156	177	159
Dakota	13	13	21	20	46	51	64	99	124	167
Dodge	21	14	17	19	26	22	45	76	52	63
Douglas	34	40	31	32	64	53	77	68	86	79
Faribault	20	30	31	51	46	49	57	47	58	73
Fillmore	21	49	22	46	50	64	75	81	108	83
Freeborn	28	40	38	37	47	34	69	60	61	67
Goodhue	32	37	34	57	63	69	71	69	113	112
Grant	6	8	10	19	18	22	27	27	33	26
Hennepin	11	19	35	78	69	44	97	78	105	156
Houston	20	36	25	46	55	70	58	67	79	75
Hubbard	26	32	42	56	97	130	102	98	126	138
Isanti	20	25	32	46	83	83	82	83	97	102
Itasca	59	59	36	98	171	146	113	127	155	169
Jackson	34	28	34	26	47	44	46	42	59	54
Kanabec	4	13	7	11	35	66	51	49	76	61
Kandiyohi	26	57	41	41	95	96	111	116	108	141
Kittson	11	13	1	8	12	10	28	32	24	23
Koochiching	15	19	23	28	33	18	21	29	20	29
Lac Qui Parle	54	28	38	53	87	82	78	108	141	107
Lake	7	8	8	18	40	46	30	39	50	40
Lake of the Woods	11	6	9	12	13	13	14	22	24	22
LeSueur	12	9	13	27	38	31	39	52	37	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Lincoln	69	32	57	50	72	56	74	35	68	54
Lyon	57	57	36	84	94	74	110	72	104	104
McLeod	6	15	63	32	40	28	2	33	35	55
Mahnomen	3	0	1	5	4	7	5	6	9	8
Marshall	31	15	18	38	39	45	66	82	79	75
Martin	26	36	25	40	35	38	56	33	41	55
Meeker	29	25	37	43	44	43	37	54	59	61
Mille Lacs	12	10	8	21	40	57	35	63	51	40
Morrison[a]	4	18	19	30	66	158	127	108	114	66
Mower	43	35	27	46	55	42	80	64	113	121
Murray	63	48	49	81	130	83	61	39	90	71
Nicollet	28	28	40	61	80	67	65	52	64	88
Nobles	27	51	34	43	79	33	54	18	43	48
Norman	11	10	11	15	20	34	35	45	43	39
Olmsted	17	20	25	24	55	51	85	84	86	108
Ottertail	58	54	60	98	133	153	175	178	234	223
Pennington	3	1	3	9	12	18	15	19	12	19
Pine	36	45	73	123	166	171	134	166	229	186
Pipestone	7	21	34	32	40	30	67	1	42	53
Polk	24	24	32	42	50	78	70	102	98	102
Pope	32	24	31	49	49	64	57	56	63	70
Ramsey	0	3	0	1	2	1	0	21	14	33
Red Lake	5	0	4	2	1	3	4	13	8	6
Redwood	43	38	38	50	81	63	82	63	72	68
Renville	29	20	20	35	55	63	59	32	62	60
Rice	22	19	31	38	45	51	39	54	56	59
Rock	6	34	16	14	38	31	14	22	51	39
Roseau	35	22	32	62	77	90	112	98	94	86
St. Louis	66	77	42	87	180	149	120	127	180	209
Scott	22	15	41	44	50	37	50	72	87	136
Sherburne	24	47	60	89	128	116	113	115	131	128
Sibley	14	15	22	33	41	30	32	43	43	44
Stearns	58	52	49	81	134	143	122	159	241	239
Steele	16	20	7	14	19	27	29	30	41	41
Stevens	1	10	13	9	11	21	27	26	25	20
Swift	45	25	23	42	67	49	67	59	68	67
Todd	29	33	45	52	95	109	103	126	169	141
Traverse	16	9	7	12	21	13	21	32	22	19
Wabasha	28	19	20	15	18	30	61	57	50	61
Wadena	9	10	14	21	45	69	70	64	43	62

Table 44. Continued.

County	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986
Waseca	20	21	20	26	46	35	55	42	27	36
Washington	16	20	15	39	75	91	88	154	174	196
Watonwan	16	16	16	31	34	30	35	20	39	39
Wilkin	2	2	2	15	26	34	39	34	34	32
Winona	43	76	72	96	116	138	117	151	234	196
Wright	8	26	29	45	71	78	83	95	92	115
Yellow Medicine	49	32	34	35	47	38	54	47	47	44
Unknown	61	10	40	20	25	63	23	34	37	70
Camp Ripley	327	190	148	b	153	129	237	387	278	257
St. Croix St. Pk.	b	128	b	b	b	b	b	b	b	b
Totals	2,609	2,608	2,577	3,641	5,535	5,566	5,977	6,390	7,575	7,610

[a] Camp Ripley not included.

[b] No archery hunt.

Table 45. 1986 deer harvest in Special Muzzleloader Season Bonus licenses.

	Adult		Fawn		Total	
	Male	Female	Male	Female	#	%
Carlos Avery WMA	7	21	6	7	41	6.9%
Carlos Avery WMA[a] (Sanctuary)[a]	2	2	1	1	6	1.0%
Chengwatana SF	0	4	1	0	5	1.0%
Cloquet Valley SF	0	0	0	0	0	0.0%
Danvers WMA[a]	1	2	2	4	9	1.5%
Elm Lake & Eckvoll WMA	0	1	0	1	2	0.0%
George Washington SF	1	12	1	3	17	2.9%
Glacial Lakes SP[a]	0	11	2	1	14	2.4%
Gores Pool WMA	0	1	1	0	2	0.0%
Helmer Myre SP[a]	12	5	5	4	26	4.4%
Lac qui Parle WMA and Big Stone NWR[a]	12	65	37	32	146	24.6%
Lake Louise SP[a]	4	6	2	2	36	6.1%
Lake Shetek SP[a]	7	12	4	5	28	4.7%
McCarthy Lake WMA	0	2	0	0	2	0.0%
Meadowbrook WMA	0	1	0	0	1	0.0%
Mille Lacs WMA	1	4	3	5	13	2.2%
Nemadji SF	1	2	0	0	3	0.5%
Paul Bunyan Game Refuge	8	10	5	5	28	4.7%
Red Lake WMA and Beltrami Island SF	7	12	6	2	27	4.6%
R. J. Dorer Memorial SF	0	0	1	1	2	0.0%
Roseau River WMA	0	2	0	2	4	0.7%
Rum River SF	2	0	3	0	5	0.8%
Savanna SF	0	4	1	1	6	1.0%
Talcot Lake WMA[a]	1	5	7	6	19	3.2%
Thief Lake WMA	0	1	0	1	2	0.0%
Whitewater	24	54	33	32	143	24.1%
Walnut Lake WMA[a]	0	5	1	0	6	1.0%
Total	90	257	125	121	593	
Percent	15.2%	43.3%	21.1%	20.4%		

[a] Special Permit Areas - See Table 46.

Table 46. Special Muzzleloader Season Harvests, 1981-86.

	1981	1982	1983	1984	1985	1986
Carlos Avery WMA	53	31	57	22	23	41
Carlos Avery WMA (Sanctuary)	--	--	--	--	16	6
Chengwatana SF	--	--	1	1	4	5
Cloquet Valley SF	--	--	--	2	1	0
Danvers WMA	--	3	1	7	7	9
Elm Lake & Eckvoll WMA	--	4	--	0	--	2
Frontenac SP	--	--	--	--	3	--
George Washington SF	--	--	5	14	16	17
Glacial Lakes SP	--	9	--	--	--	14
Gores Pool WMA	--	--	5	5	1	2
Helmer Myre SP	--	--	--	--	18	26
Lac qui Parle WMA and Big Stone NWR	91	130	168	151	199	146
Lake Louise SP	--	--	--	--	--	36
Lake Shetek SP	19	36	35	30	25	28
McCarthy Lake WMA	1	0	1	0	0	2
Meadowbrook WMA	3	4	11	6	6	1
Mille Lacs WMA	54	25	5	14	13	13
Moose-Willow WMA	16	5	--	--	--	--
Nemadji SF	--	--	1	1	0	3
Nerstrand Woods SP/GR	--	--	--	--	13	--
Paul Bunyan Game Refuge	--	--	19	33	27	28
Red Lake WMA and Beltrami Island SF	14	14	29	11	21	27
R. J. Dorer Memorial SF	7	32	10	6	1	2
Roseau River WMA	4	1	3	5	3	4
Rum River SF	--	--	3	1	7	5
Savanna SF	--	--	2	2	6	6
Talcot Lake WMA	16	61	137	13	43	19
Thief Lake WMA	12	6	5	7	8	2
Whitewater WMA	90	80	150	139	97	143
Whitewater Sanctuary	--	--	--	45	--	--
Walnut Lake WMA	5	0	4	6	5	6
Totals	385	441	652	532	563	593

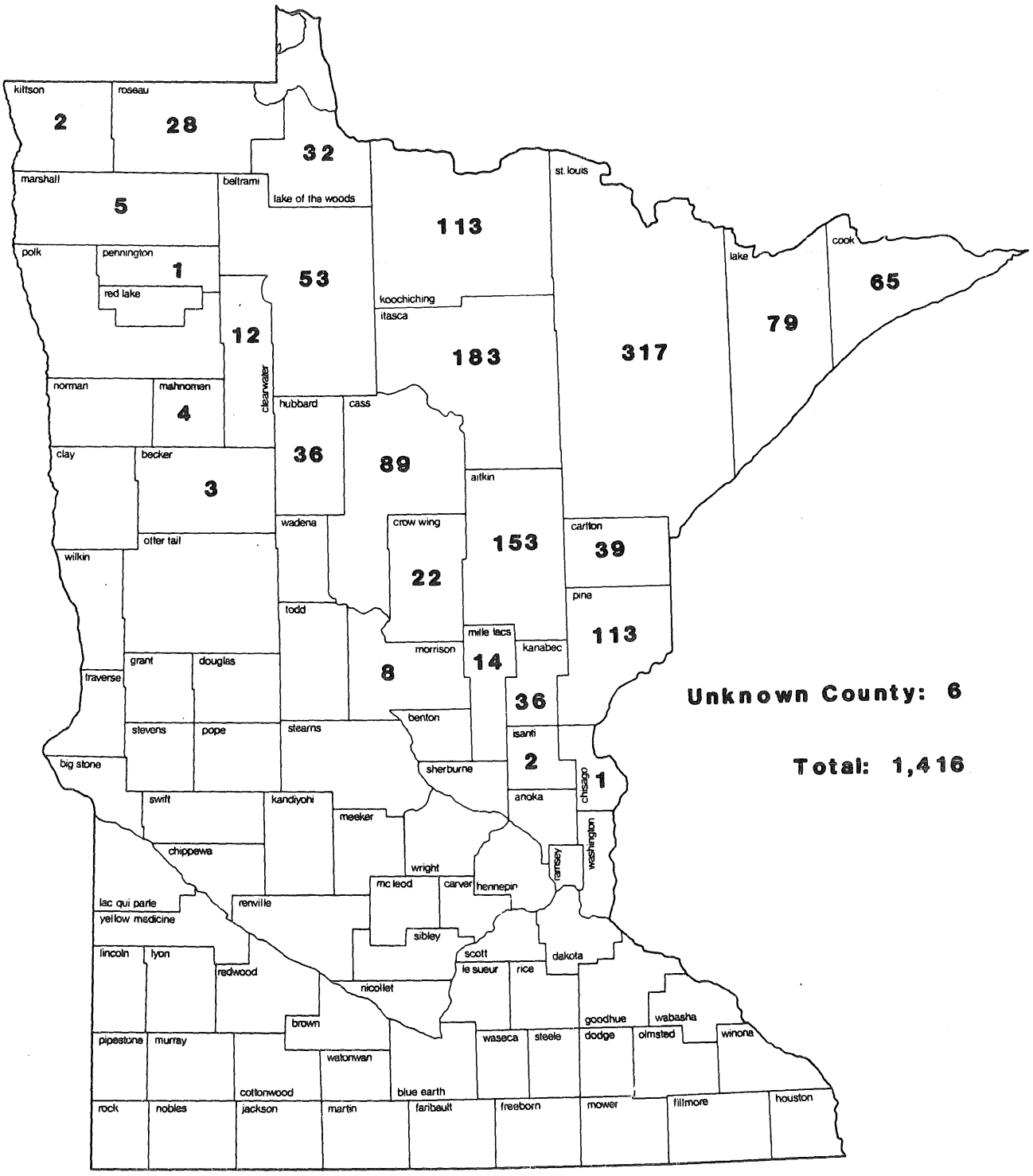

Figure 39. Black bear registered harvest by county, 1986 season.

Table 47. Registered bear harvest by county, 1976-1986.

County	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	Total
Aitkin	29	65	103	55	92	128	39	102	96	118	153	980
Becker	2	8	12	13	7	9	1	14	9	10	3	88
Beltrami	15	36	44	42	28	79	24	78	60	58	53	517
Carlton	8	12	14	7	17	18	3	9	19	34	39	180
Cass	28	56	51	57	69	110	29	93	73	114	89	769
Chisago	0	1	0	0	0	1	0	0	0	0	1	3
Clearwater	3	4	2	12	3	18	4	8	7	17	12	90
Cook	26	72	98	72	148	79	7	46	30	62	65	705
Crow Wing	6	7	9	12	9	33	8	26	21	36	22	189
Hubbard	5	8	23	16	15	19	11	25	45	41	36	243
Isanti	0	0	0	0	1	3	0	0	0	1	2	7
Itasca	80	134	158	108	212	172	50	121	128	170	183	1,516
Kanabec	10	20	28	10	12	18	8	19	19	18	36	198
Kittson	4	0	0	1	0	0	0	1	8	0	2	16
Koochiching	29	41	91	89	137	149	66	105	89	95	113	1,004
Lake	31	50	78	40	74	80	17	42	28	60	79	579
Lake of the Woods	2	8	16	12	30	43	25	32	41	29	32	270
Mahnomen	0	1	3	0	0	1	2	2	5	1	4	19
Marshall	0	1	0	1	2	3	1	9	17	12	5	51
Mille Lacs	1	10	7	5	5	12	3	11	11	28	14	107
Morrison	0	0	4	3	1	1	1	10	5	4	8	37
Norman	0	0	1	0	0	0	0	0	0	0	0	1
Pennington	0	0	0	0	0	1	0	3	2	1	1	8
Pine	21	36	58	31	62	73	20	55	52	98	113	619
Polk	0	0	0	0	1	0	0	0	0	1	0	2
Red Lake	0	0	0	0	3	2	0	0	0	0	0	5
Roseau	16	4	8	4	18	18	7	23	32	19	28	177
St. Louis	91	124	210	148	289	284	64	197	122	302	317	2,148
Wadena	0	0	1	0	0	1	0	0	0	0	0	2
Wilkin	0	0	0	1	0	0	0	0	0	0	0	1
Unknown	12	3	9	4	13	4	22	7	0	11	6	71
Total	419	701	1,028	743	1,247	1,359	392	1,038	919	1,340	1,416	10,602

Table 48. Estimates of registration compliance[a], and harvest estimates of Minnesota black bears corrected for compliance.

	1980	1981	1982	1983	1984	1985	1986
Compliance estimated from hunting success[b]	83%	75%	92%	95%	95%	92%	92%
Compliance calculated directly[c]	d	d	d	98%	99%	97%	99%
Registered harvest	1,247	1,359	392	1,038	919	1,340	1,416
Harvest estimate	1,502	1,812	426	1,055	932	1,376	1,436

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] $$\text{Compliance rate} = \frac{\text{Registered harvest}}{(\text{estimated hunting success}) \times (\text{number of hunters})} \times 100.$$

[c] $$\text{Compliance rate} = \frac{\text{Number of bears registered by survey respondents}}{\text{Number of bears taken by survey respondents}} \times 100.$$

[d] Direct comparisons not made.

Table 49. Percent hunting success of those Minnesota bear hunters that hunted.

Area/Group		1980	1981	1982	1983	1984	1985	1986
11		21	14	11	45	50	22	42
12	NW	11	20	14	34	48	34	24
13		19	27	30	29	30	46	35
21	NC	24	22	34	42	28	43	46
22	BWCAW	42	19	44	36	25	13	18
31	NE	23	16	33	44	20	52	46
40	WC	13	11	16	31	34	37	36
50	EC	13	16	27	29	30	38	40
All residents		17	16	23	34	31	39	39
All non-residents		33	24	48	53	39	55	58
All		18	17	24	35	31	40	40

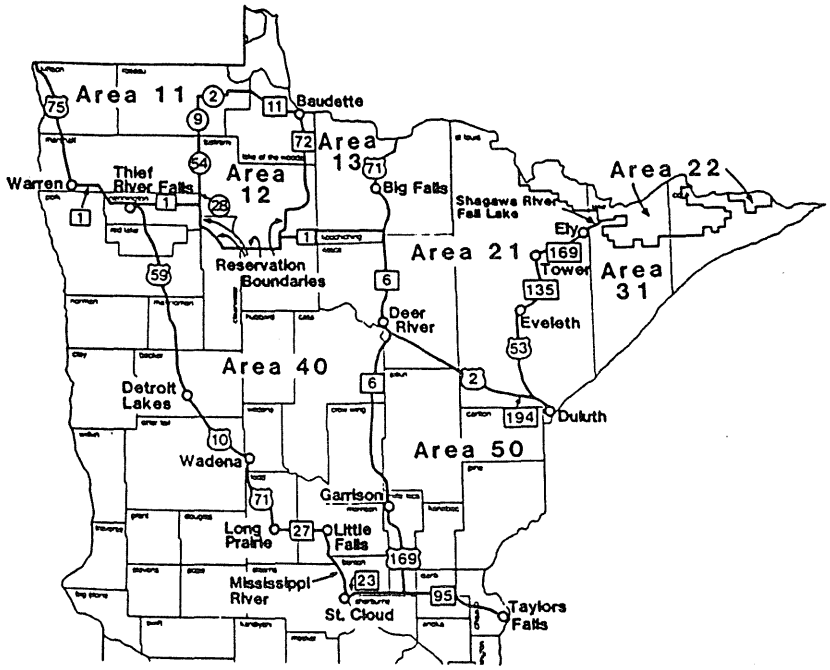

Figure 40. Boundaries of bear management units, 1986.

Table 50. Percent of Minnesota bear hunters using bows, baits, and guides, with the estimated number of hunters using guides shown parenthetically.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Bow	b	18	14	20	21	16	19
Bait	b	53	56	62	61	66	67
Guide	5	7	6	5	6	5	6
	(430)	(724)	(110)	(170)	(182)	(183)	(235)

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

[b] Not recorded in this survey.

Table 51. Percent hunting success of Minnesota bear hunters by method of hunt.[a]

Method	1980	1981	1982	1983	1984	1985	1986
Firearm		15	23	35	32	39	41
Bow only		22	18	33	27	44	31
Bait		21	25	37	33	42	42
No bait		11	21	31	26	35	33
Guide	49	18	32	45	52	41	47
No guide	17	16	23	34	30	39	39

[a] From a bear hunter survey conducted by the Forest Wildlife Populations and Research Group.

Table 52. Moose hunt quota statistics 1971-87, and harvest data, 1971-85.

Year	Area	Number of 4-person licenses issued	Number of 4-person license applications	Chances for permit	Harvest	Party Success (%)	Sex of Moose M	Sex of Moose F
1971	NW	250	9,264	1:23	240	96.0	159 (66%)	81 (34%)
	NE	150			134	89.3	87 (65%)	47 (35%)
1973	NW	335	13,560	1:26	306	91.3	213 (76%)	91 (24%)
	NE	185			159	86.0	131 (83%)	24 (13%)
1975	NW	475	15,792	1:20	449	94.5	259 (58%)	188 (42%)
	NE	275			227	82.5	147 (65%)	80 (35%)
1977	NW	630	16,586	1:18	598	94.9	348 (58%)	250 (42%)
	NE	300			243	81.0	172 (71%)	71 (29%)
1979	NW	395	19,023	1:28	330	83.5	196 (59%)	134 (41%)
	NE	290			236	81.4	158 (67%)	78 (33%)
1981	NW	505	20,521	1:23	455	90.1	283 (62%)	172 (38%)
	NE	375			309	82.4	218 (71%)	91 (29%)
1983	NW	780	17,754	1:14	737	94.5	493 (67%)	244 (33%)
	NE	523			442	84.5	273 (62%)	169 (38%)
1985	NW	768	20,553	1:19	718	93.5	419 (58%)	299 (42%)
	NE	300			250	83.3	165 (66%)	85 (34%)
1987	NW	772	17,087	1:13	-	-	-	-
	NE	528			-	-	-	-

TRAPPING

HARVEST STATISTICS

Table 53. Trapper response to mail surveys, 1979-80 through 1986-87.

Year	Number mailed	Number not delivered	Delivered questionnaires completed and returned	
			Number	Percent
1979-80	1,011	29	888	90.4
1980-81	1,345	110	1,072	86.8
1981-82	1,345	36	1,167	89.2
1982-83	925	28	794	88.5
1983-84	770	10	663[a]	87.2[a]
1984-85	556	9	495	90.5
1985-86	581	13	506	89.1
1986-87	582	8	514	89.5

[a] Includes only those surveys returned by 25 April 1984.

Table 54. Use of trapper licenses, 1979-80 through 1986-87.

		Return from mail survey	Projections from license sales
1979-80			
	Trapped	760 (85.6%)	15,512
	Did not trap	128 (14.4%)	2,609
		888 (100.0%)	18,121
1980-81			
	Trapped	918 (85.6%)	20,548
	Did not trap	154 (14.4%)	3,457
		1,072 (100.0%)	24,005
1981-82			
	Trapped	972 (83.3%)	19,725
	Did not trap	195 (16.7%)	3,954
		1,167 (100.0%)	23,679
1982-83			
	Trapped	688 (86.6%)	17,526
	Did not trap	106 (13.4%)	2,700
		794 (100.0%)	20,226
1983-84			
	Trapped	549 (82.8%)	13,862
	Did not trap	114 (17.2%)	2,879
		663 (100.0%)	16,741
1984-85			
	Trapped	445 (89.9%)	15,136
	Did not trap	50 (10.1%)	1,700
		495 (100.0%)	16,836
1985-86			
	Trapped	420 (83.0%)	12,201
	Did not trap	86 (17.0%)	2,498
		506 (100.0%)	14,699
1986-87			
	Trapped	442 (86.0%)	13,240
	Did not trap	72 (14.0%)	2,155
		514 (100.0%)	15,395

Table 55. Estimated number of trappers and estimated take per trapper of various furbearers, 1979–80 through 1986–87.

	Estimated number of trappers (thousands)								Estimated take per trapper reporting that species							
	1979–80	1980–81	1981–82	1982–83	1983–84	1984–85	1985–86	1986–87	1979–80	1980–81	1981–82	1982–83	1983–84	1984–85	1985–86	1986–87
Muskrat	13	19	16	12	11	13	9	11	55.5	75.7	62.5	48.4	75.8	75.1	51.8	72.9
Mink	10	15	13	10	8	9	8	9	6.5	6.5	5.7	5.6	6.8	8.0	7.6	8.7
Ermine	2	2	1[a]	1	<1	1	<1	1	3.7	3.1	3.2	2.2	4.6	3.5	2.6	4.2
Long-tailed weasel	1	1	1	1	<1	1	<1	1	2.3	2.9	2.8	1.6	4.0	2.1	2.0	5.2
Racoon	10	11	12	9	9	9	8	8	6.6	5.4	6.2	6.4	7.8	8.3	11.3	11.4
Striped skunk	6	8	7	5	4	5	4	4	7.6	7.0	8.1	6.4	8.5	9.4	10.3	10.2
Eastern spotted skunk (civet)	<1	<1	<1	<1	2	<1	<1	<1	2.0	7.1	1.6	6.7	2.5	1.4	2.5	2.5
Badger	2	2	2	1	1	1	1	1	1.6	1.6	1.8	1.7	2.1	1.6	2.1	1.7
Opossum	1	<1	<1	<1	<1	<1	1	1	2.0	1.7	2.1	1.8	3.1	2.8	8.7	13.8
Red fox	6	7	8	6	6	6	5	5	6.5	6.3	6.8	6.3	6.9	9.2	6.1	7.5
Gray fox	1	2	2	2	2	2	2	2	2.5	2.8	2.7	2.7	2.5	2.9	3.5	2.9
Coyote (brush wolf)	1	1	1	2	2	2	1	2	3.4	3.6	2.4	3.2	4.8	5.3	4.5	3.8
Beaver (fall)	4	6	4	2	4	5	4	6	12.4	9.2	7.5	4.4	7.3	10.0	9.8	11.5
Beaver (spring)	1	1	1	3	4	3	4	-	14.4	14.5	12.6	25.5	25.4	30.3	21.7	-

[a] 1 is any number which rounds to 1.
<1 is <0.5.

Table 56. Minnesota trapper license sales and estimated annual harvest, 1979-80 through 1986-87.

	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Trapper license sales[a]	18,121	24,005	23,679	20,196	16,741	16,836	14,699	15,395
Beaver license sales[b]	6,692	8,503	6,602	1,971	-	-	-	-
Estimated harvest[c] (thousands)								
Muskrat	707	1,419	989	570	865	963	477	826
Mink	66	96	76	57	58	75	57	77
Ermine	7	7	3	1[e]	2	3	1	3
Long-tailed weasel	3	3	4	1	1	1	1	3
Raccoon	65	61	72	60	69	78	89	95
Striped skunk	47	53	54	34	36	47	41	42
Eastern spotted skunk (civet)	<1	1	<1	1	<1	<1	<1	<1
Badger	3	3	3	2	2	2	2	2
Opossum	1	<1	1	<1	2	1	7	14
Red fox	39	42	53	41	42	58	29	40
Gray fox	4	5	5	5	5	5	6	6
Coyote (brush wolf)	5	4	3	5	9	10	7	7
Beaver (fall season)	22	16	10	76	101	103	92	-
Beaver (spring season)	54	51	30	24	30	51	43	71
Registered harvest								
Otter	1,186	1,111	485	385	408	529	559	777
Lynx[d]	42	16	17	28	9	closed	closed	closed
Bobcat[d]	291	210	260	274	208	280	119	160
Fisher	3,032	closed	862	912	631	1,289	678	1,067
Marten	closed	closed	closed	closed	closed	closed	430	798

[a] Separate licenses were issued for juveniles (13-17 years old) and adults (18 and older), beginning in 1982. Of 15,395 trapping licenses sold in 1986, 2,699 (17.5%) were juvenile licenses and 12,706 (82.5%) were adult licenses. Duplicate licenses excluded.

[b] Beginning in fall 1982, beaver could be trapped with only a general trapping license; the separate beaver trapping license was dropped.

[c] Based upon trappers' responses to mail surveys.

[d] Registered harvest for lynx and bobcat includes animals taken by hunting.

[e] 1 is any number which rounds to 1.
<1 is <0.5.

Table 57. Average price per pelt paid to hunters and trappers in Minnesota, 1975-76 through 1986-87.

Species	Average pelt prices paid hunters and trappers in Minnesota (dollars)											
	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87
Muskrat	3.00	4.03	4.25	4.56	5.90	5.62	3.47	2.19	2.24	2.81	1.85	2.89
Mink[a] (male)	(13.00)	27.40	22.15	36.69	42.83	37.55	34.35	24.43	30.33	28.40	25.29	35.75
Mink[a] (female)		10.07	8.86	14.80	18.61	16.04	17.22	10.63	14.55	14.04	13.37	18.43
Ermine (S.T. Weasel)	0.75	0.41	0.44	0.47	0.56	0.64	0.59	0.56	0.56	0.77	0.98	0.98
L.T. Weasel	0.75	0.87	0.85	1.01	0.94	0.84	0.96	0.80	0.93	1.10	1.06	1.28
Raccoon	21.00	23.54	22.30	45.83	36.42	27.44	32.35	17.95	12.66	19.91	15.51	21.81
Striped Skunk	2.50	2.95	2.78	4.13	4.14	4.74	3.46	2.58	2.77	2.74	1.58	2.06
Eastern Spotted Skunk	2.50	5.02	5.42	7.37	3.48	6.06	2.58	1.75	N.A.	3.00	6.17	N.A.
Badger	18.00	18.66	21.07	39.55	24.02	18.39	18.14	9.04	10.96	9.18	6.45	5.43
Opossum	1.50	1.72	2.11	2.10	2.12	2.52	1.58	0.87	0.71	1.14	0.62	0.97
Red Fox	50.00	49.52	52.97	72.21	55.43	50.81	51.48	31.10	32.81	29.07	17.51	22.07
Gray Fox	19.00	24.75	25.51	45.44	42.51	37.87	26.74	23.48	22.95	21.58	15.00	22.60
Coyote	29.00	41.32	34.03	56.62	39.76	31.37	41.28	25.41	18.79	19.06	18.19	22.03
Lynx	162.00	183.00	137.86	269.44	199.19	94.91	180.33	94.17	125.00	-	-	-
Bobcat	80.00	78.77	73.98	163.76	117.74	78.55	73.35	66.40	61.40	75.81	70.00	120.15
Beaver[a] (fall-winter)	12.25	15.79	13.45	17.64	32.74	17.88	14.48	10.69	9.52	12.51	15.03	20.32
Beaver (spring)	15.79	13.45	17.64	28.71	19.58	16.52	12.55	11.60	12.24	16.11	17.90	-
Otter	32.50	36.99	41.23	58.85	63.37	32.78	29.80	25.65	24.79	21.56	20.81	24.15
Fisher[a] (male)	No Open Season (71.23)			131.89	107.67	89.51	94.42	69.91	70.59	70.26	73.55	84.32
Fisher[a] (female)				147.23	127.79	104.29	110.08	99.08	121.08	121.76	130.47	162.29
Marten (male)	----------No Open Season----------										30.29	35.68
Marten (female)											27.61	26.58

[a] Differences in pelt prices were not calculated before 1975 for mink, 1979 for beaver, and 1978 for fisher.

FURBEARER REGISTRATION STATISTICS

Table 58. Total registered fur harvests and tag requests, 1984-85 through 1986-87.

Species	1984-85		1985-86		1986-87	
	Permits[a]	Harvest	Permits	Harvest	Permits	Harvest
Bobcat	--	280	--	119	--	160
Fisher	--	1,289	--	678	3,302	1,067
Otter	--	529	--	559	3,198	777
Pine Marten	--	closed	746	430	2,171	798

[a] Prior request possession tags and permits were required beginning in 1985 for marten and in 1986 for fisher and otter.

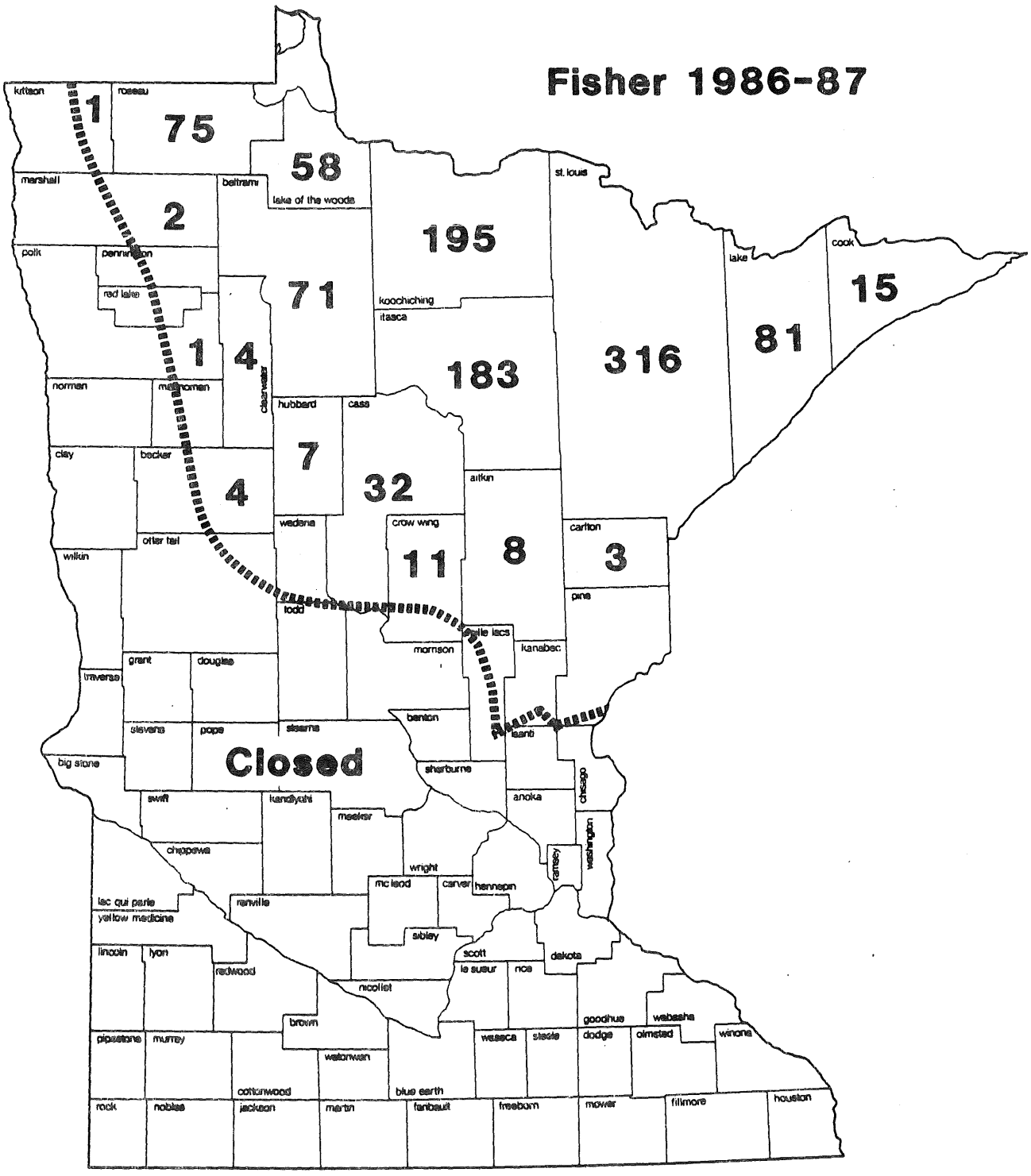

Figure 41. Fisher harvest by county, 1986-87.

Table 59. Fisher harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known total	Cumulative percent
	Male	Female	Unknown			
11/29	2	1	0	3	0.3	0.3
11/30	15	25	0	40	3.8	4.1
12/01	37	36	0	73	6.9	11.0
12/02	22	40	0	62	5.9	16.9
12/03	25	59	1	85	8.1	25.0
12/04	37	37	0	74	7.0	32.0
12/05	30	33	0	63	6.0	38.0
12/06	44	61	0	105	10.0	48.0
12/07	57	64	0	121	11.5	59.5
12/08	40	33	0	73	6.9	66.4
12/09	30	23	0	53	5.0	71.4
12/10	27	43	0	70	6.6	78.0
12/11	32	19	0	51	4.9	82.9
12/12	18	18	0	36	3.4	86.3
12/13	47	34	0	81	7.7	94.0
12/14	27	36	0	63	6.0	100.0
Unknown	2	7	6	15	-	-
Total	492	569	7	1,068	100.0	100.0

Table 60. Fisher harvest by county and sex, 1986 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	4	4	0	8
Becker	4	0	0	4
Beltrami	33	38	0	71
Carlton	3	0	0	3
Cass	24	8	0	32
Clearwater	2	2	0	4
Cook	4	11	0	15
Crow Wing	5	6	0	11
Hubbard	4	3	0	7
Itasca	93	89	1	183
Kittson	1	0	0	1
Koochiching	94	101	0	195
Lake	28	52	1	81
Lake of the Woods	24	34	0	58
Marshall	2	0	0	2
Norman	0	1	0	1
Polk	1	0	0	1
Roseau	30	45	0	75
St. Louis	139	177	0	316
Total	495	571	2	1,068

Table 61. Comparison of fisher harvest by county, 1982-86.

County	1982	1983	1984	1985	1986
Aitkin	15	5	10	8	8
Becker	2	4	3	1	4
Beltrami	41	25	96	27	71
Carlton	4	4	3	0	3
Cass	6	3	19	17	32
Clearwater	1	3	6	4	4
Cook	21	18	16	9	15
Crow Wing	6	2	11	6	11
Hubbard	0	0	7	1	7
Itasca	139	72	228	84	183
Kittson	0	6	2	1	1
Koochiching	182	123	255	157	195
Lake	115	37	80	49	81
Lake of the Woods	52	32	85	46	58
Marshall	6	13	10	5	2
Norman	0	0	0	0	1
Pine	0	1	1	0	0
Polk	0	0	0	0	1
Roseau	36	86	111	68	75
St. Louis	286	197	345	195	316
Unknown	0	0	1	0	0
Total	912	631	1,289	678	1,068

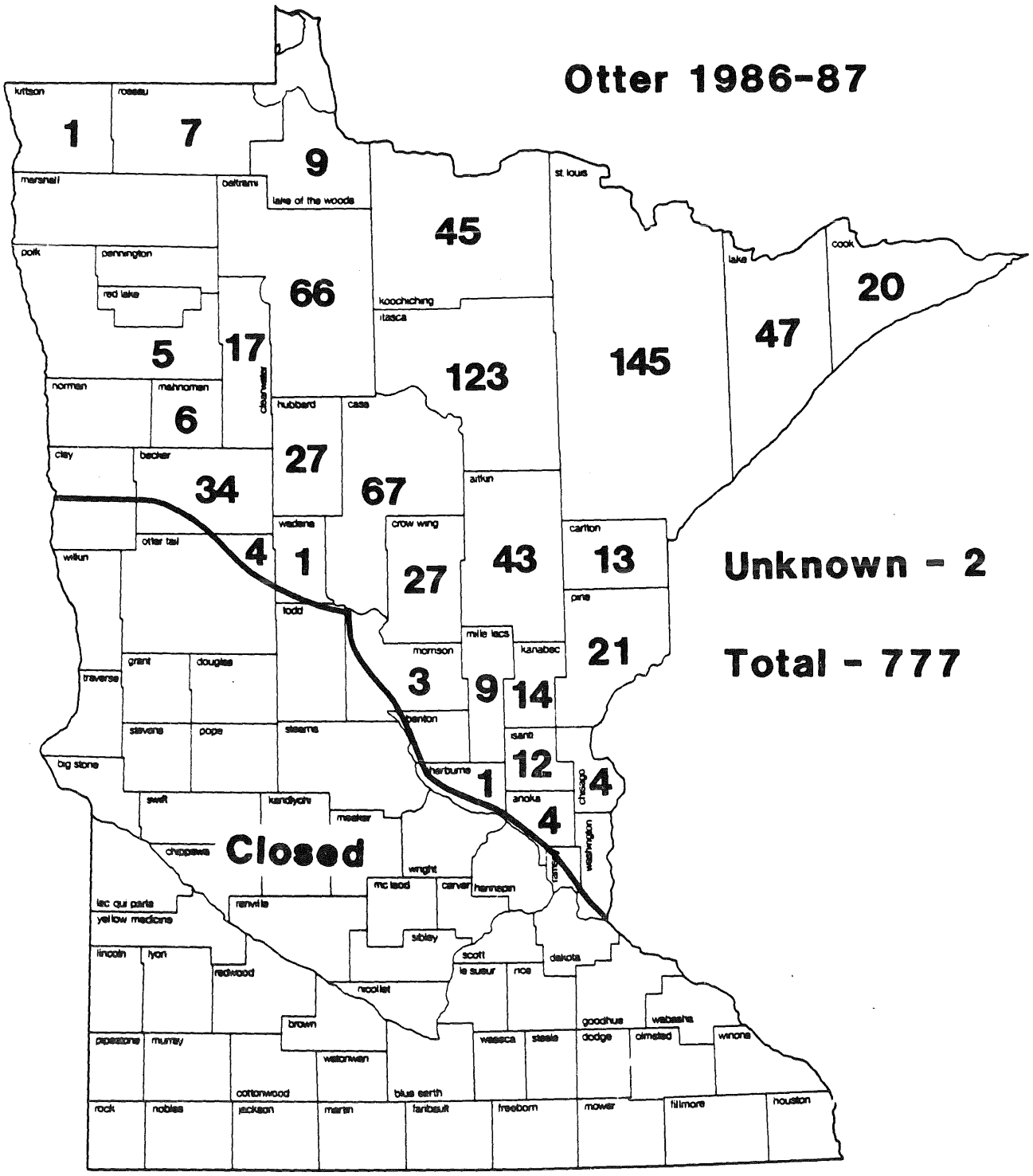

Figure 42. Otter harvest by county, 1986-87.

Table 62. Comparison of otter harvest by county, 1982-86.

County	11/13-11/27 1982	11/12-11/26 1983	11/17-12/01 1984	11/16-12/15 1985	11/01-11/30 1986
Aitkin	20	25	34	17	43
Anoka	0	0	0	0	4
Becker	8	15	18	24	34
Beltrami	39	23	33	46	66
Carlton	4	5	13	10	13
Cass	36	33	49	59	67
Chisago	0	0	0	0	4
Clearwater	9	6	11	6	17
Cook	17	4	16	5	20
Crow Wing	15	13	15	26	27
Hubbard	21	15	22	25	27
Isanti	0	0	0	0	12
Itasca	56	69	94	96	123
Kanabec	4	9	9	4	14
Kittson	0	0	0	0	1
Koochiching	23	26	34	38	45
Lake	15	20	18	25	47
Lake of the Woods	9	11	13	5	9
Mahnomen	2	2	3	14	6
Marshall	0	2	0	1	0
Mille Lacs	2	7	7	4	9
Morrison	0	0	0	0	3
Ottertail	1	1	1	1	4
Pennington	0	0	0	1	0
Pine	21	14	29	20	21
Polk	3	4	5	6	5
Red Lake	3	0	0	0	0
Roseau	3	3	5	5	7
St. Louis	69	96	96	119	145
Sherburne	0	0	0	0	1
Wadena	4	4	2	2	1
Unknown	1	1	2	0	2
Total	385	408	529	559	777

Table 63. Otter harvest by date and sex, 1986-87 season.

Date	Sex			Total	% of known Total	Cumulative percent
	Male	Female	Unknown			
11/01	3	6	0	9	1.2	1.2
11/02	19	15	0	34	4.4	5.6
11/03	39	18	0	57	7.5	13.1
11/04	24	20	0	44	5.7	18.8
11/05	20	20	0	40	5.2	24.0
11/06	21	13	1	35	4.6	28.6
11/07	30	17	0	47	6.1	34.7
11/08	16	18	0	34	4.5	39.2
11/09	17	10	0	27	3.5	42.7
11/10	25	13	0	38	5.0	47.7
11/11	10	7	0	17	2.2	49.9
11/12	15	7	0	22	2.9	52.8
11/13	2	11	0	13	1.7	54.5
11/14	8	15	0	23	3.0	57.5
11/15	28	26	0	54	7.1	64.6
11/16	15	14	0	29	3.8	68.4
11/17	11	6	0	17	2.2	70.6
11/18	10	6	0	16	2.1	72.7
11/19	4	5	0	9	1.2	73.9
11/20	21	15	1	37	4.8	78.7
11/21	6	6	0	12	1.6	80.3
11/22	11	9	0	20	2.6	82.9
11/23	4	8	0	12	1.6	84.5
11/24	15	1	0	16	2.1	86.6
11/25	10	2	0	12	1.6	88.2
11/26	15	8	0	23	3.0	91.2
11/27	6	9	0	15	2.0	93.2
11/28	11	7	0	18	2.4	95.6
11/29	7	6	0	13	1.7	97.3
11/30	11	10	0	21	2.7	100.0
Unknown	0	1	12	13	--	--
Total	434	329	14	777	100.0	100.0

Table 64. Otter harvest by county and sex, 1986-87 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	25	17	1	43
Anoka	3	1	0	4
Becker	22	12	0	34
Beltrami	37	29	0	66
Carlton	8	5	0	13
Cass	41	26	0	67
Chisago	2	2	0	4
Clearwater	11	6	0	17
Cook	8	12	0	20
Crow Wing	20	7	0	27
Hubbard	15	12	0	27
Isanti	6	6	0	12
Itasca	68	55	0	123
Kanabec	9	5	0	14
Kittson	1	0	0	1
Koochiching	25	20	0	45
Lake	26	21	0	47
Lake of the Woods	3	6	0	9
Mahnomen	3	3	0	6
Mille Lacs	7	2	0	9
Morrison	3	0	0	3
Ottertail	1	1	2	4
Pine	12	9	0	21
Polk	2	3	0	5
Roseau	4	3	0	7
St. Louis	77	67	1	145
Sherburne	0	1	0	1
Wadena	0	1	0	1
Unknown	0	0	2	2
Total	439	332	6	777

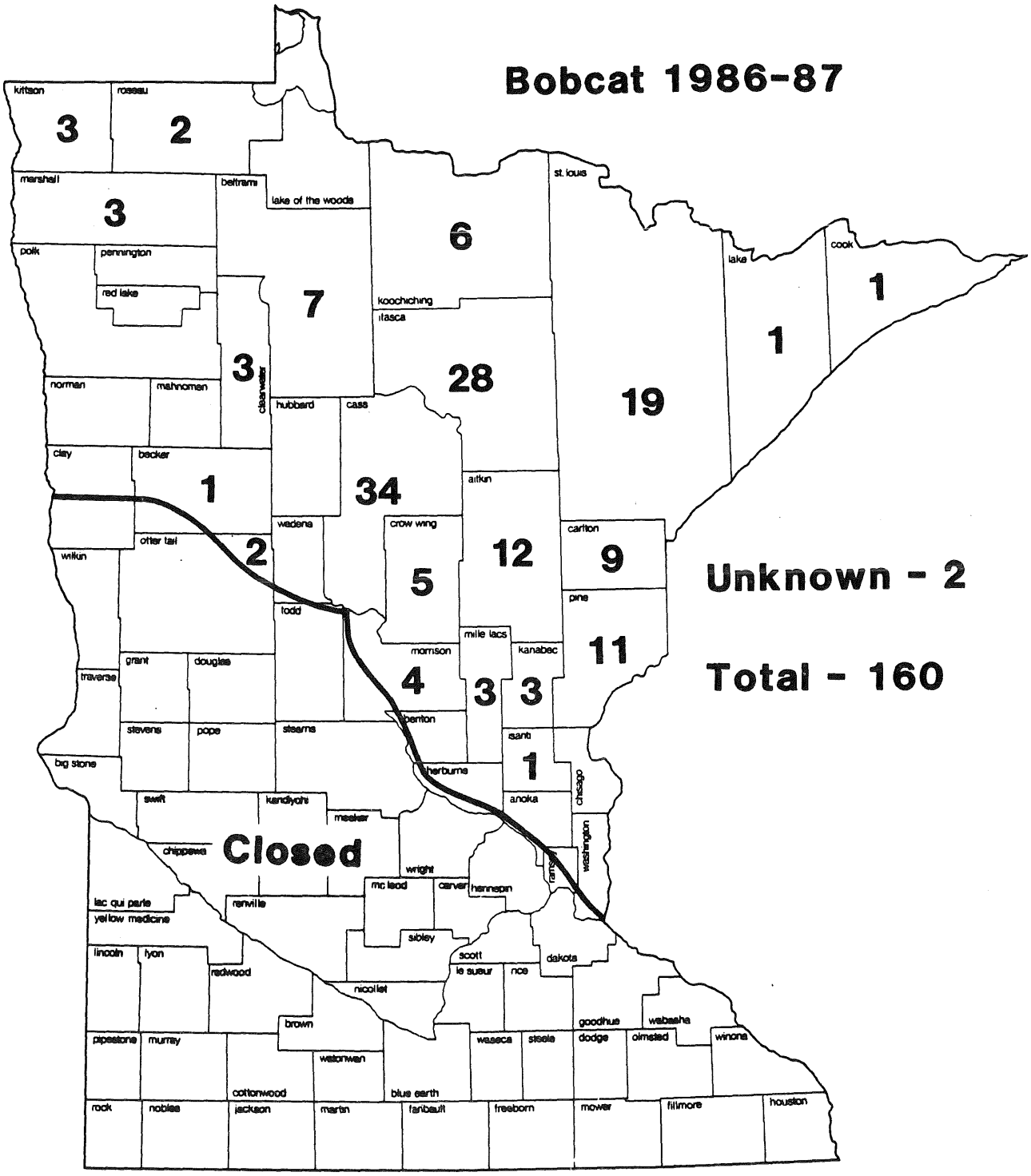

Figure 43. Bobcat harvest by county, 1986-87.

Table 65. Distribution of bobcat harvest among takers, 1979-80 through 1986-87.

Number Taken	Number of Takers																	
	1979-80		1980-81		1981-82		1982-83		1983-84		1984-85		1985-86		1986-87		Total (79-87)	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
1	88	(61.1)	51	(55.4)	123	(71.1)	111	(65.3)	108	(72.0)	116	(65.2)	70	(78.7)	92	(76.7)	759	(68.0)
2	34	(23.6)	21	(22.8)	29	(16.8)	30	(17.6)	32	(21.3)	39	(21.9)	11	(12.4)	18	(15.0)	214	(19.2)
3	9	(6.2)	6	(6.5)	10	(5.8)	16	(9.4)	6	(4.0)	13	(7.3)	6	(6.7)	9	(7.5)	75	(6.7)
4	4	(2.8)	4	(4.3)	5	(2.9)	10	(5.9)	4	(2.7)	9	(5.1)	I	(1.1)	0	(0.0)	37	(3.3)
5	9	(6.3)	10	(10.9)	6	(3.5)	3	(1.8)	0	(0.0)	1	(0.5)	1	(1.1)	1	(0.8)	31	(2.8)
Total	144		92		173		170		150		178		89		120		1,116	

Table 66. Time distribution of bobcat harvest by 5-day increments, 1986-87 season.

Interval	Sex			Total	% of Total	Cumulative Percent
	M	F	U			
Nov. 29-Dec 3.	3	6	0	9	5.9	5.9
Dec. 4-8	11	16	0	27	17.8	23.7
Dec. 9-13	10	18	0	28	18.4	42.1
Dec. 14-18	13	15	0	28	18.4	60.5
Dec. 19-23	5	9	0	14	9.2	69.7
Dec. 24-28	8	13	0	21	13.8	83.5
Dec. 29-Jan. 2	9	9	0	18	11.9	95.4
Jan. 3[a]	3	4	0	7	4.6	100.0
Unknown	0	2	6	8		
Total	62	92	6	160	100.0	100.0

[a] 1-day interval

Table 67. Comparison of bobcat harvest by county, 1982-83 through 1986-87.

County	1982-83	1983-84	1984-85	1985-86	1986-87
Aitkin	28	20	25	14	12
Becker	6	8	9	1	1
Beltrami	18	17	24	5	7
Carlton	15	4	20	6	9
Cass	30	13	42	20	34
Chisago	1	0	0	1	0
Clearwater	1	1	0	0	3
Cook	2	0	1	0	1
Crow Wing	4	4	5	6	5
Hubbard	4	1	1	0	0
Isanti	0	0	0	0	1
Itasca	46	36	50	15	28
Kanabec	2	2	6	2	3
Kittson	5	3	0	0	3
Koochiching	3	12	8	8	6
Lake	8	3	1	1	1
Lake of the Woods	3	1	1	1	0
Marshall	2	3	1	1	3
Mille Lacs	0	6	0	4	3
Morrison	5	7	5	4	4
Ottertail	2	1	1	3	2
Pine	20	24	20	14	11
Polk	0	0	1	0	0
Red Lake	0	0	0	1	0
Renville	0	0	1	0	0
Roseau	9	9	14	2	2
St. Louis	59	32	43	8	19
Wadena	0	1	1	2	0
Unknown	1	0	1	0	2
Total	274	208	280	119	160

Table 68. Bobcat harvest by method of take, 1979-1986.

Year	Total Harvest	Trapping				Hunting			
		Harvest	(% of Total)	Takers	Ave. Take	Harvest	(% of Total)	Takers	Ave. Take
1979	291	253	(86.9)	--	--	38	(13.1)	--	--
1980	210	177	(84.3)	68	2.6	33	(15.7)	24	1.4
1981	260	219	(84.2)	143	1.5	41	(15.8)	30	1.4
1982	274	239	(87.2)	147	1.6	35	(12.8)	23	1.5
1983	208	168	(80.8)	118	1.4	40	(19.2)	32	1.3
1984	280	252	(90.0)	156	1.6	28	(10.0)	22	1.3
1985	119	83	(69.7)	62	1.3	36	(30.3)	27	1.3
1986	160	119	(74.4)	89	1.3	41	(25.6)	31	1.3

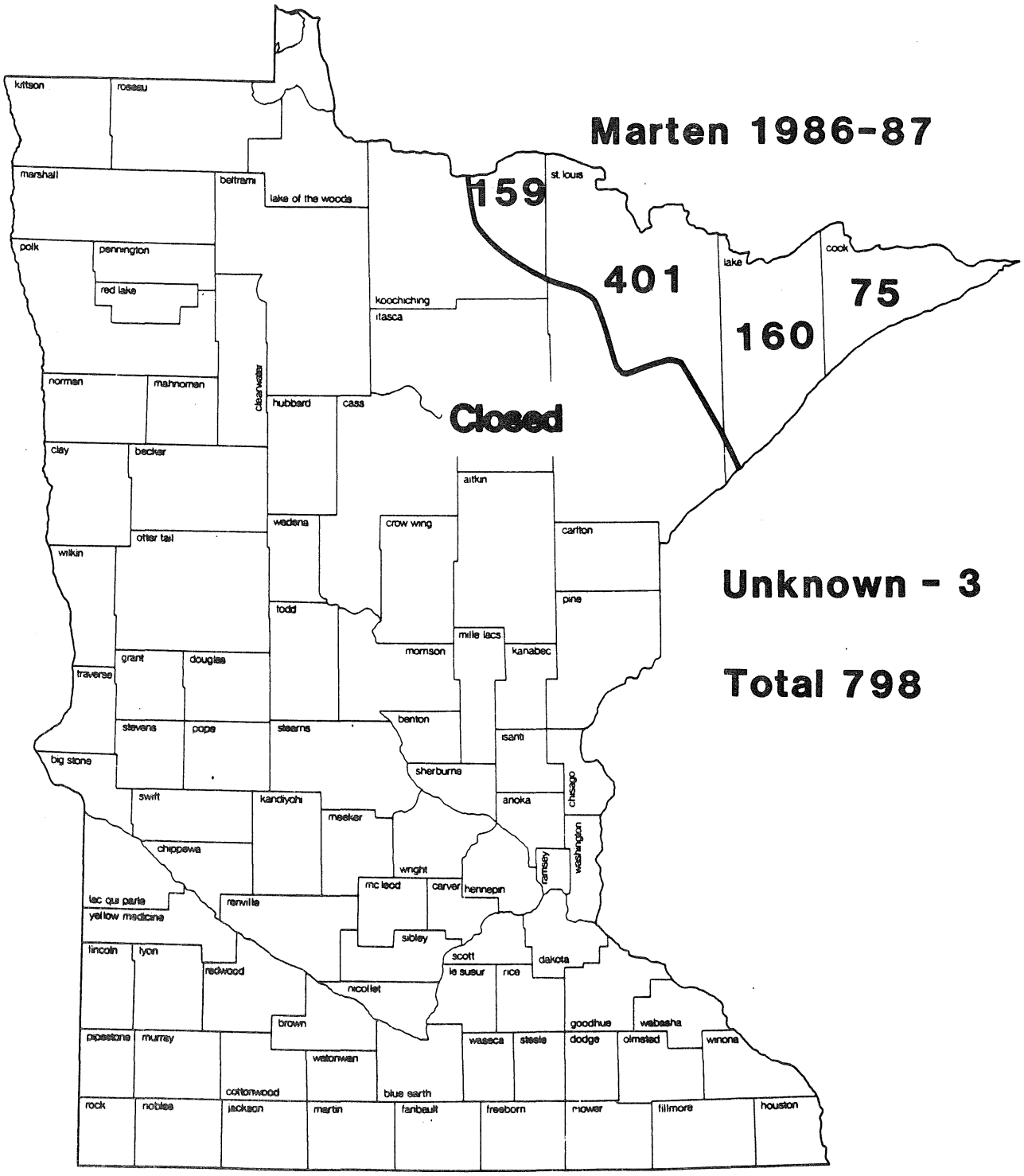

Figure 44. Marten harvest by county, 1986-87.

Table 69. Marten harvest by county and sex, 1986-87.

County	Sex			Total
	Male	Female	Unknown	
Cook	61	14	0	75
Koochiching	109	50	0	159
Lake	121	38	1	160
St. Louis	265	133	0	401
Unknown	1	2	0	3
Total	557	237	4	798

Table 70. Comparison of marten harvest by county, 1985-86.

County	1985	1986
Cook	51	75
Koochiching	72	159
Lake	119	160
St. Louis	188	401
Unknown	0	3
Total	430	798

Table 71. Marten harvest by date and sex, 1986-87.

Date	Male	Female	Unknown	Total	% of Total	Cumulative Percent
11/29	1	1	0	2	0.5	0.5
11/30	47	25	0	72	9.1	9.6
12/01	43	13	0	56	7.1	16.7
12/02	28	6	1	35	4.4	21.1
12/03	55	25	1	81	10.2	31.3
12/04	31	14	0	45	5.7	37.0
12/05	34	20	0	54	6.8	43.8
12/06	61	24	0	85	10.7	54.5
12/07	60	31	2	93	11.7	66.2
12/08	38	17	0	55	6.9	73.1
12/09	31	7	0	38	4.8	77.9
12/10	40	15	0	55	7.0	84.9
12/11	23	9	0	32	4.1	89.0
12/12	21	10	0	31	3.9	92.9
12/13	24	14	0	38	4.8	97.7
12/14	14	4	0	18	2.3	100.0
Unknown	4	2	0	6	--	--
Total	557	237	4	798	100.0	100.0