Status of Wildlife Populations, Fall 1990 and 1981-1989 Hunting and Trapping Harvest Statistics

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This report should be cited as:

Welsh, R. J., compiler. 1990. Status of wildlife populations, fall 1990 and 1981-1989 hunting and trapping harvest statistics. Unpub. Rep., Section of Wildlife, Minn. Dept. Nat. Res., St. Paul, Minnesota. 132pp.

Note: Data in this report is subject to change as a result of future verification and more comprehensive analysis.

Status of Wildlife Populations, Fall 1990

and

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This is the 14th year that the Wildlife Populations and Research Unit has compiled this booklet; it is primarily an administrative document intended for DNR personnel. (Since 1984 we have also generated a companion volume containing annual summaries of activities and findings from each ongoing research project in the Unit).

Most of the field work associated with collection of census and survey data for farmland and forest wildlife is performed by wildlife biologists and managers (conservation officers also participate in August roadside counts). The Farmland and Forest Wildlife Population and Research groups coordinate these activities, analyze and interpret data, and prepare recommendations for harvest regulations and season setting.

Much of the census and survey work for wetland species is done by personnel in the Wetland Wildlife Populations and Research Group.

Most of the hunting and trapping harvest estimates are calculated and summarized by St. Paul central office personnel.

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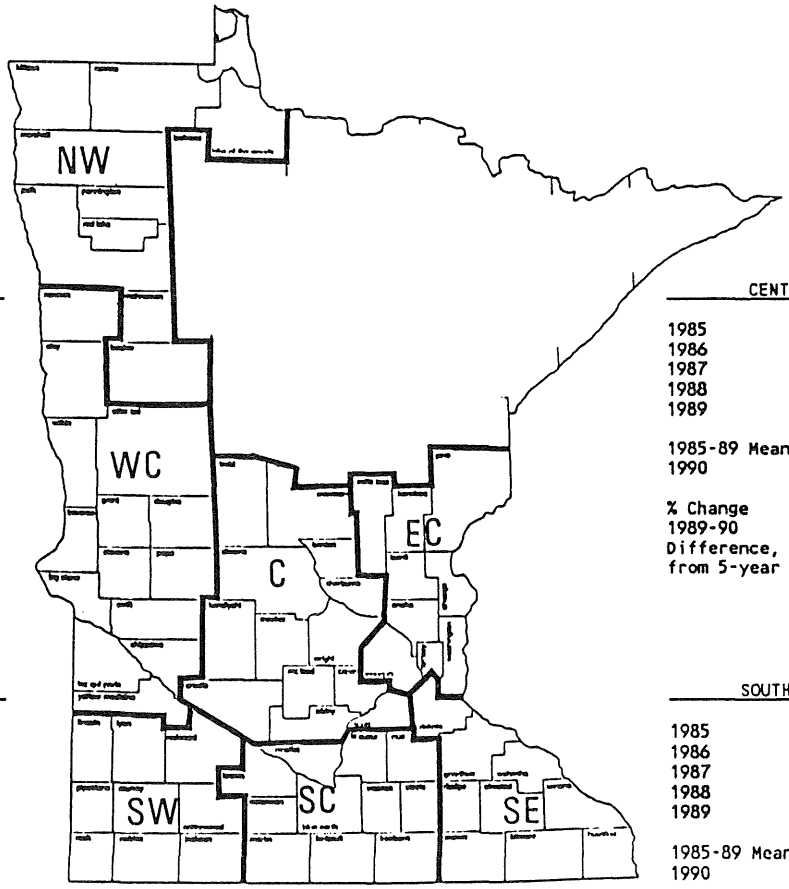
FARMLAND WILDLIFE POPULATIONS

WEST CENTRAL	
1985	63
1986	20
1987	80
1988	45
1989	33
1985-89 Mean	48
1990	46
% Change 1989-90	+38%
Difference, 1990 from 5-year mean	-4%

STATEWIDE	
1985	35
1986	21
1987	50
1988	35
1989	54
1985-89 Mean	36
1990	58
% Change 1989-90	+46%
Difference, 1990 from 5-year mean	+61%

EAST CENTRAL	
1985	41
1986	22
1987	25
1988	40
1989	54
1985-89 Mean	36
1990	72
% Change 1989-90	+34%
Difference, 1990 from 5-year mean	+100%



SOUTH CENTRAL	
1985	30
1986	24
1987	42
1988	32
1989	40
1985-89 Mean	33
1990	62
% Change 1989-90	+56%
Difference, 1990 from 5-year mean	+88%

CENTRAL	
1985	16
1986	11
1987	36
1988	31
1989	42
1985-89 Mean	27
1990	61
% Change 1989-90	+47%
Difference, 1990 from 5-year mean	+126%

SOUTHWEST	
1985	14
1986	20
1987	60
1988	25
1989	32
1985-89 Mean	30
1990	60
% Change 1989-90	+86%
Difference, 1990 from 5-year mean	+100%

SOUTHEAST	
1985	32
1986	37
1987	39
1988	30
1989	43
1985-89 Mean	37
1990	54
% Change 1989-90	+24%
Difference, 1990 from 5-year mean	+46%

Figure 1. Ring-necked pheasants observed per 100 miles of August roadside count route, 1985-90, and percent change 1989-90 for routes surveyed both years.

Table 1. County, regional and statewide August roadside count results for ring-necked pheasants in Minnesota, 1985-90.

Region and County	Miles surveyed 1990	Pheasants observed per 100 miles							Percent change[a]
		1985	1986	1987	1988	1989	1990	1985-89 Mean	1989-90
West Central	925	62.9	19.6	79.5	45.3	33.1	45.6	48.1	+38
Big Stone	75	283	21	339	96	36	136		
Chippewa	50	38	26	116	48	52	64		
Clay	75	1	0	0	9	11	0		
Douglas	50	2	2	14	14	0	38		
Grant	50	12	10	4	0	18	8		
Lac Qui Parle	75	40	24	107	200	73	73		
Norman	50	0	0	0	0	0	0		
Otter Tail	50	106	52	140	44	2	18		
Pope	75	97	40	67	61	49	96		
Stevens	75	61	33	113	29	97	103		
Swift	75	111	17	63	17	77	37		
Traverse	75	36	23	69	53	4	0		
Wilkin	75	3	1	0	0	0	1		
Yellow Medicine	75	39	21	40	21	12	31		
Central	775	16.3	10.7	36.4	31.2	42.3	60.5	27.0	+47
Benton	50	60	8	104	28	74	24		
Carver	50	4	0	26	44	14	54		
Kandiyohi	75	25	3	8	60	71	51		
McLeod	50	16	14	--	20	154	88		
Meeker	75	8	5	21	28	65	133		
Morrison	50	0	22	8	2	28	36		
Renville	50	0	0	0	0	0	0		
Scott	50	38	14	72	48	42	140		
Sherburne	50	0	0	48	0	0	0		
Sibley	75	20	19	44	26	17	63		
Stearns	100	19	3	11	14	2	16		
Todd	50	0	44	26	80	100	78		
Wright	50	16	18	100	58	38	116		
East Central	425	41.3	22.4	24.5	40.0	53.6	72.0	36.3	+34
Anoka	50	32	0	4	20	16	108		
Chisago	75	72	25	43	33	115	131		
Hennepin	25	--	0	4	120	44	164		
Isanti	75	27	23	9	57	48	45		
Kanabec	50	32	38	26	18	0	40		
Mille Lacs	50	52	70	42	18	138	102		
Pine	50	66	6	30	70	0	8		
Washington	50	0	4	26	18	36	8		

Table 1. Continued.

Region and County	Miles surveyed 1990	Pheasants observed per 100 miles							Percent change[a] 1989-90
		1985	1986	1987	1988	1989	1990	1985-89 Mean	
Southwest	475	14.3	19.8	60.4	24.7	32.0	59.6	30.3	+86 *[b]
Cottonwood	50	46	0	48	32	14	26		
Jackson	50	18	10	16	8	32	90		
Lincoln	50	4	4	76	0	18	60		
Lyon	50	0	16	22	28	48	32		
Murray	50	6	26	98	40	40	52		
Nobles	75	15	29	41	12	16	33		
Pipestone	50	18	20	46	40	20	64		
Redwood	50	6	16	6	22	0	22		
Rock	50	16	52	200	48	108	170		
South Central	800	29.6	23.5	41.7	31.6	39.6	61.8	33.3	+56 *
Blue Earth	75	8	1	29	43	37	16		
Brown	75	24	28	24	35	52	41		
Faribault	75	24	12	49	13	21	15		
Freeborn	75	51	35	72	31	37	60		
LeSueur	75	80	24	83	47	32	145		
Martin	75	15	50	74	35	3	41		
Nicollet	75	12	0	43	7	52	72		
Rice	75	0	16	12	27	71	87		
Steele	50	2	2	68	34	12	86		
Waseca	75	23	81	3	96	73	95		
Watonwan	75	59	11	21	4	36	29		
Southeast	500	31.6	37.4	39.0	30.1	43.4	53.6	36.5	+24
Dakota	50	--	62	4	0	14	6		
Dodge	50	56	12	66	48	94	62		
Fillmore	50	2	32	14	4	56	16		
Goodhue	50	2	0	4	12	10	38		
Houston	50	0	2	14	10	0	26		
Mower	75	64	72	71	44	65	88		
Olmsted	75	49	60	41	65	83	128		
Wabasha	50	16	54	6	22	20	36		
Winona	50	38	14	114	26	18	28		
Statewide	3900	34.6	21.2	50.0	34.8	39.8	57.5	36.0	+46 ***

[a] Percent change 1989-90 calculated only for routes surveyed both years.

[b] * $P \leq 0.1$; ** $P \leq 0.05$; *** $P \leq 0.01$.

Table 2. Statewide pheasant population parameters calculated from August roadside count results, 1985-90.

Population Parameter	1985	1986	1987	1988	1989	1990	1985-89 Mean	Percent change[a] 1989-90
Cocks/100 Miles	3.2	2.6	3.6	2.8	2.9	4.9	3.0	+72
Hens/100 Miles	4.4	2.5	4.9	3.8	4.6	7.8	4.0	+73
Broods/100 Miles	4.8	3.6	7.0	4.7	5.2	7.9	5.1	+54
Mean Brood Size	5.6	4.5	5.9	6.0	6.2	5.7	5.7	-9
Broods/100 Hens	108.4	147.4	142.8	123.6	113.0	101.0	125.5	-11
Median Hatch Date	Jun 6	Jun 6	May 27	May 31	Jun 6	Jun 9	Jun 1[b]	

[a] Percent change 1989-90 calculated only for routes surveyed both years.

[b] Median hatch date, 1985-89.

Table 3. Regional and statewide August roadside count results for gray (Hungarian) partridge, 1985-90.

Agricultural Region	Miles Surveyed 1990	Partridges observed per 100 miles							Percent change[a]
		1985	1986	1987	1988	1989	1990	1985-89 Mean	1989-90
Northwest	475	2.2	3.5	3.6	3.8	24.8	20.4	7.9	-18
West Central	925	30.7	10.1	14.7	25.9	20.0	14.8	20.3	-26
Central	775	17.5	4.6	15.1	18.2	13.1	19.5	13.6	+54
East Central	425	0.0	0.0	0.0	3.1	0.0	0.0	0.6	NA
Southwest	475	94.9	59.6	99.2	110.7	93.5	101.5	91.4	+9
South Central	800	63.3	45.3	47.0	63.6	84.1	62.7	60.7	-25
South East	500	42.2	20.8	66.6	40.4	42.0	34.6	42.4	-18
Statewide[b]	4375	37.0	20.6	33.4	37.3	39.7	35.2	33.6	-11

[a] Percent change 1989-90 for routes surveyed both years only.

[b] Statewide means include the Northwest agricultural region.

Table 4. Statewide gray (Hungarian) partridge population parameters calculated from August roadside count results, 1985-90.

Population Parameter	1985	1986	1987	1988	1989	1990	1985-89 Mean	Percent change[a] 1989-90
Adults/100 Miles	8.1	5.7	7.0	7.5	9.9	11.8	7.7	+21
Broods/100 Miles	3.2	1.9	2.7	3.1	3.3	3.3	2.8	+1
Mean Brood Size	9.0	8.0	9.9	9.7	9.1	7.1	9.2	-22
Broods/100 Adults	39.5	32.7	38.0	40.6	33.3	28.0	36.8	-16
Median Hatch Date	Jun 19	Jun 30	Jun 14	Jun 15	Jun 21	Jun 21	Jun 20[b]	

[a] Percent change 1989-90 for routes surveyed both years only.

[b] Median hatch date, 1985-89.

Table 5. August roadside count results for selected farmland wildlife species and percent change 1989-90 by agricultural region.

Agricultural Region	Miles Surveyed 1990	Animals observed per 100 miles											
		Cottontail			Jackrabbit			Mourning dove			White-tailed deer		
		1989	1990	Percent change[a]	1989	1990	Percent change[a]	1989	1990	Percent change[a]	1989	1990	Percent change[a]
Northwest	475	1.3	1.9	+50	1.1	2.1	+100	165.9	170.3	+3	15.4	14.3	-7
West Central	925	3.6	3.6	0	2.6	2.2	-17	501.4	443.1	-12	8.3	6.7	-20
Central	775	5.9	6.3	+7	1.1	0.4	-63	242.5	232.4	-3	1.9	3.2	+79
East Central	425	8.9	10.6	+18	0.0	0.2	NA	125.9	128.0	+2	2.4	8.2	+250
Southwest	475	6.7	4.0	-41	2.1	1.3	-40	329.7	159.4	-52	11.2	12.0	+8
South Central	800	4.2	6.6	+56	2.4	2.1	-11	257.3	175.5	-32	1.8	3.6	+107
Southeast	500	9.2	16.8	+83	0.6	1.2	+100	180.0	353.4	+96	7.8	7.6	-3
Statewide[b]	4375	5.4	6.7	+24	1.6	1.4	-9	283.4	255.6	-10	6.4	7.2	+12

[a] Percent change 1989-90 calculated only for routes surveyed both years.

[b] Statewide means include the Northwest agricultural region.

Table 6. Statewide August roadside count results for selected farmland wildlife species, 1986-90.

Species	Animals seen per 100 miles driven					Percent change[a]
	1986	1987	1988	1989	1990	1989-90
Ring-necked pheasant[b]	21.2	50.0	34.8	39.8	57.5	+46
Gray partridge (Hun)	20.6	33.4	37.3	39.7	35.2	-11
Mourning dove	204.1	252.4	245.0	283.4	255.6	-10
Eastern cottontail	4.0	6.9	4.0	5.4	6.7	+24
White-tailed jack rabbit	0.5	0.7	0.7	1.6	1.4	-9
White-tailed deer	3.9	5.4	5.2	6.4	7.2	+12
Sharp-tailed grouse	0.00	0.00	0.36	0.00	0.05	NA
Greater prairie-chicken	0.00	0.00	0.00	0.00	0.02	NA
Sandhill crane	1.33	3.44	7.66	2.44	6.19	+155
Badger	0.00	0.05	0.00	0.03	0.00	-100
Gray & fox squirrel	1.29	1.19	1.62	1.20	0.85	-33
Gray & red fox	0.42	0.26	0.22	0.74	0.91	+25
Striped & spotted skunk	0.42	0.30	0.38	0.30	0.55	+85

[a] Percent change 1989-90 calculated only for routes surveyed both years.

[b] Ring-necked pheasant means do not include the Northwest agricultural region.

Table 7. Animals observed per 100 miles of August roadside count for 5 species in Minnesota, statewide summaries, 1955-90.[a]

Year	Animals observed per 100 miles driven								
	Ring-necked pheasant	Gray partridge		Cotton-tail		Jack-rabbit		Mourning dove	
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	276.3	4.4		9.8		3.6		300.8	
1961	336.0	4.5		9.4		3.5		392.4	
1962	197.4	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	61.9	4.6		5.5		2.8		NC[b]	
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	66.4	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	33.9		7.3		3.7		347.9	
1980	104.9	44.6		6.4		2.8		352.2	
1981	133.5	42.9		10.2		2.5		347.6	
1982	60.2	24.5	(22.1)	5.6	(5.2)	1.8	(1.7)	325.0	(313.6)
1983	56.2	24.4	(23.4)	7.2	(6.7)	1.0	(1.0)	298.9	(286.6)
1984	28.6	21.3	(20.0)	3.3	(2.9)	0.9	(0.8)	292.0	(279.2)
1985	34.6	40.7	(37.0)	4.8	(4.4)	1.3	(1.2)	273.7	(270.1)
1986	21.2	22.4	(20.6)	4.4	(4.0)	0.4	(0.5)	207.0	(204.1)
1987	50.0	37.1	(33.4)	7.7	(6.9)	0.7	(0.7)	257.1	(252.4)
1988	34.8	41.5	(37.3)	4.3	(4.0)	0.7	(0.7)	252.3	(245.0)
1989	39.8	41.5	(39.7)	5.9	(5.4)	1.7	(1.6)	297.9	(283.4)
1990	57.5	37.1	(35.2)	7.3	(6.7)	1.4	(1.4)	266.0	(255.6)

[a] Eight counties in the Northwest agricultural region were added to the August count in 1982. Numbers in parentheses represent statewide means including Northwest agricultural region. These were not calculated for ring-necked pheasants because the Northwest counties are outside the pheasant range.

[b] No count.

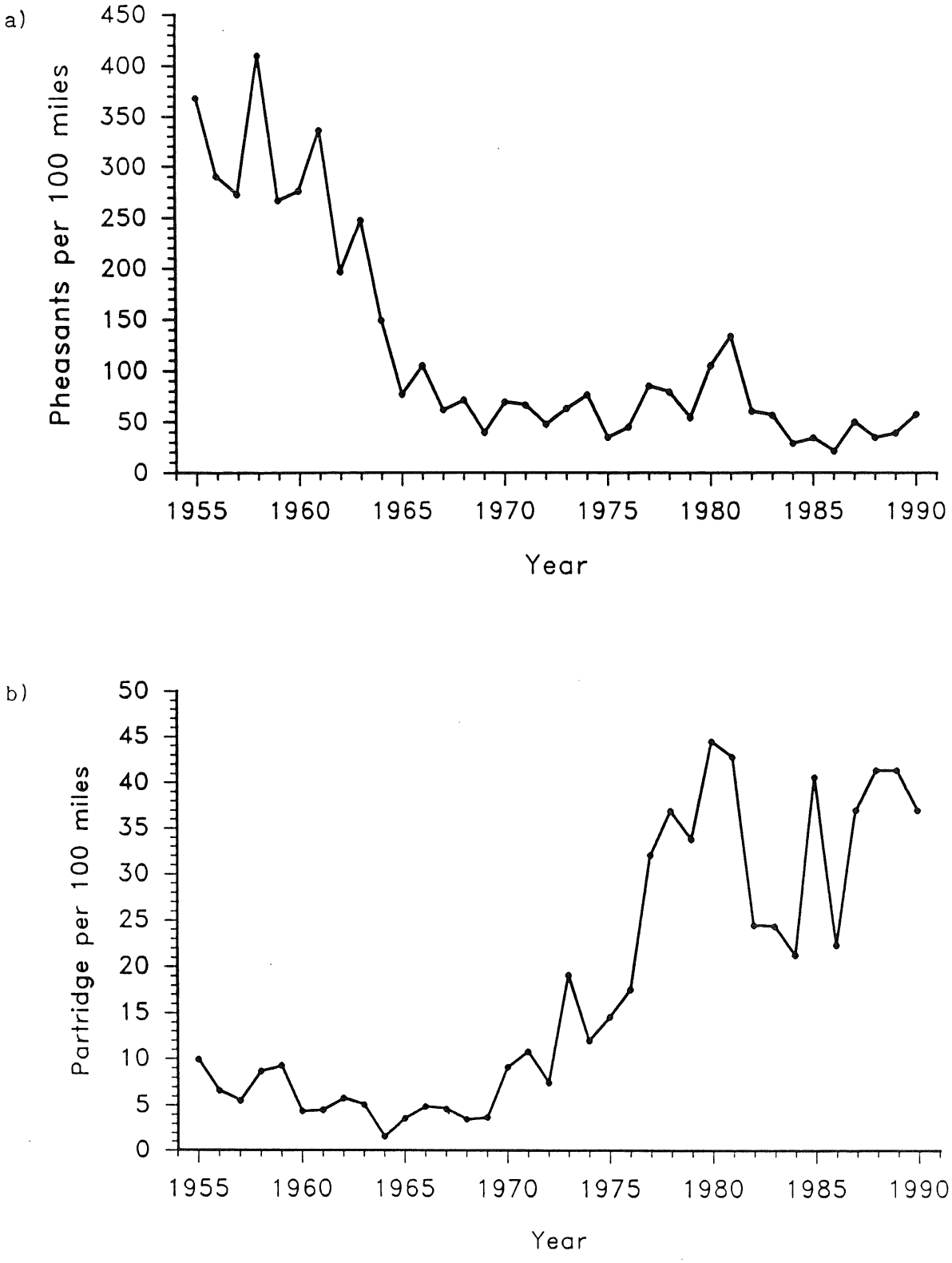


Figure 2. August roadside count indices (birds observed per 100 miles driven) for a) ring-necked pheasants and b) gray partridge, 1955-90.

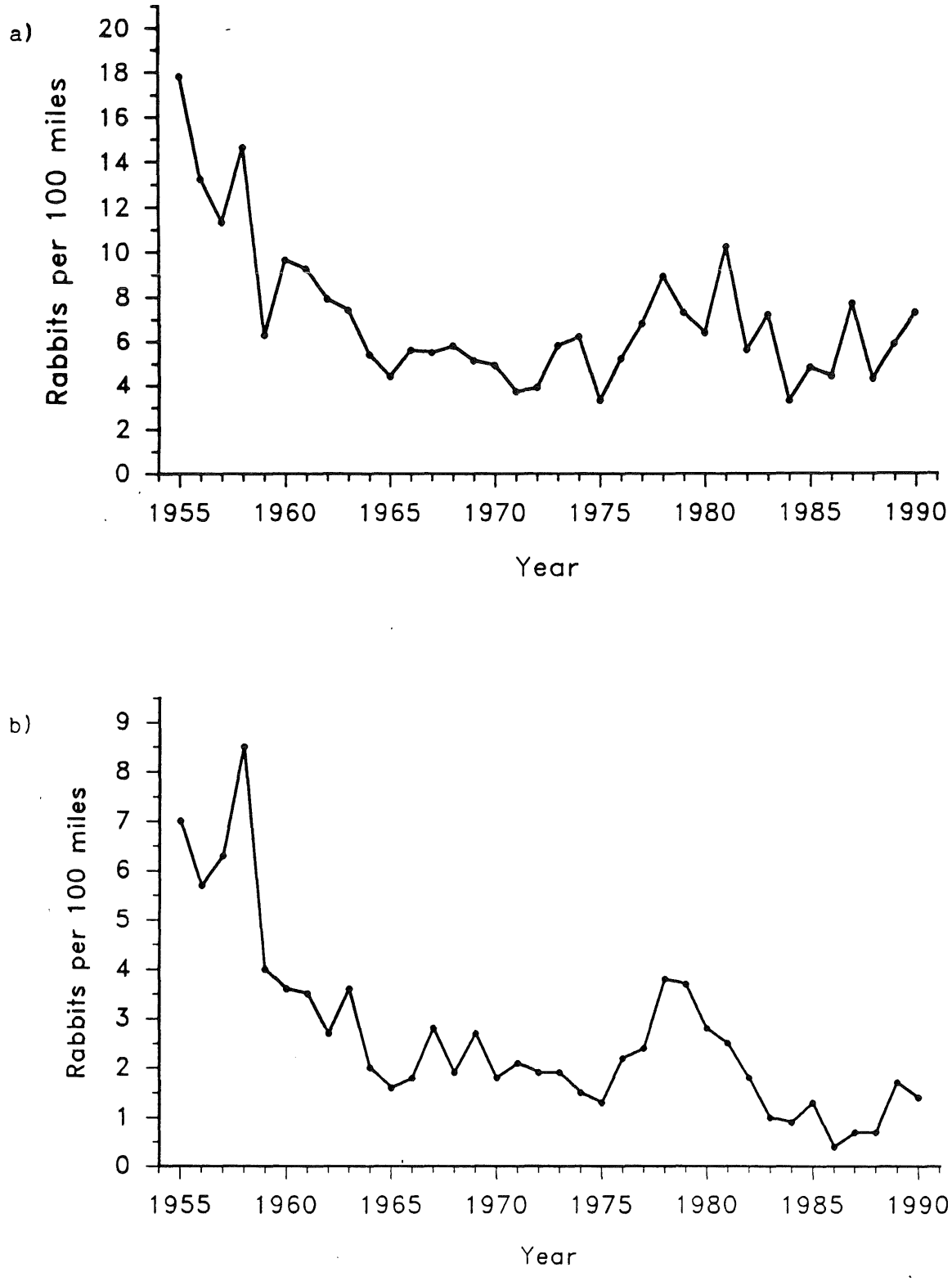


Figure 3. August roadside count indices (animals observed per 100 miles driven) for a) eastern cottontails and b) white-tailed jackrabbits, 1955-90.

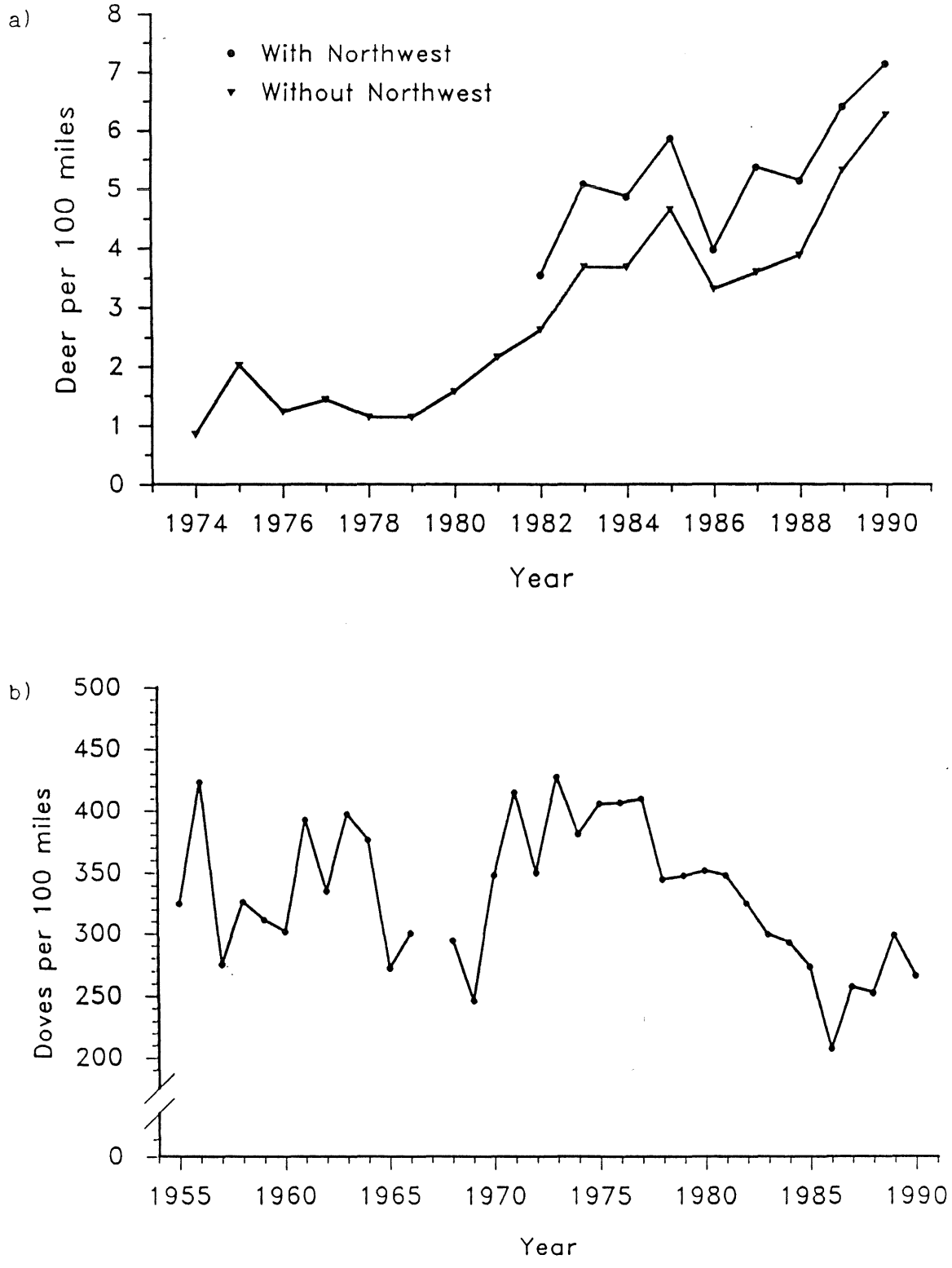
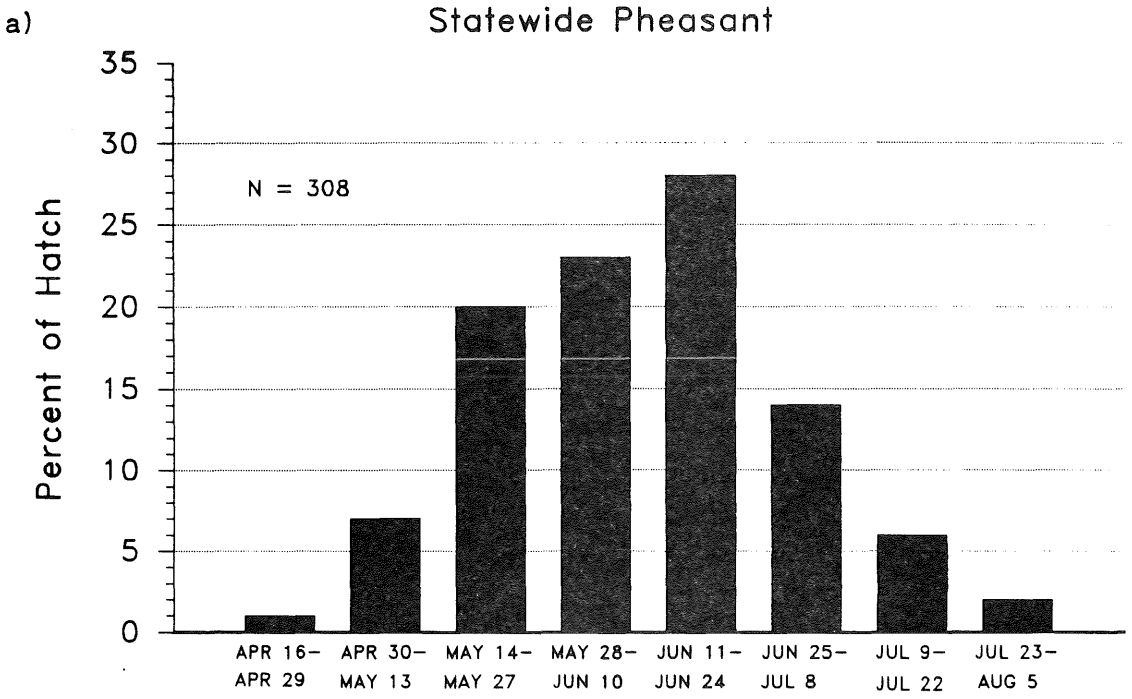


Figure 4. August roadside count indices (animals observed per 100 miles driven) for a) white-tailed deer, including and excluding the Northwest agricultural region, 1974-90, and b) mourning doves, 1955-90.



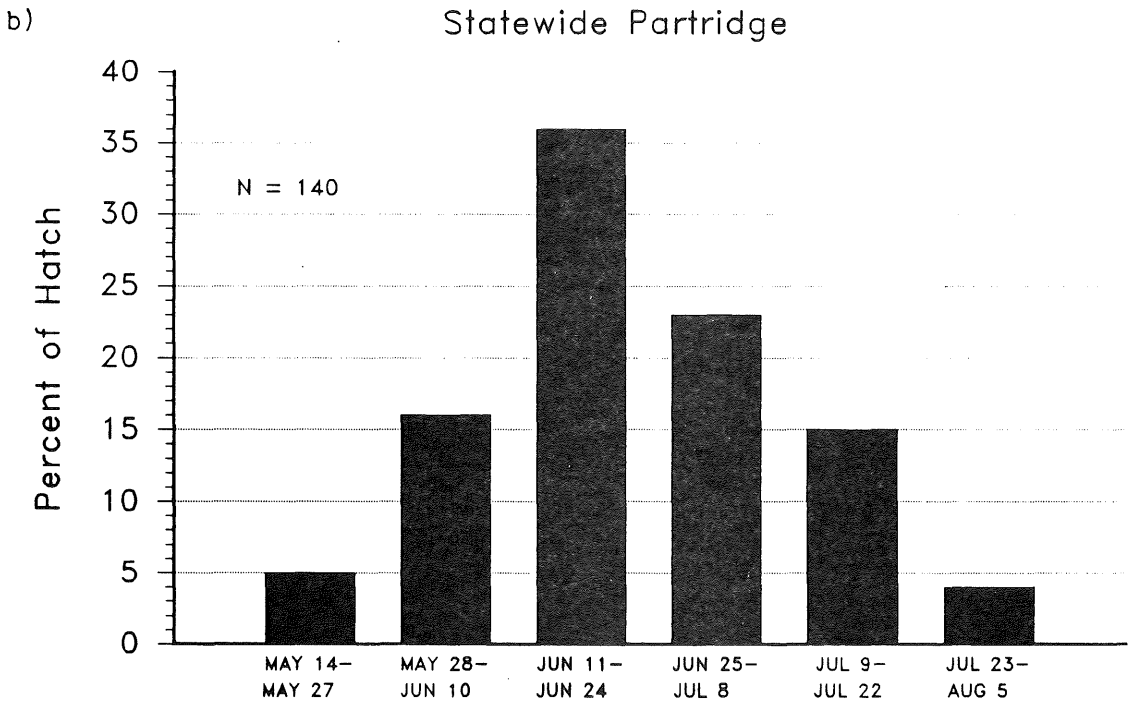


Figure 5. Distribution of hatch of a) ring-necked pheasant and b) gray partridge, 1990.

Table 8. Ring-necked pheasants observed per 100 miles of August roadside count in Minnesota, summarized by agricultural region, 1955-90.

Year	Agricultural region							State-wide[a]
	WC	C	EC	SW	SC	SE	NW	
1955	334.8	163.2	140.0	580.5	620.2	212.0	NO	368.1
1956	248.8	208.1	175.2	357.2	477.5	169.0	COUNT	290.0
1957	260.2	130.4	134.6	336.6	522.2	179.6		272.6
1958	490.3	261.9	300.0	473.4	592.9	125.6		409.1
1959	306.6	187.3	73.1	509.5	412.8	55.3		266.8
1960	367.0	243.4	202.5	294.3	356.8	37.7		276.3
1961	494.3	266.7	254.5	365.8	381.3	115.1		336.0
1962	264.2	140.5	143.8	214.7	239.3	114.0		197.4
1963	443.8	191.5	156.9	251.8	227.4	134.8		248.1
1964	224.5	83.1	26.3	185.3	211.1	83.8		149.8
1965	121.4	38.1	8.7	90.4	98.1	68.8		77.2
1966	109.6	67.2	26.3	108.8	175.5	101.8		105.0
1967	56.4	29.7	10.4	51.5	126.2	81.0		61.9
1968	64.9	39.7	16.9	78.1	124.7	94.0		71.4
1969	12.8	22.3	20.2	33.3	68.3	101.9		39.2
1970	19.7	26.9	8.9	55.2	108.6	194.2		69.6
1971	40.3	44.0	14.8	59.3	76.7	175.2		66.4
1972	19.9	28.0	44.0	37.3	66.7	104.8		47.3
1973	38.3	35.4	53.0	36.2	74.5	168.0		63.3
1974	50.6	73.3	84.7	59.8	93.0	107.5		76.3
1975	13.1	33.7	75.1	6.7	24.6	78.6		34.8
1976	11.9	28.1	68.2	2.1	82.8	80.8		44.8
1977	45.8	84.7	101.4	6.4	145.0	125.8		85.0
1978	36.1	79.9	178.4	23.2	106.0	77.2		79.0
1979	44.6	61.7	100.5	13.4	53.3	54.7		54.2
1980	78.8	116.8	221.2	19.5	110.0	84.9		104.9
1981	123.8	139.1	267.8	75.8	125.8	95.2		133.5
1982[b]	70.8	43.7	155.1	26.1	49.1	28.9	0.0	60.2
1983	89.7	51.5	107.3	10.1	24.9	51.4	0.0	56.2
1984	66.5	13.6	10.1	8.4	25.8	20.6	0.4	28.6
1985	62.9	16.3	41.3	14.3	29.6	31.6	2.5	34.6
1986	19.6	10.7	22.4	19.8	23.5	37.4	0.0	21.2
1987	79.5	36.4	24.5	60.4	41.7	39.0	0.0	50.0
1988	45.3	31.2	40.0	24.7	31.6	30.1	0.0	34.8
1989	33.1	42.3	53.6	32.0	39.6	43.4	0.0	39.8
1990	45.6	60.5	72.0	59.6	61.8	53.6	0.0	57.5

[a] Statewide means do not include the Northwest agricultural region because the Northwest counties are outside the pheasant range.

[b] Eight counties in the Northwest agricultural region were added to the August count in 1982 for all species except ring-necked pheasants.

Table 9. Gray partridge observed per 100 miles of August roadside count in Minnesota, summarized by agricultural region, 1955-90.

Year	Agricultural region							Statewide Mean	
	WC	C	EC	SW	SC	SE	NW	Without NW	With NW
1955	16.4	8.0	0.0	10.8	9.5	9.0	NO	9.9	
1956	2.9	8.3	0.0	14.7	6.0	7.8	COUNT	6.6	
1957	6.4	4.5	0.0	11.7	7.0	0.2		5.5	
1958	20.4	8.6	0.0	10.2	0.3	6.0		8.7	
1959	13.0	17.3	0.0	20.4	5.3	0.0		9.3	
1960	3.9	6.5	0.0	12.1	0.6	4.9		4.4	
1961	5.6	13.4	0.0	2.1	0.6	0.0		4.5	
1962	2.5	10.4	0.0	3.1	0.3	22.0		5.8	
1963	3.3	10.8	0.0	11.1	0.9	4.8		5.1	
1964	0.9	2.5	0.0	2.0	1.9	2.4		1.6	
1965	5.3	2.9	0.0	6.8	2.3	4.0		3.6	
1966	1.8	3.5	0.0	18.3	0.1	11.4		4.9	
1967	2.6	2.2	0.0	8.2	13.5	0.0		4.6	
1968	4.4	3.1	0.0	9.5	0.0	5.0		3.5	
1969	5.2	2.6	0.0	10.9	0.0	4.5		3.7	
1970	7.1	8.2	0.0	32.8	3.7	4.0		9.1	
1971	12.7	3.8	0.0	28.9	7.2	10.1		10.8	
1972	6.7	3.3	0.0	18.3	1.6	18.4		7.5	
1973	8.2	7.8	0.0	66.9	11.7	26.0		19.1	
1974	6.9	10.3	0.0	27.4	8.4	20.2		12.0	
1975	11.0	2.3	0.0	67.5	8.6	5.6		14.6	
1976	10.6	8.7	0.0	59.3	15.4	22.4		17.6	
1977	16.0	32.8	0.0	93.3	31.0	31.6		32.1	
1978	26.1	22.6	0.2	144.2	30.7	14.8		37.0	
1979	43.0	24.3	0.0	88.5	34.8	12.2		33.9	
1980	57.9	41.7	0.0	99.0	41.2	27.6		44.6	
1981	38.1	26.8	0.5	138.7	44.4	19.0		42.9	
1982[a]	23.6	23.0	0.7	69.7	17.1	16.0	3.6	24.5	22.1
1983	29.3	18.7	0.0	64.6	22.8	8.0	15.2	24.4	23.4
1984	18.2	17.3	0.0	49.7	26.5	16.2	9.5	21.3	20.0
1985	30.7	17.5	0.0	94.9	63.3	42.2	2.2	40.7	37.0
1986	10.1	4.6	0.0	59.6	45.3	20.8	3.5	22.4	20.6
1987	14.7	15.1	0.0	99.2	47.0	66.6	3.6	37.1	33.4
1988	25.9	18.2	3.1	110.7	63.6	40.4	3.8	41.5	37.3
1989	20.0	13.1	0.0	93.5	84.1	42.0	24.8	41.5	39.7
1990	14.8	19.5	0.0	101.5	62.7	34.6	20.4	37.1	35.2

[a] Eight counties in the Northwest agricultural region were added to the August count in 1982.

Table 10. Eastern cottontails observed per 100 miles of August roadside count in Minnesota, summarized by agricultural region, 1955-90.

Year	Agricultural region							Statewide Mean	
	WC	C	EC	SW	SC	SE	NW	Without NW	With NW
1955	8.1	15.0	14.5	20.3	19.6	32.0	NO	17.8	
1956	9.6	16.2	12.4	16.2	12.8	12.7	COUNT	13.0	
1957	6.6	9.7	8.3	18.3	13.7	14.0		11.2	
1958	12.8	13.5	16.2	22.1	17.2	6.5		14.8	
1959	5.0	16.0	5.6	6.5	5.3	2.2		6.2	
1960	5.9	13.6	6.4	15.6	11.9	4.9		9.8	
1961	6.2	12.4	6.1	13.8	10.9	5.6		9.4	
1962	5.6	7.3	4.2	12.6	10.0	8.2		7.9	
1963	6.8	4.2	4.9	11.6	9.3	8.6		7.4	
1964	5.2	3.3	1.0	11.8	6.6	5.4		5.4	
1965	3.9	4.4	0.9	5.4	5.7	5.8		4.4	
1966	5.3	3.2	1.8	9.5	7.5	6.0		5.6	
1967	5.8	4.6	2.1	7.1	8.7	3.2		5.5	
1968	4.6	3.2	3.5	9.3	8.8	5.8		5.8	
1969	3.6	3.9	0.9	9.5	8.3	4.5		5.1	
1970	3.6	5.0	1.5	6.9	5.7	6.2		4.9	
1971	4.8	2.6	1.5	6.7	3.2	2.1		3.7	
1972	3.8	4.7	3.6	4.8	3.5	3.5		3.9	
1973	5.0	8.6	6.0	6.5	5.4	4.2		5.8	
1974	3.4	6.5	14.2	6.5	6.1	6.4		6.2	
1975	2.3	4.4	8.3	1.6	1.5	3.1		3.3	
1976	3.7	5.5	6.5	2.1	6.1	7.6		5.2	
1977	4.8	6.7	12.9	6.4	4.9	7.8		6.8	
1978	5.0	8.6	21.4	11.8	7.3	4.6		8.9	
1979	4.6	7.7	7.5	12.7	8.0	4.4		7.3	
1980	4.4	7.0	9.9	6.7	7.2	3.8		6.4	
1981	7.0	10.3	18.1	9.9	8.4	12.0		10.2	
1982[a]	4.8	6.6	7.8	3.2	6.7	4.9	1.9	5.6	5.2
1983	7.0	5.9	13.2	5.7	3.6	12.2	1.9	7.2	6.7
1984	2.4	2.0	3.5	3.8	4.1	4.8	0.2	3.3	2.9
1985	2.4	4.4	4.7	6.5	5.7	7.6	0.2	4.8	4.4
1986	1.5	4.8	5.9	6.3	5.3	4.8	0.2	4.4	4.0
1987	5.7	7.0	11.5	8.2	6.6	10.6	0.6	7.7	6.9
1988	2.7	3.2	6.4	6.4	3.9	5.9	1.3	4.3	4.0
1989	3.6	5.9	8.9	6.7	4.2	9.2	1.3	5.9	5.4
1990	3.6	6.3	10.6	4.0	6.6	16.8	1.9	7.3	6.7

[a] Eight counties in the Northwest agricultural region were added to the August count in 1982.

Table 11. White-tailed jackrabbits observed per 100 miles of August roadside count in Minnesota, summarized by agricultural region, 1955-90.

Year	Agricultural region							Statewide Mean	
	WC	C	EC	SW	SC	SE	NW	Without NW	With NW
1955	9.0	2.6	1.5	13.0	10.6	1.6	NO	7.0	
1956	5.8	3.7	1.9	10.1	7.7	2.4	COUNT	5.6	
1957	4.8	5.2	0.9	19.5	6.1	1.3		6.3	
1958	7.3	6.4	0.7	20.1	11.9	0.9		8.5	
1959	1.4	0.7	0.4	15.4	7.8	0.6		4.0	
1960	3.7	4.8	0.2	9.8	2.5	0.2		3.6	
1961	3.7	5.0	0.0	6.5	3.5	0.2		3.5	
1962	4.2	2.3	0.2	4.5	2.8	0.7		2.7	
1963	9.7	2.2	0.0	2.4	3.0	1.0		3.6	
1964	2.9	1.3	0.0	3.7	2.4	0.6		2.0	
1965	1.9	1.9	0.2	4.2	1.2	0.4		1.6	
1966	2.3	1.8	0.2	4.6	1.1	0.6		1.8	
1967	5.3	1.2	0.2	4.2	4.0	0.0		2.8	
1968	1.7	0.8	0.0	6.9	1.9	1.0		1.9	
1969	3.1	0.7	0.5	10.1	1.8	0.7		2.7	
1970	4.0	1.5	0.0	1.9	1.3	0.4		1.8	
1971	5.3	1.6	0.0	2.9	0.8	0.0		2.1	
1972	3.6	1.3	0.0	1.5	2.1	0.5		1.9	
1973	4.0	0.2	0.0	2.9	1.7	0.2		1.9	
1974	3.9	1.5	0.0	1.5	0.7	0.0		1.5	
1975	3.2	0.6	0.3	2.1	0.2	0.2		1.3	
1976	4.4	0.6	0.0	5.2	1.7	1.2		2.2	
1977	3.5	2.8	0.2	4.9	1.6	0.8		2.4	
1978	3.4	2.8	0.7	13.1	3.0	1.0		3.8	
1979	4.6	5.3	0.5	6.4	2.7	1.1		3.7	
1980	3.7	1.2	1.2	8.3	1.5	2.7		2.8	
1981	2.1	2.2	0.0	7.2	1.5	3.0		2.5	
1982[a]	2.6	0.9	0.5	4.6	1.1	0.9	1.5	1.8	1.7
1983	2.3	0.9	0.0	0.0	0.9	0.8	1.3	1.0	1.0
1984	1.5	0.8	0.0	1.7	0.4	0.6	0.4	0.9	0.8
1985	1.7	0.4	0.0	3.2	1.5	0.7	1.0	1.3	1.2
1986	0.4	0.4	0.0	0.6	0.9	0.0	1.0	0.4	0.5
1987	1.2	0.3	0.0	0.4	1.0	1.0	0.4	0.7	0.7
1988	0.6	0.4	0.0	2.0	1.0	0.4	0.6	0.7	0.7
1989	2.6	1.1	0.0	2.1	2.4	0.6	1.1	1.7	1.6
1990	2.2	0.4	0.2	1.3	2.1	1.2	2.1	1.4	1.4

[a] Eight counties in the Northwest agricultural region were added to the August count in 1982.

Table 12. Mourning doves observed per 100 miles of August roadside count in Minnesota, summarized by agricultural region, 1955-90.

Year	Agricultural region							Statewide Mean	
	WC	C	EC	SW	SC	SE	NW	Without NW	With NW
1955	334.8	274.6	116.0	539.1	395.7	196.8	NO	324.5	
1956	347.4	552.6	277.7	591.5	461.0	285.9	COUNT	422.6	
1957	303.3	245.9	167.7	243.3	382.8	200.4		274.5	
1958	350.2	296.8	192.3	270.1	455.6	292.8		326.0	
1959	377.4	307.3	220.9	358.0	447.3	94.4		311.4	
1960	273.7	333.5	121.7	336.8	430.4	186.7		300.8	
1961	377.3	372.7	135.7	480.8	563.0	316.7		392.4	
1962	338.1	337.5	215.3	312.5	395.7	314.3		334.6	
1963	636.2	273.2	212.0	506.2	435.4	313.4		396.5	
1964	680.6	256.5	167.1	399.7	395.3	217.4		375.9	
1965	311.7	244.5	185.2	460.0	217.2	270.8		271.6	
1966	363.4	210.2	152.0	505.3	310.9	229.3		299.6	
1967[a]									
1968	411.4	207.7	124.9	261.3	254.2	385.0		293.5	
1969	268.3	280.1	124.9	476.5	132.0	194.9		245.6	
1970	601.2	217.9	113.2	527.1	203.7	273.5		348.3	
1971	580.4	256.9	181.6	365.8	258.9	751.7		415.4	
1972	600.2	233.8	169.0	307.7	229.6	314.3		349.8	
1973	601.7	279.6	288.0	480.3	392.1	329.1		428.2	
1974	588.4	321.1	241.5	352.4	269.1	381.5		380.8	
1975	653.5	302.5	152.9	546.0	338.3	259.8		405.8	
1976	599.9	373.4	224.0	535.7	367.0	281.8		407.4	
1977	699.2	308.2	168.0	679.5	281.5	223.7		409.8	
1978	502.1	326.2	173.9	430.6	275.9	282.4		344.5	
1979	600.7	406.1	138.0	379.5	197.5	212.8		347.9	
1980	695.7	302.1	140.3	421.5	235.0	182.3		352.2	
1981	634.1	284.6	153.0	513.6	213.0	178.9		347.6	
1982[b]	557.3	242.8	175.1	304.0	277.7	213.1	225.1	325.0	313.6
1983	517.0	289.2	130.5	277.9	213.9	193.3	188.6	298.9	286.6
1984	530.9	233.2	128.7	267.4	183.2	269.0	175.6	292.0	279.2
1985	500.6	245.4	93.2	242.5	212.5	151.1	233.9	273.7	270.1
1986	325.0	180.1	115.1	204.0	160.5	180.4	176.8	207.0	204.1
1987	440.9	222.9	104.7	257.3	208.1	161.1	215.2	257.1	252.4
1988	385.7	203.9	121.5	300.0	202.6	210.2	184.4	252.3	245.0
1989	501.4	242.5	125.9	329.7	257.3	180.0	165.9	297.9	283.4
1990	443.1	232.4	128.0	159.4	175.5	353.4	170.3	266.0	255.6

[a] Mourning doves were not counted in 1967.

[b] Eight counties in the Northwest agricultural region were added to the August count in 1982.

Table 13. Greater prairie-chicken spring booming ground counts for 14 northwestern counties, 1980-90 (counts coordinated and summarized by AWM Terry Wolfe, Crookston).

County	No. of booming males (No. of booming grounds)										
	1980	1981	1982	1983	1984[b]	1985	1986	1987	1988	1989	1990
Becker	156 (1)	159 (16)	133 (13)	174 (17)	96 (9)	41 (3)	99 (11)	53 (7)	19 (3)	18 (3)	69 (7)
Cass	17 (6)[a]	63 (15)[a]	68 (16)[a]	65 (15)	54 (15)[a]	58 (14)	52 (14)	60 (15)	59 (13)	48 (9)	51 (8)
Chippewa	2 (1)	2 (1)	0	2 (1)	0	0	0	0	0	0	0
Clay	186 (17)[a]	196 (16)[a]	216 (12)[a]	161 (15)	110 (7)	127 (7)	86 (9)[a]	87 (9)	0	83 (8)	307 (18)
Hubbard	0	4 (1)	3 (1)	3 (1)	5 (1)	16 (6)[a]	16 (4)	22 (5)	24 (4)	19 (5)	29 (5)
Mahnomen	203 (21)	223 (20)	294 (22)	316 (22)	149 (19)	134 (15)	102 (17)	63 (9)	29 (5)	0	46 (6)
Marshall	0	3 (1)	7 (2)	3 (1)	2 (2)	0	0	0	0	0	1 (1)
Norman	230 (9)	210 (9)	273 (15)	194 (11)[a]	119 (8)	86 (7)	128 (10)	87 (9)	111 (9)	73 (7)	145 (11)
Ottertail	13 (2)	9 (2)	12 (1)	10 (3)	7 (1)	5 (1)	0[a]	0	21 (3)	0	0
Pennington	0	2 (1)	6 (1)	5 (1)	4 (1)	3 (1)	0	0	0	0	9 (1)
Polk	269 (27)	254 (26)	283 (29)	232 (26)	146 (22)[a]	162 (18)	96 (17)[a]	72 (8)	72 (10)	150 (17)	204 (23)
Red Lake	8 (1)	19 (2)	19 (2)	14 (2)	12 (2)	2 (1)	0	0	0	5 (1)	34 (6)
Wadena	10 (3)	60 (12)[a]	64 (11)	18 (6)	19 (2)	34 (9)[a]	17 (7)[a]	105 (20)	99 (16)	59 (13)	134 (17)
Wilkin	164 (14)	206 (23)[a]	269 (20)	223 (18)	60 (6)	149 (15)[a]	81 (9)[a]	99 (8)	58 (3)	100 (6)	199 (15)
Total	1,258(117)	1,410(144)	1,648(146)	1,420(139)	783 (95)	817 (97)	677 (98)	648 (90)	492 (66)	555 (69)	1,228(118)
males/ground	10.8	9.8	11.2	10.2	8.2	8.4	6.9	7.2	7.4	8.0	10.4

[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.

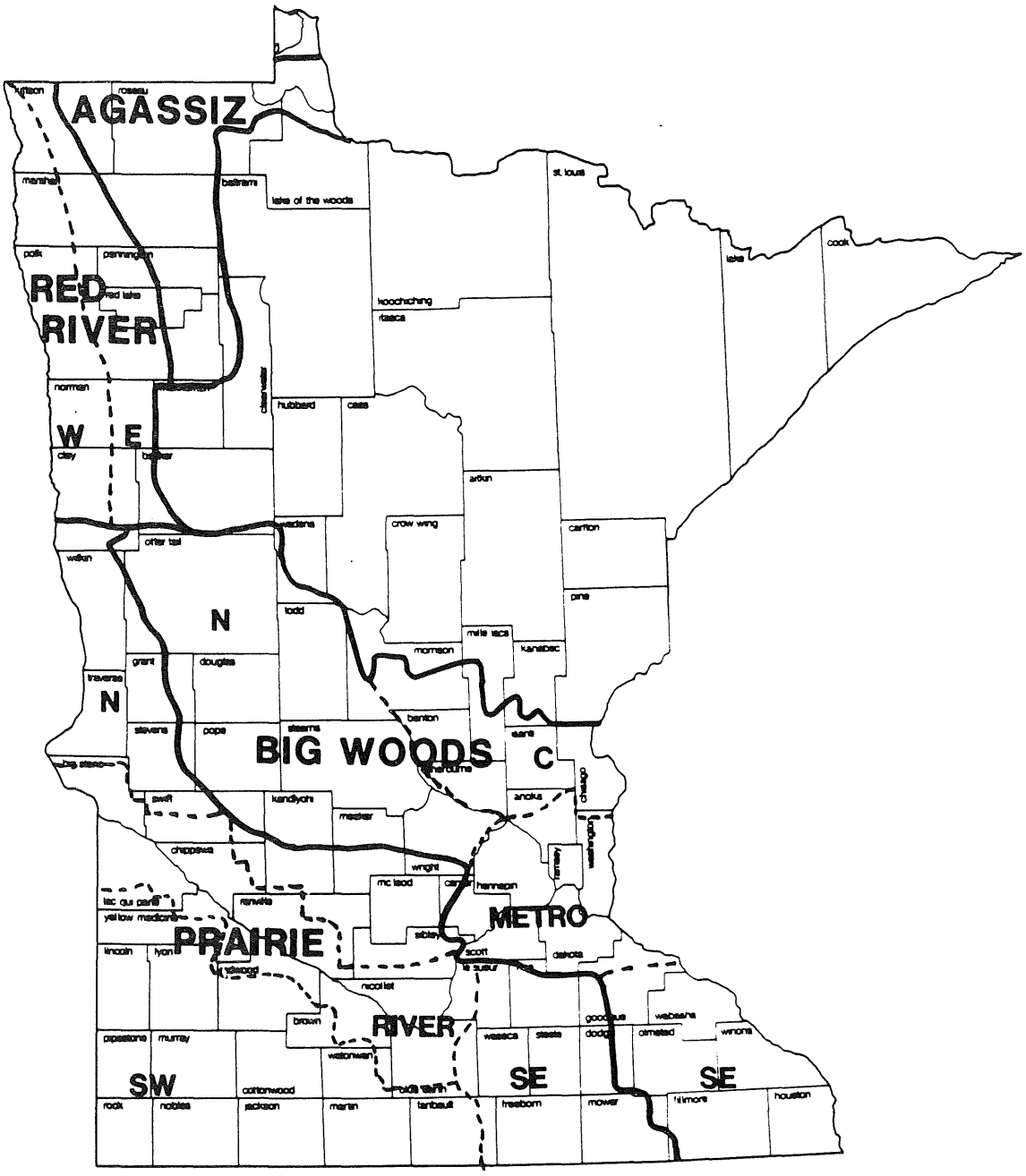


Figure 6. Deer Management Units (DMU) and sub-DMU's in the Farmland Zone.

Table 14. Number of car-killed deer reported in the Deer Management Units and sub-Units of Minnesota's farmland zone, 1980-1989. Data are adjusted for miles driven to the base year of 1972.

DMU Sub-DMU	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	$\bar{X}$ 1980's	% Chg. 1988-89
RED RIVER	206	281	344	333	323	339	366	226	238	251	291	+ 5.5
AGASSIZ	172	272	287	335	261	281	246	165	123	85	223	-30.9
BIG WOODS	3431	4186	4612	4939	5469	4958	5582	4792	3903	3963	4584	+ 1.5
North	1133	1399	1565	1715	1610	1502	1641	1417	1252	1279	1349	+ 2.2
Central	661	893	885	904	1065	934	961	775	594	537	821	- 9.6
Metro[a]	1126	1219	1296	1391	1803	1692	2031	1762	1449	1430	1520	- 1.3
SE	511	676	866	929	990	830	949	838	608	717	791	+17.9
PRAIRIE	2577	2666	2990	3078	3268	2809	3146	3057	2866	3065	2952	+ 6.9
North	392	392	394	469	349	400	440	481	462	531	431	+14.9
River	764	842	864	947	1021	829	865	793	724	760	841	+ 5.0
SW	833	871	992	967	1009	851	915	966	827	844	908	+ 2.1
SE	589	561	740	695	890	729	926	817	853	930	773	+ 9.0
FARMLAND ZONE	6387	7405[b]	8232	8684	9321	8387[b]	9340[b]	8240	7129	7366[b]	8049	+ 3.3
FOREST ZONE[c]	2072	4019	3192	3108	3494	3252	3163	2836	2935	2786	3086	- 5.1
STATEWIDE	8459	11424	11424	11792	12815	11639	12503	11076	10064	10152	11135	+ 0.9

[a] Does not include Ramsey County.

[b] Does not equal sum of DMU's due to rounding error.

[c] Forest subtotals include Ramsey County.

Table 15. Comparison of 1990 FARMLAND deer productivity to 1978-1989.

		Fawns			Adults			
	N	Preg rate %	(n)	Fetuses/ doe	Preg rate %	(n)	Fetuses/ doe	Male fetuses %
NW 1990	47	22	(18)	0.22	93	(29)	1.66	62
BW 1990	221	32	(96)	0.33	95	(125)	1.82	59
Pr 1990	105	42	(43)	0.45	97	(62)	1.84	51
*FARMLND90	373	34	(157)	0.35	95	(216)	1.80	56
78-89 MEAN		44		0.50	93		1.75	54
*FARMLND89	269	32	(102)	0.33	93	(167)	1.76	49
*FARMLND88	88	49	(37)	0.57	94	(51)	1.73	63
FARMLAND87	273	45	(75)	0.48	94	(198)	1.80	55
FARMLAND86	285	42	(107)	0.48	89	(178)	1.63	58
FARMLAND85	252	45	(87)	0.49	95	(165)	1.81	59
FARMLAND84	332	24	(117)	0.30	91	(215)	1.70	55
FARMLAND83	384	54	(140)	0.68	94	(244)	1.78	54
FARMLAND82	451	45	(151)	0.53	95	(300)	1.79	50
FARMLAND81	347	50	(139)	0.55	92	(208)	1.71	55
FARMLAND80	320	61	(146)	0.71	95	(174)	1.75	48
FARMLAND79	389	32	(173)	0.36	91	(216)	1.73	47
FARMLAND78	302	46	(99)	0.54	97	(203)	1.79	52

*Collection method changed. Conservation officers no longer responsible for roadkills.

Table 16. Spring deer densities estimated from population modeling in DMU's of Minnesota's farmland zone, 1985-90.

DMU	Deer per square mile[a] 1985	1986	1987	1988	1989	1990	Goal	1990 Percent of goal
Red River	3.1	2.6	2.5	3.6	3.5	3.3	2.1	157%
Agassiz	6.2	5.7	5.0	7.3	6.2	6.2	5.5	113%
Big Woods								
North	5.0	4.7	4.2	5.4	5.8	5.6	4.4	127%
Central	7.0	6.8	6.0	6.8	7.4	8.5	7.4	115%
Metro	2.5	2.4	2.4	3.1	5.0	4.5	4.6	98%
SE	8.4	8.4	8.4	9.0	9.9	9.8	7.9	124%
Prairie								
North	1.9	1.7	1.7	2.3	2.4	2.1	1.8	117%
River	3.0	2.6	2.3	3.3	3.4	3.2	4.3	74%
SW	2.1	2.0	1.9	2.7	2.6	2.9	2.1	138%
SE	2.1	2.1	1.9	2.7	2.9	2.6	2.0	130%
Farmland Zone	3.9	3.7	3.4	4.1	4.6	4.5	3.8	118%

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

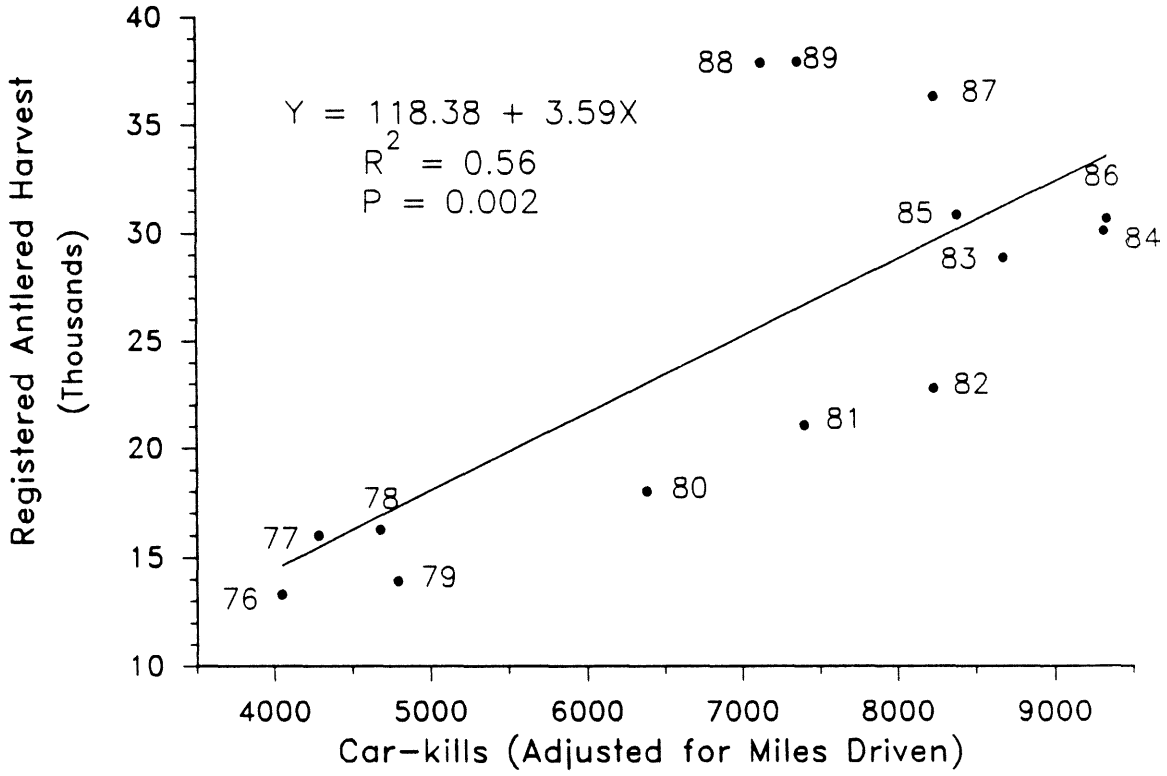


Figure 7. **The relationship between annual car-killed deer and registered antlered deer harvest in the farmland zone, 1976-89.**

Figure 8. Minnesota antlerless deer permit area boundaries, 1989.

Table 17. Survey of wild turkey sightings by Minnesota antlerless-deer hunters. Comparison of mean number of turkeys seen per hunter per day (TPD) by year, Minnesota, 1986-89.

Antlerless deer permit area	TPD 1986	1987	1988	1989
225				0.10
226		0.05	0.15**[a]	0.12
227				0.02
235		0.07	0.18**	0.05**
236		0.01		0.19
337		0.13	0.35**	0.32
338		0.28	0.73**	0.64
339		0.92	0.95	1.46
341		0.74	0.97*	1.15
342		0.27	1.44	1.49***
343		0.27	1.25***	1.94*
344		0.79	1.25***	2.50*
345		0.94	2.96***	2.81
346		2.04	3.87***	4.24
347		1.68	2.56	3.23*
348		2.81	4.17**	6.28
349	3.31	3.64	5.66**	6.47*
418		0.09	0.16	0.07
419		0.23	0.24	0.10*
427				0.08
428				0.13
431		0.28	0.31	0.18
432[b]		0.13	0.10	0.06
436[c]				0.12
438[d]				0.60
442[e]	0.68	0.67	1.06**	1.05
456			0.05	0.00**
459		0.33	0.08	0.15
461		0.24	0.06	0.15
462		0.25	0.14	0.88**
463		0.03	0.02	0.03
464		0.03	0.00*	0.02
465		0.14	0.08	0.13
466		0.10	0.31	0.22
467		0.06	0.06	0.10

[a] Significant change from previous year, *P≤0.10; **P≤0.05; ***P≤0.01.

[b] Permit areas 432, 433, and 434 combined (see figure 8).

[c] Permit areas 436 and 437 combined (see figure 8).

[d] Permit areas 438 and 439 combined (see figure 8).

[e] Permit areas 442, 443, and 444 combined (see figure 8).

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.

	Rts. done	No. segments	Station nights
Forest	37	167	1525
Transition	24	99	930
Farmland	21	80	842
	82	346	3297

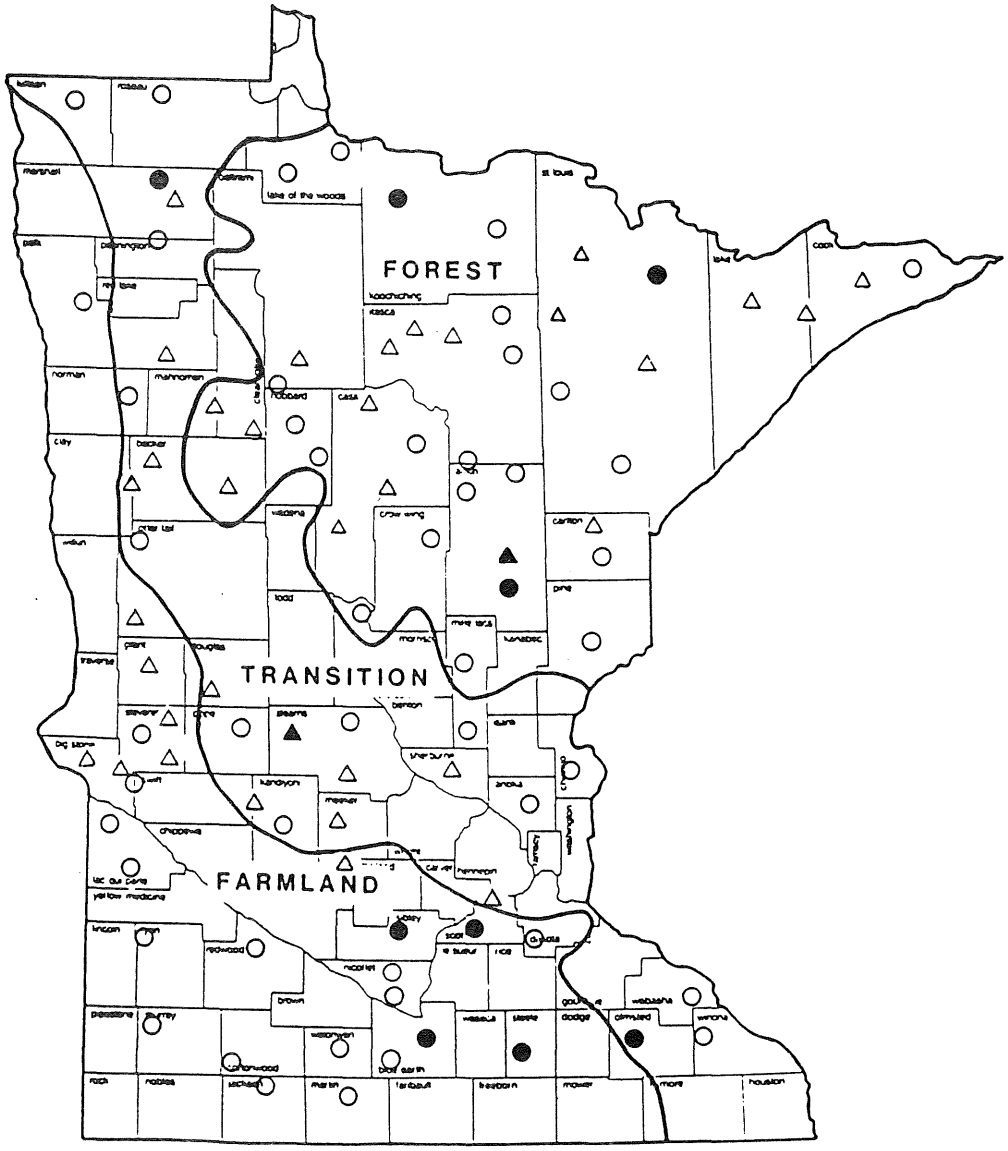


Figure 9. Approximate locations of scent post routes conducted by DNR (○) and non-DNR (△) in the Forest, Transition, and Farmland Survey Zones, 1989. Shaded symbols indicate routes that were not at least partially completed in 1989.

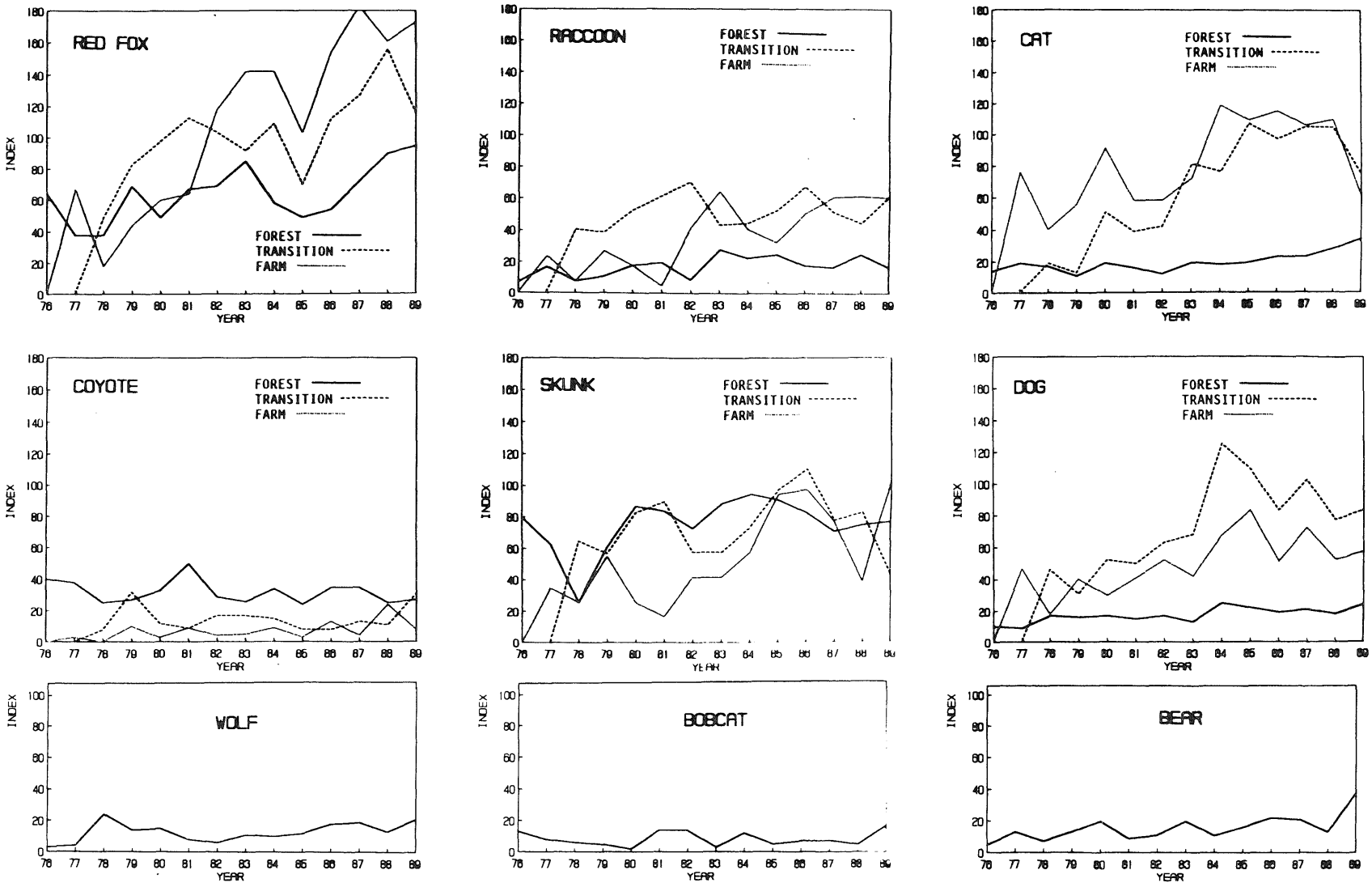


Figure 10. Scent post visitation indices for nine species in the Forest, Transition, and Farmland Survey Zones, 1976-89.

FOREST WILDLIFE POPULATIONS

Table 18. Mean number of ruffed grouse drums per stop by census zone, 1961-90.

	Census Zone					
Year	Northwest	North	Northeast	Central hardwoods	Southeast	Range-wide mean
1961	1.4	2.2	0.9	1.0	1.0	1.4
1962	3.0	2.1	0.5	1.2	1.6	1.6
1963	0.4	0.6	0.5	0.4	1.1	0.6
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
1988	1.3	2.0	1.0	1.0	1.1	1.4
1989	2.2	2.6	1.5	1.2	1.2	1.9
1990	0.8	2.5	0.9	1.1	1.2	1.6

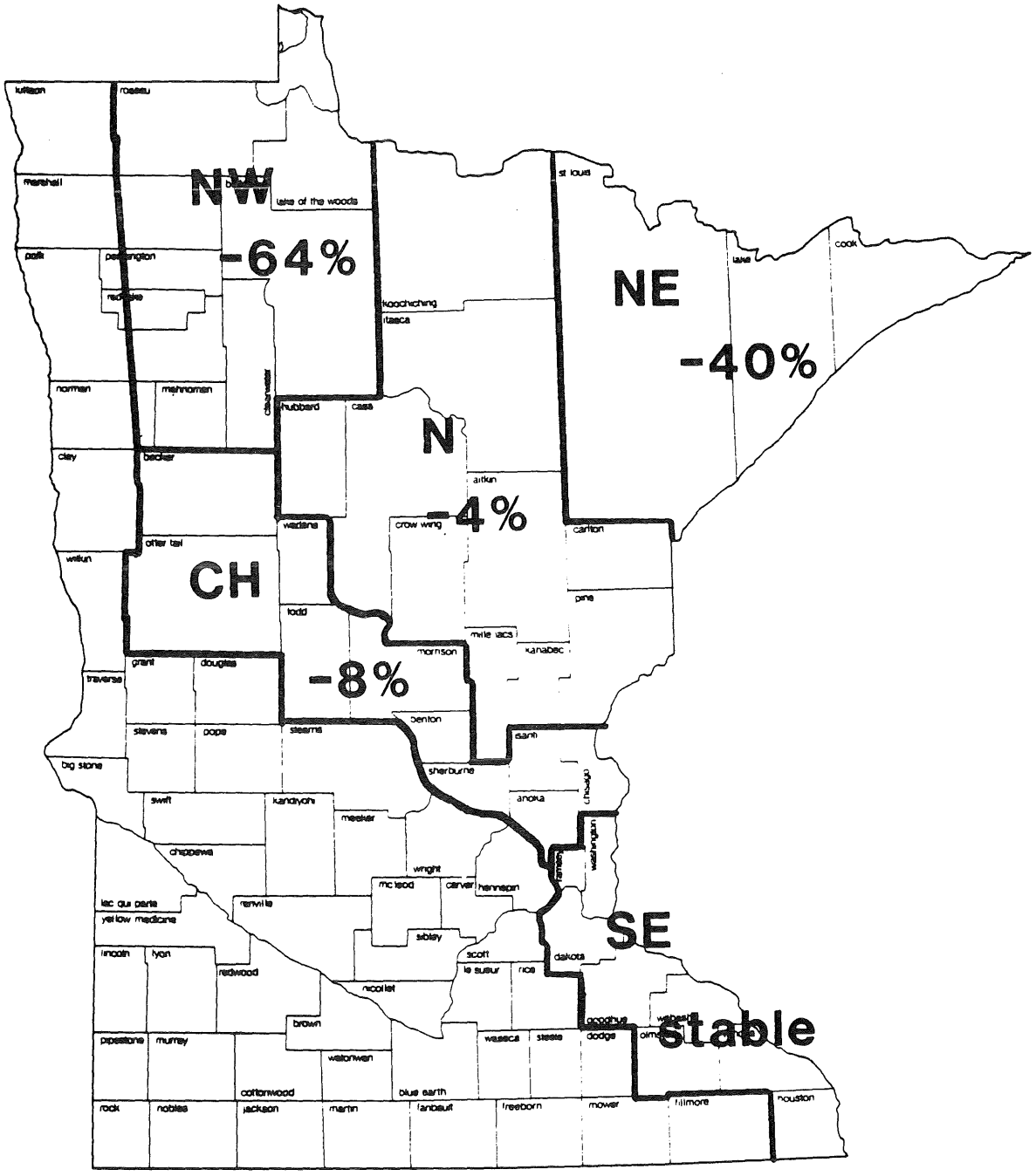


Figure 11. Changes in average numbers of ruffed grouse drums per stop on roadside counts, 1989-90.

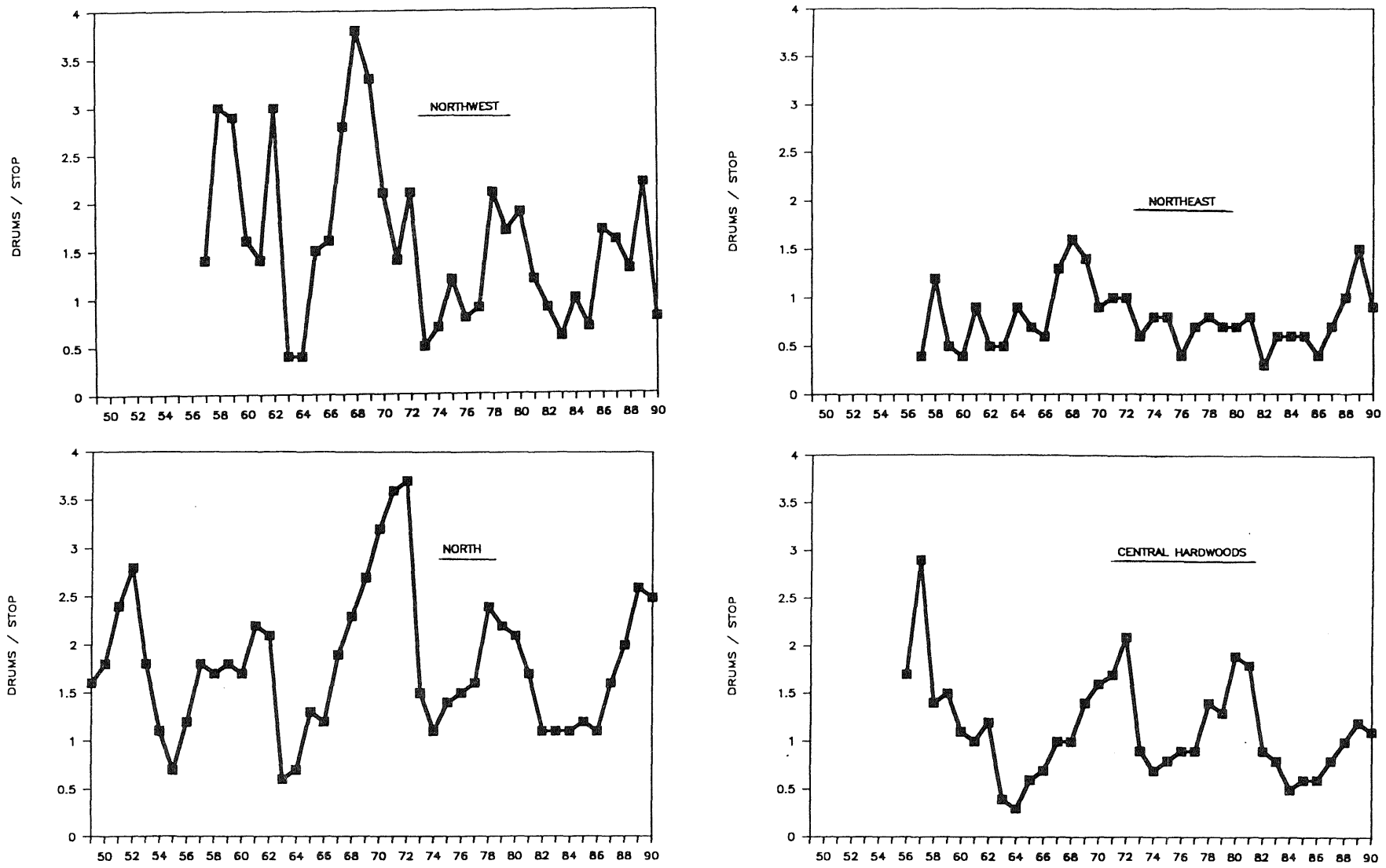


Figure 12. Ruffed grouse drumming trends in the Northwest, Northeast, North, and Central Hardwoods Survey Zones, 1949-90.

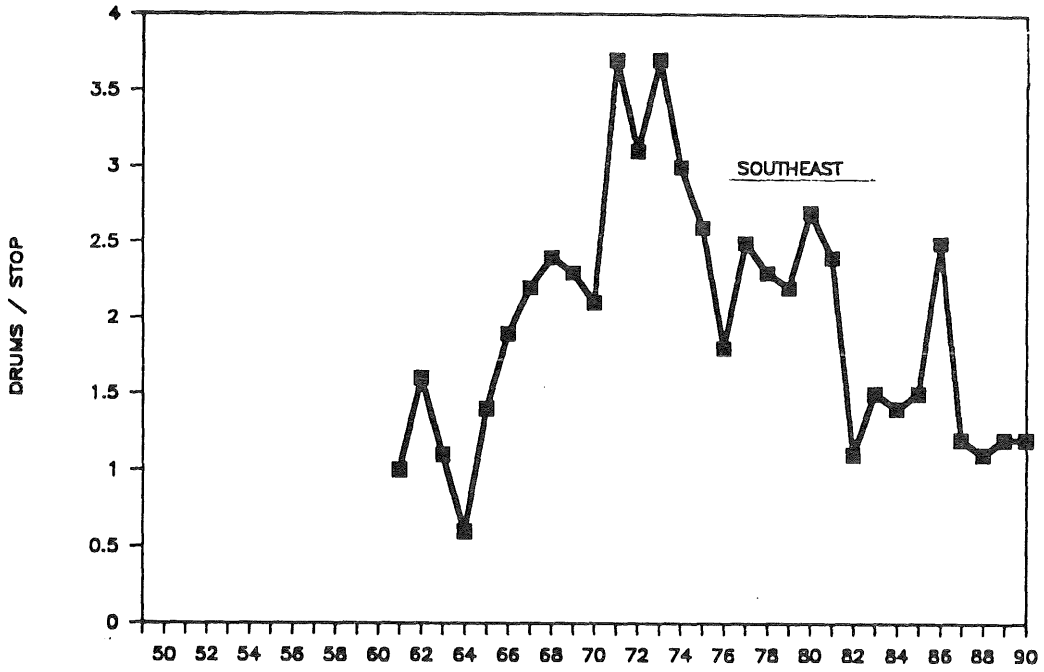


Figure 13. Ruffed grouse drumming trends in the Southeast Survey Zone, 1961-90.

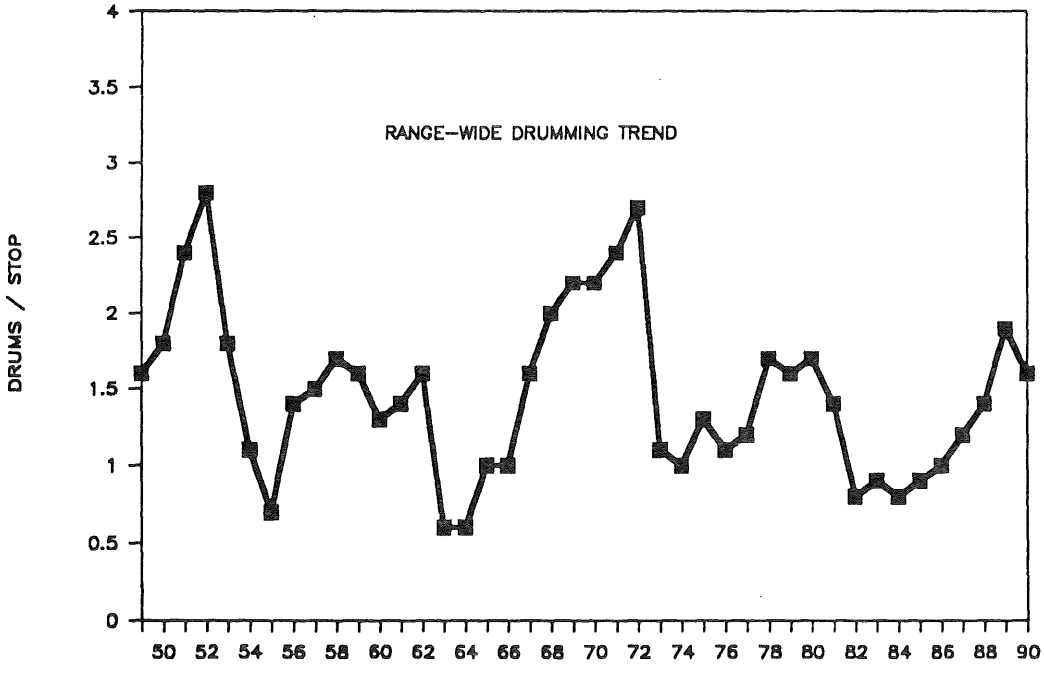


Figure 14. Ruffed grouse drumming trends range-wide, 1949-90.

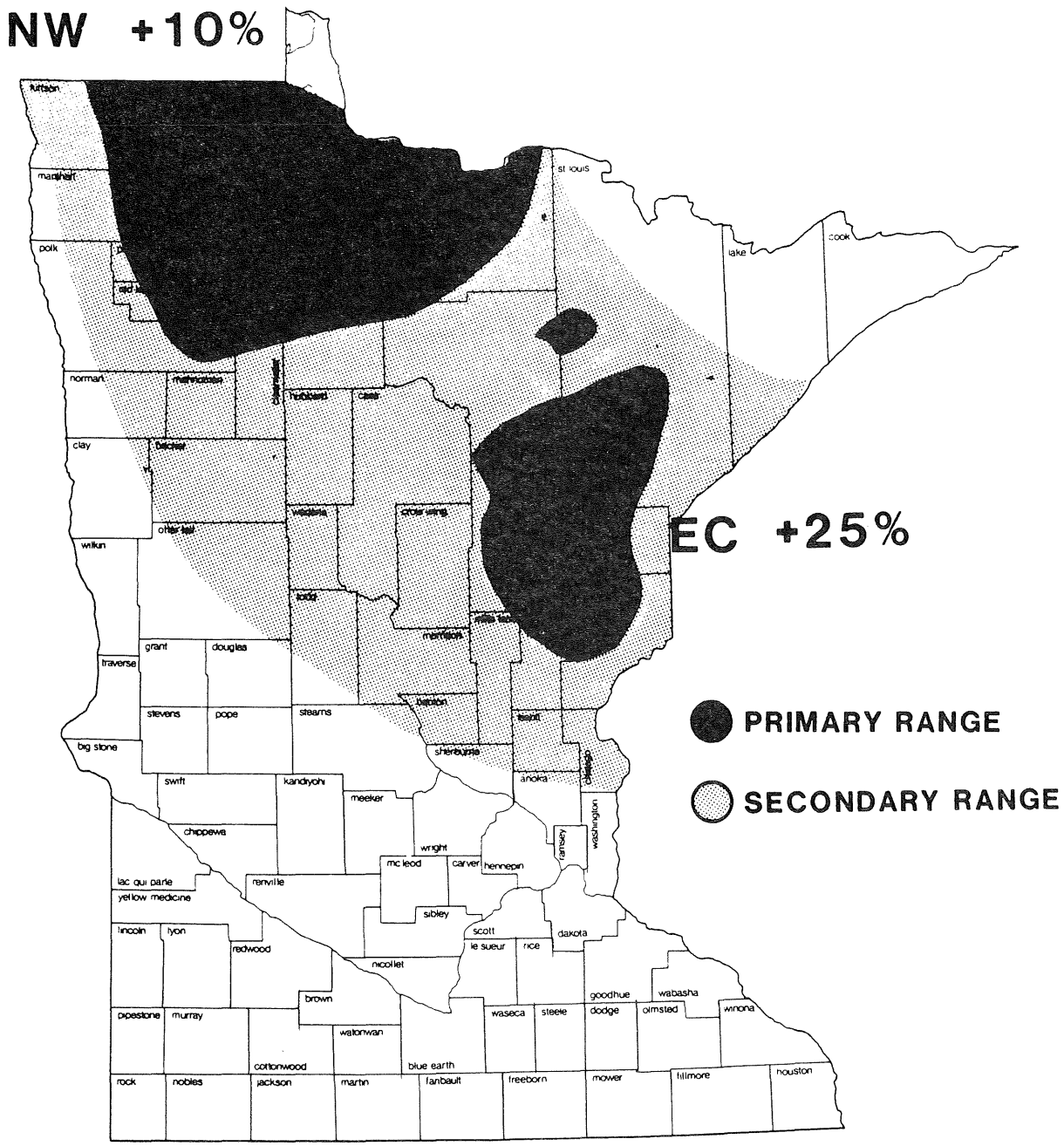


Figure 15. Changes in numbers of dancing male sharp-tailed grouse on Northwest and East-central survey areas, 1989-90.

Table 19. Number of snowshoe hares seen per 100 km of ruffed grouse drumming routes in the North, Northwest, and Northeast survey zones, 1974-90.

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
1988	0.9
1989	2.7
1990	2.3

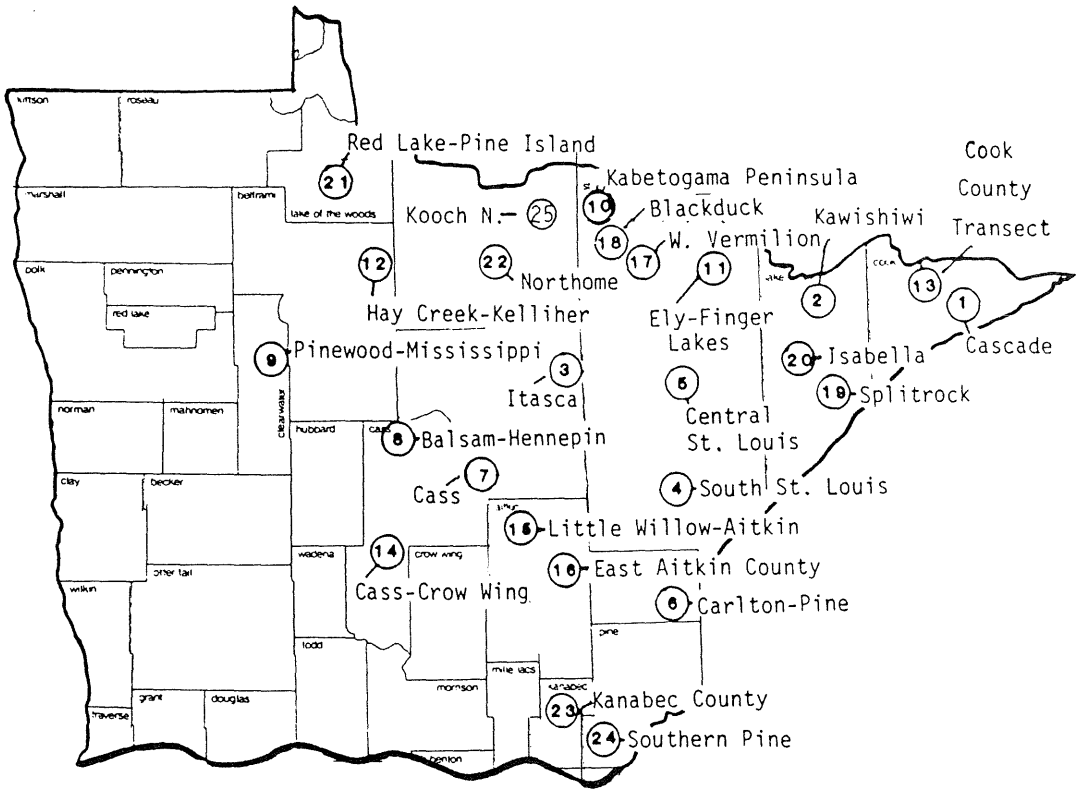


Figure 16. Approximate locations of aerial beaver survey routes. Routes 4, 6, 17, 18, and 22 were not flown in 1989.

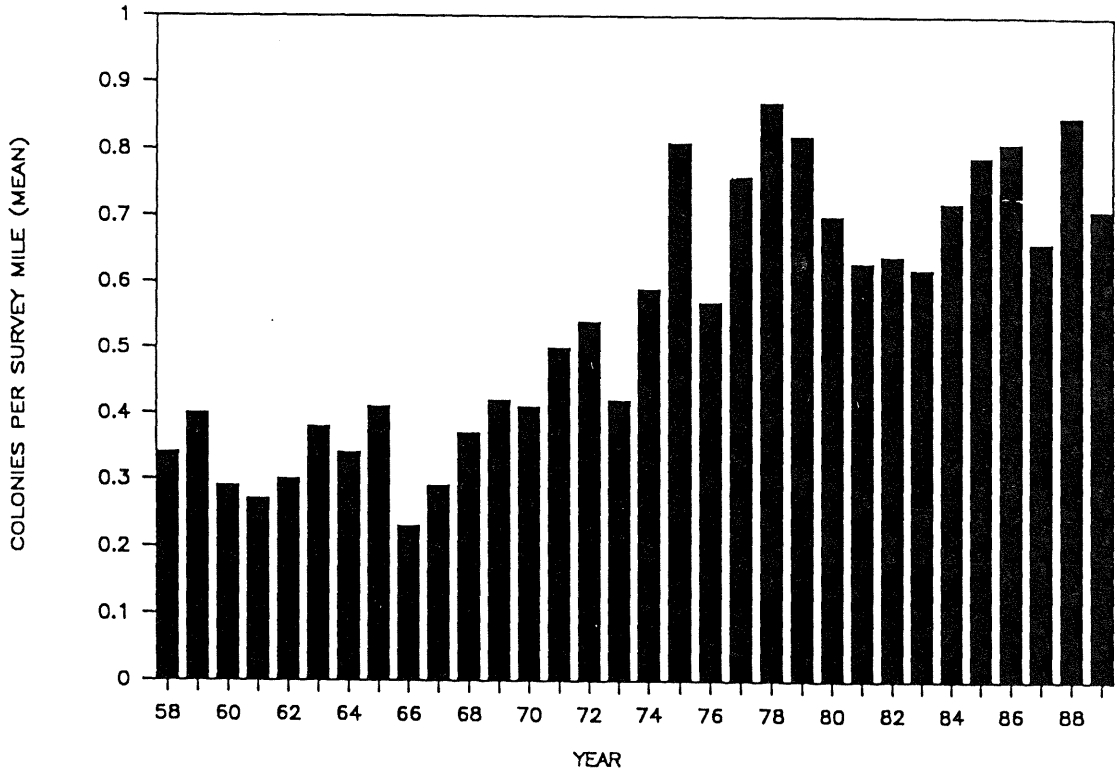


Figure 17. Range-wide mean number of live beaver colonies per mile of survey route, 1958-89.

Table 20. Live beaver colonies per mile of census route in northern Minnesota, 1980-89.

Number	Route name	Year										1983-88 Mean	% Change 1989-mean
		1980	1981	1982	1983	1984	1985	1986	1987	1988	1989		
1	Cascade	0.42	0.43	0.40.	0.35	0.44	0.46	-	0.37	0.40	0.43	0.40	7.5
2	Kawishiwi	0.75	0.50	0.72	0.65	0.70	0.78	-	1.03	0.72	0.47	0.78	-39.7
3	Itasca	0.63	0.48	0.43	0.57	0.51	0.67	-	0.22	0.48	0.56	0.49	14.3
4	South St. Louis	0.64	0.74	-	0.58	0.57	0.33	-	0.54	0.64	-	0.53	-
5	Central St. Louis	0.90	0.95	0.65	0.79	0.57	1.05	-	1.02	-	0.83	0.86	-3.5
6	Carlton & Pine	0.83	0.67	0.22	0.56	0.65	0.45	-	0.49	1.04	-	0.64	-
7	Cass	0.95	0.53	0.63	0.89	0.99	1.23	-	0.59	0.77	0.84	0.89	-5.6
8	Balsam-Hennepin	0.44	0.43	0.60	0.58	0.54	-	-	0.74	0.57	0.59	0.61	-3.3
9	Pinewood-Mississippi	0.38	0.39	0.49	0.48	-	-	-	0.38	0.36	0.49	0.41	19.5
10	Kabetogama Peninsula	2.52	3.55	2.66	2.89	3.30	2.93	2.92	2.98	2.93	2.92	2.99	-2.3
11	Ely-Finger Lakes	1.06	0.98	1.17	1.32	1.02	1.28	-	1.00	1.23	1.09	1.17	-6.8
12	Hay Creek-Kelliher	0.43	0.48	0.70	0.55	-	-	-	0.49	0.49	0.56	0.51	9.8
13	Cook County Transect	0.23	0.40	0.33	0.48	0.35	0.31	-	0.31	0.31	0.68	0.35	94.3
14	Cass-Crow Wing	0.78	0.61	0.74	0.68	0.76	0.87	0.69	0.64	0.77	0.89	0.73	21.9
15	Little Willow-Aitkin	0.44	0.38	0.40	0.40	0.31	0.59	-	0.23	0.66	0.59	0.44	34.1
16	East Aitkin County	0.72	0.52	0.86	0.82	0.81	0.90	-	-	1.03	0.80	0.89	-10.1
17	West Vermilion	0.96	1.05	0.86	0.34	1.07	0.73	0.95	0.80	0.87	-	0.79	-
18	Blackduck	1.09	1.22	0.91	0.71	1.21	1.53	-	0.84	1.20	-	1.10	-
19	Splitrock	1.07	-	-	0.55	0.65	0.56	-	1.15	1.18	0.53	0.82	-35.4
20	Isabella	0.60	0.65	-	0.15	-	-	-	-	-	-	0.15	-
21	Red Lake-Pine Island	0.40	0.41	0.50	0.39	-	-	-	0.37	0.30	0.36	0.35	2.9
22	Northome	0.86	0.91	0.97	1.06	1.37	0.95	0.80	0.75	0.77	-	0.95	-
23	Kanabec County	0.70	0.48	0.55	0.65	0.53	0.76	-	0.52	1.29	0.94	0.75	25.3
24	Southern Pine	0.93	0.58	0.76	0.69	0.72	0.86	-	-	1.95	1.03	1.06	-2.8
25	Koochiching North								1.29	1.39	1.15	1.34	-14.2

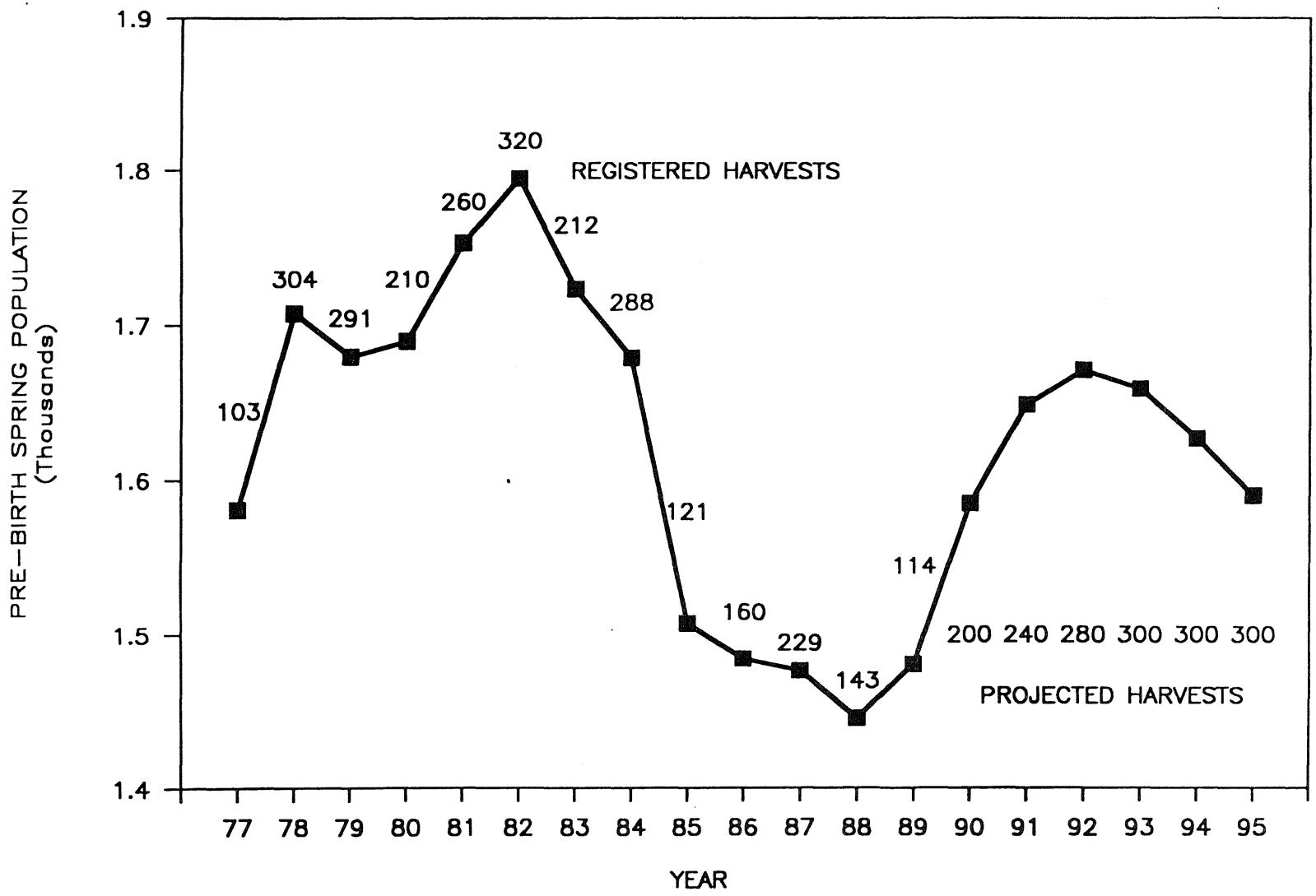


Figure 18. Population modeling summaries for bobcat, 1976-95.

Table 21. Bobcat harvest, age structure, and population index data, 1980-89.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Registered take	304	291	274	208	280	119	160	214	140	129
Mean pelt price	$ 79	$ 73	$ 66	$ 61	$ 76	$ 70	$120	$101	$ 68	$ 49
Carcass aged	48	230	261	205	288	99	132	163	114	119
% juveniles	31%	37%	35%	37%	37%	33%	26%	33%	39%	39%
% male juveniles	80%	59%	47%	56%	52%	41%	53%	44%	58%	49%
% 1.7 yrs. old	33%	23%	15%	18%	13%	19%	17%	16%	18%	17%
% males 1.7 yrs.	69%	63%	49%	56%	66%	41%	32%	52%	62%	53%
% > 2.7 yrs. old	35%	40%	50%	37%	50%	48%	58%	51%	46%	44%
% male > 2.7 yrs.	56%	55%	47%	51%	44%	43%	51%	48%	42%	56%
Overall % males	66%	58%	48%	45%	51%	42%	51%	48%	54%	53%
Juv : > 2.7 yr. females	1.9	2.1	1.3	1.5	1.4	1.2	0.9	1.4	1.7	2.0
% autumn population taken[a]	10%	12%	14%	10%	13%	6%	8%	11%	8%	6%
Scent post index[b]	2	14	14	3	12	5	8	7	5	17
Snowshoe hare index[c]	9.8	1.8	0.7	0.2	0.3	0.2	0.5	0.9	2.7	2.3

[a] Includes registered harvests plus 10% unreported harvest.

[b] Index for autumn prior to harvest season.

[c] Index for spring after harvest season.

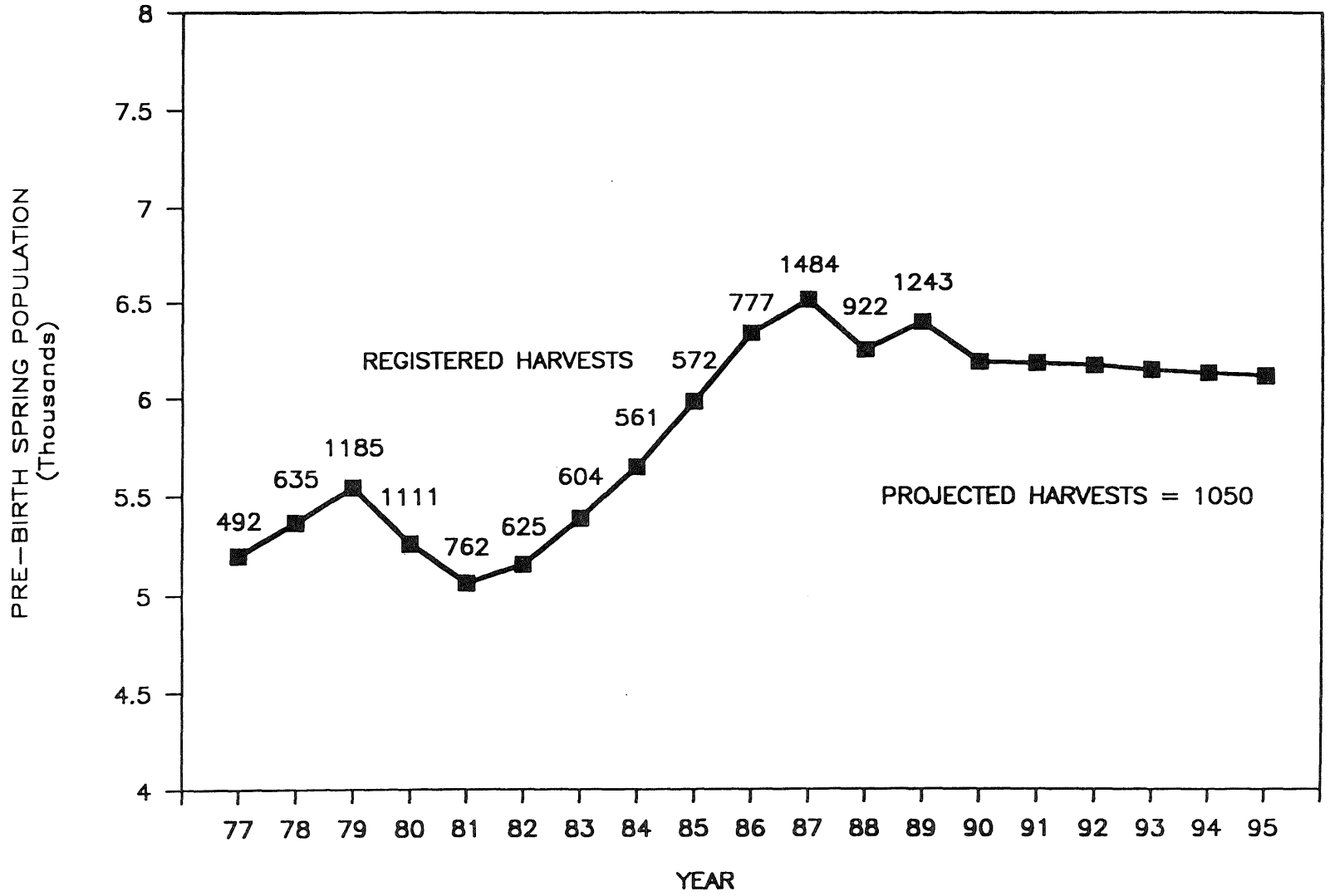


Figure 19. Population modeling summaries for otter, 1976-95.

Table 22. Otter harvest, carcass collection, and pelt price data, 1980-89. Carcasses were not collected after 1986.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Season dates	11/15-11/29	11/14-11/28	11/13-11/27	11/12-11/26	11/17-12/01	11/16-12/15	10/24-11/29	10/24-11/29	10/29-11/27	10/28-12/17
Registered harvest	1,111	485	385	408	513	559	777	1,386	922	1,294
% of autumn population harvested[a]	20%	9%	7%	7%	8%	8%	11%	17%	15%	18%
No. carcasses examined	88	471	389	433	549	572	745	---	---	---
% juveniles	54.5	55.0	50.6	42.3	47.9	43.4	45.2	---	---	---
% yearlings	14.7	19.7	25.6	30.9	23.3	22.9	23.3	---	---	---
% male juveniles	39.6	55.6	56.7	55.7	47.1	53.3	45.1	---	---	---
% males $\geq$ 1.7 yrs.	57.5	53.3	65.1	56.8	50.0	50.0	48.1	---	---	---
Mean pelt prices:										
otter	$33	$30	$26	$25	$22	$21	$24	$23	$22	$22
beaver (autumn)	$18	$14	$11	$12	$12	$15	$20	$17	$14	$12

[a] From population modeling; includes an additional 20% accidental harvest over registered total.

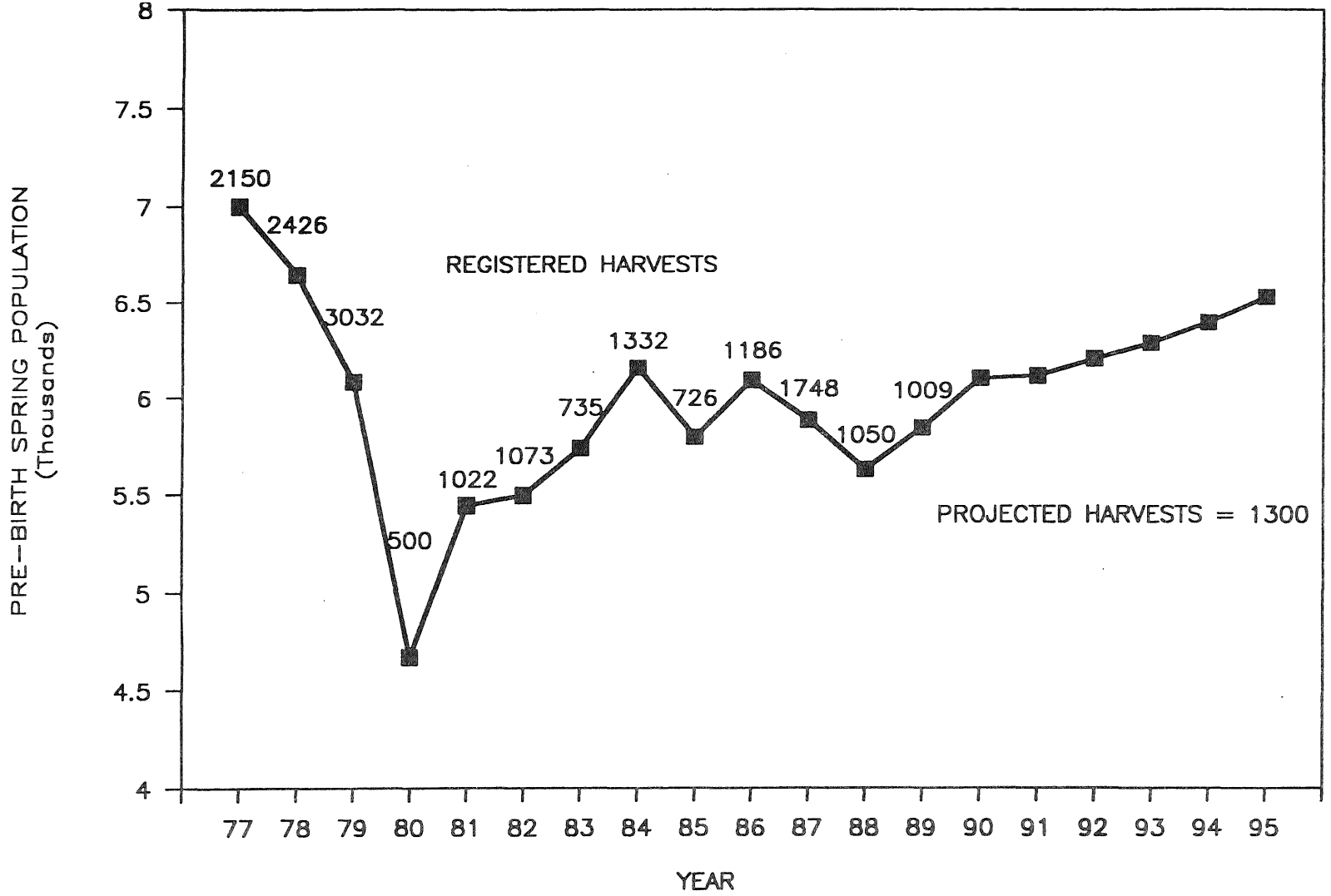


Figure 20. Population modeling summaries for fisher, 1976-95.

Table 23. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1980-89.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Season	Closed	12/01-12/10	12/01-12/11	12/01-12/11	12/01-12/16	11/30-12/15	11/29-12/14	11/28-12/13	11/26-12/11	12/02-12/17
Limit	---	1	1	1	1	1	1	1	1	1
Registered take	(423)	862	912	631	1,289	678	1,068	1,642	1,025	1,243
% of available autumn population harvested[a]	9%	17%	17%	10%	18%	10%	14%	21%	16%	15%
No. carcasses examined[b]	---	843	1,073	662	1,270	712	1,186	1,542	805	1,024
% juveniles	---	66%	66%	69%	63%	63%	59%	63%	70%	64%
% 1.7 yr.	---	24%	19%	18%	20%	20%	24%	15%	15%	19%
% ≥ 2.7 yrs.	---	10%	15%	13%	17%	18%	18%	22%	15%	17%
Juv:ad. female ratio	---	10.5:1	9.4:1	8.8:1	7.2:1	5.4:1	5.3:1	4.7:1	6.8:1	5.8:1
% male juveniles	---	48%	46%	45%	52%	46%	48%	46%	48%	47%
% male 1.7 yrs.	---	43%	41%	40%	45%	40%	50%	40%	39%	47%
% male ≥ 2.7 yrs.	---	37%	52%	40%	45%	34%	37%	37%	33%	34%
Pelt price: males	$90	$94	$70	$71	$70	$74	$84	$84	$54	$26
females	$104	$110	$99	$121	$122	$130	$162	$170	$100	$53
Snowshoe hare index[c]	9.8	1.8	0.7	0.2	0.3	0.2	0.5	0.5	2.7	2.3

[a] Estimated from population model.

[b] May exceed registration totals due to accidental catches, etc.

[c] Index for spring after harvest season.

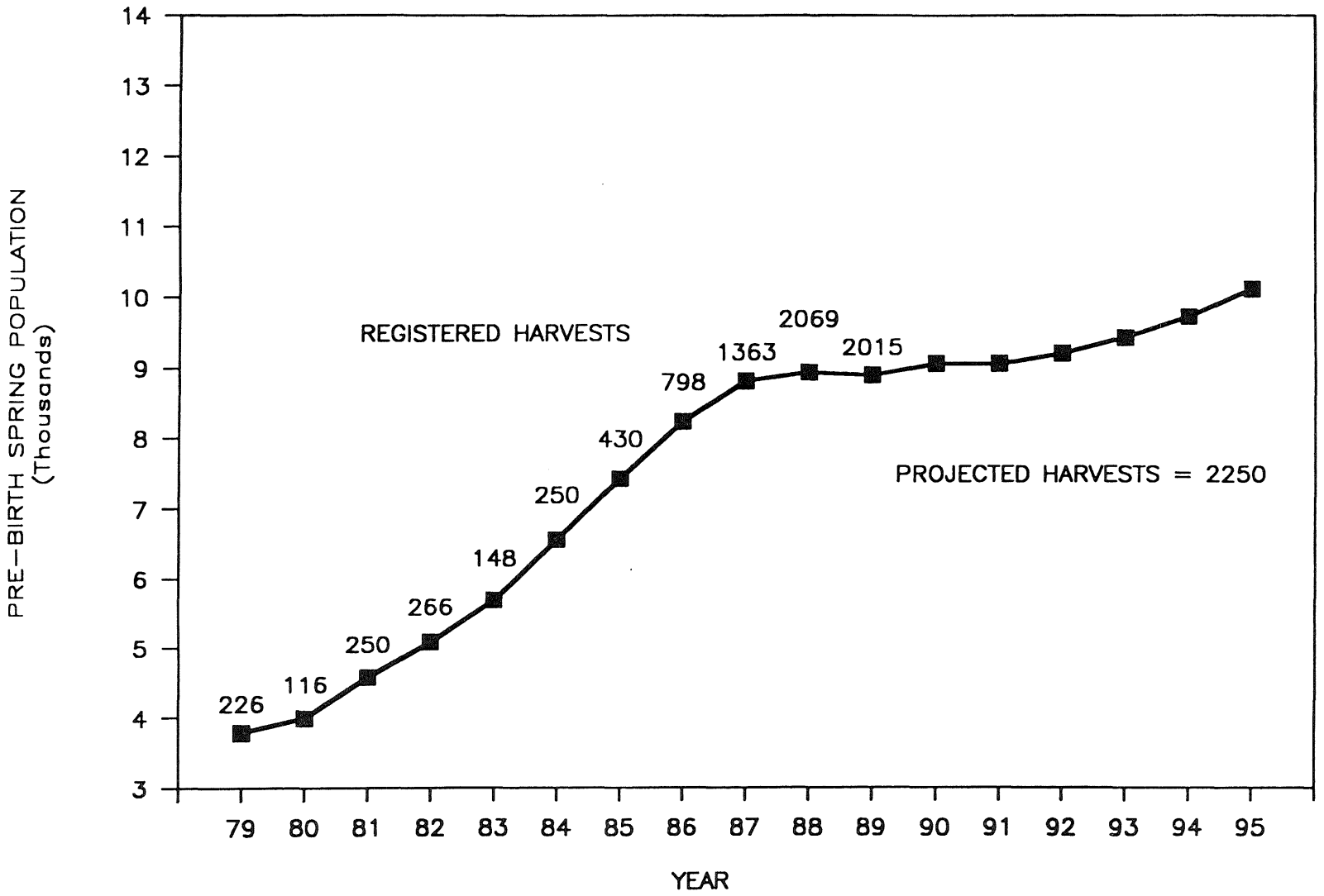


Figure 21. Population modeling summaries for pine marten, 1976-95.

Table 24. Harvest, carcass collection, and pelt price data for pine marten seasons in Minnesota, 1985-89.

	1985	1986	1987	1988	1989
Season	11/30-12/15	11/29-12/14	11/28-12/13	11/26-12/11	12/02-12/17
Limit	1	1	1	2	2
Registered take	430	798	1,363	2,072	2,119
% of available autumn population harvested	6%	9%	16%	20%	20%
No. carcasses examined	507	884	1,754	1,977	2,014
% juveniles	73%	64%	66%	66%	68%
% 1.7 yr.	18%	21%	18%	11%	12%
% ≥ 2.7 yrs.	9%	15%	16%	23%	20%
Juv:ad. female ratio	17.2:1	12.3:1	11.2:1	8.6:1	9.7:1
% male juveniles	69%	65%	65%	58%	57%
% male 1.7 yrs.	68%	71%	67%	50%	63%
% male ≥ 2.7 yrs.	82%	81%	75%	66%	65%
% males overall	70%	69%	67%	59%	59%
pelt price (male)	$30	$36	$43	$50	$48
pelt price (female)	$28	$27	$39	$43	$47

Table 25. Estimated pre-fawning deer density (deer/sq. mile) as determined by pellet counts, 1984-89. Estimates were not adjusted by dead deer correction factor and thus may differ from previous reports. Numbers in parentheses represent 95% confidence intervals.

Area	Year						
	1984	1985	1986	1987	1988	1989	1990[b]
Itasca DMU							
NW	21.8 (4.2)	30.8 (5.9)	13.2 (2.9)	19.1 (3.8)	16.8 (2.8)	18.3 (3.5)	----------
SW	17.9 (3.8)	19.7 (5.0)	13.9 (3.7)	16.6 (4.8)	14.5 (2.8)	19.7 (4.7)	----------
NE	12.7 (3.6)	16.5 (3.5)	16.0 (4.5)	18.3 (5.0)	18.7 (4.2)	21.7 (5.6)	----------
SE	12.8 (4.0)	19.7 (5.2)	15.0 (3.8)	20.7 (5.8)	18.5 (4.3)	20.0 (5.6)	----------
Bemidji	16.0 (3.8)	14.4 (4.0)	12.8 (3.3)	13.7 (3.7)	15.2 (3.9)	19.7 (5.1)	----------
Leech Lake IR	12.6 (3.8)	12.3 (2.9)	9.1 (2.4)	8.8 (1.9)	13.2 (9.2)	14.6 (4.4)	
Rainy River DMU							
West	14.9 (4.2)	----------	9.3 (3.7)	18.3 (5.5)	11.8 (2.6)	25.2 (8.0)	----------
Central	11.9 (6.3)	12.4 (5.3)	13.4 (5.1)	----------	20.9 (6.3)	26.4(10.6)	----------
East	16.0 (4.1)	17.8 (4.8)	16.9 (5.2)	14.8 (3.9)	19.4 (5.7)	18.3 (4.8)	----------
Mille Lacs DMU							
West	14.1 (2.9)	17.0 (3.8)	16.2 (4.1)	11.7 (4.5)	18.7 (6.2)	24.1 (8.0)	----------
Central	18.0 (4.6)	16.5 (3.7)	14.4 (4.0)	13.9 (4.1)	11.7 (3.2)	20.0 (5.9)	----------
East	14.1 (3.2)	11.6 (2.7)	10.5 (2.7)	13.1 (2.9)	21.3 (4.1)	28.0 (5.9)	----------
White Earth IR	11.7 (4.6)	17.6 (5.6)	9.2 (3.8)	10.2 (6.1)	6.5 (2.7)	18.6 (6.8)	----------
Superior DMU[a]							
West	19.4 (7.1)	24.6 (4.0)	23.7 (5.4)	17.3 (3.7)	26.7 (4.2)	28.6 (6.3)	----------
Central	16.1 (5.3)	15.2 (3.2)	13.5 (6.0)	17.2 (5.5)	25.1 (7.5)	18.7 (4.6)	----------
East	----------	----------	----------	----------	----------	15.3 (3.7)	----------
Agassiz NWR	16.0 (3.8)	14.4 (4.0)	12.8 (3.3)	13.7 (3.7)	15.2 (3.9)	19.7 (5.1)	----------
Aitkin County	----------	22.7 (6.1)	19.4 (6.1)	19.5 (4.2)	24.4 (5.8)	30.3 (8.7)	----------
Aitkin SE1/4 T44,R22	----------	10.3 (2.7)	30.3 (8.8)	----------	----------	----------	----------
Bearville Study Area	----------	42.9 (7.2)	21.1 (4.4)	----------	----------	----------	----------
Camp Ripley	----------	41.5 (9.8)	30.8 (9.7)	39.1(11.7)	21.8 (4.9)	50.4(15.9)	----------
Chippewa NF	----------	19.5 (3.4)	13.1 (2.2)	14.0 (2.1)	15.6 (2.6)	18.4 (2.9)	----------
Elephant Lake	----------	----------	----------	----------	----------	----------	----------
Fond du Lac IR	----------	----------	----------	----------	10.9 (5.8)	12.8 (7.8)	----------
Garden Lake Deer Yard	----------	30.6 (7.5)	13.2 (4.0)	----------	----------	----------	----------
Itasca County	----------	23.6 (3.9)	12.6 (2.4)	----------	----------	----------	----------
Mille Lacs WMA	----------	10.5 (3.7)	15.6 (7.4)	17.2 (4.5)	35.6(10.9)	43.0 (9.8)	----------
St. Croix State Park	----------	----------	----------	35.0 (9.3)	----------	73.4(14.0)	----------
Tamarac NWR	----------	38.9(11.1)	41.8(12.1)	28.3 (8.2)	38.0(11.6)	----------	----------
Voyageurs NP	----------	----------	----------	----------	----------	51.5(10.1)	----------

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

[b] No pellet counts were conducted in 1990.

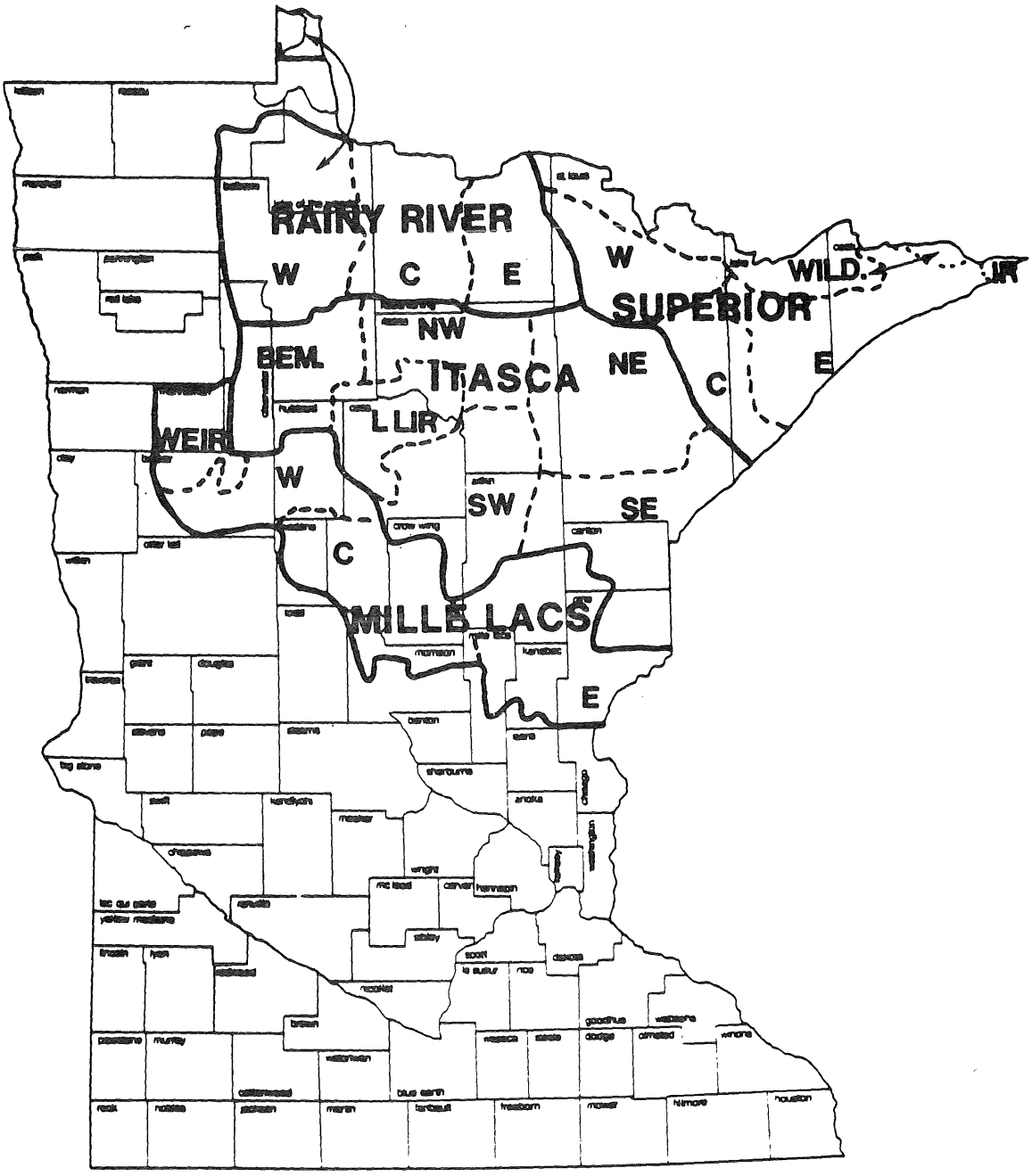


Figure 22. Deer Management Units (DMU) and sub-DMU's in the Forest Zone.

Table 26. Spring white-tailed deer densities estimated from population modeling in Deer Management Subunits of Minnesota's Forest zone, 1984-90.[a]

DMU and subunit	Deer per square mile							
	1984	1985	1986	1987	1988	1989	1990	Goal
Itasca								
Northwest	18.0	19.0	17.4	19.5	21.7	21.1	26.5	15-20
Southwest	12.0	13.2	12.4	14.4	16.2	15.5	20.0	15-20
Northeast	8.0	9.4	9.5	11.4	12.9	12.1	15.5	15-20
Southeast	10.0	11.7	12.0	14.3	16.0	15.2	18.8	10-15
Leech Lake IR	10.0	11.1	11.2	12.6	13.6	13.1	15.5	10-15
Bemidji	15.0	15.2	14.3	16.0	17.2	16.5	20.5	10-15
Mille Lacs								
West	16.0	16.3	15.5	16.4	17.7	18.0	21.8	10-15
Central	13.8	13.9	13.7	13.9	15.0	15.6	18.6	10-15
East	10.1	10.8	11.6	13.7	15.8	18.0	22.1	10-15
White Earth IR	10.0	10.7	11.1	11.8	12.3	12.0	13.9	10-15
Rainy River								
West	11.4	11.5	11.5	12.7	13.6	12.3	14.5	10-15
Central		10.5	11.1	13.5	15.5	14.3	18.5	10-15
East	14.0	15.8	15.7	18.1	19.8	17.6	21.2	15-20
Superior								
West	12.0	14.7	14.9	18.1	20.9	19.3	25.1	15-20
Central	8.0	9.6	9.8	12.1	13.9	12.3	16.7	10-15
East	5.0	6.1	6.5	8.3	10.0	8.9	11.7	3-8

[a] Historical density figures may differ from those previously published because of annual recalculation as more accurate modeling data are available.

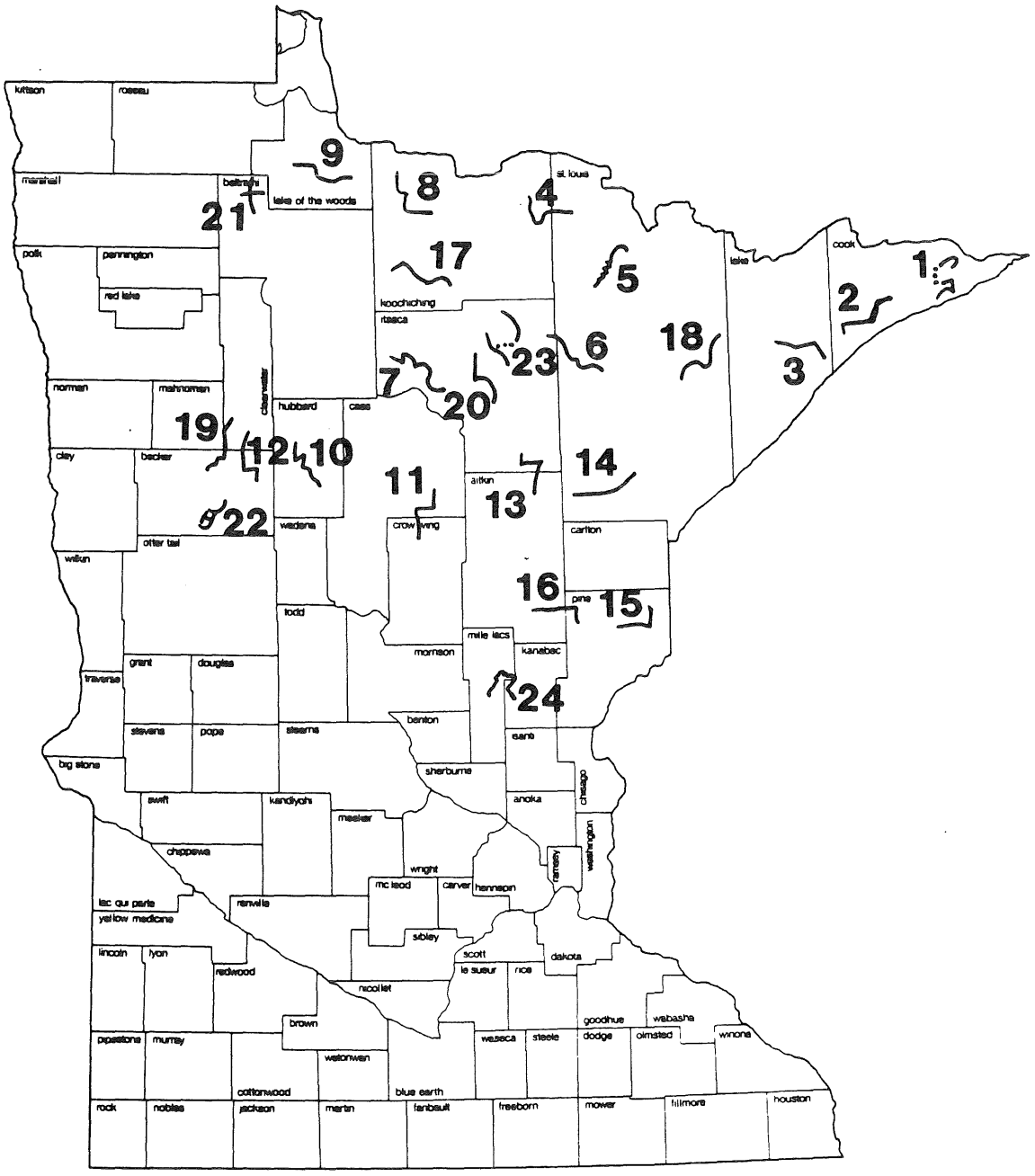


Figure 23. Locations of 24 bear bait routes.

Table 27. Percentage of baits on each bait route taken by bears, 1980-90. All baits (50 per route) except those entirely removed by other animals were considered available to bears. Baits were set July 1-7 (and also during June 10-16 in 1988 and 1989); stations were checked for visitation 7 days later.

Route No.	1980[a]	1981	1982	1983	1984	1985	1986	1987	Jun	Jul	Jun	Jul	1990
1	16	33	22	41	38	22	10	17	9	20	7	14	11
2	32	22	14	15	10	30	22	38	19	30	15	23	19
3	10	2	37	44	14	26	38	38	21	48	35	33	19
4	24	60	22	54	33	47	45	49	24	30	22	13	18
5	26	54	31	44	28	29	45	28	16	18	32	--[b]	21
6	21	27	17	18	30	44	37	26	19	23	14	--[b]	11
7	23	45	19	43	18	26	47	22	38	58	35	44	23
8	16	14	8	10	44	46	69	41	42	69	49	49	13
9	20	40	16	27	20	30	15	10	29	44	42	15	36
10	6	23	26	44	24	31	22	15	18	25	31	49	16
11	4	22	12	31	21	39	38	22	28	53	43	41	41
12	11	44	22	65	37	27	21	21	31	55	27	43	25
13	12	40	24	40	30	33	34	26	26	36	7	48	29
14	10	4	16	14	4	18	11	27	6	14	13	16	3
15	6	36	24	22	24	35	30	34	34	61	31	35	22
16				36	24	19	38	23	15	58	20	35	30
17				19	49	66	24	28	25	40	40	36	35
18				8	20	42	20	43	10	32	21	--[b]	37
19				28	10	18	25	15	25	27	18	18	20
20		48	69	66	35	45	40	20	24	35	21	40	44
21					6	6	2	19	15	15	18	23	17
22					20	8	14	11	19	41	18	29	18
23						28	40	36	44	40	23	34	34
24						20	35	54	63	68	39	70	68
Mean	16	32	24	33	24	31	30	28	25	39	26	33	25

[a] Data for 1980 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] Data forms lost in the mail.

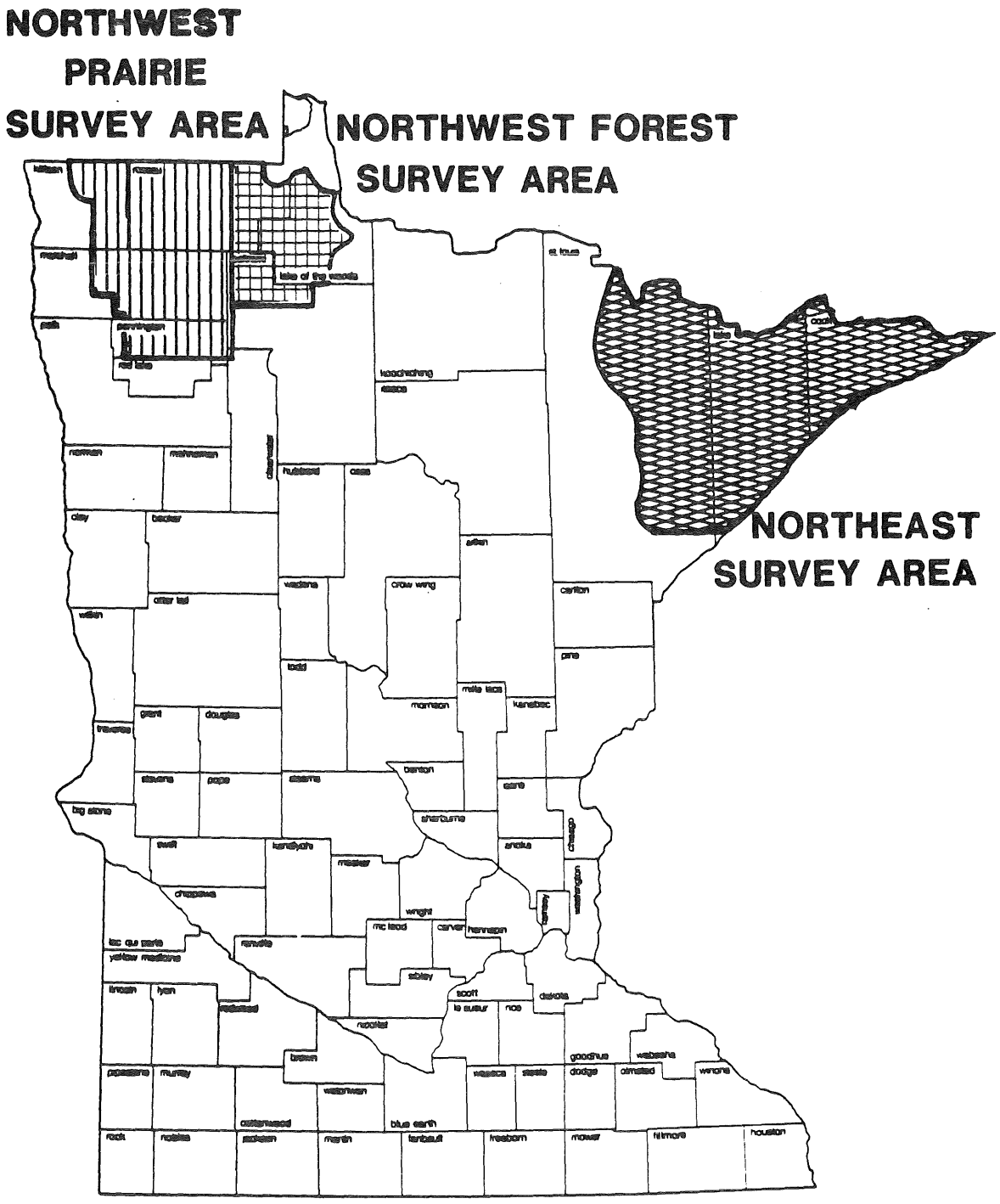


Figure 24. Aerial moose survey area boundaries.

Table 28. Moose population estimates from aerial moose survey in Minnesota, 1982-90.

Year	Population Estimate by Survey Area (+90% CI) Northwest Prairie	Northwest Forest	Northeast
1982-83	3772 (930)	370 (124)	4877 (999)
1983-84	2784 (567)	446 (139)	4274 (925)
1984-85	4086 (518)	578 (148)	5518 (1494)
1985-86	3415 (412)	433 (100)	4955 (1034)
1986-87	3740 (747)	307 (83)	6120 (1438)
1987-88	no survey	no survey	5457 (1057)
1988-89	2328 (466)	419 (153)	6702 (2357)
1989-90	2034 (492)	no survey	4429 (1218)
change 1988-89 to 1989-90	-12.6%	-	-33.9%

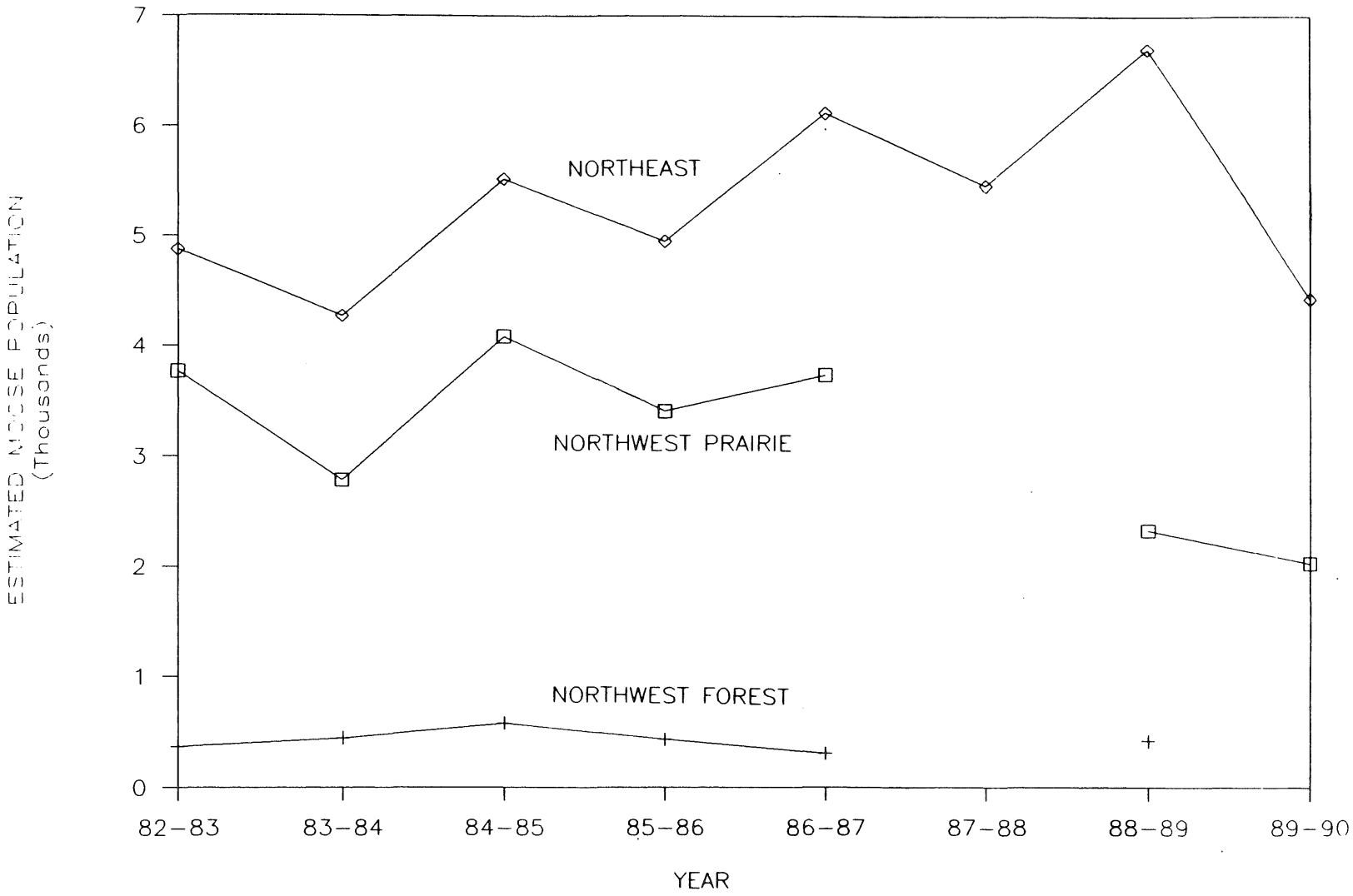


Figure 25. Moose population trends by survey area in northern Minnesota. Trend lines are broken where survey information was not collected.

MIGRATORY BIRD POPULATIONS

Table 29. Estimated spring duck populations of selected species in Minnesota, 1975-90.[a]

Species	Year	Unadjusted population index	Visibility factor	Adjusted[b] population estimate (thousands)
Mallard	1975	55,093	3.19	176
	1976	69,844	1.69	118
	1977	60,617	2.21	134
	1978	56,152	2.61	147
	1979	61,743	2.57	159
	1980	83,775	2.05	172
	1981	79,562	1.95	155
	1982	51,655	2.33	121
	1983	73,424	2.12	156
	1984	94,514	1.99	188
	1985	96,045	2.26	217
	1986	108,328	2.16	235
	1987	165,881	1.16	192
	1988	155,453	1.75	272
	1989	124,362	2.19	273
	1990	140,879	1.65	232
Blue-winged teal	1975	45,948	3.95	181
	1976	89,370	4.87	436
	1977	37,391	3.86	144
	1978	28,491	8.53	243
	1979	46,708	5.21	243
	1980	50,966	6.49	331
	1981	64,546	2.59	167
	1982	42,772	4.75	203
	1983	42.728	2.81	120
	1984	89,896	2.82	254
	1985	90,453	2.91	264
	1986	68,235	2.69	183
	1987	102,480	1.99	204
	1988	101,135	2.38	240
	1989	90,300	3.16	286
	1990	107,183	3.09	331

[a] Population estimates are not valid for species other than mallards and blue-winged teal and, therefore, will no longer be reported here.

[b] Adjusted population estimates are different from those publicized previously because of adjustments in visibility factors to standardize data for all years.

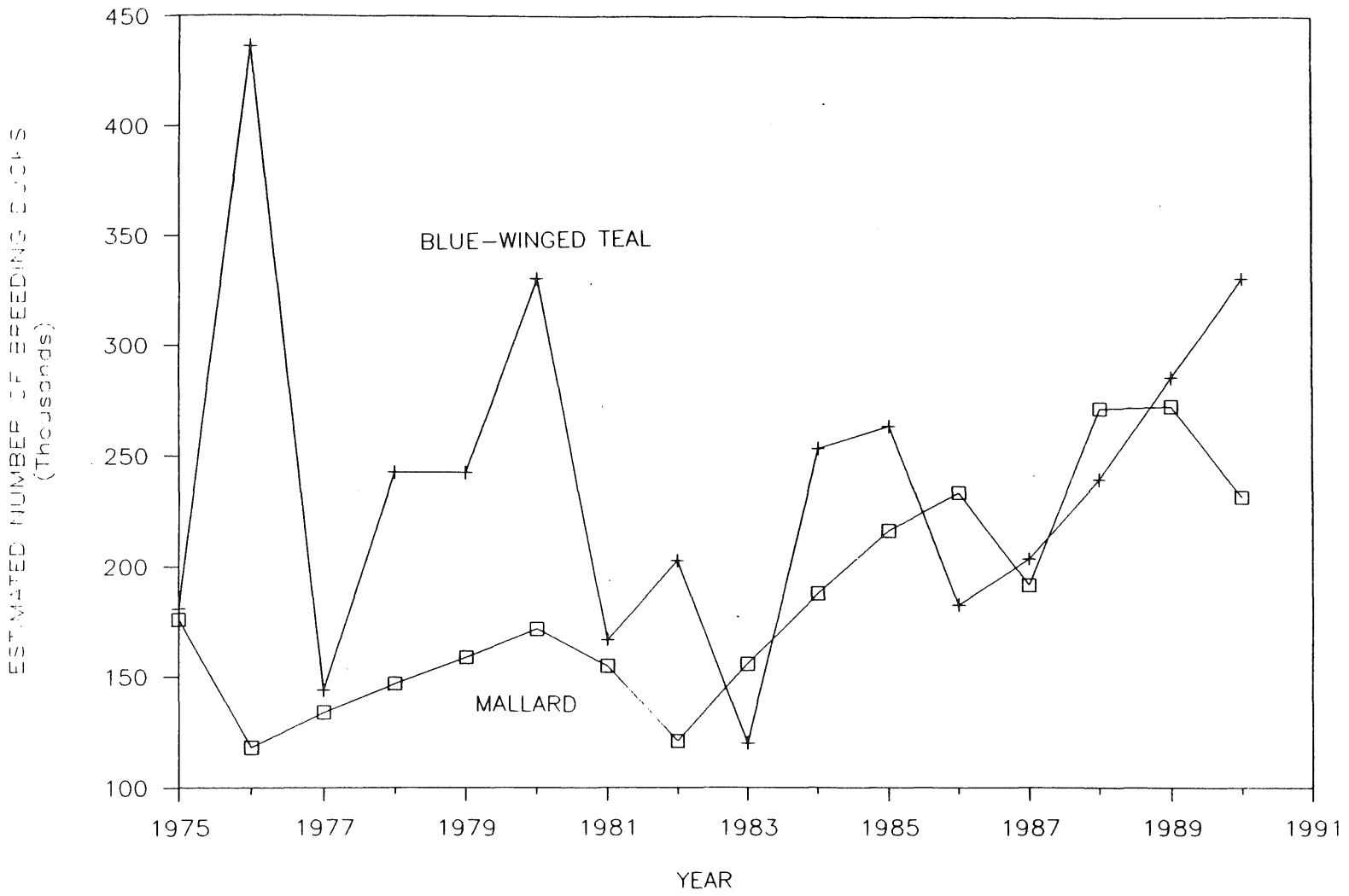


Figure 26. Estimated number of mallards and blue-winged teal breading in Minnesota, 1975-90.

Table 30. Winter population estimates (post hunting season) of the Canada goose eastern prairie flock, 1963-89 (taken from : U.S. Fish and Wildlife Service/Canadian Wildlife Service. 1990. 1990 Status of waterfowl and fall flight forecast; July 1990. 45pp).

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
1987	228,000
1988	184,000
1989	325,000

[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.

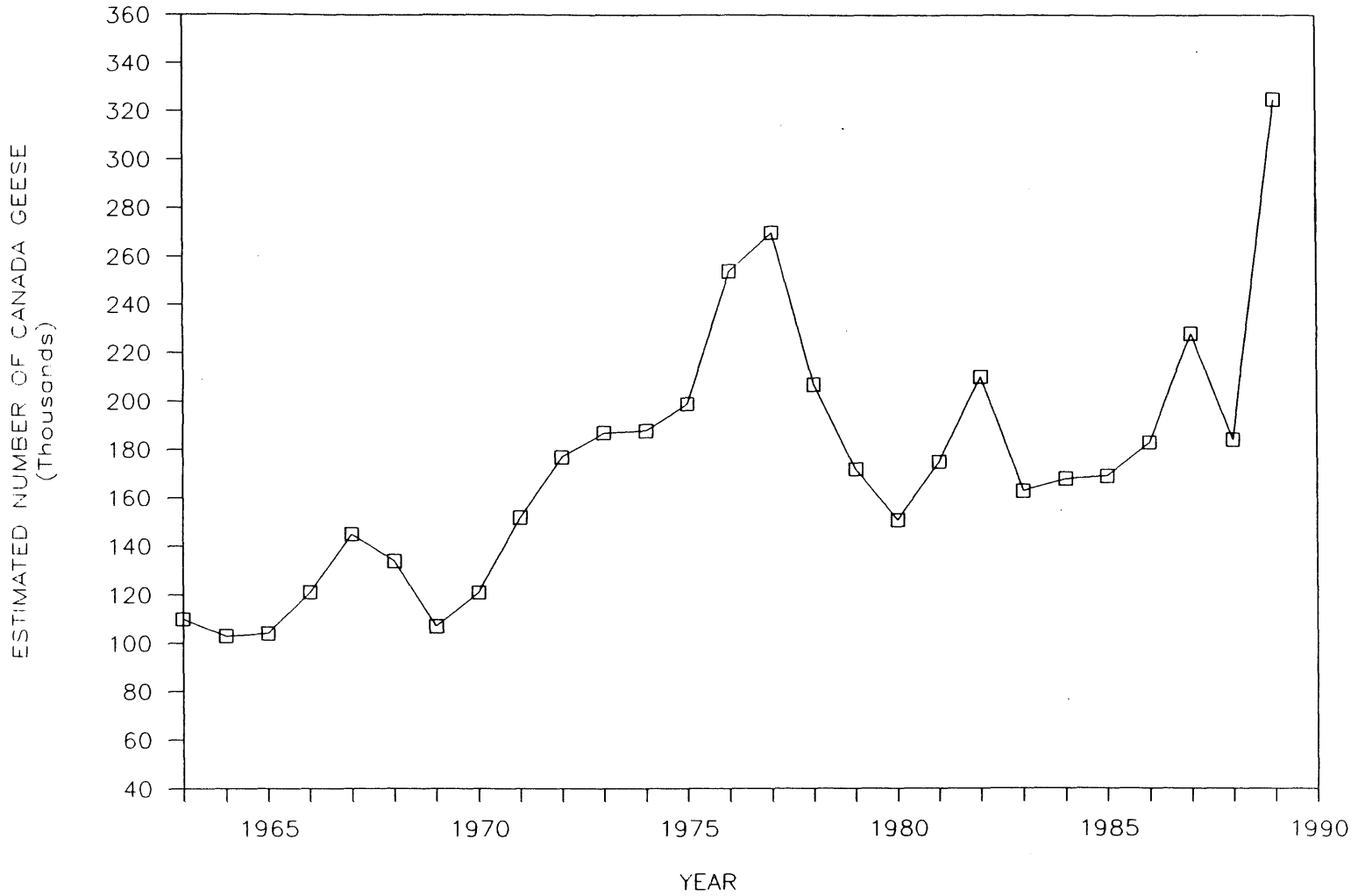


Figure 27. Winter population estimates of the Eastern Prairie Population of Canada geese, 1963-89 (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service reports 1990. 1990 Status of waterfowl and fall flight forecasts; July 1990. 45pp).

Table 31. Summary of the number of May ponds (adjusted for visibility) in Prairie Canada (portions of Alberta, Saskatchewan and Manitoba) 1961-90 and north-central U.S. (North Dakota, South Dakota and Montana) 1974-90. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service, 1990. 1990 Status of waterfowl and fall flight forecast. July 1990. 45pp).

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
1987	2,598	1,348
1988	2,110	794
1989	1,696	1,290
Average	3,533	1,320
1990	2,817	691
% Change in 1990 from:		
1989	+66	-46
Average	-20	-48

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

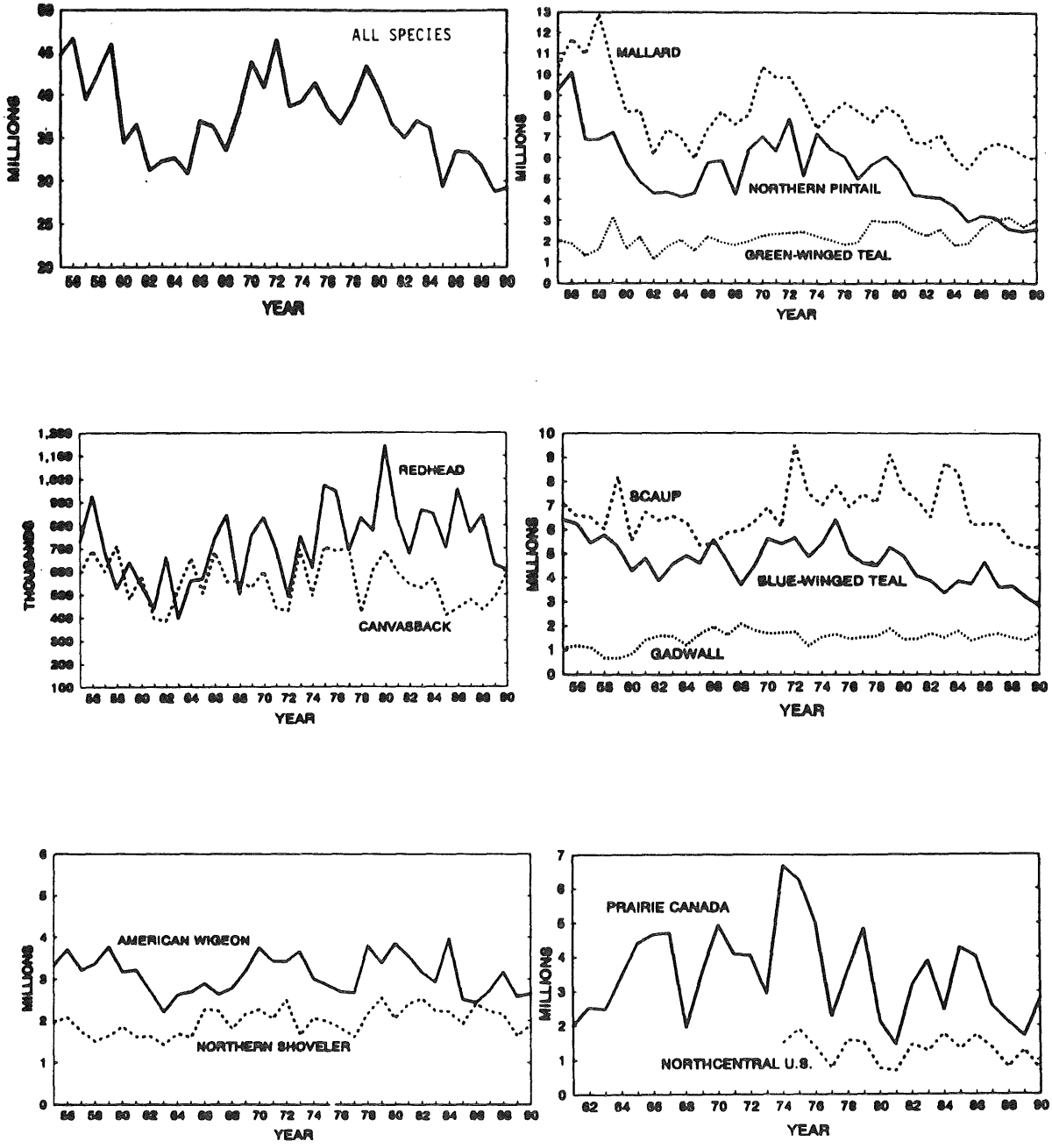


Figure 28. Estimates of North American breeding populations of selected ducks and number of water areas in May in Prairie Canada and Northcentral U.S. (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1990. 1990 Status of waterfowl and fall flight forecasts; July 1990. 45pp).

Table 32. North American breeding population estimates for 10 species of ducks, 1955-90. (from: U.S. Fish and Wildlife Service/Canadian Service. 1990. 1990 Status of waterfowl and fall flight forecast; July 1990. 45pp). 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

Table. 32. Continued.

Year	Mallard	Gadwall	American wigeon	Green-winged teal	Blue-winged teal	Northern shoveler	Northern Pintail	Redhead	Canvasback	Scaup
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
1988	6,549	1,528	3,168	3,143	3,646	2,157	2,577	846	435	5,480
1989	6,119	1,423	2,577	2,697	3,199	1,636	2,471	628	488	5,299
1990	5,897	1,745	2,659	3,032	2,832	1,904	2,590	606	593	5,277
Goals[b]	8,700	1,600	3,300	2,300	5,300	2,100	6,300	760	580	7,600
1955-89 Ave.	8,098	1,500	3,119	2,203	4,768	1,993	5,392	725	555	6,830
Percent Change in 1990 from:										
1989	-4	+23	+3	+12	-11	+16	+5	-4	+22	NC
1955-89 Ave.	-27	+16	-15	+38	-41	-4	-52	-16	+7	-23

[a] All duck indexes adjusted for visibility bias.

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

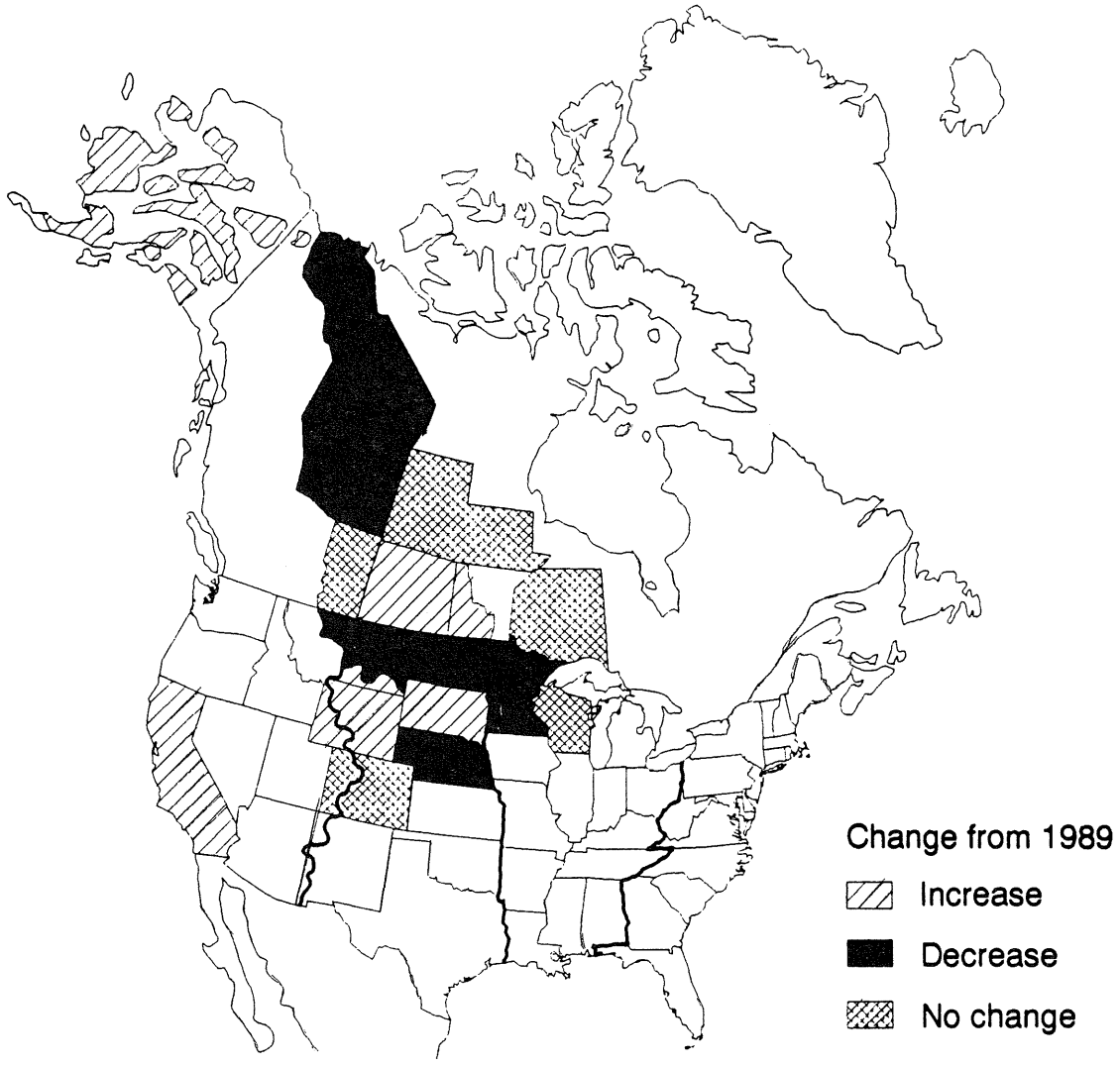


Figure 29. Fall 1990 duck flight forecast for Canada and the U.S., change from 1989, FORECAST: No Change (+1%) (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1990. 1990 Status of waterfowl and fall flight forecast; July 1990. 45pp).

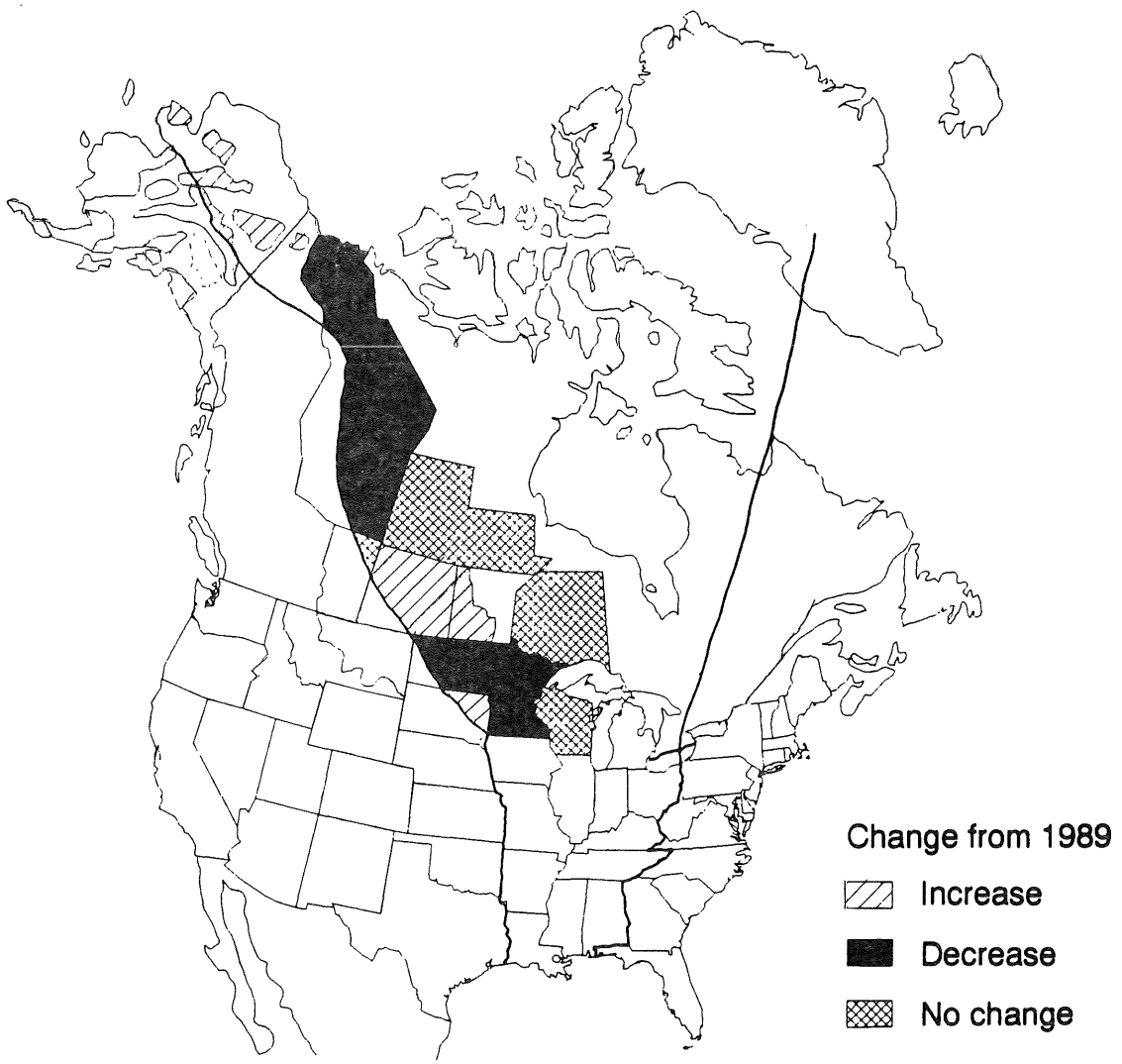


Figure 30. Fall 1990 duck flight forecast for the Mississippi Flyway, change from 1989, FORECAST: No Change (-1%) (from: U.S. Fish and Wildlife Service/Canadian Wildlife Service 1990. 1990 Status of waterfowl and fall flight forecast; July 1990. 45pp).

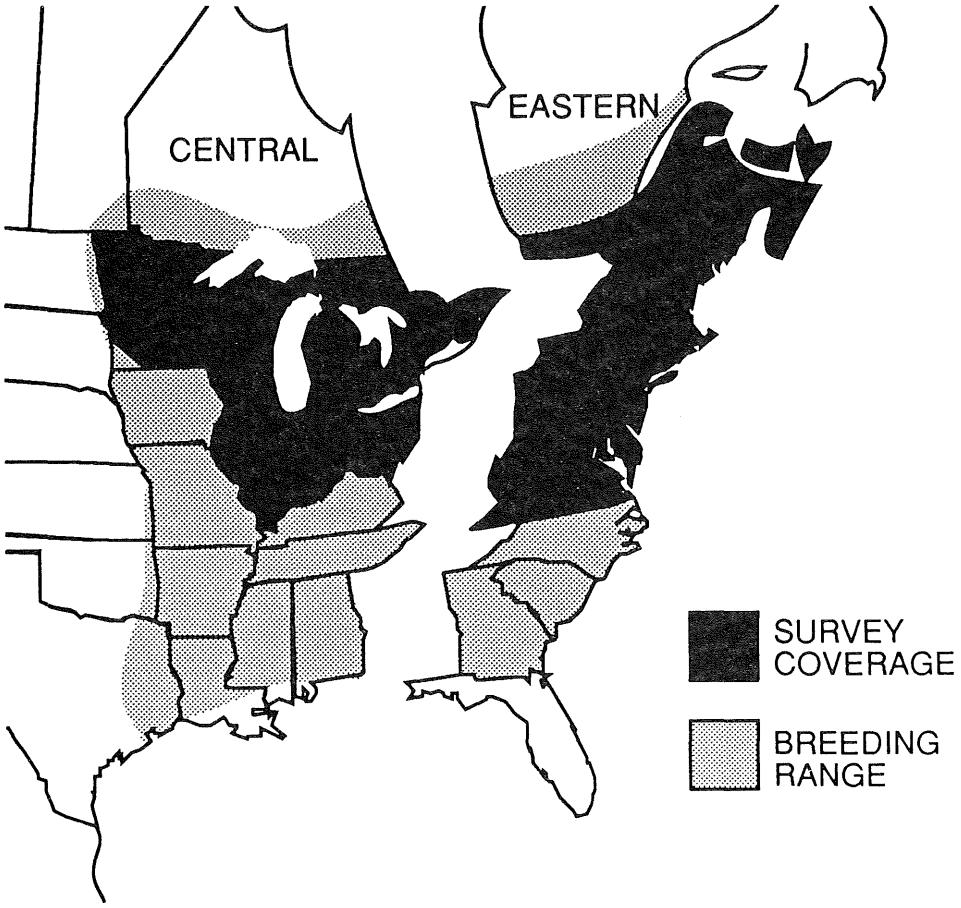


Figure 31. Woodcock breeding range, singing ground survey coverage, and woodcock management regions (from: Bortner, James B. 1990. American woodcock harvest and breeding population status, 1990. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

Table 33. Trends (% change per year[a]) as determined by linear regression in numbers of American woodcock heard by management region, state, and province. (from: Bortner, J.B. 1990. American woodcock harvest and breeding status, 1990. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

Management Unit/State	2 year (1989-90) N[b]	% Change	Routes Run[c]	6 year (1985-90) N	% Change	23 year (1968-90) N	% Change
CENTRAL	300	2.54	442	453	0.69	639	-0.78
IL	5	-64.10	20	11	-35.14***	38	-2.05
IN	9	44.00	22	17	5.38	50	-3.79
MI	100	4.48	117	124	1.10	136	-0.79
MN	56	5.52	76	76	1.32	108	0.79
OH	18	79.14***[d]	34	31	-1.10	69	-4.01**
ON	58	-4.18	84	112	-0.26	130	-0.28
WIS	54	-6.13	89	82	1.05	108	-1.63**

[a] Mean of route trends weighted by land area and population density. The estimated count in the next year is (%/100+1) times the count in the current year where % is the annual change. NOTE: Extrapolating the estimated trend statistic (% change per year) over time (e.g., 23 years) may exaggerate the total change over the period.

[b] Routes run in both 1989 and 1990 with comparable observers and densities greater than zero.

[c] Actual routes run in 1990.

[d] ** $P \leq 0.05$; *** $P \leq 0.01$.

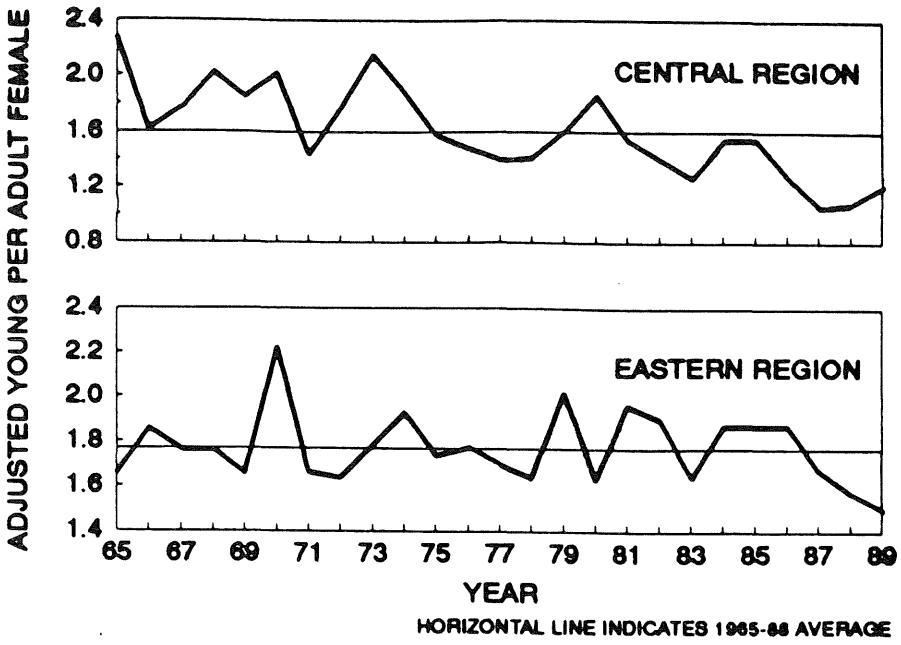


Figure 32. Adjusted index of American woodcock recruitment, 1965-89, base year 1969. (from: Bortner, James B. 1990. American woodcock harvest and breeding population status, 1990. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

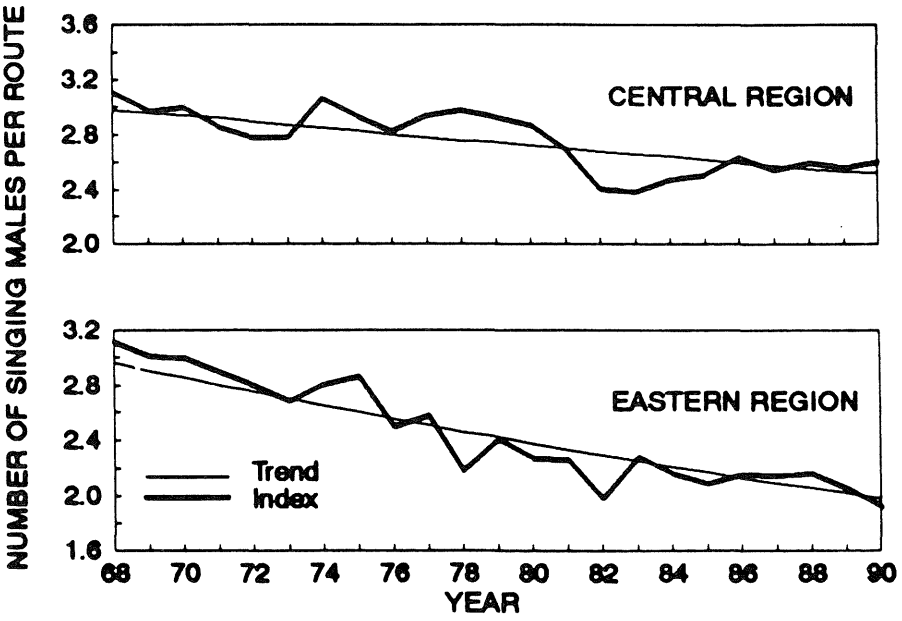


Figure 33. American woodcock breeding population trend and annual index, 1968-90; route regression analysis. (from: Bortner, James B. 1990. American woodcock harvest and breeding population status, 1990. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

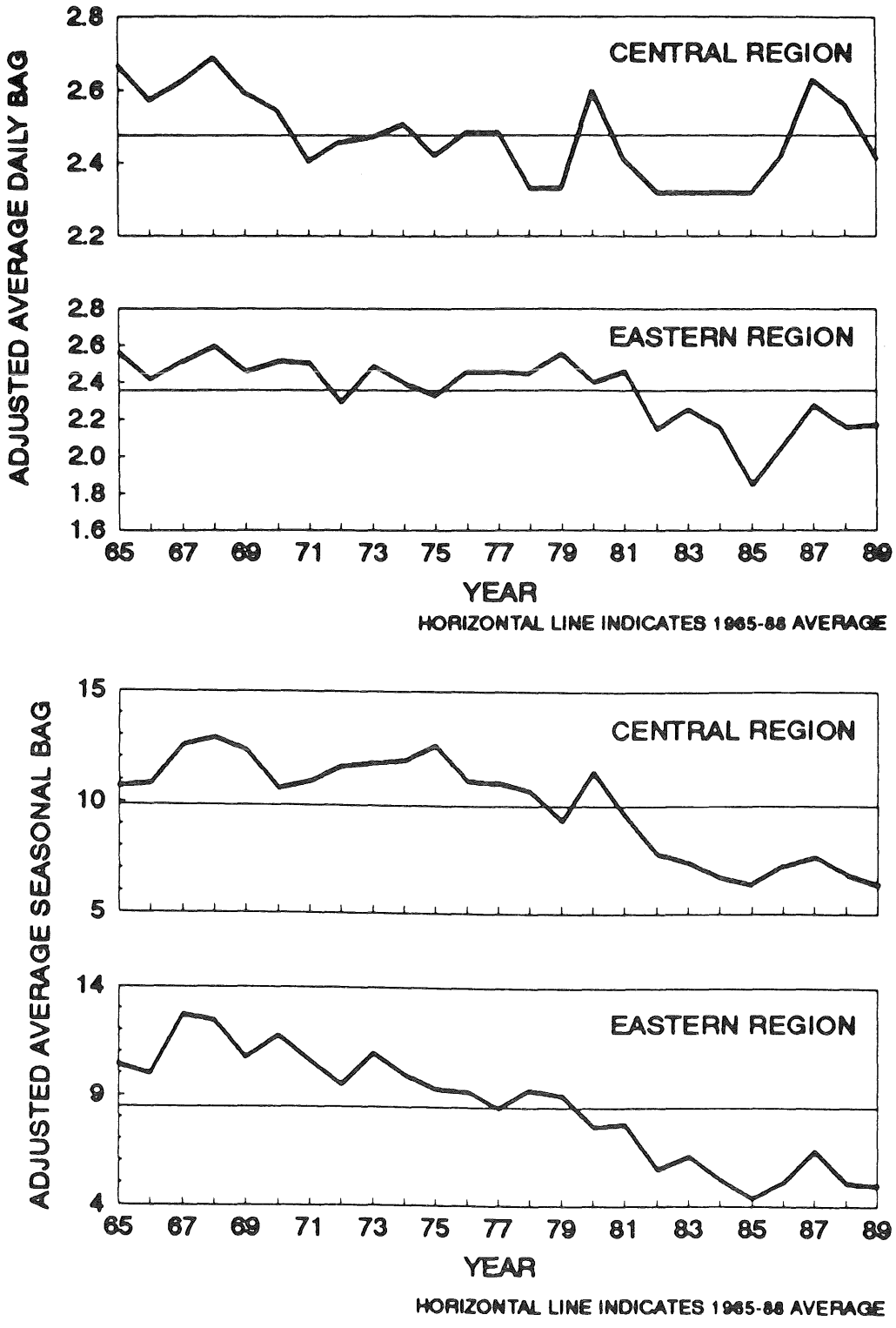


Figure 34. Adjusted indices of daily and seasonal hunting success of American woodcock, 1965-89, base year 1969. (from: Bortner, James B. 1990. American woodcock harvest and breeding population status, 1990. U.S. Fish and Wildlife Service, Office of Migratory Bird Management, Laurel, MD. 12pp).

NONGAME WILDLIFE

Table 34. Minnesota Bald Eagle Nesting Activity in Four Survey Areas, 1989.

Survey Area	Observed Breeding Areas	Occupied Breeding Areas	Successful Breeding Areas	Percent Successful	Number of Young	Young/Occupied Breeding Area	Average Brood Size
Chippewa NF	169	144	98	68	163	1.13	1.7
Superior NF	90	74	53	72	86	1.25	1.6
Voyageurs NP	23	23	9	39	13	.56	1.4
"Other Areas"	184	149	101	68	168	1.24	1.7
Minnesota Total	460	390	261	67	430	1.10	1.6

Table 35. Minnesota Bald Eagle Nesting Data, 1973-1989.

	Breeding Areas			Young		
Year	Occupied[a]	Number Successful	Percent Occupied	Total	Per Occupied Breeding Area	Average Brood size
1973	115	71	62	113	0.98	1.59
1974	127	77	61	96	0.76	1.25
1975	120	87	73	145	1.21	1.67
1976	122	93	76	163	1.34	1.75
1977	156	114	73	179	1.15	1.57
1978	168	115	68	188	1.12	1.63
1979	159	111	70	196	1.23	1.77
1980	181	133	73	239	1.32	1.80
1981	190	132	69	242	1.27	1.83
1982	207	145	70	245	1.18	1.69
1983	229	170	74	321	1.40	1.89
1984	245	165	67	274	1.12	1.66
1985	250	161[b]	71[b]	275[b]	1.21[b]	1.71[b]
1986	266	187[c]	72[c]	312[c]	1.21[c]	1.67[c]
1987	350	227	65	360	1.03	1.59
1988	372	250	67	412	1.11	1.65
1989	390	261	67	430	1.10	1.65

[a] Number of occupied breeding areas regardless of outcome.

[b] These figures do not include data from 23 occupied nesting areas of unknown outcome in the Boundary Waters Canoe Area.

[c] These figures do not include data from 9 occupied nesting areas of unknown outcome in the Boundary Waters Canoe Area.

HUNTING HARVEST STATISTICS

Table 36. Resident small game hunter[a] response to mail surveys, 1979-80 through 1989-90.

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
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
1987-88	5,513	248	4,191	79.6
1988-89	15,388	857	11,431	78.7
1989-90	10,893	735	7,790	76.7

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

Table 37. Use of resident small game hunter licenses[a], 1979-80 through 1989-90.

		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
1987-88	Hunted	3,554 (84.8%)	242,875
	Did not hunt	635 (15.2%)	43,395
		4,189 (100.0%)	286,270
1988-89	Hunted	9,391 (82.2%)	234,833
	Did not hunt	2,040 (17.8%)	50,852
		11,431 (100.0%)	285,685
1989-90	Hunted	6,924 (88.9%)	271,849
	Did not hunt	866 (11.1%)	33,943
		7,790 (100.0%)	305,792

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

Table 38. Estimated number of hunters and estimated take per hunter for various species, 1982-83 through 1989-90.

Species	Estimated number of hunters (thousands)								Estimated take per hunter							
	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Ducks	134	117	134	122	132	114	77	83	8.1	10.6	10.8	9.1	9.0	8.2	6.9	7.6
Canada goose	52	41	51	55	58	56	47	49	1.6	1.6	1.6	1.9	1.8	1.9	2.4	2.8
Other geese	11	10	9	9	7	9	5	7	0.7	0.7	0.8	1.2	0.5	1.1	0.9	2.2
American coot	11	12	9	11	11	8	3	4	4.3	4.7	4.9	4.4	5.3	3.6	2.6	3.7
Common snipe	4	6	5	5	5	6	4	5	3.2	2.8	4.0	3.2	3.9	3.4	3.3	2.9
Rails/gallinules	1	2	1	1	1	1	1	1	3.1	1.2	1.4	2.3	1.1	3.6	1.8	7.2
American woodcock	20	16	17	19	21	27	26	30	2.7	3.9	4.3	4.3	4.3	4.5	4.0	4.3
Ring-necked pheasant	125	86	65	72	62	86	84	89	2.1	3.5	2.3	3.0	2.6	3.2	3.9	4.7
Ruffed grouse	115	78	87	94	107	132	139	161	2.6	2.4	3.7	3.8	4.2	6.3	6.6	8.5
Spruce grouse	13	9	12	12	12	16	15	20	1.1	1.1	1.7	2.1	1.7	2.3	2.6	3.4
Sharp-tailed grouse	14	9	9	10	9	10	12	14	1.2	1.1	0.8	1.9	1.5	2.4	2.5	3.6
Gray partridge	21	15	20	17	23	25	23	23	3.6	2.1	4.3	3.3	3.1	3.8	4.6	4.6
Gray squirrel	53	38	39	38	41	40	37	35	5.1	5.3	5.3	5.2	5.7	5.6	5.8	6.1
Fox squirrel	39	28	26	29	29	26	26	23	4.2	4.5	4.1	5.0	5.1	4.7	5.2	5.5
Eastern cottontail	36	29	22	22	24	26	27	24	3.8	3.4	2.8	3.8	4.2	4.0	4.3	4.5
White-tailed jack rabbit	11	7	6	6	4	5	5	6	2.6	1.9	1.9	3.0	3.4	2.2	1.8	3.0
Snowshoe hare	15	9	7	7	8	10	9	10	4.2	2.3	2.3	2.3	3.2	2.6	3.7	5.7
Raccoon	13	11	12	10	11	13	9	7	6.3	8.0	9.4	9.4	10.9	13.1	11.4	8.2
Red fox	12	11	11	12	11	13	13	9	1.5	2.0	2.3	4.2	1.5	2.5	3.3	3.0
Gray fox	3	2	3	2	2	3	3	2	0.9	0.9	1.4	2.0	0.8	1.3	0.9	2.3
Coyote	3	3	3	5	4	5	6	4	0.8	0.8	1.8	3.1	1.6	1.1	1.2	2.5
Badger	1	1	1	1	1	1	1	<1	1.9	0.3	3.9	1.8	1.0	1.6	1.5	1.6

Table 39. Resident small game hunting license sales and estimated hunter harvest, 1982-83 through 1989-90.

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Small game license sales[a]	314,477	276,034	260,764	258,225	262,053	286,270	285,685	305,792
Federal duck stamp sales	134,803	138,161	138,820	134,594	139,391	125,831	92,772	93,641
State duck stamp sales[b]	123,834	125,212	131,394	125,559	146,747	120,235	89,228	97,235
Pheasant stamp sales[b]	-	114,189	81,587	85,252	81,027	102,944	100,478	107,574
Estimated harvest[c] (thousands)								
Ducks[d]	1,071	1,235	1,443	1,029	1,172	928	531	538
Canada geese[d]	81	62	82	86	101	106	114	102
Other geese[d]	7	8	8	9	3	11	5	9
American coot[d]	49	55	48	41	59	29	9	10
Common snipe	14	17	20	16	21	19	13	12
Rails/gallinules	3	2	1	2	1	5	1	3
American woodcock	54	58	70	70	87	113	104	116
Ring-necked pheasant	265	299	148	179	159	277	332	321
Ruffed grouse	302	183	320	315	442	817	917	1,203
Spruce grouse	14	10	21	21	20	36	39	55
Sharp-tailed grouse	17	10	7	14	13	24	29	35
Gray partridge	52	74	31	77	54	69	95	86
Gray squirrel	271	199	208	186	235	222	217	192
Fox squirrel	162	126	107	140	145	122	134	112
Eastern cottontail	135	98	61	75	102	102	118	90
White-tailed jack rabbit	27	13	11	17	14	12	10	12
Snowshoe hare	61	21	16	12	25	26	32	48
Raccoon	80	87	114	85	122	170	102	51
Red fox	19	21	26	44	15	33	43	18
Gray fox	2	2	4	4	2	4	2	3
Coyote	2	3	5	11	7	6	7	6
Badger	2	2	<1	2	2	<1	2	<1

Harvest estimates in this table, and the number of hunters and mean take per hunter in Table 37, 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.

[a] Duplicate licenses not included.

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

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

[d] U.S. Fish and Wildlife Service harvest estimates for 1989 are:

Ducks	299,242	Other geese	7,793
Canada geese	71,327	American coot	5,097

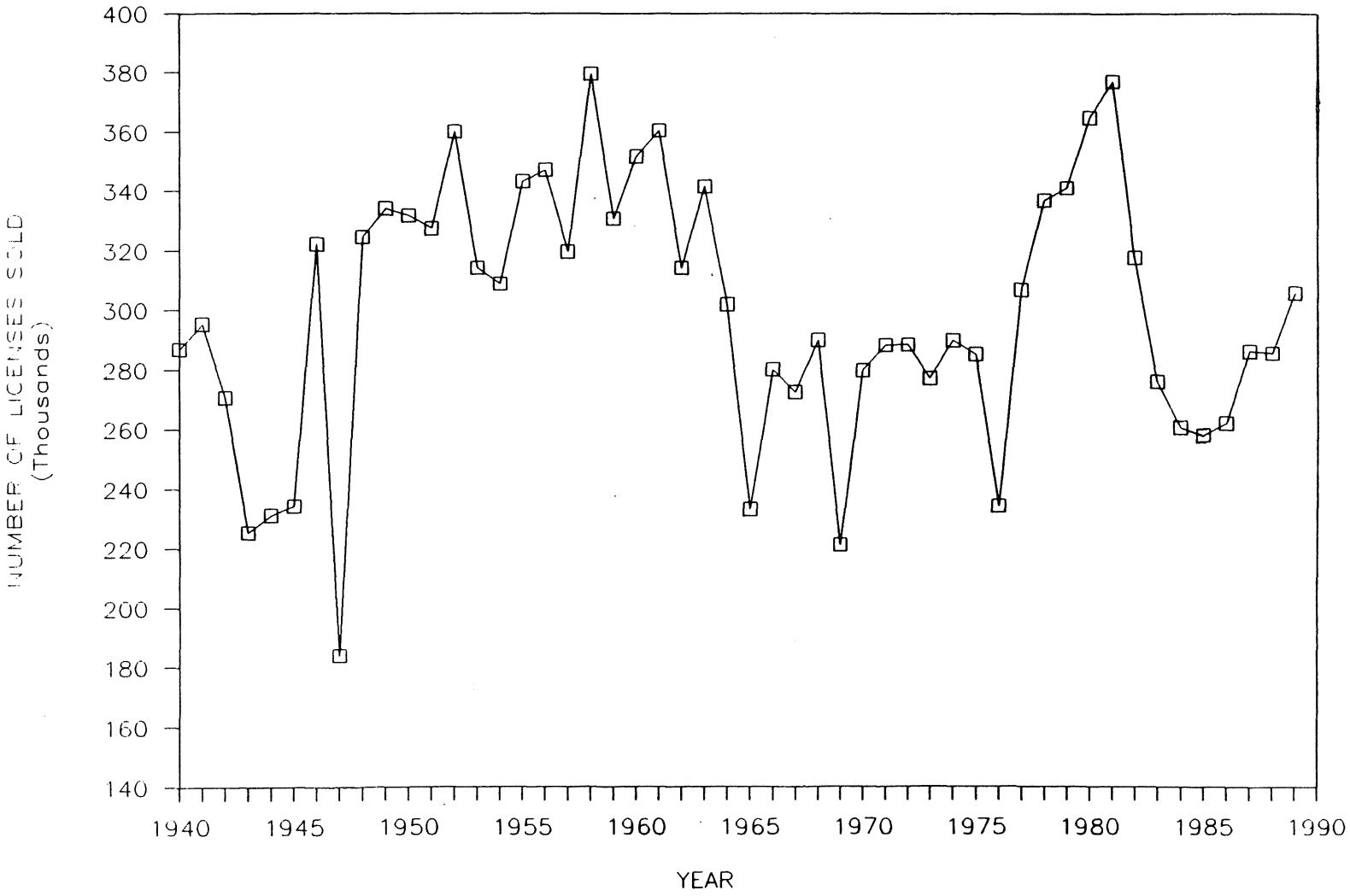


Figure 35. Numbers of Minnesota small game licenses sold, 1940-89.

Table 40. Mail survey results of nonresident small game hunters, 1982-83 through 1989-90.

	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Nonresident licenses issued[a]	3,187	2,911	3,060	3,271	3,078	3,596	3,463	4,613
Questionnaires								
Number mailed	361	384	237	338	406	429	436	553
Number not delivered	21	25	13	25	42	19	33	52
Number (percent) returned	281 (82.6)	280 (78.0)	192 (86.0)	246 (78.6)	290 (79.7)	328 (80.0)	327 (81.1)	396 (79.0)
Estimated nonresidents and percent (in parens) of all nonresidents hunting:								
Ducks	1,840 (58)	1,500 (52)	2,090 (68)	1,900 (58)	1,810 (59)	990 (28)	1,130 (33)	1,518 (33)
Canada goose	830 (26)	580 (20)	820 (27)	800 (24)	850 (28)	515 (14)	700 (20)	864 (19)
Ruffed grouse	960 (30)	620 (21)	1,000 (33)	1,090 (33)	1,000 (32)	1,000 (28)	1,960 (57)	2,604 (56)
Ring-necked pheasant	680 (21)	500 (17)	390 (13)	720 (22)	510 (17)	400 (11)	690 (20)	1,039 (23)
Raccoon[b]	100 (3)	170 (6)	130 (4)	70 (2)	85 (3)	80 (2)	42 (1)	58 (1)
Estimated nonresident take:								
Ducks	15,000	17,500	24,000	14,400	14,600	6,300	8,000	9,880
Canada goose	1,500	1,300	1,300	1,400	1,400	900	1,500	1,740
Ruffed grouse	3,000	1,700	4,200	3,500	3,800	6,100	12,300	20,694
Ring-necked pheasant	1,500	2,200	1,500	1,900	1,100	1,100	2,600	4,414
Raccoon	700	1,400	1,100	1,400	600	1,200	700	666

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

[b] 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		Number of nonresident raccoon licenses
	Resident	Nonresident	
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
1987	13	15	145
1988	11	17	73
1989	8	11	41

Table 41. Species composition of the Minnesota waterfowl harvest, 1988 and 1989 (from: Martin, E.M., P.H. Geissler, and A.N. Novara. 1990. Preliminary estimates of waterfowl harvest and hunter activity in the United States during the 1989 hunting season. U.S. Fish and Wildlife Service Adm. Rep., Office of Migratory Bird Management, Laurel, Maryland. July 1990. 34pp.).

Species	1988 Harvest	1988 Pct of harvest	1989 Harvest	1989 Pct of harvest	Percent change
Mallard	76,900	31.76	115,200	38.49	+50
Domestic mallard	0	0.00	100	0.04	-
American black duck	700	0.28	300	0.11	-57
Black x mallard	0	0.00	400	0.12	-
Gadwall	2,600	1.09	4,000	1.35	+54
American wigeon	7,500	3.09	11,800	3.95	+57
Green-winged teal	28,000	11.55	34,500	11.53	+23
Blue-winged/cinnamon teal	9,600	3.95	14,100	4.72	+47
Northern shoveler	600	0.23	2,200	0.75	+267
Northern pintail	6,600	2.74	7,000	2.35	+6
Wood duck	35,200	14.56	46,800	15.64	+33
Redhead	3,100	1.29	3,400	1.12	+10
Canvasback	0	0.00	200	0.07	-
Greater scaup	600	0.23	400	0.15	-33
Lesser scaup	34,000	14.03	18,300	6.13	-46
Ring-necked duck	19,900	8.23	25,700	8.59	+29
Goldeneyes	3,800	1.58	4,000	1.35	+5
Bufflehead	8,500	3.51	8,100	2.71	-5
Ruddy duck	500	0.22	0	0.00	-100
Scoters	600	0.25	400	0.12	-33
Hooded merganser	3,000	1.23	1,700	0.57	-43
Other mergansers	400	0.17	400	0.14	0
Total	242,000[a]	100.00[a]	299,200[a]	100.00	+24

[a] Sum of all species does not equal total because of rounding error.

Table 42. Top 10 states in number of adult waterfowl hunters, 1989, and number of hunter-days and retrieved duck kill, in each (from: Martin, E.M., P.H. Geissler, and A.N. Novara. 1990. Preliminary estimates of waterfowl harvest and hunter activity in the United States during the 1989 hunting season. U.S. Fish and Wildlife Service Adm. Rep. Office of Migratory Bird Management, Laurel, Maryland. July 1990. 34pp.).

State	Number of adult waterfowl hunters	Number of hunter-days	Retrieved duck kill	Ducks retrieved per hunter-day
Texas	98,211	674,968	557,296	0.83
Minnesota	84,108	521,595	299,242	0.57
Wisconsin	74,611	466,083	226,947	0.49
Louisiana	61,914	525,579	728,843	1.39
California	60,505	487,357	671,071	1.38
Illinois	52,492	436,673	181,563	0.42
Michigan	46,744	376,452	195,200	0.52
Pennsylvania	42,894	220,550	81,913	0.37
New York	41,102	207,497	154,494	0.74
Maryland	39,303	240,730	145,771	0.61
Mississippi Flyway	477,685	3,582,939	2,559,569	0.71
United States	1,189,763	8,264,706	6,246,900	0.76

Table 43. Turkey hunting summary, 1978-90.

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
1988	1,781	8,402	3,000	2.8:1	2,994	2,395	674	28.1
1989	2,341	13,007	4,000	3.3:1	3,821	3,057	930	30.4
1990	3,819	14,326	6,600	2.2:1	6,126	5,513	1,709	31.0

[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 1983-89 was estimated at 80% (from last year survey results were tabulated). Number actually hunting in 1990 was estimated at 90% (from preliminary results of 1990 survey).

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

Table 44. Deer hunting license sales, 1957-89[a].

Year	Firearms License Sales			Archery License Sales			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[b]	408,056	4,961	413,017	66,724	589	67,313	480,330
1986[b]	412,079	4,473	416,555	67,745	547	68,292	484,847
1987[b]	412,429	4,930	417,358	68,809	604	69,413	486,771
1988[b]	407,861	5,626	413,487	68,255	717	68,972	482,459
1989[b]	402,945	6,092	409,037	65,814	695	66,509	475,546

[a] Duplicate licenses not included. Leech Lake licenses are included during years they were issued.

[b] Numbers include the following bonus deer licenses:

Resident firearms (regular quota areas)	8,418	1,192	2,044	721	416
Resident firearms (state parks)	-	271	254	107	260
Non-resident firearms (regular quota area)	23	3	1	1	-
Resident archery (state parks)	-	27	-	-	-
Resident archery (metro)	-	917	1,380	1,013	1,225
Resident archery (orchard zone)	-	-	54	-	-
Totals	8,441	2,410	3,733	1,842	1,901

Table 45. Registered deer harvest and hunter success rates, 1974-89.

	Registered Harvest				Percent Success	
	Regular firearms	Archery	Special Muzzleloader season[a]	Total	Regular firearms and special muzzleloader seasons	Archery
1974	64,997	2,176	-	67,173	21.8	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	10.9
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	33.6	11.3
1986	129,770	7,610	593	137,973	31.3	11.1
1987	135,003	7,535	535	143,073	32.5	10.9
1988	138,946	8,762	686	148,394	33.8	12.7
1989	129,551	9,307	622	139,480	31.8	14.0

[a] No special muzzleloader seasons were held before 1977.

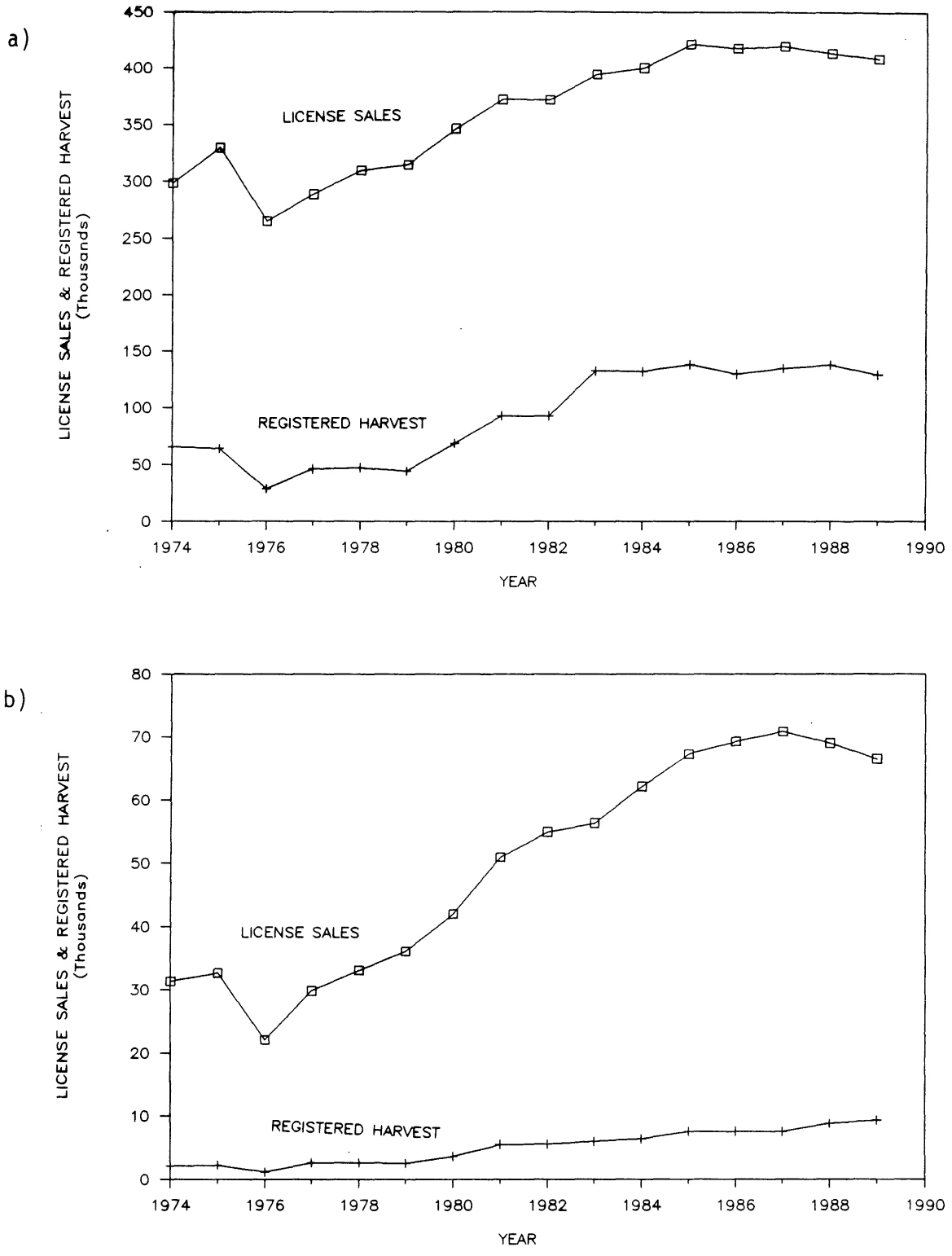


Figure 36. Numbers of Minnesota deer hunting licenses sold and registered harvest by (a) firearm and (b) archery hunters, 1974-89.

Table 46. White-tailed deer harvest and hunter success rates by DMU and Sub-DMU, 1989.

Unit	Permits Issued[a]	Antlerless Registered	Permit Success	Bucks Registered	Total Reg. Kill
Red River West	1,010	453	44.9%	446	899
Red River East	5,519	2,763	50.1%	2,232	4,995
RED RIVER Total	6,529	3,216	49.3%	2,678	5,894
AGASSIZ Total	6,951	3,380	48.6%	3,462	6,842
Rainy River West	800	405	50.6%	1,317	1,722
Rainy River Central	1,000	552	55.2%	1,377	1,929
Rainy River East	1,700	801	47.1%	1,547	2,348
RAINY RIVER Total	3,500	1,758	50.2%	4,241	5,999
Superior West	3,500	1,233	35.2%	1,378	2,611
Superior Wilderness	0	5		119	124
Superior Central	1,001	420	42.0%	949	1,369
Grand Portage I.R.	0	0		0	0
Superior East	750	284	37.9%	719	1,003
SUPERIOR Total	5,251	1,942	37.0%	3,165	5,107
Itasca NW	1,751	1,047	59.8%	2,786	3,833
Itasca SW	2,250	1,524	67.7%	4,082	5,606
Itasca NE	4,000	1,796	44.9%	2,967	4,763
Itasca SE	6,000	2,675	44.6%	3,737	6,412
Leech Lake Ind. Res.	750	342	45.6%	794	1,136
Bemidji	4,300	2,398	55.8%	2,982	5,380
ITASCA Total	19,051	9,782	51.3%	17,348	27,130
Mille Lacs West	3,199	1,802	56.3%	2,546	4,348
Mille Lacs Central	3,501	2,392	68.3%	4,250	6,642
Mille Lacs East	3,300	2,277	69.0%	6,490	8,767
White Earth Ind. Res.	300	154	51.3%	733	887
MILLE LACS Total	10,300	6,625	64.3%	14,019	20,644
Big Woods North	13,782	7,305	53.0%	8,475	15,780
Big Woods Central	2,450	1,490	60.8%	3,300	4,790
Big Woods Metro N	2,136	712	33.3%	910	1,622
Big Woods Metro S	1,555	617	39.7%	852	1,469
Big Woods SE	13,459	7,311	54.3%	6,580	13,891
BIG WOODS Total	33,382	17,435	52.5%	20,117	37,552
Prairie North	2,947	1,663	56.4%	2,412	4,075
Prairie River	2,510	1,590	63.3%	2,907	4,497
Prairie Southwest	4,350	3,014	69.3%	4,304	7,318
Prairie Southeast	2,450	1,345	54.9%	2,125	3,470
PRAIRIE Total	12,257	7,612	62.1%	11,748	19,360
Unknown		628		403	1,031
Total	97,221	52,378	53.9%	77,181	129,559

[a] Does not include bonus permits.

Table 47. Archery deer harvest by county, 1979-89.

County	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aitkin	34	68	110	107	94	88	140	130	137	146	184
Anoka	74	105	169	147	156	168	258	247	278	288	288
Becker	10	33	46	52	65	63	67	62	55	88	94
Beltrami	29	63	97	130	109	108	126	101	135	141	120
Benton	6	7	18	28	29	25	35	36	36	54	43
Big Stone	10	25	38	38	42	56	49	39	32	44	39
Blue Earth	35	73	80	78	116	94	116	95	123	147	148
Brown	27	36	46	48	47	50	38	66	60	74	76
Carlton	6	24	30	31	20	30	45	22	26	38	30
Carver	9	24	30	34	49	50	65	53	77	111	132
Cass	30	48	108	131	118	147	141	151	125	132	172
Chippewa	71	114	138	78	92	90	92	82	84	128	96
Chisago	31	38	68	78	95	103	142	135	121	140	161
Clay	19	44	75	84	94	123	111	132	109	135	147
Clearwater	3	17	21	21	27	20	22	29	30	40	27
Cook	0	1	12	7	5	9	29	12	8	14	14
Cottonwood	60	71	87	73	99	54	90	75	70	82	87
Crow Wing	32	47	123	105	99	156	177	159	165	180	197
Dakota	21	20	46	51	64	99	124	167	174	173	180
Dodge	17	19	26	22	45	76	52	63	77	80	103
Douglas	31	32	64	53	77	68	86	79	72	87	87
Faribault	31	51	46	49	57	47	58	73	53	78	66
Fillmore	22	46	50	64	75	81	108	83	109	143	120
Freeborn	38	37	47	34	69	60	61	67	87	99	104
Goodhue	34	57	63	69	71	69	113	112	111	120	123
Grant	10	19	18	22	27	27	33	26	19	33	44
Hennepin	35	78	69	44	97	78	105	156	176	138	190
Houston	25	46	55	70	58	67	79	75	92	89	114
Hubbard	42	56	97	130	102	98	126	138	127	129	128
Isanti	32	46	83	83	82	83	97	102	82	116	146
Itasca	36	98	171	146	113	127	155	169	140	175	169
Jackson	34	26	47	44	46	42	59	54	61	74	94
Kanabec	7	11	35	66	51	49	76	61	76	80	131
Kandiyohi	41	41	95	96	111	116	108	111	127	168	197
Kittson	1	8	12	10	28	32	24	23	47	40	66
Koochiching	23	28	33	18	21	29	20	29	27	31	35
Lac Qui Parle	38	53	87	82	78	108	141	107	96	122	120
Lake	8	18	40	46	30	39	50	40	40	54	42
Lake of the Woods	9	12	13	13	14	22	24	22	21	30	31
LeSueur	13	27	38	31	39	52	37	62	42	77	77
Lincoln	57	50	72	56	74	35	68	54	44	69	69
Lyon	36	84	94	74	110	72	104	104	82	113	107
McLeod	63	32	40	28	2	33	35	55	45	72	74
Mahnomen	1	5	4	7	5	6	9	8	4	2	12
Marshall	18	38	39	45	66	82	79	75	75	70	69
Martin	25	40	35	38	56	33	41	55	64	64	57
Meeker	37	43	44	43	37	54	59	61	76	102	119
Mille Lacs	8	21	40	57	35	63	51	40	64	55	70
Morrison[a]	19	30	66	158	127	108	114	66	104	118	110
Mower	27	46	55	42	80	64	113	121	105	123	117
Murray	49	81	130	83	61	39	90	71	86	88	89
Nicollet	40	61	80	67	65	52	64	88	50	75	105
Nobles	34	43	79	33	54	18	43	48	55	55	56
Norman	11	15	20	34	35	45	43	39	51	47	34
Olmsted	25	24	55	51	85	84	86	108	96	109	117

Table 47. Continued.

County	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Ottertail	60	98	133	153	175	178	234	223	237	237	253
Pennington	3	9	12	18	15	19	12	19	15	6	9
Pine	73	123	166	171	134	166	229	186	201	262	330
Pipestone	34	32	40	30	67	1	42	53	55	57	53
Polk	32	42	50	78	70	102	98	102	110	136	93
Pope	31	49	49	64	57	56	63	70	67	96	82
Ramsey	0	1	2	1	0	21	14	33	2	6	12
Red Lake	4	2	1	3	4	13	8	6	7	6	11
Redwood	38	50	81	63	82	63	72	68	63	75	77
Renville	20	35	55	63	59	32	62	60	66	61	78
Rice	31	38	45	51	39	54	56	59	93	77	108
Rock	16	14	38	31	14	22	51	39	51	44	42
Roseau	32	62	77	90	112	98	94	86	81	95	82
St. Louis	42	87	180	149	120	127	180	209	159	197	186
Scott	41	44	50	37	50	72	87	136	192	134	210
Sherburne	60	89	128	116	113	115	131	128	116	86	145
Sibley	22	33	41	30	32	43	43	44	46	46	70
Stearns	49	81	134	143	122	159	241	239	226	268	303
Steele	7	14	19	27	29	30	41	41	46	65	56
Stevens	13	9	11	21	27	26	25	20	26	28	19
Swift	23	42	67	49	67	59	68	67	84	94	96
Todd	45	52	95	109	103	126	169	141	127	147	162
Traverse	7	12	21	13	21	32	22	19	33	32	41
Wabasha	20	15	18	30	61	57	50	61	50	64	87
Wadena	14	21	45	69	70	64	43	62	43	60	68
Waseca	20	26	46	35	55	42	27	36	42	46	44
Washington	15	39	75	91	88	154	174	196	189	283	336
Watonwan	16	31	34	30	35	20	39	39	45	39	51
Wilkin	2	15	26	34	39	34	34	32	29	38	26
Winona	72	96	116	138	117	151	234	196	224	221	254
Wright	29	45	71	78	83	95	92	115	112	140	209
Yellow Medicine	34	35	47	38	54	47	47	44	49	70	92
Unknown	40	20	25	63	23	34	37	70	17	22	14
Camp Ripley	148	b	153	129	237	387	278	257	284	241	215
Totals	2577	3641	5535	5566	5977	6390	7575	7610	7715	8759	9541

[a] Camp Ripley not included.

[b] No archery hunt.

Table 48. Special Muzzleloader Season harvest by block, 1989. (Includes Special Permit Areas)

Block Number	Adult		Fawns		Total
	Male	Female	Male	Female	
152	5	13	2	5	25
157	1	14	4	3	22
159	2	11	4	1	18
169	0	7	3	4	14
173	0	1	0	0	1
174	0	0	1	0	1
175	0	1	0	0	1
179	1	2	0	0	3
180	0	1	1	0	2
182	1	3	0	0	4
183	0	3	1	0	4
201	3	3	0	1	7
202	1	0	1	1	3
211	4	6	2	4	16
225	0	0	0	1	1
227	0	1	0	0	1
235	10	15	2	2	29
245	8	22	5	4	39
246	0	2	1	0	3
249	0	1	0	1	2
339	0	0	1	2	3
342	2	4	1	1	8
344	17	35	33	30	115
345	0	0	0	1	1
348	0	0	2	0	2
416	1	0	5	0	6
424	0	1	0	0	1
431	1	1	0	1	3
432	23	72	33	18	146
433	7	12	4	3	26
434	1	1	2	0	4
436	0	2	0	0	2
455	3	5	10	13	31
489	2	3	2	3	10
495	0	10	9	9	28
499	8	19	9	5	41
Totals	101	271	138	113	622

Table 49. Muzzleloader Special Permit Area Data, 1989.

Area	Dates	Permits Issued[a]	Applications	Harvest		
				Bucks	Antlerless	Total
Carlos Avery WMA	11/25-12/01	20	56	No Data		
(Sanctuary)	12/02-12/10	20	64	No Data		
Cedar Rock WMA	11/25-12/01	19	10	0	2	2
Danvers WMA	11/25-12/01	14	14	0	0	0
	12/02-12/10	5	5	0	1	1
Helmer Myre SP[b]	11/25-11/28	76	176	8	33	41
LQP WMA/	11/25-12/01	169	169	13	50	63
Big Stone NWR	12/01-12/10	269	269	19	97	116
Lake Shetek SP[c]	12/02-12/10	41	48	0	28	28
Talcot Lake WMA	11/25-12/01	41	22	2	10	12
	12/02-12/10	51	32	1	18	19
Walnut Lake WMA	11/25-12/01	22	14	1	5	6
	12/02-12/10	28	15	1	3	4
Glacial Lakes SP	12/06-12/10	30	35	1	5	6

[a] For some hunts, permits issued is greater than the number of applications because hunters from over-subscribed areas were issued permits.

[b] 37 Bonus Licenses were issued for Helmer Myre State Park.

[c] Lake Shetek State Park hunters were restricted to shooting antlerless deer only.

Table 50. Special Muzzleloader Season Harvests, 1981-1989.

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Carlos Avery WMA	53	31	57	22	23	41	31	57	30
Carlos Avery WMA (Sanctuary)	--	--	--	--	16	6			
Cedar Rock WMA	--	--	--	--	--	--	--	--	2
Chengwatana SF	--	--	1	1	4	5	5	8	19
Cloquet Valley SF	--	--	--	2	1	0	2	4	5
Danvers WMA	--	3	1	7	7	9	3	4	1
Elm Lake & Eckvoll WMA	--	--	--	--	--	--	--	3	--
Forestville SP	--	--	--	--	--	--	10	--	--
Fort Snelling SP	--	--	--	--	--	--	4	--	--
George Washington SF	--	--	5	14	16	17	4	11	15
Glacial Lake SP	--	--	--	--	--	--	--	18	6
Gores Pool WMA	--	--	5	5	1	2	3	3	3
Helmer Myre SP	--	--	--	--	--	--	--	--	41
Lac qui Parle WMA and Big Stone NWR	91	130	168	151	199	146	112	185	179
Lake Bronson SP	--	--	--	--	--	--	--	1	--
Lake Shetek SP	19	36	35	30	25	28	25	34	28
Land-O-Lakes SF	--	--	--	--	--	--	--	--	1
McCarthy Lake WMA	1	0	1	0	0	2	5	6	8
Meadowbrook WMA	3	4	11	6	6	1	4	2	3
Mille Lacs WMA	54	25	5	14	13	13	21	28	25
Nemadji SF	--	--	1	1	0	3	2	3	4
Nerstrand Woods SF	--	--	--	--	--	--	--	45	--
Paul Bunyan Game Refuge	--	--	19	33	27	28	27	38	39
Red Lake WMA and Beltrami Island SF	14	14	29	11	21	27	14	25	17
R.J. Dorer Memorial SF	7	32	10	6	1	2	0	1	3
Roseau River WMA	4	1	3	5	3	4	2	3	7
Rum River SF	--	--	3	1	7	5	6	24	24
Savanna SF	--	--	2	2	6	6	0	4	5
Talcot Lake WMA	16	61	137	13	43	19	29	45	31
Thief Lake WMA	12	6	5	7	8	2	6	3	2
Whitewater WMA	90	80	150	139	97	143	117	121	115
Whitewater Sanctuary	--	--	--	45	--	--	96	--	--
Walnut Lake WMA	5	0	4	6	5	6	7	10	10
Totals	385	441	652	532	563	593	535	686	622

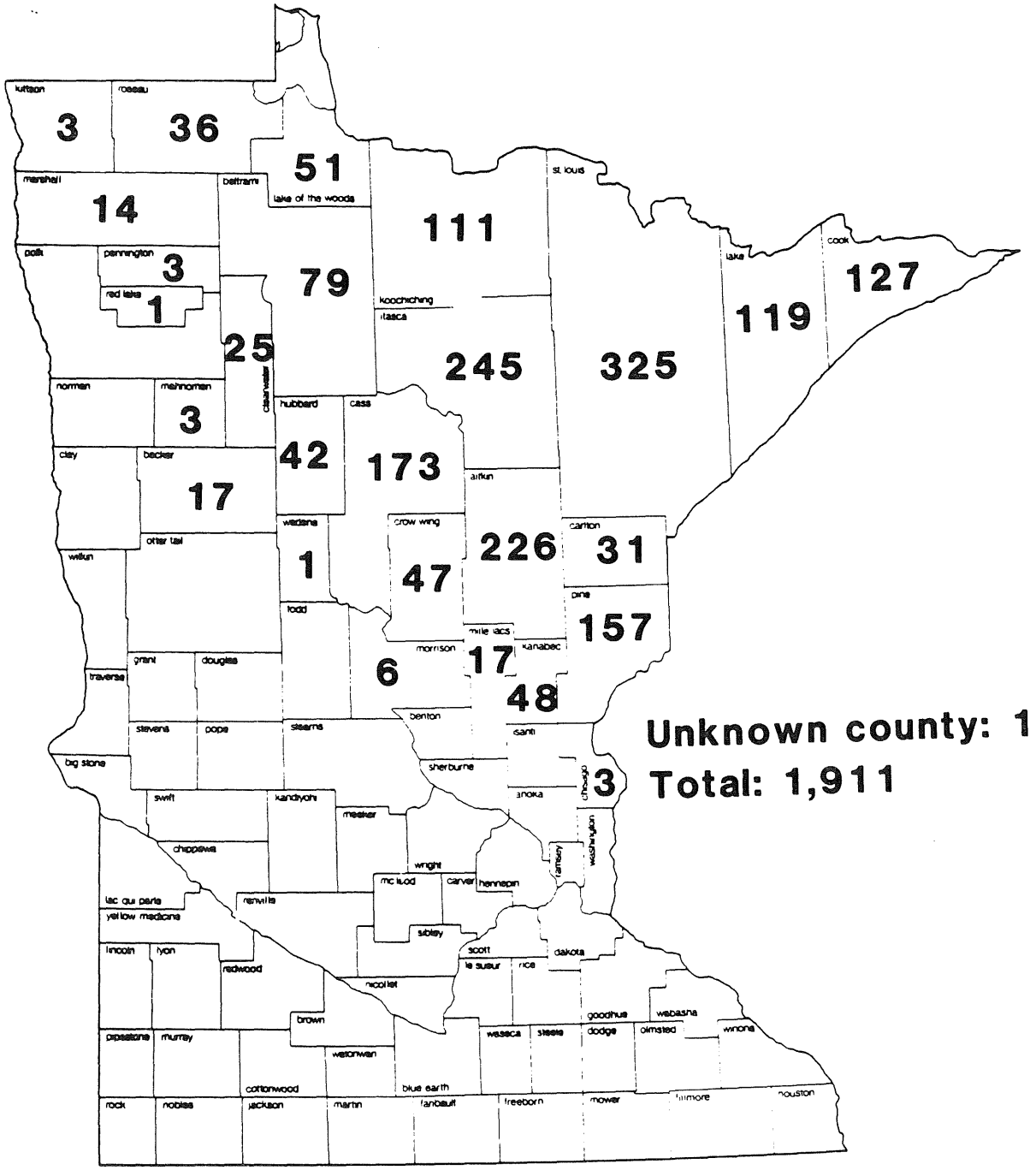


Figure 37. Black bear registered harvest by county, 1989 season.

Table 51. Registered bear harvest by county, 1978-1988.

County	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	Total
Aitkin	103	55	92	128	39	102	96	118	153	149	157	1,192
Anok	0	0	0	0	0	0	0	0	0	1	0	1
Becker	12	13	7	9	1	14	9	10	3	9	8	95
Beltrami	44	42	28	79	24	78	60	58	53	55	58	579
Benton	0	0	0	0	0	0	0	0	0	1	2	3
Carlton	14	7	17	18	3	9	19	34	39	21	28	209
Cass	51	57	69	110	29	93	73	114	89	134	96	915
Chisago	0	0	0	1	0	0	0	0	1	2	2	3
Clearwater	2	12	3	18	4	8	7	17	12	22	14	119
Cook	98	72	148	79	7	46	30	62	65	98	45	750
Crow Wing	9	12	9	33	8	26	21	36	22	37	34	247
Hubbard	23	16	15	19	11	25	45	41	36	37	30	298
Isanti	0	0	1	3	0	0	0	1	2	1	0	8
Itasca	158	108	212	172	50	121	128	170	183	242	179	1,723
Kanabec	28	10	12	18	8	19	19	18	36	34	52	254
Kittson	0	1	0	0	0	1	8	0	2	2	7	21
Koochiching	91	89	137	149	66	105	89	95	113	126	87	1,147
Lake	78	40	74	80	17	42	28	60	79	83	60	641
Lake of the Woods	16	12	30	43	25	32	41	29	32	27	48	335
hnomen	3	0	0	1	2	2	5	1	4	2	2	22
Marshall	0	1	2	3	1	9	17	12	5	14	24	88
Mille Lacs	7	5	5	12	3	11	11	28	14	16	21	133
Morrison	4	3	1	1	1	10	5	4	8	11	6	54
Norman	1	0	0	0	0	0	0	0	0	0	0	1
Pennington	0	0	0	1	0	3	2	1	1	12	4	24
Pine	58	31	62	73	20	55	52	98	113	115	208	885
Polk	0	0	1	0	0	0	0	1	0	0	1	3
Red Lake	0	0	3	2	0	0	0	0	0	1	0	6
Rice	0	0	0	0	0	0	0	0	0	1	0	1
Roseau	8	4	18	18	7	23	32	19	28	29	28	214
St. Louis	210	148	289	284	64	197	122	302	317	290	305	2,528
Wadena	1	0	0	1	0	0	0	0	0	0	1	3
Wilkin	0	1	0	0	0	0	0	0	0	0	0	1
Unknown	9	4	13	4	22	7	0	11	6	5	2	83
Total	1,028	743	1,248	1,359	412	1,038	919	1,340	1,416	1,577	1,509	12,589

Table 52. Number of bear permits, licenses, hunters, and hunter-days, 1980-89.

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Permit applications	--[a]	--[a]	9,260	13,617	17,886	22,954	20,694	19,687	25,879	24,096
Permits available	--	--	1,960	3,550	3,880	4,290	4,730	4,810	5,310	5,520
Licenses purchased:										
Quota areas	--	--	1,921	3,471	3,489	3,948	4,188	4,213	4,297	4,628
No-quota areas	8,678	11,429	--	--	--	--	--	1,789	1,297	1,156
% Permit-holders buying license	--	--	98.0	97.8	89.9	92.0	88.5	87.6	80.9	83.8
% License-holders hunting	93.2	93.3	92.0	90.4	90.0	92.9	93.4	91.2	90.5	93.2
Estimated number hunters	8,090	10,663	1,769	3,138	3,143	3,667	3,911	5,471	5,060	5,390
Mean hunting-days per hunter	5.9	5.4	6.8	6.3	6.1	5.9	5.8	6.1	6.3	6.0
Estimated total hunting-days	48,097	57,931	12,036	19,755	19,241	21,636	22,613	33,364	31,798	32,420

[a] License sales not limited by permit in 1980 and 1981.

Table 53. Percent hunting success of those Minnesota bear hunters that hunted[a], 1980-89.

Area	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
11[b]	[c]	[c]	9	33	54	21	41	29	30	33
12	13	19	14	38	42	32	25	32	37	38
13	19	27	30	29	35	45	33	48	41	44
22	42	18	44	36	25	13	18	19	8	23
23	24	24	42	46	29	38	49	50	39	41
24	20	13	20	29	22	49	33	32	48	44
31	24	16	31	47	21	52	46	40	31	44
40	14	11	16	31	34	37	37	44	39	49
51	13	16	27	30	30	42	41	31	35	37
52[b]	10	18	27	27	32	37	41	12	30	24
Statewide	19	17	24	35	31	40	40	31	34	38

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

[b] Area numbers not officially recognized, but used herein to designate no-quota hunting areas established in 1987 (see figure below). Hunting licenses were controlled by a quota in these areas during 1982-86.

[c] Few hunters in this area in 1980 and 1981.

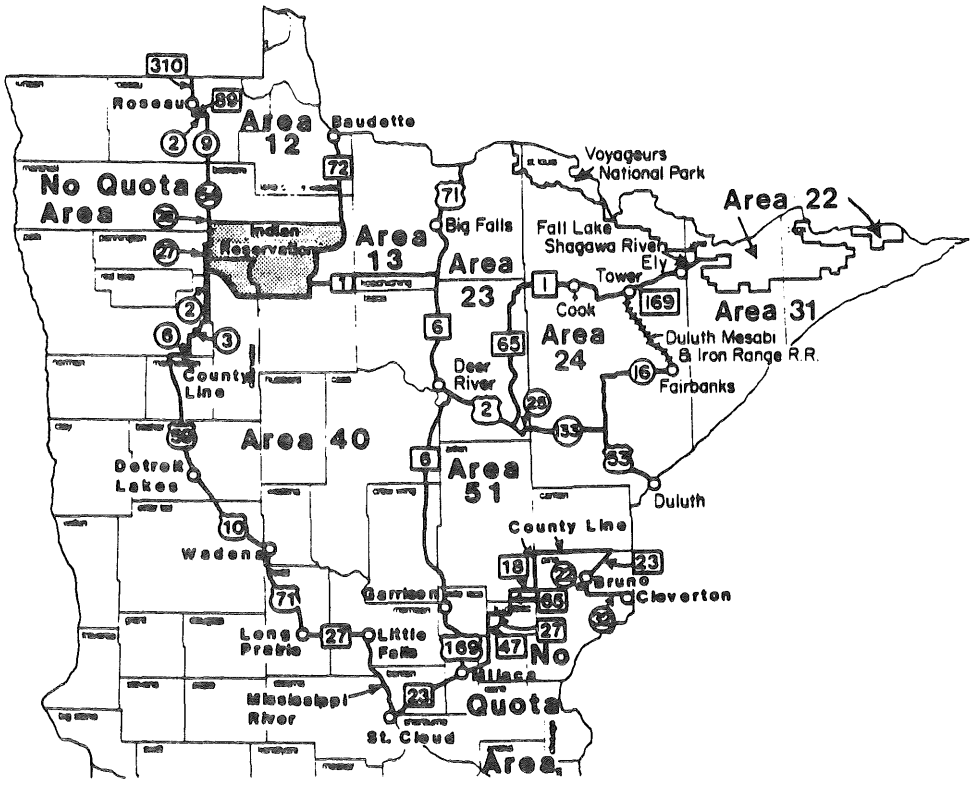


Figure 38. Boundaries of bear management units, 1989.

Table 54. Percent of Minnesota bear hunters using bows, baits, and guides[a], 1980-89.

Method	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Bow		17	14	19	21	16	19	23	21	20
Bait		53	55	62	61	66	69	75	75	75
Guide	5	7	6	5	6	5	6	6	7	6

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

Table 55. Percent hunting success of Minnesota bear hunters by method of hunt[a], 1980-89.

Method	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
Firearm		15	23	36	32	39	41	32	34	39
Bow only		22	19	34	27	42	33	31	33	35
Bait		21	25	37	33	42	42	32	37	41
No bait		11	21	32	26	34	33	30	25	31
Guide	50	19	33	50	57	36	48	56	51	50
No guide	17	16	22	34	30	39	39	30	33	38

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

Table 56. Moose hunt quota and harvest statistics, 1971-89.

Year	Area	Number of 4-person licenses issued	Number of 4-person license applications	Chances for permit	Harvest	Party Success (%)	Sex of Moose	
							M	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	14,772	1:14	718	93.5	419 (58%)	299 (42%)
	NE	300			250	83.3	165 (66%)	85 (34%)
1987	NW	772	14,234	1:11	727	94.2	505 (69%)	222 (31%)
	NE	528			436	82.6	292 (67%)	144 (33%)
1989	NW	449	15,381	1:15	438	97.6	291 (66%)	147 (34%)
	NE	545			444	81.5	285 (64%)	159 (36%)

TRAPPING HARVEST STATISTICS

Table 57. Trapper response to mail surveys, 1979-80 through 1989-90.

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	87.2
1984-85	556	9	495	90.5
1985-86	581	13	506	89.1
1986-87	582	8	514	89.5
1987-88	721	11	607	85.5
1988-89	852	25	727	87.9
1989-90	3,302	498	2,804	84.9

Table 58. Use of trapper licenses, 1979-80 through 1989-90.

		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
1987-88	Trapped	512 (84.6%)	15,777
	Did not trap	93 (15.4%)	2,866
		605 (100.0%)	18,643
1988-89	Trapped	582 (80.1%)	9,789
	Did not trap	145 (19.9%)	2,432
		727 (100.0%)	12,221
1989-90	Trapped	2,251 (80.3%)	7,286
	Did not trap	553 (19.7%)	1,787
		2,804 (100.0%)	9,073[a]

[a] Projections based on 9,103 minus 30 duplicates sold statewide as of July 19, 1990.

Table 59. Estimated number of trappers and estimated take per trapper of various furbearers, 1981-82 through 1989-90.

	Estimated number of trappers (thousands)									Estimated take per trapper reporting that species								
	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Muskrat	16	12	11	13	9	11	15	7	4	62.5	48.4	75.8	75.1	51.8	72.9	68.7	28.3	26.5
Mink	13	10	8	9	8	9	13	7	4	5.7	5.6	6.8	8.0	7.6	8.7	8.5	8.9	8.8
Ermine	1	1	<1	1	<1	1	1	1	<1	3.2	2.2	4.6	3.5	2.6	4.2	4.7	4.2	4.6
Long-tailed weasel	1	1	<1	1	<1	1	2	1	1	2.8	1.6	4.0	2.1	2.0	5.2	4.4	5.0	4.6
Raccoon	12	9	9	9	8	8	11	6	4	6.2	6.4	7.8	8.3	11.3	11.4	11.9	12.8	11.6
Striped skunk	7	5	4	5	4	4	5	3	2	8.1	6.4	8.5	9.4	10.3	10.2	10.2	10.1	9.5
Eastern spotted skunk (civet)	<1	<1	2	<1	<1	<1	<1	<1	<1	1.6	6.7	2.5	1.4	2.5	2.5	1.8	2.0	4.8
Badger	2	1	1	1	1	1	1	1	<1	1.8	1.7	2.1	1.6	2.1	1.7	1.9	2.0	1.8
Opossum	<1	<1	<1	<1	1	1	2	1	1	2.1	1.8	3.1	2.8	8.7	13.8	6.7	8.2	8.6
Red fox	8	6	6	6	5	5	6	4	2	6.8	6.3	6.9	9.2	6.1	7.5	8.7	13.3	10.1
Gray fox	2	2	2	2	2	2	2	1	1	2.7	2.7	2.5	2.9	3.5	2.9	2.6	4.1	3.1
Coyote (brush wolf)	1	2	2	2	1	2	2	1	1	2.4	3.2	4.8	5.3	4.5	3.8	3.3	3.7	4.3
Beaver (fall)	4	2	4	5	4	6	8	4	3	7.5	4.4	7.3	10.0	9.8	11.5	16.3	11.2	14.6
Beaver (spring)	1	3	4	3	4	4	4	2	2	12.6	25.5	25.4	30.3	21.7	21.7	22.7	14.1	19.9

Table 60. Minnesota trapper license sales and estimated annual harvest, 1981-82 through 1989-90[a].

	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Trapper license sales[b]	23,679	20,196	16,741	16,836	14,699	15,395	18,643	12,221	9,073
Beaver license sales[c]	6,602	1,971	-	-	-	-	-	-	-
Estimated harvest[d] (thousands)									
Muskrat	989	570	865	963	477	826	1,007	185	118
Mink	76	57	58	75	57	77	110	59	40
Ermine	3	1[e]	2	3	1	3	7	3	2
Long-tailed weasel	4	1	1	1	1	3	7	3	3
Raccoon	72	60	69	78	89	95	134	74	41
Striped skunk	54	34	36	47	41	42	54	31	17
Eastern spotted skunk (civet)	<1	1	<1	<1	<1	<1	<1	<1	<1
Badger	3	2	2	2	2	2	3	2	1
Opossum	1	<1	2	1	7	14	10	9	6
Red fox	53	41	42	58	29	40	57	53	25
Gray fox	5	5	5	5	6	6	5	5	2
Coyote (brush wolf)	3	5	9	10	7	7	7	3	4
Beaver (fall season)	30	24	30	51	43	71	132	47	48
Beaver (spring season)	10	76	101	103	92	101	26	-	31
Registered harvest									
Otter	485	385	408	529	559	777	1,386	922	1,294
Lynx[f]	17	28	9	closed	closed	closed	closed	closed	closed
Bobcat[f]	260	274	208	280	119	160	214	140	129
Fisher	862	912	631	1,289	678	1,068	1,642	1,025	1,243
Marten	closed	closed	closed	closed	430	798	1,363	2,072	2,119

[a] Includes data for all seasons from October through April of years indicated.

[b] Separate licenses were issued for juveniles (13-17 years old) and adults (18 and older), beginning in 1982. As of July 19, 1990, 9,073 trapping licenses were sold in 1989, 1,255 (13.8%) were juvenile licenses and 7,818 (86.2%) were adult licenses. Duplicate licenses excluded.

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

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

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

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

Table 61. Average price per pelt paid to hunters and trappers in Minnesota, 1977-78 through 1989-90.

Species	Average pelt prices paid hunters and trappers in Minnesota (dollars)												
	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Muskrat	4.25	4.56	5.90	5.62	3.47	2.19	2.24	2.81	1.85	2.89	3.12	2.07	0.80
Mink (male)	22.15	36.69	42.83	37.55	34.35	24.43	30.33	28.40	25.29	35.75	40.54	39.76	30.38
Mink (female)	8.86	14.80	18.61	16.04	17.22	10.63	14.55	14.04	13.37	18.43	20.25	22.70	17.26
S.T. Weasel	0.44	0.47	0.56	0.64	0.59	0.56	0.56	0.77	0.98	0.98	0.89	1.11	1.20
L.T. Weasel	0.85	1.01	0.94	0.84	0.96	0.80	0.93	1.10	1.06	1.28	1.02	1.04	1.25
Raccoon	22.30	45.83	36.42	27.44	32.35	17.95	12.66	19.91	15.51	21.81	16.67	7.53	4.88
Striped Skunk	2.78	4.13	4.14	4.74	3.46	2.58	2.77	2.74	1.58	2.06	2.47	1.90	1.31
Eastern Spotted Skunk	5.42	7.37	3.48	6.06	2.58	1.75	N.A.	3.00	6.17	N.A.	N.A.	N.A.	N.A.
Badger	21.07	39.55	24.02	18.39	18.14	9.04	10.96	9.18	6.45	5.43	5.74	2.99	2.91
Opossum	2.11	2.10	2.12	2.52	1.58	0.87	0.71	1.14	0.62	0.97	0.91	0.62	0.76
Red Fox	52.97	72.21	55.43	50.81	51.48	31.10	32.81	29.07	17.51	22.07	16.69	9.89	8.58
Gray Fox	25.51	45.44	42.51	37.87	26.74	23.48	22.95	21.58	15.00	22.60	22.56	11.45	7.39
Coyote	34.03	56.62	39.76	31.37	41.28	25.41	18.79	19.06	18.19	22.03	18.35	8.43	6.42
Lynx	137.86	269.44	199.19	94.91	180.33	94.17	125.00	-	-	-	-	-	-
Bobcat	73.98	163.76	117.74	78.55	73.35	66.40	61.40	75.81	70.00	120.15	101.10	68.31	48.50
Beaver[a] (fall-winter)	13.45	17.64	32.74	17.88	14.48	10.69	9.52	12.51	15.03	20.32	16.75	13.84	12.49
Beaver[a] (spring)	17.64	28.71	19.58	16.52	12.55	11.60	12.24	16.11	17.90	-	17.12	12.62	10.99
Otter	41.23	58.85	63.37	32.78	29.80	25.65	24.79	21.56	20.81	24.15	22.85	22.02	22.01
Fisher[a] (male)		131.89	107.67	89.51	94.42	69.91	70.59	70.26	73.55	84.32	84.36	53.83	26.15
Fisher[a] (female)	(71.23)	147.23	127.79	104.29	110.08	99.08	121.08	121.76	130.47	162.29	170.31	99.63	52.92
Marten (male)	No Open Season								30.29	35.68	43.13	50.08	47.90
Marten (female)									27.61	26.58	39.20	43.46	46.88

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

REGISTERED FURBEARER HARVEST STATISTICS

Table 62. Registered furbearer harvests and total permits issued, 1985-89[a].

Year	Bobcat		Fisher		Marten		Otter	
	Permits	Harvest	Permits	Harvest	Permits	Harvest	Permits	Harvest
1985	--	119	--	678	746	430	--	559
1986	--	160	3,302	1,607	2,171	798	3,198	777
1987	--	214	4,952	1,642	3,025	1,363	4,708	1,386
1988	--	140	4,419	1,025	3,369	2,072	4,070	922
1989	--	129	3,712	1,243	3,074	2,119	3,549	1,294

[a] Prior request tags and permits were required beginning in 1985 for marten and in 1986 for fisher and otter. No possession tags or permits are required for bobcat.

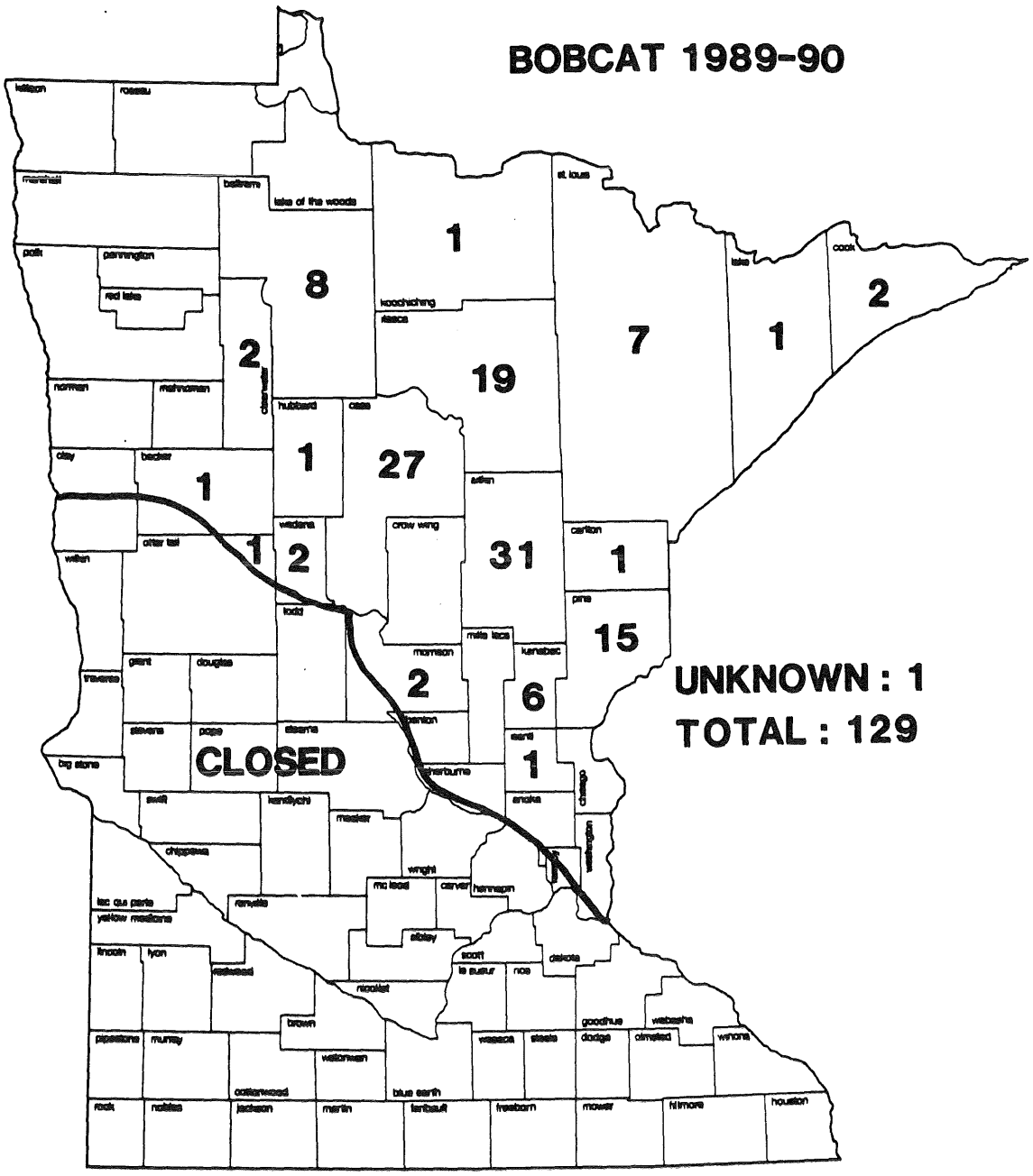


Figure 39. Bobcat harvest by county, 1989-90.

Table 63. Time distribution of bobcat harvest by 5-day increments, 1989-90 season.

Interval	Sex		Total	% of Known Total[a]	Cumulative Percent
	M	F			
Dec. 2-6	7	12	19	15.0	15.0
Dec. 7-11	4	15	19	15.0	29.9
Dec. 12-16	7	10	17	13.4	43.3
Dec. 17-21	4	7	11	8.7	52.0
Dec. 22-26	8	10	18	14.2	66.1
Dec. 27-31	9	8	17	13.4	79.5
Jan. 1-5	8	10	18	14.2	93.7
Jan. 6-7	3	5	8	6.3	100.0
Unknown	1	1	2	-	-
Total	51	78	129	100	100

[a] Sum of percentages does not equal 100.0 because of rounding error.

Table 64. Distribution of bobcat harvest among takers, 1982-83 thru 1989-90.

	Number of Takers								
Number Taken	1982-83 # (%)	1983-84 # (%)	1984-85 # (%)	1985-86 # (%)	1986-87 # (%)	1987-88 # (%)	1988-89 # (%)	1989-90 # (%)	Total 1981-89 # (%)
1	111 (65.3)	108 (72.0)	116 (65.2)	70 (78.7)	92 (76.7)	104 (71.7)	88 (81.5)	56 (69.1)	868 (71.4)
2	30 (17.6)	32 (21.3)	39 (21.9)	11 (12.4)	18 (15.0)	23 (15.9)	11 (10.2)	13 (16.0)	206 (17.0)
3	16 (9.4)	6 (4.0)	13 (7.3)	6 (6.7)	9 (7.5)	10 (6.9)	7 (6.5)	5 (6.2)	83 (6.8)
4	10 (5.9)	4 (2.7)	9 (5.1)	1 (1.1)	0 (0.0)	6 (4.1)	1 (0.9)	3 (3.7)	39 (3.2)
5	3 (1.8)	0 (0.0)	1 (0.5)	1 (1.1)	1 (0.8)	2 (1.4)	1 (0.9)	4 (4.9)	19 (1.6)
Total	170	150	178	89	120	145	108	81	1,215

Table 65. Bobcat harvest by method of take, 1979-1989.

Year	Total Harvest	Trapping				Hunting			
		Harvest	(% of Total)	Takers	Average Take	Harvest	(% of Total)	Takers	Average 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
1987	214	177	(82.7)	118	1.5	37	(17.3)	26	1.4
1988	140	94	(67.1)	76	1.2	46	(32.9)	32	1.4
1989	129	90	(69.5)	49	1.8	39	(30.5)	28	1.4

Table 66. Comparison of bobcat harvest by county, 1981-82 through 1989-90.

County	1981-82[a]	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Aitkin	45	28	20	25	14	12	25	18	31
Becker	1	6	8	9	1	1	3	2	1
Beltrami	2	18	17	24	5	7	15	7	8
Carlton	15	15	4	20	6	9	9	4	1
Cass	26	30	13	42	20	34	28	13	27
Chisago	0	1	0	0	1	0	0	1	0
Clearwater	0	1	1	0	0	3	0	1	2
Cook	Closed	2	0	1	0	1	2	4	2
Crow Wing	2	4	4	5	6	5	1	2	0
Douglas	1	0	0	0	0	Closed	Closed	Closed	Closed
Hubbard	3	4	1	1	0	0	2	3	1
Isanti	0	0	0	0	0	1	0	0	1
Itasca	32	46	36	50	15	28	44	20	19
Kanabec	2	2	2	6	2	3	0	1	6
Kittson	5	5	3	0	0	3	6	2	0
Koochiching	0	3	12	8	8	6	9	13	1
Lake	4	8	3	1	1	3	4	2	1
Lake of the Woods	3	3	1	1	1	0	2	4	0
Marshall	6	2	3	1	1	3	4	0	0
Mille Lacs	4	0	6	0	4	3	8	2	0
Morrison	0	5	7	5	4	4	4	2	2
Ottertail	3	2	1	1	3	2	1	2	1
Pennington	1	0	0	0	0	0	0	0	0
Pine	21	29	24	29	14	11	15	23	15
Polk	0	0	0	1	0	0	0	1	0
Red Lake	0	0	0	0	1	0	0	0	0
Renville	0	0	0	1	0	Closed	Closed	Closed	Closed
Roseau	4	9	9	14	2	2	2	2	0
St. Louis	78	59	32	43	8	19	26	10	7
Wadena	2	0	1	1	2	0	2	2	2
Unknown	0	1	0	1	0	2	0	0	1
Total	260	274	208	280	119	160	214	140	129

[a] Northeast zone closed to taking of bobcat and lynx included: Cook county; most of Koochiching and Lake counties; and portions of Beltrami, Itasca, Lake of the Woods, and St. Louis counties.

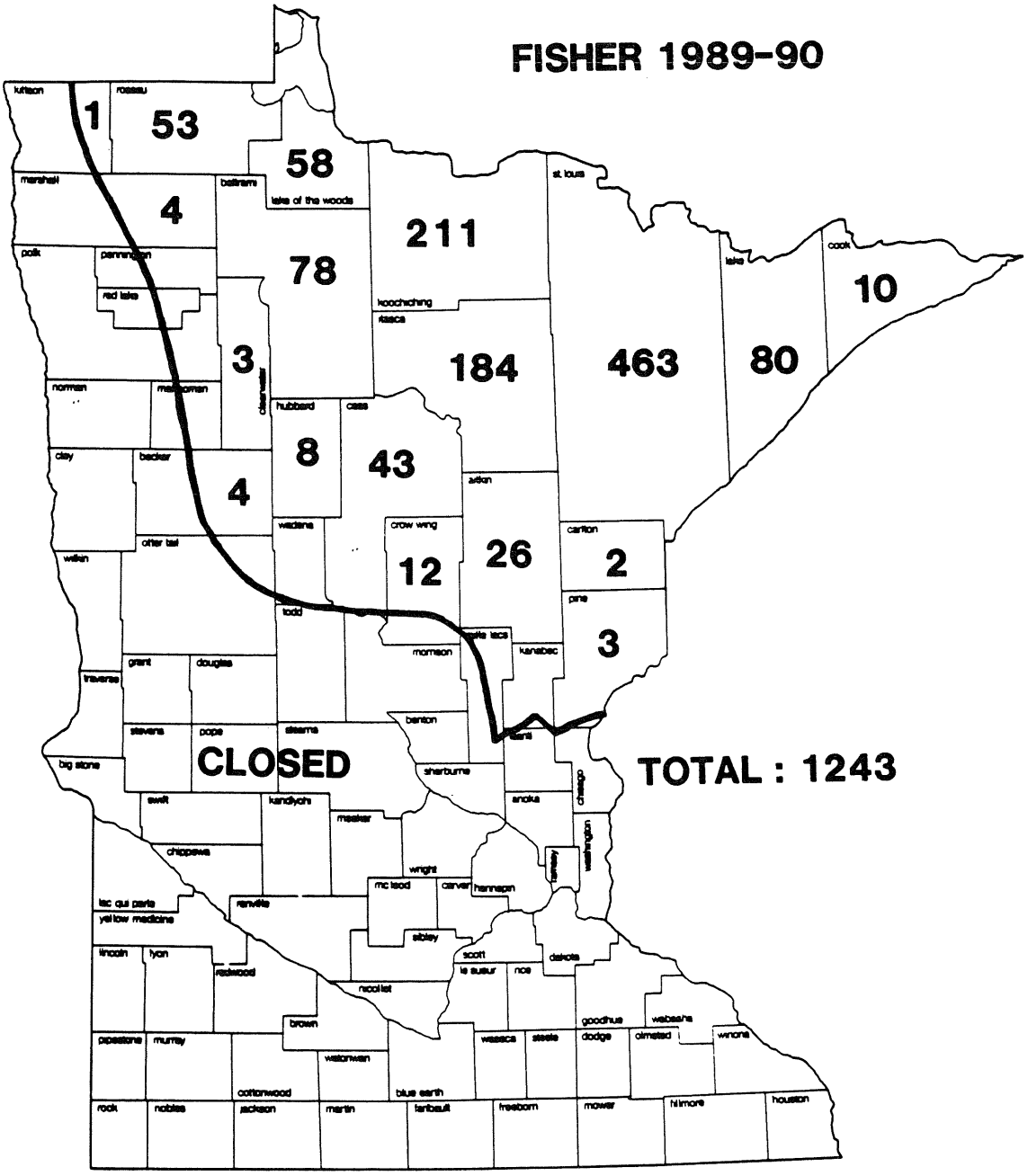


Figure 40. Fisher harvest by county, 1989-90.

Table 67. Fisher harvest by date and sex, 1989-90 season.

Date	Sex			Total	% of known Total[a]	Cumulative Percent
	Male	Female	Unknown			
Dec. 2	4	9	0	13	1.1	1.1
Dec. 3	33	53	0	86	7.2	8.3
Dec. 4	33	39	0	72	6.0	14.3
Dec. 5	54	55	0	109	9.1	23.4
Dec. 6	47	50	1	98	8.2	31.6
Dec. 7	35	47	1	83	6.9	38.6
Dec. 8	38	50	1	89	7.4	46.0
Dec. 9	55	74	0	129	10.8	56.8
Dec. 10	68	84	0	152	12.7	69.5
Dec. 11	13	26	0	39	3.3	72.8
Dec. 12	27	33	0	60	5.0	77.8
Dec. 13	23	18	0	41	3.4	81.3
Dec. 14	23	29	0	52	4.4	85.6
Dec. 15	26	23	0	49	4.1	89.7
Dec. 16	38	40	0	78	6.5	96.2
Dec. 17	20	25	0	45	3.8	100.0
Unknown	17	21	10	48	--	--
Total	554	676	13	1,243	100	100

[a] Sum of percentages does not equal 100.0 because of rounding error.

Table 68. Fisher harvest by county and sex, 1989-90 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	14	12	0	26
Becker	3	1	0	4
Beltrami	30	48	0	78
Carlton	2	0	0	2
Cass	25	18	0	43
Clearwater	1	2	0	3
Cook	5	5	0	10
Crow Wing	6	6	0	12
Hubbard	4	4	0	8
Itasca	87	97	0	184
Kittson	1	0	0	1
Koochiching	88	123	0	211
Lake	43	37	0	80
Lake of the Woods	25	33	0	58
Marshall	0	4	0	4
Pine	3	0	0	3
Roseau	14	39	0	53
St. Louis	203	247	13	463
Total	554	676	13	1,243

Table 69. Comparison of fisher harvest by county, 1981-89.

County	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aitkin	9	15	5	10	8	8	24	14	26
Becker	3	2	4	3	1	4	2	4	4
Beltrami	44	41	25	96	27	71	115	68	78
Carlton	0	4	4	3	0	3	6	3	2
Cass	6	6	3	19	17	32	60	24	43
Clearwater	3	1	3	6	4	4	3	1	3
Cook	36	21	18	16	9	15	29	29	10
Crow Wing	8	6	2	11	6	11	14	3	12
Hubbard	1	0	0	7	1	7	9	6	8
Itasca	64	139	72	228	84	183	247	135	184
Kanabec	0	0	0	0	0	0	0	1	0
Kittson	0	0	6	2	1	1	4	2	1
Koochiching	142	182	123	255	157	195	303	128	211
Lake	121	115	37	80	49	81	114	78	80
Lake of the Woods	41	52	32	85	46	58	91	66	58
Mahnomen	1	0	0	0	0	0	0	5	0
Marshall	3	6	13	10	5	2	19	7	4
Norman	----------	----------	closed	----------	----------	1[a]	1[a]	closed	------
Pennington	0	0	0	0	0	0	0	1	0
Pine	0	0	1	1	0	0	1	1	3
Polk	0	0	0	0	0	1	0	1	0
Red Lake	0	0	0	0	0	0	1	0	0
Roseau	32	36	86	111	68	75	90	68	53
St. Louis	258	286	197	345	195	316	509	377	463
Unknown	90	0	0	1	0	0	0	3	0
Total	862	912	631	1,289	678	1,068	1,642	1,025	1,243

[a] The reported harvest is accidental take - Norman County is closed to fisher trapping.

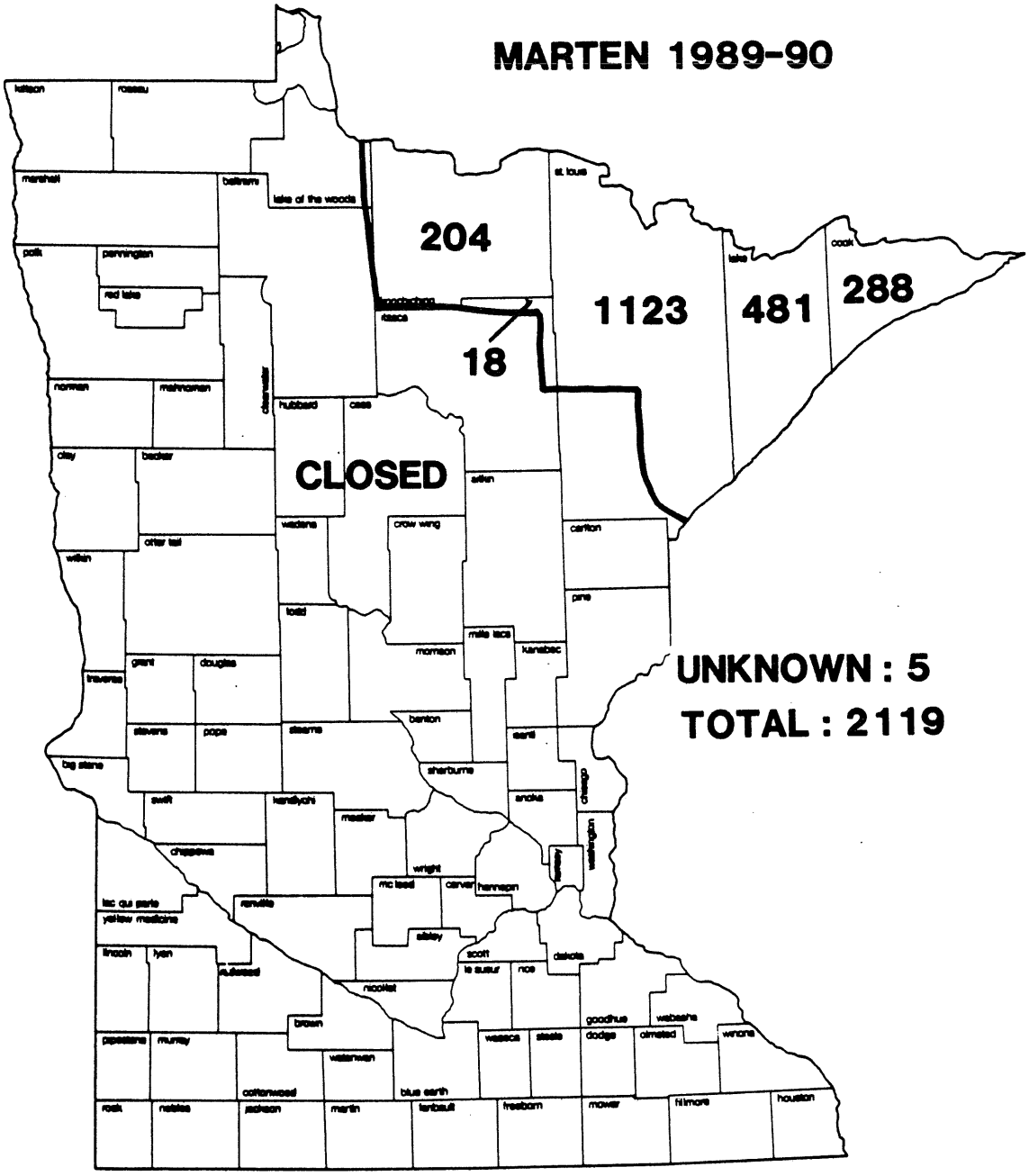


Figure 41. Pine marten harvest by county, 1989-90.

Table 70. Marten harvest by date and sex, 1989-90 season.

Date	Sex			Total	% of Known Total[a]	Cumulative Percent
	Male	Female	Unknown			
Dec. 2	18	9	0	27	1.3	1.3
Dec. 3	175	79	0	254	12.5	13.8
Dec. 4	141	70	0	211	10.4	24.2
Dec. 5	152	64	0	216	10.6	34.8
Dec. 6	116	69	0	185	9.1	43.9
Dec. 7	78	46	3	127	6.3	50.2
Dec. 8	79	37	0	116	5.7	55.9
Dec. 9	152	85	1	238	11.7	67.6
Dec. 10	128	72	1	201	9.9	77.5
Dec. 11	37	34	2	73	3.6	81.1
Dec. 12	54	30	0	84	4.1	85.2
Dec. 13	29	27	1	57	2.8	88.0
Dec. 14	43	13	1	57	2.8	90.8
Dec. 15	26	30	1	57	2.8	93.6
Dec. 16	52	39	0	91	4.5	98.1
Dec. 17	22	16	0	38	1.9	100.0
Unknown	35	36	16	87	-	-
Total	1,337	756	26	2,119	100	100

[a] Sum of percentages does not equal 100.0 because of rounding error.

Table 71. Marten harvest by county and sex, 1989-90 season.

County	Sex			Total
	Male	Female	Unknown	
Cook	197	91	0	288
Itasca	8	6	4	18
Koochiching	131	73	0	204
Lake	312	169	0	481
St. Louis	685	417	21	1,123
Unknown	4	0	1	5
Total	1,337	756	26	2,119

Table 72. Comparison of marten harvest by county, 1985-89.[a]

County	1985	1986	1987	1988	1989
Cook	51	75	143	305	288
Itasca	---------closed----------			11	18
Koochiching	72	159	275	266	204
Lake	119	160	270	457	481
Lake of the Woods	---------closed----------			1	0
St. Louis	188	401	675	1,032	1,123
Unknown	0	3	0	0	5
Total	430	798	1,363	2,072	2,119

[a] No open season on marten prior to 1985.

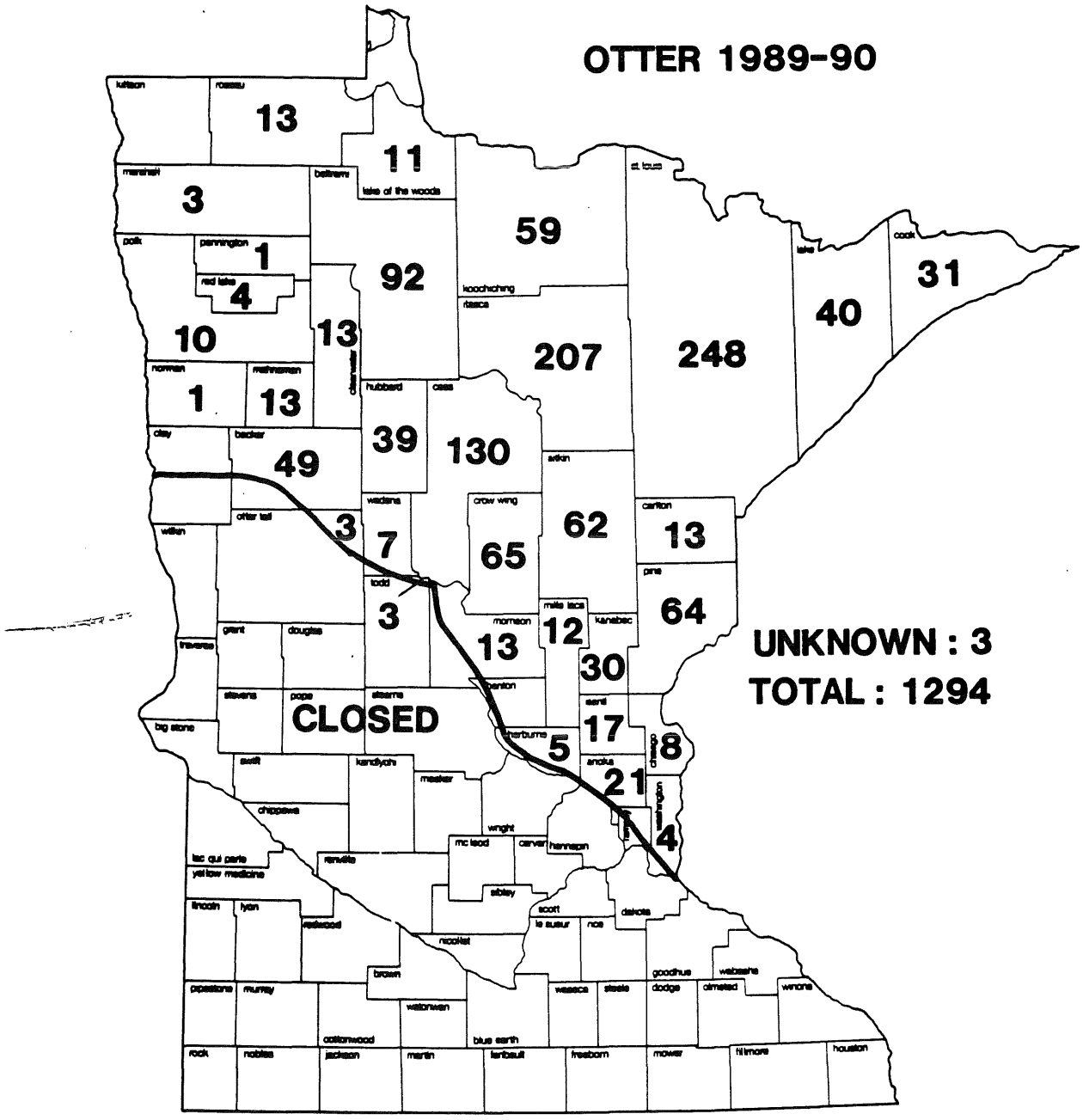


Figure 42. Otter harvest by county, 1989-90.

Table 73. Otter harvest by 5-day interval and sex, 1989-90 season.

Interval	Sex			Total	% of Known Total[a]	Cumulative Percent
	Male	Female	Unknown			
Oct. 28-Nov. 1	63	45	1	109	8.8	8.8
Nov. 2-6	124	123	3	250	20.2	29.1
Nov. 7-11	97	65	0	162	13.1	42.2
Nov. 12-16	80	69	0	149	12.1	54.3
Nov. 17-21	52	52	0	104	8.4	62.7
Nov. 22-26	64	45	0	109	8.8	71.5
Nov. 27-Dec. 1	56	43	2	101	8.2	79.7
Dec. 2-6	77	40	0	117	9.5	89.1
Dec. 7-11	49	37	1	87	7.0	96.2
Dec. 12-17[b]	22	25	0	47	3.8	100.0
Unknown	31	19	9	59	-	-
Total	715	563	16	1,294	100	100

[a] Sum of percentages does not equal 100.0 because of rounding error.

[b] Six-day interval.

Table 74. Otter harvest by county and sex, 1989-90 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	31	31	0	62
Anoka	10	11	0	21
Becker	24	25	0	49
Beltrami	57	35	0	92
Carlton	10	3	0	13
Cass	79	51	0	130
Chisago	2	6	0	8
Clearwater	6	7	0	13
Cook	16	15	0	31
Crow Wing	36	28	1	65
Hubbard	20	19	0	39
Isanti	6	11	0	17
Itasca	115	89	3	207
Kanabec	12	18	0	30
Koochiching	29	25	5	59
Lake	20	20	0	40
Lake of the Woods	7	4	0	11
Mahnomen	5	8	0	13
Marshall	3	0	0	3
Mille Lacs	5	7	0	12
Morrison	7	6	0	13
Norman	1	0	0	1
Ottertail	2	1	0	3
Pennington	0	1	0	1
Pine	29	35	0	64
Polk	7	3	0	10
Red Lake	2	2	0	4
Roseau	10	3	0	13
St. Louis	152	89	7	248
Sherburne	3	2	0	5
Todd	2	1	0	3
Wadena	4	3	0	7
Washington	2	2	0	4
Unknown	1	2	0	3
Total	715	563	16	1,294

Table 75. Comparison of otter harvest by county, 1981-89.

County	1981	1982	1983	1984	1985	1986	1987	1988	1989
Aitkin	21	20	25	34	17	43	55	57	62
Anoka	---------closed---------					4	2	8	21
Becker	12	8	15	18	24	34	41	55	49
Beltrami	28	39	23	33	46	66	125	87	92
Benton	---------closed---------					0	0	1	0
Carlton	11	4	5	13	10	13	24	12	13
Cass	41	36	33	49	59	67	147	84	130
Chisago	---------closed---------					4	11	9	8
Clearwater	12	9	6	11	6	17	19	5	13
Cook	15	17	4	16	5	20	33	25	31
Crow Wing	18	15	13	15	26	27	57	31	65
Hubbard	28	21	15	22	25	27	36	19	39
Isanti	---------closed----------					12	24	12	17
Itasca	48	56	69	94	96	123	199	141	207
Kanabec	13	4	9	9	4	14	28	31	30
Kittson	0	0	0	0	0	1	0	0	0
Koochiching	32	23	26	34	38	45	77	48	59
Lake	13	15	20	18	25	47	61	33	40
Lake of the Woods	8	9	11	13	5	9	39	16	11
Mahnomen	2	2	2	3	14	6	5	8	13
Marshall	0	0	2	0	1	0	1	1	3
Mille Lacs	8	2	8	8	4	0	28	17	12
Morrison	---------closed----------					3	17	9	13
Norman	---------closed----------					0	1	6	1
Ottertail	0	1	1	1	1	4	1	1	3
Pennington	1	0	0	0	1	0	1	0	1
Pine	17	21	14	29	20	21	70	41	64
Polk	5	3	4	5	6	5	7	8	10
Red Lake	1	3	0	0	0	0	1	0	4
Roseau	7	3	3	5	5	7	12	9	13
St. Louis	125	69	96	96	119	145	256	135	248
Sherburne	---------closed----------					1	1	4	5
Todd	0	0	0	0	0	0	0	0	3
Wadena	4	4	4	2	2	1	4	1	7
Washington	---------closed----------					0	3	3	4
Unknown	15	1	1	2	0	2	0	5	3
Total	471	385	408	529	559	777	1,386	922	1,294