

1987-88
MINNESOTA

**Registered Furbearer
Harvest Statistics
and Population Status**



Section of Wildlife
DEPARTMENT OF NATURAL RESOURCES

1987-88
Minnesota
Furbearer Registration Statistics
and Population Status

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CONTENTS

Page

PART I. HARVEST STATISTICS

INTRODUCTION..... 1
Table 1. Registered furbearer harvests and permits 2

BOBCAT HARVEST

Fig. 1. County bobcat harvest 3
Table 2. Comparative bobcat harvest by county 4
Table 3. Time distribution of bobcat harvest 5
Table 4. Distribution of bobcat harvest among takers 6
Table 5. Bobcat harvest by method of take 7

FISHER HARVEST

Fig. 2. County fisher harvest 8
Table 6. Fisher by county and sex 9
Table 7. Comparative fisher harvest by county 10
Table 8. Time distribution of fisher harvest 11

OTTER HARVEST

Fig. 3. County otter harvest 12
Table 9. Otter harvest by county and sex 13
Table 10. Comparative otter harvest by county 14
Table 11. Otter harvest by date and sex 15

MARTEN HARVEST

Fig. 4. County marten harvest 16
Table 12. Marten harvest by county and sex 17
Table 13. Comparative marten harvest by county 17
Table 14. Marten harvest by date and sex 18

PART II. POPULATION STATUS

BOBCAT 19-20

FISHER 21-22

MARTEN 22-24

OTTER 25-26

PART I.

Registered Furbearer Harvest Statistics

1987-88 REGISTERED FURBEARER HARVESTS

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The attached tables and figures summarize harvest data for Minnesota bobcat, fisher, pine marten and river otter for the 1987-88 seasons. Separate reports have been prepared to summarize population status of these species.

BOBCAT

The 1987-88 registered harvest was 214, an increase of 34% from 1986-87. The short season initiated in 1986 was maintained in 1987 to provide bobcat with some additional protection during the low snowshoe hare population years.

FISHER

The 1987-88 fisher harvest was 1642, up 53% from 1986 and the highest since more restrictive seasons were initiated in 1981. Good weather during the season and high trapper numbers, interest, and effort were probably the main factors in the increased harvest.

MARTEN

The 1987-88 registered marten harvest was 1363, an increase of 71% from 1986-87 and the highest harvest since the season was initiated in 1985. The same factors that contributed to the higher fisher harvest, plus increased marten populations, appear to be primarily responsible for the increase.

OTTER

The 1987-88 registered otter harvest was 1386, a 78% increase from 1986 and the highest otter harvest since registration began in 1976. High trapper numbers and interest, ideal weather conditions, and a longer and earlier season in the north zone were probably the primary factors leading to the record harvest. The 1987 legislature gave the Department authority to conduct otter seasons longer than 30 days, and an additional 7 days were added in the north to allow the otter season to open concurrent with beaver in that zone.

June 1, 1988

Table 1. Registered furbearer harvests and total permits issued, 1985-87^a.

Year	<u>Bobcat</u>		<u>Fisher</u>		<u>Marten</u>		<u>Otter</u>	
	Permits	Harvest	Permits	Harvest	Permits	Harvest	Permits	Harvest
1985	--	119	--	678	746	430	--	559
1986	--	160	3,302	1,067	2,171	798	3,198	777
1987	--	214	4,952	1,642	3,025	1,363	4,708	1,386

^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.

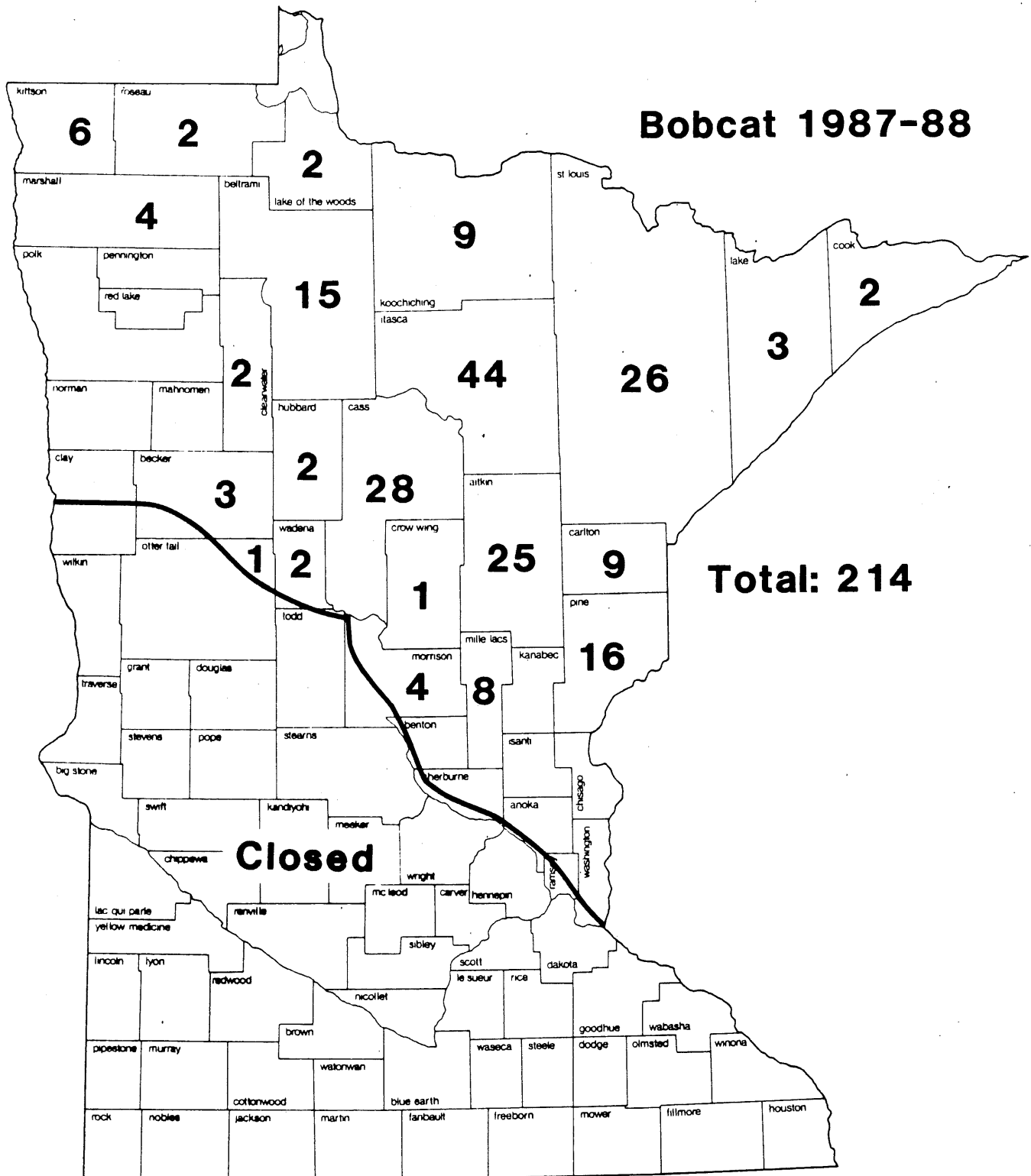


Fig. 1. Bobcat harvest by county. 1987-88.

Table 2. Comparison of bobcat harvest by county, 1983-84 - 1987-88.

County	1983-84	1984-85	1985-86	1986-87	1987-88
Aitkin	20	25	14	12	25
Becker	8	9	1	1	3
Beltrami	17	24	5	7	15
Carlton	4	20	6	9	9
Cass	13	42	20	34	28
Chisago	0	0	1	0	0
Clearwater	1	0	0	3	2
Cook	0	1	0	1	2
Crow Wing	4	5	6	5	1
Hubbard	1	1	0	0	2
Isanti	0	0	0	1	0
Itasca	36	50	15	28	44
Kanabec	2	6	2	3	0
Kittson	3	0	0	3	6
Koochiching	12	8	8	6	9
Lake	3	1	1	1	3
Lake of the Woods	1	1	1	0	2
Marshall	3	1	1	3	4
Mille Lacs	6	0	4	3	8
Morrison	7	5	4	4	4
Ottertail	1	1	3	2	1
Pine	24	20	14	11	16
Polk	0	1	0	0	0
Red Lake	0	0	1	0	0
Renville	0	1	0	0	0
Roseau	9	14	2	2	2
St. Louis	32	43	8	19	26
Wadena	1	1	2	0	2
Unknown	0	1	0	2	0
Total	208	280	119	160	214

Table 3. Time distribution of bobcat harvest by 5-day increments, 1987-88 season.

Interval	Sex			Total	% of Total	Cumulative Percent
	M	F	U			
Nov. 28-Dec. 2	9	12	0	21	9.8	9.8
Dec. 3-7	17	27	0	44	20.6	30.4
Dec. 8-12	14	29	0	43	20.1	50.5
Dec. 13-17	9	14	0	23	10.7	61.2
Dec. 18-22	15	10	1	26	12.1	73.3
Dec. 23-27	6	19	0	25	11.7	85.0
Dec. 28-Jan. 1	6	16	0	22	10.3	95.3
Jan. 2 -3 ^a	0	6	0	6	2.8	98.1
Unknown	0	0	4	4	1.9	100.0
TOTAL	76	133	5	214	100.0	100.0

^a 2-day interval

Table 4. Distribution of bobcat harvest among takers, 1980-81 thru 1987-88.

Number Taken	Number of Takers									
	<u>1980-81</u> # (%)	<u>1981-82</u> # (%)	<u>1982-83</u> # (%)	<u>1983-84</u> # (%)	<u>1984-85</u> # (%)	<u>1985-86</u> # (%)	<u>1986-87</u> # (%)	<u>1987-88</u> # (%)	<u>Total (80-87)</u> # (%)	
1	51 (55.4)	123 (71.1)	111 (65.3)	108 (72.0)	116 (65.2)	70 (78.7)	92 (76.7)	104 (71.7)	775	(69.4)
2	21 (22.8)	29 (16.8)	30 (17.6)	32 (21.3)	39 (21.9)	11 (12.4)	18 (15.0)	23 (15.9)	203	(18.2)
3	6 (6.5)	10 (5.8)	16 (9.4)	6 (4.0)	13 (7.3)	6 (6.7)	9 (7.5)	10 (6.9)	76	(6.8)
4	4 (4.3)	5 (2.9)	10 (5.9)	4 (2.7)	9 (5.1)	1 (1.1)	0 (0.0)	6 (4.1)	39	(3.5)
5	10 (10.9)	6 (3.5)	3 (1.8)	0 (0.0)	1 (0.5)	1 (1.1)	1 (0.8)	2 (1.4)	24	(2.1)
TOTAL	92	173	170	150	178	89	120	145	1117	

Table 5. Bobcat harvest by method of take, 1979-1987.

Year	Total Harvest	Trapping			Hunting				
		Harvest	(% of Total)	Takers	Ave. Take	Harvest	(% of Total)	Takers	Ave. Take
1979	291	253	(86.9)	—	—	38	(13.1)	—	—
1980	210	177	(84.3)	68	2.6	33	(15.7)	24	1.4
1981	260	219	(84.2)	143	1.5	41	(15.8)	30	1.4
1982	274	239	(87.2)	147	1.6	35	(12.8)	23	1.5
1983	208	168	(80.8)	118	1.4	40	(19.2)	32	1.3
1984	280	252	(90.0)	156	1.6	28	(10.0)	22	1.3
1985	119	83	(69.7)	62	1.3	36	(30.3)	27	1.3
1986	160	119	(74.4)	89	1.3	41	(25.6)	31	1.3
1987	214	177	(82.7)	118	1.5	37	(17.3)	26	1.4

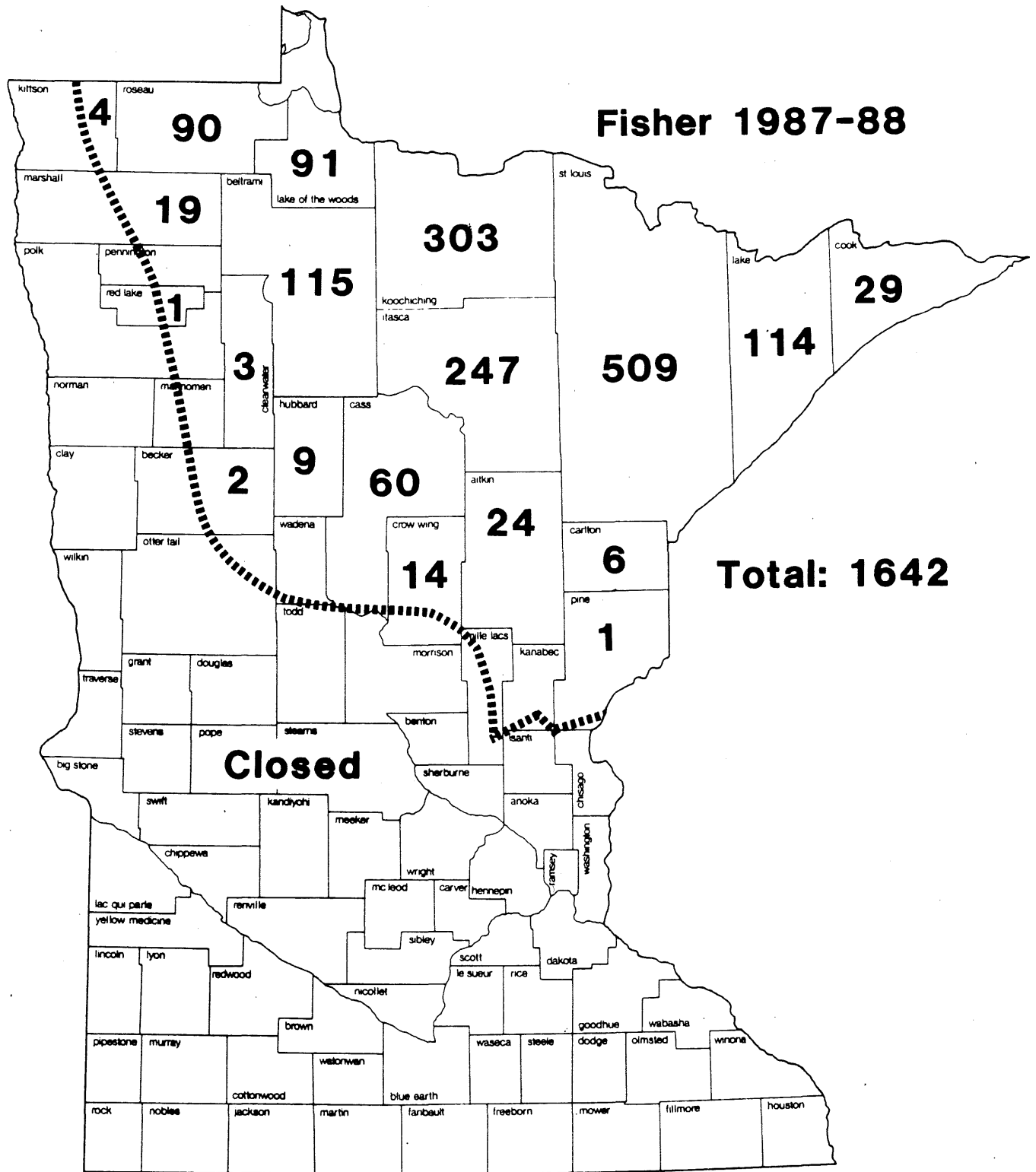


Fig. 2. Fisher harvest by county. 1987-88.

Table 6. Fisher harvest by county and sex. 1987 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	13	11	0	24
Becker	1	1	0	2
Beltrami	53	62	0	115
Carlton	2	4	0	6
Cass	34	26	0	60
Clearwater	0	3	0	3
Cook	9	20	0	29
Crow Wing	6	8	0	14
Hubbard	5	4	0	9
Itasca	98	147	2	247
Kittson	1	3	0	4
Koochiching	114	188	1	303
Lake	45	68	1	114
Lake of the Woods	52	39	0	91
Marshall	13	6	0	19
Norman	0	1	0	1
Pine	1	0	0	1
Red Lake	1	0	0	1
Roseau	51	39	0	90
St. Louis	216	293	0	509
TOTAL	715	923	4	1642

Table 7. Comparison of fisher harvest by county, 1983-1987

County	1983	1984	1985	1986	1987
Aitkin	5	10	8	8	24
Becker	4	3	1	4	2
Beltrami	25	96	27	71	115
Carlton	4	3	0	3	6
Cass	3	19	17	32	60
Clearwater	3	6	4	4	3
Cook	18	16	9	15	29
Crow Wing	2	11	6	11	14
Hubbard	0	7	1	7	9
Itasca	72	228	84	183	247
Kittson	6	2	1	1	4
Koochiching	123	255	157	195	303
Lake	37	80	49	81	114
Lake of the Woods	32	85	46	58	91
Marshall	13	10	5	2	19
Norman	0	0	0	1	1
Pine	1	1	0	0	1
Polk	0	0	0	1	0
Red Lake	0	0	0	0	1
Roseau	86	111	68	75	90
St. Louis	197	345	195	316	509
Unknown	0	1	0	0	0
Total	631	1289	678	1068	1642

Table 8. Fisher harvest by date and sex, 1987-88 season.

Date	Sex			Total	% of known total	Cumulative percent
	Male	Female	Unknown			
11/28	3	2	0	5	0.3	0.3
11/29	24	35	0	59	3.6	3.9
11/30	48	34	0	82	5.1	9.0
12/01	38	62	0	100	6.2	15.2
12/02	39	59	0	98	6.0	21.2
12/03	52	59	0	111	6.8	28.0
12/04	39	57	0	96	5.9	33.9
12/05	70	101	0	171	10.5	44.4
12/06	65	65	0	130	8.0	52.4
12/07	43	57	0	100	6.2	58.6
12/08	47	67	1	115	7.1	65.7
12/09	45	53	1	99	6.1	71.8
12/10	47	74	0	121	7.5	79.3
12/11	32	54	0	86	5.3	84.6
12/12	78	72	2	152	9.4	94.0
12/13	40	56	0	96	5.9	100.0
Unknown	3	10	8	21	-	-
Total	713	917	12	1,642	100.0	100.0

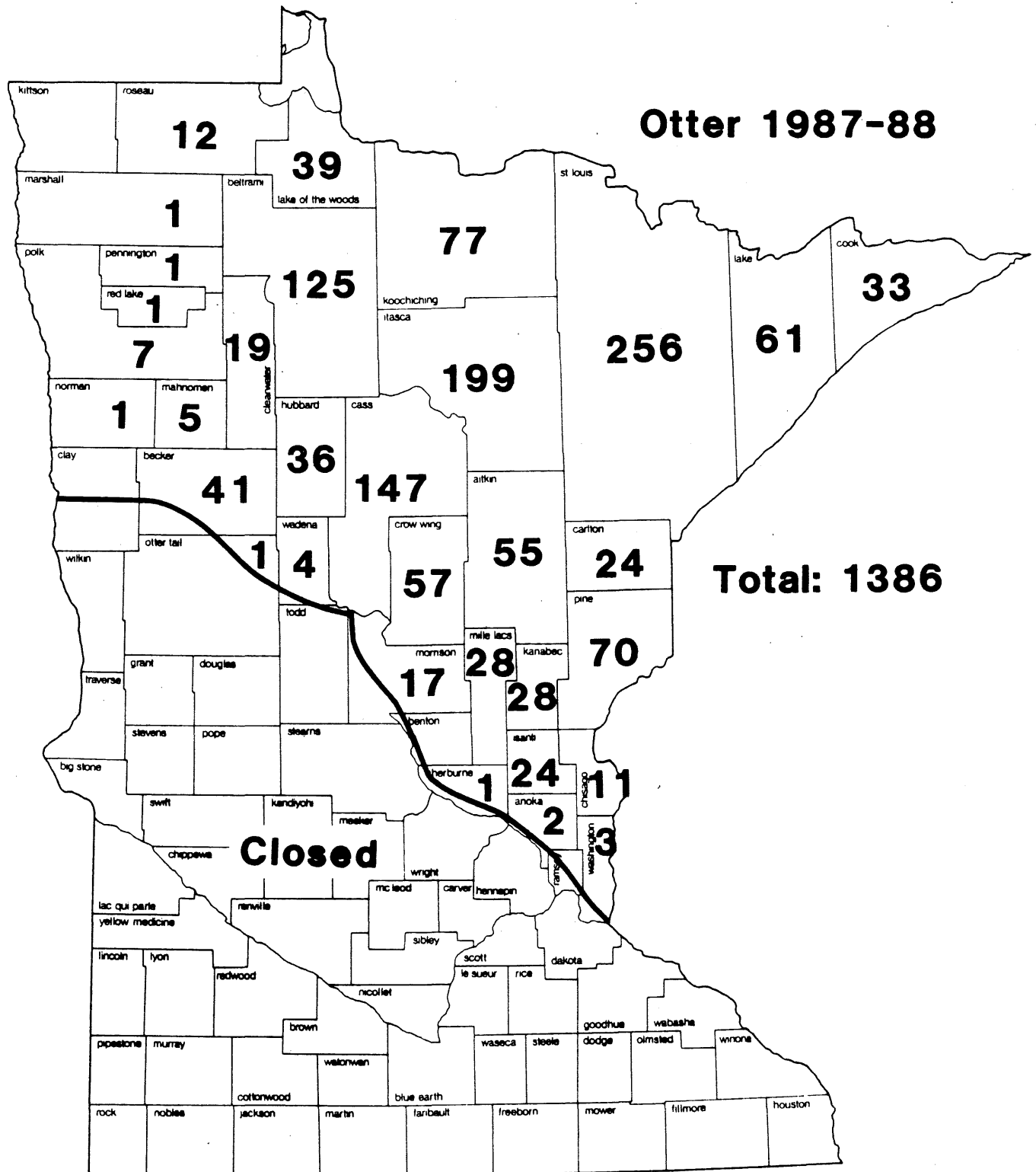


Fig. 3. Otter harvest by county. 1987-88.

Table 9. Otter harvest by county and sex, 1986-87 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	32	23	0	55
Anoka	1	1	0	2
Becker	22	19	0	41
Beltrami	61	64	0	125
Carlton	13	11	0	24
Cass	76	71	0	147
Chisago	6	5	0	11
Clearwater	12	7	0	19
Cook	21	12	0	33
Crow Wing	33	24	0	57
Hubbard	23	13	0	36
Isanti	14	10	0	24
Itasca	115	81	3	199
Kanabec	16	12	0	28
Koochiching	34	43	0	77
Lake	37	24	0	61
Lake of the Woods	20	19	0	39
Mahnomen	2	3	0	5
Marshall	1	0	0	1
Mille Lacs	9	19	0	28
Morrison	12	5	0	17
Norman	1	0	0	1
Ottertail	0	1	0	1
Pennington	1	0	0	1
Pine	32	38	0	70
Polk	4	3	0	7
Red Lake	1	0	0	1
Roseau	9	3	0	12
St. Louis	133	123	0	256
Sherburne	0	1	0	1
Wadena	2	2	0	4
Washington	3	0	0	3
Total	746	637	3	1386

Table 10. Comparison of otter harvest by county, 1983-87.

County	1983	1984	1985	1986	1987
Aitkin	25	34	17	43	55
Anoka	0	0	0	4	2
Becker	15	18	24	34	41
Beltrami	23	33	46	66	125
Carlton	5	13	10	13	24
Cass	33	49	59	67	147
Chisago	0	0	0	4	11
Clearwater	6	11	6	17	19
Cook	4	16	5	20	33
Crow Wing	13	15	26	27	57
Hubbard	15	22	25	27	36
Isanti	0	0	0	12	24
Itasca	69	94	96	123	199
Kanabec	9	9	4	14	28
Kittson	0	0	0	1	0
Koochiching	26	34	38	45	77
Lake	20	18	25	47	61
Lake of the Woods	11	13	5	9	39
Mahnomen	2	3	14	6	5
Marshall	2	0	1	0	1
Mille Lacs	7	7	4	9	28
Morrison	0	0	0	3	17
Norman	0	0	0	0	1
Ottertail	1	1	1	4	1
Pennington	0	0	1	0	1
Pine	14	29	20	21	70
Polk	4	5	6	5	7
Red Lake	0	0	0	0	1
Roseau	3	5	5	7	12
St. Louis	96	96	119	145	256
Sherburne	0	0	0	1	1
Wadena	4	2	2	1	4
Washington	0	0	0	0	3
Unknown	1	2	0	2	0
Total	408	529	559	777	1386

Table 11. Otter harvest by date and sex, 1987-88 season.

Date	Sex			Total	% of known Total	Cumulative percent
	Male	Female	Unknown			
10/24*	2	1	0	3	0.2	0.2
10/25*	12	9	0	21	1.6	1.8
10/26*	15	8	0	23	1.7	3.5
10/27*	18	7	0	25	1.9	5.4
10/28*	17	19	0	36	2.7	8.1
10/29*	13	8	3	24	1.8	9.9
10/30*	7	7	0	14	1.0	10.9
10/31	17	3	0	20	1.5	12.4
11/01	20	21	0	41	3.1	15.4
11/02	19	27	0	46	3.4	18.9
11/03	30	18	0	48	3.6	22.5
11/04	16	20	0	36	2.7	25.2
11/05	34	21	0	55	4.1	29.3
11/06	21	22	0	43	3.3	32.6
11/07	23	13	0	36	2.7	35.3
11/08	18	23	0	41	3.1	38.4
11/09	14	23	0	37	2.8	41.2
11/10	26	34	0	60	4.6	45.8
11/11	21	22	0	43	3.2	49.0
11/12	14	9	0	23	1.7	50.7
11/13	13	12	0	25	1.9	52.6
11/14	22	24	0	46	3.4	56.0
11/15	37	43	0	80	6.0	62.0
11/16	17	18	0	35	2.6	64.4
11/17	13	23	0	36	2.7	67.3
11/18	24	22	0	46	3.4	70.7
11/19	18	6	0	24	1.8	72.5
11/20	35	24	0	59	4.4	76.9
11/21	16	18	0	34	2.5	79.4
11/22	21	11	0	32	2.4	81.8
11/23	21	10	0	31	2.3	84.1
11/24	27	19	0	46	3.4	87.5
11/25	13	17	0	30	2.2	89.7
11/26	19	13	0	32	2.4	92.1
11/27	15	9	0	24	1.8	93.9
11/28	20	13	0	33	2.5	96.4
11/29	20	27	0	47	3.6	100.0
Unknown	38	13	0	51	—	—
Total	746	637	3	1386	100.0	100.0

* Open in North zone only.

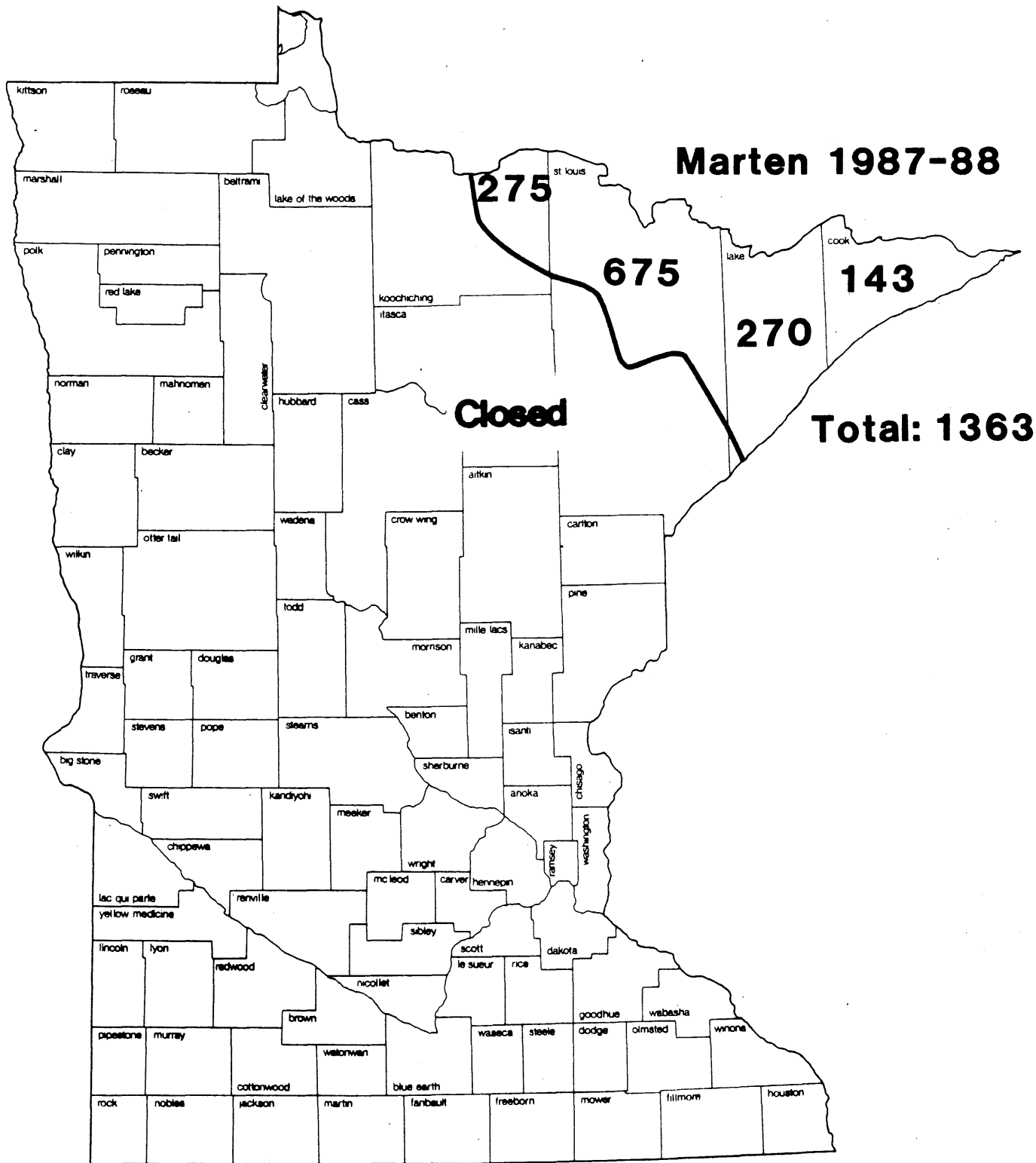


Fig. 4. Marten harvest by county. 1987-88.

Table 12. Marten harvest by county and sex, 1987-88.

County	Sex			Total
	Male	Female	Unknown	
Cook	116	27	0	143
Koochiching	175	100	0	275
Lake	212	53	5	270
St. Louis	465	207	3	675
Total	968	387	8	1363

Table 13. Comparison of marten harvest by county, 1985-87.

County	1985	1986	1987
Cook	51	75	143
Koochiching	72	159	275
Lake	119	160	270
St. Louis	188	401	675
Unknown	0	3	0
Total	430	798	1363

Table 14. Marten harvest by date and sex, 1987-88.

Date	Male	Female	Unknown	Total	% of Total	Cumulative Percent
11/28	2	3	4	9	0.7	0.7
11/29	93	30	0	123	9.0	9.7
11/30	62	19	0	81	5.9	15.6
12/01	71	31	0	102	7.5	23.1
12/02	63	28	1	92	6.7	29.8
12/03	69	22	0	91	6.7	36.5
12/04	60	22	1	83	6.1	42.6
12/05	153	49	0	202	14.8	57.4
12/06	77	35	1	113	8.3	65.7
12/07	56	22	0	78	5.7	71.4
12/08	51	27	0	78	5.7	77.1
12/09	54	17	0	71	5.2	82.3
12/10	38	35	0	73	5.4	87.7
12/11	31	9	0	40	2.9	90.6
12/12	51	23	0	74	5.5	96.1
12/13	24	13	0	37	2.7	98.8
Unknown	13	2	1	16	1.2	100.0
Total	968	387	8	1363	100.0	100.0

PART II.

Bobcat, Fisher, Pine Marten, and Otter
Population Status

BOBCAT, 1987-88

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During the Nov. 28-Jan. 3 trapping and hunting season, 214 bobcats were taken, an increase of 34% from 1986-87 (Table 1).

A total of 163 bobcat carcasses were aged; several others could not be aged because heads had been removed. Thirty-three percent were juveniles, compared to a 1977-86 mean of 36% (Table 1). Males comprised 44% of the juveniles (1977-86 \bar{x} = 55%), while both the yearling and adult sex ratios approximated 1::1. The overall sex ratio from carcasses was 48% males, compared to 36% males from registration data. The juvenile to mother (≥ 2.7 year old females) was 1.4::1 (Table 1).

In 1987-88 approximately 11% of the available modeled autumn population of 2300 bobcats was harvested. Projected harvests of 260 in 1988-89, 280 in 1989-90, and 300 thereafter stabilize the pre-birth spring population at approximately 1700 (Fig. 1).

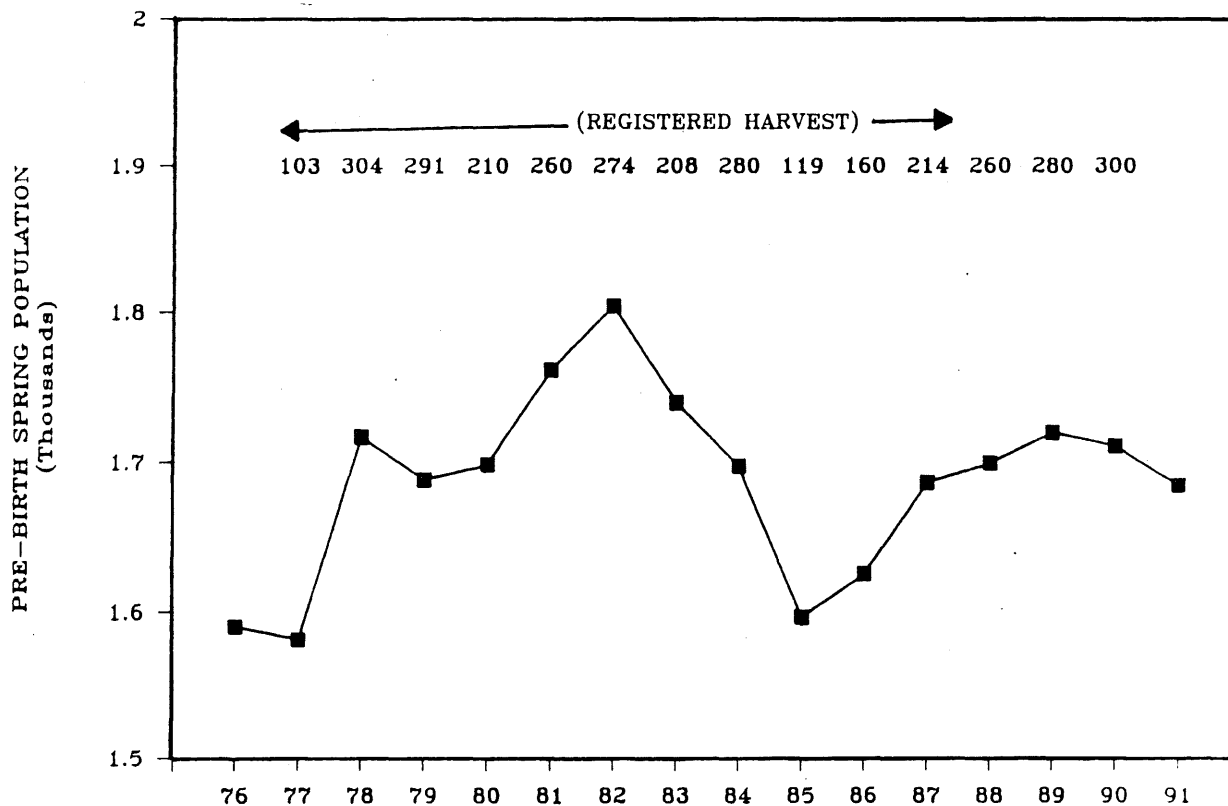


Figure 1. Bobcat population model, 1976-1991, with registered harvests to 1987, and projected harvests thereafter. Non-harvest mortality for juveniles is 30% in summer and 25% in winter, and for yearlings and adults, 10% in summer and 10% in winter. Juvenile non-harvest mortality was further increased by 5%-20% in 1982-1987 for decreased prey availability. All registration totals were increased by 10% to compensate for unregistered animals.

Table 1. Bobcat harvest, age structure, and population index data, 1977-78 to 1987, and 1977-86 mean.

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1977-86 \bar{x}
Registered take	103	304	291	210	260	274	208	280	119	160	214	---
Mean pelt price	\$74	\$164	\$118	\$79	\$73	\$66	\$61	\$76	\$70	\$120	---	---
Carcasses aged	34	113	75	48	230	261	205	288	99	132	163	---
% juveniles	35%	54%	37%	31%	37%	35%	37%	37%	33%	26%	33%	36%
% male juveniles	50%	61%	54%	80%	59%	47%	56%	52%	41%	53%	44%	55%
% 1.7 yrs. old	18%	15%	12%	33%	23%	15%	18%	13%	19%	17%	16%	18%
% male 1.7 yrs.	33%	53%	44%	69%	63%	49%	56%	66%	41%	32%	52%	50%
% >2.7 yrs. old	47%	31%	52%	35%	40%	50%	37%	50%	48%	58%	51%	45%
% male >2.7 yrs.	41%	60%	53%	56%	55%	47%	51%	44%	43%	51%	48%	50%
Overall % males	41%	59%	52%	66%	58%	48%	45%	51%	42%	51%	48%	51%
juv :: > 2.7 yr. females	1.2	4.4	1.6	1.9	2.1	1.3	1.5	1.4	1.2	0.9	1.4	1.4 ⁴
% autumn pop. taken ¹	5%	14%	14%	10%	12%	14%	10%	13%	6%	8%	11%	---
Scent post index ²	8	6	5	2	14	14	3	12	5	8	7	---
Snowshoe hare index ³	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5	0.5	---

¹ includes registered harvests plus 10% unreported harvest

² index for autumn prior to harvest season

³ index for spring after harvest season

⁴ does not include late data

FISHER

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The registered harvest of 1642 fisher during the 16 day, Nov. 28-Dec. 13 trapping season was up 53% from 1986, and was the highest since the limited harvest framework began in 1981 (Table 1).

Rather than collecting entire carcasses, age and sex was determined from the collection of heads or mandibles; 1534 ages were obtained in 1987. The proportion of juveniles in 1987 (63%) approximated the 1981-86 average (64%). As in most previous seasons, females predominated in all age classes (Table 1); the overall sex ratio from carcasses and registration was identical (43% males). The juvenile to mother (females ≥ 2.7 years old) of 4.7::1 was the lowest since carcass examinations (Table 1).

The proportion of the modeled autumn population trapped (21%) was the highest since the restrictive framework began. With continued post-1987 harvests approximating 1500, the spring pre-birth population will re-stabilize at about 7000 animals.

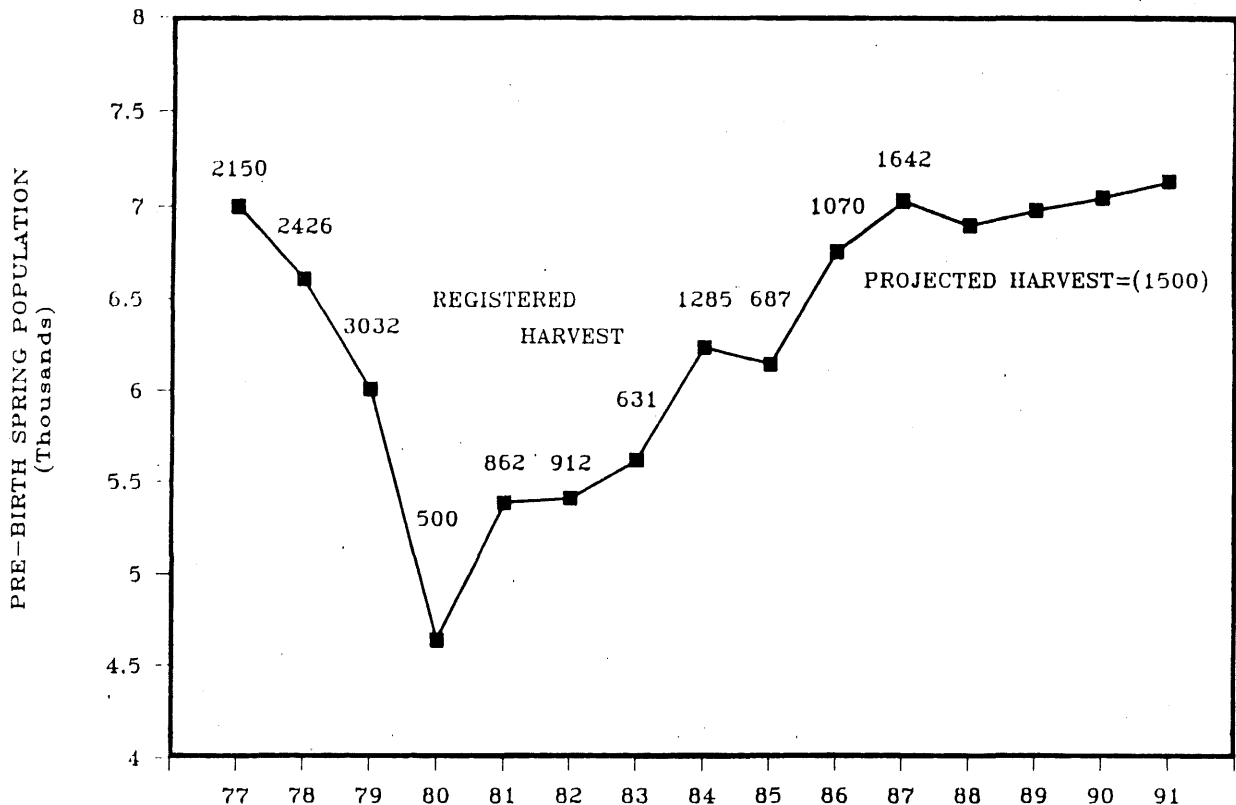


Figure 1. Fisher population model, 1977-1991, with projected harvests of 1500 after 1987. Non-harvest mortality is 30% and 25% for juveniles in summer and winter, and 10% and 1% for both yearlings and adults in summer and winter. Juvenile non-harvest mortality was increased 5-10% in summer and winter, 1983-1987 to compensate for decreased prey availability. All registered harvests were increased 25% for accidentally trapped fisher.

Table 1. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1977 to 1987. Fisher taken in 1980-81 were on Indian Reservations.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Season	12/1- 1/31	12/1- 1/31	12/1- 1/31	closed	12/1- 12/10	12/1- 12/10	12/1- 12/11	12/1- 12/16	11/30- 12/15	11/29- 12/4	11/28- 12/13
Limit	3	3	3	----	1	1	1	1	1	1	1
Registered take	2150	2426	3032	(423)	862	912	631	1285	678	1068	1642
% of available autumn population harvested ¹	26%	30%	42%	9%	17%	17%	10%	18%	10%	14%	21%
No. carcasses examined ²	562	577	467	----	843	1073	662	1270	712	1186	1542
% juveniles	69%	70%	65%	----	66%	66%	69%	63%	63%	59%	63%
% 1.7 yr.	16%	16%	15%	----	24%	19%	18%	20%	20%	24%	15%
% \geq 2.7 yrs.	14%	14%	21%	----	10%	15%	13%	17%	18%	18%	22%
Juv:ad. female ratio	8.4:1	7.1:1	5.6:1	----	10.5:1	9.4:1	8.8:1	7.2:1	5.4:1	5.3:1	4.7:1
% male juveniles	54%	44%	54%	----	48%	46%	45%	52%	46%	48%	46%
% male 1.7 yrs.	28%	35%	46%	----	43%	41%	40%	45%	40%	50%	40%
% male \geq 2.7 yrs.	43%	28%	44%	----	37%	52%	40%	45%	34%	37%	37%
Pelt price: males		\$132	\$108	\$90	\$94	\$70	\$71	\$70	\$74	\$84	---
females	\$71	\$147	\$128	\$104	\$110	\$99	\$121	\$122	\$130	\$162	---
Snowshoe hare index ³	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	0.2	0.5	0.5

¹ estimated from population model

² may exceed registration totals due to accidental catches, etc.

³ number of snowshoe hares seen per 100 km of ruffed grouse drumming route during the spring after fisher season

PINE MARTEN, 1987-1988

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A total of 1363 marten were registered during the Nov. 28-Dec. 13, 1987 season, 71% above 1986, and 217% above the 1985, totals (Table 1).

Mandatory carcass surrender resulted in 1502 carcasses (including confiscations) which could be aged. Juveniles comprised 66% of the take (Table 1). Males comprised 65%, 67%, and 75%, respectively, of the juvenile, yearling, and adult cohorts. The juvenile to mother (adult females ≥ 2.7 years) was 17::1.

For 1987 the marten population is modeled at a pre-birth population of 9250 (Fig. 1), which provides a density in spring of 1.4/mi.², and in autumn of 2.5/mi.². This revised model suggests that the proportions of the available population harvested in 1985, 1986, and 1987 were 6%, 10%, and 16%, respectively. A registered harvest in subsequent years of approximately 2400 marten annually will stabilize the pre-birth population at about 9000 (Fig. 1).

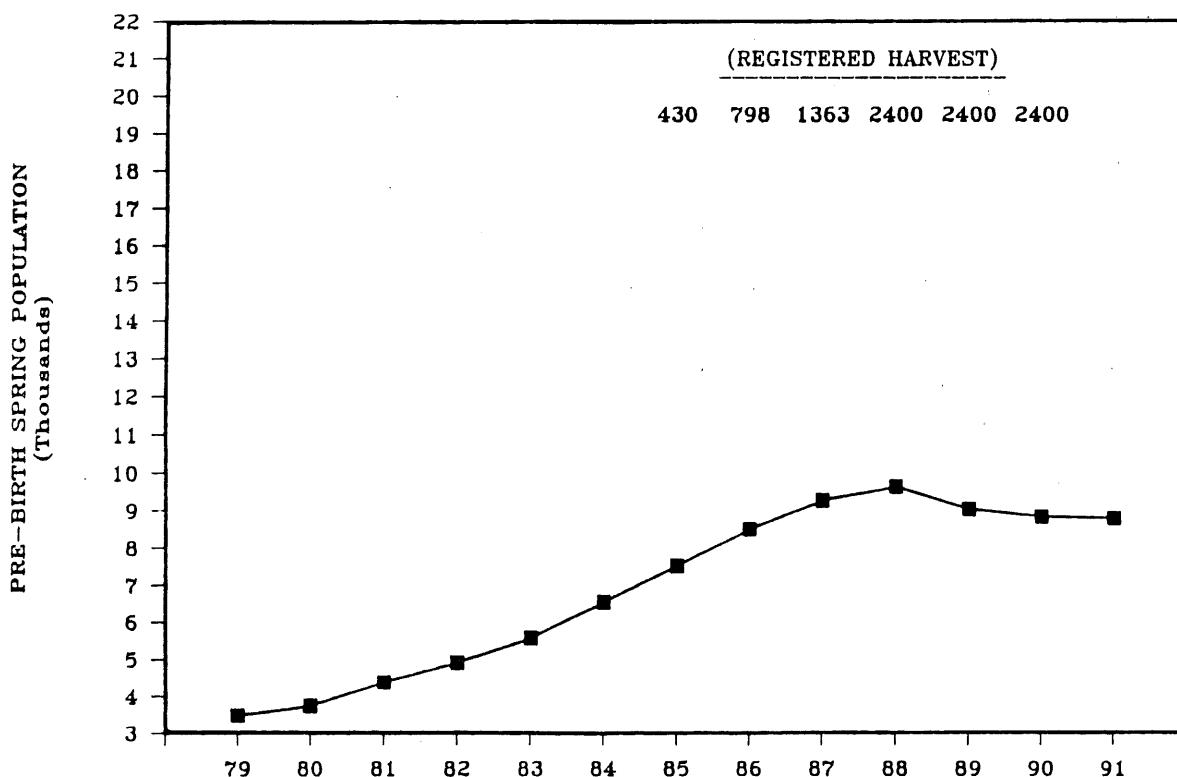


Figure 1. Pine marten population model, 1979 to 1991. Registered harvests are shown for 1985-1987; followed by projected harvests of 2400. Non-harvest mortality for juveniles is 40% and 20% in summer and in winter, and for yearlings and adults, 10% in both summer and winter. For modeling purposes the registered harvests have been increased by 50% for accidental take.

Table 1 . Marten harvest and carcass examination data, 1978-84 (combined) and 1985-1987.

	1978-84 (combined)	1985	1986	1987
Registered take	----	430	798	1363
Confiscations (approx.)	227	153	150	391
Carcasses examined	227	507	884	1502
% juveniles	60%	73%	64%	66%
% male juveniles	68%	69%	65%	65%
% 1.7 years old	30%	18%	21%	19%
% male 1.7 year olds	71%	68%	71%	67%
% \geq 2.7 years old	10%	9%	15%	16%
% male \geq year olds	91%	82%	81%	75%
Overall % males	71%	70%	69%	67%
ratio juv :: \geq 2.7 year old females	68:1	45:1	24:1	17:1

OTTER, 1987-88

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The registered harvest during the Oct. 24-Nov. 29 otter trapping season was 1386, up 78% from 1986, and also the highest since registration began in 1977. This increase is concurrent with general observations of very abundant otter, and with documented range increases.

For the first time since 1978, no otter carcasses were collected in 1987 due to the generally stable age and sex structure data from previous collections (Table 1). Data for the population model were derived from mean sex and age data prior to 1987, combined with the 1987 registration data.

In 1987, approximately 17% of the modeled autumn population of 9100 otters was harvested (1978-86 range 7%-20%). Given that future registered harvests approximate 1200, the pre-birth (spring) modeled population will stabilize at about 7000 otter (Fig. 1).

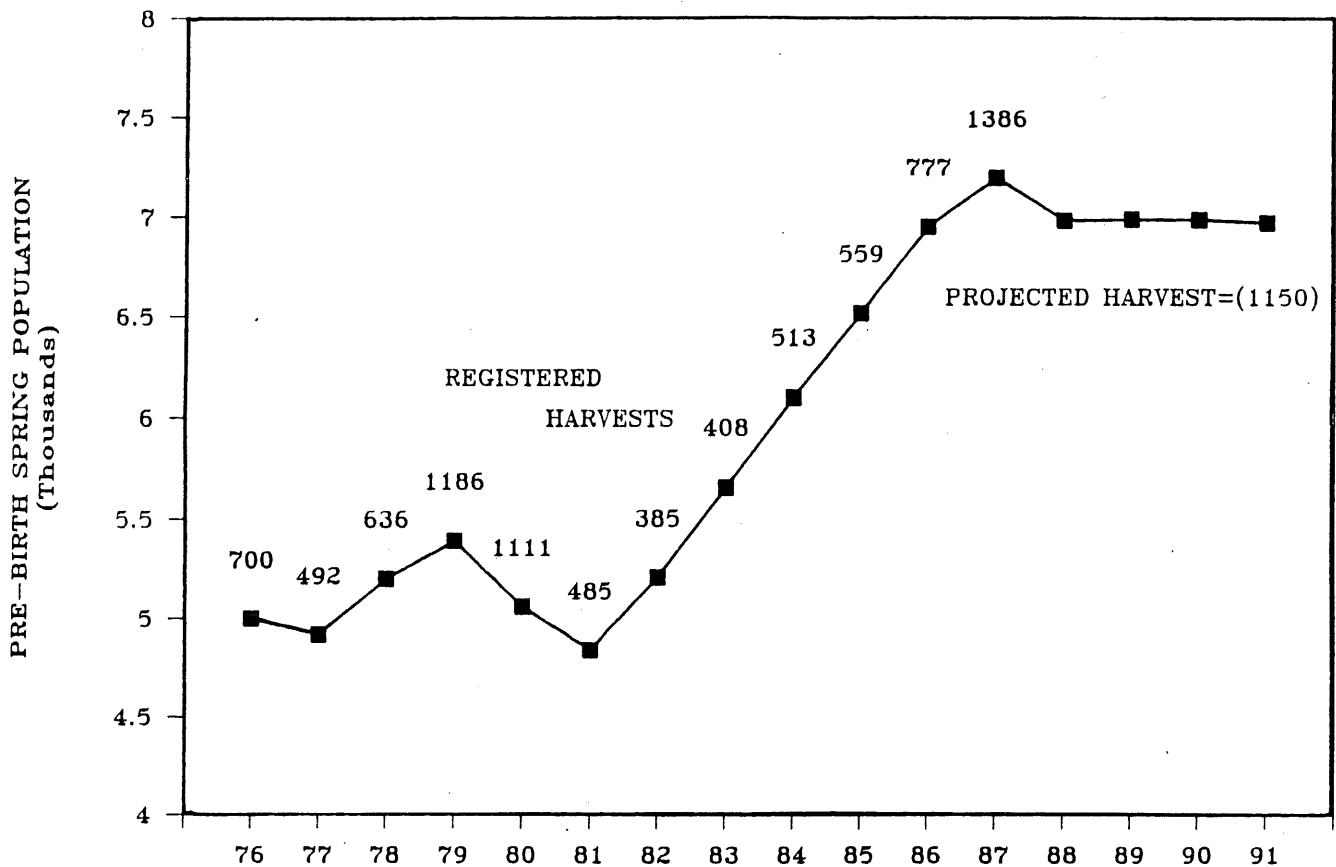


Figure 1. Otter population model, 1976-1991. Registered harvests until 1987 are followed by post-1987 harvests of 1150. Respective non-harvest summer and winter mortality is 25% and 15% for juveniles, 10% and 10% for yearlings, and 6% and 6% for adults. Harvest mortality was increased 20% over registrations (10% in 1987-88) to compensate for accidental take.

Table 1. Otter harvest and carcass examination sex-age data in Minnesota, 1978-1986. Carcasses were not collected after 1986.

	1978	1979	1980	1981	1982	1983	1984	1985	1986
Season dates	12/1-5	11/15-29	11/15-29	11/14-28	11/13-27	11/12-26	11/17-12/1	11/16-12/15	10/24-11/29
Registered harvest	636	1186	1111	485	385	408	513	559	777
% of autumn population harvested ¹	11%	20%	20%	9%	7%	7%	8%	8%	11%
No. carcasses examined	49	36	88	471	389	433	549	572	745
% juveniles	61.2	69.4	54.5	55.0	50.6	42.3	47.9	43.4	45.2
% yearlings	26.5	19.4	14.7	19.7	25.6	30.9	23.3	22.9	23.3
% male juveniles	59.4	72.0	39.6	55.6	56.7	55.7	47.1	53.3	45.1
% males > 1.7 yrs.	47.1	36.4	57.5	53.3	65.1	56.8	50.0	50.0	48.1
Mean pelt price:									
otter	\$59	\$63	\$33	\$30	\$26	\$25	\$22	\$21	\$24
beaver (autumn)	\$18	\$33	\$18	\$14	\$11	\$10	\$12	\$15	\$20

¹ From population modeling; includes an additional 20% accidental harvest over registered total.

