1985-86

MINNESOTA FURBEARER REGISTRATION STATISTICS

Section of Wildlife
DEPARTMENT OF NATURAL RESOURCES

1985-86 FURBEARER REGISTRATION STATISTICS

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The attached tables and figures summarize harvest data for bobcat, fisher, pine marten and river otter, as obtained from furbearer registration records.

The 1985-86 season was the first for pine marten in Minnesota since at least 1933. This was also the first year for a 30-day otter season (seasons had been 15 days since the first modern otter season in 1944-45). Fisher and bobcat (and, to a lesser extent, marten and otter) harvests were apparently limited by the heavy snowfall that occurred throughout much of these species' range in late November and December. Trapping and hunting conditions were less than ideal and access was seriously restricted in many areas.

The lynx season remained closed in 1985-86 as the low in the snowshoe hare population cycle continued.

May 16, 1986

Table 1. Comparison of bobcat harvest by county, 1981-82 - 1985-86.

County	1981-82[a]	1982-83	1983-84	1984-85	1985-86
Aitkin	45	28	20	25	14
Becker	1	6	8	9	1
Beltrami	2	18	17	24	5
Carlton	15	15	4	20	6
Cass	26	30	13	38	20
Chisago	0	1	0	0	1
Clearwater	0	1	1	0	0
Cook	0	2	0	1	0
Crow Wing	2	4	4	3	6
Douglas	1	0	0	0	0
Hubbard	3	4	1	1	0
Itasca	32	46	36	50	15
Kanabec	2	2	2	6	2
Kittson	5	5	3	0	0
Koochiching	0	3	12	8	8
Lake	4	8	3	1	1
Lake of the Woods	3	3	1	1	1
Marshall	6	2	3	1	1
Mille Lacs	4	0	6	0	4
Morrison	0	5	7	4	4
Ottertail	3	2	1	1	3
Pennington	1	0	0	0	0
Pine	21	20	24	20	14
Polk	0	0	0	1	0
Red Lake	0	0	0	0	1
Renville	0	0	0	1	0
Roseau	4	9	9	14	2
St. Louis	78	59	32	43	8
Wadena	2	0	1	1	2
Unknown	0	1	0	1	0
Total	260	274	208	273	119

[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.

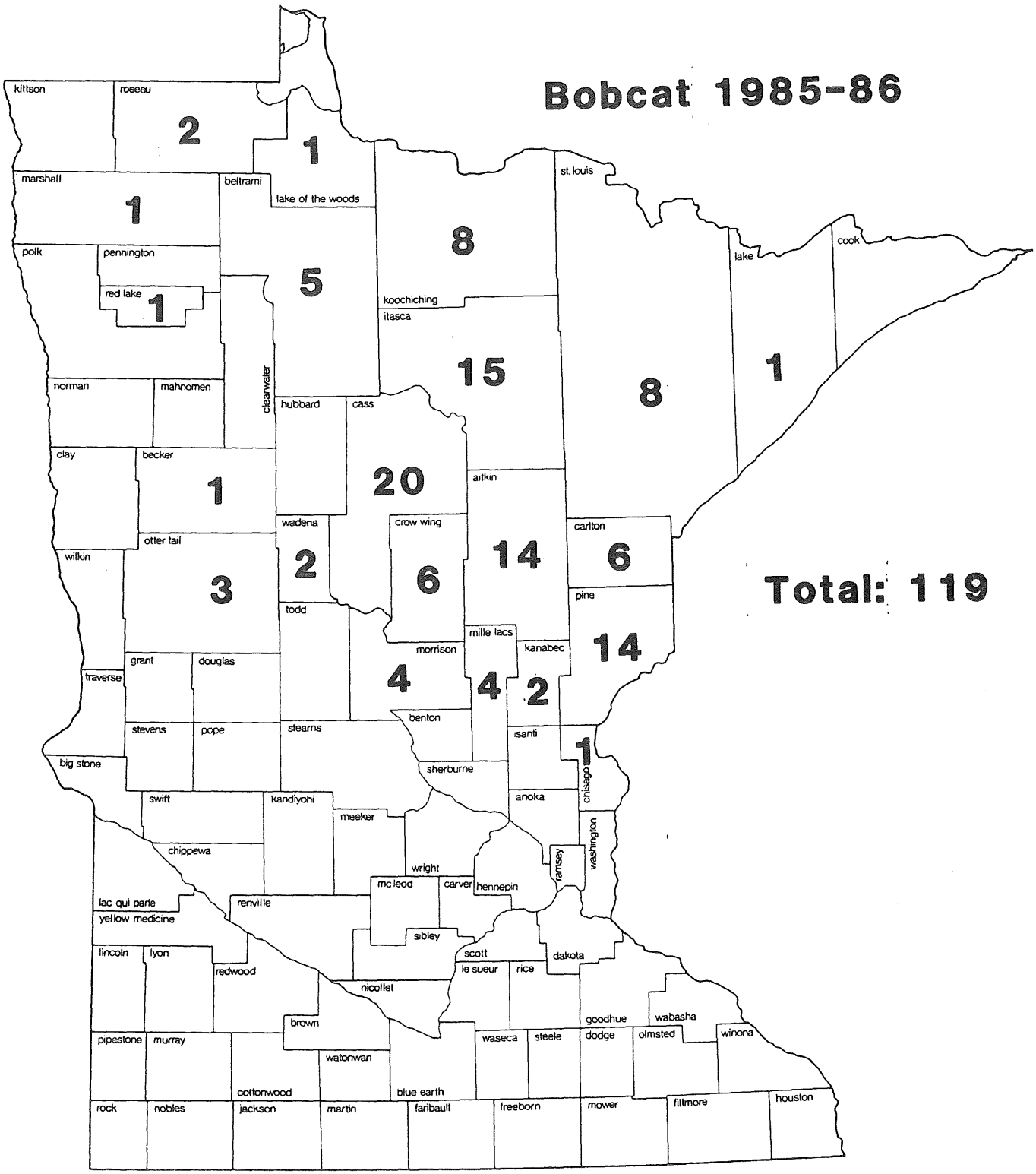

Figure 1. Bobcat harvest by county, 1985-86.

Table 2. Time distribution of bobcat harvest by 5-day increments, 1985-86 season.

Interval	M	F	Total	% of Total	Cumulative Percent
Nov. 30-Dec. 4	5	5	10	8.4	8.4
Dec. 5-9	10	16	26	21.8	30.2
Dec. 10-14	8	8	16	13.5	43.7
Dec. 15-19	3	6	9	7.6	51.3
Dec. 20-24	2	11	13	10.9	62.2
Dec. 25-29	2	6	8	6.7	68.9
Dec. 30-Jan. 3	8	6	14	11.8	80.7
Jan. 4-8	4	3	7	5.9	86.6
Jan. 9-13	2	5	7	5.9	92.5
Jan. 14-18	0	6	6	5.0	97.5
Jan. 19[a]	1	2	3	2.5	100.0
TOTAL			119	100.0	100.0

[a]1-day interval

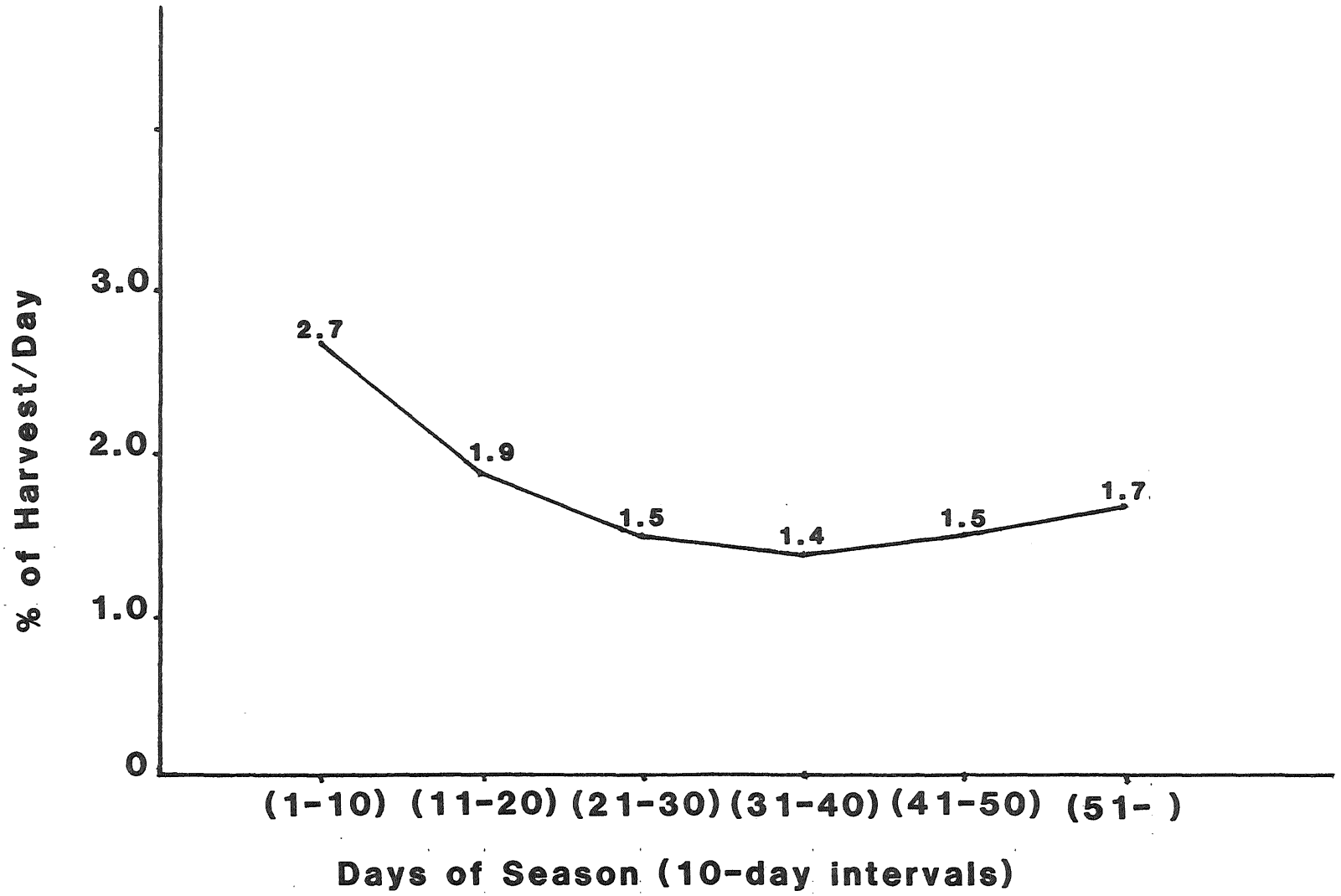

Figure 2. Proportion of bobcat take per day related to days of season (1977-1985)

Table 3. Distribution of bobcat harvest among takers, 1978-79 thru 1985-86.

	Number of Takers															
Number Taken	1978-79		1979-80		1980-81		1981-82		1982-83		1983-84		1984-85		1985-86		Total (78-85)	
	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)	#	(%)
1	130	(66.3)	88	(61.1)	51	(55.4)	123	(71.1)	111	(65.3)	108	(72.0)	113	(65.3)	70	(78.7)	794	(66.9)
2	38	(19.4)	34	(23.6)	21	(22.8)	29	(16.8)	30	(17.6)	32	(21.3)	37	(21.4)	11	(12.4)	232	(19.5)
3	17	(8.7)	9	(6.2)	6	(6.5)	10	(5.8)	16	(9.4)	6	(4.0)	13	(7.5)	6	(6.7)	83	(7.0)
4	8	(4.1)	4	(2.8)	4	(4.3)	5	(2.9)	10	(5.9)	4	(2.7)	9	(5.2)	1	(1.1)	45	(3.8)
5	3	(1.5)	9	(6.3)	10	(10.9)	6	(3.5)	3	(1.8)	0	(0.0)	1	(0.6)	1	(1.1)	33	(2.8)
TOTAL	196		144		92		173		170		150		173		85		1187	

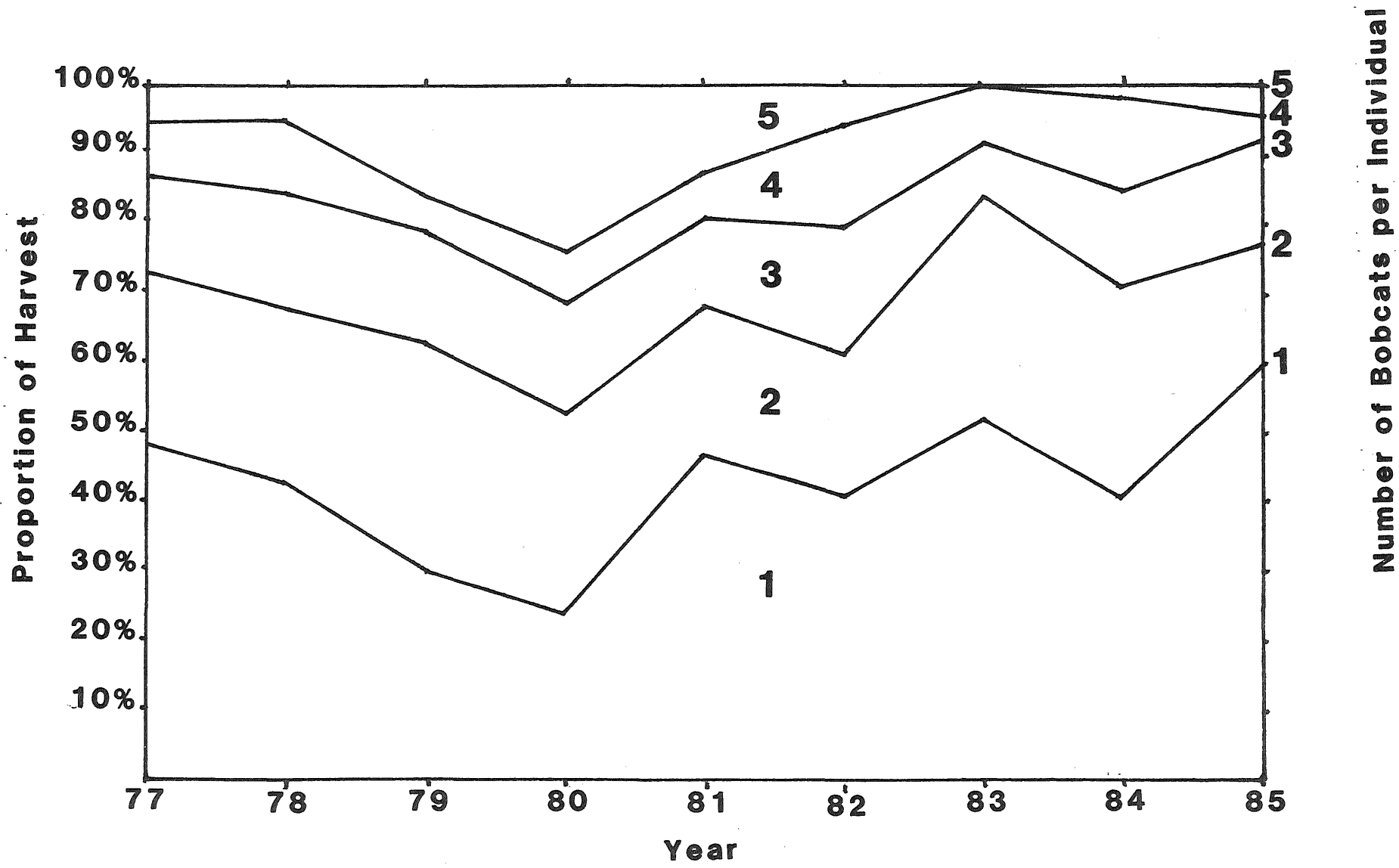

Figure 3. Distribution of proportionate bobcat harvests among trappers and hunters who took 1,2,3,4,or 5 bobcats each (1977-1985)

Table 4. Fisher harvest by county and sex. 1985 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	3	5	0	8
Becker	0	1	0	1
Beltrami	10	17	0	27
Cass	8	9	0	17
Clearwater	1	3	0	4
Cook	4	5	0	9
Crow Wing	4	2	0	6
Hubbard	1	0	0	1
Itasca	39	44	1	84
Kittson	1	0	0	1
Koochiching	61	96	0	157
Lake	21	28	0	49
Lake of the Woods	19	27	0	46
Marshall	2	3	0	5
Roseau	33	35	0	68
St. Louis	91	101	3	195
TOTAL	298	376	4	678

Table 5. Comparison of fisher harvest by county, 1981-1985

County	1981	1982	1983	1984	1985
Aitkin	9	15	5	10	8
Becker	3	2	4	3	1
Beltrami	44	41	25	96	27
Carlton	0	4	4	3	0
Cass	6	6	3	19	17
Clearwater	3	1	3	6	4
Cook	36	21	18	16	9
Crow Wing	8	6	2	8	6
Hubbard	1	0	0	7	1
Itasca	64	139	72	228	84
Kittson	0	0	6	2	1
Koochiching	142	182	123	255	157
Lake	121	115	37	80	49
Lake of the Woods	41	52	32	85	46
Mahnomen	1	0	0	0	0
Marshall	3	6	13	10	5
Pine	0	0	1	1	0
Roseau	32	36	86	111	68
St. Louis	258	286	197	345	195
Unknown	90	0	0	0	0
Total	862	912	631	1285	678

Table 6. Fisher harvest by date and sex, 1985-86 season.

Date	Sex			Total	% of Known Total	Cumulative Percent
	Male	Female	Unknown			
11/30	0	1	0	1	0.2	0.2
12/01	10	9	0	19	2.9	3.1
12/02	23	23	0	46	7.0	10.1
12/03	25	41	0	66	10.0	20.1
12/04	21	28	0	49	7.5	27.6
12/05	20	31	0	51	7.8	35.4
12/06	21	27	1	49	7.5	42.9
12/07	23	33	0	56	8.5	51.4
12/08	26	31	0	57	8.7	60.1
12/09	9	16	0	25	3.8	63.9
12/10	20	22	0	42	6.4	70.3
12/11	16	17	1	34	5.2	75.5
12/12	20	19	0	39	5.9	81.4
12/13	16	19	0	35	5.3	86.7
12/14	20	17	1	38	5.8	92.5
12/15	24	26	0	50	7.6	100.0
Unknown	1	4	16	21	—	—
TOTAL	295	364	19	678	100.0	100.0

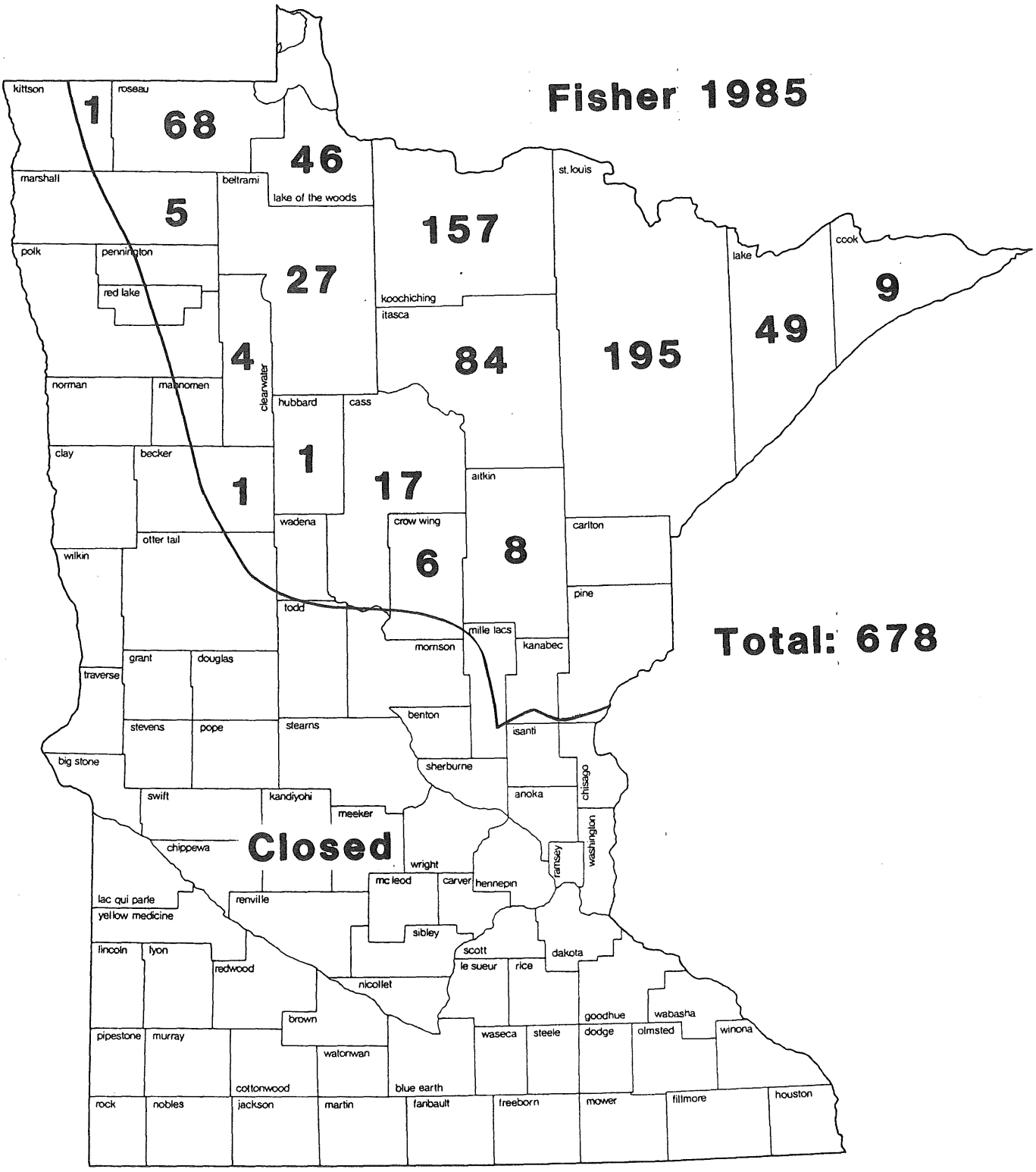

Figure 4. Fisher harvest by county, 1985-86.

Table 7. Otter harvest by county and sex, 1985-86 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	10	7	0	17
Becker	11	13	0	24
Beltrami	27	19	0	46
Carlton	7	3	0	10
Cass	32	27	0	59
Clearwater	4	2	0	6
Cook	3	2	0	5
Crow Wing	14	11	1	26
Hubbard	13	12	0	25
Itasca	59	36	1	96
Kanabec	3	1	0	4
Koochiching	24	12	2	38
Lake	17	8	0	25
Lake of the Woods	2	3	0	5
Mahnomen	9	5	0	14
Marshall	1	0	0	1
Mille Lacs	3	1	0	4
Ottertail	0	1	0	1
Pennington	0	1	0	1
Pine	12	8	0	20
Polk	4	2	0	6
Roseau	2	3	0	5
St. Louis	70	49	0	119
Wadena	2	0	0	2
TOTAL	329	226	4	559

Table 8. Comparison of otter harvest by county, 1981-1985.

County	11/14-11/28 1981	11/13-11/27 1982	11/12-11/26 1983	11/17-12/1 1984	11/16-12/15 1985
Aitkin	21	20	25	34	17
Becker	12	8	15	18	24
Beltrami	28	39	23	33	46
Carlton	11	4	5	13	10
Cass	41	36	33	35	59
Clearwater	12	9	6	11	6
Cook	15	17	4	16	5
Crow Wing	18	15	13	13	26
Hubbard	28	21	15	22	25
Itasca	48	56	69	94	96
Kanabec	13	4	9	9	4
Koochiching	32	23	26	34	38
Lake	13	15	20	18	25
Lake of the Woods	8	9	11	13	5
Mahnomen	2	2	2	3	14
Marshall	0	0	2	0	1
Mille Lacs	8	2	7	7	4
Ottertail	0	1	1	1	1
Pennington	1	0	0	0	1
Pine	17	21	14	29	20
Polk	5	3	4	5	6
Red Lake	1	3	0	0	0
Roseau	7	3	3	5	5
St. Louis	125	69	96	96	119
Wadena	4	4	4	2	2
Unknown	15	1	1	2	0
TOTAL	471	385	408	513	559

Table 9. Otter harvest by date and sex, 1985-86 season.

Date	Sex			Total	% of Total	Cumulative Percent
	Male	Female	Unknown			
11/16	4	0	0	4	0.7	0.7
11/17	20	22	0	42	7.5	8.2
11/18	29	21	1	51	9.1	17.3
11/19	21	14	0	35	6.3	23.6
11/20	26	15	0	41	7.3	30.9
11/21	15	6	0	21	3.8	34.7
11/22	14	15	0	29	5.2	39.9
11/23	14	9	0	23	4.1	44.0
11/24	10	5	1	16	2.9	46.9
11/25	12	10	0	22	3.9	50.8
11/26	8	1	0	9	1.6	52.4
11/27	8	6	0	14	2.5	54.9
11/28	8	5	0	13	2.3	57.2
11/29	4	5	0	9	1.6	58.8
11/30	15	7	1	23	4.1	62.9
12/01	19	8	0	27	4.8	67.7
12/02	13	6	0	19	3.4	71.1
12/03	9	9	0	18	3.2	74.3
12/04	7	5	1	13	2.3	76.6
12/05	8	6	0	14	2.5	79.1
12/06	0	3	0	3	0.5	79.6
12/07	9	7	0	16	2.9	82.5
12/08	11	4	0	15	2.7	85.2
12/09	5	5	0	10	1.8	87.0
12/10	8	4	0	12	2.1	89.1
12/11	2	4	0	6	1.1	90.2
12/12	3	5	0	8	1.4	91.6
12/13	3	1	0	4	0.7	92.3
12/14	5	1	0	6	1.1	93.4
12/15	4	3	0	7	1.3	94.7
Unknown	9	5	15	29	5.3	100.0
TOTAL	323	217	19	559	100.0	100.0

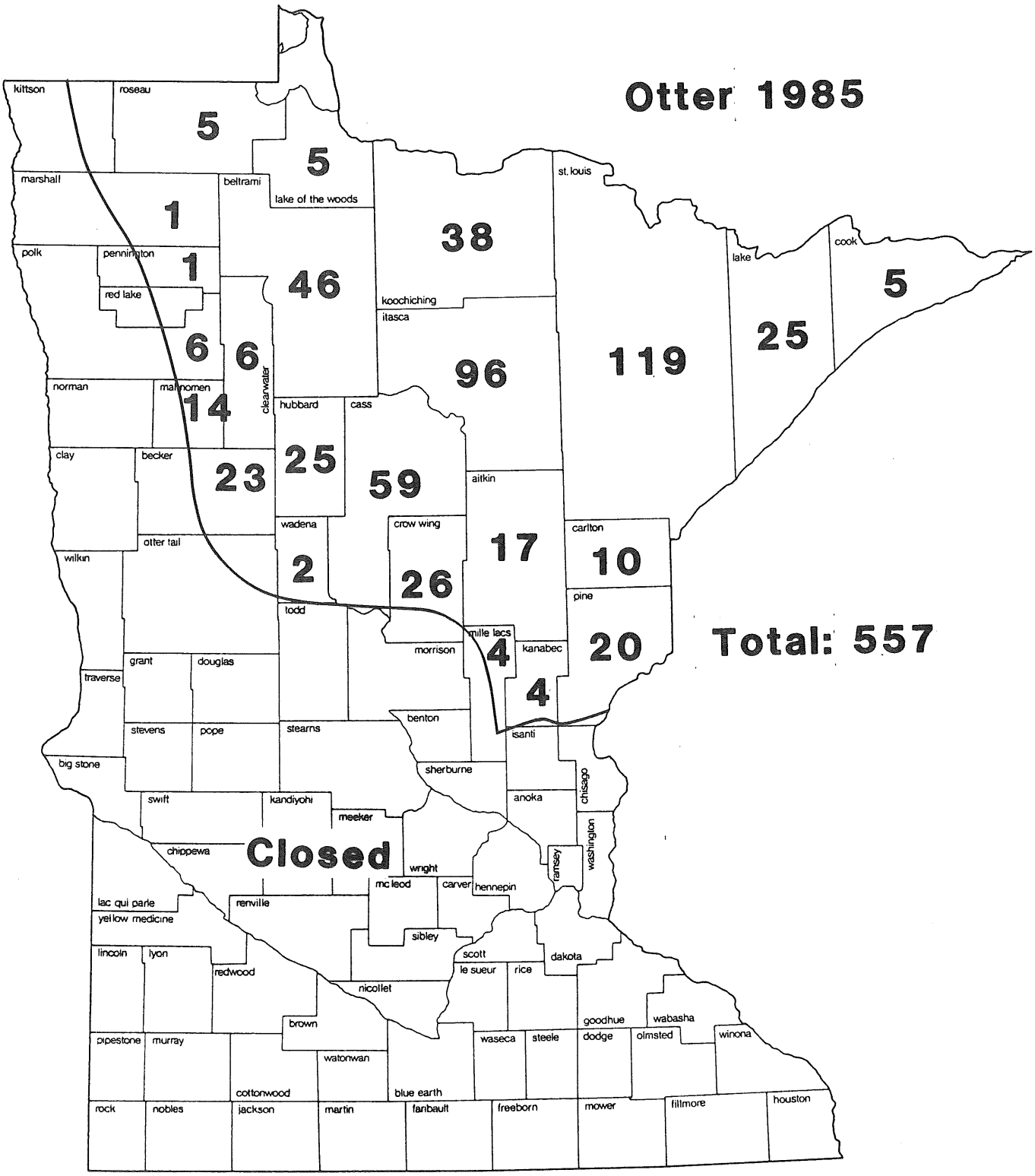

Figure 5. Otter harvest by county, 1985-86.

Table 10. Marten harvest by county and sex, 1985-86.

County	Sex			Total
	Male	Female	Unknown	
Cook	35	16	0	51
Koochiching	42	30	0	72
Lake	99	17	3	119
St. Louis	119	66	3	188
TOTAL	295	129	6	430

Table 11. Marten harvest by date and sex, 1985-86.

Date	Male	Female	Unknown	Total	% of Total	Cumulative Percent
11/30	1	1	0	2	0.5	0.5
12/1	25	5	1	31	7.5	8.0
12/2	20	3	0	23	5.5	13.5
12/3	38	12	2	52	12.5	26.0
12/4	15	4	0	19	4.6	30.6
12/5	16	12	0	28	6.7	37.3
12/6	12	7	0	19	4.6	41.9
12/7	23	16	1	40	9.6	51.5
12/8	24	16	0	40	9.6	61.1
12/9	14	9	0	23	5.5	66.6
12/10	26	13	0	39	9.4	76.0
12/11	12	1	0	13	3.1	79.1
12/12	17	4	1	22	5.3	84.4
12/13	11	4	1	16	3.9	88.3
12/14	23	12	0	35	8.4	96.7
12/15	11	2	0	13	3.1	100.0
Unknown	4	3	8	15	—	—
TOTAL	292	124	14	430	100.0	100.0

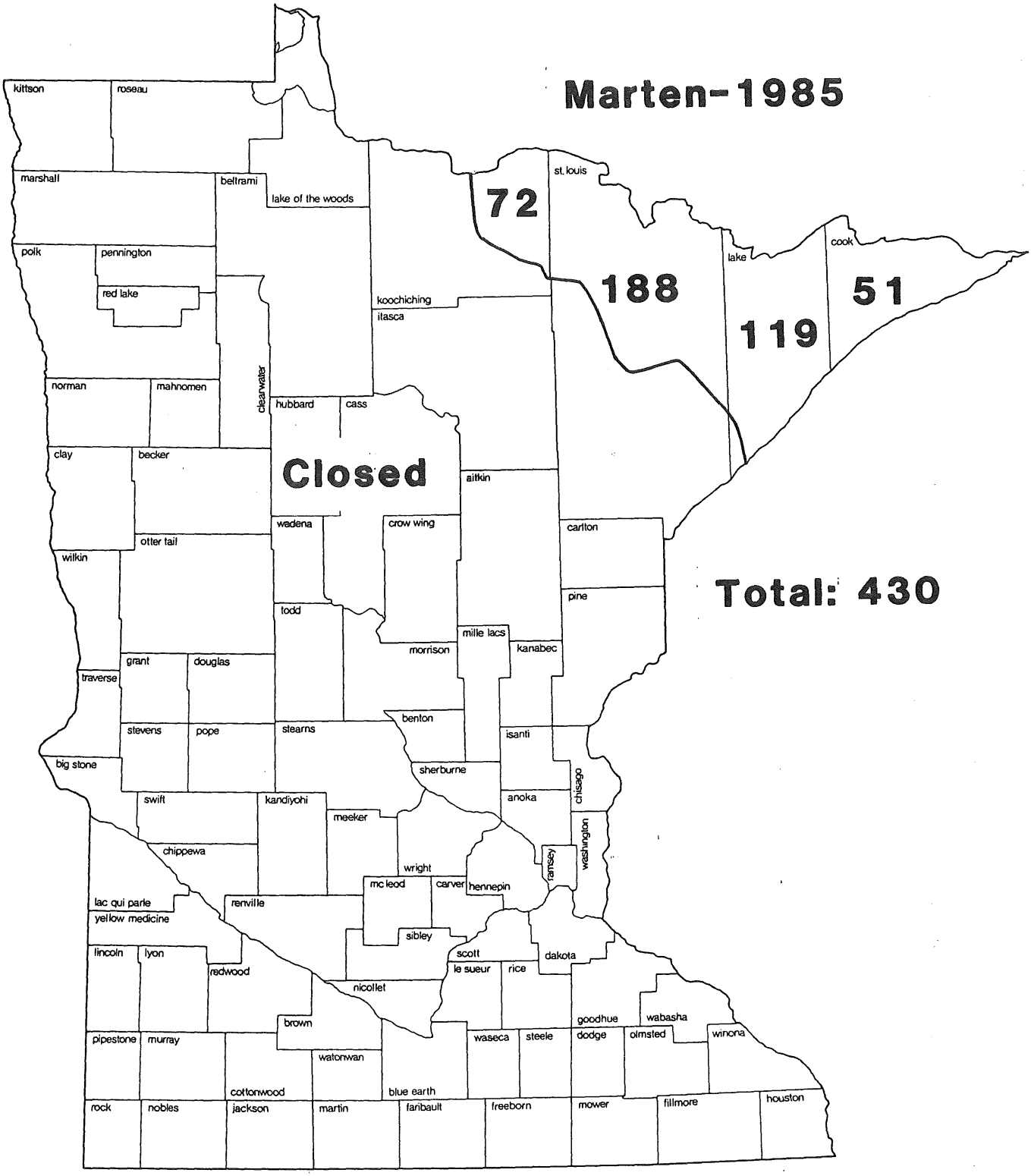

Figure 6. Marten harvest by county, 1985-86.

MARTEN 1985-86

Bill Berg and Dave Kuehn. Forest Wildlife Populations and Research Group
Minnesota Department of Natural Resources

Minnesota's first pine marten season since 1933 was held concurrently with the fisher season from Nov. 30 to Dec. 15, 1985. The projected marten harvest was modeled at 500-700; actual harvest totals for 1985 were 430 registered, and 153 accidentally taken and surrendered to Conservation Officers.

A total of 507 marten carcasses were submitted for examination. Juveniles comprised 73% of the harvest, compared to 60% for all accidentally trapped marten during 1978-1984 (Table 1). Males predominated in all age classes (possibly due to their greater pelt value), and comprised 69%, 68% and 82%, respectively, of the juvenile, yearling, and adult age classes. A paucity of adult females in the harvest precluded analysis of reproductive tracts; reproductive parameters used in population modeling were based on conservative inferences from pine marten literature.

Simulations of the effects of harvest on the population were based on (1) martens accidentally taken or confiscated prior to 1985, (2) carcass examinations prior to 1985, (3) 1985 carcass examination and harvest data, and (4) a post-1985 projected registered and accidental harvest of 600 martens annually. For modeling purposes registered and accidental harvests were increased by 50%.

Prior to 1985, modeling suggests that the marten population had been growing at 7-16% annually. With an estimated harvest of 18% of the available autumn population in 1985, this growth was slowed to about 2%. Future annual population growth approximates 5-8% with a combined registered and accidental harvest of 900 annually (Fig. 1).

Table 1. Pine marten harvest and carcass examination data for martens accidentally taken during 1978-84 (combined) and during the 1985 season.

	1978-84 (combined)	1985
Registered take	----	430
Carcasses examined	227	507
% juveniles	60%	73%
% 1.7 years old	30%	18%
% $\geq$ 2.7 years old	10%	9%
% male juveniles	68%	69%
% male 1.7 years old	71%	68%
% male $\geq$ 2.7 years old	91%	82%
Juv/$\geq$ 2.7 year old female	68	45
% of autumn pop. trapped (derived from modeling)	----	18%

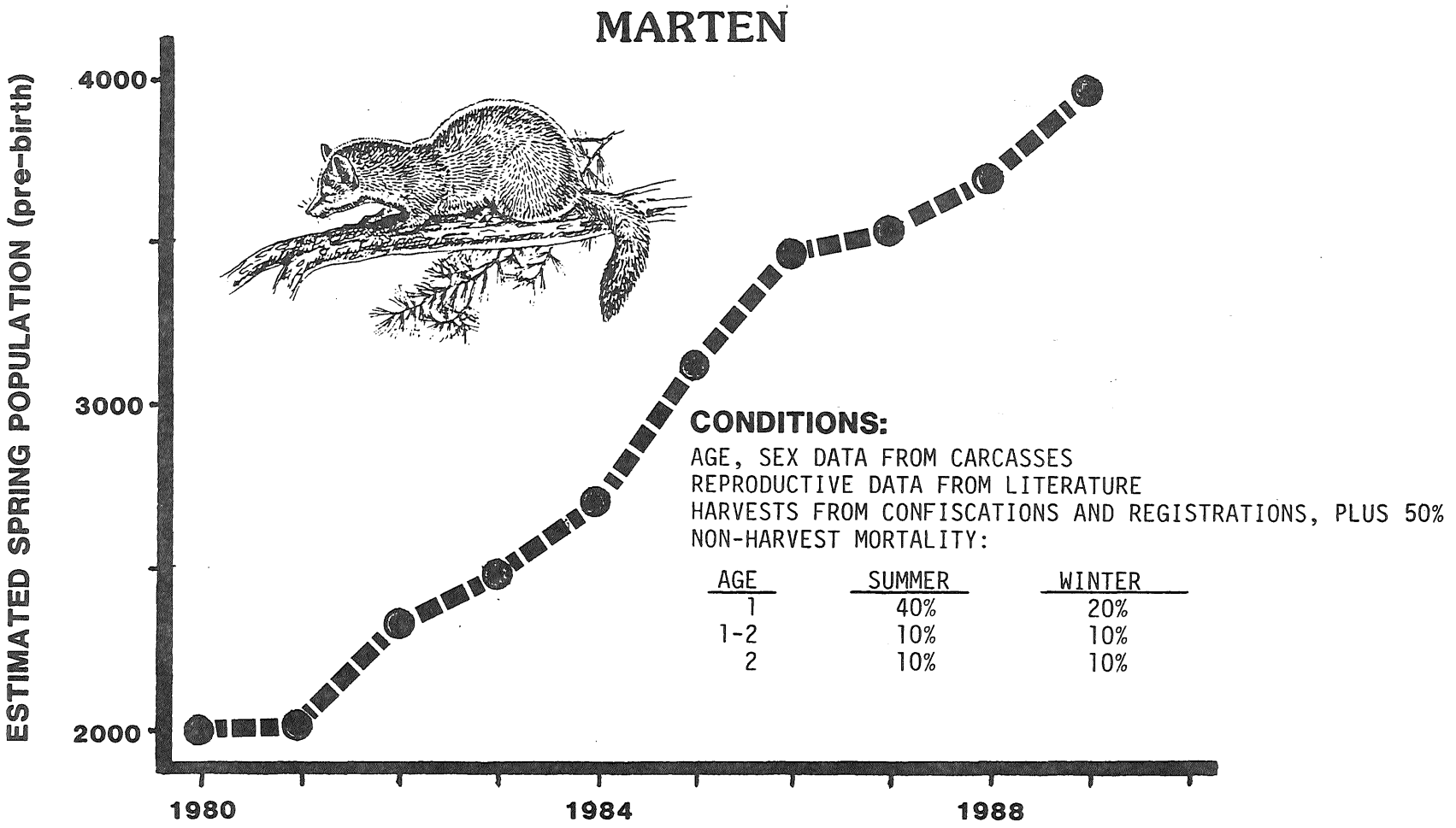

Figure 1. Pine marten population model, 1979-1988. The first trapping season was in 1985. The projected total 1986 and 1987 harvests are 900 annually.

OTTER, 1985-86

Bill Berg and Dave Kuehn, Forest Wildlife Populations and Research Group
Minnesota Department of Natural Resources

The Nov. 16 to Dec. 15 1985 otter season was Minnesota's first 30 day otter season on record, and had the first 3-otter limit since 1979. A total of 559 otters were registered, and 572 carcasses were submitted for examination under the mandatory carcass surrender program which began in 1981. Carcasses were from otters taken legally under both the DNR and Leech Lake Indian Reservation season frameworks, and from otters taken accidentally and submitted to Conservation Officers.

Otter age and sex parameters, based on carcass examinations, were similar to previous years. Juveniles (< 1year) represented 43% of the harvest, compared to 48% in 1984 (Table 1). Adults ($\geq$ 2.7 years) comprised 34% of the harvest; 43% of the adults were males. Males comprised 51% of the total harvest (Table 1).

Population modeling suggests that the otter population has increased steadily since 1982, despite several animals being taken accidentally each spring. With registered harvests, plus an estimated accidental harvest of 20%, approximately 10%-12% of the autumn otter population has been harvested annually since 1982. This has allowed an annual population increase of 2% - 6%. (Fig. 1).

Table 1. Otter harvest and sex-age data in Minnesota, 1978-1985.

	1978	1979	1980	1981	1982	1983	1984	1985
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
Registered harvest	636	1186	1111	485	385	408	513	559
% of autumn population harvested[1]	11%	20%	20%	14%	12%	11%	10%	10%
No. carcasses examined	49	36	88	471	389	433	549	572
% juveniles	61.2	69.4	54.5	55.0	50.6	42.3	47.9	43.4
% yearlings	26.5	19.4	14.7	19.7	25.6	30.9	23.3	22.9
% male juveniles	59.4	72.0	39.6	55.6	56.7	55.7	47.1	53.3
% males $\geq$ 1.7 yrs.	47.1	36.4	57.5	53.3	65.1	56.8	50.0	50.0
Mean pelt price:								
otter	$59	$63	$33	$30	$26	$25	$22	----
beaver	$18	$33	$18	$14	$11	$12	$11	----

[1] From population modeling; includes an additional 20% accidental harvest above carcass total. (See Fig. 1).

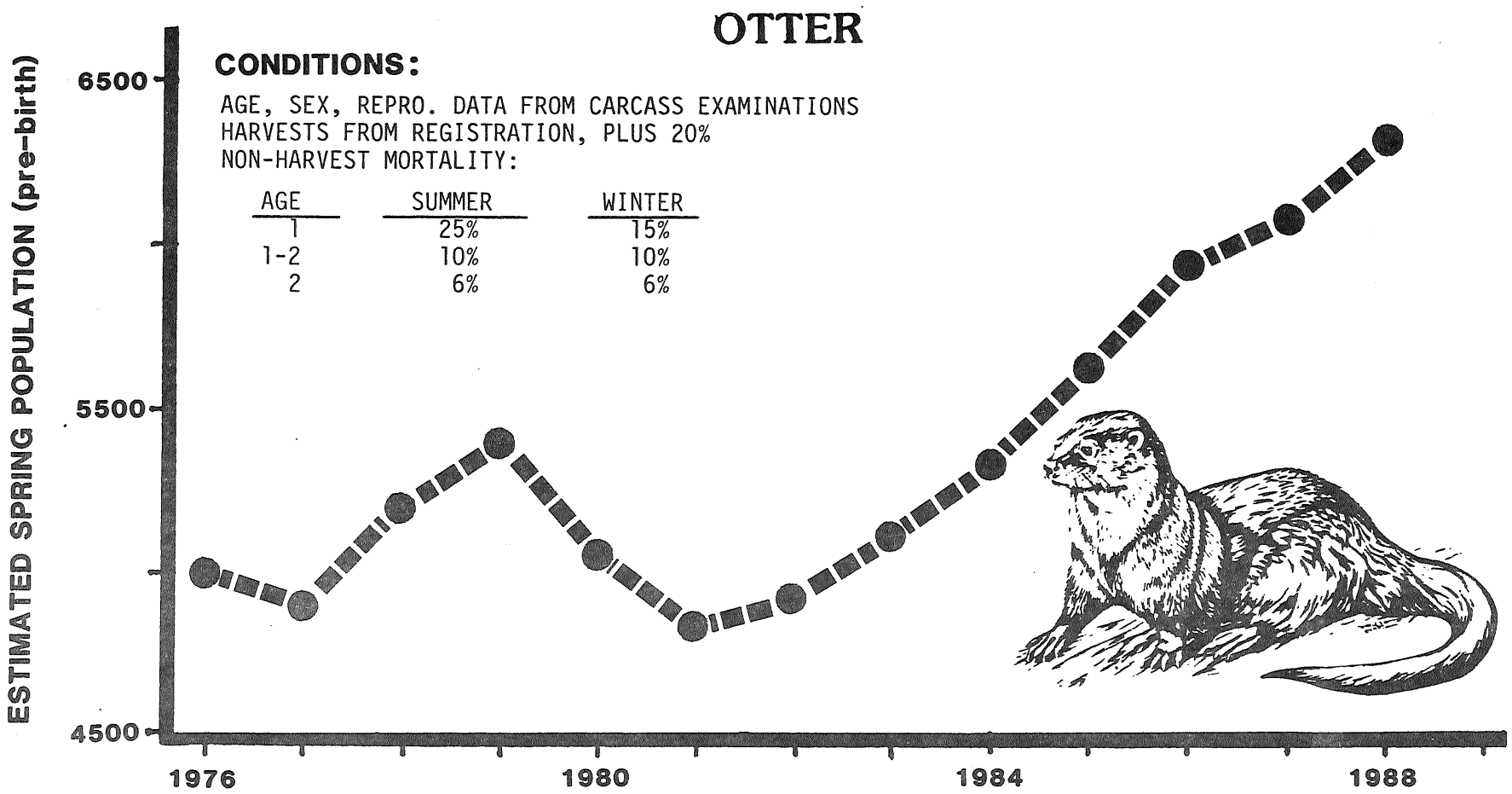

Figure 1. Otter population model, 1976-1988. The total projected 1986 and 1987 harvests are 900 annually.

BOBCATS, 1985-86

Bill Berg and Dave Kuehn, Forest Wildlife Populations and Research Group
Minnesota Department of Natural Resources

During the Nov. 30 to Jan. 19 state-wide bobcat trapping and hunting season, 119 bobcats were registered. This harvest represents a 58% decrease from 1984-85, and is the second lowest since registration began in 1977 (Table 1). Possible reasons are the deep snow in the main bobcat range which restricted access, and reduced bobcat survival due to the prolonged snowshoe hare decline.

A total of 99 bobcat carcasses were submitted for examination under the mandatory carcass surrender program. Most sex, age, and reproductive parameters were similar to previous seasons (Table 1). Juveniles, yearlings, and adults comprised 33%, 19%, and 48%, respectively, of the harvest. Females dominated all harvest age classes, and comprised 58% of the over-all take (Table 1). During the two years of low bobcat harvests (1977-78 and 1985-86), yearling and adult females predominated.

Modeling of Minnesota's bobcat population is complicated by the absence of data on non-harvest mortality, and an inadequate population survey technique. Although inutero reproductive parameters have not changed through the snowshoe hare decline, juvenile bobcat survival was reduced (for modeling purposes only) by approximately 36% for the period 1983 to 1986. The net effect simulates a reduced population (Fig. 1).

A harvest < 12%-13% of the autumn population results in a stable or increasing population; harvests > 14% generally result in a decline. A harvest of less than 200 bobcats during the next two seasons will stabilize the current (modeled) population decline. It is recommended that the current bobcat season framework be adjusted to permit the population to rebuild. The projected snowshoe hare increase should facilitate this process.

Table 1. Bobcat harvest, carcass examination, scent post survey[1], and snowshoe hare index[2] data, 1977-78 to 1985-86.

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

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

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

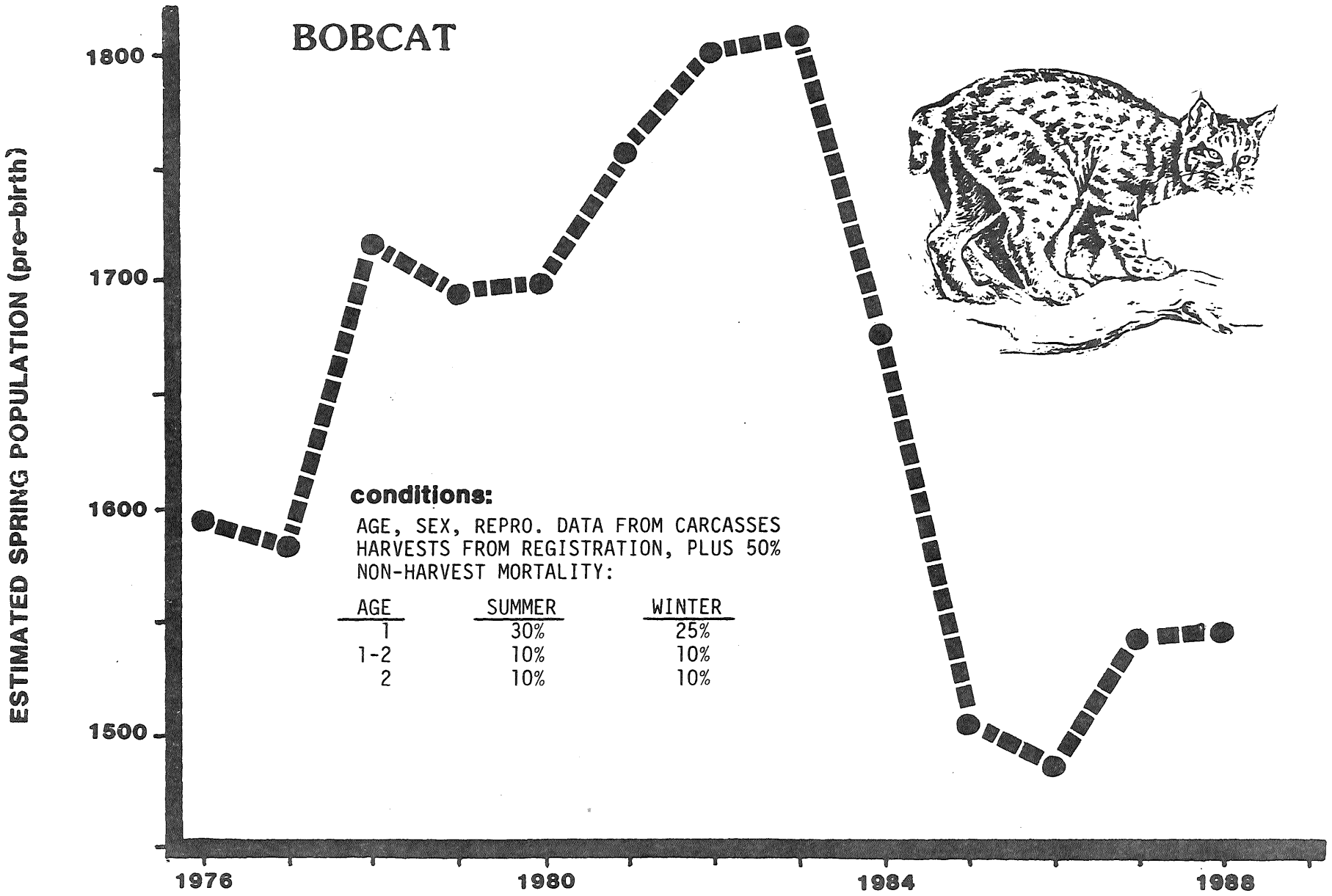

Figure 1. Bobcat population model, 1976-1988. Reproduction was reduced 38% in 1983-1986 due to the lack of snowshoe hares. Projected total harvests in 1986=220; in 1987=276.

FISHER, 1986-86

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A total of 678 fisher were registered during the Nov. 30-Dec. 15 trapping season. The 47% decline from the 1984-85 harvest was in part due to deep snows which greatly reduced access, and to a perhaps slightly lower population due to the extended snowshoe hare decline.

Mandatory carcass surrender from fisher trapped during both the DNR and Leech Lake Indian Reservation seasons provided 712 carcasses for examination. The age structure was similar to previous harvests, with juveniles (0.7 yr.), yearlings (1.7 yrs.), and adults ($\geq$ 2.7 yrs.) comprising 63%, 20%, and 17%, respectively, of the harvest (Table 1). Males comprised 43% of the total harvest; the sex ratio ranged from 34% males in the adult age class ($\bar{x}$=41%) to 46% for juveniles ($\bar{x}$=49%). The juveniles per adult female ratio was 5.4:1, the lowest since fisher seasons began in 1977. This reduction may be due to increased vulnerability of females due to reduced hare numbers in 1981-84 (r=0.82); in 1977-79 the reduction was likely due to increased trapping pressure (r=-0.98).

Although no change in inutero reproductive parameters was noted in 1985, the fisher population model was adjusted by reducing juvenile survival during 1983-1986 due to the hare decline. This reduction has the effect of slowing the population increase begun in 1980 (Fig. 1). The proportion of the autumn population harvested in 1985 was 9-12%; due to perhaps lower productivity the proportion taken in 1984 was revised (from 15%) to 17-19%.

Because of the continued restricted harvest, and projected hare population recovery, no change in the 1986 fisher season framework is suggested.

Table 1. Harvest, carcass collection, and pelt price data for fisher seasons in Minnesota, 1977 to 1985. 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
Season	12/1-1/31	12/1-1/31	12/1-1/31	closed	12/1-10	12/1-10	12/1-11	12/1-16	11/30-12/15
Limit	3	3	3	----	1	1	1	1	1
Registered take	2150	2426	3032	(423)	862	912	631	1285	678
% of available autumn population harvested[1]	24%	28%	39%	8%	15%	14%	9-10%	17-19%	9-12%
No. carcasses examined	562	577	467	----	843	1073	662	1270	712
% juveniles	69.2%	69.8%	64.8%	----	66.2%	66.4%	68.9%	62.9%	62.8%
% 1.7 yr.	16.4%	16.5%	14.6%	----	23.8%	18.9%	18.0%	19.8%	19.6%
% $\geq$ 2.7 yrs.	14.4%	13.7%	20.6%	----	10.0%	14.6%	13.1%	17.2%	17.5%
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
% male juveniles	53.5%	43.7%	53.5%	----	48.0%	46.0%	45.2%	51.9%	45.8%
% male 1.7 yrs.	28.2%	34.7%	45.6%	----	42.7%	40.9%	39.5%	45.2%	40.3%
% male $\geq$ 2.7 yrs.	43.2%	27.8%	43.8%	----	36.9%	51.6%	40.2%	44.7%	33.8%
Pelt price: males	$71	$132	$108	$90	$94	$70	$71	$70	----
females		$147	$128	$104	$110	$99	$121	$122	----
Snowshoe hare index[2]	9.0	8.8	14.1	9.8	1.8	0.7	0.2	0.3	

[1]estimated from population model

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

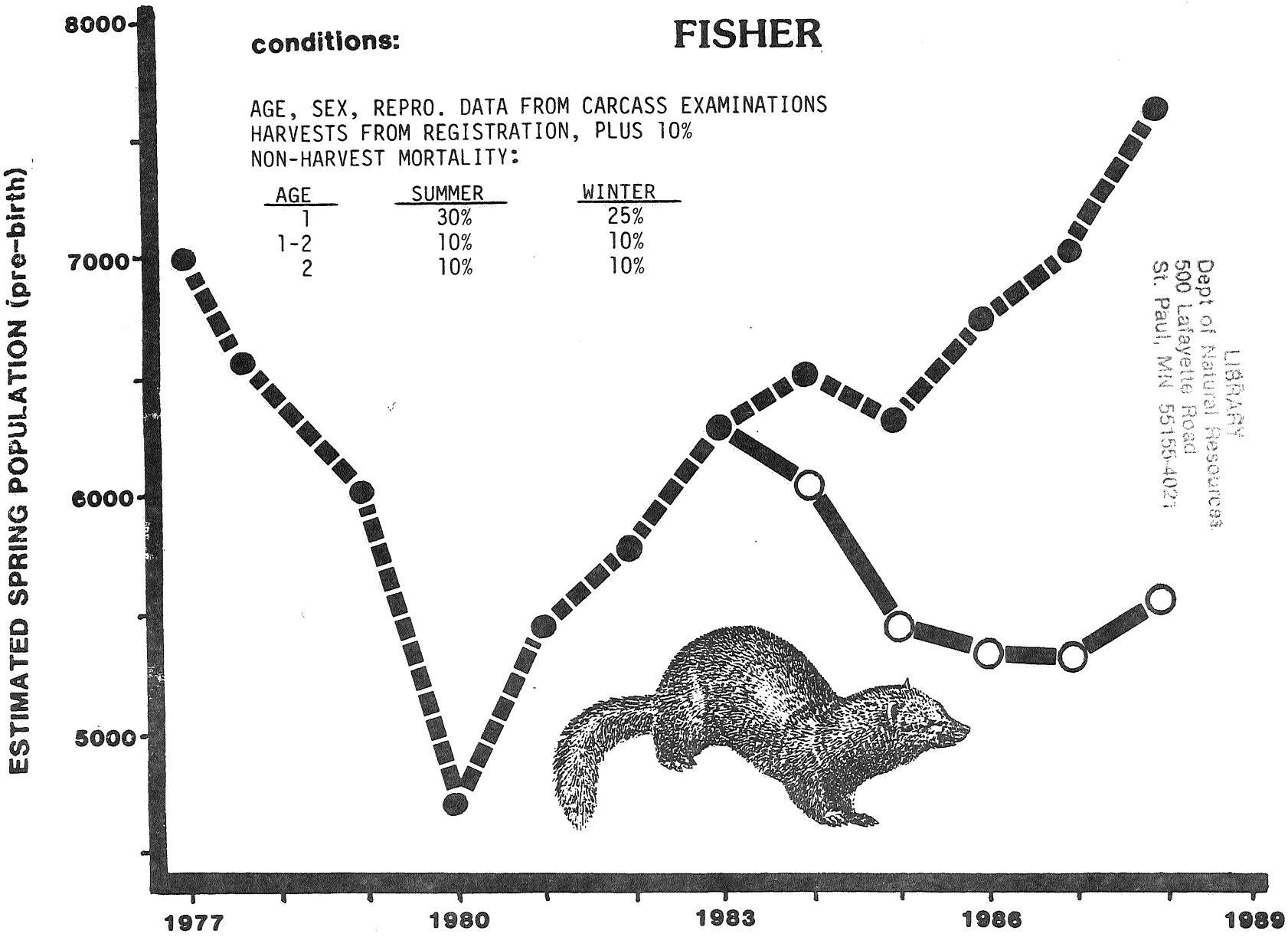

Figure 1. Fisher population model, 1977-1988. To account for the reduction in snowshoe hares and their possible affect on juvenile survival, reproduction in 1983-86 was reduced for two cases: ▬ =37%; ▬▬ =23%. Post-1985 harvests are 1430 annually.