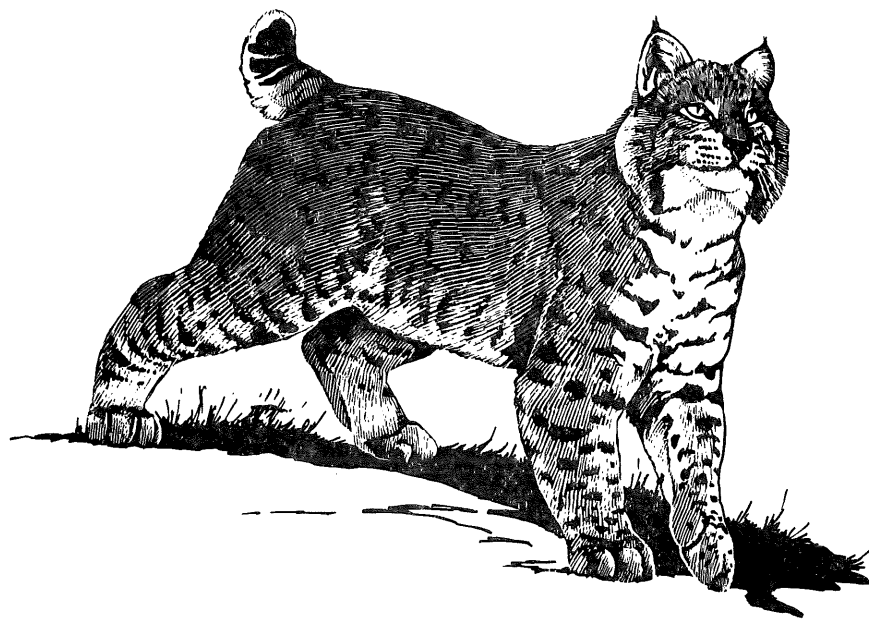


1983-84
MINNESOTA
FURBEARER
REGISTRATION
STATISTICS



BOBCAT, LYNX, FISHER AND OTTER HARVEST STATISTICS--1983-84

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This report summarizes furbearer registration statistics for Minnesota for the 1983-84 season. Except for otter, registered harvests in 1983-84 were generally lower than last year. For fisher and bobcat, this decline appears to have been primarily caused by heavy snow conditions and the resulting reduction in trapper access, particularly in eastern portions of the North Furbearer Zone.

For lynx, the expected influx of dispersing animals from Ontario failed to occur, with most lynx again coming from northwestern Minnesota in the Lake of the Woods area. It now appears that lynx numbers in Minnesota peaked during the 1979-80 season, when 42 were registered. Although this number is far below previous estimated harvests during peak years, this is the first cycle during which there has been a restricted lynx taking season.

May 21, 1984

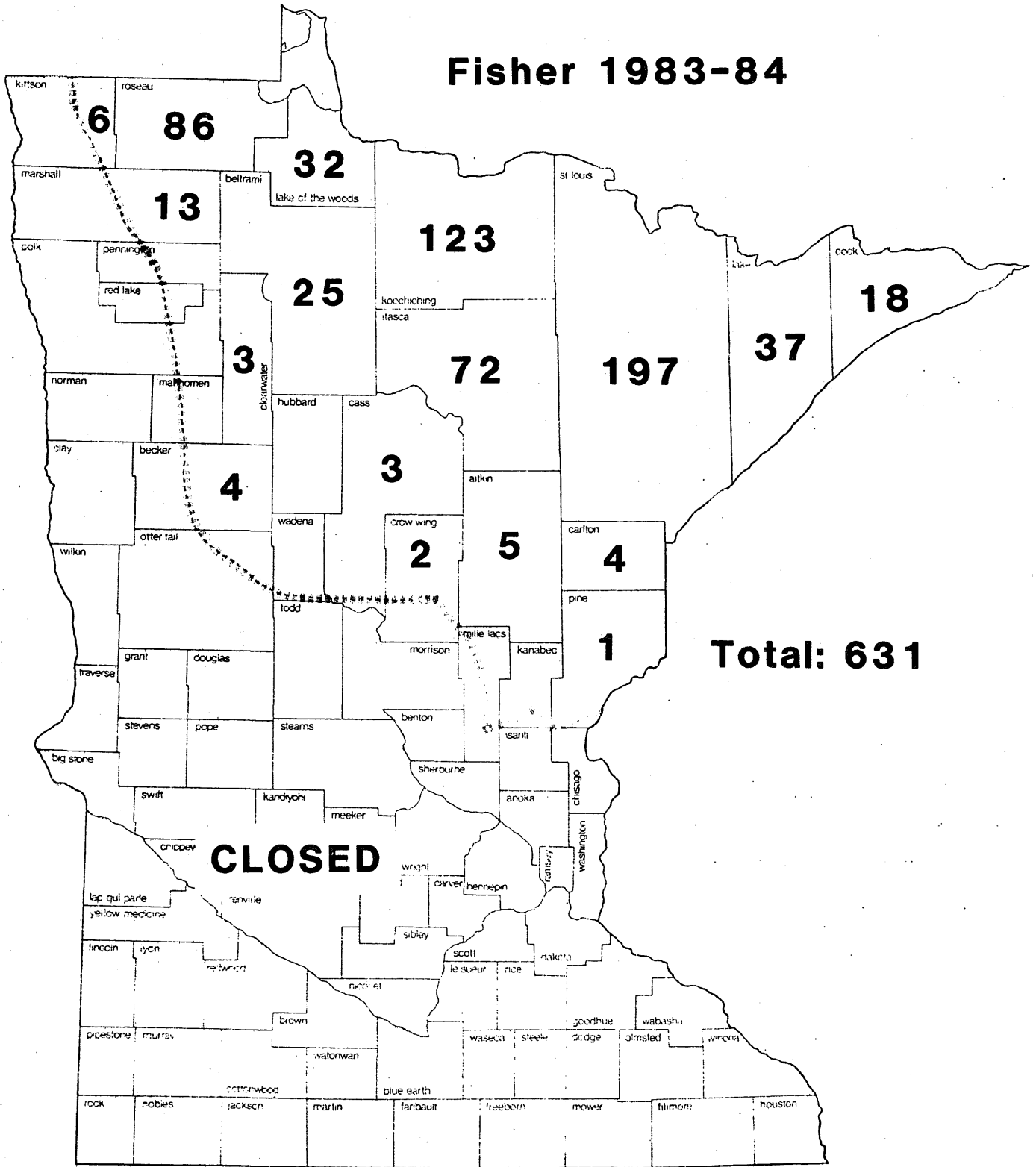


Figure 1. Registered harvest of fisher by county, 1983-84 season.

Table 1. Fisher harvest by county and sex, 1983 season.

County	Sex			Total
	Male	Female	Unknown	
Aitkin	1	4	0	5
Becker	2	2	0	4
Beltrami	16	9	0	25
Carlton	2	2	0	4
Cass	3	0	0	3
Clearwater	1	2	0	3
Cook	5	13	0	18
Crow Wing	1	1	0	2
Itasca	27	44	1	72
Kittson	5	1	0	6
Koochiching	56	67	0	123
Lake	14	23	0	37
Lake of the Woods	13	19	0	32
Marshall	7	6	0	13
Pine	1	0	0	1
Roseau	41	45	0	86
St. Louis	73	124	0	197
TOTAL	268	362	21	631

Table 2. Comparison of fisher harvest by county, 1979-1983^a

County	1979-80	1981	1982	1983
Aitkin	18	9	15	5
Becker	14	3	2	4
Beltrami	204	44	41	25
Carlton	4	0	4	4
Cass	27	6	6	3
Clearwater	9	3	1	3
Cook	60	36	21	18
Crow Wing	9	8	6	2
Hubbard	3	1	0	0
Isanti	27	closed	closed	closed
Itasca	396	64	139	72
Kittson	0	0	0	6
Koochiching	556	142	182	123
Lake	313	121	115	37
Lake of the Woods	143	41	52	32
Mahnomen	7	1	0	0
Marshall	25	3	6	13
Pennington	6	0	0	0
Pine	1	0	0	1
Polk	3	0	0	0
Red Lake	3	0	0	0
Roseau	95	32	36	86
St. Louis	1,106	258	286	197
Unknown	3	90	0	0
TOTAL	3,032	862	912	631

^aThere was no fisher season during the winter of 1980-81.

Table 3. Fisher harvest by date and sex, 1983-84 season.

Date	Sex			Total	% of Total	Cumulative Percent
	Male	Female	Unknown			
12/01	3	2	1	6	0.9	0.9
12/02	20	36	0	56	8.9	9.8
12/03	47	59	0	106	16.8	26.6
12/04	32	60	0	92	14.5	41.1
12/05	26	39	0	65	10.3	51.4
12/06	22	31	0	53	8.4	59.8
12/07	31	34	0	65	10.3	70.1
12/08	14	30	0	44	7.0	77.1
12/09	27	29	0	56	8.9	86.0
12/10	25	18	0	43	6.8	92.8
12/11	13	9	1	23	3.7	96.5
Unknown	7	15	0	22	3.5	100.0
TOTAL	268	362	2	631	100.0	100.0

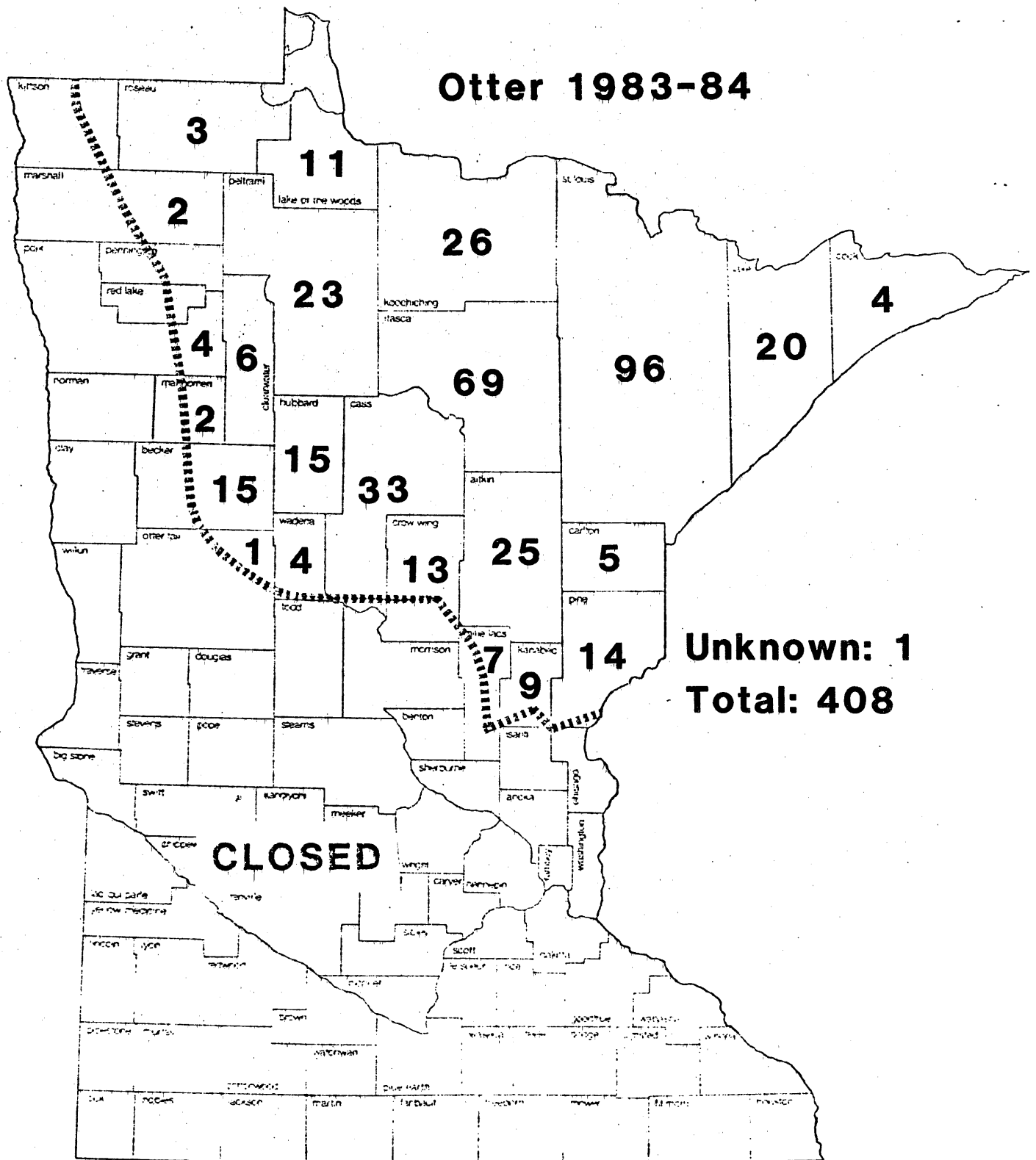


Figure 2. Registered harvest of otter by county, 1983-84 season.

Table 4. Otter harvest by county and sex, 1983 season.

County	Sex		Total
	Male	Female	
Aitkin	15	10	25
Becker	9	6	15
Beltrami	17	6	23
Carlton	4	1	5
Cass	19	14	33
Clearwater	5	1	6
Cook	4	0	4
Crow Wing	9	4	13
Hubbard	12	3	15
Itasca	42	27	69
Kanabec	3	6	9
Koochiching	15	11	26
Lake	12	8	20
Lake of the Woods	6	5	11
Mahnomen	2		2
Marshall	2	0	2
Mille Lacs	6	1	7
Ottertail	1	0	1
Pine	9	5	14
Polk	3	1	4
Roseau	3	0	3
St. Louis	51	45	96
Wadena	1	3	4
Unknown	1	0	1
TOTAL	251	157	408

Table 5. Comparison of otter harvest by county, 1980-1983.

County	15-29 Nov. 1980	14-28 Nov. 1981	13-27 Nov. 1982	12-26 Nov. 1983
Aitkin	74	21	20	25
Becker	31	12	8	15
Beltrami	47	28	39	23
Carlton	17	11	4	5
Cass	69	41	36	33
Chisago	closed	1 (closed)	closed	closed
Clearwater	16	12	9	6
Cook	28	15	17	4
Crow Wing	37	18	15	13
Hubbard	47	28	21	15
Itasca	133	48	56	69
Kanabec	23	13	4	9
Koochiching	92	32	23	26
Lake	81	13	15	20
Lake of the Woods	29	8	9	11
Mahnomen	0	2	2	2
Marshall	0	0	0	2
Mille Lacs	2	8	2	7
Ottertail	0	0	1	1
Pennington	1	1	0	0
Pine	45	17	21	14
Polk	6	5	3	4
Red Lake	0	1	3	0
Roseau	13	7	3	3
St. Louis	319	125	69	96
Wadena	1	4	4	4
Unknown	0	14	1	1
TOTAL	1,111	471	385	408

Table 6. Otter harvest by date and sex, 1983 season.

Date	Sex			Total	%of Total	Cumulative Percent
	Male	Female	Unknown			
11/12	5	3	0	8	2.0	2.0
11/13	24	18	0	42	10.3	12.3
11/14	36	17	0	53	13.0	25.3
11/15	32	20	0	52	12.7	38.0
11/16	20	10	0	30	7.3	45.3
11/17	10	10	0	20	4.9	50.2
11/18	16	17	0	33	8.1	58.3
11/19	12	10	0	22	5.4	63.7
11/20	19	12	0	31	7.6	71.3
11/21	12	7	0	19	4.7	76.0
11/22	8	7	0	15	3.7	79.7
11/23	15	9	0	24	5.9	85.6
11/24	14	7	0	21	5.1	90.7
11/25	10	5	0	15	3.7	94.4
11/26	14	4	0	18	4.4	98.8
Unknown	1	0	4	5	1.2	100.0
TOTAL	248	156	4	408	100.0	100.0

Table 7. Comparison of lynx harvest by county, 1979-80 - 1983-84.

County	1979-80	1980-81	1981-82 ^a	1982-83	1983-84
Becker	0	0	0	1	0
Beltrami	1	0	0	2	2
Carlton	0	0	1	1	0
Cook	0	0	0	0	1
Crow Wing	0	0	0	1	0
Itasca	3	1	2	0	0
Koochiching	10	2	0	1	1
Lake	11	2	0	5	0
Lake of the Woods	8	5	10	8	2
Mahnomen	1	0	0	0	0
Marshall	0	0	0	0	1
Martin	0	0	0	1	0
Morrison	0	0	1	0	0
Pine	0	0	0	1	0
Roseau	3	3	1	5	1
St. Louis	5	2	2	2	1
Unknown	0	3	0	0	0
TOTAL	42	16	17	28	9

^aNortheast 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.

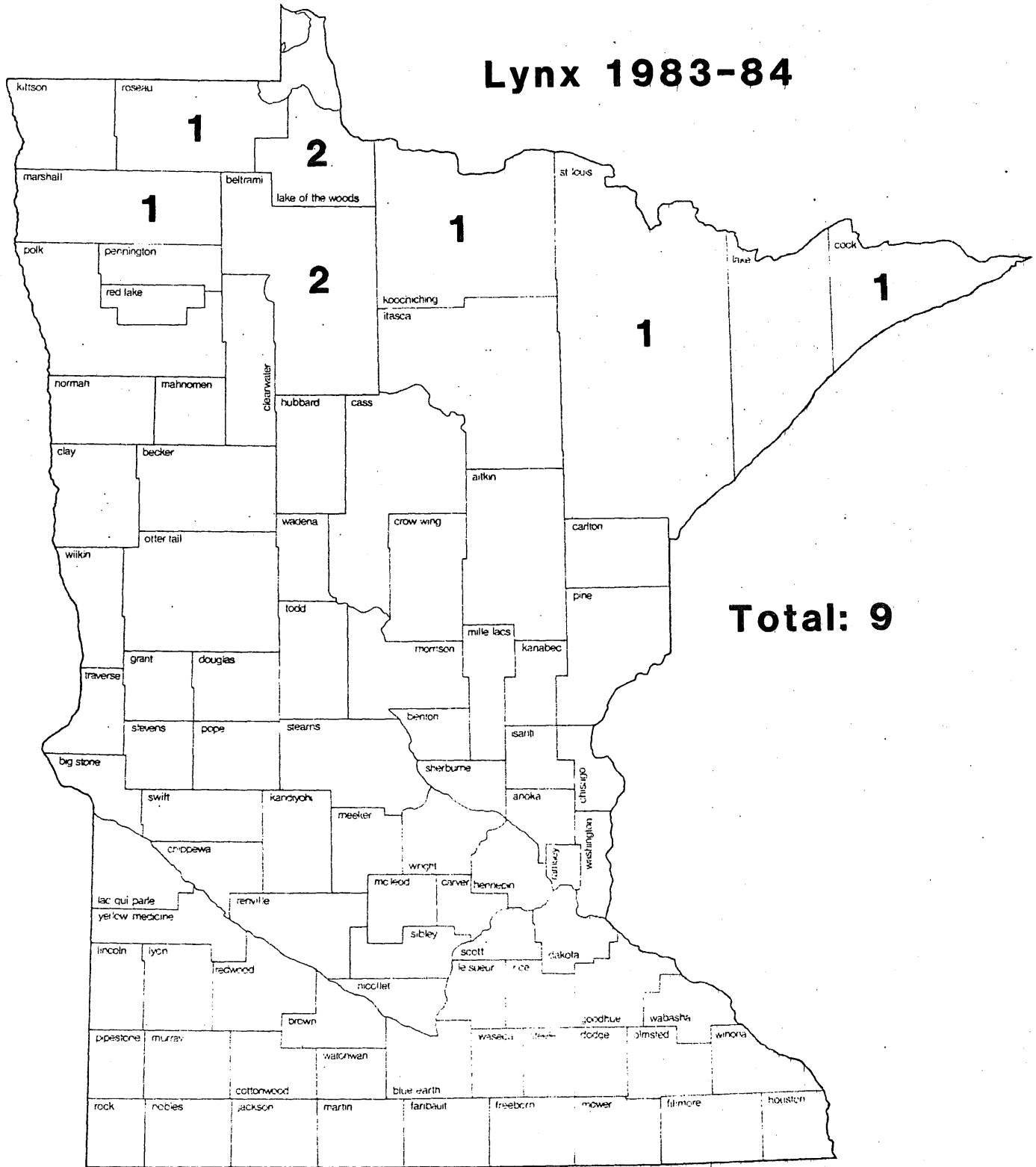
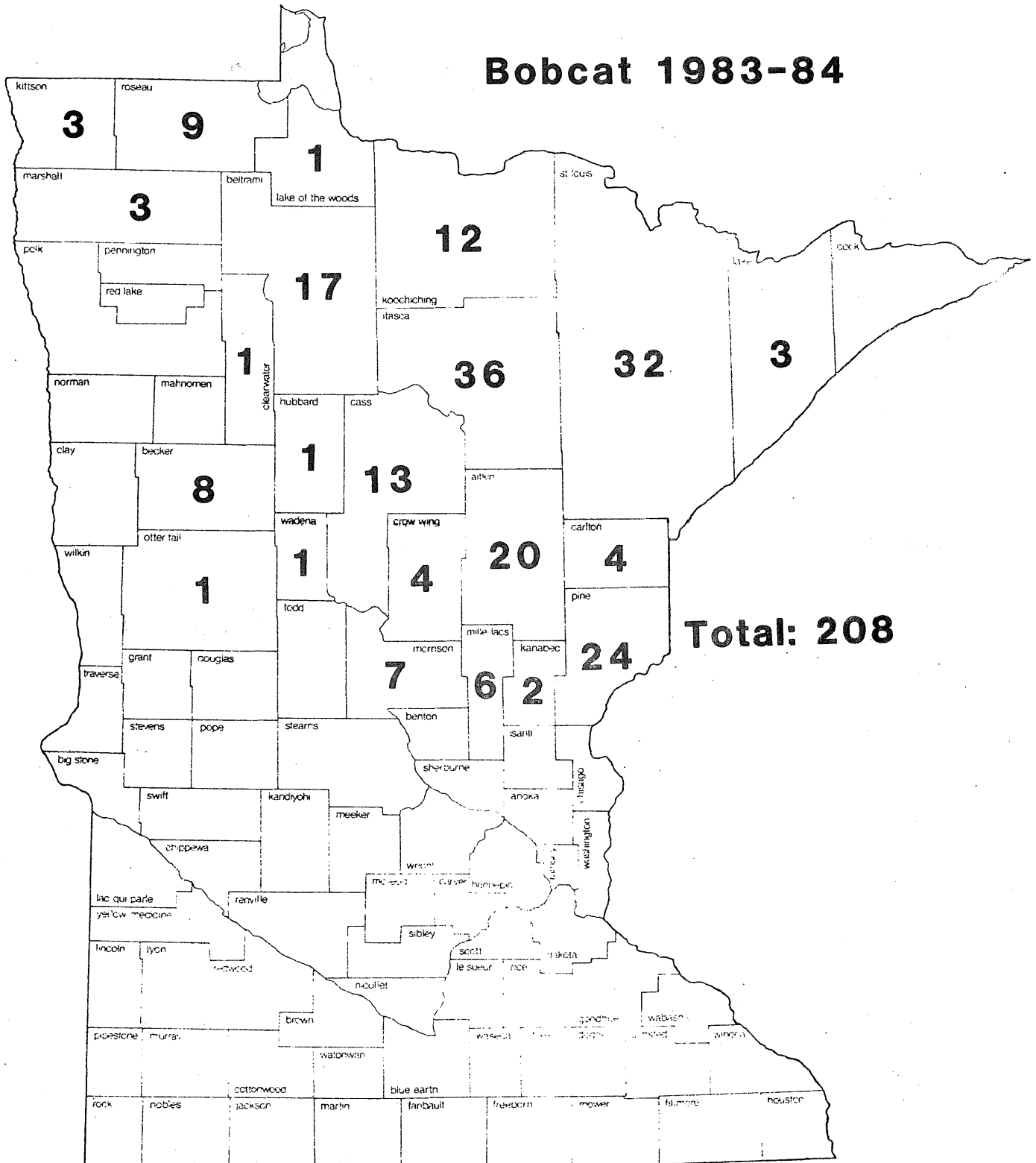


Figure 3. Registered harvest of lynx by county, 1983-84 season.

Bobcat 1983-84



Total: 208

Figure 4. Registered harvest of bobcat by county, 1983-84 season.

Table 8. Comparison of bobcat harvest by county, 1979-80 - 1983-84.

County	1979-80	1980-81	1981-82 ^a	1982-83	1983-84
Aitkin	42	36	45	28	20
Becker	6	9	1	6	8
Beltrami	10	0	2	18	17
Brown	1	0	0	0	0
Carlton	22	32	15	15	4
Cass	26	9	26	30	13
Chisago	0	0	0	1	0
Clearwater	2	1	0	1	1
Cook	1	0	0	2	0
Crow Wing	3	1	2	4	4
Douglas	0	0	1	0	0
Hubbard	13	6	3	4	1
Itasca	24	10	32	46	36
Kanabec	6	0	2	2	2
Kittson	0	1	5	5	3
Koochiching	8	3	0	3	12
Lake	7	3	4	8	3
Lake of the Woods	6	3	3	3	1
Marshall	3	0	6	2	3
Mille Lacs	3	0	4	0	6
Morrison	0	0	0	5	7
Ottertail	2	0	3	2	1
Pennington	0	1	1	0	0
Pine	40	27	21	20	24
Roseau	4	0	4	9	9
St. Louis	62	65	78	59	32
Wadena	0	0	2	0	1
Unknown	0	3	0	1	0
TOTAL	291	210	260	274	208

^aNortheast 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.

Table 9. Time distribution of bobcat harvest by 5-day increments, 1983-84 season.

Interval	Total	% of Total	Cumulative Percent
Dec. 1-5	31	14.9	14.9
Dec. 6-10	38	18.3	33.2
Dec. 11-15	17	8.2	41.4
Dec. 16-20	19	9.1	50.5
Dec. 21-25	9	4.3	54.8
Dec. 26-30	16	7.7	62.5
Dec. 31-Jan. 4	22	10.6	73.1
Jan. 5-9	10	4.8	77.9
Jan. 10-14	17	8.2	86.1
Jan. 15-19	14	6.7	92.8
Jan. 20-22 ^a	11	5.3	98.1
Unknown	4	1.9	100.0
TOTAL	208	100.0	100.0

^a3-day interval.

OTTER STATUS REPORT, 1983-1984

Bill Berg and Dave Kuehn, Forest Wildlife Populations and Research Group, Minnesota
Department of Natural Resources, Grand Rapids 55744

The early winter, 15 day otter season has continued since 1978 in northern Minnesota, with the limit reduced from 3 to 2 in 1980 (Fig. 1, Table 1). During the 1983 trapping season, 409 otter were registered; the registered harvest has varied little since mandatory carcass collections began in 1981 (Table 1). Otter was the only registered furbearer which increased in harvest (+ 6%) from 1982, despite a drastic decline (-49%) in trapping license sales. Since 1979 the otter and autumn beaver harvests have been highly correlated ($r=0.98$).

A total of 433 otter carcasses were examined. Males comprised 56% and 57%, respectively, of the juvenile (0.7 yr) and adult (≥ 1.7 yr) cohorts; sex ratios have varied little since mandatory carcass collections began (Table 1). Adult female reproductive data (20% @ 2 yrs. old, 61% @ ≥ 3 yrs. pregnant; mean in utero litter = 2.2) also was similar to previous years.

As in 1981 and 1982 the modeled 1983 harvest was increased 52% to account for otter estimated to have been taken accidentally and on Indian Reservations. Registered harvests since 1977 were increased an additional 10% for illegal and unreported take. The best population model has a spring (pre-birth) population of 5000-6000 (1 per 7.6-6.3 mi^2) in the area of Minnesota open to trapping (Fig. 1). Available pre-harvest densities are 1 per 4.6-5.2 mi^2 , and the present rate of harvest takes about 9%-10% of this population, resulting in a 3%-5% annual population increase. The percent change in the modeled otter population correlates well ($r=0.82$) with the proportion of yearling otters in the previous autumn's harvest.

Present modeling (Fig. 2) is based on conservative population estimates and reproductive parameters, and liberal (62% over registered harvests) trapping take. The registered harvest could be nearly doubled without reducing the population; an increase of approximately 300 otters in the registered harvest would still enable the population to increase.

Recommendations: (1) continue the present season framework and mandatory carcass surrender in 1984, (2) reinstate the limit of 3 otters in 1983, and (3) seek legislation for authority to extend the otter season at least 15 days.

MODEL CONDITIONS

1977 PRE-BIRTH POPULATION OF 5000
 20% 2 YR., 61% ≥ 3 YR. PREGNANCY RATE
 2.2 MEAN LITTER SIZE
 10% ILLEGAL TAKE FACTOR

NATURAL MORTALITY:

	SUMMER	WINTER
JUV.	25%	15%
YRLG.	10%	10%
AD.	06%	06%

SPRING POPULATION (PRE-BIRTH)

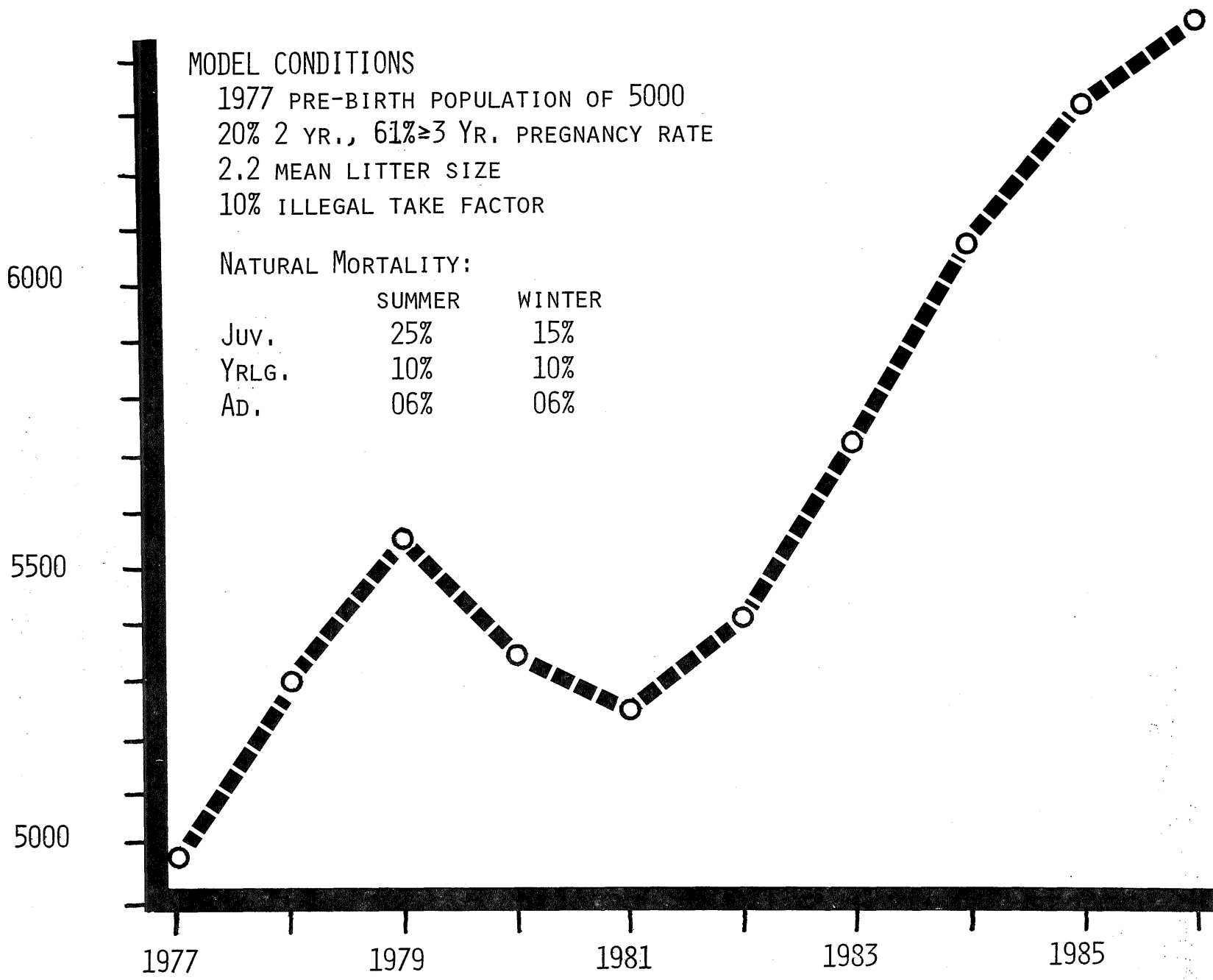


FIGURE 1. OTTER POPULATION RESPONSE TO TRAPPING HARVESTS, 1977 TO 1983, AND PROJECTED HARVESTS OF 760, 1984 TO 1985

Table 1. Otter harvest and age-sex data in Minnesota, 1978-1983.

	1978	1979	1980	1981	1982	1983
Season dates	12/1-15	11/15-29	11/15-29	11/14-28	11/13-27	11/12-26
Limit	3	3	2	2	2	2
Registered harvest	636	1186	1111	485	385	409
Carcasses examined ¹	49	36	88	471	389	433
% male juveniles	59	38	40	56	57	56
% males \geq 1.7 yrs.	47	36	58	53	65	57
Mean pelt price:						
Otter	\$59	\$63	\$33	\$30	\$26	\$25 ²
Beaver	\$18	\$33	\$18	\$14	\$11	\$10 ²

¹ mandatory carcass collections began in 1981

² estimated

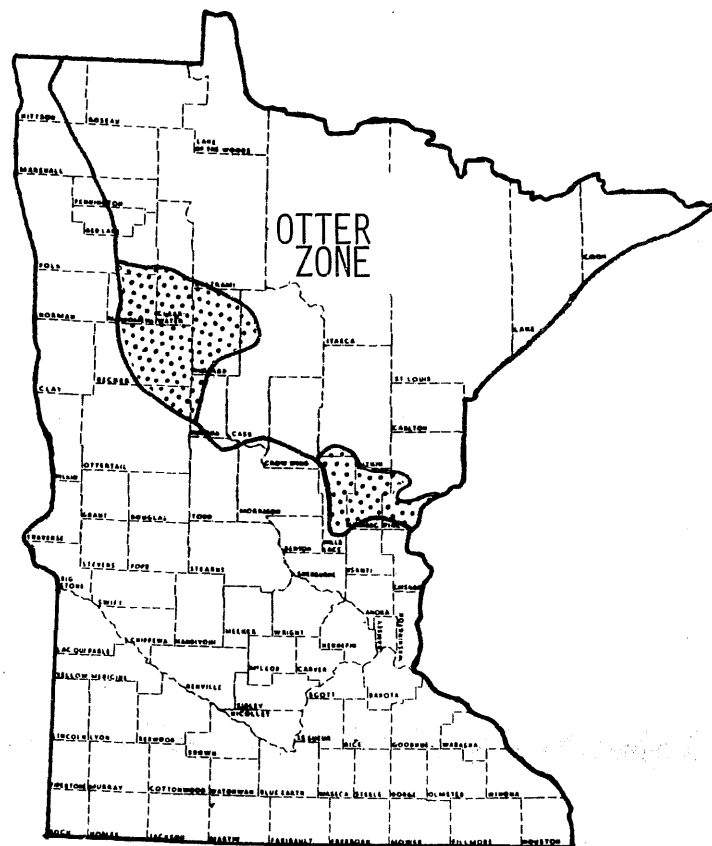


Figure 1. Zone open to otter trapping, 1979-1983. Shaded areas were closed prior to 1979

FISHER STATUS REPORT, 1983-1984

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Minnesota's fisher trapping season framework has changed dramatically since the first season in 1977. Due to excessive harvests resulting from the liberal 2 month, 3-limit seasons from 1977-78 to 1979-80, a closure in 1980 has been followed by 10-11 day seasons and a limit of 1 (Table 1). In 1979 the zone open to fisher (and otter) trapping was extended to the south; however, fisher taken in this extension comprise less than 5% of the total harvest (Fig. 1). Mandatory carcass collections commenced in 1981.

In 1983, 631 fisher were registered from the December 1-11 season, a decline of 31% from 1982 (Table 1). Probable causes for the reduced harvest include inaccessability due to 1-2 feet of snow in the main fisher range, reduced trapping pressure from lower pelt prices, a 49% decrease in trapping license sales, and a shift of fisher habitat use to non-snowshoe hare habitat (as reported by trappers).

A total of 674 fisher carcasses were examined (Table 1). Juveniles represented 68.9% of the harvest; this parameter has varied little (64.8%-69.8%) since the first season. Other age structure parameters (18.0% yearlings, 13.1% adults) were also similar to other seasons (Table 1). In 1983 sex ratios slightly favored females (45.2% σ) in the juvenile cohort, and to a greater extent (39.5% σ) in the $\geq 1\ 1/2$ year classes; this trend has been evident in most earlier carcass collections and may be caused by higher female pelt prices (Table 1). The juvenile to mother ratio, developed by the Ontario Ministry of Natural Resources as an index to fisher trapping intensity, was 8.8:1 (compared to 7.1:1 and 5.6:1 in 1978-79 and 1979-80). The relatively low ratios during the last 3 years are desirable as the fisher population rebuilds.

The decline in snowshoe hares as recorded on ruffed grouse drumming counts (Table 1) was evident in fisher stomach analysis. Hares occurred in 14% of the stomachs compared to 39% in 1977-78; conversely, deer increased in the same time period (22% to 29% occurrence). This food habits change had no effect on female reproductive parameters, or carcass weight and subcutaneous fat depth.

Due to the 1980 closure and restrictive seasons since then, the modeled fisher population has nearly recovered to the pre-1977 level (Fig. 2). Annual population increases have varied from 5-16%, and since 1980 has shown a net increase of 25% (Fig. 1). The 1982 and 1983 registered fisher take, plus known Indian and confiscated harvests, took 14% and 8%, respectively, of the available autumn population; approximately 18% can be harvested while maintaining a stable population. The population can withstand a 1200-1400 harvest in 1984 and still increase by 1-2%. To achieve this goal, a December 1-16, limit of 1 season framework is recommended.

Table 1. Fisher harvest, carcass collection, and pelt price data from Minnesota seasons, 1977-78 to 1983. Fisher taken in 1980-81 were on Indian Reservations.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Season	12/1-1/31	12/1-1/31	12/1-1/31	closed	12/1-10	12/1-10	12/1-11
Limit	3	3	3	-	1	1	1
Registered take	2150	2426	8032	(423)	862	912	631
% of available autumn population	24%	28%	39%	8%	15%	14%	8%
% juveniles	69.2%	69.8%	64.8%	-	66.2%	66.4%	68.9%
% 1 1/2 yr.	16.4%	16.5%	14.6%	-	23.8%	18.9%	18.0%
% \geq 2 1/2 yrs.	14.4%	13.7%	20.6%	-	10.0%	14.6%	13.1%
Juv:ad. female ratio	8.4:1	7.1:1	5.6:1	-	10.5:1	9.4:1	8.8:1
% male juveniles	53.5%	43.7%	53.5%	-	48.0%	46.0%	45.2%
% male 1 1/2 yrs.	28.2%	34.7%	45.6%	-	42.7%	40.9%	39.5%
% male 2 1/2 yrs	43.2%	27.8%	43.8%	-	36.9%	51.6%	40.2%
Pelt price: males		\$132	\$108	\$90	\$94	\$70	NA
females	\$71	\$147	\$128	\$104	\$110	\$99	NA
Snowshoe hare index ¹	9.0	8.8	14.1	9.8	1.8	0.7	0.2

¹ number of snowshoe hares seen per 100 km of ruffed grouse drumming routes during the spring following carcass collections.

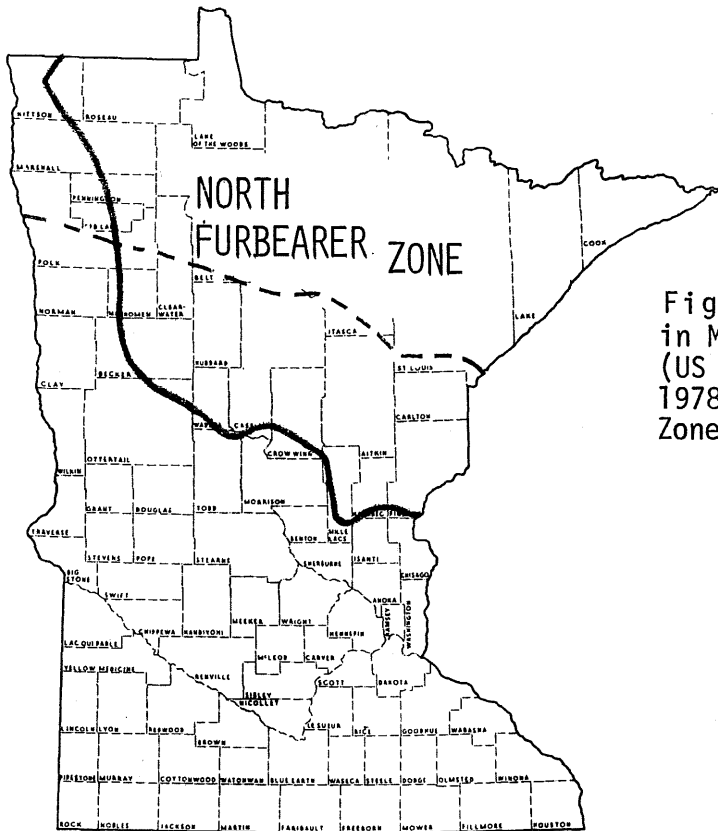


Figure 1. Zones open to fisher trapping in Minnesota. Area north of dotted line (US Highway 2) was open in 1977-78 and 1978-79; entire area in North Furbearer Zone has been open since 1979-1980.

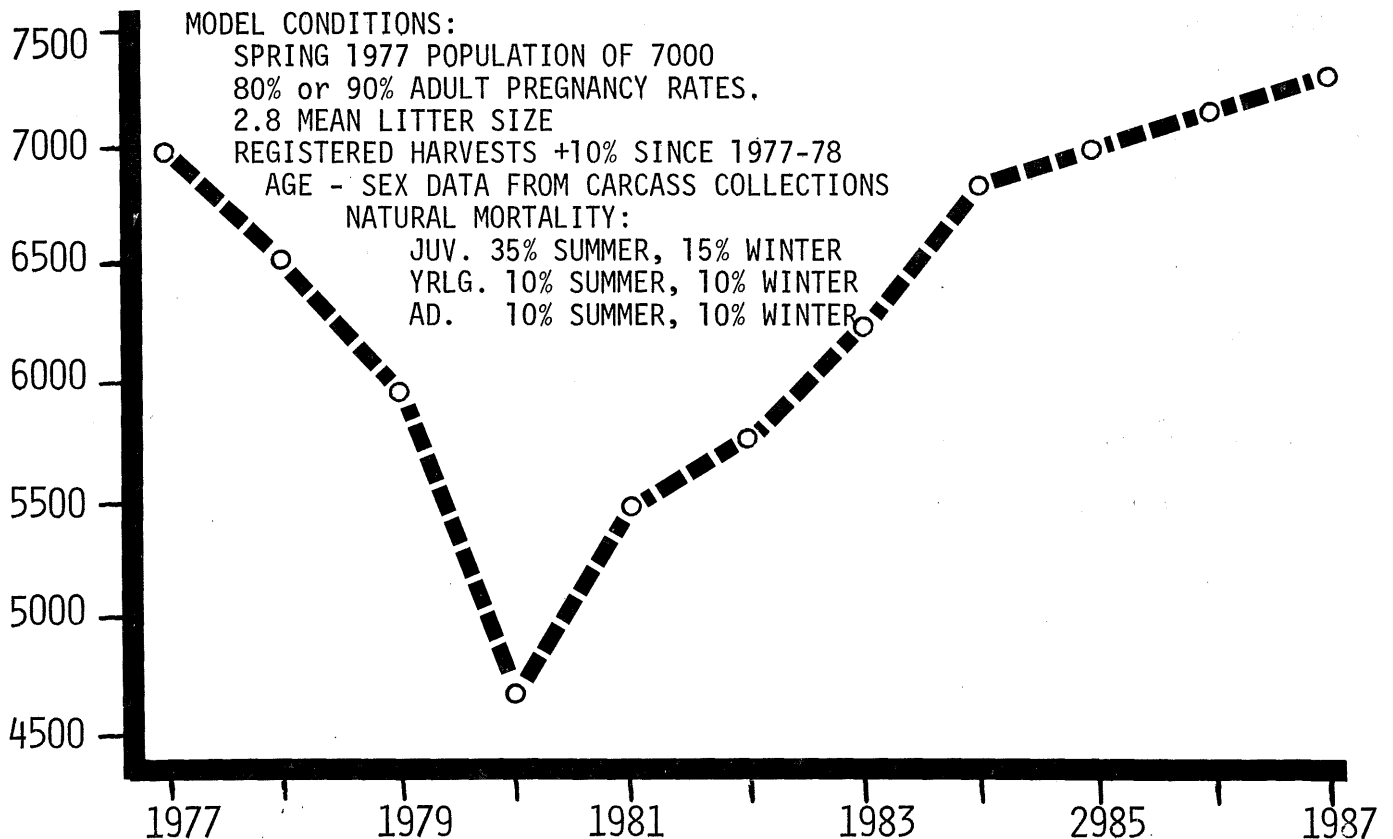


Figure 2. Fisher population response to trapping, 1977-78 to 1983, and post 1983 harvests of 1200-1500, with model conditions listed above.

BOBCAT STATUS REPORT, 1983-1984

Bill Berg and Dave Kuehn, Forest Wildlife Populations and Research Group, Minnesota
Department of Natural Resources, Grand Rapids 55744

A total of 208 bobcats were registered from the December 1 - January 22 trapping and hunting season, a decline of 24% from the 1982-83 season and the second lowest harvest since registration began in 1977 (Table 1). Since 1977 the season limit of 5 has remained unchanged, and the season has been open statewide (except in 1981-82 when bobcat and lynx were illegal in Lake, Cook, and northern St. Louis and Koochiching Counties). Beginning in 1981-82, the season was closed in the last week in January to afford additional protection to adult female bobcats (Table 1).

The third year of mandatory carcass surrender provided 205 bobcat carcasses for examination. Juveniles (1/2 y) and yearlings (1 1/2 y) comprised 37% and 26%, respectively, of the harvest compared to 1977-1982 means of 39% and 19% (Table 1). Sex ratios slightly favored males in the 1/2 (54% σ), 1 1/2 (53% σ), and 2 1/2 (51% σ) age classes, and females (44% σ) in the \geq 3 1/2 y cohort. These parameters, in addition to those for fecundity, weight, and subcutaneous fat thickness, showed little change from previous years.

Snowshoe hares, the bobcat's main food item, are at the low of their population cycle (Table 1). They were less evident in bobcat stomachs than in previous years (28% frequency of occurrence vs. 71% in 1979); however, deer was eaten more frequently in 1983-84 (34% occurrence vs. 12% in 1979).

For modeling purposes the registered harvest was increased by (1) the number of bobcats confiscated by illegal and accidental taking, (2) the registered harvest on the Leech Lake and White Earth Indian Reservations, and (3) 10% to account for other unreported or accidental taking. Thus, a more

liberal harvest than likely occurred is simulated. Modeling indicates that in 1983-84 9% of the available pre-Dec. 1 population was harvested. The population increases or remains stable with harvests less than 14-15% of the autumn population. A conservative registered harvest goal of approximately 300 bobcats should be established for the 1984-85 season, given the lack of snowshoe hares and the declining bobcat scent post index (Table 1, Fig. 1).

No season limit or framework changes are recommended for the 1984-85 season. Reducing the limit from 5 bobcats would not affect the harvest totals. In the 1983-84 season, no one took a limit of 5, only 4 persons registered 4 bobcats each, and 6 persons took 3 each.

Table 1. Bobcat harvest, carcass examination, scent post survey,¹ and snowshoe hare index² data, 1977-78 to 1983-84.

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Registered take	103	304	291	210	260	274	208
Mean pelt price	\$74	\$164	\$118	\$79	\$73	\$66	---
No. carcasses	34	113	75	48	230	261	205
% juveniles	35%	54%	37%	31%	37%	35%	37%
% 1 1/2 yrs. old	18%	15%	12%	33%	23%	15%	18%
% \geq 2 1/2 yrs. old	47%	31%	52%	35%	40%	50%	37%
% male juveniles	50%	61%	54%	80%	59%	47%	56%
% male 1 1/2 yrs.	33%	53%	44%	69%	63%	49%	56%
% male \geq 2 1/2 yrs.	41%	60%	53%	56%	55%	47%	51%
% of autumn popula- tion harvested	5%	15%	14%	10%	10%	14%	9%
scent post index ¹	8	6	5	2	14	14	3
snowshoe hare index ²	9.0	8.8	14.1	9.8	1.8	0.7	0.2

¹ derived from scent post surveys run in the Forest Zone during the autumn prior to carcass collections.

² number of snowshoe hares seen per 100 km of ruffed grouse drumming routes the spring following carcass collections.

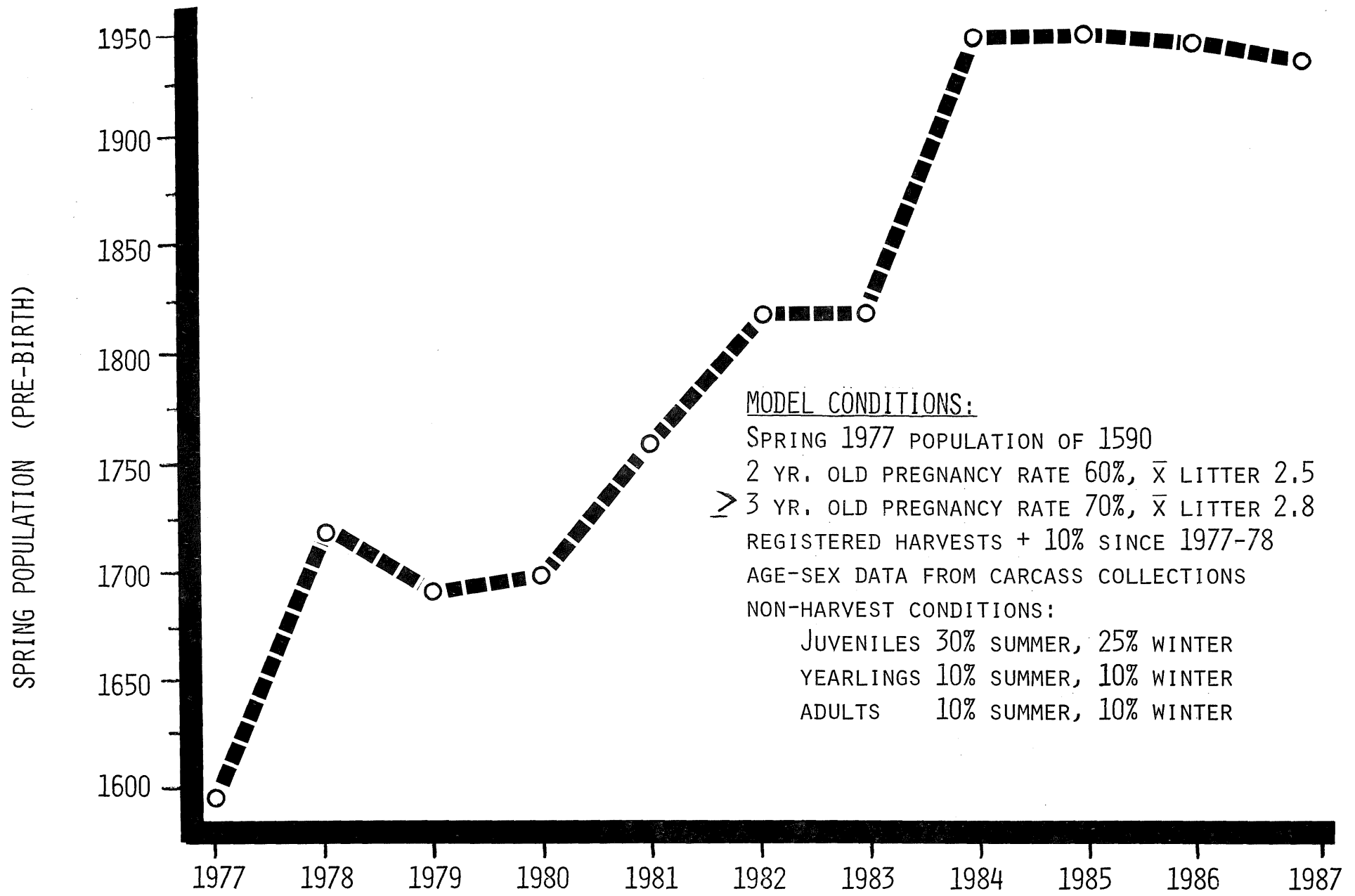


Figure 1. Bobcat population response to hunting and trapping harvests, 1977-78 to 1983-84, projected post 1983-84 harvests of 310, and model conditions described above.

1983 - 1984 FUR PRICES

SPECIES	NUMBER BUYERS	NUMBER PELTS	MINIMUM PRICE	MAXIMUM PRICE	WEIGHTED MEAN
Muskrat	59	542,102	1.25	3.46	2.24
Mink - Male	58	26,004	6.50	38.00	30.33
Mink - Female	58	18,157	3.00	18.00	14.55
Raccoon	59	74,213	6.00	20.75	12.66
Red Fox	58	39,137	24.00	61.65	32.81
Gray Fox	39	2,558	12.00	35.00	22.95
Coyote (Brush Wolf)	48	2,049	5.00	30.00	18.79
Bobcat	16	108	30.00	100.00	61.40
Lynx	3	4	100.00	150.00	125.00
Otter	19	366	15.00	30.00	24.79
Beaver (Oct. 30-Feb. 28)	47	9,017	2.00	14.00	9.52
Beaver (Mar.-Apr. 1983)	31	12,562	7.00	15.50	11.60
Long-tailed Weasel	7	29	0.50	2.00	0.93
Short-tailed Weasel	13	140	0.25	1.00	0.56
Striped Skunk	19	533	1.00	30.00	2.77
Spotted Skunk (Civet)	0	0			
Badger	42	967	2.00	20.00	10.96
Opossum	10	150	0.50	3.00	0.71
Fisher - Male	19	322	57.78	90.00	70.59
Fisher - Female	19	426	75.00	150.00	121.08
Deer Hides	50	40,079	2.75	5.03	4.06
Bear Hides	6	7	1.00	30.00	12.93

