STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
NONGAME BIRD AND MAMMAL SECTION

BOBCAT HARVEST ASSESSMENT, 1987-88

by

Gordon I. Gould, Jr.

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State of California
THE RESOURCES AGENCY
Department of Fish and Game

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ABSTRACT

An estimated 10,837 bobcats were taken during the 1987 hunting year and the 1987-88 trapping season. Trappers took 8,017 bobcats and hunters, 2,773. The total take was an increase of about 1,050 from the 1986-87 year and was very close to the average take for the previous nine years. The greatest take continued to occur in counties along California's south coast although northern California areas accounted for most of the current year's increase in take. The average pelt price, at $142.73, remained relatively high. Also, the average take per successful trapper and the average take by sport hunter per hunting day were both the second highest recorded in the last ten seasons.

Data on the bobcat harvest were gathered through the process of tagging bobcat furs for export, the annual trapping report and hunter survey, and from U.S. Fish and Wildlife Service depredation control records.

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INTRODUCTION

Bobcat harvest increased in California from the 1960's through the late 1970's. This increase reflected high fur prices and an abundant population of bobcats. The sale of bobcat fur has brought the highest dollar income to trappers of any species harvested and sold in California since the 1975-76 season. In order to determine the magnitude of the bobcat harvest and the resultant effect on bobcat populations throughout the state, a number of studies were initiated. Field studies of local population dynamics were completed on unharvested populations in Siskiyou, Riverside, and San Diego counties and on a harvested population in San Diego County. Reports on these studies have been previously distributed. A statewide harvest monitoring system was used where the age and sex structures of the harvested population were sampled to determine the effect of the harvest on various bobcat populations, and to identify the amount of harvest. The age and sex structure of the various bobcat populations in California stabilized during the mid-1980s. Currently, only the monitoring of harvest quantity is being conducted since the demand and harvest have been relataively stable since 1982-83.

Public interest in the bobcat, on both the domestic and international fronts, has increased greatly over the last 18 years. Prior to 1971, the bobcat in California was a nonprotected mammal and there were no restrictions on its take. In 1971, this species was given nongame status by the California Legislature. Subsequently, in 1974 a six month season was imposed on the take of bobcats. This season was further restricted to the standard $3\frac{1}{2}$ month furbearer season in 1976. During the 1978-79 season, the export tag quota was reached by the end of January, effectively shortening the season by one month. During 1979-80 the season was reduced to $2\frac{1}{2}$ months, but was closed on December 29, 1979, one month earlier than proposed because the quota of export tags had been reached once again.

For the 1980-81 season the state was divided into three harvest zones, each with a different length season depending upon the status of the local bobcat populations. These regulations were a result of previous research and monitoring efforts (see W-54-R-12, IV-7). The 1981-82 season length was increased by one week in length, except in the northeastern California region, in order to have the bobcat season coincide with the season on gray fox. In 1982-83, the northeastern California season was set back two weeks, and its length was increased by a week.

The season limit for bobcat sport hunters was set at two for the 1980-81 season and increased to five for the 1984-85 season. Prior to 1982-83, the sport hunting season length and timing coincided with the commercial take season. In 1982-83, the sport hunting season was extended for two weeks at the end of the commercial seasons in Del Norte, Humboldt, Kern, Lake, Mendocino, Trinity, and San Diego counties. For the 1985-86 season, the sport hunting season was extended on a statewide basis to open a week before the commercial season and to last until February 15.

The Defenders of Wildlife petitioned the Secretary of the Interior in early 1977 to place the bobcat on the endangered species list. Subjective evaluation of data from Animal Damage Control take, along with increased fur prices and commercial demand and take of bobcats, led this group to take this action. The Secretary later found that the petitioned action was not warranted.

In 1973, the United States became a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora. This treaty restricted trade in endangered species and established procedures to monitor the trade of other species that might be faced with endangerment in the future. The bobcat was one of the species deemed by the parties to the treaty as a candidate for future endangerment. The Endangered Species Scientific Authority (E.S.S.A.) was established as the scientific body to monitor the species status in the United States, and the U.S. Fish and Wildlife Service was given the authority over trade as provided by the treaty. The E.S.S.A. evaluated data to justify harvest and export of bobcat furs for three years.

In November, 1979, Defenders of Wildlife brought suit against the E.S.S.A. The suit was heard in December and the court's decision reversed the E.S.S.A.'s findings for five states and parts of two others, but not for California. After the suit, the E.S.S.A. was dissolved and the responsibility was given to the U.S. Fish and Wildlife Service, whose Office of the Scientific Authority (O.S.A.) now has the responsibility for scientific monitoring.

An appeal by Defenders of Wildlife of the court's ruling to the Court of Appeals, District Court for the District of Columbia, resulted in a court order that prohibited bobcat pelts taken after July 1, 1982 from being exported. This ban was imposed until O.S.A. could satisfy the court that export findings were based on reliable population estimates and that each state would enforce a predetermined take limit. Guidelines from O.S.A. to the states to obtain this information were not accepted by the court. During 1982 there was legislative redefinition of the Endangered Species Act which effectively voided the court's ban on export. On December 1, 1982 the export ban was lifted and the major European market was reopened.

Since late 1982 there has been little activity to ban the harvest of bobcats. However, this has been a period of intense management and monitoring of bobcat populations and harvest. It is the results of this management and monitoring that are discussed in this report.

OBJECTIVES

1. Determine the annual bobcat harvest on a regional basis.

2. Use this information along with previously gathered information on bobcat biology and population dynamics to develop a statewide management plan and to manage local populations by manipulating season lengths and chronology, take methods, and harvest limits.

METHODS

The commercial take is determined through assessment of mandatory annual reports of licensed trappers and an export tagging program for all bobcat furs. Commercial fur trappers report their take at the end of each license year (fiscal year) giving the quantity of take of each species by county. Anyone possessing or wishing to sell or to transport a bobcat fur must have it tagged. As part of the tagging process, the trapper must supply information on the place, date and method of take.

Sport take is determined through the Department's annual hunter survey questionnaire. This survey queries a 2 to 4% sample of California's licensed hunters about their hunting effort and success for various species. Information on total take, distribution of hunting effort, and percent successful hunters is gathered on bobcat hunting from this survey. Additional information on sport hunting is gathered through the sale of hunting tags and their return. Sport hunters are required to report their kill and provide information on their take.

All depredation take must be reported to the Department. This information is reported directly by the person doing the taking or from the public agencies doing the depredation control work.

RESULTS

For the 1987-88 season the total estimated take of bobcats was 10,837 individuals (Table 1). This was about 1,050 (10.7%) more than were taken during 1986-87, and from 2,100 more to 3,600 less than were taken during the eight years prior to 1986-87. Trappers continue to take the majority (74%) of bobcats and the total hunter take, of 2,773, was higher by more than 1,030 bobcats than in 1986-87. The hunter take also was slightly higher than the average hunter take since the 1980-81 season. The total take of bobcats ranged from none in three counties to 1,096 in San Bernardino County (Table 2). The harvest in each of the ten counties having the highest total take was at least 400 (compared to 370 last year). This year 25 of 58 counties reported a take of more than 100 bobcats; last year more than 100 bobcats were taken from 22 counties.

Table 1. Estimated Annual Take of Bobcats by Hunting and Trapping in California, 1976-77 to 1987-88.

Season	Total Commercial Take (IA+IB)	Commercial Trapper Take (IA)	Commercial Hunter Take (IB)	Total Hunter Take (II)	Animal Damage Control Take (III)	Total Annual Take (IA+II+III)
1976-77	5400	5000	400	10500	347	15847
1977-78	5150	4650	500	15300	208	20158
1978-79	8325	6825	1500	5811	56	12692
1979-80	7809	6686	1123	7708	32	14426
1980-81	9595	8702	893	3737	24	12463
1981-82	9337	8162	1175	3037	34	11233
1982-83	8513	7427	1086	2951	48	10426
1983-84	7362	6576	786	2077	43	8696
1984-85	8897	7495	1402	2993	48	10536
1985-86	8099	6927	1172	2861	36	9824
1986-87	9123	8003	1120	1739	44	9786
1987-88	8994	8017	977	2773	47	10837

In what has become the norm, the vast majority of bobcats are harvested from counties in southern California. For the seventh time in the last 11 years, San Bernardino County had the highest commercial take (Table 3). Five of the six counties in the South Coastal area and two of five counties in the South Sierra area comprised eight of the top ten. Siskiyou County joined Humboldt County as the only representatives of northern California counties in the top ten in commercial take.

Table 2. Take of Bobcats by County during the 1987-88 Season.

County	Licenced Trapper Take	Commercial Hunter Take	Sport Hunter Take	Animal Damage Control Take	Total County Take
Alameda			15		15
Alpine	9				9
Amador	4	1	21		26
Butte	11	7	4		22
Calaveras	20		22		42
Colusa	79				79
Del Norte	32	5	10		47
El Dorado	36		59	1	96
Fresno	317	20	15		352
Glenn	107		7		114
Humboldt	273	196	40	5	514
Imperial	42		110		152
Inyo	153	1	21		175
Kern	697	55	93	1	846
Kings	15				15
Lake	127		7		134
Lassen	114	73	11		198
Los Angeles	302		29		331
Madera	68	5	24		97
Marin		22	8	1	31
Mariposa	198	10	158	5	371
Mendocino	77	53	44	4	178
Merced	46	1	14		61
Modoc	179	44	8	2	233
Mono	85				85
Monterey	606	40	48		694
Napa	37		37	2	76
Nevada	2		7	3	12
Orange	7	2	5		14
Placer			44		44
Plumas	35	8			43
Riverside	226	2	174		402
Sacramento			7		7
San Benito	132	5	10		147
San Bernardino	891	30	175		1096
San Diego	418	1	65	8	492
San Joaquin			15		15
San Luis Obispo	330	15	51	4	400
San Mateo	9		37		46
Santa Barbara	496	20	31	1	548
Santa Clara	31		44		75
Santa Cruz			15		15
Shasta	156	77	22		255
Sierra	1				1
Siskiyou	362	134	40	1	537
Solano			15	1	16
Sonoma	76	6	53	7	142
Stanislaus	30	3	12	1	46
Tehama	50	8	21		79
Trinity	65	15	51		131
Tulare	523	109	62		694
Tuolumne	67	6	16		89
Ventura	446	1	6		453
Yolo	29				29
Yuba	1	2	13		16
Total	8017	977	1796	47	10837

No bobcats were reported taken in Contra Costa, San Francisco, and Sutter Counties.

Table 3. Ten Counties Reporting Highest Commercial Take of Bobcats 1971-88.

Rank	1971-72	1972-73	1973-74	1974-75	1975-76
1	Modoc	Merced	San Diego	San Diego	Humboldt
2	Shasta	Modoc	Modoc	Modoc	San Diego
3	Merced	Shasta	Tehama	Lassen	Modoc
4	Lassen	Siskiyou	Tuolumne	Humboldt	Shasta
5	Siskiyou	Humboldt	Siskiyou	Inyo	Inyo
6	Riverside	Sierra	Humboldt	Siskiyou	Siskiyou
7	San Bernardino	Tehama	Mendocino	Colusa	Riverside
8	San Diego	San Bernardino	Shasta	Riverside	San Bernardino
9	Humboldt	Butte	Lake	Fresno	Solano
10	Plumas	San Diego	Solano	Lake	Lake
Rank	1976-77	1977-78	1978-79	1979-80	1980-81
1	Humboldt	San Bernardino	Humboldt	Santa Barbara	San Bernardino
2	San Bernardino	Humboldt	San Bernardino	Humboldt	Monterey
3	Santa Barbara	Tulare	Shasta	Tulare	Santa Barbara
4	Shasta	Santa Barbara	Kern	Kern	San Luis Obispo
5	San Benito	Kern	Siskiyou	San Bernardino	Humboldt
6	Mendocino	Inyo	Santa Barbara	Siskiyou	Tulare
7	Tulare	Mendocino	Inyo	San Diego	Mendocino
8	Fresno	Modoc	Modoc	Mendocino	Kern
9	San Diego	Shasta	Mendocino	Monterey	San Diego
10	Inyo	Monterey	Tehama	San Luis Obispo	San Benito
Rank	1981-82	1982-83	1983-84	1984-85	1985-86
1	San Bernardino	San Bernardino	San Bernardino	Kern	Kern
2	Kern	Monterey	Kern	Tulare	San Bernardino
3	Monterey	Kern	Santa Barbara	Monterey	Tulare
4	Santa Barbara	Santa Barbara	San Luis Obispo	San Bernardino	Monterey
5	Tulare	San Luis Obispo	Los Angeles	Santa Barbara	Santa Barbara
6	Humboldt	Tulare	Monterey	San Luis Obispo	San Diego
7	San Diego	Humboldt	Tulare	Los Angeles	Ventura
8	Ventura	Los Angeles	San Diego	Humboldt	Humboldt
9	Fresno	San Diego	Ventura	Siskiyou	Los Angeles
10	San Luis Obispo	Ventura	Humboldt	San Diego	Inyo
Rank	1986-87	1987-88			
1	San Bernardino	San Bernardino			
2	Kern	Kern			
3	Santa Barbara	Monterey			
4	Tulare	Tulare			
5	Ventura	Santa Barbara			
6	Monterey	Siskiyou			
7	San Luis Obispo	Humboldt			
8	San Diego	Ventura			
9	Humboldt	San Diego			
10	Fresno	San Luis Obispo			

The take varied from previous years in the different geographic areas of California (Table 4). Substantial percentage increases in harvest occurred in the northern part of the state and in the Central Sierra area. Some noticeable percentage decreases in harvest were noted in the North Sierra, East Sierra and South Coast areas.

Table 4. Geographical Differences in the Amount of Commercial Take of Bobcats in California, 1982-83 to 1987-88.

Area	1982-83 Take	Change < to>	1983-84 Take	Change < to>	1984-85 Take	Change < to>	1985-86 Take	Change < to>	1986-87 Take	Change < to>	1987-88 Take
Northeast	522	-37	328	54	506	-23	390	32	514	17	601
Northwest	1141	-13	997	41	1404	-31	967	26	1216	11	1355
North Coast	538	-38	332	8	358	3	367	16	425	14	483
Central Coast	125	-77	29	266	106	23	130	-18	107	12	120
North Sierra	65	-46	35	43	50	-14	43	53	66	-64	24
Central Sierra	267	-16	224	1	226	12	253	- 8	232	47	342
East Sierra	260	16	301	11	333	22	406	-16	343	-28	248
South Coast	2546	- 9	2318	8	2511	- 7	2344	23	2881	-13	2510
South Sierra	1428	10	1569	33	2086	-16	1745	10	1923	- 6	1809
Southern California	1419	-13	1230	7	1317	10	1454	- 3	1416	6	1502

The market for bobcat fur has become relatively stable in both political and economic terms. There was no national or international regulatory action pending which might have influenced the demand for bobcat furs. The average value for a raw bobcat decreased 14.7% last year but is still 27.5% higher than the average pelt value for the previous 11 years (Table 5).

Table 5. Bobcat Pelt Prices, 1970-71 to 1987-88.

Season	Average Price	Highest Price
1970-71	$ 10.86	Not Recorded
1971-72	$ 18.83	$ 30.00
1972-73	$ 29.33	$ 6.00
1973-74	$ 45.00	$ 110.00
1974-75	$ 50.00	$ 110.00
1975-76	$ 133.50	$ 300.00
1976-77	$ 76.00	$ 225.00
1977-78	$ 105.00	$ 185.00
1978-79	$ 120.00	$ 426.00
1979-80	$ 114.20	$ 313.00
1980-81	$ 129.90	$ 325.00
1981-82	$ 114.53	$ 325.00
1982-83	$ 105.85	$ 342.11
1983-84	$ 102.33	$ 380.00
1984-85	$ 121.96	$ 368.00
1985-86	$ 107.86	Not Available
1986-87	$ 167.33	Not Available
1987-88	$ 142.73	Not Available

Indications from the trends in average take per trapper over the last 11 seasons are that it was easier to catch a bobcat in 1987-88 than it was in 1976-77 (Table 6). The continued maintenance of a high take of bobcats per trapper indicates that the bobcat resource was abundant during the 1987-88 season.

Table 6. Average Bobcat Harvest per Successful Trapper per Season in California.*

County	Season											
	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87	87-88
Butte	5.6	2.9	3.1	3.4	2.5							
Fresno	9.1	10.5	10.6	9.2	10.2	9.1	8.5	11.9	10.0	12.1	17.6	15.3
Glenn	5.5		7.4		5.0	5.5	6.8		5.8			10.7
Humboldt	8.8	6.6	6.0	6.1	5.3	5.7	4.8	7.6	9.3	18.0	12.5	13.0
Inyo	8.3	10.9	10.5	7.3	8.5	5.0	5.3	7.8	5.6	14.2	9.7	6.2
Kern		14.6	26.9	10.6	11.0	10.8	12.2	16.5	18.4	14.7	13.0	14.2
Lake	5.3	5.7	10.0	6.4	4.7	5.9	4.6	5.9			7.2	7.9
Lassen	5.4	3.5	6.0	4.3	3.8	5.9	6.5	3.6	4.8	4.4	4.4	9.8
Los Angeles	6.6	8.6	7.6	14.8	14.1	8.1	8.8	13.5	15.8	14.9	15.6	11.1
Madera						8.9		11.3	12.7			7.3
Mariposa			6.9	11.8	5.7	10.1	6.3		9.6	7.2	10.1	19.9
Mendocino	6.7	5.9	8.0	5.9	6.1	4.5	5.4	6.1	5.9	5.1	6.5	6.2
Modoc	5.0	5.3	5.6	4.2	3.2	4.6	5.5	7.7	7.2	6.3	6.2	7.2
Mono	6.4			5.9		4.2	6.9	9.2				6.5
Monterey	8.1	9.1	9.2	11.3	16.3	14.2	11.7	14.7	18.0	17.8	21.4	24.8
Plumas	2.9	3.4	4.5	4.3		5.5	4.5					
Riverside			7.8	9.9	5.8	7.8	9.0	7.4	10.3	10.1	9.8	12.0
San Benito	10.9	8.7	9.0	9.8	13.0	9.0	9.8		8.3		14.2	
San Bernardino	16.9	17.4	19.3	17.5	14.7	9.2	10.0	12.0	11.6	14.6	14.6	13.3
San Diego	11.1		12.1	11.5	6.0	9.4	9.8	10.6	11.8	10.8	11.6	14.0
San Luis Obispo			9.1	9.0	13.9	8.5	10.6	14.4	11.1	10.8	14.7	14.4
Santa Barbara		19.4	16.9	16.8	15.2	13.6	12.2	16.6	17.4	16.3	16.1	13.9
Shasta	5.1	4.3	4.0	3.6	2.9	3.1	3.3	4.1	4.4	4.8	4.7	4.9
Siskiyou	4.3	5.1	6.7	4.4	3.8	5.7	5.1	5.2	0.2	5.6	5.9	9.9
Sonoma			7.2	4.8	6.4	7.5	8.4	6.5	4.6		6.8	
Tehama	4.7	4.8	5.3	3.7	5.1	4.1	3.8	3.7	6.3	3.8	3.9	5.8
Trinity	3.7	4.0	5.4	4.0	3.3	3.3	4.4	2.5	3.5		8.5	5.0
Tulare	13.1	7.7	11.7	12.2	9.2	9.3	11.2	10.5	13.4	14.5	12.3	17.1
Tuolumne					7.4	5.8	6.9	5.4				5.2
Ventura			7.1	10.0	9.4	10.4	11.2	10.4	13.5	12.6	18.4	16.6
Statewide	8.11	8.08	9.04	7.76	8.04	8.78	9.08	11.86	12.01	12.71	14.75	13.55
# Trappers harvesting bobcats	446	550	766	920	1,007	909	821	488	398	547	584	664
# Trappers licenced	1,692	1,889	2,378	3,221	3,201	3,686	3,901	1,607	1,650	1,417	1,347	1,460

* County data from counties and years where more than ten trappers per county reported.

As usual the commercial take of bobcats was primarily by trapping (Table 7). At 88.5% this was the second highest take by trap. This is a reversal from 1986-87 when the take by trappers was the second lowest over the last eight seasons (Table 8). Hunting with dogs remains the second most common way to take bobcats. This method is most commonly employed in the northwestern California counties of Humboldt, Mendocino and Trinity.

About 0.1% of the bobcat furs were salvaged and of the remaining, 1.1% were taken through the use of a predator call and 0.7% were taken by hunting where the specific method was not given. Predator calling only occurs erratically as a commercial hunting method.

Table 7. Method of Commercial Take of Bobcats, 1987-88.

County	% Taken by Trap	% Taken by Dogs	% Taken by Calling	% Taken Misc. Hunting	% Salvaged Road Kill	% Method Unknown	Sample Size
Alpine	100						9
Amador	80		20				5
Butte	61	39					18
Calaveras	100						20
Colusa	100						79
Del Norte	86	14					37
El Dorado	100						36
Fresno	94	4	2				328
Glenn	100						107
Humboldt	58	42		0*			469
Imperial	100						42
Inyo	99		1				154
Kern	93	5	2	1		0	731
Kings	100						15
Lake	100						127
Lassen	61	37	2				187
Los Angeles	100						301
Madera	93	7					71
Marin		100					22
Mariposa	95	1		4	0		202
Mendocino	59	34	7				130
Merced	98	2					46
Modoc	80	17	2	0			223
Mono	98				2		85
Monterey	94	5	1	1			646
Napa	100						37
Nevada	100						2
Orange	78			22			9
Plumas	81	19					43
Riverside	100						10
San Benito	96	4					137
San Bernardino	96	0	3	1			919
San Diego	100						419
San Luis Obispo	95	1		3	0		345
San Mateo	100						9
Santa Barbara	96	3		0			515
Santa Clara	100						31
Shasta	67	30	3				233
Sierra	100						1
Siskiyou	73	25	2	0	0		496
Sonoma	93	7					82
Stanislaus	91		9				32
Tehama	78	9	3	2	9		58
Trinity	69	18		1	1	11	80
Tulare	83	17	0	0			614
Tuolumne	92	4		4			71
Ventura	99		0		0		446
Yolo	100						29
Yuba	33	67					3
Total	88.5	9.6	1.1	0.6	0.1	0.1	8710

* 0 = less than 0.5 percent.

Table 8. Method of Commercial Take of Bobcats, 1980-88.

Season	Method of Take (Percent of Total Statewide Take)					
	Trap	Dogs	Calling	Misc. Hunt.	Road Kill	Unknown
1980-81	90.6	6.6	0.7	1.4	0.3	0.5
1981-82	86.2	9.5	1.3	1.8	0.3	0.9
1982-83	86.7	10.4	0.9	1.4	0.2	0.4
1983-84	89.0	9.3	0.4	1.1	0.2	<0.1
1984-85	82.8	13.5	0.7	1.7	0.3	1.0
1985-86	85.1	13.2	0.6	0.7	0.1	0.3
1986-87	83.4	10.6	0.8	0.8	0.1	4.2
1987-88	88.5	9.6	1.1	0.6	0.1	0.1

The harvest of bobcats by hunters was approximately 2,775 (Table 1). Of these, 2,278 were taken and reported by licensed hunters (Table 9), 1,796 were taken by hunters with hunting licenses only, 482 by hunters with both hunting and trapping licenses, and 495 by hunters with only a trapping license. The estimate of 2,278 bobcats taken by licensed hunters was derived from the Department's annual "Game Take Hunter Survey". A sample of 2.85% of California's 436,294 licensed hunters produced a response of 12,439 questionnaires. This sampling provides an 80% confidence level for the estimated take of bobcats of between 1,962 and 2,738 individuals. These same hunters spent an estimated 20,740 days hunting bobcats for an average take of 0.110 bobcats per day (Table 10). This is the second highest hunter take per unit of effort in the last ten seasons. It is almost twice the harvest rate recorded in 1986 and is similar in trend to the high rate of take of bobcats by trappers.

Additional information on the extent and distribution of the sport hunting take of bobcats is gathered through the sport hunting tag program. Obtaining these tags and returning them to the Department upon taking bobcat are legal requirements of bobcat hunters and the system should provide considerable information. This has not proven to be the case, however (Table 11). Given a sport hunting public of about 1,800 (estimated from the annual hunter survey and subtracting all trappers who reported taking bobcats), only about 50% of the sport hunters bought the required tags in 1987. Additionally, sport hunters sent in tags for less than 10% of the bobcats that they reported taking in the annual hunter survey.

DISCUSSION

There appears to be nothing exceptional or abnormal in the harvest of bobcats during the 1987-88 season. The commercial demand for this species appears to have leveled off, resulting in relatively stable conditions, especially since the 1982-83 season. Since that time the bobcat population dynamics parameters have shown a similar degree of stability. These same parameters are at a considerably better level than they were during the previous years when bobcat harvest was considerably higher.

Table 9. Statistical Parameters of the Hunter Take of Bobcats during 1987, Poisson Distribution.*

Frequency Distribution: Bobcats Taken Per Hunter	No. of Hunters	Total Bobcats Taken
0	40	0
1	21	21
2	4	8
3	4	12
4	0	0
5	1	5
6	1	6
7	1	7
8	1	8
	Σf= 38	Σyf= 67

$$\text{Average take per hunter } x = \frac{\text{total bobcats taken}}{\text{total respondents}} = \frac{67}{12439} = 0.0053863$$

Statewide bag = (x)(tot. no. license buyers) = (0.0053863)(436294) = 2278

Assuming that bobcat take follows a Poisson distribution, confidence limits can be assigned by knowing x and n (total no. of respondents)

$$\sigma_{(x)} = \frac{x}{n} = \frac{0.0053863}{12439} = 0.0006580$$

Confidence interval of $x = x \pm t\sigma$

Confidence Levels	Mean ± std. deviation $x \pm t \quad \sigma$	Confidence Intervals $x \pm t\sigma$	Confidence Intervals for Total Take **
@ 80% =	x ± (1.35) σ	0.0053863 ± 0.0008883	1962 to 2738
@ 90% =	x ± (1.65) σ	0.0053863 ± 0.0010857	1876 to 2824
@ 95% =	x ± (1.96) σ	0.0053863 ± 0.0012897	1787 to 2913
@ 99% =	x ± (2.576) σ	0.0053863 ± 0.001695	1610 to 3090

* After Shimamoto (1976)
** Calculated by multiplying confidence intervals for x by the total number of license buyers.

Since the 1982-83 season, and with no change in season length, the harvest has remained below the 14,400 statewide harvest limit. Harvest monitoring should continue and if the statewide harvest reaches 14,000 bobcats the age and sex structure monitoring should be reinstituted.

The condition of bobcats in northeastern California should be examined every year. The age and sex structures have not increased to levels comparable to other areas of the state, but the population appears to continue to support a stable, if slightly cyclic harvest (Table 12). If the harvest in this local area increases to more than 425 for more than two successive seasons, additional management action should be instigated to determine the effects on that population. The local harvest has been above this level for the last two seasons. The harvest quantity in 1988-89 will be critical in deciding whether

an age and sex structure monitoring program should be reinstated for Siskiyou, Modoc, Lassen and Plumas counties.

Table 10. Licenced Sport Hunter Take of Bobcats, 1978-87.

Year	Est. Licensed Hunter Take	No. Licensed Hunters Hunting Bobcats	Percent Successful	Days Hunted	Bobcats Take/Day
1978	5733	7566	45	57603	0.100
1979	7462	5960	47	65340	0.114
1980	3373	4843	59	32951	0.102
1981	2585	4551	45	30192	0.086
1982	2574	4408	41	32984	0.078
1983	1794	3082	43	23184	0.077
1984	2232	3456	33	35670	0.063
1985	2205	2597	40	22785	0.097
1986	918	1938	21	15402	0.057
1987	2278	2482	45	20740	0.110

Table 11. Sport Hunting Tag Program Compliance, 1980-88.

	Season							
	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
No. of Sport Hunting Tag Buyers	262	427	384	495	547	777	823	908
Estimated No. of Bobcat Hunters *	3836	3642	3408	2594	3058	2050	1354	1818
Percent of Hunters Buying Tags	68	11.7	11.3	19.1	17.9	37.9	60.8	49.9
Take Reported by Return of Sport Hunting Tags	70	113	87	107	156	149	147	177
Estimated Sport Hunting Take **	2794	1862	1865	1291	1591	1689	619	1796
Percent of Take Reported	2.5	6.1	4.7	8.3	9.8	8.8	23.7	9.9

* Estimated number of bobcat hunters calculated by subtracting number of licensed trappers taking bobcats from the number of hunters estimated by annual Hunter Survey.

** Estimated sport hunting take calculated by subtracting estimated take by persons both licensed to hunt and trap from the reported licensed hunter take.

The disparity between the information provided by the annual hunter survey and the sport hunting tag program continues. In their argument to increase the limit for sport hunting tags to five and to get the Department to sell sport hunting tags on a request by mail basis, sport hunters said that these actions would increase compliance. Results from the analysis of the 1987-88 harvest demonstrate that no substantial change in compliance in buying tags and in reporting harvested bobcats has occurred in four years (Table 11). More than

90% of the bobcats estimated taken by sport hunting are not reported and for every bobcat hunter with bobcat hunting tags there appears to be another hunting illegally without tags. In fact, results from the hunter survey questionaire show that 9% of the successful hunters had so little knowledge or regard of bobcat hunting laws that they took more than the legal limit and reported that they did so.

Table 12. Recent Commercial Harvest of Bobcats in Northeastern California.

Season	County				Total Northeastern California
	Eastern Siskiyou	Modoc	Lassen	Plumas	
1978-79	81	306	246	47	680
1979-80	88	216	302	95	701
1980-81	82	126	96	39	343
1981-82	49	143	147	58	397
1982-83	74	238	177	35	524
1983-84	45	182	84	17	328
1984-85	54	231	188	33	506
1985-86	78	181	108	23	390
1986-87	78	237	139	60	514
1987-88	148	223	187	43	601

RECOMMENDATION

1. Continue to monitor the take of bobcats by geographical area in order to use that information to detrermine the management needed to maintain bobcat populations throughout California.

2. The Department should develop a more effective program to educate the public and enforce bobcat hunting regulations.