

**STATE OF CALIFORNIA
DEPARTMENT OF FISH AND GAME
WILDLIFE MANAGEMENT DIVISION
NONGAME BIRD AND MAMMAL SECTION**

BOBCAT HARVEST ASSESSMENT, 1989-90

by

William E. Grenfell Jr.

May 1991

State of California
THE RESOURCES AGENCY
Department of Fish and Game

BOBCAT HARVEST ASSESSMENT, 1989-90¹

by

William E. Grenfell Jr.

May 1991

ABSTRACT

An estimated 3,455 bobcats were taken during the 1989 hunting year and the 1989-90 trapping season. Trappers took 2,677 bobcats and hunters, 715. The total take was a decrease of 49% from the 1988-89 year and was the lowest reported take in the last 14 years. The bobcat take decreased in all regions of the state except in the East Sierra (Table 4). The bobcat take in that region increased by 62% (73 animals in 1988-89 compared to 118 animals in 1989-90). The average pelt price dropped to \$17.91, and is the lowest pelt value in the last 18 years. Also, the average take per successful trapper and the average take by sport hunter per hunting day were lower than in several previous years.

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. Department of Agriculture, Animal Damage Control records.

¹ Supported by California Environmental License Plate Fund and the California Native Species Enhancement Account, Wildlife Management Division, Nongame Bird and Mammal Section. Job III.A.1

INTRODUCTION

Bobcat harvest increased in California from the 1960s through the late 1970s. 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 relatively 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 1989-90 season the total estimated take of bobcats was 3,455 individuals (Table 1). This was about 3,252 (51.5%) less than were taken during 1988-89, and the lowest estimated take in the 14 seasons since 1976-77. Trappers continue to take the majority (77%) of bobcats. The total hunter take of 715 was lower by 1,063 bobcats than in 1988-89. The hunter take also was the lowest in 14 seasons since the 1976-77 season (Table 1). The total take of bobcats ranged from none in five counties to 324 and 323 in Kern and San Bernardino Counties respectively (Table 2). The harvest in each of the ten counties having the highest total take was at least 150 (compared to 254 last year). This year only 12 of 58 counties reported a take of more than 100 bobcats; last year more than 100 bobcats were taken from 20 counties.

Table 1. Estimated Annual Take of Bobcats by Hunting and Trapping in California, 1977-78 to 1989-90.

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)
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	870	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
1988-89	5586	4877	709	1778	52	6707
1989-90	2980	2677	303	715	63	3455

Table 2. Take of Bobcats by County during the 1989-90 Season.

County	Licensed Trapper Take	Commercial Hunter Take	Sport Hunter Take	Animal Damage Control Take	Total County Take
Alameda			2		2
Alpine	12		2		14
Amador	11	5	6		22
Butte	2				2
Calaveras		4	1	1	6
Colusa	11		2		13
Del Norte			2		2
El Dorado		7			7
Fresno	226		22		248
Glenn			2		2
Humboldt	25	101	21	3	150
Imperial	8		2		10
Inyo	76		5		81
Kern	292	14	14	4	324
Lake	17		11	3	31
Lassen	78	7	7	1	93
Los Angeles	187		5		192
Madera	28		9		37
Marin		20		4	24
Mariposa			7	5	12
Mendocino	3	3	19	6	31
Merced			7		7
Modoc	48	14	14	1	77
Mono	24	6	3		33
Monterey	193	1	20		214
Napa	5		5	2	12
Nevada		4		5	9
Orange	13				13
Placer	1		11		12
Plumas	45	2	18		65
Riverside	33		5		38
San Benito	49		18		67
San Bernardino	294		29		323
San Diego	168	9	7	8	192
San Joaquin			2		2
San Luis Obispo	105	16	7	1	129
Santa Barbara	55	7	2	1	65
Santa Clara	17		22		39
Shasta	79	17	41		137
Sierra			2		2
Siskiyou	129	13	17	6	165
Solano			4		4
Sonoma	27		5	6	38
Stanislaus	9	1	6		16
Tehama	4	1	6		11
Trinity	21	2	2		25
Tulare	99	37	14		150
Tuolumne	8		5	6	19
Ventura	242	12	1		255
Yolo	32				32
Yuba	1				1
Total	2677	303	412	63	3455

No bobcats were reported taken in Contra Costa, Kings, Sacramento, San Mateo, Santa Cruz and Sutter counties.

The majority of bobcats was harvested from counties in southern California (Table 3). Three of six counties in the South Coast area, two of five counties in the Southern California area, three of five counties in the South Sierra area, and two counties in the Northwest area made up the top ten counties with the highest bobcat harvests (Table 3).

Table 3. Ten Counties Reporting Highest Commercial Take of Bobcats 1971-90.

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	1988-89	1989-90	
1	San Bernardino	San Bernardino	San Bernardino	Kern	
2	Kern	Kern	Kern	San Bernardino	
3	Santa Barbara	Monterey	San Diego	Ventura	
4	Tulare	Tulare	Santa Barbara	Fresno	
5	Ventura	Santa Barbara	Monterey	Monterey	
6	Monterey	Siskiyou	Los Angeles	Los Angeles	
7	San Luis Obispo	Humboldt	Ventura	San Diego	
8	San Diego	Ventura	Fresno	Siskiyou	
9	Humboldt	San Diego	Tulare	Tulare	
10	Fresno	San Luis Obispo	San Luis Obispo	Humboldt	

The 1989-90 take of bobcats was among the lowest in the previous six seasons in all but one of the geographic areas monitored (Table 4). The increase in the East Sierra was from a very low 73 bobcats last year (1988-89) compared to 118 in the 1989-90 season.

Table 4. Geographical Differences in the Amount of Commercial Take of Bobcats in California, 1983-84 to 1989-90.

Area	1984-85 Take	Change <to> (%)	1985-86 Take	Change <to> (%)	1986-87 Take	Change <to> (%)	1987-88 Take	Change <to> (%)	1988-89 Take	Change <to> (%)	1989-90 Take
Northeast	506	-23	390	32	514	17	601	-53	282	-28	230
Northwest	1404	-31	967	26	1216	11	1355	-49	694	-48	362
North Coast	358	3	367	16	425	14	483	-35	312	-64	112
Central Coast	106	23	130	-18	107	12	120	-67	40	-32	27
North Sierra	50	-14	43	53	66	-64	24	-67	8	0	8
Central Sierra	226	12	253	- 8	232	47	342	-63	127	-72	35
East Sierra	333	22	406	-16	343	-28	248	-71	73	62	11
South Coast	2511	- 7	2344	23	2881	-13	2510	-30	1753	-51	857
South Sierra	2086	-16	1745	10	1923	- 6	1809	-43	1026	-32	696
Southern California	1317	10	1454	- 3	1416	6	1502	-15	1271	-58	535
Total	8897		8099		9123		8994		5586		2980

The market for bobcat fur has become relatively stable in both political and economic terms. However, the average price of a bobcat pelt dropped by about 88% in the past two years. It dropped from an all time high of \$167.33 in 1986-87 to \$17.91 (Table 5). There was no national or international regulatory action pending which might have influenced the demand for bobcat furs. The market just appears to be saturated. At this time (April 1991) bobcat pelt prices are on the increase, and are expected to reach an average of \$30.00 to \$50.00 by the fall of 1991.

Table 5. Bobcat Pelt Prices, 1970-71 to 1989-90.

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
1988-89	\$ 102.31	Not Available
1989-90	\$ 17.91	Not Available

Despite the reduction in the commercial take of bobcats, the average take per trapper remained higher than the 12 season average of 10.1 bobcats per successful trapper (Table 6). The continued maintenance of a high rate of bobcats per successful trapper, particularly with respect to low pelt prices, indicates that the bobcat resource was abundant during the 1989-90 season.

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

County	Season											
	78-79	79-80	80-81	81-82	82-83	83-84	84-85	85-86	86-87	87-88	88-89	89-90
Butte	3.1	3.4	2.5									
Fresno	10.6	9.2	10.2	9.1	8.5	11.9	10.0	12.1	17.6	15.3	16.1	17.4
Glenn	7.4		5.0	5.5	6.8		5.8			10.7		
Humboldt	6.0	6.1	5.3	5.7	4.8	7.6	9.3	18.0	12.5	13.0	8.6	2.3
Inyo	10.5	7.3	8.5	5.0	5.3	7.8	5.6	14.2	9.7	6.2		
Kern	26.9	10.6	11.0	10.8	12.2	16.5	18.4	14.7	13.0	14.2	9.1	11.7
Lake	10.0	6.4	4.7	5.9	4.6	5.9			7.2	7.9		
Lassen	6.0	4.3	3.8	5.9	6.5	3.6	4.8	4.4	4.4	9.8	3.9	5.6
Los Angeles	7.6	14.8	14.1	8.1	8.8	13.5	15.8	14.9	15.6	11.1	12.0	14.4
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	8.0	5.9	6.1	4.5	5.4	6.1	5.9	5.1	6.5	6.2	5.4	
Modoc	5.6	4.2	3.2	4.6	5.5	7.7	7.2	6.3	6.2	7.2	7.2	3.0
Mono		5.9		4.2	6.9	9.2				6.5		
Monterey	9.2	11.3	16.3	14.2	11.7	14.7	18.0	17.8	21.4	24.8	14.0	16.1
Plumas	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	8.7	16.5
San Benito	9.0	9.8	13.0	9.0	9.8		8.3		14.2			
San Bernardino	19.3	17.5	14.7	9.2	10.0	12.0	11.6	14.6	14.6	13.3	12.3	14.0
San Diego	12.1	11.5	6.0	9.4	9.8	10.6	11.8	10.8	11.6	14.0	16.9	16.8
San Luis Obispo	9.1	9.0	13.9	8.5	10.6	14.4	11.1	10.8	14.7	14.4	10.4	7.5
Santa Barbara	16.8	15.2	13.6	12.2	16.6	17.4	16.3	16.1	13.9	13.9	11.7	
Shasta	4.0	3.6	2.9	3.1	3.3	4.1	4.4	4.8	4.7	4.9	6.3	4.9
Siskiyou	6.7	4.4	3.8	5.7	5.1	5.2	0.2	5.6	5.9	9.9	6.5	5.0
Sonoma	7.2	4.8	6.4	7.5	8.4	6.5	4.6		6.8		9.3	
Tehama	5.3	3.7	5.1	4.1	3.8	3.7	6.3	3.8	3.9	5.8		
Trinity	5.4	4.0	3.3	3.3	4.4	2.5	3.5		8.5	5.0	2.2	
Tulare	11.7	12.2	9.2	9.3	11.2	10.5	13.4	14.5	12.3	17.1	8.5	6.2
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	9.9	16.1
Statewide	9.04	7.76	8.04	8.78	9.08	11.86	12.01	12.71	14.75	13.55	12.61	12.06
# Trappers harvesting bobcats	766	920	1,007	909	821	488	398	547	584	664	443	303
# Trappers licensed	2,378	3,221	3,201	3,686	3,901	1,607	1,650	1,417	1,347	1,460	1,244	834

* 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 (90%) (Tables 7 and 8). Hunting with dogs remains the second most common way to take bobcats. This method was most commonly employed in Mendocino County. About 0.4% of the bobcat furs were salvaged and of the remaining, 0.7% were taken through the use of a predator call and 1.6% were taken by hunting where the specific method was not given. Predator calling only occurs occasionally as a commercial hunting method.

Table 7. Method of Commercial Take of Bobcats, 1989-90.

County	% Taken by Trap	% Taken by Dogs	% Taken by Calling	% Taken Misc. Hunting	% Salvaged Road Kill	% Method Unknown	Sample Size
Alpine	100						12
Amador	69	31					16
Butte	100						2
Calaveras		100					4
Colusa	100						11
El Dorado		100					7
Fresno	100						226
Humboldt	20	80					126
Imperial	100						8
Inyo	100						76
Kern	95	4	1				306
Lake	100						17
Lassen	92	7	1				85
Los Angeles	100						187
Madera	93	100					28
Marin				100			20
Mendocino	50	50					6
Modoc	78	17	2	3			62
Mono	80			20			30
Monterey	99	1					194
Napa	100						5
Nevada		100					4
Orange	100						13
Placer	100						1
Plumas	100						47
Riverside	100						33
San Benito	100						49
San Bernardino	100						294
San Diego	95		3	2			177
San Luis Obispo	87		1	12			121
Santa Barbara	89	11					62
Santa Clara	100						17
Shasta	81	18			1		96
Siskiyou	91	4	5				142
Sonoma	100						27
Stanislaus	90			10			10
Tehama	80	20					5
Trinity	91	9					23
Tulare	73	27					136
Tuolumne	100						8
Ventura	95	3	1	1			254
Yolo	100						32
Yuba	100						1
Total	89.9	7.8	0.7	1.6	0	0	2980
* 0 = less than 0.5 percent.							

Table 8. Method of Commercial Take of Bobcats, 1980-90.

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
1988-89	85.5	11.8	0.9	0.4	0.1	1.4
1989-90	89.9	7.8	0.7	1.6	-	-

The harvest of bobcats by hunters was approximately 715 (Table 1). Of these, 549 were taken and reported by licensed hunters (Tables 9 and 10), 412 were taken by hunters with hunting licenses only, 137 by hunters with both hunting and trapping licenses, and 166 by hunters with only a trapping license. The estimate of 715 bobcats taken by licensed hunters was derived from the Department's annual "Game Take Hunter Survey." A sample of 3.1% of California's 384,096 licensed hunters produced 11,890 responses. This sampling provides an 80% confidence level for the estimated take of bobcats by licensed hunters of between 385 and 713 individuals (Table 9). These same hunters spent an estimated 11,154 days hunting bobcats for an average take of 0.049 bobcats per day (Table 10). This is the lowest hunter take per unit of effort in the last ten seasons.

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. Given a sport hunting public of about 950 (estimated from the annual hunter survey and subtracting all trappers who reported taking bobcats), about 94% of the sport hunters purchased the required tags in 1989. Additionally, sport hunters sent in tags for about 68% of the bobcats that they reported taking in the annual hunter survey.

DISCUSSION

The total bobcat harvest, as in last year, decreased again in the 1989-90 season. This was due primarily to the very low bobcat pelt price average of \$17.91. There has always been a fairly strong correlation between pelt price and trapper effort. The reduction in bobcat take was coupled with a substantial reduction in pelt prices of both coyotes and gray foxes. These lower pelt prices are determined by the fur market, and makes it economically unrealistic for many trappers to trap if the pelt prices for all three species (coyote, bobcat and gray fox) are low. There was no national or international regulatory action enacted or pending which might have influenced the demand for bobcat furs. The market just appears to be saturated. It is expected to improve somewhat during the 1990-91 trapping season.

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	21	0
	1	8	8
	2	3	6
	3	1	3
	4	0	0
	-----		-----
	Σf= 33		Σyf= 17

$$\text{Average take per hunter } x = \frac{\text{total bobcats taken}}{\text{total respondents}} = \frac{17}{11890} = 0.001429$$

$$\text{Statewide bag} = (x)(\text{tot. no. license buyers}) = (0.001429)(384096) = 549$$

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

$$\sigma(x) = \frac{x}{n} = \frac{0.001429}{11890} = 0.0003162$$

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

Confidence Levels	Mean ± std. deviation $x \pm t \sigma$	Confidence Intervals $x \pm t\sigma$	Confidence Intervals for Total Take **
@ 80% =	$x \pm (1.35) \sigma$	0.001429 ± 0.0004268	385 to 713
@ 90% =	$x \pm (1.65) \sigma$	0.001429 ± 0.0005217	349 to 749
@ 95% =	$x \pm (1.96) \sigma$	0.001429 ± 0.0006197	311 to 787
@ 99% =	$x \pm (2.576) \sigma$	0.001429 ± 0.0008145	236 to 862

* After Shimamoto (1976)

** Calculated by multiplying confidence intervals for x by the total number of license buyers.

Table 10. Licensed Sport Hunter Take of Bobcats, 1978-89

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
1988	1400	2040	43	18800	0.074
1989	549	1221	36	11154	0.049

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 bobcat take in northeastern California has been monitored every year because the age and sex structures had not increased to levels comparable to other areas of the state during the time the Department monitored these population parameters. The population now appears to continue to support a stable, if slightly cyclic harvest (Table 11). 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 below this level for the last two seasons.

Table 11. 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
1988-89	60	107	85	30	282
1989-90	36	62	85	47	230

The disparity between the information provided by the annual hunter survey and the sport hunting tag program continues. However, the disparity is much less than in previous years. The take reported from sport hunting tags is 68% of the estimated sport hunting take, and represents a substantial improvement over previous years. Likewise, the number of sport hunting tag buyers is about 94% of the estimated number of bobcat hunters (Table 12).

Table 12. Sport Hunting Tag Program Compliance, 1982-83 to 1989-90

	Season							
	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
No. of Sport Hunting Tag Buyers	384	495	547	777	823	908	807	890
Estimated No. of Bobcat Hunters *	3408	2594	3058	2050	1354	1818	1597	952
Percent of Hunters Buying Tags	11.3	19.1	17.9	37.9	60.8	49.9	50.5	93.5
Take Reported by Return of Sport Hunting Tags	87	107	156	149	147	177	205	280
Estimated Sport Hunting Take **	1865	1291	1591	1689	619	1796	1069	412
Percent of Take Reported	4.7	8.3	9.8	8.8	23.7	9.9	19.2	68.0
* 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.								

RECOMMENDATION

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