

Status of Mountain Lions in Nevada

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INTRODUCTION

Records indicate that the mountain lion was an uncommon denizen of the Great Basin before 1920. Hall (1946) found ample data to indicate that the lion was widely distributed by 1936 but did not find much evidence of high densities or for that matter many accounts of the animal in Nevada prior to his studies. Historical records do not provide evidence of high lion numbers. Noxious animals were bountied from 1873 through 1938 to address depredation or perceived depredation. The mountain lion, termed the "*California Lion*", was intermittently included and then removed from the noxious animal list even though sheep herding was very active in the State.

Mountain lion populations appeared to rise in concert with the mule deer populations that increased dramatically in the 1930's and 1940's. By the 1950's the lion harvest by Animal Damage Control (ADC) had increased from 46 animals killed between 1917 and 1931 to an average of 90 lions per year in the 1950's.

In 1965 the mountain lion was given the status of a game animal. During the mid to late 60's this status did not afford a great deal of protection to the lion, but regulatory mechanisms were in place for more restrictions if they were warranted. In 1968 tags were required

to harvest a lion and in 1970 a limit of one lion per hunter per year was established. Also, in 1970 we began to require a mandatory checkout of each harvested lion.

Lion populations may have declined in the 1970's but by the early 1980's populations were near all time highs.

CURRENT STATUS

Population Levels

Mountain lion populations appear to be at or near all time highs. Sight records are very common in many habitat types throughout the State. Mule deer, bighorn sheep, antelope, elk and feral horse populations are all at high levels and provide mountain lion prey.

Distribution

Hall (1946) reported that 56 lions had been killed in Nevada from 1917 to 1933 by ADC personnel and he doubted that any more than another 56 had been killed by the private sector. Based upon Hall's observations, it would appear that fewer than 6 lions were killed in Nevada per year during this period. The distribution of lion kills and sightings are shown in Figure 1 along with Hall's estimate of potential lion habitat. Figure 2 shows the most current estimate of lion range in Nevada. Ash-

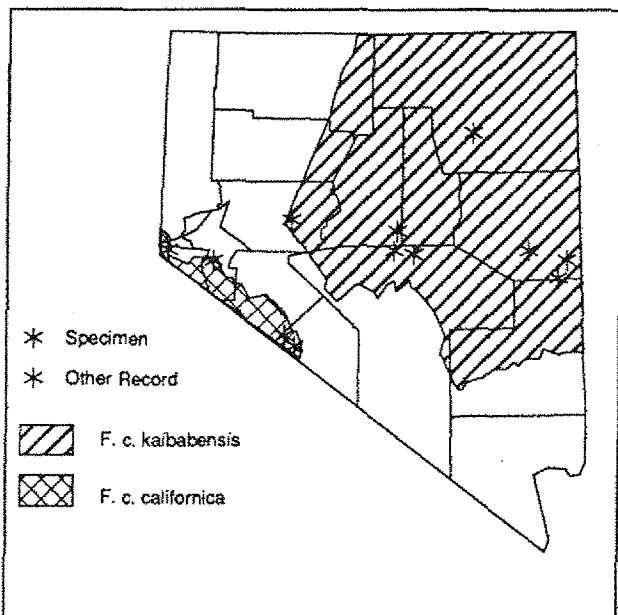


Fig. 1. Mountain lion distribution (from Hall 1946).

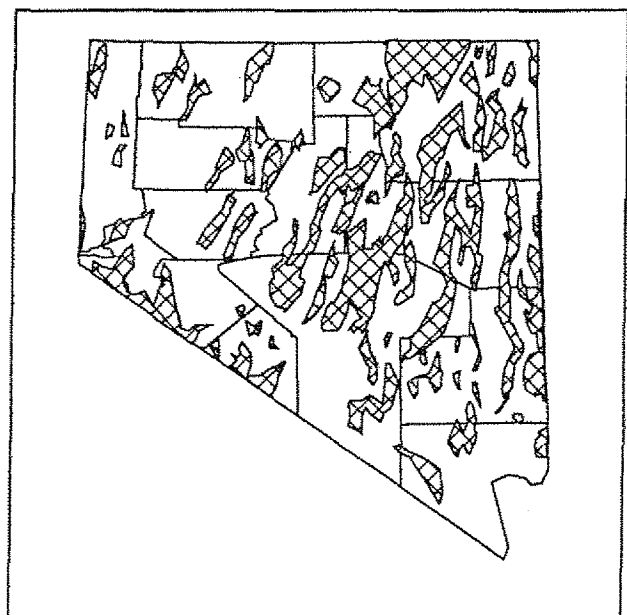


Fig. 2. Current mountain lion distribution.

man et al. (1983) estimated that 6,042 square miles have high densities averaging 0.04 lions per square mile, and 21,690 square miles have low densities averaging 0.025 lions per square mile.

Population Estimate

The lion population for Nevada was estimated by Ashman in 1983 to be 792 lions. Subsequent analyses of lion populations in selected areas indicate that Ashman's population estimates were conservative. An example of the conservative nature of the estimate is drawn from Ashman's estimate of 4 lions in a low density, small western Nevada mountain range. In 1986, six lions were killed in a several week period by ADC personnel in that range and, additionally, sign of one or two lions were recorded in the area after the ADC kill. This area would be subjectively classed as a lower density area, however, the observed density is slightly above Ashman's high density figure of 0.04 lions per square mile. Each area that was intensively evaluated has an estimated density of 0.04 lions per square mile.

MANAGEMENT PROGRAM

Nevada has pursued a vigorous management program for mountain lions since 1970. The Department has

conducted significant research, implemented innovative harvest strategies, and addressed depredation concerns and concerns of the hunting and nonhunting public.

Surveys

Population monitoring through systematic field surveys has been largely eliminated from the work program in Nevada. Intensive surveys were conducted by various means during the 1970's in a number of mountain ranges. These surveys included scratch site monitoring and track surveys by helicopter or ground vehicle.

Harvest and Harvest Program

Nevada monitors and controls harvest by hunt unit and type of harvest for each Management area. The contemporary sport and depredation lion kill for Nevada is depicted in Table 1. Since 1976, lion hunters have been limited by either a total quota or a hunt unit harvest objective. From 1976 to 1980, hunters were limited to a hunt unit in a limited entry hunting situation similar to most trophy big game hunts in the West. The tag quotas were determined after a harvest objective was established and expected hunter success levels were estimated. This system led to some of the lowest harvests experienced in Nevada and essentially failed to meet the objectives of distributing the lion kill among the hunt units.

Table 1. Lion harvest by sex and type of kill.

Year	Type Of Kill											
	Sport Harvest				Animal Damage Control				Total Kill			
	Male	Fem	Unk	Total	Male	Fem.	Unk	Total	Male	Fem	Unk	Total
1969	18	24	0	42	28	19	14	61	46	43	14	103
1970	28	27	0	55	11	9	26	46	39	36	26	101
1971	23	20	0	43	8	10	2	20	31	30	2	63
1972	34	39	0	73	8	5	1	14	42	44	1	87
1973	23	28	1	52	4	7	0	11	27	35	1	63
1974	38	50	0	88	8	4	0	12	46	54	0	100
1975	16	36	2	54	10	10	0	20	26	46	2	74
1976	10	6	0	16	14	5	0	19	24	11	0	35
1977	15	6	0	21	10	7	1	18	25	13	1	39
1978	10	13	0	23	17	7	0	24	27	20	0	47
1979	17	17	0	34	16	8	0	24	33	25	0	58
1980	10	13	0	23	12	11	0	23	22	24	0	46
1981	16	30	0	46	19	3	0	22	35	33	0	68
1982	41	20	0	61	20	17	4	41	61	37	4	102
1983	43	34	0	77	11	10	0	21	54	44	0	98
1984	53	54	0	107	13	12	0	25	66	66	0	132
1985	42	41	0	83	12	16	1	29	54	57	1	112
1986	49	38	0	87	16	9	0	25	65	47	0	112
1987	51	30	0	81	22	15	0	37	73	45	0	118
Total	537	526	3	1066	259	184	49	492	796	710	52	1558
Average	28.3	27.7	0.2	56.1	13.6	9.7	2.6	25.9	41.9	37.4	2.7	82.0

STATUS REPORTS

In 1980, Nevada modified the hunting system to allow an unlimited number of hunters to purchase a lion tag and hunt in any hunting unit that remained open, initially with number restrictions, and later without hunter number restrictions. Hunting units remain open until the close of the season or until the harvest objective is reached. The mechanics of the hunt involve the following parameters:

1. Development of season dates,
2. Development of harvest objectives by hunting unit(s),
3. A hunting permit system to keep track of hunters,
4. A lion harvest checkout system to tally harvest, and
5. A Unit closure procedure.

The hunting system currently employed by Nevada appears to be well accepted by the hunting public and the non hunting public and allows the agency considerable flexibility for harvest management. Table 2 shows the track record of the hunting system as it relates to harvest and the available resource. Generally, we are satisfied if the harvest meets or falls below the harvest objective. In areas where the harvest exceeds the harvest objective we commonly consider reducing the harvest objective for the subsequent season.

Regulations

Mountain lion hunting regulations have not changed a great deal during the past 20 years. Major points of Nevada law include the following:

1. Hunters are limited to one lion per year.
2. Females with spotted kittens are not legal.
3. Spotted kittens are not legal.
4. Trapping is not legal.
5. Hunters must possess a tag and a hunting permit for the area hunted.
6. Successful hunters must have their mountain lion validated by a Department of Wildlife representative within 72 hours of the kill.

Table 2. Lion harvest distribution.

Year	Number Of Hunters	Harvest Obj.	Sport Harvest	Areas Meeting Obj.	Areas Above Obj.	Areas Below Obj.
1980	374	56	13	0	0	8
1981	589	135	60	0	0	24
1982	580	135	61	0	2	22
1983	348	173	78	1	2	21
1984	459	183	106	6	1	19
1985	490	195	83	2	3	22
1986	459	197	87	2	0	26
1987	507	206	81	6	0	22
Totals	3,806	1,280	569	17	8	142
Average	476	160	71	2	1	18

7. Handguns, rifles, shotgun, or long bow and arrow are legal weapons.

Management Plans

The Department completed a Wildlife Policy Plan in 1985 and the *Mountain Lion in Nevada* in 1983. The documents contain the major policy statements that guide the management of lions in Nevada. The policies are:

1. Depredating lions will be removed when necessary to protect private property, human life and wildlife. The Department will cooperate fully with Animal Plant Health Inspection Service (APHIS) Animal Damage Control division to address mountain lion depredation problems;
2. Mountain lion populations will be managed to maintain balance in predator-prey relationships;
3. Mountain lion hunting season will begin on the first day of October.

Interagency Coordination

The major coordination efforts for lion management in Nevada involve the ADC program. Once each year the two agencies coordinate the permitting process and procedures that allow ADC to handle the depredation program. Generally, representatives from the Law Enforcement and Game division along with Regional personnel attend these meetings.

Depredation

Federal control programs in Nevada were initiated about 1917 and continue today. Early control work consisted of killing lions when they were located, in association with other control activities or caused a problem. Later, ADC began to kill lions in large numbers in hopes of decreasing the population. During these years private

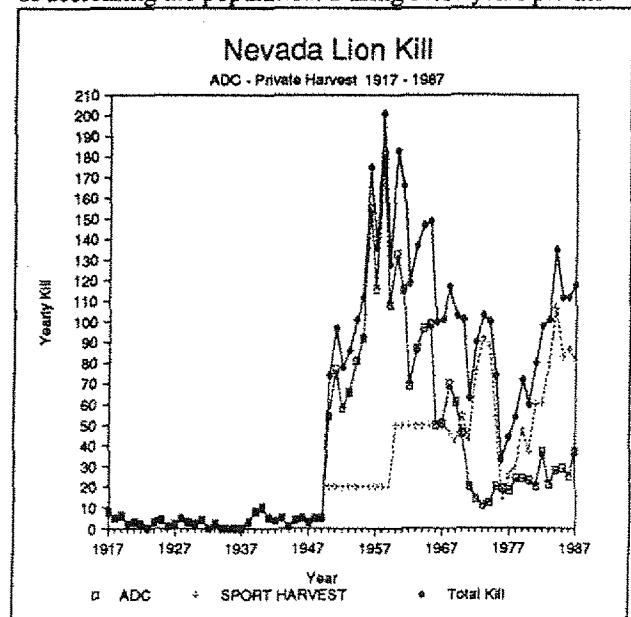


Fig. 3. Nevada mountain harvest by private hunters and ADC.

sport kill was limited but did occur. Finally, in the late 1960's ADC programs again began to concentrate on problem animal management rather than population reductions. This practice continues today. Figure 3 shows the long term lion kill by ADC and private hunters.

RESEARCH

Nevada is cooperating with California Fish and Game and the U.S. Forest Service on a study being conducted by John Turner of the Ohio College of Medicine. The study is directed towards the reproductive physiology of feral horses with lions as an agent of mortality. The study involves several collared lions and determination of food habits and home range. No other significant lion research is being conducted in Nevada at the present time.

ECONOMIC VALUES

A tag and license is required to hunt mountain lions in Nevada. The fees for hunting are \$15.00 and \$80.00 for resident and nonresident licenses, and \$15.00 and \$150.00 for tags, respectively. The total licensing cost for residents is \$35.00 and \$235.00 for nonresidents. This fee includes a \$5.00 nonrefundable application fee for the tag.

The Department has recently completed an economic bulletin on hunting in Nevada, including mountain lion hunting (Kay 1988). The survey included 53 lion hunters that received tags in 1986. All dollar figures cited are converted to a base 1986 dollar. The low percentage of returns may bias the results so we are treating the following data as preliminary; however, the costs and cost breakdown may be valuable from the comparative standpoint. Hunters in Nevada averaged 12 days in the field and spent an average of \$ 1,014.71 for the hunt. The average cost per hunter day was \$221.42 for nonresident hunters and \$52.64 for residents. Hunters reported a hunt success rate of about 28%.

The cost breakdown for lion hunting was somewhat similar for nonresidents and residents. The major costs of the hunt were guide and taxidermy fees, travel, and equipment. In general residents expended 37.4% for guide and taxidermy fees, 35.5% in travel and 12.4% for miscellaneous purchases. Nonresidents expended 31.7% for guide and taxidermy fees, 53.7% in travel, and 7.5% for license and tag.

The net economic value for lion hunters was \$21.15 per day. The nonresident valued the experience at \$27.27 per day and residents at \$18.88 per day. Kay reported the value of a WFUD (Wildlife Fishery User Day) for all hunters is \$42.02. The WFUD value was \$37.04 for residents and \$83.00 for nonresidents per hunter day.

Mountain lion depredation occurs regularly in Nevada, primarily to domestic sheep. ADC reports the following economic losses for the past 5 years.

LITERATURE CITED

- Ashman, D. L., G. C. Christensen, M. L. Hess, G. K. Tsukamoto, And M. S. Wickersham. 1983. The mountain lion in Nevada. Nevada Dept. of Wildlife, Fed. Aid Final Rpt. W-48-15, Study S&I 1, Job 5 and Study R-V, Job 1. 75pp.
- Hall, E. R., 1946. Mammals of Nevada. University of California Press. pp. 269-275

Table 3. Number of animals and economic losses from mountain lion depredation.

Year	Lamb	Sheep	Cow	Horse	Pet	Econ. Value
1983	263	134	15	2	0	\$31,461
1984	193	832	00	\$	1	9,040
1985	145	92	1	0	2	\$11,213
1986	202	126	1	0	1	\$23,830