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Cougar Predation on Livestock in New Mexico, January 1983 Through June 1984[1]

Gary A. Littauer and Ronald J. White[2]

Abstract: A telephone survey was conducted in which the objective was to obtain information from the entire population of livestock producers in New Mexico who had losses to cougars (Felis concolor) in 1983 and the first six months of 1984. A total of 103 ranchers reported losses in 1983 and 60 reported losses in the first six months of 1984. Verified (by examination of kills) losses of sheep and lambs to cougars totaled 1,202 in 1983 and 525 in the first half of 1984. Verified losses of cattle and calves totaled 230 in 1983 and 102 in the first half of 1984. Suspected losses (not verified) of sheep and cattle were similar in number to verified losses. Other verified livestock losses reported were 3 goats and 4 colts in 1983, and 25 goats and 2 colts in the first half of 1984. The value of reported losses to cougars in 1983 was at least $125,000 (producer-verified losses) and may have been as much as $220,000 (when suspected losses are included). The data suggested statewide cougar predation losses are substantially underrepresented by the passive reporting system used by the New Mexico Department of Game and Fish (NMDGF). Respondents reported a total of 217 cougars that were taken to control predation on livestock in the 18 months covered by the survey; 49% were reportedly taken on sport hunting tags suggesting that sport hunting has been a major method used by ranchers to address cougar predation problems.

INTRODUCTION

In 1983 a bill was introduced to the New Mexico State legislature to remove the cougar from the list of game animals protected under the authority of the New Mexico Department of Game and Fish (NMDGF). Hearings were held by the New Mexico House Agriculture Committee and the Consumer and Public Affairs Committee to receive public input on the bill. Considerable polarization of viewpoints between representatives of various sportsmen and trapping organizations and members of the livestock industry on one hand, and environmental groups on the other, established the controversial nature of the bill.

Concerns were voiced by some members of sportsmen groups that cougars were causing excessive adverse impacts on big game populations. Ranchers claimed cougars were causing intolerable losses of livestock and that existing legal remedies to control the problem were inadequate. They indicated some ranchers may not always report cougar predation problems to the NMDGF and may handle their own cougar predation problems. Environmental groups believed little was known about the status of cougar populations in New Mexico and requested that no cougars be killed until adequate knowledge was available to assure that cougar populations could safely withstand human-caused mortality. The NMDGF reported the status of cougar populations in New Mexico was largely unknown.

As a result of the hearings, the committees concluded inadequate information existed to make

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a decision on the bill. House Memorial 42 (HM 42) was passed requesting the NMDGF to study the status of cougar populations and the cougar predation problem. As part of its effort to respond, the NMDGF requested New Mexico Department of Agriculture (NMDA) assistance in developing a response to HM 42. NMDA conducted a survey of ranchers to determine the extent of cougar predation on livestock. This paper describes the methodology and results of the survey.

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METHODS

A list of ranchers with cougar predation problems was developed by soliciting names from (1) ADC specialists in the cooperative ADC program; (2) county extension agents; and (3) ranchers as they were contacted in the survey. The goal of this effort was to attempt to contact every rancher in New Mexico who had experienced cougar predation problems in calendar year 1983 or in the first six months of 1984. Although every impacted rancher was probably not contacted, the effort should have provided a minimum estimate of the extent of cougar predation problems during the specified periods. The major advantage of this survey methodology was reduced sampling error. Since the goal was to obtain information from the entire population (i.e., all ranchers with cougar problems), normal sampling problems were eliminated.

Attempts were made to contact each rancher on the list by telephone, in person, or by mail. Telephone interviews were conducted by NMDA personnel and personnel of the USDA/NMASS. Questions were asked to obtain information on the following subjects:

1. The number and class of livestock lost to cougars in 1983 and in the first half of 1984 that the rancher, his or her employees, or government agency personnel verified by personal examination of the carcasses.
2. The number and class of suspected but unverified livestock lost to cougars in each of the above time periods.
3. The county of the rancher's enterprise where cougar losses were experienced.
4. The number of cougars killed to control predation on livestock in 1983 and in the first half of 1984.
5. The number of cougars killed for depredation control that were taken on sport hunting tags.
6. The names and telephone numbers of additional ranchers who may have experienced cougar problems.
7. Other comments.

When telephoning was near completion in late July 1984, notices were printed in newsletters of the New Mexico Cattle Growers' Association, New Mexico Wool Growers, Inc., New Mexico Farm and Livestock Bureau, and in the New Mexico Stockman magazine. The notices requested affected ranchers who had not been contacted to contact NMDA by September 1, 1984.

A list of 209 names was developed for contacting in the survey. Twenty-six ranchers could not be reached by telephone or in person. These 26 producers were mailed a questionnaire with a letter asking them to either complete the questionnaire and return it, or to call NMDA toll-free with their information before September 1, 1984.

Respondents in the survey were assured their individual responses would be held confidential and only totals, averages, and percentages would be used in the report.

USDA/NMASS (personal communication) provided economic data used to estimate livestock values.

RESULTS

A total of 114 ranchers in 17 counties (Fig. 1) reported losing one or more head of livestock to cougars during the 18 months covered by the survey; 103 reported experiencing losses in 1983 and 60 reported losses for the first half of 1984. Forty-nine ranchers reporting losses to cougars in 1983 also had losses in the first half of 1984.

No contact was made with the 26 ranchers who were mailed questionnaires. Sixty-eight ranchers reported they either had no losses, or they were unaware of any losses to cougars during the specified periods. One rancher refused to answer specific questions although he indicated experiencing losses to cougars.

Sheep Losses

Information obtained on sheep losses to cougars is summarized in Table 1. In 1983, about 50% of the ranchers with losses and 33% of the verified losses were in Lincoln County. Eddy County contained nearly half (48%) of the total verified sheep losses but contained only 18% of the ranchers with losses. Consequently, Eddy County experienced the highest mean number lost per rancher. The number of verified losses per affected rancher in the survey ranged from 1 to 306 indicating high variability among ranchers. Over 25% of the total verified sheep and lamb losses in 1983 were reported by one rancher in the survey.

Southeastern New Mexico contained the majority of known cougar predation problems on sheep; nearly 97% of the total verified losses of sheep and lambs occurred in southeastern counties (Chaves, Otero, Lincoln, and Eddy). We located only three sheep ranchers in northern New Mexico who suffered losses to cougars.

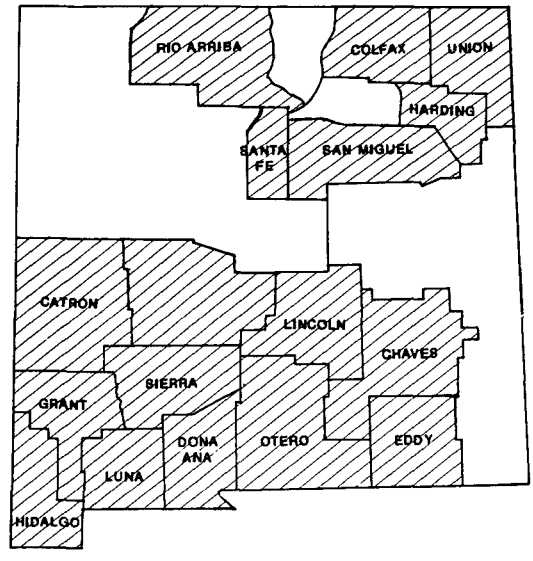

Figure 1.--New Mexico counties with reported livestock losses to cougars in 1983 or the first six months of 1984.

Table 1.--Summaries of sheep and lamb losses to cougars in New Mexico reported by ranchers for 1983 and the first half of 1984.

County	No. of Ranchers With Losses		Total No. of Sheep & Lambs Lost		Mean No. Lost Per Rancher		Total Dollar Value[3]	
	V[1]	V+S[2]	V	V+S	V	V+S	V	V+S
Calendar Year 1983								
Harding	1	1	15	15	15	15		
San Miguel	1	1	14	14	14	14		
Santa Fe	1	1	8	8	8	8		
Chaves	4	5	184	606	46.0	121.2		
Otero	2	2	5	5	2.5	2.5		
Lincoln	14	18	395	904	28.2	50.2		
Eddy	5	6	581	728	116.2	121.3		
Statewide	28	34	1202	2280	42.9	67.1	$55,833	$105,742
First Half of 1984								
Chaves	2	2	88	338	44.0	169.0		
Lincoln	6	9	216	468	36.0	52.0		
Eddy	4	4	221	326	55.3	81.5		
Statewide	12	15	525	1132	43.8	75.5	$24,671	$52,583

[1]V = losses reportedly verified by examination of carcasses.
[2]V + S = verified losses plus losses that were suspected but not verified by examination of carcasses.
[3]Value of lambs was $45.09 per head based on assumed average weight of 90 lbs. per head and average price of $50.00 per 100 lbs. (USDA/NMASS). Average 1983 inventory value of adult sheep was $47.50 per head (USDA/NMASS).

Sheep losses in the first half of 1984 were proportionately similar (on a temporal basis) to losses in 1983. Forty-three percent of the ranchers experiencing verified losses in 1983 experienced losses in the first six months of 1984. Total losses (verified plus suspected) in the first half of 1984 were 44% of those reported for 1983. The mean number of sheep lost per rancher also was similar between 1983 ($\bar{x}$=43) and the first half of 1984 ($\bar{x}$=44). The same counties where the majority of losses occurred in 1983 also experienced losses in 1984.

Cougars caused more losses of adult sheep than of lambs; 63% of the total verified losses of sheep and lambs for the 18 months was of adult sheep; 64% of the dollar value of those losses was in adult sheep.

Cattle Losses

Data obtained on cattle losses to cougars is summarized in Table 2. Numbers of cattle losses were substantially less than sheep losses but dollar values were higher. The value of verified cattle losses was nearly 24% greater than the value of verified sheep losses in 1983.

Cattle losses as determined by the survey also were distributed more widely than sheep losses in 1983, occurring in 12 counties (as

Table 2.--Summaries of cattle losses to cougars in New Mexico reported by ranchers for 1983 and the first half of 1984.

County	No. of Ranchers With Losses		Total No. of Cattle Lost		Mean No. Lost Per Rancher		Total Dollar Value[3]	
	V [1]	V+S [2]	V	V+S	V	V+S	V	V+S
Calendar Year 1983								
Grant	17	17	78	93	4.6	5.5		
Hidalgo	3	4	17	33	5.7	8.3		
Socorro	5	5	24	37	4.8	7.4		
Catron	11	12	37	60	3.4	5.0		
Sierra	11	11	36	60	3.3	5.5		
Luna	1	1	1	4	1	4		
Dona Ana	1	1	6	20	6	20		
Harding	1	2	2	8	2	4.0		
Union	1	1	1	1	1	1		
Colfax	1	2	1	2	1	1		
Lincoln	5	6	16	32	3.2	5.3		
Eddy	4	4	11	28	2.8	7.0		
Rio Arriba		1		2		2		
Chaves		1		11		11		
Statewide	61	68	230	391	3.8	5.8	$68,988	$116,349
First Half of 1984								
Grant	9	9	22	44	2.4	4.9		
Hidalgo	3	3	10	10	3.3	3.3		
Socorro	2	4	2	32	1.0	8.0		
Catron	7	9	32	62	4.6	6.9		
Sierra	5	6	15	25	3.0	4.2		
Dona Ana	1	1	1	3	1	3		
Colfax	1	1	1	5	1	5		
Lincoln	3	4	14	34	4.7	8.5		
Eddy	3	5	5	16	1.7	3.2		
Harding		1		4		4		
San Miguel		1		2		2		
Rio Arriba		1		3		3		
Statewide	34	45	102	240	3.0	5.3	$30,826	$71,495

[1]V = losses reportedly verified by examination of carcasses.

[2]V + S = verified losses plus losses that were suspected but not verified by examination of carcasses.

[3]Value of calves was $293.00 per head based on 1983 price per 100 lbs. of $65.20 and assumed average weight of 450 lbs. at marketing (USDA/NMASS). Value of cows and yearlings assumed equal to average 1983 inventory value of $340 per head (USDA/NMASS)

opposed to 7 counties for sheep losses). Approximately twice as many cattle ranchers (61) as sheep ranchers (28) were affected by verified cougar predation in 1983. However, mean number of cattle lost per affected rancher ($\bar{x}$ = 3.8) was substantially less than the mean number of sheep lost per affected rancher ($\bar{x}$ = 43). The range of verified cattle numbers lost per affected rancher was 1-12.

Most cattle losses occurred in the southwestern quarter of New Mexico. Grant, Hidalgo, Socorro, Catron, Sierra, Luna, and Dona Ana counties, which comprise that quadrant of the state, contributed 83% of the total verified cattle losses to cougars for the entire state. About 12% occurred in southeastern New Mexico and the remaining 1% occurred in the northeastern quarter of the state.

In contrast to sheep loss data, cougars caused greater losses of young than of adult cattle. Calves comprised 84% of the verified cattle losses and 82% of the dollar value of cattle lost to cougars in the survey.

Other Livestock Losses

Two ranchers reported losing domestic goats to cougars. One rancher from Union County claimed a verified loss of 25 goats to cougars in the first half of 1984. Another from Sierra County claimed a verified loss of three goats to cougars in 1983.

Three ranchers claimed verified losses of a total of four colts in 1983. Another rancher suspected a colt he lost in 1983 was due to a cougar but did not verify the cause. One rancher reported he verified the loss of two colts to cougars in the first half of 1984.

Cougars Killed For Livestock Protection

Data on cougar mortalities reported by ranchers in the survey are shown in Table 3.

Table 3.--Summaries of cougars killed to protect livestock in New Mexico as reported by ranchers for 1983 and the first half of 1984.

Area Within State	No. Killed		No. on Sport Tags		No. of Ranchers Unwilling to Report[1]
	1983	First Half 1984[2]	1983	First Half 1984	
Northwest, includes: Rio Arriba, Santa Fe counties	1	0	0	0	0
Northeast, includes: Union, Harding, Colfax, San Miguel, Quay counties	8	1	3	1	2
Southwest, includes: Grant, Hidalgo, Socorro, Catron, Sierra, Luna, Dona Ana counties	77	38	52	26	5
Southeast, includes: Chaves, Otero, Lincoln, Eddy counties	65	27	21	4	4
Statewide Totals	151	66	76	31	11

[1]Ranchers who indicated taking cougars for depredation control but would not divulge numbers or whether the cougars were taken on sport tags.
[2]Encompasses the first six months of 1984.

About 53% of cougars killed to protect livestock were taken in southwestern New Mexico while 42% were taken in southeastern New Mexico. In total, 95% of the reported cougars killed were taken in the southern half of the state. Approximately half (49%) of the cougars killed to protect livestocl. were reportedly taken on sport hunting tags. Eleven ranchers indicated they killed cougars for depredation control but would not divulge numbers.

DISCUSSION

Surveys of farmers and ranchers to quantify predation losses have been criticized as being potentially inaccurate. Producers seldom perform necropsies on dead animals, whereas necropsies are performed in biological damage assessment studies. Instead, producers often determine the cause of death by observation of the carcass and the site where the carcass is located. Doubtful cases or missing animals may be attributed as losses to the most likely cause based on experience or the circumstances at the time. For example, if the weather has been comfortable, missing lambs would not be attributed to the effects of cold, damp temperatures. Thus, more judgement is involved with ranchers' determinations of losses than in biological assessments. This factor must be considered in evaluating survey data. We attempted to resolve this problem by specifically requesting numbers of losses verified by examination of kills, as distinguished from suspected losses due to circumstantial evidence.

DeLorenzo and Howard (1977) reported that losses of sheep and lambs to predators, verified by trained biologists using radio telemetry on a range lambing operation in New Mexico, were similar to losses reported by the rancher on questionnaire surveys in two previous years. Gee et al., (1977) reported on results of a survey conducted by USDA to estimate sheep and lamb losses to predators and other causes in the western United States and provided the following observation: "Too few ranches have been included in biological damage assessment studies to permit generalization as to overall loss levels which could be statistically compared with those of the producer surveys conducted for this study. The most that can be observed so far is that the loss levels found on the few damage assessment ranches and those reported by surveyed producers appear to be generally compatible." These studies suggest rancher surveys can provide acceptable data on livestock losses to predators.

Although this type of survey cannot determine the accuracy of the response information, some general impressions were obtained by the senior author who conducted telephone interviews with approximately one-third of the respondents. Most of these ranchers would not attribute unknown losses to cougars. Many ranchers reported a number of cougar-caused losses that were verified, and implied they may have experienced other losses to cougars, but were not willing to classify them as suspected losses. These responses indicated the ranchers did not exaggerate reported losses to emphasize the importance of their problems.

A few ranchers did not know the extent of their losses to cougars, but due to circumstantial evidence, believed they had suffered losses. Achieving smaller calf crops in pastures they knew were frequented by cougars compared to calf crops obtained in pastures not considered to be habitat for cougars is an example of circumstantial evidence suggesting losses to cougars. Although these ranchers could have classified these as estimated "suspected" losses to cougars, we did not include this information to remain conservative in our estimate of total statewide losses.

We located only one rancher with cougar-caused losses in northwestern New Mexico. Approximately one-third of that quadrant is Indian reservations and we did not attempt to contact them. Therefore, losses in that quadrant may be underrepresented in survey totals.

Suspected sheep losses were nearly equal in number (1685) to verified losses (1727) in the 18-month period covered by the survey. Similarly, suspected cattle losses (299) were approximately equal to verified losses (332) reported over the same period. This information suggests ranchers only verify about half of the losses they may experience.

Certain individual sheep ranchers suffered substantially greater economic losses than individual cattle ranchers. The greatest individual loss reported by a sheep rancher was about $14,000 for verified losses in 1983 while the greatest verified cattle loss reported by an individual was about $4,000. Economic losses were not evenly distributed among ranchers suffering cougar predation problems.

Evans (1983) reported a 10-year average (1973-82) of 11.2 ranchers in New Mexico reporting cougar depredation incidents to the NMDGF. Evans reported the average total statewide value of annual livestock losses to cougars was $29,500. NMDA's survey, however, indicated the statewide value of losses in 1983 was at least $125,000 (verified losses) and may have been $220,000. These data suggested the passive reporting system (using unsolicited reports) of the NMDGF underrepresented actual losses by as much as 87%.

This survey provided minimum estimates because all ranchers with livestock losses to cougars may not have been surveyed. The range of estimated dollar losses caused by depredating cougars in the first half of 1984 was consistent with 1983 suggesting economic losses for 1983

and 1984 would have been similar had we obtained data for all of 1984.

Our estimates of economic losses by ranchers because of cougar depredations do not include various indirect costs including extra management practices, veterinarian bills, and predator control. Therefore, our estimates underrepresent the adverse financial impact of cougars on affected ranchers. For example, one respondent suffered no losses of livestock, but owned two high-valued horses that were attacked by a cougar. This individual reportedly spent approximately $8,000 on horse stalls solely for protection against cougars. These types of costs are not included in the total dollar loss estimates.

Approximately 50% of the cougars that ranchers reported were taken for controlling predation in 1983 and the first half of 1984 were taken on sport hunting tags. This suggested that ranchers relied heavily on licensed sport hunting to address cougar predation problems. Therefore, reduction of sport hunting seasons may adversely impact the ability of some ranchers to control cougar predation problems when they rely on cougar hunting guides with licensed sport hunters to take problem cougars.

The NMDGF recommended the New Mexico State Legislature appoint a study group to examine various mitigation alternatives, including compensation of ranchers for losses, in addressing cougar predation problems. Although it is unknown whether 1983 and the first half of 1984 are "average" years with regard to cougar predation problems in New Mexico, the results of this survey provide an indication of the potential funding requirements for compensation of losses.

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