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Cougar Predation on Livestock in New Mexico in 1983 and the First Half of 1984

by

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Background

In 1983 House Bill 365 was introduced to the New Mexico State Legislature. The bill would have removed the cougar (Felis concolor) from the list of protected game animals that are under the management authority of the New Mexico Department of Game and Fish (NMDGF). Hearings were held by the 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. Ranchers indicated some may not always report cougar predation problems to the NMDGF and may handle their own cougar predation problems. Environmental groups, on the other hand, believed little was known about the status of cougar populations in New Mexico and indicated the preference 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 there was inadequate information to make a decision on the bill, and House Memorial 42 (HM 42) was passed requesting the NMDGF to study the issue. The NMDGF prepared a response to HM 42 and submitted it to the House Agriculture Committee prior to the 1984 legislative session. The committee rejected the report, claiming it contained insufficient information. As a result, the NMDGF requested (Appendix I) the New Mexico Department of Agriculture (NMDA) to assist in developing a new response to HM 42 by conducting a special survey of ranchers to determine the extent of cougar predation on livestock. This report describes the methodology and results of the survey.

Acknowledgements

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Methods

Two approaches have been used in the past by researchers to assess losses of livestock due to predators: 1) biological damage assessments, and 2) surveys of farmers and ranchers. Both have advantages and disadvantages.

Biological Damage Assessments. The most exact, although time consuming and expensive, method for verification of cause of death is by necropsy of the carcass. Biological damage assessment studies of this type have been conducted by biologists and probably result in the most accurate information that can be obtained from the specific area under study. However, such studies, even on a scale as small as one ranch, are expensive, labor intensive, and usually require modified husbandry practices to accommodate the acquisition of data. Therefore, information is often obtained by surveys.

Surveys of Farmers and Ranchers. Sample surveys of farmers and ranchers provide much more information for a given expenditure of money and time. The survey approach depends upon the accuracy with which producers determine and report the number of animals lost to each cause. Most producers do not regularly perform necropsies on dead animals. Instead, they attribute the cause of death to predators, disease, or other causes 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 judgment is involved with ranchers' determinations of losses than in biological assessments, and this must be considered in evaluating survey data. However, DeLorenzo and Howard (1977) found 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. In addition, Gee et al. (1977) reported on results of a survey conducted by USDA to determine 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."

In addition, some general impressions of the accuracy of reporting by ranchers contacted in this survey were gained by telephone interviewers which included the senior author. Those impressions are discussed in the Discussion section of this report.

The questionnaire and methodology for this survey were discussed and developed with the aid of the statistician in charge and his staff at the USDA/New Mexico Crop and Livestock Reporting Service.

A list of ranchers with cougar predation problems was developed by soliciting names from (1) district field assistants in the New Mexico cooperative Animal Damage Control program (NMDA/USFWS), (2) county extension agents, and (3) other ranchers as they were contacted in the survey. The goal of this effort was to make a reasonable attempt to contact every rancher in New Mexico who had experienced cougar predation problems in calendar year 1983 or in the first half of 1984. Although it was unrealistic to expect to achieve this goal, it was felt the effort would provide a minimum estimate of the extent of cougar predation problems during the specified time periods. The major advantage of this type of survey methodology is that sampling error is greatly reduced since the goal was to obtain information from the entire population (i.e., all ranchers with cougar problems). Thus, normal problems associated with estimating population parameters from sample parameters are eliminated.

Attempts were made to contact each rancher on the list by telephone or in person. Telephone interviews were conducted by NMDA personnel and personnel of the USDA/New Mexico Crop and Livestock Reporting Service. Questions were asked that provided usable information on:

1. The number and kind of livestock each rancher lost to cougars in 1983 and in the first half of 1984 that he, his employees, or government agency personnel verified as cougar kills by personal examination of the kills.

2. The number and kind of livestock he suspected he lost to cougars but was unable to verify.

3. The county of his ranching operations where cougar losses were experienced.

4. Number of cougars killed to control predation on livestock in 1983 and in the first half of 1984.

5. Number of cougars taken for depredation control that were taken on sport hunting tags.

6. Names and telephone numbers of additional ranchers who have had cougar problems.

7. Other comments.

In his letter of March 29, 1984, Mr. Harold Olson, director, NMDGF, requested that NMDA ask ranchers to provide information on the numbers of cougar depredations verified by personnel of the NMDGF, NMDA or USFWS. That information is available in records held by the NMDGF and USFWS. Thus, in the interest of reducing response burden, it was not deemed necessary to request it from ranchers in the survey.

Mr. Olson also asked for information on annual depredations of livestock and the proportions of those depredations caused by cougars. Obtaining that information was outside the scope of this special survey. However, estimates of the causes and extent of livestock losses in New Mexico are available from

the USDA/New Mexico Crop and Livestock Reporting Service. Summaries of data on cattle and calf losses and on sheep and lamb losses obtained from that agency for calendar year 1983 are contained as Appendices II and III.

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., and the New Mexico Farm and Livestock Bureau, as well as in the August 1984 issue of the New Mexico Stockman magazine, requesting affected ranchers who had not been contacted to contact NMDA by September 1, 1984.

Respondents in the survey were assured that their individual responses would be held in confidence and only totals, averages, and percentages would be used in this report. Therefore, once survey results were compiled and analyzed, names were removed from questionnaire forms to assure confidentiality.

Results

A list of 209 names was developed for contacting in the survey. Twenty-six ranchers could not be reached by telephone or in person and 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. A total of 114 reported losing one or more head of livestock to cougars in 1983 or 1984; 103 reported having 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.

Sixty-eight ranchers reported they had no losses or were unaware of any losses to cougars during the specified time periods. One rancher refused to answer any questions even though he indicated having losses to cougars.

Sheep Losses--1983. Table 1 shows a summary of verified sheep losses, by county, to cougars in 1983. A total of 28 ranchers reported 1,202 verified sheep and lamb losses to cougars during that time. Fifty percent of the ranchers and 33 percent of the verified losses were in Lincoln County. Eighteen percent of the ranchers and 48 percent of the verified sheep losses were in Eddy County. Chaves County contained 14 percent of the ranchers and 15 percent of the losses. The mean number of verified sheep losses per affected rancher ranged from 2.5 in Otero County to 116.2 in Eddy County. The mean number of verified sheep losses per affected rancher, statewide, was 42.9. Reported verified sheep losses per affected rancher on a statewide basis ranged from 1 to 306, indicating high variability among ranchers.

Table 2 contains a summary of total sheep losses (i.e., verified plus suspected) to cougars reported for 1983. Thirty-four ranchers reported losing a total of 2,280 sheep and lambs that they either verified or had reason to suspect as being caused by cougars. Fifty-three percent of the ranchers and 40

Table 1. Summary Of Verified Sheep Losses To Cougars, By County, Reported By Ranchers In New Mexico For 1983.

County	No. of Ranchers With Losses	Total No. of Sheep & Lambs Lost	Percent of Total	Mean No. Lost Per Rancher
Harding	1	15	1.2	15
San Miguel	1	14	1.2	14
Santa Fe	1	8	0.7	8
Chaves	4	184	15.3	46.0
Otero	2	5	0.4	2.5
Lincoln	14	395	32.9	28.2
Eddy	5	581	48.3	116.2
Statewide	28	1202	100.0	42.9

Table 2. Summary Of Total Sheep Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico In 1983.

County	No. of Ranchers With Losses	Total No. of Sheep and Lambs Lost	Percent of Total	Mean No. Lost Per Rancher
Harding	1	15	0.7	15
San Miguel	1	14	0.6	14
Santa Fe	1	8	0.4	8
Chaves	5	606	26.6	121.2
Otero	2	5	0.2	2.5
Lincoln	18	904	39.6	50.2
Eddy	6	728	31.9	121.3
Statewide	34	2280	100.0	67.1

percent of these losses were from Lincoln County; 18 percent of the ranchers and 32 percent of these losses were from Eddy County. Chaves County contained about 15 percent of the affected ranchers and about 27 percent of the losses in the verified plus suspected sheep loss category. Mean number of verified plus suspected sheep losses per affected rancher ranged from 2.5 in Otero County to 121.3 in Eddy County. The mean number of verified plus suspected sheep losses per affected rancher, statewide, was 67.1. Verified plus suspected sheep losses per affected rancher in 1983 ranged from 1 to 383 head.

The estimated dollar values of verified sheep and lamb losses during 1983 are presented in Table 3. The total value of verified sheep and lamb losses reported by ranchers in the survey for 1983 was $55,833. Approximately 58 percent of this value was in losses of adult sheep while 42 percent was in losses of lambs.

The value of verified plus suspected sheep and lamb losses in 1983 was $105,742 (Table 4). Approximately 55 percent of this value was in losses of adult sheep while 45 percent was in losses of lambs.

Sheep Losses--Jan.-June 1984. Table 5 shows a summary of verified sheep losses to cougars in the first half of 1984. Twelve ranchers in three counties reported a total of 525 verified sheep and lamb losses to cougars during the period and ranged from 5 to 110 per rancher.

Lincoln and Eddy counties were almost equal in terms of verified sheep losses to cougars in the first half of 1984, having 6 and 4 respectively, of the 12 affected ranchers and 216 and 221 verified sheep losses, respectively. Chaves County was again third with 2 affected ranchers and 88 verified losses.

Verified plus suspected sheep losses to cougars in the first half of 1984 totaled 1,132 and were reported by 15 ranchers in the same three counties (Table 6).

The estimated dollar values of verified sheep and lamb losses to cougars in the first half of 1984 are presented in Table 7. The total value of these losses was $24,671 of which 80 percent was in adult sheep losses and 20 percent was in lamb losses.

The value of verified plus suspected sheep and lamb losses in the first half of 1984 totaled $52,583 (Table 8). Approximately 58 percent of this was in adult sheep losses and 42 percent was in lamb losses.

Cattle Losses--1983. Verified cattle (includes calves, cows, and yearlings) losses totaled 230 in 1983 and were reported by 61 ranchers (Table 9). Grant County had 28 percent of the affected ranchers and 34 percent of the total number of head lost in this category. Catron and Sierra counties were approximately equal with each having 18 percent of the affected ranchers and about 16 percent of the losses. Socorro County was next with about 8 percent of the ranchers with verified cattle losses and 10 percent of the total losses.

Table 3. Estimated Dollar Value Of Verified Sheep Losses To Cougars, By County, In New Mexico In 1983.

County	No. Sheep Lost	Value 1/	No. Lambs Lost	Value 2/	Total Value
Harding	15	$ 713	-	-	$ 713
San Miguel	10	475	4	$ 180	655
Santa Fe	8	380	-	-	380
Chaves	108	5,130	76	3,427	8,557
Otero	1	48	4	180	228
Lincoln	313	14,868	82	3,697	18,565
Eddy	223	10,593	358	16,142	26,735
Statewide	678	$32,207	524	$23,626	$55,833

1/Average 1983 inventory value for adult sheep was $47.50 per head (USDA/New Mexico Crop and Livestock Reporting Service). Values in table are rounded to nearest dollar.

2/Average 1983 price per 100 lbs. for lambs was $50.10 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 90 lbs. at marketing, average per head value in 1983 was $45.09. Values in table are rounded to nearest dollar.

Table 4. Estimated Dollar Value Of Total Sheep Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico In 1983.

County	No. Sheep Lost	Value 1/	No. Lambs Lost	Value 2/	Total Value
Harding	15	$ 713	-	-	$ 713
San Miguel	10	475	4	180	655
Santa Fe	8	380	-	-	380
Chaves	115	5,463	491	22,139	27,602
Otero	1	48	4	180	228
Lincoln	730	34,675	174	7,846	42,521
Eddy	339	16,103	389	17,540	33,643
Statewide	1,218	$57,857	1,062	$47,885	$105,742

1/Average 1983 inventory value for adult sheep was $47.50 per head (USDA/New Mexico Crop and Livestock Reporting Service). Values in table are rounded to nearest dollar.

2/Average 1983 price per 100 lbs. for lambs was $50.10 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 90 lbs. at marketing, average per head value in 1983 was $45.09. Values in table are rounded to nearest dollar.

Table 5. Summary Of Verified Sheep Losses To Cougars, By County, As Reported By Ranchers In New Mexico For The First Half Of 1984.

County	No. of Ranchers With Losses	Total No. of Sheep and Lambs Lost	Percent of Total	Mean No. Lost Per Rancher
Chaves	2	88	16.8	44.0
Lincoln	6	216	41.1	36.0
Eddy	4	221	42.1	55.3
Statewide	12	525	100.0	43.8

Table 6. Summary Of Total Sheep Losses (Verified Plus Suspected) To Cougars, By County, As Reported By Ranchers In New Mexico During The First Half Of 1984.

County	No. of Ranchers With Losses	Total No. of Sheep & Lambs Lost	Percent of Total	Mean No. Lost Per Rancher
Chaves	2	338	29.9	169.0
Lincoln	9	468	41.3	52.0
Eddy	4	326	28.8	81.5
Statewide	15	1132	100.0	75.5

Table 7. Dollar Value Of Verified Sheep Losses To Cougars, By County, In New Mexico During The First Half Of 1984.

County	No. Sheep Lost	Value 1/	No. Lambs Lost	Value 2/	Total Value
Chaves	53	$ 2,518	35	$1,578	$ 4,096
Lincoln	150	7,125	66	2,976	10,101
Eddy	211	10,023	10	451	10,474
Statewide	414	$19,666	111	$5,005	$24,671

1/Average value of adult sheep in 1984 was assumed to be equal to the average inventory value of adult sheep in 1983, which was $47.50 (USDA/New Mexico Crop and Livestock Reporting Service). Values in table are rounded to nearest dollar.

2/Lamb price per 100 lbs. for 1984 was not yet available at the time of this writing. Average 1983 lamb price per 100 lbs. was $50.10 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 90 lbs. at marketing, average per head value for lambs was $45.09. Values in table are rounded to nearest dollar.

Table 8. Dollar Value Of Total Sheep Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico During The First Half Of 1984.

County	No. Sheep Lost	Value 1/	No. Lambs Lost	Value 2/	Total Value
Chaves	128	$ 6,080	210	$ 9,469	$15,549
Lincoln	195	9,263	273	12,310	21,573
Eddy	316	15,010	10	451	15,461
Statewide	639	$30,353	493	$22,230	$52,583

1/Average value of adult sheep in 1984 was assumed to be equal to the average inventory value of adult sheep in 1983, which was $47.50 (USDA/New Mexico Crop and Livestock Reporting Service). Values in table are rounded to nearest dollar.

2/Lamb price per 100 lbs. for 1984 was not yet available at the time of this writing. Average 1983 lamb price per 100 lbs. was $50.10 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 90 lbs. at marketing, average per head value for lambs was $45.09. Values in table are rounded to nearest dollar.

Table 9. Summary Of Verified Cattle Losses To Cougars, By County, Reported By Ranchers In New Mexico For 1983.

County	No. of Ranchers With Losses	Total No. of Cows, Calves, Yearlings Lost	Percent of Total	Mean No. Lost Per Rancher
Grant	17	78	33.9	4.6
Hidalgo	3	17	7.4	5.7
Socorro	5	24	10.4	4.8
Catron	11	37	16.1	3.4
Sierra	11	36	15.7	3.3
Luna	1	1	0.4	1
Dona Ana	1	6	2.6	6
Harding	1	2	0.9	2
Union	1	1	0.4	1
Colfax	1	1	0.4	1
Lincoln	5	16	7.0	3.2
Eddy	4	11	4.8	2.8
Statewide	61	230	100.0	3.8

Verified cattle losses per affected rancher on a statewide basis in 1983 ranged from 1 to 12 head with a mean of 3.8. Mean number lost per affected rancher ranged from 1 in Luna, Union, and Colfax counties to a high of 5.7 in Hidalgo County.

Verified plus suspected cattle losses in 1983 are presented in Table 10. Total losses in this category for the state were 391 reported by 68 ranchers. Grant County had 25 percent of the ranchers and about 24 percent of the losses. Catron and Sierra counties had about 18 percent and 16 percent of the affected ranchers, respectively, and each had about 15 percent of the total reported losses in the state. Verified plus suspected cattle losses on a statewide basis per affected rancher ranged from 1 to 20 head with a mean of 5.8 in 1983.

The estimated dollar value of verified cattle and calf losses to cougars in 1983 was $68,988 (Table 11). Eighty-three percent of this value was in calf losses, and the remainder was in losses of cows, steers and yearlings.

The value of verified plus suspected cattle and calf losses in 1983 was $116,349 (Table 12). Of this amount, 89 percent was in calf losses, and the remainder was in losses of cows, steers and yearlings.

Cattle Losses--Jan.-June 1984. Table 13 shows verified cattle losses reported for the first half of 1984. Thirty-four ranchers from nine counties reported a total of 102 head of cattle lost to cougars during that time period. Grant, Catron, and Sierra counties were the top three in terms of numbers of affected ranchers and numbers of cattle lost to cougars during that time period.

Table 14 shows verified plus suspected cattle losses for the first half of 1984. Forty-five ranchers in 12 counties reported a total loss of 240 head in this category. Catron, Grant, Lincoln, Socorro, and Sierra counties had the majority of cattle losses to cougars in this category in the first six months of 1984.

The estimated dollar value of verified cattle and calf losses to cougars in the first half of 1984 was $30,826, of which 78 percent was in calf losses, and 22 percent was in losses of cows, steers and yearlings (Table 15).

The value of verified plus suspected cattle and calf losses to cougars in the first half of 1984 was $71,495, of which 88 percent was in calf losses, and 12 percent was in losses of cows, steers and yearlings (Table 16).

Other Types of 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. The other was from Sierra County and claimed he verified the loss of 3 goats to cougars in 1983.

Table 10. Summary Of Total Cattle Losses (Verified Plus Suspected) To Cougars, By County, Reported By Ranchers In New Mexico For 1983.

County	No. Of Ranchers With Losses	Total No. of Cows, Calves, Yearlings Lost	Percent of Total	Mean No. Lost Per Rancher
Grant	17	93	23.8	5.5
Hidalgo	4	33	8.4	8.3
Socorro	5	37	9.5	7.4
Catron	12	60	15.3	5.0
Sierra	11	60	15.3	5.5
Luna	1	4	1.0	4
Dona Ana	1	20	5.1	20
Harding	2	8	2.0	4.0
Union	1	1	0.3	1
Colfax	2	2	0.5	1.0
Rio Arriba	1	2	0.5	2
Chaves	1	11	2.8	11
Lincoln	6	32	8.2	5.3
Eddy	4	28	7.2	7.0
Statewide	68	391	99.9 1/	5.8

1/Failure of percentages to add up to 100.0 is due to rounding.

Table 11. Estimated Dollar Value Of Verified Cattle Losses To Cougars, By County, In New Mexico In 1983.

County	No. Calves Lost	Dollar Value 1/	No. Other Cattle Lost	Dollar Value 2/	Total Dollar Value
Grant	69	$20,217	9	$ 3,060	$23,277
Hidalgo	17	4,981	-	-	4,981
Socorro	24	7,032	-	-	7,032
Catron	24	7,032	13	4,420	11,452
Sierra	29	8,497	7	2,380	10,877
Luna	1	293	-	-	293
Dona Ana	6	1,758	-	-	1,758
Harding	-	-	2	680	680
Union	-	-	1	340	340
Colfax	1	293	-	-	293
Lincoln	14	4,102	2	680	4,782
Eddy	11	3,223	-	-	3,223
Statewide	196	$57,428	34	$11,560	$68,988

1/Average 1983 price per 100 lbs. for calves was $65.20 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 450 lbs. at marketing, the 1983 average value per head is calculated to be $293.00.

2/Value of other cattle (includes cows, steers, yearlings) is assumed equal to the average 1983 inventory value of $340 per head (USDA/New Mexico Crop and Livestock Reporting Service).

Table 12. Estimated Dollar Value Of Total Cattle Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico In 1983.

County	No. Calves Lost	Value 1/	No. Other Cattle Lost	Value 2/	Total Value
Grant	84	$ 24,612	9	$ 3,060	$ 27,672
Hidalgo	33	9,669	-	-	9,669
Socorro	37	10,841	-	-	10,841
Catron	46	13,478	14	4,760	18,238
Sierra	53	15,529	7	2,380	17,909
Luna	4	1,172	-	-	1,172
Dona Ana	20	5,860	-	-	5,860
Harding	4	1,172	4	1,360	2,532
Union	-	-	1	340	340
Colfax	1	293	1	340	633
Rio Arriba	2	586	-	-	586
Chaves	11	3,223	-	-	3,223
Lincoln	30	8,790	2	680	9,470
Eddy	28	8,204	-	-	8,204
Statewide	353	$103,429	38	$12,920	$116,349

1/Average 1983 price per 100 lbs. for calves was $65.20 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 450 lbs. at marketing, the 1983 average value per head is calculated to be $293.00.

2/Value of other cattle (includes cows, steers, yearlings) is assumed equal to the average 1983 inventory value of $340 per head (USDA/New Mexico Crop and Livestock Reporting Service).

Table 13. Summary Of Verified Cattle Losses To Cougars, By County, In New Mexico During The First Half Of 1984.

County	No. of Ranchers With Losses	Total No. of Cows, Calves Yearlings Lost	Percent of Total	Mean No. Lost Per Rancher
Grant	9	22	21.6	2.4
Hidalgo	3	10	9.8	3.3
Socorro	2	2	2.0	1.0
Catron	7	32	31.4	4.6
Sierra	5	15	14.7	3.0
Dona Ana	1	1	1.0	1
Colfax	1	1	1.0	1
Lincoln	3	14	13.7	4.7
Eddy	3	5	4.9	1.7
Statewide	34	102	100.1 1/	3.0

1/Failure of percentages to add up to 100.0 is due to rounding.

Table 14. Summary Of Total Cattle Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico During The First Half Of 1984.

County	No. of Ranchers With Losses	Total No. of Cows, Calves, Yearlings Lost	Percent of Total	Mean No. Lost Per Rancher
Grant	9	44	18.3	4.9
Hidalgo	3	10	4.2	3.3
Socorro	4	32	13.3	8.0
Catron	9	62	25.8	6.9
Sierra	6	25	10.4	4.2
Dona Ana	1	3	1.3	3
Harding	1	4	1.7	4
Colfax	1	5	2.1	5
San Miguel	1	2	0.8	2
Rio Arriba	1	3	1.3	3
Lincoln	4	34	14.2	8.5
Eddy	5	16	6.7	3.2
Statewide	45	240	100.1 1/	5.3

1/Failure of percentages to add up to 100.0 is due to rounding.

Table 15. Estimated Dollar Value Of Verified Cattle Losses To Cougars, By County, In New Mexico In The First Half Of 1984.

County	No. Calves Lost	Value 1/	No. Other Cattle	Value 2/	Total Value
Grant	22	$ 6,446	-	-	$ 6,446
Hidalgo	1	293	9	$3,060	3,353
Socorro	2	586	-	-	586
Catron	24	7,032	8	2,720	9,752
Sierra	13	3,809	2	680	4,489
Dona Ana	1	293	-	-	293
Colfax	-	-	1	340	340
Lincoln	14	4,102	-	-	4,102
Eddy	5	1,465	-	-	1,465
Statewide	82	$24,026	20	$6,800	$30,826

1/Calf Price per 100 lbs. for 1984 was not available at time of this writing. Average 1983 price per 100 lbs. for calves was $65.20 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 450 lbs. at marketing, the 1984 average value per head is calculated to be $293.00.

2/Value of other cattle (includes cows, steers, yearlings) lost in 1984 is assumed to be equal to the average 1983 inventory value of $340 per head (USDA/New Mexico Crop and Livestock Reporting Service).

Table 16. Estimated Dollar Value Of Total Cattle Losses (Verified Plus Suspected) To Cougars, By County, In New Mexico During The First Half Of 1984.

County	No. Calves Lost	Value 1/	No. Other Cattle Lost	Value 2/	Total Value
Grant	44	$12,892	-	-	$12,892
Hidalgo	1	293	9	$3,060	3,353
Socorro	32	9,376	-	-	9,376
Catron	53	15,529	9	3,060	18,589
Sierra	23	6,739	2	680	7,419
Dona Ana	3	879	-	-	879
Harding	4	1,172	-	-	1,172
Colfax	-	-	5	1,700	1,700
San Miguel	2	586	-	-	586
Rio Arriba	3	879	-	-	879
Lincoln	34	9,962	-	-	9,962
Eddy	16	4,688	-	-	4,688
Statewide	215	$62,995	25	$8,500	$71,495

1/Calf Price per 100 lbs. for 1984 was not available at time of this writing. Average 1983 price per 100 lbs. for calves was $65.20 (USDA/New Mexico Crop and Livestock Reporting Service). At an assumed average weight of 450 lbs. at marketing, the 1984 average value per head is calculated to be $293.00.

2/Value of other cattle (includes cows, steers, yearlings) lost in 1984 is assumed to be equal to the average 1983 inventory value of $340 per head (USDA/New Mexico Crop and Livestock Reporting Service).

Three ranchers claimed verified losses of 4 colts in 1983. Another rancher had a colt killed in 1983 that he suspected was due to cougars. One rancher claimed verified losses of 2 colts to cougars in the first half of 1984.

Dollar Value of Losses - Combined Classes of Livestock. The total estimated statewide value of verified livestock losses to cougars in 1983 was $124,821. This figure does not include the value of goats or colts reported lost to cougars in the survey. Of this total 45 percent was in verified sheep losses and 55 percent in verified cattle losses.

Adding suspected losses to verified losses for 1983 indicates the total dollar value of losses to cougars incurred by the ranchers reporting in this survey was as much as $222,091, of which 48 percent was in sheep losses and 52 percent was in cattle losses.

The total estimated dollar value of verified losses to cougars during the first six months of 1984 was $55,497, of which 44 percent was in sheep losses and 56 percent was in cattle losses. Adding suspected losses to verified losses indicates ranchers may have lost up to $124,078 worth of livestock to cougars during the first half of 1984. Of that total 42 percent was in sheep losses and 58 percent was in cattle losses.

Cougars Killed for Livestock Protection. Table 17 shows the numbers of cougars taken in 1983 for livestock protection as reported by ranchers in the survey. Ranchers reported a total of 151 cougars were taken in 1983 to protect their livestock. Of that total, the ranchers reported 76 were taken on sport hunting tags. Ranchers indicated that some of the cougars not taken on sport tags in 1983 were taken by personnel of the NMDGF or the NMDA/USFWS ADC program. No specific questions were asked to determine the numbers taken by agency personnel since those numbers should be available in agency records.

The southwest quarter of New Mexico ranked first in number of cougars killed for depredation control with 77. The southeast quarter was second with 65. The southern half of New Mexico accounted for 94 percent of the reported number of cougars killed for livestock protection in 1983.

These estimates are probably lower than the actual number of cougars taken because 11, or approximately 10 percent, of the ranchers affected by cougar predation in the survey indicated they had taken cougars but were unwilling to divulge information on numbers (Table 17).

The number of cougars reportedly taken by ranchers in the survey in the first half of 1984 was 66, of which 31 were taken on sport hunting tags (Table 18). Again, ranchers indicated that some of the cougars not taken on sport hunting tags were taken by personnel of the NMDGF or NMDA/USFWS. As in 1983, the majority (98 percent) were taken in the southern half of New Mexico.

Table 17. Summary Of Cougars Killed To Protect Livestock In New Mexico As Reported By Ranchers For 1983.

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

1/This is the number of ranchers who indicated they took cougars for depredation control but would not divulge numbers or whether the cougars were taken on sport tags.

Table 18. Summary of Cougars Killed To Protect Livestock, By Quarters Of New Mexico, As Reported By Ranchers For The First Half Of 1984.

Area Within New Mexico	No. Killed	No. on Sport Tags
Northwest	0	0
Northeast	1	1
Southwest	38	26
Southeast	27	4
Statewide Total	66	31

Discussion

Although this type of survey cannot determine the accuracy of the response information, some general impressions were obtained by telephone interviewers. Most ranchers seemed unwilling to attribute unknown losses to cougars. Many ranchers that reported losses stated a number that they "knew of," and implied they may have had other losses to cougars, but were not willing to place them in the suspected category. Consequently, actual losses to cougars may have been higher than the "verified plus suspected" category in the survey results.

A few ranchers did not know the extent of losses to cougars, but due to circumstantial evidence, believed they had suffered losses. Achieving smaller calf crops in pastures they knew contained cougars compared to what they obtained in pastures not considered to be habitat for cougars is an example of circumstantial evidence suggesting losses to cougars. Although these ranchers could conceivably arrive at an estimated "suspected" loss to cougars, such information was not included in the survey results in the interest of remaining conservative.

The survey results indicate a range of between $125,000 and $220,000 in livestock losses to cougars in New Mexico in calendar year 1983. It must be emphasized that the boundaries of this range are minimum estimates since it is doubtful that all ranchers with losses to cougars were contacted and one rancher with losses refused to divulge information. The survey estimated the range of dollar losses to cougars in the first half of 1984 at between $55,000 and $124,000 which roughly implies consistency between the two years considering that only losses from the first half of 1984 were tallied.

The estimate of dollar values lost by ranchers because of cougar depredations presented in this report do not include various indirect costs such as extra management practices, veterinarian bills, and predator control that are also incurred by ranchers with cougar predation problems. Therefore, the dollar estimates of loss contained in this survey underrepresent the true economic importance of cougars on affected ranchers. For example, one individual, although he suffered no losses of livestock, had two high-valued horses attacked by a cougar and spent approximately $8,000 on horse stalls that he considered to be solely for protection against cougars. This and similar types of costs are also not included in the total dollar estimate of losses.

Approximately 50 percent of the cougars that ranchers said were taken for controlling predation in 1983 and the first half of 1984 were taken on sport hunting tags. This suggests that licensed sport hunting has been a significant way in which ranchers have addressed cougar predation problems. Therefore, reduction of sport hunting seasons may have an impact on the ability of some ranchers to control cougar predation problems if they rely primarily on cougar hunting guides with licensed sport hunters to take problem cougars.

The initial NMDGF response to HM 42 recommended the New Mexico State Legislature appoint a study group to examine various mitigation alternatives 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 mitigation of losses. In addition to the dollar value of verified losses, estimates could be made of the administrative costs of loss verification by government agency personnel, since such verification would probably be required in any mitigation program proposed to the legislature.

Summary

In a telephone survey conducted by NMDA a total of 114 ranchers reported losing one or more head of livestock to cougars in 1983 or 1984; 103 ranchers reported losses in 1983 and 60 reported losses in the first six months of 1984. Forty-nine ranchers reporting losses to cougars in 1983 also had losses in the first half of 1984. Verified losses of sheep and lambs to cougars totaled 1202 in 1983 and 525 in the first half of 1984. Verified plus suspected sheep and lamb losses totaled 2280 and 1132 in 1983 and the first half of 1984, respectively. Verified losses of cattle and calves totaled 230 in 1983 and 102 in the first half of 1984. Verified plus suspected cattle and calf losses totaled 391 and 240 in 1983 and the first half of 1984, respectively. In addition, 3 goats and 4 colts were reported as verified cougar-caused losses for 1983; 25 goats and 2 colts were reported as verified losses to cougars for the first half of 1984.

The initial response to HM 42 by the NMDGF based its discussion and recommendations on a 10 year average (1973-82) of 11.2 ranchers who reported depredation incidents to them with an estimated total annual livestock loss of $29,500. NMDA's survey, however, indicates the value of losses in 1983 was at least $125,000 (verified losses) and may have been as much as $220,000 in direct loss to ranchers due to livestock being killed by cougars. It does not include indirect dollar losses due to increased costs of husbandry and predator control due to cougar depredations, nor does it include the losses of goats and colts reported by ranchers.

Ranchers in the survey reported a total of 151 cougars that were taken to control predation on livestock in 1983. Of that total, 76 were reportedly taken on sport hunting tags. Sixty-six cougars were reportedly taken for controlling predation in the first half of 1984, of which 31 were reportedly taken on sport hunting tags. The data suggest that sport hunting has been a major way in which ranchers have addressed cougar predation problems.

The survey indicated about 91 percent of the ranchers with losses and 97 percent of the dollar value lost due to cougar depredation occurred south of Interstate 40 (roughly the southern half of the state) in 1983. Similarly, 94 percent of the reported number of cougars killed for livestock protection in 1983 were taken in the southern half of New Mexico. Thus, although the survey was conducted on a statewide basis, it appears that nearly all of the cougar depredation problems impact the southern ranchers.

Literature Cited

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