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PREDATORS AND SHEEP MANAGEMENT PRACTICES IN SONOMA COUNTY, CALIFORNIA

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ABSTRACT: Over the last twenty-five years, sheep numbers have been declining in Sonoma and Marin Counties at the same time the number of predators has increased. With the removal of most chemical control methods, livestock producers have had to turn to other methods of preventing livestock losses. The objective of this project was to survey livestock producers to determine the levels of predation, type of predator involved, and the management methods being used to reduce these losses. This information is essential to develop a sound extension program to help livestock producers better deal with the predator problem.

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INTRODUCTION

Predators can be a significant problem to the livestock industry, especially sheep producers. Coyotes and free-roaming dogs are the most common predators in California, but other animals such as eagles, bears, bobcats and mountain lions have also taken their toll (Howard, et al, 1985). Between 1960 and 1985, sheep numbers in Sonoma County dropped from 143,000 to 27,000 (Anon. 1960, 1985). According to many sheep producers, one of the major reasons for this decrease can be attributed to predation losses. In contrast, coyotes taken during predator control programs have been on the increase during this same period. For example, in 1960, 40 coyotes were taken, compared to 207 in 1985 (J. Maestrelli, pers. comm.). Estimates of sheep predation losses from coyotes in Sonoma County are generally assumed to be 10 to 20% of the total flock.

Free-roaming dogs also cause severe losses to sheep producers in Sonoma and Marin Counties. Almost all dogs, provided the right circumstances, are capable of running, killing or injuring sheep. Domestic dogs, unlike many wild predators, often kill and injure many sheep during each attack. This means that literally whole flocks can be devastated overnight.

Sonoma County has a cooperative animal damage control agreement with the California Department of Food and Agriculture and the US Department of Agriculture (USDA-APHIS). This program is extremely valuable to livestock producers. To complement it, the University extends information to producers on management practices that can potentially reduce predation losses. However, information on these, including effectiveness in various situations, is limited.

The goal of this project was to use the counties' sheep producers to identify the predation problem, determine which management methods and practices were best suited for each region of the county, and to assess how producers felt each was in decreasing predation losses. With this information, we can develop a better extension education program geared to the various production situations in the regions.

METHODS AND MATERIALS

We conducted a mail survey in Sonoma and northern Marin Counties, California to identify the predation problem, control methods used and their effectiveness as perceived by the users. We identified 590 livestock producers in Sonoma and northern Marin Counties from our extension mailing lists and mailed them surveys. We attempted to survey all active livestock producers in the designated areas although we had no way of ensuring all producers were surveyed. Two weeks later, a reminder card was mailed in an extension livestock newsletter to all survey recipients. We analyzed the returned surveys using the MSTAT3 statistics package at the University of California, Davis.

Regions Description

The two counties were divided into six regions, each corresponding to specific terrain, general farm size, flock size, urbanization, etc. This was done to determine if area grazed, terrain and flock size had an effect on management practices used, or on their effectiveness. The regions were as follows:

Region 1: Located in the northwest corner of Sonoma County. The terrain ranges from the coastal mountains on the west to steep rolling hills on the east. Timber provides extensive cover in this region. The average sheep ranch is 2500 acres with mostly commercial flocks.

Region 2: A large area in Region 2 has no development or grazing because of geothermal geysers. Native-type vegetation is extensive in the northeast section whereas urban development and vineyards dominate in the southwest. There are many farm flocks; the average ranch size is between 100 and 500 acres.

Region 3: Region 3 is a highly developed, urbanized

area of Sonoma County. The region includes the cities of Santa Rosa, Rohnert Park and Cotati, which are heavily populated. There are no commercial flocks, only farm flocks and 4-H project animals.

Region 4: The western side of Region 4 is coastal range where mostly commercial flocks graze on properties averaging 1000 acres. The region becomes more urbanized on the eastern side where mostly farm flocks are present.

Region 5: Region 5 is divided by Sonoma Mountain with flat terrain on either side. In the southern and eastern section, small farm flocks are grazed on improved dryland pasture. Commercial flocks, along with cattle, are grazed over the mountains. There is extensive development and vineyard production surrounding the city of Sonoma. Average farm size is less than 1000 acres.

Region 6: Region 6 is the northern part of Marin County from Chileno Valley north. The terrain is steep but the hills are open with well established grazing. The range land has been seeded with grasses and forbs, and is grazed mostly by sheep. The grazed areas range between 500 and 1000 acres.

Management Methods

Sheep management methods and their effectiveness in reducing predator losses were a main component of the survey. Management practices covered included: 1) guarding dogs; 2) donkeys and/or llamas; 3)night pastures; 4) shed lambing; 5) trapping, snaring, M44s, etc.; 6) hunting; 7) electric fencing; 8) cross and/or perimeter fencing; and 9) sheep herders and/or simulated human presence.

RESULTS

Degree of Seriousness

We received 163 responses (28%) from the 590 surveys mailed out. All respondents had been or were livestock producers during the last three years. After determining their regions, the respondents were asked if the predation problem had gotten worse, better, or remained the same. For the last five years, 47% of the respondents felt predation on their ranch had remained the same and 39% felt it had gotten worse. Only 14% felt it had gotten better. When asked, "How serious of a problem is predation to you?", 39% indicated it was a serious or very serious problem (Table 1). The greatest concern was seen in Region 6 where all respondents felt predation was a serious or very serious problem. In regions 1,2, and 3, over half of the respondents felt the predation problem was serious to very serious.

Predator Species Involved

We were interested in the predator causing the most depredation on livestock. The predator type varied among regions but the majority of problems were attributable to dogs (57%) followed by coyotes (31%) and mountain lion (3%) (Fig. 1). The other category (9%) includes predators such as eagles, raccoons, and man.

Dogs

When individual predator type was evaluated by region, there was a definite regional difference (Fig. 2). The dog problem was concentrated in regions 3, 4, and 5. As expected, these regions have the heaviest urban populations.

The coyote problem (31% of all losses) was concentrated in regions 1, 2, and 4 (Fig. 3). The coyote problem was most severe in the regions where terrain is steep and heavy in timber. These are also the areas where most commercial livestock are raised.

Table 1. Percent of survey responses on the seriousness of the predation problem to livestock in Sonoma and northern Marin Counties, California, 1987.

Region	# responding	Not a problem at all	Minor problem	Serious problem	Very serious problem
Overall	163	21	40	22	17
1	25	16	28	16	40
2	16	20	27	27	26
3	17	19	31	31	19
4	66	29	43	18	11
5	24	13	70	13	4
6	6	0	0	75	25

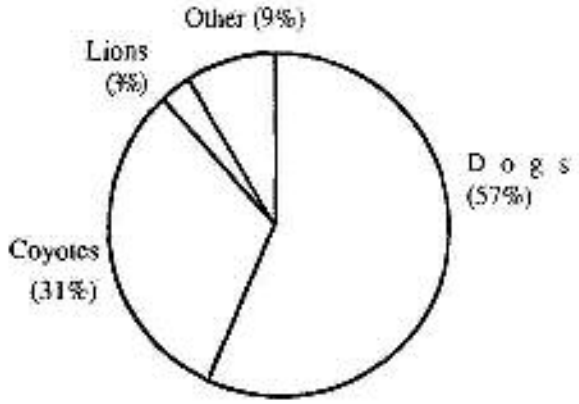

Figure 1. Predators causing predation on livestock in Sonoma and northern Marin Counties, California, 1987.

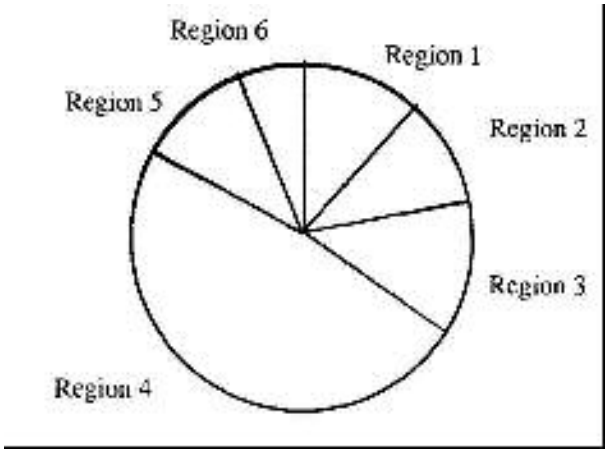

Figure 2. Dog predation on livestock by region in Sonoma and northern Marin Counties, California, 1987.

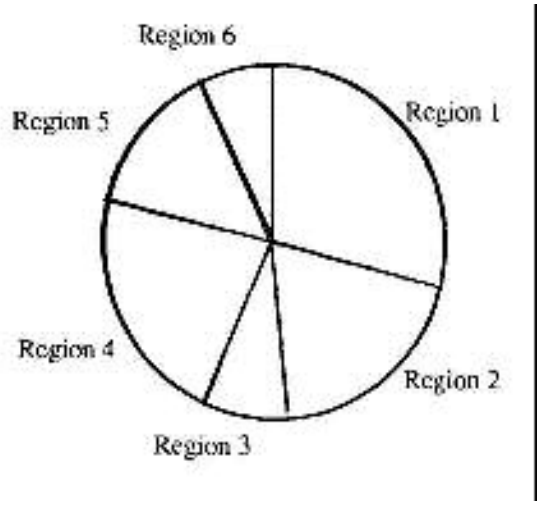

Figure 3. Coyote predation on livestock by region in Sonoma and northern Marin Counties, California, 1987.

Mountain Lions

The depredation caused by mountain lions (3% of all losses) was concentrated in three regions: Region 1 - 68%, Region 4 - 16% and Region 5 - 16%. Use of Various Management Practices

The appropriateness of certain management practices depends on many factors including livestock numbers, farm size, terrain, and costs. When the management practices used were compared to the area grazed, there were important interactions (Table 2). Guarding dogs, donkeys, and sheep herders were only used by our respondents when the ranch size was below 500 acres. Conversely, trapping, snaring and hunting were used more as the acreage increased. The other methods: night pastures, shed lambing, electric fencing and cross fencing were used in all five acreage classifications with no obvious trends.

Regional Differences

We analyzed the six regions to identify producers presently using specific management practices. If the management practices were being used, we asked about their effectiveness.

In region 1, where the greatest predator impact was from coyotes and lions, electric fencing and sheep herders were considered effective by all ranchers reporting their use. Guarding dogs were considered least effective in this region. Producers felt the area was too large for guarding dogs to be effective. Region 1 ranches are over 1000 acres.

In Region 2, the greatest predator impact was from dogs. Management methods of donkeys, night pastures, and electric fences were considered effective. Trapping and hunting were considered effective by 70% of those using them. Region 2 ranches are between 500 and 1000 acres.

In Region 3, dog depredation was high due to the large urban population in this region. Effective methods reported by survey respondents included guarding dogs, shed lambing and electric fences. Hunting was only considered effective by 20% of the respondents. Ranches in this region are less than 50 acres.

In Region 4, dogs and coyotes were the biggest problem. The use of donkeys, trapping and sheep herders was found to be effective by those ranchers who tried them. Only about half the ranchers who used guarding dogs found them effective. This region has both commercial and farm flock operations with ranch sizes of 1000 and 100 acres, respectively.

In Region 5, all three predators, dogs, coyotes, and lions, caused problems. The methods used and found effective by most ranchers were guarding dogs, night pastures and shed lambing. Trapping was reported effective by about one-half of those who used it.

In Region 6, coyotes caused the greatest predation impact. The use of electric fences and sheep herders was

Table 2. Percent of survey respondents (N=163) in five acreage classes using various management practices to reduce predatory losses in Sonoma and northern Marin Counties, California, 1987.

Management Practices	N	Area grazed (acres) 1-50	50-100	100-500	500-1000	1000+
Guarding dogs	21	55	7	11	0	0
Donkeys/llamas	4	4	7	5	0	0
Night pastures	29	32	25	29	39	44
Shed lambing	54	48	75	41	71	64
Trap, snare, etc.	29	4	43	32	75	64
Hunting	47	18	27	65	88	87
Electric fencing	32	35	47	6	33	20
Cross and/or perimeter fencing	73	77	58	56	50	82
Sheep herders	6	4	0	18	0	0

found to be effective by all those who tried them. Night pastures and trapping were not effective for those who used these methods. However, only 6 producers were represented from this region.

DISCUSSION

The goal of this survey was to collect information to assist in developing an effective extension program to help livestock (primarily sheep) producers deal with predation problems. Many extension programs dealing with predators on sheep include information on all management options. This can lead to negative feelings by producers if the options are impractical or ineffective for the specific livestock operation. This is especially true if the extension advisor is not completely familiar with solving predator problems. To maintain credibility, the extension program must be perceived by clientele as reasonable.

Surveys like this one will help in making the extension program reasonable and appropriate to the situation at hand. We found the predation problem varied by many factors such as region, and farm and flock size. Instead of developing a general extension program for all regions, specific ones tailored for each region can be developed. Likewise, the types of management practices and their perceived effectiveness varied. Again, specific extension programs addressing individual or regional needs should be developed.

The survey also revealed that livestock producers use many management practices and they often have different perceptions of their effectiveness. While differences are undoubtedly real, they do indicate an educational opportunity. Perhaps some producers have better techniques for applying the specific practice. These differences in effectiveness, either real or perceived, should be explored by the extension advisor. They likely will help refine the extension program.

When using this information, we must keep in mind that the data represent the producers' perspective and should not be considered as a definitive representation of the predation problem or of the effectiveness of the various

management practices. These practices, especially trapping and snaring, require considerable expertise and time to implement. While some producers might find trapping tedious and frustrating, for example, skilled trappers, such as those employed in the USDA-APHIS-ADC program, are extremely effective in using this method. Because of the cooperative predator control program in these counties, the predator problem, the producer's management practices and their perceived effectiveness are undoubtedly influenced by the ongoing control program. We feel a solid extension program, coupled with a professional predator control program is greatly assisting livestock producers in Sonoma and northern Marin Counties in solving the predator problem.

ACKNOWLEDGMENTS

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