

Angora goats gather about a fellow goat that was killed by coyotes. USFWS Photo by Guy Connolly.

# The Effects of PREDATION on a Angora Goat Ranch

by Jerry H. Scrivner  
Dale A. Wade  
Guy E. Connolly  
L. Charles Howard, Jr.

THE Angora goat industry is an important part of the agricultural economy of Texas. In 1983, Texas had more than 90% of the Angora goats in the United States, with an estimated population of 1.1 million. In 1965, at the peak of the Texas goat industry, there were 4.6 million goats. Since that time goat numbers have steadily declined. A significant factor contributing to the decline of goat numbers has been predation, primarily by coyotes. Predation caused nearly 75% of all goat and kid deaths, during 1982 as compared to only 50% fifteen years earlier.

Little is known regarding the total economic impact of goat losses to predators. Most dollar estimates of predation impacts have considered only the cash value of livestock killed by predators.

A study was performed on a ranch near Meridian, Texas. The ranch was a small, diversified farm and ranch enterprise producing

About the Authors: Jerry Scrivner is a post doctoral researcher at the University of California, Hopland Field Station. Dale Wade is an Extension Wildlife Specialist with the Texas Agricultural Extension Service in San Angelo. Guy Connolly is a wildlife research biologist with the U.S. Fish and Wildlife Service in Twin Falls, Idaho. Charles Howard is a Meridian, Texas rancher.

small grains, hay, and pecans and raise cattle, Angora goats, and a small flock of sheep. During the study, the goats were run on 12 separate pastures.

Pasture containing Angora goats were usually visited by the researchers on alternate days unless coyotes were known to be killing livestock, in which case pastures were visited daily. Goats were examined for injuries caused by predators. Vulture activity often was used to identify location of dead goats, including predator kills. Periodically the goats were gathered and counted and the pastures systematically searched on foot and from horseback for suspected dead and/or missing animals.

Predation by coyotes and other species as a cause of death was established from tooth puncture wounds in skin and bones, hemorrhage around tooth marks, and tracks at kill sites. Costs of predation were calculated from livestock loss data and other ranch records.

Confirmed livestock losses to predators reached a peak in 1979, when 106 animals valued at \$10,690 were killed. Predators also killed or otherwise caused the death of an

estimated 213 kids valued at \$15,980. Thus, in 1979 total costs of predation exceeded total income from goats. By late 1979, intensive predator control by several methods, which included experimental use of 1080 toxic collars, reduced coyote numbers in the ranch vicinity and costs due to predation declined accordingly. In 1980, predation losses declined to 62 animals valued at \$4,000, and in 1981, 92 animals valued at \$5,280 were killed. In 1980 and 1981, total income from the goat operation exceeded costs of production and predation losses.

In addition to cash value at the time of death predation deaths resulted in future income losses. For example, additional income could have been generated beginning in 1979 had 91 adult goats not been killed and had predators not killed or otherwise caused the death of 213 small kids and 15 large kids and had 90 adult goats not died due to parasites and complications due to penning to reduce predation. Furthermore, repayment of loans on these goats was delayed due to loss of income, causing increased interest costs.

The expense of predator removal to ranchers has several components. First, is the cost of fuel and equipment (i.e., traps, snares, M-44s, etc.) for predator control. Ranchers also may need to give support to government and/or private animal damage control agents. The direct costs of predator control (not including use of 1080 toxic collars) for labor and transportation and support of a Wildlife Damage Control Specialist employed by the Texas Rodent and Predatory Animal Damage Control Service on the ranch from 1979 through 1981 averaged approximately \$1,600/year.

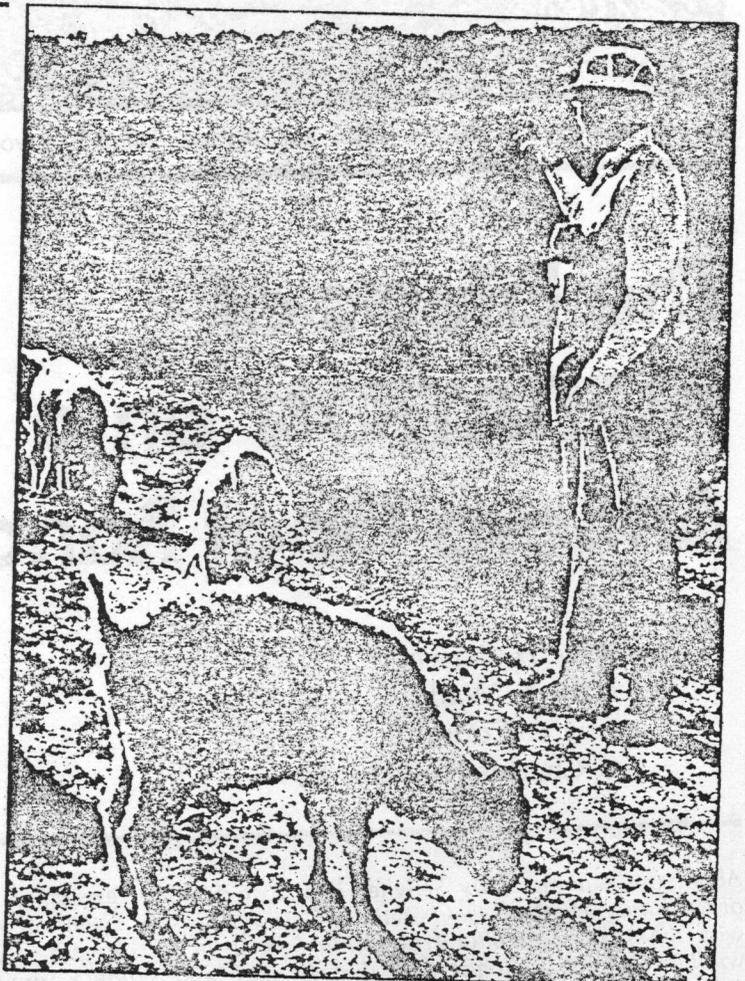
Aside from removal of predators, management techniques were used to protect goats from predation included shed-kidding, penning goats at night, moving goats from problem areas to safer pastures, and the use of guard dogs and scare devices. Costs of husbandry techniques include fuel, feed, labor, and supplies such as fencing materials and lights must also be considered.

Shed-kidding was practiced in 1979 and 1981 because of predation in pastures that were normally used for kidding. Although confine-

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*A Meridian, Texas rancher inspects his toxic-collared Angora goats.*

*USFWS Photo by Guy Connolly*



ment kidding may increase kid crops by protecting them from predation and adverse weather, the rancher preferred to kid on pasture, because the kids generally grow faster, are less subject to illness and also because of a shortage of qualified labor and kidding facilities.

Night-penning of goats was used to reduce predation losses during all three years of the study. Severe predation during spring and early summer of 1979 caused confinement of 800 goats in a single pasture by day and a small corral at night. This unusually close confinement resulted in severe parasite infestations which caused the deaths of approximately 90 adult goats and an unknown number of kids. Only by repeated drenching and moving the goats back to large pastures as coyote predation decreased was the parasite problem alleviated. The greatest single cost, however, was the loss of nearly all kids born in 1979. Weather during the 1979 kidding season was favorable and few kids were lost prior to the onset of predation. With these weather and shed-kidding conditions, the rancher normally could have expected at least 240 kids from approximately 300 breeding nannies. Only 27 kids actually survived, so it was estimated that predators killed or otherwise caused a loss of 213 kids.

In addition, night-penning increased labor and transportation costs, as two trips were required each day to pastures where goats were penned, one to pen at evening and another to let the goats out each morning. Penning also concentrates goats around the corrals, causing overgrazing at these sites and promoting soil erosion. It often results in decreased productivity due to shortened grazing periods and the increased energy costs due to penning.

In 1980, the rancher bought two Komondor dogs at \$450 each in the hope that they would help protect goats from predators. They estimated the annual cost of maintaining a Komondor dog to be \$275. One of the dogs refused to work and later died, apparently from heat exposure. The second dog was placed on pasture with a herd after several months of training. This dog appeared to be effective for approximately two months, but killing by coyotes then resumed. The dog also

began killing goats. After killing three dogs and injuring three others, the dog was removed from use.

Other protective procedures used for which no costs were recorded included moving goats from problem areas to safer pastures and operating a radio and lights continuously at the shed during kidding.

The inability to use available range because of the high risk may be the greatest single cost of predation in Texas. In 1979, when predation was at its worst, an average of 1,100 were present. The rancher had planned to buy 700 additional goats but coyote predation prevented the use of available pastures that would have supported them and labor that would have been divested to management of these additional goats was diverted to predator control. In 1979, gross revenue for mohair clipped from 700 goats would have been approximately \$42,000 (7,000 lbs. mohair @ \$6.00/lb.). The difference between the number of goats managed in 1981 and 1980 was 300. Thus, an additional 300 head could have been accommodated in 1980 if predation had been less severe. This represents an additional \$11,000 (3,000 lbs. mohair @ \$3.67/lb.) for 1980.

Predation on goats also results in other, less tangible effects. Goats eat

many plants that are relatively unacceptable to cattle and sheep and can be used to control low-growing brush and sprouts after brush has been reduced by chemical or mechanical means. Control of brush can increase soil moisture and activate springs or increase their flow rate. Grazing a mixture of livestock species often allows greater total stocking rates than does grazing by a single species and also can be beneficial to wildlife. In general, diversification of enterprises with cattle, sheep, and goats allows producers to reduce economic risk and permits the flexibility to shift to alternate livestock or crops in response to changing prices, costs, labor availability, and predation. Potential economic returns resulting from proper grazing management and brush control can be significant.

Also, predation disrupts the social life of ranch families. Family outings may be planned and anticipated only to be cancelled because coyotes have been killing livestock and efforts must be made to reduce predation. Similarly, if predation becomes serious when ranchers are preoccupied with other, time-critical production activities, such as pecan spraying or oat planting, they must decide which has the highest priority and neglect the others. Thus, ranchers sometimes operate under

**Table 1.**  
Estimated economic value of Angora goat losses to predation

	1979		1980		1981	
	No. of goats	Cost (\$)	No. of goats	Cost (\$)	No. of goats	Cost (\$)
Losses due to predation						
Adult goats killed	91	9,560	45	3,150	50	3,050
Large kid goats killed	15	1,130	17	850	27	1,430
Small kid goats killed (est. for 1979)	213	15,980	0	0	15	800
Deaths of adult goats to ketosis	7	740	0	0	8	490
Deaths of adult goats to parasites and complications	90	9,450	0	0	0	0
Lost value of goats sold because of parasites and complications (\$40 loss/head)	90	3,600	0	0	0	0
Subtotal cost		40,460		4,000		5,770
Costs of management to protect goats						
Labor and travel						
for predator control	—	1,680	—	1,020	—	360
for penning goats at night	—	1,470	—	130	—	140
for shed-kidding	—	3,430	—	0	—	3,810
Support of a Wildlife Damage Control Specialist	—	840	—	480	—	480
Veterinary fees and drugs	—	820	—	0	—	530
Extra feed for goats in sheds	—	640	—	0	—	800
Cost of purchasing and maintaining 2 guard dogs	—	0	—	1,040	—	140
Subtotal cost		8,880		2,670		6,260
<b>TOTAL COST</b>		<b>49,340</b>		<b>6,670</b>		<b>12,030</b>

excessive stress at times when a decision either way can be extremely costly. While it is difficult to quantify economic and social costs of such factors, they are real and can be severe.

In summary, most studies have underestimated the impact of predation on farm and ranch enterprises since only economic costs associated with deaths were recorded. However, this study of data from one Texas goat ranch and pertinent literature has identified other significant effects which are generally overlooked. These include the costs of animal injuries and/or deaths, management and other procedures used to reduce predation, the inefficient use or loss of forage resources, and other less tangible effects such as the inability to use goats for brush control and added personal stress from constant concern about predation. Consideration of these costs is essential to determine the potential benefits of Angora goat production and the potential costs of predation.

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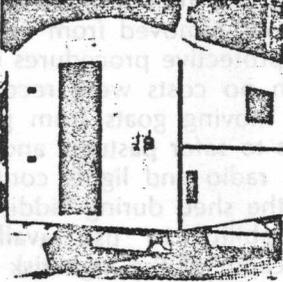
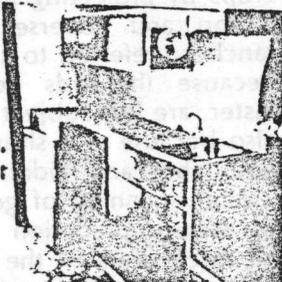
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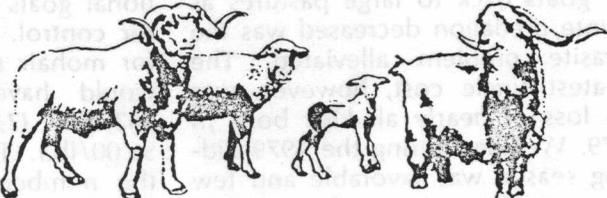
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