Using a Toll-free Telephone "Hotline" to Assess Coyote Depredation in Alabama

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Abstract: Depredation to crops and livestock by coyotes (*Canis latrans*) is a subject of much concern to agricultural producers in Alabama. This concern suggested a need for an efficient mechanism for producers experiencing perceived coyote damage to report losses. We tested a combination self-reporting/field verification technique to determine proportion of coyote damage complaints actually attributable to coyotes, determine species responsible for reported coyote damage, and collect descriptive data on coyote damage in Alabama. A toll-free telephone hotline was established, and calls concerning coyote damage were received from June 1992 to September 1993. Two hundred and sixty-three calls (214 livestock, 49 crop) resulted in only 44 field investigations. This technique of self-reporting/field verification did not prove effective as a data collection method to assess coyote damage. Much of the concern among Alabama citizens about coyotes cannot be substantiated when there is opportunity for verification.

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Coyotes were reported in Alabama from the early part of the century (Anon. 1929) and currently occur throughout the state (Hill et al. 1987). Populations have been established in the southeastern United States for more than 18 years (Sumner et al. 1984) and appear to be expanding in Alabama and other southeastern states (Hill 1987, Blanton 1988, Joint Interim Committee 1990). Along with this expansion there has been an increase in complaints about coyote damage (Jones 1987). Surveys of agricultural extension agents suggest that coyotes may be responsible for considerable agricultural damage in the Southeast (Jones 1987, Armstrong 1991). However, it is speculated that free ranging dogs (*Canis familiaris*) may be responsible for some of the damage attributed to coyotes (Denney 1974, Jones 1987).

In a previous survey of cattle producers in Alabama (U.S. Dept. Agric. 1994), producers reported that coyotes were responsible for 33% of all cattle

predation, 76% of all calf predation, 33% of all sheep predation, and 50% of all lamb predation. In comparison, dogs were implicated in 33% of cattle predation, 24% of calf predation, 33% of all sheep predation, and 25% of all lamb predation.

Most studies of livestock and crop losses from coyotes have been based on questionnaire surveys, producer estimates, or damage claims (e.g., Johnson and Timm 1987, Jones 1987, McAninch and Fargione 1987, Owens 1987, Slate 1987, Larson and Salmon 1990, Armstrong 1991, Gilbert 1991, Philipp and Armstrong 1993, 1994, USDA 1994, and others). This type of data should be interpreted with caution as noted by Balser (1974): "The problems of livestock losses to predators . . . are compounded . . . by confusion caused by too many participants, misinformation from non-authoritative sources, human emotion which polarizes opinions, and most important of all, a lack of data on livestock losses . . ." Johnson and Timm (1987) noted that damage assessment may involve tolerance levels and attitudes of producers experiencing damage, and attitudes tend to vary according to individual perceptions and experiences with damage.

While surveys are useful to estimate extent of perceived coyote damage, there is a need to determine amount of perceived damage actually caused by coyotes. According to Gilbert (1991), many people, including animal lovers, land managers, zoologists, and wildlife experts, believe that agriculturalists consistently exaggerate the damage done by coyotes. Relatively few studies have been based on field assessments of damage (e.g., McAdoo 1975, Tigner and Larson 1977, Robel et al. 1981, Schaefer et al. 1981, Dorrance 1982, O'Gara et al. 1983, Scrivner et al. 1990).

Our original hypothesis was that damage to crops and livestock by coyotes was not as prevalent as damage to crops and livestock by free-ranging dogs. We used a combination self-reporting/field verification technique to determine proportion of coyote damage complaints actually attributable to coyotes, determine species responsible for reported coyote damage, and collect descriptive data on coyote damage in Alabama.

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Methods

We established a toll-free hotline and received calls concerning coyote damage from June 1992 to September 1993. The Hotline was maintained through the Alabama Farmer's Federation office at no cost to us. Callers answered a series of recorded questions to provide investigators with initial information relative to the damage complaint.

Numerous efforts were made to publicize the "Hotline" through the radio and television media, newspaper and magazine articles, and flyers developed and distributed through the Alabama Cooperative Extension Service and Alabama Department of Conservation and Natural Resources.

Data collection occurred as calls were received. The "Hotline" was only operational in the evenings. Therefore, calls concerning recent damage were returned the following day or as soon as the cooperator could be reached.

Sites to be inspected were based on if damage occurred within 48 hours of receipt of the call and a carcass was present (if livestock was involved) or, if crops were involved, all sites where damage had occurred within 48 hours of receipt of call and no rain had occurred. Other sites were visited if, based on a telephone interview with the cooperator, adequate physical evidence of damage remained at the site. Additional criteria that determined site visitation included time lapse from damage, time of year, and weather.

A standardized procedure for field verification of damage was used during each site visit. Cause of death or damage was determined by evaluating carcass or crop and field sign left by depredating species (Roy and Dorrance 1976, Hawthorne 1980, Godin 1982, Boggess 1983, Gipson 1983, Knight 1983, Wade 1983, Wade and Bowns 1984, Bowns and Wade 1985, Widder 1989).

Identification of tracks was based on size and form of individual tracks, as well as track patterns (e.g., Murie 1974, Wade and Bowns 1984, Halfpenny 1986). Scats were identified by size, shape, and associated sign (e.g., Weaver and Fritts 1979, Green and Flinders 1981, Danner and Dodd 1982).

Photographs of carcasses showing wounds and feeding pattern and photographs of crops showing feeding pattern were taken at each damage site. Wounds and feeding patterns were described.

Data concerning adjacent habitats were collected for all verified losses. Information concerning husbandry and damage control practices, cooperator estimates of economic loss, time of year of loss, number of years losses have been experienced, why cooperator called, and how cooperator found out about the coyote hotline was collected when possible.

Damage situations were analyzed individually to determine probable cause of damage. Most of the data collected during this study was descriptive or anecdotal in nature. Descriptive statistics (frequencies, percentages) were calculated for verified calls versus unverified calls and verified coyote damage versus verified non-coyote damage. Verified losses attributed to coyotes versus non-coyotes and field criteria used to evaluate damage situations also were compared.

Results and Discussion

We received 263 calls through the coyote hotline and direct calls to the study office. Only 4.7% of the callers indicated that they heard about the hotline through an Alabama Farmer's Federation of Alabama Cattleman's Association

Table 1. Livestock or crop damage reports from callers to the coyote hotline and other sources.

Type of damage	*N*	Field Verification	
		Yes	No
Misc. information	68	2	66
Calves	47	5	42
Assorted melons	39	21	18
Goats	30	7	23
Domestic fowl	23	3	20
Dogs	14	2	12
Sweet corn	8	3	5
Cats	7	0	7
Wildlife	7	0	7
Sheep	6	0	6
Pigs	4	0	4
Horses	3	0	3
Cows	3	1	2
Domestic rabbits	2	0	2
Peaches	1	0	1
Strawberries	1	0	1
Total	263	44	219

Table 2. Reasons for lack of field verification to calls received through the coyote hotline and other sources.

Reason	*N*	%
Old damage	101	37.3
No damage	56	20.7
Unable to contact	23	8.5
No carcass present	17	6.3
Adverse weather	12	4.4
Harassment call	4	1.5
Pet damage	4	1.5
Hotline problems	2	.7
Refused cooperation	1	.4

magazine. The flyer was responsible for 21.9% of the calls and Extension agents/conservation officers were responsible for 24.2% of the calls received.

Calls associated with livestock and other domestic and wild animals accounted for 214 of the calls, while 49 calls were related to crop damage. Forty-four of the calls were classified as suitable for field investigation (Table 1). Visits were not made in response to 219 calls primarily because reports were of old damage (Table 2). Not all calls received were to report recent damage from coyotes. Eighty-eight people (72 livestock, 16 crops) called for information on damage prevention or control. These callers may or may not have experienced damage in the past. Some callers (6.4%) wished to report a recent sighting of a

Table 3. Control measures used by respondents to the coyote hotline and other sources.

Control Measure	% using the measure
Trapping	11.3
Poisoning (illegal)	8.9
Net wire fencing	8.9
Barbed wire fencing	1.8
Electric fencing	6.5
Guard dog	3.0
Guard animal (other than dog)	1.2
Scare devices	9.5

coyote. Only 10.6% of the callers (15 livestock, 5 crops) had experienced recent damage that appeared to merit follow-up field investigations.

In those cases where damage had occurred, callers were asked how they determined that damage was from a coyote. Seventeen livestock producers and 2 crop producers saw a coyote at the site of damage while 18.2% saw a coyote in the area. Most (53.1%) callers reporting damage based their theory on the idea that there were coyotes in the area, therefore coyotes did the damage. Very few (11.5%) of the callers based their decision on any knowledge of the feeding patterns of coyotes. While callers were quick to implicate coyotes in damage, most had taken no measures towards reducing damage (Table 3).

Data were collected for forty field investigations; 16 at livestock sites and 23 at crop damage sites; four sites classified originally as suitable for field investigation were not visited due to unpredicted inclement weather. Damage to livestock was to goats ($N = 7$), cattle and calves ($N = 6$), and poultry ($N = 3$). In all cases, possible coyote tracks or scat were found close to the damage; however, this was not taken as proof of coyote depredation. In some instances, there was evidence of characteristic coyote puncture wounds and hemorrhaging, suggesting that the animal was killed by a coyote. Characteristic coyote feeding patterns also were found on some carcasses.

All but 1 of the 23 crop damage field investigations could be attributed to coyotes; the exception being a case of raccoon damage to watermelons. In some instances, a variety of wildlife (coyotes, deer, raccoons) had been feeding on the crops. Coyote damage to watermelons was usually easier to ascertain than damage to livestock because of site stability and characteristic tooth marks left on the rind. In addition, the tilled ground made location of tracks easier.

Management Implications

While this study did not produce the large volume of data desired, we can draw some conclusions as to the effectiveness of this technique for assessing damage and state of coyote depredation in Alabama. First, this technique did

not produce sufficient data to make statistically valid inferences about perceived versus actual coyote damage in Alabama. It would appear that much of the concern about coyotes ceases when there is opportunity for verification. Due to the current high profile of coyote management in Alabama, many non-usable calls should be expected requesting general information. If this strategy of self-reporting followed by field verification is to be used to assess damage, intensive promotional campaigns may be necessary prior to actual implementation. Damage evidence, especially in the case of livestock, will decompose; therefore, a strategy should be developed to deploy a trained investigator immediately to the site. Second, the damage problem may not be as severe as many people believe. Number of calls received does not suggest a statewide problem of coyote damage; however, there are areas of the state that receive more damage than others. Based on this relationship, we would recommend continued efforts at localized control for offending animals or family units. While many people are upset about possible coyote damage to crops or livestock, few are taking any significant measures to alleviate the threat. A need does exist for increased educational efforts and field support to assist producers with controlling and preventing damage.

Literature Cited

Anonymous. 1929. Coyotes in Alabama. Ala. Game and Fish News. Aug. 1:9.

Armstrong, J. B. 1991. Extension wildlife damage management in Alabama. Pages 148–150 *in* Proc. East. Wildl. Damage Control Conf.

Balser, D. S. 1974. An overview of predator-livestock problems with emphasis on livestock losses. N. Am. Wild. and Nat. Resour. Conf. 39:292–300.

Blanton, K. M. 1988. Summer diets of coyotes in the Southeast, and the response of coyotes to siren surveys. M.S. Thesis, Miss. State Univ., Starkville. 82pp.

Boggess, E. K. 1983. Raccoons. Pages C73–C79 *in* R. M. Timm, ed. Prevention and control of wildlife damage. Great Plains Agric. Council and Neb. Coop. Ext. Serv., Univ. Neb., Lincoln.

Bowns, J. E. and D. A. Wade. 1985. Physical evidence of coyote depredation. Unpubl. rep. Texas Agric. Ext. Serv. College Sta. 40pp.

Danner, D. A. and N. Dodd. 1982. Comparison of coyote and gray fox scat diameters. J. Wildl. Manage. 46:240–241.

Denney, R. N. 1974. The impact of uncontrolled dogs on wildlife and livestock. Trans. N. Am. Nat. Resour. Conf. 39:257–291.

Dorrance, M. J. 1982. Predation losses of cattle in Alberta. J. Range Manage. 35: 690–692.

Gilbert, B. 1991. Coyotes have adapted to us, now we have to adapt to them. Smithsonian 21:69–79.

Gipson, P. S. 1983. Feral dogs. Pages C43–C46 *in* R. M. Timm, ed. Prevention and control of wildlife damage. Great Plains Agric. Council and Neb. Coop. Ext. Serv., Univ. Neb., Lincoln.

Godin, A. J. 1982. Striped and hooded skunks. Pages 674–687 *in* J. A. Chapman and G. A. Feldhamer, eds. Wild mammals of North America: biology, management, and economics. John Hopkins Univ. Press, Baltimore, Md.

Green, J. S. and J. T. Flinders. 1981. Diameter and pH comparisons of coyote and red fox scats. J. Wildl. Manage. 45:765–767.

Halfpenny, J. 1986. A field guide to mammal tracking in western North America. Johnson Books, Boulder, Colo. 161pp.

Hawthorne, D. W. 1980, Wildlife damage and control techniques. Pages 411–439 *in* S. D. Schemnitz, ed. Wildlife management techniques manual. The Wildl. Soc., Washington, D.C.

Hill, E. P. 1987. Status of the coyote in the southeastern United States. Proc. East. Wildl. Damage Control Conf. 3:317.

———, P. W. Sumner, and J. B. Wooding. 1987. Human influences on range expansion of coyotes in the Southeast. Wildl. Soc. Bul. 15:521–524.

Johnson, R. J. and R. M. Timm. 1987. Wildlife damage to agriculture in Nebraska: a preliminary cost assessment. Proc. East. Wild. Damage. Control Conf. 3:320.

Joint Interim Committee to Study the Control of Coyotes in the State of Alabama. 1990. Unpub. rep. Ala. Dept. Conserv. and Natural Resour., Montgomery. 4pp.

Jones, E. J. 1987. Coyote damage in the southeastern United States. Proc. East. Wildl. Damage Control Conf. 3:320.

Knight, J. E. 1983. Skunks. Pages C81–C86 *in* R. M. Timm, ed. Prevention and control of wildlife damage. Great Plains Agric. Council and Neb. Coop. Ext. Serv., Univ. Neb., Lincoln.

Larson, S. and T. P. Salmon. 1990. Predators and sheep management practices in Sonoma County, California. Pages 28–32 *in* G. A. Giusti, R. M. Timm, and R. H. Schmidt, eds. Predator management in north coastal California. Univ. Calif., Hopland Field Sta., Publ. 101.

McAdoo, J. K. 1975. Predation on domestic sheep in northeastern Nevada. M.S. Thesis, Univ. Nev., Reno. 106pp.

McAninch, J. B. and M. J. Fargione. 1987. Characteristics of predation and losses in the New York sheep industry. Proc. East. Wildl. Damage Control Conf. 3:260–268.

Murie, O. J. 1974. A field guide to animal tracks, second ed. Houghton Mifflin Co., Boston. 375pp.

O'Gara, B. W., K. C. Brawley, J. R. Munoz, and D. R. Henne. 1983. Predation an domestic sheep on a western Montana ranch. Wildl. Soc. Bull. 11:253–264.

Owens, R. D. 1987. Coyote control techniques and their applications in the eastern United States. Proc. East. Wildl. Damage Control Conf. 3:323–324.

Philipp, M. C. and J. B. Armstrong. 1993. Perceptions and knowledge of Alabama fruit and vegetable producers towards coyotes. Pages 175–181 *in* Proc. 6th Eastern Wildlife Damage Control Meeting, Asheville, N.C.

——— and ———. 1994. Perceptions by Alabama livestock producers of coyotes. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies. 48:191–200.

Robel, R. J., A. D. Dayton, F. R. Henderson, R. L. Meduna, and C. W. Spaeth. 1981. Relationships between husbandry methods and sheep losses to canine predators. J. Wildl. Manage. 45:894–911.

Roy, L. D. and M. J. Dorrance. 1976. Methods of investigating predation of domestic livestock: a manual for investigating officers. Alberta Agric., Plant Industry Lab., Edmonton. 54pp.

Schaefer, J. M., R. D. Andrews, and J. J. Dinsmore. 1981. An assessment of coyote and dog predation on sheep in southern Iowa. J. Wildl. Manage. 45:883–893.

Scrivner, J. H., W. E. Howard, A. H. Murphy, and J. R. Hays. 1990. Sheep losses to predators on a California range, 1973–1983. Pages 10–13 *in* G. A. Giusti, R. M. Timm,

and R. H. Schmidt, eds. Predator management in north coastal California. Univ. Calif., Hopland Field Sta., Publ. 101.

Slate, D. 1987. Coyotes in the eastern U.S.: status and implications—damage problems and economic losses from coyotes in the northeastern U.S. Proc. Eastern Wildl. Damage Control Conf. 3:325–326.

Sumner, P. W., E. P. Hill, and J. B. Wooding. 1984. Activities and movement of coyotes in Mississippi and Alabama. Proc. Annu. Conf. Southeast. Assoc. Fish and Wildl. Agencies 38:174–181.

Tigner, J. R. and G. E. Larson. 1977. Sheep losses on selected ranches in southern Wyoming. J. Range Manage. 30:244–252.

U.S. Department of Agriculture. 1994. Animal Damage Control Program, Final Environmental Impact Statement, Vol. 11. Appendix M. 37pp.

Wade, D. A. 1983. Coyotes. Pages C31–C41 *in* R. M. Timm, ed. Prevention and control of wildlife damage. Great Plains Agric. Council and Neb. Coop. Ext. Serv., Univ. Neb., Lincoln.

——— and J. E. Bowns. 1984. Procedures for evaluating predation on livestock and wildlife. Texas Agric. Ext. Serv., Texas Agric. Exp. Sta., and U.S. Fish and Wildl. Serv. 42pp.

Weaver, J. L. and S. H. Fritts. 1979. Comparison of coyote and wolf scat diameters. J. Wildl. Manage. 43:786–788.

Widder, E. J. 1989. Free-ranging dogs. Ala. Wildl. 53:35.