

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

USDA National Wildlife Research Center - Staff
Publications

U.S. Department of Agriculture: Animal and Plant
Health Inspection Service

February 2004

Weight and Age of Coyotes Captured in Virginia, USA

John M. Houben

USDA/ APHIS Wildlife Services, Charleston, West Virginia

J. Russell Mason

USDA APHIS Wildlife Services, National Wildlife Research Center, Fort Collins, Colorado

Follow this and additional works at: http://digitalcommons.unl.edu/icwdm_usdanwrc



Part of the [Environmental Sciences Commons](#)

Houben, John M. and Mason, J. Russell, "Weight and Age of Coyotes Captured in Virginia, USA" (2004). *USDA National Wildlife Research Center - Staff Publications*. 365.

http://digitalcommons.unl.edu/icwdm_usdanwrc/365

This Article is brought to you for free and open access by the U.S. Department of Agriculture: Animal and Plant Health Inspection Service at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in USDA National Wildlife Research Center - Staff Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Weight and Age of Coyotes Captured in Virginia, USA

John M. Houben

USDA APHIS Wildlife Services, Charleston, West Virginia

J. Russell Mason

USDA APHIS Wildlife Services, National Wildlife Research Center, Fort Collins, Colorado

ABSTRACT: We recorded the weight and age of 70 coyotes collected during depredation control efforts in western Virginia. Mean masses for adult male and female coyotes were 16.2 and 13.4 kg, respectively. Juvenile male and female coyotes weighed 14.0 and 13.0 kg, respectively. Regardless of sex, mean mass was greatest between November and January and comparable to that reported for coyotes throughout the eastern United States. Cementum aging indicated that 71% of the coyotes captured were greater than 1 year of age. Numerical trends suggest that age and sex may influence vulnerability to capture.

KEY WORDS: age, *Canis latrans*, capture, coyote, Virginia, weight

Proc. 21st Vertebr. Pest Conf. (R. M. Timm and W. P. Gorenzel, Eds.)
Published at Univ. of Calif., Davis. 2004. Pp. 75-76.

INTRODUCTION

The available evidence indicates that eastern North American coyotes (*Canis latrans*) are heavier than prairie coyotes (Hilton 1976, Gipson 1978, Moore and Miller 1986). Three hypotheses have been proposed to account for this geographic variation (Thurber and Peterson 1991): 1) hybridization with grey wolves (*Canis lupus*) 2) genotypic selection arising from changes in prey size and abundance and 3) phenotypic response to food supply. The relative merits of these hypotheses remain controversial (Lariviere and Crête 1993, Peterson and Thurber 1993).

Studies have focused on coyotes collected in the northeast United States and eastern Canada. Almost no data are available concerning the size of coyotes in the mid-Atlantic region of the United States. Our first objective was to address this lack of information. In addition, we aimed to explore whether sex and/or age influenced vulnerability to capture. Studies of western coyotes have shown that 1) transient and juvenile coyotes are more vulnerable than territorial coyotes to control methods (Windberg and Knowlton 1990), 2) territorial coyotes are more susceptible to baited methods outside their home range than within (Windberg and Knowlton 1990, Roy and Dorrance 1985), 3) juvenile coyotes may be more vulnerable to M-44s than adults (Sacks 1996), and 4) prior exposure to control methods may cause coyotes to become more wary and harder to remove (Conner et al. 1998). There is also evidence that breeding, territorial coyotes are more likely to kill livestock than non-breeding non-territorial animals (Till and Knowlton 1983, Windberg and Knowlton 1990, Sacks 1996, Conner et al. 1998).

METHODS

Seventy coyotes (34 males, 36 females) were collected during efforts to control livestock depredation in western Virginia between 1993 and April 1996. Coyotes were captured during all seasons of the year using leg-hold traps, snares, and M-44 cyanide ejectors. Coyotes were weighed shortly after capture and the lower jaw

removed and dried. The age of each coyote was determined using cementum aging by Matson's Laboratory (Gary Matson, Milltown, MT). Adults were defined as >1 year and juveniles were <1 year. The sex, date, location, and method of capture for each coyote were also recorded and analyzed.

Analyses of variance were used to evaluate age, weight, and method of capture as a function of date or sex. Subsequently, Tukey post-hoc tests were used to isolate significant differences among means.

RESULTS AND DISCUSSION

Mean masses for adult male and female coyotes were 16.2 and 13.4 kg, respectively. Juvenile male and female coyotes weighed 14.0 and 13.0 kg, respectively. Males were significantly heavier than females ($F = 20.4$; 1,68 df; $P < 0.0001$). Others have reported that weight is sexually dimorphic in coyotes (Parker 1995). The average mass of Virginia coyotes was comparable to that reported for coyotes throughout the eastern United States and Canada (Table 1).

Table 1. The mean mass (kg) of male and female coyotes reported in various studies throughout the United States and Canada.

Location	Mean Mass (kg)	
	Males	Females
Atlantic Canada		
New Brunswick (Moore and Miller 1986)	16	15
Nova Scotia (Sabeau 1993)	15	13
Northeastern United States		
Massachusetts and Vermont (Lorenz 1978)	17	15
Maine (Richens and Hugie 1974)	16	14
Southeastern United States		
Arkansas (Gipson 1978)	15	13
Midwestern United States		
Minnesota (Andrews and Boggess 1978)	14	11
Iowa (Andrews and Boggess 1978)	13	11
Western United States		
California (Hawthorne 1971)	11	10
New Mexico (Young and Jackson 1951)	11	10

These data are consistent with the generally accepted belief that coyotes are larger and heavier in eastern and northeastern North America (Parker 1995).

There were significant differences in mass among months ($F = 2.3$; 10,59 df; $P < 0.02$). Regardless of sex, coyotes were heaviest between November and January. Huot et al. (1995) have reported similar variation in the condition of coyotes collected in Quebec. Total body fat of Quebec coyotes varied between 1.7 and 26.7%, and the average mass for lean and fat adults collected in summer and winter averaged 10.2 and 12.2 kg, and 13.8 and 15.8 kg for females and males, respectively.

There was no statistical difference ($P > 0.25$) between juvenile and adult coyotes in vulnerability to leg-hold traps, M-44s or snares. However, 71% of the coyotes trapped in the present study were greater than 1 year of age (28.6% < 1 yr; 35.7% 1 - 2 yrs; 37.7% > 2 yrs). Therefore, we believe that the trapping methods we employed might have been relatively selective for older animals, and thus, for animals more likely to hold territories. The available evidence suggests that older animals are territorial, and that territorial coyotes are usually responsible for livestock depredation (Conner et al. 1998, Till and Knowlton 1983, Windberg and Knowlton 1990, Sacks 1996). We suggest that depredation control efforts in western Virginia selectively target those animals most likely to kill livestock.

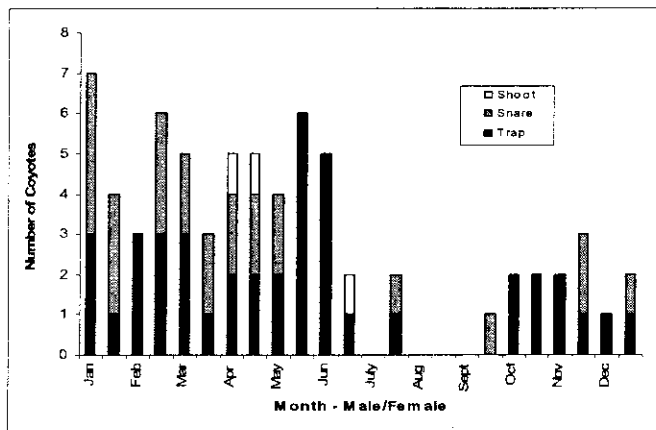


Figure 1. The number of male and female coyotes captured each month during depredation control efforts in western Virginia by method.

Females comprised 51% of our sample and males 49%. We were unable to show a significant sex difference in vulnerability to capture ($P > 0.25$). When different methods of capture were considered, numerically, males appeared to be more susceptible to baited methods (traps and M-44s) than snares during breeding season and during dispersal (Figure 1). A considerably larger sample size would be needed to adequately address this question.

ACKNOWLEDGEMENTS

We express our sincere thanks to H. McDaniel who helped collect coyotes, and to M. Lowney and M. W. Fall who provided useful comments on earlier manuscript drafts.

LITERATURE CITED

- ANDREWS, R. D., AND E. K. BOGGESS. 1978. Ecology of coyotes. Pp. 251-265 in: M. Bekoff (Ed.), *Coyotes: Biology, Behavior, and Management*. Academic Press, New York, NY.
- CONNER, M. M., M. M. JAEGER, T. J. WELLER, AND D. R. MCCULLOUGH. 1998. Effect of coyote removal on sheep depredation in northern California. *J. Wildl. Manage.* 62: 690-699.
- GIPSON, P. S. 1978. Coyotes and related *Canis* in southeastern United States with a comment on Mexican and Central American *Canis*. Pp. 199-208 in: M. Bekoff (Ed.), *Coyotes: Biology, Behavior, and Management*. Academic Press, New York, NY.
- HAWTHORNE, V. M. 1971. Coyote movements in Sagehen Creek Basin, northeastern California. *Calif. Fish & Game* 57:157.
- HILTON, H. 1976. The physical characteristics, taxonomic status, and food habits of the eastern coyote in Maine. M.A. thesis, Univ. of Maine, Orono, ME.
- HUOT, J., M. L. POULLE, AND M. CRÉTE. 1995. Evaluation of several indices for assessment of coyote (*Canis latrans*) body composition. *Can. J. Zool.* 73:1620-1624.
- LARIVIERE, S., AND M. CRÉTE. 1993. The size of eastern coyotes (*Canis latrans*): a comment. *J. Mammal.* 74:1072-1074.
- LORENZ, J. R. 1978. Physical characteristics, movement, and population estimate of the eastern coyote in New England. M.A. thesis, Univ. of Massachusetts, Amherst, MA.
- MOORE, G. C., AND J. S. MILLER. 1986. Food habits and average weights of a fall-winter sample of eastern coyotes, *Canis latrans*. *Can. Field Nat.* 100:105-106.
- PARKER, G. 1995. *Eastern Coyote, The Story of Its Success*. Nimbus Publishing, Halifax, NS, Canada. 254 pp.
- PETERSON, R. O., AND J. M. THURBER. 1993. The size of eastern coyotes (*Canis latrans*): a rebuttal. *J. Mammal.* 74: 1075-1076.
- RICHENS, V. B., AND R. D. HUGIE. 1974. Distribution, taxonomic status, and characteristics of coyotes in Maine. *J. Wildl. Manage.* 38:447-454.
- ROY, L. D., AND M. J. DORRANCE. 1985. Coyote movements, habitat use, and vulnerability in central Alberta. *J. Wildl. Manage.* 49:307-313.
- SABEAN, B. 1993. Coyote carcass collections. *Nova Scotia Trappers Newsletter* 29:10.
- SACKS, B. N. 1996. Ecology and behavior of coyotes in relation to depredation and control on a California sheep ranch. M.A. thesis, Univ. of California, Berkeley, Berkeley, CA. 223 pp.
- THURBER, J. M., AND R. O. PETERSON. 1991. Changes in body size associated with range expansion in the coyote (*Canis latrans*). *J. Mammal.* 72:750-755.
- TILL, J. A., AND F. F. KNOWLTON. 1983. Efficacy of denning in alleviating coyote depredations upon domestic sheep. *J. Wildl. Manage.* 47:1018-1025.
- WINDBERG, L. A., AND F. F. KNOWLTON. 1990. Relative vulnerability of coyotes to spacing patterns in southern Texas. *Wildl. Soc. Bull.* 18:282-290.
- YOUNG, S. P., AND H. H. T. JACKSON. 1951. *The Clever Coyote*. Wildlife Management Institute, Washington, D.C. 411 pp.