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**Some Foods Used by Coyotes and Bobcats in  
Cimarron County, Oklahoma  
1954 Through 1956<sup>1</sup>**

**RALPH J. ELLIS and SANFORD D. SCHEMNITZ,  
Oklahoma Cooperative Wildlife Research Unit,<sup>2</sup>  
Stillwater**

It is common knowledge that coyotes and bobcats feed on rabbits and rodents. However, the other foods, and the extent to which they are consumed, are not so commonly known. Past investigations of both the bobcat (Pollack, 1951; Rollings, 1945; Dixon, 1925) and the coyote (Murie, 1951, 1940; Korschgen, 1957) show that the diets of these two predators vary considerably from one place to another. Likewise, in northcentral Oklahoma the diets of Coyotes only thirty miles apart were shown to differ significantly (Ellis 1958). Thus one might expect the diets of bobcats and coyotes in Cimarron County, Oklahoma, to be somewhat different from those reported from other localities.

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<sup>2</sup> Oklahoma Department of Wildlife Conservation, Oklahoma State University, U. S. Fish and Wildlife Service, and Wildlife Management Institute cooperating.

Man's concern with coyotes and bobcats usually centers around their diets. For example, the supposition that these predators eat considerable numbers of game and livestock leads some people to favor predator control. Others not favoring such control feel that these predators eat more than enough "harmful wildlife" to offset the damage they might do. Thus it is worthwhile to know what is eaten by bobcats and coyotes in specific localities. As previously pointed out, we cannot rely on studies done in other areas to tell us this.

The stomachs reported on here were collected by Schemnitz while primarily occupied in a study of scaled quail. The few stomachs, thus provided, do not constitute a reliable index to the foods then used by bobcats and coyotes in Cimarron County, but are offered as a partial index. It must be remembered that the diets of these predators can be expected to change somewhat, annually and seasonally.

METHODS AND MATERIALS

Sixteen coyote and ten bobcat stomachs were collected in Cimarron County from September, 1954 through December, 1956. Except for one trapped coyote, all stomachs came from road kills or animals killed by dogs. Fourteen of the coyote stomachs were collected during November, December and January. Approximately equal numbers of bobcat stomachs were collected during each season of the year.

The stomachs were preserved in ten percent formalin and washed and dried before analysis. The analysis was then conducted by comparing the food residues with known reference materials. The method of Hardy and Plitt (1940) was used in the identification of questionable hairs. After identification, each kind of residue was weighed to the nearest tenth of a gram. The results were recorded as percentages of the total weight of all bobcat or coyote stomach contents as appropriate. Percentages of occurrence were calculated as the percentage of bobcat or coyote stomachs in which each item or group occurred (Table 1.). No special attempt was made to determine how many individuals of one kind were present in each stomach.

Table 1

Percentages of Weight and Occurrence of Food Items in Ten Bobcat Stomachs and Sixteen Coyote Stomachs Collected in Cimarron County, Oklahoma, from September 1954 through December 1956.

Food Items	Bobcats		Coyotes	
	Weight	Occurrence	Weight	Occurrence
Mammals	99.9	100.0	99.5	100.0
Rabbits	70.2	60.0	91.0	87.5
Woodrats	22.4	10.0		
Kangaroo Rats	6.7	20.0	.5	6.2
Grasshopper Mice	.4	10.0		
Pocket Mice	.1	10.0		
Cattle			8.0	43.8
Birds	t*	10.0		
Reptiles			t	6.2
Insects			.2	31.3
Grasshoppers			.2	12.5
Other Insects			t	18.8
Grass	.2	20.0	.3	50.0

\* Trace = less than .1 gram

## RESULTS

**Bobcats** — Rabbit remains formed the greater part of the food items identified in the bobcat stomachs (Table I.). Cottontail rabbit remains were identified in three of these stomachs and jackrabbit remains in another. Two stomachs contained remains which were identified only as "rabbit." When present, the rabbit remains usually made up all or the greater part of a stomach's contents.

The remains of woodrats made up the entire contents of the only stomach in which this species was found. Kangaroo rat remains were found in only two bobcat stomachs. One of these contained the remains of at least three kangaroo rats. In both stomachs, containing kangaroo rat remains, other species of rodents were also identified.

The remains of one grasshopper mouse were noted in the only stomach in which this species was represented. This was likewise true for pocket mice. In both stomachs the residues were associated with those of kangaroo rats.

Grass was noted in two bobcat stomachs. Buffalo grass seed was found in one of these and made up the greater part of the grass remains of both.

Six of the bobcat stomachs contained stomach worms, so dehydrated that identification was not attempted.

**Coyotes** — Rabbit remains were by far the most important food item found in the coyote stomachs (Table 1.). Jackrabbit remains were identified in three stomachs and those of cottontail in another. The rabbit remains in the other ten stomachs containing this item were not further identified.

Cattle remains were second only to the remains of rabbits as the most important food item in the coyote stomachs. The cattle remains occurred in 43.8 percent of the coyote stomachs, but made up only eight percent of the weight of the total food contents. The percentage of the cattle remains which represented carrion was not determined.

Rodent remains were found in only one coyote stomach and were identified as kangaroo rat. Likewise, parts of a lizard (*Holbrookia maculata*) were the only reptile remains identified in coyote stomachs.

Residues representing more than twenty grasshoppers were found in a coyote stomach collected during August. The only other evidence of this item in coyote stomachs were traces found in one collected during January. Beetles were represented only in trace quantities and in only two stomachs. Likewise a few fly larvae were noted in another stomach.

Grass leaves were found in one-half of the stomachs. Although this was usually found in trace quantities, it made up more than half of the contents of one stomach.

## DISCUSSION

**Bobcats** — On the basis of this analysis, it appears that the bobcats in Cimarron County subsisted mostly on rabbits (Table 1.). If the ratio of cottontail and jackrabbit remains observed in the bobcat stomachs is typical, the bobcats of Cimarron County ate approximately three times as many cottontails as jackrabbits. This does not seem unreasonable because the cottontail and bobcat habitats are usually more similar than those of jackrabbits and bobcats.

Nearly one-third of the bobcat diet, according to the analysis, appears

to have been made up of woodrats and kangaroo rats. Although woodrat remains occurred in only one of the ten stomachs, the entire contents of this stomach was made up of the residues of two or more of these rodents. Similarly, kangaroo rats were represented in only two stomachs and their remains made up the greater part of the contents of these.

Grasshopper mice and pocket mice were also included in the diet of the bobcats studied. No doubt if more stomachs had been examined, other rodents would have been represented.

It is noteworthy that bobcats did occasionally use birds as food (Table 1.). However, it appears probable that adult flying birds, such as the one represented in this study, are better adapted to escape terrestrial predators than rodents and rabbits and would, therefore, be less prominent in the diet of such predators. The meager representation of bird remains in this small sample lends some support to this concept.

The occurrence of grass in two bobcat stomachs does not necessarily mean that it was a desired food. These occurrences may have resulted accidentally while the bobcats were capturing or feeding on animals. This view is strengthened by noting that grass was represented in the bobcat stomachs only in very small amounts. Furthermore, most of the grass was found associated with rabbit remains in one stomach. It is quite possible that this was contained by the rabbits at the time they were eaten.

**Coyotes** — It appears from the analysis that the coyotes of Cimarron County also subsisted mostly on rabbits (Table I.). Three-fourths of these, according to the ratio of remains identified as those of jackrabbits or cottontails, are estimated to represent jackrabbits. The other one-fourth are similarly estimated to represent cottontails.

The only food item other than rabbits which added appreciably to the contents of the coyote stomachs was cattle. Usually it was not determined whether the cattle remains represented carrion or animals killed by the coyotes. Fly larvae associated with the cattle remains found in a coyote stomach collected during March suggest that these remains were taken as carrion. The absence of fly larvae from the other stomachs, however, does not necessarily suggest coyote predation on livestock, especially since the others were collected during winter when fly larvae would not be present. It is suspected that cattle carrion would be more available to coyotes during the winter as a result of increased cattle mortality brought about by calving and the overall poorer nutrition of range cattle. Both of these mortality causes are most prevalent during the winter or spring.

Rodents usually make up an appreciable part of the coyote diet (Gier, 1957; Ellis, 1958; Sperry, 1941 and others). Therefore, the presence of only one rodent, a kangaroo rat, in the nineteen coyote stomachs examined was unexpected. Possibly more rodents would have been represented in a larger sample.

Reptiles and amphibians seldom make up a very significant part of coyote diets. Thus it was considered somewhat unusual to find a lizard in this small sample of stomachs.

Coyotes of Cimarron County appeared, on the basis of this analysis, to have fed frequently on insects. One of the four stomachs which contained insect remains contained only fly larvae associated with cattle remains. These larvae, it seems, were accidental food items. The abundance of grasshopper remains in the only stomach collected during late summer suggests the usual increased availability of these insects at that time of year.

Grass occurred frequently and, since it was associated with mammalian remains and was usually found in trace quantities, it appears to have been ingested accidentally when the coyotes fed on these mammals. However, 3.2 grams of grass were found in one stomach. Such a large quantity would appear to have been ingested deliberately.

It is noteworthy that bird remains were not found in coyote stomachs. In northcentral Oklahoma, birds, especially poultry, formed a significant part of the coyote diet (Ellis, 1958). However, there was probably a smaller total population per unit area of both wild and domestic birds in Cimarron County than in northcentral Oklahoma. This seems likely because, when compared with northcentral Oklahoma, on a unit-area basis, Cimarron County has fewer farmsteads and, therefore, probably a lesser density of poultry. Likewise, the more xeric habitats in Cimarron County probably had a lower carrying capacity in terms of wild birds than did northcentral Oklahoma.

Six of the coyote stomachs contained stomach worms and, as in bobcats, these were so dehydrated that identification was not attempted.

#### COMPARATIVE BOBCAT-COYOTE FOOD USE

In some respects the bobcats and coyotes studied appeared to have had similar feeding habits. For example, the analysis suggested that they both subsisted primarily on rabbits. Similarly, kangaroo rats were eaten by both predators. Possibly several other rodents would have been revealed as common foods if more stomachs had been examined.

The most significant difference between the feeding habits of these bobcats and coyotes appeared, according to the analysis, to be in the foods of secondary importance. In the coyote stomachs, rabbits, the staple food, was significantly supplemented only by cattle residues. In the bobcat stomachs, however, the staple food, again rabbits, was significantly supplemented by woodrats and kangaroo rats.

Another noteworthy difference in the feeding of these two carnivores also was suggested by the analysis. It appeared that bobcats ate three times as many cottontails as they did jackrabbits. In contrast, the coyotes seemed to have eaten three times as many jackrabbits as they had cottontails.

The coyote stomachs contained a more diversified array of food items than did the bobcat stomachs. Such foods as insects, reptiles and cattle were represented in the coyote stomachs, but not in those of the bobcats. On the other hand, the bobcat stomachs contained the remains of four species of rodents whereas the coyote stomachs contained the remains of only one. Thus it appears that the bobcats had a tendency to restrict their feeding to warm-blooded vertebrates and that the coyotes sometimes fed on invertebrates and cold-blooded vertebrates.

The significantly higher occurrence of grass in the coyote stomachs as compared with those in the bobcat stomachs is unexplained. Perhaps the bobcats were more meticulous in their eating.

#### SUMMARY

The stomachs of sixteen coyotes and ten bobcats were collected in Cimarron County, Oklahoma, from September 1954 through December 1956. These were examined for food remains and the results were recorded by percentage weight and percentage occurrence.

According to the analysis, rabbits appeared to be the staple food of both the bobcats and coyotes studied. Kangaroo rats, woodrats, grasshop-

per mice, pocket mice, birds and grass were also represented in the bobcat stomachs. Of these only the remains of kangaroo rats and woodrats contributed significantly to the total contents of the stomachs. In the coyote stomachs the remains of cattle, kangaroo rats, lizards, insects, and grass were also found. Other than rabbit remains, those of cattle were the only ones which were especially significant in the total stomach contents.

A noticeable difference between the bobcat and coyote feeding which was suggested by the analysis concerned foods of secondary importance. It appeared that the bobcats tended to supplement the staple rabbit item with kangaroo rats and woodrats whereas the coyotes seemed to have supplemented the same staple with livestock flesh. Another difference suggested by the analysis was that the bobcats appeared to have eaten many more cottontails than did jackrabbits. Coyotes, it seems, did the reverse.

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