Notes on Winter Food Habits of Raccoons From Western Oklahoma

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Analysis of food from 204 raccoon (*Procyon lotor*) stomachs collected in western Oklahoma during the winter of 1982-1983 yielded food items in the following order of importance: hackberries (*Celtis reticulata*), oats (*Avena sativa*), wheat (*Triticum aestivum*), fish, and small rodents.

INTRODUCTION

Food habits of the raccoon (*Procyon lotor*) have been studied in several states contiguous to Oklahoma. Stains (*1*), Wood (*2*), and Tester (*3*) examined foods eaten by raccoons in Kansas, Texas, and Colorado, respectively. The raccoon is hunted throughout most of Oklahoma and is one of the most abundant furbearers. However, there is little published information on the biology of this species in the state. Food habit information from Oklahoma, which could be used to make future management decisions, will add to our understanding of the natural history of this wide-ranging species.

METHODS

Most of the 204 carcasses examined were obtained from fur dealers in Blaine, Caddo, Comanche, Custer, Dewey, Kiowa, and Washita counties of western Oklahoma which are in the Mixed-grass Plains Biotic District (*4*). A few carcasses came from Canadian and Lincoln counties of central Oklahoma in the Osage Prairie (blackjack oak [*Quercus marilandica*]-postoak [*Q. stellata*] Savannah) District. Collections were made between 20 November 1982 and 15 January 1983, which was a mild winter. All specimens had been frozen. After thawing, the stomach contents were removed, oven-dried, and segregated. Palmer and Fowler (*5*) and Martin and Barkley (*6*) aided greatly in the identification of many food species, as did reference collections in the Cameron University Museum of Zoology (CUMZ). For each specimen, number and weight of each food item were recorded.

RESULTS and DISCUSSION

Raccoons are opportunists, and their diets vary with the seasonal availability of foods (*7*). Of 204 stomachs examined, 29 (14%) were empty, and 23 (11%) contained only unidentifiable woody and fragmentary plant debris. Such debris is often consumed while animals are in traps. The 29 empty stomachs might indicate a local scarcity of food during winter in areas where these individuals were collected, but some animals may have been held in traps long enough to digest most of their stomach's contents. According to MacClintock (*7*), the stomach is empty 1 h after feeding. It is also relevant to note that these animals do not feed when temperatures drop to near freezing. The 29 empty stomachs and the 23 containing only plant detritus were omitted from the calculations in Table 1.

Plant material was found in 128 (63%) of all samples (n = 204), animal matter occurred in 67 (33%). Hackberry (*Celtis reticulata*) was the natural food eaten most frequently; 32 (21%) of the 152 stomachs with food contained hackberry seeds (Table 1). However, hackberry ranked only third in total weight, probably because larger, more easily obtained stores of oats (*Avena sativa*) and wheat (*Triticum aestivum*) were available from grain bins and cattle feeders. Among animal food items, mammals, principally

cricetine rodents, appeared in 29 (19%) of the stomachs, birds in six (4%), invertebrates in five (3%), and frogs (*Rana* spp.) in two (1%). Cotton rats (*Sigmodon hispidus*) were more abundant during the period of this study than during any year since 1958 (Tyler, field notes). The percentage of total weight of all animal matter amounted to just over 21%, mammals contributing 52% of this. Although not a food item, four specimens were found to have raccoon hair and claws in their stomachs, possibly because they had gnawed on a trapped foot in an attempt to escape. Similarly, the large number of fish (16% by occurrence) may be misleading because fish are frequently used as bait in trapping raccoons. Considering the season, the relative scarcity of insects and other arthropods was expected. The pond snails (*Helisoma* spp.) and cotton seeds (*Gossypium hirsutum*) may have been eaten incidentally with other foods, and the opossum (*Didelphis virginiana*) and house cat (*Felis catus*) could have been roadkills.

The results from other states were similar, but generally reported greater quantities of native plant foods and fewer animals. For example, Stains (*1*) found that growing and stored corn (*Zea mays*) in Kansas was the staple year-round and that the raccoon's greatest reliance was on crayfish (*Cambarus* spp.), a few other invertebrates, and cottontails (*Sylvilagus* spp.). Important plant foods included sorghums (*Sorghum* spp.), acorns (*Quercus* spp.), grapes (*Vitis* spp.), mulberry (*Morus* spp.), and hackberry fruits.

Tester (*3*) reported that 73% of the fall diet in northeastern Colorado was plant material, particularly corn, plums and cherries (*Prunus* spp.), and grapes (*Vitis* spp.). Animal material constituted only 23% and included crayfish (*Cambarus* spp.), birds, small mammals, insects, and occasional poultry.

In two east Texas studies, acorns and crayfish (*8*) or insects (*2*) were the principal staples throughout the year. In winter, plant foods contributed over half the food volume in both studies, acorns being followed to a greater or lesser extent by hollies (*Ilex* spp.) , persimmon (*Diospyros virginiana*), and hawthorn (*Crataegus* spp.) fruits. One study (*8*) found that crayfish were the principal winter animal food item, other invertebrates making up most of the remainder, but no mammal remains were present. The other study (*2*) indicated insects in first place by a wide margin, followed by small mammals and miscellaneous invertebrates.

In this study, there was clearly a smaller variety of native plant foods found than was the case in other states, but we found more animal food items. The great extent to which stored grains were used may have indicated a shortage of natural foods. Acorns were eaten infrequently or not at all. It appears that in Oklahoma, as elsewhere in the Southwest, stored grains, supplemented with wild fruits and berries (particularly hackberries), an occasional invertebrate, and a few fish and small mammals constitute the major components of the raccoon's diet during mild winters. Stored grains (oats, corn, wheat, sorghums), and small mammals apparently gain importance during the colder months.

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Table 1. Food items found in the stomachs of 152 raccoons from western Oklahoma.

Food Item	Percent Occurrence	Percent of Total Weight
hackberry (*Celtis reticulata*)	21	17
fish - Osteichthyes	16	8
wheat (*Triticum aestivum*)	13	18
oats (*Avena sativa*)	12	21
rats (*Sigmodon* and *Neotoma*)	9	7
milo (*Sorghum bicolor*)	7	5
corn (*Zea mays*)	5	6
small rodents (Muridae)	5	2
persimmon (*Diospyros virginiana*)	3	5
chicken (*Gallus domesticus*)	3	tr[a]
millet (*Panicum miliaceum*)	3	2
raccoon (hair and claws) (*Procyon lotor*)	3	tr
pond snails (*Helisoma* spp.)	2	tr
cotton seeds (*Gossypium hirsutum*)	2	2
cottontails (*Sylvilagus* spp.)	1	tr
Carolina snail seed (*Cocculus carolinus*)	1	2
frogs (*Rana* spp.)	1	tr
opossum (*Didelphis virginiana*)	1	tr
ducks (Anatidae)	1	1
crayfish (*Cambarus* spp.)	0.4	tr
grasshoppers (Acrididae)	0.4	tr
soapberry (*Sapindus drummondii*)	0.4	tr
house cat (*Felis catus*)	0.4	1

[a]tr = trace; items composing < 1% total weight.