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## Ecology of the Raccoon in Central Iowa

By J. L. CABALKA, R. R. COSTA, AND G. O. HENDRICKSON

The marked increase of the Upper Mississippi Valley raccoon (*Procyon lotor hirtus* N. and G.) in Iowa during recent years is well-known. Sanderson (1951) and recent releases by the Iowa State Conservation Commission suggest a yearly average of about three or four times as many raccoons during the decade 1943-'52 as in the period 1933-'42.

The general opinion of hunters and trappers was that such increases were apparent also in Story County, of central Iowa. From raccoon family track and other signs along streams Costa and Hendrickson estimated roughly two family groups of raccoons to the mile, or approximately 10 raccoons to the square mile traversed by the larger wooded streams in late summer, 1950. Cabalka through participation with three groups of hunters learned that in the autumn, 1951, on 30 square miles coursed by larger streams they took 79 raccoons averaging 17 pounds in weight, of which 41 were males and 38 females. The raccoons were taken at the rate of two an hour of group night hunting.

As study areas on which to learn about the feeding habits of the numerous raccoon, Costa (1951) selected two areas containing large streams, of nearly constant yearly flowage, running through pastured native woods. Adjacent to the woods were mostly fields of corn, small grains and soybeans. One area was five miles of Squaw Creek and the land within one-half mile at each side extending northwest from the west side of the Iowa State College recreational area, and the other five miles of Skunk River and the land within one-half mile at each side extending north from the junction of Keigley's Creek and the river. Raccoon scats were gathered chiefly from latrine sites at intervals of two or three days during the autumn, 1950, and the spring and summer, 1951. For each of the seasons 100 scats were analyzed and the results are in Table I.

Corn was first in volume of scat refuse in spring and autumn, and second in summer. Fruits—chiefly wild cherries (*Prunus*), gooseberries (*Ribes*), elderberry (*Sambucus canadensis*), hackberry (*Celtis occidentalis*)—were first in summer, second in autumn, and last in spring. Crayfish (*Cambarus*), in third place each season, were close to corn in summer and to vertebrates in spring. Vertebrates—

**Table 1**  
Seasonal Distribution of Raccoon Major Foods Refuse in 300 Scats.

Food Group	Percent of total scats containing	Percent of total fecal remains by volume
SPRING		
Corn	82	62
Vertebrates	47	12
Crayfish	68	11
Insects	73	10
Snails	14	3
Fruits	10	1
SUMMER		
Fruits	70	55
Corn	41	18
Crayfish	62	17
Snails	23	6
Vertebrates	8	2
Insects	33	1
AUTUMN		
Corn	92	82
Fruits	25	9
Crayfish	36	3
Insects	69	3
Vertebrates	13	2
Snails	8	trace

quillback (*Carpionodes cyprinus*), darter (*Percidae*), turtle (*Testudinidae*), owl (*Strigidae*), woodpecker (*Dryobates*), meadow-lark (*Sturnella*) robin (*Turdus m. migratorius*) chicken (*Gallus gallus*), Mearns cottontail (*Sylvilagus floridanus mearnsi*), western fox squirrel (*Sciurus niger rufiunter*), white-footed mice (*Peromyscus*), and meadow-mice (*Microtus*)—were second in spring and fifth in summer and autumn. The larger vertebrates likely were carrion. Insects of approximately 40 recognized forms, of which June beetles (*Phyllophaga*) and grasshoppers (*Melanoplus*) were the most numerous individuals, were fourth in spring and autumn, and last in summer. Snails (*Physa*, *Lymnaea*, *Pomatiopsis*, *Heliosoma*, *Aplexa*, *Goniabasis*), never numerous, were fifth in spring, fourth in summer, and last in autumn. Corn, fruits, and crayfish were the most important groups of food for the year.

Small quantities of other ingested materials were represented by small amounts,—traces—of grass, leaves, seeds, nut shells, and undigested invertebrate remnants in the scats.

Because of differing values placed on the raccoon, the farmers of <https://scholarworks.uni.edu/pias/vol60/iss1/84>

the areas were interviewed with regard to depredation by the animal. Of 17 farmers willing to comment one reported significant damage only to sweet corn, four attested to sweet corn loss and molestation of poultry, and 12 stated that they did not know of raccoon damage. Waste in early maturing sweet corn brought the most complaint. The greatest loss observed in any field by Costa was approximately 30 percent of the ears in a small patch of 16 square rods of early sweet corn between July 20 and August 5, 1951. As none stated the number of birds taken, it seemed that the depredation on poultry was not taken seriously by the farmers.

In a year of low raccoon numbers Giles (1939) studied the food habits of the raccoon on the same Squaw Creek and Skunk River areas from mid-October to mid-November, 1937, and found practically the same food representations as Costa. And Costa's report by food groups for the three seasons does not differ essentially from that of Giles (1940) on food habits of the raccoon in eastern Iowa, Dubuque County, although some items differed. Raspberries (*Rubus*), numerous in Dubuque County, replaced the more numerous gooseberries in Story County. Other changes in food items were indicative of local abundance, or availability.

Cabalka (1952) chose to study the resting habits of the raccoon in autumn, 1951, through spring, 1952, particularly on the Squaw Creek area. There he selected 68 den trees of species and numbers: American elm (*Ulmus americana*), 21; slippery elm (*U. rubra*), 17; silver maple (*Acer saccharinum*), 14; basswood (*Tilia ameri-*

Table 2  
Data on 68 marked den trees along Squaw Creek.

Species of tree	Number of trees			Average diameter used trees in inches	Average height of den entrances used in feet	Average size of entrances used in inches	Average distance of used trees from water in feet
	Marked	Used	Not used				
Cottonwood	3	0	3				
American elm	21	8	13	50	22	8.5x15	270
Slippery elm	17	6	11	34	29	7x15	288
Black maple	4	0	4				
Silver maple	14	5	9	35	23	7x25	64
Boxelder	1	1	0	28	10	6x10	65
Basswood	8	3	5	19	19	7x14	2640
Total or Average	68	23	45	37	23	7x17	221

*cana*), 8; black maple (*A. nigrum*), 4; cottonwood (*Populus deltoides*), 3; box elder (*Acer negundo*), 1. (Table 2).

By use of frayed spring-steel hair-catchers attached to den entrances, tracks and other sign study, and direct observation he found that 23 tree dens were used in winter and spring. By species and numbers the used den trees were: American elm, 8; slippery elm, 6; silver maple, 5; basswood, 3; box elder, 1.

The entrances of observed tree dens varied from 1.5 inches to 24 inches in width. The average dimensions of used dens was 7 inches by 17 inches. The smallest used entrance was approximately three inches in diameter. The den entrances averaged 23 feet above ground, with extremes of 0 to 40 feet. Few used den openings were less than 10 feet above the tree bases. At breast height the diameters of used trees varied between 16 and 82 inches to average 37 inches. The used trees averaged 221 feet from water, with extremes of 25 to 2640 feet.

An 8-inch drain tile and a 24-inch drain tile without guards were used for intermittent resting in winter.

Early fall resting sites noted were grassy field corners, large branches of trees, a farm combine, farm sheds and road culverts.

The relationship between resting habits and temperature was that, (1) in late fall raccoon activity decreased with temperature drops of 15 degrees F. and (2) raccoons often become active in winter when temperatures between 10 and 35 degrees F. increased at least 20 degrees in one to three days. Snow early in winter reduced raccoon activity, but with melting temperatures in December, January and February, they become active in spite of snow as deep as five inches. In spring signs of raccoon activity were abundant, except from April 10 to May 10, the major birth period.

*In summary*, the major food groups of the raccoon in central Iowa, 1950 and 1951, were corn, wild fruits and crayfish. Vertebrates, insects and snails were of less importance. The foods of the raccoon at a time of high population did not differ substantially from those of the animal when approximately one-fourth to one-third as numerous about 15 years before in central and eastern counties. Approximately one-third of 68 den cavities in seven species of trees were used as winter and spring resting sites. The most frequent den trees in order of occurrence—American elm, slippery elm, silver maple and basswood—were used in about an equal ratio without apparent species preference in winter denning.

The smallest den entrance was about three inches in diameter, and the average was approximately 7 inches by 17 inches. The den

entrances were in average 23 feet above the ground in trees that averaged 37 inches in diameter at breast height. The average distance of a den tree to water was 221 feet and the extremes 25 and 2640 feet. Other late fall and winter resting sites were much less in number than the tree cavities. Late in autumn drops of 15 degrees F., or more, sent the raccoons to denning cover. The extent of winter out-of-den activity varied with raising temperatures and seasonal progress. Generally, an increase of 20 degrees F., or more, above 10 to 35 degrees F. in one to three days of winter prompted noticeable outside activity. Snow late in fall reduced raccoon activity much more than later snow.

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