FOOD HABITS OF THE PRAIRIE SPOTTED SKUNK, *SPILOGALE INTERRUPTA* (RAFINESQUE), IN SOUTHEASTERN IOWA

by

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INTRODUCTION

The prairie spotted skunk (Spilogale interrupta Raf.) is one of the more common mustelids in the state of Iowa. Because of its general distribution, and its tendency to live about farm yards as well as its omnivorous appetite, many queries, and not a few complaints, have been received by responsible agencies concerning the management of this animal. As the value of the prairie spotted skunk as a furbearer has been questionable, it is important that its worth be determined in other ways. An understanding of its relationship to economic species of insects, birds and mammals is of fundamental importance in the process of formulating and putting into effect wise management practices for the species. For these reasons the following investigation was undertaken as the first part of an intensive study on the ecology and management of the species.

The area chosen for this investigation lies in the northeast corner of Van Buren county, near the southeast corner of the state. (Fig.1) It consists of approximately 17.5 square miles. A diversified terrain was selected in order to obtain a more comprehensive study of the ecological requirements of the species. The western side of the area contains about seven square miles of rough, eroded woodland pasture largely of oak-hickory formation with

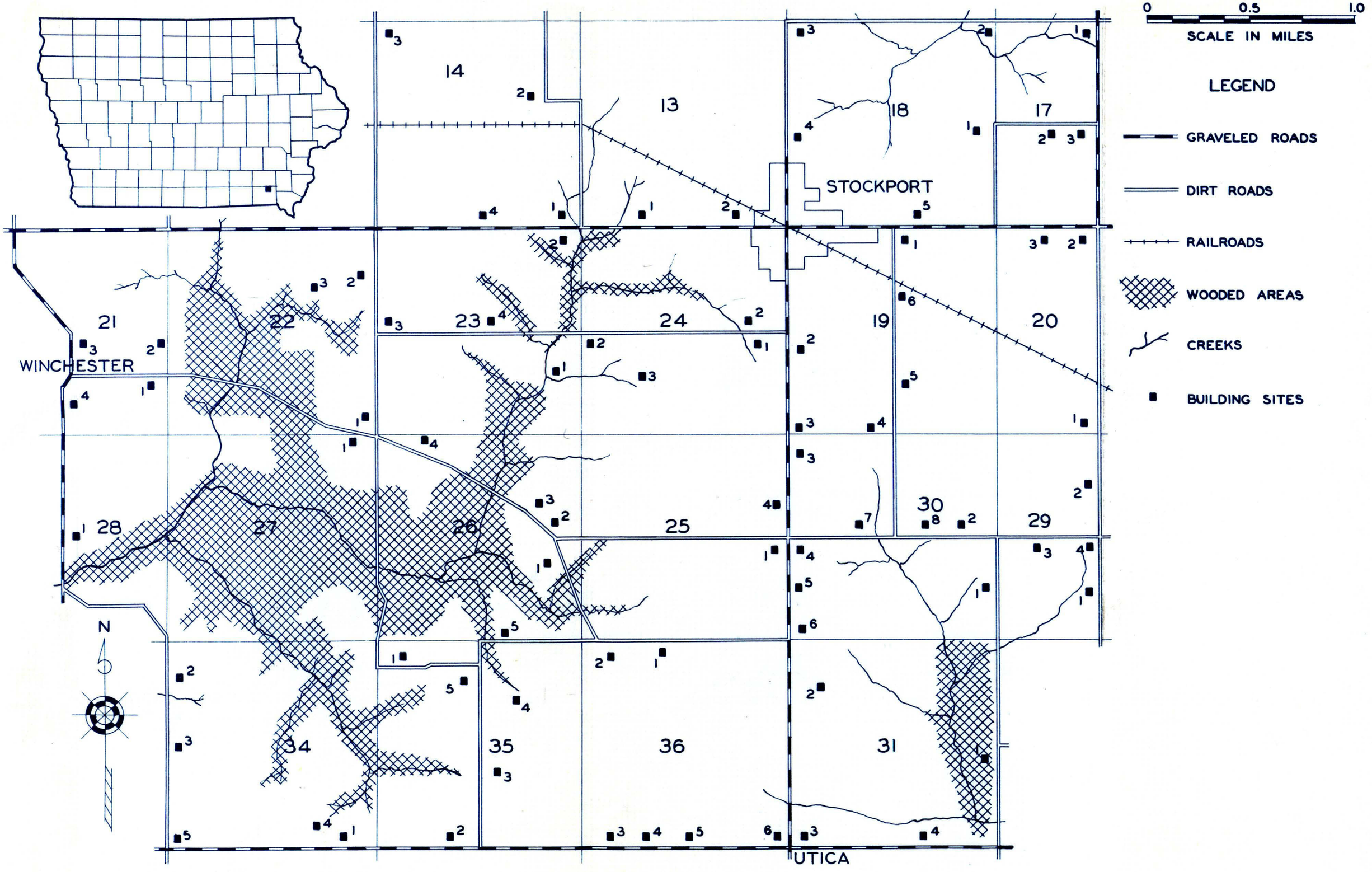

FIG. 1 SPOTTED SKUNK RESEARCH AREA, VAN BUREN CO., IOWA

several hundred acres cut-over and grown up to hickory sprouts. (Fig. 2) This wooded area is interspersed with farms and clearings on the higher ground. The rougher western portion of the area changes gradually to a flat plateau of about ten square miles almost entirely tiled for drainage and subjected to intensive agriculture. Corn, hogs, sheep and hay are the principal products of the area. The soil on the eastern portion is the rich black Grundy silt loam characteristic of southern Iowa where erosion has not had its effects. (Fig. 3)

The time of investigation covered a 12-month period from March 18, 1939, to March 1, 1940. During this time seven months were spent in continuous residence on the area. When not in residence the author made trips at least twice a month with the exception of December, 1939, when only one visit was made to the area.

This thesis is based upon the analysis of 834 scats obtained during this period. Within the bounds of the area 699 scats were gathered; 135 were picked up at one place less than a mile and a half from the east border.

Fig. 2. A general view of the wooded pasture land at the west side of the area.

Fig. 3. A typical view of the flat tiled land on the eastern side of the area. This land is cultivated intensively.

HISTORICAL REVIEW

Very little has been written concerning the food of the spotted skunk. Still less has been written about any systematic investigation of the animal's food habits. There have been a number of short notes published illustrating its proficiency and value as a rodent killer and its ability to control rats and mice about buildings has been referred to occasionally. Lantz (1923) says, "The little spotted skunks are remarkably efficient as destroyers of rats and mice. They are small and nearly like a weasel in shape; they are quick in their movements, and can follow rats and mice into smaller crannies than the ordinary skunk can enter. In Kansas the writer once lived in a house with cellar openings on the outside. The dwelling had been unoccupied for a year and during this time the cellar had been used for storing corn, with the result that the entire house had become infested with rats and mice. A short time after the writer occupied the house it was noticed that a prairie spotted skunk had taken up its quarters in the cellar and night combats with rats were often heard. The skunk was frequently seen, but it was carefully left unmolested. After a few weeks the rats and mice had all been killed or driven away, and the skunk then left the premises."

Howell (1906) says, "The food of the spotted skunks,

judged by the records of seventeen stomach examinations made by collectors of the Biological Survey, consists in large measure of insects, chiefly beetles and grasshoppers. These are supplemented by mice and other small mammals, lizards, salamanders, small birds, and crayfish. One stomach contained persimmons and several species of fungus.

"In some localities these skunks are known to destroy hens' eggs, and doubtless wild birds' eggs are frequently eaten. Most of the reports received by the Biological Survey with reference to damage done in poultry yards by spotted skunks come from the Pacific Coast, where they are particularly abundant."

Pellet (1913) writes as follows, "On one occasion rats became very troublesome under a big pile of cobs in one of the outbuildings. A cat with a fine reputation as a ratter was borrowed and confined in the building. She made so little impression that she was soon returned to her owner. Not long after a small skunk took up its abode in the same building and the rats moved out with little delay and less ceremony. The same thing was repeated a year or two later minus the cat. During cold weather one winter one of these little skunks killed a full grown hen. A trap was promptly set beside its victim and the animal disposed of. This was the only instance of the kind among a dozen or more observed. They are expert in catching pocket gophers and I have several times found them in the holes apparently in pursuit of the gopher. In

winter they frequently catch rabbits and I have found tracks in the fresh snow leading to the hiding place of the cottontail, while the blood-stained remnant of the carcass of that animal told the story of a tragedy."

Selko (1937) investigated 59 scats of the spotted skunk gathered in September, October, and November of 1936 in central and northwestern Iowa. He found insects and mammals sharing first place in importance. They appeared in 26 percent of the feces. White grubs appeared in five scats and ranked first in importance, grasshoppers ranked second and crickets a close third according to his volumetric computation. Mammal remains ranked second among the classes of food, appearing in 47 percent of the feces but in volume was exceeded by the insect remains. Meadow mice appeared in 14 scats and cottontail fur appeared in three, as did white-footed mouse, fox squirrel, and mole. Bird remains appeared in 16 scats or 27 percent of the total. Eight of these scats contained the remains of Bluewinged teal. Selko thinks it was likely a dead or crippled duck, for the hunting season was in progress on a nearby lake. Vegetable matter appeared 16 times. Grass leaves, wheat kernels, horsenettle berries, oats, acorns, apple seeds and two kernels of corn made up the list of items.

THE INVESTIGATION

Method of Procedure

During the time of residence on the area scats were gathered not oftener than every other day at any one place, although several places on the area were visited as often as twice a week. Most of the locations used by the animals were visited at least every two or three weeks, depending somewhat upon accessibility and probable success in finding scats.

The feces of the spotted skunk are generally distinguishable by one feature or another. There were few striped skunks on the area and when there might be some question the scats were discarded. Size, form, contents, location and odor all help to determine the species concerned. (Figs. 4, 5, 6, 7). No single criterion was always an infallible indication of the species. One scat found in the attic of a schoolhouse--unquestionably spotted skunk--measured 11/16 of an inch in diameter and 1½ inches long. This scat contained insect remains and would have been very questionable if found in the field. Most spotted skunk scats measure ½ inch or less in diameter.

Spotted skunks appear to be much less inclined to making so-called "latrines" than the striped skunks and as

Fig. 4. Scats containing corn were quite common during the fall and winter months.

Fig. 5. Typical scats of the spotted skunk after eating a bird.

Fig. 6. Typical scats during the summer and fall when the skunks ate many insects.

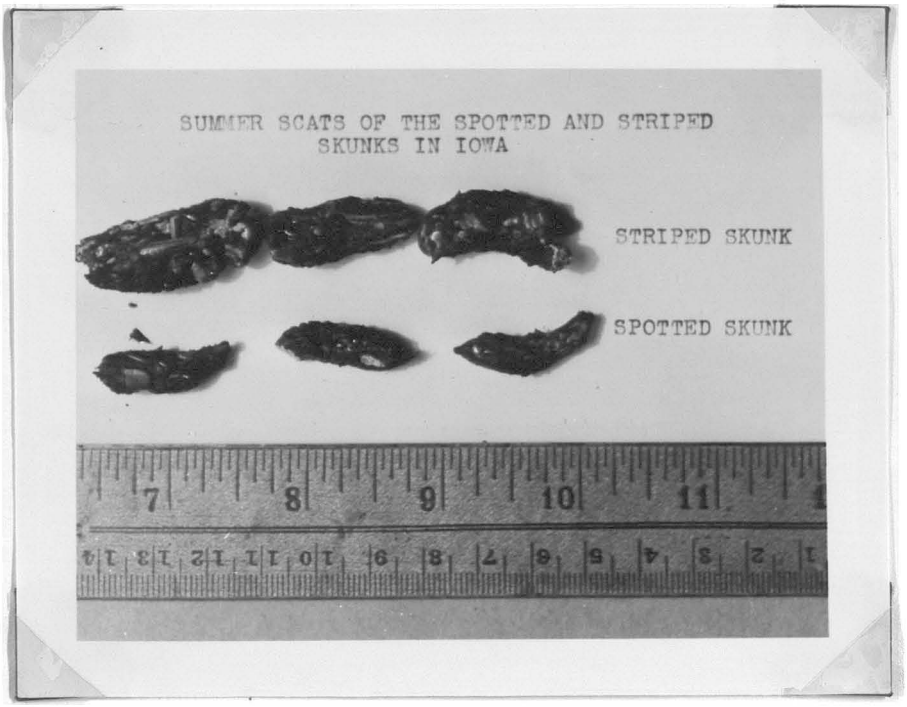

Fig. 7. Spotted skunk scats compared to striped skunk scats.

a rule defecate promiscuously--often in their runways and in such inaccessible places as under buildings, in woodpiles or postpiles and strawpiles. As this study was primarily one of food habits every effort was made to avoid altering the natural situations of the animals or the forces shaping their environment. This often prevented obtaining inaccessible scats.

In order to facilitate a more accurate determination of the age of scats that were not strictly fresh about two dozen fresh scats from a captive spotted skunk, which contained the remains of typical food items, as well as some scats that were found in the field, were exposed to the weather during May and June and checked daily. It was found that a scat retained its natural moisture about two days, and that the odor remained with a scat one to two weeks, depending on the contents. After two weeks there was no certain way to determine the age by the condition of the scat when picked up. It was found that scats well protected from the weather retained their odor longer and their shape almost indefinitely. On the other hand those that were exposed to rains, tramping of livestock and other destructive factors deteriorated very rapidly. A daily record of the weather was invaluable in estimating the age of scats in many instances.

Each scat found was placed in a separate paper sack, plainly marked with the time and place of discovery and its probable date of deposition.

No scats were used in this study that could possibly be over one month old. Many scats were discarded because of indefinite age such as those found in haybarn runways when the hay was removed in early spring.

The scats were analysed dry. Each item was separated from the rest of the scat contents and the number of individuals counted. The identifications were made by comparison with a large collection of known foods from the area and by comparison with the collections of insects, seeds, mammals and birds kept at the laboratory for that purpose. The scats were numbered. The data were tabulated on 4 x 6 cards along with a complete history of the scat concerned. In this form the information contained could be easily shifted and shuffled and the correlation and evaluation of the data were greatly facilitated.

Quite a wide variation exists between the number of scats gathered during the winter months and the other three seasons. For this reason to consider the whole as a complete picture would tend to over-emphasize some items at the expense of others; hence it was decided to consider the food habits data by seasons. The seasons were arbitrarily divided into units of three months each: (1) winter period--December, January, and February, (2) spring period--March, April and May, (3) summer period--June, July and August; and (4) fall period--September, October and November.

The data on the cards were evaluated on the basis of

appearances. Percentages were worked out for the appearances of the four large fundamental groups into which the spotted skunks' food falls: mammals, birds, arthropods, and plant material. (Table V) The larger groups were then broken down and percentages worked out to show the relationship of each item to its representative group: for example, the relation of meadow mice to the mammal group as a whole. The data were further broken down to show the percentage of every individual item as related to all the items appearing during that particular season. (Tables I, II, III, and IV).

With regard to the time of feeding the only data gathered were concerned with the emergence of the animal from its daytime hiding place. The animals could not be followed. Ten records were made of the time of emergence at six different places with the average time of appearance being 8:26 p.m. These records were all made the last two weeks of July and the first week of August when the sun set at the average time of 7:30 p.m. It was usually deep dusk before they appeared.

Data

Winter foods.

Mammals were the most important winter food; 90.44 percent of all the scats contained the remains of one or more species in this group. Cottontail rabbits (Sylvilagus

floridanus mearnsii) were the most important single item. They appeared in 38 of a total of 75 scats or in 50.54 percent. They also represented 54.26 percent of all mammal appearances. There was a heavy population of cottontails on the area during 1938 and 1939. The winter of 1939-40 when these scats were gathered, the cottontails were so numerous that they did extensive damage to shrubs and fruit trees. Large numbers were shot by farmers all over the area as a protective measure. Most of these rabbits were left where they fell and with little spoilage during the cold weather they were almost continually available as carrion to the spotted skunks and other scavengers. (Fig. 8)

Meadow mice (Microtus pennsylvanicus, and M. ochrogaster) were the next in importance. This genus appeared in 18.62 percent of all the scats and represented 19.92 percent of all the mammals appearing during this period. (Fig. 9)

Norway rats (Rattus norvegicus) were third in importance among the mammals. They were found in 9.31 percent of all the scats during this period and made up 10 percent of the mammal appearances. The spotted skunks' predation on rats in winter about farm buildings was very noticeable. It was observed at several places on the area that a heavy population of rats during the summer and fall completely disappeared, or nearly so, during the winter months when a spotted skunk was in residence. Whether the skunks killed

Fig. 8. This photograph, taken Feb. 7, 1940, on the area shows a few of the cottontails shot by farmers during the winter. Notice the damage done to the shrubbery along this fence line. Cottontails such as these were available to scavangers, including the spotted skunk, during most of the winter.

Fig. 9. A typical sight; meadow mouse killed by spotted skunk in an alfalfa field. The scat was pried up from the depression melted under it in the snow so that it would show in the photograph. Taken during February.

more than they drove away is a question, but they, nevertheless, exercised a very definite controlling influence on the rats. (Fig. 10)

Other mammals appearing in five percent or less of the scats were: white-footed mice (Peromyscus spp.); harvest mice (Reithrodontomys megalotis dychei) and house mice (Mus musculus). Mice of undetermined species appeared in 3.99 percent of the scats.

The next important group of items was plant material in which corn (Zea mays) took a dominant position. It exceeded all other single items except cottontail in appearances. It appeared 19 times or in 25.27 percent of all the scats and represented 70.3 percent of all vegetable matter. Many spotted skunks lived about buildings, frequently under and in corn cribs and while taking their regular toll on the rat and mouse population also utilized the corn. They apparently ate it many times in preference to other things. Two or three of the animals deposited scats containing entirely corn in the traps when they were caught for tagging purposes. (Fig. 4)

Insects appeared in 14.63 percent of all the scats gathered during this period. This is significant in view of the fact that few appeared to be available. Dearborn (1932) says of the striped skunk in Michigan, "Skunks continue to find insects as long as the ground remains uncovered with snow." This observation seems to apply

Fig. 10. These buildings were kept free of rats by spotted skunks during the winter of 1939-40. Three males were trapped and ear-tagged here during February.

equally as well to the spotted skunks for traces of Hemiptera, Coleoptera, Orthoptera, and Lepidoptera all appear from one to four times in the scats. (See Table I for complete list of food items and Figs. 20, 21 for graphic presentation.)

Birds consistently appeared in the scats. Bird remains were in 5.32 percent of the winter scats. Pigeon (Columba livia) appeared twice, domestic chicken three times and an unidentified small bird once. The chicken in this case was known to be carrion. All three chicken-containing scats were from the same skunk during one week in January.

Spring foods.

Mammals were the most important spring food taken. Mammal remains appeared in 86.35 percent of all the scats. The field mice came into prominence this season. Of these meadow mice were the most important and appeared in 36.66 percent of all the scats. They represented 34.96 percent of all mammal appearances. The white-footed mice appeared in 20.3 percent of all the scats and represented 19.36 percent of the mammal appearances. These mice became more accessible during the spring months when the snow was off the ground. Other foods being relatively more difficult to procure, the spotted skunks probably range farther afield during this season in search of these mice.

Cottontail rabbit was still a very important item in

Fig. 11. March 28, 1939, on the Stockport area; cottontail carrion being eaten by the spotted skunk. This rabbit was entirely eaten the next night.

the diet. Cottontails appeared in 17.87 percent of all the scats and represented 17.05 percent of all the mammal appearances. These scats were gathered in 1939 after a heavy population of rabbits had wintered over. During the spring months many adult cottontails succumbed to natural causes and dead ones could be found in almost every weed patch or brush pile. Since other foods were more abundant then than in the winter fewer of these rabbits were utilized than might otherwise have been the case. The rabbits appearing in the scats were probably all carrion. (Fig. 11) No evidence was ever found of predation on adult cottontails by the spotted skunks.

Other mammals appearing in the feces during this period and the percent of scats containing them were as follows: house mouse 6.36 percent, Norway rat 6.06 percent, harvest mouse 1.81 percent, and shrew (Cryptotis parva) 3.33 percent. Unidentified mice appeared in 11.81 percent of the scats. The spotted skunks continued to prey upon rats during this period but when other foods which were probably more palatable were available they only killed the rats and did not make a practice of eating much of the carcasses. That this was true was suspected several times but on one occasion was positively proven. (Fig. 12)

The next important group of items was the arthropods as 47.57 percent of all the scats contained their remains. Arthropods were represented in a few more than one half the

Fig. 12. April 7, 1939. This rat was killed in a horse barn manger at Stockport by a spotted skunk, but it was not eaten. Notice the mutilation of the head and neck.

number of scats containing mammal remains. Insects and insect larvae appeared in 37.87 percent of all the scats. Most prominent were various species of carabids which represented 9.22 percent of the total insect appearances. Next in importance were the various species of May beetles (Phyllophaga spp.) which appeared in 10.3 percent of the scats and represented 19.51 percent of all the insects present.

Millipeds (Parajulus spp.) appeared in 26.66 percent of all the scats. They were quite abundant about strawpiles and weedy fence rows during this period and the skunks seemed to relish them. Occasionally, a scat appeared which contained nothing but millipeds as food remains. The greatest number ever appearing in any one scat was ten. Usually a scat containing millipeds also contained considerable soil ingested with the food.

Plant material appeared in 10.60 percent of all the scats. Corn was again most important, representing 51.20 percent of the vegetable matter. Oats (Avena sativa) and grass represented 20.48 and 23.04 percent respectively. Grass was probably ingested accidentally many times but the large amount appearing would indicate that the animal, like the domestic cat, may at times purposefully eat grass. Oats, however, were sometimes taken intentionally, for one scat in March contained 9 c.c. of them. Oats may be used as a "stuffing" food at times.

Birds and birds' eggs represent the smallest percentage in appearances forming only 3.81 percent of the total. Feathers of small birds appeared nine times or in 2.72 percent of all the scats. Pigeon appeared four times, flicker (Colaptes spp.) once, and domestic chicken three times. Small birds' eggs appeared three times, and hens' eggs once. (See Table II for complete list of food items and Figs. 20, 21 for graphic presentation.)

Summer foods.

Arthropods were the most important summer food as 92.35 percent of the scats gathered during this period contained them. Millipeds appeared only eight times. All the rest of the arthropods were insects. Here again the species of carabids led all the rest with the genera Harpalus and Scarites particularly numerous. Harpalus appeared in 46.37 percent of all the scats and represented 20.17 percent of all insects. Scarites appeared in 22.40 percent of all the scats and represented 9.74 percent of all insects. May beetles and larvae were second in appearances with 32.61 percent of all the scats containing them. A large number of these beetles, especially May beetles, were dug up at the roots of greater ragweeds (Ambrosia trifida) during June. The spotted skunks dug a shallow hole about two inches deep following the tap root. They would systematically go in one night to almost every plant in a patch of two or three hundred and dig at

Fig. 13. June 14, 1939. An illustration of the digging at the roots of greater ragweeds on the Stockport area for insects. Fresh scats were picked up within two feet of these two plants.

the roots for these insects. (Fig. 13) They seldom captured all of them under a weed for when these same weeds were pulled up the next morning some specimens of these beetles could be obtained. None of this type of activity was observed during July and August but it appeared again in the fall.

For several days during early July the spotted skunks on the area dug up a great many larvae of the scarab, (Osmoderma eremicola) a large white grub found in rotting strawpile butts at that time. Their industry in pursuit of this grub was demonstrated several places where a thousand square feet or more of surface would be stirred up to a depth of about three inches as though a man had done it with a fork. (Fig. 14) At one place on the area it was found that striped skunks (Mephitis mesomelas avia) had been just as assiduous in the search for these grubs as the spotted skunks.

Mammals were found in 34.97 percent of all the summer scats. The various species of mice made up 73 percent of all the mammal remains. (Fig. 15) Meadow mice led again, representing 20 percent of all the mouse appearances. Norway rats did not appear during this season. The fact that the rat appearances in the spring dwindled and disappeared entirely during the summer months, undoubtedly indicates a food preference. Several observations were made of spotted skunks living side by side with Norway rats during this

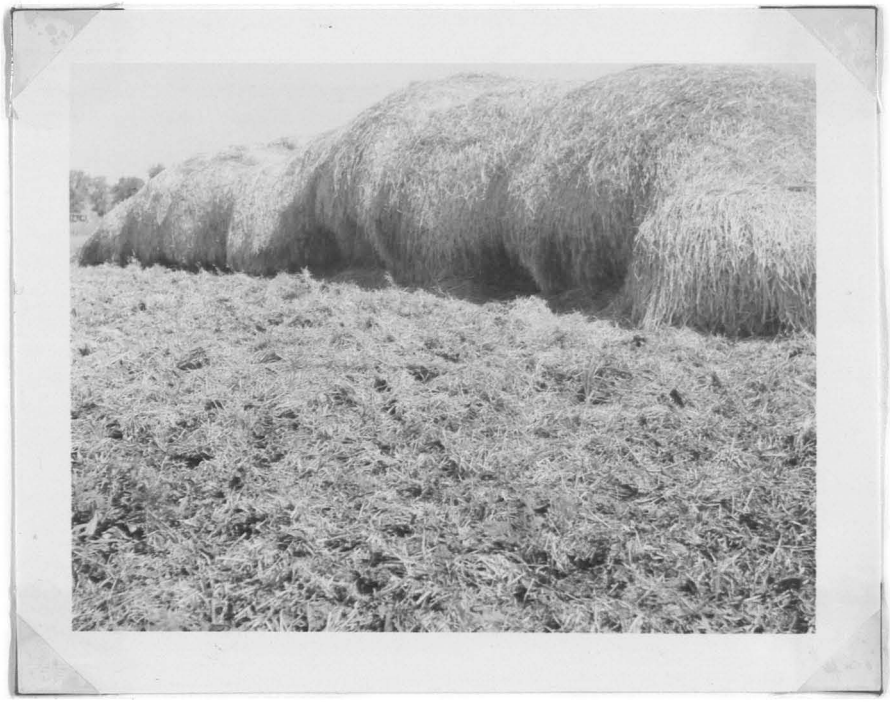

Fig. 14. July 12, 1939. This shows the thorough uprooting of a rotting strawpile butt by the spotted skunks in search of the larvae of the scarab, Osmoderma eremicola. This is evidence of several nights' work.

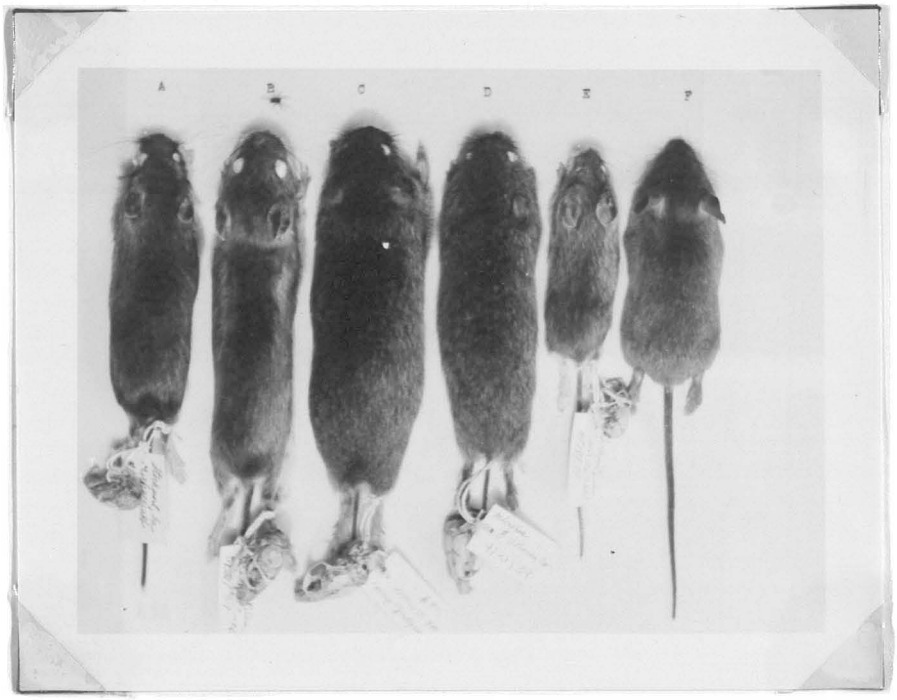

Fig. 15. The principal species of mice taken by the spotted skunk during this investigation.

A. Baird white-footed mouse (Peromyscus maniculatus bairdi)
B. Northern white-footed mouse (P. leucopus noveboracensis)
C. Pennsylvania meadow mouse (Microtus p. pennsylvanicus)
D. Prairie meadow mouse (Microtus ochrogaster)
E. Prairie harvest mouse (Reithrodontomys megalotis dychei)
F. House mouse (Mus m. musculus)

These mice were part of the mammals collected on the Stockport area by the author and used in the identification of material found in the scats.

period; frequently under the same buildings and woodpiles. A single illustration will be sufficient. At one place in late July and early August rats and a mother spotted skunk were seen several times running in and out of a chicken house over the same door sill and under a wooden floor in one end of the building. (Fig. 16) In this particular situation the mother skunk had five young less than half-grown. The rats appeared unafraid and from their many fresh droppings it was evident that they were well established. The fact that the rats were not disturbed was further confirmed by the many fresh scats at the place from the mother skunk which contained insects with but one exception.

Plant material appeared in 26.72 percent of all the scats with mulberries (Morus rubra) an outstanding item. Mulberries appeared in 18.47 percent of all the scats and represented 70.03 percent of all the plant material. Mulberries were particularly abundant during June. Large numbers of ripe berries fell to the ground under the trees which were numerous and well distributed over the area. (Fig. 17)

The number of birds appearing during this period was significant yet made up a small percentage of the total appearances. Birds and birds' eggs were found in 11 percent of all the summer scats. One scat during June contained the breast feathers and egg shell of a meadowlark, (Sturnella magna) mute evidence of a tragedy to a nesting bird. Meadowlark feathers appeared five times and represented 19 percent

Fig. 16. Chicken house used by many rats and a spotted skunk family during July. Neither the rats nor the chickens were molested by the skunks.

Fig. 17. A mulberry tree growing from the end of a rock reinforced railroad culvert. Many ripe mulberries fell on these rocks and were eaten by the spotted skunks living at this place.

of the total bird appearances. Bob-white (Colinus v. virginianus) eggs appeared once. Other bird appearances were as follows: barn pigeon three times, chicken three times, robin (Turdus m. migratorius) twice, mourning dove (Zenaidura macroura) once, unidentified bird five times, and unidentified small bird eggs five times. (See Table III for complete list of items and Figs. 21, 22 for graphic presentation.)

Fall foods.

Arthropods dominated the fall food habits picture. They appeared in 80.46 percent of all the scats. Millipeds were quite numerous, showing in 13.53 percent of all the scats; however, the bulk of this group were insects; 47.51 percent of all appearances fell within the insect classification. The most important insects were members of the family Locustidae, the short-horned grasshoppers. Melonoplus femur rubrum and M. differentialis were the two most common species taken. Members of this family appeared in 57.52 percent of all the scats during this period. (Figs. 6 and 7) They also represented 39.16 percent of all the insects taken. May beetles were the next important insects; they represented 10.75 percent of the insect appearances. The various species of carabids were important; members of the genus Harpalus were found in 8.06 percent of all the insect scats. (Figs. 18 and 19)

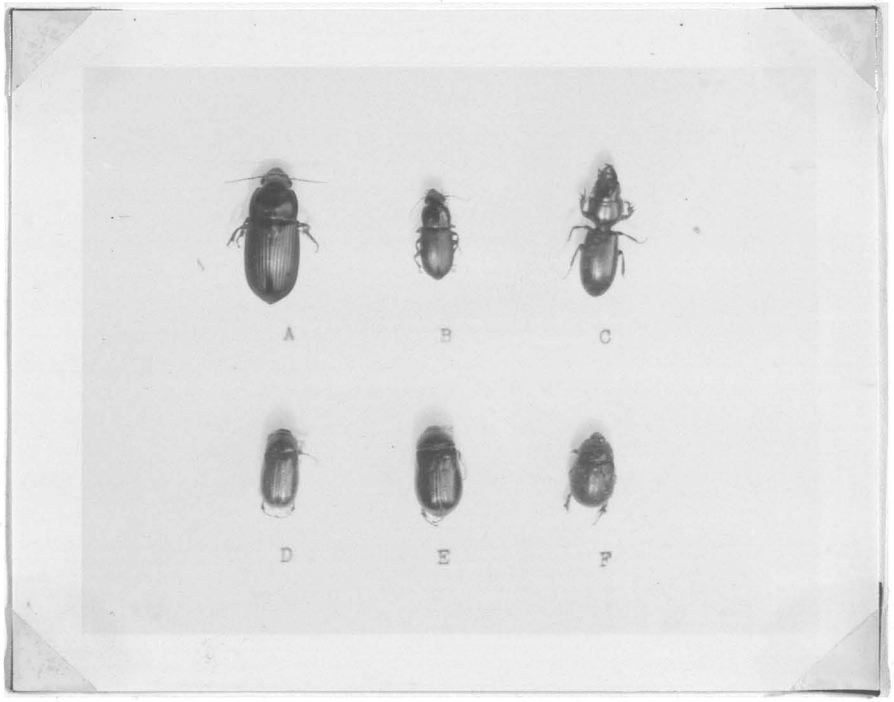

Fig. 18. Some of the insects most commonly found in spotted skunk scats during this investigation.

A. Harpalus caliginosis
B. Harpalus pennsylvanicus
C. Scarites substriatus
D, E. Species of Phyllophaga
F. Ligyrus gibbosus

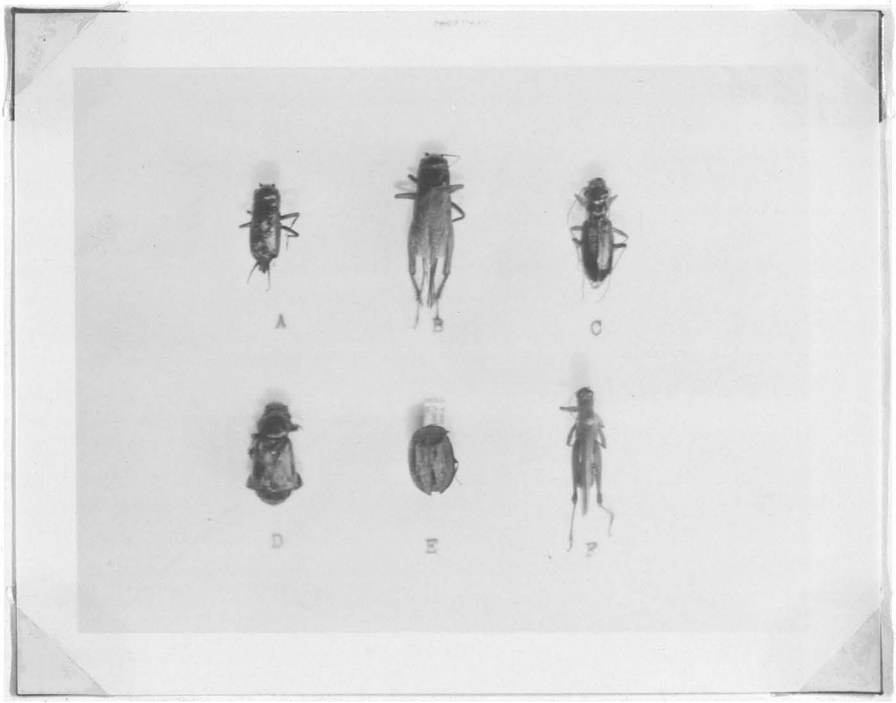

Fig. 19. Other insects frequently found in the diet of the spotted skunk. The two silphids may be eaten along with carrion.

A. Gryllus spp.
B. Gryllus assimilis
C. Tetracha virginica
D. Necrophorus marginatus
E. Silpha inaequalis
F. Melanoplus femur rubrum

Mammals came into prominence again with the cooler weather. They were found in 58.32 percent of all the scats. Meadow mice were most important, representing 34.02 percent of the mammal appearances. Norway rats again began to show and accounted for 3.62 percent of the mammal appearances. Cottontail rabbits were again frequently found in the scats, representing 15.92 percent of all the mammals. Vegetable matter, especially fruit, was common in the early fall diet. Ground cherries (Physalis spp.) and wild grapes (Vitis spp.) were especially numerous. Later in the fall much corn was taken and consequently it outranked the individual fruits in appearances, for 31.61 percent of the vegetable matter appearing was corn. Ground cherries represented 26.16 percent and grapes 21.80 percent of vegetable appearances. To procure the grapes it was necessary for one of the skunks to climb up a brace post in a fence corner and take them off the vine. Although this was not observed all evidence indicated this to be a fact. A few mulberries were still available in the early fall and were utilized. Wild black cherries (Prunus serotina) were very numerous on the area but little used by the skunks. They appeared only twice in the feces.

Comparatively fewer birds were taken in this period than during the other three seasons. Only 3.78 percent of the scats contained bird remains. Unidentified small birds appeared five times, chicken eggs once, and bob-white eggs once. The bob-white egg must have been left over from the

nesting season. That the spotted skunks are fond of rotten eggs is attested to by trappers who report that such eggs make ideal trap bait for the species. (See Table IV for complete list of items and Figs. 20 and 21 for graphic presentation.)

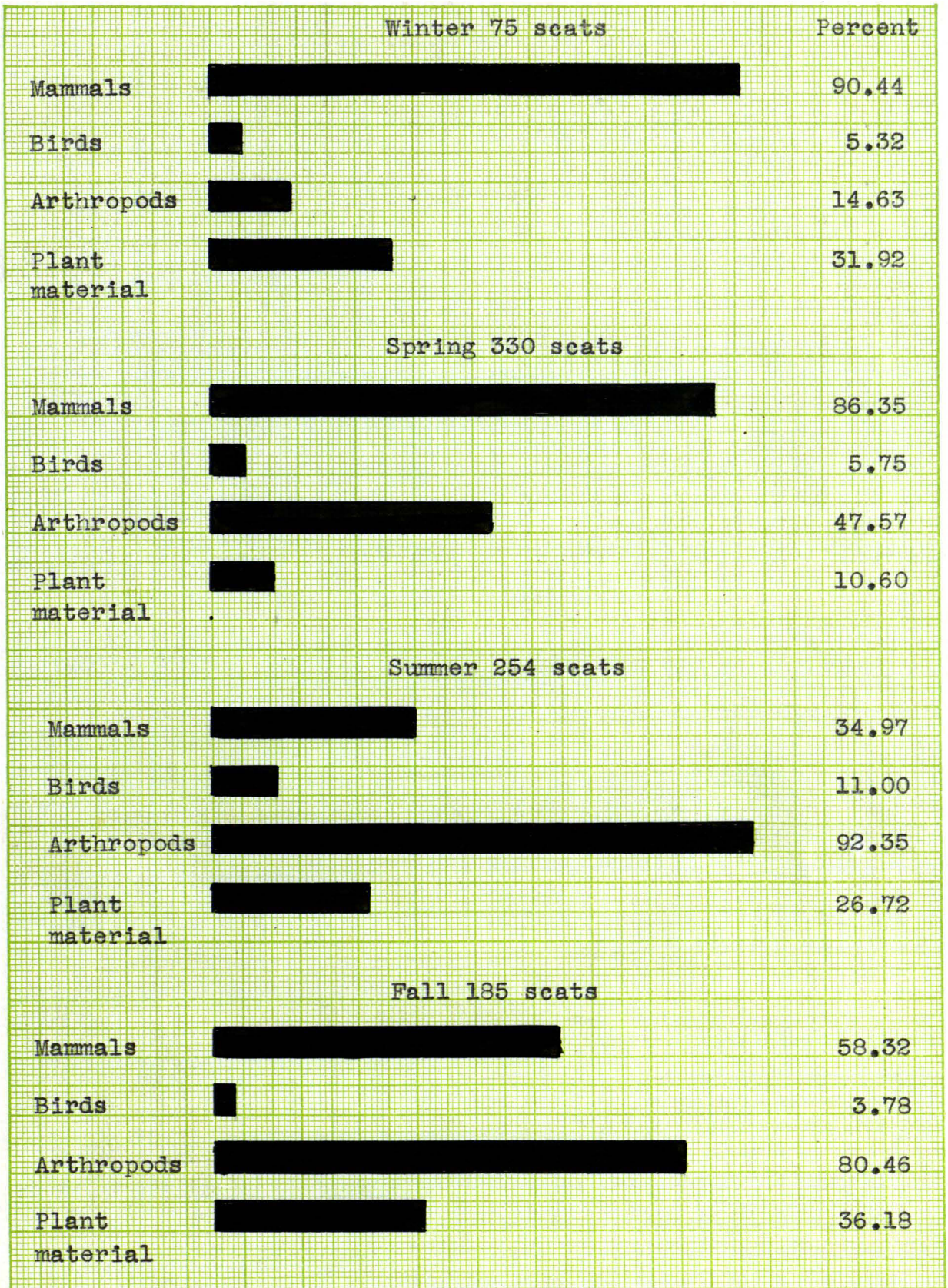

Fig. 20. Spotted Skunk Food.
Percentage of Total Scats Appeared In.

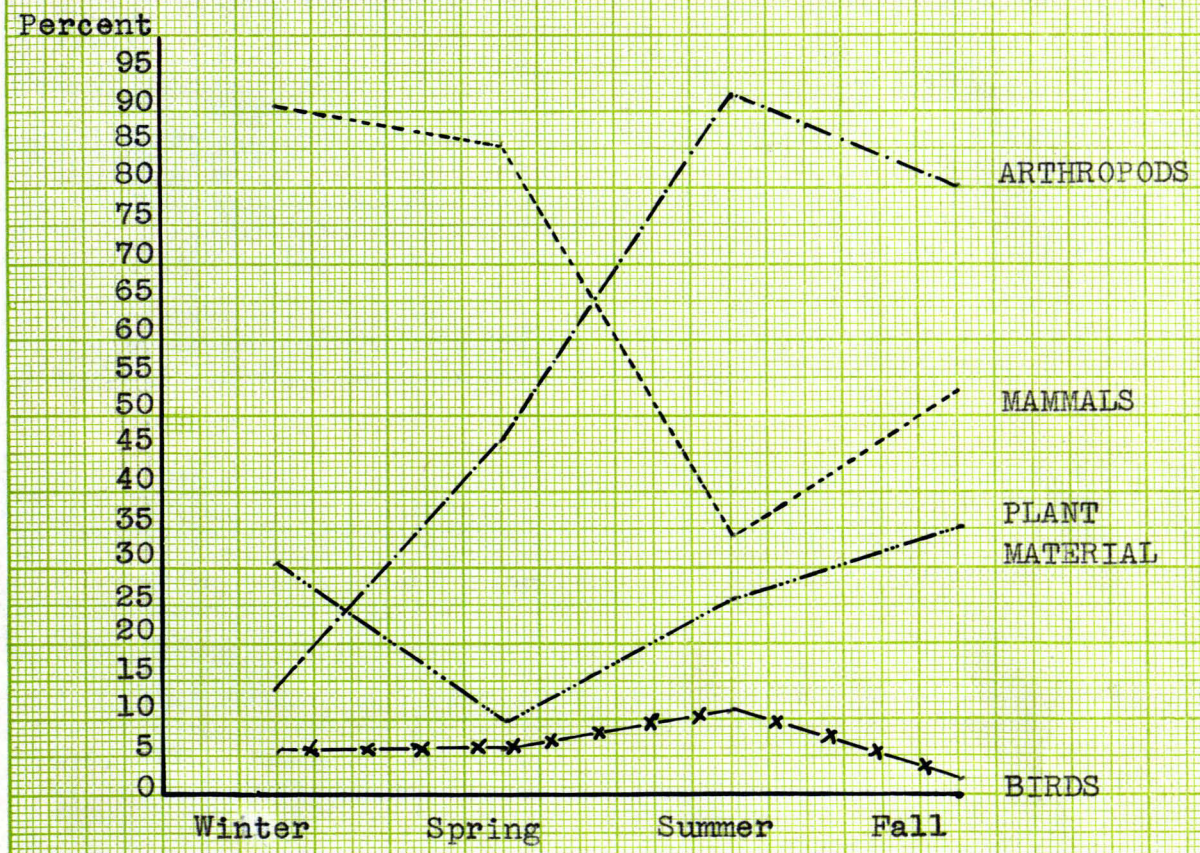

Fig. 21. Percentage of Scats Appeared in by Seasons.

TABLE I

FOOD TAKEN DURING WINTER MONTHS

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Mammals				
Microtus spp.	14	19.92	1	18.62
Peromyscus spp.	4	5.71	2	5.32
Reithrodontomys megalotis dychei	1	1.42	1	1.33
Mus musculus	3	4.28	1	3.99
Unidentified mice	3	4.28	1	3.99
Rattus norvegicus	7	9.99	1	9.31
Sylvilagus floridanus mearnsii	38	54.26	1	50.54
Total		100.00		
Birds				
Columba livia	2	33.20	1	2.66
Gallus gallus	3	49.80	1	3.99
Unidentified bird	1	16.60	1	1.33
Total		100.00		
Arthropods				
Millipeds				
Parajulus spp.	1		1	1.33
Insects				
Locustidae	4	33.32	4	5.32
Hemiptera	2	16.66	1	2.66
Coreidae	2	16.66	1	2.66
Coleoptera	1	8.33	1	1.33
Lepidoptera	1	8.33	1	1.33
Unidentified insect parts	2	16.66		2.66
Total		100.00		
Plant Material				
Zea mays	19	70.30	8 c.c.	25.27
Avena sativa	3	11.10	1	3.99
Vitis spp.	1	3.70	1	1.33
Setaria spp.	2	7.40	1	2.66
Grass	2	7.40	1	2.66
Total		100.00		

TABLE II

FOOD TAKEN DURING SPRING MONTHS

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Mammals				
Microtus spp.	121	34.96	3	36.66
Peromyscus spp.	67	19.36	3	20.30
Reithrodontomys megalotis dychei	6	1.73	2	1.81
Mus musculus	21	6.06	2	6.36
Unidentified mice	39	11.27	1	11.81
Rattus norvegicus	20	5.78	1	6.06
Cryptotis parva	11	3.17	3	3.33
Sylvilagus floridanus mearnsii	59	17.05	1	17.87
Ovis aries	2	.57	1	.60
Total		100.00		
Birds				
Colaptes auratus	1	4.76	1	.30
Unidentified small birds	9	43.84	1	2.72
Columba livia	4	19.04	1	1.21
Gallus gallus	3	14.28	1	.90
Wild bird eggs	3	14.28	1	.90
Gallus gallus eggs	1	4.76	1	.30
Total		100.00		
Fishes				
Cycloid fish	1		1	.30
Arthropods				
Millipeds				
Parajulus spp.	85		10	25.75
Insects				
Locustidae	15	8.61	6	4.54
Harpalus spp.	17	9.75	6	5.15
Scarites spp.	14	8.03	2	4.20
Calosoma spp.	1	.57	1	.30
Carabidae (other than above)	28	16.07	1	8.48
Phyllophaga spp.	34	19.51	20	10.30
Scarabaeidae (other than above)	2	1.14	1	.60
Necrophorus spp.	9	5.16	1	2.72
Silpha spp.	4	2.29	2	1.21
Macrobasis spp.	1	.57	1	.30

(Continued)

TABLE II
(Continued)

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Elateridae larvae	1	.57	1	.30
Ptinidae	1	.57	1	.30
Coleoptera (other than above)	11	6.31	1	3.33
Coreidae	3	1.72	1	.90
Hemiptera (other than above)	1	.57	1	.30
Vespidae	1	.57	1	.30
Unidentified insect parts	31	17.79		9.39
Total		100.00		
Plant Material				
Zea mays	20	51.20	5 c.c.	6.06
Avena sativa	8	20.48	9 c.c.	2.42
Abutilon spp.	1	2.56		.30
Setaria spp.	1	2.56		.30
Grass	9	23.04		2.72
Total		100.00		

TABLE III

FOOD TAKEN DURING SUMMER MONTHS

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Mammals				
Microtus spp.	20	20.00	1	7.86
Peromyscus spp.	11	11.00	1	4.32
Mus musculus	4	4.00	1	1.57
Unidentified mice	38	38.00	1	19.93
Sylvilagus floridanus mearnsii	27	27.00	1	10.61
Total		100.00		
Birds				
Columba livia	3	11.40	1	1.17
Gallus gallus	3	11.40	1	1.17
Sturnella magna	5	19.00	1	1.96
Turdus m. migratorius	2	7.60	1	.78
Zenaidura macroura	1	3.80	1	.39
Unidentified small birds	5	19.00		1.96
Unidentified small birds' eggs	5	19.00		1.96
Sturnella magna eggs	1	3.80		.39
Colinus v. virginianus eggs	1	3.80		.39
Total		100.00		
Arthropods				
Millipeds				
Parajulus spp.	8		4	3.14
Insects				
Locustidae	16	2.73	3	6.28
Gryllidae	88	15.04	6	34.58
Cicindelidae	9	1.53	1	3.53
Scarites spp.	57	9.74	4	22.40
Harpalus spp.	118	20.17	7	46.37
Calosoma spp.	5	.85	1	1.96
Chlaenius spp.	2	.34	1	.78
Evarthus spp.	4	.68	1	1.57
Carabidae (other than above)	41	7.01	1	16.11
Silpha spp.	2	.34	2	.78
Necrophorus spp.	6	1.02	1	2.35
Pelidnota spp.	3	.51	1	1.17
Canthon spp.	3	.51	1	1.17
Euphoria spp.	1	.17	1	.39

(Continued)

TABLE III
(Continued)

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Osmoderma eremicola larvae	4	.68	3	1.57
Phyllophaga and Ligyrus spp.	82	14.02	10	32.22
Phyllophaga larvae	1	.17	2	.39
Scarabaeidae (other than above)	5	.85		1.96
Meloidae	2	.34	1	.78
Lucanus dama	1	.17	1	.39
Tenebrionidae	1	.17	1	.39
Chrysomelidae	2	.34	1	.78
Curculionidae	1	.17	1	.39
Coreidae	4	.68	2	1.57
Lepidoptera larvae	25	4.27	3	9.82
Formicidae	6	1.02	18	2.35
Vespidae	1	.17	1	.39
Polistes spp.	2	.34	1	.78
Sphecidae	1	.17	1	.39
Unidentified insect parts	81	13.85		31.83
Total		100.00		
Plant Material				
Morus rubra	47	70.03	4 c.c.	18.47
Solanum nigrum	1	1.49		.39
Grass	7	10.43		2.75
Zea mays	2	2.98		.78
Avena sativa	2	2.96		.78
Physalis spp.	1	1.49		.39
Ambrosia spp.	1	1.49		.39
Ribes spp.	1	1.49		.39
Vitis sp.	3	4.47		1.17
Prunus serotina	1	1.49		.39
Unidentified seed	1	1.49		.39
Total		100.00		

TABLE IV.

FOOD TAKEN DURING FALL MONTHS

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Mammals				
Microtus spp.	47	34.02	2	26.50
Peromyscus spp.	6	4.34	1	3.38
Mus musculus	6	11.58	2	3.38
Unidentified mice	41	29.68	1	23.12
Rattus norvegicus	5	3.62	1	2.82
Sylvilagus floridanus mearnsii	22	15.92	1	12.40
Ovis aries	1	.72	1	.56
Total		100.00		
Birds				
Unidentified small birds	5	71.40		2.82
Gallus gallus eggs	1	14.28	1	.56
Colinus v. virginianus eggs	1	14.28		.56
Total		100.00		
Arthropods				
Millipeds				
Parajulus spp.	24		6	13.53
Insects				
Locustidae	102	39.16	10	57.52
Gryllidae	14	5.37	8	7.89
Harpalus spp.	21	8.06	3	11.84
Scarites spp.	3	1.15	2	1.69
Carabidae (other than above)	26	8.98	3	14.66
Aphodius spp.	10	3.84	107	5.64
Phyllophaga spp.	28	10.75	12	15.79
Phyllophaga larvae	1	.38	1	.56
Elateridae	1	.38	1	.56
Curculionidae	3	1.15	1	1.69
Coccinellidae	1	.58	1	.56
Cicindelidae	3	1.15	1	1.69
Necrophorus spp.	2	.76	1	1.12
Coreidae	9	3.45	1	5.07
Pentatomidae	1	.38	1	.56
Diptera	1	.38	1	.56
Lepidoptera larvae	4	1.53	6	2.25

(Continued)

TABLE IV
(Continued)

Food Items	APPEARANCES			Percent of total scats appeared in
	No.	Percent	In one scat	
Formicidae	3	1.15	155	1.69
Unidentified insect parts	28	10.75		15.79
Total		100.00		
Plant Material				
Zea mays	29	31.61	3 c.c.	16.35
Physalis spp.	24	26.16	3 c.c.	13.35
Avena sativa	1	1.09		.56
Grass	7	7.63		3.94
Vitis spp.	20	21.80		11.28
Prunus serotina	2	2.18		1.12
Setaria spp.	3	3.27		1.69
Malus spp.	1	1.09		.56
Morus rubra	1	1.09		.56
Ambrosia spp.	1	1.09		.56
Unidentified seed	2	2.18		1.12
		100.00		

TABLE V

PERCENTAGE OF PREY APPEARANCES
IN SCATS, BY GROUPS

Group	Month			Scats appeared in	
75 scats	Dec.	Jan.	Feb.	No.	Percent
MAMMALS	15	32	21	68	90.44
BIRDS		1	3	4	5.32
ARTHROPODS	6	3	2	11	14.63
PLANT MATERIAL	14	4	6	24	31.92
330 scats	March	April	May	No.	Percent
MAMMALS	78	128	79	285	86.35
BIRDS	8	4	7	19	5.75
ARTHROPODS	19	55	83	157	47.57
PLANT MATERIAL	20	12	3	35	10.60
254 scats	June	July	Aug.	No.	Percent
MAMMALS	45	30	14	89	34.97
BIRDS	16	10	2	28	11.00
ARTHROPODS	98	105	32	235	92.35
PLANT MATERIAL	30	20	18	68	26.72
185 scats	Sept.	Oct.	Nov.	No.	Percent
MAMMALS	15	20	73	108	58.32
BIRDS	0	2	5	7	3.78
ARTHROPODS	45	32	72	149	80.46
PLANT MATERIAL	21	10	36	67	36.18

SUMMARY

1. The research into the food habits of the spotted skunk covered a 12-month period, March 18, 1939 to March 1, 1940. The investigation was confined to an area of 17.5 square miles in southeastern Iowa.
2. Seven months were spent in continuous residence in the field. During the other five months trips were made to the area twice a month for the purpose of gathering scats (with the exception of December when only one trip was made). The collection totaled 834 scats.
3. All of the 834 scats were analyzed dry and the individual items separated and counted.
4. The tabulation and interpretation of the data were based upon the frequency of occurrences of the various items.
5. The scats were grouped arbitrarily into seasonal periods: winter, spring, summer and fall.
6. Winter foods were largely of mammal origin. Of the winter scats, 90.44 percent contained this group. Cottontail rabbit appeared most frequently. It was found in 54.26 percent of 75 winter scats. Corn was an important item during this season, appearing in 31.92 percent of the scats.
7. Spring food was predominantly mammals. The various species of field mice were most common and appeared in approximately

80 percent of 330 spring scats. Insects also appeared frequently and were found in 47.57 percent of the scats during this period.

8. Summer food was predominantly insects; they were found in 92.35 percent of 254 scats. Mammals appeared in only 34.97 percent of the scats. Plant material (mostly fruit) appeared in 26.72 percent of the scats, while birds and birds' eggs were found in 11 percent of these scats. Birds were eaten more frequently during this period than at any other time.

9. Fall food, like summer food, was predominantly insects; 80.46 percent of 185 scats contained them. Mammals were also important this season, appearing in 58.32 percent of the scats. Fruits such as grapes, mulberries and ground cherries appeared in 36.18 percent while birds were found in only 3.78 percent. Fewer birds appeared during this period than at any other time.

10. The spotted skunk is an omnivorous animal. During this investigation insects seemed to be the preferred food with members of the families Carabidae and Scarabaeidae most frequently taken. Small mammals were a regular and important item in the diet. Norway rats were eaten freely when other foods were difficult to obtain. Cottontail carrion and chicken carrion were taken very freely during the winter when they were available. Birds appeared infrequently in the diet, probably because

they are more or less unavailable, although they were readily utilized when possible. Grain, such as corn, was eaten frequently when other foods were more difficult to procure. Fruits were taken readily when available.

11. There was a wide variation of food items during the year, but the change was gradual from one group of items to another.

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