FURBEARERS In Kansas

A Guide to Trapping

by
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Preface

The trade in pelts of fur-bearing animals in western North America, including what is now Kansas, was one of the prime motivating factors in the exploration and settlement of this region by Europeans. After settlement, pelts of furbearers became less important to man's economy and the animals were left to exist as best they could in the face of increasing utilization of their living places by man. It seems necessary that something be done to stimulate more interest in the preservation and wise management of this resource which in Kansas is worth annually as much as $500,000 divided among as many as 10,000 families. Aside from the monetary worth of the pelts of these animals to a small segment of the population, the mere presence of furbearers provides many more persons, who enjoy nature, with an aesthetic satisfaction which would be difficult to express in terms of dollars and cents.

Recently the State Biological Survey at the University of Kansas undertook a study of the fur-bearing animals of Kansas. This bulletin has been assembled to acquaint Kansans with the current value and status of this valuable part of our heritage, and to inform the people of the habits of these animals and the methods of catching, handling, and marketing furs. This knowledge would aid persons in obtaining larger catches of furbearers and in receiving more money for well-prepared pelts. We recognize that much information presented here is well-known to veteran trappers and hunters. Consequently, this bulletin may be of greatest assistance and encouragement to persons less experienced in various techniques and to those young people just beginning to catch fur-animals and prepare and market their pelts.

This bulletin presents information concerning the natural history of the various kinds of fur-bearing animals, where, how, and when to trap them, methods of preparing pelts for sale or personal use, suggested conservation practices that aid in keeping the seasonal crop of furbearers at a high level, pointers on buying fur, wearing apparel for the lady of the house, and the economic importance of these fur-bearing animals.

The authors appreciate the cooperation of the Kansas Forestry, Fish and Game Commission, many trappers in Kansas, and others who have been helpful in the preparation of this bulletin.

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Less than 150 years ago, Kansas was an unsettled part of the vast area known as the Louisiana Territory. Along streams lived beaver and other fur animals, whose pelts were valued highly. The trappers and persons who traded for furs with the Indians were among the first White Men to visit what is now Kansas. These hardy frontiersmen learned about the country and helped establish the trails used later by settlers—the farming people. The Indians and buffalo declined and so did the furbearers. Trapping of fur-bearing animals in recent years has been mostly by farm residents, who, having fewer chores in midwinter than at other times of the year, trapped animals on their farms and surrounding areas. Here was a money-crop of the land available at a time when other work around the farm was slack. Many trappers found that over-trapping hurt their chances of having a sustained annual income from fur so did not trap excessively and left sufficient numbers of animals to replenish the area. Through the sale of furs, many youths obtained their spending money; others saved part of their income to help pay their way through school; and all learned something about business methods from their dealings with various fur buyers. Today in Kansas much of our fur is taken by the younger people; few older "professional" trappers are in business. Dog handlers who take raccoons and other furbearers as "by-products" of their sport, make up another large group who pursue fur animals.

The number of persons who purchase licenses to take fur animals has fluctuated widely in the past 25 years (see Table 1). When fur prices are high, more persons buy licenses and take fur. According to Table 1, license sales were highest in 1929 and 1930 and were high again in the war years, 1939-1946.

The number of kinds of mammals the fur of which is used commercially has increased as the over-all population of furbearers has decreased. In frontier days, beaver was the fur in greatest demand although pelts of bear, otter, wolf, lynx, fox, mink, raccoon,

muskrat and others also were exported to Europe in considerable numbers as early as 1750. In 1843, the pelts of the house cat and rabbit were first used commercially and exported. The opossum and fur seal were added to this list in 1849, and in 1858 the pelts of skunks were first marketed.

TABLE 1.—TRAPPING LICENSES SOLD IN KANSAS, 1928-1957

Year	Licenses	Year	Licenses
1928-29	17,616	1943-44	14,885
1929-30	28,147	1944-45	11,015
1930-31	25,060	1945-46	13,214
1931-32	14,895	1946-47	14,525
1932-33	8,054	1947-48	8,677
1933-34	10,312	1948-49	7,826
1934-35	9,778	1949-50	7,204
1935-36	7,531	1950-51	7,358
1936-37	10,312	1951-52	8,448
1937-38	9,359	1952-53	6,229
1938-39	9,852	1953-54	4,021
1939-40	14,064	1954-55	3,561
1940-41	10,785	1955-56	3,234
1941-42	13,379	1956-57	2,793
1942-43	10,293		

In the early days, trappers used snares and deadfalls to obtain their animals. These crude methods entailed considerable time and an enormous amount of work. In 1823, Sewell Newhouse, when only 17 years old, invented the steel-jawed trap and began to manufacture it in Oneida, New York. This invention was a great boon to the trapping industry.

Furbearers, especially those that are meat-eaters, often are needlessly killed out-of-season because they are believed to cause damage of one sort or another. True, outlaws that cause damage will be found occasionally, but there is no profit in killing an entire population to stop one individual. In one area in central Iowa muskrats were damaging corn, but the farmer received twice the value of the corn damaged when he trapped and pelted these "nuisance" muskrats. He also left a sufficient breeding stock of muskrats for the next season. Thus, as with all natural resources, through wise use the public will realize greater economic benefit.

Today, there is a need for a greater understanding of furbearers in Kansas. Little is known of the natural history of most of these animals; for example, their habits, chief foods, preferred living places, abundance, enemies, diseases and parasites. We must know these things if this resource is to be harvested wisely. Just as the farmer should know the condition of his soil and what fer-

tilizers are needed to grow the most productive crops, the fur trapper needs to know which natural conditions are going to affect his crop.

Fur and Fur Values

The terms, "fur" or "pelt," denote the skin of an animal with all or part of the hair intact. The value of fur for apparel or for warmth or adornment is determined by size, color, density, thickness of the fur, primeness of the skin, and durability of the skin and the hair.

Coat-color varies in a single species; often dark-furred individuals are obtained in forests, along wooded streams and in brush covered areas, whereas paler individuals of the same kind often are obtained in more open situations. Usually, the darker furs command the better prices. The total cash received by fur trappers in the Temperate region greatly exceeds the total received by trappers in the Arctic region. This is because the larger number of trappers in the Temperate region harvest a much larger total number of pelts.

In the Arctic and colder regions, furbearers have a long, dense growth of hair but are "thin-skinned." This thinness of skin may reduce the value of the fur. Conversely, in tropical and subtropical climates hair is sparse and the skin is thick. This combination also lessens the value of furs. An intermediate climate in the northern part of the United States, including parts of Kansas, produces many of the furs of finest quality.

Primeness refers to condition of the fur and skin. The pelt of an animal caught in early autumn will be unprime because of being "thin-furred," the hairs having not completed their normal growth, and because the skin contains blood that imparts a bluish color to the flesh side. In late autumn and in winter, land mammals are usually prime or fully-furred. In spring, they shed their winter coat and become unprime again. The fur dealer determines primeness by observing the condition of the skin. In late summer or autumn, the skin takes on a "blue" color because the dark bases of the growing guard hairs show through the skin. If the fur is used at this time, some of the guard hairs will be loosened and lost in the fleshing process. When fur is prime, the bases of the completely grown hairs are not seen and the skin is white or cream-colored and soft to the touch. As spring approaches and the winter fur begins to shed, the skin takes on a reserve of fatty tissue, becomes tough and acquires a reddish tinge. This condition is known as "springy" and is a sign of unprimeness of a sort.

TRAPPING

Reading Sign

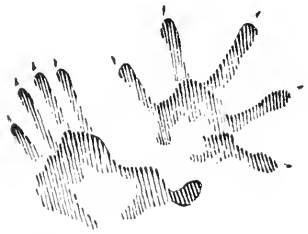
The experienced trapper knows the kinds and approximate numbers of furbearers in his trapping area by observing the variety and abundance of sign of animals, sign consisting of tracks, fecal droppings (scats), hair, feeding places or partly eaten foods, slides, dens, and houses. Sign provides clues as to the best places for sets and types of sets to make.

Thus, a week or two before trapping season opens, the experienced trapper examines closely the area which he intends to trap, in order to keep abreast of the activities and breeding success of animals that later will be trapped.

Tracks

Tracks are perhaps the easiest sign to identify. Each species of animal has a different kind of footprint and way of taking steps. For the beginner, tracks are found easiest on the day following a rain. At this time, muddy areas along creek bottoms, ponds, ditches, roads, and trails can be inspected. Dusty roads also are excellent places to look for tracks.

A key and drawings follow which will help one to recognize tracks of furbearers. The key is made up of pairs of choices. In each pair, one statement concerning the track will be true, and the other will not. Beginning with 1 and 1′, choose which is true and proceed to the number indicated at the end of the line after that choice. Decide which of the two choices given with this second pair of numbers is true, and continue until the name of the animal is found. For example, we will key out the tracks above: Looking at 1 and 1′, we decide that the track has a pad and five toes. We then go to 15, where our choice is whether the track is more than, or less than, 2½ inches long. Because it is less than 2½ inches long, we turn to 21. Since the print of the big toe on the hind foot points inward and is at right angles to the other toes, the track was made by an opossum.



KEY TO TRACKS

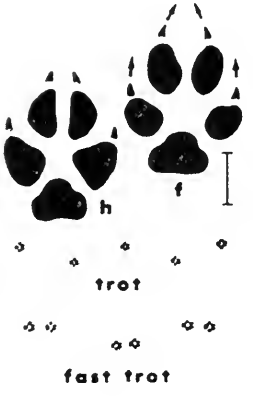
1. Pad and four toes or an oval pad and no toes 2

1′ Pad and five toes 15

2. Track usually more than 2½ inches long 3

2′ Track usually less than 2½ inches long 5

3. Toe-prints absent or indistinct, claw marks not separate, two larger tracks beside each each other and two smaller tracks behind ..... Jackrabbit



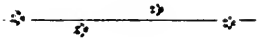
3′ Toe-prints always distinct, claw marks separate, tracks almost in a straight line 4

4. Prints of outer toes of hind foot larger than prints of inner toes, toe-pads compact and small, nails point forward or inward ..... Coyote

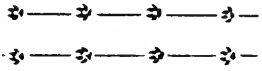
4′ Prints of outer toes same size as prints of inner toes, toe-pads spreading and large, nails point outward, feet often are dragged ..... Dog

Vertical line alongside track represents one inch

5. Claw-prints visible in track..... 6
5′ Claw-prints not visible in track.... 12
6. Track 2 inches long or longer, tracks almost in a straight line..... 7



6′ At least one track (fore) less than 2 inches long, tracks in two lines.. 8

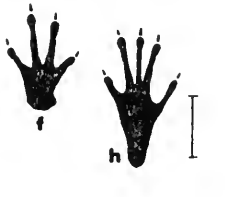


7. Pad of front foot narrow, small, and widely spaced from the small toes, Red Fox

7′ Pad of front foot rounder, larger, and track resembles that of a small dog ..... Gray Fox

8. Track of hind and front foot almost the same size, track 1½ inches long or longer, claw marks not separate from toe marks, print of heel 3-lobed, print of hind foot usually shows 4 toes ..... Mink

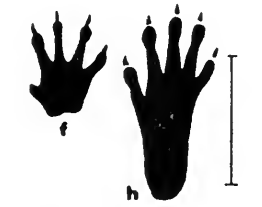
8′ Track of hind foot larger than track of front foot 9
9. Track of hind foot longer than 1½ inches and shows five toes..... 10
9′ Tracks of both hind and front feet less than 1½ inches long..... 11
10. All tracks less than 2¾ inches long; does not drag feet ..... Squirrel



Vertical line alongside track represents one inch

10′ Track of hind foot longer than 3 inches; feet often are dragged leaving marks between prints..... Woodchuck

11. Track of hind foot showing 4 toes ..... Weasel



11′ Track of hind foot showing 5 toes ..... Woodrat

12. Track of hind foot much larger than that of front foot 13

12′ Track of hind foot and front foot the same size 14

13. Print of dragging tail may show between tracks, track of hind foot shows claw marks and may partly cover track of front foot..... Muskrat

13′ Print of tail never present, tracks of hind foot usually not showing claw marks, and tracks of hind feet side by side; tracks of two front feet in a straight line behind.... Cottontail Rabbit

Vertical line alongside track represents one inch

14. Print of heel with no more than 3 lobes, track of foot less than 1¼ inches long ..... Housecat

14′ Print of heel with 4 or 5 lobes, track of foot approximately 2 inches long .. Bobcat

15. Track usually more than 2½ inches long 16

15′ Track usually less than 2½ inches long 21

16. Separate claw marks present in track of front foot, may be absent from hind foot 17

16′ No claw marks, or claw marks joined to print of pad 18

17. Five distinct front toes, tracks arranged in a diagonal row when the animal is running ..... Striped Skunk

17′ Four distinct front toes, tracks arranged in twos when the animal is running ..... Squirrel

18. Track of hind foot at least twice as long as that of front foot; impression of tail, dragging, usually present... 19

18′ Track of hind foot less than twice as long as that of front foot; impression of tail, dragging, absent . 20

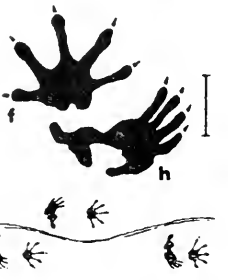
19. Largest track less than 4 inches long; impression of dragging tail, when present, narrow and in zig-zag pattern; marks of toes point outward .. Muskrat

Vertical line alongside track represents one inch

19′ Largest track more than 4 inches long, impression of dragging tail wide and in a fairly straight line, marks of toes point inward . . . . . Beaver

20. Track of front foot having marks of long, heavy claws; track of hind foot lacking claw marks, marks of toes point inward . . . . . Badger

20′ Track of front foot having small claws; track of hind foot having claw marks, marks of toes point outward, Raccoon



21. Impression of large thumb at right angle to other toes and points inward . . . . . Opossum

Vertical line alongside track represents one inch

21′ Impression of thumb same size as those of other toes and points in same direction 22

22. Marks of claws visible on tracks of both front and hind feet, tracks same size 23

22′ Marks of claws not visible or visible only in front tracks, hind track larger than front 24

23. Both tracks more than 1½ inches long, and less than 2 inches long, claw marks not separate from marks of toe pads, impression of heel 3-lobed ..... Mink

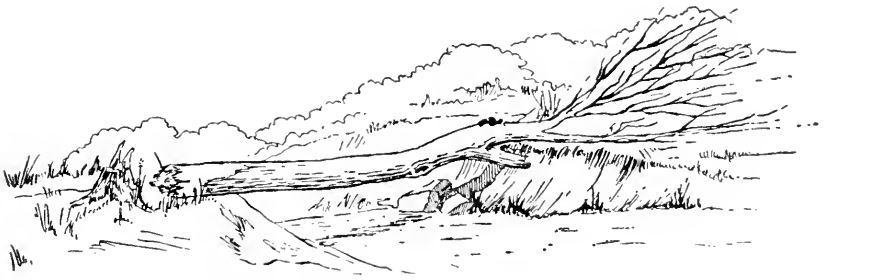
23′ Front track no more than 1½ inches long, and hind track more than 2½ inches long, claw marks separate from marks of toe pads, impression of heel at least 4-lobed, track of front foot with 4 toes and track of rear foot with 5 toes ..... Woodchuck

24. Largest track less than 1¾ inches long ..... Spotted skunk

24′ Smallest track more than 1¾ inches long ..... Striped skunk

Vertical line alongside track represents one inch

Scats



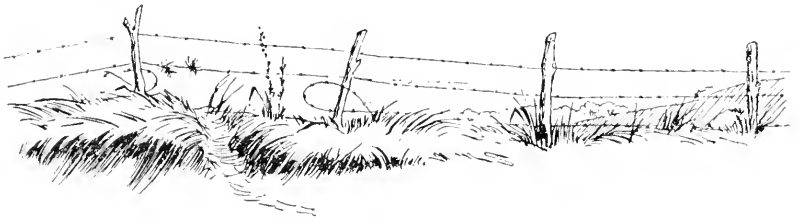
Scats or fecal droppings of animals can be used to identify furbearers. The recognition of the scat often is made easier by studying the location of the scat or hair found in it. Many scats contain the hairs of the animal itself since hairs frequently are swallowed when the animal is grooming. Some of these hairs are easy to identify because the hairs of many mammals have distinguishing characteristics. By breaking the scat apart, animal remains (hair, bones and parts of invertebrates) or plant material (seeds and vegetable fibers) can be easily identified.

Scats of the muskrat and beaver are not difficult to identify. The muskrat scat is an elongated droplet-shaped object ½ to ¾ inch long that is found usually on logs, rocks, roots, islands or feeding places along the edge of water. Beaver scats are much larger and more nearly round. The roll of fine wood chips of which these scats are often composed is characteristic. These scats, however, are seldom found because the beaver usually defecates in the water where the scats quickly break apart.

Where the scats are found is often a clue to their identity. Some animals, such as the striped skunk, dig open latrines in which they deposit scats. Other animals have special locations at which scats are deposited; the raccoon, for example, usually selects a ledge, leaning or fallen tree-trunk, or a large drift. The opossum, coyote and other furbearers deposit their excrement at random; coyote scats usually are found in the center of one of the trails in his territory. The bobcat, like other members of the cat family, covers its scat with soil.

In learning to identify droppings of furbearers, the best method is to associate these droppings with as much other animal sign as possible, keeping in mind which kinds of furbearers would normally use the type of habitat in which the scat is found.

Fur and Hair



A piece of fur or a few hairs, caught on a rock or root of a tree at a den entrance, can be used to identify the animal using that den-site. Hairs may be found on rough sticks, along well-used paths, or on the barbs of a barb-wire where the animal passed under or through a fence.

A key to the larger guard hairs, which often can be identified in the field without the use of a microscope, is on page 16. The shorter underfur is usually not identifiable without the aid of a microscope.

USING THE KEY

For instructions in using the key, turn back to page 10. When a person uses the key more than one guard hair should be examined because guard hairs vary depending on the location on the animal's body from where the hair came. For this reason, the key has been arranged to account for differences in guard hairs. In some cases, a hair of one kind of animal can not be distinguished visually from that of another; this is another reason why several hairs from one animal should be studied. The entire hair is needed to use the key. Incomplete or broken hairs will not always key-out properly. Try to find the longer and coarser hairs (the guard hairs) since small, wavy hairs of the underfur cannot be used.

Color can best be determined by holding the hair against a light blue background; a white, black, or brown background blends with several of the colors found in hair, and makes use of the key more difficult.

Hair of dogs and cats is not mentioned in the key since there is a great variety of colors and sizes of hairs on these animals. Hair that cannot be identified with this key may therefore be from one or another of the many breeds of these domestic animals.

KEY TO GUARD HAIRS

1. Tip black 2
1′ Tip not black 39
2. Only one color, black 3
2′ More than one color 8
3. Less than one inch long 4
3′ More than one inch long 5
4. Rigid, straight, high in luster ..... Spotted Skunk (belly)
4′ Soft, curly, dull in color ..... Bobcat (tail)
5. Less than two inches long 6
5′ More than two inches long 7
6. Base in many or few delicate waves ..... Spotted Skunk (back)
6′ Base straight or in few large waves ..... Striped Skunk (belly)
7. Less than three inches long ..... Striped Skunk (back)
7′ More than three inches long ..... Spotted Skunk (tail)
8. Two colors only (from tip, black over white, black over brown, or black over tan) 9
8′ Three or four colors 22
9. Colors in two to five bands 10
9′ Colors in eight bands ..... Fox Squirrel (tail)
10. Colors in two or three bands only 11
10′ Colors in four or five bands only 18
11. Colors in two bands only 12
11′ Colors in three bands 17
12. Colors from tip: black over brown 13
12′ Colors from tip: black over white 14
13. Short black tip followed by long band of lustrous brown ..... Beaver (back)
13′ Black over brown ..... Bobcat (belly)
14. More than four inches long; coarse and with little or no wave ..... Striped Skunk (tail)
14′ Less than four inches long 15
15. More white than black, thin wavy ..... Opossum (back)
15′ More black than white, straight from tip to base 16
16. More than one inch long ..... Striped Skunk (tail)
16′ Less than one inch long ..... Badger (front foot)
17. Colors from tip: black-white-black or black-brown-black. Woodchuck
17′ Colors from tip: black-tan-black ..... Cottontail (back)
18. Hair colors in four bands: from tip, black-white-black-white 19
18′ Two colors in five bands: from tip, black-white-black-white-black. Woodchuck
19. Black tip less than one-half inch long; hair may have large waves near base 20
19′ Black tip more than one-half inch long; hair straight 21
20. In large waves ..... Coyote (tail)
20′ Not in large waves ..... Raccoon (back)

21. Color bands distinct.....Gray Fox (tail)
21′ Color bands not distinct, blending.....Raccoon (back)
22. Three colors.....23
22′ Four colors: black-white-brown-gray.....Raccoon (back)
23. Three colors in three bands.....24
23′ Three colors in more than three bands.....28
24. Color combinations from tip: black-white-brown.....Raccoon (back)
24′ Not as above.....25
25. Color combinations from tip: black-white-gray.....Cottontail or Jack Rabbit
25′ Color combinations from tip: black-brown-white.....26
26. Less than three inches long.....27
26′ More than three inches long.....Striped Skunk (tail)
27. Wavy at base.....Opossum (groin)
27′ Not wavy at base.....Red Fox (tail)
28. Three colors in four bands.....29
28′ Three colors in more than four bands.....36
29. Color combination from tip: black-brown-black-gray.....Cottontail (back)
29′ Not as above.....30
30. Color combination from tip: black-white-black-brown.....Gray Fox (back)
30′ Not as above.....31
31. Color combination from tip: black-white-black-gray.....32
31′ Not as above.....34
32. Less than one inch long; wavy at base.....Bobcat (tail)
32′ More than one inch long; not wavy at base.....33
33. Less than two inches long.....Jack Rabbit (back)
33′ More than two inches long.....Raccoon (back)
34. Color combination from tip: black-white-dark brown-light brown.....Bobcat (back)
34′ Not as above.....35
35. Color combination from tip: black-white-brown (or gray)-white.....Coyote (back)
35′ Color combination from tip: black-white-brown-black.....Woodchuck
36. Three colors in five bands; less than three inches long.....37
36′ Three colors in six bands; from tip, black-brown-white-brown-black-white; more than three inches long.....Coyote (back)
37. Color combination from tip: black-white-black-brown-black.....38
37′ Color combination from tip: black-white-brown-white-brown (or gray).....Gray Fox (tail)
38. Less than one inch long.....Fox Squirrel (back)
38′ More than one inch long.....Woodchuck
39. Tip white.....40
39′ Tip not white or black.....54
40. Only one color, white.....41
40′ More than one color.....48
41. Less than one inch long.....42
41′ More than one inch long.....45

42. More than one-half inch long; coarse and straight..Cottontail (belly)
42′ Not as above..... 43
43. Short, fine, and very wavy..... Opossum (belly)
43′ Not as above..... 44
44. Less than one-half inch long ..... Weasel (belly)
44′ More than one-half inch long ..... Bobcat (tail)
45. Less than two inches long..... 46
45′ More than two inches long 47
46. Thin and tends to be wavy..Bobcat (belly) or Striped Skunk (back)
46′ Straight..... Jack Rabbit (belly), Striped Skunk (belly), Spotted Skunk (back), or Badger (back)
47. Less than three inches long ..... Opossum (back), Striped Skunk (back), Coyote (belly), or Spotted Skunk (tail)
47′ More than three inches long; coarse ..... Striped Skunk (tail)
48. Two colors only..... 49
48′ More than two colors; color combination from tip: either white-black-white-brown or white-brown-black-brown-white...Badger (back)
49. Two colors in two bands..... 50
49′ Two colors in three bands 53
50. Color combination: white over gray..... 51
50′ Not as above..... 52
51. Less than two inches long..... Jack Rabbit or Cottontail (tail)
51′ More than two inches long ..... Raccoon (belly)
52. Color combination: white over black..... Jack Rabbit or Cottontail (back or tail)
52′ Color combination: white over dark brown.....Woodchuck (belly)
53. Color combination from tip: white-brown (or black)-white..... Badger (belly or back)
53′ Color combination from tip: white-gray-white. Raccoon (base of tail)
54. All yellow; less than one-half inch long ..... Weasel (belly)
54′ Tip brown 55
55. Only one color, brown..... 56
55′ More than one color or shade of color..... 68
56. Less than one inch long..... 57
56′ More than one inch long 59
57. Uniform shade from tip to base; does not shine; orange or reddish brown in color ..... Fox Squirrel (belly)
57′ Not of uniform shade, darker at tip; shines 58
58. Less than one-half inch long ..... Weasel (back, tail)
58′ More than one-half inch long ..... Mink (back, tail)
59. Less than two inches long..... 60
59′ More than two inches long..... 67
60. Thick, coarse, and shreds when broken ..... Woodchuck (tail)
60′ Not as above..... 61
61. Dark brown; lustrous (shiny) as found in animals which live in water. 62
61′ Dark or light brown; not lustrous..... 64
62. Uniform chocolate-brown color..... 63
62′ From chocolate brown at tip, grading into lighter brown at base..... Mink (tail)

63. Usually more than one and one-half inches long ..... Beaver (back)
63′ Usually less than one and one-half inches long ..... Muskrat (back)
64. Light or reddish-brown 65
64′ Chocolate-brown; wavy ..... Raccoon (tail)
65. Light brown; dull in color (doesn't shine) 66
65′ Reddish-brown; shiny ..... Red Fox (belly, back)
66. Wavy ..... Raccoon (tail)
66′ Straight ..... Gray Fox (belly)
67. Much darker at tip than at base ..... Red Fox (tail)
67′ About same shade for entire length ..... Badger (tail)
68. Two color bands, or with a distinctly different shade at base 69
68′ More than two color bands 74
69. Color combination: brown over white 70
69′ Not as above 73
70. More than one and one-half inches long 71
70′ Less than one and one-half inches long 72
71. Tip tapers slowly and evenly ..... Beaver (belly)
71′ Tip tapers abruptly ..... Mink (side)
72. Color combination: light brown over white ..... Beaver (belly)
72′ Color combination: dark brown over white ..... Opossum (belly)
73. Color combination: light brown over gray; less than one and one-half inches long ..... Muskrat (belly)
73′ Color combination: light brown over black; more than one and one-half inches long ..... Beaver (back)
74. Three color bands: from tip, reddish brown-black-white. Fox Squirrel
74′ More than three bands 75
75. Four color bands: from tip, dark brown-white-brown-white ..... Gray Fox (tail)
75′ Five or more color bands 76
76. Five color bands: from tip, brown or gray-white-black-brown or gray-black ..... Woodchuck (back)
76′ Eight color bands, alternating black and brown bands ..... Fox Squirrel (tail)

Houses

Two furbearers, the beaver and the muskrat, often build houses which can be recognized readily. Beaver houses or lodges are unusual in Kansas but may be constructed where banks of soil are absent or so low as to prevent the animals from digging a dry living chamber. These houses or lodges are composed of the same materials as those found in the dam. A foundation is begun on the bottom of the pond. Sticks, mud, stones, and other materials found about the area are added to this foundation until a large dome-shaped structure is formed. The house may rise several feet above the surface of the water and is usually at least 10 feet in diameter at the base and may be much larger.

No two beaver lodges are exactly alike and any attempt to frame a description that applies to all is difficult. Entrances, under water, usually near the base, lead to interior chambers above waterline. Big lodges that have been torn apart for study, after the ponds in which the lodges were situated had been drained, contained more than one level of chambers. Interstices between the poles and sticks that form the walls are filled with mud. When the lodge is covered by a blanket of snow the interior is especially well insulated against cold. In latitudes more northern than those of Kansas, some trappers cut holes through the ice near a beaver lodge, thrust a freshly chopped log through the hole and on into the muddy bottom, set traps around the base of the log, and thus trap beaver that come to feed on the bark of the log.

The muskrat house or bed is much smaller than that of the beaver. Construction is usually begun in early summer. The foundation is laid in two to four feet of water and more often is of mud than of vegetation. The upper part of this dome-shaped structure is largely a mass of rushes, cattail and other plants. The house may project as much as three feet above the surface of the water and averages four feet in diameter at the base. Openings below water lead into the house and give access to the central chamber. Its floor is made of the same kind of plant materials as is the house. Plate 1, Figure 1 shows a typical muskrat house in a farm pond.

Dens

Most, if not all, furbearers use some type of den. The raccoon and sometimes the opossum locate their dens in trees, although both will use ground dens. It is often difficult to know what kind of animal is using a particular den. Hair found on the floor or around the entrance can be the best clue to the animal's identity.

Dens in stream-banks with entrances under water may be inhabited either by beaver or muskrat. Mink and weasel will also use dens on a stream-bank but the entrances usually are immediately above the water line; these often are vacated muskrat burrows.

Dens in dry soil may be inhabited by one kind of furbearer and then another. Many furbearers do not dig their own dens but use those dug by other mammals. Preferred den-sites of furbearers are listed below.

OPOSSUM: Favors mixed woodlands where roots of trees are exposed along a stream bank, but may use any type of cover for a den such as rocks, crevices, abandoned dens, heavy brush, buildings and logs.

STRIPED SKUNK: May dig its own den or use dens of others or take cover in hollow logs, under tree roots, in rock piles, in haystacks, under buildings, or beneath clumps of prickly pear.

SPOTTED SKUNK: Dens in grassy banks, along fence rows, under buildings, in hollow trees, and under piles of rocks or wood.

COYOTE: Prefers den-sites in a fallow field or pasture near the heads of small ravines or in rocky areas and often close to timber. Entrance usually 10 by 20 inches and hidden by brush, log, or tree.

RED FOX: Favors den site on the sunny side of a slope with a bare bank "lookout post" at the entrance to the den; often dens of other furbearers are used.

BADGER: Dens in open areas away from trees and in well-drained places are preferred; entrances usually wider than high.

Cuttings

Animals leave sign at or near feeding sites. The muskrat and beaver feed mostly on plants and often leave cuttings in the vicinity of water.

Teeth of the beaver leave broad grooves in trees that they cut. A cone-shaped stump showing these tooth marks is conspicuous sign. Chips or flakes of wood left by the beaver are slanted at each end and are rough in the middle. The beaver is able to clip off small branches with a single bite. Such a branch, especially if found stripped of bark and without much trace of tooth marks, indicates presence of beaver.

Plants cropped-off along streams may result from feeding by cattle, or deer, or by muskrats and other rodents. Rodents cut off stems and leaves cleanly, whereas cattle and deer break off the plants leaving an uneven cut.

Raccoons, opossums, muskrats, beavers, skunks, and squirrels may be attracted to cornfields. Each of these animals feeds on corn in a different way; this makes identification easy. Squirrels do not clip the stalks or break down the plants, but either cut off the ears of corn or eat the kernels leaving the cob intact. Another special feature about squirrels is that they eat only the heart of the kernel leaving a V-shaped cut which is surrounded by the harder more yellow part of the grain. Raccoons seldom cut off the stalks of corn but break them down when climbing for the ears. Skunks also break over cornstalks but in removing the kernels of corn they usually chew on the cob much as a hog does. Beavers sometimes cut off the stalks of corn and in many cases the stalks, at least in the green stage, seem to be relished as much as the ears. Cuttings are usually made within one foot of the ground and the entire plant may be dragged to the bank of the stream where it is eaten or stored. Beavers often use old cornstalks in constructing their dams or houses. Muskrats, in some

instances, drag green cornstalks and ears to the muskrats' burrows. Among observers, opinion differs as to whether or not only stalks that are down and ears that touch the ground are dragged to the burrows.

Slides and Dams

Muskrat, beaver and mink may make slides. A slide is a slick incline on a high, muddy bank, used as a means of getting into the water rapidly. The otter, which is now thought to be extinct in Kansas, is perhaps best known for slides. The kind of animal using a slide can best be determined from tracks found in the vicinity.

Beaver dams are common in Kansas, and are on small sluggish streams or in marshy areas. The dam, like the house, is constructed of mud and sticks. Figure 3 of Plate 1 illustrates a typical beaver dam.

Odors

Trappers are quick to detect animal odors in the field. The pungent odors left by spotted and striped skunks are most prominent. Persons who have caught both species say that the odors of these two animals are different. Foxes, however, also possess an odor which, although less strong, resembles that of the skunk. Coyote dens often contain a strong doglike odor. Other furbearers have characteristic odors of varying strengths.

Other Sign

Diggings often provide means for identifying the animals responsible. The fox makes a deep narrow hole. The badger frequently digs a large oval-shaped hole when searching for food, often leaving large pieces of torn up sod intact. The striped skunk digs a shallow, round, funnellike hole in quest of grubs, one of its favorite foods.

Remains of crayfish are common signs left along the edge of water by the raccoon. The forepart of the crayfish, the pincers, and a few of the smaller legs often remain uneaten. The tail is almost always eaten.

At the edges of ponds or in many marshy areas, muskrats dig canals (Figure 2 of Plate 1), especially when the water level is low, to provide a route from the burrow, which otherwise might have a dry entrance, to deeper water. Thus the muskrat does not need to expose itself on dry land. In marshy areas the beaver digs canals that he uses for travel and for towing limbs and logs.

EQUIPMENT FOR THE TRAPPER

The equipment of the trapper need not be elaborate. However, he should dress to insure warmth to himself as well as efficiency in setting and running his traps.

Clothing that is warm and light is essential. Wool clothing is warmest for work in the cold out-of-doors. Two light wool garments are much warmer than one thick wool garment of the same weight, and they are less bulky. Trappers of muskrat, mink, raccoon, and beaver need hip boots. They should have a felt innersole and be large enough for heavy wool stockings.

Many professional trappers use what is known as a "pack basket" in which they carry all their trapping equipment. This large cane basket has straps so that it may be carried on the back. A plain burlap or grain sack also can be used for this purpose.

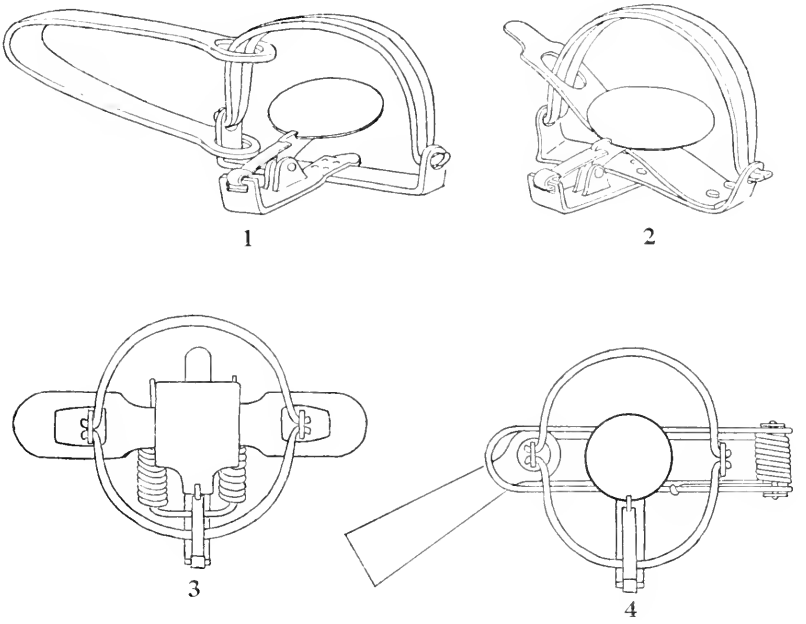


FIGURE 1. Types of traps used for catching furbearers.

Several kinds of traps are available. The type used depends partly upon the preference of the trapper. Like the owners of automobiles, some trappers prefer one brand or style over another. Three types of steel traps are in common use: 1. the end or long spring trap, 2. the under spring or jump trap, and 3. the coil spring trap. Each is made in two styles: single spring and double spring.

The stop-loss trap looks like other traps but has one more jaw which works in the opposite direction from the two jaws of the main trap. This stop-loss jaw, which is operated by an extra spring at its base, comes up and over the trap jaws when the trap is sprung. The stop-loss jaw holds the captive animal away from the trap thus preventing the animal from escaping by gnawing its leg free. This type of trap is used most in muskrat trapping where the water is not deep enough to drown the animal.

Steel traps are regarded by many persons as inhumane for catching animals. However, most wild animals do not become overly excited and injure themselves in the traps until sunrise. The trapper who checks his traps early in the morning and twice a day is therefore treating the animals more humanely than by inspecting the traps less often.

Live traps, snares, deadfalls and other trapping devices are regarded as more humane by many people, but usually are not nearly so successful in catching animals. Many of these devices were developed by early man and are still used today in many parts of the world. Several modified versions of primitive trapping devices have been on the market in recent years. One, the Verbail trap, was developed by mammalogist Vernon Bailey whose primary object was to devise and popularize a more humane trap. In this trap the animal's foot is caught and held without harm in a loop formed by two light chains held tight, after springing, by a heavy spring-steel wire. Bailey was able to catch both small and large animals —even puma—in such traps. Box traps of several designs in either wood or metal have been constructed to capture animals, alive. Bait or other lure attracts them into the boxlike enclosure. In most styles of these traps, a trigger, set off when the animal's weight is placed directly on the false bottom, causes the trap door to close and lock. There are some very efficient folding live traps on the market.

Baits, scents or other lures to attract animals to traps are important items of equipment for the successful trapper. Although many "blind" sets are made along trails, in water or elsewhere, baits are used in many situations. Flesh, entrails, urine, extracts of glands, commercial preparations, tinned fish and even shiny objects can be used successfully, often depending on the kind of fur animal concerned. In addition, many trappers prepare their own special baits or scents and keep secret from other trappers the nature of the mixture used. Skillful application of such attractants often increases the catches of highly valued mink and other animals.

Principal Furbearers

The Opossum

Didelphis marsupialis

The opossum is one of the most abundant fur animals in Kansas. In numbers caught and pelts sold, however, it does not lead the fur trade from this state.

Approximately the size of a house cat and sometimes weighing 10 pounds or more, the opossum is best identified by its hairless prehensile tail and opposable big toes, which aid the animal in balancing and clinging to branches. The face is long and pointed and the ears are hairless. The jaws have 50 teeth, more than any other Kansas furbearer. The fur is long and white, with many hairs black-tipped. Unlike any other Kansas mammal, the female has a marsupium or pouch on the belly. In this pouch the young are carried after birth.

The opossum generally is active at night although it is sometimes seen in the daytime. Its slow-moving gait may account for the large number killed along highways. The animal, however, seemingly can survive severe injuries; Black (1935) noted that one-third of 95 skeletons that he examined had one or more bones that had been broken and healed.

The term "playing possum" comes from the animal's habit of becoming motionless and limp when cornered. The exact cause of this pose is not known, but it is believed to result from nervous shock since the heart beat slows down during this act.

The distribution of the opossum is state-wide although it is more common in the eastern part of the State than farther west. In pioneer days, the animal was rare or absent in most of western Kansas. With increased farming, it has become more numerous and has actually extended its range westward. This was made possible by an increase in suitable habitat as the result of man's occupation of the land.

Habitat

The preferred habitat is mixed woodlands where exposed roots of trees on stream banks provide natural den sites. Den sites also are found in rock crevices, abandoned woodchuck and skunk dens, cracks and holes in the foundations of buildings, and in abandoned muskrat holes. The opossum does not dig its own den but merely occupies a suitable natural cavity, often an old den that has been vacated by another animal. The authors have found an opossum living in the house of a woodrat (*Neotoma floridana*); the woodrat seemed not to be disturbed by the intruder; anyhow the wood rat continued to live in the house.

Breeding and Reproduction

Contrary to the many fantastic beliefs of some trappers, copulation by the opossum is in the same fashion as that carried on by other mammals. The period from copulation to the birth of the young is 13 days. Opossums have large litters; one litter of 21 is reported. However, the female has only 11 to 13 teats and any young born in excess of the number of teats die soon after birth. The young are so small at birth that all can be placed in a teaspoon. They have well developed front legs, but the rear legs are still undeveloped. By using the front legs, they climb up to the pouch on the belly of the female. The young then attach themselves to the teats of the female and remain there approximately 70 days. After detaching themselves from the teats, the young remain with the mother for about one month, returning to the pouch to suckle. We do not know whether the young voluntarily leave the mother or whether she forces them to leave her. The total time involved in rearing the young is not less than three and one-half months.

There is evidence that two breeding seasons occur in northeastern Kansas. One litter appears in February; the peak number of births is in the second to fourth week of that month; ordinarily a second litter is born, usually in the last half of June. The female becomes pregnant soon after weaning the first brood.

Food Habits

The opossum is omnivorous, eating a variety of foods. In northeastern Kansas, from September to February opossums eat more insects than any other foods; also eaten, in lesser amounts, are mammals, birds, and fruit. No corn has been found as part of the opossum's diet in Kansas although in Iowa, opossums eat considerable corn in winter.

Carrion, often badly decomposed, makes up an important part of the opossum's diet. The dumping of dead chickens may give the opossum a taste for chickens and so lead certain individual opossums to make forays into hen houses.

Predation, Parasites, and Disease

Dogs, great horned owls, and foxes are perhaps the chief predators of opossums in Kansas. Probably coyotes and bobcats also prey on these animals.

Perhaps more research has been done on the parasites of the opossum than on those of any other furbearer except those species raised on fur farms. Several roundworms, flatworms, tapeworms and a flagellate have been described from this animal. One kind of tapeworm and two kinds of flatworms have been found as internal parasites in animals in Kansas.

As external parasites, fleas, mites, ticks, and lice have been found on the opossum. Animals trapped in the winter in Kansas seemingly lack external parasites. At other seasons, four kinds of fleas and one kind of tick have been collected. Tularemia has been reported in this animal but does not seem to be of frequent occurrence.

Primeness and the Season to Trap

Opossum fur is more difficult to grade as to primeness than that of any other native furbearer. Unlike most other animals, this animal may be prime in pelt but at the same time have poor fur. When unprime, dark blue spots on the flesh side of the pelt are present on the sides of the throat; the more conspicuous these spots, the poorer the condition of the fur.

In Kansas, the fur has the best quality from November 1 to March 1. Before November, pelts are unprime and hairy with little under-fur. After the end of February, the pelts show signs of molt of the heavy winter coat. After a long, cold winter, the furs become faded, rubbed, and lose their luster much sooner than they ordinarily do in a moderate winter.

In northeastern Kansas, opossum fur is as good in quality and size as that from anywhere in the United States. To the southward the fur becomes shorter and less dense. The trapping season in Kansas, from December 1 to January 31, is well timed as at this period the fur of the opossum is at the peak of primeness.

Methods of Trapping

The opossum is usually easy to trap. It can be taken in a variety of places and often enters traps set for other animals. The opossum is attracted by bait and, like the skunk, is trapped most often when bait is used. A bait, such as chicken heads, used in a trap-set made at a fence row or near a stream is often sucessful for catching

FIGURE 2. A bait-set for opossum.

opossums. Figure 2 shows the method of attaching the bait and placing the trap. Traps of sizes No. 1 to No. 2 can be used; No. 1½ is recommended.

Other effective baits are small bits of flesh of muskrat or rabbit, small fish, frogs, crayfish, honey, and corn. Many of these baits are used also in trapping mink and raccoon. Commercially canned dog-food has a strong odor attractive to the opossum and is easy to use.

Fish-oil scent is also a good lure for the opossum as well as for most other fur animals. The scent is easily prepared by cutting the bodies of fish into small pieces, placing them in a glass jar, leaving the cover loose, and permitting the fish to decay in the sun. The oil is then poured off and used as the lure.

Preparing the Pelt

Because opossum fur currently has a low commercial value, the preparation of pelts of this animal provides, especially for the beginner, good practice in the proper skinning and fleshing techniques.

Choose a clean place to do your skinning. Place the animal on its back, hold one of the hind feet and slit the skin (do not cut too deeply) down the inside of the leg from the heel to the base of the tail and up the side of the tail to the scaly part. Repeat this process for the other leg. Cut around the tail and free the pelt on both the belly and the back sides. Skin around the anus and cut it loose.

Placing the fingers under the skin at the base of one of the hind legs, peel the skin off to the foot and cut the skin free. Repeat this process for the other leg. Now step on the tail to hold it down and with the hands under the skin on each side of the animal, work or peel the skin forward over the animal's body until the front legs are reached. Place one finger in the junction of the front leg and the body and, with the other hand, peel off the skin from the front leg. Pull the skin completely over the foot. A little pressure will tear the skin free, leaving the foot on the carcass. Repeat this for the other front leg.

With both front feet free, peel the entire pelt over the head of the animal until a white tube connecting the pelt to the skull appears on each side. These are the ear tubes and should be cut off by placing the knife between the skull and the skin in front of the ear tubes. With the knife resting on the side of the skull slice towards the rear of the animal through each tube.

Pulling the skin over the head one-half inch or more beyond the ears will reveal thin-skinned areas often white in appearance. Below these areas are the eyes and care must be taken in removing the skin complete with eyelids. With a sharp knife or razor blade gently stroke across one of these white areas while gently pulling the pelt forward; the eyeball will appear. Continue pulling the pelt forward, cutting around the eye area as the pelt pulls forward in such a way that the eyelids are left intact on the pelt and the eyeball remains in the skull. With practice, the same method used in freeing the ears can be used for the eyes. Repeat for the other eye. When pelts are torn off roughly at the ears or eyes they appear mutilated and are shortened enough to cause a large skin to be marked down considerably in value.

Continue peeling the skin over the head when both eyes are free. Use the knife when needed. The sides of the mouth will appear next. A slit similar to that used in uncovering the eyes will open the mouth cavity. Using the knife, free the lips from the skull near the base of the teeth. Skin out the lower jaw in this manner first then free the upper jaw to the point of the nose. When the nose has been reached, pull off the skin until a point is reached where by slicing downward you can cut through the white cartilage of the nose. The pelt is now ready for fleshing.

The pelt of the opossum is likely to be fat in late autumn and early winter. This fat must be removed or the pelt will heat or "burn" and be damaged. To flesh a pelt properly, that is to remove the fat, takes practice; so, do not be disappointed if the first one or two pelts you attempt to flesh are torn slightly in the process.

The equipment needed is a fleshing knife and a fleshing beam. An inexpensive fleshing knife can be made from an old flat file by sharpening the edges and putting handles on each end (Figure

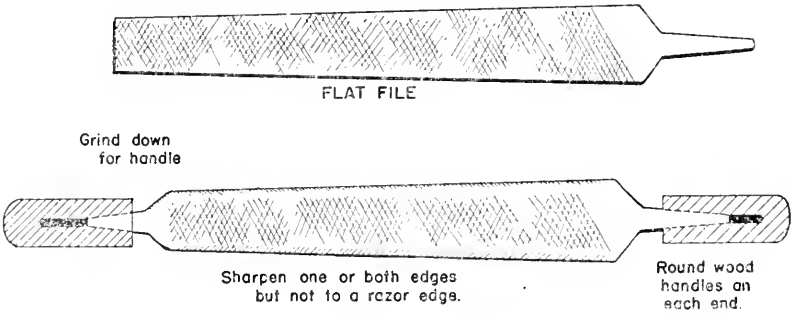


FIGURE 3. An inexpensive fleshing knife made from a flat file.

3). The fleshing beam can be either attached to the wall or used on the floor (Figure 4).

In fleshing, the knife should be used lightly. Bearing down too hard will either cut the pelt or the base of the root hairs. Some trappers use a pocket knife for fleshing and others get excellent results with a tablespoon, which lessons the danger of cutting the pelt.

A good supply of sawdust or corn meal will come in handy in keeping the pelt free from fat or grease. Sawdust, sprinkled on the pelt as the fleshing is done, will absorb the excess grease and fat as it is removed. Use the sawdust freely and shake all of it from the pelt when the fleshing has been completed.

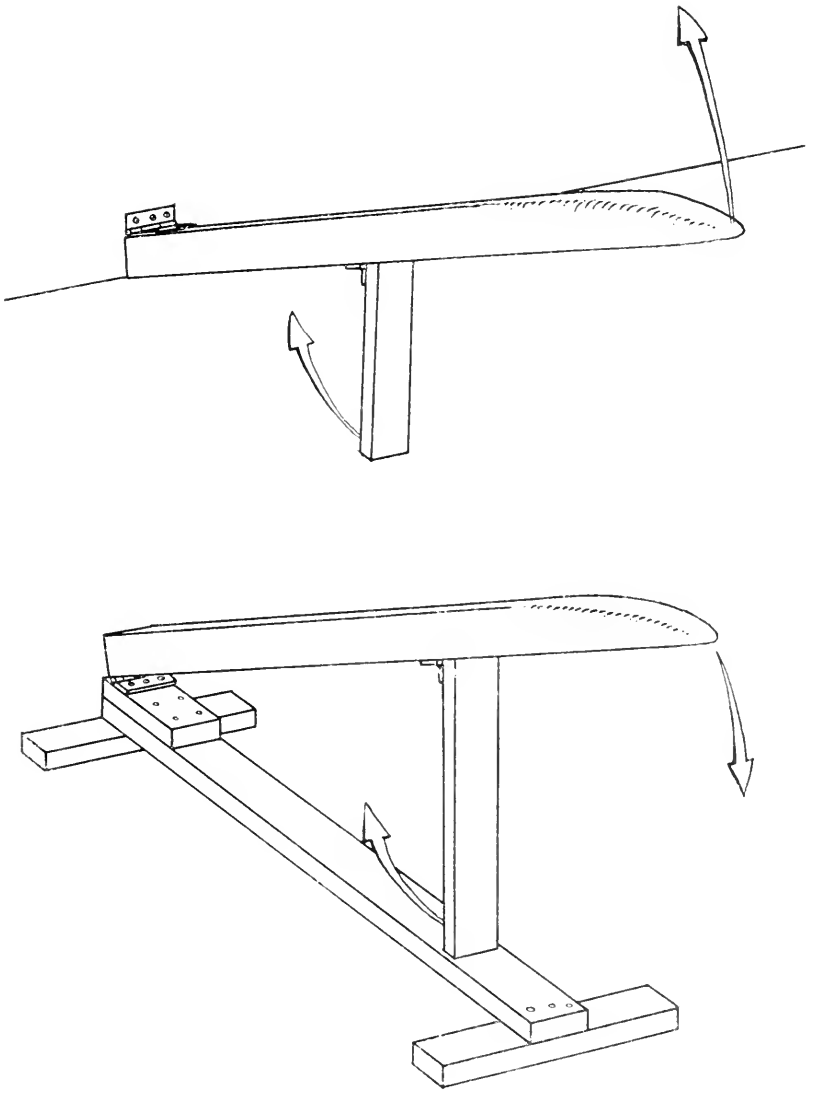


FIGURE 4. Beams for fleshing pelts.

Pelts can be dried either on commercial wire stretchers or on boards that you can make yourself. It is a good idea to make up a number of boards before the trapping season begins. Pelts should be stretched fur-side inward; those of fox and coyote can be turned fur-side out after being on the board for a day or two.

When placing the pelt on the drying board, roll up the pelt as you would a sock that you were going to put on your foot. The back of the pelt should be placed on one side of the board and the belly on the other. Pull the pelt firmly up over the board. If you must use exceptional force, the board is too large. If the

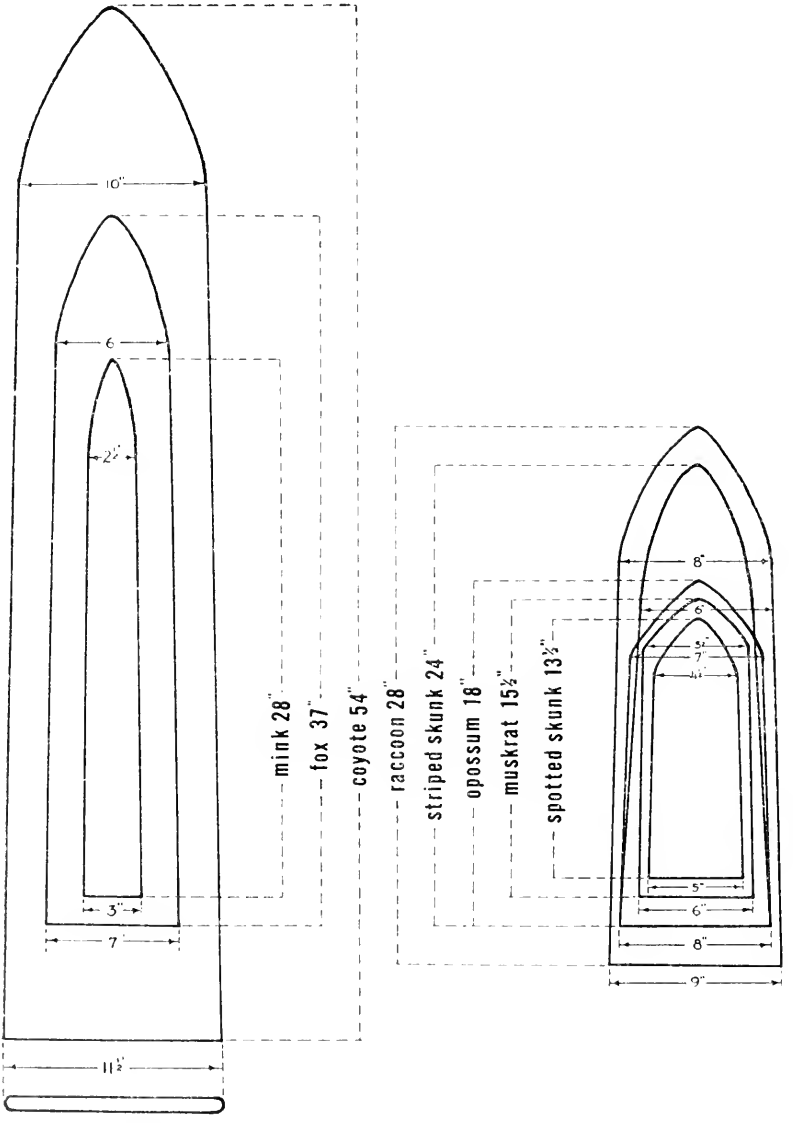


FIGURE 5. Measurements of stretching boards for furbearers of average size.

pelt goes on too easily and is free in many places, the board is too small. Figure 5 gives the measurements of a stretching board for an opossum of average size. After the pelt is stretched on the board, tack rear flaps of skin, stretching as you tack.

Pelts thus stretched should be hung in a cool, well-aired place away from the sun where they can dry by natural evaporation. Sun or artificial heat will turn the pelts dark, giving them an unprime appearance. Rain or excess moisture in the air may cause them to mildew; this reduces the value. Piling the pelts may also result in sweating and mildew. Hang pelts by a wire through a hole in the stretching board. Boards should be hung so as to leave a space between pelts. Do not remove the pelts from the boards until thoroughly dry or the pelts will wrinkle.

Preparing the Meat

The skinned carcass (body) of the opossum is often discarded by the trapper. To many people, this would be considered a waste of good food. Opossum is relished by many people as a delicacy. In the South, 'possum and sweet 'taters will light up many an eye. Following are recipes for preparing this animal as food.

Baked Opossum (Baker, 1942:7)

Place the undressed opossum in boiling water and then scrape off the hair as one would on a pig. Clean and dress the meat. It is best to leave skin intact since parboiling and baking often cause flesh to fall to pieces.

The meat should be parboiled with red peppers and salt until tender and then baked in a roaster, seasoned with black pepper and sprinkled with flour. The stock is used to baste the roast.

Sweet potatoes baked with the roast are quite appetizing.

Some recipes call for the use of bay leaves placed on the roast during baking.

It is sometimes desirable to prolong roasting of meat to allow excess fat to drain from the flesh, since the animals may contain considerable fatty tissue.

Roast Opossum (Remington Arms, 1951:22)

Rub opossum with salt and pepper. Brown (one) onion in fat. Add opossum liver and cook until tender. Add (one cup) bread crumbs (¼ teaspoon), Worcestershire sauce, one (hard boiled) egg, salt and water. Mix thoroughly and stuff opossum. Truss like a fowl. Put in roasting pan with bacon across back and pour one quart water into pan. Roast uncovered in moderate oven at 350° F. until tender (about 2½ hours). Baste every fifteen minutes. Serve with sweet potatoes.

Conservation and Management

Because its pelt brings only a small price, the opossum has not been over-trapped in most places. It is wasteful for persons hunting raccoons to take opossums and then leave them in the field. This practice should be discontinued.

The Muskrat

Ondatra zibethicus

When the beaver lost its early day leadership in the fur trade, the muskrat took its place. Today, the muskrat is the most important fur-bearing animal in the United States and one of the most important in Kansas. The present leadership stems from its popularity with the fashion world; the fur is stylish, soft, thick, warm, and durable.

This small, stocky rodent is best identified by its laterally flattened, scaly tail. The fur is soft, dark brown on the back and paler (more grayish) on the belly. Like the beaver, the muskrat seems not to have a neck, the head appearing to be joined directly to the body. The ears are short, rounded and almost hidden in the fur and the eyes resemble tiny beads and appear to be too small for the animal.

The front legs are much shorter and smaller than the hind legs. The hind feet are fringed with short, stiff hairs that aid the animal in swimming. Each foot has four toes and a small thumb; the thumb as well as each toe bears a claw.

Weighing an average of two pounds and averaging 22 inches in length, the muskrat is a valuable fur animal. It brings a good price on the fur market, and is easy to trap and skin.

In many states, much research has been done on the muskrat. This is especially true in Louisiana and Maryland where the animal occurs in great abundance. Biologists in Iowa and Missouri have added much to our knowledge of this animal's life history and habits.

Habitat

The muskrat is semi-aquatic and needs water in which to live. Although the muskrat occurs in all counties today, it is most numerous in the wetter, eastern part of Kansas. The preferred habitat is a sluggish, marshy area although the muskrat is found along most streams and rivers, and in lakes and farm ponds. In

times of drought, the animals live for weeks without water except for that which they obtain from moist foods.

Harding (1915) aptly summarized the muskrat habitat when he said that "so long as there is water there will be rats. But no matter how numerous they are in a certain place, drain the water off and in a month the rats which existed there are but a memory. Restore the water after a lapse of ten years and the rats as quickly return in a single season. . . . ponds formed are very soon inhabited by muskrats."

Breeding and Reproduction

In Iowa, muskrats breed as early as April and as late as September, although most litters appear in May and June. The young are born approximately 30 days after conception. Muskrats have from one to four litters a year; two litters are usual and three are frequent. The number of young per litter averages 6.5 at birth. The young grow rapidly and are almost full grown when six months old.

Food Habits

The muskrat is essentially a vegetarian and eats principally roots, bulbs and leaves of aquatic plants, although corn is sometimes relished. Once a muskrat acquires a taste for corn plants or ears, it often prefers corn to other available foods and will expose itself to great dangers to obtain corn from fields. The muskrat is known to eat also animal matter such as frogs, crayfish, salamanders, fish, mussels, flesh of rabbits and turtles and even the flesh of other muskrats.

Marsh-dwelling muskrats obtain their food from the marsh each day, and seldom develop storage habits, but many ditch-dwelling muskrats regularly carry large quantities of ear corn, grass and other edible material into their burrows in the autumn.

Predation, Parasites, and Disease

The muskrat has many enemies, probably the most noted of which is the mink. The surplus, unmated, strife-beaten, wandering males usually are the victims of mink. These rats probably are doomed to die without reproducing anyway. Reports have been received of a heavy population of mink annihilating the muskrat on one or another stream in the central and eastern parts of Kansas. We have never had the opportunity to check the facts in one of these instances. The mink seemingly is not a great threat to the muskrat population throughout any large geographic area, even if it does adversely affect muskrat populations locally.

The fox is often an effective predator because of the specialized hunting techniques it uses. Because of the low population of foxes in most of Kansas, predation by these animals is usually not important.

Other predators known to kill muskrats are weasels, dogs, hawks, owls, and large fish such as pike, channel catfish, and pickerel. Trappers have witnessed the drowning of young muskrats by snapping turtles which reportedly grab the young rat by a leg and drag it under the water. The deadliest enemies of young muskrats, however, may be older muskrats, especially when populations are high.

Some muskrats become heavily infested with tapeworms, flatworms, and roundworms. As many as 415 tapeworms have been collected from the digestive tract of one 'rat. When an animal becomes so heavily infested, its chances for survival are lowered and if not taken by a predator, the animal will surely lose out in competition for food with other muskrats.

Perhaps the most notable disease of the muskrats found by biologists in recent years is "Errington's disease." The discoverer, Paul L. Errington of Iowa, reported that 10 per cent of the muskrats he examined were afflicted by this disease and that 92 per cent of the diseased animals apparently died. He stated that the disease, caused by a fungus, was not known to be positively dangerous to man but that caution should be taken. The principal symtoms in the 'rat are a severe inflammation of the intestine and sores on the liver. An animal affected with the disease may crawl out on the shore, may be found in mud dragging its hindquarters, or may be seen thrashing about violently and dying with its feet in the air.

Tularemia, commonly termed rabbit fever, is another disease occasionally contracted by muskrats. Although many persons think that only rabbits have tularemia, several other animals carry this bacterial disease. Cases of human infection from the muskrat have been reported. The symptoms, as found in the muskrat, are sores in the spleen and liver as well as in the inguinal glands.

Primeness and the Season to Trap

The muskrat pelt, like that of the beaver, becomes prime later in the season than the pelts of other furbearers. The pelt may not be completely prime until late February or March. Many of the pelts are damaged or torn because of fighting in the mating season, which occurs in late February and March. The trapping season

extends from December 1 to January 31. The later in the season the trapper sets for muskrats the more nearly prime the pelts taken will be. Early trapping results also in the higher percentage of "kits" or young 'rats of little value in the catch; late trapping will help overcome this. Often, if the trapper waits until January to trap muskrats, he finds frozen streams and rats difficult to trap. Thus the problem arises as to the best time to trap. If freezing weather usually occurs in the trapper's area in January, then he should plan to harvest his muskrat crop in December.

Methods of Trapping

The muskrat is one of the easiest furbearers to trap. Many methods have been devised by experienced trappers. Each trapper has his favorite method, and the technique that works best for one trapper may not produce good results for another. Several popular methods are presented in order that the beginner can try each and choose for himself the method or methods that give him the best results.

Prior to the open season, it is a good idea to cut stakes for securing traps. Good stakes, made from such hardwoods as oak or osage-orange ("hedge"), should be approximately ¾ inch in diameter, at least 2½ feet long and sharpened to a point at one end. Allow these stakes to season for several months before the trapping period begins.

Trap-sizes No. 1 or No. 1½ are best for muskrat. The trap can be either a jump-trap, spring trap or "stop-loss" type. If it is unlikely that the animal will drown when trapped, the "stop-loss" trap is recommended because it prevents the animal from escaping by biting or twisting out of the trap. Careful investigations have proven that a great number of animals crippled by traps escape to their houses or dens where they die.

Completing the equipment list should be a pair of hip boots, warm clothing, a hatchet, a trowel, and a knife. Many trappers use a pair of shoulder length rubber gloves which protects the hands and arms from icy waters.

The most common set for muskrat is that placed at or near dens, scratchings, slides, and runways. In these places the trap should be set firmly on the bottom under at least two inches of water. The chain should extend into deeper water and be fastened to a stake pushed down into the muddy bottom until the stake is firm and at a slant away from the trap. Caught with this type of set, the trapped animal will drown quickly with no harm to the pelt.

Other successful sets can be made at feeding places found along creeks or at ponds. Such places can be recognized by the presence of fecal droppings and bits of cut plants. As many as three traps can be used in such a situation. These traps are placed around the feeding area with the attached chains leading into deeper water to stakes as described above.

Two types of ice sets are popular with experienced trappers. One type is made on a board six or eight inches wide and long enough to stick into the bottom of the pond. This board is secured in the bottom at a slant and the trap held in place on the board by a block of wood (see Figure 6). A log with a place chipped out for the trap may be used instead. A carrot or other bait is placed on the board, three or four inches above the trap. Another method of making this set is to build a shelf on the board and place the trap on the shelf with the bait above it (see Figure 6). The board, in this case, is placed vertically in the water instead of at a slant. In either case both trap and bait should be shoved under water through a hole cut in the ice and the water allowed to freeze over again.

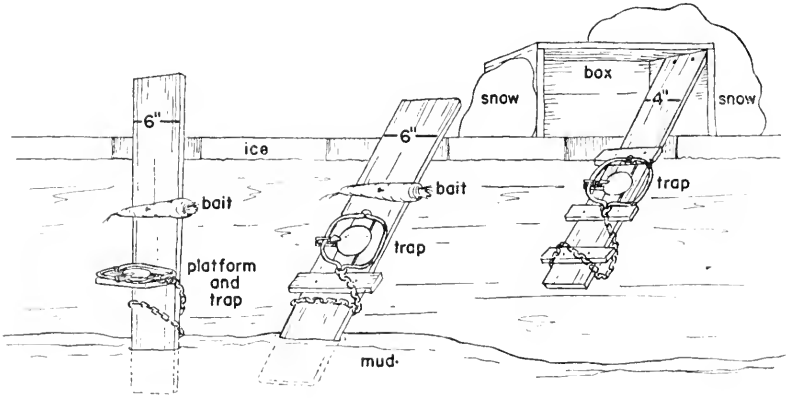


FIGURE 6. Ice sets for muskrat.

A second type of ice set, called "ice hole and box" consists of a wooden box turned upside down over a hole cut in the ice. A ladder made of a four-inch board with cleated cross boards is nailed onto a top corner of the box so that it slants down into the water. A trap is set under water on one of the cleats and the chain nailed to the board. Snow should be banked around the box to keep the water beneath from freezing (Figure 6). Muskrats are attracted to the box and one 'rat after another may be caught.

Baits and scents are used with varied success by trappers. Baits attractive to muskrats are apples, parsnips, carrots, and other common garden vegetables. Roots of various water plants, the muskrat's natural food, also are good baits.

A scent or lure recommended by Derrell Kniss, of the Michigan Department of Conservation, is as follows:

"Mix 1 ounce muskrat musk with 20 drops oil of rhodium and 10 drops oil of anise"

The musk of a muskrat is obtained from a pair of glands at the base of the tail behind the anus. The odor is noticeable especially during the breeding season in spring. Oil of anise or oil of peppermint also are recommended.

Preparing the Pelt

With experience, the muskrat's pelt is removed in a few minutes using the same method as that used in skinning the opossum. For a description of the correct method, see pages 33 and 34.

Before skinning is begun, the animal's fur should be cleaned and dried. An easy way is to rub snow into the fur and shake. This also will help dry a wet animal. If no snow is available the animal can be rinsed clean in water then dried as much as possible by squeezing the water out by hand. Some trappers run the fresh skins through the ringer of an ordinary washing machine.

The only fleshing needed on a muskrat pelt can be done with the fingers. Pull the pelt over your hand with the flesh side out and remove all the fat and flesh.

If you have a large number of muskrats to be placed on stretching boards at the same time, turn the flesh side of the pelts in to prevent excessive drying until you are ready to stretch them.

It is a good idea to make up a number of stretching boards before the trapping season begins. These boards should be at least 18 inches long and ½ inch thick. A soft but tough wood such as basswood, poplar, or cottonwood should be used. Yellow pine, gum and sycamore are hard to work and they split easily. Near the rear end of the board drill a small hole to use for hanging the board and pelt. Figure 5 gives the measurements of a board for a muskrat pelt of average size. Of course, some larger and smaller boards of the same shape will be needed. For stretching methods, see pages 36 and 37.

Preparing the Meat

The meat of the muskrat can be prepared as a tasty food and in some areas is sold in markets under the name of "marsh rabbit."

Trappers and other residents of Kansas should be encouraged to serve this food at the table. At present most muskrats are discarded, representing a huge waste of good food. Lantz (1910) lists several successful recipes as follows.

Fried Muskrat

Wash the meat thoroughly and cut into quarters. Let the meat soak in salt water for an hour or more, then wash, dry with a cloth and season. Dip the pieces in a prepared egg batter and dust them with flour or meal. Place lard in frying pan and let it get hot. Then fry very slowly for an hour. Prepare a gravy of milk, butter, flour and parsley and season to taste. After it thickens, pour it over the cooked muskrat.

Roast Muskrat

Wash thoroughly, let the meat soak for an hour or more in salt water and then wash again. Put it in a pan with water, salt, pepper, butter, and little onion. Sprinkle flour over it and baste until thoroughly done.

Stewed Muskrat

Wash thoroughly, cut into pieces and let the meat soak in salt water for an hour and then wash again. Put in water in saucepan and season with butter, salt, and pepper to taste. Let the preparation simmer slowly and when almost done put parsley and a little chopped onion into it and then thicken with a gravy of flour and water.

Conservation and Management

The fur of the muskrat brings spending money to many rural youths. One of the most important products of the farm pond, if managed properly, is the muskrat. A practice most beneficial to the muskrat and also recommended by agricultural experts is to fence ponds as well as marshes and even stream banks to exclude livestock. This action prevents grazing by livestock of aquatic and semi-aquatic food plants used by muskrats and also eliminates the usual trampling and breaking in of their bank dens. The better the habitat, the higher the population of muskrats.

The draining of marshy areas destroys good habitat for muskrats. Actually, the muskrat and other furbearers may be the best and the most practical crop that can be raised on such areas. Often marshy areas can be improved by building a dam across the outlet of a marsh. The dam should be so constructed that it will hold the water in the marsh at a constant level and let the excess flow out.

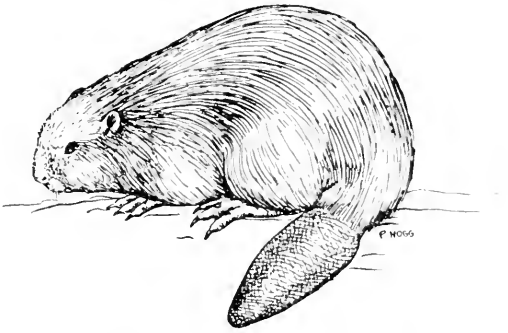
The chief problem in managing streams may be merely the safeguarding of what already exists. Most of the management needed might call for limited work or expense or might be passive in nature, such as not clearing away the natural vegetation along a stretch of stream. Some willows can be planted to bind banks in which burrows occur; deflectors such as logs or rocks can be used.

Muskrats spread naturally into ponds, and seemingly there is no practical way to keep them out of ponds. Dams covered on the lake side with rock or by one-inch mesh wire will be protected from the burrowing of the animals. If a muskrat-free pond is wanted by the landowner, the adult animals should be trapped from the pond in spring, before litter production occurs and after spring dispersal is over. Extensive trapping in the last month of the trapping season in Kansas should greatly reduce this problem.

Trapping practices worth-while include the following: trap late in the season to obtain larger and primer pelts, leave breeding stock for next year, and place traps away from muskrat houses. Cutting a hole into a house to set a trap allows the inlets to freeze thus making the house uninhabitable.

The Beaver

Castor canadensis



The beaver is the largest rodent found in the United States. The broad, flat, scaly tail is distinctive. In general appearance, the beaver resembles an overgrown muskrat and like the muskrat, has small beady eyes and small ears. The fur is dark brown above but paler on the sides and underparts. The hind feet are webbed; the claw of the second toe is cleft and is used as a comb. A pair of large musk glands lie under the skin of the belly immediately in front of the anal opening and contain castoreum, which has a strong odor and is of commercial value as a perfume base.

Large, old individuals—we suppose more than 4 years old—weigh 60 or more pounds. There are records of old, fat beavers that weighed between 100 and 110 pounds.

When the first settlers came to Kansas, they found the beaver along most of the streams. At the turn of the nineteenth century the beaver was near extinction because of overtrapping, but in the

late 1920's after years of protection beaver were on the comeback through natural re-invasion of good habitat. The beaver now occurs in suitable habitats in all counties and in recent years a few have been trapped each season under permit. In the seasons of 1951-1952 and 1954-1955, these limitations were removed and a full season of unrestricted trapping was permitted. As a result the beaver was reduced in numbers along many of the streams.

Habitat

The beaver requires an aquatic habitat with suitable plant food. Where water is not sufficiently deep, the animals construct dams forming ponds. The beaver commonly makes its home in a high bank using an underwater entrance. Some bank burrows are 40 to 50 feet long and large enough to accommodate a man. This type of den is common in Kansas. In ponds and lakes a dome-shaped house or lodge of mud and sticks is constructed in the water away from shore. In areas where a house is built, the water must be deep enough so that the underwater entrance into the house will remain open all winter below the level of surface ice. Such a house may be built far from shore, in water five or six feet deep, or on the bank. The construction of a house usually is not begun until a feeding area has been used for a year or more.

Three essential features of a suitable habitat are: (1) a water supply at least equal to that which will flow freely through a one-inch pipe, (2) an ample food supply of trees and other plant materials, and (3) a location where disturbance by man is at a minimum.

Breeding and Reproduction

A male beaver mates with more than one female. The female is believed by many to have only one litter a year but others have found indications that two litters are produced annually. The exact length of the gestation period is not known but seems to be approximately three months.

In midwestern states young are born usually in April or May. The number of young varies from two to eight per litter, with an average of less than four. More than four young may be unusual since the female has only four teats.

The young remain within the home colony for almost two years. Shortly before the arrival of the next litter, the yearlings are forced to migrate, after which they establish new home-sites, and gather a food supply to provide for winter needs.

Food Habits

Beavers eat the inner bark and twigs of many kinds of trees, and the roots and other parts of aquatic plants. Aspen, cottonwood, and willow are preferred trees. Beaver living near farms and orchards, sometimes cut cornstalks and fruit trees. Corn in the green state is cut, dragged to the stream, and eaten. If the corn has matured, the stalks are used in the dam after the ears are cut off and the kernels consumed.

Predation, Parasites, and Disease

The adult is relatively safe from most predators, especially if there is water into which it may escape. The larger meat-eating animals such as the coyote occasionally kill beaver. Mink sometimes prey on young beaver. Man is the most important enemy.

Some beaver are heavily infested by flatworms; as many as 1200 worms were found in one animal. Few kinds of external parasites live on the beaver. A curious, small, brown beetle occurs on the beaver. Fleas are common.

Tuberculosis is the only known fatal disease of beaver kept in zoological parks. Tularemia has been found on several occasions in beaver in the wild.

Primeness and the Season to Trap

When prime, the flesh side of the pelt is white. A pelt graded as a No. 2 will be bluish on the flesh side when dried and the coat hairy, whereas a No. 3 has a coarse coat and short under-fur. Local fur-buyers report that the pelt is seldom, if ever, fully prime in Kansas until about the 15th of February. Beaver taken in the late autumn are worth at least 25 per cent less than those caught in early spring.

A trapping season in late winter (February and March) and regulated by special permits should be the method used in harvesting these animals if the full value of this resource is to be realized.

Methods of Trapping

Trapping beaver can be likened to catching muskrats; habits of the two animals are similar and water sets are usually made. No trap smaller than a No. 3 should be used; a No. 4 is desirable.

Traps should be so set that the animals drown quickly when caught. Perhaps the easiest method is that of wiring a stone, weighing at least ten pounds, to the trap chain. This stone, with the end of the trap chain attached, is placed where the stone will drop into

deep water (Figure 7) when a beaver is caught. Another method is to use a long wire running from the set to deep water. The ring of the trap chain is threaded on this wire allowing the captured

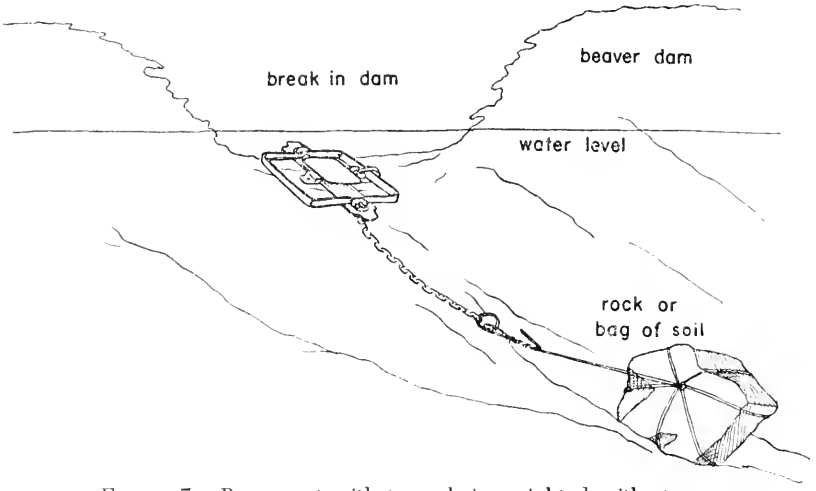


FIGURE 7. Beaver set with trap chain weighted with stone.

animal to pull the trap along the wire when the beaver dives into deeper water. Several stop-loops on the wire prevent the chain ring from sliding back up the wire; thus, the beaver is held under water and drowns (Figure 8).

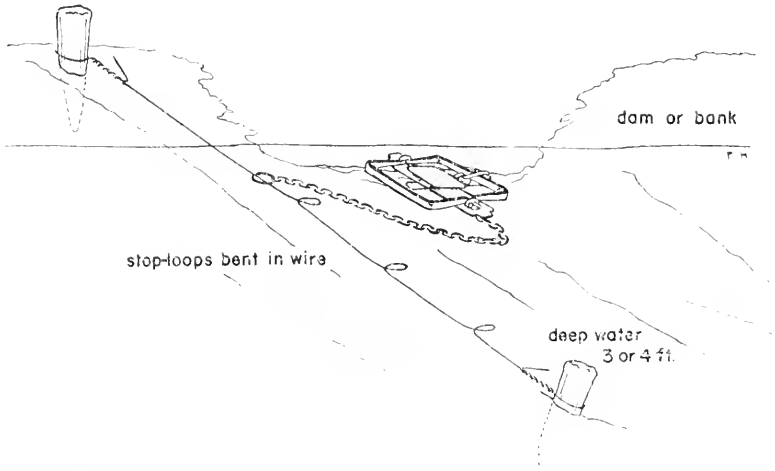


FIGURE 8. Beaver set with trap chain attached to wire with stop-loops.

PLATE 1

FIG. 1. Typical muskrat house in a farm pond in Franklin County, Kansas.

FIG. 2. Canal dug by muskrat from den to open water.

FIG. 3. Beaver dam in Ellsworth County, Kansas

PLATE 2

Measuring a beaver pelt.

Sets at slides, along runs, at feeding stations and in holes in the ice, all identical to those described for trapping muskrats, can be used. Another successful set can be made in the spillway over the dam or by breaking the dam slightly in one place and setting traps there. The beaver visits the dam the next night to repair the break. In either case, the trap should be placed in shallow water. Ordinarily, the animal will be walking and a foot will trip the trap.

Placing the castor glands of a beaver in such a position that the beaver walks across a trap in order to reach the castor lures beavers into traps. Trail-sets and dam-sets usually are not scented.

Preparing the Pelt

The beaver is one of the most difficult of the furbearers to skin, and if the pelt is improperly removed will bring a poor price. Allot yourself at least five hours to skin your first beaver. The pelt cannot be removed by any amount of pulling but must be cut free. The most important tool, therefore, is a knife that is razor sharp. Keep a whetstone handy and sharpen the knife often.

The first step is to remove the feet of the beaver at the point where the fur ends. This can be done with an ax. Next slit the pelt of the animal from the chin, down the belly and to the base of the tail. Beginning at either corner of the chin, cut the hide away from the carcass leaving as much flesh and fat as possible on the carcass. *It is much easier to remove this fat as you skin than it is later.* If dark streaks are appearing in the hide as you cut, you are cutting too close and exposing the roots of the hairs. If you are skinning the beaver properly, there should be no dark streaks and yet the pelt should be thin. If the pelt is thick, you are leaving on too much fat.

From the chin remove the flap of skin around the gum-line of one side of the mouth and down to a point on the belly between the front legs. Repeat the same process on the other side.

Next, remove the skin from the head, taking particular care around the ears, eyes, and nose (see page 33). After the head has been skinned out, hang the beaver by its head on a hook, or lay it in a V-shaped trough of comfortable height, for ease in skinning. Work slowly down the front legs until the skin is free.

Continue loosening the skin down the belly on both sides to the rear legs, and remove the rear legs in the same manner as the front ones. Cut the skin free at the base of the tail and free the skin from the backside of the animal's body.

Any excess fat or flesh left on the hide must now be removed. The process of fleshing the pelt is the same as that described for preparing the pelt of an opossum (see page 34).

Beaver pelts are stretched in a circular shape by one of two methods. The pelt may be laced inside a hoop or tacked on a door or shaded wall. The hoop should be at least six feet in diameter; a green sapling bent to form a circle works well. The sapling must be strong enough to resist the pressures applied when lacing on the pelt. Beginning at the head end of the pelt, a strong cord or leather

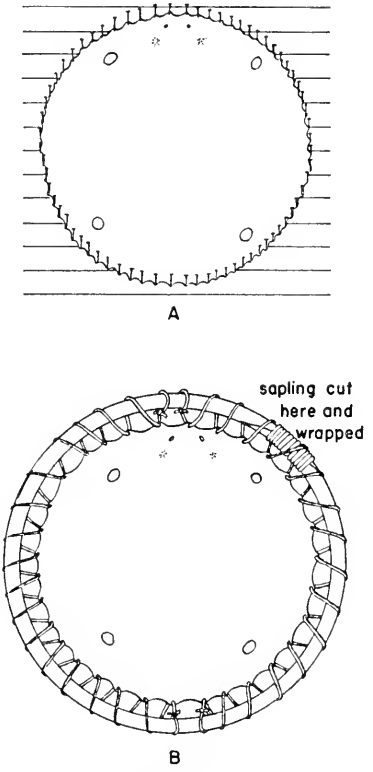


FIGURE 9. Methods of stretching beaver pelts.

thong is stitched over the hoop through the hide and over the hoop again. By this sewing method the pelt takes a circular form on the hoop. It is best to use two thongs started at the same time, one down each side from the head to the tail. Neither thong should be drawn tight until the stitching on both sides is complete. Then be-

gin at the head of the animal and pull the stitching tight on both sides. Continue this tightening down both sides, pulling the skin into an even oval and tie the thongs securely at the bottom (Figure 9).

In nailing the pelt to a wall, slats or small sticks should be placed between the pelt and the board to allow a free circulation of air. Using small nails, placed about one inch apart, tack loosely down each side of the animal or at the head, tail, and each side in a circular fashion. Gradually work the skin into a circle by pulling and retacking.

Beaver pelts are graded according to size and condition of pelt. A blanket pelt commands the best price. The standard trade names for sizes are:

65 inches or more	super blanket
63-65 inches	blanket
60-63 inches	extra large
55-60 inches	large
50-55 inches	large-medium
40-49 inches	medium
Less than 40 inches	small or kit

These sizes are obtained by adding the measurement from the tip of the nose to the tail, to that across the pelt at right angles to the first measurement (Plate 2).

Preparing the Meat

The meat of the beaver was relished by early fur trappers and settlers. The tail, resembling fat pork in taste, was considered a delicacy by the American Indians.

In preparing the beaver, remove as much fat as possible from the carcass before cooking as both the flavor and odor of the fat are objectionable. Swank (1949:59-60) gives several recipes for preparing beaver as follows:

Roast Beaver a la Michigan

Remove all surface fat from beaver. Cover meat with a weak solution of soda and water (1 teaspoon soda to 1 quart water). Parboil for about 10 minutes. Drain, place meat in roaster, cover with sliced onions, strips of bacon, and roast in moderately hot oven until well done.

Fried Beaver

Remove fat and cut beaver into pieces as you would a fowl. Soak overnight in cold water, drain. Cook until tender in a pot with a small amount of water and a piece of bacon. Season and brown in bacon or cooking fat. This is recommended for small animals only. Wild rice, grapefruit salad and watercress with oil and vinegar dressing add a proper touch to the meal.

Atlanta Special

Remove nearly all the fat from the beaver. Cut up as you do rabbit. Soak overnight in salt water. Parboil until about half cooked with one bay leaf, 2 medium onions, and garlic. Celery leaves can be added or not. Drain, roll in flour, and brown in hot fat; season with salt and pepper. Bake in covered pan in a moderate oven until tender. Gravy can be made from the drippings.

Conservation and Management

Kansas is an agricultural state and there are few agricultural areas in which beaver live where the animals will not be accused of damaging crops or other plantings along streams. Damage can be lessened or avoided by a controlled trapping season in which the landowner is given special permission to trap the beaver. Such a management program is profitable to the landowner, provides a wise harvest, and can result in a sustained yield of this valuable fur animal.

Various techniques can be used to reduce beaver damage. Desirable trees can be protected by coating the trunks with creosote or enclosing them in wire or galvanized tin. Flooding desirable cropland with back water from a beaver dam can be prevented by a pipe through the dam so that the water will be brought down to the desired level. This pipe should have a wire mesh strainer on the dam side to prevent the beaver from plugging the opening. The pipe outlet should project a few feet beyond the lower face of the dam to prevent the opening from being covered with mud. Also, the pipe should be pushed through the dam at a slant so that when the water level is lowered, the intake does not show. Finally, the pipe should be securely held in place. Using this method will discourage the beaver and may cause it to abandon the site. Removing dams will only cause the beaver to rebuild promptly.

The beaver is a useful animal in many ways and is one of our foremost water conservers. Backwater from dams assists in holding the water above the water table of adjacent lands. Such ponds provide habitat for aquatic and semi-aquatic animals and plants and often provide good fishing. Beaver ponds check the flow of fast moving streams and collect and hold silt in the smaller tributaries of the watershed. This keeps the soil in the uplands. Silt may eventually fill the pond; then the beaver leaves and a meadow remains, providing fertile soils on which productive crops or good forage for cattle can be grown. There are many places where the presence of beaver is a great asset to man and to the wildlife community in which the beaver lives and works.

The Raccoon

Procyon lotor

In Kansas the raccoon is the most popular furbearer. It is trapped and hunted with dogs for fur as well as for sport. Its meat also is considered a delicacy. The large sums expended in keeping and training valuable 'coon hunting dogs indicates the great popularity of this furbearer.

A broad head with a black mask, a short pointed muzzle, and a bushy ringed tail characterize the animal. An average-sized raccoon weighs approximately 16 pounds. The trailing ability of the best hounds is taxed by the cunningness of the raccoon, and its fierceness makes it a good match for a dog much larger than itself.

Raccoons occur in all counties of the State but are most common along streams and in wooded areas in the eastern part. The raccoon population has increased markedly in the past 12 years, and today is one of the more abundant furbearers in the State. This increased population has caused concern in some places, because the animals feed on corn and, to a lesser extent, on poultry. Even vacated buildings sometimes are occupied by 'coons, possibly because some areas have too few natural dens.

Habitat

The raccoon occurs in woodlands usually where some water is present and in marshes. The animal does not construct or dig its own home, but usually uses hollows in trees or dens dug by other animals. Most dens are no farther than one-quarter of a mile from permanent water.

Breeding and Reproduction

Raccoons do not pair permanently and a male may mate with more than one female. The peak of the mating period occurs in

late February. Yearling males usually become sexually active later in the spring than do the adults and thus the yearling probably does not find unmated females. Approximately 50 per cent of the yearling females produce litters the first year. The gestation period is approximately 66 days, most young being born in late April and early May.

The number of young per litter varies from one to eight. There is only one litter of young per female annually. The young are totally dependent on the female for food for the first ten weeks. After this time, they begin to eat solid foods but the female does not cease to lactate until the young are from 16 to 20 weeks old. Also in this time, the milk teeth of the young are replaced by permanent teeth.

Food Habits

The raccoon eats mostly vegetable material but will eat also fresh meat. Studies of food habits have revealed that the raccoon's diet changes according to the availability of food in the particular season. These studies have been made by examining both the stomach contents and fresh droppings (scats).

In Kansas, corn is the most important food of the raccoon. In western Kansas corn is replaced by sorghum. Native seasonal foods, especially important in autumn, include acorns, hackberry seeds, pokeweed berries, grapes, and insects. In winter, raccoons feed principally in cultivated fields and grassy areas where mice and other small mammals are a ready source of food. In spring, more of the raccoon's food is taken along streams; in western Kansas more than 70 per cent of the animal's food comes from along water courses. In summer, raccoons depend mostly on insects and ripening native foods, taking each kind of fruit or berry as it becomes available.

A complete list of fruits, plants, seeds, and insects that raccoons are known to utilize would be sizeable. Some animal foods used, however, are fish, snails, birds, snakes, turtles, lizards, earthworms, frogs, mussels, muskrats, fox squirrels, bats, mice, rabbits, and shrews.

Predators, Parasites, and Diseases

Aside from dogs and man, the raccoon has few enemies. The coyote and bobcat may prey occasionally on this animal. Young raccoons are more susceptible to such danger but are relatively safe when in protected dens. In captivity, the adults, especially when disturbed, are known to kill and eat their young.

Lice and fleas are probably the most common external parasites. Raccoons are reported to have roundworms, tapeworms, and lung worms. Various forms of fungi attack the skin, fur and internal organs.

Raccoons are known to harbor the following infectious diseases: tetanus, botulism, encephalomyelitis, enteritis, distemper, tuberculosis, histoplasmosis, haplomycosis, and rabies.

Primeness and the Season to Trap

The northeastern part of Kansas produces one of the largest, darkest and finest raccoon pelts in the United States, ranking in value along with those from parts of the Dakotas, Minnesota, Wisconsin, Iowa, and Nebraska. This fur is usually long, thick, and dark gray, in some pelts tinged with dark brown. To the westward and southward in Kansas, the raccoon pelt becomes less valuable, having shorter, paler fur.

The pelt becomes prime earlier in autumn than do the pelts of most other furbearers; only that of the skunk becomes prime earlier. The legal trapping period (December and January) occurs at the time when the fur of the raccoon is fully prime.

A No. 1 or prime skin is fully furred and the flesh side is entirely white with a tinge of fleshy red coloring. A No. 2 in quality is full-furred but is hairy and the flesh side bears a bluish appearance. A No. 3 has the underfur not completely grown, the entire pelt hairy, and the pelt side black. A No. 4 possesses a small short growth of fur, and the pelt side is black.

Raccoon pelts are graded first as to primeness of pelt, then as to size and care in handling the pelt. Thus all prime furs are not necessarily classed as No. 1's.

Methods of Trapping

The raccoon is a clever animal but curiosity is often its downfall because the wise trapper takes advantage of this trait. A favorite method employed is to attach a bright object such as tin foil or a glittering piece of metal to the pan of the trap. Attracted by the bright material, the 'coon investigates and is caught.

Traps placed in water along the bank of a stream or lake are often effective. A row of stakes stuck in the bank on each side of the trap will aid in directing the animal to the trap (Figure 10). This set should be placed at a point where the animal's tracks indicate that it has previously entered the water in quest of food. To cross creeks, raccoons often use logs, and these make excellent places on which successful trap-sets can be made.

Sets that are baited or scented at dens and along trails also are successful. A set at the junction of two streams can profitably be baited or scented. At such a place a pocket is made in the bank in which the bait is placed. The trap is placed in front of or beneath the pocket. Fish (canned or fresh), crayfish, frogs, bits of muskrat or rabbit flesh, chicken feathers, or corn make good bait.

A good raccoon scent consists of a mixture of one ounce of fish oil, one ounce of honey, 10 drops of oil of rhodium, and 20 drops of oil of anise. This preparation should be shaken well and permitted to stand for 10 days.

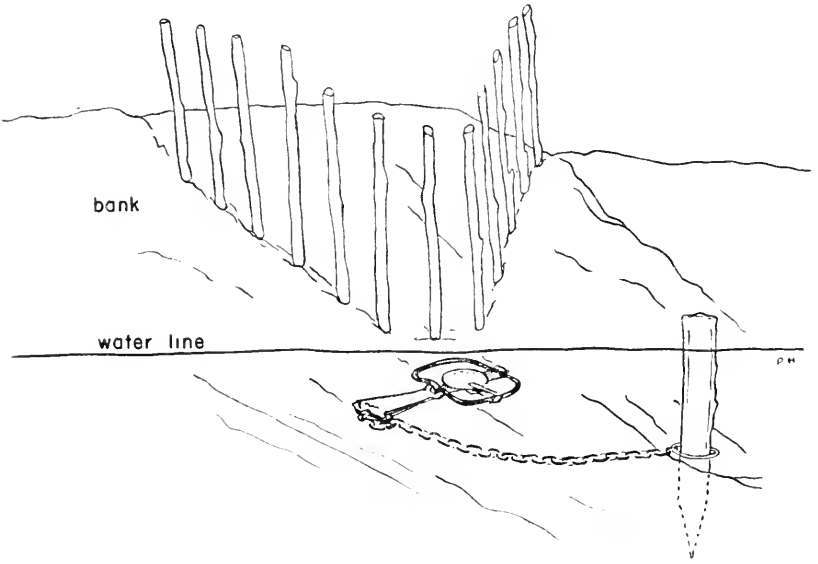


FIGURE 10. Trap set for raccoon.

A trap set for raccoon is usually not staked. The accepted method is to attach the end of the chain to a drag—something that will give when the trapped animal pulls on the trap chain. A good drag is a large branch or small log that is large enough or bulky enough to prevent the raccoon from climbing a tree or moving a great distance. When first trapped the animal may lunge frantically and the "give" of the drag prevents the chain from snapping or the held foot from pulling out. Eventually, the drag becomes entangled in adjacent underbrush and holds the raccoon until the trapper arrives. The animal soon tires and ceases to struggle strongly after the initial lunges are made. A No. 3 trap is recommended for the raccoon, although a No. 2 double spring is often used successfully.

Preparing the Pelt

The larger skins, obtained in northeastern Kansas, should be cased using the method employed for preparing the pelt of the opossum (see pages 33-37). The tail should not be cut off. When stretching the skin, the tail should be split its full length along its underside and tacked out to dry.

The smaller pelts are best stretched square. Old time trappers skinned the raccoon as usual but split the nose and head down even with the ears. Both points of the nose were then stretched out, one each way, and nailed on a shaded, flat, wooden surface. Next the longest part of each front leg was pulled out and nailed, then the balance of the forelegs were pulled out and nailed, using about one dozen nails to completely stretch the top part of the raccoon. Starting down one side, a nail was placed about every inch but the pelt was not stretched. Then moving to the other side, the process was repeated but the skin now was stretched as the trapper nailed. The skin, still loose in the center, was pulled down to remove this slack and nailed along the bottom edge and tail.

The heavy layer of winter fat should be cleaned from the raccoon pelt. This layer can be removed at the time of skinning. The pelt can be fleshed after the skin has been stretched two or three weeks. In this interval of time the fat breaks down into an oily consistency; however, neglecting to clean the pelt at this time will result in damage because of heat generated by the oil which may cause sloughing of the fur or at least cause it to loosen and pull out easily.

Preparing the Meat

Meat of the raccoon is in more demand as food than that of any other furbearer. Several recipes are available for the preparation of fine dishes from this meat. Some of these are as follows:

Roast Raccoon (Baker, 1942:5)

Place the dressed raccoon in a large pot, and cover with water. Put one or two pods of red pepper in the pot and salt the water to taste. Parboil until tender, then remove and place in a baking pan. Sprinkle with black pepper and flour. Add some stock to the roast as it is being baked. Onion may be added if desired. Cook until brown.

Fried Raccoon (Baker, 1942:5)

Cut a young dressed raccoon into small pieces suitable for frying. Place the meat in a bowl and cover with milk. Let it stand for 30 or 40 minutes. Remove the milk and roll the meat in flour which is well seasoned with salt and pepper. Fry in deep fat until brown. For gravy, pour off most of the fat, leaving just enough to cover the bottom of the pan. Add three tablespoons of seasoned flour and brown. Pour about two cups of milk, used for soaking meat, into browned flour and cook until thick, stirring constantly.

Stewed Raccoon (Baker, 1942:5)

Cut the meat into small pieces, removing all fat. Cover with water and boil in a stew pan until the meat is ready to fall to pieces. Add potatoes, onions, boiled rice, and any other vegetables desired. Season with salt and pepper. Skim off any fat which may rise to the top. If the mixture is not thick enough, add a little flour paste.

Barbecued Raccoon (Baker, 1942:5, 7)

Without seasoning, parboil the dressed meat until thoroughly done, but not to the point where the meat is loosened from the bones or falls to pieces. Remove the raccoon from water and mop well with barbecue sauce. Place the meat on a grate of an outdoor pit containing coals preferably from hickory wood. Turn meat frequently, basting with plenty of barbecue sauce. Let the meat cook slowly until brown and well saturated with sauce.

Fricasseed Raccoon (Remington Arms, 1951:22)

Clean the raccoon and remove all the fat. Cut into pieces, rub with salt and pepper and roll in flour. Cook in hot fat until brown. Add two cups of water, cover and simmer for two hours or until tender.

Raccoon Patties (Remington Arms, 1951:22-23)

Remove meat from bones and grind. Add bread crumbs, onion, salt and pepper, egg and fat and mix thoroughly. Form into patties, dip into egg and then in bread crumbs. Fry until brown in hot fat. Cover with current jelly sauce and bake in slow oven for one hour.

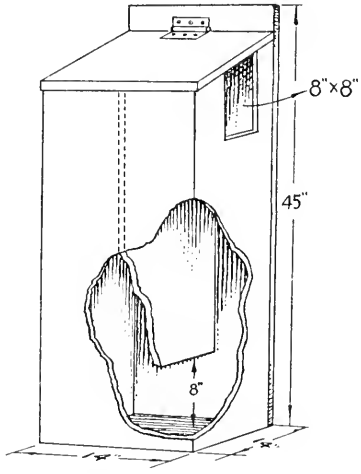


FIGURE 11. Successful nesting box used by raccoon.

Conservation and Management

Three essentials, food, water, and shelter, must be present for the raccoon to survive. If one of these three requirements is miss-

ing, the raccoon population will be reduced accordingly. Every effort should be made to preserve existing den trees not only for raccoons but for squirrels and other wildlife. Where den trees and ground dens are scarce, nesting boxes may be substituted. One type of successful nesting box is shown in Figure 11. Boxes of this type should be placed within one-quarter mile of a permanent water supply and between 35 and 40 feet above the ground in a large tree.

The stocking of raccoons is expensive and may not increase numbers appreciably where native animals already exist. The provision of better habitat and the regulation of hunting allows the population to increase naturally to the maximum carrying capacity of the land. Where native stock is low or absent, some hunting clubs capture several raccoons alive and place them in holding pens until the season is over. These animals are then released in desired locations, thus holding a nucleus of breeding stock for the next year.

The Striped Skunk

Mephitis mephitis

The striped skunk is best known by the repelling odor of the scent that the animal ejects, from specialized anal glands, as a defense in time of danger. Its long bushy tail and color pattern of black with two white stripes, distinguish the striped skunk from its smaller, and equally odoriferous relative, the spotted skunk.

The male striped skunk weighs about 6 pounds, while the female averages slightly less. The forefeet are equipped with long claws, used in digging for food and excavating the den.

When approached by an enemy or when at bay, the "striper" will often stamp or scratch rapidly with its front feet, the tail being raised upward with every hair held erect. The release of its powerful odor may result if the animal is pressed any closer. The odoriferous scent which the skunk uses for defense has given rise to many good stories. One is that the skunk discharges the scent on its tail and then scatters it in a manner similar to shaking paint from a brush. Actually the animal raises its tail high and out of the way when about to eject its powerful "perfume." This fluid is ejected in two fine jets of spray which unite to form a single stream. The ordinary distance to which the fluid is thrown is from six to ten feet, but large animals have been known to throw the fluid a distance of 20 feet. It is always best to approach a skunk upwind.

A live skunk cannot be carried safely by its tail as the animal can discharge scent in most positions. Scent sprayed in the eyes of the victim does not cause permanent blindness although the experience is most painful.

The problem of removing scent from clothing, hands, face, traps, or hides is often troublesome. Washing in chloride of lime or gasoline will remove odor from the hands. Chloride of lime should not be used on clothes, however, because of its effects on colored fabrics. Clothes can be treated by washing them in gasoline, ammonia, or benzene, and then hanging them in a sunny, windy place. Also, the clothes may be buried in moist soil for a few days or allowed to soak in a cool flow of water. Another method of removing odors is to hold the articles over a good fire on which the green branches and leaves of juniper or cedar have been placed. These green branches produce a large volume of thick smoke which is said to eliminate effectively these odors.

Habitat

Skunks are frequently found in settled country and are well adjusted to life close to, or even under, the dwellings of men although the animals prefer woodlands adjoining grassland often in the vicinity of water.

Although striped skunks are capable of digging dens, they usually enlarge the burrows of other animals. Often they take refuge in hollow logs, under tree roots, in rock piles, in haystacks, in covered drains, or under buildings. In arid regions, the stripers' favorite den site is beneath a clump of prickly pear or yucca plants.

Females usually den apart from males, at least in early autumn. As many as 13 females have been taken from one den; these females

may remain together during the coldest part of the winter. Adults rarely den up for more than one month at a time, but immature animals may remain inactive throughout the winter.

Breeding and Reproduction

The striped skunk is promiscuous, the male often breeding with more than one female. The breeding season of the striped skunk in northeastern Kansas occurs principally in the latter part of February. At this time there is frequent fighting between males. The gestation period is 62 to 63 days. From two to 16 young may be born in one litter but four is the usual number for the first brood of a female and six to eight for the second brood. Young are born beginning in late April or early May in the northern part of Kansas, and as late as early June in the southern part. The eyes do not open until the fourth week. By the sixth week the young are able to creep to the entrance of their burrow and in the seventh week leave the den and feed with the mother, often following her in single file.

Food Habits

The striped skunk is omnivorous and thus eats a large variety of foods. Insects make up a large part of its diet. In northeastern Kansas 40 per cent of the food taken by skunks in autumn has been found to consist of insects, and 96 per cent of this insect food was composed of grasshoppers. In addition, 35 per cent of the food consisted of mammals, 18 per cent plant materials, and 7 per cent birds. In winter, the food was 31 per cent insects, 32 per cent mammals, 27 per cent birds and 13 per cent plants. Owing to its food habits, the striped skunk is one of the most beneficial animals to the farmer.

The striped skunk relishes grubs and by using its long claws, digs them out of the ground and from rotten wood. Other food items taken are pocket gophers, lizards, turtle eggs, fresh water clams, snakes, frogs, salamanders, fish, crustaceans, earthworms, moles, shrews, bats, berries, fruit, roots, grass, small rodents, birds, eggs, garbage, and carrion.

Damage to chickens and bees is reported. Preference for such foods are developed by one or a family of skunks and can be prevented by trapping the specific offenders. Dead chickens or chicken remains left on trash piles may attract skunks and allow them to acquire the chicken-eating habit. Burial of this material or burning it might reduce such predation. For the farmer the food habits of the striped skunk are beneficial.

Predators, Parasites, and Disease

The predators of skunks are coyotes, foxes, badgers, and great horned owls. A great horned owl can dispatch an adult skunk. Dogs can kill skunks and are often trained for this purpose. Highway mortality is also often high. An occasional male kills the young.

Internal parasites of the skunk, such as tapeworms, roundworms, and flatworms, are often numerous. Lice, fleas, mites, and ticks have been reported as external parasites. The striped skunk in northeastern Kansas sometimes contracts the fungus that is the causative organism of histoplasmosis (a respiratory disease often confused with tuberculosis).

Primeness and the Season to Trap

The skunk is the first of our furbearers to acquire a prime pelt in autumn. Only four unprime pelts were found in a total of 72 pelts taken in two trapping seasons. Animals caught late in the season (January), often are "den burned" or "springy," a condition in which the hair is coarse and scattered in spots over the pelt. The trapping season is correctly correlated with primeness of fur, at least in northeastern Kansas. To eliminate the possibility of the "den burned" or "springy" condition when trapping for skunk, a concentrated effort should be made to catch these animals before late January.

Methods of Trapping

Two methods are commonly used in trapping the striped skunk; the den-set and the bait-set. In making the den-set, be sure that the den is being used by the animal. If the entrance is free of cobwebs and has a slight odor of skunk, the den probably is inhabited. Examination of rocks, twigs and sharp objects in and around the entrance to the den will usually reveal a few hairs that aid in identifying the kind of animal using the den.

A shallow depression, large enough to hold the trap, is dug in the path at the entrance to the den. If the weather is cold, line the hole with dry leaves or dry wood dust to prevent the trap from freezing to the ground. A few leaves over the treadle is usually enough concealment. The trap can be fastened to a drag or staked. If staked, it is a good practice to extend the chain away from the den entrance in order to prevent the animal from getting back into the den. Traps of sizes No. 1 and 1½ are recommended.

A chicken head, tainted meat or a bit of fur or meat of skunk can be tacked either to a tree or suspended from a branch with the trap

beneath. The bait can be placed in an enclosure made of rocks with traps at each entrance. Skunks, as well as many other animals, are attracted to any place where one of their number previously has been killed and left its odor. Therefore, after a catch is made it is wise to leave the trap in the same spot at least a few days.

Killing a trapped skunk in such a way that it will not release its scent is possible. One way is to attach the trap chain to a long drag pole. Lift the trapped animal by means of the pole, slowly carry the skunk to a stream or pond and drown the animal. Another method is to approach the animal slowly, stopping whenever it threatens with its tail, and continue forward until close enough to strike the animal a sharp blow across the back with a heavy stick. The blow may paralyze the hind quarters and so prevent the animal from discharging its scent. As an extra precaution, a shield, such as the top of an old wash boiler, can be carried in gladiator-like fashion.

Preparing the Pelt

The striped skunk is pelted in the same fashion as the opossum (see pages 33-37), except that the tail is left on the pelt. Split the tail down the underside, remove the bone, and tack the tail out flat to allow drying. While skinning the animal, care should be taken not to cut or squeeze the scent glands situated on each side of, and anterior to, the anus. Many trappers remove the glands before skinning is begun. The layer of fat next to the skin should be removed; see page 34 for instructions on fleshing pelts. Skunk pelts are stretched flesh-side out. Figure 5 gives the shape and dimensions of a stretching board for a striped skunk of average size.

The Meat

The meat of skunk is eaten in some localities, and is reported to have an acceptable flavor. Care must be taken in removing the scent glands. Many skunk carcasses are used as chicken feed or as fertilizer.

Conservation and Management

The striped skunk often is trapped heavily; even so, it is common in most areas. The striped skunk may become objectionable when its odor is detected in the vicinity of dwellings and when the animal preys on poultry in the farmyard. Such individuals should be controlled by trapping or be discouraged by pest-proofing the foundations of dwellings, clearing away potential dens and foods in trash heaps, and burying or burning dead chickens or chicken parts.

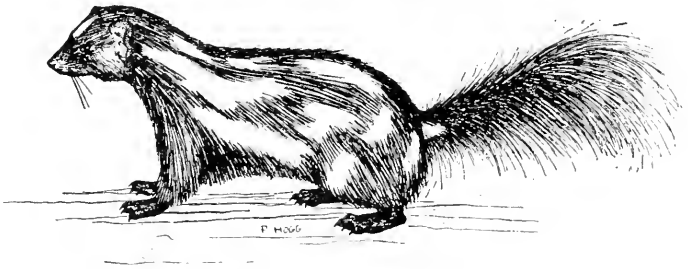
One of the greatest steps in conserving and properly managing the striped skunk was the passage of a law prohibiting the excavation of dens. Since female skunks have the habit of living together in groups of as many as ten or more in one den in winter, entire populations could be destroyed by digging them out of dens.

An acquaintance, who dug out two or more groups of wintering females before the mentioned law was passed, believes that one male always is with any such group of females.

Since investigators have found that the skunk feeds on many of the destructive insects and rodents, landowners are now tolerating skunks more than in previous years.

The Spotted Skunk

Spilogale putorius



The spotted skunk is also commonly, but erroneously, called the "civet cat." The true civets are natives of the Old World.

The spotted skunk is much smaller than its relative, the striped skunk. The name "spotted" skunk is derived from the animal's color pattern, which is of white spots on a black background. This animal is approximately 21 inches in total length, the tail, usually tipped with white, making up about eight inches of this length.

The spotted skunk, like the "striper," is provided with powerful scent glands, which are used for defense. When frightened or in a mood for play, the spotted skunk often does a "hand-stand." Besides this type of acrobatics, this fascinating animal can be easily trained to do other tricks, such as rolling over.

The odor can be removed from clothing by the means recommended for removal of the stripers' scent (see page 60).

The spotted skunk was formerly rare or absent over most of western Kansas. Changes in land use allowed this animal either to become more numerous or to extend its range westward from eastern Kansas. At present, the spotted skunk is known from all parts of the state, except densely wooded areas.

Habitat

The animal is more secretive than the striped skunk, and is seldom seen in broad daylight. For this reason, even if common in an area, its presence often may not be suspected. The spotted skunk often uses a den in a grassy bank or along a fencerow. These skunks frequently den near or under farm buildings. The three requirements of the den are exclusion of light, protection against weather, and protection from enemies. Seven individuals have been taken from a single den. Both sexes may occur in the same den; usually more males will be present than females.

Breeding and Reproduction

Spotted skunks are reported to have one litter a year. Two to seven young are born per litter, the usual number being reported as four or five.

Food Habits

Mammals (meadow mice, rabbits, deer mice) and some insects (white grubs, crickets, grasshoppers) provide the most important foods for spotted skunks. In autumn in the hunting season for wildfowl remains of blue-winged teal and other waterfowl have been found in the stomach, but are believed to have been taken as cripples and carrion. Small mammals are eaten in the greatest quantities in winter and spring; cottontails are preyed upon most frequently in winter whereas meadow mice provide the bulk of the diet in spring. Some corn is eaten in winter. In summer and autumn, insects are the most important foods but plant materials are taken in small quantities.

The spotted skunk is said to excel cats in catching rats, and is encouraged to live near granaries by some farmers. These skunks are said to ignore chickens and to catch rats under the chicken roost.

Predators, Parasites, and Diseases

Enemies of the spotted skunk are man, dogs, and cats. In more than 8,000 stomachs of the coyote examined by Sperry, there were only four records of the spotted skunk being used as food.

Round worms, lice, fleas, mites, and ticks have been recorded from spotted skunks. Frequently the spotted skunk is called the "hydrophobia skunk." Actually the animal is no more subject to hydrophobia or rabies than any other mammal. Perhaps the spotted skunk feels that he is relatively safe because of his protective scent and so does not run from a "mad" animal harboring the disease and is more liable to be bitten than some other mammals.

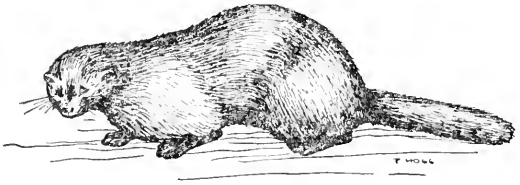
Trapping the Spotted Skunk

In recent years, the spotted skunk pelt has been of little value. Large, prime pelts are worth most. The pelt is prime from the first of December to the middle of January.

Trapping methods suggested for catching the striped skunk (pages 62-63) are also recommended for the spotted skunk. Traps of either No. 1 or 1½ size are best. The pelt of the spotted skunk should be removed and stretched in a manner identical to that described for the striped skunk (page 63). The stretching board used should not be more than ½ inch thick (see Figure 5).

The Mink

Mustela vison



The mink is a slender furbearer with a thick coat of light to dark-brown fur with a small white spot or spots on the throat, chest or belly. It resembles its close relative, the weasel, in body form and gait. The weasel, however, is smaller, slenderer, paler and has whitish to yellowish underparts. The male mink is larger than the female. One large mink from Kansas stretched 35 inches and weighed 4½ pounds. The average total length of an adult male is approximately 26 inches, the tail comprising 7½ inches of this total. The adult male will average 1½ to 2 pounds larger than the adult female.

The mink is usually found in the vicinity of permanent bodies of water. For this reason, it is more numerous in eastern than in western Kansas.

Habitat

The mink prefers streams that have abundant bank-vegetation. Areas of brush and timber near swamps or other wet areas are preferred although marshes containing sedge and cat-tail also provide good habitat.

Favored dens are under roots of trees on stream-banks; such burrows often being those made by muskrats. These dens have one or more entrances just above the normal water level and one or two surface openings about five feet back from the edge of the bank.

Breeding and Reproduction

Male mink run with the females from as early as mid-January to as late as early March. The young are born in April or May. The size of the single yearly litter is usually five or six but there may be as many as 10 or 12.

The male and female may share the same den for a time, but the male is a traveller and does not stay in one den for long. Females range in an area usually not exceeding 20 acres.

Food Habits

The mink often preys on muskrats in winter. Most predation on muskrats reduces overpopulations and is directed toward muskrats in a weakened or diseased condition. A large, healthy muskrat might be able to defend itself successfully against the mink.

Other important winter foods of the mink are rabbits, shrews, meadow mice, frogs, crayfish, and birds. The summer food is chiefly mice, fish, and aquatic beetles although some muskrats are eaten. Clams, ground squirrels, and bats are also eaten. One meal of 100 grams a day is sufficient for a captive wild mink.

Diseases and Parasites

Known diseases of mink on fur farms are distemper, encephalitis, urinary calculi, anthrax, and food poisoning. Flatworms and roundworms have been recorded from the mink and it is parasitized by the bot fly which lays its eggs on the mink's fur. These eggs hatch, burrow into the skin of the animal, develop as larva, and emerge from the skin leaving a small hole in the pelt.

Coccidiosis, caused by any one of several species of minute one-celled animals, is also reported from the mink. Mange, which is caused by a mite, is known in stocks of ranch mink. Fleas and lice are external parasites of the mink.

Primeness and the Season to Trap

The pelt of the mink becomes prime shortly after that of the raccoon and is prime by the opening date for trapping, December 1. Mink begin to molt and to fade in color in February. The pelt is often damaged because of vigorous mating activities with other mink in late winter. Because of this, the fur is usually in best condition if taken before January 15.

Methods of Trapping

Many trappers believe that the mink is the most difficult of all furbearers to catch. Trappers ordinarily catch only a few because

(1) the animals are not numerous, (2) sets are made in a small area through which only a few mink range, and (3) good sets are not made.

David Pugh, who has trapped in northeastern Kansas for many years, reported an average catch of one hundred mink per season from 1905 to 1920. He states that gloves were never used or special precautions taken other than to leave the trap-site as undisturbed as possible. He has used No. 1 and No. 1½ steel traps.

Mr. Pugh describes an efficient set for mink called a "pocket set," which is best made along a small stream where mink sign or tracks are found. On a steep bank situated so that the mink must approach the bait from the water, excavate a small hole or pocket four or five inches in diameter and five or six inches deep. This pocket should be dug so that two-thirds of the opening will be above the water line. A piece of meat (muskrat or rabbit can be used) well saturated with blood should be pushed into the pocket and held there by a stick. Now, scatter some fur from the animal used as bait near both sides of the pocket. If the bank is low, put some fur on top of the bank. The trap is set in front of the pocket, with the spring toward the pocket, in two or three inches of water. A forked stick, used to stake the trap, is placed out in the stream the length of the chain and pushed into the stream bottom, fork end with the inverted V towards the stream surface, until the entire stake is out of sight. The stake, chain, and trap should then be concealed by well rotted leaves or mud. If the stream bed is sandy, set the trap on leaves to prevent it from settling down into the sand. Mr. Pugh suggests that four or five of these sets to one mile of stream are sufficient. By wading in the water a minimum of disturbance or scent is left where the trap is set.

The following trap scent is used by some to attract mink: to the musk sacs of two mink, add 1 ounce fish oil, and 1 ounce glycerin. Mix well and let stand a week or 10 days.

Preparing the Pelt

The mink is pelted in the same manner as is described for the opossum (see pages 33-37); however, the tail, feet, and toenails are left on the pelt. When skinning out the leg, work slowly until the second joint of the toe is reached. Cut the carcass loose from the skin at this second joint.

Mink should be stretched from ⅓ to ½ longer than actual size (see Figure 5 for correct shape). The mink pelt should be left flesh side outward to protect the fur from fading or other damage.

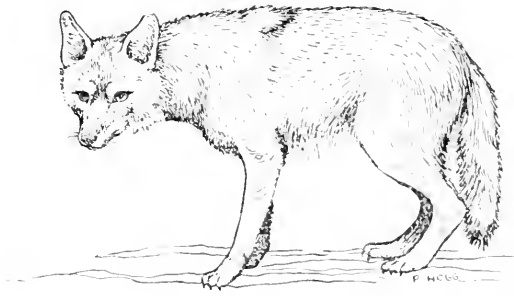
Conservation and Management of the Mink

The mink is a valuable fur species and natural breeding stock should not be destroyed needlessly. Mink occasionally prey on other useful species; however, like all predators this species has its place in the animal community. Excessive trapping for mink seriously reducing the breeding stock should be avoided and discouraged.

Brush and trees along water serve as protective cover and hunting territory for mink. With proper soil conservation practices on the farm, these conditions are usually attained. Shallow marshes also offer good habitat for mink.

The Coyote

Canis latrans



To most people the coyote is an outcast without friends. It is hunted, trapped, poisoned, gassed, and dug from its den. Even so, the animal has survived and in many places is holding its own. To some people, however, the coyote is a symbol of the plains, and they feel that the wildness of the prairie is gone if his voice is stilled.

Smaller than most dogs, the adult coyote varies from gray to tan, measures from 40 to 53 inches in total length and weighs from 20 to 50 pounds. The coyote is often mistaken for a German shepherd dog but the sharply-pointed ears, that never droop, the sharply-pointed nose, and the long bushy tail that is held down, serve to identify the coyote.

Habitat

This animal, found in all counties, favors open upland country and frequently travels in fields and pastures on or near ridges. The den is in the ground usually in an unused field near the head of a small ravine, often close to timber. The entrance to the den is ap-

proximately 10 by 20 inches, and usually is hidden by a small patch of brush, a hollow tree or a log. The coyote does most of its hunting and is most active shortly after daylight or at dusk or at both times.

Breeding and Reproduction

Coyotes breed in February and March and probably mate for life. The gestation period is approximately 63 days, the young being born in April and May. The one litter a year contains from two to ten young, but the average number is approximately six. Coyote pups, six to twelve weeks old, are able to travel from the den.

Food Habits

The coyote eats chiefly rabbits and rodents. Occasionally a coyote will develop a taste for poultry, small lambs, goats, and small pigs. Such "outlaws" are the animals which man detests and strives to eliminate. They are also the cause for man's condemnation of all coyotes. The outlaw coyote is often a coyote with a "peg-leg" (an animal which has injured a foot) and preys or feeds on livestock and carrion. In other words, the "peg-leg" obtains its food from animals which are easy to catch and kill or which are dead.

Diseases and Parasites

The coyote, like its relatives the dog and fox, is subject to rabies and probably is subject also to other diseases which these relatives are known to have. Fleas, ticks, and biting lice have been found on the coyote. Stomach worms (roundworms and tapeworms) are not uncommon.

Primeness and the Season to Trap

Because of the low price that the pelt of the coyote currently commands, few pelts are being marketed. Probably more coyotes are taken in Kansas with the aid of hounds or in "wolf" drives than with steel traps. Because there is no closed season, the animal can be killed at any time of year. The use of poisons or other indiscriminate control measures are detrimental to all furbearers and should be discouraged by the trapper.

The pelt is prime in December and January and begins to shed about the first of February. In the past when "long furs" were in greater demand, a scalped coyote pelt (one from which the scalp was removed in order to collect bounty) was worth only two-thirds as much as an unscalped pelt. At present, the scalp is turned in for bounty and the pelt, not salable, is thrown away.

Methods of Trapping

Coyotes have a more or less definite route that they follow in their travels; thus the trapper should first search for tracks of this animal on ridge-crossings in open country or in other like habitat. If you are trapping coyotes out of the regular trapping season, timbered creek-bottoms should be avoided in order to help reduce the possibility of catching other furbearers.

A two-trap set, using at least size No. 3 trap, gives better results in fields and pastures than a single-trap set. In making a set, a cloth, 3-feet square, is spread on the ground next to where the set is to be placed. Being careful to stay on the cloth, the trapper then digs a trench about 1½ inches deep, 7 inches wide and 3 feet long. The soil removed in making the set is placed on the cloth in order to reduce disturbance to the area.

The traps are placed at each end of the trench, and a 5 x 7 inch piece of cloth is placed over the pan and under the jaws of the trap to prevent soil from getting under the pan (see Figure 12). A two-

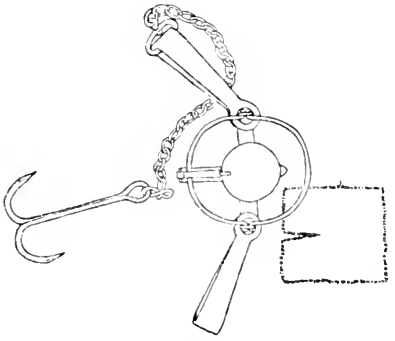


FIGURE 12. Setting a trap for coyote.

pronged iron hook that resembles a miniature anchor is used as a drag. The traps, chain, and hook are then covered with fine soil sifted through a ¼ inch mesh screen. The set is then smoothed over with a broom fashioned from small twigs. The remaining soil is discarded 20 or 30 yards from the trap set. A small dried piece of cow-chip or wood is then placed between the two traps and sprinkled with 10 to 20 drops of scent. This serves as the "scent post." Be sure that there is not more than ⅛ inch of soil on top of the pan of each trap.

Hunting by Means of Dogs

In eastern Kansas, sportsmen in autos use trail hounds that follow the coyote's scent. The hunters aim to intercept and shoot

the coyote where it crosses a road. In western Kansas, when a coyote is seen, the hunters in autos release hounds that rely on sight. They pursue, and with good luck kill, the coyote. Remarkably few of the hunters that are pursuing the hounds are killed in automobile accidents.

Coyote Scent

The best scent is made from one pint of coyote urine to which is added 4 tablespoonfuls of glycerine and the gall bladder and anal glands from the carcass of the coyote. A scent made of fish as described on page 65 is also attractive to coyotes.

Preparing the Pelt

Coyote pelts are cased in a manner similar to those of other furbearers (see pages 33-37). However, some buyers recommend slitting the tail and others do not; some recommend slitting the skin of the front legs and others do not; and some recommend cutting the feet off whereas others want only the claws removed. You should ask your fur-dealer how he wishes to have the animals prepared before you skin them. The coyote pelt is stretched fur side out.

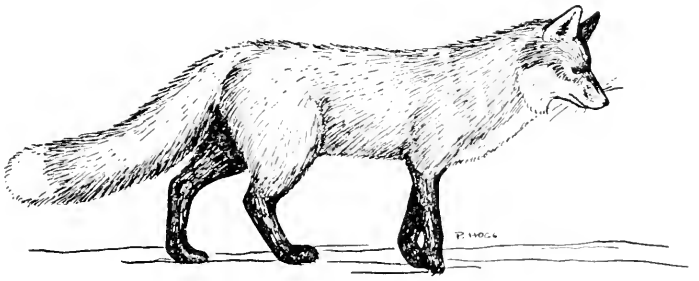
Conservation and Management

Studies have shown that coyotes feed generally on rabbits and rodents and by their actions benefit man's interests by reducing farm and ranch pests. The coyote will take domestic stock and poultry when natural foods are scarce and when the taking of such prey is easy. Poultry suffers when allowed to roam away from coyote-proof enclosures. Usually such predation may be traced to one or a few individuals, which should be sought and eliminated. Selective trapping of these outlaw coyotes seems to be the best control plan yet devised. This method is used in Missouri and other states. Cyanide guns and poisoning are dangerous and much less selective than steel trapping and may be responsible for the death of pet dogs as well as beneficial wild creatures.

Thus far the coyote has thrived in spite of man's attempts to exterminate the animal. The bounty system repeatedly has been shown to be of little value because the coyote population has remained somewhat stable even when high bounties are paid. In 1903-04, the average number of coyotes turned in for bounty per county in Kansas was 208; in 1949 the number was 256. In many states authorities now regard the bounty system as obsolete and have replaced it with improved methods of control of outlaw individuals and have achieved better results at a much lower cost.

The Red Fox

Vulpes fulva



The red fox is a medium-sized, doglike animal with a thick, reddish coat except for a white tip on the tail. Although once scarce, this fox is now common in the forested parts of eastern Kansas.

Habitat

Brushy areas and woodlands form the best living places for the red fox. The territory covered by a family of foxes is ordinarily within a circle having a radius of one mile. The den is usually on the sunny side of a slope or on a stream bank. This den may be a burrow that the female fox has dug, a woodchuck hole, a hollow log, or a small, rocky cavern.

Breeding and Reproduction

The red fox mates in late January or February and the gestation period is from 49 to 55 days. The size of the litter ranges from one to eight with an average of between four and five pups. Young have been seen outside the den on May 15 in Douglas County. While growing, young pups are moved several times to different dens. The family disperses in early autumn.

Food Habits

The food habits of the red fox have been the subject of intense observation and interest for a number of years. This is because of the alleged destruction of bob-white quail by foxes. Controversies between quail hunters and fox hunters have been numerous. Predation on quail seems to be a matter of accidental catches and depends on the numbers of both quail and foxes present in an area. Mammals are the most common food-items taken by red foxes. Birds, invertebrates and plants are used to a lesser degree, and cold-blooded vertebrates only occasionally. Meadow mice are

high on the scale of preference and young cottontails appear to be preferred to old ones by the young foxes at the den.

Diseases and Parasites

The diseases and parasites of the red fox have been emphasized as a result of intensive fur-farming. Rabies or hydrophobia is an important disease carried by the red fox in the wild. Serious outbreaks of this disease, in which the red fox has played a part, have occurred in various parts of the United States, especially the Southeast. The gray fox, however, may be more important in outbreaks of rabies than the red fox.

Some parasites reported from the red fox include the guinea-worm, flatworm, tape worm, roundworm, and sarcoptic mange which is caused by mites.

Primeness and the Season to Trap

The fox pelt is prime when the color of the flesh side is all red or white. A blue pelt or black pelt, on the flesh side, is unprime. The fox pelt is in its best prime condition from December to February.

Methods of Trapping

The same method for trapping foxes should be used as that suggested for coyotes (see page 71), with one exception. For fox, one trap is placed from 8 to 12 inches from the scent or bait, and the other trap is placed 8 to 12 inches farther away. The object of this change in the trap positions is because of the tendency of foxes to circle an object whereas a coyote walks straight in.

Urine of the fox or fish scent are the best lures for traps. A good fish scent is described on page 68.

Preparing the Pelt

The pelt of the fox is thin and in skinning care must be taken to avoid tearing. The method of casing the pelt is the same as that described for the opossum (pages 33-37), except that the tail and feet should be left on the pelt. A fox pelt is placed on the stretching board fur side in. Before the pelt is fully dry, it should be removed, and turned fur side out. The pelt should not be left on the stretching board for more than three or four days, and less than that if the weather is warm or dry. Because the pelt of the fox never has much fat or grease, it dries rapidly. Dirt, matted hair, or burrs should be combed and brushed out of the pelt.

Conservation and Management of the Red Fox

Because of the present low market value of "long-haired" furs, there is little public interest in the status of the red fox. There is certainly a need to point out the useful qualities of the red fox (for example, predation on injurious insects and rodents), which should balance or outweigh the bad reputation it has received from its predations on livestock and poultry. Fox hunters, often well-organized into progressive groups, can be effective in publicizing beneficial habits of this animal, and in some states do so in order to have foxes to hunt.

The Badger

Taxidea taxus

The badger is a short-legged carnivore having powerful forelimbs and long, sharp claws. The badger's fur is predominantly a grizzled-gray above and a yellowish below. The white stripe that runs from the nose, up over the top of the head, and down the nape of the neck is characteristic. The legs are dark or black. The yellowish tail is short and the body of the animal is characteristically wider than high, giving the animal a flattened appearance. An adult weighs between 15 and 20 pounds and is approximately 29 inches in length. The badger is found in most counties of the State but most commonly in western Kansas. In the past ten years its numbers have increased in eastern Kansas.

Habitat

Open plains, prairies, grazing land, farm land, and thinly wooded areas are the preferred habitats of the badger; it shuns heavily timbered or swampy areas and is found almost exclusively on dry, rolling uplands.

The flattened appearance of the badger is reflected in the shape of its burrow, which is wider than high. The badger lives in holes in the ground and is a powerful digger.

Breeding and Reproduction

Females have 1-7 embryos as early as December 10. They develop slowly. One litter (often of 4 young) per year is born in March.

Food Habits

More than one-half of the food consists of ground squirrels and one-third of mice; insects, birds, and eggs make up the remainder. Young badgers, which are less powerful and less skillful in digging out ground squirrels, feed predominantly on insects. Other foods are rabbits, gophers, moles, prairie dogs, snails, worms, and rattlesnakes.

The badger used to be considered a pest by many farmers and ranchers chiefly because the deep holes, which the animal digs, were a danger to a running horse; the horse might break a leg by stepping into a hole, and the rider might be thrown at the same time. However, the badger renders the farmer and rancher a great deal of service by preying on populations of injurious rodents.

Trapping

Primeness of pelt sometimes is not correlated with quality of fur or its growth in the badger's pelt. Most skins are prime from November until March or somewhat later. Badger hair, two or three inches in length, is used in shaving brushes and paint brushes. Another use of badger fur is for the pointing of other furs. An ordinary black fox can be made into a silver fox by pointing or attaching badger hair (guard hair) to those of the fox hair. Furriers are so skillful in this technique that the deception is often difficult to detect.

A No. 3 trap set at a den is often successful if the trap is carefully concealed. Bait, such as rabbit or ground squirrel, is attractive to the animal.

The pelt of the badger is prepared either cased or open; the latter is usually desired. Following the directions as described in preparing the pelt of the raccoon on page 57, the badger is similarly skinned and stretched. The tail should be split and dried flat.

Conservation and Management

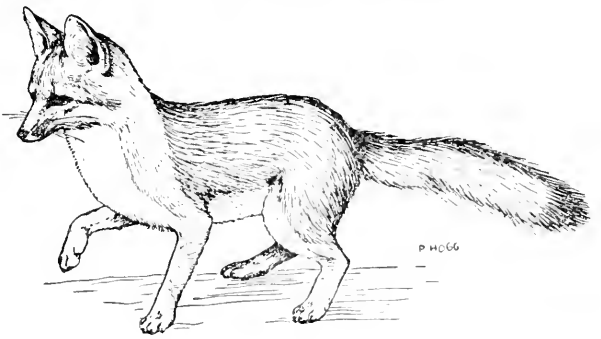
Trapping badgers is currently unprofitable because of the low price paid for the pelt. At present, the animal is worth more to the farmer and stockman when it is alive than when dead because its food consists largely of some of the most destructive rodents.

RARE AND UNCOMMON FURBEARERS

Furbearers that are present in small numbers or are rare or extinct in the State are discussed below. The Museum of Natural History at the University of Kansas, Lawrence, always welcomes reports of the capture or finding of these animals in the State.

The Gray Fox

Urocyon cinereoargenteus



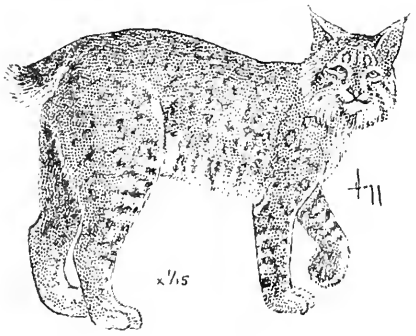
The gray fox resembles the red fox in body form but it is slightly smaller. An adult weighs from 7 to 12 pounds and measures 35 to 43 inches in total length. The gray fox can be distinguished by its grayish back with rusty colored belly and legs. The tail is black tipped with a line of long, stiff, black hairs along the upper side.

This animal is limited in its distribution to the eastern, wooded sections. Only four records of the gray fox in Kansas are available from 1900 to 1951. Reports of gray fox were received from C. C. Kaste of Bronson in Bourbon County, and Kenneth Daniels of Lawrence in Douglas County in 1952. Reliable observers have reported seeing one or more of these foxes in Douglas County every year since then.

There is one litter per year of 3 to 5 young born in April. Although there is one record of a den in the ground used by a gray fox for rearing her young, this species more often makes its den in a pile of boulders, and more often still in a hollow log or hollow tree. Some of the dens in hollow trees are reached only by a hole, several feet above the ground, in the trunks of the trees. To many persons familiar with the habits of only the red fox, it comes as a surprise that the gray fox climbs well. A friend's pet climbed limbless, vertical trunks 14 inches in diameter by clawing and hugging—literally "shinning" up such trees.

The Bobcat

Lynx rufus



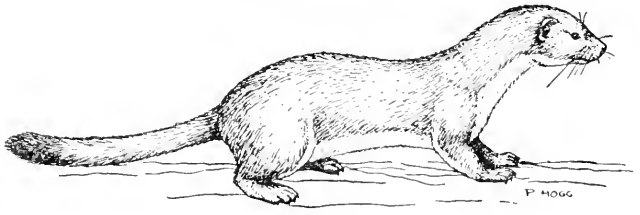
The bobcat is a medium-sized, short-tailed cat; an adult may be 36 inches in length. The coat of the bobcat is either light brown or tan in color and usually streaked with black spots. A full grown bobcat may weigh as much as 20 to 30 pounds.

Most reports of bobcat, at present, come from the southeastern part of the State, east of Arkansas City.

At present, the value of the pelt of a bobcat is slight. If it is made into a rug or mounted, the hide commands a much better price.

The Long-tailed Weasel

Mustela frenata



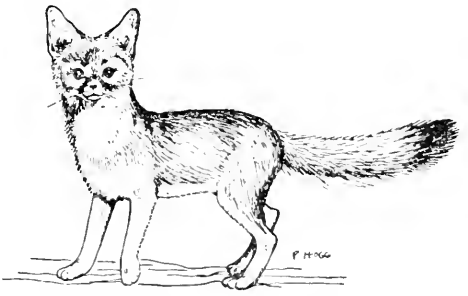
The weasel, like the mink, is a long, slender animal but is smaller being not more than 15½ inches long. The weasel has a brown back, a whitish belly, brown hind legs, and a black tip on the long tail.

This animal is found in all parts of the State. Twelve weasels were reported in the trapping survey made in the 1951-1952 trapping season. The pelts of these animals were taken in the following counties: Johnson (1), Jefferson (1), Cloud (1), Linn (1), Crawford (1), Reno (3), and Franklin (4).

Some weasels in Kansas change into a white winter coat but most change into brown. Fur buyers frequently refer to this white pelt as "ermine," a name rightfully belonging to another kind of animal, *Mustela erminea,* not occurring in Kansas.

The Swift Fox

Vulpes velox



The swift fox of the western 2/3 of Kansas is 26 in. long (tail 9 in. of this), has a buffy gray back, black-tipped buffy-gray tail, and was almost killed out, but has been seen again since 1955.

The Black-footed Ferret

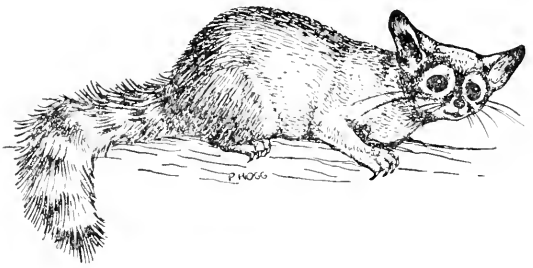
Mustela nigripes

The black-footed ferret is a long, slender, weasellike mammal with light tan upper parts, black feet, a black tip on the tail, and a black forehead and eye mask. The male ferret averages nearly 23 inches in length, being somewhat longer than a mink. The fur, like that of the swift fox has little commercial value.

The black-footed ferret usually associates with prairie dogs, never was abundant, and in Kansas is now rare, probably owing to elimination of prairie dog towns by means of poisoning operations. The last authentic Kansas record in the Museum of Natural History at the University of Kansas was in 1944.

The Ring-tailed Cat

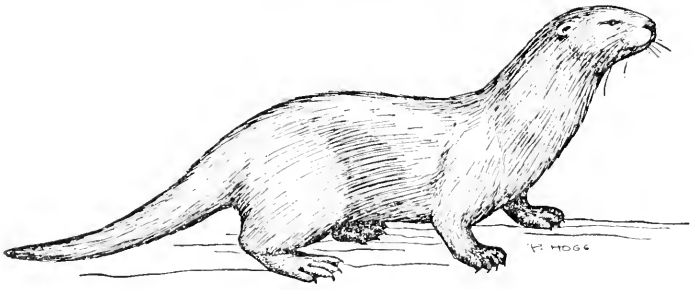
Bassariscus astutus



The ring-tailed cat resembles a small, sharp-nosed cat but has a long ringed-tail. Adult animals average 30 inches long; the tail comprises half of this length. The animal is grayish brown with large ears and eyes. The long tail is more conspicuously ringed than that of the raccoon, with alternating whitish and brownish rings. The ring-tailed cat prefers the rocky habitat of the Southwest. The fur is marketable but not highly valued.

The Otter

Lutra canadensis



This sleek, amphibious animal, which is a large relative of the mink, seemingly has been extirpated in Kansas. The otter can be distinguished readily from the mink by its larger size, webbed feet, and broad based tail. The short, thick fur is brown above and silvery brown below.

The otter formerly occurred along most of the streams. The last record of this animal was near Manhattan in 1904. After many years of protection in Missouri, the species has reappeared there. It is hoped that the otter will work its way back into Kansas streams and be rigidly protected until firmly established.

MISCELLANEOUS FURBEARERS

Rabbits

The black-tailed jack rabbit (*Lepus californicus*), the desert cottontail (*Sylvilagus audubonii*), and the eastern cottontail (*Sylvilagus floridanus*) occasionally are taken for their fur. The Seventh Biennial Report of the Forestry, Fish and Game Commission records that 49,319 rabbit pelts (species not specified) had been sold in the preceeding two-year period. With the price of wild-rabbit skins currently bringing less than 10 cents a pelt, few pelts are marketed. The only outlet for wild-rabbit skins in 1937 was in the hatter's trade, but pelts of the hutch-raised domestic rabbits were preferred.

The Mole

Pelts of the eastern mole (*Scalopus aquaticus*) are marketable and are bought by a few dealers. Those interested in selling mole skins can write the U. S. Fish and Wildlife Service, Washington, D. C., for the addresses of firms who buy these small pelts.

The House Cat

The pelts of the house cat (*Felis catus*) also are bought by fur dealers, although prices are currently low. The pelts are handled like those of fox or mink.

The Nutria

The nutria (*Myocastor coypus*) a South American rodent, has been introduced into several parts of the United States, and is, at present, being raised on a few fur farms in the country.

The adult animal resembles the muskrat but is larger, weighing as much as 20 pounds, and has a round instead of a flattened tail. The four front teeth of the nutria are orange in color, and become a deeper red-orange as the animal grows older.

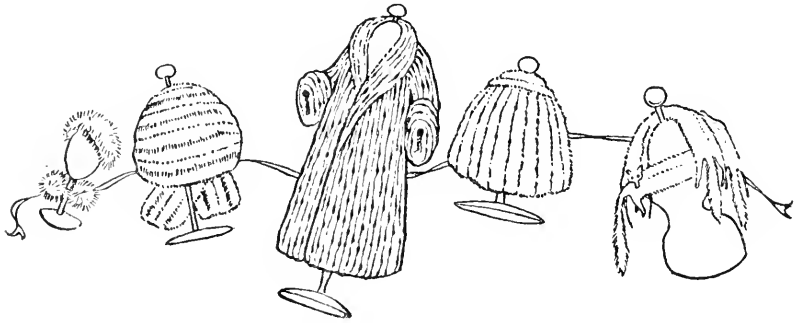
Being an introduced animal, the nutria may affect, adversely, the native wildlife present where it is introduced. One nutria was taken on Peace Creek in Reno county in the autumn in 1945. Since the fur of the nutria is currently less valuable than that of the

muskrat and since the feral (wild) nutria might become an agricultural pest, it seems wise to prevent the establishment of the nutria in Kansas.

The Chinchilla

The Chinchilla (*Chinchilla lanigera*), a South American rodent, is being raised on fur farms in Kansas. The pelt of this animal is valued highly and live breeding stock is worth considerable money. The animal is the size of a small rabbit with large round ears which are partly furred. The body is covered with very soft fur, but the hairs on the tail are harsh. A good chinchilla pelt is slaty-blue in color with a fine luster; the guard hairs are white with dark tips.

THE FINISHED PRODUCT—FUR COAT



From Trap to Coat

The tanning techniques, the color-matching of furs, and the cutting and stitching of pelts are only a few of the steps in the production of a stylish fur garment. This work is highly technical, calling for expert workmanship. Swank gives the steps in the tanning process of a raw beaver pelt as follows:

1. The pelt is soaked in water; the length of time depending upon the thickness of the pelt.
2. It is then placed in a revolving drum with sawdust from hard maple. This sawdust acts as an abrasive on, and a cleansing agent to, the hair and leather, also taking up any excess moisture.
3. The leather side of each skin is then brushed with a soaking solution; the pelt is folded lengthwise with the leathery side in, and hung on a rack to dry. The exposed hair becomes dry, but the leather remains soft and moist.
4. At the proper time the pelts are taken from the drying room to the plucking room. Here the hairy side is dusted with a fine calcium carbonate powder and the pelt is then placed flesh-side out across a round, loglike beam. While holding the pelt in place with his leg, the

operator pushes a drawknife across the flesh-side of the pelt, this action draws out the guard hairs and their roots. The fine underfur is not marred.

5. After the plucking operation, the chalk is removed from the skin by placing it in a rotating screened drum.
6. The skin is again soaked until soft and pliable, then removed from the vat and the thickness of the leather is reduced. This is done by drawing the leather side of the pelt over a circular shaving knife.
7. The pelt is then placed in a tanning solution for three to twelve hours, depending upon the time required for the solution to penetrate through the leather to the hairy side. The tanning solution is made principally of salt, alum, and water.
8. After coming out of the tanning solution the pelt is stretched and dried.
9. The skin is then run through a large staking wheel which takes out all the wrinkles.
10. The skin is again cut down in thickness.
11. The skin is now oiled on the leather side and put into a mechanical kicker, which literally beats the oil into the skin, making it soft and pliable.
12. When sufficiently beaten the skins are removed and placed in a rotating drum containing sawdust to remove the excess oil; then to a rotating cage to remove the sawdust.
13. The leather is now shaved down again and the whole process of oiling, kicking, and cleaning is repeated.
14. The last shaving of the leather is done after soaking the skin overnight in a chemical which puffs up the leather. This enables the operator to cut the leather side of the skin right down almost to the roots of the hair, making the pelt lighter in weight.
15. The skin is then put through a series of seven drummings with sawdust and is given a cleaning between each drumming.
16. The pelt is now ready for shearing. This operation is performed by running the pelt up, over, and down a triangular shaped shearing board. As the pelt is pulled, fur-side out, over the apex of the triangle, the thin line of hair standing straight up is sheared off to the length desired. The skin is then drummed vigorously, brushed, run through an exhaust blower, and clipped again.
17. The final process is running the skins through a powerful vacuum to remove any loose hair. The skins are then packed for shipment.

MANUFACTURING THE COAT—When the coat manufacturer gets a shipment of beaver skins, they are all laid out and matched in coat lots. Eighteen skins of the kit size are required for a coat. The size of the skins chosen depends upon the weight of the coat and the number of stripes desired. Large skins are used in making the heavier coats. Five stripes appear in a coat made from skins of the kit size. The striped effect is produced by matching light-colored belly fur with dark fur from the back. This color contrast is accentuated by shearing the belly fur closer than that from the back. The skins are cut into strips about one-fourth inch wide, then sewed together again.

Inferior pelts and those parts of the pelt cut off in the manufacture of coats are used for trimming hats and other small items.

From the account above, it is evident that a tremendous amount of work must be done to the pelt after it has left the trapper and before it again appears in public as a fur garment.

WHAT TO LOOK FOR WHEN BUYING A FUR COAT

The problem of deciding what type of fur coat to buy is not an easy one.

Pelts of more than 100 different kinds of mammals are used in the manufacture of fur garments. The buyer must consider color, pattern, beauty, durability, style, and economy. The Household Finance Corporation in 1934, published a 29-page pamphlet entitled, "Furs" in their Better Buymanship series of articles. Much of the following information is from this excellent publication.

The lady of today has one problem solved, however, for the Federal Trade Commission in 1952, ruled that the fur industry must use the true name of the mammal from which the pelt was taken for any fur offered for sale. Before this time, trade names were used that obscured the true identity of many furs.

Choosing a Fur Coat for Wear

Before purchasing a fur coat, have in mind what type of wear the garment will receive. Most fur coats will not take such treatment as the strain of being sat upon or long exposure to heat. The luxury furs are often the ones which stand the least amount of this type of wear.

Types of furs grouped according to serviceability and price are as follows: good serviceability and low in price, bear and wolf; good serviceability and moderate in price, badger, beaver, fisher, yellow fitch, Hudson seal-dyed muskrat, kolinsky, Persian lamb, stone marten, monkey, muskrat, otter, raccoon, Alaska sealskin, skunk, wolf, and wolverine; good serviceability and expensive, fisher, Persian lamb, American mink, and Alaska sealskin; fair serviceability and low in price, calf, Chinese civet cat, gray fox, red fox, caracul lamb, cross Persian lamb, marmot, American and Australian opossum, pony, rabbit, hair seal, tropical seal, and wolf; fair serviceability and moderate in price, American civet cat or spotted skunk, Chinese civet cat, white fitch, blue fox, cross fox, gray fox, red fox, silver fox, white fox, Hudson seal-dyed muskrat, kolinsky, caracul lamb, Persian lamb, leopard, American marten, Baum marten, Japanese marten, China mink, Japanese mink, Russian mink, muskrat, nutria, ocelot, American and Australian opossum, pony, sable, hair seal, tropical seal, squirrel, weasel, and wolf; fair serviceability

and expensive, ermine, blue fox, silver fox, white fox, full bred Persian lamb, American marten, Japanese marten, sable, and weasel; low serviceability and low in price, burunduki, calf, kit fox, red fox, hare, galyak, kidskin, marmot, American opossum, pony, rabbit, and tropical seal; low serviceability and moderate price, blue fox, kit fox, red fox, broadtail lamb, galyak, kidskin, cross Persian lamb, leopard, lynx, mole, American opossum, pony, and tropical seal; low serviceability and expensive, chinchilla, blue fox, and broadtail lamb; poor in serviceability and low in price, marmot; poor in serviceability and moderate in price, ocelot.

Many of the above furs, it will be noted, appear in several price ranges and degrees of serviceability, depending on the quality of the individual pelt and on the kind of workmanship that went into the different garments. Many of the longer furs are being placed in lower price ranges today.

Points to be Considered When Buying a Fur Coat

1. Decide in Advance What Type of Fur You Are Interested in Buying. Buy furs which are of top quality and which have expert workmanship in a price you can afford. If you are intending to buy your new fur coat on the "budget" plan, add the carrying charges to the purchase price of your coat. Using this total as the price you are paying for the coat, keep in mind the amount that you can afford. After checking the price range and serviceability you may expect from the desired fur, pick one of two types of furs that you would consider to fit your financial estimate. Fix well in mind the desirable qualities you are going to look for and the questions you wish to ask the furrier. Choose a reliable furrier and ask to see the type of fur in which you are interested.

If you desire a long-haired type of fur, the guard hairs should be well distributed because they protect the underfur and are the first to wear and break off.

2. Examine the Furs for Uniformity of Color, Depth, and Texture. The fur in a well-matched coat is lustrous and uniform throughout the garment. In examining a garment, pay particular attention to the skins used under the arms, the under part of the sleeves and the front lap which is folded under when the coat is buttoned; make certain that these parts of the garment are not made of inferior or mismatched skins. These points may be best checked by carefully examining the garment in daylight.

Some furs such as mink, raccoon, muskrat, and marmot are blended (tips of fur dyed) to improve the color or to simulate a

better grade of the same fur. Blended furs may fade unevenly if the blending is done inexpertly. Cheap raccoon pelts may be heavily dyed or painted in stripes or patterns; such heavily painted fur feels sticky rather than smooth and clean.

Sable, marten, fox, mink and the like should be examined for guard hairs which have been singed or have split-ends. These are signs of inferior furs and may result from natural causes, from poor dressing and handling techniques, or be a sign of old fur.

3. See How the Coat Is Made. Several clues which will indicate good workmanship in a fur garment are easy to detect even by the inexperienced buyer.

The facings of fronts, except with bulky furs such as raccoon or bear, should be skins folded over instead of extra pieces seamed at the turn. A well made coat has a facing of from one and one-half to two inches.

The edges that are subject to hard wear, such as cuffs, pockets, back of the neck and bottom, should be adequately protected by the best quality of fur. Fine details in buttons, linings, loops and needlework may be distinguishing marks between a good garment and a poor one.

To wear well, the lining should be a closely woven fabric that will resist friction and wear. Innerlinings usually are light or medium weight cotton or wool flannel, quilted cotton, woolen fabric, suede, or lamb's wool. While the heavier innerlinings are used for added warmth and give body and firmness to coats with thin leathers, the purpose of an innerlining in other fur coats is to protect both the leather and the lining from friction and wear.

4. Whenever Possible Examine the Leather Side of the Coat Carefully. A good skin has leather that is soft and supple but firm and strong. Old or poorly dressed skins are harsh and brittle.

The leather side of a good coat should have a uniform appearance throughout. "Let out" coats such as dyed muskrat or "dropped" coats such as mink may show hundreds of seams but all should be uniform in pattern. If the leather side shows many bits and pieces roughly patched together without uniformity, it is an indication that the coat has been made of cheap quality furs which necessitated such piecing.

It is a common practice in making some coats to stitch or otherwise attach a "staying" fabric to the leather. This adds strength to the leather and the seams, increases the resistance to strain, and adds to the general serviceability of the garment. Examine care-

fully, however, to see that the "staying" is not done to hold defective skins together.

5. Be Sure the Coat Fits Properly and Is Stylish. A fur coat should be loose and roomy but still be comfortable and should hang from the shoulders. A well fitted fur coat never feels cumbersome or heavy. There should be no strain on the fur through the back, under the arms or in the sleeves. Undue strain will split tender skins.

In selecting a fur-trimmed garment bear in mind that a fur collar accentuates primarily the face and upper portions of the figure. An untrimmed coat has a tendency to direct the eye of the observer toward the legs and feet.

6. When You Have Checked on the Above Points and Purchased the Coat, Be Sure to Get a Receipt Stating the Exact Kind of Fur Which Has Been Used and Whether or Not the Furs Are Natural, Dyed, or Blended.

If in doubt whether the skins or coat purchased are the ones which will be delivered, it is best to write one's name in indelible ink on the leather side of the skins or lining. If repairs are to be made for a period of one year without charge, get a statement in writing to that effect.

CARE OF A FUR COAT

Any fur coat, no matter how durable, can easily be ruined if it is not given the proper care and handling. Also, a fur coat that rates low in serviceability, can be kept in good condition and attractive if it is given careful and proper treatment. The recommendations of the Household Finance Corporation will be given here because this organization has made tests and has had advice from many competent furriers.

The subject of the care of furs may be divided into three parts: care at home and when being worn, care in cleaning, and care at the storage plant.

Care of the Coat at Home and When Being Worn

When fur coats are not being worn, they should be hung on wide, well constructed hangers that are shaped to conform with the shape of the neck and the shoulders of the coat. Such hangers will not cut the fur or form sharp creases that might strain the leather around the shoulder seams.

Fur coats should be placed in the coolest closet in the home, because heat dries out or removes much of the oils of the leather. Be

sure that the closet is not crowded or that the furs are not jammed between other clothing; crowding may mat or break the fur. As an extra precaution against drying of the oils in a fur garment, a bowl of water containing a rubber sponge may be placed on a shelf in the closet.

Before hanging a fur coat and after removing it from a hanger, it is well to shake the garment so that the fur will remain fluffy.

When fur garments have become wet, place them to dry in a cool room where air circulates freely. If they become extremely wet, send them to a furrier for proper care. Never brush or comb furs while they are wet.

Avoid, as much as possible, carrying packages, books, or hand bags under the arm while wearing a fur coat. Such practices are likely to abuse the fur and cause that section of the garment to wear out prematurely.

There are but few furs durable enough to withstand the friction caused by wearing the coat in a moving automobile. This friction occurs at the shoulders, elbows, lower part of the back of the coat, and especially at the cuffs which rub against the steering wheel.

When sitting down, always unfasten a fur coat and loosen it up at the shoulders by giving the shoulders a slight shrug. Button a fur coat when standing, to avoid having it mashed or torn, especially in crowded places.

Sunning furs, once regarded as a part of the household routine, is no longer recommended, because strong sunlight is injurious to furs. Sunlight causes the color to fade, even of undyed furs, and tends to dry out the leather by removing the oils.

Be sure to inspect your furs regularly for rips and tears, and have repairs made immediately by a reliable furrier. Seams may open up or leather may tear under strain even in good wearing garments. Such openings at the seams, or small tears, are no cause for alarm unless they occur with sufficient frequency to indicate that the skins are defective. However, a small rip may become a jagged tear which may make a new skin necessary, unless the tear is cared for immediately.

When the fur becomes matted, the guard hairs break off easily and the life of the fur is seriously impaired. To keep fur in finest sheen, the garment should be glazed at least once a year.

If a fur coat is to be "restyled" select your furrier on the same basis that you would use in buying a new coat. Workmanship is very important. An honest furrier will advise when and if a coat is worth remaking. Old furs may be too brittle to stand handling.

Cleaning and Glazing

Only reputable furriers or dry cleaners who will give fur garments special care, should be trusted with the cleaning of them. These workers have special processes which preserve the softness of the leather and bring out the natural luster of the fur. Usually furs are tumbled for an hour or two in a large drum with sawdust to which a non-inflammable cleaning fluid sometimes is added. The process is completed by shaking out the sawdust in a revolving, screen-covered drum.

Fur coats, fur collars, and fur pieces should never be cleaned by the so-called "dry cleaning" process which consists of dipping or immersing the garment in a solution containing naphtha, benzene, gasoline, or other petroleum derivatives, since they remove both natural and dressing oils from the fur. This drying-out process may result in breaks in the leather, loosening of the hair, and if the fur is dyed, discoloration.

Slightly soiled linings may be cleaned with the furs by the sawdust method. Badly soiled linings are "spot cleaned" or removed from the garment and dry cleaned separately. For best results, fur trimmings should be removed from the cloth coats and the two cleaned separately.

Glazing is a process for restoring luster to the fur. Many furriers use cold water. Others have preferred preparations including glycerine or other liquids. Usually a warm iron is run over the fur to bring the oil and waxes to the hair surface. Glazing gives luster to the fur and straightens out the hair.

In all methods of cleaning and care, one fact must be remembered. Pelts will last and retain a lively appearance only so long as there is sufficient oil in the leather. When the oil dries out, the leather becomes tender and crumbly or may turn stiff and hard. Always send furs or fur garments to a furrier or cleaner who is familiar with furs and equipped to do fur cleaning and glazing.

Storage

The greatest enemies of furs are moths, heat, light, and friction. Constant vigilance is necessary to outwit the persistent menace of moths. When furs are being worn constantly, the danger is lessened, but if they are hung away for even two or three weeks, there is a possibility that one of the tiny insects will find a hiding place in the soft underfur.

The use of moth preventives, such as naphthalene (mothballs), paradichlorobenzene and others, is of questionable value. They

are effective only if the garment is kept in an airtight container and sufficient quantities of the chemical are used to completely saturate the air in the container.

For out-of-season storage of furs, home methods are not recommended because of atmospheric conditions. Even if furs are kept free from moths, they may become dry and lustreless owing to too much warmth or to too uneven a temperature.

Cold storage for furs has developed into a large business because moth eggs will not hatch at low temperatures. The balanced humidity of many cold storage vaults also prevents the leather from drying out and losing its natural or dressing oils. Cold storage ordinarily does not kill moth larvae and so after the coat is removed from cold storage, moths, if present, may again become active.

Fumigation before storage or while in storage destroys all stages of moth life and is recommended for insurance against moth damage. However, the disadvantage of this method is that the gas must be used at a temperature above 70 degrees Fahrenheit to work efficiently. When this temperature is maintained for any length of time, the leather and hair of the fur will have a tendency to dry out.

The cost of placing furs in storage usually includes insurance against moths, fire or burglary, or all three. It is advisable to get a receipt so there will be no cause for future disputes. The receipt should give a description of the garment, its value, the type of storage, what protection is included, and whether the cost of the garment is fully insured by the furrier for the stated value.

ECONOMIC IMPORTANCE OF FURBEARERS

As with any wildlife resource, it is difficult to evaluate our furbearers in terms of money. The economic importance of these animals should be measured not only by the income of trappers and fur dealers, but also by aesthetic and recreational values, and the checking effect of the furbearers on injurious insects and rodents.

The aesthetic values of wildlife enjoyed by our citizenry are numerous. Every person finds some enjoyment in the out-of-doors, whether it be the howl of the hounds during the chase, the marvels of a beaver dam, a mother skunk leading her young, or a child reading of the slyness of the fox. Aesthetic values are an important part of our American way of life.

Recreational benefits are received also by those who catch furbearers. The trapper walks many miles to check traps each morning and may consider this to be recreation instead of work. A sur-

vey made to find out some of the details about trapping in Kansas revealed that trappers have lines averaging 3.3 miles long and set traps for an average of 30 days. In the trapping season the average distance walked was 99 miles to check traps if the trapper checked them but once a day. Several trappers stated that they trapped purely for the exercise and enjoyment received, and to get out of stuffy offices and into the fresh air.

The sportsmen, who use trailing hounds to hunt raccoon, receive plenty of exercise following the dogs. These hunters will attest that "coon hunting" is one of the greatest of recreational sports.

If we wish to determine the value of our furbearers in terms of dollars and cents, the return to the trapper for the pelts he catches can be used. In the 1951-52 trapping season, questionnaires were sent to one of every ten licensed trappers in Kansas. These trappers were asked their methods of trapping and handling the catch, the number of animals caught, and the price received for pelts. Table II lists the total number of animals estimated caught by 8448 trappers, the average price received per animal, and the estimated total income received by trappers for each species of furbearer.

TABLE 2.—FURBEARERS CAUGHT AND PRICES RECEIVED FOR THEIR PELTS IN THE 1951-52 SEASON.

SPECIES	ESTIMATED TOTAL CATCH	AVERAGE VALUE	TOTAL VALUE
Raccoon	109,000	$1.87	$203,830.00
Muskrat	99,015	1.29	127,729.35
Mink	7,059	14.61	103,132.89
Beaver	4,008	9.52	38,156.16
Striped skunk	17,890	1.08	19,321.20
Opossum	54,969	.32	17,590.08
Coyote	3,042	2.07*	6,296.94
Spotted Skunk	2,331	.52	1,212.12
Badger	409	.35	143.15
Weasel	130	.97	126.10
Red Fox	279	.25	69.75
Gray Fox	37	.50	18.50
Bobcat	175**	.....	.....

* Includes amount received for bounty of $2.00.
** This estimate is believed to be high.

Incomes were reported from a low of zero for trappers who bought a license but caught nothing, to a high of $1,429.68 (see Figure 13). A man who can make more than $700 a month trap-

ping is realizing a considerable income. However, years of experience may be required and an intimate knowledge of the ways of the animals must be known before a trapper can be this successful. Those who say that trapping is no longer a paying occupation are wrong for even though considered a part-time occupation, the trappers of Kansas in 1952 received an income averaging $63.20.

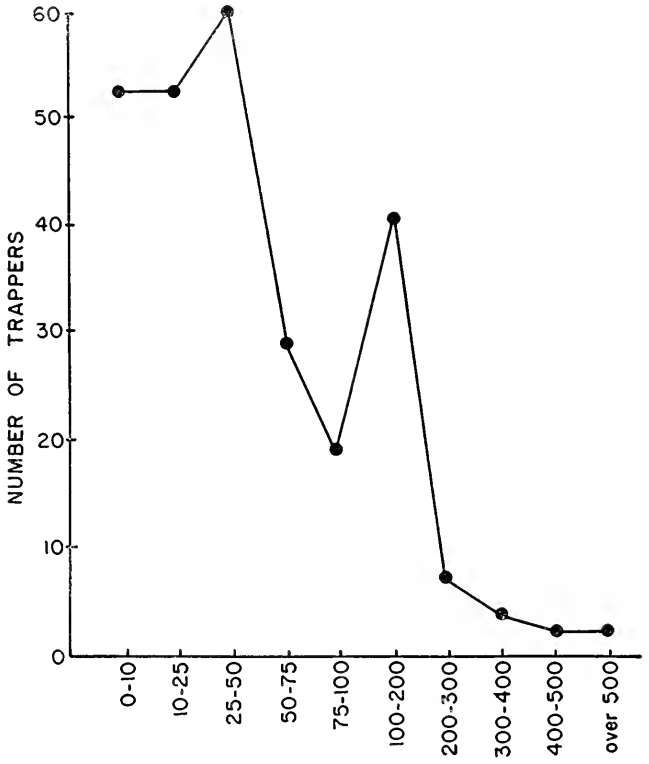


FIGURE 13. Reported income, in dollars, of 269 trappers in Kansas in 1951-52.

Because the traps were set an average of only 29.6 days, this is a part-time income or a pastime income of more than two dollars per day. Much of this trapping was done half-heartedly. By using good traps of the correct size, making the proper sets, and checking the traps twice a day, almost any trapper can catch more than $200.00 worth of furs in a normal trapping season, and on a part-time basis, on week-ends and before and after normal working hours.

The flesh of furbearers is eaten by many people. Muskrats are sold at the markets in St. Louis, Chicago, and Baltimore as "marsh rabbit" and are said to be excellent food. Raccoon and opossum

meat frequently bring a higher price than the pelt. In addition, the carcasses of any furbearer can be used as hog food, chicken food or fertilizer. Considering the 1951-52 fur catch, an estimated 500 to 600 tons of edible furbearer meat were harvested in Kansas. Probably much of this meat now is wasted. If there is no ready market for the meat in your area, TRY EATING SOME OF THE ANIMALS YOURSELF. If there is a ready market, try them as food anyway. You will not only save on your food budget, but will experience new and pleasing flavors. Recipes for preparation of the flesh of furbearers are given under the discussion of each species.

Most furbearers are efficient allies of the farmers. Skunks, opossums, foxes, and badgers eat mostly rodents and insects, and help to keep in "balance" the populations of other species, which can be genuinely harmful to man if they become unnaturally abundant. Nagel says that "using a low estimate of four ounces of food per day for each animal, a single skunk eats in one year about 90 pounds of insects and similar foods and less than one pound of poultry and game." The modern farmer now realizes the importance of these animals, and many land operators do not allow the animals to be over-trapped. The damage done by most furbearers is usually more than paid for by the income received for the pelt and the meat.

As sport animals, the raccoon, opossum, and the coyote are the most important furbearers in Kansas. Fifty-four per cent of the trappers which answered questionnaires hunted one of these animals with dogs. It is becoming an annual tradition in many areas to have a "barbecued 'coon feed" sponsored by the local Coon Hunters Association.

In summarizing the economic importance of our furbearers, it may be said that (1) they bring the trapper and fur-dealer ready cash for their fur, (2) their flesh is a valuable food resource, (3) some furbearers are of value for sport, (4) they are of aesthetic value, (5) they aid in the welfare of the people who pursue them, and (6) most of them have food habits that are beneficial to the farmer.

TRAPPING LAWS IN KANSAS

For the benefit of those trappers who do not have a copy of the laws relating to trapping in Kansas, a summary is presented here. These laws are amended from time to time, and for this reason the new laws should be reviewed before each trapping season. In general, the laws remain relatively unchanged.

Licenses

No person shall hunt, shoot, kill, molest, trap, catch or take in any manner any game or furbearing animal during any portion of the year, without first having in his or her possession a license issued to himself or herself for the fiscal year in which such hunting or trapping is done. It is unlawful for any person or persons to sell or ship or offer for sale or shipment any fur-bearing animals or their hides, pelts or furs without first having in his or her possession a trapping license issued to such person for the fiscal year. Also, such persons must carry such license with him while pursuing the above activities, and such person shall permit said license to be examined by the officer demanding same. A fur-dealer's license is necessary if the person is buying furs or selling furs other than those caught by himself.

Seasons for Taking Furbearers

Open season for taking furbearing animals are established by commission regulation. It is unlawful, unless and except as permitted by regulation, to pursue, injure, trap, take, attempt to take, capture, kill, destroy or chase with dogs, or have in his or her possession any of the following furbearing animals, alive or dead, or the pelts, skins, carcasses of the same, to wit: Beaver, otter, muskrat, skunk, mink, raccoon, opossum, civet cat, badger, bobcat, lynx, marten, weasel, red or gray fox, swift or prairie fox.

Methods of Taking Furbearers

Furbearing animals may be taken by steel traps, dogs or guns, and by any other method which the commission may by regulation establish as legal. Not more than twenty steel traps shall be used by any one person at one time.

Unlawful and Lawful Practices

It is unlawful to possess the pelts, skins, carcasses or the live furbearer when the season is closed. Any person desiring to engage in the business of rearing and selling wild birds, game birds, game animals or furbearing animals in a wholly enclosed preserve, of which he is the owner or lessee, must make application to the director of the Forestry, Fish and Game Commission for a permit to do so. Such practice requires a permit costing $2.00. The above laws thus include wild "pets," either confined or not.

It is unlawful to destroy any muskrat house, beaver dam, mink run, or any hole, den or runway of any furbearing animal. No person shall use ferrets or force smoke or liquid into the holes, dens, runways, or houses of any furbearing animal, or kill with poison. It is not unlawful to chase, trap or take coyotes, moles or gophers. Owners or legal occupants of land may kill any animals found on or near buildings on their premises.

It is unlawful for any nonresident to trap in Kansas. Any person who has not been a bona fide resident in the State for sixty days is considered a nonresident of the State.

The possession of fur by fur dealers in Kansas is limited to the regular trapping season and ten days thereafter.

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