KANSAS MAMMALS

A THESIS

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P.A.

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INTRODUCTION

It has been the purpose of this study to make a non-technical key whereby the mammals found in Kansas might be easily and quickly identified. An attempt has been made to eliminate as many as possible of the technical terms, phrases, and characters and yet give definite information making the study suitable for popular use. It is hoped that it will be an aid to those who have had no previous training in systematic zoology.

A complete list of Kansas Mammals was presented by Knox[1] in 1875, Lantz[2] in 1904, and Hibbard[3] in 1935. Additions and revisions were made from time to time by Kellogg,[4] Baker,[5] Wooster,[6] Black,[7] and Hibbard.[8] An

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1 M. V. B. Knox, Kansas Mammalia Trans. Kans. Acad. Sci.* Vol. IV, pp. 19-1875.

2 D. E. Lantz, A List of Kansas Mamals, Trans. Kans. Acad. Sci., Vol. XIX, pp. 171-1904.

3 Claude W. Hibbard, A Revised Check List of Kansas Mammals. Trans. Kans. Acad. Sci., Vol. XXXVI, pp. 235-1933.

4 Remington Kellogg, Mamals of Kansas (unpublished thesis in the University of Kansas Library).

5 A. B. Baker, The Mammals of Western Kansas. Trans. Kans. Acad. Sci., Vol. XI, pp. 56-1899.

6 L. D. Wooster, The Present Status of Certain Animals in Western Kansas. Trans. Kans. Acad. Sci., Vol. XXXV, pp. 112-1934.

7 J. D. Black, A New Woodchuck for Kansas, J. of Mammal., Vol. XVI, pp. -1935.

8 Claude W. Hibbard, Notes of Some Cave Bats of Kansas. Trans. Kans. Acad. Sci., Vol. XXXVII, pp. 235-1934.

* Abbreviations used in footnotes in this thesis are according to Sam F. Trelease and Emma Sarapeta Yule, Preparation of Scientific and Technical Papers (Baltimore: The Williams & Wilkins Company, 1936), p.

attempt has been made to include in this study all undomesticated animals definitely known to live within the state. Selection has been made largely from Hibbard's check list of 1933. Keys have been made for ninety-five species and subspecies. Not included in the keys but in a supplementary list (page 68) are forms which are now extinct in Kansas or for some reason or other are of doubtful occurrence.

The scientific names were checked with the 1923 edition of Miller's "List of North American Recent Mammals." The common names here used were nearly all taken from Anthony's "Field Book of North American Mammals." Common names vary from locality to locality; sometimes the same one is applied to several mammals, and often more than one common name is given to the same.

The descriptions of the mammals were taken from Anthony's "Field Book of North American Mammals" and Cory's "Mammals of Illinois and Wisconsin"; modified for Kansas after examination of specimens in the museums of the University of Kansas at Lawrence, the Kansas State College of Agriculture and Applied Science at Manhattan, and the Kansas State Teachers College at Emporia. The distribution maps accompanying each description are based on actual records kept by the above institutions and the Kansas State College at Hays. These are necessarily incomplete due to the fact that not all parts of the state have been worked over by collectors and not all specimens actually collected have been reported to these institutions.

Furthermore it must not be supposed that animal distribution and proportional populations are static. There are constant changes due to

changing climatic conditions, introduction of new species of plants and animals, changing in bounty and protection laws, damming of streams, drainage of swamps and the like. Very little detailed research has been done on these problems. Changes due to drought were reported by Wooster in 1931 and 1936.

One of the influences which affects the mammalian life of Kansas is the peculiar geographical location which it has relative to the life zones of animals. These life zones are occasioned largely by temperature and rainfall factors. All of Kansas is in the upper Austral zone with the exception of southeast corner and one small spot in the southwestern part. The eastern two-thirds of Kansas is in the Carolinian zone while the western one-third is in the Upper Sonoran. An extension of the Austroriparian zone includes the counties of Cherokee, Crawford, Labette, Montgomery, Chautauqua, and Cowley. A lesser extension of the Lower Sonoran takes in Barber, Comanche, Meade, and Seward counties.

There are several cases of intergradation within the state. For instance the wood rat, Neotoma floridana baileyi intergrades with Neotoma floridana campestris on the west and with Neotoma floridana attwateri on the south. Within the area of intergradation there will be found individuals which are intermediate between the two forms.

The preparation of this paper has clearly convinced the writer that there is still much to be done before a definite knowledge of the distribution habits, economic value, control, and conservation of the mammals of our state can be had. The work involved will include collecting of speci-

means, their study and comparison in the museum and field study of the animals in their natural environment. Accurate records must be kept over a period of years before definite conclusions may be drawn as to some of the forms now suspected to be present.

As used in this study, the term dentition means the dental formula or number of teeth. As an example the permanent dentition of man may be expressed as follows, $\frac{2\ 1\ 2\ 3}{2\ 1\ 2\ 3}$, in which the figures above the horizontal line indicate in order from left to right the number of incisors, canines premolars, and molars on the right side of the upper jaw, while the figures below the line stand for the corresponding teeth in the lower jaw. It is unnecessary to indicate the teeth of the left side which are like those on the right except in reverse order.

Certain terms should be defined at the outset although most of them are defined when first used. "Fulvous" is a color composed of yellow, brown, and gray. "Ochreous" is a dull or tawny yellow. "Ferruginous" is the color commonly called "rusty," which is reddish brown to yellowish brown.

HOW TO USE THE KEYS

The keys in this study are arranged on the alternative basis. This means that either one of the other of two contrasted statements is true. The statements are placed together so that they may be more easily contrasted. The true statement is placed first followed by its alternative.

With the specimen at hand the family to which it belongs must first be determined. For instance, if the specimen at hand is lynx rufus (wild cat), to determine the family, the family Key is used. To do this turn to the family Key and select the first statement. "Tail bare" is not true so go to the second statement, "tail hairy," which is followed by the number two. Going to number two, the statement "wings absent" is true and refers next to number four. "Canines present and prominent" fits the specimen and again refers to number five. Going to number five, "those that walk on sole of feet," it is found upon examination that the animal at hand does walk on the whole sole of its foot. When number six, which appeared after the above statement, is read it says "claws retractile" and gives the family name "Felidae" together with the page where the description of the species of that family may be found. Turning to page 6, the first statement, "Tail short with distinct collar of brown," describes the specimen and is followed by the page 32, upon which the description of the animal is found.

In using the Key, follow each statement read until the name of the family or species wanted and the page number where it is located is found.

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CLASSIFIED LIST OF KANSAS MAMMALS

Order Marsupiala (Pouched Mammals)

Family Didelphidae (Opossums)

Didelphis virginiana virginiana Kerr, Virginia opossum

Order Insectivora

Family Talpidae (Moles)

Scalopus aquaticus machrinoides, Jackson, Missouri valley mole.

Scalopus aquaticus caryi, Jackson, Northern plains mole.

Scalopus aquaticus intermedius (Elliot) Southern plains mole.

Family Soricidae (Shrews)

Cryptotis parva (Say) Small Shrew.

Blarina brevicauda brevicauda (Say) Short tailed shrew.

Blarina brevicauda hulophaga Elliot, Woodland shrew.

Order Chiroptera (Bats)

Family Vespertilionidae

Myotis velifer incautus (Allen) Cave bat

Myotis velifer lucifugus (LeConte) Little brown bat

Myotis subulatus subulatus (Say) Small winged bat

Lasionycteris noctivagans (LeConte) Silver-haired bat

Pipistrellus subflavus subflavus Miller, Yellow brown bat

Eptosicus fuscus fuscus (Beauvois) Big brown bat

Nycteris borealis borea lis (Muller) Red bat

Nycteris cinerea (Beauvois) Hoary bat

Corynorhinus rafinesquii pallescens (Miller) Pallid-eared bat

Antrozous bunkeri Hibbard

Family Molossidae

Tadarida mexicana (Saussure) Mexican free-tailed bat

r Carnivora

Family Procyonidae (Raccoons)

Procyon lotor hirtus Nelson & Goldman, Missouri valley raccoon

Family Mustelidae

Mustela longicauda longicauda Bonaparte, Long-tailed weasel

Mustela longicauda primilina Jackson, Missouri weasel

Mustela frenata neomexicana (Barber & Cockerell) New Mexico brown weasel

Mustela vison letifera Hollister, Eastern mink

Mustela nigripes (Audubon & Bachman) Blackfooted ferret

Spilogale interrupta (Rafinesque) Spotted skunk

Mephitis mesomelas avia (Bangs) Illinois skunk

Mephitis mesomelas varians (Gray) Long-tailed skunk

Taxidea taxus taxus (Schrever) Common badger

Family Canidae

Vulpes fulva (Desmarest) Eastern red fox

Vulpes velox velox (Say) Swift fox

Urocyon cinereoargenteus ocythous Bangs, Gray fox

Canis latrans Say, Say's coyote

Canis nebrasconsis nebrasconsis Merriam, Nebraska coyote

Family Felidae (Cats)

Lynx baileyi Merriam, Plateau bobcat

Lynx rufus rufus (Schrever) Wildcat or bobcat

Order Rodentia

Family Sciuridae

Marmota monax bunkeri

Marmota monax monax (Linne) Woodchuck

Citellus franklinii (Sabine) Franklin's spermophile

Citellus obsoletus (Kennicott) Kennicott's spermophile

Citellus spilosoma major (Merriam) Large spotted ground squirrel

Citellus tridecemlineatus tridecemlineatus (Mitchill) Thirteen-lined ground squirrel

Citellus tridecemlineatus pallidus (Allen) Pale striped ground squirrel

Citellus tridecemlineatus arenicola Howell, Kansas striped ground squirrel

Citellus tridecemlineatus texensis (Merriam) Texas striped ground squirrel

Cynomys ludovicianus ludovicianus (Ord) Prairie dog

Tamias striatus griseus Mearns, Gray striped chipmunk

Tamias striatus venustus Bangs, Southern chipmunk

Sciurus carolinensis carolinensis Gmelin, Gray squirrel

Sciurus niger rufiventer (Geoffrey) Fox

Glaucomys volans volans (Linne) Flying squirrel

Family Geomyidae (Pocket gophers)

Geomys bursarius (Shaw) Shaw's pocket gopher

Geomys lutescens (Merriam) Yellow pocket gopher

Geomys breviceps llanensis Bailey, Mesquite plains gopher

Family Heteromyidae

Perognathus flavescens flavescens (Merriam) Plains pocket mouse

Perognathus flavus flavus Baird, Baird's pocket mouse

Perognathus hispidus paradoxus (Merriam) Kansas pocket mouse

Perognathus hispidus maximus Elliot Oklahoma pocket mouse

Dipodomys ordii richardsoni (Allen) Kangaroo rat

Family Castoridae (Beavers)

Castor canadensis missouriensis Bailey, Missouri river beaver

Family Cricetidae

Onychomys leucogaster arcticeps (Rhoads) New Mexico grasshopper mouse

Onychomys leucogaster breviauritus Hollister, Oklahoma grasshopper mouse

Reitrodontomys albescens griseus Gray, harvest mouse

Reithrodontomys megalotis dychei (Allen) Dyche's harvest mouse

Reithrodontomys fulvescens aurantius (Allen) Golden harvest mouse

Peromyscus maniculutus osgoodi Mearns, Black-eared mouse

Peromyscus maniculutus nebrascensis (Coues) Nebraska deer mouse

Peromyscus maniculatus aridulus Osgood

Peromyscus maniculatus bairdii (Hoy and Kennicott) Baird's white-footed mouse

Peromyscus leucopus noveboracensis (Fisher) Northern deer mouse

Peromyscus leucopous tornillo Tornillo, deer mouse

Peromyscus boylii attwateri (Allen) Attwater's deer mouse

Oryzomys palustris texensis Allen, Texas rice rat

Sigmidon hispidus texianus (Audubon & Bachman) Texas cotton rat

Neotoma floridana baileyi (Merriam) Bailey's wood rat

Neotoma floridana campestris (Allen)Plains wood rat

Neotoma micropus micropus Baird, Baird's wood rat

Neotoma micropus canescens Allen, Hoary wood rat

Synaptomys cooperi gossii (Coues) Coss lemming mouse

Microtus ochrogaster (Wagner) Meadow mouse

Microtus haydenii (Baird) Hayden's Meadow mouse

Pitymys nemoralis (Bailey) Pine mouse

Ondatra zibethica zibethica (Linne) Muskrat

Ondatra zibethica cinnamomina (Hollister) Great plains muskrat

Family Muridae

No native species; two introduces

Rattus norvegicus (Erxleben) House-rat

Mus musculus musculus Linne, House-mouse

Family Zapodidae (Jumping mice)

Zapus hudsonius campestris Preble, Prairie jumping mouse

Family Erethizontidae (American porcupines)

Erethizon epixanthum bruneri Swenk, Nebraska yellow-haired porcupine

Order Lagomorpha

Family Leporidae (Hares and rabbits)

Lepus townsendii campanius Hollister, White-tailed jack rabbit

Lepus californicus melanotis (Mearns) Balck-eared jack rabbit

Sylvilagus floridanus mearnsii (Allen) Mearns' cottontail

Sylvilagus floridanus similis Nelson, Nebraska cottontail

Sylvilagus floridanus alacer (Bangs) Oklahoma cottontail

Sylvilagus audubonii baileyi (Merriam) Wyoming cottontail

Sylvilagus audubonii neomexicanus Nelson New Mexico cottontail

Sylvilagus aquaticus aquaticus (Bachman) Swamp rabbit

KEY TO FAMILIES OF KANSAS MAMMALS

			PAGE
1.	Tail bare; Order Marsupalia, Family Didelphidae		3
	Tail hairy	2	
2.	Wings present; Order Chiroptera	3	
	Wings absent	4	
3.	Tail free; Family Molossidae		5
	Tail not free; Family vespertilionidae		4
4.	Canines present and prominent	5	
	Canines present and not prominent	8	
	Canines absent	9	
5.	Those that walk on sole of foot	6	
	Those that walk on toes	7	
6.	Claws retractile; Order Ferae, Family Felidae		6
	Claws nonretractile; Family Canidae		6
7.	Taily bushy with rings; Order Carnivora, Family Pryconidae .		5
	Tail sometimes bushy, never ringed; Family Mustelidae . . .		5
8.	Forefeet modified for digging; external ear absent; Order Insectivora, Family Talpidae		3
	Forefeet not modified for digging, external ear present; Family Soricidae		3
9.	Two ~~canines~~ incisors, ears and hind legs long; Order Lagomorpha, Family Leporidae		12
	~~Two canines~~ One incisor, ears and hind legs not long; Order Rodentia	10	

PAGE

10. With Quills; Family Erethizontidae 11

Without Quills 11

11. Flat Tail; Family Castoridae 9

Tail not flat 12

12. Hind legs elongated; Zapodidae 11

Hind legs not elongated 13

13. Tail bushy; Family Sciuridae 7

Tail not bushy 14

14. External cheek pouches present 15

External cheek pouches not present 16

15. Tail slim and long as head and body; Family Heteromyidae . . 8

Tail thick and 1/3 length of head and body; Family Geomyidae 8

16. Crown pattern of teeth two longitudinal rows of tubercles on molars; Family Cricetidae 9

Crown pattern of teeth, three longitudinal rows of tubercles on molars; Family Muridae 11

KEY TO SPECIES OF KANSAS MAMMALS

PAGE

Family DIDELPHIDAE
(Opossums)

Tail bare, ears nearly so, abdominal pouch present in females; Didelphis virginiana virginiana 13

Family TALPIDAE
(Moles)

1. Color grayish in summer, clove brown in winter; Scalopus aquatius machrinoides 13

   Same as above but much lighter 2

2. Nose and ankles tipped with ochraceous; Scalopus aquaticus intermedius 14

   Nose and ankles not tipped with ochraceous but usually with ivory yellow; Scalopus aquaticus caryi 14

Family SORICIDAE
(Shrews)

1. With 30 teeth; Cryptotis parva 15

   With 32 teeth 2

2. Tail black above; Blarina brevicauda brevicauda 16

   Tail brown above; Blarina brevicauda hulophaga 16

Family VESPERTILIONIDAE
(Bats)

1. Fur brownish or blackish with white tips; Lasionycteris noctivagans; 36 teeth 18

Fur brownish with not white tips 2

2. Ears narrow and long, reaching to nostril when laid forward; 38 teeth; Myotis lucifugus lucifugus 17

Ears narrow and long, reaching beyond tip of nose when laid forward; 38 teeth; Myotis subulatus subulatus . . . 17

Ears broad and low, rounded at tip and reaching beyond tip of nose when laid forward; 34 teeth; Pipistrellus subflavus subflavus 18

Ears medium length and narrowly rounded at tip; 32 teeth; Eptiscus fuscus fuscus 18

Ears joined across forehead and with narrow tips; 36 teeth; Corynorhinus rafinesquii pallescens 20

Ears large and broad, crossed by 9 or 10 fine transverse lines; Antrozous bunkeri Hibbard 20

Ears short and pointed:

Color light brown; Myotis incautus velifer; 38 teeth . . 17

Ears low, broad, and rounded:

Color conspicuous reddish; Nycteris borealis borealis; 32 teeth 19

Color gray; Nycteris cinerea; 32 teeth 19

Family MOLOSSIDAE
(Free tailed bats)

1. Tail projecting beyond femoral membrane; Tadarida 21

Family PROCYONIDAE
(Raccoons)

1. Tail ringed and black band across eyes; Procyon lotor hirtus 22

Family MUSTELIDAE
(Skunks, badgers, and weasels)

1. Claws retractable or semiretractable 2

   Claws non-retractable 4

2. Color buff; Mustela nigripes 25

   Color above and below brown except white spot on the chin, throat, and breast; Mustela Vision letifera 24

   Color above brown with yellowish underparts 3

3. Chin white; Mustela primulina 23

   Chin and upper lip white; Mustela longicauda longicauda . . 23

   V-shaped white band from nose around to throat over eyes and under ears; Mustela frenata Neomexicana 24

4. Tail elongated and more than one-fourth total length of body 5

   Tail short and fat, less than one-fourth total length of body; Taxidae 28

5. Upper parts with 4 interrupted white stripes; Spilogale . . 26

   Upper parts with 2 white stripes 6

6. Tail with white tip; Mephitis Mesomelas avia 26

   Tail without white tip; Mephitis Mesomelas varians 27

Family CANIDAE
(Wolves and Coyotes)

1. Color on sides of neck yellow and brown, pupil of eye elliptical 2

   Color on sides of neck not yellow or brown, pupil of eye round 4

2. Back and sides red, yellow or brown hair on tail fine, mixed with soft underfur 3

   Back and sides not brown or red, hair on tail coarse, not mixed with soft underfur; Urocyon cinereoargenteus 31

3. Tail vertebrae more than 16 inches long; Vulpes fulva . . . 29

   Tail vertebrae 9 inches or less; Vulpes velox velox 29

4. Color of back reddish brown; Canis latrans 30

   Color of back buffy; Canis nebrascensis 30

Family FELIDAE
(Lynx and Bobcat)

1. Tail short, less than one-fourth length of body, upper parts brown and white mixed with distinct collar of brown; Lynx rufus 32

   Upper parts buffy with no distinct collar of brown; Lynx baileyi 32

Family SCURIDAE
(Squirrels)

1. Tail more than one-fourth length of body 2

   Tail less than one-fourth length of body 11

2. Fore and hind legs connected by a membrane; Glaucomys

   volans volans 40

   Fore and hind legs not connected by a membrane 3

3. Internal cheek pouches present 4

   Internal cheek pouches not present 10

4. With 22 teeth; (6 premolars) 5

   With 20 teeth (4 premolars) 9

5. Upper parts striped 6

   Upper parts not striped 7

6. Color whitish with dark brown stripes, size 11 inches;

   Citellus tridecemlineatus tridecemlineatus 35

   Color, as above but paler and stripes snuff brown,

   Citellus tridecemlineatus arenicola 36

   Color same as above but smaller and lighter; size 9 inches;

   Citellus tridecemlineatus pallidus 36

   Color reddish; Citellus tridecemlineatus texensis 36

7. Size over 12 inches; Citellus franklini 34

   Size 9½ inches or less 8

8. Color Cinnamon brown with distinct spots; Citellus 35

   spilosoma major . . . . . .

   Color gray, not conspicuous spots; Citellus obsoletus . . . 34

9. Color dull gray with stripes from shoulder to rump;
   Tamias striatus griseus 38
   Color light, stripes not so long; Tamias striatus venustus . 39
10. Color grayish; Sciurius Carolenensis carolenensis 39
   Color ferruginious; Sciurius niger rufiventer 39
11. Forefeet with 4 clawed digits 12
   Forefeet with 5 clawed digits; Cynomys ludovicianus
   ludovicianus 37
12. Forefeet with 4 clawed digits;
   Feet black; Marmota monax bunkeri 33
   Feet brown; Marmota monax monax 33

Family GEOMYIDAE
(Gophers)

1. Color rufuous brown; Geomys bursarius 41
   Color cinnamon drab; Geomys lutescens 41
   Color liver brown; Geomys breviceps llanensis 41

Family HETEROMYIDAE
(Pocket Mice)

1. White ring at base of tail; Dipodomys ordii richardsoni . . 45
   No white ring at base of tail 2
2. Sole of hind feet entirely naked 3
   Sole of hind feet naked on front half 4
3. Color pale yellowish brown; Perognathus flavescens
   flavescens 43
   Color pinkish buff; Perognathus flavus flavus 43

4. Tail color black above and white below; Perognathus hispidus paradoxus 44

Tail color brownish black above and white below; Perognathus hispidus maximus 44

Family CASTORIDAE
(Beavers)

1. Short fat with flat tail; Castor canadensis missouriensis . 46

Family CRICETIDAE
(Native Rats and Mice)

1. Ridge over eye socket 2

No ridge over eye socket 5

2. Tail longer than head and body; Oryzomys p. texensis 54

Tail shorter than head and body 3

3. Feet white; Sigmodon hispidus texianus 54

Feet brown 4

4. Color light yellowish gray; Neotoma floridana campestris . . 55

Color dark rusty brown; Neotoma micropus canescens 56

Color Vinaceous buff; Neotoma micropus canescens 56

Color R. brown or buffy gray, tail brownish gray above; Neotoma floridana baileyi; white below 55

5. Incisors grooved 6

Incisors smooth 14

6. Tail length more than one-half length of body 7

Tail length less than one-half length of body 9

7. Tail length over 80 m.m. Reithrodontomys fulvescens aurantius 50

Tail length less than 80 m.m. 8

8. Color dark buff or brown; Reithrodontomys megalotis dychei . 49

Color gray or light buff; Reithrodontomys albescens griseus . 49

9. Tail rounded 10

Tail flattened 13

10. Upper incisors with distinct grooves near outer edge; Synaptomys cooperi gossorii 57

Incisors without above groove 11

11. Claws of hind feet longest 12

Claws of fore feet longest; Pitymys nemoralis 58

12. Color grayish yellow or brown; Microtus ochrogaster Laydeni 58

Color dark gray with fulvous; Microtus ochrogaster ochrogaster 57

13. Color dark brown or black; Ondatra zibethica zibethica . . . 59

Color cinnamon brown; Ondatra zibethica Cinnamomina 59

14. Tail less than one-half length of body 15

Tail more than one-half length of body 16

15. Color distinct pink or cinnamon buff; Onchomys leucogaster articeps 47

Color blackish brown; Onchomys leucogaster breviauritis . . 48

16. Tail covered with fine hairs; ears large; Peromyscus boylii attwaterii 53

Tail covered with stiff hairs; ears small 17

17. Color buff; Peromyscus maniculatus nebrascensis 51

Color creamy buff; Peromyscus maniculatus osgoodi 51

Color dark brown or blackish; Peromyscus maniculatus bairdi 52

Color fawn to tawny; Peromyscus maniculatus noveboracensis . . 52

Color fawn or cinnamon; Peromyscus maniculatus tornillo . . 53

Color reddish buff; Peromyscus maniculatus aridulus 53

Family MURIDAE
(Mice and Rats: Domestic)

1. Tail small and hairy; Musmus musculus 60

Tail large and sparsely haired; Rattus norvegicus 60

Family ZAPODIDAE
(Jumping Mice)

1. Zapus hudsonias compestris 61

Family ERETHIZONTIDAE
(Porcupine)

1. Erethizon epixanthum bruneri Swenk 62

Family LEPORIDAE
(Rabbits)

1. Tail completely white; Lepus townsendi campanius Hollister . 63

   Tail with black top; Lepus californicus melanotis 63

   Under side of tail white 2

2. Ears short, generally less than 2¼ inches 3

   Ears medium length, generally more than 2¼ inches . . 5

3. Upper parts pale buffy gray; Sylvilagus f. similis 65

   Upper parts rusty reddish 4

4. Size medium (16 inches) Sylvilagus floridanus alacer 65

   Size large (18 inches) Sylvilagus floridanus mearnsi 66

5. Upper parts pale creamy buff; Sylvilagus auduboni baileyi . 66

   Upper parts slightly rusty; Grey Sylvilagus audaboni neo-
   mexicanus 66

   Tail small, slender, and thinly haired; Sylnilagus
   aquaticus aquaticus 66

Didelphis virginiana virginiana Kerr

(Opossum)

Dentition $\frac{5\ 1\ 3\ 4}{4\ 1\ 3\ 4} = 50.$

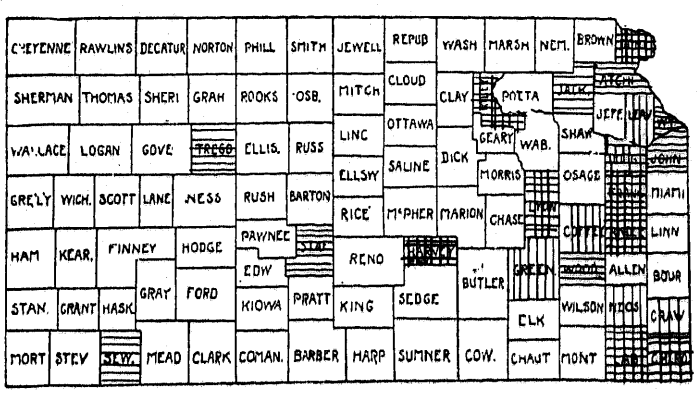
Head long with slender muzzle; ears prominent, naked; naked tail; forefeet with five toes; each with nail; hind feet with five toes, the first toe nailless, soles naked. Coloration--upper parts long, outer fur a mixture of black and white hairs to give the grizzled appearance, head whitish to yellowish, cheeks white, black about top of head, ears with yellow spot on upper edge; under parts a mixture of dark and white hairs to give a dusky appearance; legs and feet dusky, tail naked, scaly portion black at base then yellowish white. Marsupial pouch found on females, a fur-lined opening along lower abdomen. Habits and habitats--Lives on land or in trees. Food--Small animal life or fruit. Range--from New York to Florida and from Atlantic Coast to the Great Lakes and Texas.

Scalopus aquaticus machrinoides--Jackson

(Missouri Valley Mole)

Dentition $\frac{3\ 1\ 3\ 3}{2\ 0\ 3\ 3} = 36.$

Soft velvety fur, naked tail, pig-like snout, eyes and ears so small as to escape detection. Coloration--Soft close fur, velvety grayish in summer, clove brown in winter; muzzle naked; feet and tail whitish; tail thick and almost naked. Under parts--slightly paler than above, tinged with brown on chest. Habits and habitat--Seldom seen above ground, presence is known only through raised ridges and mounds of earth pushed up from below. Food--Animal, insects, and meadow mice. Range--All of eastern North America and as far west as Colorado.



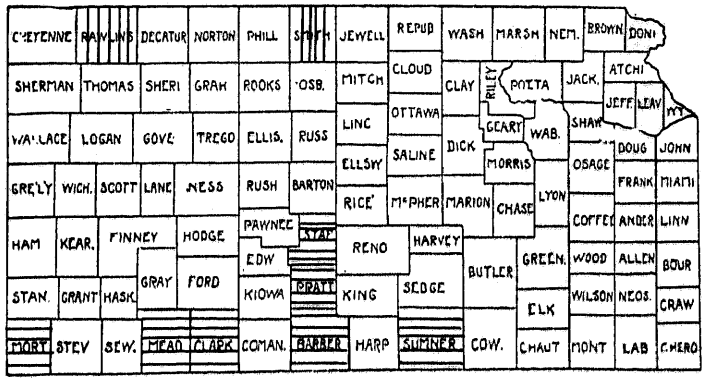
Distribution of Didelphis virginiana virginiana
Distribution of Scalopus aquaticus machrinoides

Scalopus aequaticus intermedius (Elliot)
(Southern Plains Mole)

Same as above but much darker and more ochraceous, nose and ankles tipped with ochraceous. Range--Southwestern Kansas, central and western Oklahoma, adjacent parts of northern Texas.

Scalopus aequaticus caryi Jackson
(Northern Plains Mole)

Much paler in color than either of the above named forms. Nose and ankles usually tipped with ivory yellow. Range--Plains region to central and western Nebraska, northwestern Colorado, and northwestern Kansas.



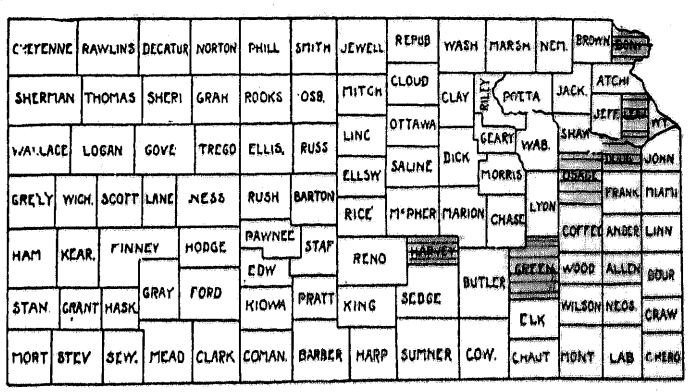
Distribution of Scalopus aquaticus intermedous
Distribution of Scalopus aquaticus caryi

Cryptotis parva (Say)

(Small Shrew)

Dentition $\frac{3\ 1\ 2\ 3}{2\ 0\ 1\ 3} = 30$.

Smallest of American mammals, muzzle sharp and pointed, eyes small, slender body, tail short, covered with hair. Color--upper parts sepia or dark brown, tail brown above and grey below; under parts ashey gray. Habits and habitat--Found where there is abundant vegetation. Very nervous and quick in movements. May be seen in the day-time but are best seen at night. Food--insects. Any animal it can capture, fond of dark damp localities. Range--From New York to Florida and as far west as Texas and eastern Nebraska.



Distribution of Cryptotis parva

Blarina brevicauda brevicauda (Say)

(The Large Short Tailed Shrew)

Dentition $\frac{4\ 1\ 2\ 3}{2\ 0\ 1\ 3} = 32$.

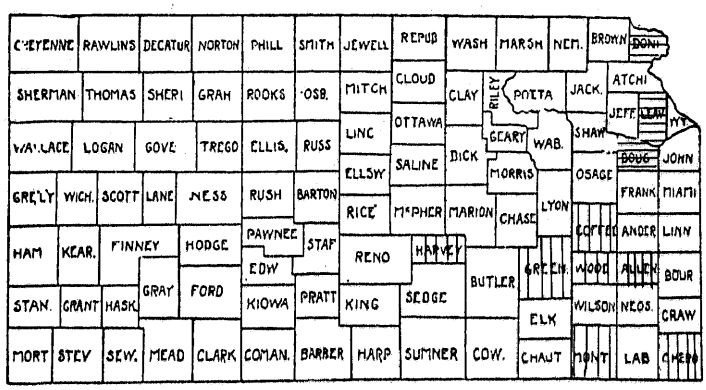
Color--upper parts slate color in winter; tail blackish above and paler below; under parts, ashey gray. Habits and habitat--Prefer old logs, mossy banks and damp localities; seldom seen in daytime. Occasionally dig their own burrows. Food--insects and mice. Habits and food: Typical shrew. Range--Eastern half of North America.

Blarina brevicauda hulophaga (Elliot)

(Sylvan Short Tailed Shrew)

Dentition $\frac{4\ 1\ 2\ 3}{2\ 0\ 1\ 3} = 32$.

Smaller than brevicauda brevicauda and lighter colored, tail very short. Color--upper parts silvery gray to light brownish, tail--above, brown, below, brownish white; under parts, light gray. Habits, habitat, and food--Same as brevicauda brevicauda. Range--Oklahoma and Kansas.



Distribution of Blarina brevicauda brevicauda
Distribution of Blarina brevicauda hulophaga

Myotis velifer incautus (Allen)

(Cave Bat)

Dentition $\frac{2\ 1\ 3\ 3}{3\ 1\ 3\ 3}$ = 38.

Large delicately built, hairy face, long tail, ears short and pointed, fur fairly long and soft. Color--upper parts dull, light brown olive shade; membranes, blackish brown. Under parts, grayish washed with buff. Habits and habitats--Generally flies at dusk, flies close to the ground. Voice, fine wirey squeak. Lives in caves, hollow trees, under the eaves, and in vacant buildings. Best observer at the edge of a forest clearing, under bridges, over surface of a lake, or near an open shed or barn. Food--Eats flying insects. Range--New Mexico, Texas, Kansas, and Oklahoma.

Myotis lucifugus lucifugus (LeConte)

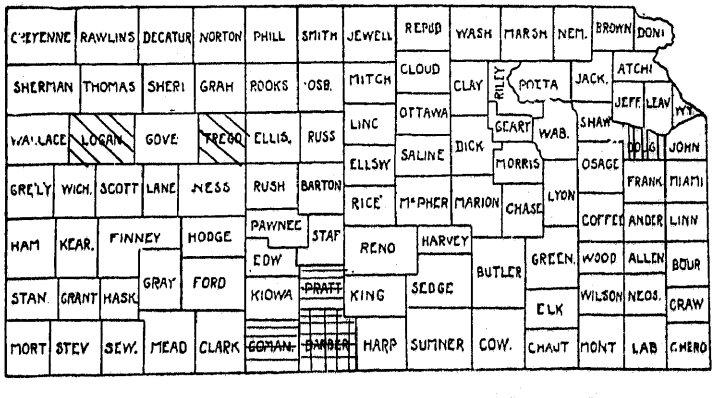
(Little Brown Bat)

Same as above except ear reaches nostril when laid forward. Range--The whole of North America, north of southern boundary of U.S., except in Rocky Mountains and on Pacific coast of California, Oregon, Washington, and British Columbia and Southern Alaska.

Myotis subulatus subulatus (Say)

(Small Winged Bat)

Same as incautus except upper parts yellowish brown, under parts slightly paler. Membranes dark brown. Long ears which reach well beyond the tip of the nose when laid forward. Range--Irregularly distributed in North America east of the Rocky Mountains.



Distribution of Myotis velifer incautus
Distribution of Myotis lucifugus lucifugus
Distribution of Myotis subulatus subulatus

Lasionycteris noctivagans (LeConte)

(Silver-haired Bat)

Dentition $\frac{2\ 1\ 2\ 3}{3\ 1\ 3\ 3} = 36$.

Medium sized bat, dark appearance. Ear medium size, broad, rounded at tip. Color--Upper parts dark chocolate brown tipped with silvery white; under parts much like upper parts with less light tips. Habits and habitats--Prefer banks of forested streams or mountain meadows. Food--flying insects. Range--North America north of Mexico from Atlantic to Pacific. Probably not breeding south of the Transition Zone.

Pipistrellus subflavus subflavus--Miller

(Yellow Brown Bat)

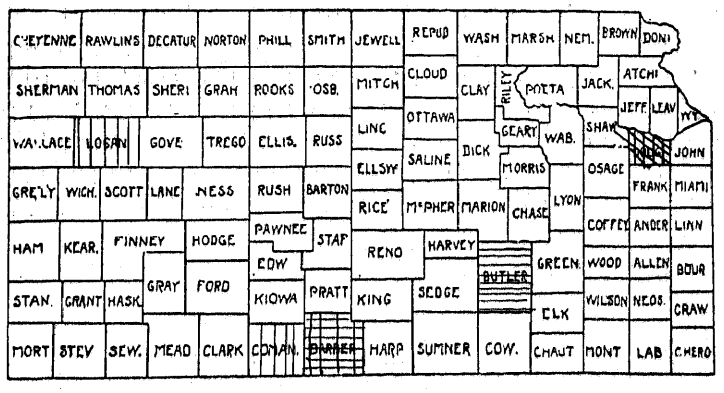
Dentition $\frac{2\ 1\ 2\ 3}{3\ 1\ 2\ 3} = 36$.

Among the smallest of the bats; ear of medium size, broad rounded at tip and reaching slightly beyond nostril when laid forward. Fur everywhere slaty black at base. Color--Upper parts light yellowish brown; under parts very much like upper or slightly paler. Habits and habitats--Show a preference for cliffs and rocky hillsides. Appear after sunset or very early in the morning. Food--flying insects. Range--Eastern U.S. from Atlantic Coast to Iowa to southern Texas.

Eptesicus fuscus fuscus (Beauvois)

(Common Brown Bat or Big Brown Bat)

A large bat, brown in color with ears of medium length and narrowly rounded at tip. Color--Upper part varies from sepia to cinnamon brown.



Distribution of Lasionycteris noctivagans
Distribution of Pipistrellus subflavus subflavus
Distribution of Eptiscus fuscus fuscus

Membranes blackish. Face and ears blackish. Under parts--somewhat lighter. Habits and habitats--A very steady flyer, may be seen shortly after sundown. May be found in meadows, forest clearing, or over water courses. May be found hibernating in buildings. Food--flying insects. Range--Found in Austral, Transition and lower edge of Boreal Zones throughout greater part of U.S. and adjoining British provinces.

Nycteris borealis borealis (Muller)

(Northern Red Bat)

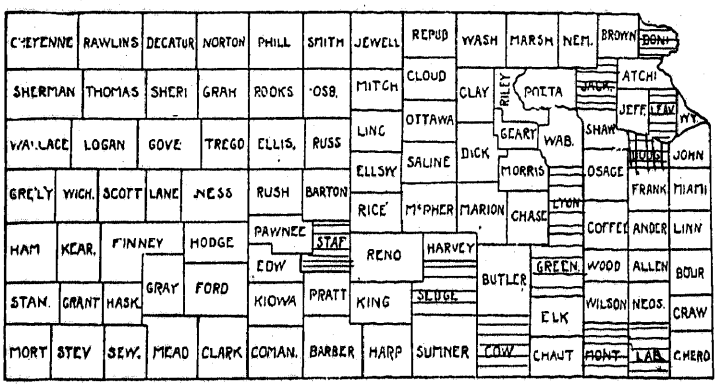
Dentition $\frac{1\ 1\ 2\ 3}{3\ 1\ 2\ 3} = 32.$

Medium sized bat, conspicuous reddish coloration, ears low, broad and rounded. Coloration--Upper parts bright rufous red; fur blackish at base, sprinkled with whitish tips; color varies somewhat and may be yellowish gray above, generally with a faint tinge of salmon; a yellowish white shoulder patch present. Under parts--paler and less reddish than upper parts. Habits: Food--Flying insects. Range--Found in Boreal, Transition, and Austral zones in eastern North America from Canada to Florida and Texas and as far west as Colorado.

Nycteris cinerea (Beauvois)

(Hoary Bat)

Dentition same as borealis. Larger than borealis. Broad low ear, which is furred almost to the tip and rimmed with black. Color--Upper parts grayish white, with darker color showing through, hairs brownish black at base then pale yellowish brown followed by a narrow band of chocolate brown and finally tipped with whitish. Under parts yellower



Distribution of Nycteris borealis borealis
Distribution of Nycteris cinerea

and without so much of white tipping, except on throat where long hairs form a sort of ruff colored like back. Membranes brownish black except for a narrow yellowish brown strip along forearms and half way down fingers on upper side. Habits and habitat--Flight very swift and erratic; appears after twilight is nearly past and flies quite high. Food--flying insects. Range--Boreal North America from Atlantic to Pacific. Migrating in autumn and winter to southern border of U.S.

Corynorhinus rafinesquii pallescens (Miller)

(Pallid Lump-nosed Bat)

Dentition $\frac{2\ 1\ 2\ 3}{3\ 1\ 3\ 3} = 36.$

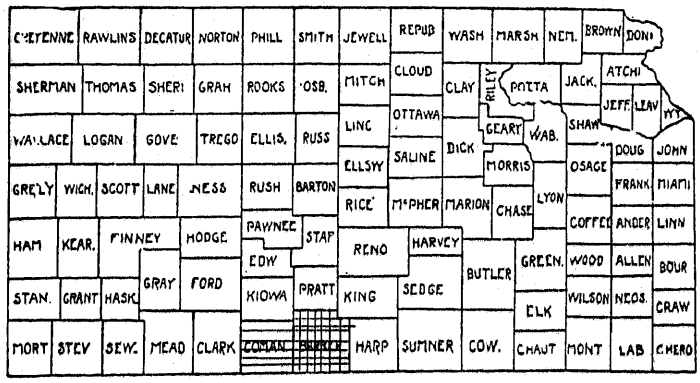
Medium sized bat with peculiar lump like warty outgrowth on muzzle and very large ears. Ears much longer than head and joined across the forehead with narrow band. Color--Upper parts pinkish buff; whitish patch back of ear. Under parts pale ochraceous buff. Fur everywhere gray at base, except on mid throat where hairs are colored alike from root to tip. Habits and habitat: These bats prefer to live in caves although occasionally found in abandoned mine shafts. They appear at twilight and sleep during the day. May be found in buildings. Food--flying insects. Range--From South West South Dakota, south to western Texas and west to Pacific Coast.

Antrozous bunkeri Hibbard

(Pale Bat)

Dentition $\frac{1\ 1\ 1\ 3}{2\ 1\ 2\ 3} = 28.$

Definite ridge above nostrils. Large bat with big ears, extending



Distribution of Corynorhinus rafinesquii pallescens —
Distribution of Antrozous bunkeri ||

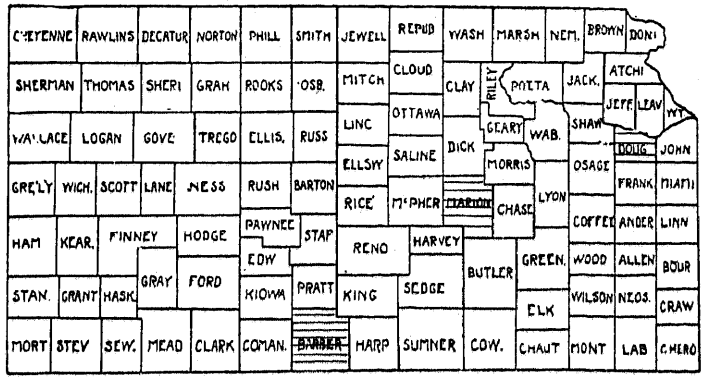
considerably beyond end of nose when laid forward, crossed by 9 or 10 transverse lines, tip narrowly rounded. Color--Upper parts: hairs cream buff at base tipped with broccoli brown; sides pale cream buff. Under parts: grayish white. Feet and wing membranes sepia. Brown band running from shoulders to forehead between ears. Habits and habitat--May be found in roofs of buildings or other darkened nooks and in crevices and cliffs. Food--flying insects and crickets. Range--Found in Austral zones of western United States and northwest Mexico.

Tadarida mexicana (Saussure)

(Free-tailed Bat)

Dentition $\frac{1 \text{ or } 1}{2 \text{ or } 3} \; \frac{2 \; 3}{1 \; 2 \; 3} = 32.$

Medium sized bat with tail free for about half its length; ears low, very broad, stiff bristly hairs on face, upper lip wrinkled, wings very narrow, feet with long hairs on toes. Color--Upper parts warm brown, membranes brownish. Under parts lighter than upper parts and more yellow. Habits and habitat--These bats may be found in colonies in darkened nooks in buildings. Very swift flyers. Food--flying insects. Range--Southwestern United States from Kansas south into Mexico, west to Pacific Coast.



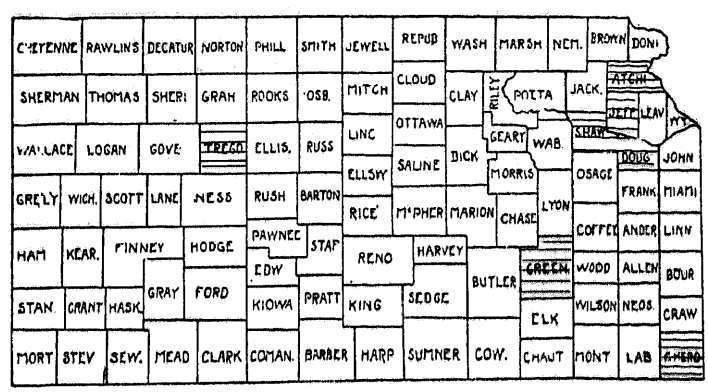
Distribution of Tadarida mexicana

Procyon lotor hirtus Nelson and Goldman

(Missouri Valley Raccoon)

Dentition $\frac{3\ 1\ 4\ 2}{3\ 1\ 4\ 2}$ = 40.

A fair-sized animal with long hair and long, banded, rather bushy tail, muzzle long and slender, head broad across the cheeks, ears erect and prominent, fore and hind feet with five toes, soles naked. Color--Upper parts grizzled gray, brown and black. Fur, dull brown at base, a black band across forehead and eyes, grayish on muzzle and back of ears; tail banded with 6 or 7 alternate grayish and blackish rings, hands and feet yellowish gray. Under parts dull brownish grizzled with yellowish gray. Habits and habitat--Found near streams, lakes or marshes. Live in hollow trees, hollow logs, rocks, or burrows. Always wash their food before eating it. Almost never seen in daytime. Food--omnivourous. Range--Kansas.



Distribution of Procyon lotor hirtus

Mustela longicauda longicauda (Bonaparte)

(Long-tailed Weasel)

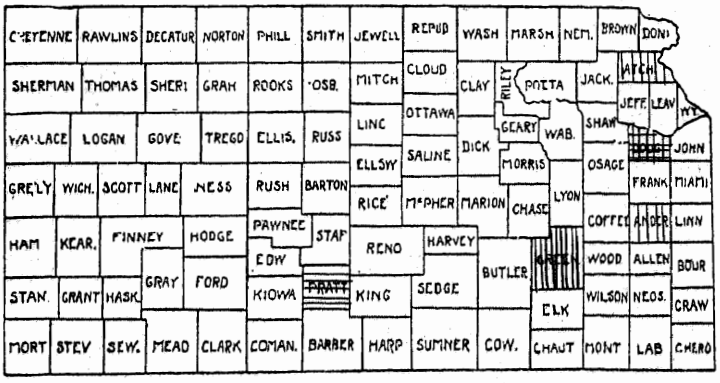
Dentition $\frac{3\ 1\ 3\ 1}{3\ 1\ 3\ 2} = 34$.

A slender, long bodied, short legged, predatory mammal, small in size. Head small, ears low and rounded, tail short, tipped with black, soles of hands and feet furry. Pelage composed of soft, close underfur and long, hard, glistening, outer hairs; brown of upper parts in sharp contrast to whitish under parts; summer pelage brown above, winter pelage white all over except for black tip of tail. Color--upper parts pale yellowish brown, darker on head; white on upper lip and chin. Under parts deep buffy yellow to warm ochraceous, white in winter. Habits and habitat--Most active at night, rests much of day, hunts on ground or in burrows under the ground. Quick of movement, very curious. Kill for sheer pleasure rather than food. Have musk glands capable of secreting a very powerful and disagreeable odor. Food--Small mammals and birds, warm blood which is sucked from neck or base of skull. Range--Great plains region of United States from Kansas northward.

Mustela primulina (Jackson)

(Missouri Weasel)

Dentition--same as longicauda. Description same as above except in color. Upper parts brussels brown, chin white. Under parts yellow, not buff. Habits and habitat--same as above. Range--Missouri and Kansas.



Distribution of Mustela longicauda longicauda
Distribution of Mustela primulina

Mustela frenata neomexicana (Barber and Cockerell)

(New Mexico Bridled Weasel)

Dentition, as longicauda.

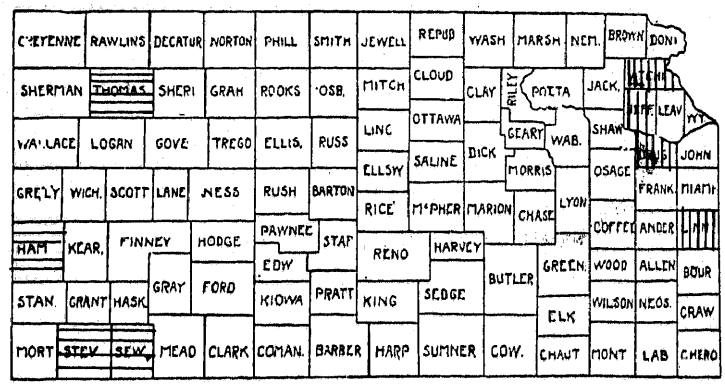
A long tailed weasel, large with conspicuous white on head, tail with approximate 2 inch black tip. Color--Upper parts pale yellowish ochre. Under parts similar but lighter, head brownish black with large whitish patch between eyes and broad whitish band between eye and ear. Habits and Food--same as above. Range--Southwest Kansas, southeast Colorado and New Mexico.

Mustela vision letifera Hollister

(Eastern Mink)

Dentition $\frac{3\ 1\ 3\ 1}{3\ 1\ 3\ 2} = 34$.

A weasel-like mammal nearly as large as a small house cat but much more slender. Body elongate and supple; head subrriangular viewed from above; ears small; neck long; legs short; tail about half as long as head and body, moderately bushy; feet with five toes; pelage composed of soft underfur more or less concealed by long, glistening guard-hairs; color dark, glossy brown; anal muskgland well developed; semi-aquatic in habit; alert and active in behavior. Color--Upper parts light umber brown slightly darker along back and tail. Under parts same as upper except for white area on chin and irregular white spots found on throat and breast. Habits and habitat--Found in vicinity of streams and forests, capable of catching fish, very disagreeable odor of musk when aroused. Not as blood-thirsty as smaller weasels. Food--Carnivorous--fish, frogs, snakes, muskrats, rabbits, and birds. Range--From northern Wisconsin and South Dakota, south to northern Illinois, northern Missouri and southern Kansas.



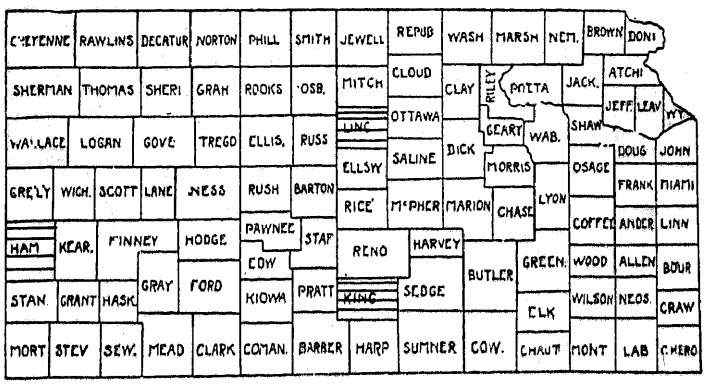
Distribution of Mustela frenata neomexicana
Distribution of Mustela vision letifera

Mustela nigripes (Audubon and Bachman)

(Black-footed Ferret)

Dentition, same as longicauda.

Larger than weasels, nearly as large as a housecat, but long, slender neck and body. Color--Upper parts pale buffy yellow with a sprinkling of dark brown hairs on crown and back. Under parts buffy or cream colored. Hands and feet blackish, broad black band across eyes like a mask, tail short colored like body, except for short blackish tip. Habits and habitat--same as weasels. Food--same as weasels with addition of prairie dogs. Range--Great Plains from northern Montana to Texas.



Distribution of Mustela nigripes

Spilogale interrupta (Rafinesque)

(Little Spotted Skunk)

Dentition $\frac{3\ 1\ 3\ 1}{3\ 1\ 3\ 2} = 34.$

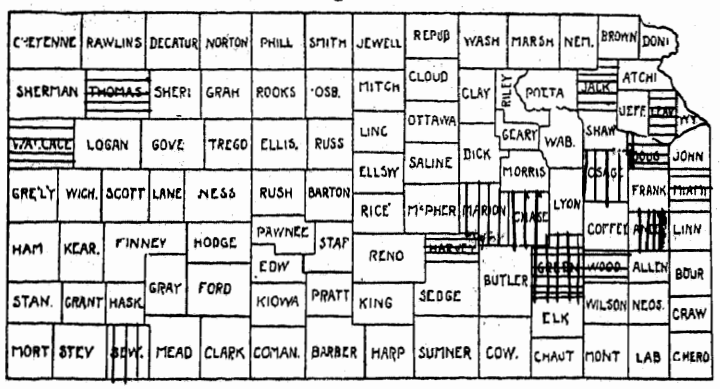
Size of half-grown housecat, head small and weasel-like. Legs short, tail bushy, anal scent glands highly developed. Color--Upper parts, body and tail black, white spots on forehead between eyes, small white frontal spot. White ear spot usually not running into white back stripe. Tail entirely black or small terminal tuft white. Dorsal stripes very narrow, interrupted, broken into widely separated spots. Under parts black. Habits and habitat--A terrestrial creature, living in holes in the ground. Rather inquisitive and peaceful. Digs after food. Given to playing in the afternoon and evening; may be seen at any time of day. Foods--insects, small mammals, birds, eggs, lizards and fruit. Range--Iowa, southern Minnesota, Nebraska, Kansas, Missouri, Oklahoma, and south to east Texas to about middle of the state.

Mephitis mesomelas avia (Bangs)

(Illinois Skunk)

Dentition $\frac{3\ 1\ 3\ 1}{3\ 1\ 3\ 2} = 34.$

Heavy, body size of house cat, legs short, claws of fore feet developed for digging. Pelage, long, hard hairs over short soft underfur. Weight about 8 pounds. Color--Upper parts, glistening black with broad white stripe from top of head to shoulders; from shoulders to base of tail 2 white stripes enclosing a middle black area. Narrow white stripe from tip of nose to top of head. Tail black and white, having tail hairs white at base, black at outside. Under parts--Solid black. (Considerable variation in color according to individual.) Habits and habi-



Distribution of Spilogale interrupta
Distribution of Mephitis mesomelas avia

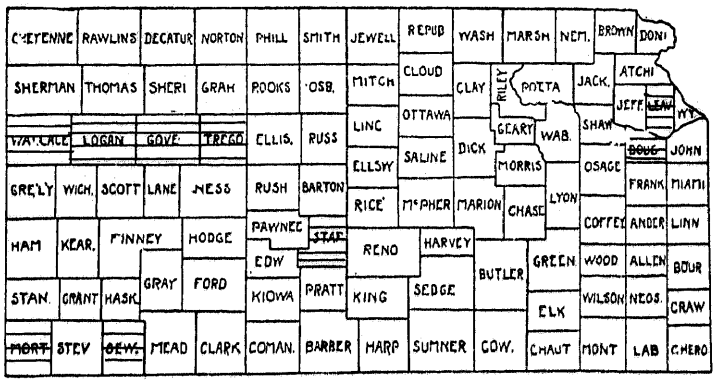
tat--Same as Spilogale. Foods--Insectivorous and carnivorous. Range--Prairie region of Illinois, west Indiana, eastern Iowa, and eastern Kansas.

Mephitis mesomelas varians (Gray)

(Long-tailed Skunk)

Dentition, same as avia.

Large, long tail without white tip. Color--Upper parts narrow white stripe from nose to between ears. Same as Mephitis. Fairly constant in markings. Under parts black. Habits and habitat--same as Spilogale. Food--Insectivorous and carnivorous. Range--South and west Texas, east New Mexico, north into Oklahoma, Colorado, Kansas, and Nebraska.



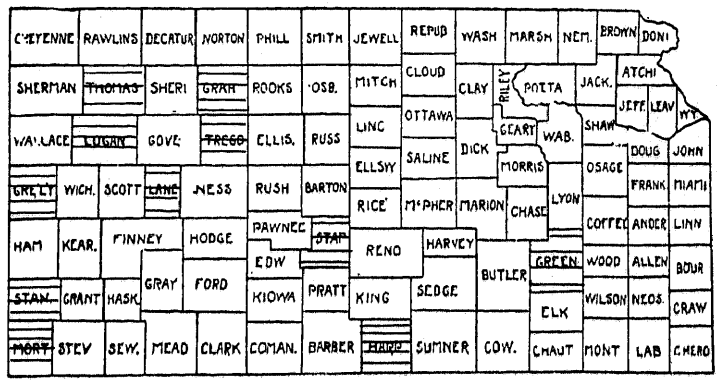
Distribution of Mephitis mesomelas varians

Taxidea taxus taxus

(Common Badger)

Dentition $\frac{3\ 1\ 3\ 2}{3\ 1\ 3\ 2} = 36$.

Large powerful, heavy body. Head small, broad, and flat. Ears, low and rounded, body squat and low, legs short and powerful, feet with 5 toes, claws large, well developed, especially on fore toes, tail short and thick. Color--Upper parts, hairs dirty gray at base, then grayish white, followed by black band and tipped with silver white. Pelage on head much shorter than on body. Narrow whitish stripe from muzzle to shoulder. White patch on face below eye and below ear, top of head and back of ear, dusky gray. Under parts--feet blackish, yellowish white to soiled whitish. Habits and habitat--Found in holes and on the ground, very fond of digging. Occasionally seen in daytime, mostly at night. Foods--Small mammals, birds, eggs, and insects. Range--Great Lakes, Saskatchewan and the Athabaska and Clearwater rivers, Alberta on the north, Wisconsin on the east, south to Texas.



Distribution of Taxidae taxus taxus

Vulpes fulvus fulvus (Demarest)

(Eastern Red Fox)

Dentition $\frac{3\ 1\ 4\ 2}{3\ 1\ 4\ 3} = 42$.

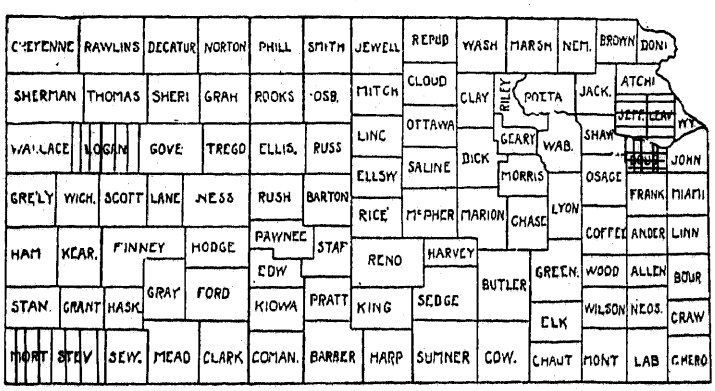
Resembles small, slender, sharp-nosed dog, muzzle long and slender; ears large and erect; tail long and bushy; claws medium length and sharp. Pelage long and soft, pupil of eye linear. Color--Upper parts bright and golden yellow, darker along middorsal region, rump grizzled with white, head reddish yellow grizzled with white, fore feet to elbow, black, hind feet black. Under parts: Tail yellow, mixed with black, black spots on upper surface near base, tip white. Habits and habitat--Terrestrial. Foods--Rats, mice, fish, birds, poultry, small mammals, fruit and berries. Range--Northeastern United States west to Kansas and south to Georgia.

Vulpes velox velox (Say)

(Swift Fox)

Dentition, same as fulvus.

Very small, delicately built, smallest of foxes. Color--Upper parts buffy yellow, frosted with tipped hairs, sprinkled with black tipped hairs, back of ears and outer sides of limbs yellowish brown; black spot on sides of snout, tail buffy gray, black spot near base of tail, tip black. Under parts whitish. Tail yellowish below. Habits and habitat--Plains or prairie dweller, lives in burrows, stays within range 5 to 10 miles in area. Tracks much like small dog. Foods--Smaller mammals. Range--northwestern Oklahoma north through eastern Colorado, all of Kansas, Nebraska to plains of Saskatchewan.



Distribution of Vulpes fulvus fulvus
Distribution of Vulpes velox velox

Canis nebracensis nebracensis Merriam

(Nebraska Coyote)

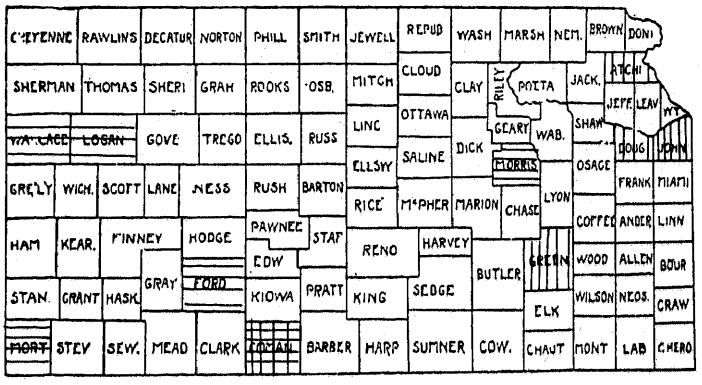
Dentition $\frac{3\ 1\ 4\ 2}{3\ 1\ 4\ 3} = 42$.

A small, slender wolf, resembling a shepherd dog. Hair long and heavy especially in winter; tail large and bushy. Color--Upper parts coarse grizzled buff, gray and black; yellowish on muzzle, ears, and outer side of legs; grizzled gray on top of head; buffy back of ears. Tail above like back, below whitish near base, pale yellowish tipped black. Under parts whitish, throat with some black hairs. Habits and habitat--Much the same as dogs; skulks under cover in daytime and comes out at night. Known by its distinctive yapping bark. Food--Small mammals, birds, insects, fruit, and carrion. Range--Arid plains of eastern Colorado and western Kansas to Montana.

Canis latrans (Say)

(Northern Coyote or Say Coyote)

Description same as Nebracensis except much larger and the color of back reddish brown rather than buffy. Range--Humid prairies and bordering woodlands of northern Mississippi valley, westward to base of Rocky Mountains.



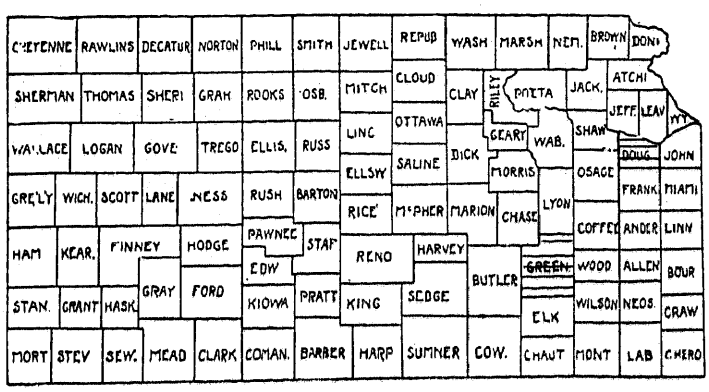
Distribution of Canis nebracensis nebracensis =
Distribution of Canis latrans ||

Urocyon cinereoargenteus ocythous (Bangs)

(Wisconsin Gray Fox)

Dentition $\frac{3\ 1\ 4\ 2}{3\ 1\ 4\ 3} = 42$.

Much like red fox except for color. Trifle longer in leg. The calls resemble those of Red fox, but are a trifle coarser. Muzzle fairly long, ears erect, tail long, bushy with a concealed mane of stiff hairs. Color--Upper parts grizzled gray and black, lighter on sides, reddish brown about ears, sides of neck, sides of legs; muzzle blackish, long tail heavily marked with black. Cheek and inside of ear, white. Under parts--white with yellowish along lower sides and tail. Blackish on chin. Habits and habitat. May climb trees. Chiefly nocturnal, however may be seen in daytime. Easy to trap. "Trees" quickly when chased by dog. Digs burrows in ground. Fur much inferior to that of red fox. Feeds--Smaller mammals and eggs of birds. Range--Upper Mississippi Valley from southern Wisconsin south to Eastern Kansas and Missouri.



Distribution of Urocyon cinereoargenteus ocythous

Lynx baileyi Merriam

(Plateau Bobcat)

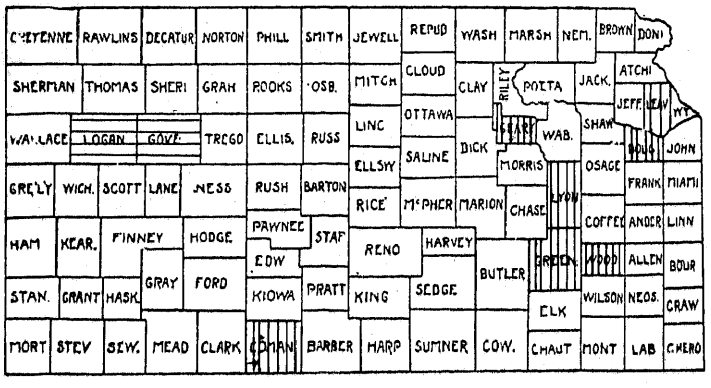
Dentition $\frac{3\ 1\ 2\ 1}{3\ 1\ 2\ 1} = 28$.

A good sized cat with tufted ears, tail very short, long limbs, large broad feet and rather long loose fur. Color--Upper parts buffy and brown mixed with a sprinkling of gray. Tail with black tip having one blackish and one fulvous band in front of black tip. This band is found only on top side of tail. Under parts--same as upper except lighter. Habits and habitat--found both on ground and in trees, especially fond of trees. Mainly found at night but occasionally seen in the day. It is active the year around. Food--mammals up to size of adult sheep. Range--Kansas to Texas west to eastern half of California.

Lynx rufus rufus (Schrever)

(Wildcat or Bobcat)

Description--same as baileyi, except feet smaller, ears but slightly or not at all tufted. Tail not black all around the tip, fur brownish and spotted rather than grizzled. Hair not so long, top of head streaked with black, no bands on tail, ears marked heavily with black, on back side with a large gray spot. Tuft on ear, if present small and black. Habits and habitat--same as baileyi. Range--In eastern United States from Maine to Georgia and west to Kansas.



Distribution of Lynx baileyi
Distribution of Lynx rufus rufus

Marmota monax monax (Linnaeus)

(Southern Woodchuck)

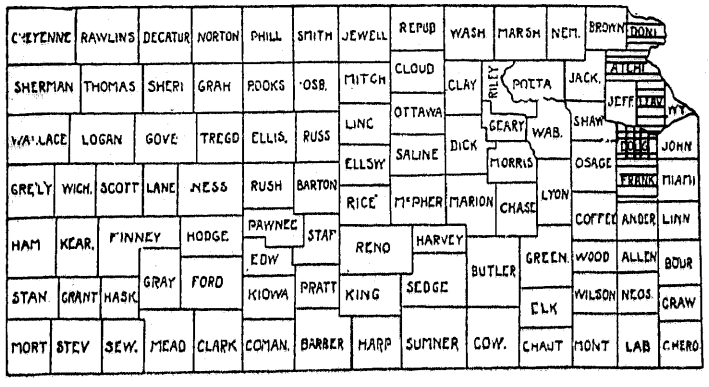
Dentition $\frac{1\ 2\ 0\ 3}{1\ 0\ 1\ 3}$ = 22.

Large squirrel-like animal, heavy-set body and short tail, head broad and short, nose blunt; ears low, rounded. Ears small; tail hairy and flattened. Claws adapted for digging. Small thumb with flat nail. Long coarse hair with short soft underfur. Color--Upper parts grizzled brownish, greyish, and reddish hairs; underfur dark gray at base tipped with ochraceous or cinnamon. Head dark brown, white or buff on sides of face, nose, lips, and chin. Fore legs and feet dark brown and black. Hind legs yellowish, tail dark brown to black. Under parts--Vary from buffy white to tawny or brown. Bases of hairs being blackish brown. Habits and habitat--May be found in burrows in the ground, woodpiles, or stone heaps. Has habit of standing or sitting up on hind legs when feeding, to watch for enemies. Foods--Grasses, clover, vegetables. Range--Middle of Eastern United States from Pennsylvania, New Jersey, Ohio, Indiana, Illinois, and Iowa south to northern parts of South Carolina, Georgia, Alabama, and Arkansas west to Kansas.

Marmota monax bunkeri Black

(Kansas Woodchuck)

Dentition same as monax monax. Female as large as the male. Hind foot and skull larger than monax monax. Coloration similar to Monax but much darker. Legs and lateral stripe (Almost always present) cinnamon rufous. Feet are always black and tail is much less mixed with white than is monax. Color--Upper parts, top of head varies from seal brown to clove brown. Fur, neutral gray to buff on the outer ends, and



Distribution of Marmota monax monax =
Distribution of Marmota monax bunkeri ||

brown to black at the base. Long hairs of upper parts clove brown to pure black broadly banded with tip of white then with the black band. On the majority of adults a faint ventro-lateral line of cinnamon rufous from the axilla to the groin. Food and habits the same as Monax. Range unknown.

Citellus franklinii (Sabine)

(Franklin's Ground Squirrel)

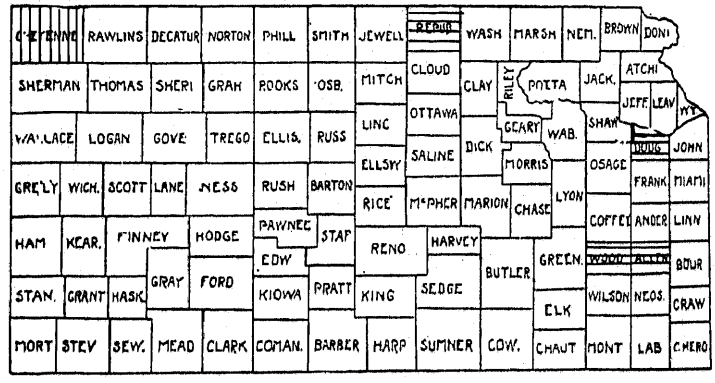
Dentition $\frac{1\ 0\ 2\ 3}{1\ 0\ 1\ 3} = 22$.

Relatively large animal, nearly equal to gray squirrel in size. Head rather rounded and nose blunt; ears low and rounded. Limbs short, tail flat and moderately bushy. Color--Upper parts iron gray, pepper and salt to brownish, marked with small light and dark spots. Tail mixed black and gray. Under parts--grayish to buffy. Habits and habitat--Are found on ground or in burrows. Are good swimmers, found in open fields, prairies and meadows. Usually the dirt about mouth of burrow is scattered about so that none of it shows. Food--grain, fruits, insects, eggs, and small mammals. Range--Central United States and Canada from Oklahoma and Illinois to Athabasca River.

Citellus obsoletus Kennicott

(Kennicott's spermophile or
Northern Spotted Ground Squirrel)

Dentition--Same as franklinii. Small spotted squirrel, short tail, half as long as head and body; ears small. Claws long and slender. Tail round, slightly bushy toward tip. Color--Upper parts sandy gray with



Distribution of Citellus franklini
Distribution of Citellus obsoletus

yellowish tinge, indistinctly spotted with grayish white; hands and feet whitish, tail above like back. Somewhat bushy on end and banded with black. Below pale ochraceous, banded with black near tip and fringed with yellowish. Under parts--Whitish to creamy white. Habits and food--same as franklinii. Range--Western Nebraska, South Dakota, Colorado, Utah, and Kansas. Limits unknown.

Citellus spilosoma major (Merriam)

(Large Spotted Ground Squirrel)

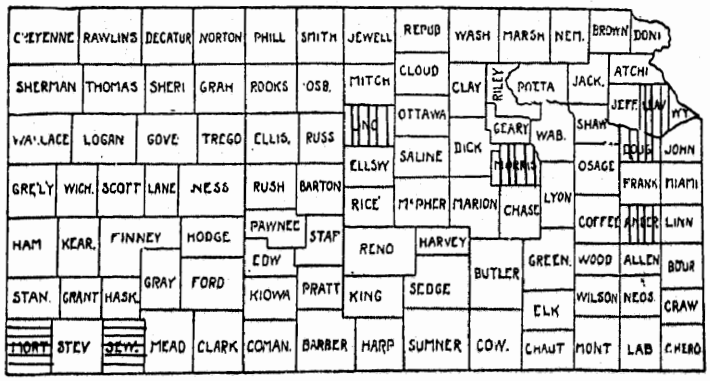
Dentition same as typical citellus.

Somewhat larger than obsoletus. Color--Upper parts, light brown spots indistinct and most numerous on rump; nose tinged with pale fulvus; tail pale reddish brown on body end, buffy brown on outer end, with black band on top of tail; tail below, buffy. Under parts--white. Habits and food--same as obsoletus. Range--Eastern New Mexico, Colorado, Kansas as far as Arkansas river valley.

Citellus tridecemlineatus tridecemlineatus (Mitchell)

(Thirteen Striped Ground Squirrel)

Small to medium size squirrel with conspicuously striped and color pattern; ears very small; body slender rather than large; tail short, less than one-half total length. Color--Upper parts heavily marked with alternate longitudinal stripes of dark brown and whitish, the dark stripes with central rows of whitish spots, stripes on neck to shoulders, solid and unbroken by spotting; end of nose yellowish brown, top of head indistinctly striped; sides of neck, lower sides of body, fore limbs, and under parts yellowish; tail mixed black and buffy. Habits and food--



Distribution of Citellus spilosoma major
Distribution of Citellus tridecemlineatus tridecemlineatus

same as above. Range--Southern Illinois and northern Missouri to northwestern Ohio, southern Michigan, and central Wisconsin, west and northwest to North Dakota and Saskatchewan.

Citellus tridecemlineatus pallidus (Allen)

(Pale Striped Ground Squirrel)

Slightly smaller than typical tridecemlineatus and paler in color. Color--ground color of upper parts, chestnut sparingly sprinkled with black, the light markings creamy white and as wide as the dark ones. Under parts, pale yellowish white. Food and habits as above. Range--From Montana and Southwestern North Dakota southeast to Kansas and south to Western Texas and New Mexico.

Citellus tridecemlineatus arenicola Howell

(Kansas Striped Ground Squirrel)

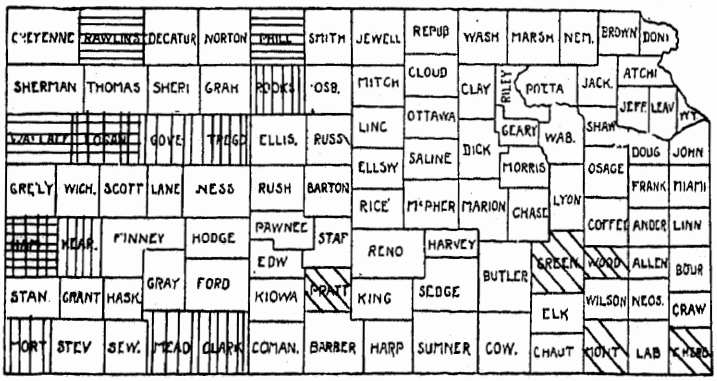
Similar to Citellus tridecemlineatus, but smaller and paler, the dark dorsal stripes snuff brown (instead of sepia). Food and habits those of typical tridecemlineatus. Range--Southwestern Kansas, extreme Eastern Colorado, Northwest Texas, to Western Oklahoma and Eastern New Mexico.

Citellus tridecemlineatus texensis (Merriam)

(Texas Striped Ground Squirrel)

Dentition $\frac{1\ 0\ 2\ 3}{1\ 0\ 1\ 3} = 22.$

Smaller than the typical tridecemlineatus, and redder in color.



Distribution of Citellus tridecemlineatus pallidus
Distribution of Citellus tridecemlineatus arenicola
Distribution of Citellus tridecemlineatus texensis

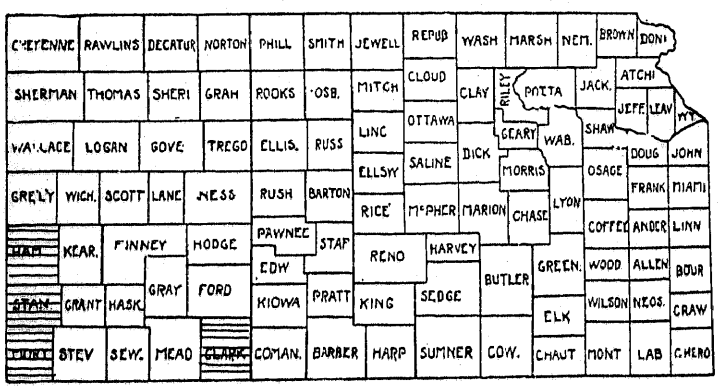
Color--Upper parts chestnut with light markings buffy; tail above with tinge of rusty red outer half, below strongly marked with rusty red. Under parts and edges of tail buffy. Food and habits same as above. Range--Found between 96 and 98 degrees in Texas north to Kansas. Limits of range unknown.

Cynomys ludovicianus ludovicianus (Ord)

(Prairie Dog)

Dentition $\frac{1\ 0\ 2\ 3}{1\ 0\ 1\ 3} = 42$.

A heavy-bodied squirrel-like animal. About the size of a small woodchuck; head broad and rounded; ears low and rounded; body stout; tail very short, flat, and well haired; legs short, wrist and heel well furred with tuft of hair in center of palm, forefeet with five claws; cheek pouches present. Fur rather coarse. Color--upper parts dark pinkish cinnamon with grizzling of buff; whitish or buffy on sides of nose, upper lip, and eye ring; sides, arms, and legs pale cinnamon; feet buffy, tail like back except for outer third which is blackish, under side of tail paler than above. Under parts, whitish to buffy white. Habits and habitat--Live in colonies, dig deep holes, piling the dirt around the opening. Sit up on their haunches and bark at their enemies. Very destructive. Food--Green vegetation, grass, and grass roots. Range--Great plains region of western United States, south from near the Canadian border in Montana to west central Texas (Mason County to eastern Pecos Valley), east to about the ninety-seventh meridian in Nebraska, Kansas, and Oklahoma; west to the Rocky Mountains in central Montana, Wyoming, and Colorado, and in extreme eastern New Mexico.



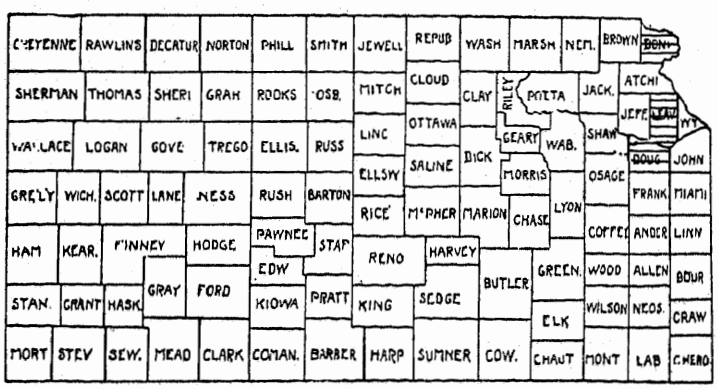
Distribution of Cynomys ludovicianus ludovicianus

Tamias striatus griseus Mearns

(Gray Striped Chipmunk)

Dentition $\frac{1\ 0\ 1\ 3}{1\ 0\ 1\ 3} = 20.$

A small, terrestrial Squirrel, with conspicuous dorsal stripes; flattened and hairy tail; well developed cheek pouches; ears prominent but short and rounded. Color--Upper parts: Summer, grizzled rusty red to reddish brown from nose to rump, clearest and brightest on rump; five blackish stripes extending from shoulders to rump, arranged as follows: a black median stripe running from between ears almost to root of tail, most conspicuous from shoulders to hips; on either side of the median stripe is a narrow band of the grizzled reddish or chestnut body color; then on either side are two dark stripes, shoulders to hips, separated by a light colored stripe, bright buffy to whitish. While those dark and light stripes are brilliantly conspicuous along most of their extent, they fade away more gradually into the body color of the neck and shoulders and rump. Upper side of tail similar to back, the hairs banded with black and tipped with whitish or yellowish; ochraceous or buffy stripes above and below the eye and a dark stripe passing through eye; flanks and sides tawny brown or chestnut; hands and feet ochraceous to tawny. Under parts--Much lighter colored than above, generally whitish, sometimes with suffusion of buffy or ochraceous; under side of tail rufous, bordered laterally with blackish and fringed with gray. Habits and habitat--Generally found on ground although it can climb trees when feeding or running from dogs. When alarmed gives a sharp chirping whistle accompanied by short twitchings of the body or tail. Food--A great variety of seeds, grains, nuts, acorns, berries, and some insects, birds' eggs, and young mice. Range--Eastern North America through northern Illinois, Wisconsin, Minnesota, Michigan, Iowa, and eastward to the Atlantic south to about latitude 34°.



Distribution of Tamias striatus griseus

Tamias striatus venustus Bangs

(Southern Chipmunk)

Dorsal stripes shorter, but colors brighter and more intense than in typical striatus. Habits and foods are same as above. Range--Found in the extreme southwestern limits of the range of the striatus group. Oklahoma and Kansas.

Sciurus carolinensis carolinensis Gmelin

(Gray Squirrel)

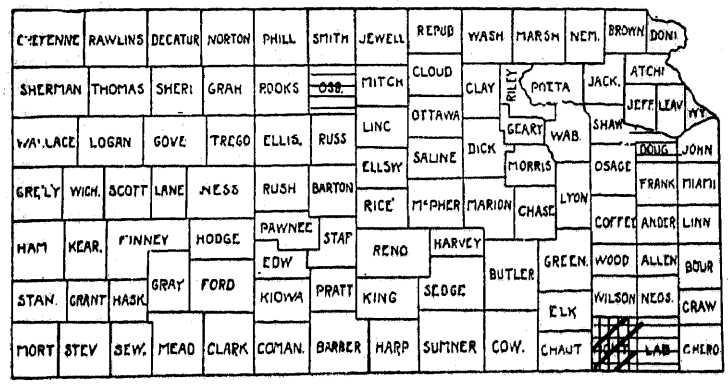
Dentition $\frac{1\ 0\ 2\ 3}{1\ 0\ 1\ 3} = 22.$

A large, arboreal Squirrel with long, flat, bushy tail; ears usually without tufts; prevailing color of upper parts grayish. Color--Upper parts mixed gray and yellowish brown, head and back darker and with more of a brownish tinge than sides of limbs, neck, and rump which are grayish; ears yellowish white; hairs of tail yellowish at base, banded with black, tipped with white, the general impression being blackish overlaid with white. Under parts--whitish. Habits and Food--Mainly of vegetable nature, such as nuts, fruits, buds, seeds, grains, some animal food such as insects, and their larvae, young birds and eggs. Range--Forest parts of eastern North America from Florida to southern New Brunswick and Ontario, west through the Alleghenies south of Pennsylvania to Indiana, Missouri, Oklahoma, and the edge of the plains.

Sciurus niger rufiventer (Geoffroy)

(Western Fox Squirrel)

Rather medium sized squirrel, total length approximately 21 inches. Color--variable but usually tawny brown, grizzled with gray above, pale



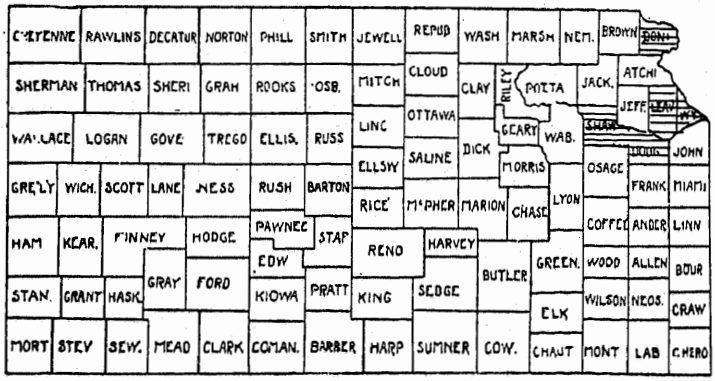
Distribution of Tamias striatus venustus
Distribution of Sciurus carolinensis carolinensis
Distribution of Sciurus niger rufiventer

reddish or yellowish brown below. Nose and ears never white, tail mixed black and tawny. Range--Greater part of Mississippi valley from northern Louisiana to southern Wisconsin.

Glaucomys volans volans (Linnaeus)

(Flying Squirrel)

An arboreal squirrel of small to medium size, with large eyes, very soft pelage, and broad, lateral folds of skin extending from wrists to ankles which enclose a slender, cartilaginous process or stiffening rod arising from the wrist. Tail flat and broad, tip rounded. Color--Upper parts--Varying with the individual, from drab to pinkish cinnamon; washed with pinkish buff along sides; fur state colored at base; head grayish, ears light brown; tail above similar to back but without pinkish suffusion, below, light pinkish cinnamon; hind feet hair brown, toes white. Under parts--White to roots of hairs, under side of flying membrane edged with pinkish cinnamon. Summer specimens are darker than winter ones. Habits and foods--Nuts, seeds, berries, buds, grain, occasional insects and meat when it can be secured. Very nocturnal; almost never seen during the day. Range--Found in Northeastern United States and extreme southern Canada, from central Minnesota, Wisconsin, and Michigan, southern Ontario, northern New York and southern New Hampshire south to North Carolina, Tennessee and northern Arkansas and Oklahoma eastern Nebraska and eastern Kansas.



Distribution of Glaucomys volans volans

Geomys bursarius (Shaw)

(Shaw's Pocket Gopher)

Large in size and dark in color. Color--Upper parts dark brown to chestnut; forefeet white, hind feet dirty white; tail white toward tip, brownish toward body. Under parts--lighter brown than upper parts. Habits and habitat--Lives in burrows in ground. Strictly terrestrial. Food--Strictly vegetable as roots and underground tubers, bulbs as well as surface foliage and green vegetation, occasionally bark. Destructive to crops such as potatoes, garden vegetables, alfalfa, clover, grain, and in orchards to the roots of fruit trees, especially apple and pear. Range--Found in upper Mississippi Valley from a short distance south of the Canadian boundary southward to eastern Kansas, southeastern Missouri, and southern Illinois east nearly to Lake Michigan, west to the Dakotas and Nebraska.

Geomys lutescens (Merriam)

(Yellow Pocket Gopher)

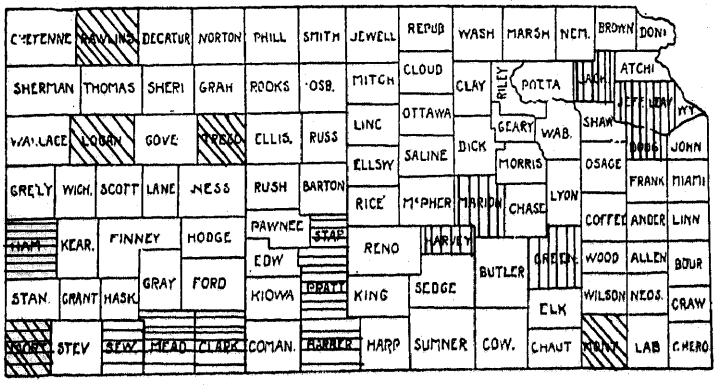
A pale, medium sized species, with tail of medium length; scantily haired. Color--Upper parts in summer pale, dull yellowish to buffy ochraceous; Under parts buffy. In winter, drab above, with many black tipped hairs along dorsal line to form dorsal band. Habits and habitat--Live in burrows in the ground, storing up food in underground bins or holes. May be quite destructive to small trees due to cutting of roots. Food--Vegetation, seeds, etc. Range--The Upper Sonoran Belt of the Great Plains from Southwestern South Dakota southward to Colorado, Texas, covering the sand hill region of western Nebraska, extreme eastern Wyoming, western Kansas, eastern Colorado, western Oklahoma, and western Texas.

Geomys breviceps llanensis Bailey

(Mesquite Plains Gopher)

Larger and lighter colored than typical breviceps. Color--Upper parts light liver brown above, sometimes darker, back dusky. Under parts creamy to buffy white. Habits and food--Seeds and few roots, same as Kansas pocket mouse. Likes sandy river bottoms or in scattered

mesquite bushes. Range--Texas, Colorado, and southcentral Kansas.



Distribution of Geomys bursarius
Distribution of Geomys lutescens
Distribution of Geomys breviceps llanensis

Perognathus flavescens flavescens (Merriam)

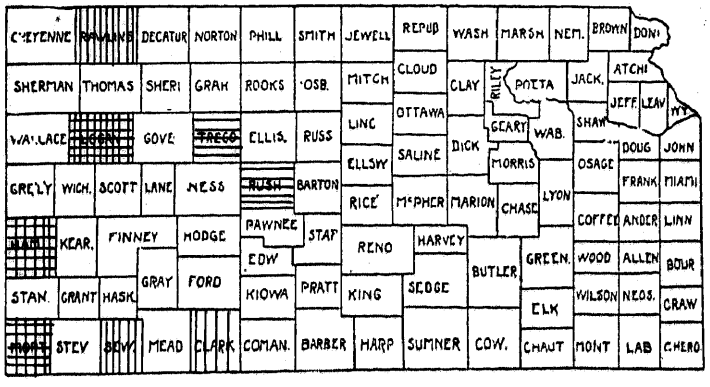
(Plains Pocket Mouse)

A small mouse with fur-lined cheek pockets; tail fairly long; hind legs long; ears small but not hidden in fur; nocturnal in habit. Color--Upper parts light grayish buff mixed with dusky; tail indistinctly bicolor; under parts, feet and legs white. Habits--Burrow in ground but play at night. They carry seeds and nuts in the cheek pockets to an underground storehouse. Found in sandy parts of the plains. Food--Seeds, nuts, vegetable bulbs. Range--Upper Austral Plains of South Dakota, Nebraska, and Kansas, south possibly to northern Texas, and west to base of Rocky Mountains.

Perognathus flavus flavus Baird

(Baird's Pocket Mouse)

Very small; pelage very soft; tail short, moderately haired; sole of hind foot hairy on upper half. Color--Upper parts pinkish buff with light sprinkling of black, darkest on back; lateral line not sharply differentiated; a prominent buffy spot back of ear; tail almost concolor, slightly dusky above, pale buffy below. Under parts--pure white. Habits and food--Same as Kansas pocket mouse. Range--Found in Upper and Lower Sonoran Zones from northeastern Colorado and western Nebraska to northern Mexico, extending westward into central Arizona and eastward to western Texas.



Distribution of Perognathus flavescens flavescens
Distribution of Perognathus flavus flavus

Perognathus hispidus paradoxus (Merriam)

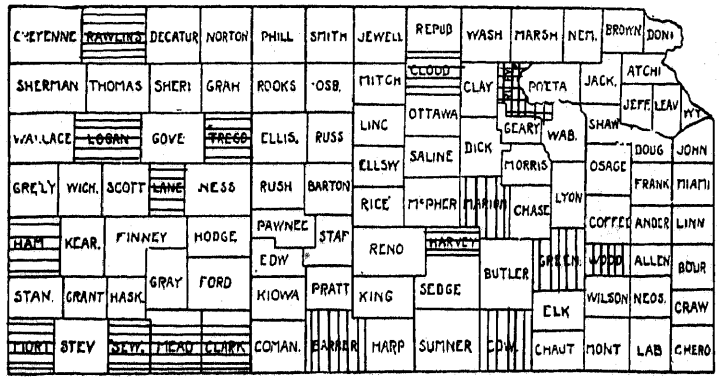
(Kansas Pocket Mouse)

Like typical hispidus but larger and with softer pelage. Color--Paler and duller. Habits and Foods--Plaindwellers in loose soil or sand; burrow extensively. Spend much time above ground. Seeds and grains. They store up much food. Strictly nocturnal. Range--Upper Sonoran Zone of the Great Plains from the Dakotas to Texas, westward to base of Rocky Mountains.

Perognathus hispidus maximus Elliott

(Oklahoma Pocket Mouse)

Resembling typical hispidus but larger in size and brighter in color. Color--Upper parts ochraceous heavily mixed with black; face without so much black; lateral line bright ochraceous buff; inside of ear dusky, outside buffy; tail above blackish brown, below, white, sides buffy. Underparts white. Range--Found in Cleveland County, Oklahoma. Limits unknown.

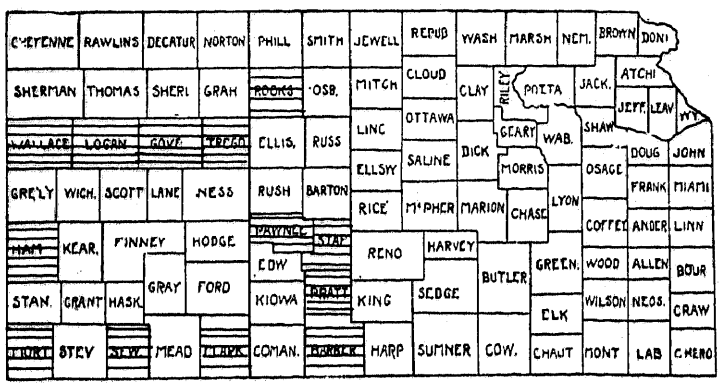


Distribution of Perognathus hispidus paradox
Distribution of Perognathus hispidus maximus

Dipodomys ordii richardsoni (Allen)

(Kangaroo Rat)

Paler colored than montanus, smaller than luteolus. Upper parts pale buffy ochraceous, sprinkled with black. Habits and food--Seeds are main food. Do not hibernate. Very clean little animals, very gentle disposition, make fascinating pets. Usually live on prairies, arid plains, and deserts. Like sandy, loose, dry soil. Burrow extensively and spend most of the daytime underground. Range--Found in Oklahoma, western Kansas and Texas, eastern New Mexico, Colorado, northeastern Utah and Wyoming.

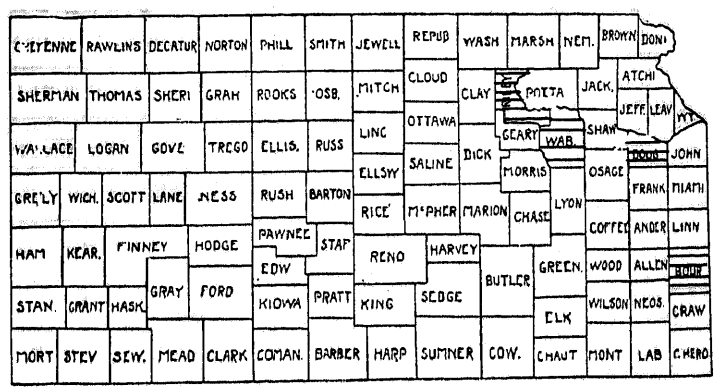


Distribution of Dipodomys ordii richardsoni

Castor canadensis missouriensis Bailey

(Missouri River Beaver)

Size very large, largest of North American rodents; form heavy; tail broad, flat, scaly; ears short; five toes on fore and hind feet; hind feet webbed, with claw of second toe split or double; fur made up of long, hard hairs and soft underfur. Color--Upper parts rich dark brown, the long hairs chestnut brown, the underfur without any reddish tinge; head brighter; incisors orange; under parts somewhat lighter in tone than upper parts and lacking the chestnut tinge. Habits and habitat--Noted for its pelt. Found near water courses where it builds its home in the bank with the opening leading into it from under the water. The beaver constructs dams on streams, felling the trees with its teeth. A beaver cannot "fell" a tree in any direction but rather lets it fall where it may and then cuts it up into sections and drags it down to the water. Food--bark, twigs, and even trees as aspen, cottonwoods, and willows. Also roots of water plants and grass. Range--Found on the Missouri River drainage from Nebraska north and west to Montana.



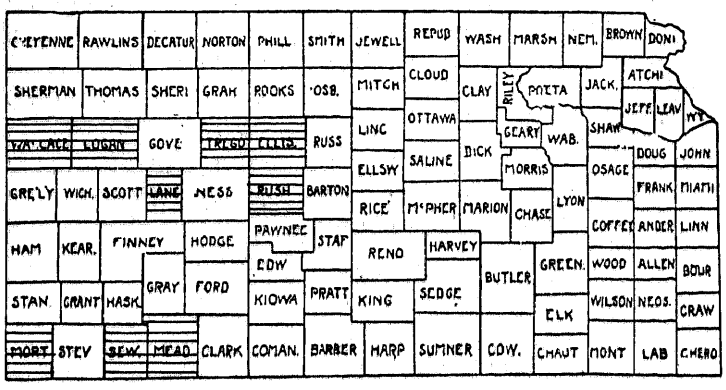
Distribution of Castor canadensis missouriensis

Onchomys leucogaster arenicola (Rhoads)

(New Mexico Grasshopper Mouse)

Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16$.

A rather sturdily built mouse with a comparatively short tail which is thick and tapering. Forefoot fairly large with five tubercles; hind foot with four tubercles, densely furred on sole from heel to tubercles; color pattern sharply bicolor. Color--Upper parts light wood brown washed with pinkish cinnamon sprinkled with dark brown hairs, darkest along back region and top of head; nose grayish; pure white tufts at the base of ears; ears dark brown on front, whitish behind; lined inside with white hairs; tail white with narrow middle stripe above. Under parts--clear white in marked contrast to upper parts, white reaching up on lower sides and cheeks, and extending down on feet; fur of upper parts blackish slate at base, fur of under parts white at base on throat, chin, and forelegs, blackish slate at base on middle chest and abdomen. Habits and habitat--Found on plains and dry areas, not in woods. Life in burrows in the ground. Easily identified by the white underparts and the short thick tail. Food--Insects, seeds, and other vegetation. Range--Upper Sonoran and Great Plains, Wyoming and South Dakota to Texas, north to Big Horn River in Wyoming and to the Cheyenne River in South Dakota, east to Vonesteele, South Dakota and Trego County, Kansas, south to Fort Lancaster, Texas, and west to Bear River divide in southwestern Wyoming; Golden and Salida, Colorado, Santa Rosa, New Mexico.

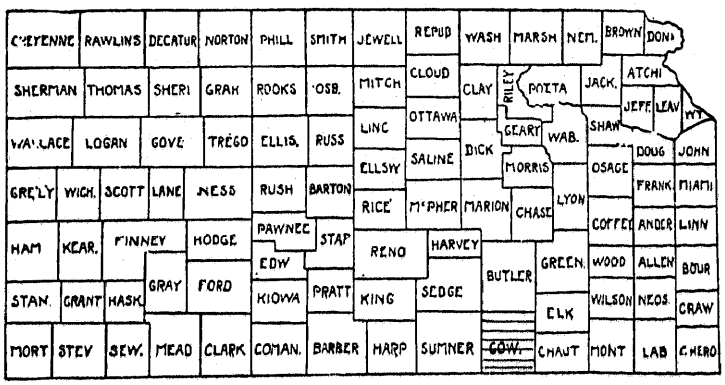


Distribution of Onchomys leucogaster arenicola

Onychomys leucogaster breviauritus Hollister

(Oklahoma Grasshopper Mouse)

Larger than arcticeps. Tail short; no conspicuous ear tufts. Color--Upper parts (winter) rich blackish brown; sides lighter; hips and rump almost pure pinkish cinnamon; gray on nose; cinnamon at base of whiskers; cinnamon-buff ear tufts; grayish brown on upper side of tail; under parts white. Summer, grayish brown above, no conspicuous tufts on ears. Food and habits same as arcticeps. Range--Eastern Nebraska, eastern and south-central Kansas and Oklahoma.



Distribution of Onchomys leucogaster breviauritus

Reithrodontomys albescens griseus (Bailey)

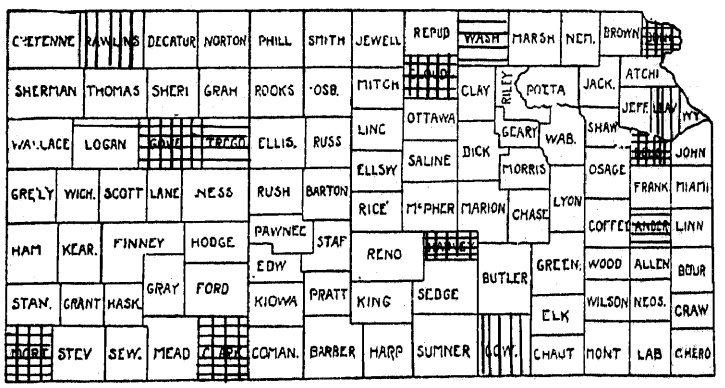
(Gray Harvest Mouse)

A small long-tailed mouse with longitudinally grooved incisors. Ears large and prominent, no cheek pouches; tail slender; sparsely haired; soles of hind feet with six tubercles. Looks somewhat like a small house mouse. Color--Upper parts dark brown, darkest along middle of line of back forming an indistinct stripe. Under parts, grayish washed with light pinkish cinnamon; under parts sand color of sides merging into one another. Food--mostly wild or native vegetation, rarely eats cultivated vegetation. Habits--same as above. Range--Southern Nebraska, Kansas, Oklahoma, and central and western Texas and eastern New Mexico.

Reithrodontomys megalotis dychei (Allen)

(Dyche's Harvest Mouse or Prairie)

Description same as griseus in size. Color--blacker with an ochraceous tinge, tail bicolor, brown above, white below. Under parts white. Habits and Food--Same as griseus. Range--Greater part of Kansas, Nebraska, Iowa, Missouri, South Dakota, southern North Dakota; southeastern Montana; eastern Colorado and eastern Wyoming.

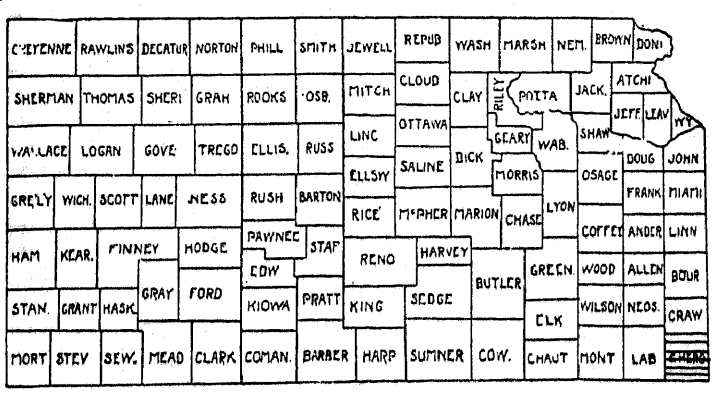


Distribution of Reithrodontomys albescens griseus =
Distribution of Reithrodontomys megalotis dychei ||

Reithrodontomys fulvescens aurantius (Allen)

(Golden Harvest Mouse)

Description and Dentition--Same as typical reithrodontomys. Color--Upper parts dark yellowish buff with heavy mixture of blackish brown along back, sides dark rich yellow or tawny. Under parts grayish white, often washed with pale buff; tail brownish above, grayish white below. Habits and food--Same as typical reithrodontomys. Range--west of Mississippi River, in Louisiana, south and east central Arkansas, eastern Texas, and eastern Oklahoma, southwestern Missouri, and southeastern Kansas.



Distribution of Reithrodontomys fulvescens aurantius

Peromyscus maniculatus osgoodi Mearns

(Black-eared Mouse)

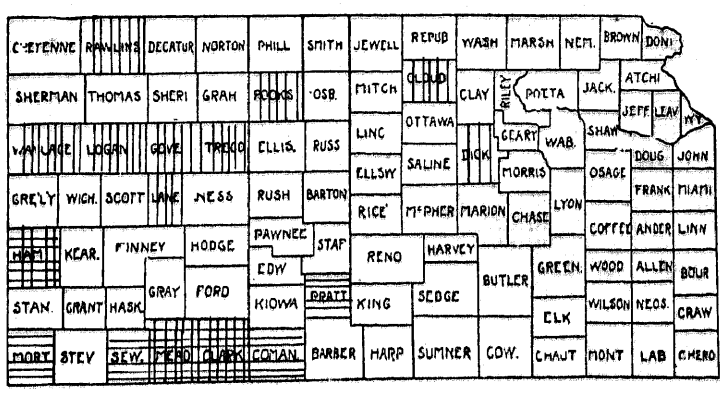
Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16.$

Mouse of medium size, tail long and well haired; ears of good size, thinly covered with hair; eyes rather large; soles of hind feet with six tubercles. Color pattern distinctly bicolor. Color--Upper parts cream buff to pale yellowish buff with light sprinkling of dusky. Back not much darker than sides; white tufts on front side of ear at base, clear buffy spots at back side of ear on base. Ankles buffy, sometimes touched with dusky, tail bicolor, blackish brown above and white below. Under parts--clear creamy white. Habits and Food--Strictly ground inhabitants, prefer cover such as woods or long grass easily recognized by white underparts and white feet. Food--Seeds and grains, nuts and dry vegetable food. Range--Eastern parts of Montana, Wyoming, Colorado, western parts of Nebraska, and Kansas in Upper Sonoran and Transition Zones.

Peromyscus maniculatus nebrascensis (Coues)

(Nebraska Deer Mouse)

Resembles Osgoodii, except small in size, ears noticeably smaller and color brighter. Color--Upper parts yellowish buff, sometimes much brighter and near orange buff, with light sprinkling of dusky; no distinct stripe on back. Under parts--clear creamy white. Feet white. Habits and Food--Same as typical peromyscus. Range--Sandhill region of western Nebraska and adjoining parts of states of Kansas, Colorado, South Dakota, Wyoming. Possibly western North Dakota and south to western Oklahoma.



Distribution of Peromyscus maniculatus osgoodi =
Distribution of Peromyscus maniculatus nebrascensis ||

Peromyscus maniculatus bairdii (Hoy and Kennicott)

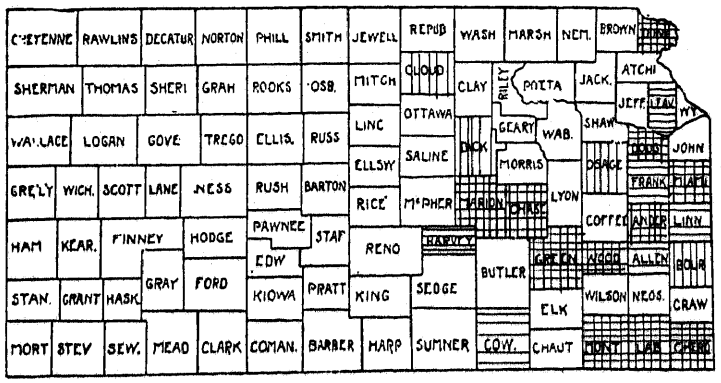
(Baird White-footed Mouse)

Description similar in size to Nebraskensis, but darker in color. Color--Upper parts Russet or warm brown, heavily sprinkled with black, usually darker along mid back; a narrow russet lateral line may be present; tufts at bases of ears, russet mixes with blackish upper side of tail in sharp contrast to white underside. Under parts, clear white. Habits and Food--same as typical peromyscus. Range--Prairie region of Upper Mississippi valley in southern Wisconsin, Minnesota, Illinois, and Indiana, eastern Ohio, Iowa, Missouri, Oklahoma, and eastern parts of Kansas and Nebraska, South Dakota, North Dakota, north to southern Manitoba. Upper Austral and Transition Zones.

Peromyscus leucopus noveboracensis (Fischer)

(Northern White-footed Mouse)

Size in common with maniculatus. Hind foot hairy on front 2/5. Feet white, hairy tail, color fawn to cinnamon rufous or bright tawny, with light sprinkling of dusky, heaviest on back, less on sides. Under parts, creamy white. Habits and Food--Same as Maniculatus. Range--Upper Austral and Transition Zones of eastern United States and Canada, from Nova Scotia to central Minnesota, then south through eastern Nebraska and Kansas and eastward to Atlantic Coast.



Distribution of Peromyscus maniculatus bairdi
Distribution of Peromyscus leucopus noveboracensis

Peromyscus leucopus tornillo (Mearns)

(Tornillo Mouse)

Resembles aridulus, but paler fawn colored instead of yellowish. Color--Upper parts fawn finely lined with dusky tail, indistinctly bicolor, pale brownish above and white below. Under parts, clear creamy white. Habits and Food--Typical leucopus. Range--Upper Sonoran Zones and part of lower Sonoran Zone of western Texas and eastern New Mexico; north to southwestern Kansas, southeastern Colorado and western Oklahoma.

Peromyscus leucopus aridulus Osgood

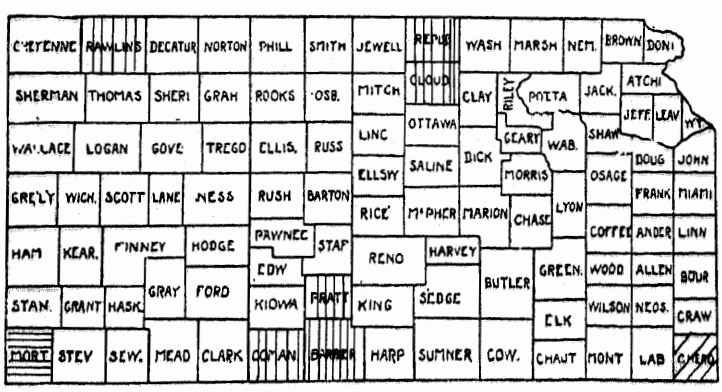
(Bad Lands White-footed Mouse)

Larger and paler than noveboracensis. Color--Upper parts yellowish buff, lightly sprinkled with dusky; back very little darker than sides. Under parts, creamy white. Habits and Food--Same as noveboracensis. Range--Upper Sonoran Zone of eastern Montana and Wyoming and adjoining western parts of South Dakota and Nebraska; south to Oklahoma and Kansas, west into eastern Colorado.

Peromyscus boylii attwateri (Allen)

(Attwater's Deer Mouse)

Tail as long or longer than length of head and body; ears medium size; under side of hind foot hairy, fore front 2/5 hairy. Color--Under parts, creamy white; upper parts pale cinnamon sprinkled with dusky; slightly grayish about head; yellowish buff on lower sides of face, narrow line on back, dusky on hind leg down as far as upper side of hind foot. Habits and Food--Found chiefly in rocky cliffs, eats mostly seeds and grains.



Distribution of Peromyscus leucopus tornillo
Distribution of Peromyscus leucopus aridulus
Distribution of Peromyscus boylii attwateri

dry vegetable food. Range--South-central and parts of western Texas; north to eastern Oklahoma, central Missouri, southern Kansas.

Oryzomys palustris texensis Allen

(Texas Rice Rat)

Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16.$

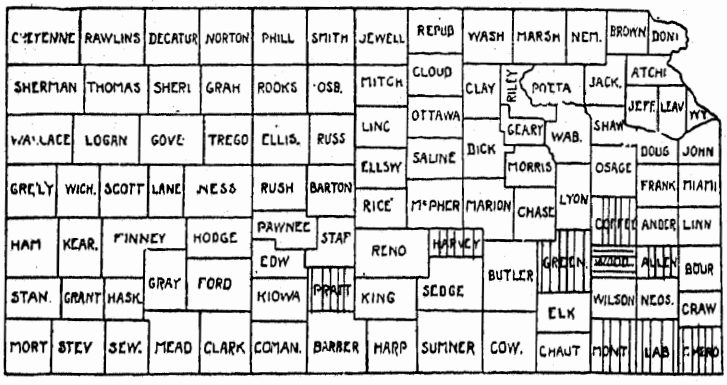
Very rare. Similar to typical palustris but paler in color, with less coloring above. Color--Upper parts grayish brown without the wash of tawny or buffy. Under parts, sometimes with a light buffy wash. Habits and Foods--Frequents meadows and grassy lands, mainly nocturnal. Eats grasses, sedges, and foliage of shrubs, rice and seeds of native plants, some animal food such as small crustaceans, mollusks, and meat. Range--From Corpus Christi Bay north and east along the Gulf Coast of Texas and Louisiana to the delta of the Mississippi, thence north in the Mississippi valley to southeastern Missouri; general range reaching southeastern Kansas probably by way of Arkansas river valley through Oklahoma.

Sigmodon hispidus texianus (Audubon and Bachman)

(Texas Cotton Rat)

Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16.$

Rather small rat with long rather rough hair. Ears nearly hidden in fur; tail slightly less than equal to length of head and body, scaley and thinly haired. Color--Upper parts grayish brown to dark buffy gray, feet gray; under parts, whitish to grayish white. Habits--Found in grass lands and open places, may prove injurious to crops, may be found in burrows, under rocks, logs, or other surface shelters. Food--Stems, foliage and



Distribution of Oryzomys palustris texensis
Distribution of Sigmodon hispidus texianus

seeds of plants, grasses, and cultivated crops. Range--Approximate eastern half of Texas, westward to Vernon and San Antonio, northward to southwestern Missouri and southeastern Kansas.

Neotoma floridana baileyi (Merriam)

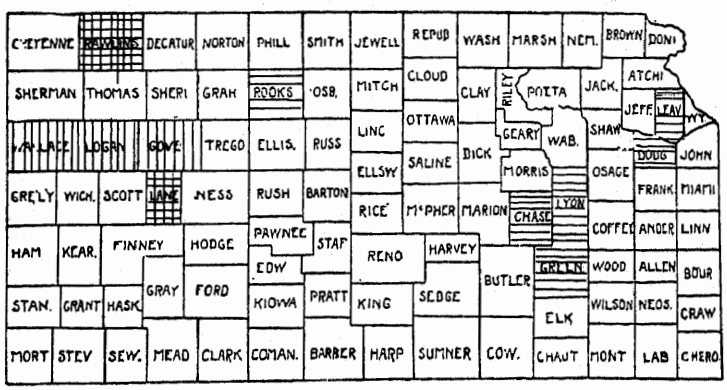
(Bailey's Wood Rat)

Pelage longer than in typical floridana; grayer in color; tail shorter, bicolored. Color--Upper parts in winter creamy buff to buffy gray sprinkled with dusky on back; sides clearer in tone than back; feet white; tail brownish gray above, white below in sharp contrast. Summer pelage dark rusty brown above. Under parts, white. Habits and Food--Usually build large conspicuous nests of dead twigs, grass and debris. Seems to be possessed of an inquisitive or collecting instinct. Sometimes called trade rat, will often take coins, nails or any bright object and bring something else in return for them. May be seen either night or day. Food--Green vegetation such as foliage and grass; fruit, roots, bulbs, bark, fungi, and seed and nuts. In desert regions cactus is an article of diet. Range--Western North America southward into Mexico and the Gulf states; Florida and a narrow belt from southern New York to Tennessee.

Neotoma floridana campestris (Allen)

(Kansas Wood Rat)

Almost like baileyi, except softer fur and slight color difference. Color--Upper parts buffy ochraceous to light yellowish gray; a white stripe from posterior base of ear down side of neck to throat; no ochraceous spot on side of throat in front of foreleg; tail paler below than above but not sharply bicolor. Foods and Habits--Same as baileyi. Range--Found in



Distribution of Neotoma floridana baileyi
Distribution of Neotoma floridana campestris

western Kansas and eastern Colorado.

Neotoma micropus micropus (Baird)

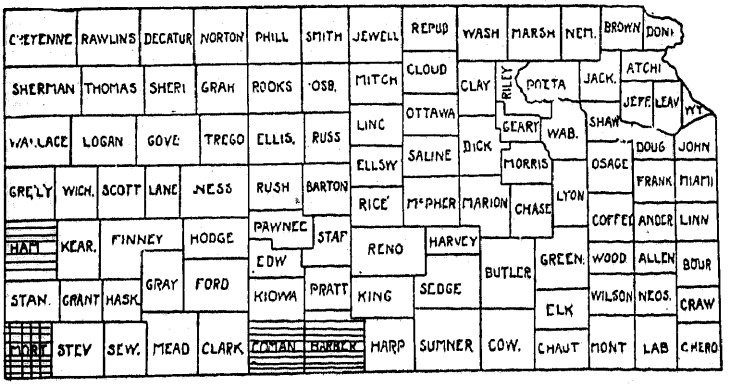
(Baird's Wood Rat)

Paler than compestris, fur short and somewhat coarse in texture. Color--Upper parts in winter pale ecru drab, with dusky hairs along back; tail above blackish, below grayish; feet white. Under parts, white, on pectoral and inguinal regions white to roots of hair. Habits and food--Same as baileyi. Range--Found in southeastern Colorado and southern Kansas, south through Oklahoma and central Texas to southern Tamaulipas, mainly in Lower Sonoran Zone.

Neotoma micropus canescens Allen

(Hoary Wood Rat)

Smaller than typical micropus with longer fur and paler color. Color--Upper parts in winter pale ashy gray with light blackish wash on back; tail grayish brown to blackish above; rest of pelage as in typical micropus. Habits and food--Same as baileyi. Range--Southeastern Colorado, northwestern Oklahoma, and northern and western Texas, west in New Mexico to the Rio Grande Valley and south to southern Coahuila, mainly in Lower Sonoran Zone.



Distribution of Neotoma micropus micropus
Distribution of Neotoma micropus canescens

Synaptomys cooperi gossii (Coues)

(Goss' Lemming Mouse)

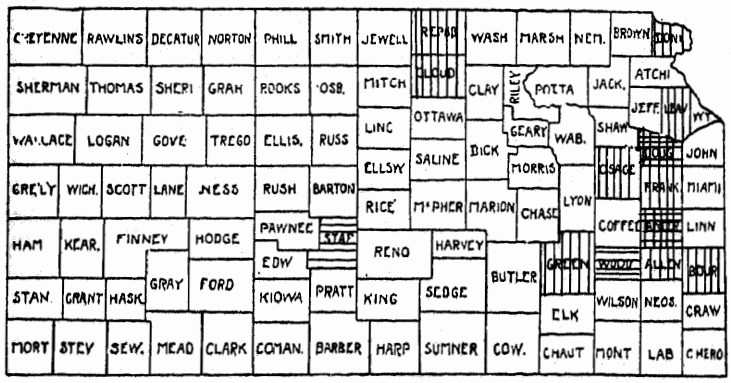
Very much like a short-tailed meadow mouse. Form thick set; tail very short; fur coarse, incisors orange; upper incisors with longitudinal groove, molars rootless, nail of first toe of forefoot flat. Color--Upper parts mixed grey reddish brown and black, giving a grizzled appearance similar to reddish brown. Tail brownish above, white below. Under parts, soiled whitish. Habits--Found in boggy or sepia areas. Preferably covered with blue grass, seems to appear in cycles. May be found in a given area one season, then disappear for a few seasons, only to reappear. Cause unknown. Food--Green grass, bulbs, insects. Not much is known about food habits. Range--West central Mississippi valley. Mostly in upper Austral Zone, from northeastern Arkansas and southern Illinois and into Kansas and Iowa, and in extreme southeastern South Dakota.

Microtus ochrogaster (Wagner)

(Meadow Mouse)

Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16.$

Medium size mouse, long loose fur, comparatively short tail, ears medium size, five tubercles on sole of foot, hind legs not elongated, tail covered with short hairs, upper incisors ungrooved. Color--Upper parts dark gray, grizzled black pale reddish, sides paler, feet dusky, tail bicolor dusky and buffy. Under parts, pale cinnamon to reddish. Habits--May be found under all conditions from swamp lands to plains and sea level to highest mountain ranges. Usually found in meadows and grass lands. Making well-defined runways through the grass. Best place to



Distribution of Synaptomys cooperi gossii
Distribution of Microtus ochrogaster

discover them is in rank heavy grass which retains moisture. Here their run-ways may be traced for long distances. The mice cut the grass to form clear passage or tunnel. Are generally active throughout day and night. Live in underground burrows. Food--vegetation, plants, shrubs, trees, and meat upon some occasions. Range--central part of Mississippi valley and from southern Wisconsin to southern Missouri and Ft. Reno, Oklahoma, west into eastern Nebraska and Kansas.

Microtus haydeni (Baird)

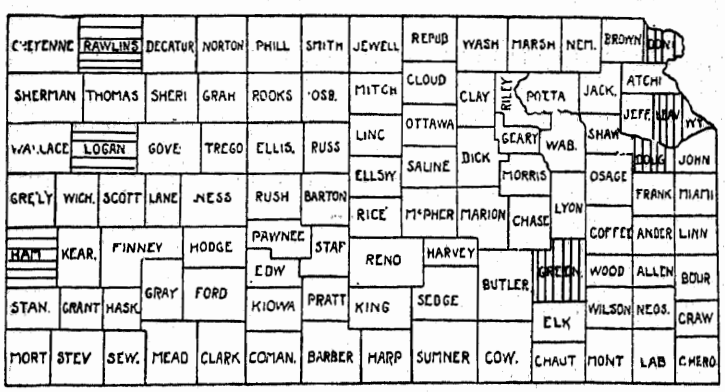
(Hayden's Meadow Mouse)

Description same as ochrogaster, only larger and lighter colored. Color--light gray, grizzled whitish and blackish; feet dusky gray; tail bicolor, dusky and whitish; under parts, silvery whitish to soiled whitish or light buff. Habits and food--Same as ochrogaster. Range--Plains region of South Dakota, Nebraska, and Kansas, eastern Colorado and Wyoming, and southern Montana, in Transition Zone.

Pitymys Memoralis (Bailey)

(Woodland Pine Mouse)

Ears large, fur long and coarse, tail short, colors bright. Color--Upper parts dull chestnut sprinkled with blackish; sides paler; feet pale buffy to dusky; tail faintly bicolor, above like back, below like belly. Under parts--washed with bright cinnamon. Habits and food--Live in mole-like tunnels just below surface of ground. Eat roots and bulbs, much like meadow mice in other habits. Range--West of the Mississippi River from central Arkansas north to Council Bluffs, Iowa.



Distribution of Microtus haydeni
Distribution of Pitymus memoralis

Ondatra zibethica zibethica (Linnaeus)

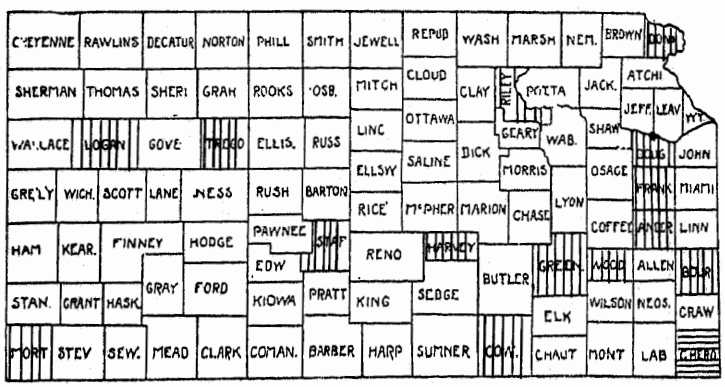
(Common Muskrat)

A large rat, short legs, broad feet specialized for swimming, hind feet partially webbed; tail long, flat, scaly, and sparsely haired; ears scarcely show above fur; secretes strong odor of musk. Has two types of hair, a close, waterproof underfur and longer, glistening guard hairs. Color--Upper parts dark brown, slightly darker on head; sides chestnut, pelage glossy; underfur slate colored at base. Under parts like pelage of sides, but washed with tawny and lighter in appearance, whitish on throat and belly; a blackish spot on chin and blackish about wrists and heels, tail black; feet, dark brown. Habits--Always live near water. Food--Eats mainly vegetation, mostly water plants, but sometimes traveling from water for other vegetation; some animal food such as mussels, fish, and salamanders. Range--Southeastern Canada, southeastern and east central United States from New Brunswick and Quebec west to Minnesota, and south to northern Georgia and Arkansas except along the Atlantic seaboard south of Delaware Bay.

Ondatra zibethica cinnamomina (Hollister)

(Great Plains Muskrat)

Smaller than typical zibethica, pale in color with cinnamon brown upper parts. Habits and food--Same as zibethica. Range--Great central plains region of western United States and Canada; from Manitoba south to northern Texas, east to central Iowa and west to the Rocky Mountains.



Distribution of Ondatra zibethica zibethica
Distribution of Ondatra zibethica cinnamomina

Mus musculus musculus (Linnaeus)

(House Mouse)

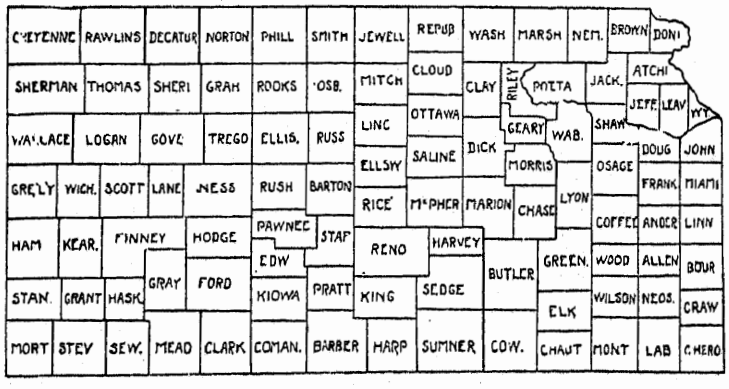
Dentition $\frac{1\ 0\ 0\ 3}{1\ 0\ 0\ 3} = 16.$

A small Mouse with long tail, sparsely haired, pelage dull in color, no great contrast between upper and lower parts. Color--Upper parts mixed yellowish brown and black, feet brownish, tail above dusky, below slightly lighter; under parts, ashy gray. Habits and food--Not necessarily a house mouse, but in northern climates must seek shelter in winter; almost omnivorous, but prefers grain and vegetable products. Range--Found almost everywhere in United States and Canada where settlements or commerce exist.

Rattus norvegicus (Erxleben)

(House Rat)

A good-sized rat, with large nearly naked, ears; long semi-naked tail with rather conspicuous annulations; pelage somewhat coarse; brown or grayish above, ashy below. Color--Upper parts grayish or brownish, with mixture of more or less black; feet grayish or whitish; tail not distinctly bicolor, dusky above, somewhat lighter below. Under parts, grayish to soiled whitish; transition in color from sides to under parts gradual. Habits and food--Frequently lives under filthy conditions, carrying diseases and very destructive. Practically omnivorous; eats grain, green vegetation, meat, eggs, etc. Range--Nearly everywhere men have settled.



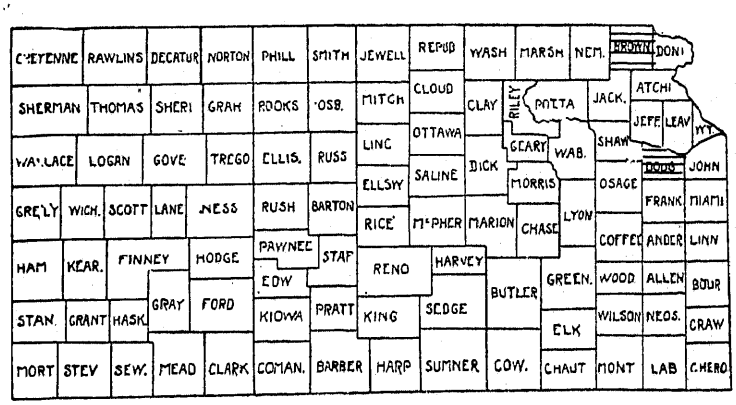
Rattus norvegicus and Mus musculus found throughout the state.

Zapus hudsonius campestris Preble

(Prairie Jumping-mouse)

Dentition $\frac{1\ 0\ 1\ 3}{1\ 0\ 0\ 3} = 16.$

Medium-sized mouse, with greatly elongated hind legs; very long slender tapering tail; short forelegs. Color--Upper parts mixed yellowish fawn and black; fur slate colored at base and only tips of hair is colored; a dark band from crown of head to base of tail on back. Tail above, grayish brown, below, white; feet white. Underparts, white. Habits and food--These mice show a fondness for meadow and grassy spots. Found in forested sections and on less arid plains. Hibernate during cold weather. Food--vegetation, seeds, and grain. Range--Most of United States and Canada, north to Artic Circle, south to California, North Carolina.



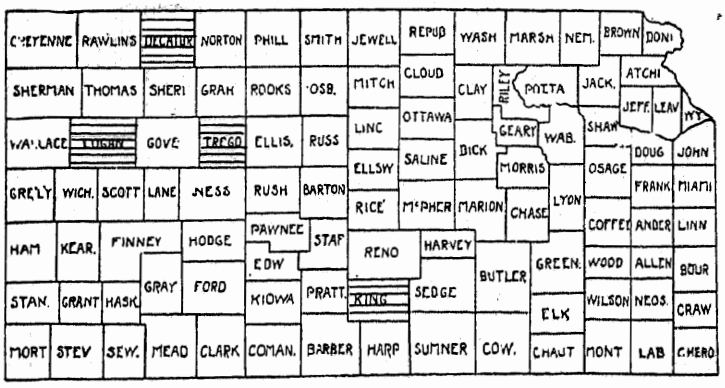
Distribution of Zapus hudsonius campestris

Erethizon epixanthum bruneri Swenk

(Nebraska Yellow-haired Porcupine)

Dentition $\frac{1\ 0\ 1\ 3}{1\ 0\ 1\ 3}$

A large, clumsy rodent, with long sharp spines in its fur. Head proportionally small; muzzle blunt; lips hairy; body thick and heavy; limbs short, four claws on fore feet, five on hind feet; tail short, thick, muscular. Hair fairly long, soft wooly with which is mixed much longer, hard, glistening hairs and long spines. Spines stiff, sharp, and barbed and occurring all over upper parts from crown of head and sides to end of tail. Under parts, spineless. Color--Upper parts very slaty black or brownish black, liberally sprinkled on upper parts and sides with light tipped hairs which are whitish to yellowish white; spines yellowish white tipped with greenish yellow; spines most conspicuous on rump and tail; incisors orange red; under side of the tail largely or wholly brownish yellow. Habits--Usually found on ground but may climb trees, often live in burrows. Very fond of salt and will frequently come to a habitation in search of anything salty. These animals may kill trees by removing too much bark or by girdling. The thick tail is used as a weapon of defense, and the spines may be deposited in an enemy by a quick slap of it. Porcupines do not shoot quills. The base of the quill is loosely fastened in the skin of the porcupine and any slight pressure against an enemy is enough to sink the barbs in, thus pulling them from their original position. Food--Bark, buds, foliage of trees, shrubs, and plants. Range--Found in forested area in Nebraska, Wyoming, Montana, and Kansas. Limits of range unknown.



Distribution of Erethizon epixanthum bruneri

Lepus townsendii campanius Hollister

(White-tailed Jack-Rabbit)

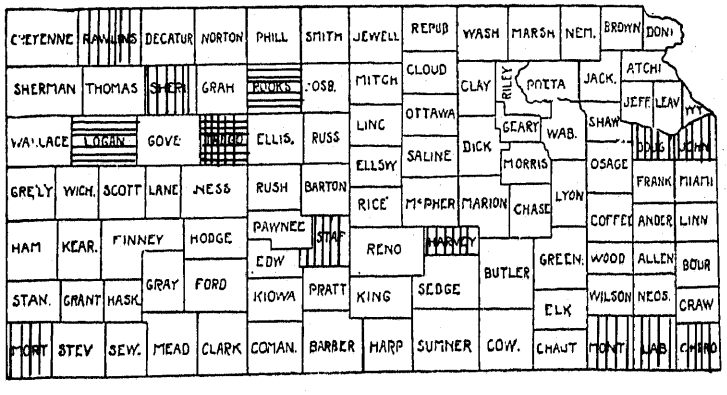
Dentition $\frac{2\ 0\ 3\ 2}{1\ 0\ 2\ 3} = 28$.

One of the largest of the rabbits, heavy body, long ears (4 inches or more in length), tail long and white throughout the year. Color--Upper parts a uniform buffy gray with yellowish suffusion; nape buffy to grayish; tail completely white, sometimes with a faint dusky median line above; legs much like back; tops of hind feet whitish. Under parts white, except for throat which is gray with buffy wash; ears brownish, washed with buffy or gray, black tipped and with white on posterior half. Winter pelage in northern part of range, pure white except for black tips to ears and irregular buffy patches on top side of forefeet, nose, and about eyes, dark rusty area about front and inside of ears; underfur of upper parts usually reddish brown. Habits and Food--Usually live on the plains, but may be found on mountain slopes to high elevations. Very fast runners, run with powerful leaps, twelve to twenty feet. Can outrun Black-tailed rabbits usually and almost all breeds of dogs. Food--Foliage, grass, grain, trees, and plants. Range--Found on the Great Plains of southern Canada and then south on plains of the United States east of the Rocky Mountains, over Montana, Wyoming, the Dakotas, Minnesota, to extreme southeastern corner Iowa, east to the Mississippi River, Nebraska, northern half of Kansas, Colorado, east of summit of the Rocky Mountains, and middle northern border of New Mexico.

Lepus californicus melanotis (Allen)

(Great Plains Jack-Rabbit or Black-eared Rabbit)

Same as campanius, except ears are longer and has a large whitish rump patch; black band from rump onto tail broad and well developed. Color--



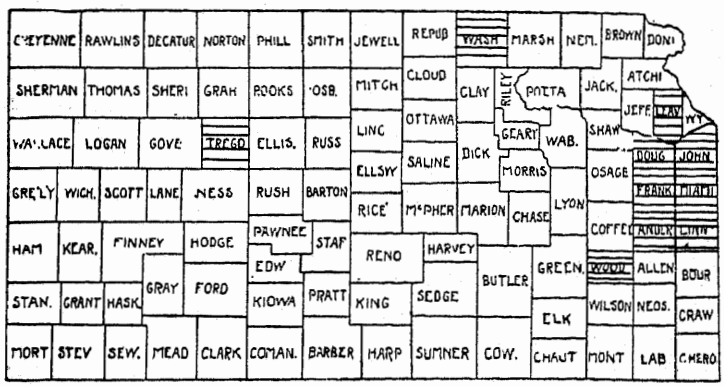
Distribution of Lepus townsendi campanius
Distribution of Lepus californicus melanotis

Upper parts pale buffy gray with light black wash, throat richly colored, deep yellowish buff. Under parts, white. Habits--In running the animal dodges from side to side and occasionally leaps into the air, possibly to ascertain the whereabouts of the pursuer. May be found in open prairies and slightly forested areas. When not eating or running, animals may be found crouched down beneath a tuft of grass, by a weed, or in a small depression in the ground, with ears laid back. It blends so well with the surroundings that one may walk by without noticing it. Food--Typical lepus. Range--Great Plains from east-central and northern Texas, northeastern New Mexico and north through western half of Indian Territory, all of Oklahoma, extreme eastern parts, southwestern Dakota, southeastern Wyoming, and all of Colorado east of the Rocky Mountains.

Sylvidagus floridanus mearnsi (Allen)

(Mearn's Cottontail)

A small medium-size, hind legs long, not so well developed as in Jackrabbits; ears large but not excessively developed. Tail short, white underside. Average total length of adult, 18 inches. Color--Upper parts varying from light buffy brown with reddish tinge to brown, with grayish wash; sides, rump, and back finely sprinkled with black, fore legs dark reddish cinnamon, fore feet more buffy than legs. Tail above rusty brown, below, clear white. Ears dark grayish, buffy bordered with black. Under parts, white except for buffy area on throat. Habits and Food--May be found in all regions. Come out for feed in late afternoon or early morning, on the prairies, commonest where green vegetation affords them food. Live in burrows in the ground. While it can run fast it depends on shelter for protection. Food--Green vegetation, grasses, bark, etc. Range--West of Allegheny Mountains from Lake Simcoe, Toronto, Canada, central New York, central Pennsylvania, western West Virginia, and eastern Kentucky, and eastern Tennessee, west through southern Michigan and Wisconsin to southeastern Minnesota, and south through Iowa to Trego, County, Kansas,



Distribution of Sylvilagus floridanus mearnsi

northern Missouri and Illinois, with all of Indiana and Ohio.

Sylvilagus floridanus similis Nelson

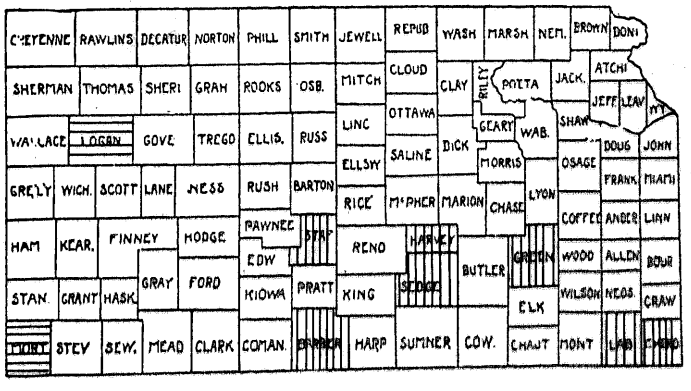
(Nebraska Cottontail)

Same as Mearnsi, except smaller. Average total length of adult 16 inches. Color--Upper parts pale pinkish buffy washed with grayish over shoulders and black over rest of back. Under parts, white. Habits and Food--Same as mearnsi. Range--Found on dry plains (mainly along wooded streams) of extreme western Minnesota, eastern North and South Dakota, all of Nebraska (except along the Missouri bottom lands) northern Kansas, northeastern Colorado, along tributaries of Platte River to base of mountains near Denver and southeastern Wyoming.

Sylvilagus floridanus alacer (Bangs)

(Oklahoma Cottontail)

Closely resembles mearnsi, except paler, with more rusty red on upper parts. Color--same as mearnsi except rusty red on upper parts. Habits and food--Same as mearnsi. Range--Found on Gulf coast from Mobile Bay, north through most of Alabama, northwestern Georgia; all of Mississippi, Louisiana, and Arkansas; western Tennessee and Kentucky, extreme southern Illinois, southern Missouri, southeastern Kansas, all of Oklahoma, except extreme western parts, and western Texas to eastern border of Panhandle.



Distribution of Sylvilagus floridanus similis
Distribution of Sylvilagus floridanus alacer

Sylvilagus sudubonii baileyi (Merriam)

(Wyoming Cottontail)

Slightly smaller than mearnsi. Average total length of adult, 17 inches. Fur long and thick, ears and feet hairy. Color--Upper parts pale creamy buff, lightly washed with black, neck light reddish throat dark to creamy buff. Under parts, white. Habits and Food--Same as Mearnsi. Range--Found in plains and valleys of eastern Montana, most of Wyoming, northeastern Utah, northwestern and eastern Colorado (east of the mountains), western parts of North and South Dakota, Nebraska, and as far east as Trego County, Kansas.

Sylvilagus auduboni neomexicanus Nelson

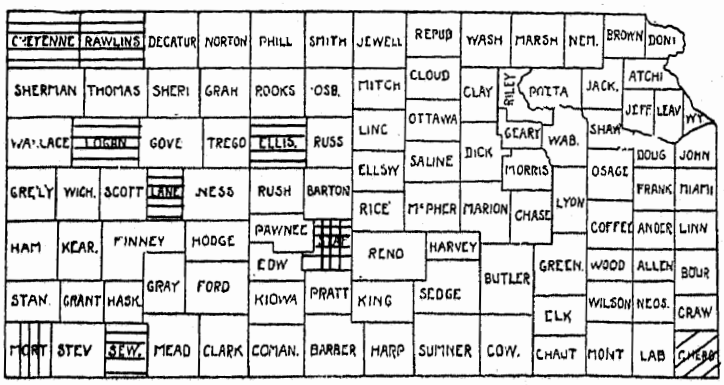
(New Mexico Cottontail)

Smaller than Mearnsi, total length approximately 15 inches, ears and hind feet about the same length as Mearnsi, more red in color. Color--Upper parts dark buffy gray, nape rufuous; poorly outlined rump patch dull iron-gray; throat dark ochraceous buffy. Under parts, white. Habits and food--Same as typical sylvilagus. Range--In Pecos Valley from near Fort Stockton, Texas, north to about Fort Sumner, New Mexico, and thence east to Abilene and Wichita Falls, Texas, and north through eastern New Mexico, western Texas, and western Oklahoma to extreme south central Kansas.

Sylvilagus aquaticus aquaticus (Bachman)

(Swamp Rabbit)

A large rabbit (total length of adult approximately 22 inches) with large ears. Color--Upper parts grayish brown washed with buffy, top of



Distribution of Sylvilagus audubonii baileyi
Distribution of Sylvilagus audubonii neomexicanus
Distribution of Sylvilagus aquaticus aquaticus

head yellowish buffy brown; rump reddish brown; sides grayer than back; legs and feet cinnamon; ears like top of head in color; tail, above, like rump, below, white. Under parts--clear white; throat dull buffy grayish. Habits and habitat--May usually be found in swamps or on the high ground between sunken areas. Food--Vegetation, berries, and nuts. Range--River bottoms and swamp woods from southwestern Georgia, west to near San Antonio, middle Texas, north to southeastern Kansas and wooded bottoms of Ohio and Mississippi rivers to southern Illinois.

SUPPLEMENTARY LIST

Myotis keenii septentrionalis (Trouessart) Bat

This bat should be found in the extreme northeastern corner of Kansas.

Myotis grisescens Howell Gray Bat

The gray bat has been taken in the southwest corner of Missouri and should occasionally occur in southeastern Kansas.

Nyoticeius humeralis (Rafinesque) Rafinesque Bat

This bat should occur occur occasionally in eastern Kansas as specimens have been taken in Oklahoma, Arkansas, and Nebraska.

Mustela vison mink (Peale and Beauvois) Southern Mink

The mind along the streams in the southeast corner of Kansas should be of these subspecies.

Vulpes macroura Baird Mountain Red Fox

According to N. S. Goss, (Forest and Stream, Vol. 27, p. 465, January 6, 1887, a Prairie Fox) Vulpes macroura Baird was taken in Cowley County sometime in 1885. The specimen was mounted and taken to the home of Mr. Fred Whittney, in Meade County. If this specimen could be found and proves to be the Mountain Red Fox it should be included in the list of Kansas mammals.

Peromyscus nuttali aureolis (Audubon and Bachman)

This mouse could occur along the Neosho River lowlands. It has been taken at Redland, Oklahoma; also there are a number of skins and skulls in the University of Kansas Museum of Birds and Mammals of this species taken at Winslow, Arkansas by Mr. J. D. Black, in 1932.

Neotoma floridana attwateri (Mearns) Texas Pack-rat

Pack or Wood Rats have been reported from Cherokee, Labette, and Montgomery counties. These rats should be of this subspecies if they occur.

Ursarctos americanus americanus (Pallas) Black Bear

This bear was once common in extreme eastern portion of Kansas. Now extinct in the state.

Ursarctos americanus amblyceps (Baird) New Mexico Black Bear

In early days this bear was found in south-central Kansas in the gypsum caves. Now extinct in the state.

Ursus hirribilis horribilis Ord. Plains Grizzly

The Plains Grizzly was once common throughout Kansas west of the Flint Hills. Now extinct in the state.

Lutra canadensis lataxina (F. Cuvier) Carolina Otter

This otter once was found along the streams in Kansas but is now extinct in the state.

Canis nubilus Say. Timber or Gray Wolf

The Gray Wolf was once common throughout the state. Now extinct in the state.

Felis cougar Kerr. Panther.

The Panther was occasionally found in the eastern part of the state in the early days. Now extinct in the state.

Felis oregonensis hippolestes (Merriam) Rocky Mountain Lion

Probably occurred over most of the western part of the state before it was settled. Now extinct in the state.

Castor canadensis carolinensis Rhodes. Southern Beaver

Once common throughout the state but exterminated by trappers.

Rattus rattus rattus (Linnaeus) Black Rat

Once common throughout the state but has been replaced by Rattus norvegicus.

Cervus canadensis canadensis (Erxleben) Elk or Wapiti

The Elk was once abundant in Kansas but is now extinct.

Odocoileus hemionus hemionus (Rafinesque) Mule-deer

This deer was once abundant in the plains section bordering streams. Now extinct.

Odocoileus virginianus macrourus (Rafinesque) White-tailed deer.

Once common in Kansas. Now extinct.

Antilocapra americana americana (Ord) American Antelope.

The antelope existed in this state until a very few years ago. Now extinct.

Bison bison bison (Linnaeus) Plains bison

Once found on the plains but now extinct.

ADDENDA

Since the completion of this manuscript* the appearance of "Mammals of Kansas," by J. D. Black, makes desirable the following notations:

Page 16. Blarina brevicauda hulophaga (Elliot). According to H. H. T. Jackson of the Bureau of Biological Survey, the Kansas specimens formerly classified as hulophaga should be referred to Blarina brevicauda carolinensis (Bachman).

Page 18. Black includes Eptesicus fuscus pallidus (Young), Pale brown bat, which is paler in coloration than E. f. fuscus. "There has been much controversy regarding the subspecific distinctness of this and other races of Eptesicus fuscus, but I can see no reason for not recognizing the form."

Page 33. Marmota monax monax and M. m. bunkeri. It is highly probable that all present Kansas specimens should be referred to M. m. bunkeri. Much more material from central and southern Kansas is necessary to settle this point.

Page 44. Perognathus hispidus maximus Elliott. This name has been found to be synonomous with P. h. spilotus Merriam.

Page 72. Add to references: Black, J. D., "Mammals of Kansas," Thirtieth Biennial Report of the State Board of Agriculture, Topeka, Kansas, Vol. 35, pp. 116-217, 1937. (Printed by State Printing Plant, Topeka.)

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* April, 1938.

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