Comments on the Taxonomy and Geographic Distribution of Some North American Marsupials, Insectivores and Carnivores

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Comments on the Taxonomy and Geographic Distribution of Some North American Marsupials, Insectivores and Carnivores

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In preparing maps showing the geographic distribution of North American mammals we have found in the literature conflicting statements and questionable identifications, which have led us to examine the specimens concerned with results as set forth below. Our studies have been aided by a contract (NR 161-791) between the Office of Naval Research, Department of the Navy, and the University of Kansas. Grateful acknowledgment is made to the persons in charge of the several collections of mammals consulted for permission to examine and study the specimens therein.

Didelphis marsupialis californica Bennett

From Cuernavaca, Morelos, Hooper (Jour. Mamm., 28:43, February 1, 1947) lists a specimen, as he says, on purely geographic grounds, as of the subspecies *Didelphis mesamericana tabascensis*. We have examined this specimen, an unsexed skull-only, which falls within the range of individual variation of *Didelphis marsupialis californica* and refer the specimen to that subspecies.

Didelphis marsupialis etensis J. A. Allen

From El Muñeco, Costa Rica, Harris (Occas. Papers, Mus. Zool. Univ. Michigan, no. 476:7, October 8, 1943) lists as *Didelphis richmondi* a specimen (♂, No. 67550 U.M.). Our examination of the specimen shows it to be within the range of individual variation of populations that have been referred to *D. m. etensis* from adjoining areas. We identify the specimen as *Didelphis marsupialis etensis*.

Didelphis marsupialis tabascensis J. A. Allen

From Minatitlán, Veracruz, J. A. Allen (Bull. Amer. Mus. Nat. Hist., 14:168, June 15) listed a specimen under the name *Didelphis marsupialis* [in the trinomial sense] instead of under the name *Didelphis marsupialis tabascensis*, which would be expected, on geographic grounds, to apply. The specimen is No. 78123, U.S. Nat. Mus., Biol. Surv. Coll. Our examination of the specimen reveals that it is within the range of individual variation of *Didelphis marsupialis tabascensis* and we identify the specimen as of that subspecies. From Yaruca, Honduras, Bangs (Bull. Mus. Comp. Zool., 39:157, July, 1903) doubtfully listed as *Didelphis yucatanensis* a specimen, No. 10611, M.C.Z. Our examination of the specimen indicates that it is within the range of variation expectable in *Didelphis marsupialis tabascensis*, known from surrounding areas, and we identify the specimen as *Didelphis marsupialis tabascensis*.

Didelphis marsupialis virginiana Kerr

J. A. Allen (Bull. Amer. Mus. Nat. Hist., 14:166, May 28, 1901) and A. H. Howell (N. Amer. Fauna, 45:20, October 28, 1921) have identified four skulls from Sylacuga, Alabama, as *Didelphis virginiana pigra*. The two subspecies *virginiana* and *pigra* are not known to differ cranially. We have, however, examined the skulls which are Nos. 44057-44060 in the U.S. Nat. Mus., Biol. Surv. Coll. Because they are from a place north of other localities (Auburn and Greensboro, Alabama) from which the subspecies *virginiana* has been recorded, and within the geographic range of *virginiana*, we identify the specimens as *Didelphis marsupialis virginiana*.

Sycamore Creek (synonymous with Fort Worth), Texas, is a place from which J. A. Allen (*op. cit.*:173) recorded a specimen as *Didelphis marsupialis texensis*. This specimen (No. 24359/31765 U. S. Nat. Mus., Biol. Surv. Coll.) is in the black color-phase. There are only a few white hairs on the hind feet, and the basal fourth of the tail is black. The black phase occurs all through the range of the species *D. marsupialis* and our examination of the specimen reveals no characters by which it can be distinguished from *D. m. virginiana* of the

surrounding region and we accordingly identify the specimen as *Didelphis marsupialis virginiana*.

Didelphis marsupialis pigra Bangs

Davis (Jour. Mamm., 25:375, December 12, 1944) was one writer who presented evidence that *Didelphis virginiana* (through its subspecies *virginiana* or *pigra* or both) was only subspecifically distinct from the species *Didelphis mesembrinus* (= *D. marsupialis*) through the subspecies *texensis*. Davis, however, did not actually employ a name combination that would enforce his conclusion and he remarked that he had not seen specimens which showed actual intergradation in the color of the toes. As the remarks below will show, Davis (*loc. cit.*) was correct in his supposition that J. A. Allen had seen such specimens.

Deming Station, Matagordo, and Velasco, Texas, are three places from which J. A. Allen (Bull. Amer. Mus. Nat. Hist., 14:162, May 28, 1901) listed specimens as *Didelphis virginiana*. The specimens concerned are in the Biological Surveys Collection of the U.S. Nat. Museum and bear catalogue numbers as follows: Deming Station, 32430/44266, 32432/44268, 32433/44269; Matagordo, 32431/44267; Velasco, 32812/44833. In each specimen the tail is shorter than the head and body. The specimen from Velasco is semi-black, has the basal tenth of the tail black and there is no white on the ears or tail. The specimen from Matagordo is grayish, has the basal fifth of the tail black, ears black, the right hind foot black, but there is some white on the toes of the left hind foot and on each of the forefeet. Of the three specimens from Deming Station, all are in the gray color-phase. The first has the tail black only as far from the base as there is hair and there is considerable whitish on the hind toes. The second specimen has the basal fifth of the tail black and a slight amount of whitish on the hind toes. The third specimen has the basal third of the tail black and the toes are all black. In the sum total of their characters the specimens mentioned above are referable to *Didelphis marsupialis pigra*. These five specimens, and indeed the three from Deming Station alone, show intergradation in coloration of the feet between *Didelphis marsupialis texensis* and *Didelphis virginiana pigra*. Probably there is three-way intergradation here at Deming Station in that *D. v. virginiana* immediately to the north is involved. The specimens mentioned above, along with the information recorded by Davis (*loc. cit.*) and other authors (for example, J. A. Allen, *loc. cit.*, and Bull. Amer. Mus. Nat. Hist., 16:249-279, August 18, 1902), give basis for arranging the North American *Didelphis* as follows:

Didelphis marsupialis virginiana Kerr.

1792. *Didelphis virginiana* Kerr, Animal Kingdom, p. 193, type locality Virginia.

Didelphis marsupialis pigra Bangs.

1898. *Didelphis virginiana pigra* Bangs, Proc. Boston Soc. Nat. Hist., 28:172, March, type from Oak Lodge, opposite Micco, Brevard Co., Florida.

Didelphis marsupialis texensis J. A. Allen.

1901. *Didelphis marsupialis texensis* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 14:172, June 15, type from Brownsville, Cameron County, Texas.

Didelphis marsupialis californica Bennett.

1833. *Didelphis Californica* Bennett, Proc. Zool. Soc. London, p. 40, May 17, type probably from northwestern part of present Republic of Mexico.

1924. *Didelphis mesamericana mesamericana*, Miller. Bull. U.S. Nat. Mus., 128:3, April 29, 1924, and authors. Type locality, northern Mexico. (*Did[elphys]. mesamericana* Oken, Lehrbuch d. naturgesch., pt. 3, vol. 2, p. 1152, 1816, along with other names from Oken 1816, is judged to be unavailable under current rules of zoological nomenclature.)

Didelphis marsupialis tabascensis J. A. Allen.

1901. *Didelphis marsupialis tabascensis* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 14:173, June 15, type from Teapa, Tabasco.

Didelphis marsupialis yucatanensis J. A. Allen.

1901. *Didelphis yucatanensis* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 14:178, June 15, type from Chichenitza, Yucatán.

Didelphis marsupialis cozumelae Merriam.

1901. *Didelphis yucatanensis cozumelae* Merriam, Proc. Biol. Soc. Washington, 14:101, July 19, type from Cozumel Island, Yucatan.

Didelphis marsupialis richmondi J. A. Allen.

1901. *Didelphis richmondi* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 14:175, June 15, type from Greytown, Nicaragua.

1920. *D[idelphis], m[arsupialis], richmondi*, Goldman, Smithsonian Misc. Coll., 69(5):46, April 24.

Didelphis marsupialis etensis J. A. Allen.

1902. *Didelphis marsupialis etensis* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 16:262, August 18, type from Eten, Piura, Perú.

Didelphis marsupialis battyi Thomas.

1902. *Didelphis marsupialis battyi* Thomas, Novitates Zoologicae, 9:137, April 10, type from Coiba Island, Panamá.

Didelphis marsupialis particeps Goldman.

1917. *Didelphis marsupialis particeps* Goldman, Proc. Biol. Soc. Washington, 30:107, May 23, type from San Miguel Island, Panamá.

Didelphis marsupialis insularis J. A. Allen.

1902. *Didelphis marsupialis insularis* J. A. Allen, Bull. Amer. Mus. Nat. Hist., 16:259, August 18, type from Caparo, Trinidad.

In listing the subspecific names given immediately above we are aware of the possibility that a thorough study of the geographic variation in *Didelphis marsupialis* may contract or expand the list of recognizable subspecies. We are aware also that Hershkovitz (Fieldiana: Zoology, 31 (No. 47):548, July 10, 1951) has arranged several of the subspecific names listed immediately above as synonyms of *Didelphis marsupialis californica* Bennett. We have not employed his arrangement because he has not given proof that the currently recognized subspecies are indistinguishable.

Caluromys derbianus canus (Matschie)

Matschie (Sitzungsberichte der Gesellschaft Naturforschender Freunde zu Berlin, Jahrgang 1917, p. 284 (for April), September, 1917) applied the name *Micoureus canus* to a specimen on which the locality was no more precise than Nicaragua. Comparison of Matschie's description with specimens in the United States National Museum (including the holotype of *Philander centralis* Hollister and referred specimens of *Philander laniger pallidus* Thomas) reveals that Matschie's specimen was intermediate in coloration between the other two kinds of woolly opossums named above and that there is nothing distinctive, in the specific sense, in the cranial measurements which Matschie published (*op. cit.*). *M. canus*, therefore, may be merely an intergrade between the two previously named woolly opossums (*C. d. centralis* and *C. d. pallidus*), an individual variant of a previously named kind, say, *C. d. pallidus*, or a valid subspecies. If it is a recognizable subspecies, it probably comes from somewhere in the eastern half of Nicaragua. As a means of handling the name, *Micoureus canus* Matschie, we tentatively place it as a subspecies of the species *Caluromys derbianus*. The name may, therefore, stand as *Caluromys derbianus canus* (Matschie), with type locality in Guatemala.

Caluromys derbianus fervidus (Thomas)

Elliott (Field Columb. Mus. Nat. Hist., Publ. No. 115, Zool. Ser., 8:5, 1907) lists as *Caluromys laniger pallidus* a specimen from Honduras that was acquired for the Field Columbian Museum (= Chicago Natural History Museum) by purchase from Ward's Natural Science Establishment of Rochester, New York. On August 4, 1951, in the Chicago Natural History Museum, we found in the catalogue of the collection of Recent mammals an entry for a male *Caluromys* bearing catalogue number 6 and listed as from "San Pedro Sula [Honduras]. From Wards. Mounted". In the collection of study specimens there is no specimen from Honduras that was purchased from Ward's, mounted or unmounted. In the sealed, glass-fronted, exhibit cases of mammals on display there is one, and only one, *Caluromys*. It is presumed to be specimen No. 6. This specimen is not *C. d. pallidus* because it is too dark. It could be *Caluromys derbianus fervidus* and we tentatively refer it to that subspecies.

Caluromys derbianus pallidus (Thomas)

From Puntarenas, Costa Rica, Harris (Occas. Papers Mus. Zool. Univ. Michigan, 476:7, October 8, 1943) listed as *Caluromys laniger centralis* a female, skull and skin, No. 62702 in the Museum of Zoology of the University of Michigan. We have examined this specimen, the color of which is darker than in some other specimens of *C. d. pallidus* but lighter than that of specimens of *C. d. centralis* (for example, specimens from Turrialba, Costa Rica) and on basis of color we refer No. 62702 to *Caluromys derbianus pallidus*.

Scalopus aquaticus aereus (Bangs)

Bangs' (Proc. Biol. Soc. Washington, 10:138, December 28, 1896) name *S. a. aereus* was based on a single specimen that shows more than an average amount of coppery color. Jackson (N. Amer. Fauna, 38:52, September 30, 1915) and subsequent authors accord full specific rank to the specimen under the name *Scalopus aereus*. Blair (Amer. Midland Nat., 22:98, July, 1939) recorded, from the type locality of *Scalopus aereus*, normally colored individuals of *Scalopus aquaticus pulcher* Jackson. Previously, Scheffer (Kansas State Agric. College, Exp. Bull., 168:4, August 1, 1910) reported that in his examination of 100 individuals of *Scalops* [= *Scalopus*] *aquaticus* from Manhattan, Kansas, there were two

individuals "that were suffused all over with rich golden brown." Because our examination of the type specimen of *Scalops texanus aereus* Bangs reveals no features additional to coppery color that differentiate *aereus* from other individuals of *Scalopus aquaticus pulcher* Jackson (Proc. Biol. Soc. Washington, 27:19, February 2, 1914) we conclude that Jackson's name and Bangs' name (*Scalops texanus aereus*) apply to the same subspecies. Bangs' name has priority and the correct name, therefore, for the populations of moles that in recent years have been designated as *Scalopus aereus* Bangs and *Scalopus aquaticus pulcher* Jackson will be *Scalopus aquaticus aereus* (Bangs). This name combination was previously used by Miller (U.S. Nat. Mus. Bull., 79:8, December 31, 1912).

Scalopus aquaticus australis (Chapman)

Quay (Jour. Mamm., 30:66, February 14, 1949) recorded *Scalopus aquaticus* from Springhill Plantation, 10 miles south-southwest of Thomasville, Georgia. He stated that the specimens were intermediate between the subspecies *S. a. australis* and *S. a. howelli*, but did not refer the specimens to either subspecies. The locality whence the material was obtained is approximately half way between the geographic ranges, as previously known, of *S. a. australis* and *S. a. howelli* (see Jackson, N. Amer. Fauna, 38, September 30, 1915).

The specimens recorded by Quay probably are two females in the Cleveland Museum of Natural History bearing Catalogue Nos. 18136 and 18262 and labeled as from Springhill Plantation, Thomas County, Georgia. We have examined these specimens and find that they resemble *S. a. howelli* in narrowness across the upper tooth-rows, but that they resemble *S. a. australis* in length of tail (22, 24), in shortness of maxillary tooth-row (9.5, 9.5), and in convex dorsal outline of the skull. Accordingly, we refer the specimens to *Scalopus aquaticus australis*.

Sorex cinereus cinereus Kerr

In his revision of the American long-tailed shrews, Jackson (N. Amer. Fauna, 51, vi + 238, 13 pls., 24 figs., July 24, 1928) referred specimens of *Sorex cinereus* from Tyonek, Cook Inlet, Alaska, to the subspecies *S. c. cinereus* (*op. cit.*: 46) and one specimen from Chester Creek, Anchorage, Alaska, to the subspecies *S. c. hollisteri* (*op. cit.*: 56). Thus, the geographic ranges of the two subspecies would seem to overlap around the northern shores of Cook Inlet. In an attempt to resolve this seemingly anomalous distribution, we have examined pertinent materials in the Biological Surveys Collection, U.S. National Museum. We agree with Jackson (*op. cit.*) that the series of specimens from Tyonek is readily referable to *S. c. cinereus*. To our eye, however, the specimen, No. 232691, from Anchorage is referable to *Sorex cinereus cinereus*, rather than to *S. c. hollisteri*. The reference is made on the basis of the darker color, especially of the underparts. In this specimen, other characters that distinguish the two mentioned subspecies are not apparent, probably because it is relatively young; the teeth show only slight wear.

Sorex trowbridgii humboldtensis Jackson

In his account of the long-tailed shrews, Jackson (N. Amer. Fauna, 51:98, July 24, 1928) listed under specimens examined of *Sorex trowbridgii montereyensis* four specimens from 7 mi. N Hardy, Mendocino Co., California. Under his account of the subspecies *S. t. humboldtensis*, however, he (*op. cit.*:97) mentions that specimens (seemingly the same four) from 7 mi. N Hardy "have shorter tails than typical representatives of *humboldtensis*, but in color and cranial characters they are similar to this [*humboltensis*] subspecies." We conclude, therefore, that the specimens mentioned were inadvertently listed as *S. t. montereyensis* and are *Sorex trowbridgii humboldtensis*. This conclusion is supported by the fact that the locality concerned, 7 mi. N Hardy, is within the geographic range assigned to *S. t. humboldtensis* by Jackson (*op. cit.*:97); his southern records of occurrence of *S. t. humboldtensis* are Sherwood and Mendocino, both in Mendocino County, California. Our conclusion is further supported by Grinnell's (Univ. California Publ. Zool., 40(2):80, September 26, 1933) statement of the range of *S. t. montereyensis* as "from southern Mendocino County south...."

Blarina brevicauda churchi Bole and Moulthrop

Kellogg (Proc. U.S. Nat. Mus., 86:253, February 14, 1939) tentatively referred specimens of the short-tailed shrew from the mountainous parts of eastern Tennessee to the subspecies *Blarina brevicauda talpoides*, with the remark that they were unlike specimens of that subspecies obtained in eastern and southern West Virginia. Subsequently, Bole and Moulthrop (Sci. Publ. Cleveland Mus. Nat. Hist., 5:109, September 11, 1942) named the subspecies *Blarina brevicauda churchi* with type locality at Roan Mountain, North Carolina. We have examined the specimens in the U.S. National Museum recorded by Kellogg (*loc. cit.*) from the following localities: Shady Valley, 2900 ft. (Catalogue No. 267182); Holston Mtn., 4 mi. NE Shady Valley, 3800 ft. (Nos. 267176-267178, 267180, and 267181); Holston Mtn., 3 mi. NE Shady Valley, 3000 ft. (No. 267179); Roan Mtn., (Nos. 267469-267475); Mt. Guyot, 6300 ft. (No. 267183); 4½ mi. SE Cosby, 3300 and 3400 ft. (Nos. 267184 and

267185); and Snake Den Mtn., 3800 ft. (No. 267186). Among named kinds of *Blarina brevicauda*, we find these specimens to resemble most closely *Blarina brevicauda churchi* and so refer them. They are readily distinguishable from specimens of *B. b. kirtlandi*, that occurs farther north in the same mountain range, by larger size and longer tail. Incidentally, in the specimens that we have examined, we do not find that *B. b. churchi* is darker colored than other subspecies of *Blarina brevicauda*; *B. b. churchi*, to us, is indistinguishable in color from *B. b. kirtlandi*. Bole and Moulthrop (*op. cit.*) thought that *B. b. churchi* was notably darker than other subspecies from adjoining areas.

Blarina brevicauda carolinensis (Bachman)

Blair (Amer. Midland Nat., 22(1):99, July, 1939) referred specimens of the short-tailed shrew from the Arbuckle Mountain area of Oklahoma to *Blarina brevicauda hulophaga* and specimens from Mohawk Park, Tulsa County, Oklahoma, to *B. b. carolinensis*. Later Bole and Moulthrop (Sci. Publs. Cleveland Mus. Nat. Hist., 5:108, September 11, 1942) saw two of the specimens from Mohawk Park and assigned them to *B. b. hulophaga*. According to the most recent published account, therefore, *B. b. hulophaga* would seem to have a peculiarly discontinuous geographic range. We have examined the material seen by Blair and by Bole and Moulthrop (Nos. 75946, 75947, 75643, Mus. Zool. Univ. Michigan) in an attempt to form our own judgment as to their subspecific identity. The teeth of No. 75946 are well worn, whereas the teeth of the other two are scarcely worn. We are unable to distinguish No. 75946 from topotypes of *B. b. carolinensis* by size, color, or cranial features. The two younger specimens are smaller and paler, but do not agree with the description of *B. b. hulophaga*. The nearly-complete narrow, white girdle of No. 75947 is clearly an individual variation. We assign the animals to *Blarina brevicauda carolinensis* (Bachman) as did Blair (*loc. cit.*).

Blarina brevicauda minima Lowery

Bailey (N. Amer. Fauna, 25:207, October 24, 1905) identified as *Blarina brevicauda carolinensis* one specimen from Joaquin and two specimens from Big Thicket, 8 mi. NE Sour Lake, both localities in eastern Texas. Strecker and Williams (Jour. Mamm., 10:259, August 10, 1929) later recorded the specimens again under the same name. The subsequent naming of *B. b. plumbea* from Aransas National Wildlife Refuge, Aransas County, Texas (Davis, Jour. Mamm., 22(3):317, August 14, 1941) and *B. b. minima* from Louisiana (Lowery, Occas. Papers Mus. Zool., Louisiana St. Univ., 13:218, November 22, 1943) leaves the identity of the specimens from eastern Texas in doubt. We have examined the following specimens in the Biological Surveys Collection, U.S. National Museum: No. 117372, from Joaquin; No. 136407, from 7 mi. NE Sour Lake; and No. 136788, from 8 mi. NE Sour Lake. We judge these to be the specimens referred to by Bailey (*loc. cit.*). We find that they are indistinguishable from specimens of *Blarina brevicauda minima* and they seem to differ from *B. b. plumbea* in being chestnut rather than plumbeous in color and in lacking the highly-arched posterior border of the palate. They are easily distinguished from *B. b. carolinensis* by their chestnut, rather than slaty-black, color and small size. They are distinguishable from *B. b. hulophaga*, to which they might conceivably be referred on geographic grounds, by their color and small size. We refer them to *Blarina brevicauda minima* Lowery.

Spilogale angustifrons angustifrons A. H. Howell

In his "Revision of the skunks of the genus Spilogale" (N. Amer. Fauna, 26, November 24, 1906) A. H. Howell identified certain specimens in the United States National Museum as follows:

> *Spilogale leucoparia*, ♂ sad. 55585 from Tulancingo, Hidalgo (*op. cit.*:21).
>
> *Spilogale gracilis*, ♂ sad. 88154 from San Sebastian in Jalisco, ♂ ad. 79017 from Lagos in Jalisco, ♂ ad. 47177 from Pátzcuaro in Michoacán (*op. cit.*:23).
>
> *Spilogale ambigua*, ♂ ad. 35667/20437 from Barranca Ibarra in Jalisco, ♂ yg. 120101 from Ocotlán in Jalisco (*op. cit.*:25).

Hall and Villa (Univ. Kansas Publ., Mus. Nat. Hist, 1:448, December 27, 1949) inferred that No. 47177 from Pátzcuaro was instead referable to *Spilogale angustifrons angustifrons*. Our examination of No. 47177 and of each of the other specimens mentioned by catalogue number immediately above leads us to conclude that they all are of one species, and that, among named kinds of *Spilogale*, they should be referred to the subspecies *Spilogale angustifrons angustifrons* Howell.

Our examination of all of the specimens that Howell (*op. cit.*) identified as *Spilogale [angustifrons] angustifrons* reveals that none of the specimens from the type locality had attained full adult stature; the holotype is a subadult and the other specimens from the type locality are even younger. The small size of these specimens from the type locality seems to have misled Howell into thinking that they were taxonomically distinct from the larger specimens—those from Jalisco, Michoacán and Hidalgo—that he identified as other kinds.

Spilogale gracilis gracilis Merriam

In the genus *Spilogale* four specific names, concerning the status of which we have been uncertain, are listed below in the order of their appearance in the literature.

> 1890. *Spilogale gracilis* Merriam, N. Amer. Fauna, 3:83, September 11, type from bottom of canyon, Grand Canyon, Arizona.
>
> 1890. *Spilogale leucoparia* Merriam, N. Amer. Fauna, 4:11, October 8, type from Mason, Mason County, Texas.
>
> 1891. *Spilogale phenax arizonae* Mearns, Bull. Amer. Mus. Nat. Hist., 3:256, June 5, type from near Fort Verde, Yavapai County, Arizona.
>
> 1897. *Spilogale ambigua* Mearns, Preliminary diagnoses of new mammals ... from the Mexican boundary line, p. 3, January 12 [reprinted in Proc. U.S. Nat. Mus., 20:460, December 24, 1897], type from summit of Eagle Cliff Mtn., 2 mi. S of Monument No. 5 of Emory's Survey which, according to Miller (U.S. Nat. Mus. Bull., 128:134, April 29, 1924), is "Eagle Mountain, Chihuahua, Mexico, about four miles south of Dona Ana County, New Mexico."

In 1906 (N. Amer. Fauna, 26:1-55, 10 pls., November 24) A. H. Howell's "Revision of the skunks of the genus Spilogale" was published and the four names listed above were retained by him as applying to four species (not subspecies). His map (*op. cit.*, pl. 1) showing the geographic distribution of the four kinds looks reasonable enough at first inspection and does not indicate any overlapping of the geographic ranges of the species in question, but if a map be made by plotting the localities of occurrence recorded by Howell (*op. cit.*), for specimens examined by him, a notably different geographic distribution is shown. For one thing the geographic ranges of *gracilis*, *leucoparia*, *arizonae* and *ambigua* coincide over a considerable part of Arizona. Also, specimens collected in recent years from Arizona and adjoining areas do not readily fit into the "species" recognized by Howell; some specimens are structurally intermediate between two or more of these species and other specimens combine the diagnostic characters ascribed to two or more of the alleged species. For these and other reasons a re-appraisal of the application of the names mentioned above long has been indicated.

Before re-appraising the names it is pertinent to recall that Howell's paper in 1906 on *Spilogale* was only the second revisionary paper that he prepared. It was prepared by a man who at that time lacked much taxonomic experience, and who held to a morphotype concept. Howell worked under the guidance, in the literal sense, of Dr. C. Hart Merriam. The concept of species and subspecies held by Merriam fortunately was recorded by him (Jour. Mamm., 1:6-9, November 28, 1919). Merriam's reliance on degree of difference and his disregard of intergradation were naturally (and necessarily, we think, in Howell's work in 1906) adopted by Howell. For example, of six specimens from Point Reyes in west-central California, a place less than ten miles from the type locality of *Spilogale phenax phenax*, Howell (*op. cit.*:33) assigned one specimen to the subspecies *Spilogale phenax latifrons*! *S. p. latifrons* occurs in Oregon and in northern California—no nearer than 200 miles to Point Reyes. Howell's assignment of this specimen to *S. p. latifrons* was not a *lapsus*, as persons with the modern (geographic) concept of a subspecies would be likely to suppose. Howell's assignment of the one specimen to *S. p. latifrons* and the other five specimens to *S. p. phenax* was intentional, as he told one of us (Hall). He explained that he relied upon the morphological characters of the individual animal instead of upon the morphological characters of a population of animals. To him, therefore, there was nothing inconsistent in his procedure in 1906. Also, variation that was the result of difference in age and variation that was the result of individual deviation were not understood, or at least not taken into account, by Howell in 1906, nor by Merriam in 1890. For example, Merriam selected the most extensively white specimen available to him for the holotype of *Spilogale leucoparia*. He, and Howell in 1906, used the extensiveness of the white areas of that particular specimen (see fig. 3, pl. 2, N. Amer. Fauna, 26, 1906) as a character diagnostic of the "species" *S. leucoparia* although each of the authors had available two other specimens of *S. leucoparia* from the type locality, and all of the other referred specimens in the United States National Museum, that were less extensively white than the holotype. The *individual specimen* was the primary basis for the species or subspecies and one selected specimen alone often was used in making comparisons between a given named kind and some other species or subspecies. Also, be it remembered, degree of difference, and not presence or absence of intergradation, was the basis on which subspecific *versus* specific rank was accorded to a named kind of animal. Howell wrote on the labels of some specimens of *Spilogale* "not typical" when the individuals differed from the type specimen in features that owe their existence to individual variation, and he wrote the same words on the labels of other specimens that had not yet developed mastoidal crests because the animals were not yet adult.

Anyone who examines the specimens that Howell used will do well to bear in mind the

circumstances noted above concerning Howell's paper of 1906; otherwise the reasons for Howell's identifications of certain specimens can not be understood.

We have examined and compared the holotypes, and other specimens used by Howell. While doing so we have borne in mind the degree of individual variation well shown by each of several series of specimens (for example, that in six adult males, from the Animas Mountains of New Mexico, recorded by V. Bailey, N. Amer. Fauna, 53:339, 1932) and age variation (for example, that shown in specimens of *S. interrupta* from Douglas County, Kansas). The degree of each of these kinds of variation, although considerable, is not extraordinary. That is to say, the variations are of approximately the same degree as we previously have ascertained to exist in *Mephitis mephitis* and in *Mustela frenata*, two species that are in the same family, Mustelidae, as *Spilogale*. As a result of our comparisons, we conclude, first that the four names mentioned at the beginning of this account all pertain to one species, and second that the three names *S. gracilis*, *S. p. arizonae* and *S. ambigua*, and probably also *S. leucoparia*, were based on individual variations in one subspecies. *S. gracilis* has priority and will apply; the other names are properly to be arranged as synonyms of it, as follows:

1890. *Spilogale gracilis* Merriam, N. Amer. Fauna, 3:83, September 11.

1890. *Spilogale leucoparia* Merriam, N. Amer. Fauna, 4:11, October 8.

1891. *Spilogale phenax arizonae* Mearns, Bull. Amer. Mus. Nat. Hist., 3:256, June 5.

1897. *Spilogale ambigua* Mearns, Preliminary diagnoses of new mammals ... from the Mexican boundary line, p. 3, January 12.

Some information in support of the above arrangement, along with some other observations on *Spilogale*, are as follows: The type specimen of *Spilogale gracilis* bears on the original skin-label in the handwriting of Vernon Bailey, the collector, the statement that the tail was imperfect. The recorded measurements of 400 for total length and 142 for length of tail, therefore, are presumed to be subject to correction. This presumption and the further circumstance that other specimens from Arizona and New Mexico are as large as specimens of comparable age and sex that we have examined from Nevada and Utah of *Spilogale gracilis saxatilis* Merriam, indicate that *S. g. saxatilis* differs less from the allegedly smaller *S. g. gracilis* than was previously thought. Nevertheless, from north to south (for example, from northern Nevada to southern Arizona) there is an increase in extent of white areas at the expense of black areas of the pelage. As a result, the lateralmost white stripe in *S. g. saxatilis* averages narrower (and often is wanting) than in *S. g. gracilis*. The absence, or narrowness, of the lateralmost white stripe seems to be the principal basis for recognizing *S. g. saxatilis*, just as the tendency to narrow rostrum in Coloradan specimens seems to be the principal basis for recognizing *Spilogale gracilis tenuis* A. H. Howell. Both *S. g. saxatilis* and *S. g. tenuis* are "poorly" differentiated from *S. g. gracilis* and from each other.

The holotype of *Spilogale ambigua* Mearns is slightly smaller than other adult males of comparable age, and the braincase, relative to its width, is slightly deeper than in the average adult male. These variations, nevertheless, are within the range of individual variation, as also are those characterizing the holotype of *Spilogale phenax arizonae* Mearns. The latter specimen is an adult male, with much inflated mastoidal bullae, nearly straight dorsal profile on the skull, relatively shallow braincase, and only slightly worn teeth.

The holotype of *Spilogale leucoparia* Merriam, as pointed out above, is an extreme example of the extensiveness of the white areas of the pelage at the expense of the black areas. This feature occurs more often in the southwestern desert areas of the United States than it does farther north. In addition to the extensiveness of the white markings, the other two characters allegedly distinctive of *S. leucoparia* are broad and much flattened braincase and great degree of inflation of the mastoidal bullae. Although these three mentioned features do distinguish *S. leucoparia* from *S. indianola* to the eastward, they seem not to set *S. leucoparia* apart from *S. gracilis* to the westward. For example, in Arizona some specimens are extensively white and some others have the braincase flattened and the mastoidal bullae much inflated. V. Bailey (N. Amer. Fauna, 53:339, 1932) refers to a specimen (♂, No. 147252 USBS) from the head of the Rio Mimbres in New Mexico in which, as our comparisons show, the inflation of the mastoidal bullae exceeds that of any Texan specimen of *S. leucoparia*, the holotype included. Also, at the type locality of *S. leucoparia*, subadult male No. 188467 USNM and adult male No. 188468 USNM are narrower across the mastoidal region than is the holotype. In summary and review, specimens from the eastern part of the range heretofore ascribed to *S. leucoparia* nearly all have much inflated mastoidal bullae whereas less than half of the specimens of *Spilogale* from western New Mexico and Arizona have these bullae as greatly inflated; but, in No. 147252 from the head of the Rio Mimbres of New Mexico the inflation of the bullae is more extreme than in any specimen that we know of that has been referred to *S. leucoparia*.

If intergradation occurs between *Spilogale gracilis gracilis* and *Spilogale indianola* and between one or both of these kinds on the one hand and *Spilogale interrupta* on the other

hand, central Texas would be a logical place to collect intergrades. We suppose that such intergradation will be found to occur and that eventually *Spilogale putorius* will be the specific name to apply to all of the Recent subspecies of spotted skunks. Until proof of such intergradation is forthcoming we employ current nomenclature.

Spilogale gracilis microdon A. H. Howell

A. H. Howell (N. Amer. Fauna, 26:31, November 24, 1906) listed as *Spilogale arizonae martirensis* one specimen (♀ sad.-yg., 145886 USBS) from Comondú, which is the type locality of *S. microdon*. Our examination of ♀ No. 145886 convinces us that it is referable to *S. microdon*.

Examination of the materials used by Howell (*op. cit.*) reveals that there is an increase in size of animal and its skull from within the geographic range of *S. g. martirensis* southward to Cape St. Lucas which is the type locality of *S. lucasana*. Specimens of *S. microdon*, which so far has been recorded only from Comondú, the type locality, are, as would be expected, intermediate in size between *S. g. martirensis* and *S. lucasana*. The differential characters of these three named kinds of *Spilogale* are principally those of size, and we can see no characters judged to be of more than subspecific worth. Consequently the named kinds should stand as:

Spilogale gracilis martirensis Elliott;

Spilogale gracilis microdon A. H. Howell;

Spilogale gracilis lucasana Merriam.

Spilogale gracilis microrhina Hall

When Hall (Jour. Mamm., 7:53, February 15, 1926) named as new *Spilogale phenax microrhina*, he did not mention specimens previously recorded by A. H. Howell (N. Amer. Fauna, 26:32, November 24, 1906) as *Spilogale phenax* from San Bernardino Peak (57026 USBS), La Puerta (99580 USBS), Dulzura (55848, 56173, 56873, 33693/45728, 36291/48656 and 36292/48657) in southern California. On geographic grounds these specimens would be expected to be *S. g. microrhina* although geographically slightly outside the area that could be delimited by Hall's (*op. cit.*) marginal record-stations of occurrence. Our examination of the pertinent specimens reveals that they are *Spilogale gracilis microrhina*. The localities from which the specimens came are, respectively, the northeasternmost, easternmost and southernmost occurrences so far listed for the subspecies.

Conepatus mesoleucus mearnsi Merriam

Examination of the holotypes of *Conepatus filipensis* Merriam, *Conepatus pediculus* Merriam, *Conepatus sonoriensis* Merriam, and *Conepatus mesoleucus mearnsi* Merriam, and other specimens of the two kinds last named, convinces us that all are the same species and that the names should stand as follows: *Conepatus mesoleucus filipensis* Merriam (type locality, Cerro San Felipe, Oaxaca); *Conepatus mesoleucus pediculus* Merriam (Sierra Guadalupe, Coahuila); and *Conepatus mesoleucus sonoriensis* Merriam (Camoa, Río Mayo, Sonora).

One method of designating the ages of individuals in *Conepatus* is to recognize four categories from younger to older, as follows: 1) juvenile—retaining one or more deciduous teeth; 2) young—sutures open and clearly to be seen between bones of the facial part of the skull; 3) subadult—skull of adult form, but lacking sagittal and lambdoidal crests and retaining faint traces of sutures between facial bones; and 4) adult—sutures obliterated, lambdoidal ridge high and temporal ridges (of females) or sagittal crest (of males) prominent.

On this basis of designating age, the holotype of *C. pediculus* is young and nearer the juvenal than the subadult stage. Its small size is partly the result of its youth. Other than its small size we find no characters to distinguish it from *C. m. mearnsi*. Unfortunately no young male of *C. m. mearnsi* of the same age as the holotype of *C. pediculus* is available. Also, from the general area of the Sierra Guadalupe, Coahuila, only the one specimen of *Conepatus mesoleucus* (the holotype of *C. m. pediculus*) is known. Consequently, we can not yet prove that some young males of *C. m. mearnsi* are as small as the holotype of *C. pediculus*. Because of this lack of proof we tentatively recognize the subspecies *Conepatus mesoleucus pediculus* instead of placing the name *Conepatus pediculus* in the synonomy of *Conepatus mesoleucus mearnsi*.

The holotype of *C. sonoriensis* is a young female, older than the holotype of *C. pediculus*, and approximately midway between the juvenal and subadult stages.

The holotype of *C. filipensis* is an adult male.

We suppose that *C. mesoleucus mesoleucus* Lichtenstein and *C. mesoleucus mearnsi*

Merriam on the one hand, and *Conepatus leuconotus leuconotus* Lichtenstein and *C. l. texensis* Merriam on the other hand will be found to intergrade, in which event the name *Conepatus leuconotus*, having page priority over *Conepatus mesoleucus*, will apply to the species. Proof of complete intergradation is not yet available. The one difference between the two that prevents our uniting them as subspecies of one species is the larger size of *C. l. leuconotus* and *C. l. texensis*. Measurements of the smallest adult male and female available to us of *C. l. texensis* and of the largest adult male and female of *C. m. mearnsi* are given below.

Where the geographic ranges of the two species approach one another the only taxonomically significant difference detected by us is in size, *C. leuconotus* being larger than *C. mesoleucus*. Other characters that are useful in separating the two alleged species now are known to vary geographically in a fashion that indicates only subspecific status for the two kinds. For example, three specimens from Laredo, Texas (previously recorded by V. Bailey, N. Amer. Fauna, 25:205, October 24, 1905—Nos. 24839/32237, 24840/32238 and 24842/32245 USBS), bridge the gap in color pattern between *C. l. texensis* to the east and *C. m. mearnsi* to the west. *C. l. texensis* characteristically has the white stripe terminating anteriorly in an obtuse angle, and on the hinder back the area of white is restricted to a narrow line or is wanting. *C. m. mearnsi* characteristically has the white stripe truncate anteriorly and approximately as broad on the hinder back as on the shoulders. In the specimens from Laredo, the young female, No. 24842, has the white nearly truncate anteriorly (pointed in the other two specimens, adult females). In No. 24839 the area of white on the hinder back is only slightly restricted in width (noticeably restricted but present in the other two specimens).

The proof of intergradation, or the lack of it, between the two alleged species, *Conepatus mearnsi* and *Conepatus leuconotus*, would seem to be profitably sought by obtaining specimens along the Rio Grande in Texas between the Blocker Ranch ("50 miles southeast of Eagle Pass") and Laredo.

Measurements illustrating the size difference between the two alleged species are as follows:

TABLE 1. Measurements of *Conepatus* from Texas

Column Heading Legend:

Col. A: ♂ ad. 186455 USNM, Mason, Texas. Type
Col. B: ♂ ad. 31970/24575 USBS, Blocker Ranch, Texas
Col. C: ♀ ad. 126241 USBS, 8 mi. S Langtry, Texas
Col. D: ♂ ad. 47122 USBS, Brownsville, Texas. Type
Col. E: ♂ ad. 45132/33129 USBS, Brownsville, Texas
Col. F: ♂ yg. 45900/33865 USBS, Brownsville, Texas
Col. G: ♀ ad. 47121/34865 USBS, Brownsville, Texas
Col. H: ♀ ad. 24839/32237 USBS, Laredo, Texas
Col. I: ♀ ad. 24840/32328 USBS, Laredo, Texas
Col. J: ♂? sad. 16651 AMNH, Kingsville, Texas

	C. mesoleucus mearnsi		C. leuconotus texensis							
	A	B	C	D	E	F	G	H	I	J
Total length	633	...	610	800	920	770	670	685	700	...
Length of tail	...	...	269	360	410	300	250	220	260	...
Length of hind foot	72 [1]	75 [1]	71	74	70	90	65	78	80	...
Condylobasal length	72.0	72.8	64.5	83.5	78.9	78.2	72.0	75.7	74.5	...
Zygomatic breadth	51.3	50.1	43.4	55.3	76.8	...	48.3	49.0	48.0	50.3
Mastoidal breadth	41.0	44.2	37.0	47.3	78.2	43.7	40.5	40.5	40.7	...
Length of upper tooth-rows	28.9	29.8	31.8	28.9	28.0	25.8	32.7	55.3	30.4	29.9
Outside length of P4	7.3	...	6.1	8.5	53.2	7.5	7.5	6.6	7.7	7.6
Outside length of M1	7.8	7.0	6.7	9.2	52.7	8.4	8.3	7.6	9.3	9.1
Breadth of M1	7.6	7.0	6.5	9.3	...	8.6	8.2	7.9	9.4	8.2

[1] Measured dry.

Conepatus mesoleucus venaticus Goldman

When Goldman (Jour. Mamm., 3:40, February 10, 1921) named *C. m. venaticus* from Arizona he did not mention material which Merriam (Proc. Biol. Soc. Washington, 15:163, August 6, 1902) had recorded from Ft. Verde, Arizona, under the name *Conepatus mesoleucus*

mearnsi. This material seems to be specimens in the American Museum of Natural History of which the two oldest specimens are as follows: No. 2486/1921, male, adult, from Box Cañon, 20 mi. S Ft. Verde; No. 2487/1922, female, subadult, from Verde River, Arizona. Pertinent measurements of these specimens are, respectively, as follows: condylobasal length, 72.4, 68.8; zygomatic breadth, 50.0, 44.2; width of braincase at constriction behind zygomata, 36.4, 33.8; mastoidal breadth, 44.3, 38.4. Comparison of these measurements with those given for *C. m. venaticus* (Goldman, *loc. cit.*) reveals that the specimens concerned agree in narrowness of skull with *C. m. venaticus* (*C. m. mearnsi* is relatively wider) and it is on this basis that we refer the specimens to *Conepatus mesoleucus venaticus*.

Urocyon cinereoargenteus costaricensis Goodwin

J. A. Allen (Bull. Amer. Mus. Nat. Hist., 20:48, February 29, 1904) listed two specimens of gray fox from Pozo Azul, Costa Rica, as *Urocyon guatemalae*. Goodwin, in his "Mammals of Costa Rica" (Bull. Amer. Mus. Nat. Hist., 87(5):271-474, December 31, 1946) did not mention any material from Pozo Azul. We have examined the skull of the adult female (No. 19208 AMNH) taken on July 17, 1902, at Pozo Zul [sic], by M. A. Carriker and find it to be indistinguishable from other specimens of *Urocyon cinereoargenteus costaricensis* to which subspecies we therefore refer the specimen.

Canis lupus griseoalbus Baird

In 1823 Sabine (No. V, Zoological Appendix, p. 654, *In* Narrative of a journey to the shores of the Polar Sea ... xvi + 768, 30 pls., 4 maps, 1823, London, by John Franklin) applied the name *Canis Lupus-Griseus* to the gray wolf in the vicinity of Cumberland House, Saskatchewan. On the following page (p. 655) he employed the name *Canis Lupus-Albus* for a white wolf obtained at Fort Enterprise, Northwest Territories. In 1937 Goldman (Jour. Mamm., 18(1):45, February 14) did not consider the wolves of the Cumberland House region to be sufficiently different from animals from surrounding areas to warrant nominal separation for them and he placed the name *Canis lupus griseus* Sabine as a synonym of *Canis lupus occidentalis* Simpson. Anderson (Jour. Mamm., 24(3):386, August 17, 1943) revived Sabine's name *griseus* and assigned to *Canis lupus griseus* an extensive geographic range in central Canada. Later, Goldman (Part II, Classification of wolves, p. 395 and 424, *In* The Wolves of North America, American Wildlife Institute, May 29, 1944) by implication, again arranged *griseus* of Sabine as a synonym of *Canis lupus occidentalis* and pointed out (*op. cit.*:395) that, in any event, the name *griseus* is preoccupied by *[Canis] Griseus* Boddaert, 1784 [= *Urocyon cinereoargenteus* (Schreber), 1775]. Still later, Anderson (Bull. 102, Nat. Mus. Canada, p. 54, January 27, 1947) again recognized the subspecies formerly known as *Canis lupus griseus* Sabine, and, because of Boddaert's prior usage of *[Canis] griseus*, renamed the subspecies *Canis lupus knightii*. It appears, however, that there is an earlier name available for this subspecies. Goldman (*op. cit.*, 1943:395) points out that "apparently combining the names *Canis (Lupus) griseus* and *Canis (Lupus) albus* of Sabine ... as *Canis occidentalis* var. *griseo-albus*, Baird [Mammals, Repts. Explor. and Surv. for R. R. to Pacific Ocean, Washington, p. 104, vol. 8, (1857) July 14, 1858] seems to have entertained a somewhat composite concept of a widely ranging race varying in color from 'pure white to grizzled gray.' No type was mentioned and the name does not appear to be valid or clearly assignable to the synonomy of any particular race." We agree with Goldman that Baird's concept was a composite one, but Baird's name, *Canis occidentalis* var. *griseo-albus*, was clearly based on the primary names of Sabine (*griseus* and *albus*), of De Kay (*occidentalis*), of Maxmillian (*variabilis*, a synonym of *Canis lupus nubilis*) and of Townsend (*gigas*, a synonym of *Canis lupus fuscus*). Nevertheless, the name *griseo-albus* was applied to, among others, the subspecies of wolf the type locality of which is at Cumberland House, Saskatchewan, and, by restriction, the name *Canis lupus griseoalbus* Baird is available for the subspecies and, of course, antedates *Canis lupus knightii* of Anderson (*op. cit.*, 1947:54). It might be argued that Baird did not intend to propose a new name, but that he did so is a *fait accompli*. *Canis lupus albus* Sabine, 1823, is not available since it is preoccupied by *C[anis]. Lupus albus* Kerr (Animal Kingdom, Class I, Mammalia, p. 137, 1792), a name applied to the wolf of the Yenisei region of Siberia.

The name and synonomy of the wolf of central Canada should stand as follows:

Canis lupus griseoalbus Baird

> 1858. *Canis occidentalis*, var. *griseo-albus* Baird, Mammals, Repts. Explor. and Surv. for R. R. to Pacific Ocean, Washington, vol. 8, p. 104 (1857), July 14, 1858, based on *Canis Lupus-Griseus* Sabine 1823 from the vicinity of Cumberland House, Saskatchewan.
>
> 1823. *Canis Lupus-Griseus* Sabine, No. V, Zool. App. p. 654, *In* Narrative of a journey to the shores of the Polar Sea ... by John Franklin (*nec [Canis] Griseus* Boddaert, Elench. Anim. p. 97, 1794, a synonym of *Urocyon cinereaorgenteus* (Schreber), Säugethiere, p. 92, 1775).

1943. *Canis lupus griseus*, Anderson, Jour. Mamm., 24(3):386, August 17.

1947. *Canis lupus knightii* Anderson, Bull. 102, Nat. Mus. Canada, p. 54, January 24. (A renaming of *Canis Lupus-Griseus* Sabine, 1823.)

The name *Canis Lupus-Albus* Sabine, 1823 (*nec C[anis]. Lupus albus* Kerr, Animal Kingdom, p. 137, 1792) should, of course, be retained as a synonym of *Canis lupus mackenzii* Anderson as arranged by Anderson (Bull. 102, Nat. Mus. Canada, p. 55, January 24, 1947).

When Anderson (*op. cit.*:54) recognized the subspecies *Canis lupus knightii* [= *C. l. griseoalbus*] he made no mention of a specimen of wolf from Norway House, Manitoba, which Goldman (*op. cit.*, 1944:427) had referred to *C. l. occidentalis*, but the subspecific identity of which was placed in doubt by Anderson's action. We have examined the specimen, No. 115995, in the Biological Surveys Collection, U.S. National Museum, and have compared it with specimens, including topotypes, of *C. l. occidentalis* and *C. l. hudsonicus*. The specimen fits the description of *C. l. griseoalbus* and differs from *C. l. occidentalis* in its long and narrow incisive foramina, larger skull, more nearly straight frontal profile (not markedly concave), and slightly higher coronoid processes. Other differences alleged to obtain between these two subspecies offer no assistance in the present case. The specimen from Norway House differs from *C. l. hudsonicus* in larger size of skull and stouter, blunter, postorbital processes, the posterior borders of which turn less abruptly inward. In brief, among currently recognized subspecies, the specimen from Norway House seems best referred to *Canis lupus griseoalbus* Baird.

Canis niger rufus Audubon and Bachman

Goldman (Part II, Classification of wolves, p. 486, *In* The wolves of North America, American Wildlife Institute, May 29, 1944) referred two specimens of the red wolf from Reeds Spring, Missouri, to the subspecies *C. n. gregoryi*. Leopold and Hall (Jour. Mamm., 26(2):143, July 19, 1945) referred wolves from 5 mi. N Gainesville and from 3 mi. N Thomasville, both localities in Missouri, to *C. n. rufus*. The identification of Leopold and Hall was made on the basis of the small size of their specimens and they did not have the advantage of comparative material. The locations of these and other records of occurrence in Missouri and Arkansas suggest that the specimens from Reeds Spring might be better referred to *C. n. rufus*, the more western subspecies. An examination and comparison of the two specimens from Reeds Spring, Nos. 244127 and 244527, Biological Surveys Collection, discloses that they are intergrades between *C. n. rufus* and *C. n. gregoryi*. They resemble *C. n. rufus* in small size and cranial characters, but are more nearly *C. n. gregoryi* in the darker, less brightly rufescent color of the pelage. Being, in this case, more strongly influenced by the size and cranial features than by the color, we consider the animals from Reeds Spring best referred to *Canis niger rufus*.

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