

Rabies in Nebraska

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Background

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ith few exceptions, rabies occurs worldwide. The CDC estimates that 70,000 human deaths occur annually, with 95% of cases caused by dogs outside of the United States.¹ In the United States, the number of human deaths attributed to rabies has declined from 100 or more each year in the early 1900s to under ten cases per year. Two programs have contributed to this substantial reduction. Animal control and vaccination programs started during the 1940s and more recent oral rabies vaccination programs have eliminated domestic dogs as reservoirs of rabies in the United States.² Also, effective human rabies vaccines and immunoglobulins have been developed; modern day post-exposure prophylaxis (PEP) has proven nearly 100% successful.¹

During 2000–2024, only 42 cases of locally acquired human rabies were recorded in the United States.^{3,4} During 2024, NDHHS and partner agencies investigated a possible case of human rabies in a deceased Nebraska resident. This case was not confirmed since no patient specimens were available for testing, but the patient's clinical history and a likely exposure to a bat prior to death suggested the patient might have died of rabies. Before this case and on the basis of historic records at the Nebraska Department of Health and Human Services (NDHHS), the last reported known human case of rabies in Nebraska likely occurred in the 1920s.

Wild mesocarnivores (e.g. raccoons, skunks, and foxes) are important rabies reservoir species among which skunks are most often found to be infected with the virus in Nebraska. In contrast to eastern US states, rabies in raccoons in Nebraska is not common and the raccoon rabies virus variant has never been detected in Nebraska wildlife. Rabid bats are increasingly implicated as an important wildlife reservoir of rabies in Nebraska; transmission can occur from minor, underappreciated or unrecognized bites. Given ongoing presence of this disease in these two reservoir species, rabies remains a potentially serious threat to public health in Nebraska.

Summary 2025

During 2025, a total of 1,489 animals in Nebraska were submitted for testing (Table 1); 40 (2.7%) were positive including 37 bats, 2 raccoons, and 1 skunk. These animals originated from ten of Nebraska's 93 counties; Figure 1 depicts the geographic distribution of 2025 cases by species. The two rabid raccoons were reported in May and July within 54 days of one another and were both found to be infected with South Central Skunk Rabies Virus Variant (RVV). These two cases occurred in Chase county where a skunk had previously tested positive in April 2025.

Among all positive animals in 2025, 50% (20/40) were associated with human contact necessitating PEP for 35 total exposed persons. A report listing the current year-to-date positive cases and a menu of links to data from previous years are available on the NDHHS website at the following URL:
<http://dhhs.ne.gov/Pages/Rabies-Data.aspx>.

TABLE 1: Summary of rabies testing by species and result – Nebraska, 2025

Species	Total submitted N (%)	Positive n (%)
Bat	858 (57.6)	37 (4.3)
Dog	251 (16.9)	0 (0.0)
Cat	171 (11.5)	0 (0.0)
Raccoon	99 (6.6)	2 (2.0)
Rodent	40 (2.7)	0 (0.0)
Bovine	24 (1.6)	0 (0.0)
Skunk	15 (1.0)	1 (6.7)
Equine	7 (0.5)	0 (0.0)
Sheep (domestic)	6 (0.4)	0 (0.0)
Opossum	5 (0.3)	0 (0.0)
Fox	5 (0.3)	0 (0.0)
Other*	8 (0.5)	0 (0.0)
Total	1,489	40 (2.7)

*Includes 2 coyotes, 2 cougars, 1 rabbit, 1 red panda, 1 goat, and 1 weasel.



The Nebraska Department of Health and Human Services issues a Rabies Approval (RA) number for testing of animals involved in potential human rabies exposures if criteria as specified by the state's Rabies Control Program are met. Examples include persons who were bitten, had saliva contact in open wounds or mucus membranes, or were in the same room with a bat and cannot be certain that they were not bitten (e.g., sleeping person, unattended child, intoxicated person or individual who has a mental disability). Fees for tests which qualify for an RA number are paid by the Program.

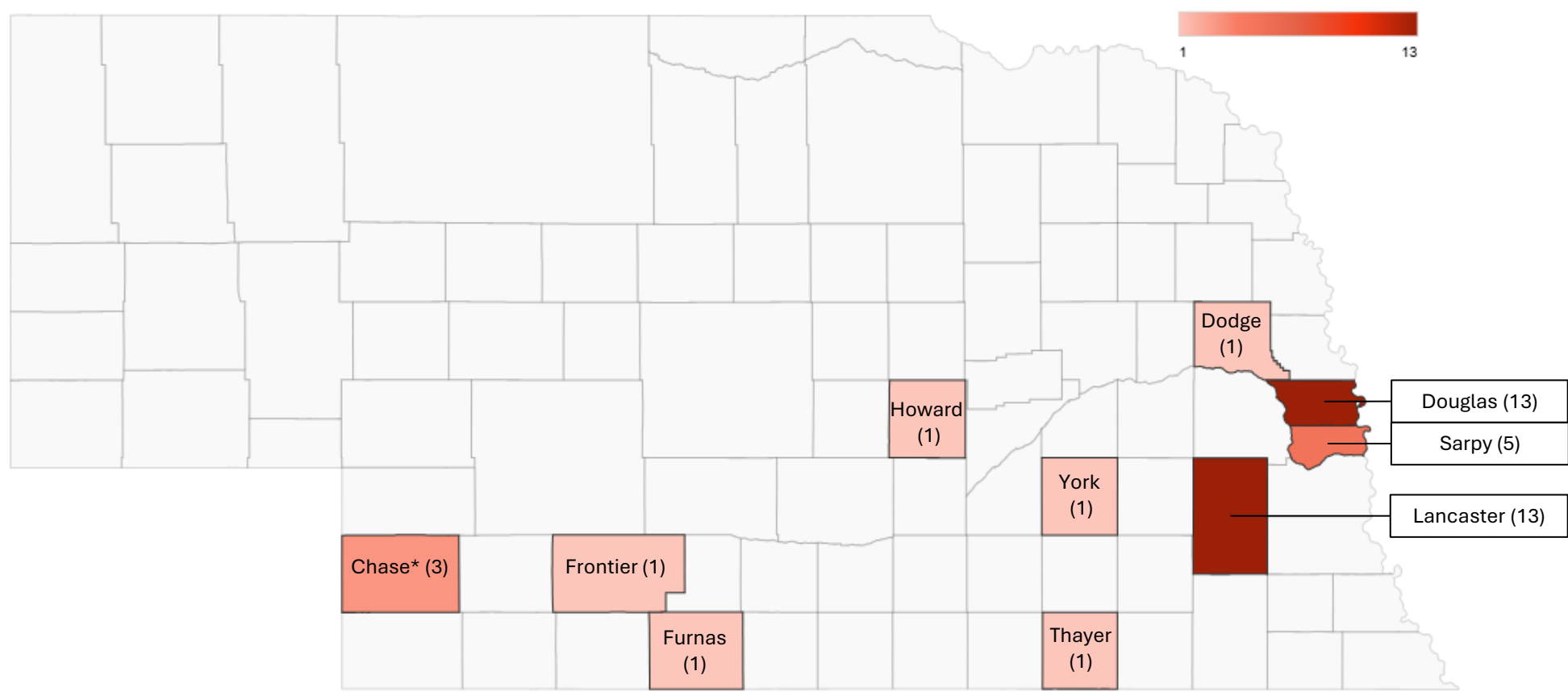
This targeted testing provides rapid evaluation of risk after human exposure to potentially rabid animals. On the basis of timely results, medical professionals and public health officials are then able to make well-informed decisions and provide recommendations for the exposed person(s) regarding need for post-exposure prophylaxis (PEP) which is extremely effective at preventing human rabies when administered appropriately. When test results are negative, such findings allow exposed persons to avoid expensive and time-intensive PEP.

During 2025, the Nebraska Rabies Control Program issued RA numbers for 606* tests. Of these, 15 (2.5%) were positive and 24 (4.0%) were unsuitable or indeterminate. PEP was required among exposed persons in most instances, totaling 46 human exposures from 34 animals. The remaining 93.6% (n = 567) of animals in confirmed 2025 exposure events were associated with negative tests, avoiding costly PEP for >800 potentially exposed persons.

*605 RAs issued to Nebraska animals with 317 confirmed human exposure events. One RA number was issued for a Missouri feline that was seen by a veterinarian in Nebraska. That animal tested negative for rabies.

Figure 1

Number of animals testing positive for rabies by county (N = 40) – Nebraska, 2025



*In Chase county, two raccoons and one skunk tested positive. In all other counties, only bats tested positive.

Five-year Report

During 2020-2024, 7,244 animals from Nebraska were submitted for rabies testing of which 130 (1.8%) were positive (Table 2). Over this five-year period, bats were the most commonly submitted animal. Of 4,801 bats submitted for testing, 113 (2.4%) tested positive. The majority of bats testing positive were from counties with larger urban population (Figure 2). Skunks represented the species with the highest proportion of positive tests. Of 65 submitted, 8 were positive (12.3%). Compared to bats, the locations of skunks and other animals that tested positive were more widely distributed throughout the state (Figures 3 and 4). See Table 7 for total counts of tests submitted and positive results, by species and year, during 2020 to 2024.

TABLE 2: Summary of rabies testing by species and result – Nebraska, 2020-2024

Species	Total		Positive	
	N	median/year (range)	n (%)	median/year (range)
Bat	4,801	962 (919-997)	113 (2.4)	21 (20-26)
Cat	829	164 (148-170)	3 (0.4)	1 (0-1)
Dog	746	126 (114-174)	2 (0.3)	0 (0-1)
Raccoon	288	60 (47-69)	0 (0.0)	0 (0-0)
Rodent	210	41 (40-43)	0 (0.0)	0 (0-0)
Bovine	143	28 (27-30)	1 (0.7)	0 (0-0)
Skunk	65	14 (9-16)	8 (12.3)	1 (1-3)
Opossum	49	7 (7-15)	0 (0.0)	0 (0-0)
Equine	42	8 (7-10)	2 (4.8)	0 (0-1)
Other*	71	12 (11-17)	1 (1.4)	0 (0-0)
Total	7,244	1,438 (1,436-1,469)	130 (1.8)	25 (22-30)

*Other includes fox (16), rabbit (16), domestic sheep (12), coyote (7), goat (7), ferret (2), hog (2), bear (1), red panda (1), donkey (1), bobcat (1), deer (1), primate (1), badger (1), bighorn sheep (1), and llama (1). Of these, a single fox was positive.

Five-year Report

Of the nine animals other than skunks and bats that tested positive for rabies during 2020–2024, seven had variant typing completed. Of these, four were infected with South Central Skunk RVV (year, county) including 1 cat (2021, Chase), 1 horse (2022, Holt), 1 bovine (2021, Keith) and 1 puppy (2023, submitted from Colfax but known infected in Box Butte); 2 with bat RVVs including 1 dog and 1 fox infected with *Lasiurus cinereus* (2023, Colfax) and *Eptesicus fuscus* (2024, Lancaster) variants, respectively; and 1 kitten (2023, Douglas) infected with Eastern Raccoon RVV. With the latter detection, an extensive interagency investigation and response was initiated given the urgency of finding a non-enzootic rabies variant in Nebraska. Refer to the following publications for additional information regarding these efforts.

1. [CDC MMWR](#): *Notes from the Field: Enhanced Surveillance for Raccoon Rabies Virus Variant and Vaccination of Wildlife for Management – Omaha, Nebraska, October 2023–July 2024*
2. [Journal of the American Veterinary Medical Association: Special Report](#): *Identification of raccoon rabies virus variant in a stray kitten: the role of veterinary practitioners in detection and reporting of a non-native zoonotic pathogen – Nebraska, 2023*

During 2020–2024, NDHHS issued a total of 3,330 Rabies Approval numbers (Table 3). Of these, 56 (1.7%) were positive (median/year, 11), 122 (3.4%) were unsuitable (median/year, 25), and 3,152 (94.7%), were negative (median/year, 627).

TABLE 3: Count of Rabies Approval (RA) numbers and result by year – Nebraska, 2020–2024

Year	Total RAs N	Positive n (%)	Unsuitable n (%)	Negative n (%)
2024	670	13 (1.9)	25 (3.7)	631 (94.2)
2023	614	11 (1.8)	21 (3.4)	577 (94.0)
2022	639	7 (1.1)	20 (3.1)	612 (95.8)
2021	660	16 (2.4)	17 (2.6)	627 (95.0)
2020	747	9 (1.2)	31 (4.1)	705 (94.4)
Total	3,330*	56 (1.7)	122 (3.4)	3,152 (94.7)

*Total includes indeterminate results in 2020 (n = 2), 2023 (n = 5), and 2024 (n = 1) that are not listed.

Human Exposure

NDHHS and our local health department (LHD) and animal control partners conduct investigations for potential animal rabies exposures when contact with wildlife or suspicious animals are reported. Rabies post-exposure prophylaxis is recommended for all those exposed to animals who test positive for rabies, and for animals with unsuitable or indeterminate test results where we cannot rule out rabies infection. Rabies exposures occur in several forms. The most direct is physical contact with an infected animal, such as a bite or scratch. NDHHS also recommends post-exposure prophylaxis as a precaution when a bat is found indoors and direct contact cannot be ruled out.

During 2020–2024, 202 animals involved in confirmed exposure events were identified. Of these, 161 (79.7%) had an RA number assigned. All 202 animals exposed a total of 333 people of whom 260 (78.1%) were exposed to animals with RA numbers. Of all 333 people exposed, 174 (52.3%) were exposed by animals with unsuitable or indeterminate test results. This high proportion of exposure events whereby rabies could not be ruled out highlights the importance of prompt reporting of all such events and value of proper handling of animal specimens. Minimizing the number of unsuitable and indeterminant samples to maximize the number with definitive results whenever possible could greatly reduce the overall amount of PEP required.

TABLE 4: Confirmed exposures by RA status and year – Nebraska, 2020–2024

Year	Events with PEP Recommended			No. of Exposed Persons		
	RA n	No RA n	Total N	RA n	No RA n	Total N
2020	42	2	44	54	2	56
2021	32	7	39	49	25	74
2022	23	16	39	41	17	58
2023	32	9	41	68	17	85
2024	32	7	39	48	12	60
Total	161	41	202	260	73	333

Cost

From 2020–2024, NDHHS provided rabies tests for 3,330 animals at a cost to the Program of \$97,260. After investigation, those animals were responsible for 2,413 total potential exposures. Of these, 260 were from positive or unsuitable samples whereby the vast majority of exposed people sought PEP; with an assumption all were treated, the total estimated cost was \$2.3 million. Among exposures with a corresponding negative test, the exposed persons could confidently avoid costly PEP as a direct result of State-funded rapid testing. From 2,153 individuals exposed to negative animals, an estimated \$19.4 million was saved by avoiding unnecessary PEP.

TABLE 5: Summary of rabies exposures, testing costs, and estimated PEP costs—Nebraska, 2020–2024

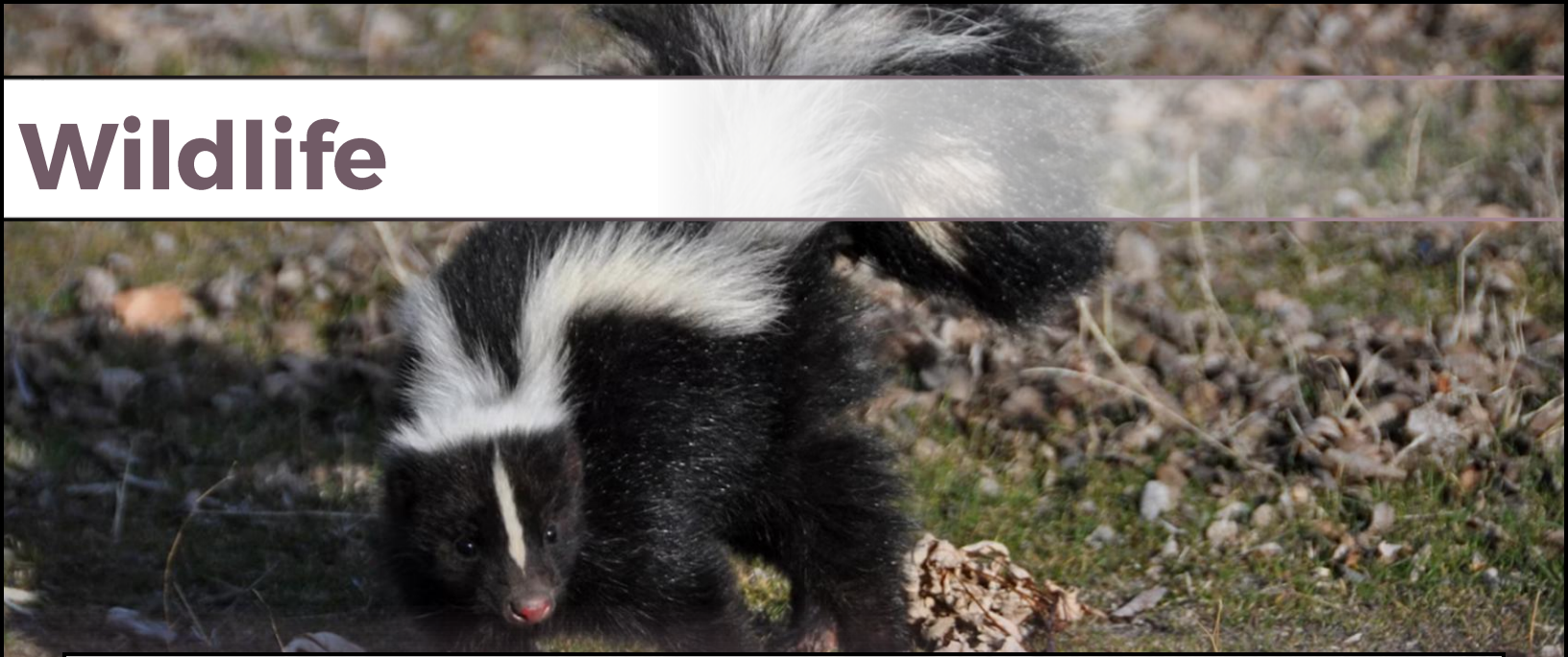
Recommended PEP (Y/N)	Exposures (%)	Cost of Testing	Est. Cost of PEP
Y	260 (10.8%)	\$4,700	\$2,340,520
N	2,153 (89.2%)	\$92,560	\$19,381,306
Total	2,413	\$97,260	\$21,721,826

The cost of PEP was estimated from a Minnesota Department of Health study that concluded median cost for rabies PEP (4-dose vaccine series) during 2017–2018 was \$7,195 USD.⁵ Adjusting for 2024 US inflation,⁶ we used a per person adjusted estimate of \$9,002 per series.

TABLE 6: Summary of rabies testing costs by result and year — Nebraska, 2020–2024

Year	Negative (Y/N)	Animals (n)	Exposures (n)	Cost
2020	Y	702	1,072	\$19,656
	N	42	54	\$1,176
2021	Y	624	883	\$17,472
	N	32	49	\$896
2022	Y	611	822	\$17,108
	N	26	44	\$728
2023	Y	575	820	\$16,100
	N	32	68	\$896
2024	Y	628	931	\$21,352
	N	32	48	\$1,088
Total		3,304*	4,791	\$96,472*

*26 RAs totaling \$788 not included in estimate because no confirmed exposures were identified after exposure assessments were completed.



Skunks and bats remain the two primary wildlife reservoirs for the rabies virus in Nebraska. During 2020–2024, eight of 65 skunks tested (12.3%) were positive for rabies (Table 2). Due to the high prevalence of the virus among the skunk population in Nebraska, all skunks should be considered a potential source of the virus. Any bite by a skunk or other wild carnivore or exposure to saliva from such animals should be considered a possible rabies exposure and reported to the regional local health department. All wounds should be thoroughly cleaned with soap and water immediately. Exposed persons should also contact their physician for appropriate medical care. In such instances of exposure, the local health department can provide consultation regarding risk and, if indicated, the Nebraska Rabies Control Program should be contacted for an RA number to facilitate rabies testing if the exposing wild animal can be captured safely.

Transmission of rabies from bats can occur from seemingly minor or unrecognized bites. Bites, scratches, or mucus membrane exposures from bats should be considered potential rabies exposures. Any instance where a person is in the same room as a bat and cannot declare with certainty that they were not bitten should also be considered a potential exposure. Such instances include persons sleeping in a room with a bat in it or an adult witnessing a bat in the room with a child who was unattended, a person with a mental disability, or an intoxicated person. During 2020–2024, 113 of 4,801 bats submitted (2.4%) were positive for rabies (Table 2). Given their hibernation behavior, bats often enter homes in late summer and early fall. A correspondingly higher level of testing is generally observed during these time periods as are relatively higher numbers of rabid bats. Because capture of bats from homes drives testing, bats with positive test results were more frequently encountered in counties with urban populations (Figure 2).



Domestic Animals

Eight domestic animals tested positive for rabies in 2020–2024 (feline, 3; canine, 2; equine, 2; bovine, 1). All were of a species in which a licensed vaccine is currently available. Of particular concern, five of the eight animals were either never vaccinated or had not been vaccinated recently. The vaccine status of the final three could not be determined. All five unvaccinated animals were associated with documented human exposure including two events in which humans were reportedly bitten. As a result of exposure to these five animals, potentially avoidable PEP was required among 34 exposed persons because owners failed to vaccinate animals in their care.

Vaccination of dogs, cats, and ferrets is required by Nebraska statutes and continues to be a critical, safe, and cost-effective component of rabies control to safeguard both animal and public health from this fatal virus.

In each of these exposure events involving domestic animals, appropriate vaccination would likely have prevented rabies, thus reducing or eliminating the associated human risk and corresponding necessity for PEP. Equally troubling are the numbers of domestic animals tested for rabies in Nebraska for which inadequate vaccination is reported. Among those for which vaccination status was known, 87.2% of cats and 50.4% of dogs tested for rabies were reported as not current or unvaccinated. Vaccination rates were also poor among cattle and horses with all 33 cattle with reported vaccination status and 62.5% of equines reported as not current or unvaccinated. Given that lack of vaccination among domestic animals involved in exposure events often necessitates testing, such high proportions are not unexpected. However, adequate vaccination of such animals would simply preclude the need to sacrifice them for testing in most situations. Further, vaccination of dogs, cats, and ferrets is required by Nebraska statutes and continues to be a critical, safe, and cost-effective component of rabies control to safeguard both animal and public health from this fatal virus. All persons keeping domestic animals including livestock should consult their veterinarian to establish and maintain an appropriate vaccination schedule to prevent rabies.

References & Acknowledgements

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Table 7

Number of animals submitted for rabies testing and number positive by species and year – Nebraska, 2020–2024

Species	2020		2021		2022		2023		2024		Total	
	n	Positive	n	Positive	n	Positive	n	Positive	n	Positive	N	Positive
Bat	997	21	919	26	1,021	16	902	20	962	30	4,801	113
Cat	148	0	164	1	147	1	170	1	200	0	829	3
Dog	126	0	106	1	114	0	174	1	226	0	746	2
Raccoon	38	0	47	0	74	0	69	0	60	0	288	0
Rodent	43	0	40	0	38	0	48	0	41	0	210	0
Bovine	38	0	27	1	20	0	28	0	30	0	143	1
Skunk	18	3	8	1	14	3	16	0	9	1	65	8
Opossum	7	0	15	0	17	0	7	0	3	0	49	0
Equine	12	1	8	0	8	1	10	0	5	0	43	2
Fox	2	0	0	0	4	0	2	0	8	1	16	1
Rabbit	4	0	4	0	2	0	5	0	1	0	16	0
Domestic Sheep	2	0	0	0	4	0	2	0	4	0	12	0
Goat	1	0	2	0	2	0	0	0	2	0	7	0
Coyote	1	0	3	0	0	0	0	0	3	0	7	0
Ferret	0	0	0	0	2	0	0	0	0	0	2	0
Hog	1	0	0	0	0	0	1	0	0	0	2	0
Bear	0	0	0	0	1	0	0	0	0	0	1	0
Bobcat	0	0	0	0	0	0	0	0	1	0	1	0
Red Panda	0	0	0	0	1	0	0	0	0	0	1	0
Badger	0	0	0	0	0	0	1	0	0	0	1	0
Deer	0	0	0	0	0	0	0	0	1	0	1	0
Primate	0	0	0	0	0	0	0	0	1	0	1	0
Bighorn Sheep	0	0	0	0	0	0	1	0	0	0	1	0
Llama	0	0	1	0	0	0	0	0	0	0	1	0
Total	1,438	25	1,344	30	1,469	21	1,436	22	1,557	32	7,244	130

Figure 2

Count of bats with positive rabies test results by county (N = 113) – Nebraska, 2020–2024

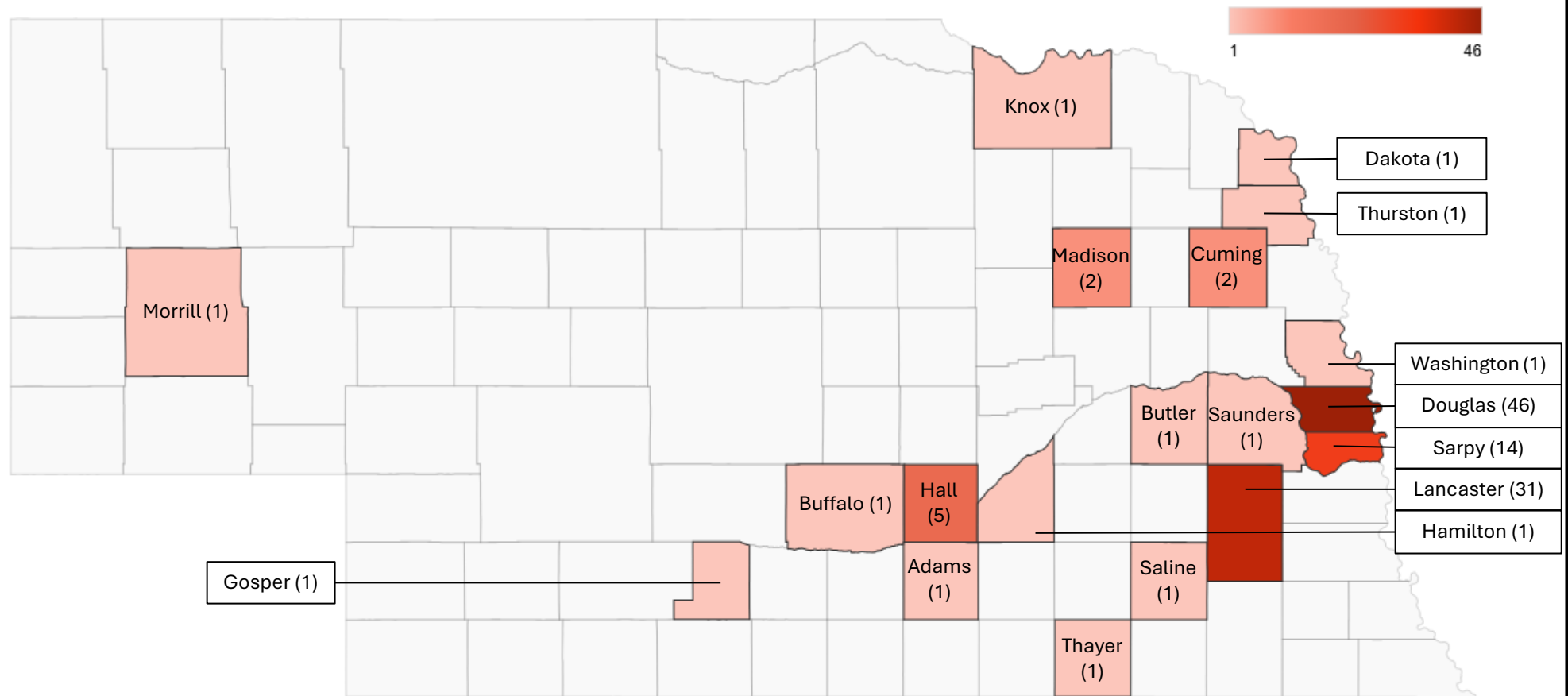


Figure 3

Count of skunks with positive rabies test results by county (N = 8) — Nebraska, 2020–2024

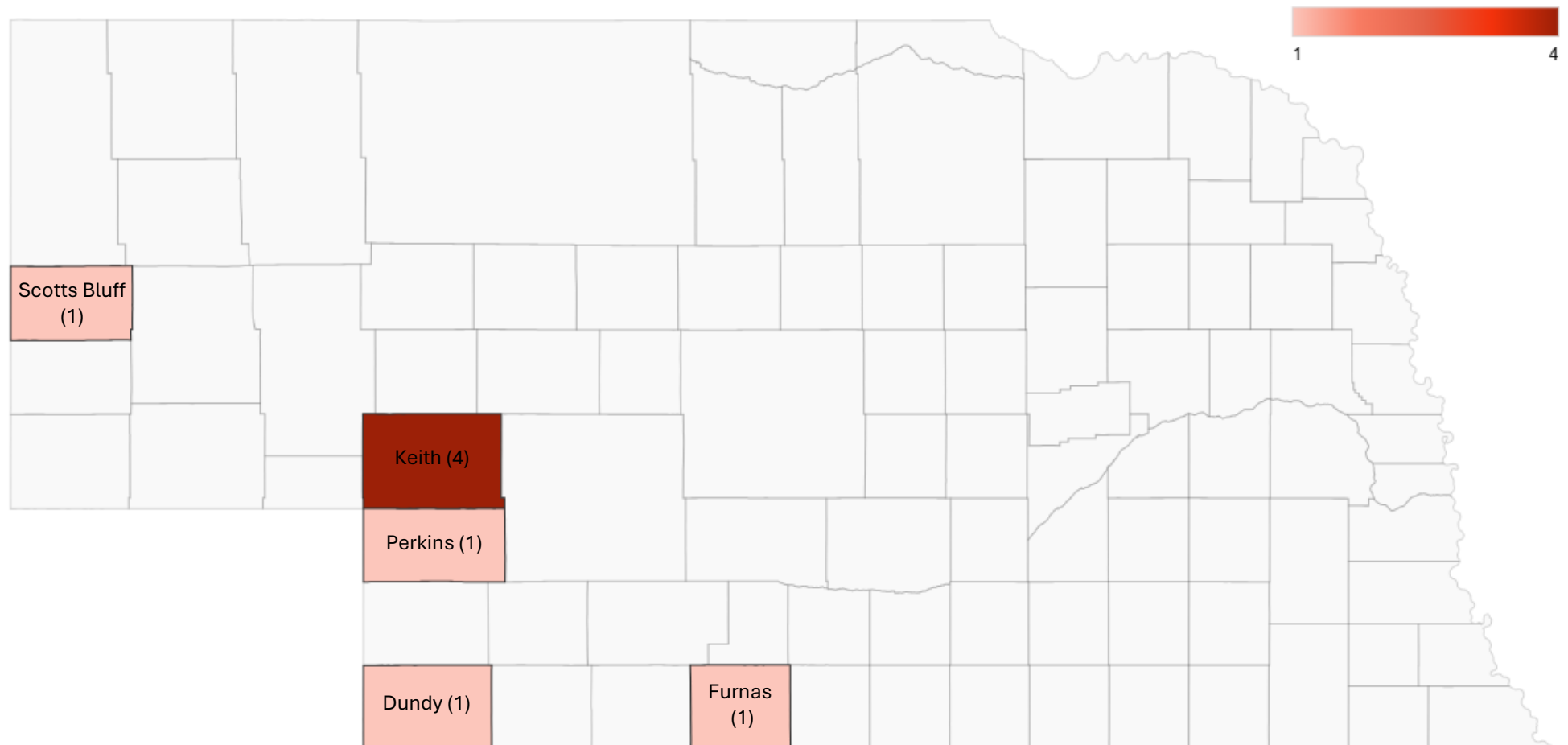
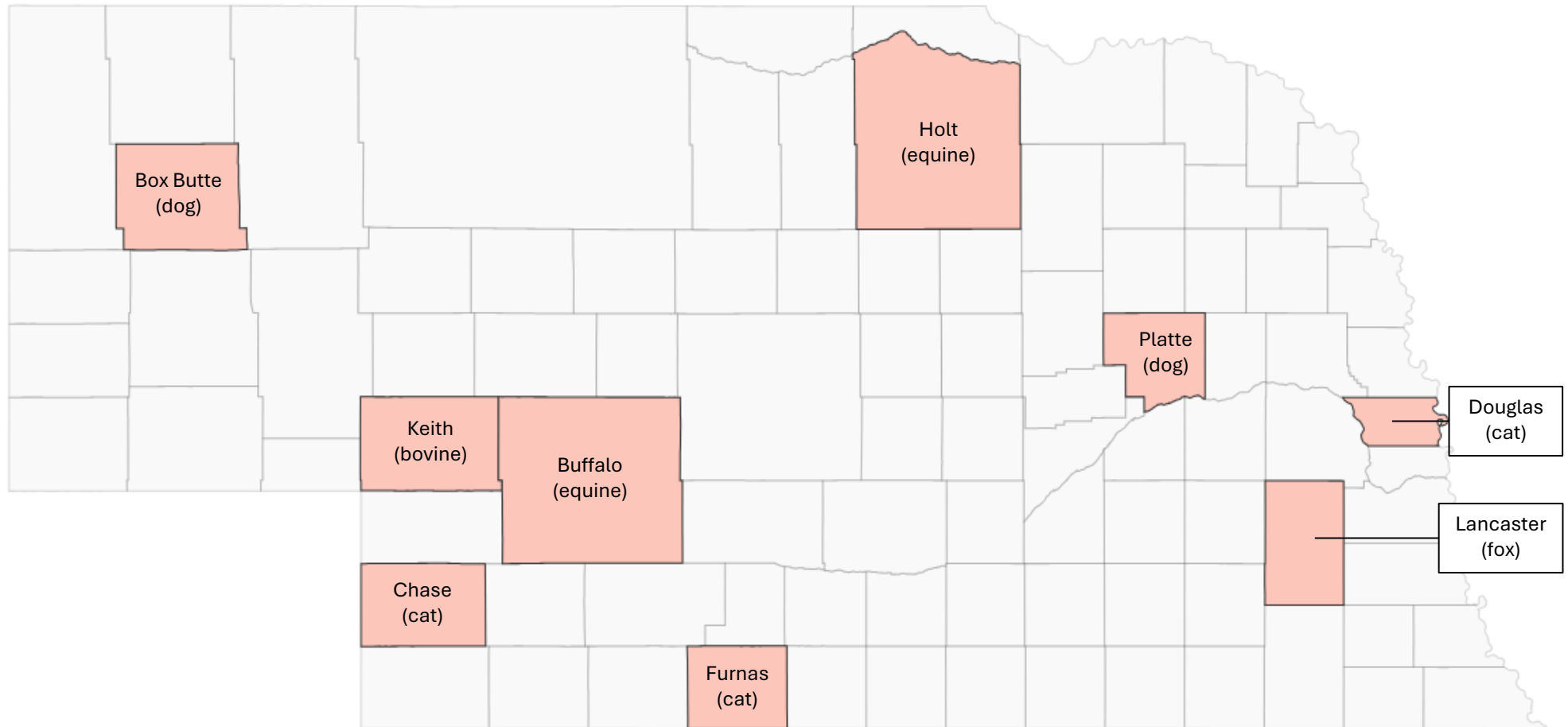


Figure 4

Positive rabies test results by species and county (excluding bats and skunks; N = 9) — Nebraska, 2020–2024



Each county shown reported only one rabies-positive animal, excluding bats and skunks.