

Rabies in South Dakota: an unclear but present danger

South Dakota ONE HEALTH

Sioux Falls

30 October 2017

- Rabies is a nearly always fatal, viral disease affecting the central nervous system.
- Transmitted when the virus is introduced into bite wounds or open cuts in skin, onto mucous membranes or by transplant.
- Infectious agent: RNA Lyssavirus.

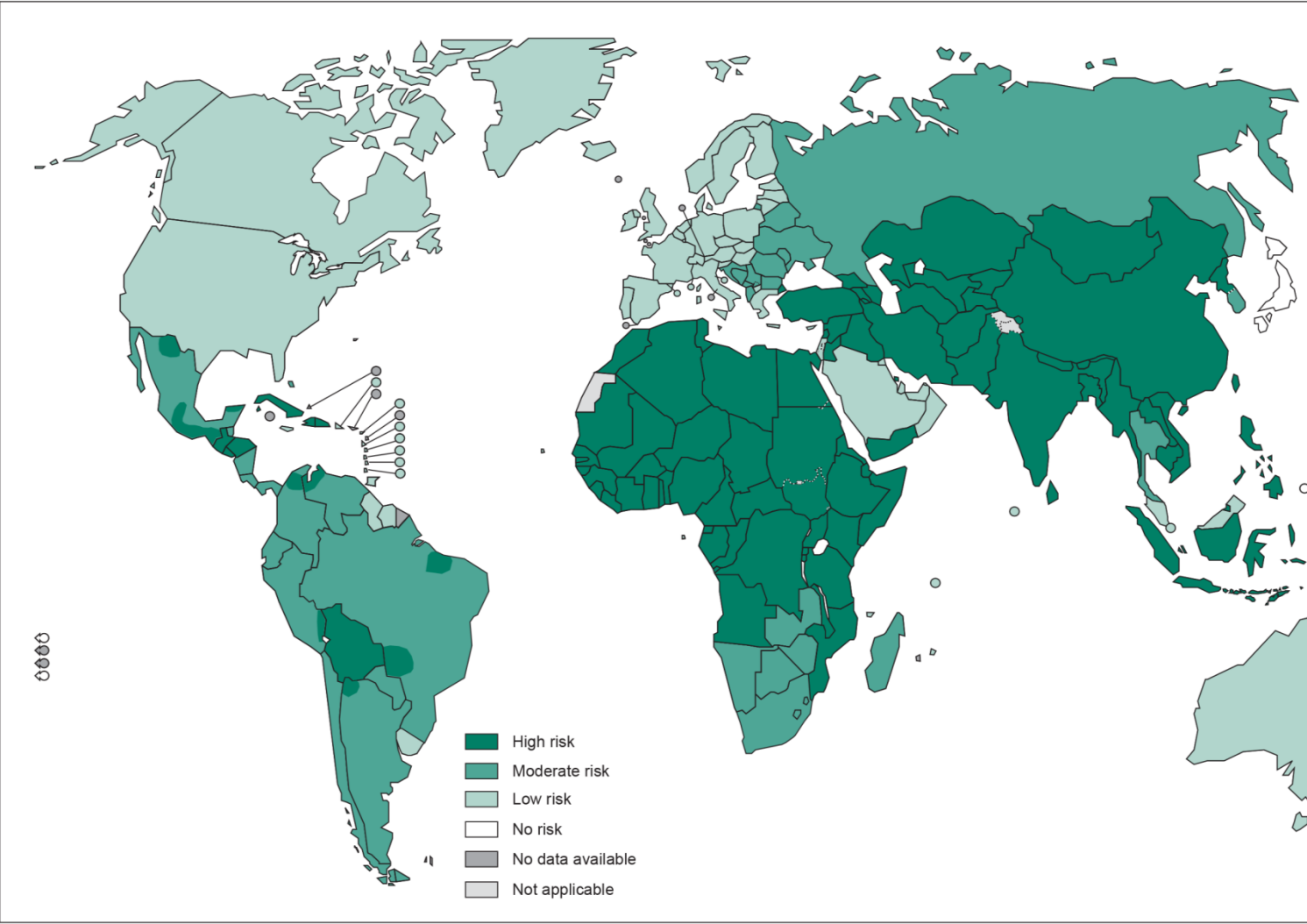
Lon Kightlinger, MSPH, Ph.D., State Epidemiologist
South Dakota Department of Health
Pierre, South Dakota



Human rabies progression

- **Incubation period:** few days to 19 years.
- **Prodrome (2-10 days):**
 - malaise,
 - anorexia,
 - headache, fever, irritability,
 - pain at bite site.
- **Acute neurological, furious rabies 80% of cases (2-7 days):**
 - dysphagia (difficulty swallowing),
 - hydrophobia,
 - manic behavior alternating with lethargy,
 - salivation with abnormal biting or chewing.
- **Paralytic rabies, 20% of cases (2 - 7 days):**
 - Ascending flaccid paralysis
- **Death.**

Distribution of risk levels for humans contacting rabies, worldwide, 2013



Rabies deaths
2010-2014

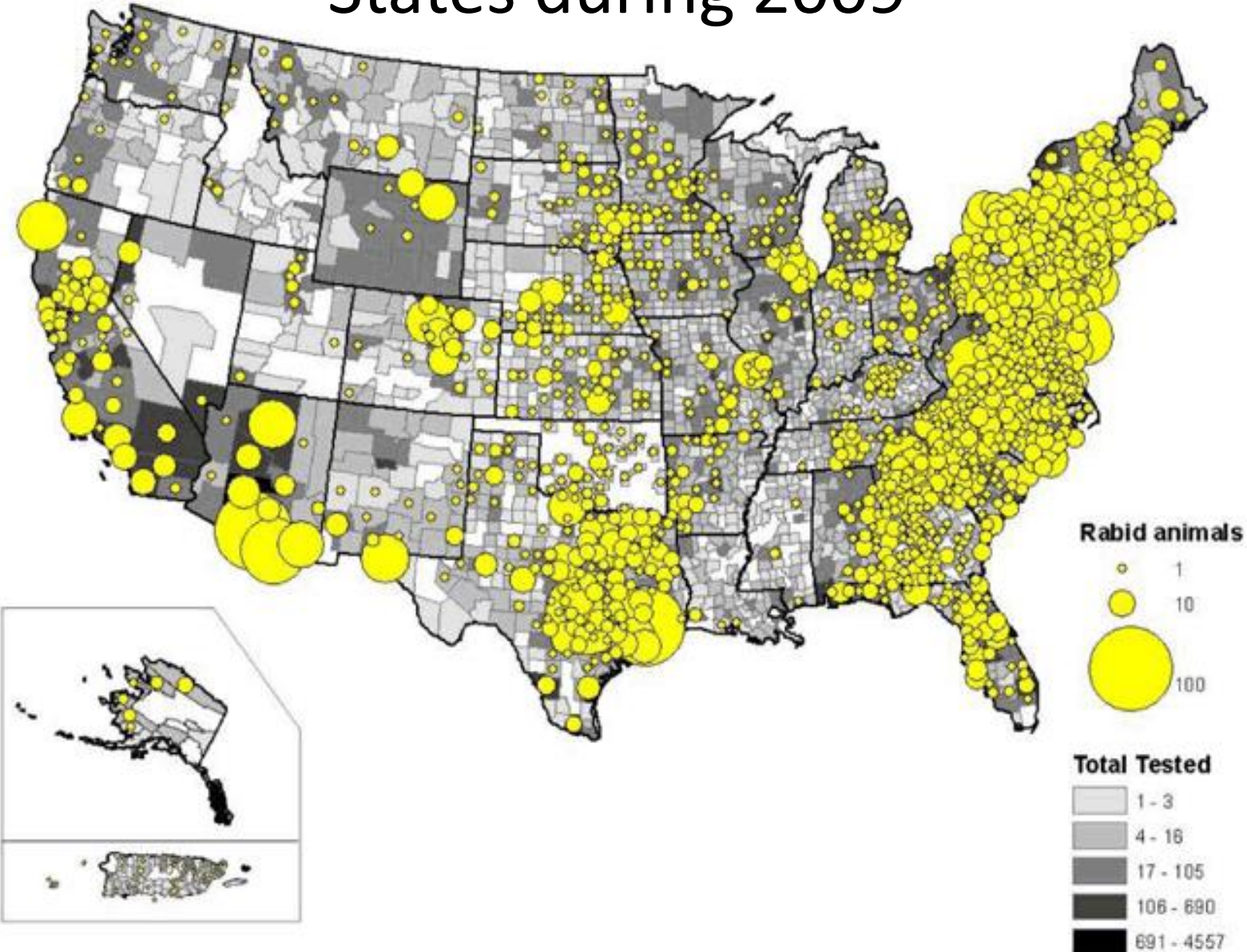
China	7,236
Philippines	1,182
Viet Nam	467
Sri Lanka	175
Uganda	163
Egypt	130
South Africa	52
Yemen	48
Thailand	38
Zimbabwe	38
Senegal	34
Tanzania	32
Iran	27
Kyrgyzstan	27
Morocco	25
Russia	24
Sudan	23

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement. © WHO 2014. All rights reserved

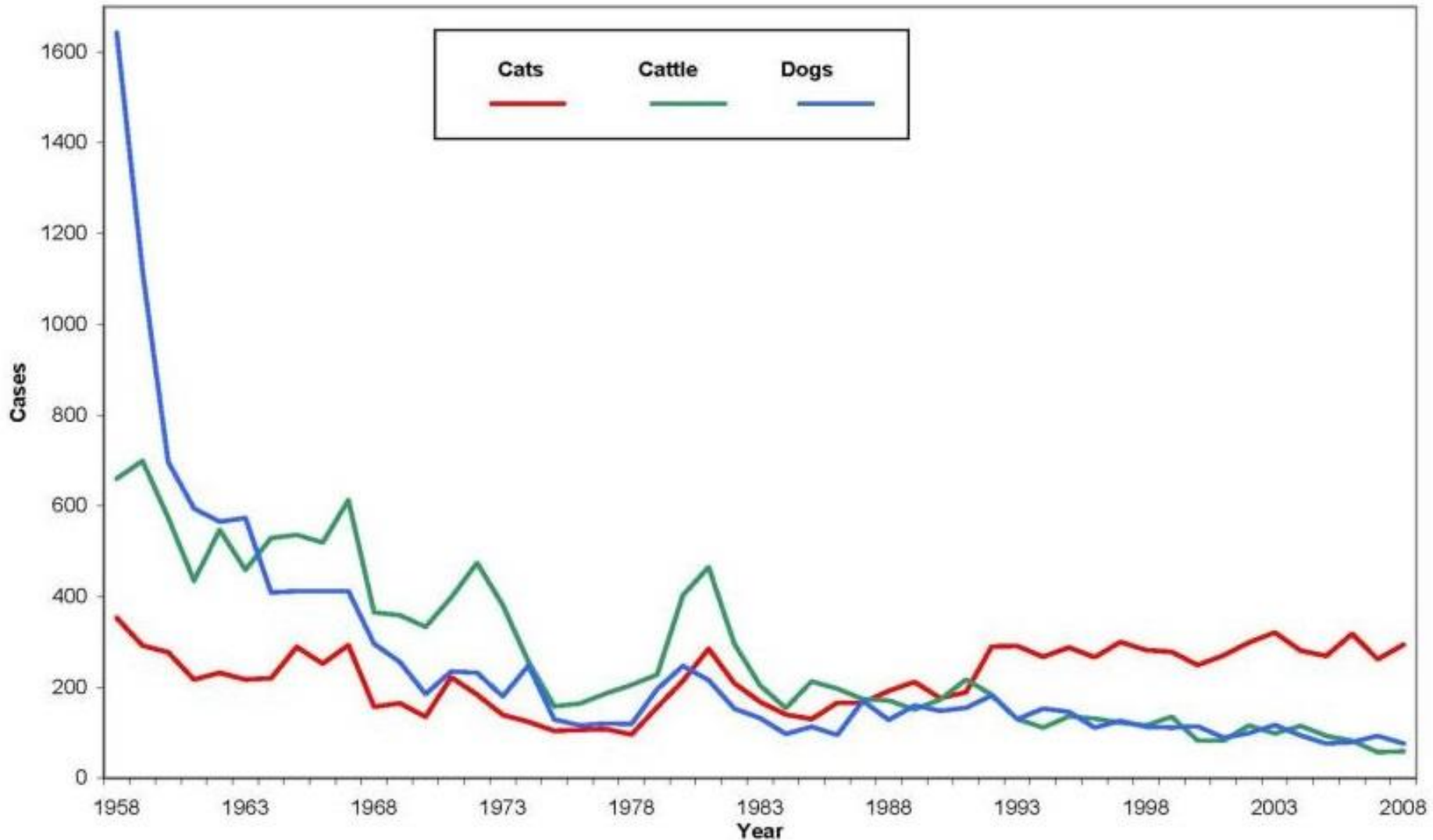
Data Source: World Health Organization
 Map Production: Control of Neglected Tropical Diseases (NTD)
 World Health Organization



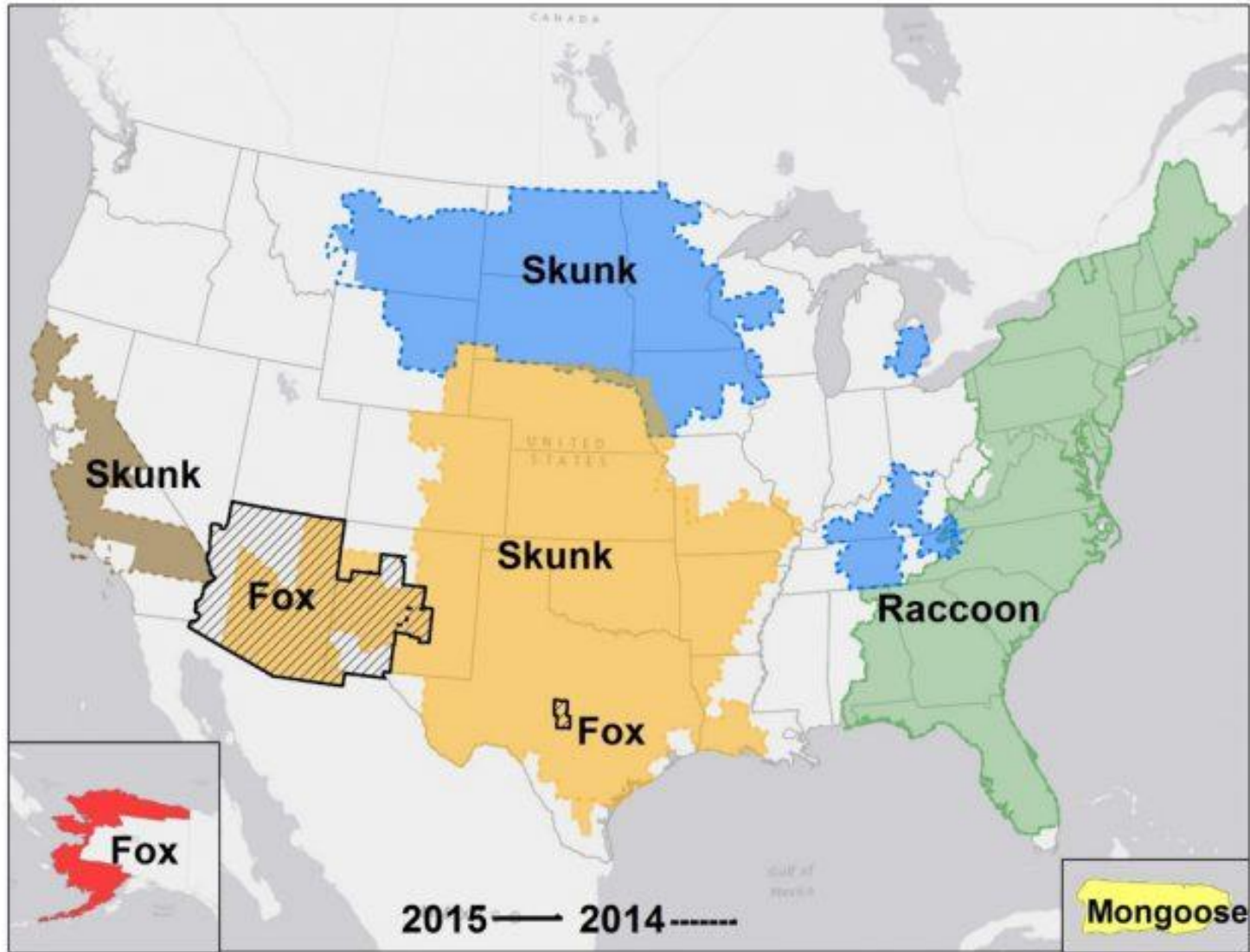
Rabid Animals Reported in the United States during 2009



Rabies in domestic animals, United States, 1958-2008



Terrestrial Rabies Reservoirs in the United States, 2015



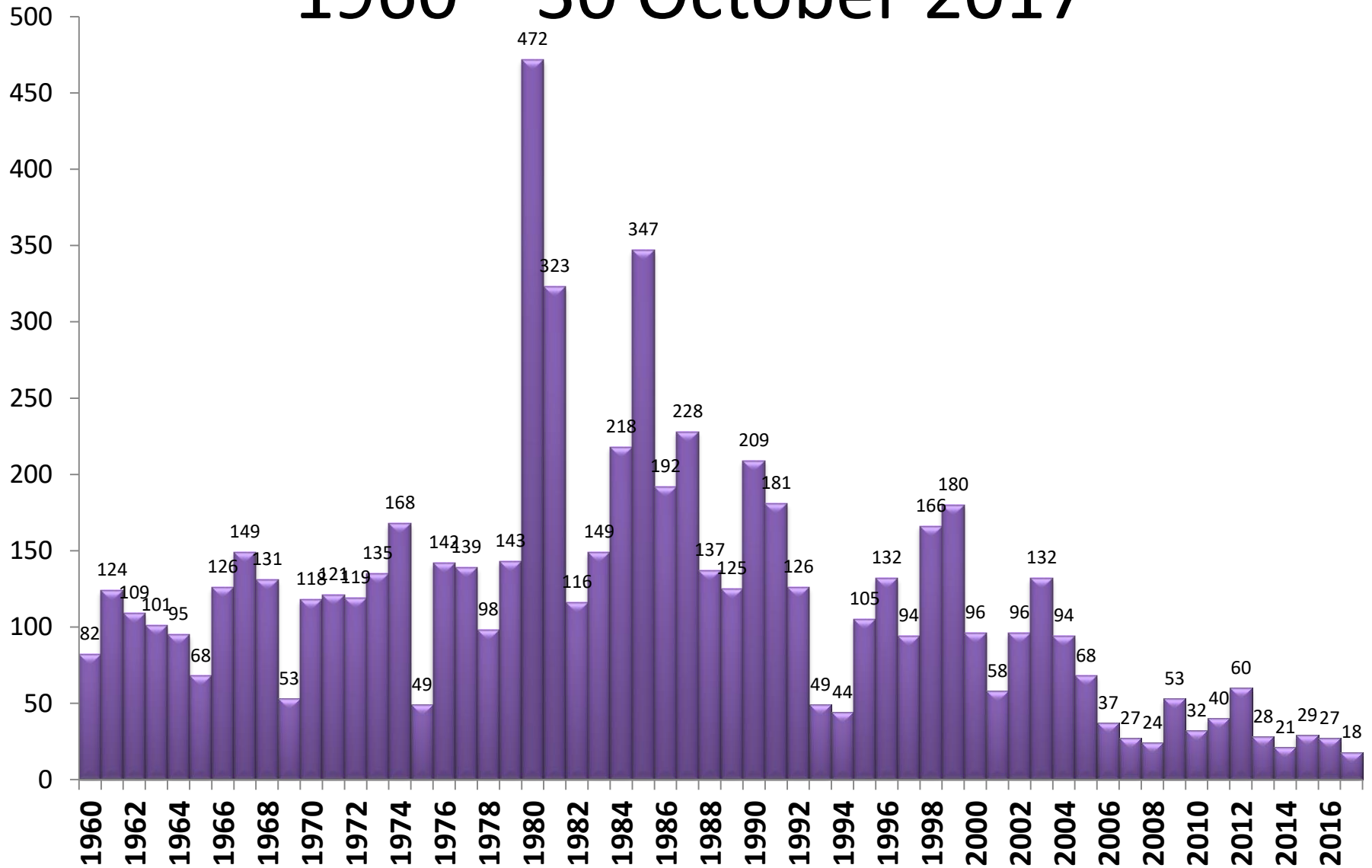
Birhane et al. 2017. Rabies surveillance in the United States during 2015. *Journal of the Am Veterinary Medical Assoc* 250: 1117-1130.

<http://avmajournals.avma.org/doi/10.2460/javma.250.10.1117>

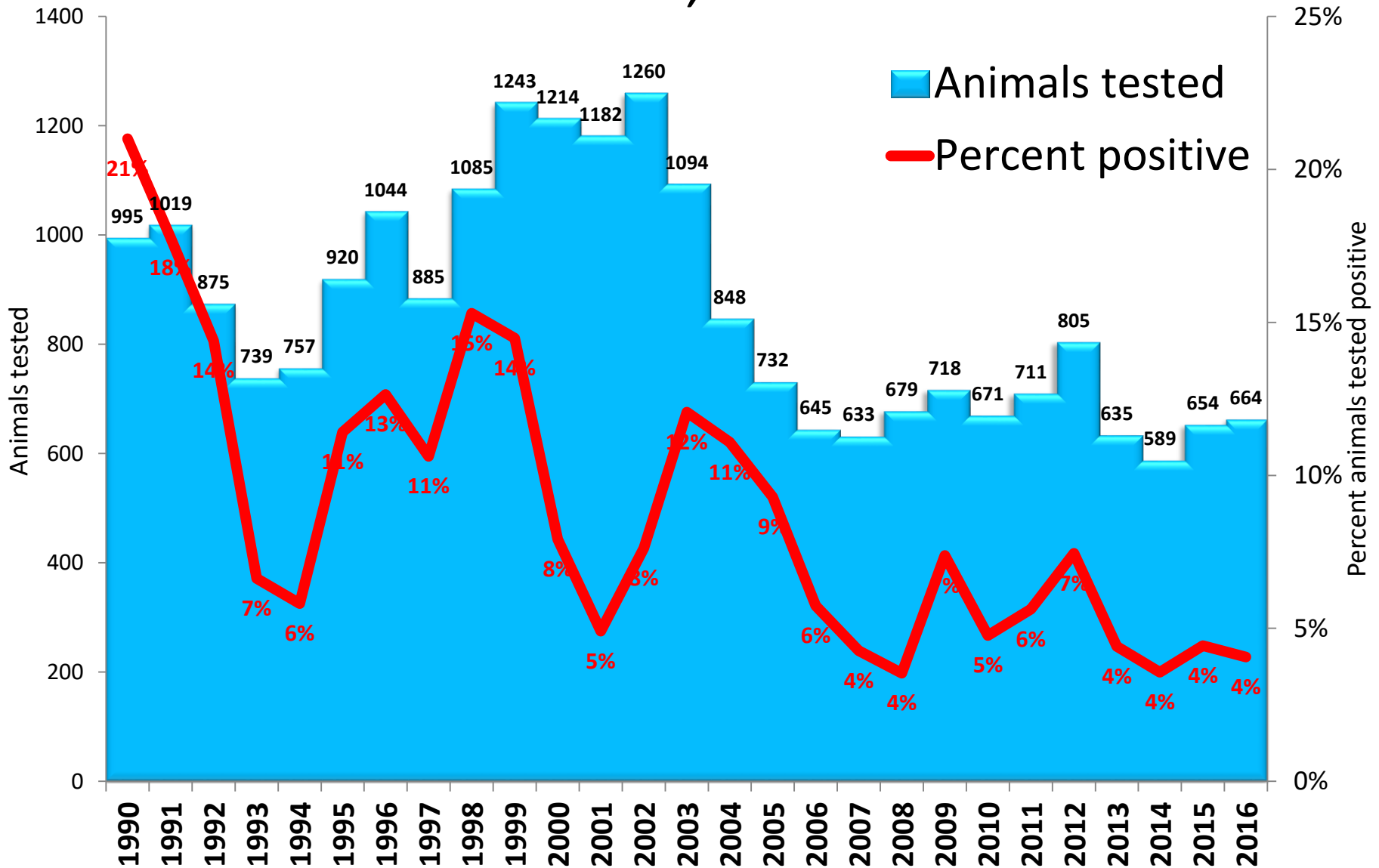
The SKUNK is the primary reservoir of rabies in South Dakota



Animal rabies, South Dakota 1960 – 30 October 2017



Animal rabies tests and percent positive, South Dakota, 1990 – 2016

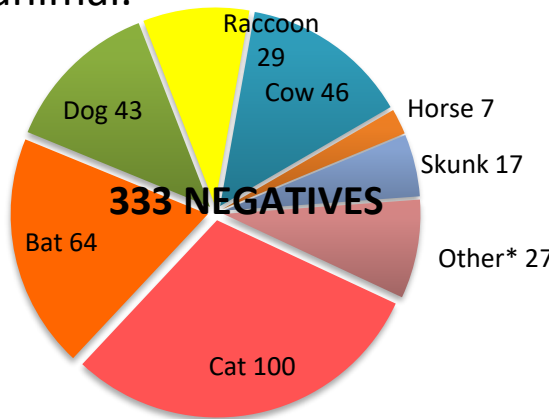
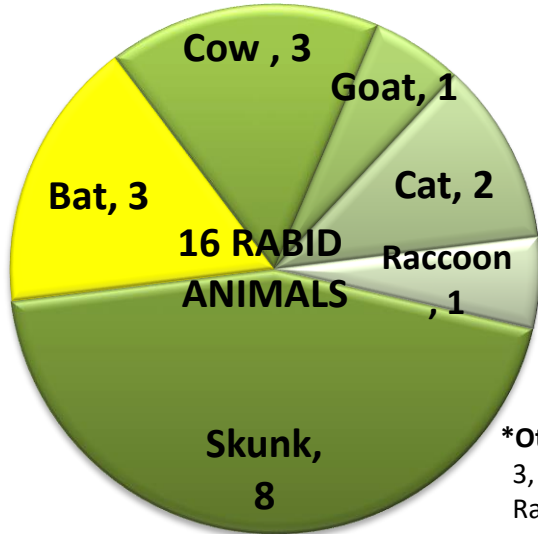


Rabies

Rabies is a fatal, but preventable, disease of mammals most often transmitted through the bite of a rabid animal.

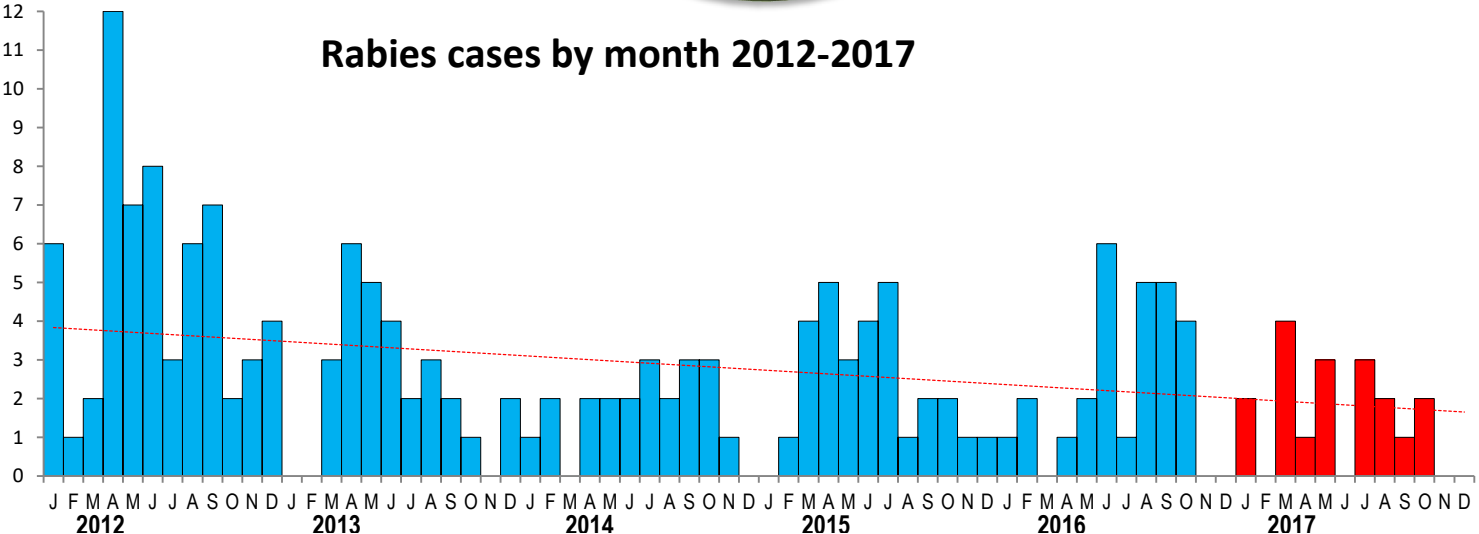
County: rabid animals 18

- Edmunds: skunk 1
- Grant: cow 1
- Hand: goat 1
- Hughes: cat 1
- Hyde: cow 1
- Lawrence: bat 2
- Minnehaha: bat 1
- Miner: skunk 2, cow 1
- Perkins: raccoon 1
- Roberts: skunk 3, cat 1
- Walworth: skunk 1



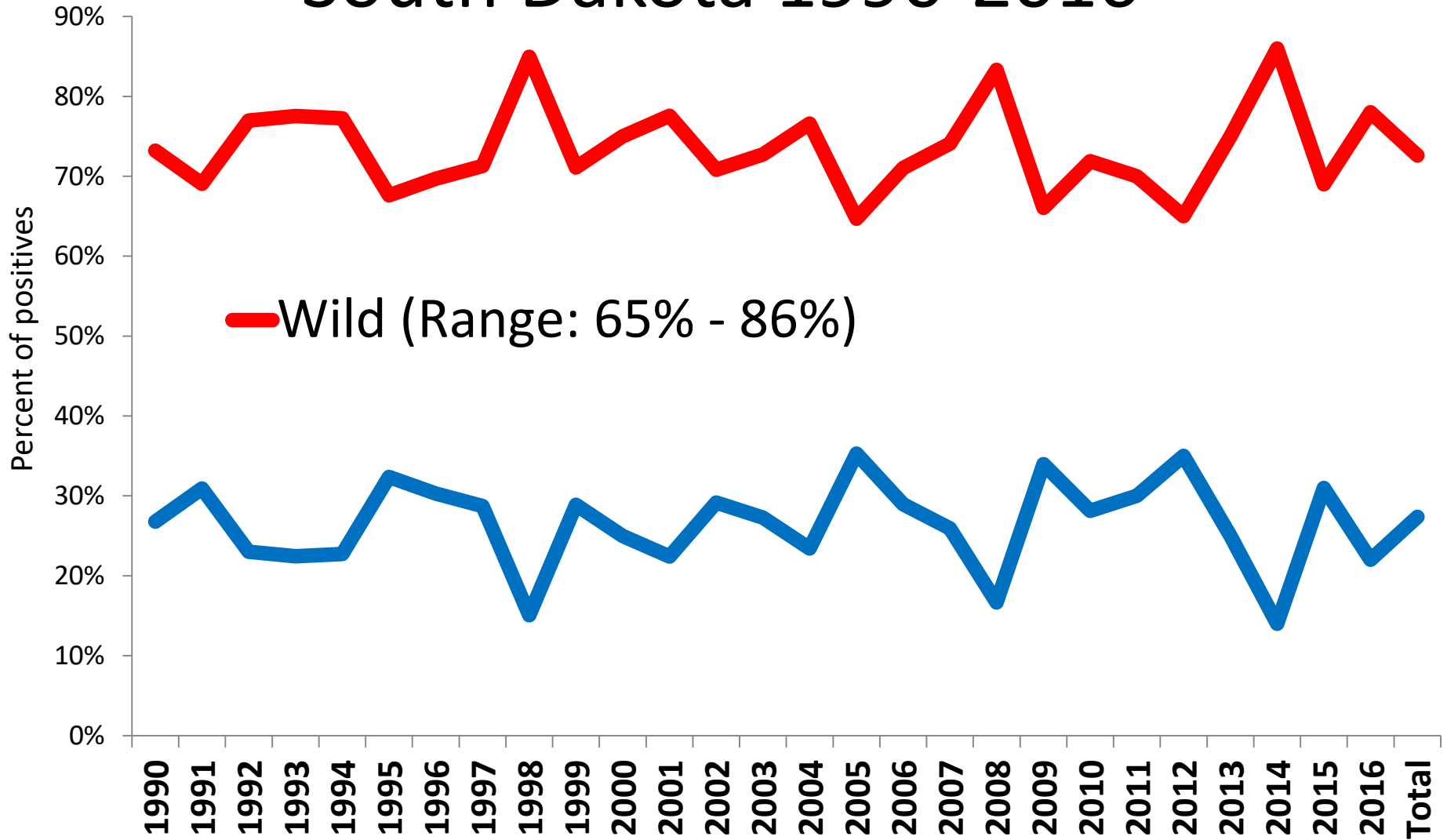
-33% below baseline
(5-yr median)

*Others: Coyote 2, Deer 3, Donkey 1, Fox 2, Goat 3, Gopher 1, Marmot 1, Muskrat 3, Opossum 3, Rabbit 1, Rat 2, Sheep 3, Woodchuck 2.



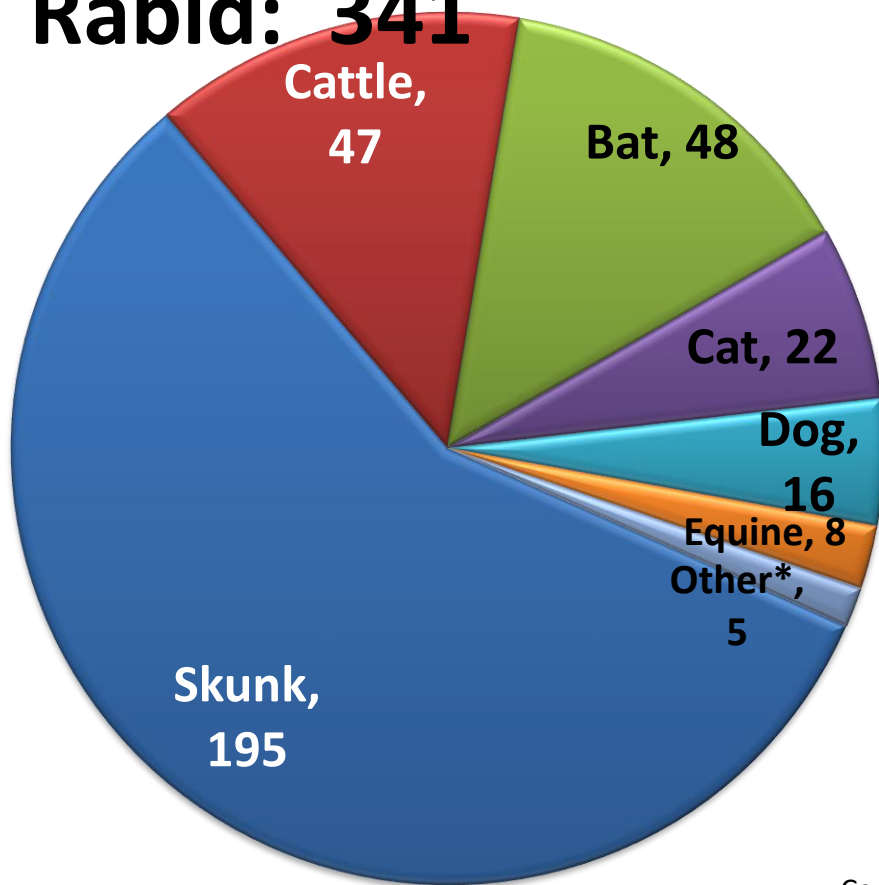
SD Rabies surveillance: <http://doh.sd.gov/documents/statistics/2015Rabies.pdf>

Rabies in Domestic and Wild Animals, South Dakota 1990-2016

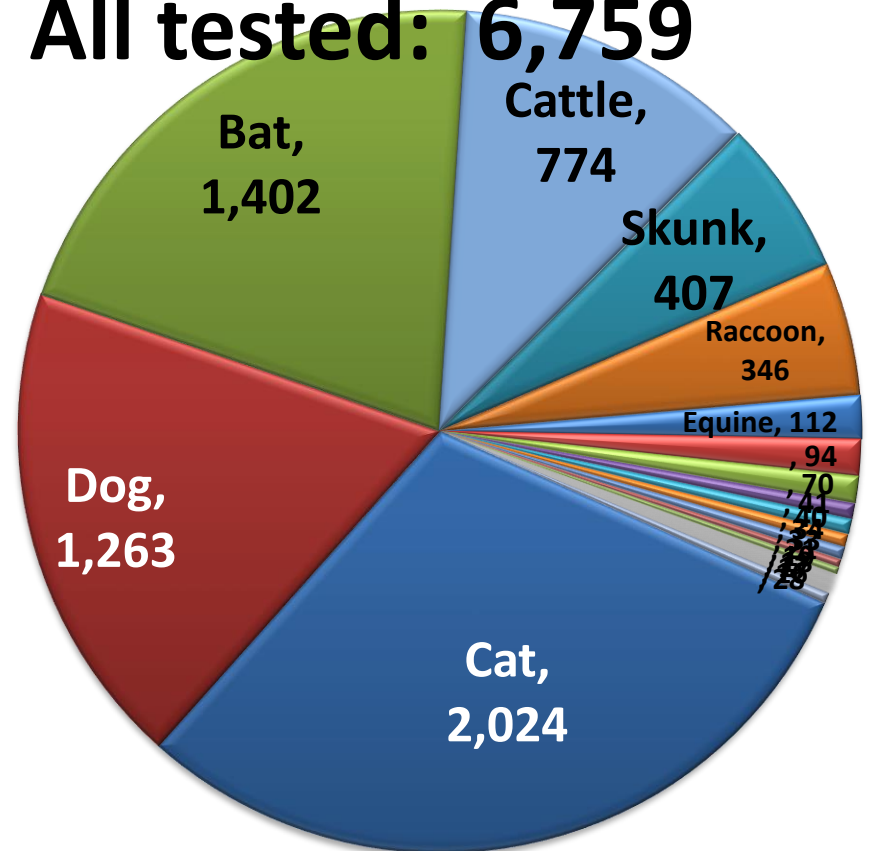


Animals tested and confirmed rabid cases, South Dakota 2007 – 2016

Rabid: 341



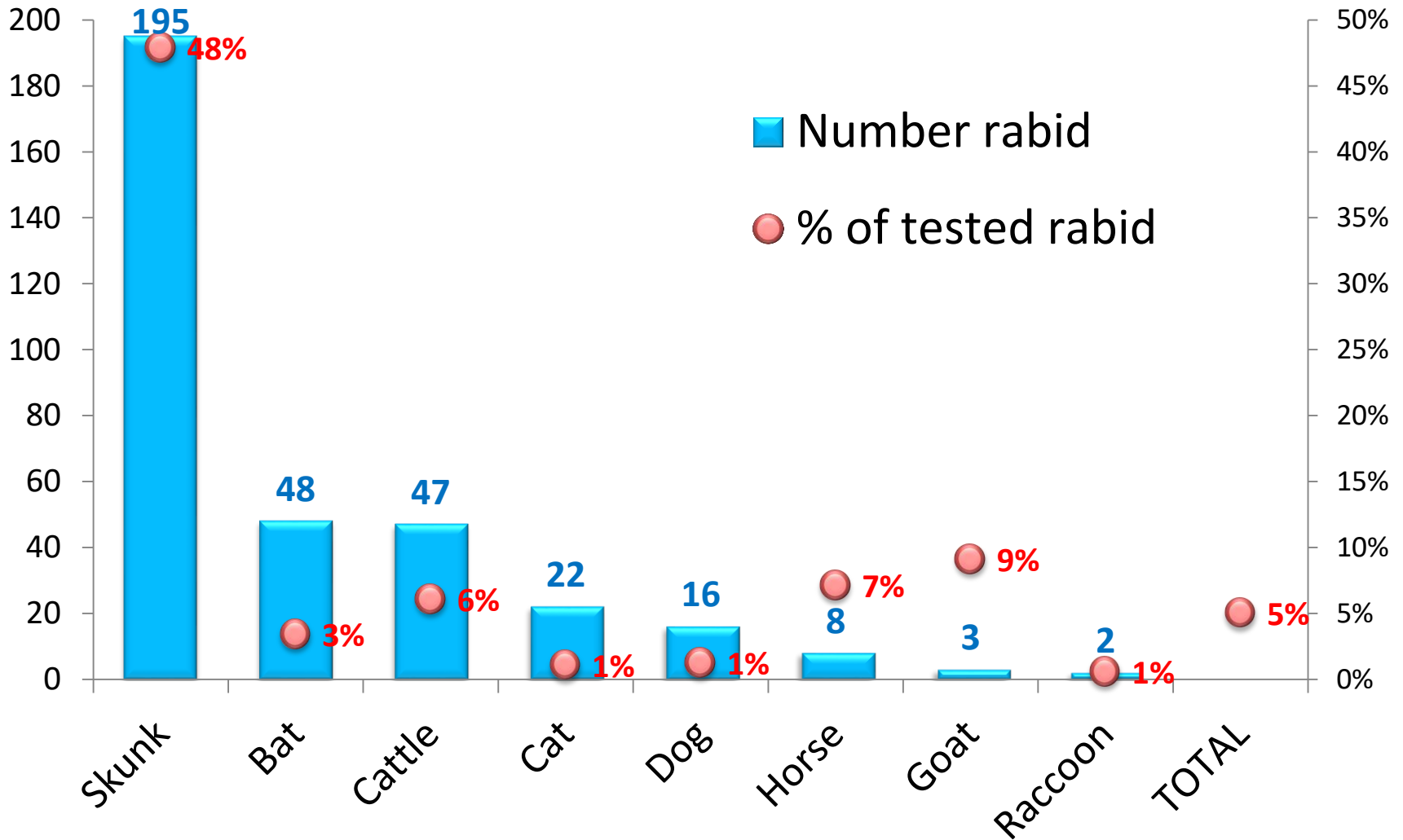
All tested: 6,759



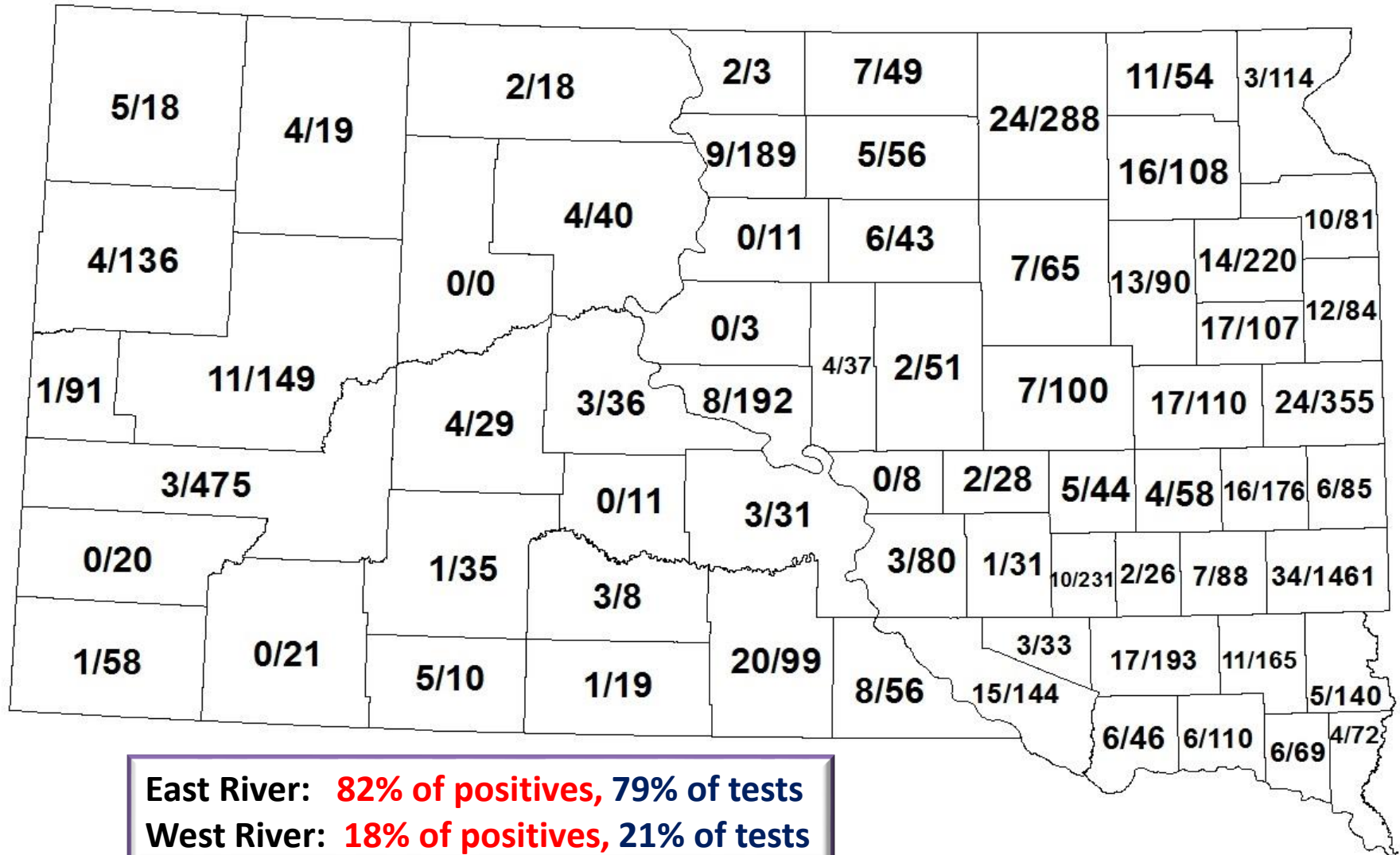
*Other: 3 goat, 2 raccoon

Cervid 94, Rodent 70, Squirrel 41, Muskrat 40, Sheep 34, Goat 33, Coyote 21, Fox 19, Weasel 18, Woodchuck 17, Opossum 16, Lagomorph 6, Pig 3, Badger 6, Mountain lion 2, Bison 1, Shrew 1, Lemur 1, Mongoose 1, Otter 1

Number and percent of animals rabid (positive/total tested), South Dakota, 2007-2016

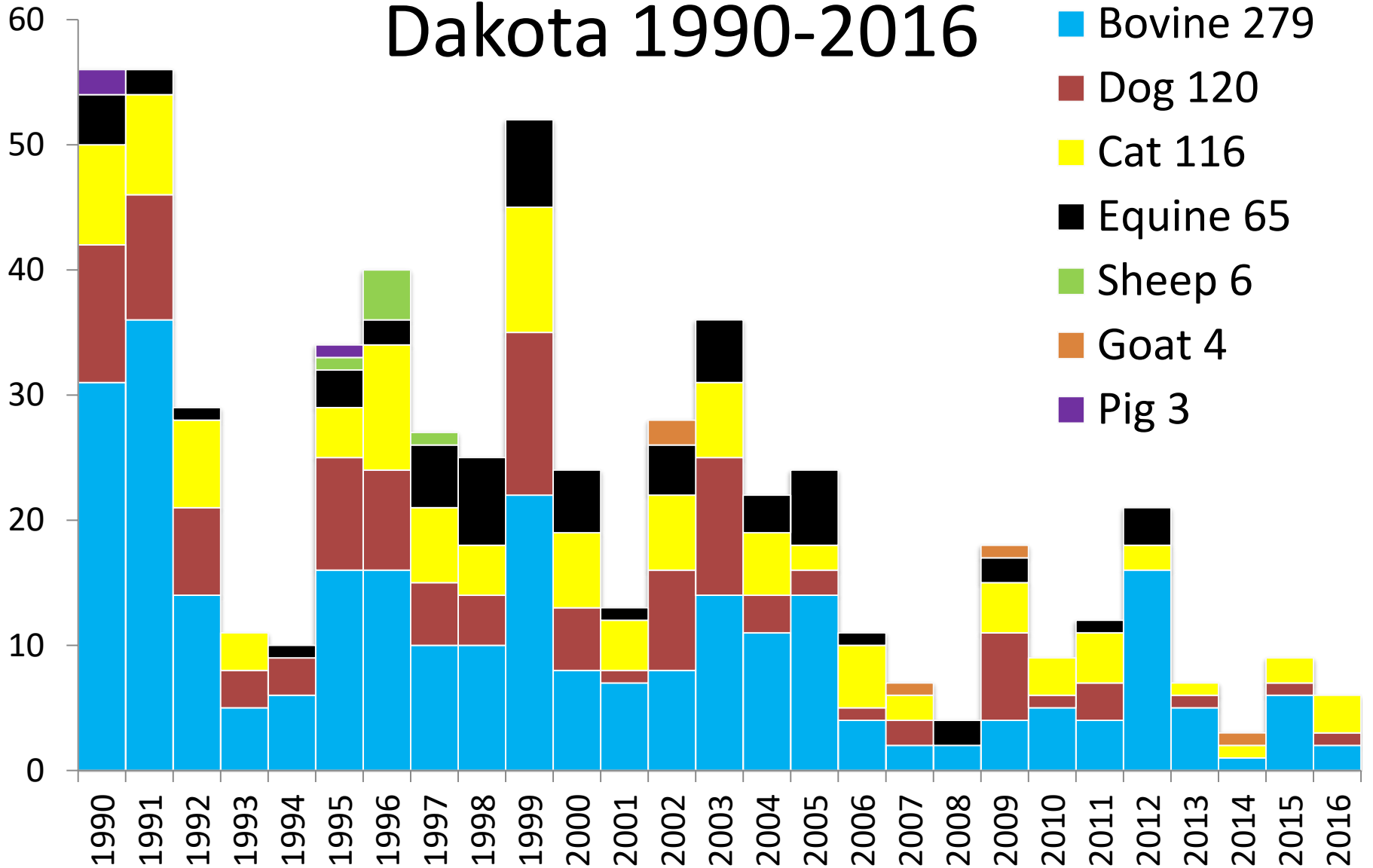


Animal rabies tests (464 positive/ 7,077 total tested), South Dakota 2004-2013

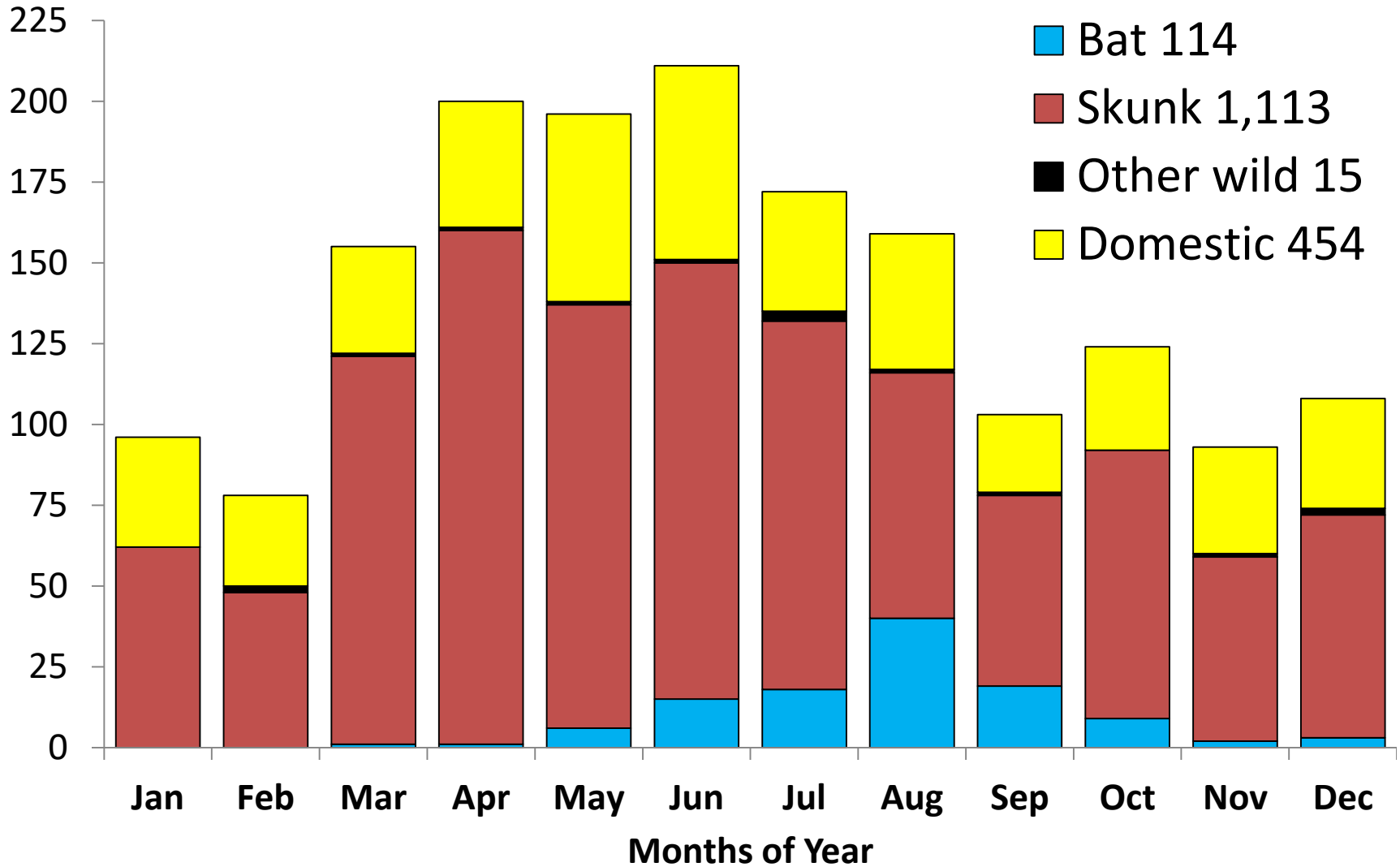


Rabies in Domestic Animals, South

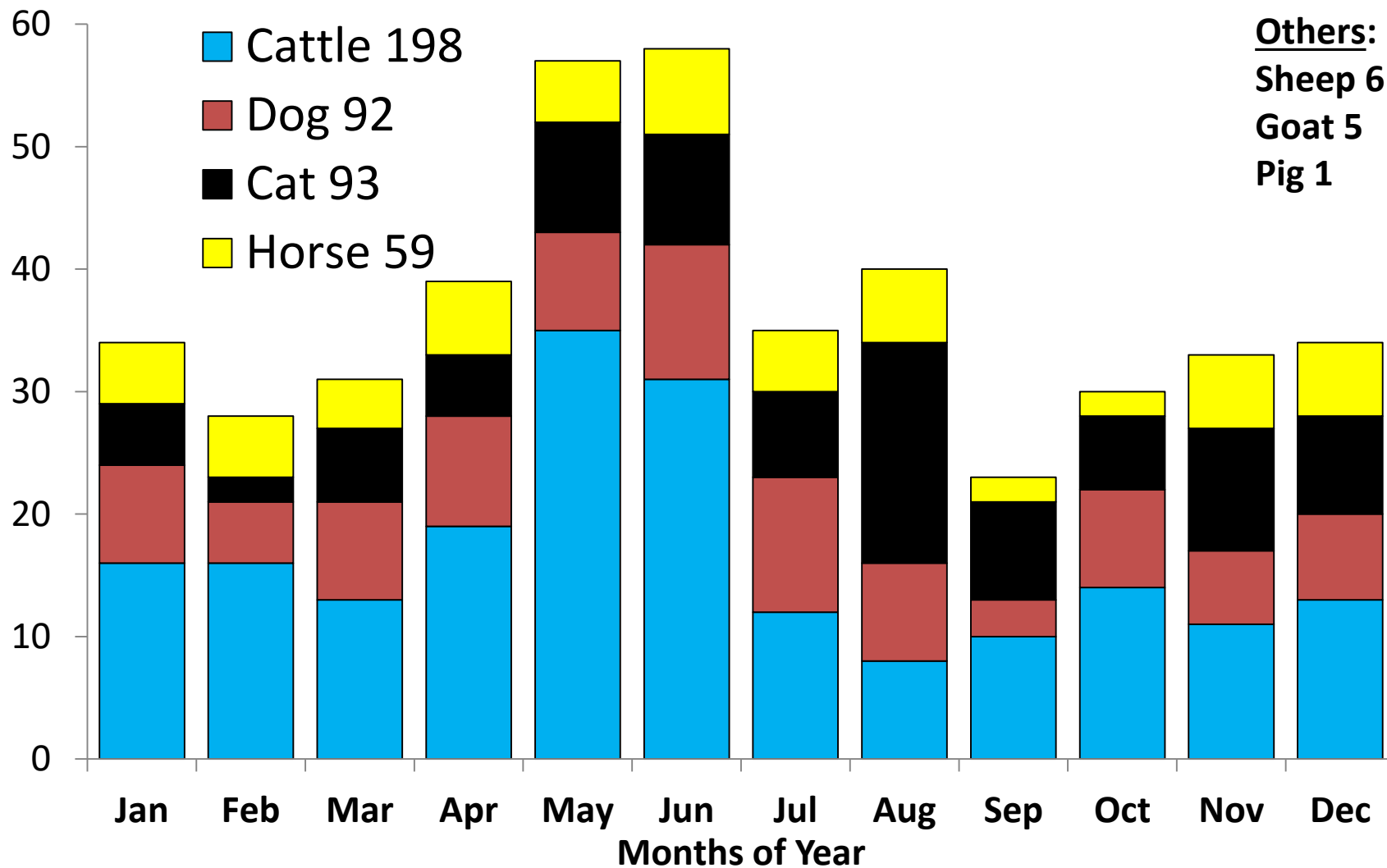
Dakota 1990-2016



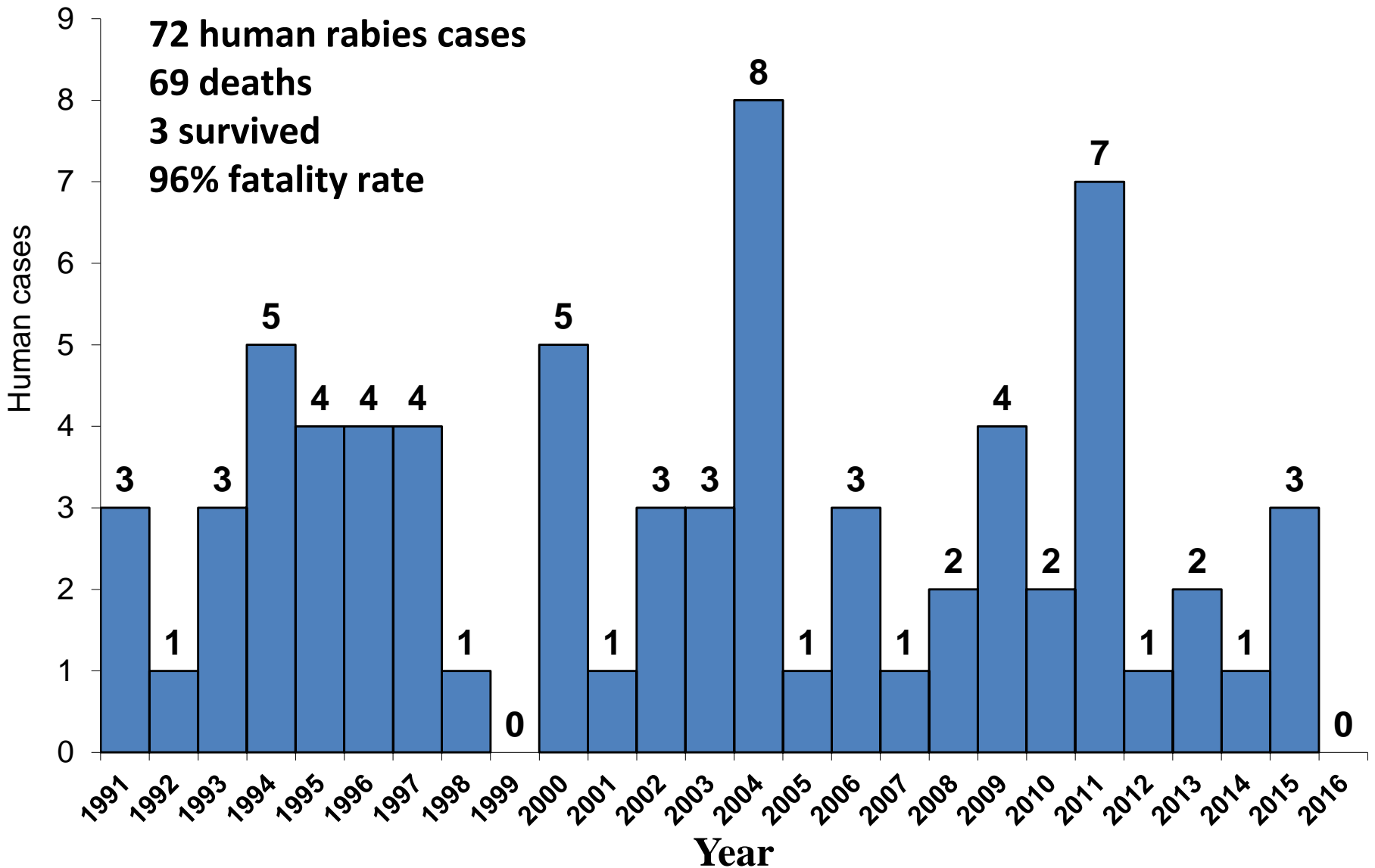
Animal rabies by month, South Dakota 1993-2016



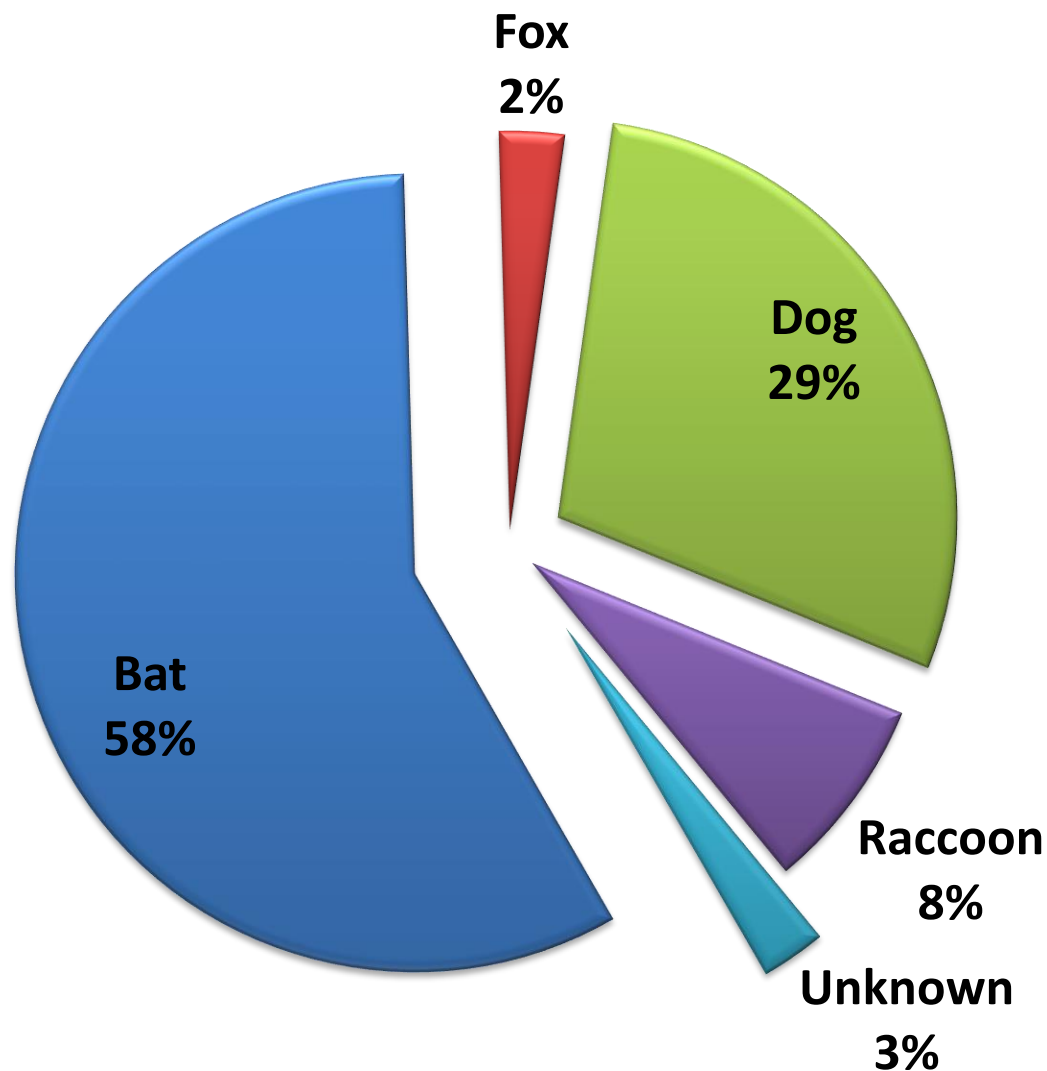
Domestic animal rabies by month, South Dakota 1993-2016



Human rabies in the USA, 1991-2016 (n=72)



Source of human rabies virus, United States, 2003-20016 (n = 35 deaths, 3 survivals)



Texas 6
California 6
Massachusetts 3
Indiana 2
Missouri 2
Virginia 2
Wisconsin 2
Puerto Rico 2
Arkansas 1
Florida 1
Louisiana 1
Maryland 1
Michigan 1
Minnesota 1
Mississippi 1
New Jersey 1
New York 1
North Carolina 1
Oklahoma 1
South Carolina 1
Wyoming 1

Country of exposure

Haiti 2
Philippines 2
Afghanistan 1
Brazil 1
Caribbean 1
El Salvador 1
Guatemala 1
India 1

Last known rabies deaths in South Dakota

- A. 1966, Hamlin County, 10 yr old white male, bitten by skunk.**

- B. 1970, Brule County, 3 yr old white male, bitten by skunk.**

1966 Rabies death in South Dakota

“A Bryant youth, who was bitten by a rabid skunk August 3 (1966), died at a Sioux Falls hospital Monday. CS, 10, seemed to be recovering from the bites until Saturday when he began suffering headaches and was rushed to Sioux Falls.

CS was bitten while sleeping out with friends. The skunk entered the sleeping bag which CS had received a week before as a birthday gift.

He was bitten on about 6 places on the ear, arm, hand and leg. The animal was found 5 blocks away and was killed and sent to Brookings for tests. The lad underwent treatment at the DeSmet Hospital for rabies before being transferred to Sioux Valley Hospital.”

(Argus Leader, 6 September 1966)

1966 Rabies death in South Dakota

“The skunk was chased down and killed with a baseball bat 5 blocks away. The animal’s brain was brought to the veterinary science department at SDSU where fears were confirmed; It was rabid.

CS was treated at DeSmet Hospital, received 21 rabies shots, and returned home, then later returned to the hospital. He died over a month after he was bitten.

Dr. Keith Van Steenberg (SDSU) tested the skunk. The skunk’s brain contained “negri bodies””

(Brookings Register, 10 September 1966)

Thank you

