

2018 TEXAS PLAGUE SURVEILLANCE REPORT

Each year the Texas Department of State Health Services (DSHS), in conjunction with Texas AgriLife Extension/Wildlife Services and occasionally other agencies, collects samples from wildlife for plague (the bacterium *Yersinia pestis*) testing. Samples are collected primarily from carnivores using Nobuto blood filter strips during predator-control activities or as part of targeted surveillance efforts for plague and other zoonotic diseases. Although most carnivores are resistant to plague, they develop antibodies when exposed to *Y. pestis*, thereby making them good indicators of plague activity within their territories. Animal and arthropod surveillance results indicate that there are natural reservoirs for the plague organism in much of the state.

Plague, which occurs naturally in Texas, can cause severe human disease and death. Clinical- or laboratory-confirmed cases in animals or humans are reportable to DSHS. Surveillance for plague enables DSHS to alert physicians and veterinarians to be vigilant for signs of the disease in their patients when increased plague activity is detected in wildlife. *Y. pestis* can be used as a bioterrorism weapon and unusual plague activity related to its use as a weapon can be recognized more easily if natural disease occurrence is well characterized.

Plague in Humans

There were no reported human cases of plague in Texas during 2018.

Plague in Animals

In calendar year 2018, samples from 971 mammals collected from 97 counties (38.2% of Texas counties) were submitted for plague testing. The DSHS Laboratory Services Section tested 963 (99.2%) of the samples; 8 (0.8%) of the samples were not tested due to insufficient specimen quantity.

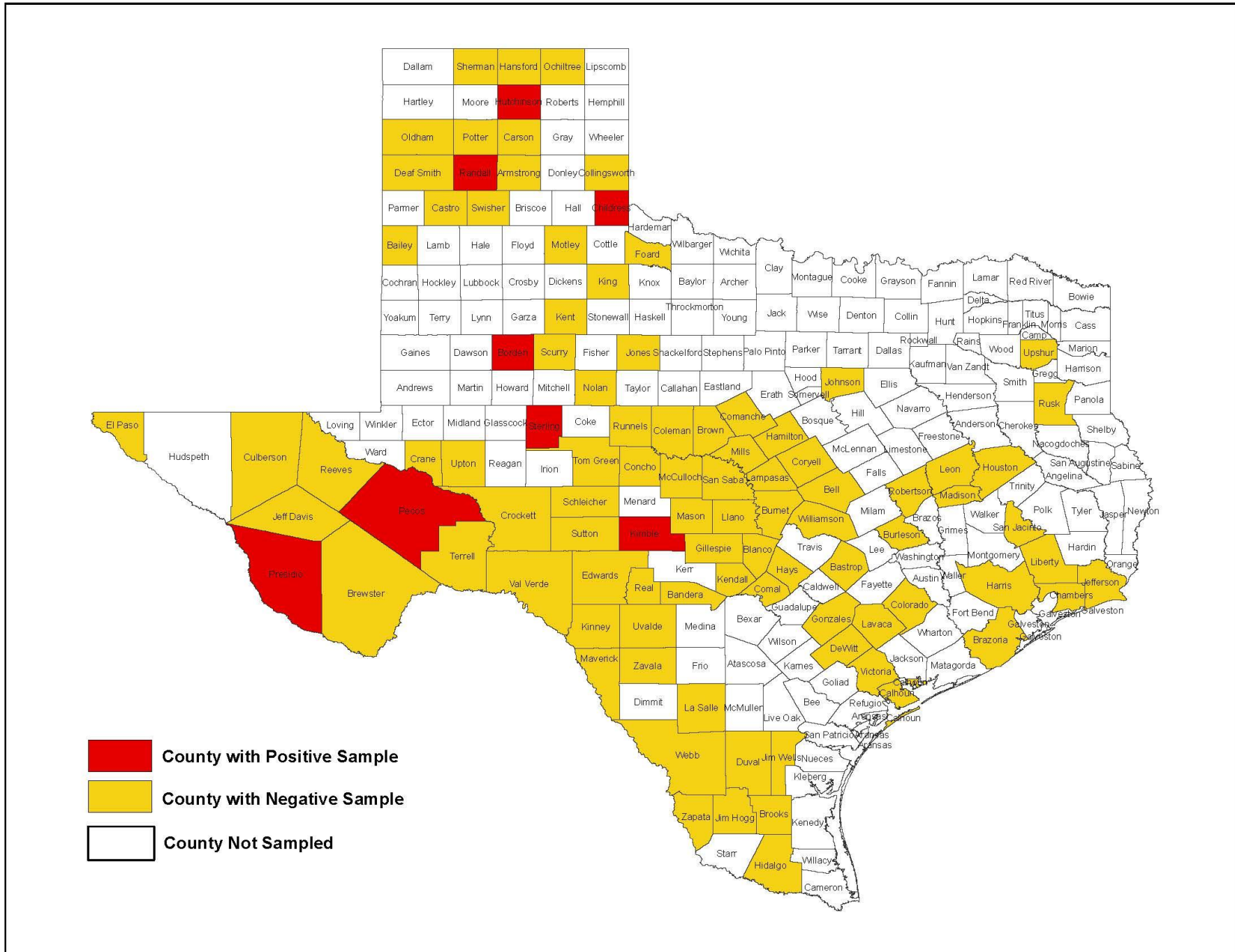
Plague antibodies at a titer of $\geq 1:32$, which indicates probable exposure to *Y. pestis*, were reported for 10 samples (1.0% of those tested by DSHS) collected from 8 counties (3.1% of Texas counties) and 953 samples (99.0% of those tested by DSHS) were negative at a titer of $<1:32$. Positive results are reported in Table 1; negative results are reported in Table 2.

Table 1. Animals Positive for Plague by County and Titer, 2018

County	Titer	Coyote	Number Positive (County)	Number Tested (All Species)	Percent Positive (All Species)
Borden	1:256	2	3	8	37.5%
	1:512	1			
Childress	1:512	1	1	3	33.3%
Hutchinson	1:256	1	1	4	25.0%
Kimble	1:128	1	1	31	3.2%
Pecos	1:256	1	1	49	2.0%
Presidio	1:256	1	1	18	5.6%
Randall	1:128	1	1	24	4.2%
Sterling	1:1024	1	1	7	14.3%
Number Positive (Statewide)		10	10		
Number Tested (Statewide)		772	963 (all species)		
Percent Positive (Statewide)		1.3%	1.0%		

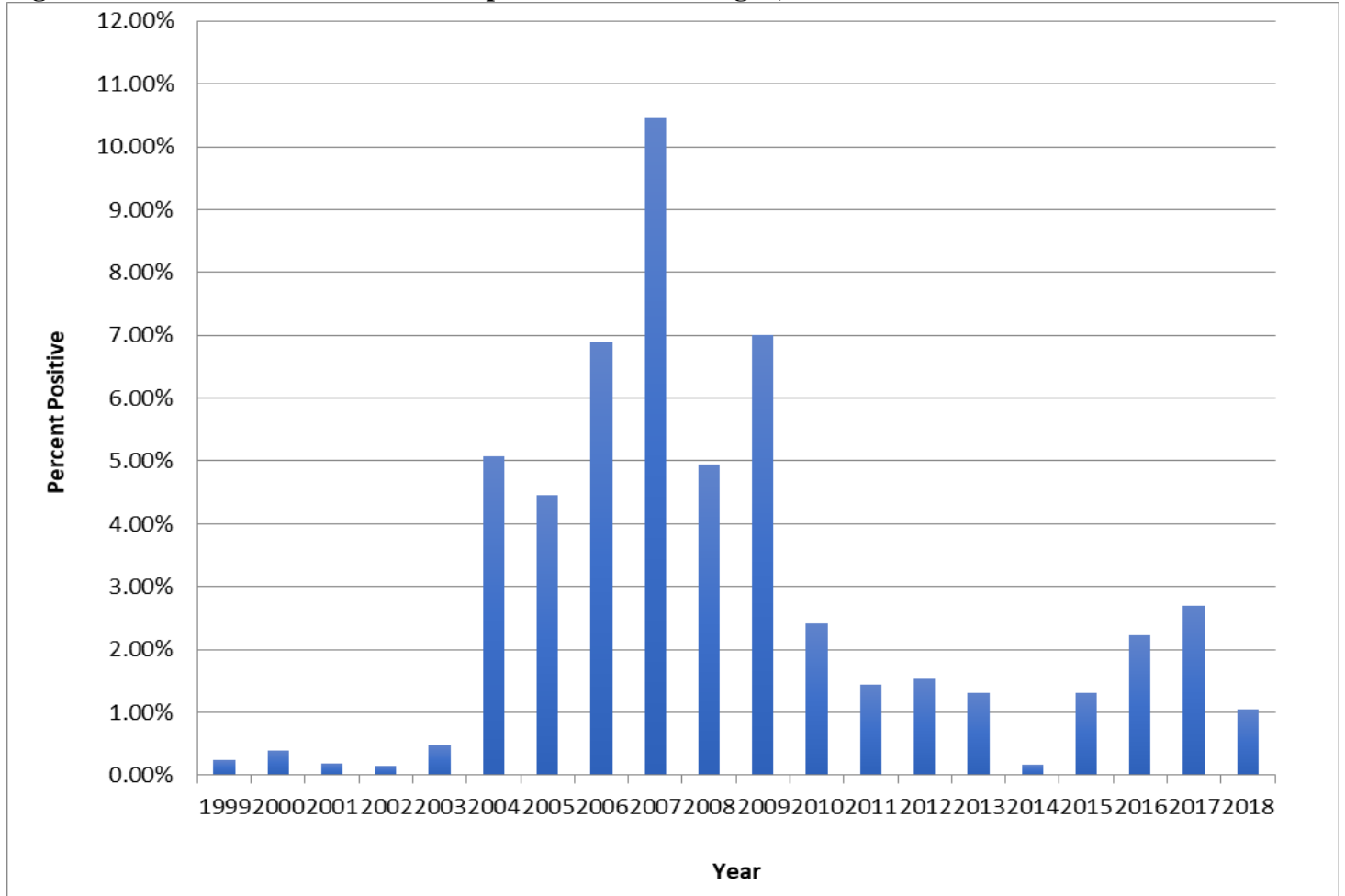
The geographic distribution by county of specimens tested and specimens testing positive for *Yersinia pestis* in 2018 is illustrated in Figure 1.

Figure 1. Counties Sampled for Plague Surveillance, 2018



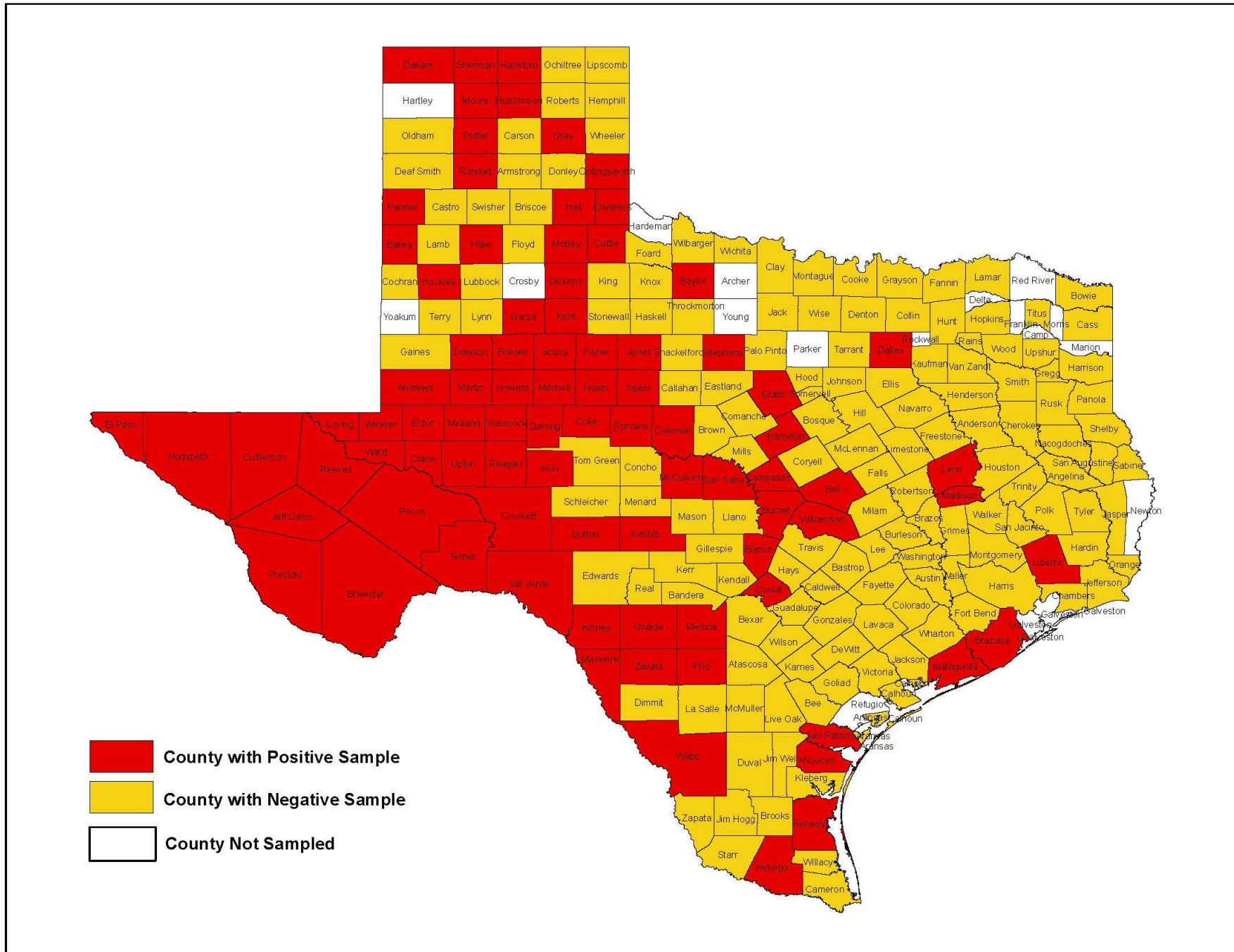
A comparison of the percent of surveillance samples positive for plague during 2018 to the percent positive in the previous 19 years indicates a continuing overall lower level of detected plague activity from 2010-2018, as compared to 2004-2009 (Figure 2); however, prevalence is still higher than for the 1999-2003 period. Factors such as climate, changing ecosystems, predator activity, and host and flea population size and dynamics may affect the magnitude of plague transmission within wildlife populations. Differences in sampling rates and the species and locations sampled may also affect the detection of plague activity within wildlife populations.

Figure 2. Percent of Surveillance Samples Positive for Plague, 1999-2018



While plague is considered endemic in far west Texas and the Panhandle region, statewide surveillance demonstrates that there may be naturally occurring risk in all but the extreme eastern part of the state (Figure 3).

Figure 3. Counties Sampled for Plague Surveillance, 1976-2018



By using educational materials, news releases, a website, and conference presentations, DSHS personnel keep veterinarians, physicians, and the public aware of the plague risk in Texas. Even in areas with historically low plague activity, infections may occur in hunters or campers who visit plague-endemic areas or in pets and wildlife transported from those areas. There is also a risk that new areas of infection may be established by moving animals across the state.

Table 2 shows the complete listing, by county and species, of samples that tested negative for plague in 2018.

Table 2. Animals Negative for Plague by County, 2018

County	Bobcat	Coyote	Gray Fox	Raccoon	Red Fox	Total
Armstrong		2				2
Bailey		5				5
Bandera			3			3
Bastrop		1				1
Bell		5				5
Blanco		1	28			29
Borden	1	4				5
Brazoria		1				1
Brewster		19	9			28
Brooks		1				1
Brown		2				2
Burleson		3				3
Burnet		4				4
Calhoun		2				2
Carson		2				2
Castro		1				1
Chambers		19				19
Childress		2				2
Coleman		3				3
Collingsworth		3				3
Colorado		4				4
Comal		15				15
Comanche		3				3
Concho		1	5			6
Coryell		10				10
Crane		8				8
Crockett		3	1			4
Culberson		18	1			19
Deaf Smith		25				25
DeWitt		3				3
Duval		3				3
Edwards		2				2
El Paso		32				32
Foard		1				1
Gillespie			8	3	1	12

County	Bobcat	Coyote	Gray Fox	Raccoon	Red Fox	Total
Gonzales		2				2
Hamilton		11				11
Hansford		7				7
Harris		2				2
Hays		7				7
Hidalgo		8				8
Houston		7				7
Hutchinson		3				3
Jeff Davis		2				2
Jefferson		48				48
Jim Hogg		13				13
Jim Wells		20				20
Johnson			1			1
Jones	1					1
Kendall			28		2	30
Kent		1				1
Kimble		23	7			30
King		1				1
Kinney		6	2			8
La Salle		1				1
Lampasas		12	3			15
Lavaca		4				4
Leon	1	1				2
Liberty		20				20
Llano			1			1
Madison		10				10
Mason		1		1		2
Maverick		43	1			44
McCulloch	1	3				4
Mills		18				18
Motley		11				11
Nolan		1				1
Ochiltree		5				5
Oldham		2				2
Pecos		40	8			48
Potter		8				8
Presidio		17				17
Randall	1	22				23
Real		4				4
Reeves		4				4
Robertson		2				2
Runnels		31				31
Rusk		1				1

County	Bobcat	Coyote	Gray Fox	Raccoon	Red Fox	Total
San Jacinto		1				1
San Saba		2	2			4
Schleicher		5	1			6
Scurry			1			1
Sherman		13				13
Sterling			5		1	6
Sutton			1			1
Swisher		1				1
Terrell		6	52			58
Tom Green		6				6
Upshur			3			3
Upton		19	1			20
Uvalde	1	2	1			4
Val Verde		5	1			6
Victoria		4				4
Webb		54				54
Williamson		9	3			12
Zapata		3				3
Zavala		2				2
Total	6	762	177	4	4	953