

2020 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. Clinically- 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 2020.

Plague in Animals

In calendar year 2020, samples from 627 mammals collected from 72 counties (28.3% of Texas counties) were submitted for plague testing. The DSHS Laboratory Services Section tested 282 (45.0%) of the samples from 52 counties (20.5% of Texas counties); 345 (55.0%) of the samples from 53 counties (20.9% of Texas counties) were not tested due to insufficient specimen quantity, quality, or limited laboratory capacity.

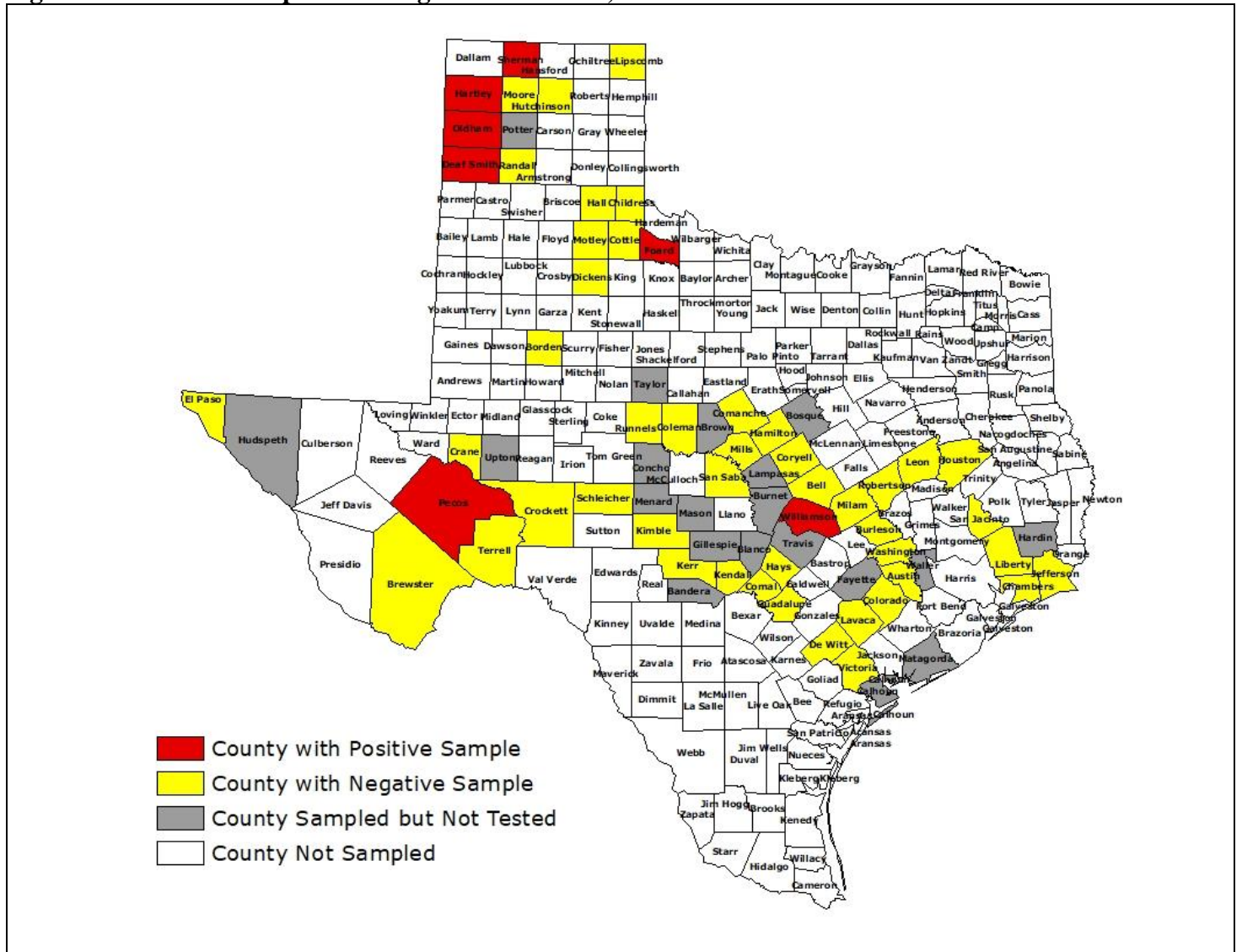
Plague antibodies at a titer of $\geq 1:32$, which indicates probable exposure to *Y. pestis*, were reported for 7 samples (2.5% of those tested by DSHS) collected from 7 counties (2.8% of Texas counties; 13.5% of tested counties) and 275 samples (97.5% of those tested by DSHS) from 50 counties (19.7% of Texas counties) 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, 2020

County	Titer	Coyote	Number Positive (County)	Number Tested (All Species)	Percent Positive (All Species)
Deaf Smith	1:1024	1	1	10	10.0%
Foard	1:128	1	1	1	100.0%
Hartley	1:1024	1	1	1	100.0%
Oldham	1:256	1	1	2	50.0%
Pecos	1:32	1	1	25	4.0%
Sherman	1:512	1	1	21	4.8%
Williamson	1:32	1	1	7	14.3%
Number Positive (Statewide)		7	7		
Number Tested (Statewide)		253	282		
Percent Positive (Statewide)		2.8%	2.5%		

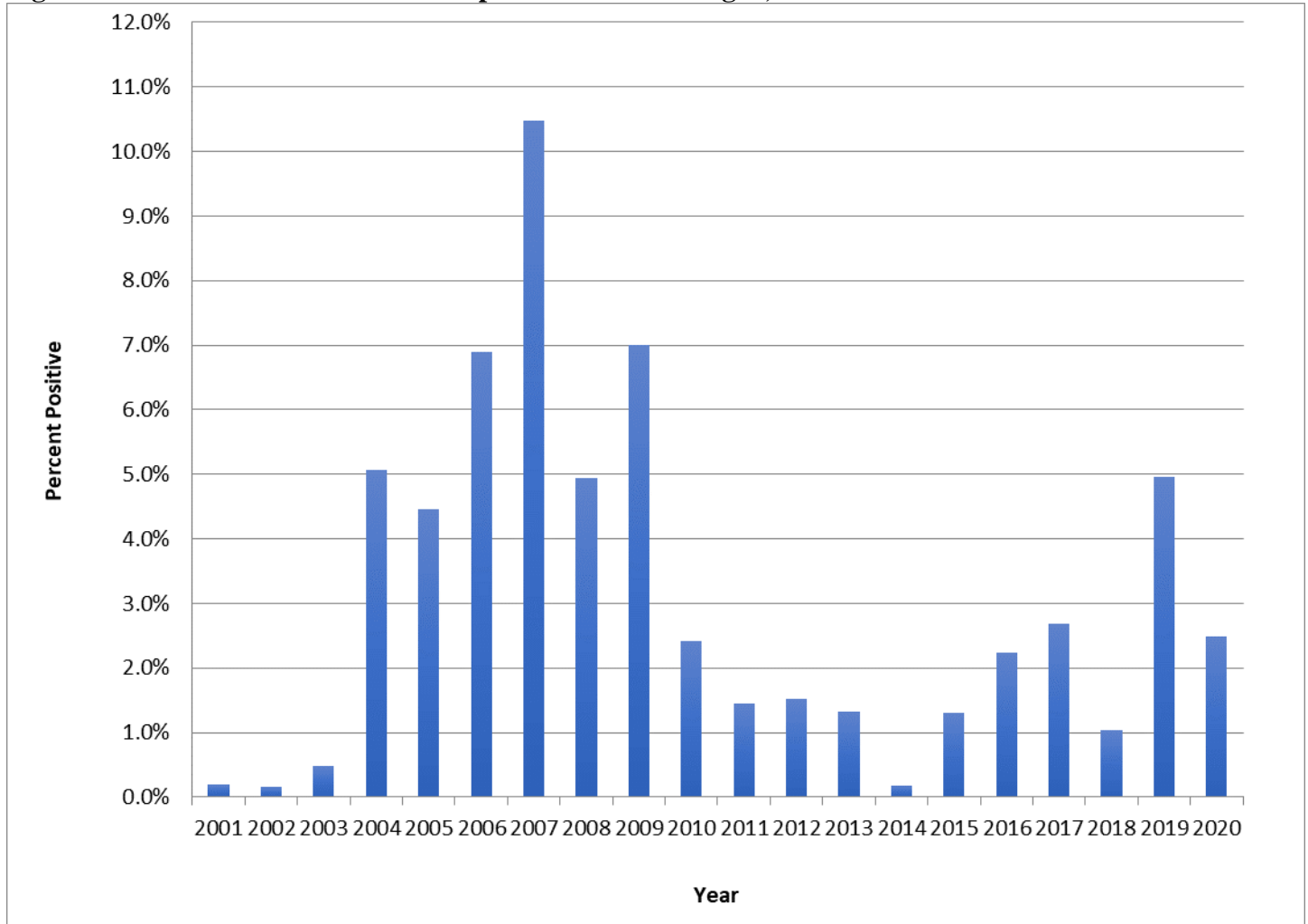
The geographic distribution by county of specimens tested and specimens testing positive for *Yersinia pestis* in 2020 is illustrated in Figure 1.

Figure 1. Counties Sampled for Plague Surveillance, 2020



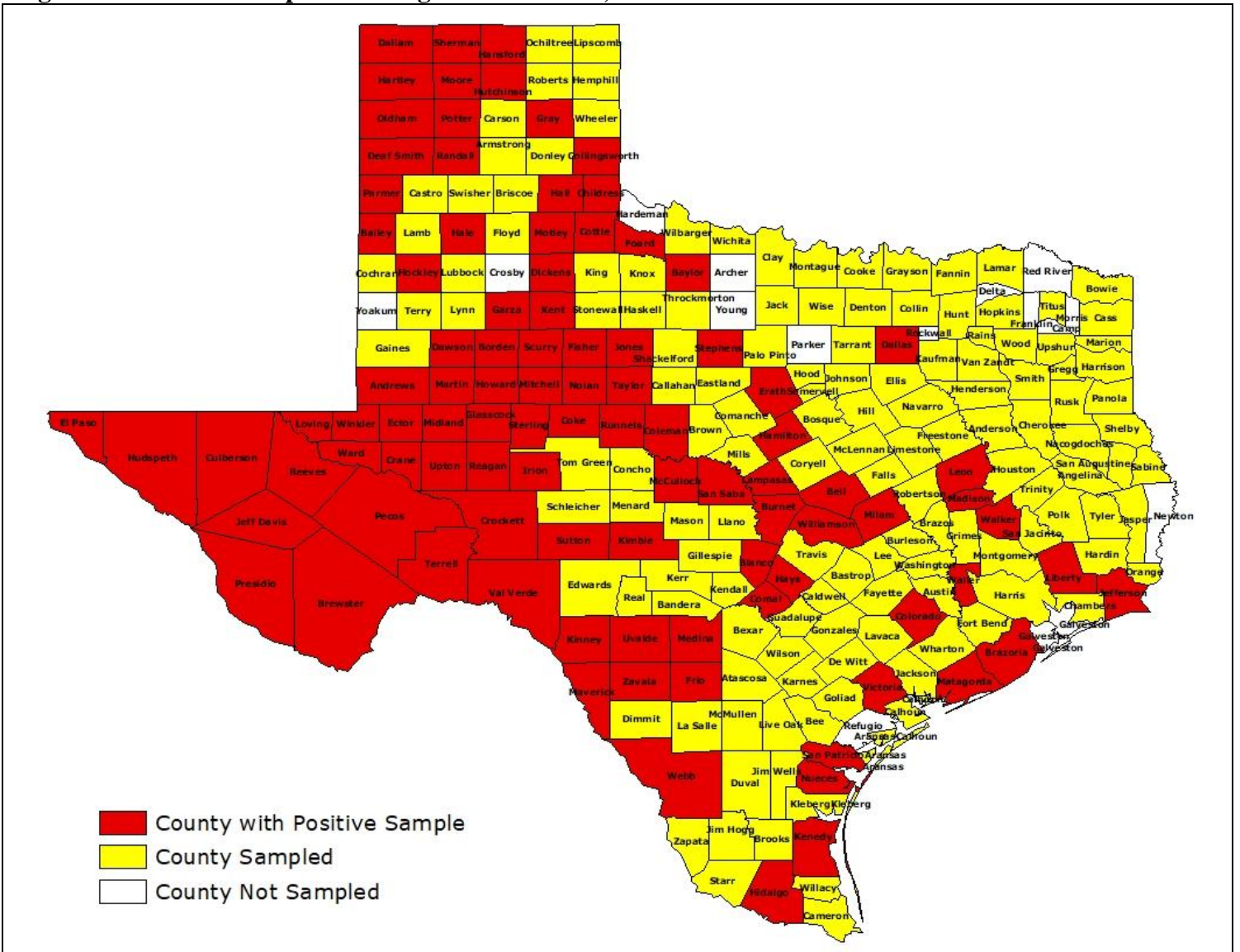
A comparison of the percent of surveillance samples positive for plague during 2020 to the percent positive in the previous 19 years indicates an overall lower level of detected plague activity from 2010-2020, as compared to 2004-2009 (Figure 2); however, prevalence is still much higher than for the 2001-2003 period and may represent the beginning of another multi-year period of elevated activity. 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, 2001-2020



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, 1976-2020



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 2020.

Table 2. Animals Negative for Plague by County, 2020

County	Black-tailed Jackrabbit	Bobcat	Coyote	Gray Fox	Raccoon	Red Fox	Total
Austin			2				2
Bell			1				1
Borden			2				2
Brewster			2	2			4
Burleson			1				1
Chambers			2				2
Childress			2				2
Coleman				1			1
Colorado			5				5
Comal			1	1			2
Comanche			3				3
Coryell			4				4
Cottle			1				1
Crane			9				9
Crockett			7				7
Deaf Smith			9				9
DeWitt			1				1
Dickens			2				2
El Paso	2		14				16
Guadalupe			1				1
Hall			1				1
Hamilton			3				3
Hays			4				4
Houston			2				2
Hutchinson			2				2
Jefferson			3				3
Kendall			1	3	1		5
Kerr				2			2
Kimble				1			1
Lavaca			2				2
Leon			7				7
Liberty			14				14
Lipscomb			12				12
Milam		1	2	1			4
Mills			18				18
Moore			1				1

County	Black-tailed Jackrabbit	Bobcat	Coyote	Gray Fox	Raccoon	Red Fox	Total
Motley			5				5
Oldham			1				1
Pecos			18	6			24
Randall			23			1	24
Robertson			2				2
Runnels			14				14
San Jacinto			1				1
San Saba			8	1			9
Schleicher			4				4
Sherman			19	1			20
Terrell				4			4
Victoria		1	3				4
Washington			1				1
Williamson			6				6
Total	2	2	246	23	1	1	275