

## 2010 PLAGUE SURVEILLANCE REPORT (Revised 10-10-14)

Each year the Texas Department of State Health Services (DSHS), in conjunction with Texas AgriLife Extension/Wildlife Services, Texas Parks and Wildlife Department, and other agencies, collects samples from wildlife for plague (the bacterium *Yersinia pestis*) testing. Samples are collected primarily from carnivores using Nobuto blood filter strips in the course of predator control actions 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 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. 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* is also an organism that can be used as a bioterrorism weapon. Unusual plague activity related to its use as a weapon can be recognized more easily if natural disease occurrence is well known.

### Plague in Humans

There were no reported human cases of plague in Texas during 2010.

### Plague in Animals

The DSHS Laboratory Services Section received 1,698 animal samples collected during calendar year 2010 from 103 counties, of which 1,692 were tested; 6 samples were not tested due to damage or insufficient quantity. Plague antibodies at a titer of  $\geq 1:32$ , which indicates probable exposure to *Y. pestis*, were reported for 41 samples (2.4% of samples tested) collected from 11 counties (Table 1); 1,651 samples were negative at a titer of  $<1:32$  (Table 2). Of note in 2010, all positive samples were from coyotes; all samples from other animal species which commonly test positive, such as gray fox, raccoon, and bobcat, tested negative. The detection of plague antibodies in a single coyote from Madison County, at the minimum detectable titer of 1:32, may suggest low-level, localized plague activity in the eastern 1/3 of the state, where plague is thought to be uncommon. Despite additional sampling in Madison County, no other plague antibody-positive animals were identified.

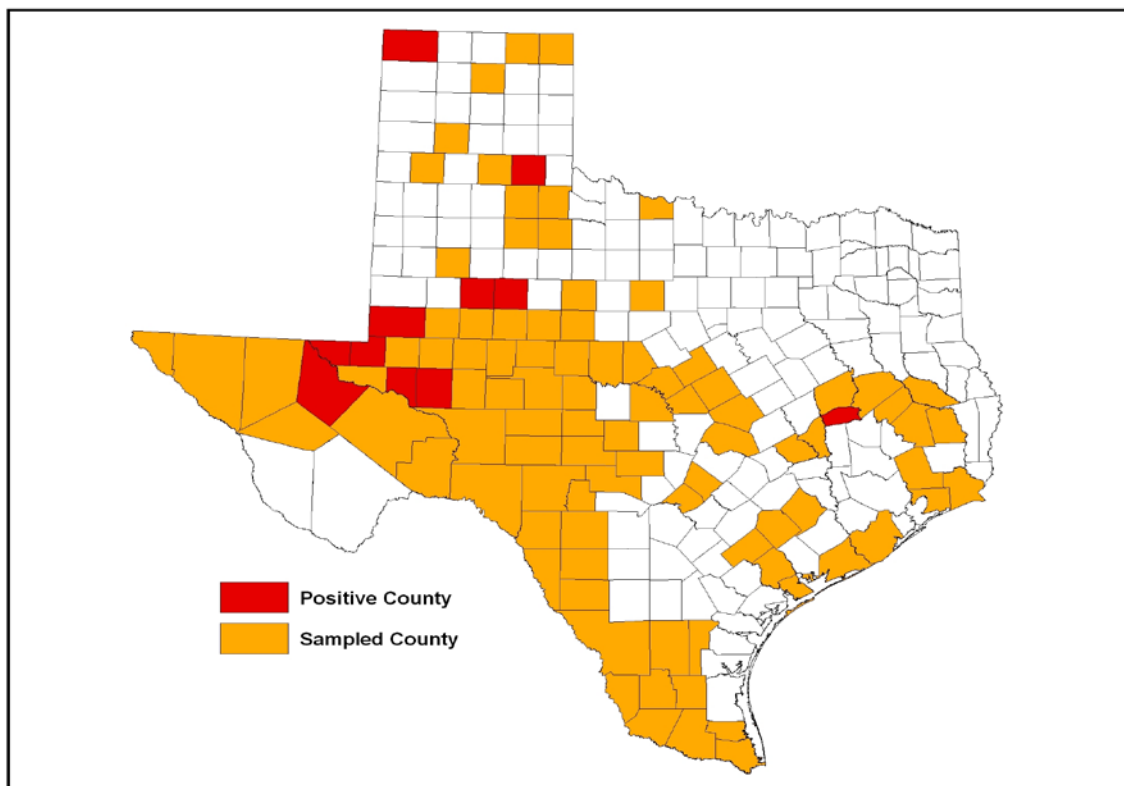
**Table 1. Animals Positive for Plague by County, Titer, and Percent Positive, 2010**

County	Result	Coyote	Percent Positive – Coyotes Sampled in County	Percent Positive - All Species Sampled in County
Andrews	1:128	1	12.5%	12.5%
Borden	1:32	2	14.3%	12.7%
	1:64	2		
	1:128	2		
	1:512	1		
	<b>Borden Total</b>	<b>7</b>		
Crane	1:32	2	4.7%	4.4%
	1:64	2		
	1:512	1		
	1:1024	2		
	<b>Crane Total</b>	<b>7</b>		

County	Result	Coyote	Percent Positive – Coyotes Sampled	Percent Positive - All Species Sampled
Dallam	1:128	1	5.6%	5.6%
Hall	1:256	1	16.7%	12.5%
Loving	1:128	2	55.6%	55.6%
	1:512	2		
	1:2048	1		
	Loving Total	5		
Madison	1:32	1	12.5%	4.5%
Reeves	1:32	4	23.2%	22.8%
	1:64	2		
	1:128	1		
	1:256	1		
	1:512	2		
	1:1024	2		
	1:2048	1		
	Reeves Total	13		
Scurry	1:128	1	16.7%	12.5%
	1:512	1		
	Scurry Total	2		
Upton	1:128	1	3.8%	2.7%
	1:1024	1		
	Upton Total	2		
Winkler	1:512	1	16.7%	16.7%
Number Positive		41		
Number Tested (All Counties Sampled)		1162		
Percent Testing Positive (All Counties Sampled)		3.5%		

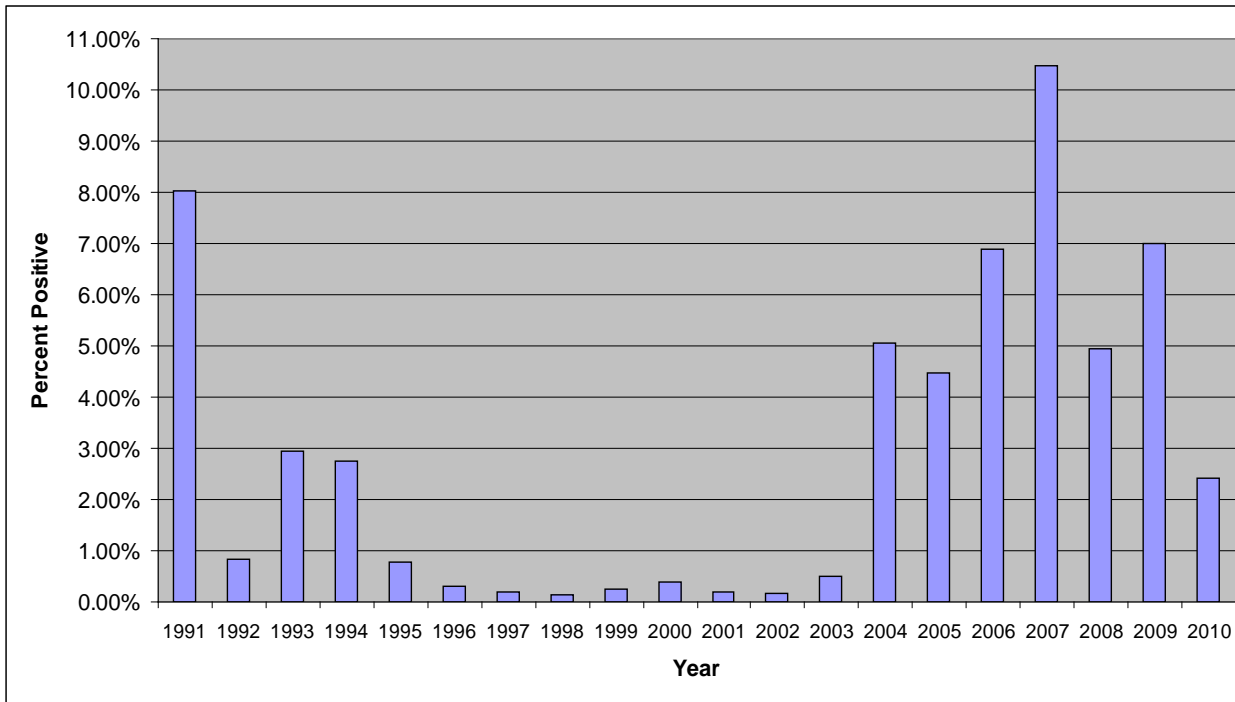
The geographic distribution by county of specimens tested and specimens testing positive for *Yersinia pestis* in 2010 is illustrated in Figure 1.

**Figure 1. Counties Sampled and Counties Positive for Plague, 2010**



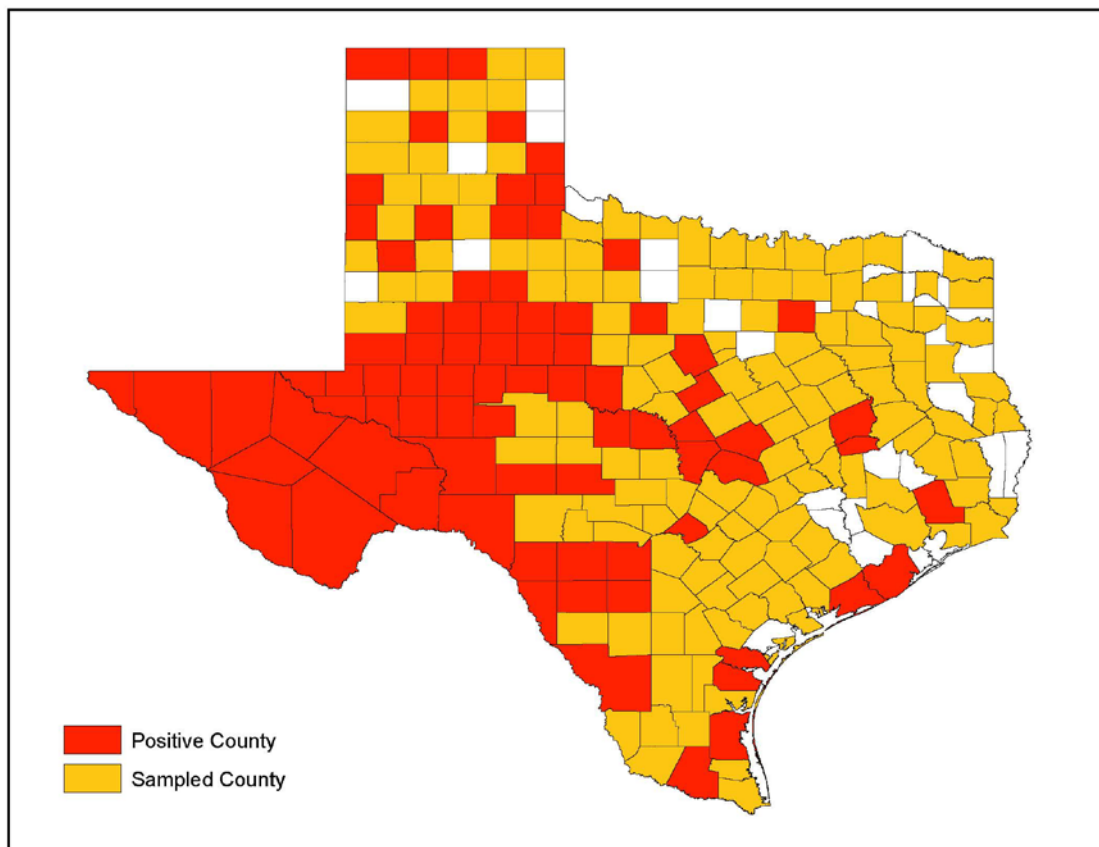
Comparing the percent of surveillance samples positive for plague during 2010 to the percent positive in the previous 19 years indicates a continued elevation in detected plague activity for 2004-2010 compared to detected activity from 1995-2003 (Figure 2), although percent positivity for 2010 was significantly lower than that in the previous 6 years. Factors such as climate, changing ecosystems, predator activity, and host and flea population size and dynamics may affect the extent 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, 1991-2010**



The historic distribution of plague surveillance and detection in Texas is shown in Figure 3, on the following page. While plague is considered endemic in far west Texas and the Panhandle region, the surveillance results demonstrate that there may be naturally occurring risk in all but the extreme eastern part of the state.

**Figure 3. Counties Sampled and Counties Positive for Plague, 1976-2010**



By using educational materials, news releases, a public-access website, and conference presentations, DSHS personnel keep veterinarians, physicians, and the general 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, beginning on the next page, shows the complete listing by county and species of samples that tested negative for plague in 2010.

**Table 2. Animals Negative for Plague by County, 2010**

County	Badger	Bobcat	Coyote	Domestic Dog	Feral Pig	Gray Fox	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Andrews			7								7
Angelina								1			1
Bell			1								1
Borden		2	42					4			48
Brazoria			5					6			11
Brazos			1							1	2
Briscoe			3								3
Brooks		1	1								2
Brown			1								1
Burleson			1								1
Calhoun			9								9
Cameron			1								1
Castro			1								1
Chambers			11								11
Coke		2	2			2		4			10
Coleman		1	7			2					10
Colorado								2			2
Comal			4								4
Concho			2			12					14
Coryell			11								11
Cottle			1								1
Crane		5	141			7					153
Crockett			3			13		1			17
Culberson			1								1
Dallam			17								17
DeWitt			7								7
Dickens			23								23
Dimmit			14								14
Duval			1								1
Ector			19								19
Edwards		5	1			25		9			40
El Paso			1								1
Gillespie			7					2			9
Glasscock		4	25			4		5			38
Hall		2	5								7

County	Badger	Bobcat	Coyote	Domestic Dog	Feral Pig	Gray Fox	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Hamilton			10								10
Hays			8								8
Hidalgo			6								6
Houston			2								2
Howard			5								5
Hudspeth		1									1
Hutchinson			1								1
Irion		1	5			3		3			12
Jeff Davis		1	4			19					24
Jefferson			34								34
Jim Hogg			23								23
Jim Wells		1	7								8
Jones			1								1
Kerr						3					3
Kimble		3	15			18		26	1		63
King			2								2
Kinney		2	9			6		1			18
Lampasas		1	16			6		1	1		25
Lavaca			9								9
Leon			1								1
Liberty			6	1		3		2	1		13
Lipscomb			1								1
Loving			4								4
Lynn		1	3								4
Madison			7		1			13			21
Martin			2								2
Mason			2			3					5
Matagorda			18								18
Maverick			8								8
McCulloch			1			4					5
Menard			2			2		1			5
Midland			24								24
Mills			19		5	3					27
Mitchell	1		16					1			18
Motley		2	12								14
Nolan		1	6								7
Ochiltree			1								1

County	Badger	Bobcat	Coyote	Domestic Dog	Feral Pig	Gray Fox	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Pecos			31			12		13		1	57
Polk			3								3
Randall			5								5
Reagan		2	28			7		12			49
Real			1			6					7
Reeves			43			1					44
Runnels			41								41
San Saba	1	1	10		4			2			18
Schleicher		1	5			13		1			20
Scurry			10				2	2			14
Starr			29								29
Stephens			1								1
Sterling		5	22			3		11			41
Sutton			6			14		17			37
Taylor		2	13		2						17
Terrell		4	2			26		4		2	38
Tom Green		3	7			15		9			34
Trinity			2					1			3
Tyler			2								2
Upton		5	51			15		1			72
Uvalde		2	2			3					7
Val Verde		8	8			22		4			42
Victoria			2								2
Ward			26								26
Webb			38								38
Wichita			1			1		2			4
Willacy			1								1
Williamson			21			1					22
Winkler			5								5
Zapata			32					2			34
Zavala			7								7
<b>Total Negative</b>	<b>2</b>	<b>69</b>	<b>1121</b>	<b>1</b>	<b>12</b>	<b>274</b>	<b>2</b>	<b>163</b>	<b>3</b>	<b>4</b>	<b>1651</b>