

2009 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. 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 2009.

Plague in Animals

The DSHS Laboratory Services Section and the U.S. Centers for Disease Control Plague Laboratory received 1,675 animal samples from 104 counties during calendar year 2009, of which 1,671 were tested; 4 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*, or positive results by PCR testing were reported for 117 samples (7.0% of all samples tested) collected from 26 counties (Table 1); 1,554 samples were negative at a titer of $<1:32$ or by PCR testing (Table 2).

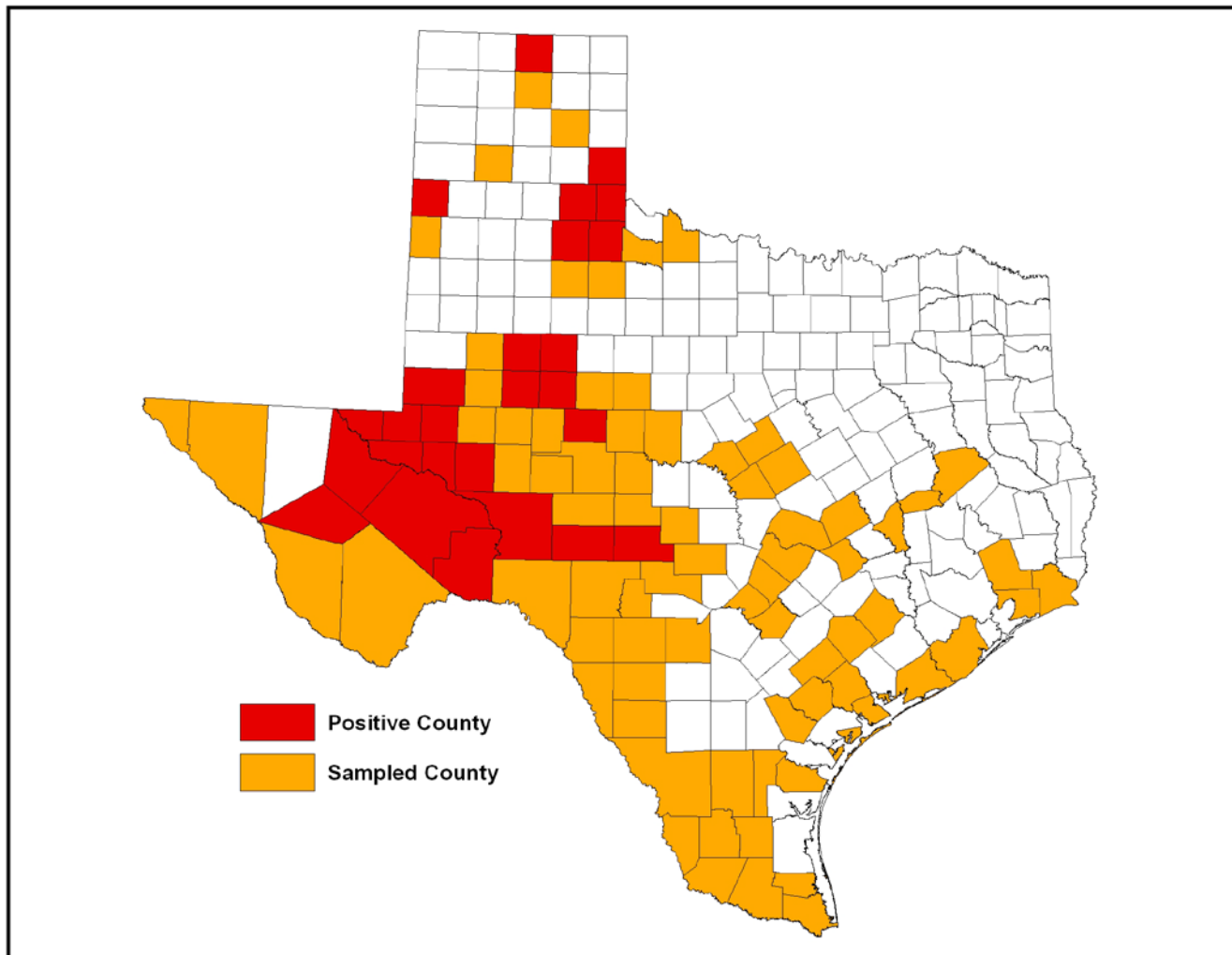
Table 1. Animals Positive for Plague by County and Result, 2009

County	Result	Bobcat	Coyote	Flea	Gray Fox	Raccoon	Total
Andrews	1:32		1				1
	1:64		2				2
	Andrews Total		3				3
Borden	1:32	1					1
	1:128		1				1
	Borden Total	1	1				2
Childress	1:64		1				1
	1:256		1				1
	1:512		1				1
	1:2048		1				1
	Childress Total		4				4
Coke	1:64				1		1
Collingsworth	1:256		1				1
Cottle	1:256		1				1
	1:2048		1				1
	Cottle Total						
Crane	1:32		1				1
	1:64		2				2
	1:128		1				1
	1:512		2				2
	Crane Total		6				6
Crockett	1:32				1		1
Ector	1:64		1				1
	1:128		2				2
	1:256		1				1
	1:1024		1				1
	1:4096		1				1
	Ector Total		6				6

County	Result	Bobcat	Coyote	Flea	Gray Fox	Raccoon	Total
Hall	1:64		1				1
	1:128	1	1				2
	1:256		1				1
	1:512	1	1				2
	Hall Total	2	4				6
Hansford	1:64		1				1
	Positive by PCR			9			9
	Hansford Total		1	9			10
Howard	1:256		1				1
Jeff Davis	1:32		1				1
	1:64		2				2
	1:128		1				1
	Jeff Davis Total		4				4
Kimble	1:32				1		1
Loving	1:32		1				1
	1:64		1				1
	1:128		3				3
	1:256		3				3
	1:512		1				1
	1:1024		2				2
	1:2048		2				2
	Loving Total		13				13
Mitchell	1:512		1				1
Motley	1:32		1				1
	1:64		1				1
	1:256		4				4
	1:2048		1				1
	Motley Total		7				7
Parmer	Positive by PCR			6			6
Pecos	1:32				1		1
	1:128		1				1
	Pecos Total		1		1		2
Reeves	1:32		2				2
	1:64		7				7
	1:128		5				5
	1:256		8				8
	1:512		2				2
	Reeves Total		24				24
Scurry	1:32		1				1
	1:128	1	1			1	3
	1:256					1	1
	Scurry Total	1	2			2	5
Sutton	1:32				1	1	2
Terrell	1:32				1		1
Upton	1:64		2				2
	1:128		1				1
	1:256		1				1
	1:512		1				1
	1:1024		1				1
	Upton Total		6				6
Ward	1:32		1				1
Winkler	1:128				1		1
Number of Listed Species Positive		4	88	15	7	3	117
Number of Listed Species Tested		63	1133	24	307	115	1642
Percent of Listed Species Testing Positive		6.3%	7.8%	62.5%	2.3%	2.6%	7.1%

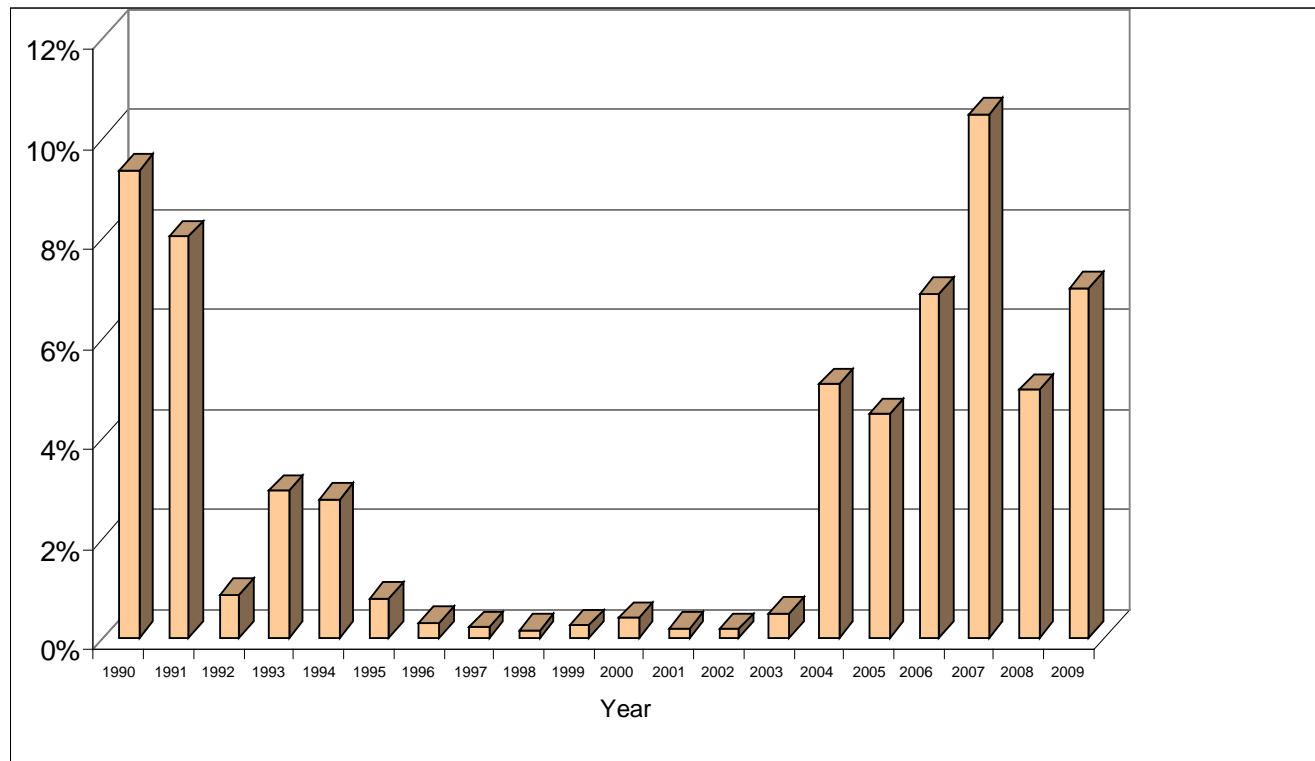
The geographic distribution by county of specimens tested and specimens testing positive for *Yersinia pestis* in 2009 is illustrated in Figure 1.

Figure 1. Counties Sampled and Counties Positive for Plague, 2009



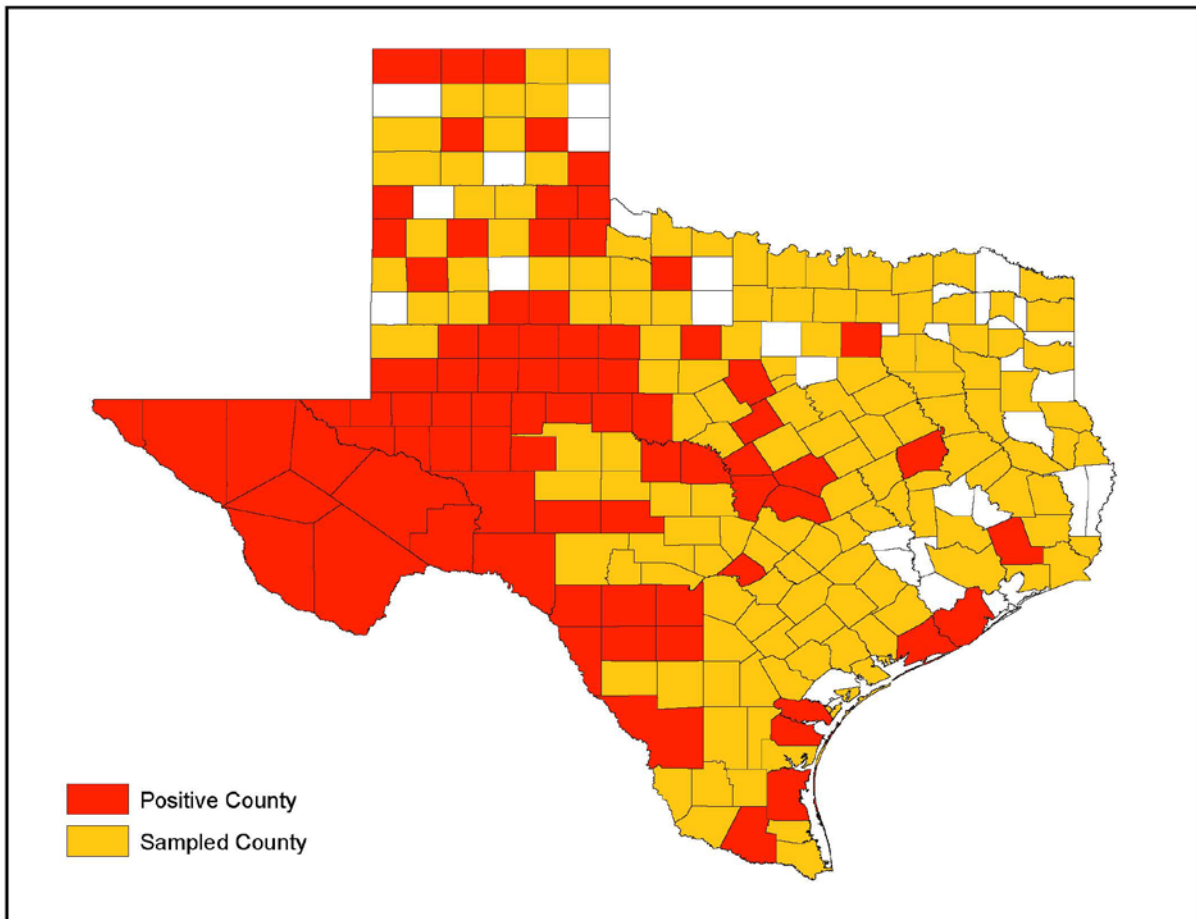
Comparing the percent of surveillance samples positive for plague during 2009 to the percent positive in the previous 19 years indicates a continued elevation in detected plague activity for 2004-2009 compared to detected activity from 1992-2003 (Figure 2). Factors such as climate, changing ecosystems, 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, 1990-2009



The historic distribution of plague surveillance and detection in Texas is shown in Figure 3. 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, 1976-2009



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 2009.

Table 2. Animals Negative for Plague by County, 2009

County	Badger	Beaver	Bobcat	Bovine	Coyote	Domestic Dog	Feral Hog	Flea	Gray Fox	Gray Wolf	Mountain Lion	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Andrews					11											11
Aransas					2											2
Bailey					6											6
Bee					6											6
Borden			3		48				1				6			58
Brazoria					5		1									6
Brazos					4											4
Brewster			1		15				8				1			25
Brooks					5											5
Calhoun					2											2
Cameron					3											3
Chambers					17								3			20
Childress					4											4
Coke					4								1			5
Coleman					1											1
Collingsworth					4											4
Colorado													3			3
Comal					7											7
Concho			1		1				6				5			13
Coryell					23											23
Cottle	1				4											5
Crane					57											57
Crockett									6				5			11
Dawson					3											3
De Witt					6											6
Dickens					4											4
Dimmit					8											8
Duval					1											1
Ector					26											26
Edwards					1				2				2			5
El Paso									2							2
Foard					2											2
Gillespie					5				3							8
Glasscock			3		19				1					1		24

County	Badger	Beaver	Bobcat	Bovine	Coyote	Domestic Dog	Feral Hog	Flea	Gray Fox	Gray Wolf	Mountain Lion	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Goliad			1		17											18
Gray			1		11											12
Guadalupe													1			1
Hall			1		4								1			6
Hamilton					13											13
Hansford						1		5		1						7
Hays					15											15
Hidalgo					9											9
Houston		1			4											5
Howard					9								1			10
Hudspeth				1												1
Hutchinson					1											1
Irion			3		6				1							10
Jeff Davis					8											8
Jefferson					16											16
Jim Hogg					32											32
Jim Wells					7											7
Kerr					5				6							11
Kimble			4		16				9				30	1		60
King					1											1
Kinney			1		4				11				2	1		19
Lampasas					20				2				2			24
Lavaca			2		7		3									12
Lee												2	3			5
Liberty					7											7
Loving					33											33
Madison					5								1		1	7
Martin					1											1
Mason					3				3							6
Matagorda					9		1									10
Maverick			1		10											11
McCulloch			1						3							4
Medina					1											1
Menard									3							3
Midland			3		16				1				1			21
Milam					2											2
Mills					1		1		1							3

County	Badger	Beaver	Bobcat	Bovine	Coyote	Domestic Dog	Feral Hog	Flea	Gray Fox	Gray Wolf	Mountain Lion	Opossum	Raccoon	Red Fox	Striped Skunk	Total Negative
Mitchell			1		17								2			20
Motley			1		19											20
Nolan					12				1							13
Nueces									3				3			6
Parmer					1			4								5
Pecos			6		44				32		1		8			91
Presidio					11											11
Randall					3											3
Reagan			1						2				1			4
Real					1				2							3
Reeves	1				15											16
Runnels					30				1							31
Schleicher			1		1				5				3			10
Scurry	2		6		7								2			17
Starr					21											21
Sterling	3		1		22				6				12	1		45
Sutton					2				2				4			8
Taylor					4											4
Terrell			3						51		1		2			57
Tom Green			1		4				8				2			15
Travis					1											1
Upton			5		30				22					2		59
Uvalde			1		8				1							10
Val Verde			4		5				88				2			99
Victoria					6								1			7
Ward					27											27
Webb					34											34
Wilbarger					2								1			3
Willacy					2											2
Williamson					17											17
Winkler					66	1			7							74
Zapata					25								1			26
Zavala			2		11											13
Total Negative	7	1	59	1	1045	2	6	9	300	1	2	2	112	6	1	1554