

2007 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 *Yersinia pestis*, thereby making good indicators 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. *Yersinia 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. In 2007, there were no reported human cases of plague in Texas.

The DSHS Laboratory Services Section – Diagnostic Serology Team tested 2,092 animal samples from 108 counties during calendar year 2007. Plague antibodies at a titer of $\geq 1:32$, which indicates probable exposure to *Yersinia pestis*, were reported for 219 samples (10.5% of all samples tested) collected from 24 counties (Table 1). Six samples were not testable and 1,867 samples were negative at a titer of $<1:32$. **Note that Table 1 includes only positive results and lists only those animal species for which there was at least one positive result. Negative results are reported separately in Table 2.**

Table 1. Animals Positive for Plague by County and Result, 2007

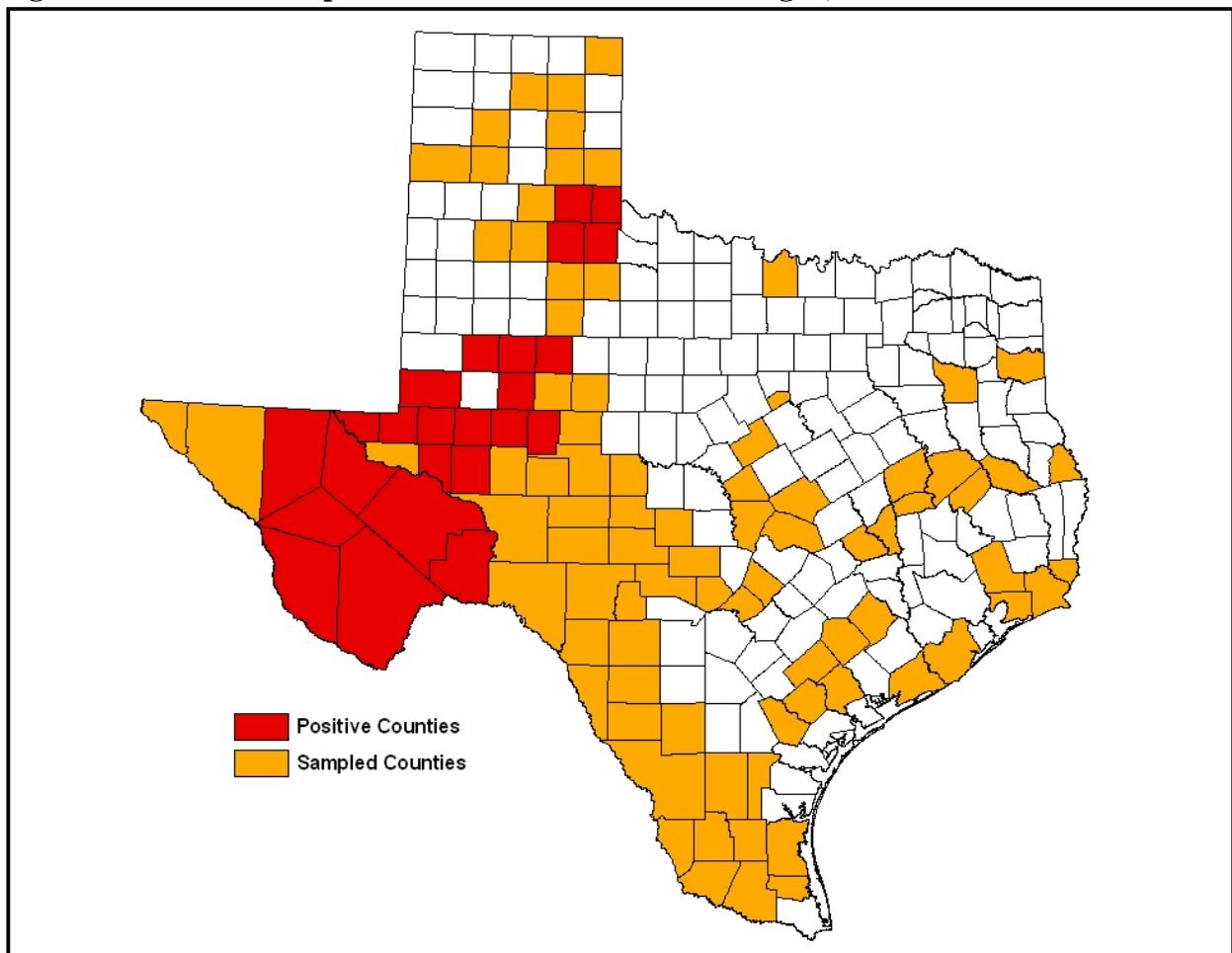
County	Result	American Badger	Bobcat	Coyote	Gray Fox	Raccoon	Total
Andrews	1:32			1			1
	1:64			1			1
	1:256			1			1
	1:512			1			1
	1:1024			1			1
	Andrews Total			5			5
Borden	1:32			1		1	2
	1:64			1			1
	1:128			1		1	2
	1:256			4			4
	1:512			1			1
	1:1024			6		1	7
	1:2048		1	5			6
	>1:2048			5	1		6
	>1:4096			2			2
	Borden Total		1	26	1	3	31
Brewster	1:512			1			1
Childress	1:2048			1			1
Cottle	>1:2048			1			1
Crane	1:32			1			1
	1:64			1			1
	1:128			2			2
	1:256			3			3
	1:1024			2			2
	>1:2048			8			8
Crane Total			17			17	
Culberson	1:32			1			1
	1:512			1			1
	Culberson Total			2			2
Dawson	1:1024			1			1
	>1:2048			1			1
	Dawson Total			2			2

County	Result	American Badger	Bobcat	Coyote	Gray Fox	Raccoon	Total
Ector	1:32			1			1
	1:64	1		4			5
	1:128			4			4
	1:256			3			3
	1:512			2			2
	Ector Total		1		14		
Glasscock	1:128			1			1
Hall	1:256			1			1
	1:512			1			1
	1:2048			1			1
	Hall Total			3			3
Howard	1:256			1			1
	1:512			2			2
	1:1024			1			1
	1:2048			7			7
	Howard Total			11			11
Jeff Davis	1:32			1			1
	1:128			2			2
	1:256			1			1
	Jeff Davis Total			4			4
Loving	1:64			1			1
	1:256			1			1
	1:1024			2			2
	1:2048			10			10
	Loving Total			14			14
Midland	1:64		1	1			2
	1:256			1	2		3
	1:512			2			2
	>1:2048			2			2
	Midland Total		1	6	2		9
Motley	1:32			1			1
	1:128			1			1
	1:512			1			1
	1:1024			3			3
	1:2048			3			3
	>1:2048			2			2
	Motley Total			11			11
	Pecos	1:128					1
>1:2048				1			1
Pecos Total				1		1	2
Presidio	1:32			1			1
	1:64			3			3
	1:128			3			3
	1:256			4			4
	1:512			2			2
	Presidio Total			13			13
	Reeves	1:32			3		
1:64				7			7
1:128				1			1
1:256				4			4
1:512				5			5
1:1024				8			8
1:2048				10			10
>1:2048				1			1
Reeves Total				39			39
Scurry	1:64			1			1
	1:128			1			1
	1:2048			4			4
	>1:2048			1			1
	>1:4096					1	1
	Scurry Total			7		1	8

County	Result	American Badger	Bobcat	Coyote	Gray Fox	Raccoon	Total
Sterling	1:256			2			2
	1:512			1			1
	>1:2048			1			1
	Sterling Total			4			4
Terrell	1:512			1			1
Upton	1:64			1			1
	1:128		1				1
	1:256				2		2
	1:512			3			3
	1:1024					1	1
	1:2048			7			7
	>1:2048				1		1
Upton Total		1	11	3	1	16	
Winkler	1:64			2			2
	1:128			2			2
	1:256			2			2
	1:512			2			2
Winkler Total			8			8	
Number of Listed Species Positive		1	3	203	6	6	219
Number of Listed Species Tested		5	123	1461	301	152	2042
Percent of Listed Species Testing Positive		20.0%	2.4%	13.9%	2.0%	3.9%	10.7%

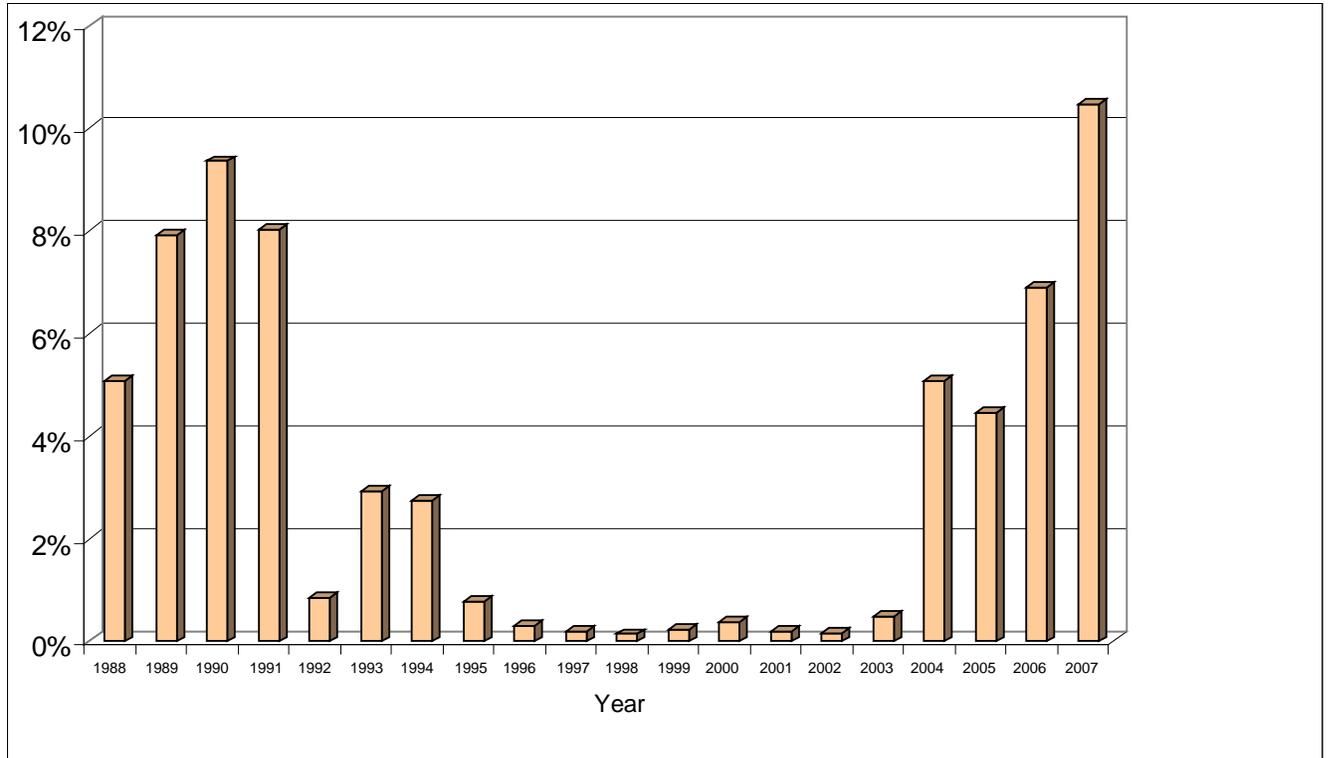
The geographic distribution of specimens collected and specimens testing positive for *Yersinia pestis* in 2007 is illustrated in Figure 1.

Figure 1. Counties Sampled and Counties Positive for Plague, 2007



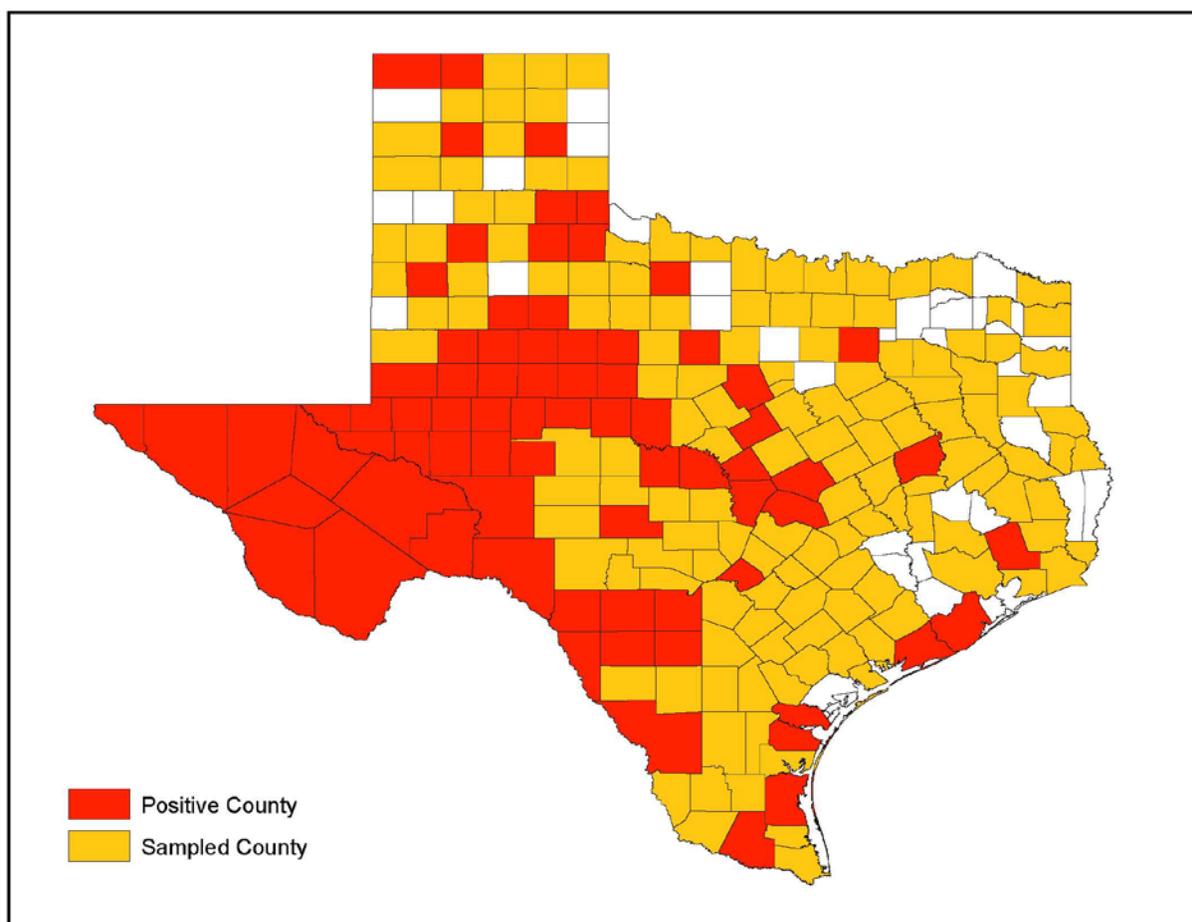
Comparing the percent of surveillance samples positive for plague during 2007 to the percent positive in previous years indicates a noticeable increase in detected plague activity for 2004-2007 compared to detected activity from 1992-2003 (Figure 2). Factors such as climate, changing ecosystems, predator activity, and host and flea population size and dynamics may affect the potential for 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, 1988-2007



The historic distribution of plague surveillance and detection in Texas is shown in Figure 3. While plague is considered endemic in far west Texas, 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, 1976-2007



ons,
 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 2007.

Table 2. Animals Negative for Plague by County, 2007

County	American Badger	Beaver	Bobcat	Coyote	Feral Pig	Gemsbok	Gray Fox	Mountain Lion	Opossum	Raccoon	Red Fox	Ringtail	Striped Skunk	Total
Andrews				2										2
Angelina				3										3
Bee				2										2
Bell					3									3
Borden			1	24					2	2				29
Brazoria				10										10
Brazos				1						1				2
Brewster				18		1	15							34
Briscoe				1										1
Brooks				2										2
Burleson				4									1	5
Burnet				6										6
Chambers				29										29
Childress				1										1
Coke			11	4			5				1			21
Collingsworth				1										1
Colorado				5						12				17
Comal			1	8			1							10
Concho							1							1
Crane			1	38			1							40
Crockett			1	6			6			3	1			17
Culberson				10			1							11
Dawson				1										1
De Witt				3										3
Deaf Smith				2										2
Dickens				2										2
Dimmit				1										1
Donley			2	2										4
Duval			2	16										18
Ector			2	72										74
Edwards			1	3			3			25			1	33
Floyd				1										1
Gillespie			1	11			2							14
Glasscock				12			2			1	2		1	18

County	American Badger	Beaver	Bobcat	Coyote	Feral Pig	Gemsbok	Gray Fox	Mountain Lion	Opossum	Raccoon	Red Fox	Ringtail	Striped Skunk	Total
Goliad				7										7
Gray			2	12										14
Hale				3										3
Hamilton				4										4
Harrison				1										1
Hays			2	21										23
Hidalgo				35										35
Houston				2										2
Howard				1	1									2
Hudspeth	1			1										2
Hutchinson			1											1
Irion			2				1							3
Jeff Davis			3	18			2							23
Jefferson				22										22
Jim Hogg			1	24										25
Jim Wells				1										1
Kendall			1	4			1							6
Kenedy				34										34
Kent				1										1
Kerr				1						1				2
Kimble			7	16			16			33				72
King				2						1				3
Kinney			2	2			18				1		2	25
La Salle				3										3
Lampasas				19			4			8				31
Lavaca				8										8
Leon			1	1										2
Liberty				17										17
Lipscomb				3										3
Loving				30	3									33
Madison				11										11
Mason				1										1
Matagorda				18										18
Maverick				2										2
Mcculloch							2							2
Menard				7			3			1	2			13
Midland			5	12			3			1				21

County	American Badger	Beaver	Bobcat	Coyote	Feral Pig	Gemsbok	Gray Fox	Mountain Lion	Opossum	Raccoon	Red Fox	Ringtail	Striped Skunk	Total
Mitchell			2	13										15
Montague		2												2
Motley				6										6
Nolan				3										3
Orange				2										2
Pecos			12	67	1		68	1		12			3	164
Potter				2										2
Presidio			4	15										19
Randall				1										1
Reagan				1										1
Real				1			1							2
Reeves				148			2							150
Roberts				1										1
Sabine		2												2
Schleicher			1				3			5			1	10
Scurry	2		1	12					1	2				18
Smith		1												1
Somervell				1										1
Starr				40										40
Sterling			10	58			3			11	3			85
Sutton			3	2			1			7			1	14
Terrell	1		17	10			29			1			2	60
Tom Green				2			8			4				14
Trinity				2										2
Upton			11	6			21					1	2	41
Uvalde				2										2
Val Verde			7	6			70			8			1	92
Victoria				15										15
Ward				19										19
Webb			1	70						1				72
Willacy				11										11
Williamson				17			2							19
Winkler				38										38
Zapata			1	38						5				44
Zavala				4						1				5
Total Negative	4	5	120	1258	8	1	295	1	3	146	10	1	15	1867