

2004 PLAGUE SURVEILLANCE REPORT
(REVISED 10-10-14)

Each year the Texas Department of State Health Services (DSHS), in cooperation with Texas Wildlife Services, Texas Parks and Wildlife Department, and other agencies, collects blood samples from Texas wildlife. Samples are collected primarily from carnivores using Nobuto blood filter strips. Although most carnivores are resistant to plague (*Yersinia pestis*), they develop antibodies when exposed to the plague organism, thereby making them good indicators of local plague activity.

Surveillance for plague activity is important because the organism can cause severe human disease and death and it occurs naturally in Texas. Early detection of increased plague activity enables DSHS to alert physicians and veterinarians to be vigilant for signs of the disease in their patients. *Yersinia pestis* is also an organism that can be used as a bioterrorism weapon. Unusual disease activity related to its use as a weapon can be recognized more easily if usual disease occurrence and risk is well known. Although the last reported human case of plague in Texas occurred in 1993 (editor's note: a human case has since been reported in 2006), surveillance results indicate that there are natural reservoirs for the organism in much of the state.

The DSHS Laboratory tested 3,005 samples from animals and arthropods in 119 counties during calendar year 2004. The plague organism or plague antibodies at a titer of 1:32 or greater, which indicates probable exposure to plague, were found in 100 (3.3%) samples from 20 counties (Table 1).

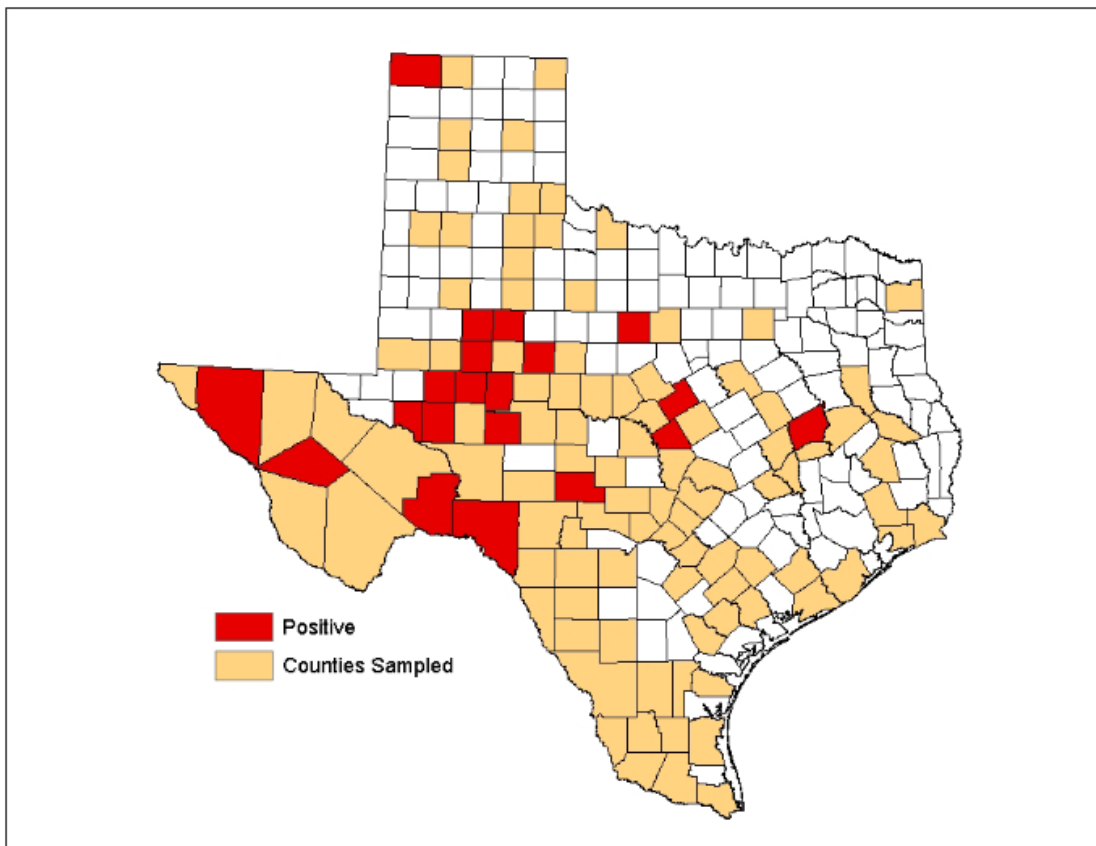
Table 1. Animals and Arthropods Positive for Plague by County and Result, 2004

County	Result	Badger	Bobcat	Coyote	Feral Pig	Flea	Gray Fox	Porcupine	Raccoon	Red Fox	Swift Fox	TOTAL
Borden	1:64			1								1
	1:512			4								4
	1:2048			1								1
Crane	1:64			2								2
	1:128			5								5
	1:256			1								1
	1:512			3								3
	1:1024			1								1
	1:4096			1								1
Dallam	Positive					7						7
	1:256										1	1
	1:1024										5	5
Glasscock	1:32						1					1
	1:64			1					1			2
	1:128						1					1
	1:256			4								4
	1:512			1								1
	1:1024				1	2				1		4
	1:2048			2					1			3
	1:65536			1								1
Hamilton	1:128				1							1
Howard	1:256			1								1
Hudspeth	1:64			1								1
	1:1024			5								5
	1:4096			1								1
Irion	1:2048			1								1
Jeff Davis	1:128			2								2
Kimble	1:64								1			1
	1:256						1		1			2
	1:1024				2		1		1			4
	1:2048								2			2
Lampasas	1:128			1				1				2
Leon	1:128				1							1
Midland	1:128		1									1
	1:256			1			1					2
	1:512	1		2			1					4
	1:1024			1								1
	1:2048		1	4								5
	1:4096			1								1

County	Result	Badger	Bobcat	Coyote	Feral Pig	Flea	Gray Fox	Porcupine	Raccoon	Red Fox	Swift Fox	TOTAL
Nolan	1:128								1			1
Scurry	1:128							1				1
Stephens	1:64				1							1
	1:256			1								1
Sterling	1:128			1								1
	1:256								1			1
	1:1024						1					1
Terrell	1:128		1									1
Upton	1:64			1								1
	1:128			1								1
	1:4096			1								1
Val Verde	1:128						2					2
Total Positives by Species		1	4	56	5	7	9	1	10	1	6	100
Total of Positive Species Tested		4	19	58	6	8	256	30	11	22	12	426
Percent Positive		25.0%	21.1%	96.6%	83.3%	87.5%	3.5%	3.3%	90.9%	4.5%	50.0%	23.5%

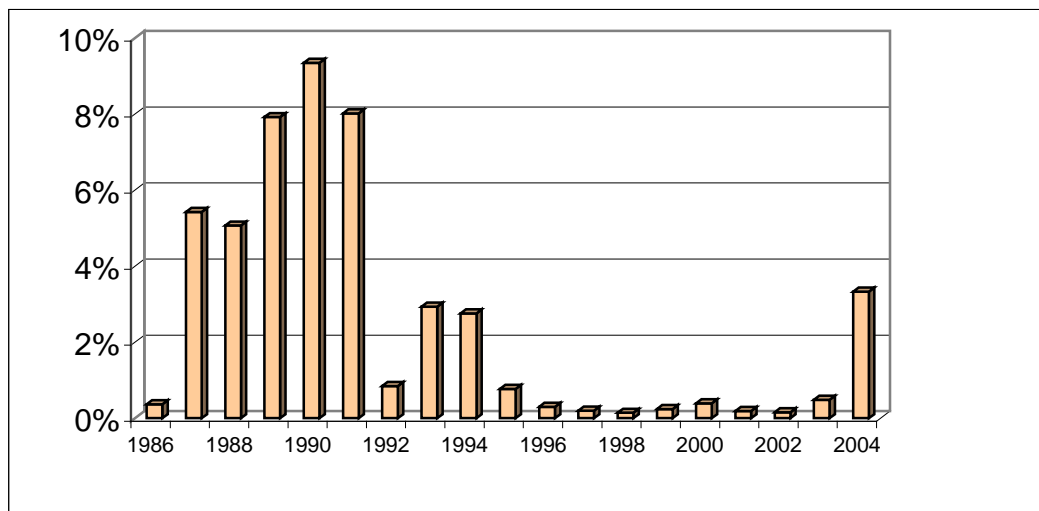
The geographic distribution of specimens collected and specimens testing positive for 2004 is illustrated in Figure 1.

Figure 1. Counties Sampled and Counties Positive for Plague, 2004



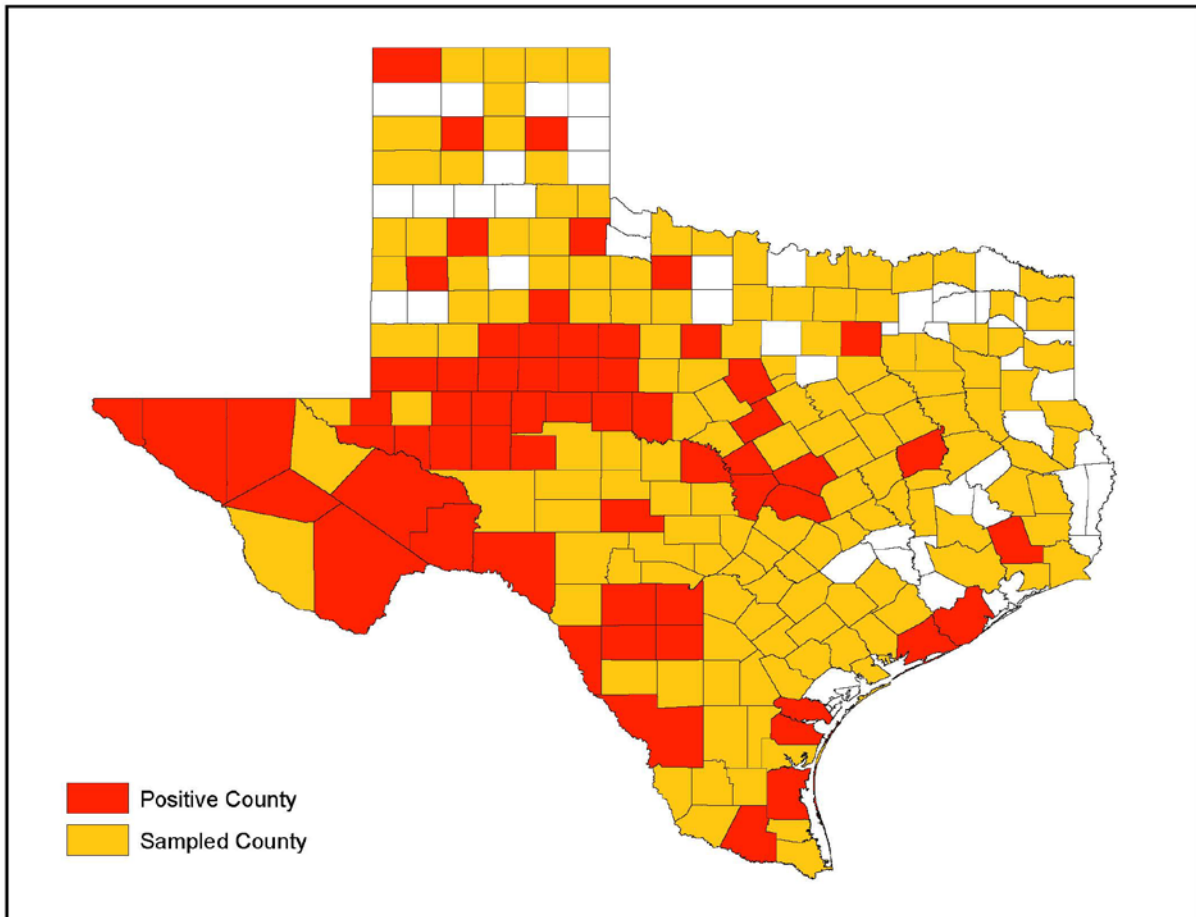
Comparing the percent of surveillance samples positive for plague during 2004 to the percent positive in previous years indicates a noticeable increase in 2004 compared to activity since 1995, which has been a period of relatively low plague activity in Texas (Figure 2). Factors such as climate, changing ecosystems, predator activity, and host population size and dynamics may all affect the potential for plague transmission within wildlife populations.

Figure 2. Percent of Surveillance Samples Positive for Plague, 1986-2004



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, 1976-2004



tations, 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 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 2004.

Table 2. Animals Negative for Plague by County, 2004

County	Flea	Tick	Ringtail	Black-tailed Jackrabbit	Bobcat	Dog	Hog-nosed Skunk	Coyote	Black-tailed Prairie Dog	Nine-banded Armadillo	Porcupine	Cat	Mountain Lion	Feral Pig	Gray Fox	Fly	River Otter	White-throated Woodrat	Raccoon	Eastern Fox Squirrel	Hispid Cotton Rat	Thirteen-lined Ground Squirrel	Striped Skunk	Desert Cottontail	Badger	Virginia Opossum	Swift Fox	Red Fox	TOTAL	
Andrews				2																						1			3	
Angelina				2																										2
Bee				2														1					2							5
Blanco				5																										5
Borden				57			1	1					3		8	2	1	4					4	1		4				86
Brazoria				24																			4							28
Brazos				2												7		1												10
Brewster				24											1												6			31
Brooks				7			10								1			7												25
Brown				9																							5			14
Burleson				3												1														4
Burnet				21											1			3					1				3			29
Cameron				5			4											3												12
Cass																		1												1
Chambers				43														2									1			46
Cherokee																							1							1
Childress				2																										2
Coke				7											15			1									44	3		70
Coleman				7											1												1			9
Colorado				1			2											11					4							18
Comal				16																										16
Comanche				26																										26
Concho				3																								1		4
Coryell				9																										9
Cottle				1																			1							2
Crane				136											2									2						140
Crockett				3			1								4			16					1				9	2		36
Culberson				6														2									4			12
Dallam				1	1						29	1										1			3		6			42
Dallas				2														31												33
De Witt				8																										8
Dickens				2																			9							11
Dimmit				8																										8
Duval				11														1												12

County	Flea	Tick	Ringtail	Black-tailed Jackrabbit	Bobcat	Dog	Hog-nosed Skunk	Coyote	Black-tailed Prairie Dog	Nine-banded Armadillo	Porcupine	Cat	Mountain Lion	Feral Pig	Gray Fox	Fly	River Otter	White-throated Woodrat	Raccoon	Eastern Fox Squirrel	Hispid Cotton Rat	Thirteen-lined Ground Squirrel	Striped Skunk	Desert Cottontail	Badger	Virginia Opossum	Swift Fox	Red Fox	TOTAL
Edwards				8					1						16			33				9				2			69
El Paso				30												1													31
Gillespie				10																									10
Glasscock				34											8			3								7	5	57	
Goliad				16																									16
Gonzales				1																									1
Gray				14															1				1						16
Guadalupe				2																									2
Hale					12																			6					18
Hall				3																									3
Hamilton				15														1					18						34
Haskell				1																									1
Hays				20		1									1														22
Hidalgo				38			1								1														40
Hill				1														1											2
Houston				1																									1
Hudspeth				13																									13
Irion				3											8			1									7		19
Jeff Davis				17											1												2		20
Jefferson				148																									148
Jim Hogg				2																									2
Jim Wells				2			1																2		1				6
Kendall				4														1											5
Kenedy				2																									2
Kent				1																									1
Kerr				14											2			4									2		22
Kimble				15											9			64									10		98
Kinney			1	21										1	8			18					3				15	1	68
La Salle				6																									6
Lamb				2																									2
Lampasas				23												1		11									3		38
Lavaca				8											1														9
Leon				12													3												15
Liberty				19			2										2	1									2		26
Limestone																2													2

County	Flea	Tick	Ringtail	Black-tailed Jackrabbit	Bobcat	Dog	Hog-nosed Skunk	Coyote	Black-tailed Prairie Dog	Nine-banded Armadillo	Porcupine	Cat	Mountain Lion	Feral Pig	Gray Fox	Fly	River Otter	White-throated Woodrat	Raccoon	Eastern Fox Squirrel	Hispid Cotton Rat	Thirteen-lined Ground Squirrel	Striped Skunk	Desert Cottontail	Badger	Virginia Opossum	Swift Fox	Red Fox	TOTAL	
Lipscomb				1																				1					2	
Lynn				2																										2
Madison				1														1												2
Martin				7											1															8
Mason				4																										4
Matagorda				13																										13
Maverick				5																										5
McCulloch				35					1																		12			48
McMullen																							1							1
Medina				1																										1
Menard				18											3			12					6				5			44
Midland				32											6												7			45
Mills				2																										2
Mitchell				17											1												2			20
Motley				22	1		1								1			1					2							28
Nolan				9				1							3	1		1												15
Nueces							11									1		1												13
Palo Pinto				3																										3
Pecos		1		59											24	8		27							8		43	1		171
Polk				3																										3
Potter		1		17																										18
Presidio				3																										3
Randall				8											1															9
Reagan				5											1															6
Real				10											6			6					12				4			38
Reeves				1																										1
Robertson				1																										1
Runnels				21											1			1									3			26
San Saba				8																			1							9
Scurry				16			3		3						4	7		8							2		1		3	47
Sherman					1																									1
Starr				39																					2					41
Stephens				39																			2							41
Sterling				17			4								11	7		38							1		13		4	95
Sutton															4			1									8			13

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Taylor				1											1											3			5
Terrell	1			13						2					23			18						1		49			107
Tom Green				1													14			1						2			18
Travis				2																									2
Upton				15											5											16	1		37
Uvalde				23											6			2				2				2			35
Val Verde				6						1					54			38								61			160
Victoria				11														2											13
Webb		1		50																									51
Wharton				5																		2							7
Wilbarger				2																									2
Williamson				25																						1			26
Wilson				1																		1							2
Zapata				50																									50
Zavala				23											3														26
TOTAL	1	3	1	1608	15	3	39	2	5	3	29	1	3	1	247	43	15	379	1	1	1	88	7	19	3	360	6	21	2905