# 2008 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. In 2008, there were no reported human cases of plague in Texas.

The DSHS Laboratory Services Section and the U.S. Centers for Disease Control Plague Laboratory received 1,535 animal samples from 105 counties during calendar year 2008, of which 1,517 were tested. Plague antibodies at a titer of ≥ 1:32, which indicates probable exposure to *Y. pestis*, or positive results by PCR testing were reported for 75 samples (4.9% of all samples tested) collected from 20 counties (Table 1). Eighteen samples were not tested and 1,442 samples were negative at a titer of <1:32 or by fluorescent antibody testing. **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.**

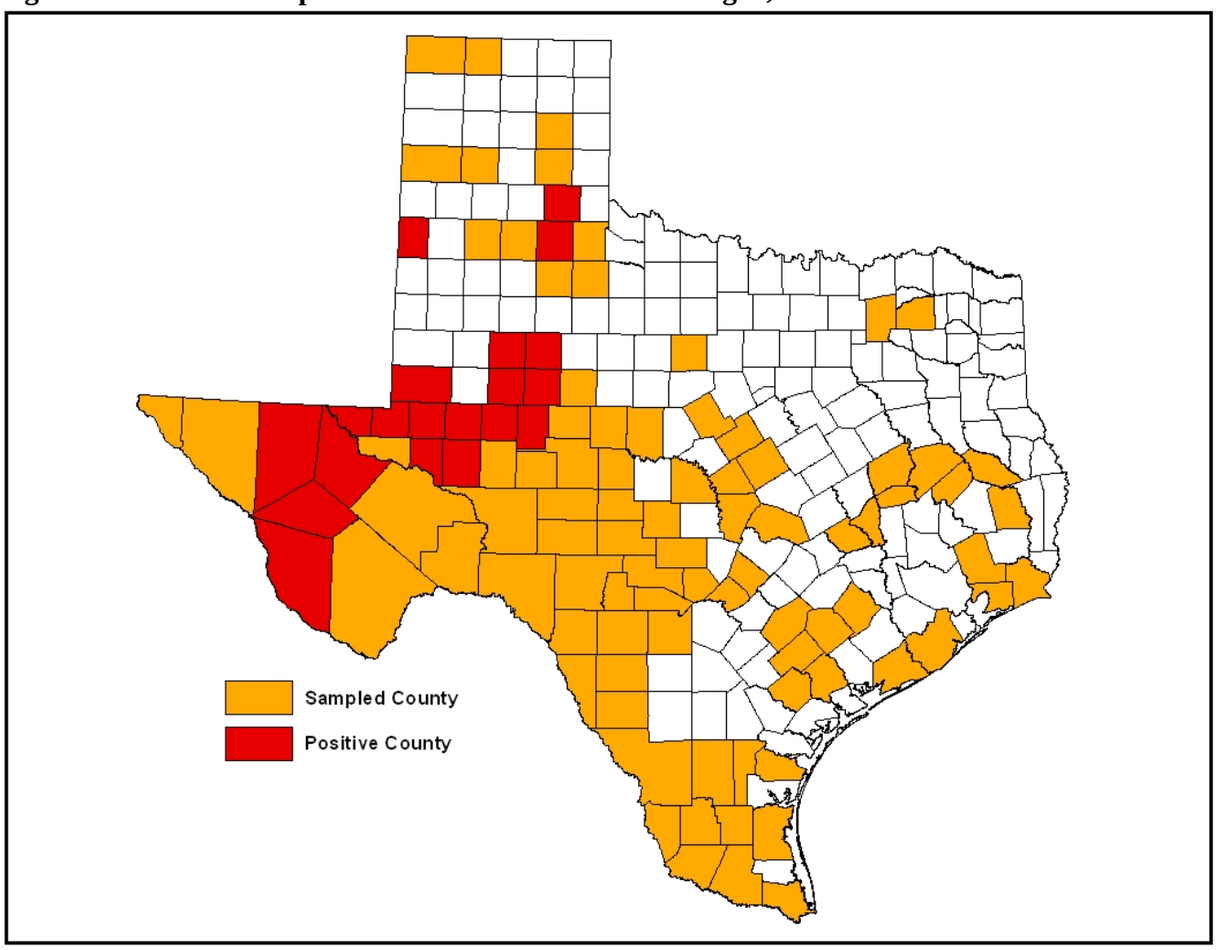
**Table 1. Animals Positive for Plague by County and Result, 2008**

| County | Result | Badger | Bobcat | Coyote | Flea | Gray Fox | Raccoon | Total |
|---|---|---|---|---|---|---|---|---|
| **Andrews** | 1:1024 | | | 1 | | | | 1 |
| **Bailey** | Positive by PCR Testing | | | | 1 | | | 1 |
| **Borden** | 1:32 | | | 2 | | | | 2 |
| | 1:64 | | | 1 | | 1 | | 2 |
| | 1:128 | | | 1 | | | | 1 |
| | 1:256 | | | | | 1 | 2 | 3 |
| | 1:512 | | | 5 | | | | 5 |
| | Borden Total | | | 9 | | 2 | 2 | 13 |
| **Crane** | 1:128 | | | 1 | | | | 1 |
| | 1:256 | | | 1 | | | | 1 |
| | 1:512 | | | 1 | | | | 1 |
| | 1:2048 | | | 3 | | | | 3 |
| | Crane Total | | | 6 | | | | 6 |
| **Culberson** | 1:32 | | | 2 | | | | 2 |
| | 1:256 | | | 1 | | | | 1 |
| | 1:2048 | | | 1 | | | | 1 |
| | Culberson Total | | | 4 | | | | 4 |
| **Ector** | 1:1024 | | | 1 | | | | 1 |
| | 1:2048 | | | 3 | | | | 3 |
| | Ector Total | | | 4 | | | | 4 |
| **Glasscock** | 1:256 | | | 2 | | | | 2 |
| **Hall** | 1:128 | | | 1 | | | | 1 |
| | 1:512 | | | 1 | | | | 1 |
| | Hall Total | | | 2 | | | | 2 |
| **Howard** | 1:1024 | | | 1 | | | | 1 |
| **Jeff Davis** | 1:1024 | | | 1 | | | | 1 |
| | 1:4096 | | | | | 1 | | 1 |
| | Jeff Davis Total | | | 1 | | 1 | | 2 |

| County | Result | Badger | Bobcat | Coyote | Flea | Gray Fox | Raccoon | Total |
|---|---|---|---|---|---|---|---|---|
| Loving | 1:512 | | | 2 | | | | 2 |
| | 1:1024 | | | 1 | | | | 1 |
| | 1:2048 | | | 2 | | | | 2 |
| | Loving Total | | | 5 | | | | 5 |
| Midland | 1:64 | | | 2 | | | | 2 |
| | 1:128 | | | 1 | | | | 1 |
| | 1:1024 | | | 1 | | | | 1 |
| | Midland Total | | | 4 | | | | 4 |
| Mitchell | 1:32 | | | 1 | | | | 1 |
| | 1:64 | | | 1 | | | | 1 |
| | 1:128 | | | 1 | | | | 1 |
| | 1:256 | | | 1 | | | | 1 |
| | 1:2048 | | | 1 | | | | 1 |
| | Mitchell Total | | | 5 | | | | 5 |
| Motley | 1:64 | | | 1 | | | | 1 |
| | 1:128 | | | 1 | | | | 1 |
| | 1:256 | | | 1 | | | | 1 |
| | Motley Total | | | 3 | | | | 3 |
| Presidio | 1:32 | | | 1 | | | | 1 |
| | 1:64 | | | 1 | | | | 1 |
| | 1:256 | | | 2 | | | | 2 |
| | Presidio Total | | | 4 | | | | 4 |
| Reeves | 1:32 | | | 1 | | | | 1 |
| | 1:256 | | | 1 | | | | 1 |
| | 1:512 | | | 1 | | | | 1 |
| | 1:1024 | | | 1 | | | | 1 |
| | 1:2048 | | | 1 | | | | 1 |
| | Reeves Total | | | 5 | | | | 5 |
| Scurry | 1:64 | | | 1 | | | | 1 |
| | 1:128 | | 1 | | | | | 1 |
| | 1:512 | 1 | | | | | | 1 |
| | Scurry Total | 1 | 1 | 1 | | | | 3 |
| Sterling | 1:32 | | | 1 | | | | 1 |
| Upton | 1:512 | | | 1 | | | | 1 |
| | 1:4096 | | | 1 | | | | 1 |
| | Upton Total | | | 2 | | | | 2 |
| Winkler | 1:128 | | | 1 | | | | 1 |
| | 1:512 | | | 2 | | | | 2 |
| | 1:1024 | | | 2 | | | | 2 |
| | 1:2048 | | | 2 | | | | 2 |
| | Winkler Total | | | 7 | | | | 7 |
| **Number of Listed Species Positive** | | **1** | **1** | **67** | **3** | **1** | **2** | **75** |
| **Number of Listed Species Tested** | | **11** | **101** | **959** | **232** | **7** | **172** | **1482** |
| **Percent of Listed Species Testing Positive** | | **9.1%** | **1.0%** | **7.0%** | **1.3%** | **14.3%** | **1.2%** | **5.1%** |

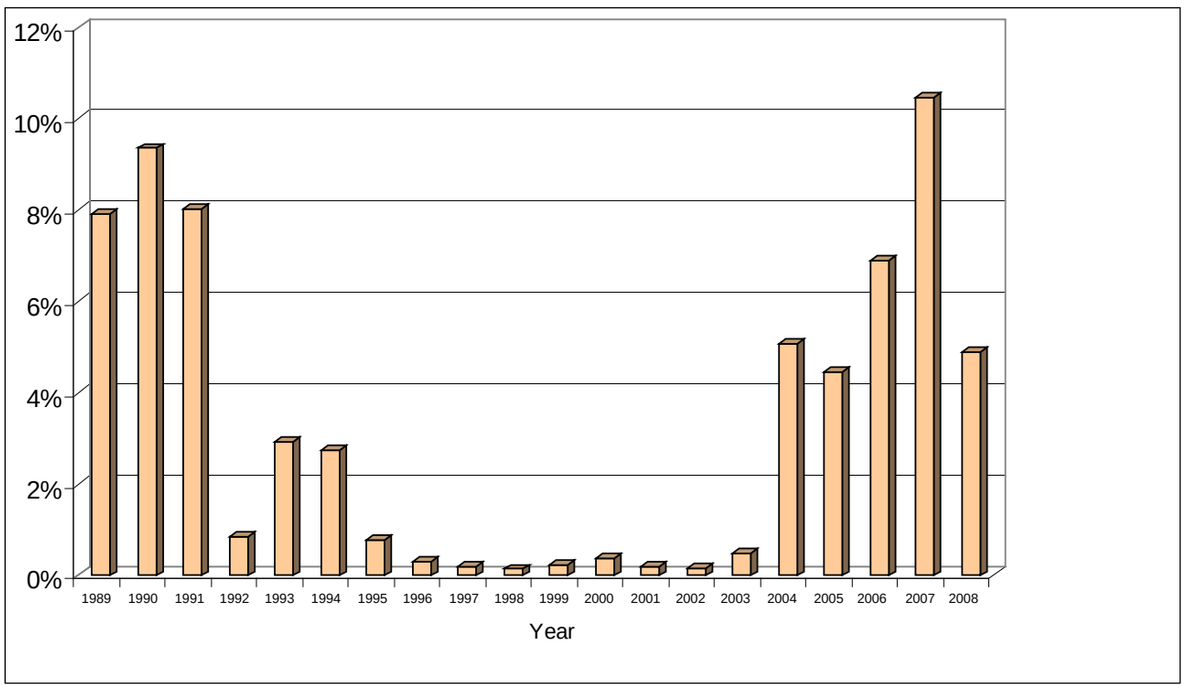
The geographic distribution of specimens collected and specimens testing positive for *Yersinia pestis* in 2008 is illustrated in Figure 1.

**Figure 1. Counties Sampled and Counties Positive for Plague, 2008**



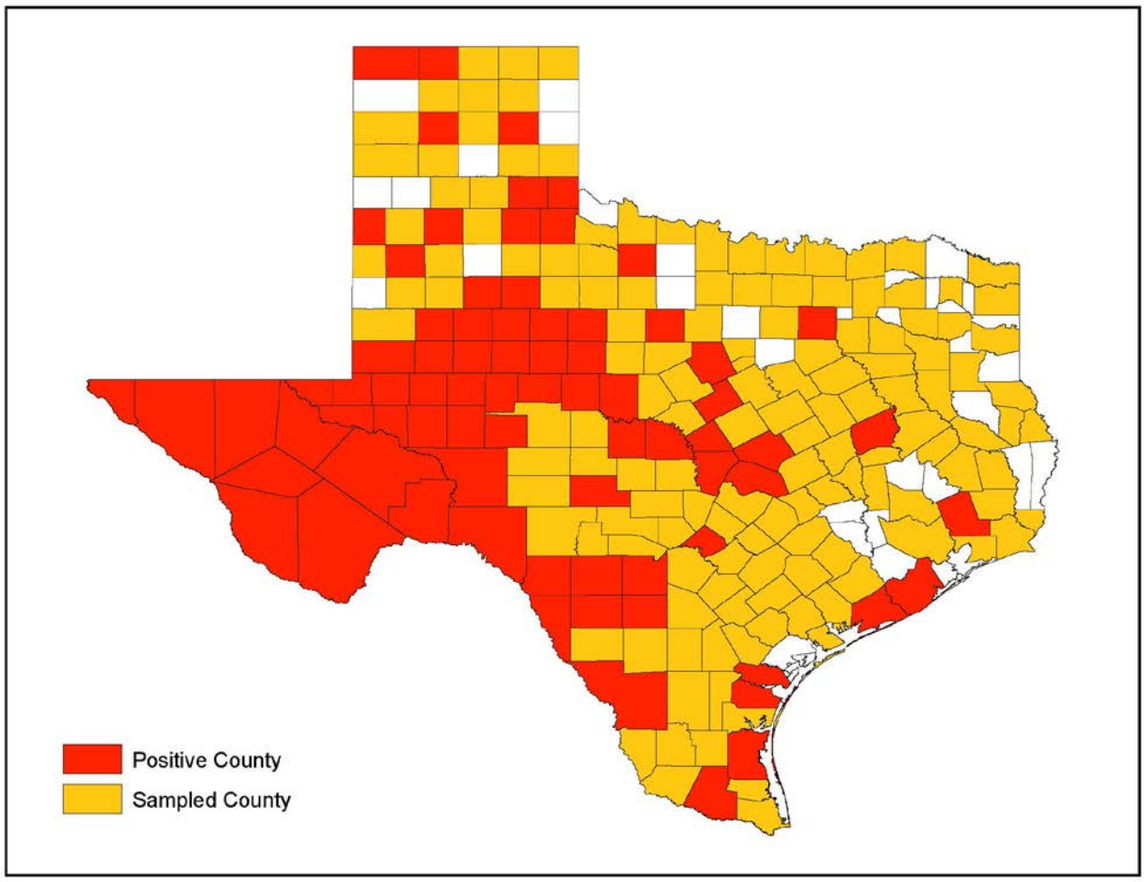

Comparing the percent of surveillance samples positive for plague during 2008 to the percent positive in previous years indicates a continued elevation in detected plague activity for 2004-2008 compared to detected activity from 1992-2003 (Figure 2). Factors such as climate, changing ecosystems, predator 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, 1989-2008**



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, 1976-2008**




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 2008.

**Table 2. Animals Negative for Plague by County, 2008**

| County | Badger | Beaver | Bobcat | Cat | Coyote | Feral Hog | Flea | Gray Fox | Nutria | Opossum | Raccoon | Red Fox | Striped Skunk | Total Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrews | | | | | 3 | | | | | | | | | **3** |
| Angelina | | | | | 1 | | | | | | 6 | | | **7** |
| Bailey | | | | | | | 6 | | | | | | | **6** |
| Bandera | | | | | 1 | | | | | | | | | **1** |
| Borden | | | 5 | | 50 | | | | | 1 | 10 | | | **66** |
| Brazoria | | | | | 10 | | | | | | 1 | | | **11** |
| Brazos | | | | | | | | | | | 1 | | | **1** |
| Brewster | | | | | 3 | | | | | | | | | **3** |
| Brooks | | | | | 2 | | | | | | | | | **2** |
| Burleson | | | | | 1 | | | | | | | | 1 | **2** |
| Burnet | | | | | 2 | | | | | | | | | **2** |
| Cameron | | | | | 4 | | | | | | | | | **4** |
| Chambers | | | | | 17 | | | | | | | | | **17** |
| Coke | | | 2 | | 8 | | | 1 | | | | | | **11** |
| Coleman | | | | | 3 | | | | | | | | | **3** |
| Colorado | | | | | 1 | | | | | | 3 | | 1 | **5** |
| Comal | | | | | 16 | | | | | | 1 | 1 | | **18** |
| Comanche | | | | | 1 | | | | | | | | | **1** |
| Concho | | | | | 8 | | | 5 | | | | | | **13** |
| Coryell | | | | | 3 | | | | | | | | | **3** |
| Cottle | | | 1 | | 3 | | | | | | | | | **4** |
| Crane | | | | | 15 | | | | | | | | | **15** |
| Crockett | | | | | 1 | | | 4 | | | 2 | | 1 | **8** |
| Culberson | | | 1 | | 10 | | | | | | | | | **11** |
| De Witt | | | | | 2 | | | | | | | | | **2** |
| Deaf Smith | | | | | 1 | | | | | | | | | **1** |
| Dickens | | | | | 2 | | | | | | | | | **2** |
| Dimmit | | | | | 8 | | | | | | | | | **8** |
| Donley | | | | | 2 | | | | | | | | | **2** |
| Duval | | | | | 4 | | | | | | | | | **4** |
| Ector | | | | | 13 | | | | | | | | | **13** |
| Edwards | | | 3 | | | | | 4 | 1 | | 26 | | | **34** |
| El Paso | | | | | 6 | | | | | | | | | **6** |
| Floyd | | | | | 1 | | | | | | | | | **1** |

| County | Badger | Beaver | Bobcat | Cat | Coyote | Feral Hog | Flea | Gray Fox | Nutria | Opossum | Raccoon | Red Fox | Striped Skunk | Total Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Gillespie | | | | | 8 | | | | | | | | | **8** |
| Glasscock | | | | | 23 | | | | | | 3 | | | **26** |
| Goliad | | | | | 16 | | | | | | | | | **16** |
| Gonzales | | | | | 1 | | | | | | | | | **1** |
| Gray | | | | | 9 | 2 | | | | | | | | **11** |
| Hale | | | | | 1 | | | | | | | | | **1** |
| Hall | | | | | 1 | | | | | | | | | **1** |
| Hamilton | | 1 | | | 3 | | | | | | | | | **4** |
| Hays | | | | | 21 | | | | | | | | | **21** |
| Hidalgo | | | | | 16 | | | | | | | | | **16** |
| Hopkins | | 3 | | | | | | | | | | | | **3** |
| Houston | | | | | 5 | | | | | | | | 1 | **6** |
| Howard | | | | | 14 | | | | | | | | | **14** |
| Hudspeth | | | | | 3 | | | | | | | | | **3** |
| Hunt | | 1 | | | | | | | | | | | | **1** |
| Irion | | | 1 | | | | | 2 | | | | | | **3** |
| Jeff Davis | | | | | 5 | | | 10 | | | | | | **15** |
| Jefferson | | | | | 17 | | | | | | 2 | | 4 | **23** |
| Jim Hogg | | | | | 3 | | | | | | 2 | | | **5** |
| Jim Wells | | | 1 | | 6 | | | | | | | | | **7** |
| Kendall | | | | | | | | 4 | | | | 1 | | **5** |
| Kenedy | | | | | 2 | | | | | | | | | **2** |
| Kerr | | | | | 1 | | | 3 | | | | | | **4** |
| Kimble | | | 4 | | 16 | | | 12 | | | 43 | | | **75** |
| King | | | | | 2 | | | | | | | | | **2** |
| Kinney | | | 2 | 1 | 12 | | | 8 | | | 3 | | | **26** |
| Lampasas | | | 3 | | 27 | | | | | | 13 | | 1 | **44** |
| Lavaca | | | 1 | | 15 | | | | | | | | | **16** |
| Leon | | | | | 11 | | | | | | 1 | 1 | | **13** |
| Liberty | | | | | 3 | 1 | | | | | | | | **4** |
| Loving | | | | | 16 | | | | | | | | | **16** |
| Madison | | | 1 | | 4 | | | | | | 1 | | | **6** |
| Mason | | | | | 1 | | | | | | | | | **1** |
| Matagorda | | | | | 11 | | | | | | | | | **11** |
| Maverick | | | | | 5 | | | | | | | | | **5** |
| Mcculloch | | | | | | 2 | | 2 | | | | | | **4** |
| Medina | | | | 1 | 2 | | | | | | | | | **3** |

| County | Badger | Beaver | Bobcat | Cat | Coyote | Feral Hog | Flea | Gray Fox | Nutria | Opossum | Raccoon | Red Fox | Striped Skunk | Total Negative |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Menard | | | | | 2 | | | 1 | | | | | | **3** |
| Midland | | | 1 | | 8 | | | | | | | | | **9** |
| Mitchell | 3 | | 2 | | 32 | | | | | | | | | **37** |
| Motley | | | 2 | | 17 | | | | | | | | | **19** |
| Nolan | | | 2 | | 7 | | | | | | | | | **9** |
| Nueces | | | | | 1 | | | | | | 1 | | | **2** |
| Pecos | | | 23 | | 45 | 1 | | 33 | | | 9 | | | **111** |
| Presidio | | | 1 | | 7 | | | | | | | | | **8** |
| Randall | | | | | 8 | | | | | | 4 | | | **12** |
| Reagan | | | 1 | | 5 | | | 2 | | | 4 | | | **12** |
| Real | | | | | | | | 3 | | | | | | **3** |
| Reeves | | | | | 25 | | | | | | | | | **25** |
| Runnels | | | 1 | | 5 | | | 5 | | | | | | **11** |
| San Saba | | | | | 19 | 2 | | 1 | | | 2 | | | **24** |
| Schleicher | | | 1 | | 2 | | | 5 | | | | 2 | | **10** |
| Scurry | 3 | | 3 | | 12 | | | | | | 3 | 1 | 1 | **23** |
| Starr | | | | | 21 | | | | | | | | | **21** |
| Stephens | | | | | 3 | | | | | | | | | **3** |
| Sterling | 3 | | 10 | | 47 | | | 5 | | | 21 | 1 | | **87** |
| Sutton | | | | | | | | 5 | | | | 1 | | **6** |
| Terrell | 1 | | 8 | | 7 | | | 33 | | | | | | **49** |
| Tom Green | | | 4 | | 10 | | | 11 | | | | | | **25** |
| Trinity | | | | | | | | | | | 1 | | | **1** |
| Tyler | | | | | 1 | | | | | | | | | **1** |
| Upton | | | | | 6 | | | 20 | | | | | | **26** |
| Uvalde | | | 1 | | 3 | | | | | | | | | **4** |
| Val Verde | | | 12 | | 5 | | | 50 | | | 7 | | | **74** |
| Victoria | | | | | 12 | | | | | | | | | **12** |
| Ward | | | | | 12 | | | | | | | | | **12** |
| Webb | | | | | 32 | | | | | | | | | **32** |
| Williamson | | | | | 17 | | | | | | | | | **17** |
| Winkler | | | | | 12 | | | | | | | | | **12** |
| Zapata | | | | | 18 | | | | | | | | | **18** |
| Zavala | | | 3 | | 9 | | | | | | | | | **12** |
| **Total Negative** | **10** | **5** | **100** | **2** | **892** | **8** | **6** | **229** | **1** | **1** | **170** | **8** | **10** | **1442** |