


West Nile Virus in Colorado, 2003

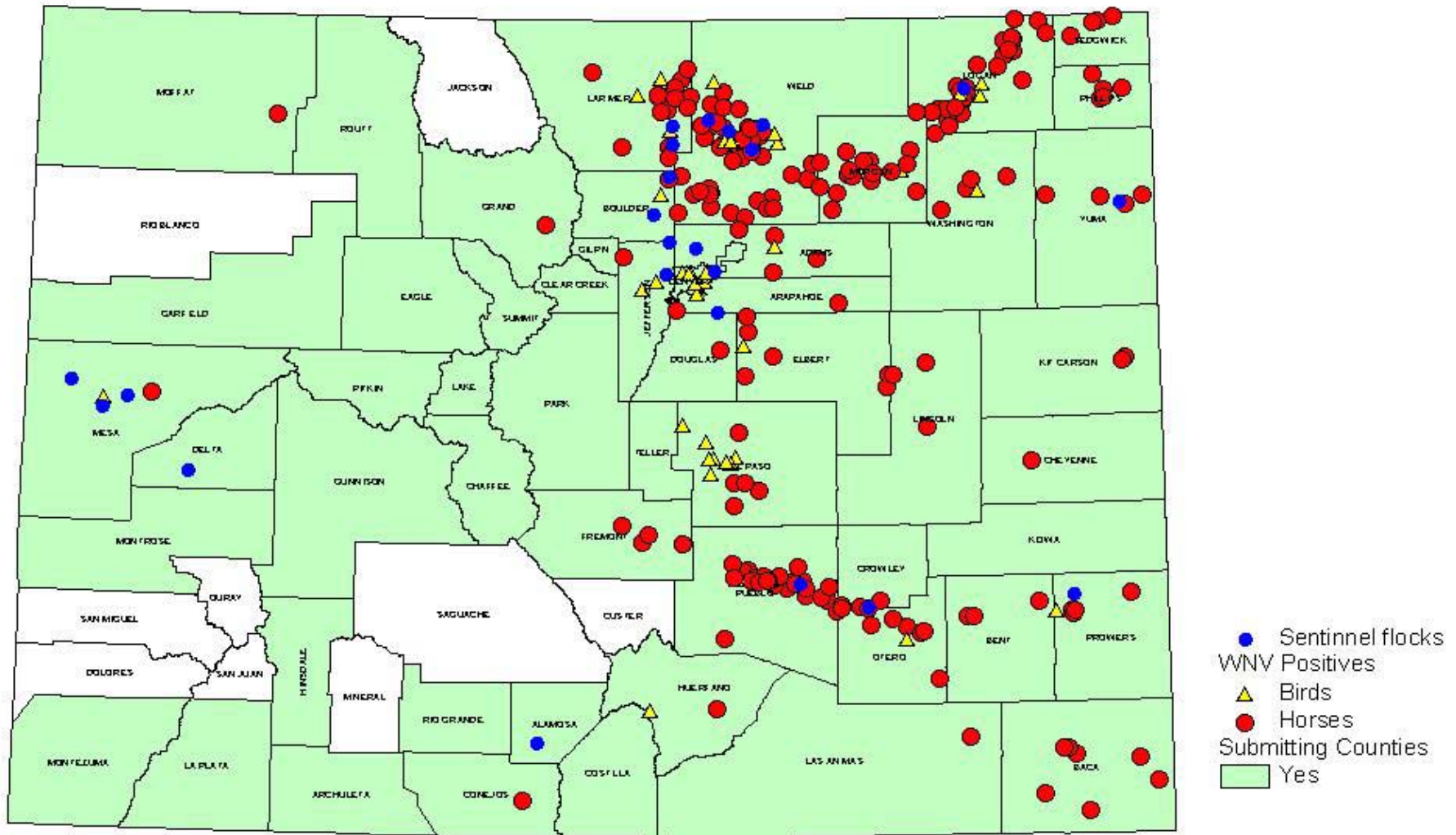
OR

What I Did on My Summer Vacation



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Colorado West Nile Virus Surveillance Final Map - December 2002

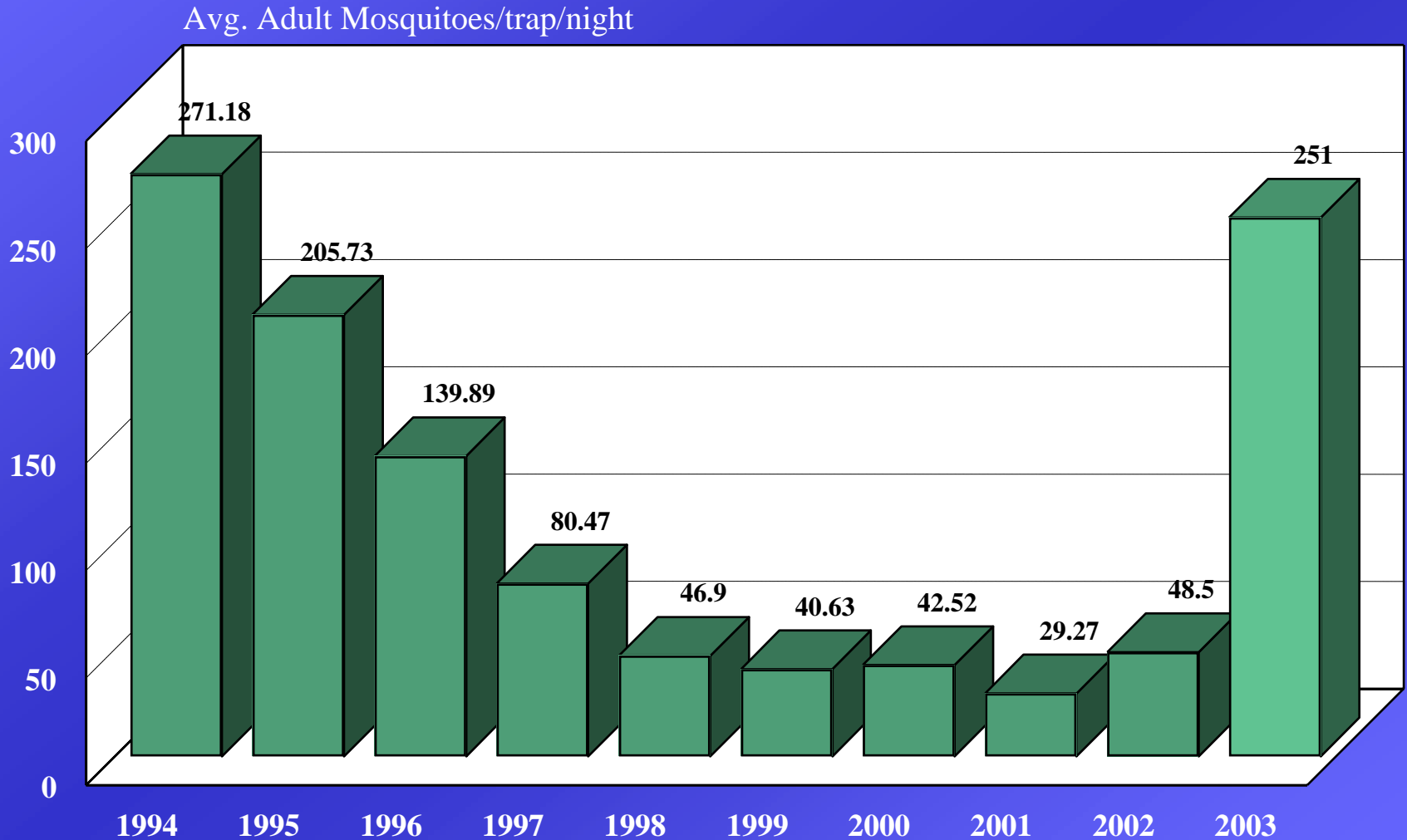


Factors Leading to Colorado's 2003 WNV Epidemic

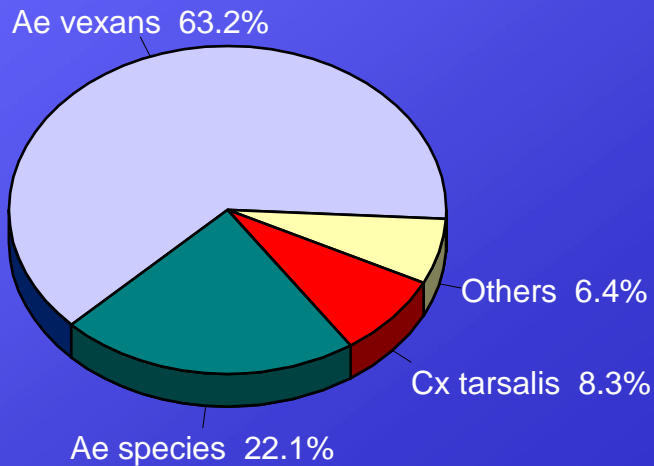
- Second Year Phenomenon
 - Whole season to amplify in a naïve local bird populations
- Ideal weather for mosquito production
 - Wet spring, hot summer
 - Renewal of agricultural irrigation
- *Culex tarsalis* highly competent vector
- Plenty of “soft” targets

Adult Mosquito Population Comparison '94-'03

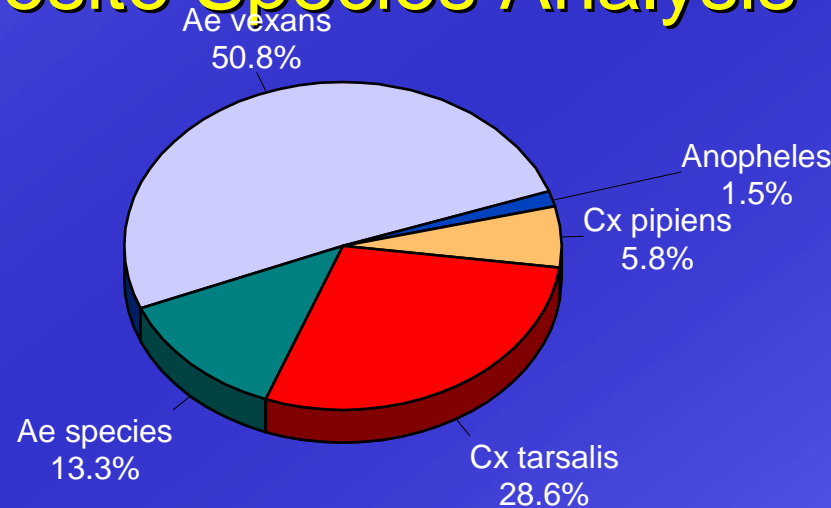
Boulder County Mosquito Control District



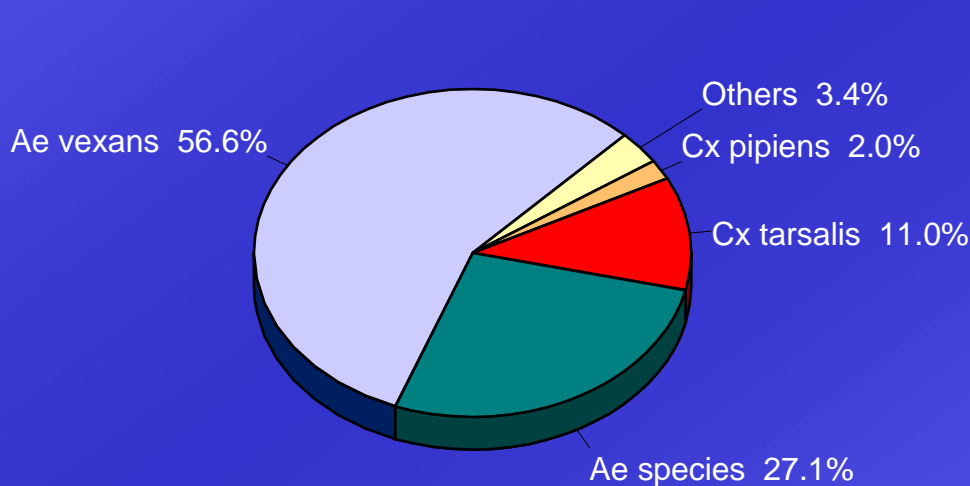
Boulder County Mosquito Control District 2000-'03 CDC Trap Composite Species Analysis



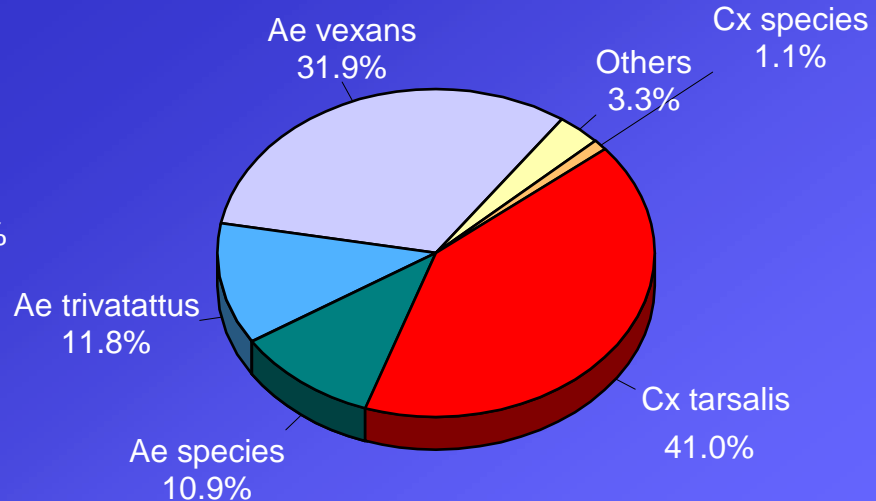
2000



2001

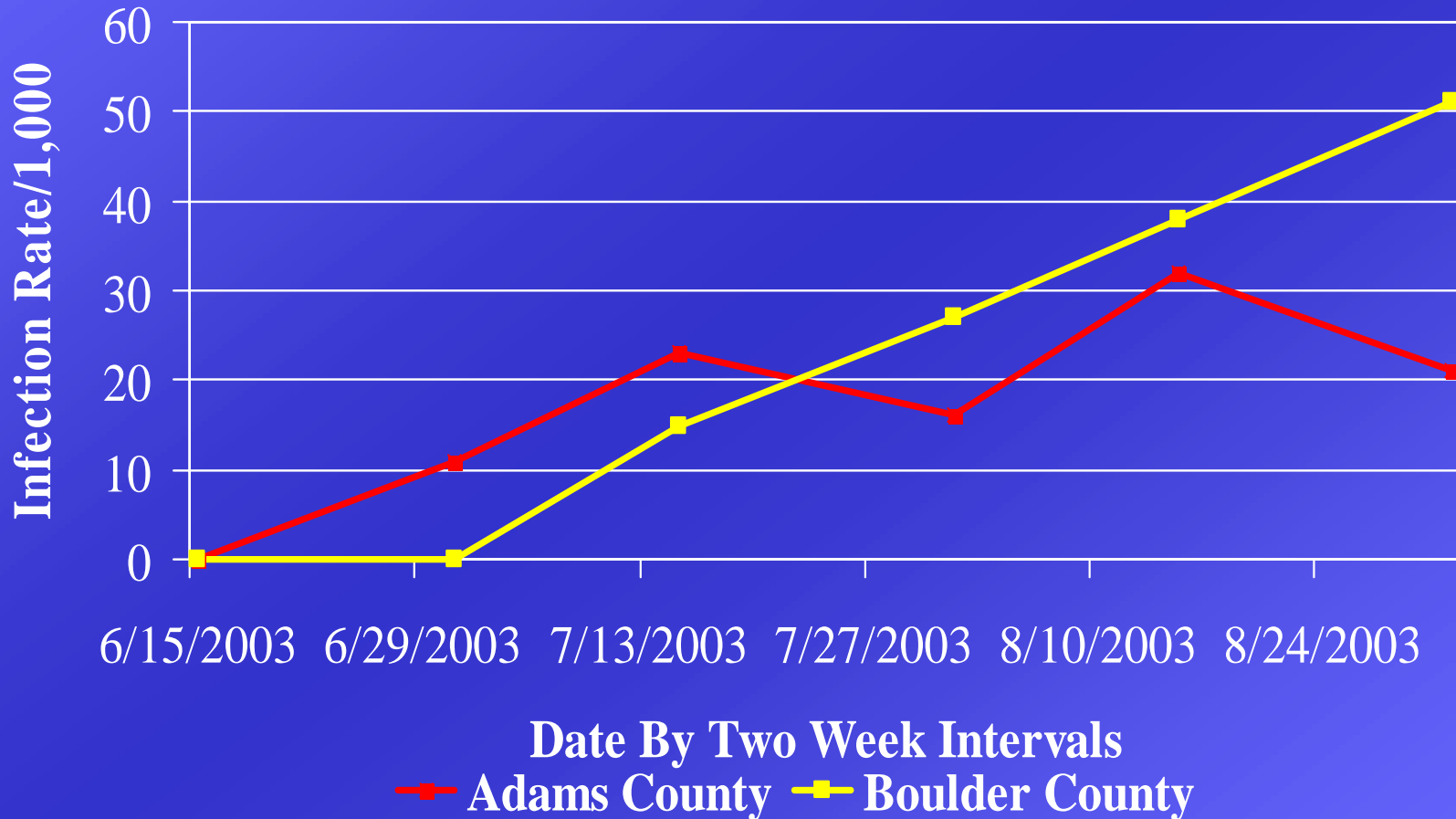


2002

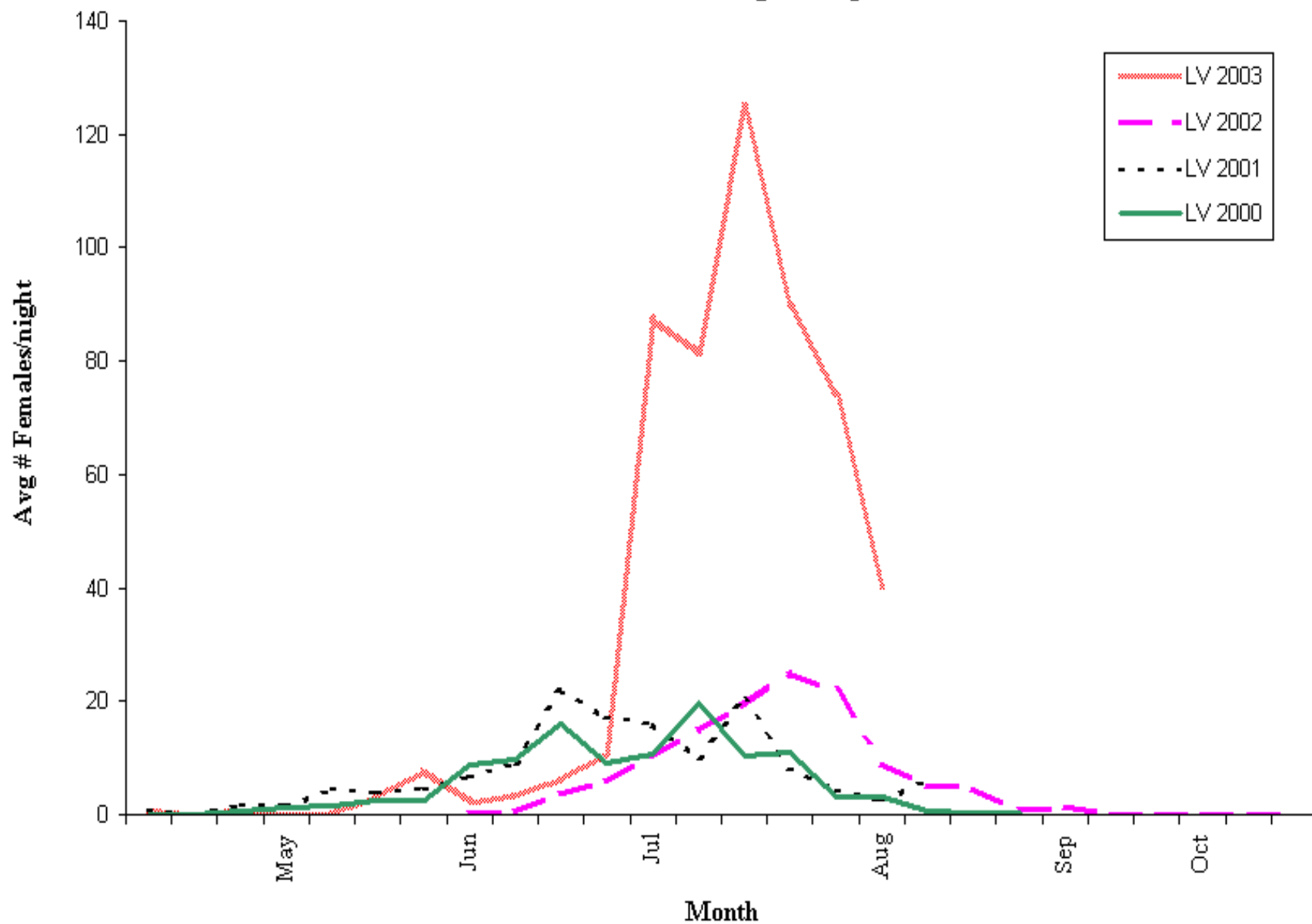


2003

Mosquito Infections Rates, Culex Species, Selected Colorado Counties, 2003

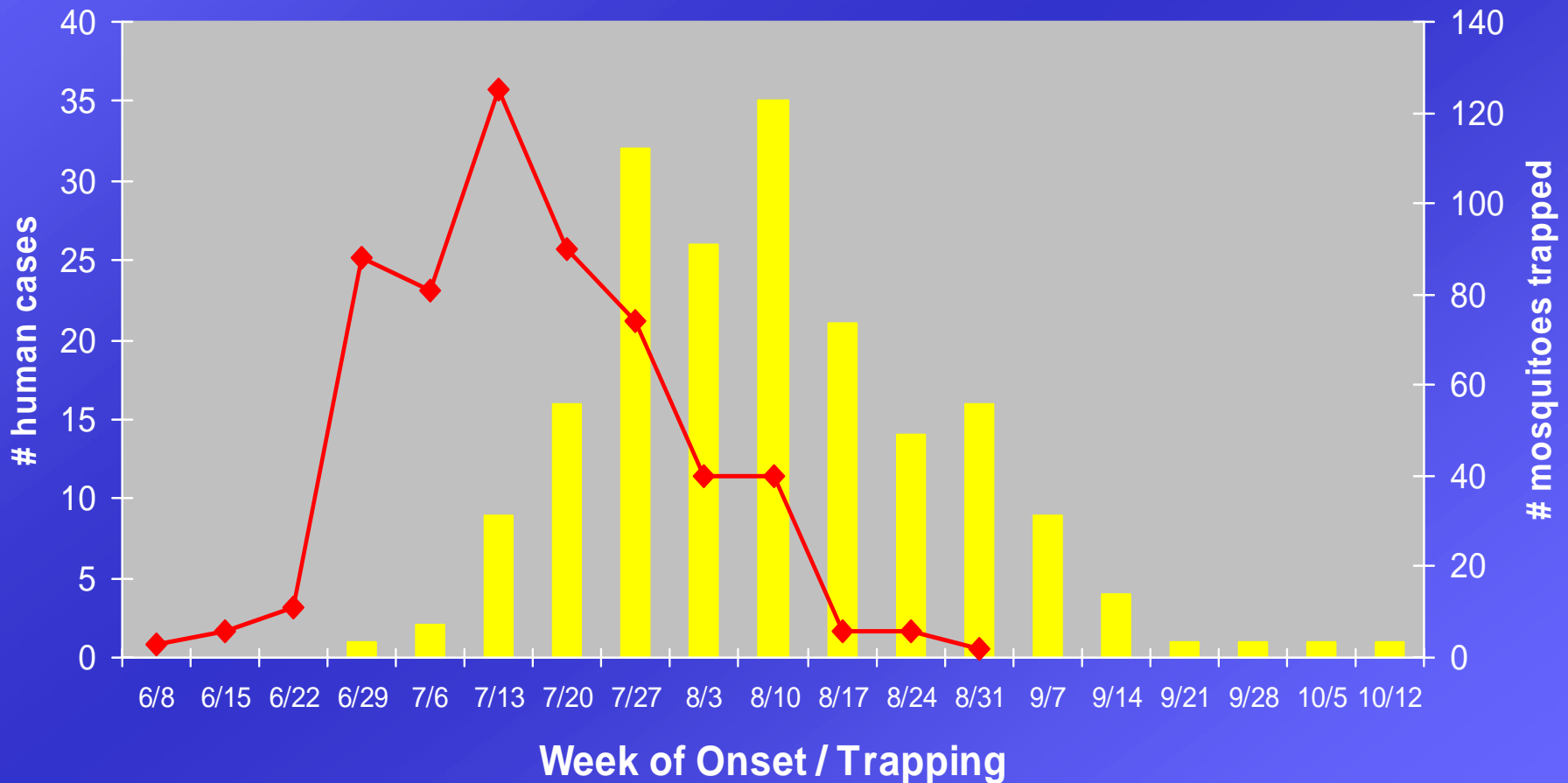


Culex tarsalis
Loveland Area
CDC/ CO2 light traps



Culex tarsalis Populations Compared to Illness Onset, Loveland, 2003

■ # of cases ◆ C tarsalis



Mosquito Surveillance Colorado 2003

Species	Pools tested	Positive	% Positive
All Species*	2704	639	24%
<i>C tarsalis</i>	1415	477	34%
Other Culex	595	141	24%
Other species	47	4	9%

* Includes 646 mixed species pools

WNV Positive Avian Species, Colorado, 2003

- **Corvids**

- American crow (249/414 = 60%)
- Magpie (286/658 = 43%)
- Raven (18/39 = 46%)
- Jays (121/ 246 = 49%)
 - Blue (93), Scrub (19), Stellar (7), Pinon (2)

- **Non-Corvids**

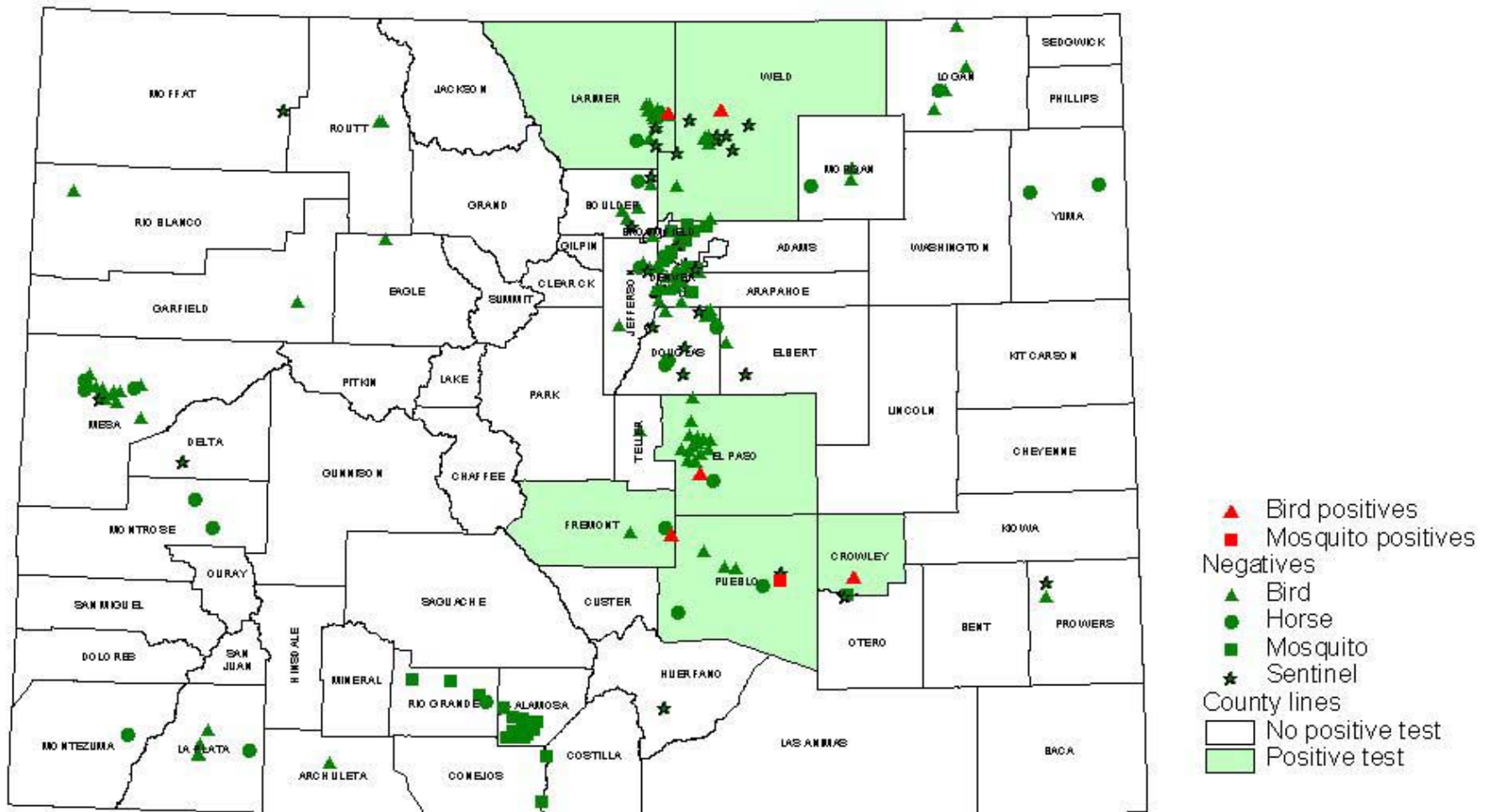
- Raptors (58/89 = 65%)
- Other avian (39/129 = 30%)
- Zoo (4)
 - Brant goose, flamingo, swan, red-breasted goose

WNV Positive Mammalian Species, Colorado, 2003

- Horses 604 / 1099 (55%)
- Alpaca (10)
- Dog (4)
- fox squirrel (4)
- Abert's squirrel (2) ; prairie dog (2) ; elk (2)
- One each: coyote, fox, grey squirrel, mule deer, raccoon, reindeer, wolf,

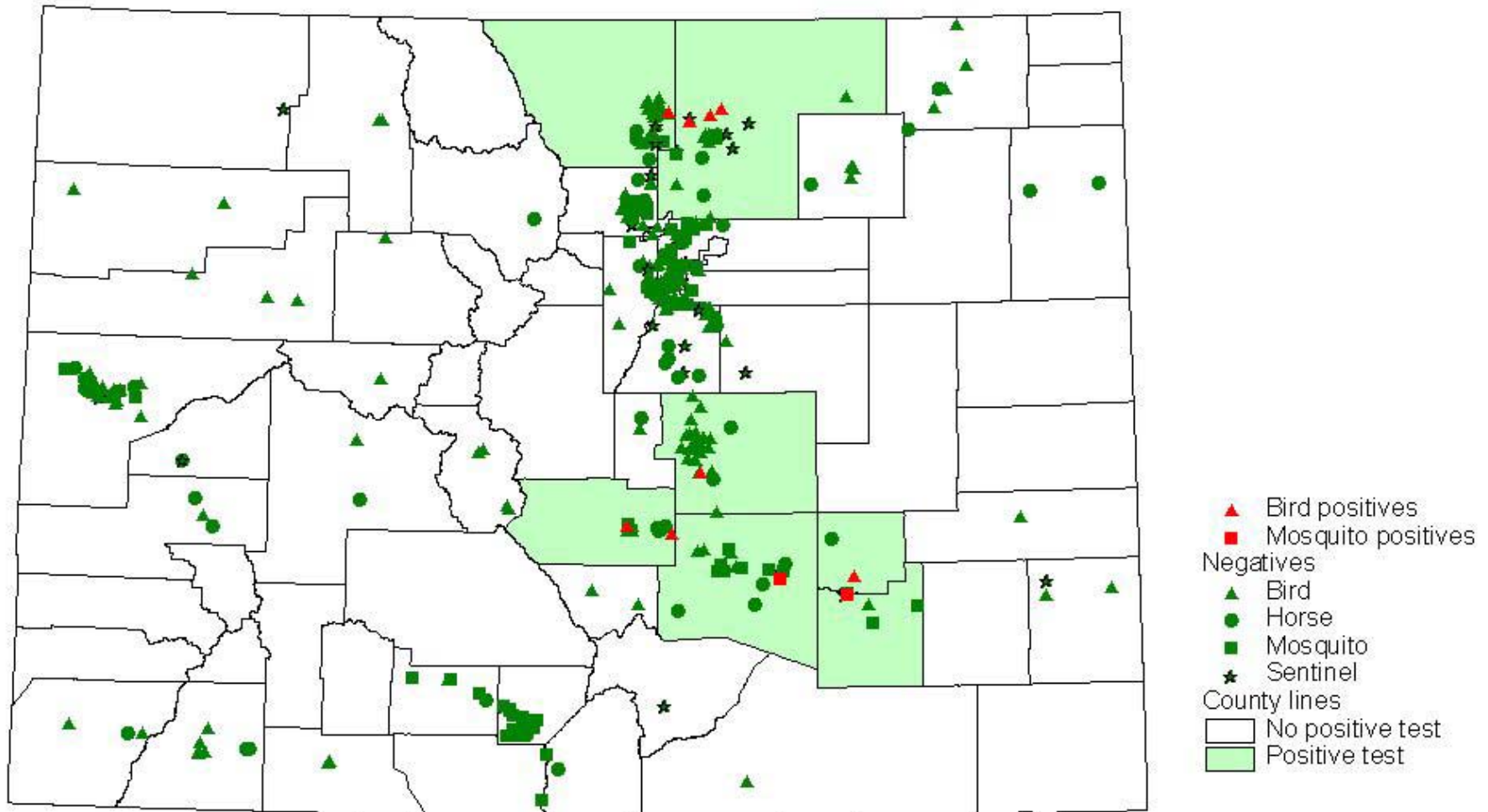
Colorado West Nile Virus Surveillance

Updated July 1, 2003



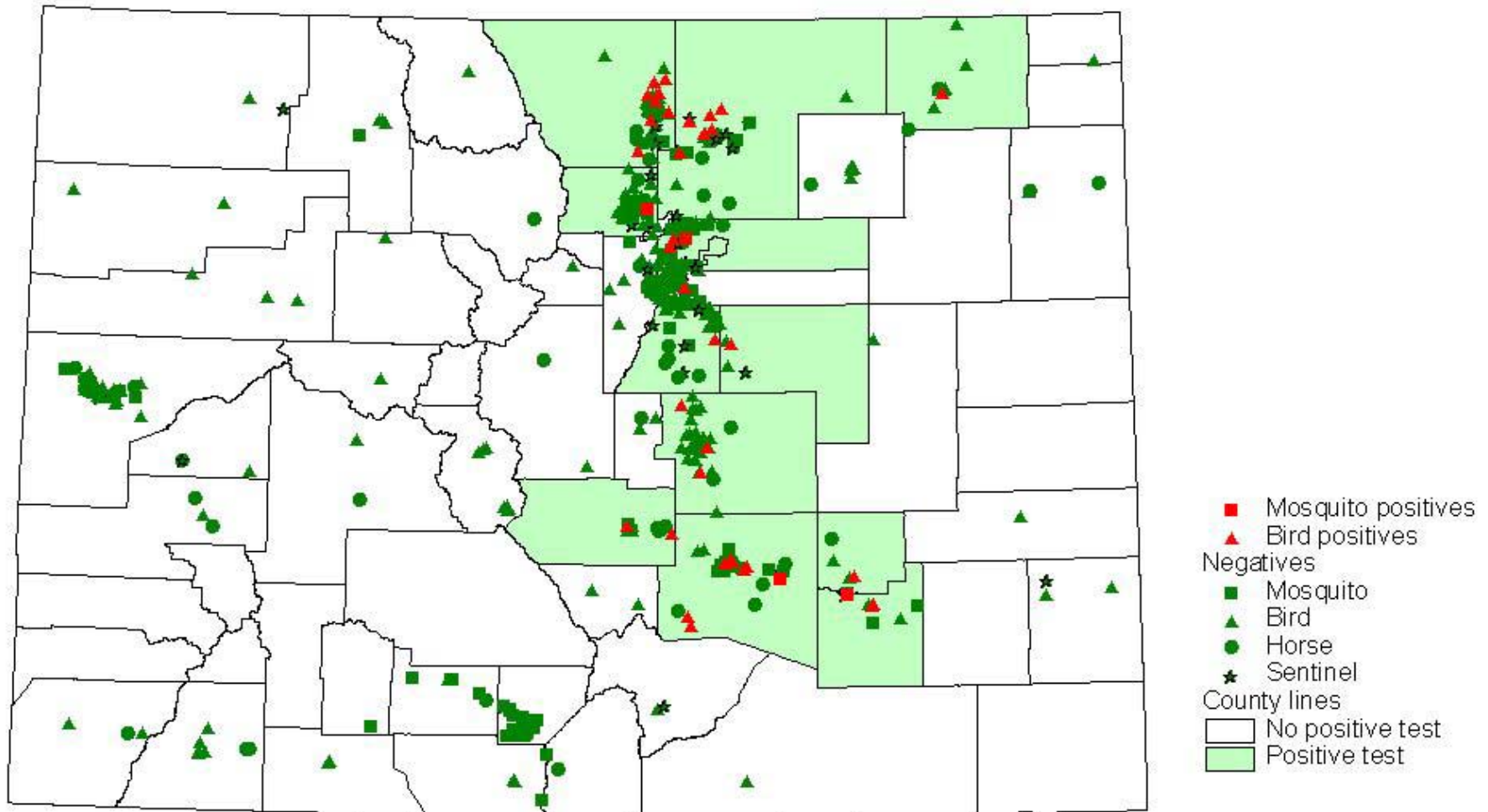
Colorado West Nile Virus Surveillance

Updated July 10, 2003



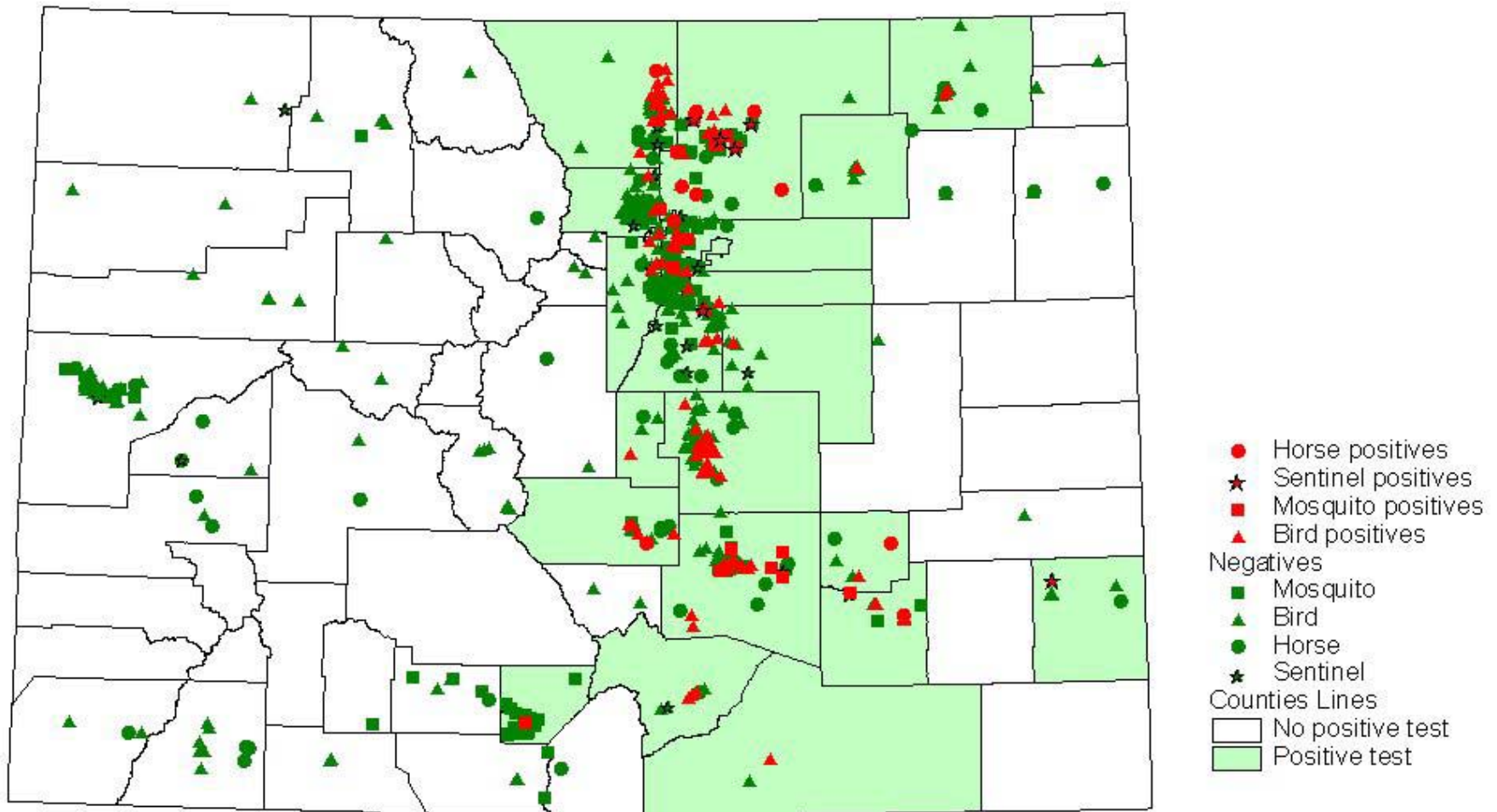
Colorado West Nile Virus Surveillance

Updated July 15, 2003



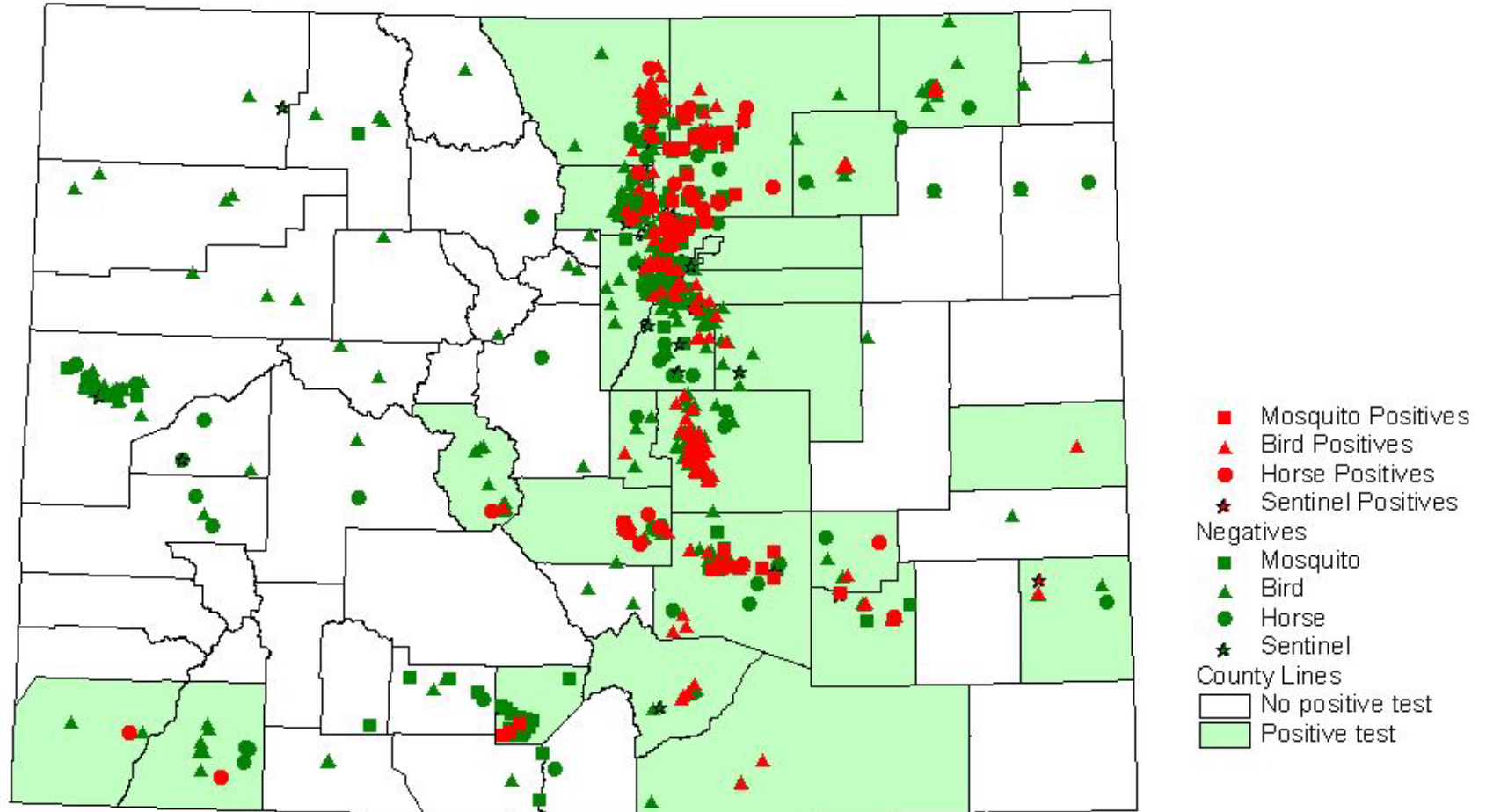
Colorado West Nile Virus Surveillance

Updated July 22, 2003



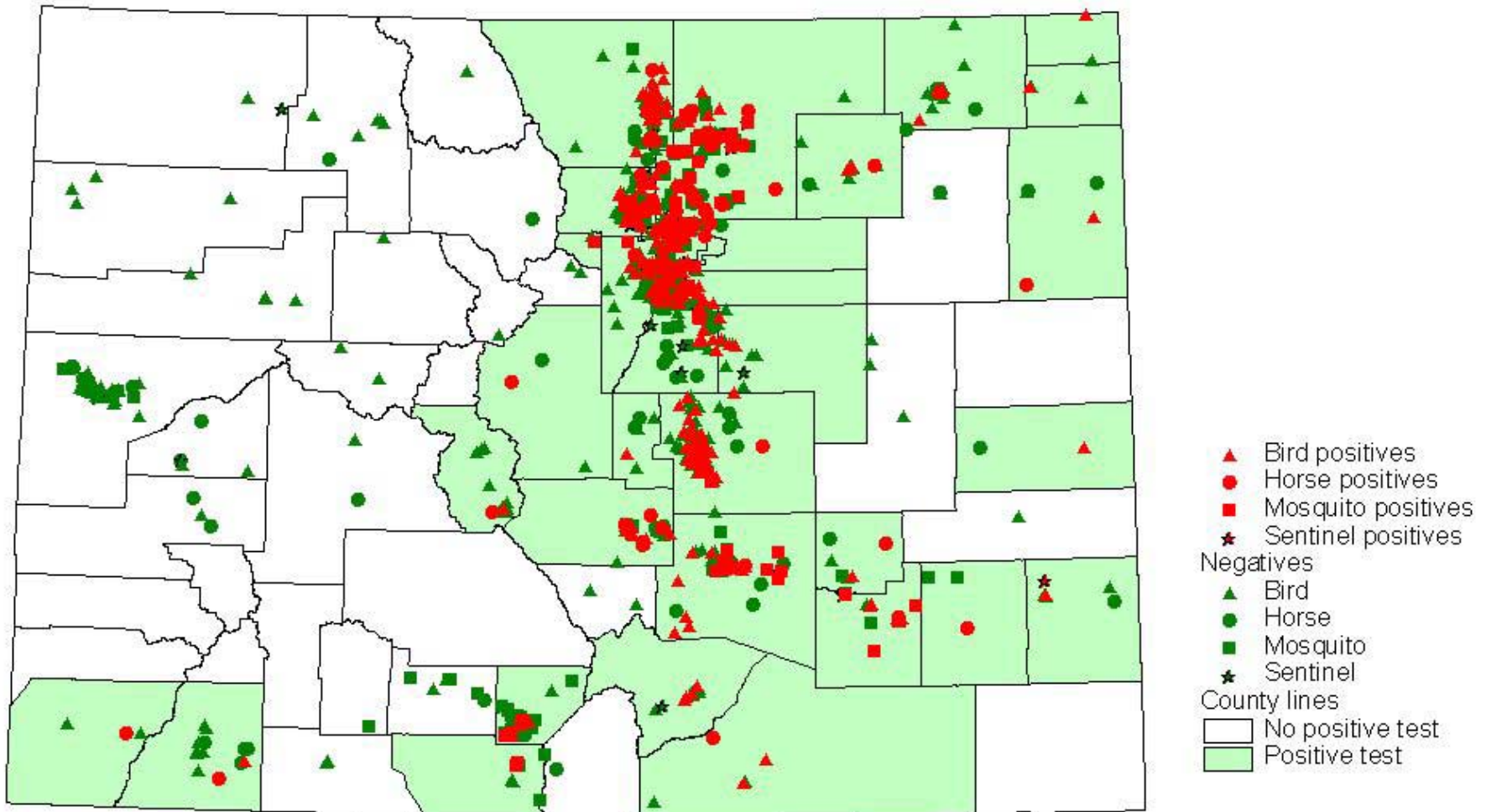
Colorado West Nile Virus Surveillance

Updated July 25, 2003



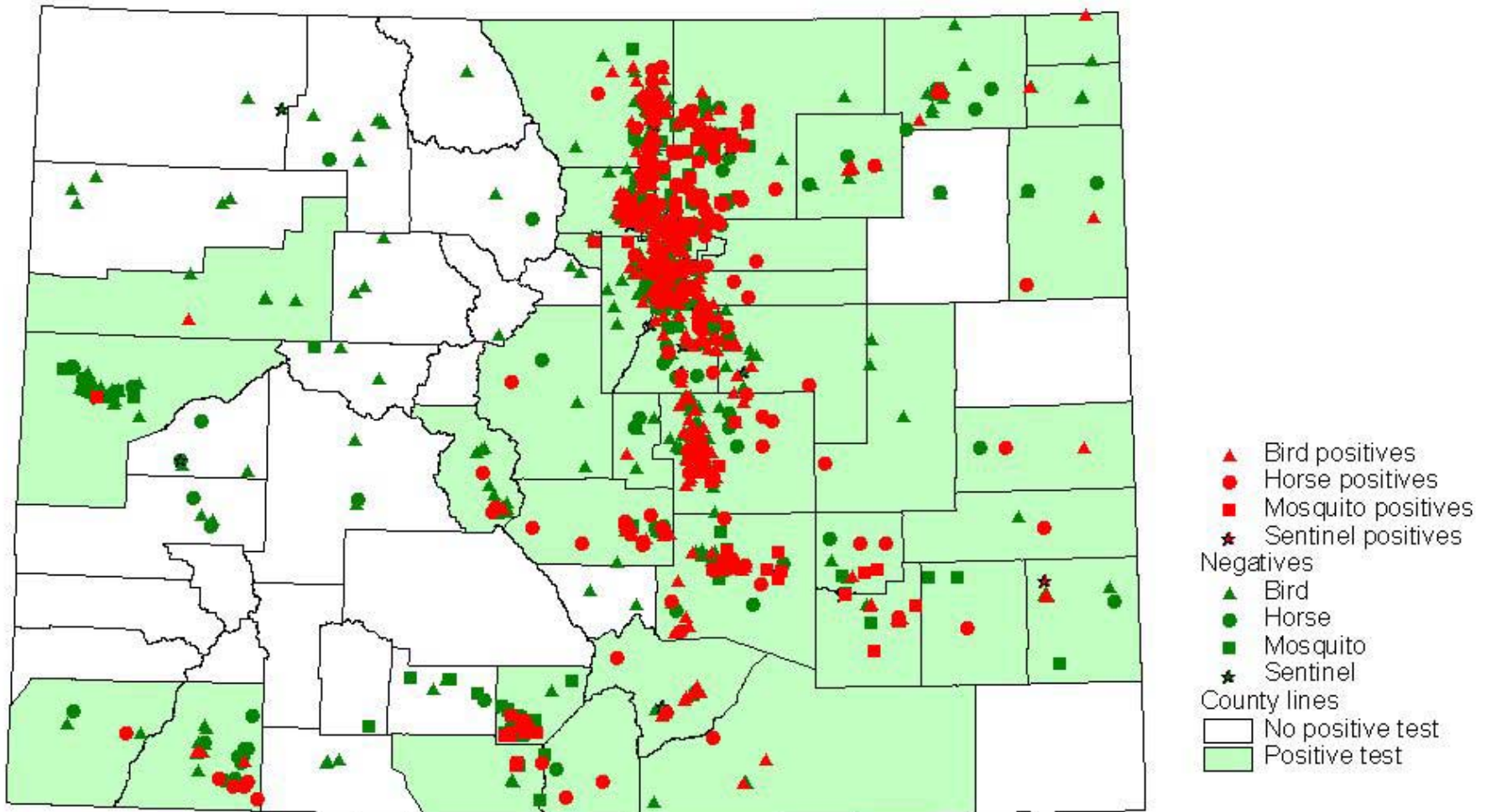
Colorado West Nile Virus Surveillance

Updated August 1, 2003



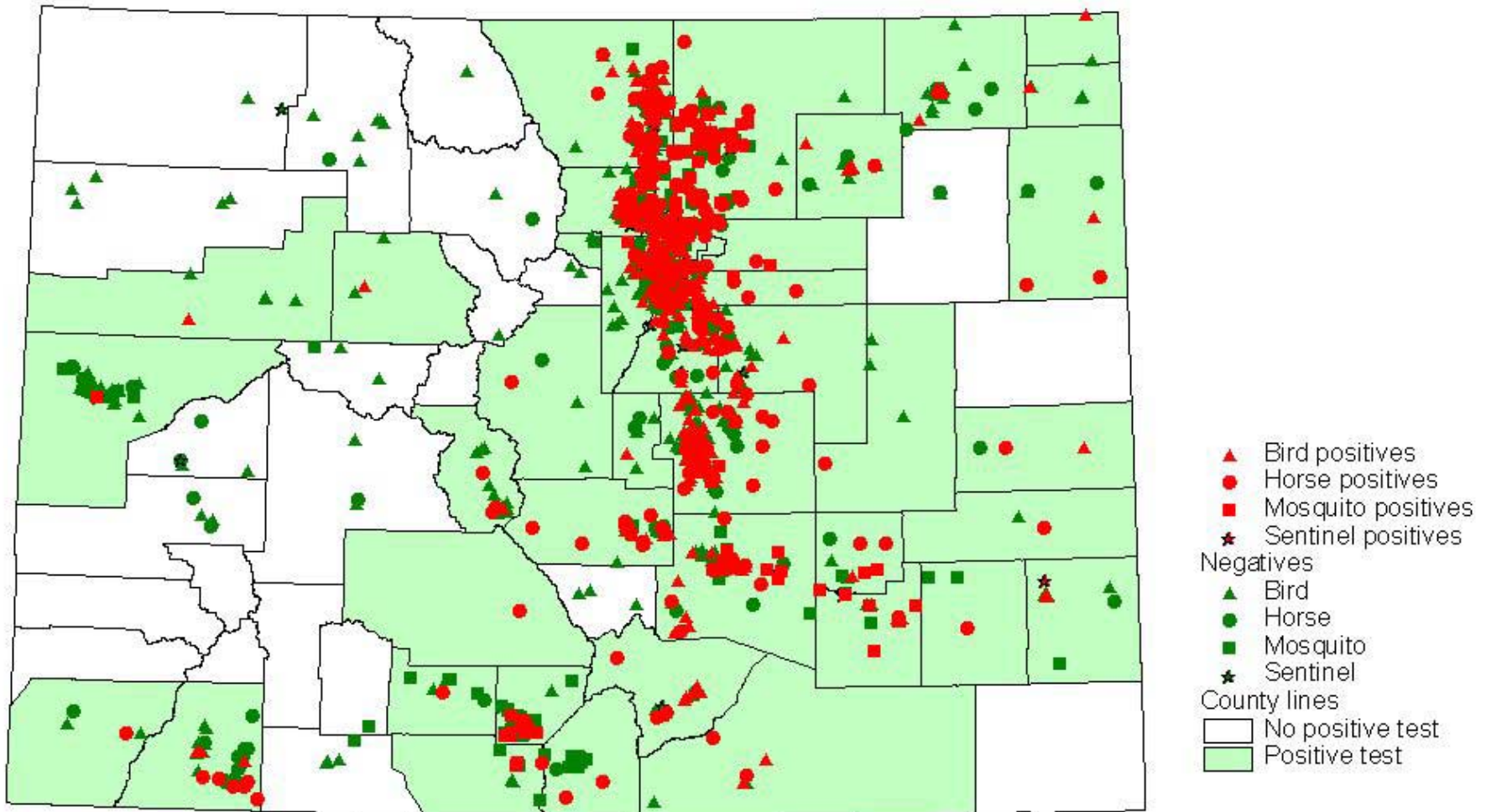
Colorado West Nile Virus Surveillance

Updated August 8, 2003

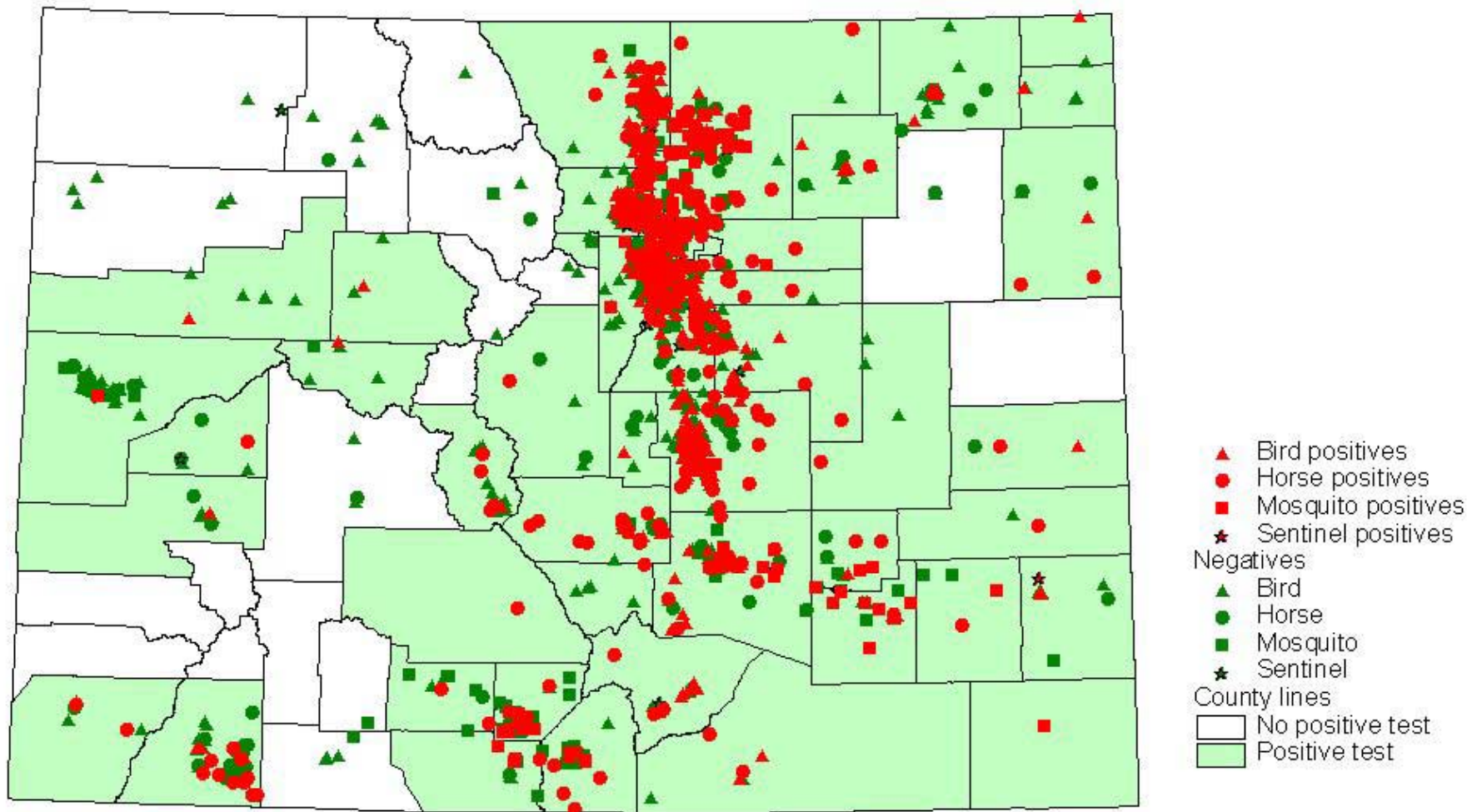


Colorado West Nile Virus Surveillance

Updated August 14, 2003

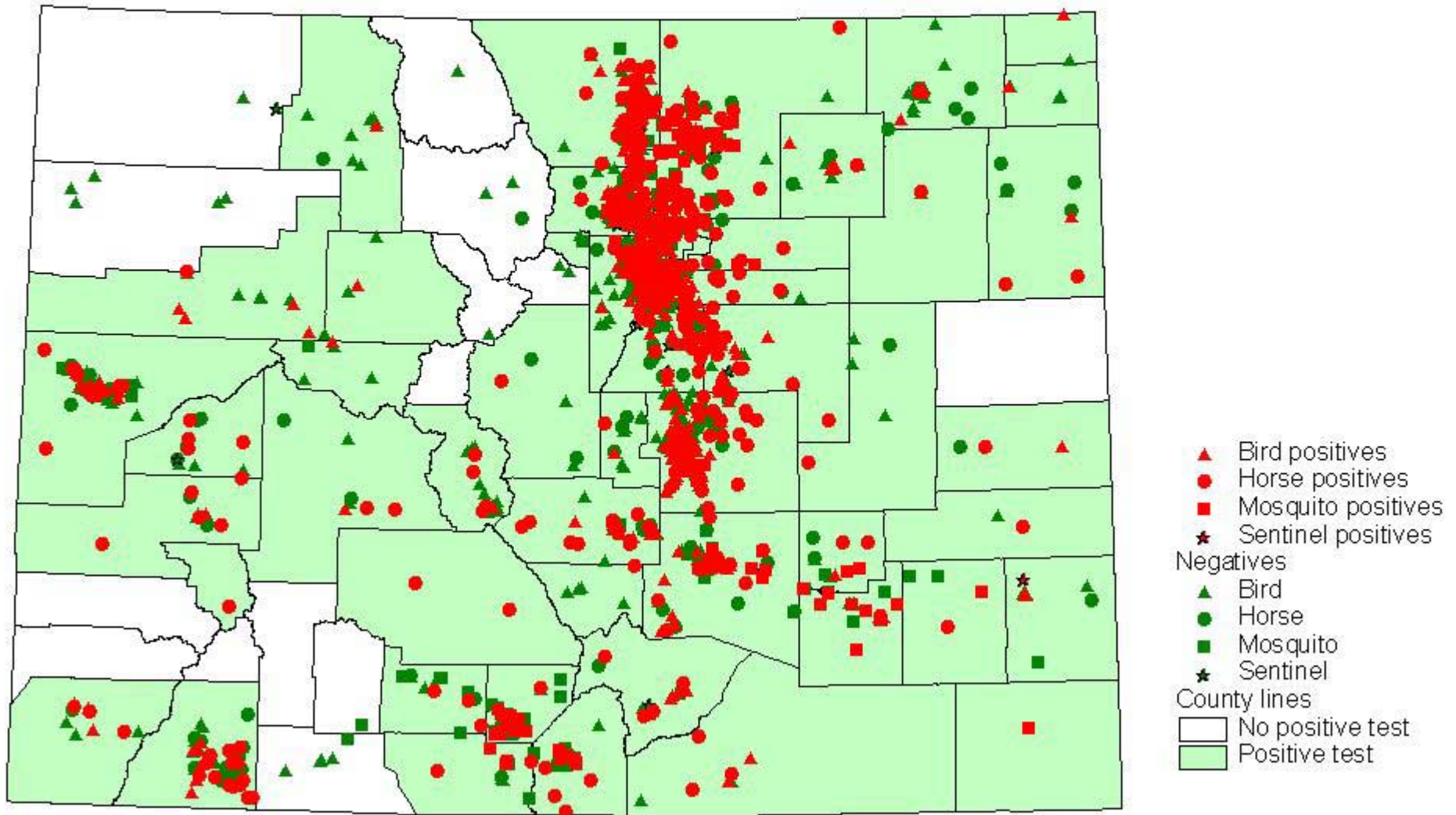


Colorado West Nile Virus Surveillance Updated August 20, 2003



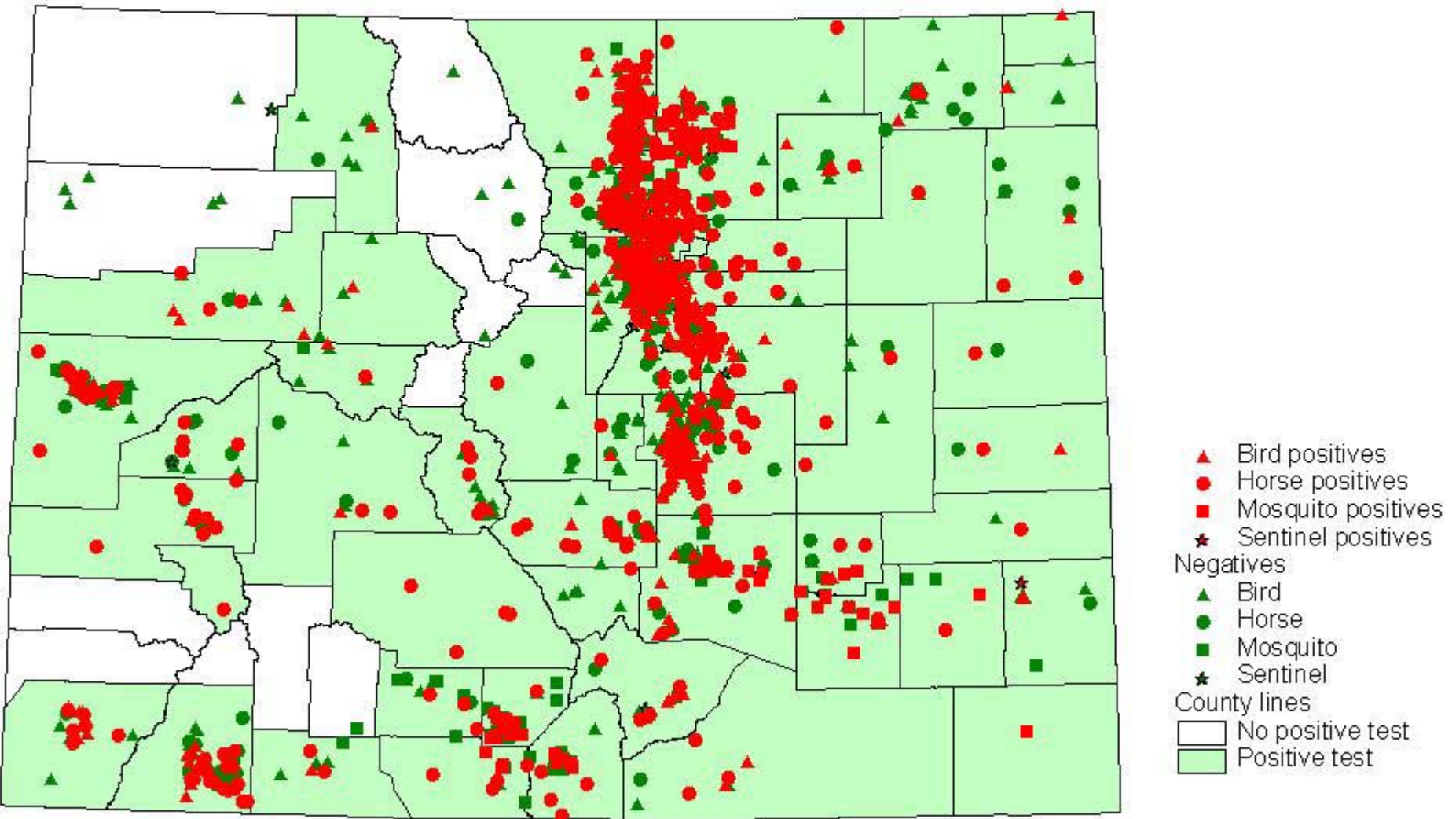
Colorado West Nile Virus Surveillance

Updated August 29, 2003



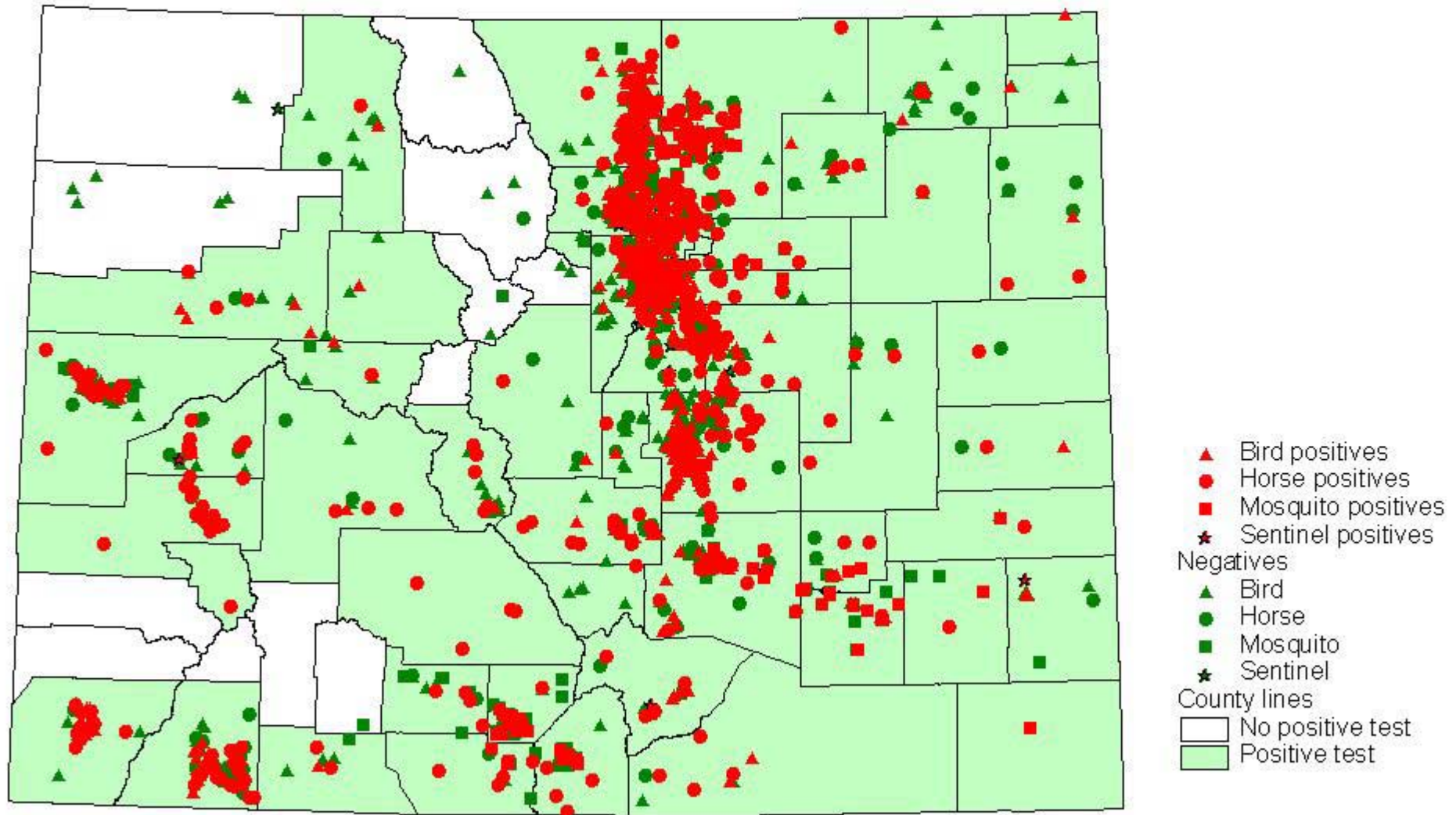
Colorado West Nile Virus Surveillance

Updated September 5, 2003



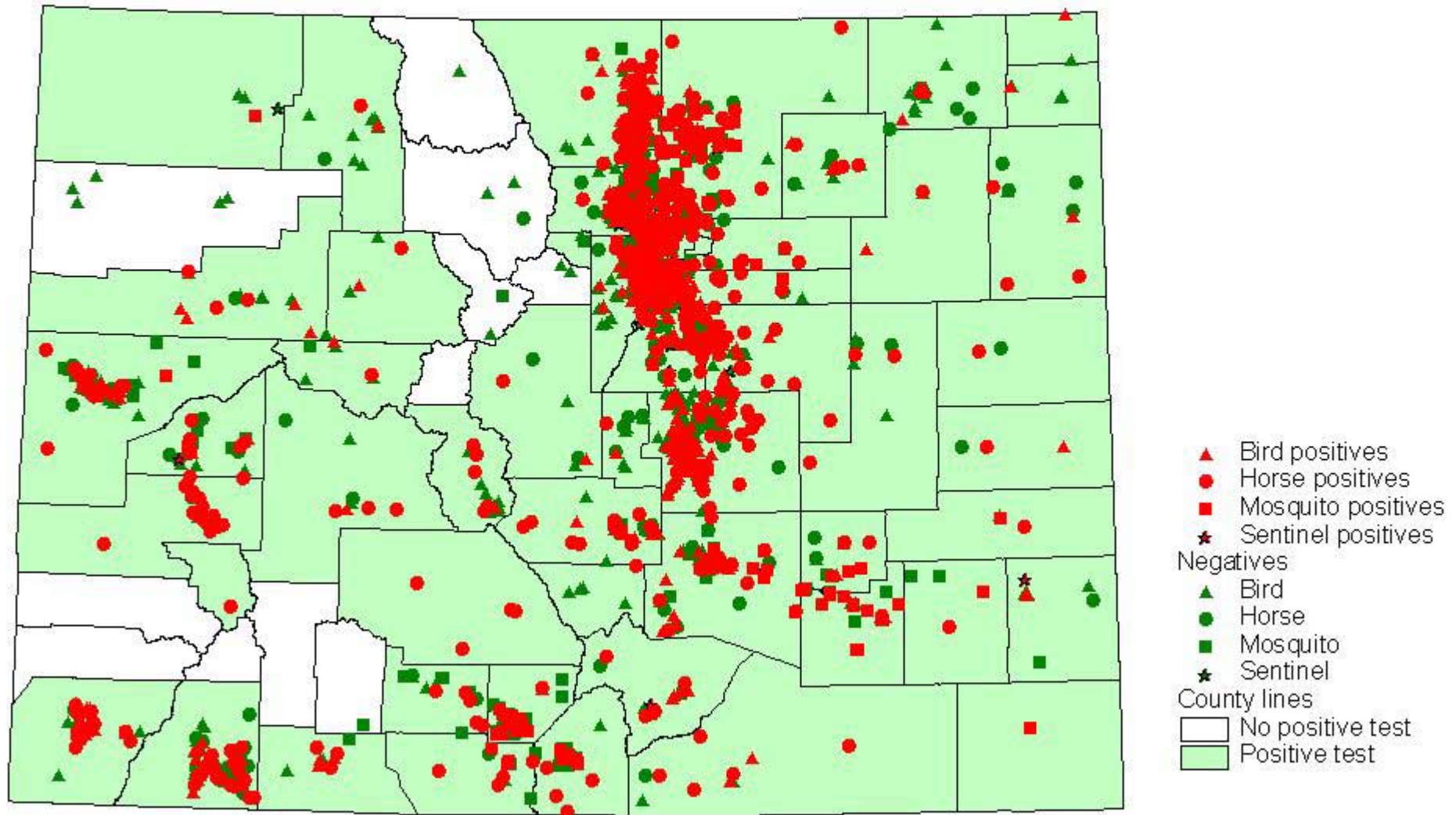
Colorado West Nile Virus Surveillance

Updated September 12, 2003



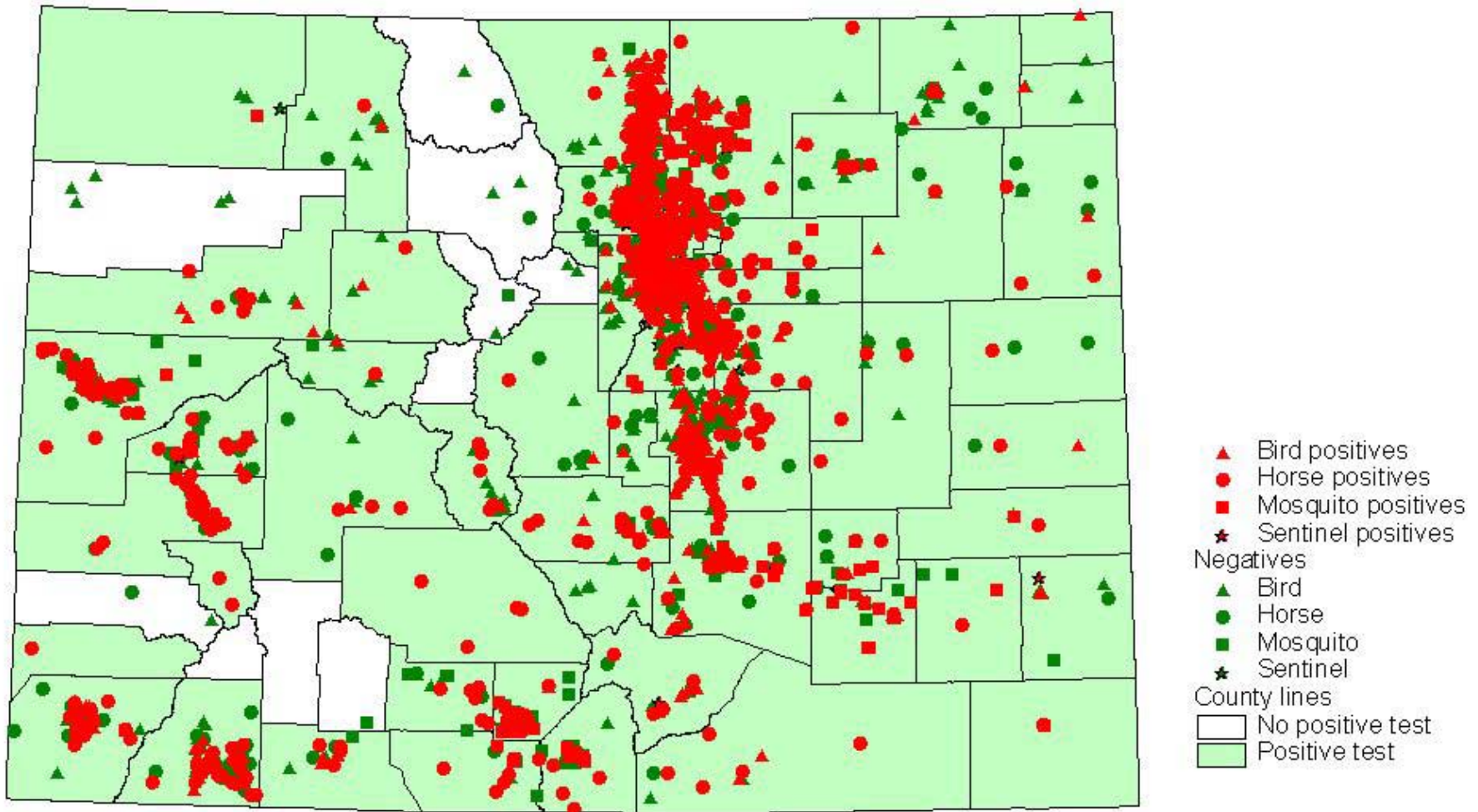
Colorado West Nile Virus Surveillance

Updated September 18, 2003

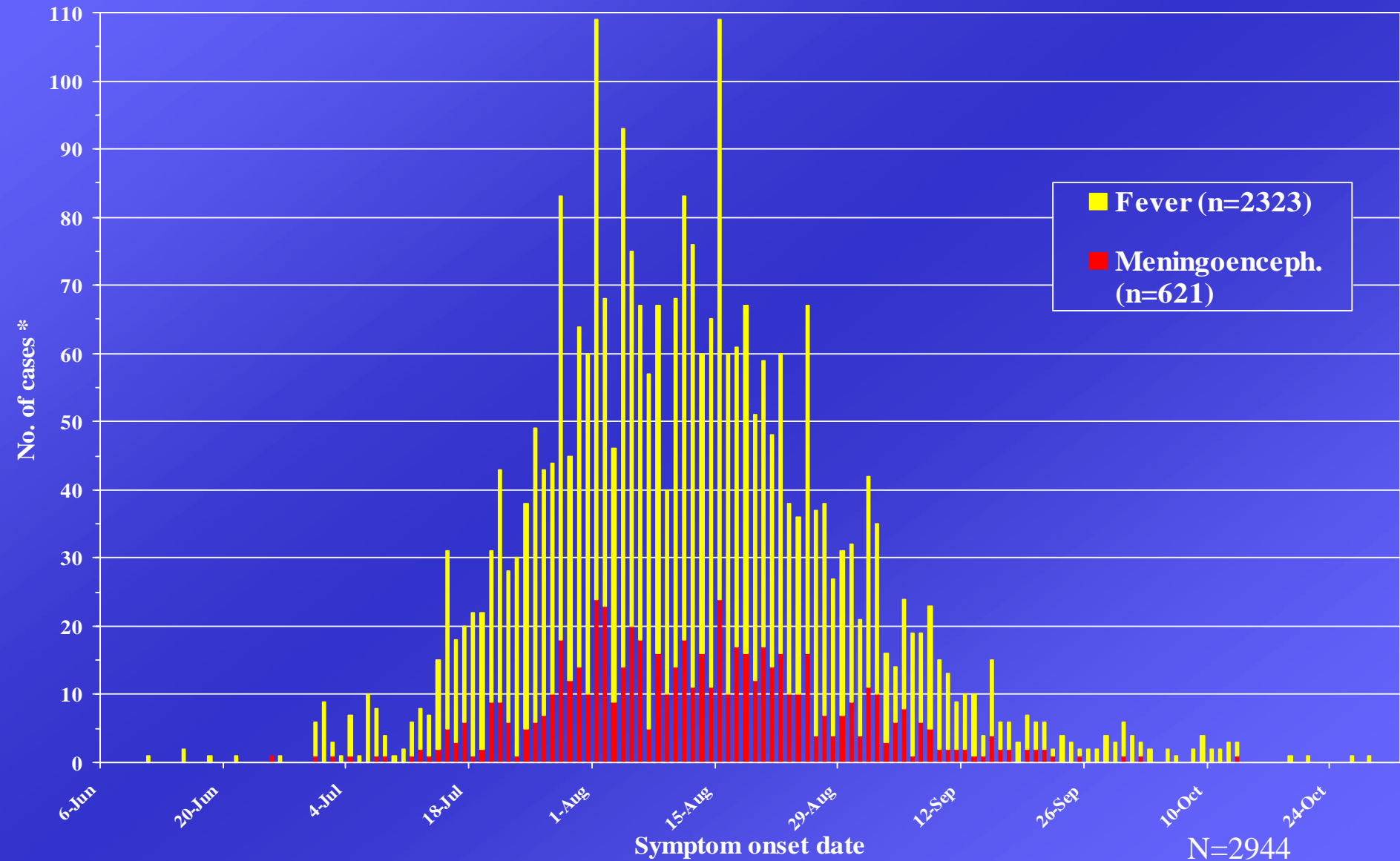


Colorado West Nile Virus Surveillance

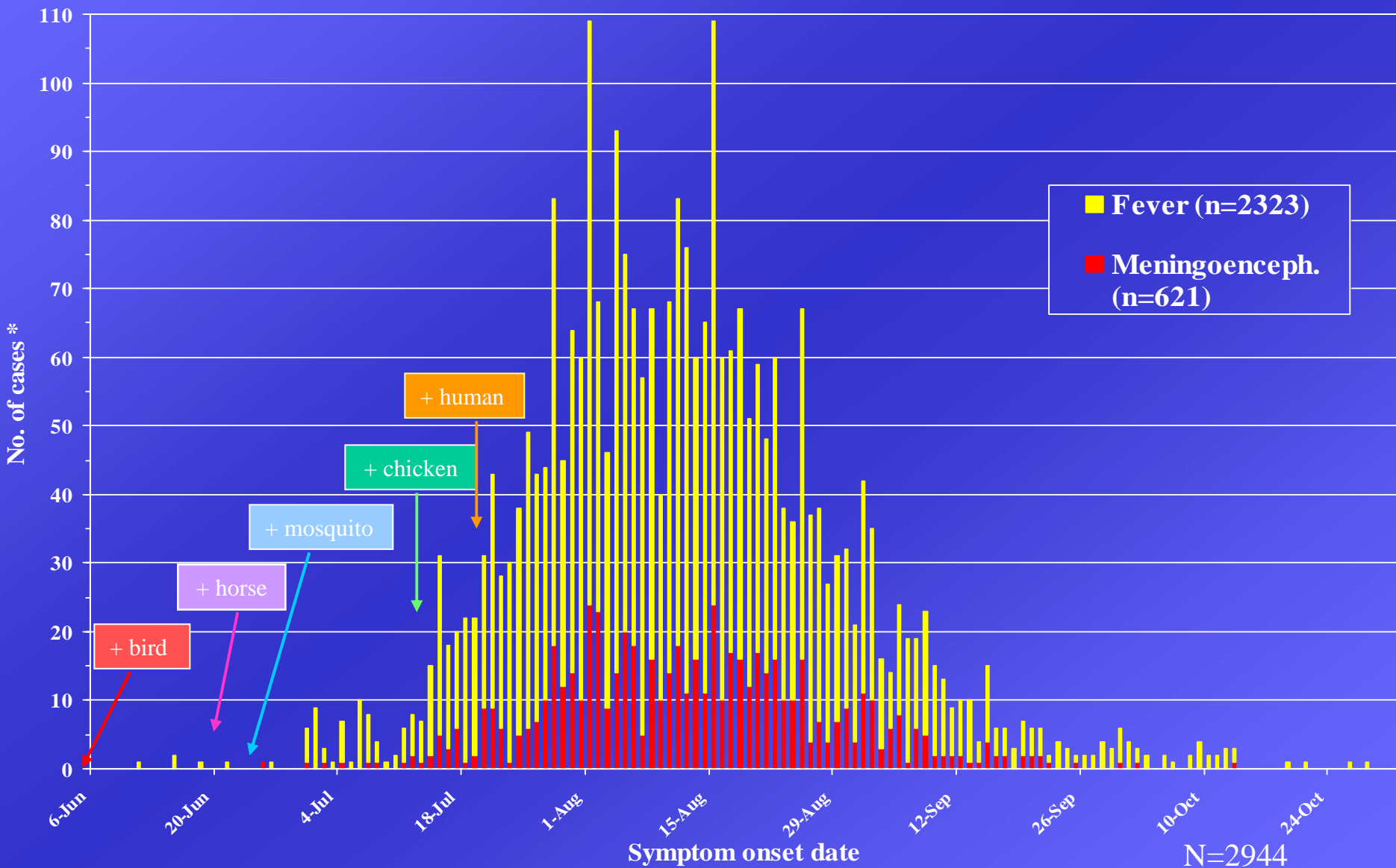
Updated October 15, 2003



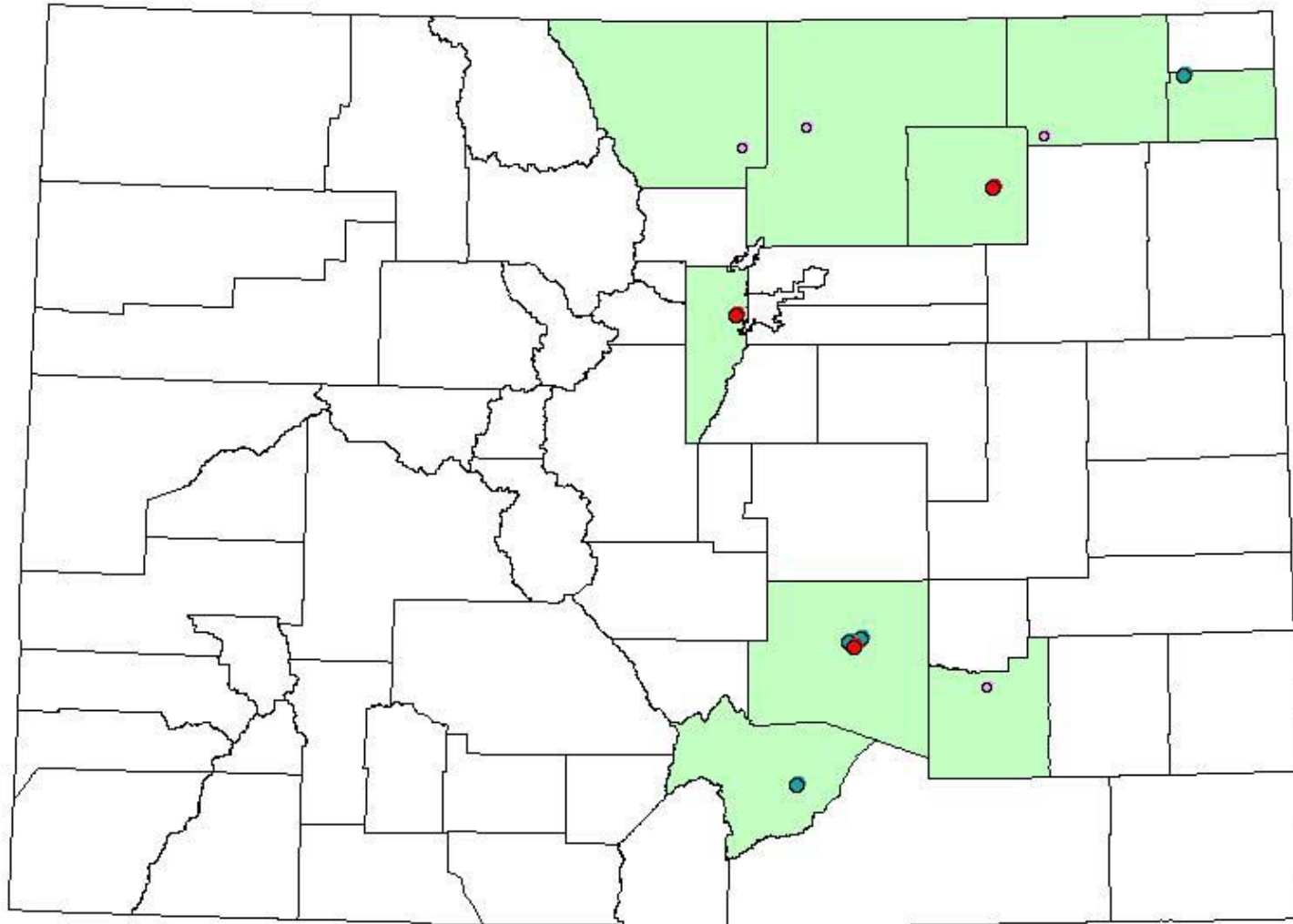
Onset Dates of Human West Nile Virus Cases, Colorado, 2003



Onset Dates of Human West Nile Virus Cases, Colorado, 2003



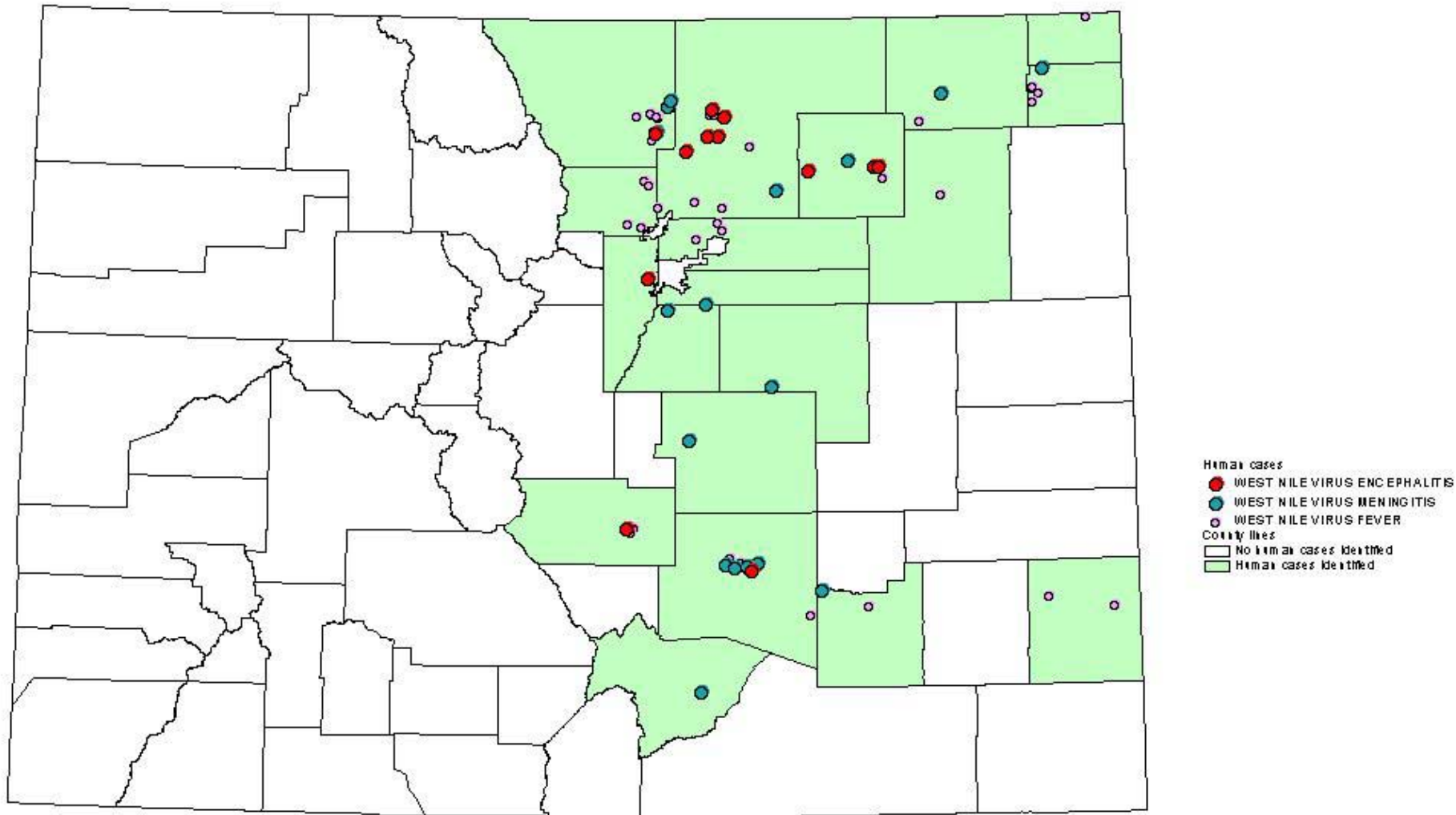
Colorado West Nile Virus Human Cases Updated July 25, 2003



- Human cases
- WEST NILE VIRUS ENCEPHALITIS
 - WEST NILE VIRUS MENINGITIS
 - WEST NILE VIRUS FEVER
- County lines
- No human cases identified
 - Human cases identified

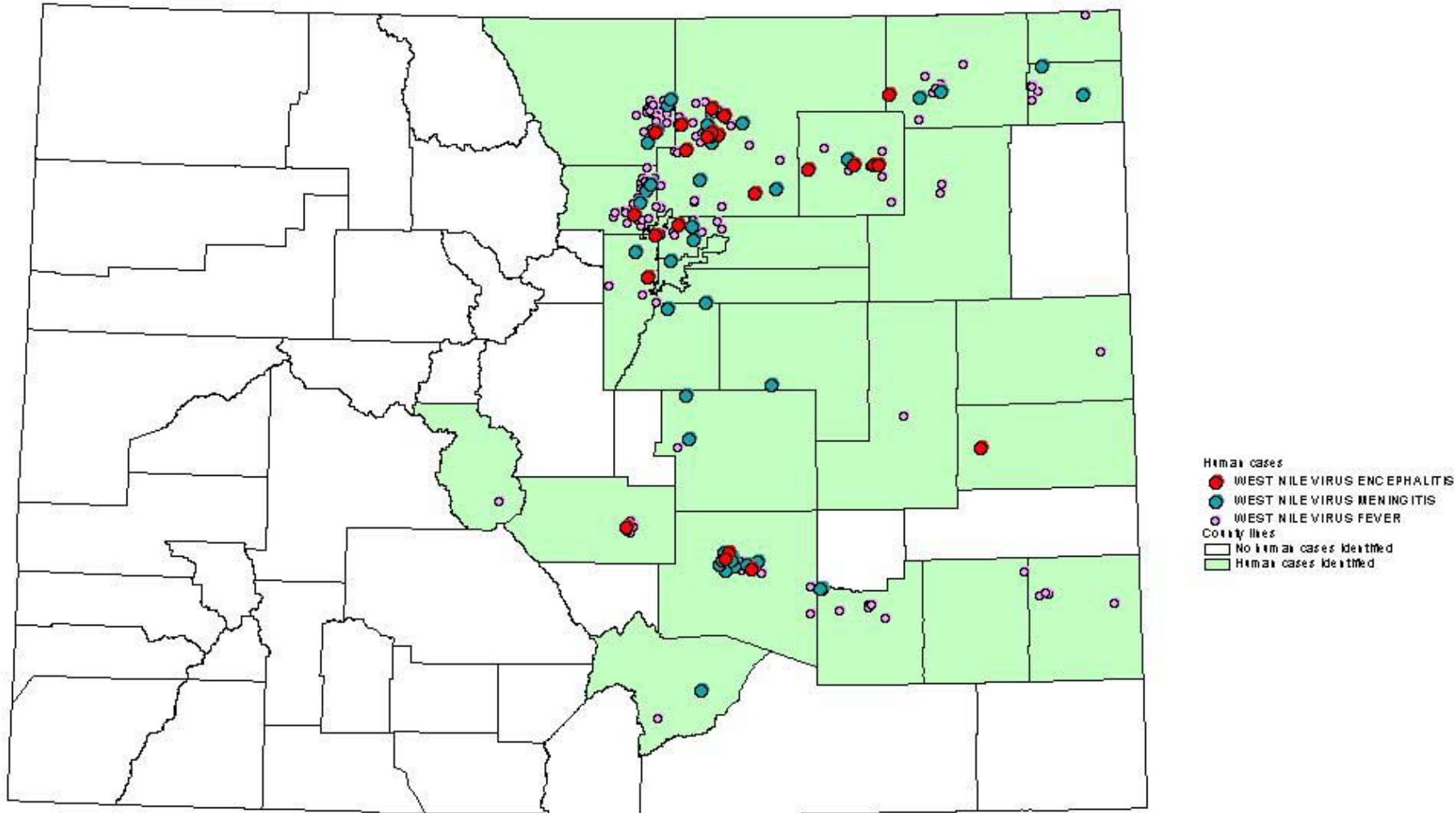
N = 11

Colorado West Nile Virus Human Cases Updated August 1, 2003



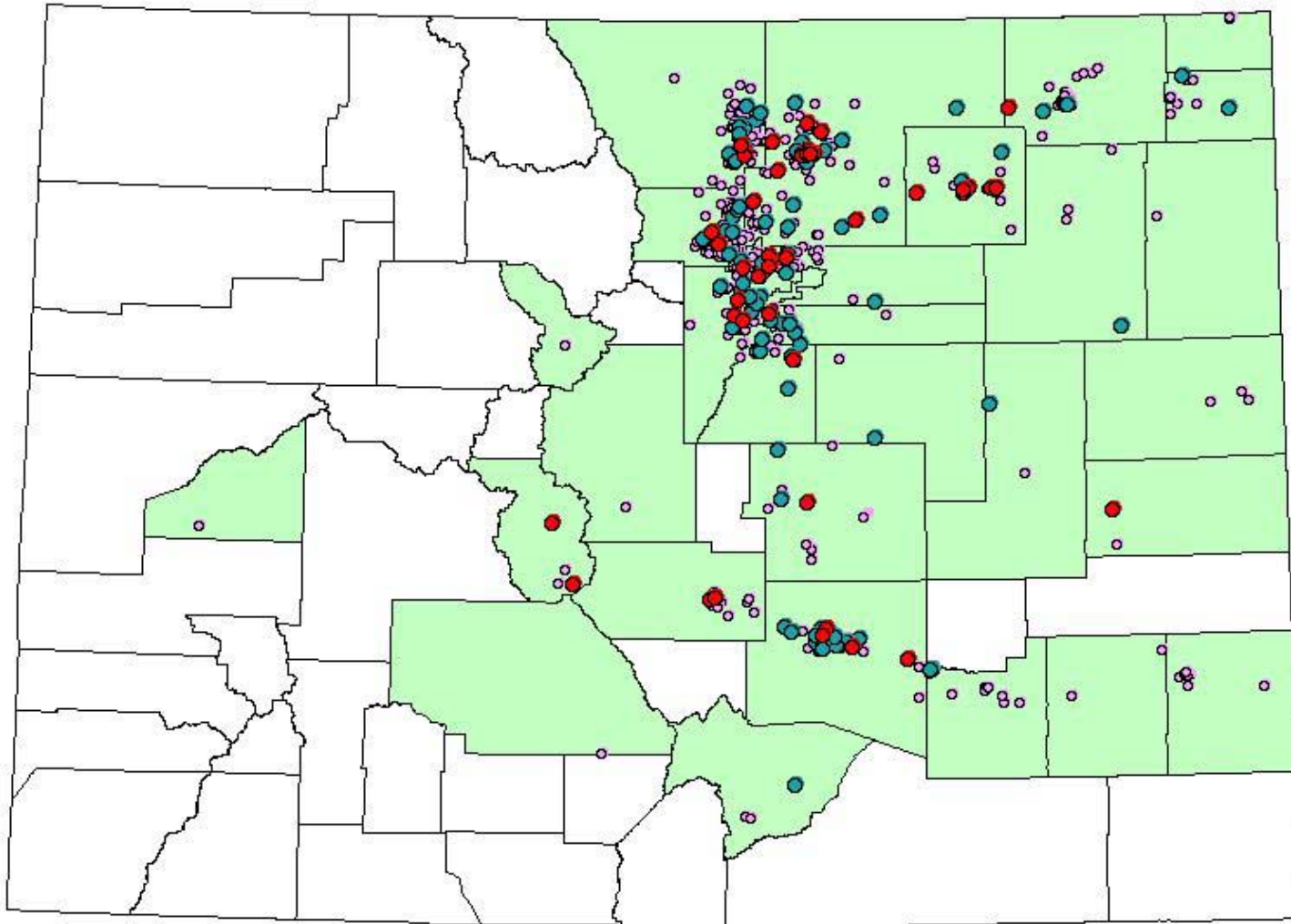
N = 77

Colorado West Nile Virus Human Cases Updated August 8, 2003



N = 252

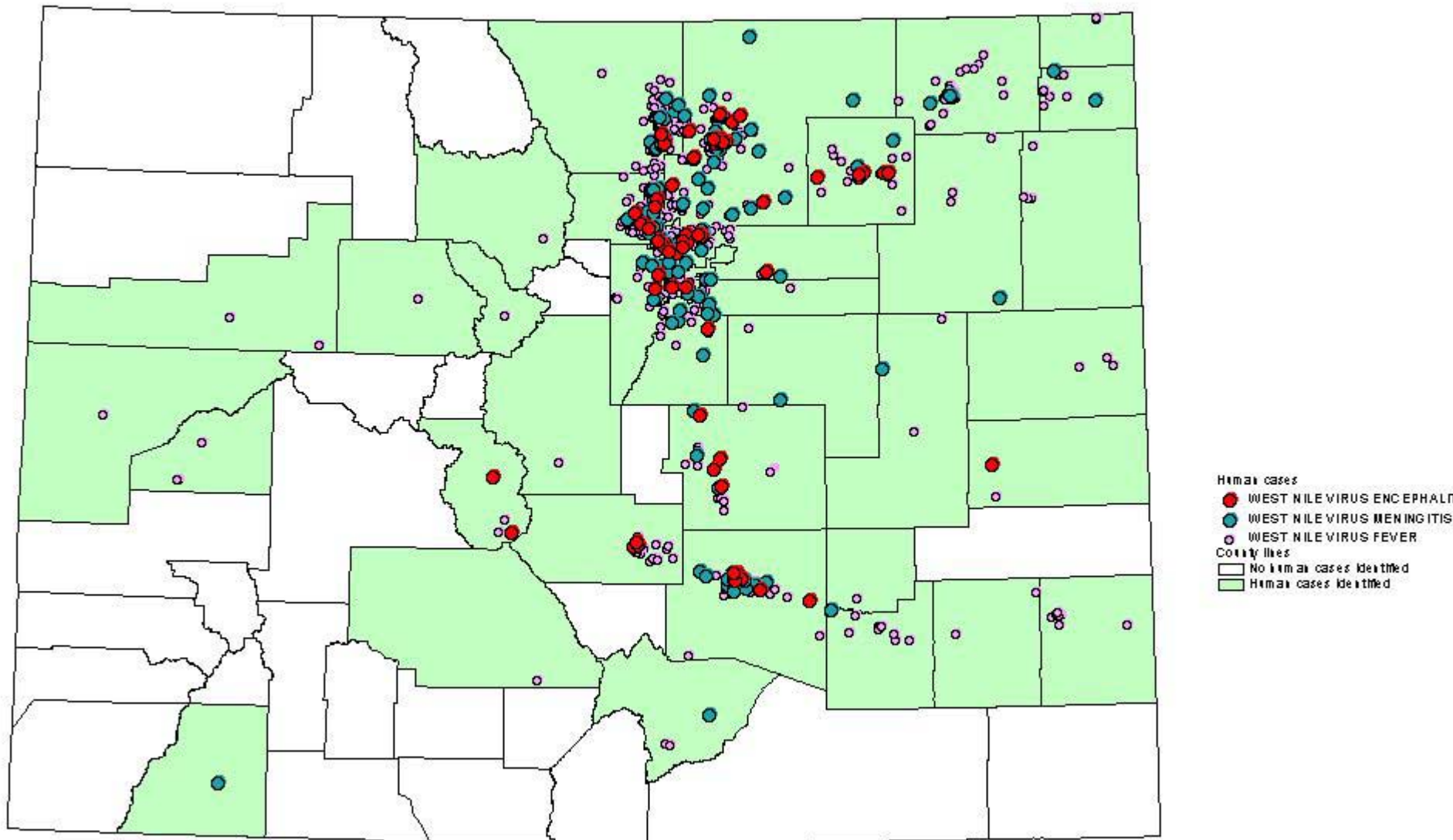
Colorado West Nile Virus Human Cases Updated August 15, 2003



- Human cases
- WEST NILE VIRUS ENCEPHALITIS
 - WEST NILE VIRUS MENINGITIS
 - WEST NILE VIRUS FEVER
- County lines
- No human cases identified
 - Human cases identified

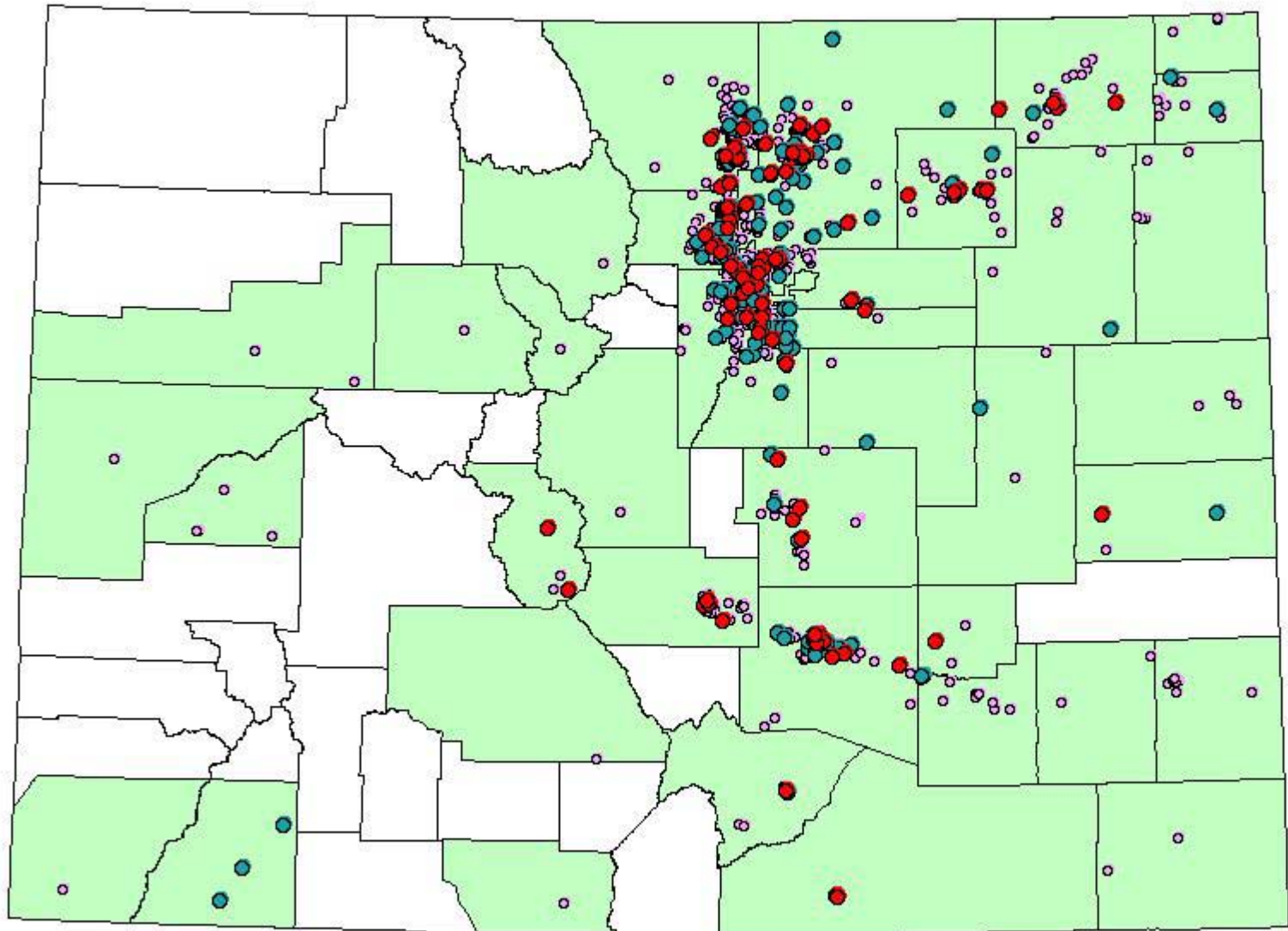
N = 621

Colorado West Nile Virus Human Cases Updated August 29, 2003



N = 813

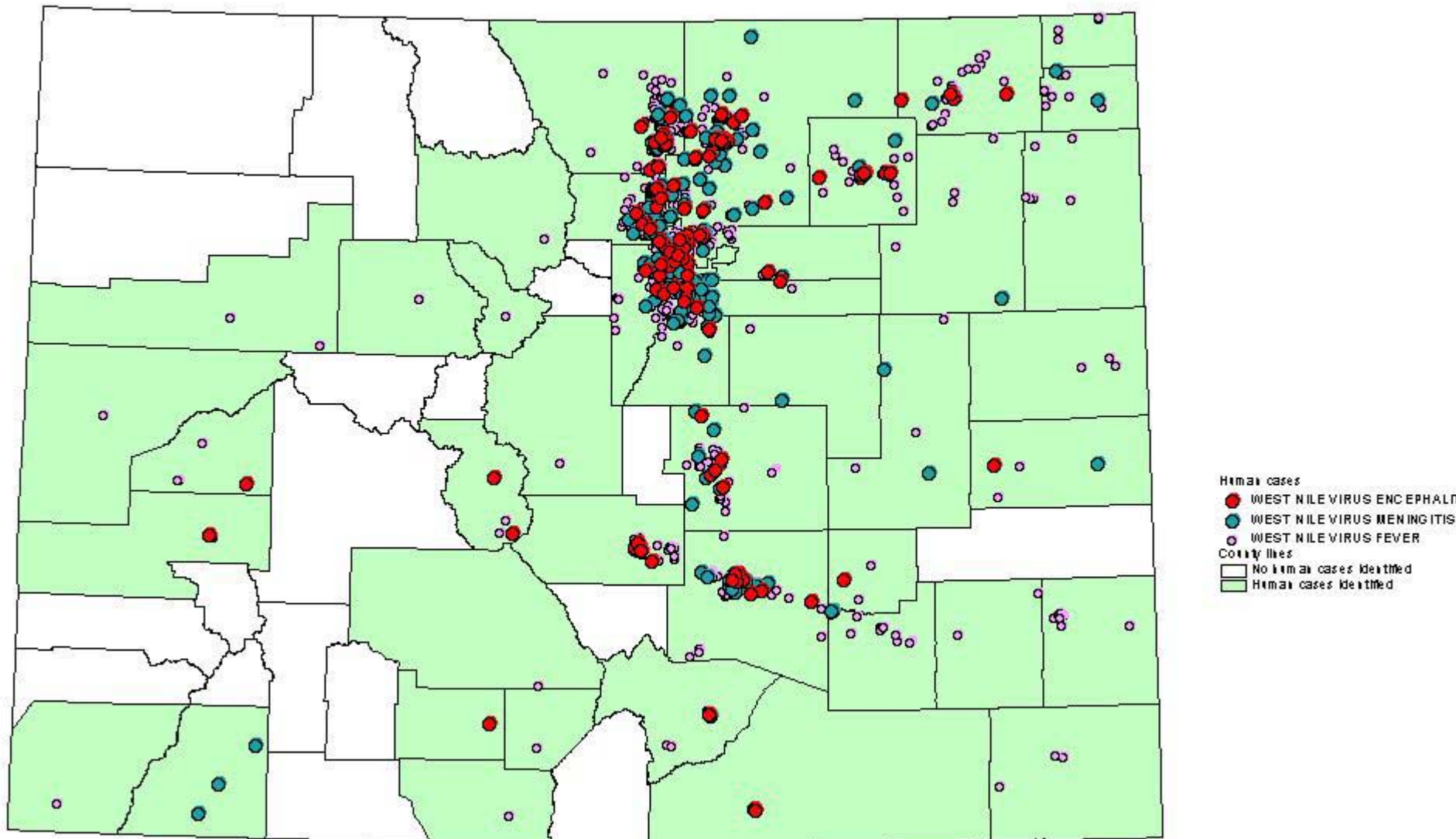
Colorado West Nile Virus Human Cases Updated September 5, 2003



- Human cases
- WEST NILE VIRUS ENCEPHALITIS
 - WEST NILE VIRUS MENINGITIS
 - WEST NILE VIRUS FEVER
- County lines
- No human cases identified
 - Human cases identified

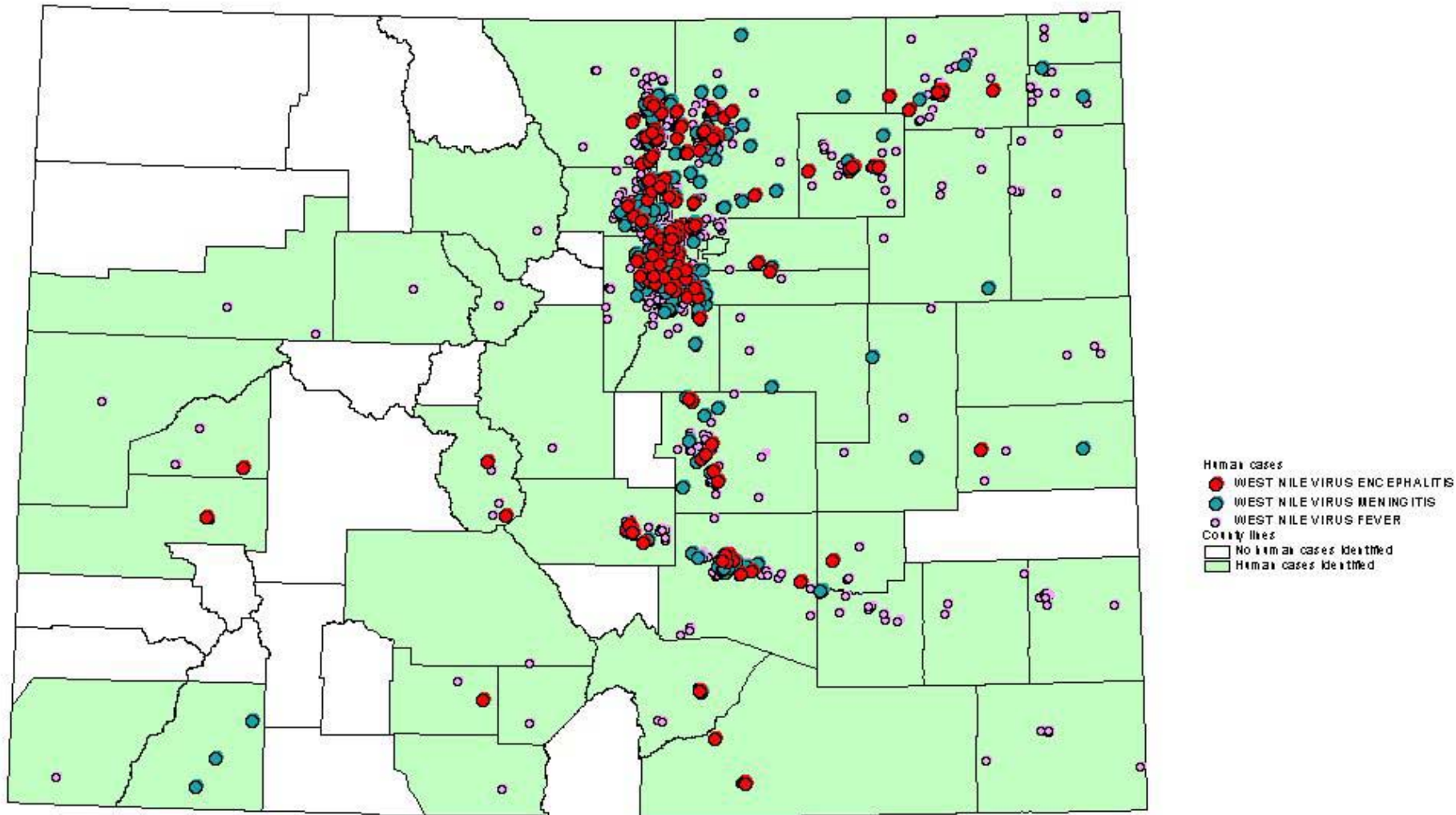
N = 1,043

Colorado West Nile Virus Human Cases Updated September 10, 2003



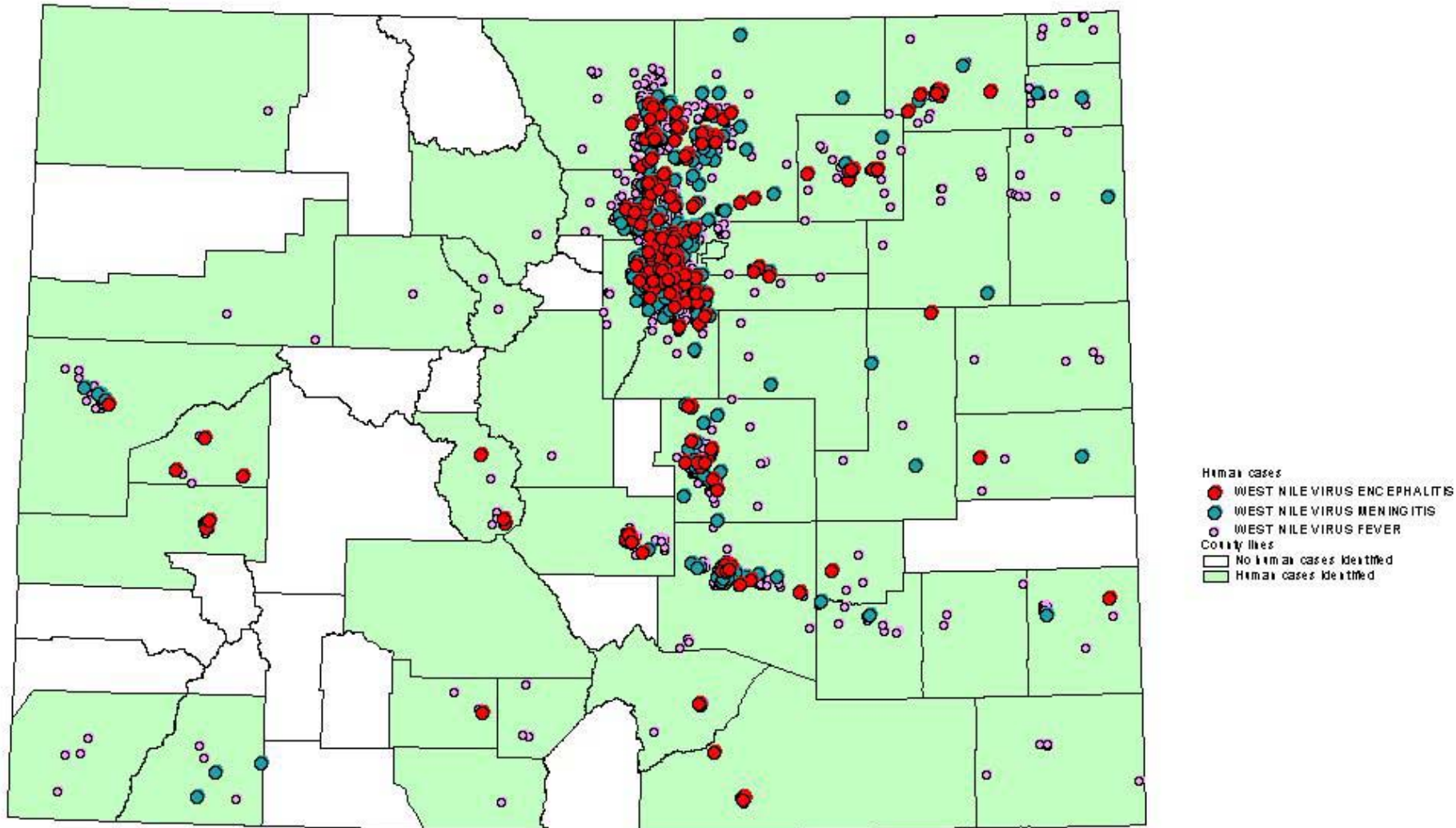
N = 1,243

Colorado West Nile Virus Human Cases Updated September 18, 2003



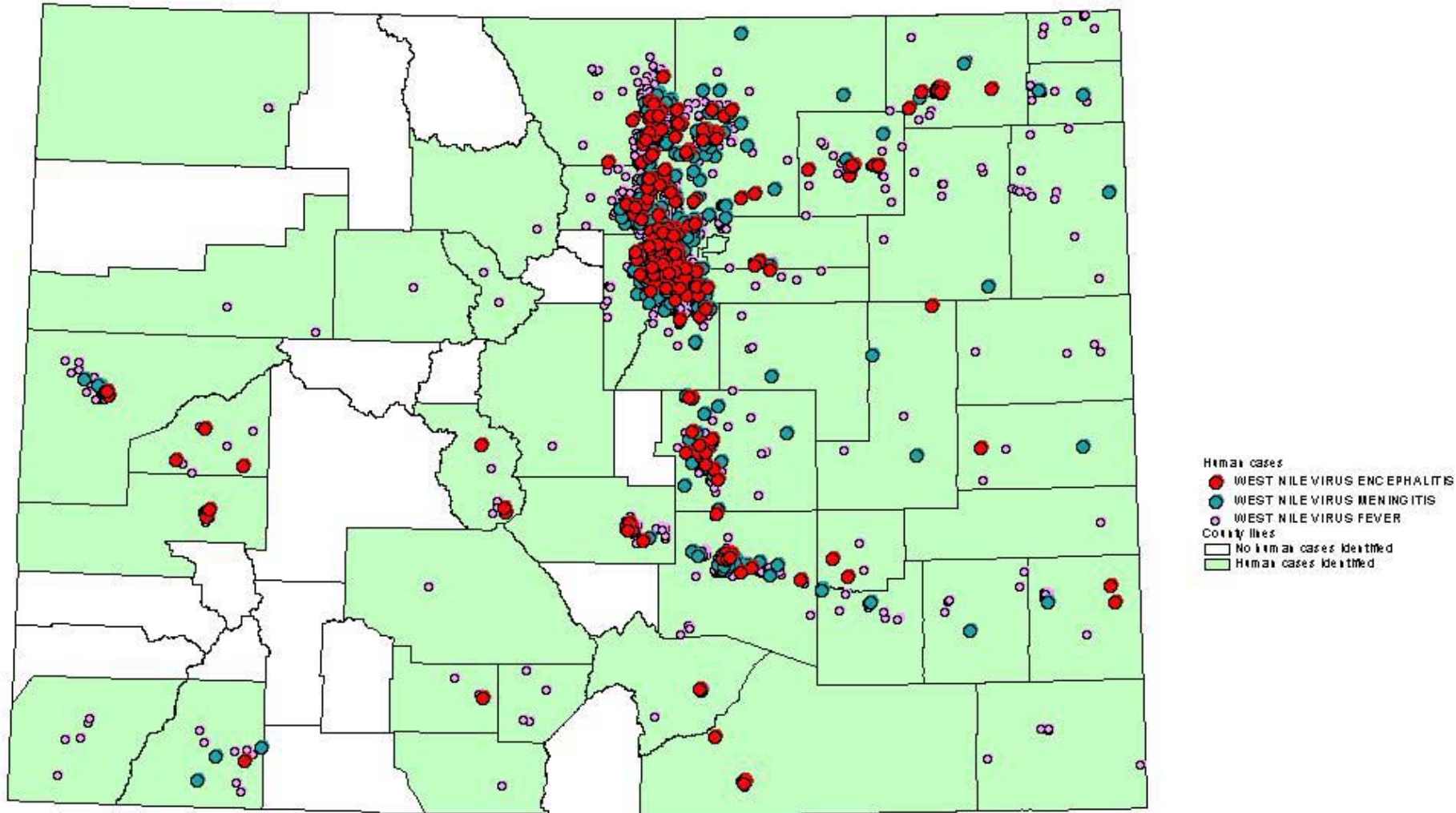
N = 1,598

Colorado West Nile Virus Human Cases Updated October 29, 2003



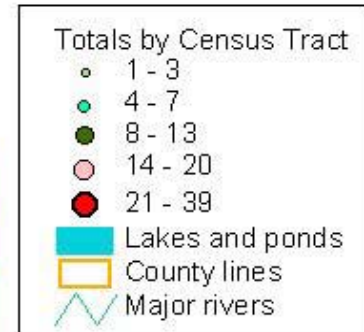
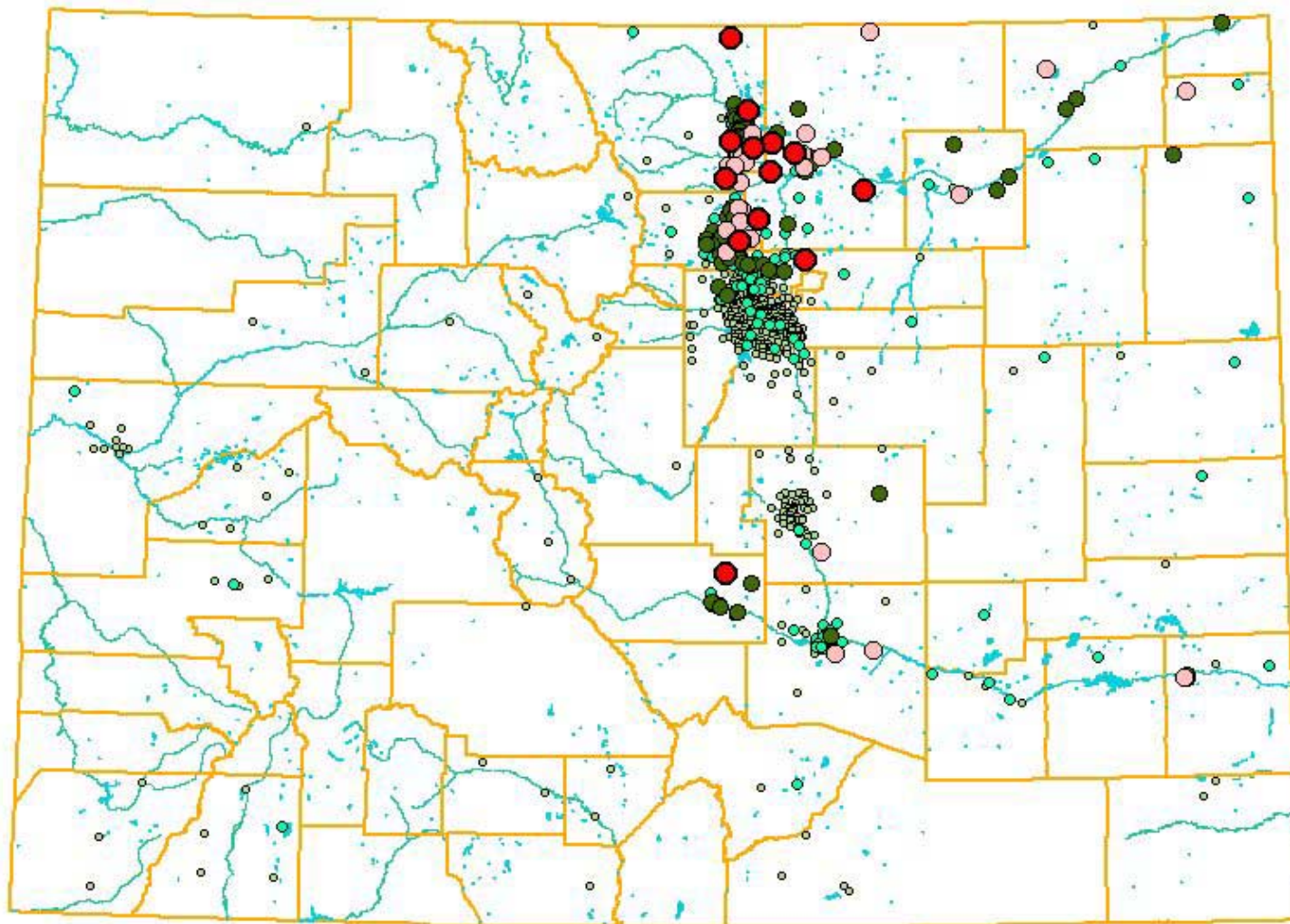
N = 2,464

Colorado West Nile Virus Human Cases Updated January 29, 2004



N = 2,944

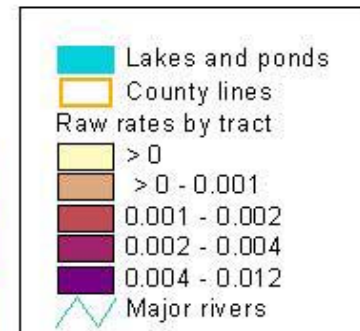
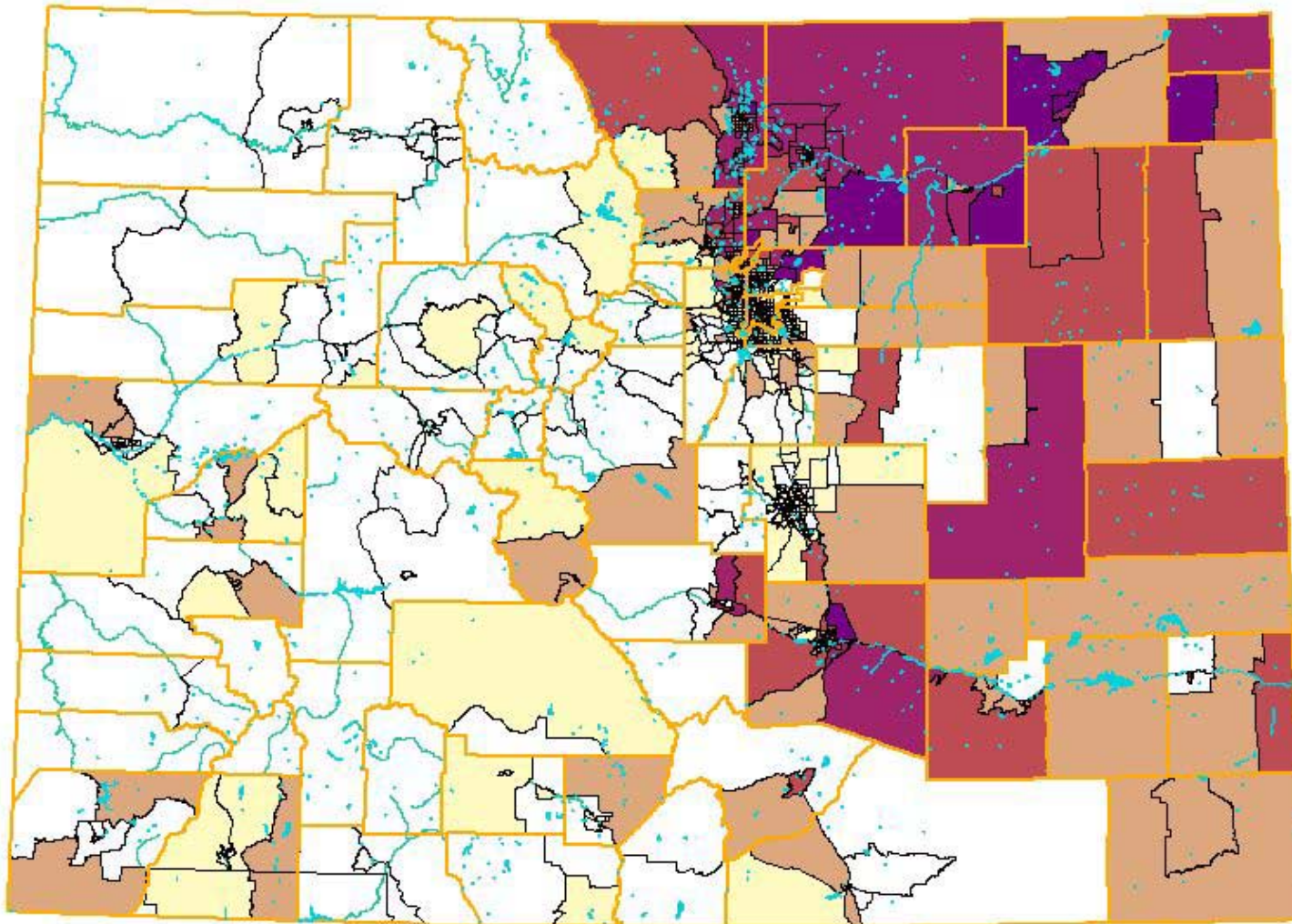
Colorado West Nile Virus Human Cases - Summed by Census Tract Updated January 30, 2004



N = 2,944

Each point represents the centroid of a 2000 census tract. The size and color of the point represents the total number of people in that tract who contracted West Nile Virus in 2003.

Colorado West Nile Virus Human Cases - Summed by Census Tract Updated January 30, 2004



N = 2,944

WNV Human Cases, Colorado, 2003

- 2944 cases / 54 deaths
 - 2323 fever (79%), 390 meningitis (13%), 231 encephalitis (8%)
 - 2609 (89%) interviewed
- Age
 - Median 47 years (range 6 wks – 95 years)
- 52% females
- 174 positive blood donors, 36 pregnant women, 11 breast-feeding
- AFP and long term sequelae being investigated.

Impact on Medical System

- LA study cost per hospitalized pt = \$26,000
- Colorado 2003
 - 861 hospitalized cases = \$22.4 million
 - Not calculated
 - Missed work, outpt costs, rehab, long term disability
- One Medical Center
 - 10 – 12 admission day at peak
 - 10% of all admission July – September

Top Five Reported Symptoms of WNV Fever (n = 2100)

- Malaise (85%)
- Headache (85%)
- Myalgia (77%)
- Fever (75%)
- Muscle weakness (72%)

Top Five Reported Symptoms of WNV Meningitis (n = 325)

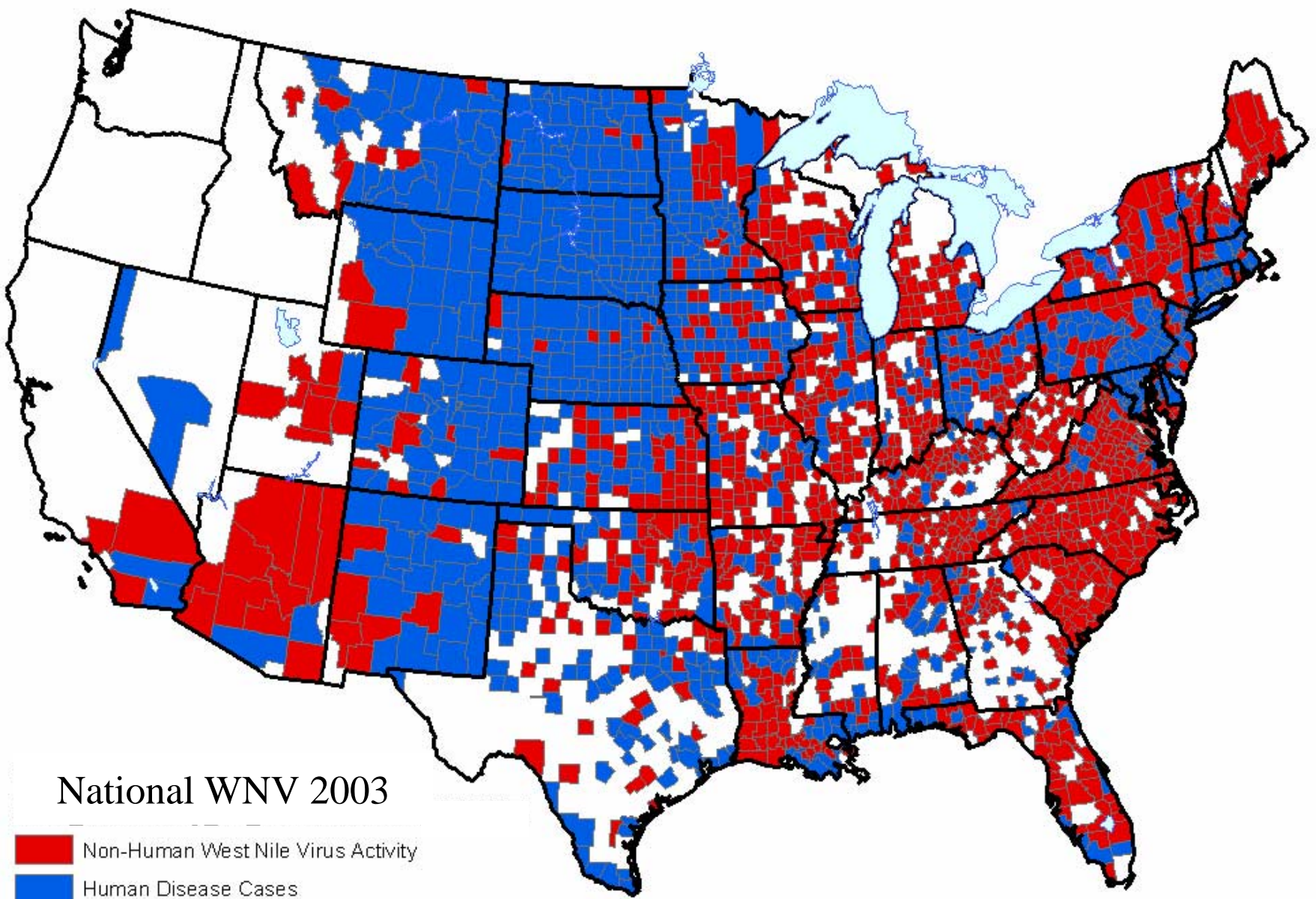
- Fever (94%)
- Headache (90%)
- Malaise (86%)
- Muscle weakness (86%)
- Myalgia / anorexia (81%)

Top Five Reported Symptoms of WNV Encephalitis (n = 181)

- Fever (93%)
- Muscle weakness (83%)
- Changed mental state (78%)
- Malaise (69%)
- Headache (66%)

Interesting Findings . . .

- Average duration of illness = 13.9 days
- Patients still ill at time of interview = 37%
- Known mosquito bites = 67%
- Repellant use: Never = 53.7% Always = 11.2%
- 60% of patients reported a rash
- 45% reported a change in mental state
- 31% reported muscle tremors



And for 2004 ?