

Vector-Borne Diseases in California 2005

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Hantavirus



Hantavirus Rodent Surveillance

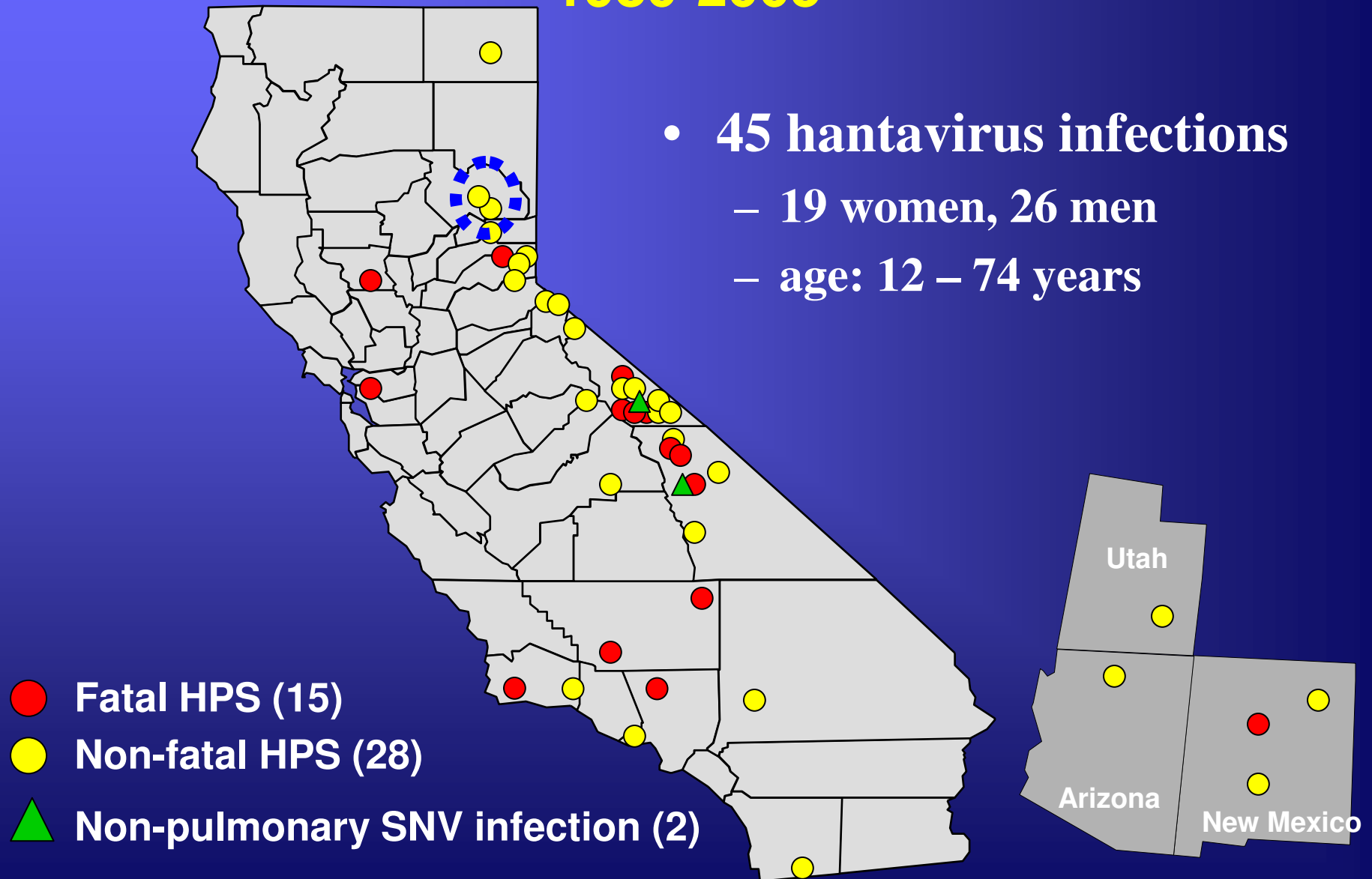
California, 1975 - 2005

- Over 20,000 rodents and other small mammals collected and serologically tested
 - 43 species from 26 genera

Species	No. tested	No. positive	Percent positive
<i>Peromyscus maniculatus</i>	9130	1173	12.8
<i>P. boylii</i>	1998	79	4.0
<i>P. californicus</i>	1901	37	1.9
<i>P. eremicus</i>	1764	82	4.6
<i>P. truei</i>	756	26	3.4
<i>P. crinitus</i>	330	13	3.9

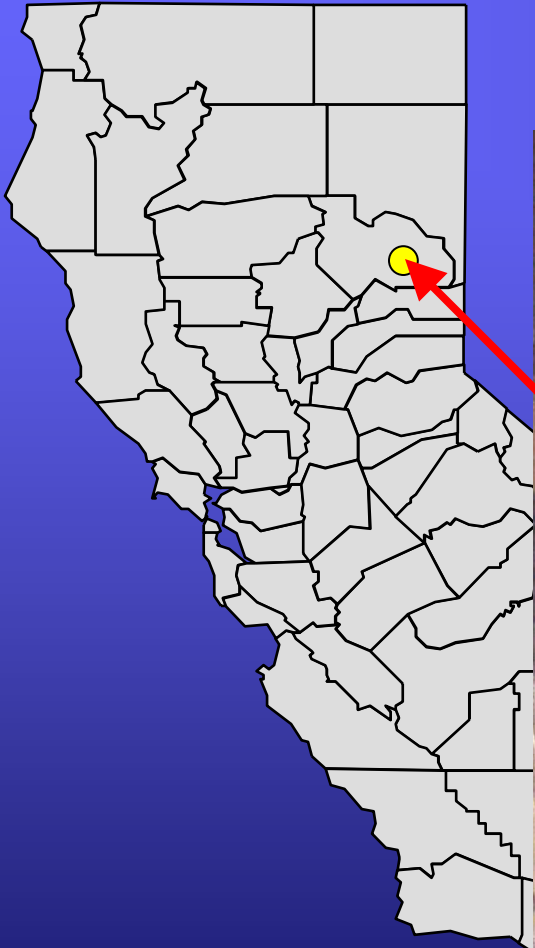
Hantavirus infection in California residents 1980-2005

- 45 hantavirus infections
 - 19 women, 26 men
 - age: 12 – 74 years



Mapped by suspected site of exposure

2004: HPS in Plumas NF





Investigation

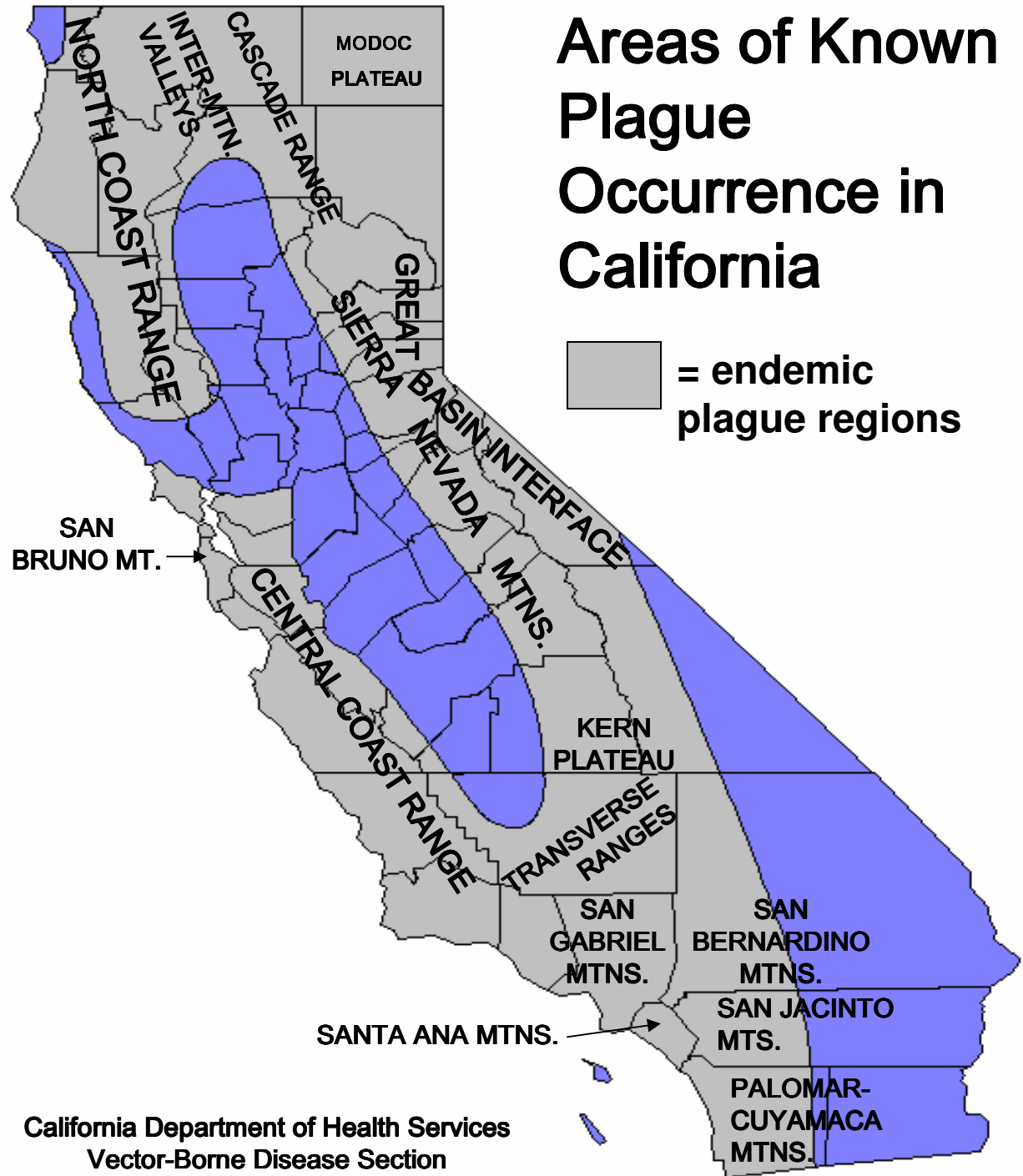
- **Exposure investigation**
 - frequently handled rodents as field biologist for academic research project
 - deficiencies noted in personal protection protocols for rodent handling
 - 11 of 24 *P. maniculatus* from study sites seropositive
 - evidence of rodent ingress and activity at workers' cabins
 - 5 of 21 *P. maniculatus* from cabins seropositive
- VBDS provided education and training on rodent handling, exclusion, and control

Plague

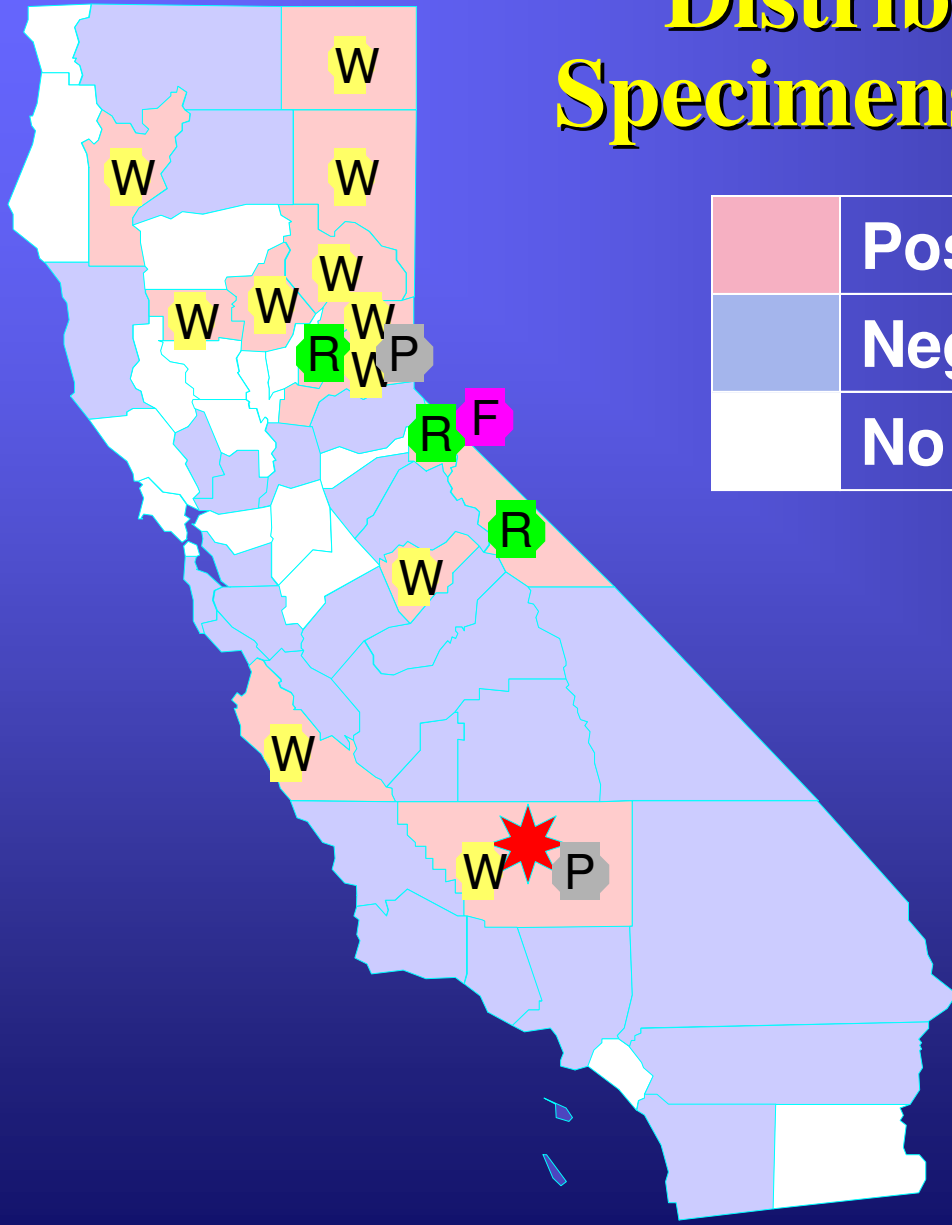


Plague Foci






- No two plague foci alike
- Rodent / flea complexes differ
- Environments differ
- Plague activity cycles up and down



Distribution of Plague Specimens by County, 2005



	Positive Test Results
	Negative Test Results
	No Sampling Done

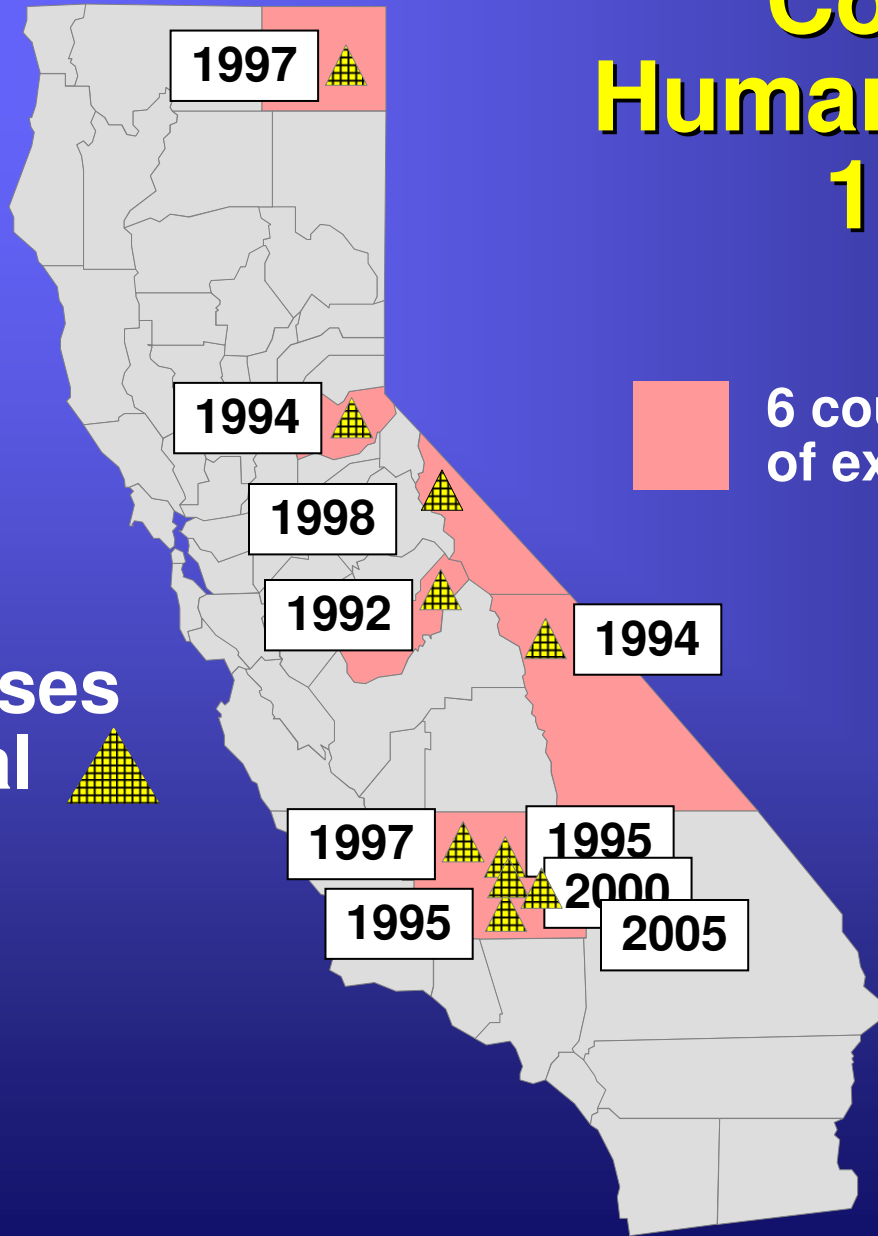
-  Human Case
-  Domestic pet
-  Rodent flea pool
-  Wild carnivore serum
-  Rodent serum

14 / 41 counties positive
79 / 1308 specimens pos

Counties with Human Plague Cases 1990 - 2005

6 counties of exposure:
Modoc
El Dorado
Mono
Madera
Inyo
Kern

10 Cases
1 Fatal



Type of Exposure in Human Plague Cases, in California: 1965-2005

<u>Exposure Type</u>	<u>Number</u>	<u>Percent</u>	<u>1965-79</u>	<u>1980-2005</u>
Home	16	39%	6	10
Recreational	16	39%	5	11
Work Related	4	10%	1	3
Unknown	4	10%	1	3
Out-of-State	1	2%	1	0
Total	41		14	27

Plague 2005

Kern County, CA

- **Two domestic cats:** June, August
- **One human:** November
 - 72 yo male resident of Tehachapi
 - Onset symptoms: November 11
 - Gram negative rods isolated from blood culture (11/13), confirmed as *Y. pestis* (12/1)
 - Fleas flagged from CA ground squirrel burrows at residence NEG for *Y. pestis*
 - Delay in confirmation of isolate and notification of public health concerning

Tick-borne Diseases



Tick-borne Diseases in California

Lyme Disease

Ehrlichiosis

Anaplasmosis

Babesiosis

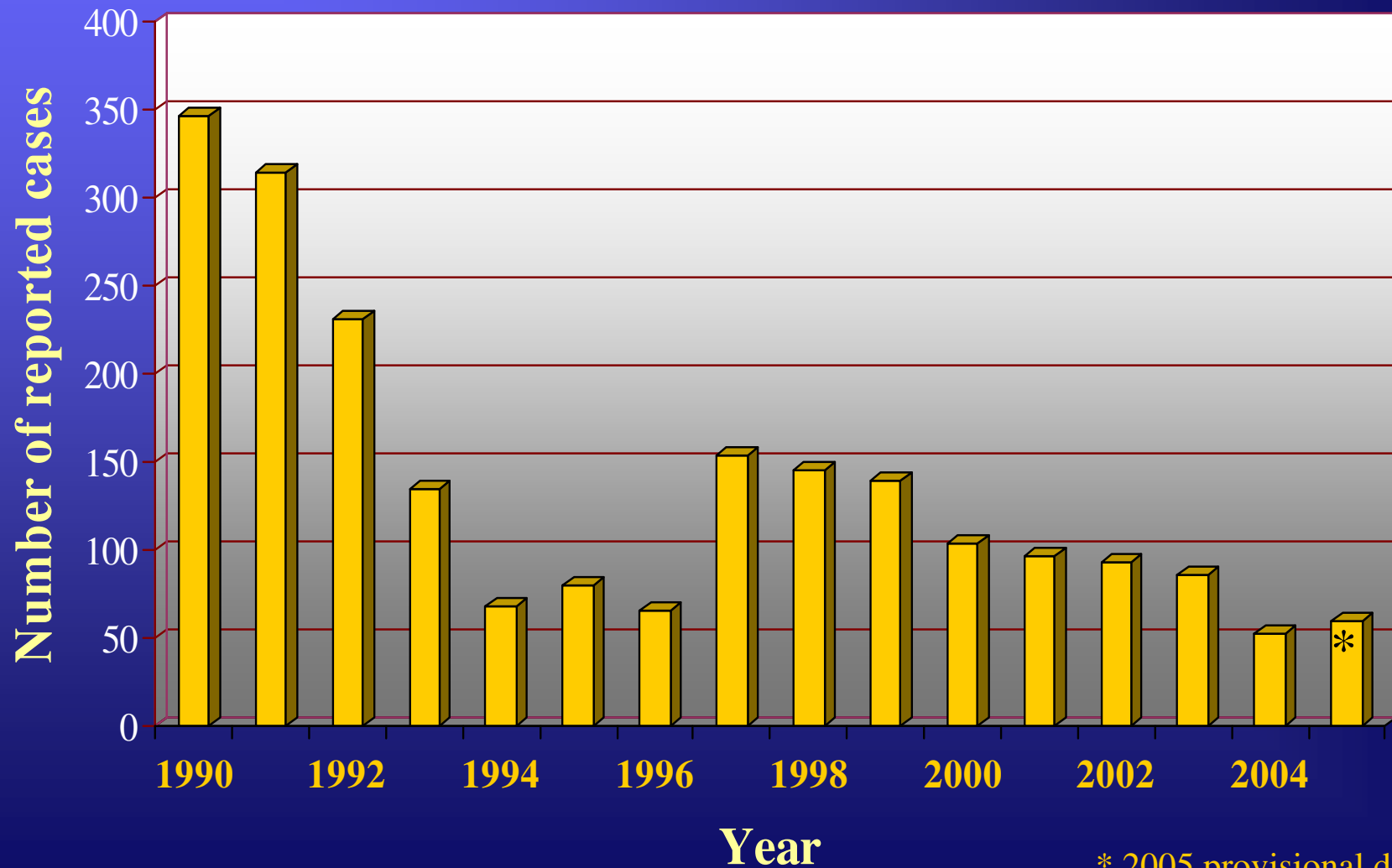
Tick-borne Relapsing Fever

Rocky Mountain Spotted Fever

Tularemia

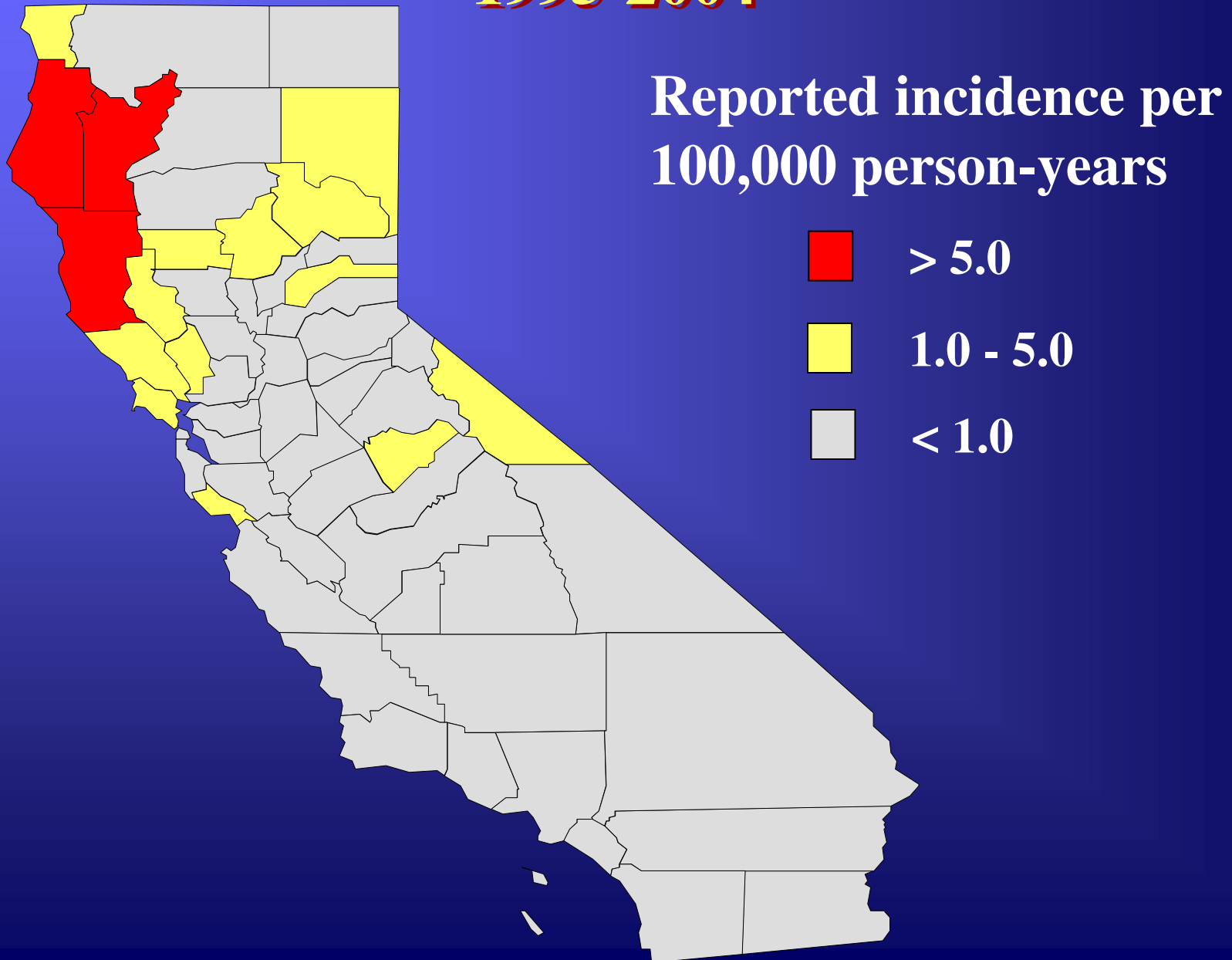
Tick Paralysis

Reported Lyme Disease Cases California, 1990-2005



* 2005 provisional data

Reported Lyme Disease Cases in California 1995-2004



Lyme Disease Public Education

Lyme Disease in California



- Ixodes pacificus* found and tested positive for *Borrelia burgdorferi*, the Lyme disease agent (42 counties)
- Ixodes pacificus* found (14 counties)
- Ixodes pacificus* not found to date (2 counties)

The western black-legged tick (*Ixodes pacificus*) has been found in 56 of 59 counties to date. The map generalizes available data, and patterns vary within counties.

Brochure

California Department of Health Services
Vector-Borne Disease Section

COMMON HUMAN-BITING TICKS IN CALIFORNIA

Western black-legged tick
Ixodes pacificus

Foliole mead tick
Dermacentor occidentalis

American dog tick
Dermacentor variabilis

SOME TICKS CAN TRANSMIT DISEASE

- Lyme disease
- Ehrlichiosis
- Anaplasmosis
- Babesiosis
- Rocky Mountain spotted fever
- Tularemia
- Tick Paralysis

PERSONAL PROTECTIVE MEASURES

- Avoid tick-infested areas
- Wear light-colored clothes
- Wear a hat, long-sleeved shirt, and long pants
- Tuck shirt into pants, pants into boots or socks
- Remove attached ticks promptly and properly

LOOK FOR THE TICKS!

- Check each other often while in tick habitat
- Inspect children carefully, particularly at the hair line
- Conduct daily full body check (hair line, armpit, back of knees, groin) at home, up to 3 days after returning from tick habitat
- Check pets, use tick repellents on them

TICK REMOVAL TECHNIQUE

- Use tweezers to grab the tick close to your skin
- Pull the tick firmly, straight out, away from the skin (do not jerk, twist, or burn the tick)
- Wash your hands and the bite site with soap and water after the tick is removed and apply an antiseptic to the bite site
- The sooner a tick is removed, the less likely it is that a person will be infected

TICK REPELLENTS

- Apply DEET repellent (Cutter®, Off®, Repel®, Skintastic®, etc.) to skin not covered by clothing
- Treat clothing with permethrin repellent (Permethrin®, Duntan®, etc.) as directed on label

IF YOU GET BITTEN BY A TICK

- Remove all ticks promptly!
- If you develop a spreading rash or flu-like symptoms 1-30 days after bite, consult with your physician
- Let your physician know that you were bitten by a tick

Prevention of tick bites is key to prevention of disease

For more information, contact the Vector-Borne Disease Section: 916-624-9730
<http://www.dhs.ca.gov/pe/diseases/ticks/tickidcard.htm>

Tick Awareness for Work-Place Posting

Ticks in California

Ticks in California can transmit disease.
Ixodes pacificus may carry Lyme disease or anaplasmosis. *Dermacentor* ticks may carry Rocky Mountain spotted fever or tularemia.

Prompt removal of ticks can help prevent disease transmission!

To remove a tick:

- Use tweezers to grab the tick as close to your skin as possible.
- Pull the tick firmly, straight out, away from the skin (do not jerk, twist or burn the tick).
- Wash your hands and the bite site with soap and water after the tick is removed and apply an antiseptic to the bite site.
- See your doctor if you develop a rash or flu-like symptoms within 30 days after a tick bite.

For more information: <http://www.dhs.ca.gov/>
Call: 916-624-9730 or your local health department

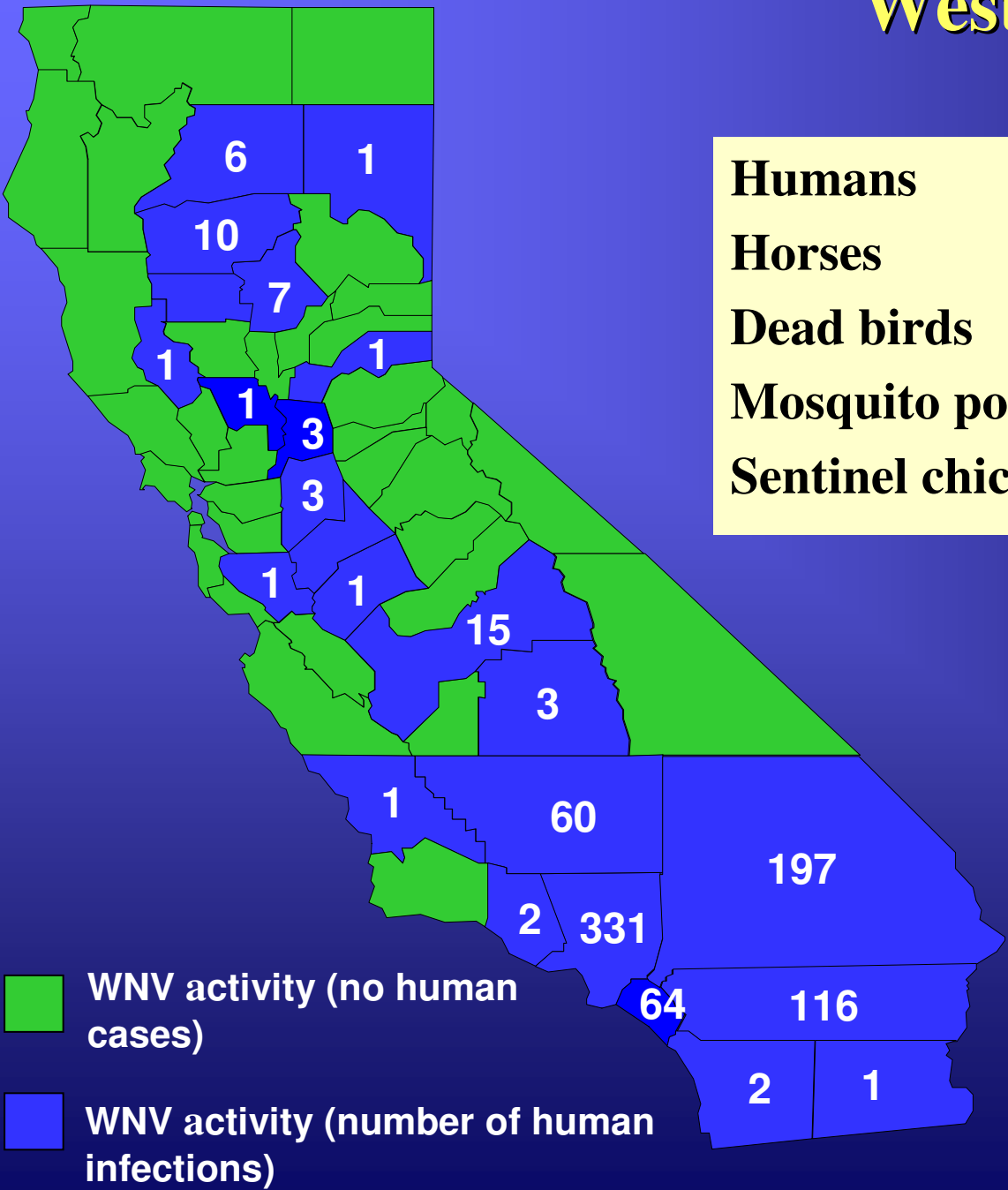
Wallet Tick ID and Removal Card

Mosquito-borne diseases



West Nile Virus 2004

Humans	830 / 28
Horses	540 / 230
Dead birds	3232
Mosquito pools	1136
Sentinel chickens	805

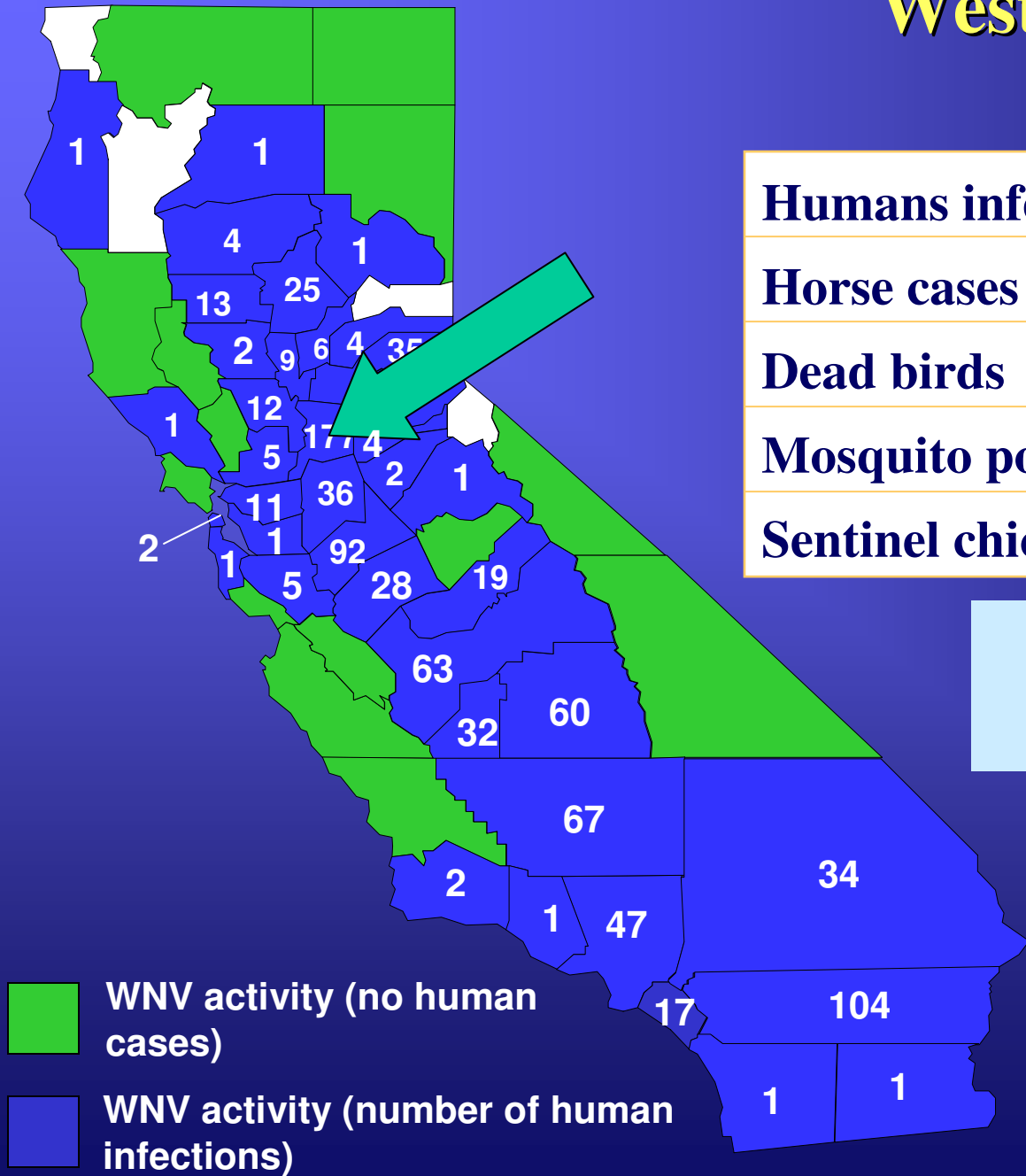


■ WNV activity (no human cases)
■ WNV activity (number of human infections)

West Nile Virus 2005

Humans infections	928 / 18
Horse cases	456 / 200
Dead birds	3,046
Mosquito pools	1,242
Sentinel chickens	790

**N = 40 counties
with human
infection**

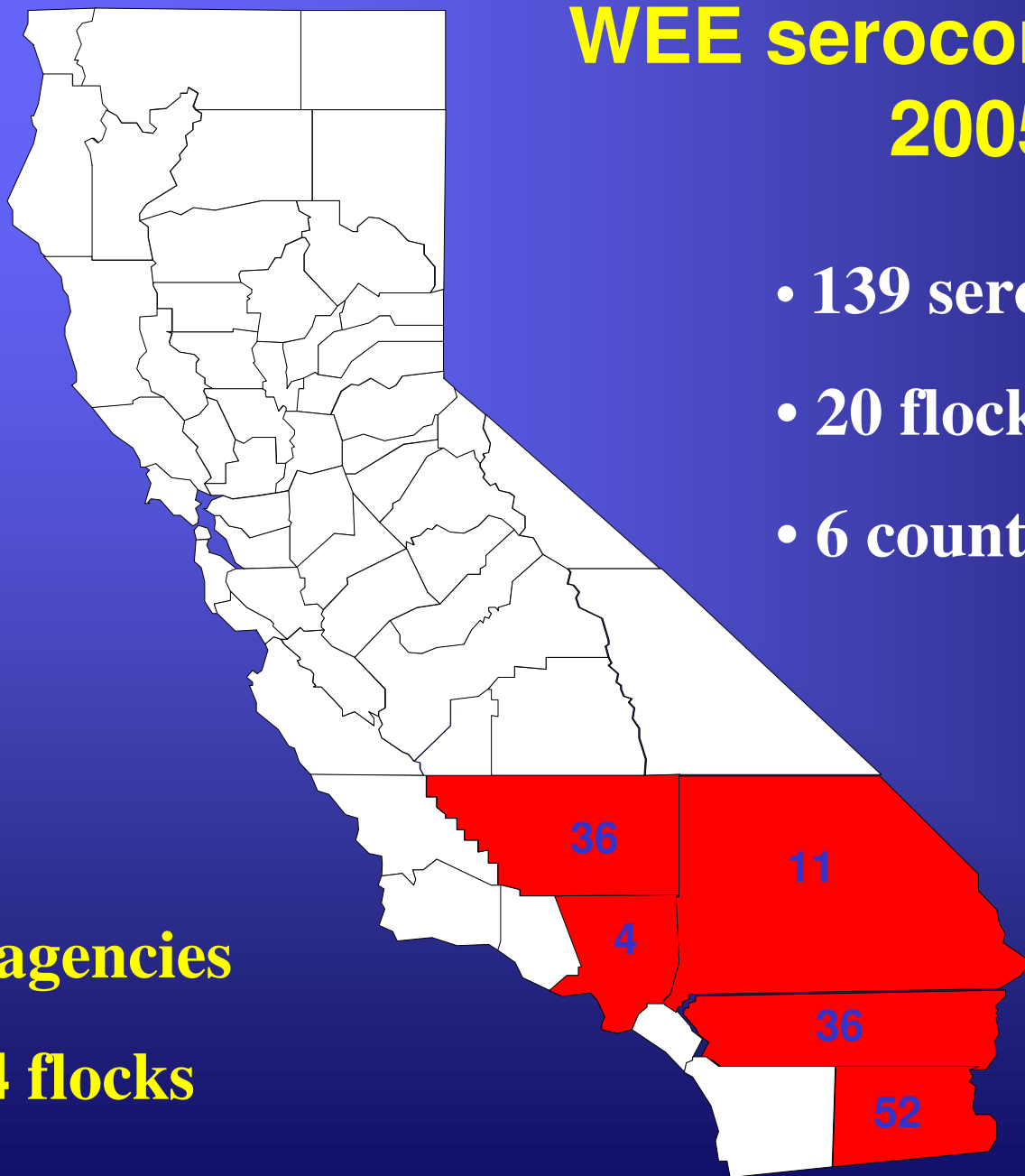


WEE seroconversions 2005

- 139 seroconversions
- 20 flocks
- 6 counties

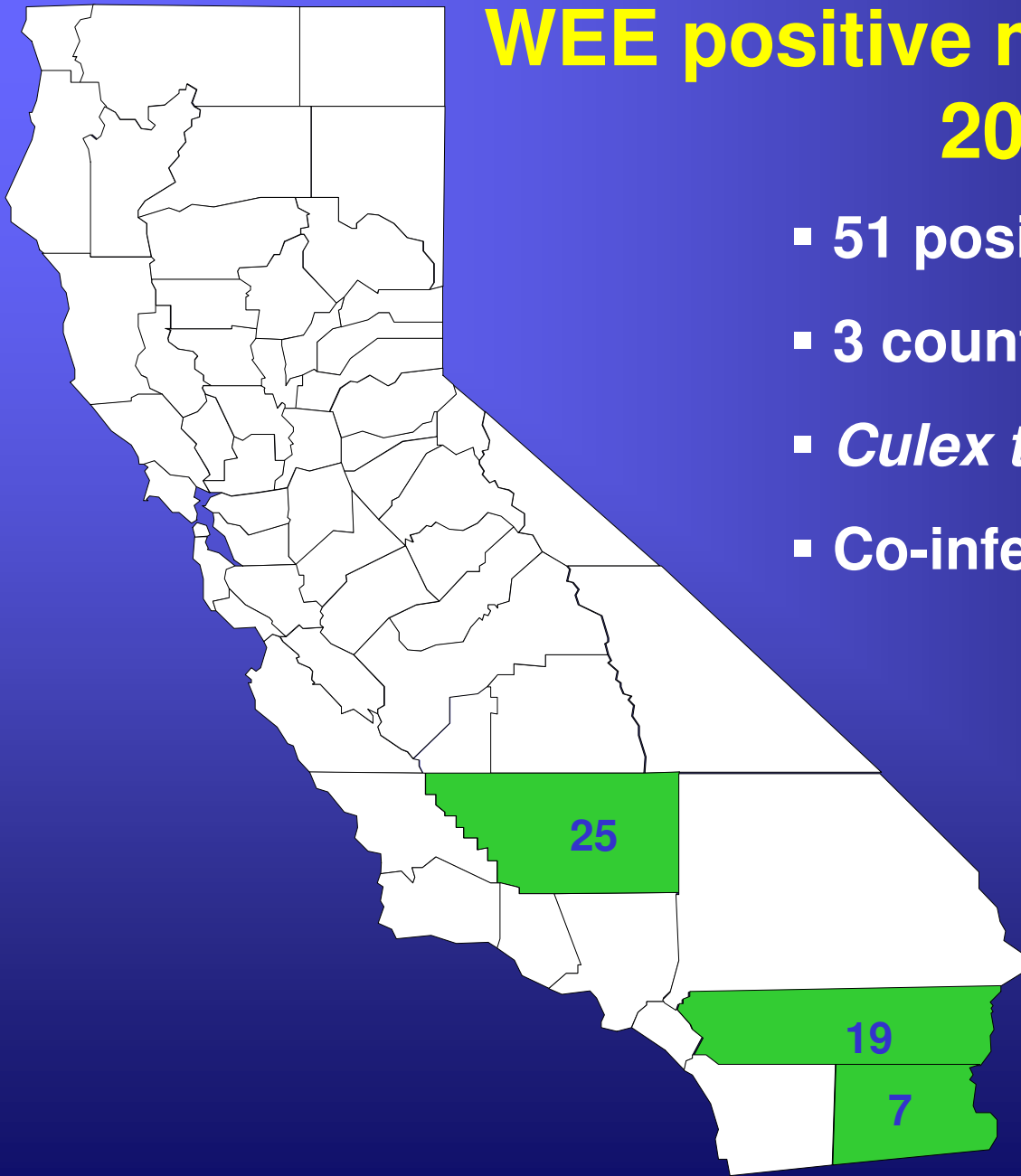
53 agencies

244 flocks



WEE positive mosquito pools 2005

- 51 positive pools
- 3 counties
- *Culex tarsalis*
- Co-infection with WNV (10)



Documents

- **California Mosquito-borne Virus Surveillance and Response Plan**
- **Operational Plan for Emergency Response to Mosquito-borne Disease Outbreaks**

<http://westnile.ca.gov>

Thanks to:

- **Staff of the DHS Vector-Borne Disease Section & Viral and Rickettsial Disease Lab**
- **Local mosquito and vector control agencies**
- **University of California**