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# Vector Borne Disease Bulletin



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## A Note from the Editor:

Welcome to the third issue of the newly revised Vector-borne Disease Bulletin! The intent of this quarterly bulletin is to keep you better informed about the vector-borne disease investigations and surveillance conducted by the California Department of Public Health and collaborating state and local agencies in California. This issue provides a brief summary of surveillance activity since June 29<sup>th</sup>, 2007. Look for the next bulletin at the beginning of January. In the meantime, please email me with any suggestions to make this bulletin more useful for your work and research. Thanks to everyone who contributed to this bulletin.

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For updated and historical WNV data, visit the



California West Nile Virus  
Website:  
[www.westnile.ca.gov](http://www.westnile.ca.gov)



## Mosquito-borne Virus Surveillance



As of September 25, 2007, West Nile virus (WNV) activity has been reported from 51 counties. A total of 271 human WNV cases have been reported from 28 counties, for a statewide incidence of 0.80 cases per 100,000 people. Of the 271 cases reported, 152 (56%) are classified as West Nile fever, 110 (41%) are classified as neuroinvasive disease, and 9 (3%) are of unknown clinical presentation. The median age of all cases is 53 years (range: 2-96 years) and 143 cases (53%) are male. Fourteen WNV-related fatalities have been reported this year from Colusa (1), Fresno (1), Kern (4), Kings (1), Los Angeles (1), Riverside (3), Sacramento (1), San Joaquin (1), and Tulare (1) counties.



Non-human WNV activity reported as of September 25, 2007 includes the following: 12 counties reported 24 equine WNV cases; 50 counties reported 1170 WNV-positive dead birds; 29 counties reported 917 WNV-positive mosquito pools; 26 counties reported 330 WNV-positive sentinel chickens, and eight counties reported 17 WNV-positive tree squirrels.

Western equine encephalomyelitis virus (WEE) has also been detected in California this year in 15 mosquito pools from Fresno (1 pool) and Kern (14 pools) counties, and two sentinel chickens from Kern County.

**2007 & 2006 YTD West Nile Virus Comparisons\***

	<b>2007</b>	<b>2006</b>
Total Dead Bird Reports	27,491	38,779
Positive Counties	51	52
Human Cases/ Tested	271 / 920	197 / 1,077
Horse Cases/ Tested	24 / 290	43 / 360
Positive Dead Birds/ Tested	1,170 / 4,677	1,006 / 4,566
Positive Mosquito Pools/ Tested	917 / 23,371	723 / 18,505
Positive Chicken Sera/ Tested	330 / 22,411	446 / 25,038
Positive Squirrels/ Tested	17 / 150	23 / 101

\* As of September 27<sup>th</sup>, 2007



Year to date WNV activity by county can be found at:

[http://westnile.ca.gov/2007\\_casecounts.php](http://westnile.ca.gov/2007_casecounts.php)



## Hantavirus Surveillance

Two cases of hantavirus pulmonary syndrome were identified in July. Case-patients were residents of El Dorado and Mono counties. Both survived.

### Results of testing for serum antibody to Sin Nombre virus in *Peromyscus maniculatus* reported in June-August, 2007

County	No. Positive	No. Tested
Butte	2	13
El Dorado	29	146
Lassen	2	33
Madera	10	42
Mono	55	173
Orange	5	32
Riverside	0	1
San Diego	0	8



VBDS staff during animal processing for hantavirus and plague surveillance

## Plague Surveillance

A total of 824 specimens have been tested for plague antibody from 31 counties. Of these, 31 samples from seven counties were seroreactive.

### Mammals testing positive for plague (*Yersinia pestis*), Jan-Sept, 2007

County	Location	Date	Host	No. positive	Results
Inyo	Taboose Creek CG	8-May	California Ground Squirrel	7	1:128,1:256, 1:256,1:256, 1:512,1:512, 1:2048
Inyo	Baker Creek CG	15-May	California Ground Squirrel	2	1:128, 1:256
Inyo	Diaz Lake CG	22-May	California Ground Squirrel	1	1:512
Inyo	Schulman Grove	12-Jun	Chipmunk	1	1:64
Kern	Bakersfield, 5E	19-Jan	Coyote	1	1:512
Kern	Kernville, 5SE	19-Jan	Coyote	1	1:256
Kern	Hart Flat	30- Apr	Domestic Cat	1	POS
Mariposa	Yosemite NP	6-Aug	Black Bear	1	1:64
Modoc	Hackamore Reservoir	5-Jul	Coyote	1	1:32
Modoc	Camby, 4NE	6-Jul	Coyote	1	1:64
Modoc	Cedarville, 2E	20-Jul	Coyote	1	1:64
Plumas	Beckwourth, 7N	29-May	Coyote	2	1:256, 1:256
Plumas	Johnsville	31-May	Black Bear	1	1:32

Plumas	Graeagle	7-Jun	Black Bear	1	1:32
Plumas	Portola, 3W	26-Jun	Coyote	1	1:128.
Plumas	Portola, 5W	26-Jun	Coyote	1	1:128
Plumas	Portola	11-Jul	Black Bear	1	1:64
Plumas	Portola	13-Jul	Black Bear	1	1:128
Plumas	Quincy	27-Jul	Black Bear	1	1:128
San Diego	Palomar Mt SP, Cedar Grove	14-Aug	California Ground Squirrel	2	1:64, 1:256
Sierra	Calpine, 5N	1-Jun	Coyote	2	1:32, 1:64
Sierra	Tahoe NF, Webber Lake	8-Aug	Black Bear	1	1:64
<b>Total No. Mammals Positive for Plague</b>				<b>32</b>	



A heavy load of *Ixodes pacificus* ticks at a sampling site in March. It is almost adult tick season again.

**Remember to protect yourself!**

## Tick-borne Disease Surveillance

The California Department of Public Health recorded 21 cases of Lyme disease between January and September, 2007

As part of an on-going collaborative surveillance effort of local, state, and federal agencies, 1,610 field-collected western-black legged ticks (*Ixodes pacificus*) from 12 counties were tested by indirect fluorescent antibody assay (IFA), direct fluorescent antibody assay (DFA), and polymerase chain reaction (PCR) to determine *Borrelia* infection prevalence. Of 1,575 adult *I. pacificus* tested, 27 (1.7%) from 7 counties were positive for *Borrelia* species; of these, 21 were identified as *Borrelia burgdorferi* (1.3%). Two of 35 *I. pacificus* nymphs (5.7%) tested from Alameda and Santa Clara counties were positive for *B. burgdorferi*. Four *I. pacificus* tested by PCR were positive at genus level but were negative when tested with *Borrelia burgdorferi*-specific primers: Butte (1), Santa Clara (2), and Sonoma (1). Comparative sequence analysis with other *Borrelia* will be performed on these samples to determine species.

### *Ixodes pacificus* ticks tested for evidence of *Borrelia* species, California, 2007

County	Location	No. ticks tested	No. pools tested	No. pools positive				Laboratory
				IFA	DFA	PCR		
				<i>Borrelia</i> Spp.	<i>Borrelia</i> spp.	<i>Borrelia</i> spp. <sup>a</sup>	<i>B. burgdorferi</i> <sup>b</sup>	
Alameda	Tilden Park – Jewel Lake Trail	2	2		0			CDHS-VBDS
	Tilden Park – Laurel Canyon Road	7	7		0			CDHS-VBDS
	Kilkare Road, Sunol	9*	9	1				Sonoma Co PHL
	Pineneedle Rd, Oakland	17*	17	0				Sonoma Co PHL

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County	Location	No. ticks tested	No. pools tested	No. pools positive				Laboratory
				IFA	DFA	PCR		
				<i>Borrelia</i> spp.	<i>Borrelia</i> spp.	<i>Borrelia</i> spp. <sup>a</sup>	<i>B. burgdorferi</i> <sup>b</sup>	
Alameda	Sobrante Rd, Oakland	8*	8	1				Sonoma Co PHL
Butte	Loafer Creek SRA	113	13			2	1	US Army
Calaveras	Parrots Ferry Road	19	3			0		US Army
Contra Costa	Tilden Park – Nimitz Trail	92	92		2			CDHS-VBDS
Los Angeles	Griffith Park-Zoo and Fern Trails	183	19			0		US Army
Mariposa	Indian Flat Campground	2	1			1	1	US Army
	Mariposa Reservoir	19	3			2	2	US Army
	McCabe Campground	29	4			0		US Army
	Midpines	3	1			0		US Army
Napa	Main CG, Bothe-Napa SP	84	84	2				Napa MAD
	Bale Grist Mill SHP	44	44	0				Napa MAD
	Skyline Wilderness Park	90	90	0				Napa MAD
	Table Rock Trail	88	88	4				Napa MAD
San Bernardino	Butterfield Ranch	2	1	0				Sonoma Co PHL
	Chino Hills SP	96	25	0				Sonoma Co PHL
Santa Clara	Henry Coe SP – Corral Trail	75	8			4	2	US Army
	Henry Coe SP – Corral Trail	1*	1			0		US Army
	Henry Coe SP – Forest Trail	280	29			9	9	US Army
Shasta	Hirz Bay CG	47	47		0			CDPH-VBDS
	McCloud Bridge CG	27	27		0			CDPH-VBDS
Sonoma	Diamond A	110	11			1	0	US Army
	Tilton Road – Sebastopol	71	9			0		US Army
Tuolumne	Columbia SP – Karen Baker Smith Trail	4	2			0		US Army
Total ticks tested		1610	655					
Total pools positive				8		19	15	

\* Nymphs

CG, Campground  
SHP, State Historic Park  
SP, State Park  
SRA, State Recreation Area

Laboratory: US Army, United States Army Center for Health Promotion and Preventive Medicine - West  
CDPH-VBDS, California Department of Public Health, Vector-Borne Disease Section  
Napa MAD, Napa County Mosquito Abatement District  
Sonoma Co PHL, Sonoma County Public Health Laboratory

<sup>a</sup>Ticks that tested positive for *Borrelia* spp. by PCR were tested a second time using primers specific for *B. burgdorferi*.



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## *Featured Publication*

Castro, M.B, & S. A. Wright. 2007. **Vertebrate hosts of *Ixodes pacificus* (Acari: Ixodidae) in California.** Journal of Vector Ecology, Vol 32 (1): 140-149.

*Ixodes pacificus* is the primary human-feeding tick in California and has the ability to transmit a variety of infectious diseases. Host associations are important in disease risk determination and identifying tick control strategies. The objective of this study was to compile a comprehensive current list of California hosts for *I. pacificus* with designated tick life stages. It had been 23 years since the last list was published. A total of 108 vertebrates were identified as hosts for at least one life stage. Thirty three published references provide the earliest published *I. pacificus* record for each host. This review adds new host records to the list.



**If you have questions about the information contained in this report, please contact your CDPH VBDS Regional Biologist, or VBDS Headquarters at 916-552-9730.**