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Vector Borne Disease Bulletin

In This Issue:

A Note from the Editor:

Welcome to the fourth 2008 issue of the 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 fourth publication of the year includes a brief summary of surveillance results since August 1st, 2008. Look for our year-end summary bulletin at the beginning of 2009. 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.

Denise Bonilla
Denise.Bonilla@cdph.ca.gov

Mosquito-borne Virus Surveillance

As of October 24, 2008, West Nile virus (WNV) activity has been reported from 48 counties. A total of 345 human WNV cases have been identified in 24 counties and nine WNV-related fatalities have been reported. Twenty-nine equine WNV cases have been reported from 14 counties; 17 died or were euthanized as a result of their infection. Forty-five counties have detected a total of 2,418 WNV positive dead birds and seven counties have reported a total of 30 WNV positive tree squirrels. Twenty-six counties have detected a total of 1,921 WNV positive mosquito samples and 515 sentinel chickens from 24 counties have tested positive for WNV antibodies.

2008 & 2007 YTD West Nile Virus Comparisons*

	2007	2008
Positive Counties	51	48
Human Cases/Tested	361/1,128	345/1,048
Horse Cases/Tested	27/314	29/288
Total Dead Bird Reports	29,674	31,320
Positive Dead Birds/Tested	1,344/5,236	2,418/5,572
Positive Mosquito Pools/Tested	999/26,351	1,921/29,351
Positive Chicken Sera/Tested	467/26,351	515/27,139
Positive Squirrels/Tested	26/203	30/282

Dipping for mosquito larvae in Mendocino National Forest

** As of October 24th, 2008*

A summary of West Nile virus activity from 2003-2008 can be found at:

www.westnile.ca.gov

Hantavirus Surveillance

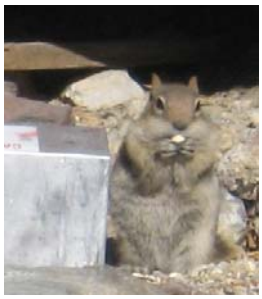
VBDS and NPS staff set traps for hantavirus surveillance on Alcatraz Island.

Rodent surveillance for Sin Nombre virus (SNV) was conducted in 11 California counties from July through September, 2008. Of 160 deer mice (*Peromyscus maniculatus*) collected and tested, antibodies to SNV were detected in 19 (11.9%).

Results of testing for serum antibody to Sin Nombre virus in *Peromyscus maniculatus* reported in July-Oct, 2008.

County	No. Positive	No. Tested
Alameda	0	10
Calaveras	0	4
El Dorado	**13**	58
Lassen	**2**	11
Mono	**3**	38
Riverside	---	0
San Bernardino	0	12
San Diego	0	1
San Francisco	0	13
Sierra	0	3
Siskiyou	**1**	10

Plague Surveillance



A total of 743 sera samples have been tested for plague antibody in 2008. Twenty seven animals have tested positive for plague to date in 2008 (from 7 of 37 counties tested). Of these, 5 specimens have tested positive since July, 2008.

Mammals testing positive for plague (*Yersinia pestis*), July-Oct 2008

County	Location	Date	Host	No. pos	Results
Kern	Frazier Park, Cuddy Valley	10-Mar	Bobcat	1	1:128
Nevada	Tahoe NF, Sardine Lookout	4-Jun	Lodgepole Chipmunk	1	1:64
Nevada	Tahoe NF, Sardine Lookout	4-Jun	Shadow Chipmunk	1	1:64
Inyo	Millpond CoP and CG	10-Jul	CA Ground Squirrel	2	1:128; 1:256
Total No. Mammals Positive for Plague				**5**	

Tick-borne Disease Surveillance

VBDS, CDC, Lake County VCD, and Marin-Sonoma MVCD staff investigate Rickettsia 364D

Nineteen cases of Lyme disease and four cases of TBRF have been reported this year to date in California.

Of note, spotted fever group *Rickettsia* 364D was recently detected from a Lake County resident by researchers at the Viral and Rickettsial Zoonoses Branch at the Center for Disease Control and Prevention. Although *Rickettsia* 364D has been detected in the Pacific Coast tick, *Dermacentor occidentalis*, this is the first time this organism has been associated with human disease.

Tick Surveillance

Lyme Disease

From January to October, 2008, 3,935 adult *Ixodes pacificus* and 251 nymphal *I. pacificus* were collected from 22 California counties. Of these, 808 adults (96 pools) and 22 nymphs (5 pools) were tested for *Borrelia* spirochetes by PCR by the US Army, Center for Health Promotion and Preventive Medicine. An additional 73 adult and 159 nymphal *I. pacificus* were tested individually by direct fluorescent antibody assay (DFA) by the Vector-Borne Disease laboratory. Eleven adults and 3 nymphs tested positive for *Borrelia* species by DFA or PCR; of these, 5 adults and 1 nymph were positive for *B. burgdorferi* by PCR. These results are similar to previous years, in that approximately half of all *Borrelia* positive tick pools were positive for *B. burgdorferi.*

VBDS conducting nymphal tick surveillance at Tilden Regional Park

In addition, 25 *Ixodes spinipalpis* nymphs from Tilden Regional Park were tested in 10 pools for *Borrelia* spirochetes by DFA and PCR; of these 3 of 25 (12%) were positive for *B. burgdorferi.*

Tick-Borne Relapsing Fever

VBDS staff conducted follow up case investigations of four reported cases of TBRF (Nevada County, n = 3; Inyo n = 1) as well as four possible exposure sites in El Dorado, Inyo, Los Angeles, and Mariposa Counties. Four replete soft ticks, *Ornithodoros hermsi*, were collected at residences of two case-patients and submitted to the Rocky Mountain NIH laboratory to test for *Borrelia hermsii*.

Spotted Fever Group *Rickettsia*

The Viral and Rickettsial Zoonoses Branch at the Center for Disease Control and Prevention recently detected *Rickettsia* 364D in Lake County Pacific Coast Ticks (*Dermacentor occidentalis)* collected in April, 2008. Three of 33 (9.1%) ticks were positive by PCR. This corresponds with previous testing that found 3.7% (n = 215) of *D. occidentalis* positive for *Rickettsia* 364D in Lake County using hemolymph and immunoflourescent assays (Lane, Philip and Casper, 1981. *Rickettsiae and Rickettsial Diseases*). A recent study detected *Rickettsia* 364D in 7.7% of southern California *D. occidentalis* (n = 365) by PCR (Wiskswo et al., 2008. Journal of Medical Entomology).


Daniela Mahawi

Ixodes pacificus ticks tested for evidence of *Borrelia* species, California, 2008

				No. pools positive			
		No ticks	No. pools	DFA	PCR		
County	Location	tested	tested	*Borrelia* spp.	*Borrelia* spp.	*B. burgdorferi***	Lab
Amador	Grinding Rock SP	31	4		1		US Army
Calaveras	Natural Bridge	103	11		4	3	US Army
	Water Treatment Site	13	4				US Army
Contra Costa	Tilden Regional Park	17 (159*)	17 (159*)	0 (2*)			CDPH-VBDS
Lake	Mendocino NF	190 (2*)	19 (1*)		4		US Army
Los Angeles	Angeles NF	17	17	0			CDPH-VBDS
	Charmlee Wilderness	38	38	0			CDPH-VBDS
	Malibu	100	10		0		US Army
Madera	Chepo Saddle	2 (1*)	1 (1*)		0		US Army
Mariposa	Sierra NF	20	2		0		US Army
Nevada	Nevada City	17 (8*)	11 (2*)		0		US Army
Riverside	San Bernardino NF	1	1	0			US Army
San Bernardino	San Bernardino NF	6	2		0		US Army
San Diego	Cleveland NF	24	3		0		US Army
San Joaquin	Carnegie SP	22	8		0		US Army
Santa Clara	Henry Coe SP	100 (11*)	10 (1*)		2 (1*)	2 (1*)	US Army
Shasta	Anderson River Park	38	4		0		US Army
	Baily Cove CG	18	2		0		US Army
	Anderson	51	5		0		US Army
	Redding	70	7		0		US Army
Stanislaus	Patterson	3	2		0		US Army
Total ticks tested		**881 (181*)**	**178 (164*)**				
Total pools positive				**2***	**11 (1*)**	**5 (1*)**	

* Nymphs

**PCR primer sets were specific for *B. burgdorferi*

CG, Campground

NF, National Forest

SP, State Park

Test: DFA, Direct Fluorescent Antibody
PCR, Polymerase Chain Reaction

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

Vector Borne Disease Section
California Department of Public Health

Headquarters:
1616 Capitol Avenue, MS-7307
P.O. Box 997413
Sacramento, CA 95899-7377
916-552-9730

Elk Grove:
8633 Bond Road
Elk Grove, CA 95624
916-686-8414

Ontario:
2151 Convention Center Way
Suite 218B
Ontario, CA 91764-5429
909-937-3440

Redding:
2135 Civic Center Drive
Room 13
Redding, CA 96001
530-225-2071

Richmond:
850 Marina Bay Parkway
Richmond, CA 94804
510-412-6251

Santa Rosa:
50 D Street
Suite 200
Santa Rosa, CA 95404
707-576-2733

San Luis Obispo:
342 Tyrus Court
Nipomo, CA 9344
805-929-5377

We're on the Web at:

www.cdph.ca.gov

CalSurv

www.calsurv.org

Research in the Spotlight

Mosquitoes and Storm Sewers

Evaluation of an adult mosquito barrier

Culex pipens/quinquefasciatus mosquitoes have an affinity for standing water found in belowground storm sewers and stormwater treatment systems. They access these sources by flying into any available opening (e.g. storm drain inlets, pick holes in manhole covers), but have a preference for vertical entry points. Using a simulated belowground stormwater treatment device (constructed from a plastic trash bin) baited with pungent hay infusion, VBDS evaluated the efficacy of plastic manhole dish inserts as barriers to female mosquito entry through pick holes in the lid. The manhole inserts were found to be 100% effective at preventing mosquito entry through pick holes when no other openings existed and they reduced mosquito oviposition by 64% when a lateral conveyance pipe existed as an alternate entry point. The findings of this study strongly suggest that providing barriers to vertical entry into small stormwater treatment devices could greatly minimize mosquito production in these systems. Additional studies are needed to test this concept in actual devices.

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.