

2009 Annual Report



# San Mateo County Mosquito and Vector Control District



San Mateo County Mosquito and Vector Control District

An Independent Special District Working for You!



## Letter from the Manager



On behalf of the Board of Trustees and staff, it is my great pleasure to present the 2009 Annual Report for the San Mateo County Mosquito and Vector Control District.

In spite of the state and nation-wide economic crisis brought on by the housing market collapse of 2008, the district was able to withstand the decline in property tax revenue and remain in sound financial condition.

Staffing levels were maintained and all services to county residents were continued and even expanded throughout the year. In fact, 2009 marked the first full year that the district provided enhanced vector control services to county residents, incorporating many responsibilities formerly held by the county's department of environmental health. These services include residential rodent inspections, interior inspections for certain household pests, and oversight of contracts between cities and private pest control operators for control of Norway rats in sewers.

The district also completed construction of the new auxiliary facility in Redwood City in 2009. The new facility provides extra storage capacity for seasonal mosquito control equipment, such as catch basin jeeps, boats, and amphibious Argo vehicles. Additionally, it will be used as a staging and storage area for special projects and has a work area for constructing public education displays.

A review of 2009 would be incomplete without mentioning a major regulatory change which may profoundly impact the district's operations. On January 7, 2009, the United States Supreme Court reversed the Environmental Protection Agency's (EPA) November 2006 Rule on Aquatic Pesticides. This ruling will mean that vector control agencies will need to apply for permits from the State Water Quality Control Board in order to apply mosquito larvicides or adulticides in or near waters of the United States. Although the issuance of the court's mandate has been stayed until 2011, the district has been working tirelessly throughout the year with the Mosquito and Vector Control Association of California, the state water board, the national EPA, and the Department of Pesticide Regulation to draft a rational and effective permit for mosquito control applications across the state. This permit, part of the National Pollution Discharge Elimination System (NPDES), will be finalized in early 2011.

If you have any questions about the district or our services, please don't hesitate to visit us on the web at [www.smcmad.org](http://www.smcmad.org), call us at **(650) 344-8592** or drop by our office at 1351 Rollins Road in Burlingame. We look forward to another year of serving you!

Respectfully submitted,

Robert B. Gay, M.S.  
District Manager



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## Mission Statement

### OUR MISSION:

***“To safeguard the health and comfort of the citizens of this district through a planned program to monitor and reduce mosquitoes and other vectors.”***

### Goals:

- Prevent the emergence of biting adult mosquitoes by applying control to the larval stage.
- Answer all requests for service from the public within 24 hours.
- Monitor the distribution of vector-borne diseases in nature and prevent the occurrence of human cases among district residents.
- Research new pesticides and methods of control for mosquitoes.
- Enhance surveillance for adult mosquitoes in order to uncover new sites of larval development.
- Increase public awareness of district services with an active educational program.



## Governance

### 2009 Board of Trustees

<u>City</u>	<u>Trustee</u>	<u>Years of Service</u>	<u>Position</u>
Atherton	Samuel Lerner	2	Vice President
Belmont	Robert Blake	11	
Brisbane	Robert Maynard	5 <sup>1</sup> / <sub>2</sub>	
Burlingame	Dennis Preger*	14	
Colma	(vacant)		
Daly City	Christine Fuller	3	
East Palo Alto	Donna Rutherford	3	
Foster City	Ronald Anderson	16	
Half Moon Bay	Tim Frahm	4	
Hillsborough	Dr. Lawrence Peterson	24	
Menlo Park	Valentina Cogoni	4 <sup>1</sup> / <sub>2</sub>	Secretary
Millbrae	Leon Nickolas	12	
Pacifica	John Curtis	5 <sup>1</sup> / <sub>2</sub>	
Portolla Valley	Joseph Fil	9	Asst. Secretary
Redwood City	Robert Bury*	11 <sup>1</sup> / <sub>2</sub>	
San Bruno	Robert Riechel	5 <sup>1</sup> / <sub>2</sub>	
San Carlos	Betsey Schneider	5	
San Mateo	James Ridgeway	3	
San Mateo - County at Large	Cal Hinton*	3	
South San Francisco	Raymond Honan	5 <sup>1</sup> / <sub>2</sub>	President
Woodside	Richard Tagg	20	
<hr/>			
Clerk of the Board	JoAnn Dearman		

\* Trustees who left the board in 2009

The San Mateo County Mosquito and Vector Control District is a special purpose district, governed by a board of trustees. Trustees are appointed by the elected councils of each city within the district, with an additional representative for the county-at-large appointed by the county board of supervisors. The board consists of individuals dedicated to community service and willing to accrue the knowledge required to effectively govern a public health agency. The current board members possess a variety of skills and expertise in business, government, law, public health, and engineering.

Board meetings are held on the second Wednesday of each month at the district office, 1351 Rollins Road, Burlingame at 7:00 p.m. These meetings are open to the public. The agenda and minutes for each meeting are posted on the district website at [http://www.smcmad.org/board\\_meeting.htm](http://www.smcmad.org/board_meeting.htm).

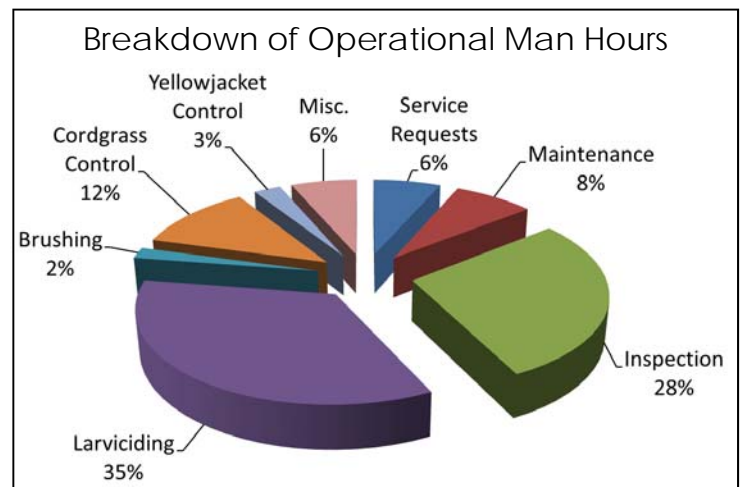


## District Personnel and Man Hours Spent in Major Operations Categories

In 2009, district personnel consisted of 12 operational staff, four biologists, three administrative staff and a general manager. Mosquito control activities made up the majority of time spent by operational staff. The district controls mosquitoes through an integrated vector management program. Technicians conduct regular inspections of standing water sources and apply control as needed.

District staff also respond to service requests from the public. Further information on types of service requests received can be found on page 11. The district carries out much of its own equipment repair and maintenance and fabricates specialized surveillance tools. Maintenance activities occupied approximately 8% of field staff time.

During late summer and fall, field staff conduct control for invasive cordgrass. This work is funded by grants from the US EPA and US Minerals Management Service.



### 2009 District Personnel

#### Administration

Robert Gay, Manager  
JoAnn Dearman, Finance Administrator  
Vika Sinipata, Accounting Administrative Assistant

#### Years of Service

13  
1  
<1

#### Laboratory

Chindi Peavey, Vector Ecologist  
Angie Nakano, Assistant Vector Ecologist  
Tina Sebay, Assistant Vector Ecologist  
Theresa Shelton, Assistant Vector Ecologist

11  
4  
5  
1 $\frac{1}{2}$

#### Operations

James Counts, Operations Supervisor  
Richard Chow, Foreman

37 $\frac{1}{2}$   
10 $\frac{1}{2}$

#### Mosquito Control Technicians

Stephanie Busam  
Danielle Hern  
Stanley Kamiya  
Kimberly Keyser  
James O'Brien  
Ben Rusmisl  
Eric Schultz  
Casey Stevenson  
Samantha Wallingford  
Brian Weber

5  
1 $\frac{1}{2}$   
20  
5 $\frac{1}{2}$   
11  
5  
5  
1 $\frac{1}{2}$   
5  
4



## Mosquito Control Activities—Surveillance for Larval Mosquitoes

The district controls mosquitoes through a planned program of Integrated Vector Management. This program includes surveillance, application of control measures when mosquitoes are present, and post-treatment monitoring to assess the success of control. Control measures vary depending on conditions and may include physical, biological, or chemical methods.



Even a relatively small body of water can serve as a breeding source for thousands of mosquito larvae.

### Surveillance for Larval Mosquitoes

Mosquito larvae are surveyed by inspecting sources of standing water with a long-handled plastic dipper. Larvae collected in this manner are brought to



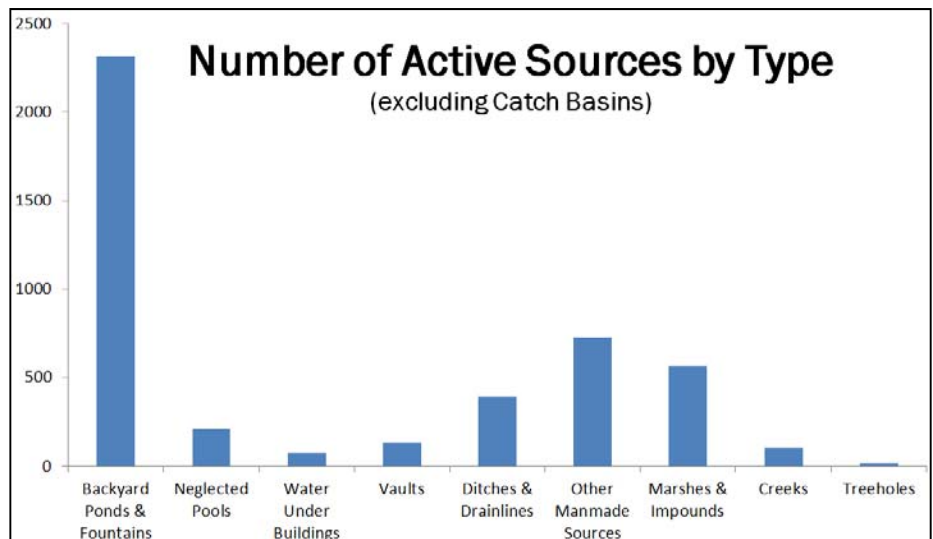
Brian Weber checks impounded water for mosquito larvae in Redwood Shores

the district laboratory, identified and counted. The district maintains a database of the places larvae have been found (see table of sources below). Mosquito control technicians inspect these sources regularly and apply control as needed. Technicians inspected 36,302 sources in 2009 and made applications to 14,562 of those sites. Mosquito control applications included treatment with biorational materials or fish (discussed on page 8). The graph below presents the relative counts of different source types, excluding catch basins (discussed on page 9). In terms of acreage, marshes and seasonal impounds comprise the majority of area treated.

#### Cataloged sources of Larval Mosquitoes in 2009 (excluding Catch Basins)\*

##### Source Group

Backyard Ponds	2314
Swim Pools	210
H2O under bldgs	77
Misc Containers	354
Vaults	132
Ditches	337
Drainlines	54
Multiple	360
Sewage Tx Plants	6
Other Sewage Related	9
Treeholes	18
Creeks	106
Marshes & Impounds	563
<b>Total</b>	<b>4540</b>



\*note: See page 9 for information on the district catch basin treatment program.



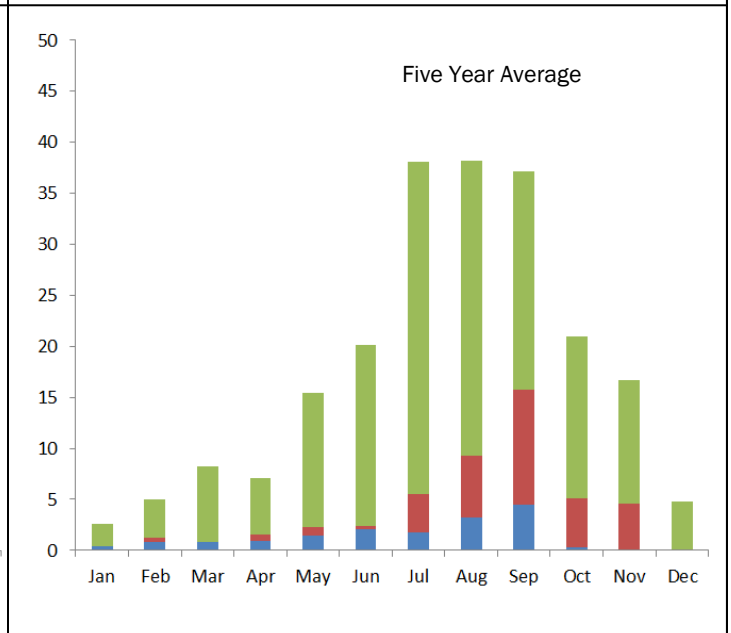
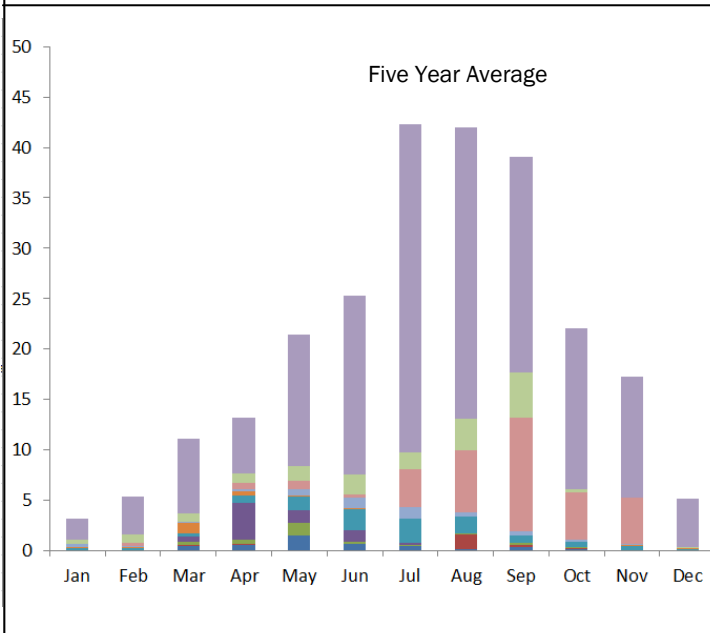
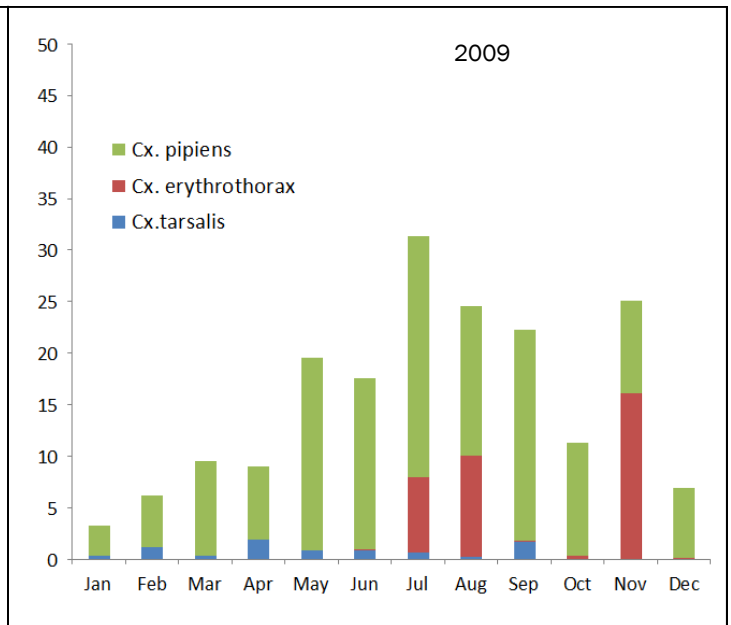
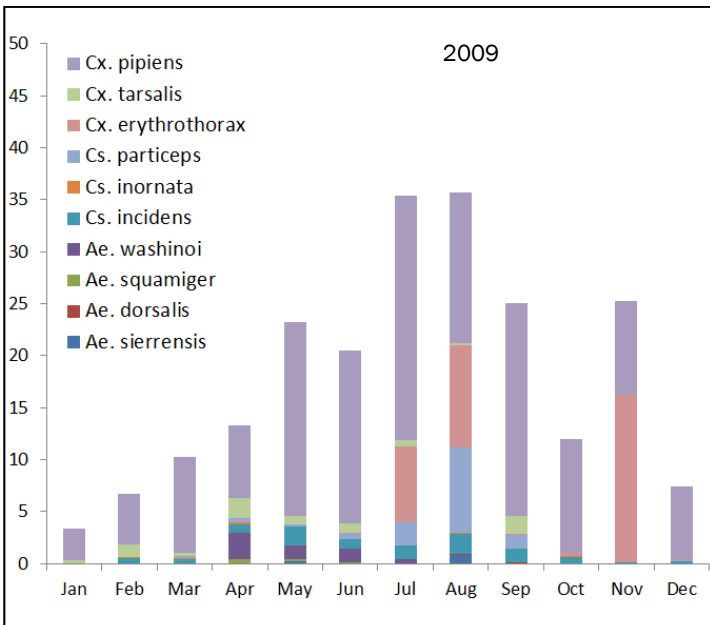
## Mosquito Control Activities—Surveillance for Adult Mosquitoes

### Surveillance for Adult Mosquitoes

The district uses carbon dioxide-baited traps to monitor adult mosquitoes and assess the effectiveness of control operations. These traps are battery-operated and attract mosquitoes with CO<sub>2</sub> emitted from a canister of dry ice. CO<sub>2</sub> traps are placed at approximately 30 sites throughout the county every week. Ten species of mosquitoes are captured regularly in CO<sub>2</sub> traps; three of these species are vectors of West Nile virus.

**Seasonal Density of Adult Mosquitoes in CO<sub>2</sub> Traps**  
(All 10 species regularly collected in Traps)

**Seasonal Density of Adult mosquitoes in CO<sub>2</sub> Traps**  
(WNV vector species)





## Mosquito Control Operations

The district uses primarily biorational larvicides to control mosquitoes. The table to the right shows the number of acres treated with each product in 2009. *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bs) are bacteria that kill larval mosquitoes by rupturing the stomach lining. Methoprene is a synthetic mosquito hormone that prevents larvae from developing into adults. All three of these products are specific to mosquitoes. Golden Bear 1111 and BVA2 oils are refined mineral oils that form a thin film on the top of the water and kill larvae through suffocation. These products are used in underground drains.

Larvicide Use by Acreage 2009		Acres Treated
Bacteria		
	Bacillus sphaericus	388.43
	Bacillus thuringiensis israelensis	1445.76
Insect Growth regulators		
	Methoprene	2074.89
Surface Films		
	BVA 2 Oil	248.39
	Golden Bear Oil 1111	165.80

### Neglected Swimming Pools

Abandoned swimming pools can become a major breeding source of mosquito species known to carry West Nile virus. Mosquito control technicians treated swimming pools 1,161 times, and swimming pool covers 66 times. Sixteen abandoned pools were drained. Technicians used either mosquito fish or biorational materials in these pools, depending on the conditions.

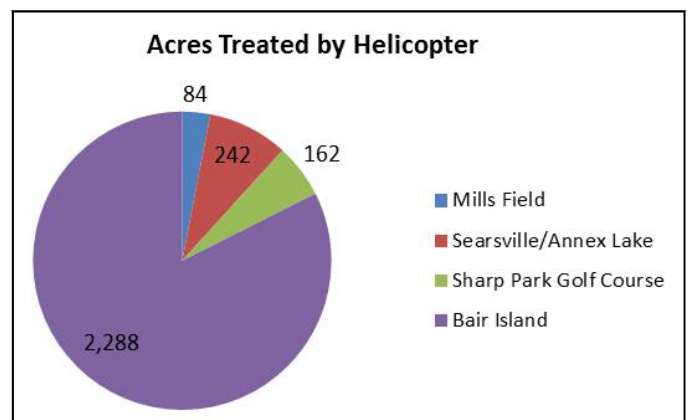


### Helicopter Applications of Larvicides

Most of the mosquito control applications carried out by the district staff are done using ground-based equipment. However, in some cases the extent of the area to be treated can only be effectively covered with aerial application. In these cases, the district hires a helicopter contractor to apply the material. Four areas are regularly treated in this manner: Mills Field, east of the San Francisco Airport in Millbrae; Bair Island in Redwood City; Laguna Salada in Sharp Park, Pacifica; and Searsville Lake near Portola Valley. Bair Island is treated by helicopter for winter salt marsh mosquitoes between January and late May using liquid formulations of Bti and methoprene. The other three sites are treated during summer months for tule mosquitoes.



GPS devices in the helicopter provide a map showing the area that was treated with mosquito larvicide at Sharp Park.





## Mosquito Fish

In 2009, mosquito control technicians stocked mosquito fish (*Gambusia affinis*) in 425 sources. Mosquito fish are provided as a free service to county residents with ornamental ponds. The district only places fish in isolated water bodies such as decorative fish ponds, neglected swimming pools or containers.



### Mosquito Sources Stocked with Fish in 2009

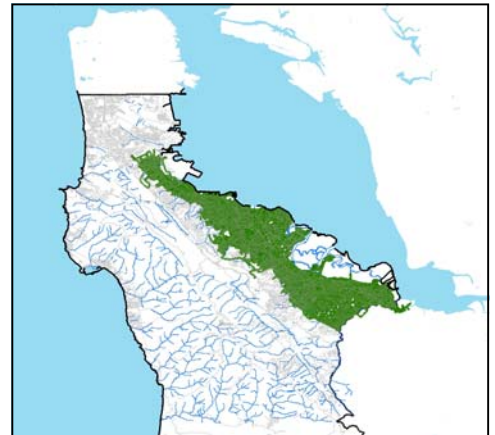
Source Type	Number
Back yard fishponds	307
Horse Troughs	76
Neglected Swimming pools	27
Tanks, sumps and other containers	15
<b>Total</b>	<b>425</b>

## Mosquito Control in Catch Basins



Eight right-hand-drive Jeeps are used for catch basin treatment .

Storm drains and their associated catch basins are some of San Mateo County's most significant sources of mosquito larvae during summer months. Catch basins are treated with modified right-hand-drive jeeps. The district has identified specific problem areas in the county which are treated every 7-10 days throughout the warmer months. The district

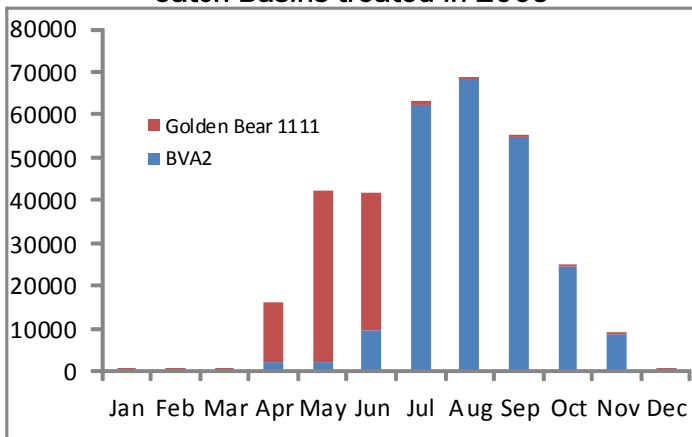


Area of San Mateo County with catch basin treatment in 2009.

hires seasonal workers from May to October to assist in this work. A single driver can treat between 300 and 500 catch basins per day. District staff treated 320,216 catch basins in 2009. An average of approximately 40,000 basins were

treated per month between April and November.

### Catch Basins treated in 2009



In 2009, the district replaced GB-1111 with BVA2 oil as the primary material used to control mosquito larvae in catch basins. Both products are refined mineral oils. BVA2 is clearer and has less odor than GB-1111. The new product was field tested in 2008, with promising results. This work was presented by district staff member Jim O'Brien at the annual conference of the Mosquito and Vector Control Association of California in 2009.



## West Nile Virus Activity

West Nile virus (WNV) surveillance in 2009 included testing of dead birds and squirrels, one flock of sentinel chickens and county-wide monitoring of mosquito populations with CO<sub>2</sub> traps. 2009 saw the lowest incidence of West Nile virus in San Mateo County since the virus made its appearance in 2004. One bird tested positive for WNV in 2009 compared to 15 birds in 2004. West Nile virus was not detected in squirrel carcasses in the county in 2009 and no cases of virus were reported in humans or horses.

### Summary of 2009 Dead Bird and Squirrel Reports

	Reported	Tested	Positive
Birds	178	33	1
Squirrels	11	3	0

### Historical San Mateo County West Nile Virus Statistics



Year	# of Positive Birds
2004	15
2005	10
2006	7
2007	2
2008	2
2009	1
Total	37



### Sentinel Chicken Flock

The district maintained one flock of ten sentinel chickens located in Portola Valley. Blood was drawn from sentinel chickens bi-weekly from May through October. Samples were tested for St Louis Encephalitis, Western Equine Encephalitis and California Encephalitis, in addition to West Nile virus. No sentinel chickens have tested positive for virus antibodies in San Mateo County this year.

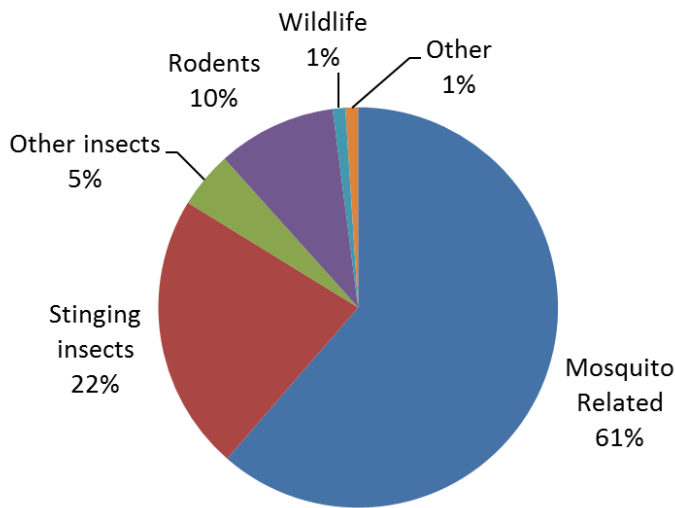




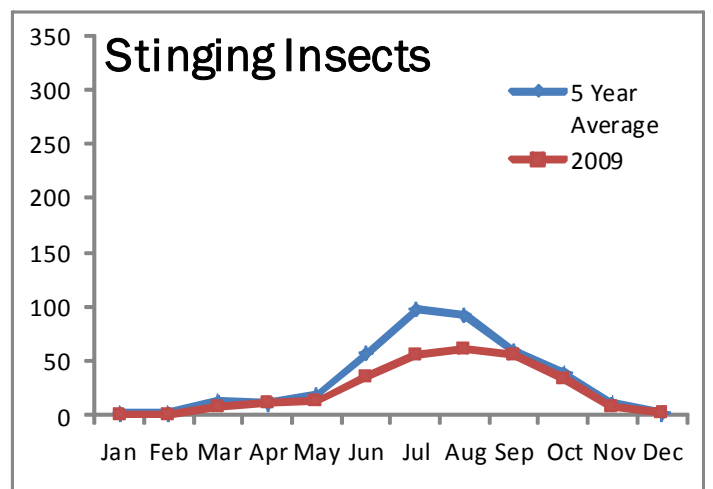
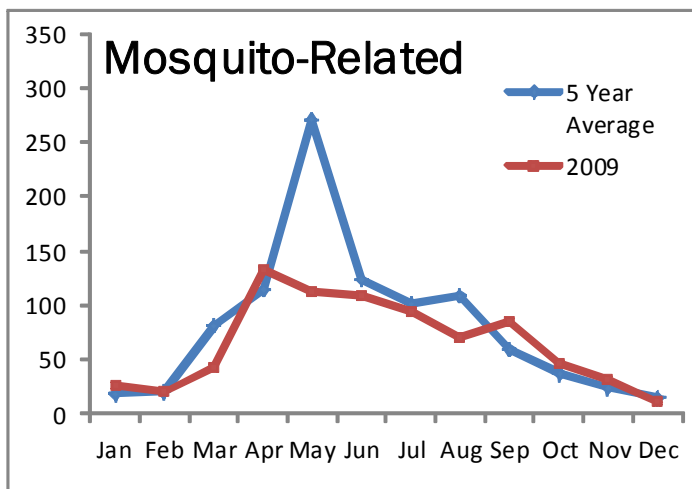
## Service Requests

District staff responded to 1,265 service requests in 2009. The majority of these (61%) requests were related to mosquitoes (residents experiencing mosquito bites, reports of standing water, and requests for delivery of mosquito fish). Service requests related to stinging insects (primarily abatement of underground yellowjacket nests) made up the second most common category (22%). Requests categorized as “other insects” included requests for identification or information about termites, stored product pests and ticks. Requests for inspections and advice regarding roof rats made up the majority of rodent-related service requests. Wildlife service requests included property inspections or advice on issues with raccoons, squirrels, gophers, pigeons, skunks, bats and opossums. Service requests in the category of “other” are unusual items that occur once or twice a year and do not fit in any other category. Examples include calls regarding slime mold, abandoned rodent burrows, and submissions of unidentifiable substances.

### Service Requests by Category and Month



	No. of Requests	% of Total
Mosquito-related	775	(61%)
Stinging Insects	284	(22%)
Other Insects	59	(5%)
Rodents	122	(10%)
Wildlife	13	(1%)
Other	12	(1%)
<b>Total</b>	<b>1265</b>	





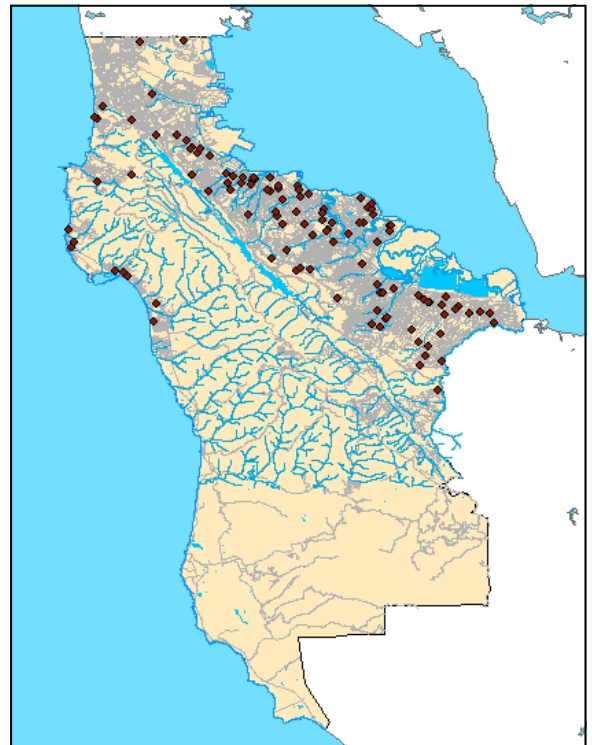
## Other Vector Control Activities

In April of 2008, the Division of Environmental Health for San Mateo County transferred to the district responsibility for all non-mosquito vectors in residential property. The first full year of the new distribution of service responsibilities was 2009. District staff provide inspections and advice on rodents, raccoons, pigeons, skunks and other urban wildlife in residential dwellings of three units or less.

On a typical rodent inspection, a technician will provide the resident with detailed information on signs of rat activity such as rodent droppings and rub marks. Once rat activity is confirmed, the district will also provide advice on effective rodent-proofing of property and options for control work. These measures may include blocking off building access points, environmental management, trapping and baiting.



Holes in vent screens are common access points for rodents in buildings.



Distribution of rodent survey requests in San Mateo County in 2009.

The district is also responsible for overseeing contracts between cities and private pest control companies for control of rats in sewer systems. The district maintains a database of the results of inspections and tracks rat populations in the urbanized areas of the county.

## Ticks

During winter and spring, district staff conduct surveys for the western black-legged tick (*Ixodes pacificus*) at recreational areas throughout the county. Ticks are tested for the bacteria that causes Lyme disease. This pathogen has been found in about 1% to 3% of western black-legged ticks in the county.

District staff also monitor the Pacific Coast tick (*Dermacentor occidentalis*) and the American Dog tick (*D. variabilis*). Numerous during summer months, these ticks can transmit Rocky Mountain Spotted Fever and tularemia. Though local cases are uncommon, ticks carrying the causative agents for these diseases have been collected in the county in past years.



Western Black-Legged tick (*Ixodes pacificus*)



Pacific Coast tick (*Dermacentor occidentalis*)



American Dog Tick (*Dermacentor variabilis*)



## Public Education and Outreach

Educating the public about vectors and district services is often the most effective way of preventing the spread of vector-borne disease. Every year, the district takes part in a variety of public education and community outreach events. In 2009, district staff manned booths at seven community festivals, and set up a stand-alone display booth at the San Mateo County Fair.

### Festivals and Fairs:

Foster City Art and Wine Festival  
 San Carlos Hometown Days  
 San Mateo County Fair  
 Millbrae Art and Wine Festival  
 South San Francisco Day in the Park  
 Pacifica Fog Fest  
 Brisbane Day in the Park  
 San Francisco Insect Zoo 30th Anniversary

### School Presentations:

Carlmont High School biology classes (6)  
 Stanford University biology class

### Other Presentations:

Foster City Lions Club  
 Healthy House Forum  
 Woodside Lyme Forum  
 Regional Stormwater Prevention Group  
 San Mateo County Realtors Association  
 District Open House  
 Ta-Ki-Ma Cub Scout Camp



Assistant vector ecologist Angie Nakano teaches scouts about insect diversity and adaptations.



Summer lab employee Tyson Reid introduces cub scouts to some of the district's Madagascar hissing cockroaches.

The district provides insect identification and control advice for residents who submit specimens or call with questions. Laboratory staff emphasize Integrated Pest Management techniques for the most effective and long term results. This service increases public awareness of the diversity of insect pests and reduces the amount of ineffectual pesticide use.

In the summer of 2009, the entomology lab had one seasonal employee, Tyson Reid, a student from the University of California, Berkeley.



## District Financial Statements (Fiscal Year 2008-09)

### Statement of Net Assets

June 30, 2009

#### ASSETS

Cash and investments	\$4,746,700
Receivables	\$44,573
Capital assets, net <sup>1</sup>	<u>\$4,913,331</u>
<b>Total Assets</b>	<b>\$ 9,704,604</b>

#### LIABILITIES AND NET ASSETS

Current liabilities	
Accrued liabilities	\$88,649
Long Term Liabilities	
Due within one year	
Certificate of participation <sup>2</sup>	\$265,000
Due in more than one year	
Compensated absences	\$323,008
Certificate of participation	<u>\$275,000</u>
<b>Total Liabilities</b>	<b>\$951,657</b>
Net Assets	
Invested in capital assets, net of related debt	\$4,373,331
Restricted for debt service	\$251,762
Unrestricted	<u>\$4,127,854</u>
<b>Total Net Assets</b>	<b>\$8,752,947</b>

<sup>1</sup> Capital assets include buildings, vehicles, and equipment.

<sup>2</sup> Certificates of participation are a type of government financing similar to bonds. The proceeds from these were used to finance the new building which currently houses the district's headquarters



## District Financial Statements (Fiscal Year 2008-09)

### Statement of Activities

June 30, 2009

#### Expenses

##### Programs

Personal Services	\$ 2,188,284
Services and supplies	1,423,402
Depreciation	320,271
Interest Expense	35,642

<b>Total Program Expenses</b>	<b>3,967,599</b>
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#### Program Revenues

Service abatement agreements and grants	447,652
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Net Program Expense	(\$ 3,519,947)
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#### General Revenues

Property Taxes	1,583,278
Special Mosquito Control Tax	442,886
Other Taxes	165,661
Special Benefit Assessment	1,396,087
Investment Earnings	75,856
Miscellaneous Revenue	111,338

<b>Total General Revenues and Special Item</b>	<b>3,775,106</b>
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#### Other Revenues (Expenses)

Investment Loss (investment pool losses, Lehman Bros account)	(193,767)
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<b>Total Other Revenues (Expenses)</b>	<b>(193,767)</b>
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<b>Increase in Net Assets</b>	<b>61,392</b>
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<b>Prior Period Adjustments</b>	<b>8,000</b>
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<b>Net Assets – beginning of the year – as restated</b>	<b>8,683,555</b>
---------------------------------------------------------	------------------

<b>Net Assets – end of the year</b>	<b>8,752,947</b>
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We're on the  
web!

[www.smcmad.org](http://www.smcmad.org)



"An Independent Special District  
Working for You Since 1916"

SAN MATEO COUNTY MOSQUITO  
AND VECTOR CONTROL DISTRICT

1351 Rollins Road  
Burlingame, CA 94010

Phone: 650-344-8592  
Fax: 650-344-3843  
[www.smcmad.org](http://www.smcmad.org)

The San Mateo County Mosquito and Vector Control District is an independent, Special District funded by a property tax voted in by individual cities. Our mission is to safeguard the health and comfort of our citizens through a planned program to reduce mosquitoes and other vectors in an environmentally responsible manner.

	Extension
Robert B. Gay, Manager_____	12
Chindi A. Peavey, Laboratory Director_____	32
Angie Nakano, Vector Ecologist_____	31
Tina Sebay, Vector Ecologist_____	38
Theresa Shelton, Vector Ecologist_____	44
James Counts, Operations Director_____	16
JoAnn Dearman, Finance Director_____	11

*"A VECTOR is any animal that can transmit  
disease to animals or people."*

## Conference Presentations in 2009

### Field Evaluations of BVA 2 Larviciding Oil in Catch Basins

James O'Brien: 77th Annual Conference of the MVCAC, Burlingame

### History of Ground Squirrel Control on the San Francisco Peninsula

Chindi Peavey: 77th Annual Conference of the MVCAC, Burlingame

### Dog Heartworm in San Mateo County, 2008

Angie Nakano: 77th Annual Conference of the MVCAC, Burlingame

### An Assessment of Stream Restoration in the Presidio of San Francisco Using Aquatic Macro Invertebrates

Theresa Shelton: 77th Annual Conference of the MVCAC, Burlingame

## Credits

### Contributing Writers:

Chindi Peavey, Angie Nakano, Tina Sebay, Theresa Shelton

*-Special thanks to Richard Tagg for providing his valuable editorial input*