SAN MATEO COUNTY MOSQUITO & VECTOR CONTROL DISTRICT

Protecting public health since 1916

ANNUAL REPORT
FISCAL YEAR 2016-2017

Dear Residents,

I'm excited to share with you our annual report for Fiscal Year 2016/2017. This report showcases work done between July 2016 and June 2017, and shares updates on some key issues affecting your risk of vector-borne disease in San Mateo County.

Many residents wondered if the relatively wet 2016/2017 winter would be followed by an intense West Nile virus season in the summer of 2017. Fortunately, the 2017 West Nile virus season was exceptionally mild. Despite regular surveillance, the District laboratory detected no sign of West Nile virus in San Mateo County during the 2017 WNV season.

In 2016, the District received the Special Districts Leadership Foundation's District Transparency Certificate of Excellence. In order to receive the award, a special district must demonstrate the completion of eight essential governance transparency requirements, fifteen website requirements, and at least one community outreach project. In 2017, the District also became the first mosquito and vector control district in California to be designated a District of Distinction by the Special Districts Leadership Foundation, recognizing our commitment to good financial management and public transparency.

In June, 2017, the Board of Directors authorized an additional $250,000 to reduce the District's share of accrued unfunded pension liability. Last fiscal year, the District paid down the unfunded pension liability by nearly $1.7 million. The effect of this prepayment resulted in lowering the District's employer contribution rate for Fiscal Year 2017/18 from 31.95% to 25.61%. The current payment of will result in additional savings of employer retirement costs in Fiscal Year 2018/2019.

These and many other successes were made possible by the hard work and dedication of the District's staff and board of trustees. Thanks to their efforts, San Mateo County is a safer and healthier place to live, work, and visit.

Sincerely,

Chindi Peavey

ANNUAL REPORT FISCAL YEAR 2016–2017

Contents

ABOUT THE DISTRICT

Our Mission

"To safeguard the health and comfort of the citizens of San Mateo County through a planned program to monitor and reduce mosquitoes and other vectors."

Our Goals

- Prevent the emergence of biting adult mosquitoes by applying control to the larval stage.
- Monitor adult mosquito populations to uncover new sites of larval development and assess the effectiveness of control.
- Monitor the distribution of vector-borne diseases and prevent the occurrence of these diseases among district residents.
- Evaluate new pesticides and methods of control for mosquitoes.
- Increase public awareness of District services and participation in protecting public health with an active educational program.

This report includes accomplishments from July 2016 through June 2017.

The Board of Trustees

As an independent special district, San Mateo County Mosquito and Vector Control District delivers specific services to citizens within its boundaries under the guidance of its own Board of Trustees. The District's Board of Trustees consists of one resident from each city, appointed by their respective City Council, to govern the Mosquito and Vector Control District knowledgeably and effectively. They serve for a term of two or four years and are highly dedicated to this community service.

CITY	REPRESENTED BY
Atherton	Mason Brutschy
Belmont	Wade Leschyn
Brisbane	Carolyn Parker
Burlingame	Joe Galligan
Colma	Joe Silva
Daly City	Glenn R. Sylvester
East Palo Alto	Donna Rutherford
Foster City	Rick Wykoff
Half Moon Bay	Kati Martin
Hillsborough	Dr. D. Scott Smith
Menlo Park	Justin Evans
Millbrae	Dr. Muhammad Baluom
Pacifica	Peter DeJarnatt
Portola Valley	Raymond Williams
Redwood City	Kathryn Wuelfing Lion
San Bruno	Robert Riechel
San Carlos	Dr. Mairin Joseph-Talreja
San Mateo	Ed Degliantoni
South San Francisco	Dr. Alvin Zachariah
San Mateo County, at Large	Jason Seifer
Woodside	Vacant

BOARD OFFICERS

Jan 2016 –Dec 2017

Board President
Rick Wykoff

Board Vice President
Joe Galligan

Board Secretary
Kati Martin

Board Assistant Secretary
Kathryn Wuelfing Lion

District Staff

ADMINISTRATION

Chindi Peavey, Ph.D., *District Manager*
Brian Weber, *Assistant Manager*
Richard Arrow, CPA (inactive), Senior Financial Advisor (RGS)
Megan Sebay, MPH, *Public Health Education & Outreach Officer*
Mary Leong, *Accountant*
Devina Walker, *Office Administrator*
Paul Weber, *Facility Maintenance Technician*

LABORATORY

Nayer Zahiri, Ph.D., *Laboratory Director*
Warren Macdonald, *Vector Ecologist*
Tara Roth, Ph.D., Vector Ecologist
Cheryl Tina Sebay, *Vector Ecologist*
Theresa Shelton, *Vector Ecologist*

OPERATIONS

Casey Stevenson, *Field Operations Supervisor*
David Allen, *Vector Control Technician*
Walter Bruj, *Vector Control Technician*
Stephanie Busam, *Vector Control Technician*
Hector Cardenas, *Vector Control Technician*
Eric Eckstein, *Vector Control Technician*
Sean Jones, *Vector Control Technician-Mechanic*
Kim Keyser, *Vector Control Technician*
James P. O'Brien, *Vector Control Technician*
Ryan Thorndike, *Vector Control Technician*

SERVICE REQUESTS

Resident Services

In addition to ongoing preventative control work, the District provides a variety of services directly to residents upon request, including residential mosquito surveillance and larval control, delivery of mosquito fish to backyard water features, control of ground-nesting yellowjackets and wasps, property inspections and information on rodents and nuisance wildlife, pick-up of dead bird or squirrel specimens for disease testing, identification of insects or ticks, presentations, and public outreach events.

District staff responded to a total of 3055 requests for service during Fiscal Year 2016/2017. This was an increase of 15.5% over the previous year and 23% over the District's four-year average. This was due in part to changes in weather: the relatively wet 2016/2017 winter increased insect populations overall, and pest and vector populations were no exception. Reports of standing water accounted for 20% of overall service requests.

A large number of service requests reported 'swarms of mosquitoes' in early 2017. These were caused by non-biting midges, which are frequently mistaken for mosquitoes due to their similar appearance. These insects, which have a life-span of 1-3 days, hatch in the hundreds of thousands from waterways adjacent to the Bay.

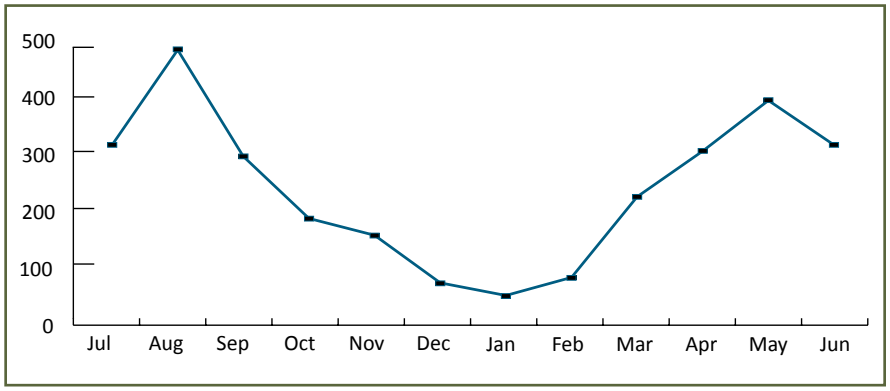


Figure 1: Total number of service requests by month, FY 2016/2017

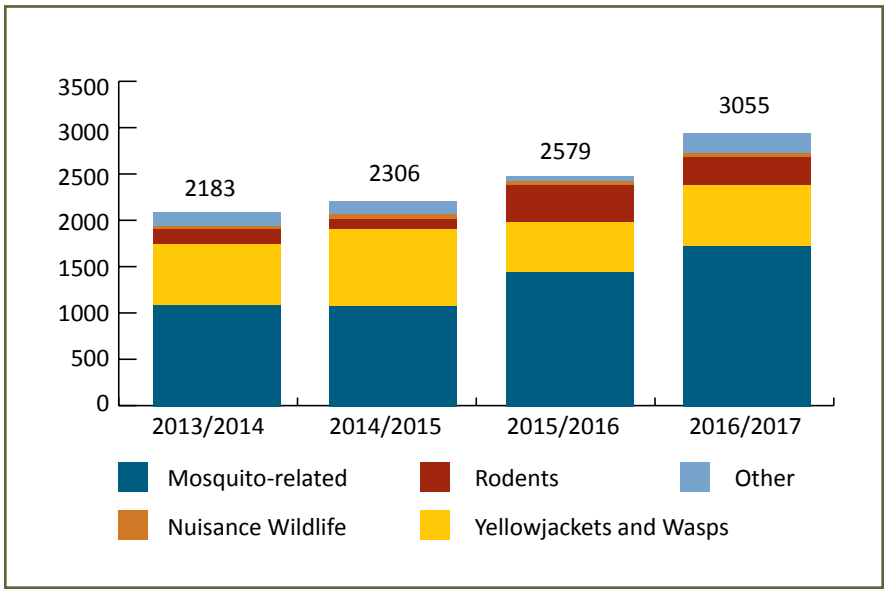


Figure 2: Service Requests by Category, FY 2013/2014 to FY 2016/2017

MOSQUITO PROGRAMS

Mosquito Population Surveillance

The District laboratory conducts surveillance year-round for both native and invasive mosquito species. These results are used to estimate population levels of various mosquito species in San Mateo County and to provide comparative data on changing mosquito population levels from year to year. Mosquito population data is compared over time and seasonally at specific locations. This data is used to optimize mosquito control and disease surveillance efforts in response to seasonal challenges throughout the year.

Although mosquitoes are present in San Mateo County throughout the year, each season brings new challenges. For example, *Aedes washinoi*, which breeds in shallow woodland pools, is most common in May, while *Culex erythrothorax*, the tule mosquito, begins emerging in June and requires a large larvicing effort to prevent its natural peak in the fall. However, *Culex pipiens*, the mosquito that most commonly transmits West Nile virus, makes up a large portion of local mosquito populations year-round, and is the biggest cause of mosquito-related complaints.

The total abundance of adult mosquitoes was lower than usual during the spring months of 2016, mostly because of a later start of the emergence of *Culex pipiens* and fewer than usual *Aedes washinoi.* Otherwise, the abundances are consistent with the five-year average

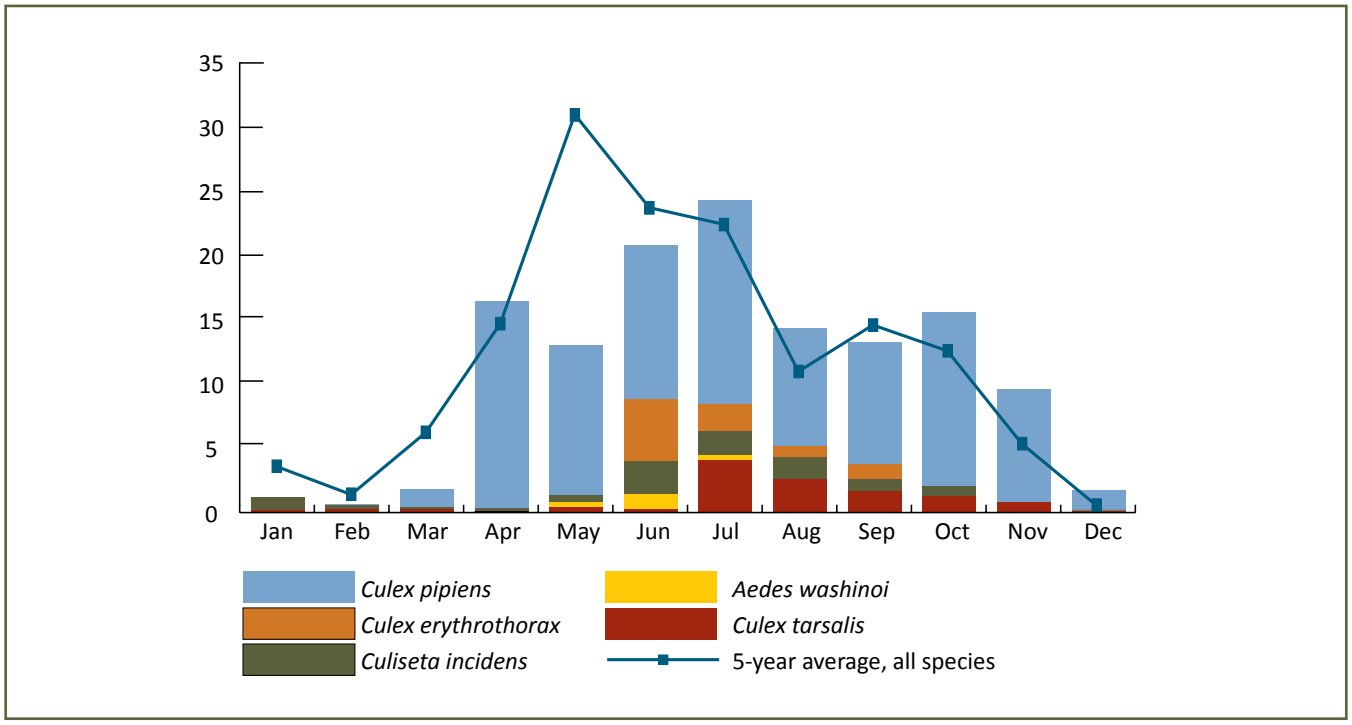


Figure 3: Average relative and total seasonal abundance of common adult mosquito species in Fiscal Year 2016/2017 compared to 5-year average for all mosquito species

West Nile Virus Surveillance

The District's year-round West Nile virus surveillance program is part of the California Department of Public Health's mosquito-borne encephalitis surveillance program, which includes surveillance for western equine encephalitis, St. Louis encephalitis, and other mosquito-borne viruses. These viruses are maintained in the area through mosquito/bird transmission cycles. Surveillance for these viruses is done in multiple ways. The District tests carcasses of dead birds and tree squirrels, as well as live adult mosquitoes collected from CO2 baited traps. The viruses are detected using real-time PCR and other molecular techniques. In addition, the District maintains three flocks of sentinel chickens, located in San Mateo, East Palo Alto, and Woodside, as a method for monitoring the transmission of virus by local mosquitoes.

During the 2017 season, the overall risk of West Nile virus infection in San Mateo County remained low. There was only one detection of West Nile virus in January of 2017, which was detected from a dead American crow. The detection of West Nile virus from a bird carcass in winter could be due to a number of factors, including a chronic infection from the summer, bird-to-bird transmission while roosting, or an infection picked up in another region then brought into the county via migration. The lab followed up with surveillance trapping (see the section *Mosquito Trapping and Testing* for details) in the area where the bird was collected, and found neither high numbers of mosquitoes nor any evidence of infected mosquitoes. These results indicate that the risk of transmission of West Nile virus to humans was extremely low despite the detection of West Nile virus in a bird carcass.

DETECTION TYPE	2012	2013	2014	2015	2016	2017
Human Case	0	0	0	0	0	0
Sentinel Chicken Seroconversion	0	0	0	0	0	0
Mosquito	0	0	15	5	5	0
Bird	5	4	21	23	15	1
Squirrel	2	1	0	0	0	0

Table 1: West Nile virus detections in San Mateo County 2012-2017

Mosquito Trapping and Testing

Mosquito trapping for West Nile virus surveillance is typically conducted when there is reason to believe the virus is present in adult mosquitoes in a particular geographical area, such as when bird carcasses test positive for West Nile virus or when a human West Nile virus case is reported. Culex mosquitoes (the genus that transmits West Nile virus) are separated by species and pooled from each trap for testing. The results of mosquito testing for West Nile virus are used to plan mosquito control treatments.

SAN MATEO COUNTY	2013	2014	2015	2016	2017
Mosquito Pools Tested	533	437	205	291	4
Positive Mosquito Pools	0	15	5	5	0
Percent Positive Mosquito Pools	0%	3.4%	2.4%	1.7%	0%

Table 2: West Nile Virus Surveillance of Mosquito Samples, 2015-201t

Control of Mosquito Larvae

The vast majority of the District's mosquito control program consists of larviciding, or treating for mosquitoes in the larval stage. Mosquito larviciding is both efficient and cost-effective. This tactic eliminates mosquito larvae before they develop into adult mosquitoes capable of transmitting diseases to humans. Products used for control of mosquito larvae are specific to mosquito species and have minimal effects on non-target animals. These products include bacterial larvicides, insect growth regulators, and mosquito fish.

The type of water source treated varies seasonally, with natural water sources – creeks, ponds, marshes, and impounds – treated frequently in response to winter and spring rain. In summer and fall, backyard water sources and municipal sources – including water treatment plants, storm drains, and ditches – make up the majority of the District's mosquito larvicide treatments. The county's storm water system also requires extensive treatment during the dry season (April through October); the District hires seasonal staff to complete the more than 20,000 treatments needed annually to keep these storm water catch basins mosquito-free.

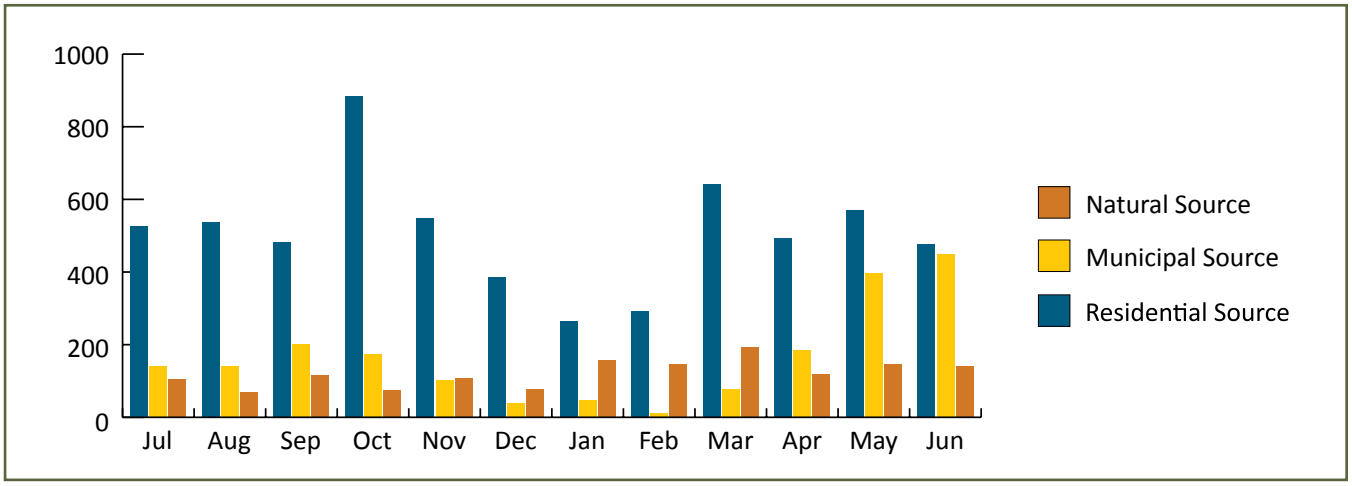


Figure 4: Mosquito larvicide applications by source type, FY 2016/2017

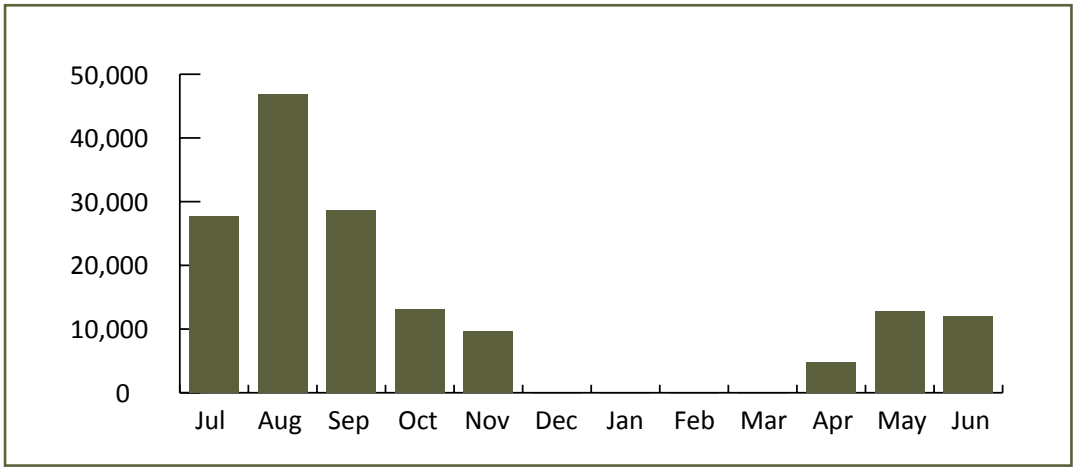


Figure 5: Number of seasonal catch basin larvicide treatments by month, FY 2016/2017

Control of Adult Mosquitoes

San Mateo County Mosquito and Vector Control District takes a preventative approach to mosquito control. Whenever possible, mosquitoes are controlled in their immature stages, before they emerge as biting adults capable of transmitting disease to humans. Sometimes, however, adult mosquito populations become a threat to human health, including when they are found to be infected with West Nile virus. When this happens, information collected through mosquito surveillance is used to make the decision to reduce adult mosquito populations by conducting an adult mosquito control treatment. Adult mosquito control, or adulticiding, is always conducted in conjunction with intensified efforts to locate and reduce mosquito larvae in standing water so that additional adult mosquitoes cannot emerge.

During Fiscal Year 2016/2017, no truck-mounted adult mosquito control treatments were needed.

Surveillance for Invasive *Aedes* Mosquitoes

Three species of non-native *Aedes* genus mosquitoes – *Aedes aegypti, Aedes albopictus,* and *Aedes notoscriptus* – have been identified in California to date. These species are concerning for vector control agencies across the state because they are highly invasive, difficult to control, and are the primary vectors for a variety of diseases affecting humans, including Zika virus, chikungunya, dengue, and yellow fever. Allowing large populations of these invasive *Aedes* species to become established creates the risk that travel-acquired human cases of these diseases may lead to local outbreaks in California. Both *Aedes aegypti* and *Aedes albopictus* have been detected in San Mateo County in the past. Most recently, in *Aedes aegypti* was found inhabiting a one square mile area in the city of Menlo Park in 2013. After three years of extensive surveillance and treatment, the infestation was eradicated. There have been no further detections in that area since May of 2015. However, new introductions of invasive mosquitoes could occur at any time.

In order to reduce the risk of invasive *Aedes* mosquitoes becoming established in San Mateo County, the District conducts surveillance for invasive *Aedes* species throughout the county using a variety of traps specific to invasive *Aedes*, including ovicups, Autocidal Gravid Ovitraps (AGOs), BG-Sentinel traps, and carbon dioxide traps. Additional surveillance is conducted in areas where travel-acquired human cases of *Aedes*-vectored illnesses – including chikungunya, dengue, Zika, and yellow fever – are reported to the San Mateo County Health System. This ensures that there is no risk that the infection will be transmitted by mosquitoes locally.

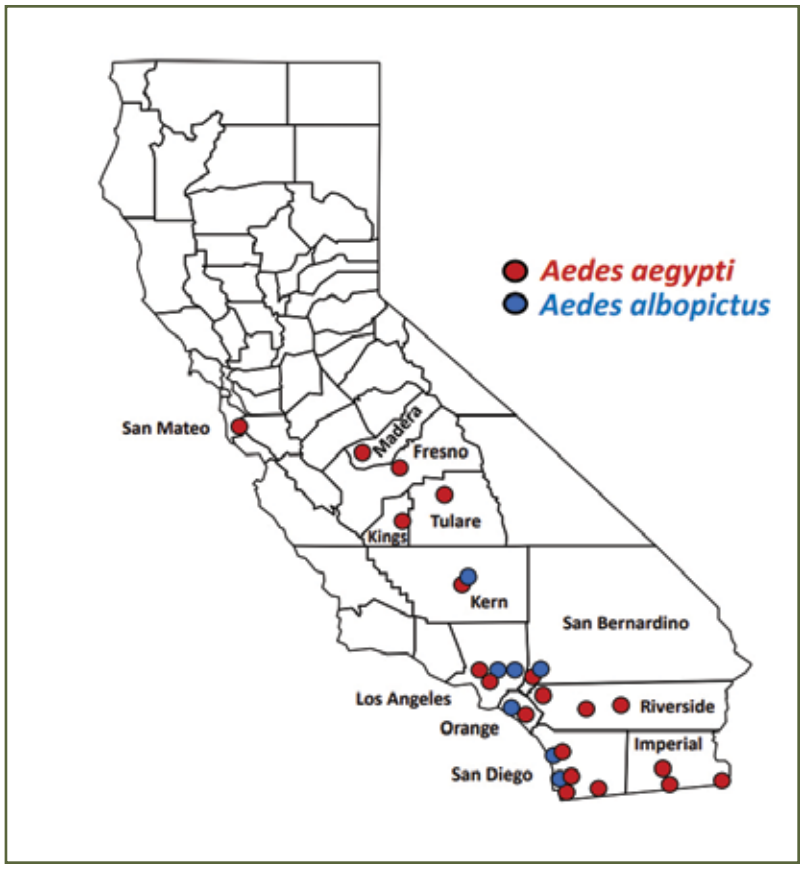


Figure 6: California counties where invasive Aedes mosquitoes have been detected since 2011. (Map from California Department of Public Health)

In early 2017, the District was awarded a grant to enhance our ability to detect invasive *Aedes* mosquitoes. The grant funding came from the Centers for Disease Control and Prevention, and was administered by the nonprofit corporation Public Health Foundation Enterprises on behalf of the California Department of Public Health. The District used these funds to hire a seasonal employee dedicated to invasive *Aedes* surveillance. This allowed the District to increase placement of *Aedes*-specific mosquito traps from 924 in 2016 to 2,072 in 2017. There was also an expansion of the surveillance area from 42 to 143 sites.

Despite additional surveillance, invasive *Aedes* mosquitoes were not detected in any area of San Mateo County during Fiscal Year 2016/2017. However, the risk of introduction of invasive *Aedes* mosquito species from other parts of California (see fig. 7) remains high.

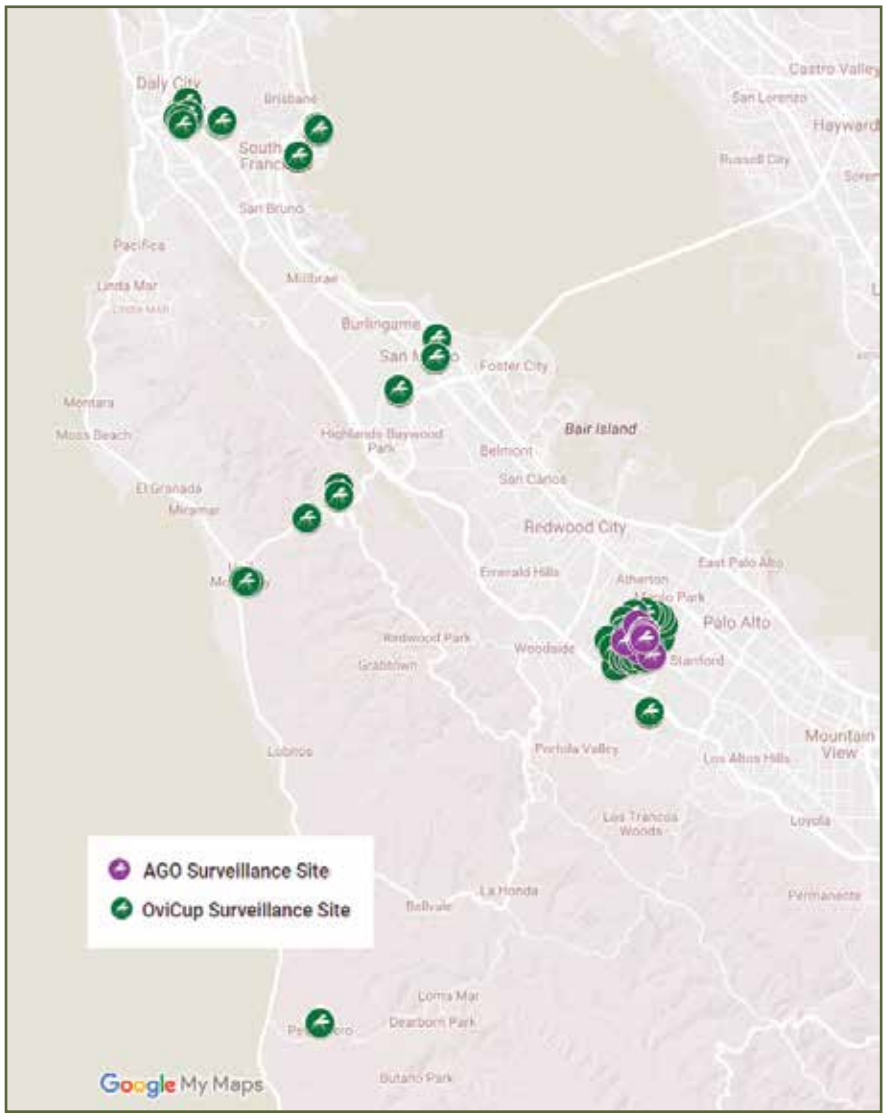


Figure 7: Invasive Aedes mosquito surveillance locations, 2017

RODENT PROGRAMS

Rodent Service Requests

The District's vector control technicians responded to an average of 175 service requests per year related to rodents between Fiscal Years 2013/2014 and 2015/2016. However, during Fiscal Year 2015/2016, the District responded to more than 400 rodent-related service requests, mostly from a single city which was experiencing issues with roof rats. During Fiscal year 2016/2017, the District responded to 339 rodent service requests. San Carlos continued to experience a higher number of service requests for rodent inspections compared to other cities. Control and public outreach efforts are ongoing to address the immediate needs of the affected communities.

Rodent Control in Sewers and Creeks

In 2010, San Mateo County turned over a large portion of residential rodent control to the District. The District oversees contracts between private pest control operators and several local cities and sanitary districts to provide rodent control in sewers and creeks. These control programs use tamper-resistant bait stations and a reduced-risk rodenticide to control commensal rats. The cities of San Mateo and San Carlos contract directly with the District for rat control services along creek and waterways. .

Surveillance for Rodent-borne Disease

The District conducts surveillance annually for pathogens in wild rodents that may cause disease in humans, including hantavirus and plague. Hantavirus causes fatal respiratory disease in humans. The virus is carried by wild mice and can be acquired by inhalation or ingestion of virus particles from the urine or feces of infected animals. There are several different strains of Hantavirus; each is carried by a different species of wild mice. Only Sin Nombre hantavirus, which occurs in deer mice, has been associated with human disease cases. Plague is an infectious disease caused by the bacterium Yersinia pestis. It is most commonly transmitted through the bites of fleas that have previously fed on infected rodents.

The District laboratory selects locations for rodent-borne disease surveys based on historical patterns of disease detection. Staff conduct humane live trapping at these sites in order to collect biological samples for testing. During 2017, the District conducted rodent-borne disease surveys at San Bruno Mountain and Montara. These two locations have been historically active for hantavirus and plague in wild rodents. Evidence of hantavirus infection was detected on San Bruno Mountain in five (5) out of 43 deer mice. In the unincorporated city of Montara four (4) out of 20 mice tested positive for hantavirus during two surveys in May and July. The results indicate that hantavirus is present at the locations that were surveyed, although because mouse sample sizes are low, we cannot conclude the relative prevalence of the virus between locations. Plague was not detected in any of these wild rodents (or in any animals from either site).

DATE	TRAIL NAME	TOTAL CAPTURES	# POSITIVE	SPECIES
3/9/2017	San Bruno Mountain State and County Park	43	*5*	*Peromyscus maniculatus*
5/24/2017	Montara	9	*4*	*Peromyscus maniculatus*
		1	*0*	*Peromyscus californicus*
7/18/2017	Montara	8	*0*	*Peromyscus maniculatus*
		2	*0*	*Peromyscus californicus*

Reducing Ticks in Parks by Treating Rodents for Ectoparasites

Ticks in San Mateo County can carry disease-causing bacteria that is a public health risk to residents. During the immature stages of their lives, ticks feed on wild rodents, sometimes picking up these harmful bacteria, which they can transfer to a later human host. The District tested a proactive approach this past year to reduce human disease risk by targeting ticks directly on rodents.

Beginning in the summer of 2016, District staff placed green, carpet-lined PVC tubes containing non-toxic rodent bait along trails in Big Canyon and Eaton parks in San Carlos and Water Dog Lake park in Belmont. The tubes at some trails also contained deltamethrin dust in the carpet lining. This dust is an acaricide, meaning it kills ticks. It is transferred to the rodents' fur when they enter the tubes to eat the bait. The tubes were placed along trails and maintained for three months in the summer of 2016, and for three months in the summer of 2017.

Staff flagged for adult ticks in February 2015 to collect baseline numbers and in February 2016 to see if there was any change in tick populations along trails. Although the tick abundance was reduced in treated areas of both parks in February 2016, tick abundance was also lower along trails without treated tubes, indicating that other factors were the cause. However, because these ticks have a two-year life cycle, it is possible that an effect from the treated tubes might not be detectable until the winter of 2018.

Laboratory staff also captured live wild rodents at the sites and counted ticks and fleas on them. In the summer of 2016, there was a significant decrease in the density of ectoparasites on the captured rodents along trails with treated bait tubes. These numbers are summarized in the table below.

		NUMBER RODENTS	NUMBER ECTOPARASITES	FLEAS/ MAMMAL	TICKS/ MAMMAL	ECTOPARASITES/ MAMMAL	PERCENT REDUCTION (ECTOPARASITES/MAMMAL)
Pre-study April 2016	Untreated	14	15	0.3	0.8	1.1	
	Treated	18	48	1.3	0.4	2.7	
Mid Study June 2016	Untreated	22	60	2.0	0.7	2.7	No reduction
	Treated	19	7	0.2	0.2	0.4	85%
Post Study Sept. 2016	Untreated	18	12	0.5	0.5	1.0	9%
	Treated	6	0	0	0	0	100%

The number of ectoparasites per mammal was significantly reduced in treated areas between April (M=2.67, SD=2.85) and June (M=0.37, SD=1.21) (paired t-test, p = .01) and April and September (M=0, SD=0) (paired t-test, p=.01). However, the number of ectoparasites on untreated trails in September was not significantly different from the treated areas (t-test) indicating that by September the reduction of ectoparasites was also impacted by seasonal factors.

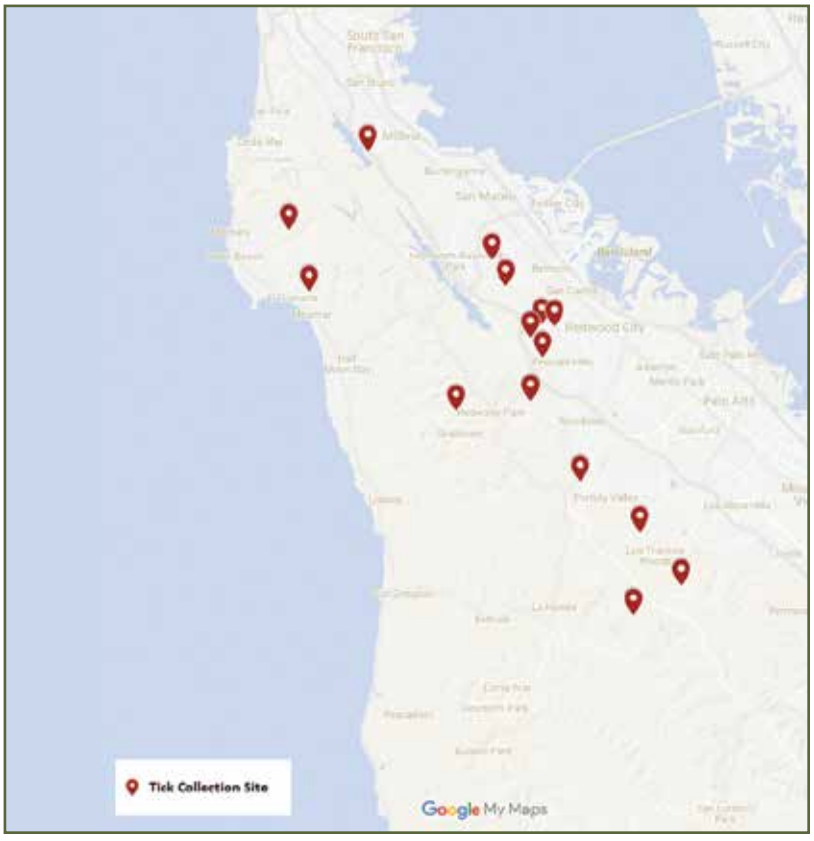
Surveillance for Ticks and Tick-Borne Disease

The District conducts annual surveillance for pathogens in ticks that may cause disease in humans, including Lyme disease. Surveillance for tick-borne disease was conducted on trails at 15 city and county parks in the 2017 water year (October 2016 through September 2017). Surveillance was also conducted when locally-acquired human cases of tick-borne disease were reported to the District by the San Mateo County Health System. In 2016, the California Department of Public Health reported three confirmed cases of Lyme disease and one case of anaplasmosis in San Mateo County residents.

All western black-legged ticks collected by the District in 2016 were tested for the bacteria causing Lyme disease, *Borrelia miyamotoi* infections, and anaplasmosis. Lyme disease, caused by a bacterium called *Borrelia burgdorferi*, is an infection that starts with flu-like symptoms and can lead to severe joint pain and neurological problems. A related bacterium, *Borrelia miyamotoi*, is a recently recognized human pathogen and can cause reoccurring fever symptoms. Anaplasmosis is a disease caused by the bacteria *Anaplasma phagocytophilum*, which can be transmitted to humans by tick bites. Symptoms of anaplasmosis can be similar to Lyme disease, and may include fever, abdominal pain, aching joints, fatigue and other flu-like symptoms. It is less common than Lyme disease in California. All three of these bacteria are transmitted by the same tick species, the western black-legged tick (*Ixodes pacificus*).

Ticks are tested in groups, or "pools," of five and results are reported as a minimum infection prevalence, or MIP. This is the standard way of expressing the proportion of vectors tested that are infected with a particular pathogen and assumes that only one tick in a given pool is infected. An MIP of 2-3% is typical for our county, and does not indicate an elevated level of risk. In Fiscal Year 2016/17, a total of 2,956 western black-legged ticks were collected from 15 parks. Results are presented from parks where at least 150 ticks were collected. County-wide, *Borrelia burgdoferi, Borrelia miyamotoi*, and *Anaplasma phagocytophilum* were detected in 0.6%, 0.5%, and 0.5% of tested *Ixodes pacificus* ticks, respectively. This represents a slight increase for *B. burgdorferi* (0.2% in 2016) and slight decrease in *B. miyamotoi* (0.7% in 2016) but these year-to-year differences are not statistically significant. This was the first year all ticks were tested for *Anaplasma*. Individual park MIPs did not exceed normal levels.

Figure 8: Tick collection sites, FY 2016/2017



PARK NAME	CITY	TOTAL TICKS COLLECTED	NUMBER OF POOLS	POSITIVE *B.BURGDORFERI* POOLS (MIP)[A]	POSITIVE *B.MIYAMOTOI* POOLS (MIP)	POSITIVE *A.PHAGOCYTOPHILUM* POOLS (MIP)
Thornewood OSP	Woodside	599	121	5 (0.8%)	8 (1.3%)	5 (0.8%)
Los Trancos OSP*	Portola Valley	175	36	3 (1.7%)	1 (0.6%)	3 (1.7%)
Huddart Park	Woodside	220	45	3 (1.4%)	2 (0.9%)	1 (0.5%)
Pulgas Ridge OSP*	Redwood City	255	52	0 (0%)	0 (0%)	0 (0%)
Edgewood Park	Redwood City	160	33	0 (0%)	1 (0.6%)	0 (0%)
Crystal Springs Regional Trail	Millbrae/ Burlingame	174	35	1 (0.6%)	2 (1.1%)	0 (0%)
Water Dog Lake Park[b]	Belmont	189	189	0 (0%)	0 (0%)	0 (0%)
Portola Valley Ranch	Portola Valley	279	59	1 (0.4%)	0 (0%)	2 (0.7%)
Russian Ridge OSP*	Redwood City	273	56	2 (0.7%)	1 (0.4%)	0 (0%)
Laurelwood Park	San Mateo	249	50	0 (0%)	0 (0%)	3 (1.2%)
Big Canyon Park[b]	San Carlos	201	201	0 (0%)	0 (0%)	1 (0.5%)
Eaton Park[b]	San Carlos	182	72	2 (1.1%)	0 (0%)	0 (0%)
Total San Mateo County	All	2956	949	17 (0.6%)	15 (0.5%)	15 (0.5%)

[a] Minimum Infection Prevalence – a measure of pathogen prevalence equal to the number of positive pools divided by the total number of ticks tested, expressed as a percentage.

[b] Ticks were tested individually from these parks.

* Open Space Preserve

Table 3: Results from surveillance for Tick-borne disease in local parks.

PUBLICATIONS AND PRESENTATIONS

WARREN MACDONALD

Tick-borne Disease Surveillance in Wild Rodent Populations
2017 Mosquito and Vector Control Association of California Annual Conference

CHERYL SEBAY

A Tale of Two Traps: A Comparative Study
2017 Mosquito and Vector Control Association of California Annual Conference

THERESA SHELTON

Ectoparasite Treatment of Wild Rodents in Suburban Parks to Reduce Ticks and Tick-Borne Disease
2017 Mosquito and Vector Control Association of California Annual Conference

NAYER ZAHIRI

Monitoring Susceptibility of Culex pipiens to Larvicide Products Currently in Use in San Mateo County
2017 American Mosquito Control Association Annual Conference

Public Health Education and Outreach

The District's integrated pest management program includes extensive public outreach aimed at improving public participation in vector-borne disease prevention, including vector attractant/source reduction and behaviors to reduce the risk of vector-borne disease transmission.

During Fiscal Year 2016/2017, the District's public outreach program continued to expand rapidly. Based on data collected from residents who requested service from the District, the internet – including internet searches, social media posts, and email subscriptions – and word-of-mouth remain the most common sources of referrals to the District. The proportion of residents reporting that they learned about the District through advertising continues to increase each year.

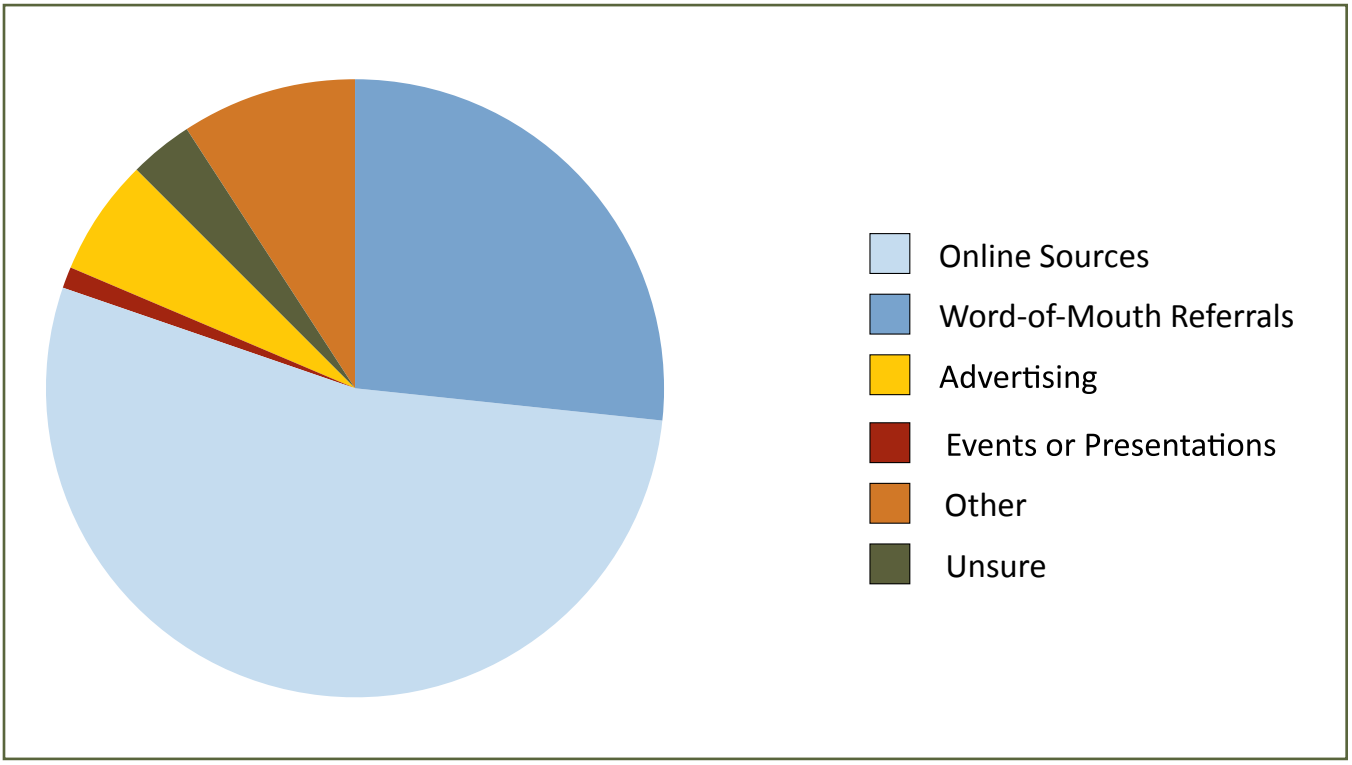


Figure 9: Resident-reported source of referrals to the District during FY 2016/2017

The District website received nearly 23,000 visits during Fiscal Year 2016/2017. Although the total number of visits decreased by approximately 8% compared to Fiscal Year 2015/2016, the average number of pages viewed per visit increased by 12%, the average session duration increased by 19%, and the bounce rate – the proportion of visitors who exit the site immediately – fell by 10%. These changes suggest improved user engagement, and indicate that most visitors to the District website are finding the content they're searching for.

Public Opinion of the District Slowly Improves

Beginning in November 2014, residents who provided an email address when requesting service were sent a link to a brief survey about their experiences with the District. In addition to a satisfaction rating, residents were asked to rate their agreement with a series of statements relating to the public's opinion of the District.

From 2014 to 2017, nearly 900 residents responded to the survey. Based on the results, resident perception of the District improved dramatically during this time for five of the six metrics; in 2015, the proportion of residents strongly agreeing that the District 'cares about the environment' dropped after a series of well-publicized adult mosquito control treatments. Fortunately, this number increased in 2016 and 2017, in part due to increased outreach on the role of adult mosquito control in public health.

The proportion of respondents who strongly agreed that the District 'uses taxpayer money responsibly' increased by 9% between 2014 and 2017, but continued to lag behind the other metrics.

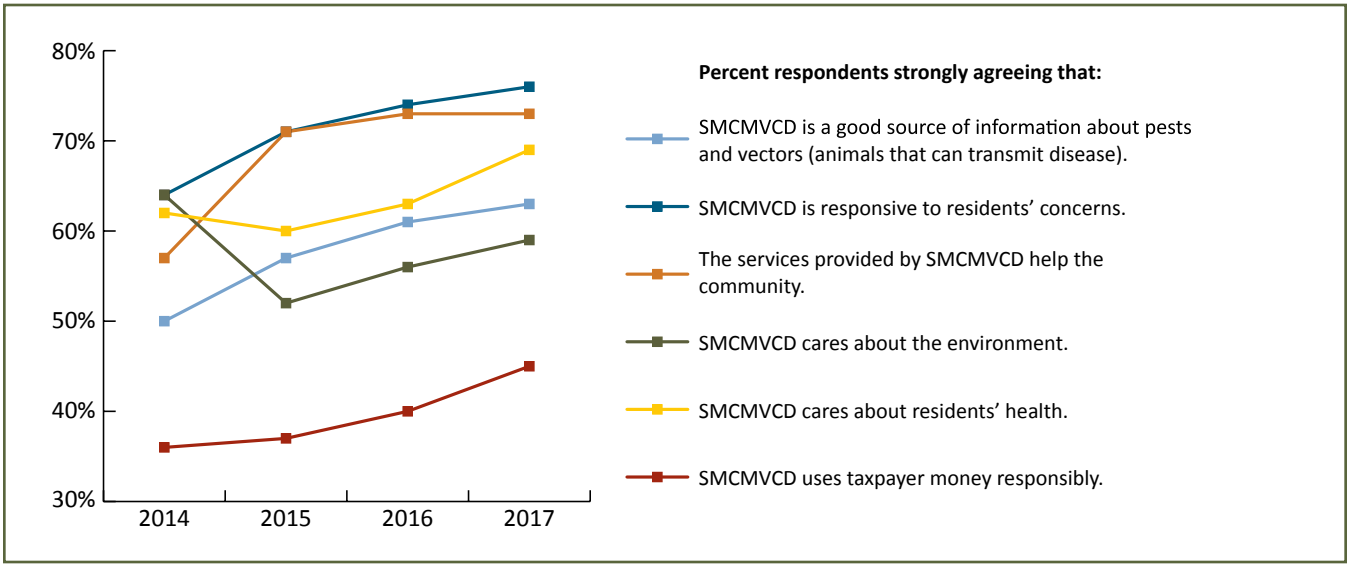


Figure 10: Public opinion of the District, 2014-2017

Recognition of District Transparency Efforts

During FY 2016/2017, the District received two honors that would not have been possible without the previous fiscal years' improvements to the District website.

In 2016, the District received the Special Districts Leadership Foundation's District Transparency Certificate of Excellence. To be awarded this certificate, a District must fulfill an extensive list of requirements, including 19 website-related requirements and two general outreach requirements. In 2017, the District was accredited by the Special Districts Leadership Foundation as a District of Distinction. This accreditation is only available to Districts that have earned the District Transparency Certificate of Excellence.

FINANCIAL REPORTS

Who Pays for Services

District services are paid for by property taxes. The District receives a small portion of ad valorem property taxes from properties in the Southeast part of San Mateo County. Properties in this area also pay a special mosquito control tax of $3.74 per parcel. Revenues from ad valorem property tax and mosquito special tax were $2.67 million or 54% of total revenue in FY 2016/2017.

Property owners in the North and Western (coastal) portions of San Mateo County pay a benefit assessment for mosquito and rodent abatement and vector control. Assessment revenue was $1.45 million or 30% of total revenue.

Revenue by Category

The District's total revenue in Fiscal Year 2016/2017 was $5.0 million. 84% of revenue in Fiscal Year 2016/2017 came from three sources: property tax, special mosquito tax, and benefit assessment. The largest source of revenue was ad valorem property tax (45%), followed by benefit assessment (30%), and special tax (10%).

REVENUE SUMMARY FOR FISCAL YEAR ENDING JUNE, 30, 2017	
CATEGORY	**AMOUNT**
Service Abatement Revenue	$267,332
Special Benefit Assessment & Tax	$1,986,021
Property Taxes	$2,251,632
Other Tax Revenues	$437,253
Investment & Other Revenue	$90,966
Total	**$5,033,204**

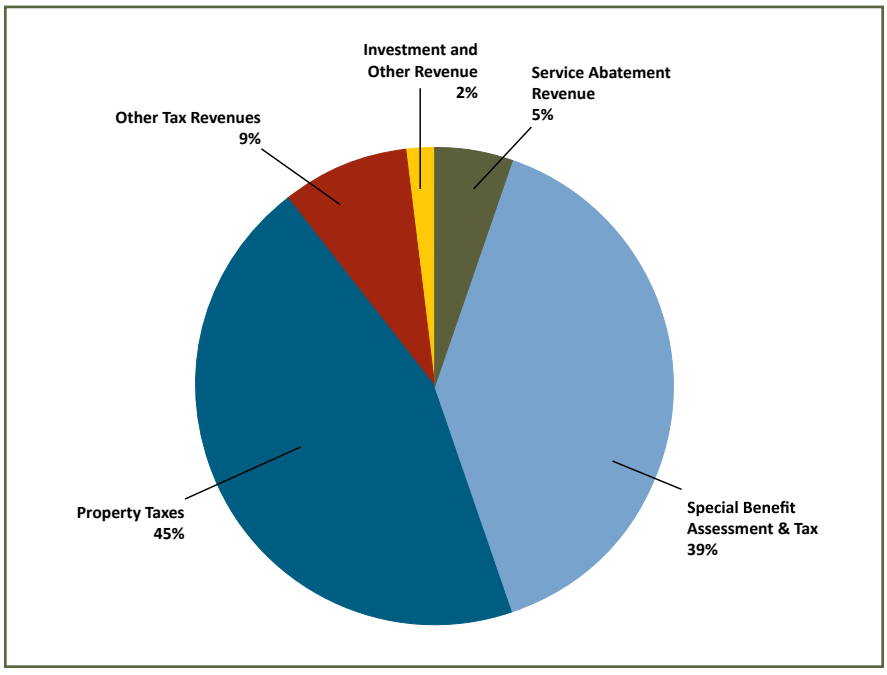


Figure 11: Actual revenue by category, FY 2016/2017

Expenditures by Category

Total annual operating expenditures in Fiscal Year 2016/2017 were $4.8 million. As is typical for local government agencies, most District expenditures were for employee salaries and benefits. In addition to annual salaries and benefits, the District made a one-time payment of $250,000 from its reserves into a supplemental account with the San Mateo County Employee Retirement Association (SamCERA) to reduce its long term unfunded liability for employee pension expense. This payment reduces the District's required employer contribution to the pension fund in future years. In the previous fiscal year, the District also made a required deposit of $1.8 million into an OPEB (Other Post-Employment Benefits) trust to cover retiree health benefit costs. The trust is now fully funded and future expenditures for retiree medical benefits can be paid from the trust rather than from the District's annual operating budget. These two deposits reduce the District's long-term liabilities and will substantially reduce future annual employee expenditures.

EXPENDITURE SUMMARY FOR FISCAL YEAR ENDING JUNE, 30, 2017	
CATEGORY	**AMOUNT**
Salaries	$2,095,939
Benefits	$1,057,529
Retirement Liability Reduction	$250,000
Materials and Services	$1,303,319
Capital	$25,133
Total	**$4,731,920**

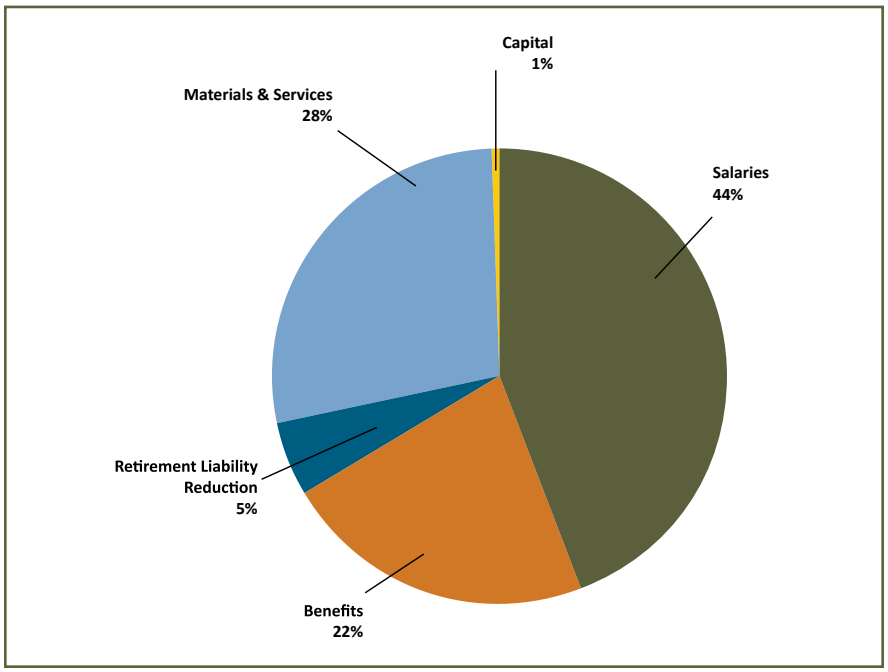


Figure 12: Actual expenditures by category, FY 2016/2017

San Mateo County Mosquito & Vector Control District

Protecting Public Health since 1916

The mosquito control program in San Mateo County is one of the oldest in the United States. Control work was initiated in 1904, when the Burlingame Improvement Club asked entomologists from the University of California to assist them in developing a plan to fight the city's mosquito infestations. A control plan was developed which included ditching, repair of existing dikes and tide gates, and filling of low areas. These physical control measures were to be supplemented with oiling of the remaining standing water.

On April 8th, 2008, San Mateo County Board of Supervisors passed a resolution to transfer specific vector control operations and responsibilities to San Mateo County Mosquito Abatement District. Our Board of Trustees reviewed and approved the transfer of services resolution during the board meeting on April 9th, 2008. San Mateo County Mosquito Abatement District Board of Trustees also approved a name change to San Mateo County Mosquito and Vector Control District.

OUR SERVICES

for San Mateo County Residents

- **Mosquito Control**
- **FREE Mosquitofish**
- **Tick Identification & Education**
- **Rodent & Wildlife Inspections**
- **Disease Surveillance**
- **Public Education & Treatment Notifications**

SAN MATEO COUNTY MOSQUITO & VECTOR CONTROL DISTRICT

(650) 344 - 8592
1351 Rollins Road
Burlingame, CA 94010

Monday-Friday
8a.m. to 4:30p.m.
www.smcmvcd.org