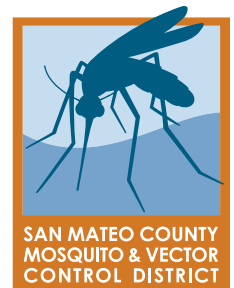


# San Mateo County Mosquito & Vector Control District **Annual Report 2021**





Daly City

Brisbane

Colma

South San  
Francisco

San Bruno

Pacifica

Millbrae

Burlingame

Hillsborough

Foster City

San Mateo

Belmont

San Carlos

Redwood City

East Palo Alto

Atherton

Half  
Moon Bay

Menlo Park

Woodside

Portola  
Valley

# San Mateo County Mosquito & Vector Control District Annual Report 2021

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Mosquito control in San Mateo County started as early as 1905, when residents requested assistance from entomologists in reducing mosquitoes coming from marshes. In 1916, a formal agreement between cities in the central part of the County resulted in the creation of a formal mosquito control program. Over the past 117 years, the District has expanded to cover the entire County and currently conducts a variety of other vector control services along with mosquito control.

# ABOUT THE DISTRICT





### Manager's Note

Although the COVID-19 pandemic continued to affect many aspects of District operations, we are steadfastly advancing mosquito and vector control efforts in San Mateo County. 2021 was highlighted by several acquisitions that will enhance our ability to address our Mission and Vision.

The District completed the purchase of a 16,500 sq. ft. building near our existing facilities, which will be renovated to house our large equipment and fleet of Jeeps used for summer storm drain mosquito control.

Also in 2021, three District staff became FAA-certified pilots, and we purchased an UAS (Unmanned Aircraft System) that will eventually be used in situations where sensitive plant and animal species exist, to reduce disturbances to those species. The purchase of an automated extraction instrument updated our laboratory capacity and will allow for increased efficiency processing mosquito and tick samples for disease surveillance.

We remain committed to our mission of protecting public health through an agile science-based integrated vector management approach, and we look forward to maintaining a high level of service to residents in 2022 and beyond.

*Brian Weber*

**District Manager**, San Mateo County Mosquito and Vector Control District

### Our Vision

We are an agency that protects public health through a science-based program of integrated vector management, which is responsive to the community, and prepared to adapt to new challenges.

### Our Mission

To safeguard the health and comfort of the citizens of San Mateo County through a science-based program of integrated vector management.

# Our Goals

1

**Reduce or eliminate** host-seeking vector populations and maintain consistency in control operations by evaluating vector populations before and after they are carried out.

---

2

**Use scientific methods** to evaluate the distribution of vectors and vector-borne diseases in nature and work toward preventing the occurrence of human cases among District residents.

---

3

**Engage in research and development** to optimize the District's ability to carry out its mission with available resources.

---

4

**Maintain a highly motivated, productive staff** that is aware of, and has access to, the latest materials, technologies, and techniques in vector control.

---

5

**Ensure residents are aware** of the District's Integrated Vector Management Program and cooperate with recommendations to reduce populations of vectors and minimize the risk to human health posed by vectors.

---

6

**Ensure that residents are aware** of District services, utilize them as needed, and are satisfied with the service they receive.

---

7

**Cultivate strong, mutually beneficial relationships** with local, state, county, and federal agencies.

---

8

**Conduct** all aspects of District business in a transparent and accountable manner.

---

9

**Adequately maintain** the District's physical assets and keep them up to date with the best technology available.

---

10

**Anticipate and be prepared** to respond to future scientific, operational, and financial challenges.

---

11

**Ensure** that the Board of Trustees operates in an ethical manner, makes sound decisions based on current and complete information, and has the capacity to lead the agency effectively.

---

12

**Ensure** that District finances are adequately managed to provide for long term financial stability and sustainability.

---

# Our Board

## The Board of Trustees

As an independent special district, the 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, and one appointed by the County Board of Supervisors 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.

2021 BOARD OFFICERS	<b>CITY</b>	<b>REPRESENTED BY</b>
<b>President</b> Kati Martin  <b>Vice President</b> Kathryn Wuelfing Lion  <b>Secretary</b> Donna Rutherford  <b>Assistant Secretary</b> Ross Graves	Atherton .....	Mason Brutschy
	Belmont .....	Wade Leschyn
	Brisbane.....	Carolyn Parker
	Burlingame .....	Joe Galligan
	Colma.....	Laura Walsh
	Daly City .....	Glenn R. Sylvester
	East Palo Alto.....	Donna Rutherford
	Foster City.....	Catherine Mahanpour/Paul Norton
	Half Moon Bay .....	Kati Martin
	Hillsborough .....	Dr. D. Scott Smith
Menlo Park .....	Catherine Carlton	
Millbrae.....	Dr. Muhammad Baluom	
Pacifica .....	Peter DeJarnatt	
Portola Valley.....	Raymond Williams	
Redwood City.....	Kathryn Wuelfing Lion	
San Bruno .....	Robert Riechel	
San Carlos .....	Ross Graves	
San Mateo .....	Ed Degliantoni	
San Mateo County, at Large...	Claudia Mazzetti	
South San Francisco.....	Michael Yoshida	
Woodside .....	Paul Fregulia	

Board meetings are held at 6pm on the second Wednesday of each month. Regular board meetings are not held in August or December. Special meetings, as well as any schedule changes, will be listed on the District calendar at [smcmvcd.org/calendar](http://smcmvcd.org/calendar).

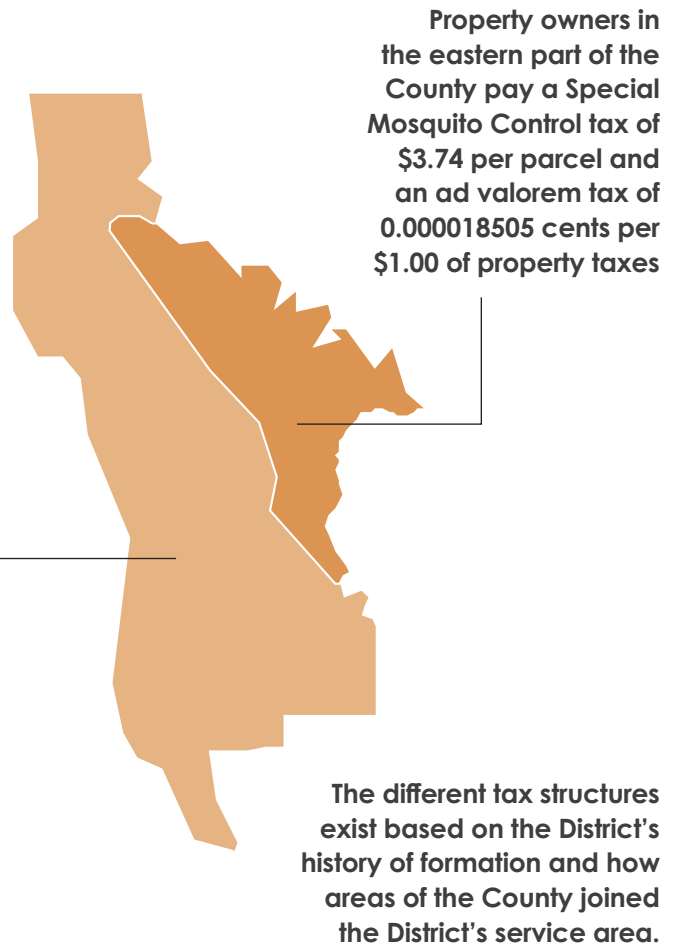


# Our Financials

## Who Pays for Services

County property owners, who pay property taxes and assessments, are the source of almost all District revenue. The District's usual top three revenue sources – ad valorem property taxes, a special mosquito tax, and a benefit assessment – provide 83% of revenue.

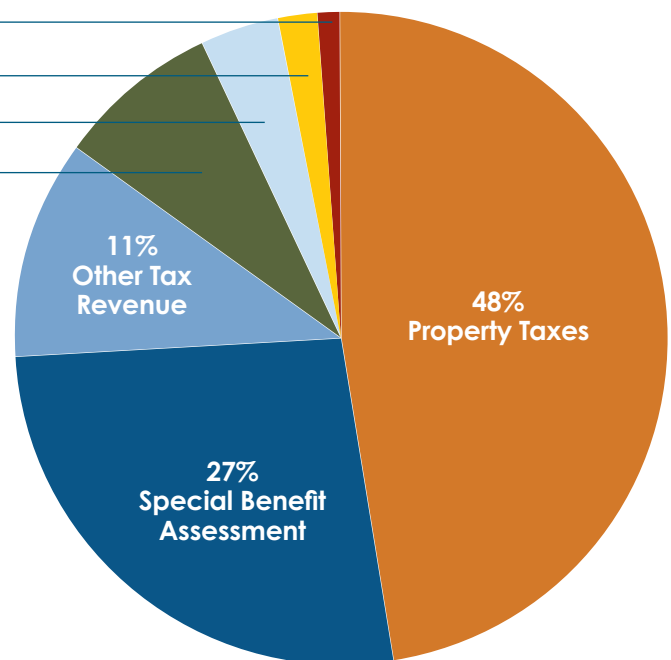
**In Fiscal Year 2020-21, total revenue from all sources was \$6.15 million.**



## Revenue Sources for Fiscal Year 2020-21

- 1% Other Revenue
- 2% Capital Lease Financing
- 4% Service Abatement Revenue
- 8% Special Mosquito Control Tax

Investment Earnings were negative in FY 2020-21





## How Revenue is Used

**Total annual operating expenditures for FY 2020-21 were \$5.47 million.**

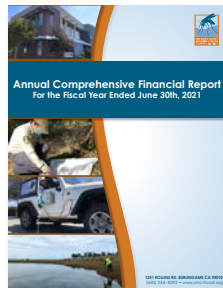
As is typical for local government agencies, most District expenditures were for employee salaries and benefits. The District's integrated vector management program reduces pesticide use but is labor-intensive and requires highly trained staff.

Field staff conduct inspections and choose from a variety of control strategies and tools depending on the conditions present at a given site. Field and Laboratory staff monitor vector populations by trapping vectors and identifying the species present.

In 2021, in addition to its Annual Financial Audit, the District published a Annual Comprehensive Financial Report (ACFR), which gives a deeper look into the District finances for Fiscal year 2020-21. The ACFR for FY 2020-21 can be found on the District website at [www.smcmvcd.org/ACFR](http://www.smcmvcd.org/ACFR).

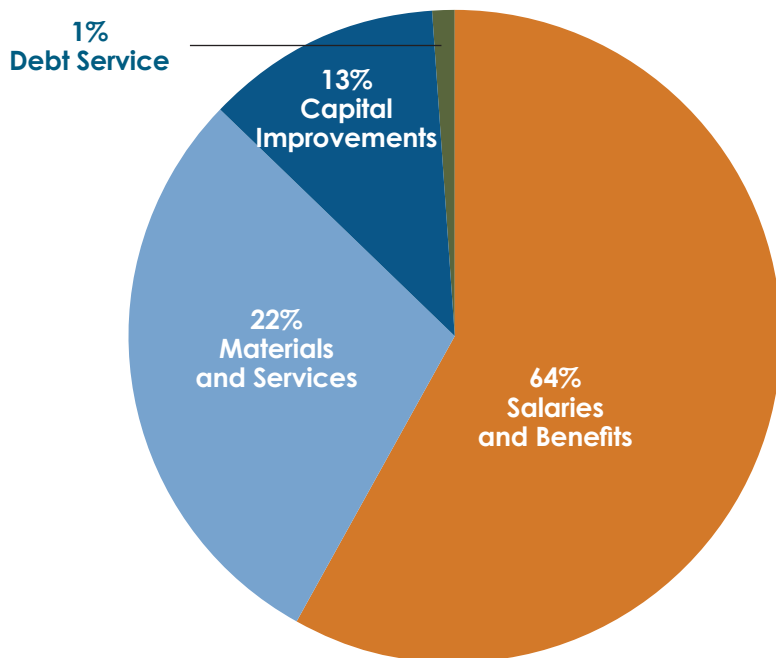


**20** full-time staff  
**9** seasonal staff



View the full Annual Comprehensive Financial Report at [www.smcmvcd.org/ACFR](http://www.smcmvcd.org/ACFR)

### Expenditures for Fiscal Year 2020-21



# Our Staff



## ADMINISTRATION

Brian Weber, *District Manager*  
Richard Arrow, CPA, *Finance Director*  
David Kwan, *Information Technology Director*  
Mary Leong, *Accountant*  
Rachel Curtis-Robles, PhD,  
*Public Health Education and Outreach Officer*  
Devina Walker, *Office Administrator*  
Paul Weber, *Facility Maintenance Coordinator*

## LABORATORY

Angie Nakano, MS, *Laboratory Director*  
Arielle Crews, MS, *Vector Ecologist*  
Tara Roth, PhD, *Vector Ecologist*  
Theresa Shelton, MSc, *Laboratory Technician*



## OPERATIONS

Casey Stevenson, *Field Operations Director*

Ryan Thorndike, *Field Operations Supervisor*

David Allen, *Vector Control Technician*

Walter Bruj, *Vector Control Technician*

Stephanie Busam, *Vector Control Technician*

Eric Eckstein, *Vector Control Technician*

Sean Jones,

*Vector Control Technician-Mechanic*

Kim Keyser, *Vector Control Technician*

Devon MacDonald, *Vector Control Technician*

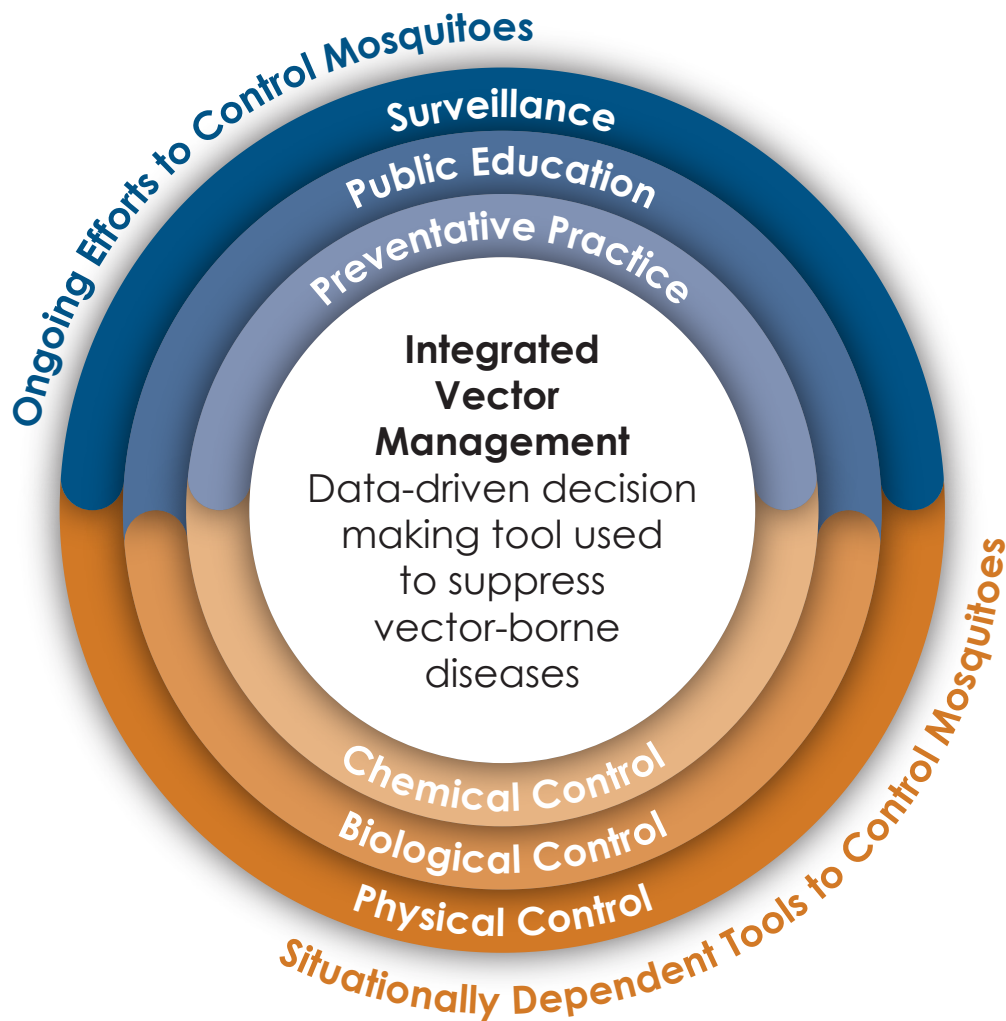
Evan Ostermann, *Vector Control Technician*

# CORE MOSQUITO CONTROL SERVICES



# INTEGRATED VECTOR MANAGEMENT

**Integrated Vector Management (IVM)** is core to the District's work. Through a multi-component, science-based program, we can make evidence-based decisions to mitigate vectors and vector-borne diseases in our County. IVM has six core components that synergistically support each other for optimal vector control.



The District's use of each of these six components is outlined on the following pages

<< Vector Control Technician Evan checks a water sample for mosquito larvae.

## SURVEILLANCE

Mosquito abundance and disease surveillance data enable the District to make informed decisions about where to focus resources and what level of intervention is required

### WEST NILE VIRUS

West Nile virus is transmitted through the bite of an infected mosquito. The District conducts surveillance for infected mosquitoes as part of our core work. Mosquitoes become infected by feeding on infected birds. Some species of birds are very sensitive to infection and die—public reports of dead birds are very helpful to our surveillance efforts.

- **Mosquito trapping.** District staff set over 1,552 carbon dioxide-baited traps (designed to capture adult mosquitoes), which collected 37,737 mosquitoes (yes, we counted every single one!). 3,414 mosquitoes were grouped into 127 pools for testing for West Nile virus and other mosquito-borne pathogens. No detections of West Nile virus occurred in San Mateo County in 2021.
- **Sentinel chickens.** Chickens do not become ill when infected with WNV, but antibodies can be detected in their blood after an infection. District staff maintained 2 flocks of surveillance chickens. The chickens were tested for WNV and other viruses every two weeks during the summer – a total of 168 tests. No chickens were positive for West Nile virus in 2021.
- **Public reports of dead birds.** A total of 302 dead birds were reported by the public; 97 of these were suitable for testing. No WNV was detected in any samples.
- **Novel trap design.** Staff tested a prototype of an in-house designed trap to capture elusive tulle mosquito larvae (*Culex erythrothorax*), which are a West Nile virus vector. Improved traps can greatly enhance our surveillance abilities.



Vector Control Technician Stephanie sets a carbon-dioxide baited trap to capture adult mosquitoes to test for WNV.



Vector Ecologist Theresa was among staff caring for our chickens that were tested for West Nile virus every two weeks.

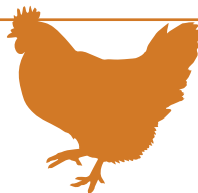
### MOSQUITOES

37,737 trapped & counted  
3,414 tested  
0 positive for viruses



### CHICKENS

2 flocks  
168 samples tested  
0 positive for West Nile virus



### DEAD BIRDS

302 reported  
97 testable  
0 positive for West Nile virus

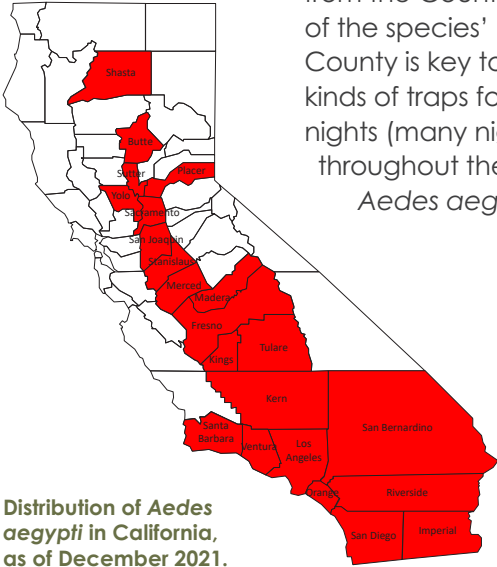


Vector Ecologist Tara sets a novel trap designed to capture tulle mosquito larvae.

### INVASIVE SPECIES

*Aedes aegypti*, a mosquito that can transmit dengue, chikungunya, yellow fever, and Zika virus, is rapidly spreading through California.

*Aedes aegypti* was detected in San Mateo County in 2013. However, after an intensive effort by District staff, the species was eradicated from the County in 2015. Early detection of the species' presence in San Mateo County is key to control efforts. Staff set two kinds of traps for a total of over 15,000 trap-nights (many nights had multiple traps set throughout the County) and no evidence of *Aedes aegypti* was detected.



Distribution of *Aedes aegypti* in California, as of December 2021.



*Aedes* mosquitoes have noticeable black and white markings on their bodies and legs.



Actual Size: About 1/4 inch long

*Aedes* traps are simple in design — a dark container with a bit of water encourages females to lay their eggs on a paper in the container. Staff retrieve the papers and inspect for eggs.



### INVASIVE AEDES SURVEILLANCE

>15,000 trap nights

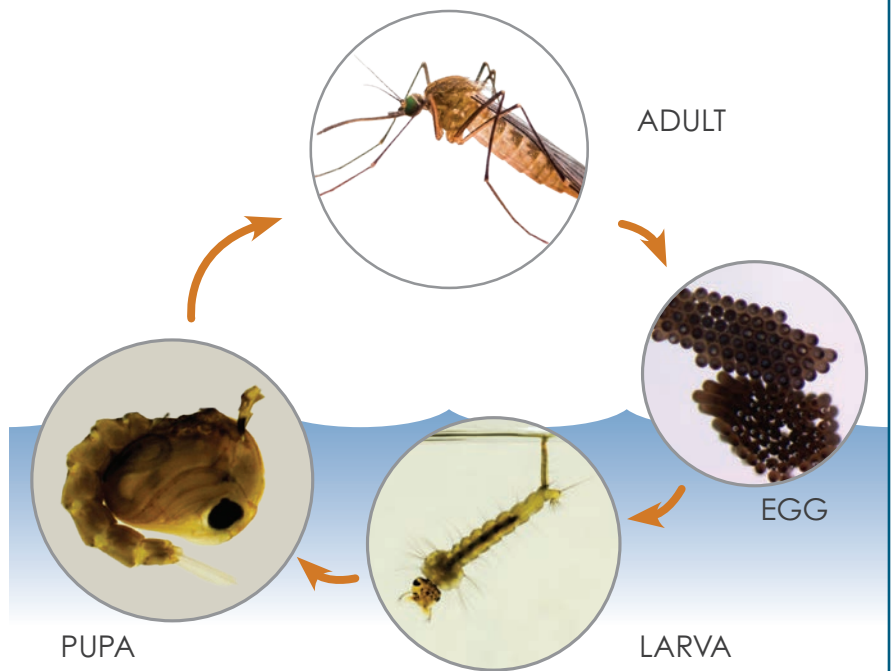
0 invasive *Aedes* detected



### MOSQUITO LIFE CYCLE

Mosquitoes need water to develop! The first three stages of the mosquito life cycle - egg, larva, and pupa - are spent in the water.

Our surveillance focuses heavily on sampling standing water to look for larvae. Control efforts are most effective when applied to water sources.



## PUBLIC EDUCATION AND PREVENTATIVE PRACTICES

Outreach education encourages the public to protect themselves from mosquito bites and prevent mosquito breeding. Preventative practices include integrating strategies into local planning activities to encourage good water management and mosquito-prevention habits.

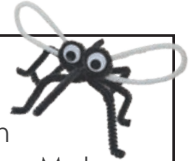
- District staff provided educational presentations and materials at events throughout the County in 2021. We collaborated with San Mateo County Libraries, San Mateo County Parks, San Mateo County Office of Education, and scouting groups to reach children throughout the District. We also presented at various town/city meetings and the San Mateo County Civics 101 community education series in the fall of 2021.
- Staff worked with several preschools and school districts to provide outdoor presentations to students. COVID-19 safety protocols resulted in necessary flexibility in scheduling, but District staff coordinated carefully on a school-by-school basis to bring mosquito education to local children.

26 OUTREACH EVENTS  
reached over  
2,000 RESIDENTS



### MOSQUITO CRAFT KITS

1,000 distributed in partnership with San Mateo County Library system



 **Are you growing MOSQUITOES in your yard?**

Dump water once a week and scrub items clean (some mosquitoes have sticky eggs!). The District can help with larger sources like ponds and fountains – contact us to learn more!



MOSQUITOES ONLY NEED A TINY BIT OF WATER TO GROW – EVEN A BOTTLE CAP CAN GROW MOSQUITOS!

(650) 344-8592 • [www.smcmvcd.org](http://www.smcmvcd.org)

Outreach materials include standing water sources awareness.



Hands-on activities are a core part of our youth outreach programs.

## BLOCK THE BITE

Protect yourself and your family by using an effective, EPA-registered mosquito repellent

DEET

Picaridin

Oil of  
Lemon  
Eucalyptus

IR3535

(650) 344-8592 • [smcmvcd.org](http://smcmvcd.org)



An educational campaign about insect repellents was run on SamTrans bus interiors and exteriors in 2021.



## PHYSICAL, BIOLOGICAL, AND CHEMICAL CONTROL

A multi-component approach allow us to control mosquitoes in a variety of situation-dependent ways.

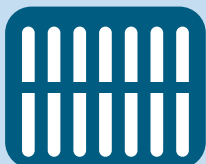
A robust surveillance system is key to quickly detecting mosquito issues. When mosquitoes are detected, we have a variety of tools in our IVM toolbox:

- **Physical control** issues can include altering areas to not hold water where mosquitoes can breed. Drilling holes in old water features, cutting back plants or deepening sections of creeks to help water run, and other methods are examples of physical control. Manual deepening of channels in marshes to allow tide water to freely flow was an important part of mosquito control history; today our staff regularly check Bair Island marshes for larval mosquitoes to prevent mosquito breeding.
- **Biological control** includes our robust mosquitofish program, which provides these voracious little fish to residents with artificial water features or unkept swimming pools. In addition, some of the larvacides we use contain bacteria that control mosquito populations.
- **Chemical control** is generally reserved for situations in which other methods are non-optimal. Chemical pesticides are only applied by our certified vector control technicians.

### CATCH BASINS

Storm drain systems contain “catch basins,” which are designed to catch sediment and have a sump area which is lower than the rest of the drainage system. During winter months, storm drain systems are flushed out regularly by winter rainstorms. However, during the summer, water collects in the basins when residents water their lawns or wash their cars. This underground water stands long enough for mosquitoes to breed in catch basins.

There are over 80,000 catch basins within the District and each has the potential to produce vast numbers of mosquito larvae. In particular, the *Culex pipiens* mosquito that is a main West Nile virus vector prefers to breed in these catch basins. Therefore the District hires seasonal mosquito control technicians to help treat catch basins during the summer months, applying a refined mineral oil in catch basins from right-hand drive Jeeps.



**34,298 storm drains** were treated every two weeks during the summer of 2021, totaling **286,823 treatments** to prevent mosquitoes from breeding.



Vector Control Technician Kim drills holes in an old decorative water feature at the request of a resident to help reduce water where mosquitoes can breed.



Mosquitofish are small but can eat hundreds of mosquito larvae every day.



Vector Control Technician Walter applies an oil-based larvacide to a storm drain to control mosquitoes.

# RESIDENT SERVICE REQUESTS



# SERVICE REQUESTS

## Resident Services

Residents can request a variety of services provided by the District. Staff typically visit the location within one business day to address the issue. If the issue is complex - such as mosquitoes coming from an unknown source - staff work diligently in the surrounding area to find and resolve the issue.

In 2021, the most frequently requested service was removal/treatment of yellowjacket and wasp nests. Yellowjacket activity usually peaks between July and September, resulting in some very busy months for our technicians!

As in previous years, the majority of service requests were received over the summer, with a seasonal peak occurring during late summer as the area's warmest temperatures boosted mosquito populations and allowed yellowjacket and wasp activity to rise, resulting in dozens of resident service requests during the warmest months of the year.

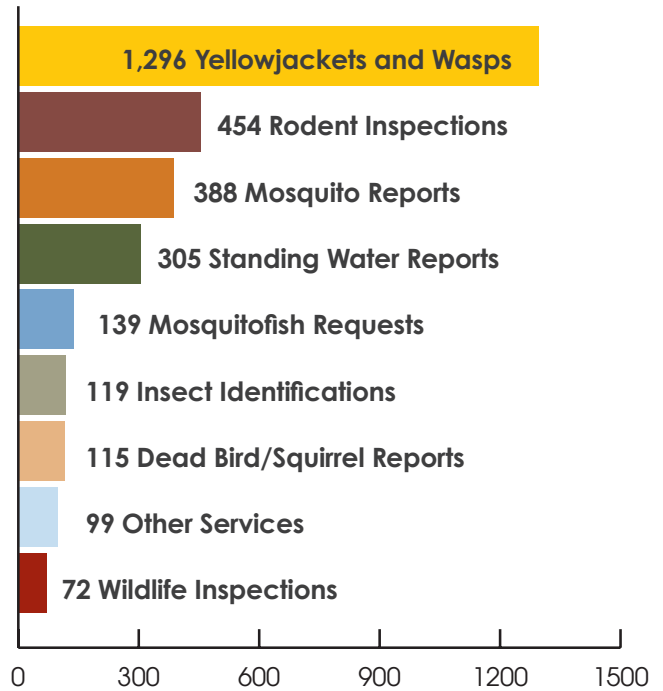
To submit a service request, visit [www.smcmvcd.org/request-service](http://www.smcmvcd.org/request-service).



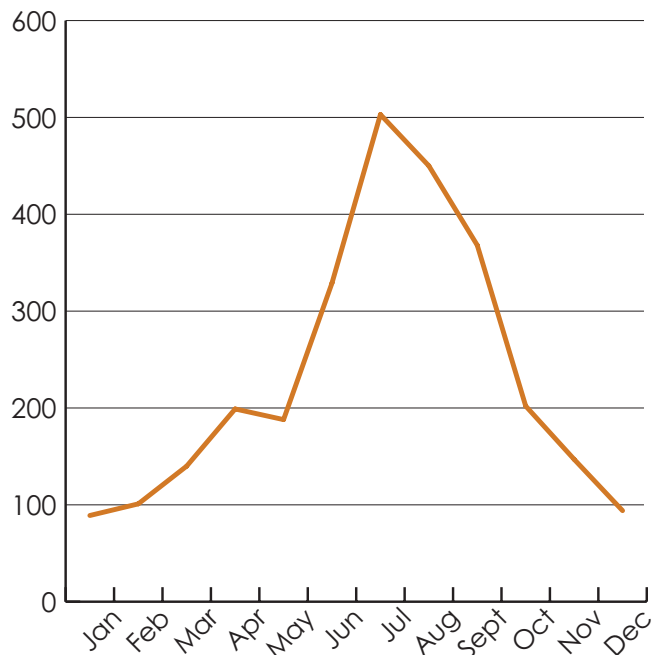
Vector Control Technician Ryan returning from a resident-requested service request.

<< Vector Control Technician Sean prepares mosquitofish for a resident to place in their decorative pond - the fish will eat larval mosquitoes.

## Service requests in 2021



## Service requests peak in the warm summer months

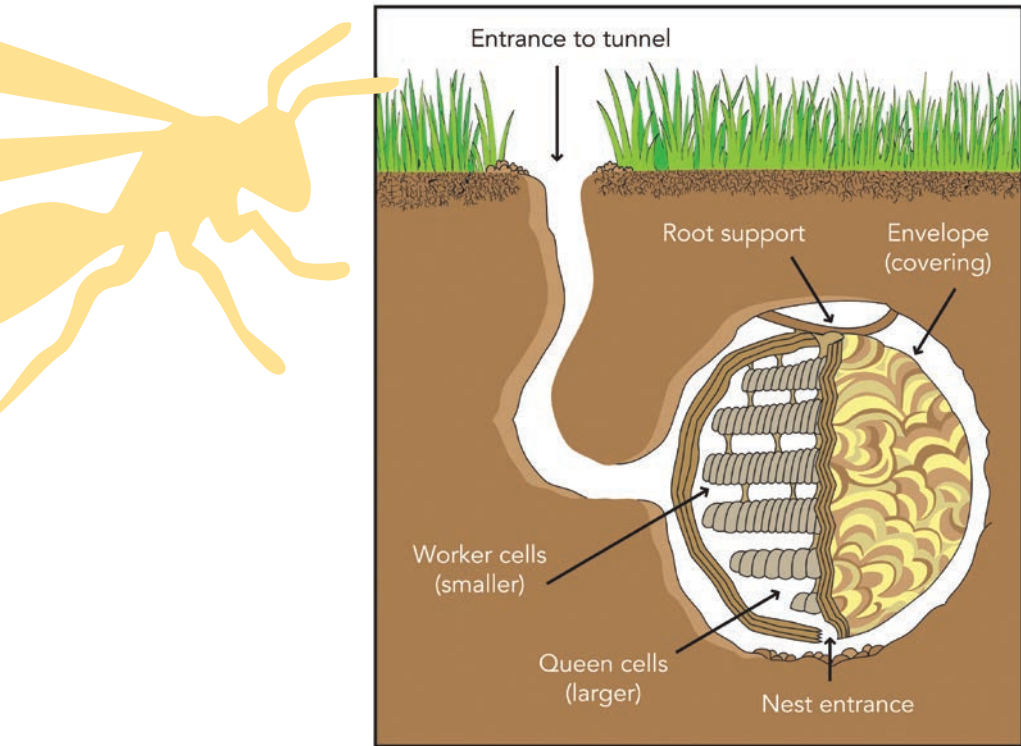


## Yellowjackets

During the summer months, one of the District's most requested services is the control of yellowjackets on private and public property. Yellowjackets are medium-sized black wasps with yellow markings. There are several species of yellowjackets: some build nests aboveground in trees, or under the eaves of houses, other build nests below ground in burrows or holes. Yellowjackets are often very aggressive if their nest is disturbed.

The District can treat outdoor yellowjacket nests if the location of the nest is known. Nests are commonly hidden in dense vegetation, wood piles, utility vaults, or rock walls. When a resident knows the location of the nest entrance, they can submit a service request for a technician to visit to treat the nest at [www.smcmvcd.org/request-service](http://www.smcmvcd.org/request-service)

To learn more about yellowjackets and other kinds of wasps, visit [www.smcmvcd.org/yellowjackets-and-wasps](http://www.smcmvcd.org/yellowjackets-and-wasps)



The small entrance of a yellowjacket ground nest is deceptive – the narrow opening usually leads to a large nest! Image courtesy of Marin-Sonoma Mosquito and Vector Control District



This small yellowjacket larva is likely just one of thousands in a large yellowjacket nest.



Operations Supervisor Casey finds the entrance of a yellowjacket nest in the ground to apply an insecticide.



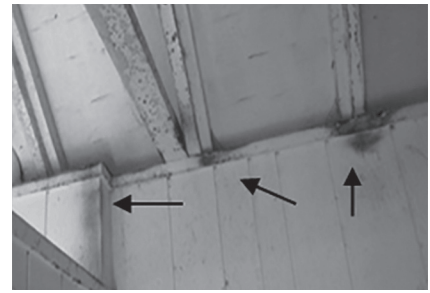
Vector Control Technician Ryan trims vegetation to access an underground yellowjacket nest.

## Rodent Inspections

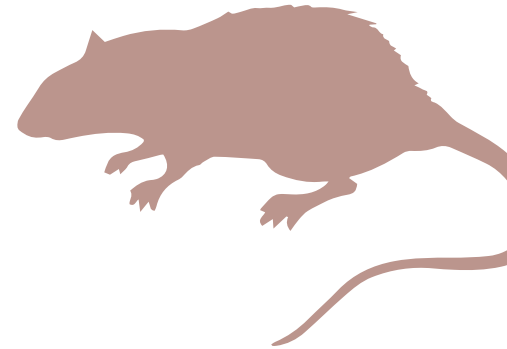
Rodents inspections are a popular service year-round, as residents request professional assistance in identifying how rats and mice may be entering their homes. Residents can request a District technician to visit their property for an inspection that generates a helpful, customized report. The report lists possible rodent/wildlife entry points, types of attractants around the property, and tips on modifications that can be made to deter rodents and wildlife from visiting the property and entering the home. Some residents request inspections prior to hiring a private pest control company to conduct the modifications, while others choose to make minor modifications and fixes themselves.

District staff do not conduct any rodent or wildlife trapping on private property, and staff do not provide exclusion work (covering holes in vent screens, fixing structures, etc.). However, our inspection service can be very helpful to residents dealing with a current rodent issue or hoping to prevent a future issue.

To learn more, visit [www.smcmvcd.org/rodent-prevention-and-control](http://www.smcmvcd.org/rodent-prevention-and-control)



Oils from rat fur are left on the surfaces they run near – rub marks are a sign that you might need a rodent inspection.

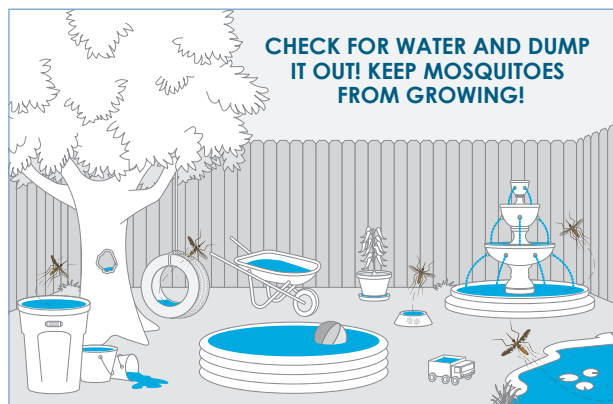


## Mosquitoes and Standing Water

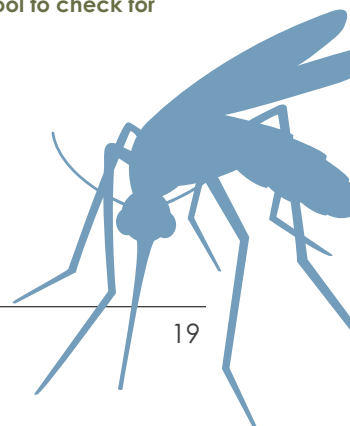
The District's core mosquito control work focuses on known and large standing water sources. When residents notice an usual number of mosquitoes around their home, they can request a technician visit to inspect and determine where the water source may be.

In some cases, the source is a neglected pool or container holding water. In other cases, a broken water or sewer pipe under a building is causing an issue. Land subsidence under buildings is an issue in certain parts of the County as well. In many cases, residents can play an active part in reducing mosquito breeding sites around their homes. Dumping and draining water around the yard at least once a week can drastically reduce mosquito breeding areas.

Our technicians carefully inspect all possible sources in the area to find the source and then control the mosquitoes using IVM.



Vector Control Technician David dips water from an old pool to check for mosquito larvae.



## Mosquitofish

Mosquitofish (*Gambusia affinis*) are live-bearing fresh water fish. These small fish are only 1-2 inches long, but they can eat several hundred mosquito larvae a day. The District provides mosquitofish at no cost for control of mosquitoes in ponds, fountains, and abandoned swimming pools on private property. Mosquitofish must NOT be placed in natural water sources where they can reach creeks and other waterways.

A few fish go a long way - Many people are surprised that only 4-8 fish are usually provided. Mosquitofish will die if too crowded, and they are efficient at reproducing to fit the space where they are placed.

If you live in San Mateo County, you can submit a service request online or via phone for a technician to deliver mosquitofish to your property.



Mosquitofish can eat several hundred mosquito larvae a day.

## Insect Identification

District entomologists can help identify insects and other arthropods and provide information on whether the insect is harmful and how to control it. Samples can be submitted in a variety of ways:

- You may email photos to [info@smcmvcd.org](mailto:info@smcmvcd.org) for our entomologists to review. Not all insects can be identified from a photograph, so save the sample in case we need it later.
- You may drop off a sample at our District office in Burlingame anytime we are open. Call or visit our website to learn what types of samples are accepted: [www.smcmvcd.org/insect-identification](http://www.smcmvcd.org/insect-identification)
- If you'd like a technician to pick up a sample from your house, you can fill out a service request online or call to request a sample pick-up.



Laboratory Director Angie uses a dissecting scope to identify an insect for a resident.

## HIGHLY TRAINED STAFF ARE CRITICAL TO OUR WORK

Our field and laboratory staff maintain Vector Control Technician certifications from the California Department of Public Health. The certification process starts with four separate tests covering extensive material in each of the following categories: **Pesticide Application and Safety, Biology and Control of Mosquitoes in California, Arthropods of Public Health Significance in California,** and **Vertebrates of Public Health Importance in California.** To learn more visit [www.smcmvcd.org/staff-training-and-certification](http://www.smcmvcd.org/staff-training-and-certification).

Certified Vector Control Technicians maintain their certification by completing at least 36 hours of continuing education units (CEUs) every two years.



In 2021, District staff completed over 280 hours of training.

## POST-SERVICE SURVEY FEEDBACK

After a service request is completed, the resident may fill out a survey asking about their experience. Residents are generally very pleased with our services, and many continue to request other kinds of services over subsequent years.

4.9 ★ Average rating [out of 5]



Based on post-service request survey

### Top words in resident comments about District services

- Service
- Thank you
- Great
- Helpful
- Prompt



### Residents' Remarks

“I was impressed that my problem was taken care of the day after I sent a message.”

“Very fast, educational and professional service.”

“I was very pleased with the speedy response in regard to my call and online form. The employee who attended to the yellowjacket nest was informative, kind, and thorough.”

# SURVEILLANCE FOR TICKS AND TICK-BORNE DISEASE

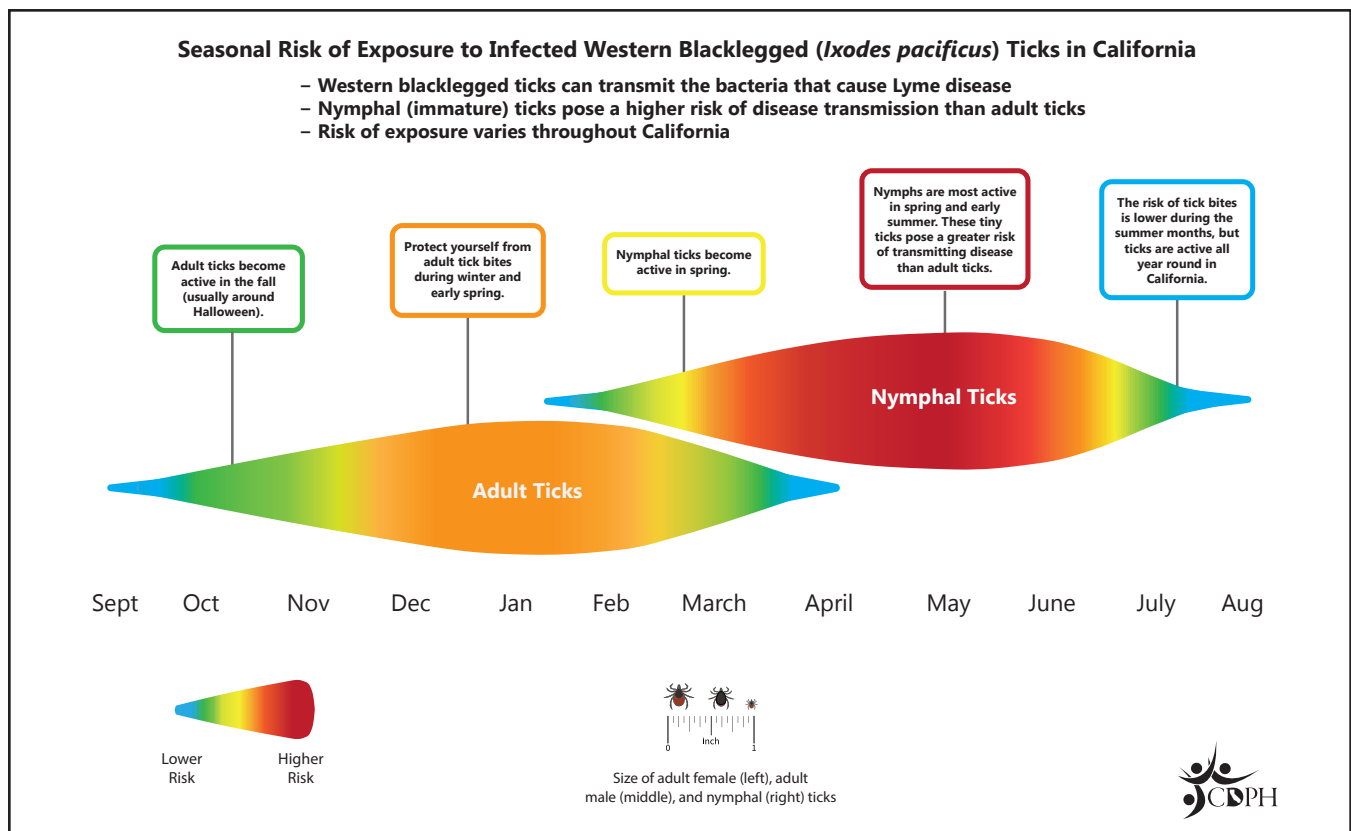
District staff collect ticks from December through June, as ticks collected during these months are most likely to bite humans. Staff use white cloths to drag along trail edges or through forest understories to collect questing ticks – ticks that are actively seeking hosts for blood meals. Ticks are picked off the cloths and returned to the laboratory where they are identified to species and tested for pathogens.

Real-time PCR is used to test western black-legged ticks (*Ixodes pacificus*) for three tick-borne pathogens found in California. Associated tick-borne diseases are Lyme disease (specifically the *Borrelia burgdorferi* sensu lato complex which includes *B. burgdorferi* sensu stricto, the agent of Lyme disease), hard-tick relapsing fever (caused by *Borrelia miyamotoi*), and human granulocytic anaplasmosis (HGA) (caused by *Anaplasma phagocytophilum*). All three diseases may be vectored by both nymphal and adult ticks.

Adult ticks are tested in groups, or “pools,” of a maximum of five individuals. The 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. As prevalence values are highly dependent on the number of ticks collected, we sample 150 or more adult ticks per park, which increases the chance that our sample will represent the true prevalence.

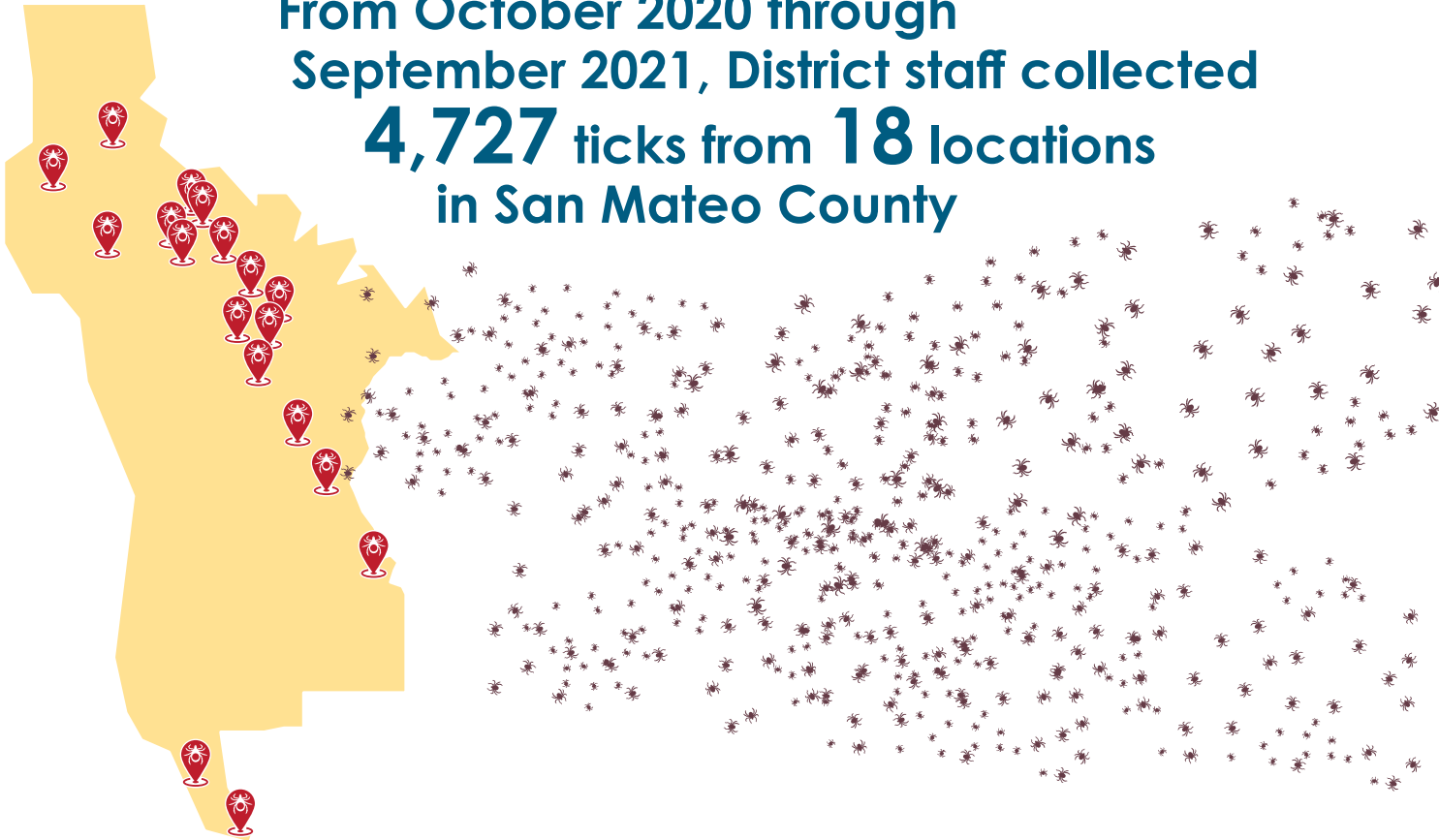


Vector Ecologist Arielle picks ticks off a white cloth after collecting questing ticks from along a trail edge

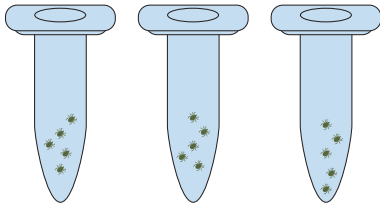




From October 2020 through  
September 2021, District staff collected  
**4,727** ticks from **18** locations  
in San Mateo County



Ticks were grouped into 982 pools of 1-5 ticks and tested for 3 pathogens:



**Bbsl:** *Borrelia burgdorferi sensu lato*, agent of Lyme disease

**Bm:** *Borrelia miyamotoi*, agent of *Borrelia miyamotoi* disease

**Ap:** *Anaplasma phagocytophilum*, agent of anaplasmosis

Based on the testing, staff determined minimum infection prevalences of:

~**0.6%** for **Bbsl**, agent of Lyme disease

~**0.7%** for **Bm**, agent of *Borrelia miyamotoi* disease

~**0.5%** for **Ap**, agent of anaplasmosis



**The risk of Lyme disease from a tick bite in San Mateo County is low**  
(minimum infection prevalence on the East Coast can be as high as 60%!)

Checking for and properly removing ticks are important steps to reducing risk.  
Learn more at [www.smcmvcd.org/preventing-tick-bites](http://www.smcmvcd.org/preventing-tick-bites)

## SPECIAL PROGRAMS

### RODENT CONTROL IN SEWERS AND CREEKS

In 2010, San Mateo County turned over a large portion of residential rodent control responsibilities 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 also contract directly with the District for rat control services along above-ground public storm control waterways and urban creekways. Between July and October of 2021, the District conducted 452 contracted rodent inspections and deployed 113 bait stations in San Carlos. In San Mateo, the District conducted 1,336 contracted inspections and deployed 334 bait stations. This work totaled 291 technician-hours for 2021.

### GENETIC ANALYSIS OF TWO SIMILAR SPECIES

Laboratory staff received *Anopheles hermsi* and *Anopheles freeborni* mosquitoes from other districts across the state for a project to use genetic identification to describe the ranges of these morphologically similar species. These mosquitoes are medically significant because of their ability to vector malaria. The information from this project will enhance mosquito knowledge across the state.

### INVASIVE CORDGRASS

*Spartina foliosa*, commonly known as cordgrass, is a native tall grass that grows in coastal salt marshes in San Mateo County. This native species is threatened by a rapidly spreading invasive species of cordgrass, *Spartina alterniflora*. The invasive species threatens key habitats important for shorebirds and other species that make their homes in marshes along the San Francisco Bay. To control the invasive cordgrass, the California Coastal Conservancy's San Francisco Estuary Invasive Spartina Project employs biologists focused on identifying and eliminating the invasive cordgrass. The District has assisted seasonally in summers for the past 17 years.

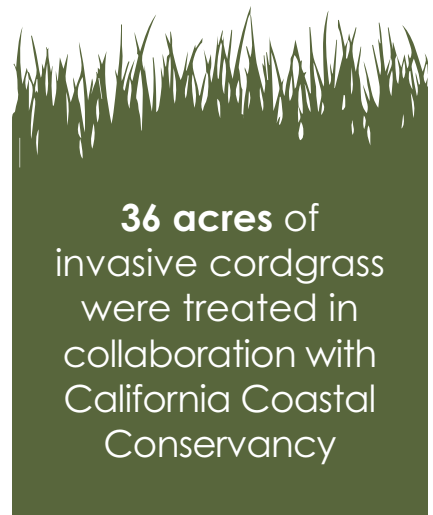
The District is uniquely suited to this collaboration because of our airboat, pesticide training, and familiarity with Bair Island from our mosquito control work. Controlling invasive cordgrass not only keeps the Bay habitats native, but can also reduce the potential for the invasive cordgrass to create additional mosquito breeding areas that would need control measures. The control work is physically intense, but also a rewarding way to support the native habitats of our County.



Vector Control Technician Eric checking a tamper-proof bait station.



Twenty mosquito control agencies contributed samples for this project in 2021.



**36 acres** of  
invasive cordgrass  
were treated in  
collaboration with  
California Coastal  
Conservancy

## PRESENTATIONS AND PUBLICATIONS IN 2021

**Assessing tick risk at schools in San Mateo County: Leveraging surveillance to improve tick safety education.** Presented at MVCAC 2021 conference by Angie Nakano; co-authors Tara Roth, Tina Sebay, Theresa Shelton, and Arielle Crews.

**Tools and techniques in rodent surveillance.** Presented at MVCAC 2021 conference by Tara Roth.

**Conducting physical control at residential mosquito sites.** Presented at MVCAC 2021 conference by Ryan Thorndike.

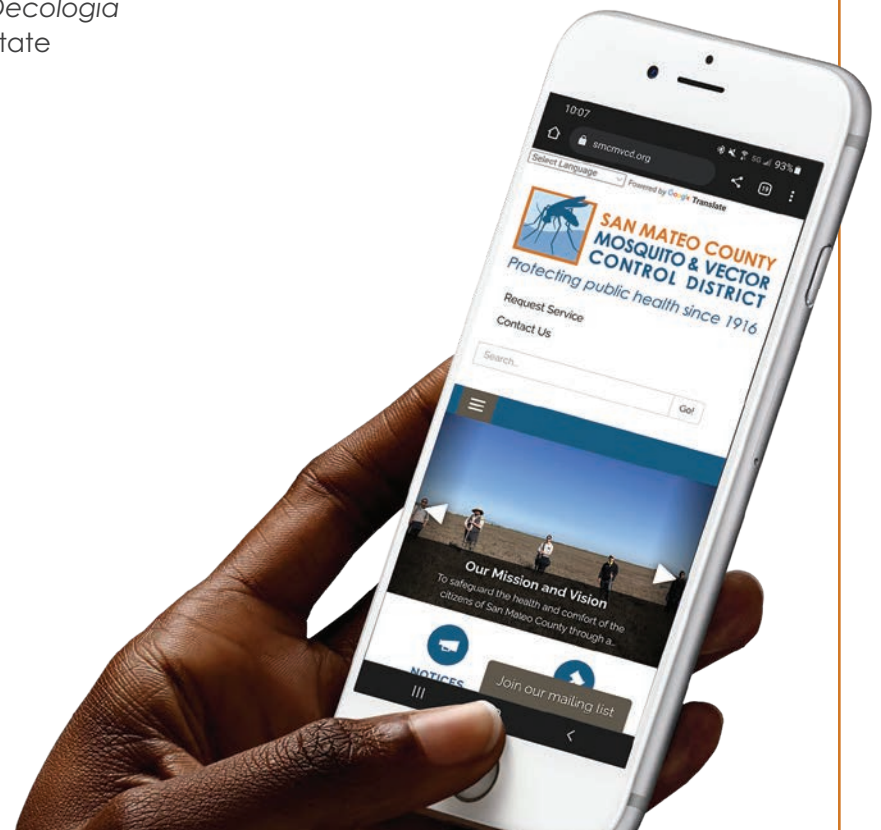
**Evolution of catch basin treatment equipment.** Presented at MVCAC 2021 conference by Sean Jones.

**Host infection and community composition predict vector burden.** Published in *Oecologia* by Arielle Crews and San Francisco State University researchers.

## OTHER 2021 EVENTS AND ACCOMPLISHMENTS

**A *Salmonella* outbreak** in the local Pine Siskin bird population caused an increase of dead bird reports in early 2021. These small birds are not typically affected by WNV, but the District was able to re-direct interested residents to California Department of Fish and Wildlife to learn more about how to prevent wild bird die-offs. Taking down bird feeders and frequent cleaning of bird baths can help to reduce disease transmission in song bird populations.

**The District website** was updated with a new look-and-feel in summer of 2021. The website now utilizes a built-in Google translation option, offers a more modern experience for mobile users, and more easily complies with Brown Act public transparency requirements and Section 508 accessibility standards for people with disabilities.



# OUR SERVICES



Mosquito Control



Mosquitofish



Insect and Tick Identification



Rodent Inspections



Yellowjacket Control



Community Education



Disease Surveillance



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

Monday-Friday  
8a.m. to 4:30p.m.  
[www.smcmvcd.org](http://www.smcmvcd.org)