

# ANNUAL REPORT

**SANTA CRUZ COUNTY  
MOSQUITO & VECTOR CONTROL**  
Agricultural Commissioner's Office

2023



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## STATEMENT FROM THE MANAGER

Thanks to the hard-working team at Santa Cruz County Mosquito & Vector Control, I am pleased to present our 2023 Annual Report.

The team remained dedicated to service in our community. Staff completed over 700 service calls (Service Requests) from the public, while maintaining nearly 3,500 locations that breed mosquitoes throughout the County. Additionally, the laboratory and surveillance team set over 700 mosquito traps in different neighborhoods in the community to monitor for local species that can carry West Nile virus and invasive species, such as *Aedes aegypti*, that are making their way through California.

This past summer, the invasive mosquito *Aedes aegypti* made major headlines in Southern California for locally transmitting Dengue fever-- showing for the first time since its introduction that it is more than just a nuisance mosquito, but a dangerous one as well. Locally, our staff continued to diligently monitor for this cryptic mosquito following the October 2022 detection in Watsonville. Although we thankfully did not find *Aedes aegypti* this season, it is known to lie dormant at times, so we remain vigilant with our surveillance efforts.

Overall, I am thankful for our team and the work they do to keep our community safe. I look forward to the year ahead as we continue to adapt to new changes, protect public health, and serve the beautiful county we live in.

A handwritten signature in black ink that reads "Amanda Poulsen". The signature is written in a cursive, flowing style.

Amanda Poulsen  
Assistant Vector Control Manager

# Our Mission



Santa Cruz County Mosquito & Vector Control (MVC) is committed to protecting the public from pests capable of transmitting disease or creating a nuisance. Our service, consultation, and education enable residents to resolve problems and protect themselves with a better understanding of vector biology, behavior, and vector-borne diseases. MVC was established in 1993 as a County Service Area program within the Agricultural Commissioner's Office in response to public interest in mosquito relief. In August 2005, residents voted to enhance our services to include other vectors, as well as expand our service area to the entire county.



# Our Team

The Santa Cruz County Mosquito and Vector Control team is dedicated to the protection of public health. Our team is comprised of five Vector Control Specialists, one Vector Ecologist, and our Assistant Vector Control Manager. We operate under our Director, the Santa Cruz County Agricultural Commissioner.

Each member of our staff brings a unique skillset that, together, form a highly efficient public service agency. It is our honor to serve the citizens of Santa Cruz County and educate them on vectors and vector borne disease. We work to empower our residents to take control of their health, homes, and families' safety.



**Stephen Bowling**  
Vector Control Specialist



**Michael Pini**  
Vector Control Specialist



**Steven Driscoll**  
Vector Control Specialist



**Emma McDonough**  
Vector Ecologist



**Ray Travers**  
Vector Control Specialist



**Nader Sidhom**  
Vector Control Specialist



**Amanda Poulsen**  
Assistant Vector Control Manager

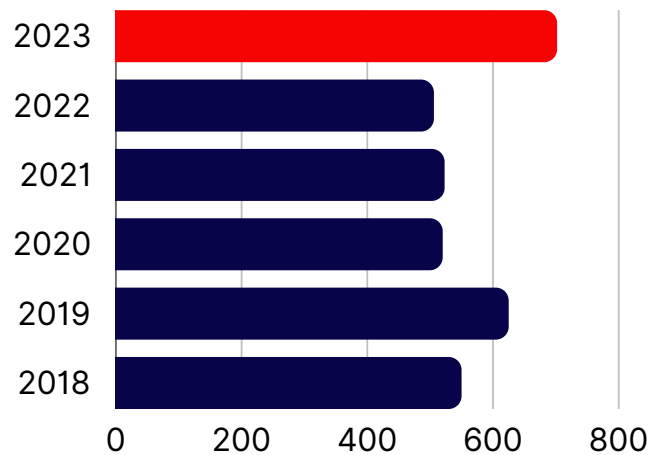


**Liam Ruff**  
Agricultural Bio. Seasonal Aide



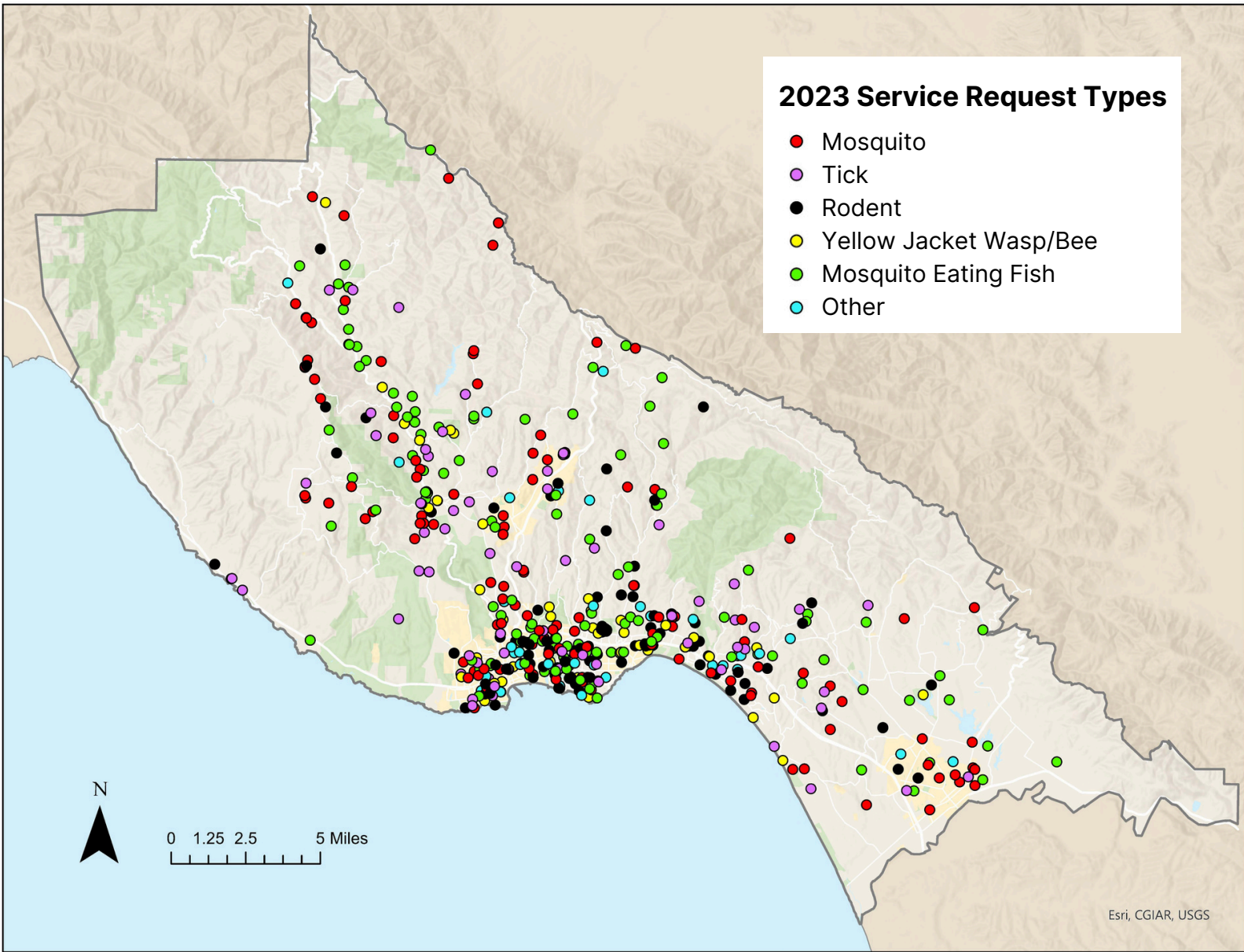
# In 2023, the demand for our services reached a record high.

Fig. 1: Service Requests in recent years.

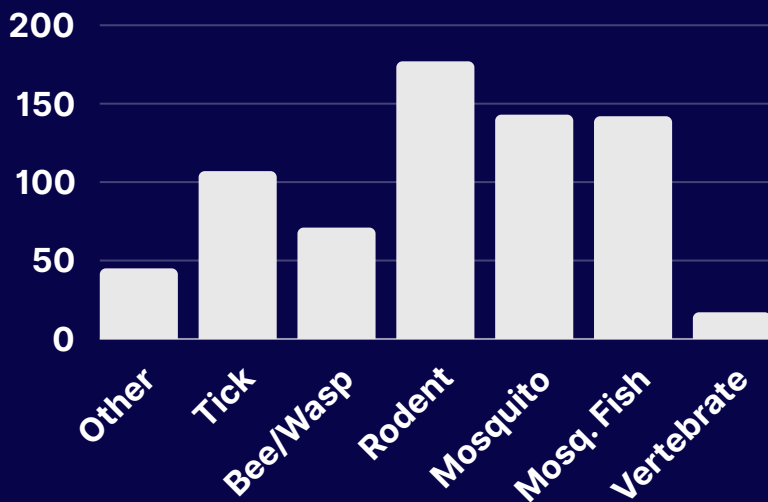


## Our Free Services:

- MOSQUITO CONTROL AND DISEASE SURVEILLANCE.
- MOSQUITO FISH DELIVERY FOR PONDS, ANIMAL TROUGHS, FOUNTAINS, AND UNUSED SWIMMING POOLS.
- TICK IDENTIFICATION, SURVEILLANCE AND DISEASE MONITORING.
- CONTROL OF YELLOW JACKET WASPS IN PUBLIC AREAS.
- RODENT EXCLUSION INSPECTIONS FOR HOMES & BUSINESSES.
- ADVICE ON BEES, BATS, RACCOONS, FLIES, BED BUGS, MITES, HEAD LICE, FLEAS, AND ANY OTHER PESTS.
- PUBLIC EDUCATION ABOUT VECTOR BIOLOGY AND CONTROL.



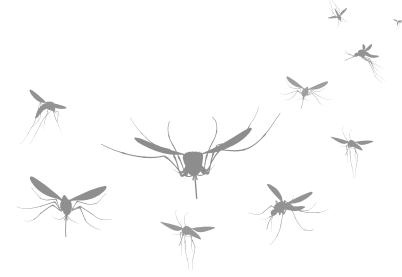
## Types of Service Requests in 2023



(Fig. 2)

SCCMVC responded to **702** requests for service in 2023. The public's requests for our services increased by 39% in 2023. Over 20% of all service requests involved mosquito issues, and 20% of requests were for mosquito eating fish deliveries. Rodent inspections comprised 25% of service requests, and tick identifications made up 15%. Service requests about bees and yellowjacket wasps made up 10% of calls. The "Other" category made up 10% of all service request calls, which included: mysterious biting/itching, mites, fleas, bedbugs, spiders, bats, various vertebrates and invertebrates, and unknown parasites (Fig. 2)

# Mosquito Control



Decisions to control mosquitoes are made based on their species, abundance, potential to vector diseases, proximity to humans, and the presence of natural predators or protected wildlife species.

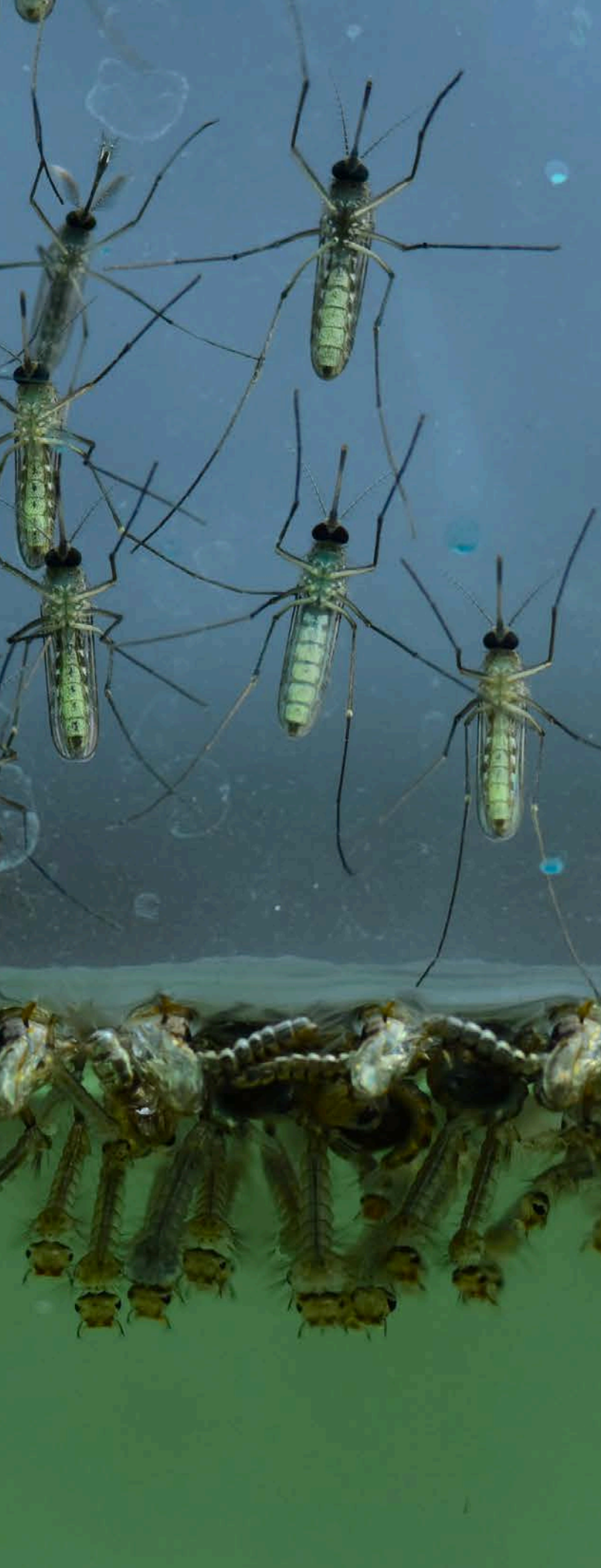
Minimizing mosquito breeding potential is paramount to mosquito control. We provide water management advice to residents, stock mosquito-eating fish for backyard ponds, and consult on new development projects in the County. If mosquito breeding in an area reaches intervention thresholds, we apply low-toxicity larvicides to the water so the mosquito larvae do not develop into adults. In 2023 we treated

3,427 larval breeding sources. When controlling mosquitoes in the larval stage is not feasible, as with adult tree-hole breeding mosquitoes, we employ other methods like applying garlic oil-based sugar bait barrier treatments to shrubbery.

Targeting adult mosquitoes is a last resort for our program, as control of larvae is more selective and efficient. Wide area spraying (the dispersal of products via micro-droplets into the air) is not part of our current program and would require approval by the County Board of Supervisors as part of the Emergency Disease Response Plan.







# Disease Monitoring

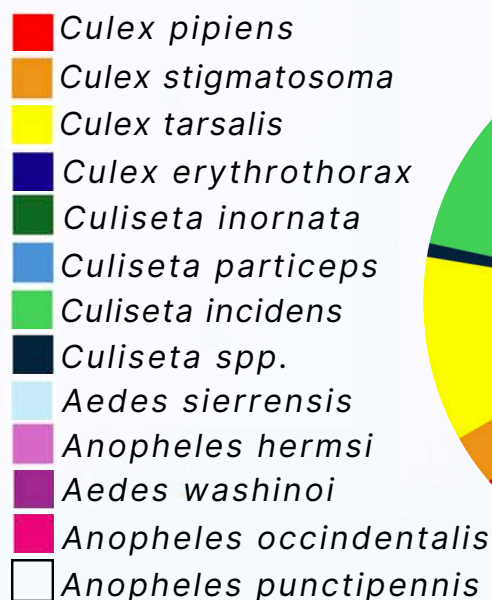


Several types of traps were utilized to collect adult mosquitoes for population and disease monitoring. Nearly 700 CO<sub>2</sub>-baited and 53 gravid traps were deployed from March to November 2023, in which nearly 14,000 adult mosquitoes were captured. Weekly trap data enables our staff to focus our control efforts on high-risk areas.

Of the species in our county capable of transmitting West Nile Virus (WNV) to humans, *Culex pipiens* made up 7% (n = 947) and *Culex tarsalis* made up 11% (n = 1,456) of all mosquitoes caught. *Culex erythrothorax* were the most numerous as they made up 48% (n=6,526) of total mosquitoes caught (Fig. 3).

Of the 91 pools of mosquitoes that were submitted to CDPH for WNV, Saint Louis Encephalitis Virus, and Equine Encephalitis Virus testing, none were positive for any disease. Of the 44 dead birds that were reported by the public for WNV testing, none were positive.

## Total Adult Mosquitoes Caught by Species

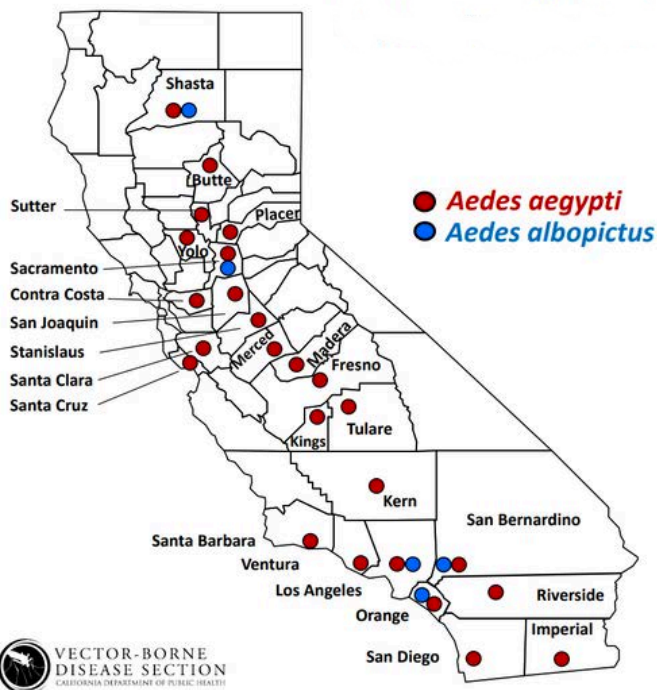


(Fig. 3)

# INVASIVE MOSQUITO: *Aedes Aegypti*

On October 13, 2022, we detected invasive *Aedes aegypti* (Yellow Fever Mosquito) mosquitoes in Watsonville. It was the first detection in Santa Cruz County. This is an aggressive, day-biting mosquito capable of transmitting Zika Virus, Dengue, Chikungunya, and Yellow Fever. These viruses are not currently present in Santa Cruz County, but local transmission of Dengue did occur in Southern California in 2023. Upon detecting the mosquito in a service request trap, we immediately responded with multiple rounds of door-to-door property inspections, educational mail-outs, and high-density trap deployment.

Our swift and thorough response in 2022 led to no detections in 2023. 2023 trap surveillance within a 250m radius of the initial detection site included: deploying 120 In2cares, using 3 BG Sentinels for constant monitoring with human scent lure (plus weekly dry ice inoculations for 20 weeks), setting 121 EVS with human lure, and inspecting 33 Ovicups biweekly for 17 weeks. We also conducted door-to-door property inspections every 6 weeks from April to November. We spent 30 days inspecting and servicing 575 specialized traps.

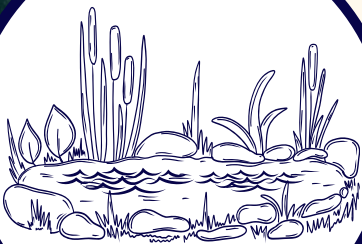


Data from our surveillance efforts so far indicate that the infestation is isolated, but still has the potential to spread. Our next steps include the Integrated Pest Management (IPM) strategies of monitoring their population, continuing yard inspections, and treating water-holding containers in backyards to prevent the immature stages of the mosquito from developing into adults.

The California Department of Public Health requires us to maintain eradication efforts and monitoring for 2 years. Residents must be vigilant in eliminating standing water from their property to prevent mosquito breeding as we fight the establishment of *Aedes aegypti* in Santa Cruz County.

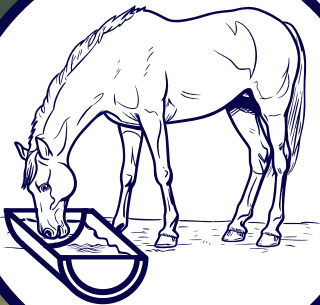


# Mosquito Fish



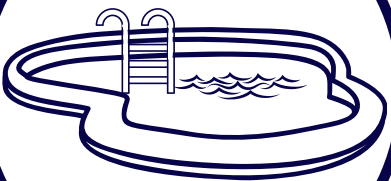
## Control Mosquitoes at Home

Mosquito fish (*Gambusia affinis*) provide excellent control of mosquito larvae in many backyard water sources. They work well in ponds, fountains, animal troughs, and unused swimming pools. In the warmer months, they eat larva. In the winter, they eat fish food.



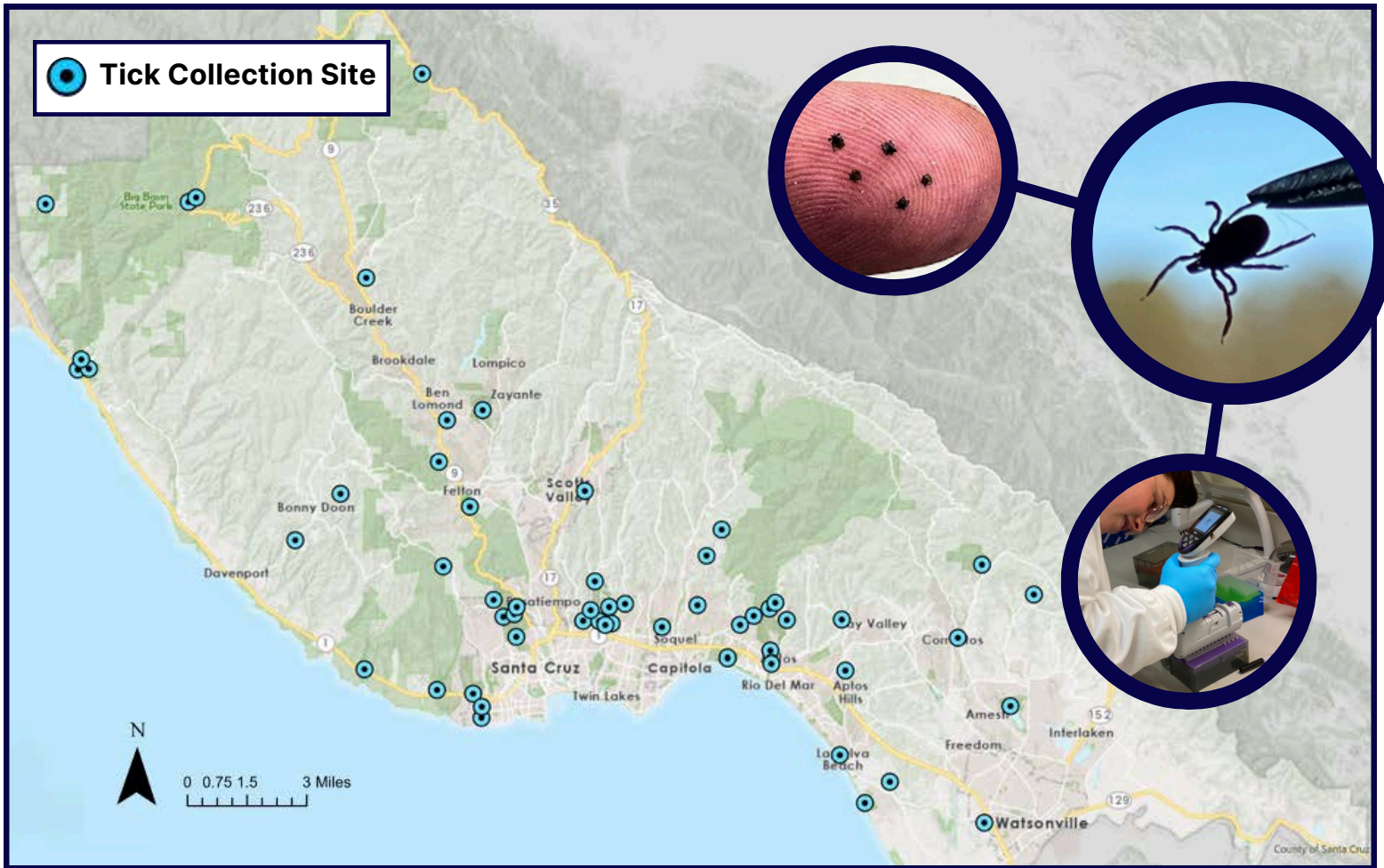
## Biological Control

Mosquito fish are an important part of our Intergrated Vector Managment toolkit. Their use in Santa Cruz County pre-dates our program, having been established statewide for several decades. Each adult fish can eat hundreds of mosquito larva per day.



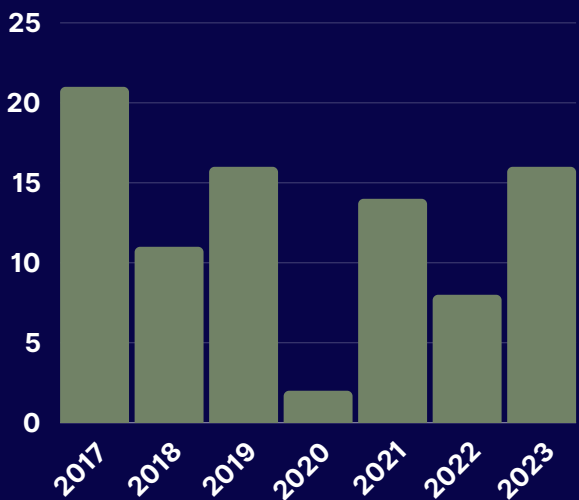
## Free Delivery

Mosquito fish help us do our job, so we deliver them to your door. Delivery helps us know where our fish end up. Because they are not a native species, we don't put them in natural water bodies where they may compete with our native fish and amphibians.



## HUMAN CASES OF LYME DISEASE

Reported to the Public Health Department in Santa Cruz County over the past 7 years.



# TICKS and Lyme Disease

Lyme Disease is the most important vector borne disease in Santa Cruz County. In 2023, we responded to 107 tick service requests, 9 of which were referrals from doctors. We provide both in-person and photo identification of ticks to determine species, life stage, and sex. We provide in-depth consultation on associated disease transmission risk and Lyme disease testing resources. We post warning signs in recreational areas of high tick exposure and collect ticks from various places throughout the county to assess species diversity, abundance, and pathogen prevalence. Lyme Disease is transmitted by the bite of an infected Western Black-Legged tick (*Ixodes pacificus*). In 2023, we collected 559 adult *Ixodes pacificus* ticks from all over the county and tested them in our laboratory. Of those, 5 were positive for *Borrelia burgdorferi* the bacterial agent of Lyme Disease, or *Borrelia miyamotoi* which can cause related bacterial disease. All test results are reported to the California Department of Public Health. Santa Cruz had 16 confirmed human cases of Lyme disease in 2023; slightly more than the 7 year average of 13 cases per year.



# RODENTS

Call us for free inspection and advice.



## We offer free exterior rodent inspections for:

- Houses
- Mobile Homes
- Condos/Apartments
- Businesses
- New developments
- Chicken Coops

We also provide in-depth consultations on rodent eradication and exclusion methods, empowering Santa Cruz residents with the knowledge needed to solve their rodent issues. When additional assistance with exclusion work is desired, we refer residents to local pest control operators. Rodents and their ectoparasites can spread

diseases to human beings including: Bubonic Plague, Salmonellosis, Rat-Bite Fever, Tularemia, Leptospirosis, Hantavirus Pulmonary Syndrome, and more. Rodent control should be taken seriously as they can also destroy personal property and cause electrical fires by chewing on wires. Exclusion and sanitation are most effective in preventing rodent activity in the home. In 2023, 25% of our service requests regarded rodents, primarily rats. Our staff performed 177 rodent inspections this year, an increase of 74% from 2022.

# OTHER PESTS



Santa Cruz County Mosquito and Vector Control offers laboratory identification for all biting or nuisance pests, alongside expert consultation services to help residents effectively manage and eradicate infestations. We commonly provide advice on bed bugs, various species of mites, biting flies, cockroaches, lice, fleas, or any source of mysterious biting or itching. If it is capable of spreading disease or causing significant discomfort, we can help.

One initiative of 2023 included assisting our Santa Cruz County Public Works, Sewer and Water Division in efforts to control American cockroach infestations in the sewer systems, which included treating approximately 25 sewage inlets. Cockroaches can cause allergies, food poisoning, dysentery, & childhood asthma.



**...itchy?  
Call us.**



# Serving our Community

For full details on the MVC budget, see the County website: <http://www.sccvision.us>, under "Department Budgets" and "Agricultural Commissioner".

SCCMVC provides free services funded by a special benefits assessment that appears on your property bill. For rates, please visit our website: [www.agdept.com/mvc.html](http://www.agdept.com/mvc.html) MVC cooperates with the Santa Cruz County Integrated Pest Management Departmental Advisory Group and receives oversight from the CA Department of Public Health and the Agricultural Commissioner. MVC applies aquatic larvicides under a National Pollution

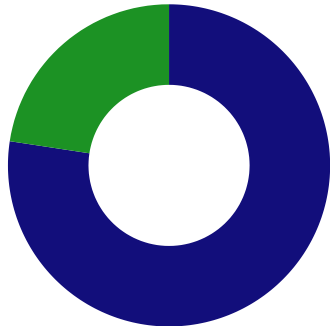
Discharge Elimination System permit as required in waters of the United States, and reports use to the State Water Resources Control Board (WRCB) and County Agricultural Commissioner. MVC has a Mosquito Management Plan on file with WRCB, state and federal Fish and Wildlife agencies. We comply with Water Quality Control Board requirements, and are in a Cooperative Agreement with the CA Department of Public Health.





# Budget for Fiscal Year 2023-2024

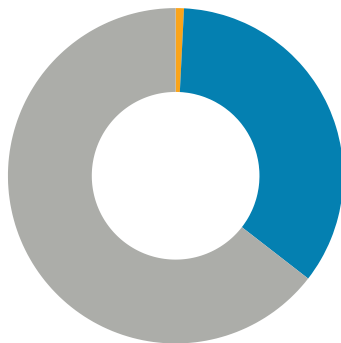
Santa Cruz County Mosquito & Vector Control is funded by Benefit Assessments: North County Mosquito and Disease Control Assessment (CSA 53-North) established in 2005, the original South County Mosquito Abatement/Vector Control Assessment (CSA 53) established in 1993, and the supplemental South County Mosquito and Disease Control Assessment (CSA 53-South) established in 2004.



### Approved Revenue for Fiscal Year 2023

- Mosquito Abatement CSAs #53, 53S, 53N  
\$1,547,332 (77.4%)
- Mosquito Reserves\*  
\$450,811 (22.6%)

Total Revenue: \$1,998,143



### Approved Expenses for Fiscal Year 2023

- Salaries and Employee Benefits  
\$1,286,465 (64.5%)
- Services and Supplies  
\$693,162 (34.7%)
- Other Charges  
\$15,401 (0.8%)

Total Expenses: \$1,995,028

\*The Mosquito Reserves balance currently stands at \$1,708,275. For years where division expenses exceed revenues from the CSAs, reserve funds must be drawn to balance the budget. Due to increasing salaries and benefits, inflation, and the demands of invasive species, the division will continue to operate at a deficit in further fiscal years. For FY 2023-2024, \$450,811 were approved for withdrawal from the reserves balance to cover the difference between revenues and expenses and to prepare for a new benefits assessment.



## Santa Cruz County Mosquito & Vector Control

📞 831-454-2590

✉️ PestHelp@santacruzcountyca.gov

🌐 www.AgDept.com

📍 640 Capitola Rd. Santa Cruz, CA 95062



- Mosquito Control
- Mosquito Eating Fish
- Rodent Inspections
- Tick Identifications
- Report Dead Birds
- Biting Pest ID
- Public Education
- Yellow Jacket Control

