ANNUAL REPORT 2023

Solano County Mosquito Abatement District

A Letter from the Manager

It is with great pleasure and a deep sense of responsibility that I address you as the newly appointed manager of the Solano County Mosquito Abatement District. I am honored to lead a team of dedicated professionals committed to the vital task of safeguarding public health within our community.

In the world of mosquito control, science and innovation have become the guiding principles of our approach to serving the public. Our commitment to protecting the health and well-being of our community remains our highest priority, and it is with great enthusiasm that we present our annual report.

In the face of evolving challenges, such as changes to weather patterns and the discovery of invasive mosquitoes, our commitment to the health and safety of our community stands resilient. Our district will adapt and innovate to meet the demands of the times. We understand that our responsibility extends beyond mere mosquito control; it encompasses the broader spectrum of environmental stewardship and community well-being, and we approach our responsibilities with the utmost dedication.

Our district comprises nine full-time employees, each contributing their expertise to the comprehensive integrated pest management strategies we employ. Together, we form a cohesive team dedicated to addressing the unique challenges presented by mosquitoes in our region. Additionally, we are fortunate to have the support and guidance of eight esteemed board of trustees, who bring diverse perspectives and invaluable insights to our decision-making processes.

I would like to take a moment to acknowledge the exemplary service of Richard Snyder, who has played a crucial role in shaping the district. His dedication has set the stage for our continued success, and I am grateful for the opportunity to build upon the foundation Richard Snyder has established.

As we embark on this new chapter, I want to assure you, the residents of Solano County, that our commitment to your well-being is unwavering. We will continue to prioritize public health and environmental stewardship.

I look forward to working collaboratively with the board, our dedicated staff, and the community to build a future that prioritizes public health, scientific innovation, and sustainable practices. Together, we can create a safer and more enjoyable environment for all residents.

Thank you for your continued support, and I am eager to serve you in my capacity as the District Manager of the Solano County Mosquito Abatement District.

My /

Miguel Cardenas District Manager Solano County Mosquito Abatement District

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Independent Special District

The Solano County Mosquito Abatement District (SCMAD) is an independent special district and is not a part of the Solano County governmental system. Rather, each city within the district's jurisdiction appoints a trustee to represent their community on the SCMAD's Board of Trustees; in addition to the trustees that represent the municipalities, the county at large is also given a representative trustee position called the Trustee-at-Large. Independent special districts are formed by residents and sanctioned by the State of California Government Code to provide local services.



2023 Board of Trustees

President: Joe Anderson, Dixon
Vice President: Robert C. Meador, Vacaville
Secretary: Daniel Glaze, Vallejo
Trustee: Ronald Schock, Trustee-at-Large
Trustee: Marlon Osum, Suisun City
Trustee: Walt Stanish, Rio Vista
Trustee: Paul Wade, Fairfield
Trustee: Mike White, Benicia

SCMAD Staff

Manager: Richard Snyder Supervisor: Mark McCauley Administrative Assistant: Tami Wright Biologist: Bret Barner Mosquito Control Technicians: Tommy Bosson Ian Caldwell Ryan Dawson Damon Gray

Brian Slover



Mission Statement

The SCMAD is a special district responsible for mosquito abatement throughout the incorporated and unincorporated areas of Solano County, which covers 909 square miles. Within this area, SCMAD contends with an extremely diverse range of aquatic habitats and temperature regimes. There are 24 mosquito species known to occur within Solano County, 12 of which are significant either as disease vectors (i.e., capable of transmitting disease) or as nuisance pests.

SCMAD functions to control all mosquitoes that may bring disease or harassment to humans and domestic animals. Our program evaluates and selects the most effective and economical techniques to carry out this mission, all while prioritizing the least possible damage to nontarget organisms and the environment. SCMAD deploys a variety of preventative management techniques, known as Integrated Vector Management (IVM), to control mosquitoes including biological, physical, and chemical control measures.



History of SCMAD

Founded in 1930 to control the *Aedes* mosquitoes produced in the 184 square mile Suisun Marsh, the SCMAD was formed according to the guidelines set forth by the Mosquito Abatement Act of 1915 and the California Health and Safety Code.

Working with the Public

SCMAD staff works diligently to monitor and suppress mosquito populations within Solano County's 909 square miles boundary. It is, however, nearly impossible to predict the mosquito population trends with any degree of certainty. SCMAD relies on information provided by the public, which assists us in allocating our resources to respond effectively and efficiently. In 2023, SCMAD's mosquito control technicians responded to approximately 1,020 service requests. During service request, SCMAD mosquito control technicians conduct habitat evaluations and make treatment applications if necessary. If you would like to make a service request, you can do so by calling the SCMAD office at (707) 437-1116 or visiting SolanoMosquito.com.



Mosquito Biology

In general, mosquitoes can be broken into two categories: standing water species and floodwater species. Standing water species require water to be present at the time of oviposition (egg laying), while floodwater mosquitoes require a dry surface for oviposition in areas that are prone to flooding. Eggs of standing water mosquitoes will all hatch sequentially within days of being deposited, whereas the eggs of floodwater species require a prolonged period of dormancy before they can hatch in a nonsequential pattern.

All mosquitoes undergo a four-stage life cycle, a process known as complete metamorphosis, which includes egg, larvae, pupae, and adult mosquito. Adult male and female mosquitoes feed primarily on sucrose from plants; the female mosquito also requires the addition of protein found in a bloodmeal to produce viable eggs. It is during this blood feeding stage that both humans and domestic animals are prone to mosquito bites, causing both annoyance to the host and exposure to disease transmission.





Mosquito Abatement Methods

SCMAD utilizes an Integrated Vector Management (IVM) strategy. IVM is a rational, decision-making process used to optimize the use of resources for vector control. The purpose of IVM is to improve the efficacy, costeffectiveness, ecological soundness, and sustainability of disease-vector control. Additionally, when compared to traditional pest control methods, IVM is a more environmentally conscious method of mosquito control. The SCMAD's IVM program integrates biological and disease surveillance information into selecting the appropriate abatement method. The vector control methods of IVM can be broken into three methods: physical control, biological control, and chemical control.

Physical Control

The most effective method of controlling mosquitoes is to drain or eliminate standing water where mosquitoes may breed; this method of physically modifying mosquito breeding habitat is referred to as physical control. Physical control can be broken into two types: source elimination/reduction and source management.

Source Elimination/Reduction

This form of physical control eliminates larval habitat by modifying the landscape to allow for better drainage or by eliminating the source entirely. Habitat modification or elimination can be as simple as cleaning gutters, flushing pet water bowls, or covering an unmaintained spa or it could be as complex as adding drainage canals to a marsh. While SCMAD does not conduct these more complex types of habitat modification or land management strategies that eliminate habitats conducive to mosquito breeding (such as ditching and vegetation management), we do work closely with landowners to promote this method of mosquito control on their own properties.



Source Management

When a source of mosquitoes cannot be eliminated completely, source management is a practice that can reduce the population of mosquitoes. Source management often includes water management, vegetation management, and infrastructure maintenance like floodgate repairs. This method of habitiat modification is often employed at duck clubs when lowlands are flooded to create a desirable duck habitat prior to duck hunting season. Source management requires more labor hours to monitor for mosquito larvae and often results in the application of a chemical treatment when necessary.

Physical control may not always be a practical method of mosquito abatement due to the practical limitations of source size, logistical hurdles, or cost. For this reason, the SCMAD utilizes biological and chemical control methods to prevent mosquitoes from completing their lifecycle.

Biological Control

When a body of water does not drain regularly or is a permanent feature not suitable for physical control, such as source elimination, reduction, or maintenance, it may be selected as a candidate for biological control. Biological control takes place when the mosquito population is managed by introducing a predator population into the mosquitoes' ecosystem. Mosquitofish (*Gambusia affinis*) are a prime example of biological control.



SCMAD distributes free mosquitofish to the public for

use on private properties in Solano County. Mosquitofish are commonly stocked in places like ornamental ponds, livestock troughs, neglected swimming pools, and large fountains. The SCMAD staff will also stock mosquitofish in other locations including golf course ponds and sedimentation ponds.

Mosquitofish are ideally suited for biological control because they are small (under 2.5 inches in length) and are able to reproduce quickly. These fish have also been observed eating up to two times their body weight in mosquito larvae per day. Mosquitofish are also extremely resilient in harsh environmental conditions and can be successfully stocked where other aquatic predators might not survive. Stocking mosquitofish in a permanent water feature can result in months, or even years, of effective mosquito control.

The SCMAD mosquitofish program has become very popular with the public. These fish are distributed at special events through Solano County where staff educate the public about mosquito control. In 2023, 29.15 lbs. of mosquitofish were distributed county wide, providing long-lasting, pesticide-free mosquito abatement to an estimated 105 acres.





Chemical Control

When physical and biological control methods are not viable options to reduce the mosquito population, SCMAD selects a chemical control method to reduce the number of mosquitoes. SCMAD works diligently to select and use all chemical pesticides in a manner that poses the lowest possible risk to both the public and to the environment. Chemical pesticides used by SCMAD are classified into two categories: larvicides and adulticides.



Total Acres Treated with Pesticide 2009-2023

Larvicides

Larvicides are insecticides that target mosquitoes in the larval stage. Larvicides are, by far, SCMAD's most frequently used form of pesticide, although adulticide applications treated a greater area per application. Most larvicides used by SCMAD contain the active ingredient (AI) known as (S) Methoprene, an AI frequently used as a public health pesticide because of its low toxicity to people, animals, and non-target aquatic organisms. It can be highly effective at reducing the number of mosquitoes that emerge from any treated aquatic environment.



In 2023, SCMAD applied larvicides by hand, by ATV, and even aircraft. Larvicides are important in controlling the mosquito populations that develop in tidal marshes in late winter, spring, and summer. Larvicides are also utilized to control mosquito populations that develop in the fall when duck clubs are flooding prior to duck hunting season.

Adulticides

Adulticides are chemical pesticides that target mosquitoes in their adult life stage. Adulticides utilized by SCMAD are effective in rapidly reducing the number of adult mosquitoes in a specific area for a short period of time; however, if the mosquito source is not abated, adulticide treatments will not provide long-term control.

Adulticides used by SCMAD are not targetspecific and could negatively impact the beneficial insect population. For this reason, SCMAD only applies adulticides in or around areas that have known arbovirus transmission actively occurring. In Solano County adulticides are ONLY deployed by ground vehicle or with a hand applicator. SCMAD has never applied adulticides using aircraft.





Total Acres Treated 2009-2023

2023 Mosquito Surveillance

In 2023, SCMAD used a variety of surveillance techniques to monitor and lower the mosquito population for both public nuisance and public health reasons. Mosquito surveillance yields an abundance of data that is useful for district staff. For example, the species and abundance of adult mosquitoes trapped in a specific time period could yield valuable information about where the mosquitoes are breeding, what flight range the mosquitoes have, and whether the public is at risk of disease transmission; larvae mosquito samples give us information about when the next generation of mosquitoes might emerge, their potential population size if unabated, how far they could travel, whether the species is a known vector of disease, and if pesticides applied are effective.

Larval Surveillance

To identify mosquito breeding sources and plan abatement efforts, SCMAD technicians collect larval samples from aquatic habitats as a response to service requests or from known breeding sources. These samples are brought back to SCMAD laboratory where the specimens are inspected, and all mosquito larvae are identified to species. This population data allows SCMAD to assess the upcoming risk to the public and the future adult mosquito population if unabated. Larval surveillance is crucial to not only achieving mosquito control before the mosquito population emerges as biting adults, but it also allows us to monitor our pesticides' effectiveness. In 2023, SCMAD laboratory processed 653 mosquito larvae samples.



of Mosquito Larvae Samples Processed 2007-2023

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New Jersey Light Traps

SCMAD uses New Jersey Light Traps (NJLTs) as semi-permanent monitoring stations for adult mosquito surveillance. The SCMAD deploys these traps throughout the county for roughly 9 months a year by partnering with local landowners. NJLTs use light to attract mosquitoes at night, capturing and killing them. These traps are very effective in providing SCMAD staff with mosquito diversity and long-term comparable population data used for resource allocation decisions. The trap numbers and location are roughly the same year to year, which allows the SCMAD to use the data from previous years to compare and identify trends and patterns in the adult mosquito population.

Light traps are a very effective method in measuring the mosquito population overall because they attract a wide range of mosquito species. These traps are also useful in measuring the male adult mosquito population, too. The number of male mosquitoes



captured in a NJLT provides useful information in terms of source proximity to the trap site. Male mosquitoes in general do not fly far from their source of origin. Male mosquitoes are, in general, not strong fliers nor do they possess the need to fly great distances in the way female mosquitoes may to attain a blood meal. Interpreting both the species and sex ratio of the trapped mosquitoes will aid technicians in determining where a particular type of source may be located. In 2023, 22 light traps were collected and reset on a weekly basis from March through November. The map below plots the location for each of the NJLTs deployed in 2023.





NJLT Adult Totals 2018-2023

■ 2023 ■ 2022 ■ 2021 ■ 2020 ■ 2019 ■ 2018



2023 NJLT Mosquito Species Totals

BG Sentinel Trap

BG Sentinel traps contain a battery-powered motor that pulls in mosquitoes flying near the top of the trap. These traps can also be retrofitted to receive power from an electrical outlet. Mosquitoes are attracted to the octenol, carbon dioxide, and BG-Lure with which this trap is baited. The overall black and white design of the BG Sentinel trap is attractive to *Aedes* mosquitoes.

BG Sentinel traps attract female mosquitoes in search of a host and are used mainly to monitor for invasive *Aedes aegypti* and *Aedes albopictus*. In 2023, the most abundant species this trap collected was *Culex tarsalis*. *Culex* mosquitoes captured in BG Sentinel traps were pooled and tested for arbovirus, making this trap useful for the SCMAD arbovirus surveillance program.

Invasive Aedes Mosquitoes

SCMAD incorporates two trap types into the invasive mosquito surveillance program. These traps are specifically designed to attract and capture the invasive Aedes aegypti (Yellow Fever mosquito) and Aedes albopictus (Asian Tiger mosquito). These two mosquito species were introduced to North America and act as highly competent vectors of diseases not transmitted by any of our other mosquito species; these diseases include yellow fever, dengue, chikungunya virus and Zika virus. SCMAD conducts a long-term surveillance effort to monitor for *aegypti*. Our first detection of Aedes aegypti in Solano County was in the city of Winters on August 18, 2021. In September of 2023, Aedes aegypti were detected in the city of Dixon. SCMAD staff responded utilizing public outreach in the form of press releases, door hangers, and door-to-door yard inspections. Surveillance trapping allowed SCMAD to understand the exact boundaries of the Dixon aegypti population (right), and larvicide and adulticide applications were carried out once these boundaries were determined.

2023 BG Sentinel Trap Mosquito Species





Arbovirus Surveillance

Mosquito Population Testing

A robust mosquito sampling program is very important to identify areas where arboviruses are active to prevent human transmission from occurring. In 2023, there were 237 CO_2 traps deployed from which 42,685 mosquitoes were captured and then identified in the SCMAD laboratory. From this total there were 15,653 mosquitoes pooled and tested for arbovirus.

The purpose of this testing is to identify areas within Solano County where the human population was at risk of contracting mosquito-borne disease, such as West Nile virus, which is most active between the months of August and September in Solano County. When these areas are identified, mosquito control technicians respond by conducting a habitat assessment and developing and implementing an effective abatement strategy to quickly lower the mosquito population in these areas. Solano County Public Health and the Municipalities City Managers are also notified of any positive test results.



Number of Female *Culex* Mosquitoes Tested 2016-2023



CO₂ Traps

CO2 mosquito traps emit carbon dioxide to attract adult mosquitoes, and these traps yield a very high catch rate. However, due to battery and bait limitations, they can only be deployed for less than 24 hours; adult mosquitoes are still alive and viable for arbovirus testing when these traps are collected the next day. Mosquitoes must be fresh to test for the viral RNA that is present in an arbovirus-infected mosquito. The mosquitoes that are trapped in CO₂ traps do not yield the same population information as New Jersey Light Traps. Instead, CO₂ traps attract host seeking female mosquitoes. Male mosquitoes are certainly captured by these traps as well, but it is thought that they are attracted to the female mosquitoes that have already been trapped.

CO₂ Trap Adult Mosquito Totals 2019-2023





2023 CO₂ Trap Total Adult Mosquito Species

2019-2023 CO2 Trap Species Abundance									
Mosquito Species	2019 Total	2020 Total	2021 Total	2022 Total	2023 Total				
Aedes aegypti	0	0	0	0	11				
Aedes dorsalis	48	252	1923	957	801				
Aedes melanimon	8042	256	1636	943	327				
Aedes nigromaculis	144	5	36	0	0				
Aedes sierrensis	44	19	9	13	28				
Aedes squamiger	7	0	1	0	3				
Aedes vexans	11	3	1	12	0				
Aedes washinoi	6	0	3	0	4				
Anopheles franciscanus	15	40	4	31	4				
Anopheles freeborni	58	42	39	9	10				
Anopheles punctipennis	1	0	0	1	0				
Anopheles occidentalis	0	0	0	0	1				
Culiseta incidens	1257	414	243	332	137				
Culiseta inornata	752	31	132	216	181				
Culiseta particeps	22	3	8	285	77				
Culex erythrothorax	1806	566	33	97	233				
Culex pipiens	3212	3534	9576	3968	1285				
Culex restuans	0	0	0	0	4				
Culex stigmatosoma	119	71	46	73	52				
Culex tarsalis	35910	14901	29589	41344	39523				
Culex thriambus	0	0	18	2	3				
Orthopodomyia signifera	0	0	0	0	1				
TOTAL	51454	20137	43297	48283	42685				





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	2023			2022		2021		2020			2019				
Culex Species	# Doolod	Total Pools (#	Average # per	r #Pooled	Total Pools	Average #	#	Total Pools Average #	# Doolod	Total Pools	Average #	#	Total Pools	Average #	
	#Pooleu	pools +)	Pool		(# pools +)	per Pool	Pooled	(# pools +)	per Pool	# FOOleu	(# pools +)	per Pool	Pooled	(# pools +)	per Pool
thriambus	N/A	N/A	N/A	2	2 (0)	1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
stigmatosoma	N/A	N/A	N/A	18	9 (1)	2	2	1 (0)	2	N/A	N/A	N/A	N/A	N/A	N/A
erythrothorax	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	300	7 (0)	42.86	N/A	N/A	N/A
pipiens	1,233	49(1)	25.16	3,744	152(2)	24.63	3,840	124 (1)	30.97	3,577	164 (0)	21.81	3,194	275 (1)	11.61
tarsalis	14,420	349(23)	41.32	9,517	317(9)	30.02	11,338	299 (21)	37.92	12,152	359 (8)	33.85	16,490	558 (4)	29.55
TOTAL	15,653	398	39.33*	13,281	480	27.67*	15,180	424	35.80*	16,029	530	30.24*	19,684	833	23.63*
* • • • • •															

* Average of the total # pooled



Seasonality of WNV Positive Mosquito Pools 2007-2023

West Nile Virus Transmission Cycle



Dead Bird Testing

SCMAD works with the California Department of Public Health (CDPH) and the University of California Davis to collect and test dead birds within Solano County for arboviruses. Dead birds are reported by calling **1 (877) 968-2473** or by reporting them online at <u>http://westnile.ca.gov</u> to the CDPH West Nile Virus and Dead Bird Call Center. In 2023, SCMAD sampled 11 bird species; a total of 49 dead birds were reported, 42 dead birds were tested, and 18 birds tested positive for WNV.



Dead Bird Activity 2016-2023



2023 Dead Bird Submissions by Solano County City



Sentinel Chickens

Sentinel chickens provide SCMAD with crucial information about arbovirus activity within Solano County. Three sentinel chicken flocks are located throughout Solano County. Chickens develop antibodies in response to arbovirus exposure. Chickens cannot transmit West Nile virus back to mosquitoes; they do not serve as a reservoir for the virus. Every two weeks a blood sample is taken from each chicken in our program. Flocks were downsized in 2020 to allow for faster sample collecting, increased space per chicken and cost-savings to the district; historically there have been 12 birds per flock, until 2020 when we started using 7 birds per flock. 11 sentinel chickens tested positive in 2023.







Monthly Seroconversions in SCMAD Sentinel Chickens 2005-2023



Human Arbovirus Case Response

It is our goal at the SCMAD to identify areas where arbovirus transmission is present and reduce the risk of disease to the residents of Solano County. In the event of a human infection, the occurrence is reported to the SCMAD by the Solano County Public Health Department (SCPHD). All information provided to SCMAD is given in a manner compliant with all HIPAA regulations and guidelines. When possible, the SCMAD will collaborate with the SCPHD to determine the likelihood of the disease transmission occurring in Solano County by conducting trapping and habitat surveys. For human case responses traps are deployed, sampled and tested for arboviruses. *Culex* spp. are the target vector for West Nile virus cases. Malaria response trapping focuses on *Anopheles* spp. and dengue and/or Zika virus response trapping focuses on invasive *Aedes* spp.

Mosquito abatement is conducted in areas where arbovirus activity is confirmed to rapidly reduce the risk of disease transmission to the public. Any areas where arbovirus activity occurs are then monitored for 14 to 21 days to ensure a low risk to the public. In 2023 there were six confirmed human cases of arbovirus infections (all WNV) within Solano County. By comparison, there were three confirmed human cases of WNV in 2022, two human cases in 2021, and only one human case of WNV in 2020.



Solano County Human WNV Cases 2007-2023

Public Outreach

Advertising

It is our intention that 2023's advertising campaign yielded positive, long-term results and would allow us to interact with more residents of Solano County. Public education about mosquito control is an essential component of SCMAD's mission. Our agency relies on public awareness about mosquitorelated issues like reporting neglected swimming pools or calling about high mosquito numbers.



In 2023, SCMAD continued to develop our official

website and several advertising campaigns. To educate and conduct outreach to the public, bus ads were created and ran on busses in Fairfield, Suisun, and Vacaville. In addition to bus ads, newspaper ads were printed in The Reporter and the Vallejo Times Herald. Below is a complete list of all 2023 advertisements:

Daily Republic Sunday newspaper ads ran March through July (pictured below)

Solano Life half-page advertisement

Solano Senior Living magazine spring, summer, and fall issues

Benicia Times Herald

Vacaville Reporter & Vallejo Times Herald Monthly Package ran March 26 through September 3 (6-month campaign) included both a Fight the Bite advertisement and a Report Dead Birds advertisement.

Spring Home & Garden Show (April)

Dixon May Fair (May)

Solano County Fair (June)

How To Guide (July)

Fairfield Tomato & Vine Festival (August)

Vallejo Waterfront Weekend (October)

Holidays in Vallejo (December)

Merriment on Main (December)



MOSQUITO ABATEMENT DISTRICT

707-437-1116

437-1







Public Events

Our staff is always engaging with the public during service requests, routine inspections, and other types of daily interactions. Part of SCMAD's public outreach includes conducting presentations free-of-charge to the public upon request. To schedule an appointment, please call the SCMAD office. PowerPoint presentations are catered to meet the abilities of each audience. Examples of presentations given in 2023 are listed below:

March 29: Vallejo Flood & Wastewater District, City of Vallejo staff, & Mare Island Company.

April 26: Mare Island Homeowners & Residents at historic St. Peter's Chapel, Vallejo (*pictured bottom left*)

September 20: Suisun Resource Conservation District workshop

October 30: Mare Island Company at Quarters D, Vallejo (*pictured center left*)

Typical presentations include an introduction to SCMAD as a government agency, an overview of the mosquito lifecycle, explanation of the various mosquito species that occur in the geographic area the presentation is taking place, a review of SCMAD's IVM program, and conclude with an explanation of the importance of our reliance on public support to effectively fulfill our mission.

These presentations are meant to give Solano County residents the opportunity to ask staff and trustees about our program. It also allows SCMAD staff and trustees the opportunity to meet with the residents we serve and explain our methods and long-term goals.

2022-2023 Financial Statement

The District Manager, the Board of Trustees, and the District's Administrative Assistant manage the budgeting, accounting, and record keeping. The finances are also audited annually by a certified third-party public accountant (Fecther & Co.). The SCMAD is committed to the ethical and fiscally responsible management of public funds in the efforts to reduce the risk of disease transmission and nuisance to members of the public in Solano County.

<u>Revenues</u>	<u>2022-2023</u>
Property Taxes	\$2,744,123.00
Other Tax Revenue	\$791,338.00
Charges for Services	\$0.00
Use of Money and Property	\$151,188.00
Miscellaneous	\$2,714.00
Total Revenues	\$3,689,363.00
<u>Expenditures</u>	<u>2022-2023</u>
Salaries and Wages	\$1,038,252.00
Employee Benefits	\$336,882.00
Pesticides	\$947,784.00
Aircraft Services	\$152,232.00
Insurance	\$93,086.00
Structure & Grounds Maintenance	\$36,247.00
Property Tax Administration	\$34,948.00
Utilities	\$46,682.00
Motor Vehicles/Equipment Maintenan	\$29,864.00
Gas & Oil	\$28,885.00
Materials and supplies	\$48,577.00
Professional Services	\$47,296.00
Memberships	\$19,215.00
Publishing & Advertising	\$32,765.00
Conference	\$13,662.00
Communications	\$13,530.00
Continuing Education	\$1,130.00
Travel	\$442.00
Capital outlay	\$279,164.00
Total Expenditures	\$3,200,643.00









Solano County Mosquito Abatement District 2950 Industrial Court Fairfield, CA 94533 Phone: (707)437-1116 Fax: (707)437-1187 SolanoMosquito.com