

Mosquito & Vector Control Program

2011 Annual Report



COUNTY OF SAN BERNARDINO
Environmental Health Services
DEPARTMENT OF PUBLIC HEALTH



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Mission Statement

“The mission of the San Bernardino County Mosquito and Vector Control Program is to protect public health and enhance the quality of life of County residents through integrated vector and pest management practices, proactive disease surveillance, and education.”

Corwin Porter, REHS, Division Chief
Environmental Health Services

Jason Phillippe, REHS, Supervising EHS
Mosquito and Vector Control Program

County of San Bernardino
Department of Public Health
Division of Environmental Health Services



I. PROGRAM OVERVIEW

This report summarizes daily operations and disease surveillance activities conducted by the San Bernardino County Mosquito and Vector Control Program from January 1, 2011 through December 31, 2011. The report provides an overview of vector control activities and analyzes the level and distribution of MVCP services throughout the County.

The San Bernardino County Vector Control Program (MVCP), under the Division of Environmental Health Services, pursues the mission by providing quality and responsive vector control services to a majority of County residents. Covering an area of 20,105 square miles and serving 2,035,210 people in the County, MVCP responds to citizen complaint/service requests for community control of vectors such as mosquitoes, flies, rodents, and Africanized Honeybees. MVCP monitors for the presence of vector borne diseases, and inspects poultry ranches, dairies, and riding academies for nuisance flies and other vectors. MVCP also provides direct abatement and control of vectors in sanitary sewer systems, flood control channels and basins.

The California Legislature adopted the "Mosquito Abatement Act" in 1915. The law later incorporated into the State Health and Safety Code, which authorized the creation, function, and governance of Mosquito Abatement Districts in the State of California. This law was amended in 1939 and 1980, and it was then repealed and replaced by a new comprehensive Mosquito Abatement and Vector Control District Law in 2002.

The 1972 Saint Louis encephalitis outbreak in Los Angeles infected four people in San Bernardino County. This outbreak increased mosquito-borne disease awareness in the County and prompted the establishment of a vector control program in the Department of Public Health.

On November 24, 1986, the County Board of Supervisors adopted a County ordinance which granted authority for the creation of a Mosquito and Vector Control Program with the services provided to County residents in a wider area, enhancing the surveillance of vectors and vector-borne diseases.

The detection of Hantavirus in the County in the mid 1990s increased collaboration with local, state, and federal agencies. The arrival of Africanized Honeybees to the County in 1998 increased activities and efforts to mitigate the heightened concern of citizens.

The arrival of West Nile Virus (WNV) in the United States in the summer of 1999 required increased vigilance and an extensive outlay of resources. Once the disease was detected in the County in 2003, the focus of MVCP shifted to monitoring and controlling mosquito-borne diseases. This increase in services demanded additional resources to reduce the risk of WNV among County residents.

A new vector with the attention of MVCP is the establishment of the Asian Tiger Mosquito in nearby counties which will again shift resources and abatement strategies to properly respond to this new species of mosquito to the area.

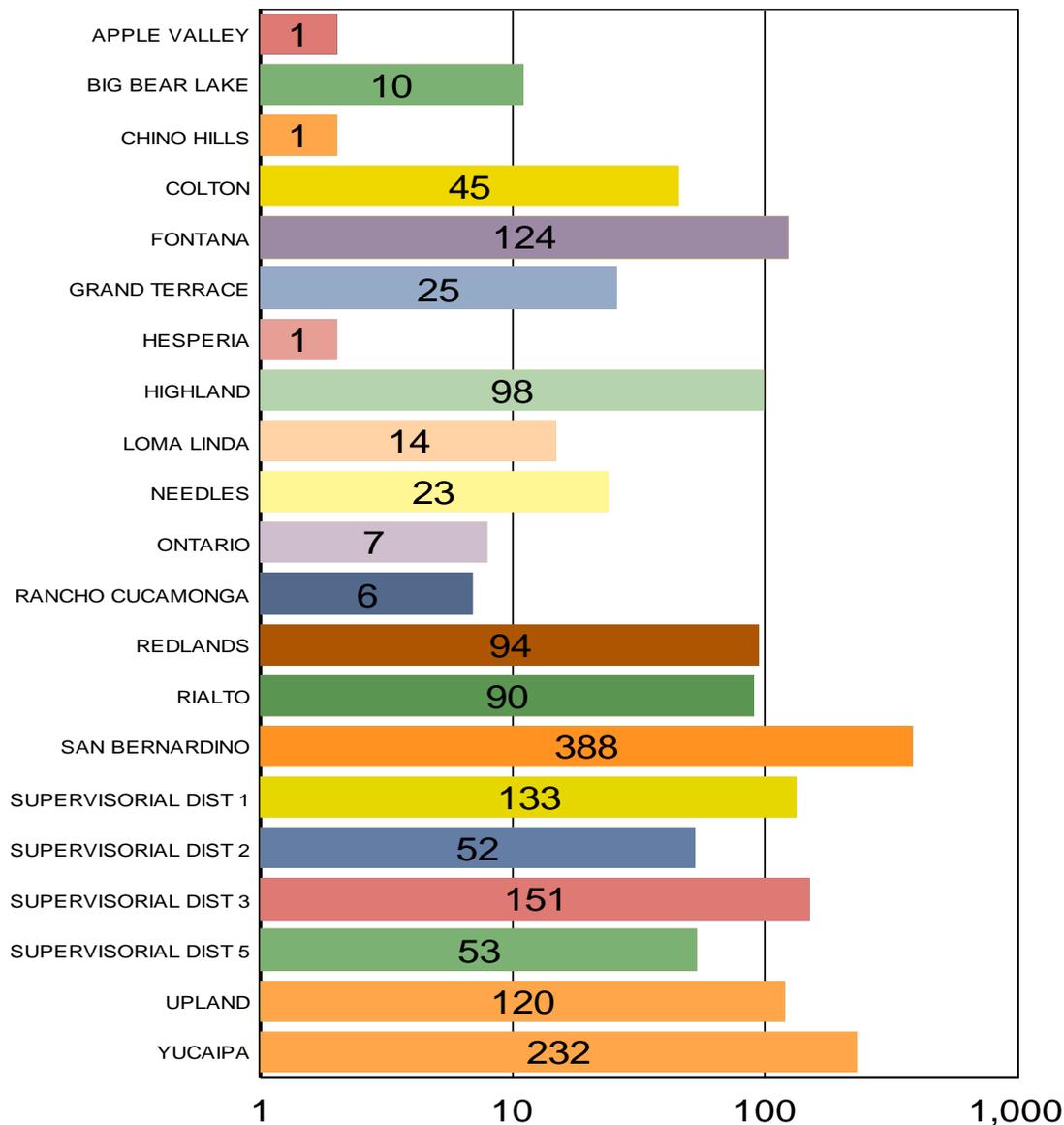


A vector is any animal or insect, such as a rat, mosquito, cockroach and fly that can transmit disease, cause injury and be a nuisance to humans.

II. DAILY OPERATIONS

MVCP is currently staffed by a Supervising Environmental Health Specialist, a Vector Ecologist, 2 Vector Control Technician IIs, 7 Vector Control Technician Is, 4 Seasonal Positions and an Office Assistant III. Services provided to the community and to residents of San Bernardino County include responding to service requests/complaints relating to vector control issues within 24 to 48 hours, routine mosquito control, surveys that target vector species, and community education. In 2011, MVCP staff responded to over 1,668 service requests and conducted approximately 9,020 water source inspections with 1,099 inventoried water sources for mosquito breeding. Details of MVCP services are included below.

Table 1: Number of service requests received and responded to by city.



Citizen Request for Service

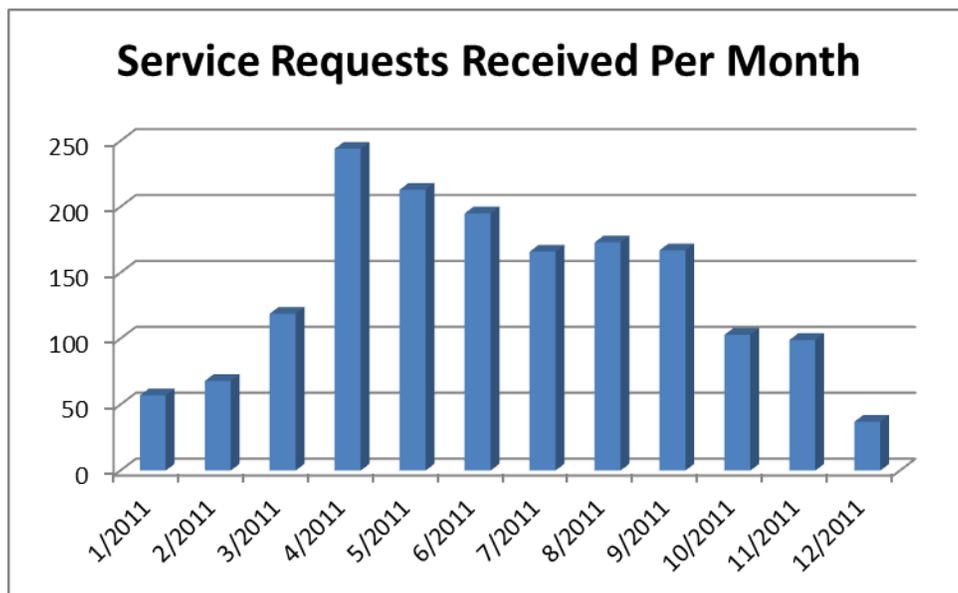
Response to service requests by MVCP is the most reactive aspect for field technicians. MVCP responses vary from giving phone advice, mailing vector literature, identifying vector specimens, inspecting premises, abating vectors, and enforcement of the County Code.

Of the service requests handled by MVCP vector control technicians in 2011, the highest number was received for green pools, followed by rats, bees, flies and mosquitoes. An ongoing concern has been mosquito breeding in un-maintained swimming pools. Of the 621 mosquito service requests, 441 swimming pools, primarily at vacant, foreclosed properties, were inspected and treated with larvicide to control breeding. 33 of those were drained by Vector Control staff to eliminate mosquito breeding. 1,292 follow-up inspections were conducted to ensure mosquitoes were controlled until properties were brought into compliance.



Vector Technician treating a green pool for mosquitoes.

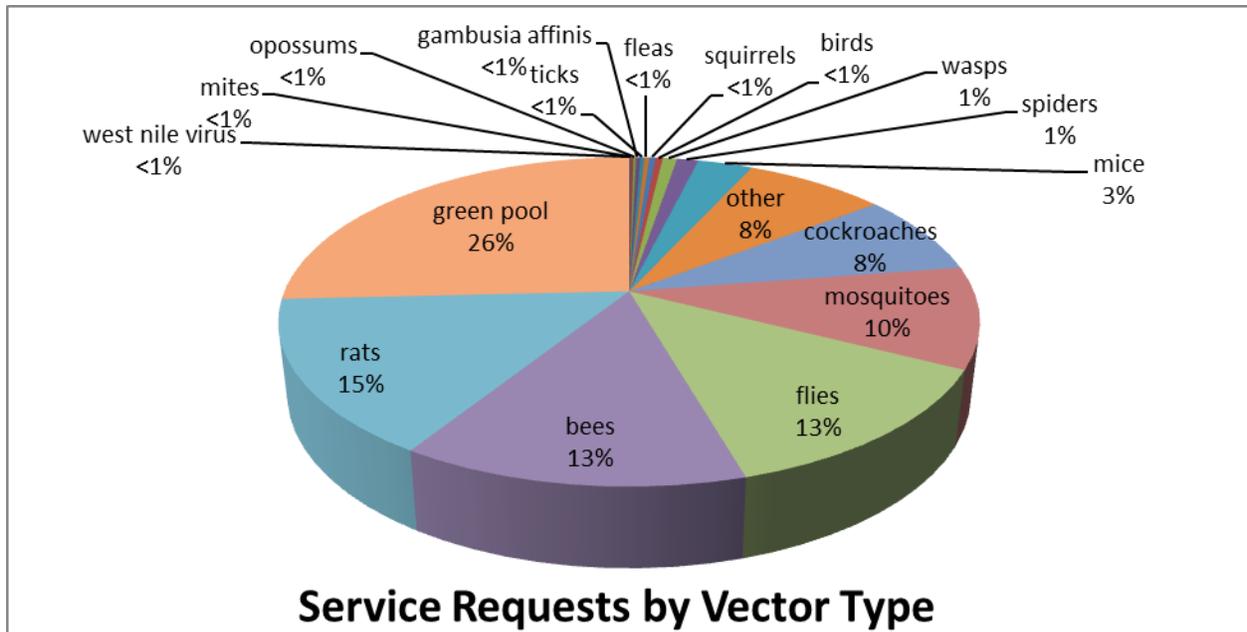
Table 2: Service requests for specific vectors and pests in each area of the County in 2011.



Under the “Other” category, the predominant vector was bed bugs. Though not of significant concern for the last several decades, bed bugs are increasing in numbers, and are spreading rapidly. Where previous reports were regarding infestations in motels and hotels, MVCP currently receives calls about them infesting summer camps, health care facilities,

apartments and single family residences. Though they have not been found to transmit disease in the United States, their bite(s) can cause significant discomfort.

Chart 1: Service requests by vector type.



In some circumstances, enforcement actions were necessary to gain compliance with county code. Methods of compliance included Courtesy Notices to Abate, Notices of Violation, Office Hearings and Billable Inspections. Table 3 shows the number of actions taken in 2011.

Table 3: Total Notice of violation and office hearings during 2011.

Notice of Violations	Office Hearings
1743	20

Animal Establishment Inspections

Confined livestock farming can produce large numbers of nuisance flies, causing annoyance for nearby residents. These animal establishments include commercial poultry ranches, dairies and riding academies. Inspections are routinely conducted to ensure fly, mosquito and rodent breeding are prevented/controlled, and manure is managed properly. A total of 288 poultry ranch inspections, 54 dairy inspections and 11 riding academy inspections were conducted during 2011.



Common places where mosquitos can be found breeding in your neighborhood. Maintain areas dry or regularly clean and maintain standing water.

Sanitary Sewer Inspections

The sanitary sewer system is composed of a network of underground ducts that can provide a habitat for rats and cockroaches. 5 surveys were performed in 2011. Each survey may cover a specific local target area, or a broad area of a city.



Vector Inspections in County Flood Control System

Under a written contract between the MVCP and the County Department of Public Works, the County Flood Control District, MVCP inspects and treats for mosquito and black fly breeding at all flood control channels and basins. MVCP works with Flood Control to identify basins and channels that require debris and vegetation removal to prevent breeding.

MVCP spent 1,018 direct work hours inspecting and conducting surveillance for mosquitos and breeding sources in flood control facilities. A variety of larvicides were used in the flood control channels and catch basins to control mosquitoes, midges, and black flies.



Floodwater mosquito eggs may remain dormant for several years, and hatch when they are covered with water.

Integrated Vector Management Services

MVCP Program in 2011 used several strategies that included physical, biological, and chemical agents, in addition to active surveillance and trapping.

Mosquito fish (*Gambusia affinis*) are the primary biological agent for controlling mosquito larvae in decorative ponds and other community water sources. MVCP Program places the fish in sources where other methods of control are not advisable.



The insect responsible for the most human deaths worldwide is the mosquito.

A total of 141 pounds of rodent poison was used to control the infestation of rats and mice. 12.3 pounds of pesticide was used to treat infestations of Africanized Honeybees and cockroaches. 5.2 gallons of pesticide concentrate and pounds of pesticide was used to control Africanized Honeybees and wasps. 18 gallons and 2,318 pounds of pesticide was used to control mosquitoes in neglected (green) residential swimming pools, roadside ditches, flood control channels, golf courses, constructed waterways, and other mosquito breeding habitats. A total of 9,020 routine inspections were performed at these water sources.



MVCP Program started a midge control program in 2008 in basins owned by the Flood Control District, using a total of 58.5 pounds of a control agent to control midge larvae in 2011.

A total of 8.5 gallons of mist sprayer formulations were used in 2011 to control adult fly populations in residential neighborhoods in close proximity to and on dairies and poultry ranches.

Active surveillance was an additional tool for monitoring and controlling some vectors. Trapping and removal techniques were used to control rats, mice, and opossums within the County.



IV. DISEASE SURVEILLANCE

MVCP Program maintains a pro-active surveillance and monitoring program to determine the abundance of vector populations and the prevalence of diseases they transmit, focusing mainly on mosquito-borne viruses, rodent-borne diseases and tick-borne infections. Surveillance efforts in 2011 are summarized below.

Mosquito Surveillance Program

MVCP disease surveillance program monitors adult mosquito populations throughout the County using New Jersey Light Traps (NJLT), Carbon Dioxide (CO₂) – baited traps, and Gravid traps. The NJLT uses a light source to attract both male and female mosquitoes. The CO₂-baited traps use Carbon Dioxide to attract host-seeking female mosquitoes, while Gravid traps use a hay infusion as an attractant for ovipositing (egg-laying) females. Combinations of these



Senior vector control technician collects and labels a sample from a New Jersey Light Trap.

trapping methods are continually being used across the County to provide an accurate representation of mosquito activity throughout the year. Higher mosquito counts and the presence of virus in mosquitoes, sentinel chicken flocks and dead birds are factors used to determine the risk of infection to humans and horses.

The abundance of adult mosquito species was monitored weekly using NJLT throughout the County. 19 NJLTs in 2011 were stationed in rural, suburban, and urban habitats of the valley, mountain, and desert regions of the County. Trap sites in the valley region included the cities of Colton, Fontana, Grand Terrace, Highland, Mentone, Redlands, Rialto, San Bernardino, Yucaipa, and Upland. Traps in the mountain region were located at Barton Flats, Big Bear Lake, Lake Arrowhead and Silverwood Lake. Three trap sites located in the desert region included two in the City of Needles, as well as one at the Mohave Narrows Regional Park in Victorville. All

mosquito counts were reported to the California Department of Public Health on a weekly basis.

In 2011, a total of 1,561 mosquito surveys were performed, from which 31,956 mosquitos were collected. Of the 921 mosquito pools tested, 26 pools tested positive for West Nile Virus (WNV), indicating a low prevalence of the virus in MVCP mosquito population. The following table shows the type of traps and the number of mosquitos caught per trap, and which traps tested positive for WNV.

Trap Type	Number of Mosquitos	Number of Pools	Number Pools Tested Positive For WNV
NJLT	3,254	N/A	N/A
Gravid Traps	5	1	0
CO2	28,692	920	26

Blood Samples from Sentinel Chicken Flocks.

Ten sentinel (chicken) flocks, each with 10 chickens, are placed in various areas to monitor arbovirus activity within the County. Blood samples were taken from all the sentinel flocks once every two weeks and mailed to the State laboratory for viral testing. Of the 123 chickens bled in 2011, 9 chickens were infected with WNV throughout the season. Positive chickens with WNV were confirmed in the Cities of Rialto and Needles.



Vector control technician prepares to draw samples from a sentinel chicken flock.

Dead Bird Surveillance Program

This program started in 2000 to enhance WNV detection capabilities. MVCP responded to a total of 78 dead bird reports in 2011, where 29 tested positive for WNV. Positive dead birds were from the Cities of Bloomington, Fontana, Highland, Redlands, Rialto, San Bernardino and Upland.

Human Cases of West Nile Virus

There were 4 WNV human cases in the County with no fatalities in 2011. Human cases and the prevalence of WNV in the County increased in 2011 from 2 cases in 2010. Compared to 41 human cases and one fatality in 2008.

WNV in Equine (Horse) Population

WNV was not detected in any of horses in 2011 attributed to successful WNV vaccination.

Plague Surveillance

MVCP Program carried out routine surveys in the endemic mountain and foothill areas of the County to detect and monitor for Plague, and the fleas that carry it. 6 Plague surveys,

with a total of 31 rodents trapped, were conducted in 2011. None of the fleas collected (99 percent) tested positive for Plague, and no human cases were identified in 2011.

Hantavirus Surveillance

Hantavirus surveillance consists of rodent trapping in various sites of the County, and testing for antibodies against a pulmonary syndrome causing disease, Sin Nombre Virus (SNV). 6 surveys were conducted in 2011 to determine the prevalence of the virus. Of 27 rodents trapped 0 tested positive for SNV with 54 samples pending results.

Tick Surveillance

The tick surveillance program primarily involves collection of questing ticks for tick-borne infections, especially Lyme disease. 73 tick surveys were conducted in 2011 that yielded 2,633 ticks. None of the ticks tested returned positive with Lyme disease.



Wear a hat and light-colored clothing (so ticks can be easily spotted), including long-sleeved shirts and long pants tucked into boots or socks.

V. EDUCATION AND TRAINING

Community outreach and health education benefits the citizens and visitors of the County and the community by delivering vector control information and educational material directly to the public. Health education efforts by MVCP included telephone and personal visits, distribution of flyers and brochures, lectures and presentations, and participation at local health fairs. We also provided presentations to public forums, businesses and community organizations. Radio and television interviews were provided, and press releases were distributed to the media when incidents of public health significance occurred.



Vector control staff conducting public outreach and awareness.



ACKNOWLEDGEMENTS

San Bernardino County Mosquito and Vector Control Program vector control technicians and clerical staff

Cities of Colton, Fontana, Grand Terrace, Highland, Loma Linda, Needles, Ontario, Redlands, Rialto, San Bernardino, Upland, and Yucaipa

San Bernardino County Departments of Agriculture, Public Health, and Transportation/Flood Control

Mosquito and Vector Control Association of California

Vector-Borne Disease Section and Viral and Rickettsial Disease Laboratory, California Department of Health Services

California Department of Food and Agriculture

California Department of Parks and Recreation

School of Veterinary Medicine and Center for Vector-Borne Disease Research, Department of Entomology and the Davis Arbovirus Research Unit at University of California-Davis

University of Texas Medical Branch-Galveston

US Army Center for Health and Preventive Medicine-West, Fort Lewis, Washington State

Bureau of Land Management

Rocky Mountain Laboratories

Centers for Disease Control and Prevention—Atlanta

United States Forest Service