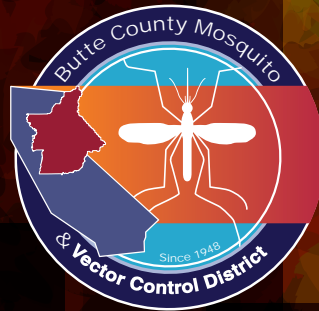


*Butte County Mosquito
And
Vector Control District*



2013 Annual Report

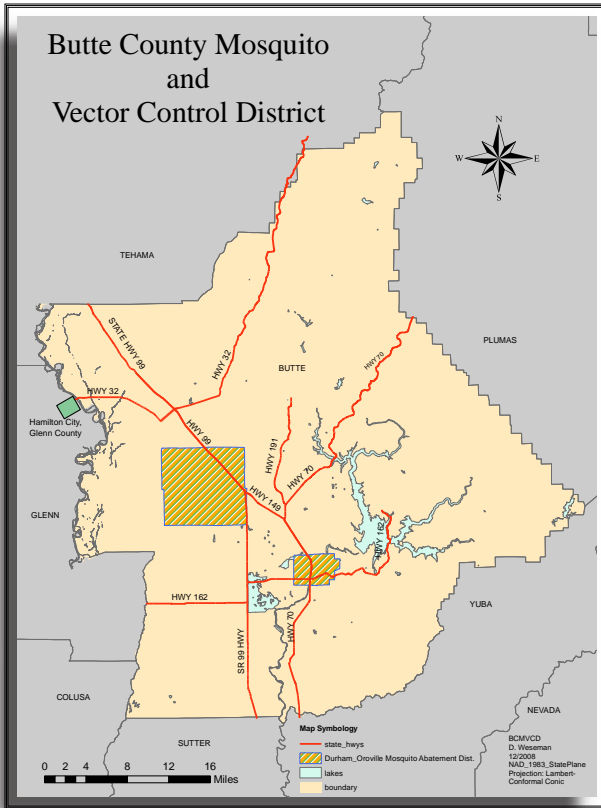
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Contact Information

Butte County Mosquito
and Vector Control District
5117 Larkin Road, Oroville, California 95965
(530) 533-6038 (530) 342-7350
Fax (530) 534-9916
Visit us on the web at www.BCMVCD.com

BCMVCD Jurisdiction



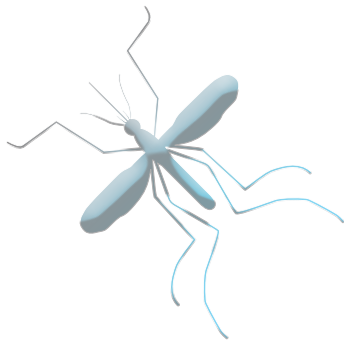
History

The Butte County Mosquito Abatement District was formed in June of 1948. The District covers 1600 square miles, and includes all of Butte County, except the small areas served by the Durham and Oroville Mosquito Abatement Districts, which were formed earlier. The District also includes the Hamilton City area of Glenn County. In April of 1994, "Vector Control" was added to the District name to reflect the additional disease surveillance and information now provided.



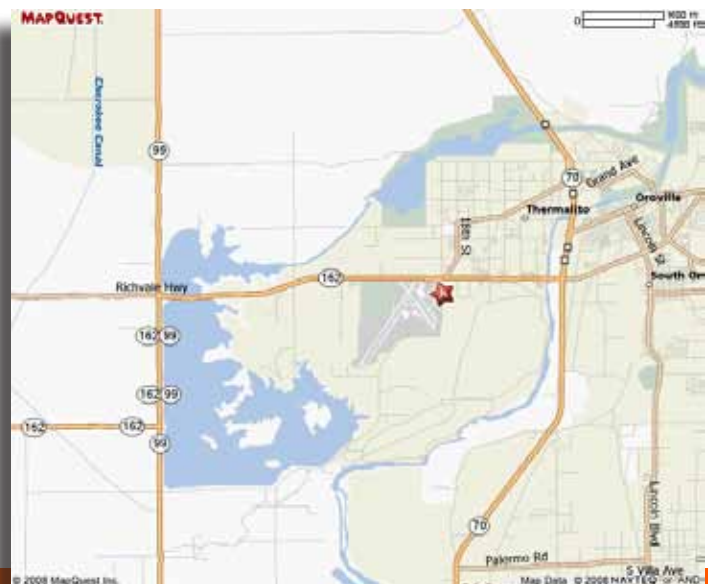
Mission

The mission of BCMVCD is to primarily suppress mosquito-transmitted disease and to also reduce the annoyance levels of mosquitoes and diseases associated with ticks, fleas and other vectors through environmentally compatible control practices and public education.



Main Office Location

5117 Larkin Road
Oroville, CA. 95965



Foreword

It is with great pleasure that I submit the 2013 Annual Report for the Butte County Mosquito and Vector Control District. The District had a very successful year serving the residents of Butte County and Hamilton City by utilizing an integrated vector management (IVM) approach that included public education and outreach, vector surveillance, reduction of breeding grounds by physical and cultural control by altering the environment and/or management practices, and by using sound biological and chemical control methods. This report outlines the work conducted by the District to accomplish its primary goal of protecting public health.

The prevention of vector-borne disease outbreaks remains the District's primary goal and it's most important responsibility to the public. West Nile virus (WNV) is now considered to be endemic in the state of California and remains the District's largest public health concern. The state observed a decrease from 431 WNV human infections to 361 in 2013. However, Butte County's human infection rate increased from 10 in 2012 to 24 in 2013. Butte County has had confirmation of 128 WNV human infections with 7 fatalities since the virus arrived in 2004. Since 2003 when WNV first appeared in California, 3986 human infections with 128 fatalities have been confirmed.

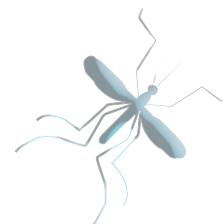
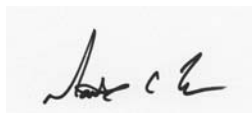
The extraordinary efforts to combat WNV epidemic in California should be credited to the combined efforts of more than 60 mosquito and vector control districts and local health departments, working in close cooperation with the California Department of Public Health and numerous other agencies indirectly related to mosquito and vector control.

With the continued economic recession and the decline of the housing market, the District is continuing to see an increase in the number of vacant homes with abandoned swimming pools, spas, and other water features that breed mosquitoes. The District continues to aggressively control catch basins, storm drains, and retention / detention ponds and works in partnership with other local agencies and governments to maintain improper functioning utilities that could and have breed mosquitoes. Regardless of drought conditions, the over watering of landscaped yards and environments continues to add to the mosquito breeding problems in urban mosquito sources and extends the length of our mosquito season. In addition to urban mosquito breeding problems, the District continues surveillance and control in agricultural, rural, and wetland areas that breed mosquitoes.

"The Mission of the Butte County Mosquito and Vector Control District is primarily to suppress mosquito-transmitted disease and to also reduce the annoyance levels of mosquitoes and diseases associated with ticks, fleas, and other vectors through environmentally compatible control practices and public education." To achieve this goal the District provides continual surveillance of mosquitoes and other vectors to ascertain the threat of disease transmission and annoyance levels and then uses integrated pest management methods to keep mosquitoes and other vectors below those levels. The District continues to work in cooperation with property owners, residents, social groups, and other governmental agencies to minimize mosquito breeding and to reduce the threat of mosquito-transmitted diseases.

The Board of Trustees and employees continue to plan for the future and search for better ways to improve our programs to be prepared for future disease outbreaks that would be a threat to the health of Butte County and Hamilton City residents. We look forward to providing our services to you in the future and if you have any questions or need more information please visit our website at www.BCMVCD.com or call us at 530-533-6038 or 530-342-7350.

Respectfully,



Board of Trustees

Back row, left to right: Secretary Tom Anderson, Vice President Charles Bird, President Dr. Albert Beck, Gordon Andoe, Dr. Larry Kirk, Bo Sheppard.

Front row, left to right: Terry Mallan, Allan K. Seefeldt, Jack Bequette, Assistant Secretary Jerry Ann Fichter. Not pictured: Carl Starkey



Staff



Back row, Left to right: Glen Williams, MVCS; Eric Dillard, MVCS; Aaron Goff, MVCS; Aaron Lumsden, MVCS; Phillip Henry, MVCS; Shane Robertson, MVCS; Front row: Beth Vice, MVCS; Bill Kunde, Regional Supervisor; Del Boyd, Pilot 2; Don Lasik, MVCS; Jim Richards, MVCS; (MVCS: Mosquito and Vector Control Specialist)

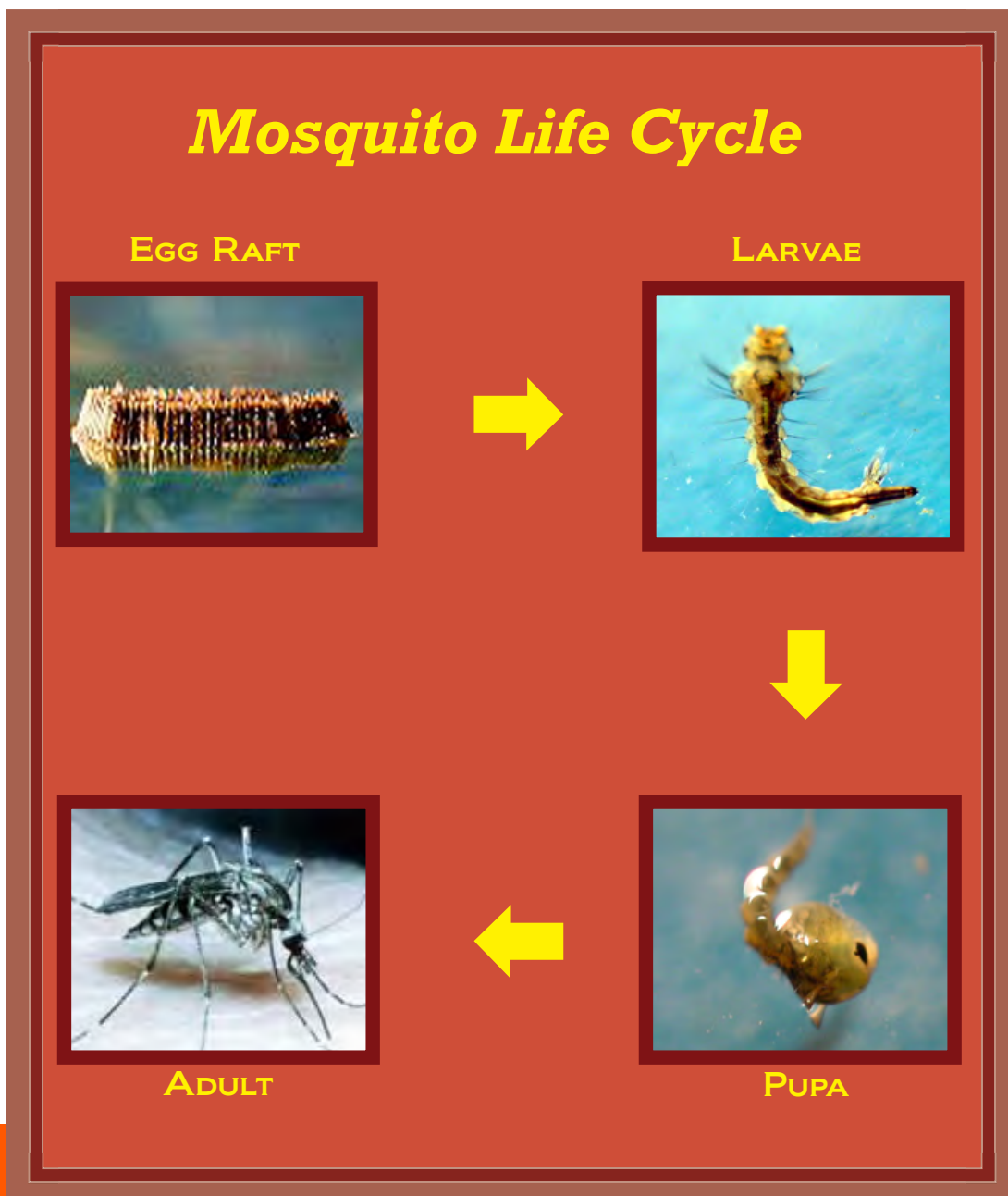
Administrative Staff

Left to right: Dan Moench, Assistant Manager; Eric Gohre, Entomologist; Doug Weseman, Public Information Officer; Matt Ball, District Manager; Darlene Starkey, Office Manager



Mosquito Biology

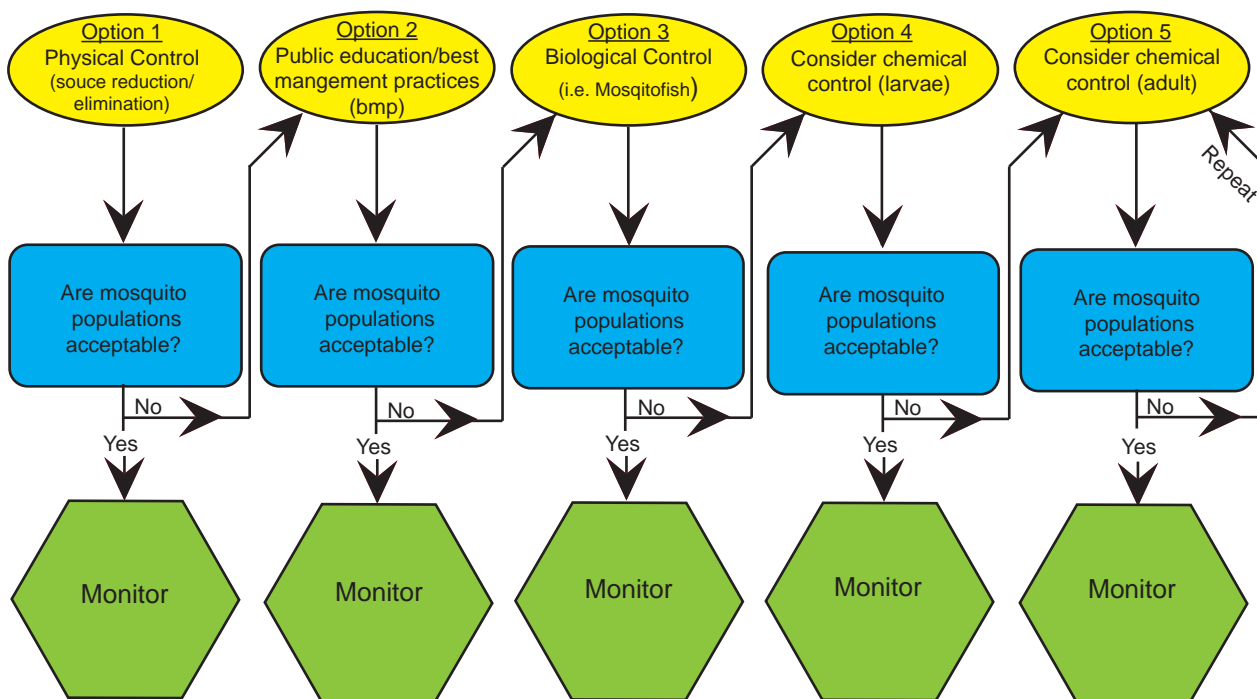
There are approximately 3,500 species of mosquitoes distributed worldwide. In California there are 53 species of mosquitoes and 25 of these are commonly found in Butte County. Mosquitoes, like other animals, must have water, food and some protection from the elements to survive. Mosquitoes undergo complete metamorphosis with four different life stages, egg, larva, pupa, and adult. Mosquito eggs and pupa are unable to feed. Larvae and adults however must feed to survive. Adult female mosquitoes need a blood meal to produce eggs, while adult male mosquitoes feed on plant nectar and juices. The time it takes for a mosquito to develop from an egg to an adult varies with different species and environments. Generally, it takes 3-5 days under optimal conditions for a mosquito to complete it's life cycle. The adult then lives between three weeks and one year. Some egg species have been known to survive for over fifty years. Female mosquitoes can have up to three or four broods of eggs in their lifetime.



Integrated Vector Management (IVM) Program

Integrated Vector Management (IVM) is an effective and environmentally sensitive approach to vector management that relies on a combination of common sense practices. The District's IVM program uses current, comprehensive information on the life cycles of vectors and their interaction with the environment. This information, in combination with available vector control methods, is used to manage vector nuisance and public health threats by the most economical means and with the least possible hazard to people, property, and the environment. The District's IVM program includes public education/best management practices, physical control (source reduction and/or elimination), biological control, chemical control, and monitoring.

Each time one of the District's state certified Mosquito and Vector Control Specialists locates a mosquito breeding source the site is accessed and the flow chart below is followed. If the mosquito breeding source can be eliminated then the flow chart stops and the source is monitored.



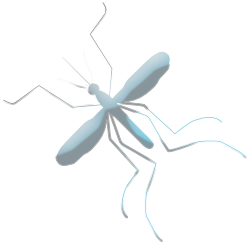
Checking a Light Trap



Sentinel Chicken

Physical Control / Source Reduction and/or Elimination

The best method of mosquito control is source elimination (the complete removal of standing water). All mosquitoes need water to breed, unfortunately water is vital to keep lawns green, to grow crops, to sustain life, and to provide habitat for other aquatic insects and animals. District Mosquito and Vector Control Specialists actively work with property owners, land managers, and municipalities to reduce the amount of water needed for irrigation, to observe or consider best management practices, to actively participate in the design of new developments, and the overall reduction of standing water on a property.



Mosquito and Vector Control Specialist draining water in a cemetery flower vase

Public Education/ Outreach and Best Management Practices

The District's mission is to protect residents from mosquitoes and other vectors that transmit disease. Public education and information is an important part in the success of combating diseases such as West Nile virus and Lyme disease. The District's education program consists of public appearances at local city and county fairs, participation in the state Mosquito and Vector Awareness week, and presentations at schools and local civic groups. In addition to the above, the public education and outreach strives to find new and more effective ways of better educating the public by arming residents with knowledge to prevent mosquito bites and reduce or eliminate mosquito-breeding through informational pamphlets, website information, best management practice manuals, repellent suggestions, one on one interaction, and homeowner safeguards.

In 2010, the District and the Board of Trustees adopted a final version of a Best Management Practices (BMP) to Reduce Mosquitoes manual. The manual provides property owners with tools and techniques to minimize mosquito populations through the proper use of land management practices while reducing the use of pesticides. The BMP's contained in the manual are assembled from a number of sources including scientific literature, state and inter-agency documents, and from experienced vector control professionals. The BMP manual includes general guidance to all properties that can, have, and will breed mosquitoes. A copy of the BMP manual can be viewed on the District's website at www.BCMVCD.com. The manual has successfully been used to reduce mosquito populations/public health threats without the need of additional pesticides.

2013 Public Education

2013 turned out to be another successful year for the Butte County Mosquito and Vector Control District's (District) Public Education Department.

The District again teamed up with Stott Advertising for a county wide billboard advertising campaign. The billboards utilized the District's 2013 public outreach theme "Fight The Bite". The artwork for the billboards was created by the District's public education intern Lonnie Thompson. The billboards were placed in Chico, Gridley, Oroville, and Paradise and rotated throughout these cities during mosquito season.

The District also continued its dog and cat heartworm prevention campaign at veterinarian offices throughout the county. These offices were randomly chosen to receive heartworm prevention brochures, brochure holders, and a wooden mosquito model.

The District again observed the American Mosquito Control Association's (AMCA) "Mosquito Control Awareness Week" by holding an open house at the District Headquarters.

A recap of this year's events that the District was represented at include the Home and Garden Show in Chico, the Chico Creek Nature Center "Celebrate The Jewel" day in Chico, Gold Nugget Days in Paradise, Feather Fiesta Days in Oroville, the Poplar Avenue School Health Fair in Oroville, Red Suspenders Day in Gridley, the Silver Dollar Fair in Chico, the Gridley Expo, Biggs National Night Out, the Berry Creek Berry Festival, the Butte County Fair, the Salmon Festival in Oroville, the Chico Senior Fair in Chico and the Tribal Health Fair in Oroville.

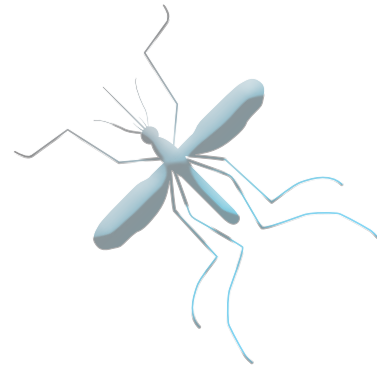
Group presentations were given to/at the California Conservation Corps. in Chico, the Lake Oroville Visitors Center in Oroville, and the Gridley Lions Club. Several school presentations on the dangers of mosquitoes and ticks were given throughout the District. Also, radio interviews were granted to KKXX radio in Chico as well as KPAY radio in Chico. Several television interviews were granted to KHSL 12 News, KNVN 24 News, and KRCR News Channel 7. Newspaper/internet interviews were granted to the Chico Enterprise Record and the Oroville Mercury Register.



District Brochures

2013 Public Education Highlights

- **Billboard Advertising Throughout the County**
- **Butte County Fair, Gridley (Booth)**
- **Silver Dollar Fair, Chico (Booth)**
- **Gold Nugget Days, Paradise (Booth)**
- **Feather Fiesta Days, Oroville (Booth)**
- **Berry Creek Berry Festival (Booth)**
- **Salmon Festival, Oroville (Booth)**
- **Senior Fair, Chico Area Recreation and Parks (Booth)**
- **Red Suspenders Day, Gridley (Booth)**
- **K-6 Classroom Presentations on Ticks and Mosquitoes (Throughout the County)**
- **Butte County Agencies/Businesses “Report Standing Water” Campaign**
- **Chico Home and Garden Show, Chico (Booth)**
- **Gridley Expo, Gridley (Booth)**
- **Lion’s Club, Gridley (Presentation)**
- **Community Health and Safety Fair, Oroville (Booth)**
- **AMCA National Mosquito Control Awareness Week, Open House at District Office**
- **Chico Creek Nature Centers “Celebrate The Jewel” day, Chico (Booth)**
- **Poplar Avenue School Health Fair, Oroville (Booth)**
- **California Conservation Corps (Presentation)**
- **Several Print, Radio, and Television Interviews**
- **Biggs National Night Out, Biggs (Booth)**
- **Lake Oroville Visitors Center, Oroville (Presentation)**
- **Bilingual Tick Awareness Partnership Formed with Farm Labor Housing (Gridley)**
- **Tribal Health Fair, Oroville (Booth)**
- **Trained/Worked With Chico State Intern**






BCMVCN Intern Lonnie Thompson



Butte County Mosquito and Vector Control District:

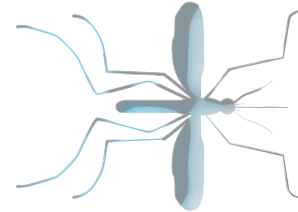


ADDRESS: 5117 Larkin Rd. Oroville CA. 95965
 PHONE: 530 533 6038 or 530 342 7350
 FAX: 530 534 9916
 Website: www.bcmvcd.com

2013 Chico News and Review Ad



Educating the Public



Fight The Bite!

- **AVOID DAWN AND DUSK**
- **DRAIN STANDING WATER**
- **WEAR REPELLENT**



WWW.BCMVCD.COM ○ 533-6038

© www.FightTheBiteColorado.com

2013 Billboard Theme

GIS/GPS System

Over the past six years the District has formed a close partnership with the CSUC Geographic Information Center (GIC) in Chico, CA. to create a new geographic information system (GIS) for the District. GIS is a system that captures, stores, analyzes, manages, and presents data that is linked to a location (spatial data). In 2010 the District went “live” with the new system. This system took the place of the old system which utilized map books, handwritten reports, and outdated handheld electronic devices called “Timewands”. The new system consists of a laptop computer for each Mosquito and Vector Control Specialist, including seasonal workers, that runs ESRI Corporations ArcMobile software and a GPS unit that connects to the laptop computer. The new GIS system also includes a data management server that is housed at the GIC in Chico and a new in-house computer that runs ESRI’s ArcGIS version 10.1. This computer is used to manage source data collected from the laptops in the field and is also used as a link to the District’s Office Managers computer and the Microsoft Access database that it controls. The new system increases accuracy, facilitates user friendly reporting, minimizes data manipulation and corruption, and maximizes time efficiency.

WWW.BCMVCD.COM

The District’s website continues to be an important tool in educating the public about mosquitoes and other vectors and the practices of the District. On the website the user can make a service request, sign up for email notification of upcoming fogging operations, and view maps of where the District will be fogging and where the District has fogged in the past. The user can also view Board of Trustee agendas and minutes, read the latest news that affects the District and their constituents, and view information on viruses and other diseases that are transmitted by mosquitoes and other vectors such as ticks. Visitors to the website may also be interested in the mosquitofish page, as well as, the services page which lists the locations in Butte County and Hamilton City where residents can pick up free mosquitofish. The services page also includes yellowjacket and wasp nest removal, tick and insect identification, and a public education section where interested parties can find out how to request the District come to their school or service group for a presentation. The website also has links to the pesticide labels and MSDS sheets for the public health pesticides that it uses, as well as, a frequently asked questions page and a “contact us” page.



Laptop mounted inside vehicle



District website home page

Email Notification System

In 2011 the District continued to improve the mosquito fogging notification system. The email notification system was created to meet public concerns and expectations, to enhance media coverage, and to help inform other agencies that need to know when and where the District is mosquito fogging. The Chico Enterprise Record uses these fogging notifications in their newspaper to inform their readers of the planned fogging operations. To meet these needs the District used Constant Contact software, modeled after the award winning Contra Costa Mosquito and Vector Control District's email notification system, to compose and send out the fogging notifications via email. These email notifications are sent out, in most cases, 30 plus hours before a fogging operation takes place. The notifications include maps of the areas to be fogged, links to the labels and material safety data sheets of the public health pesticides used, the dates and times of the fogging operations, and a link to the District website. The public can sign up for email notifications on the District website, www.BCMVCD.com. The District website also has the fogging notifications, as well as links to the public health pesticides. The District also makes phone calls to notify residents and agencies that do not use email or have access to a computer.

Butte County Mosquito and Vector Control District

Fogging Notification

Mosquito Fogging will take place on 09/24/2013 in the Honcut, Pacific Heights, Palermo, South Oroville areas. Please see attached map(s) for detailed information. If you are unable to open or view the map(s) because of browser, memory space, or software problems please see the same map(s) at our website at <http://www.bcmvcd.com/advisory.php>. The fogging will take place from approximately 7:15 PM to 11:30 PM. Fogging operations may be canceled due to unfavorable weather conditions.

Product(s) used in these areas will be Anvil 10 + 10 and/or Pyrocyde 7395

Links To:

Anvil 10 + 10
Label

MSDS

Pyrocyde 7395
Label

MSDS

Additional information can be obtained by viewing the manufacturers websites at:

[Clarke Mosquito Control](#)
[Adapeco](#)
[McLoughlin Gormley King Company](#)
[Crop Data Management Systems](#)

For more information please call the Butte County Mosquito and Vector Control District at (530) 533-6038 (from Oroville, Richvale, Biggs, Gridley, Berry Creek) or (530) 342-7350 (from Chico, Paradise, Cahasset, Forest Ranch) or visit www.bcmvcd.com

Free Mosquitofish

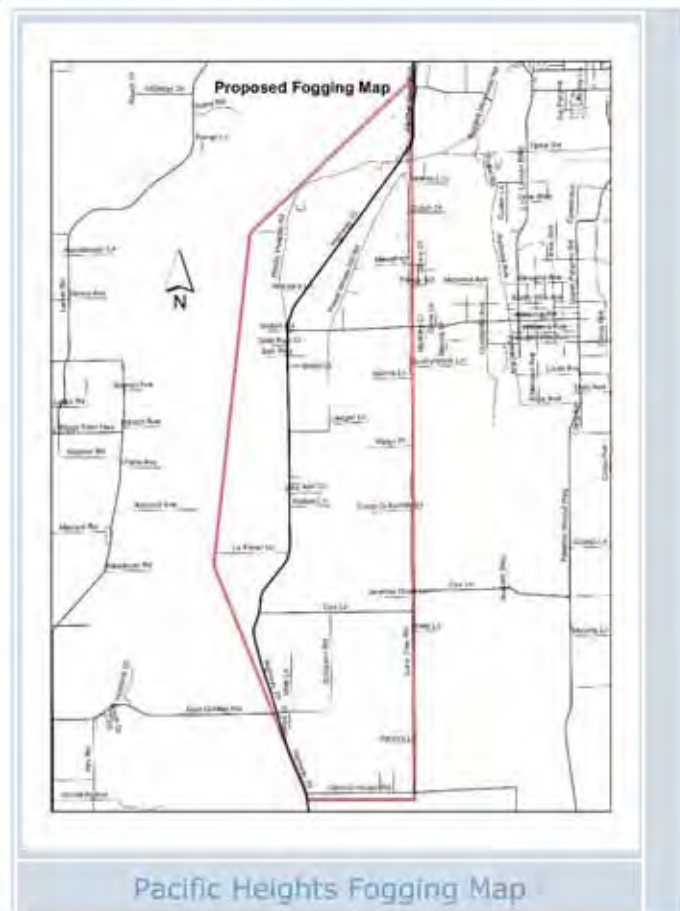
As a reminder, the District has a FREE Mosquitofish program. FREE Mosquitofish are available for pick up in the following communities: (1) Concow, (3) Paradise, (1) Magalia, (1) Hamilton City, (1) Gridley, (3) Chico. Additionally FREE Mosquitofish can be picked up by appointment at the District's Chico substation at 444 Otterson Drive or any time during business hours at the District's main office located at 5117 Larkin Road in Oroville. Also, Mosquitofish can be delivered to you just by visiting the District's website or by calling the District office. For more information, locations of the FREE mosquitofish pickup locations, and/or delivery of FREE Mosquitofish, please contact us at 530-533-6038 or 530-342-7350 visit the District website at www.BCMVCD.com

MOSQUITOFISH ARE ONLY TO BE USED ON PRIVATE PROPERTY and ARE NOT TO BE PLANTED IN CREEKS, STREAMS, RIVERS, and LAKES.

SUSPECTED MOSQUITO-BREEDING

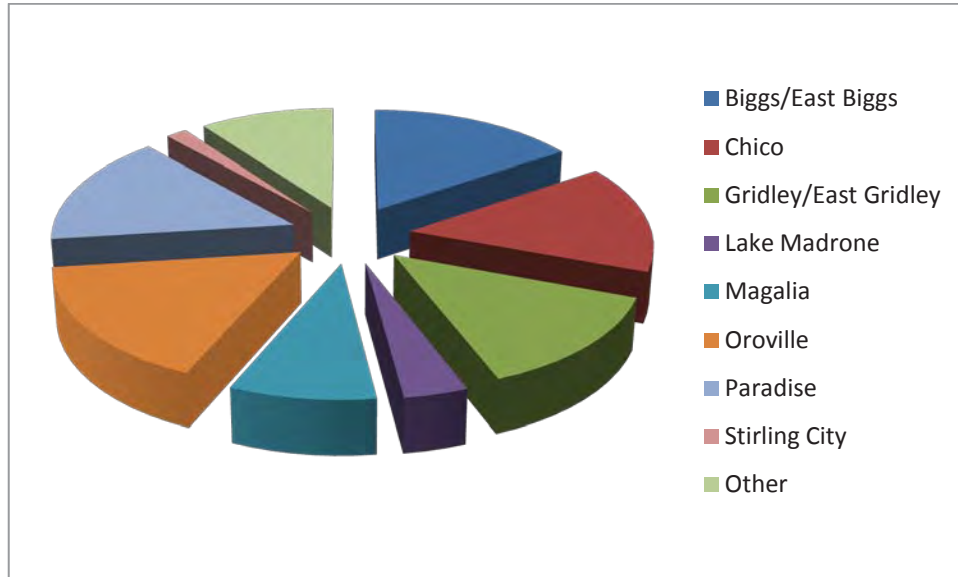
Should you observe and/or see a water source that you believe or could produce

mosquitoes, please call us at 530-533-6038 or 530-342-7350 or visit www.BCMVCD.com. Reporters of suspected mosquito-breeding sources have the option to remain anonymous.



Example of Constant Contact email notification

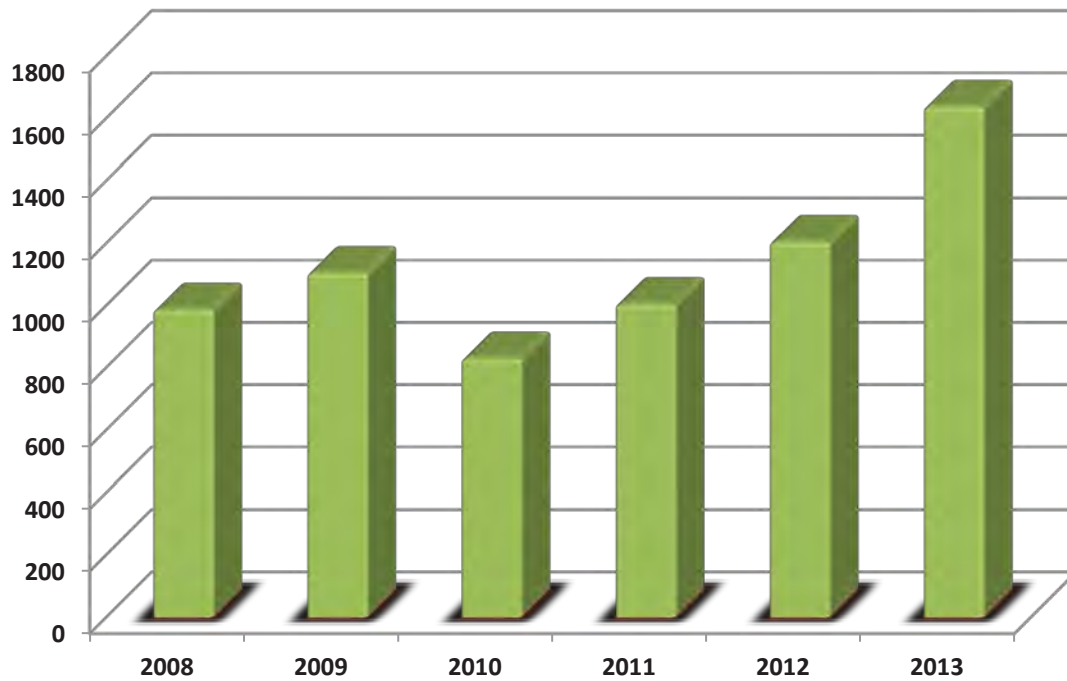
2013 Service Request Percentages



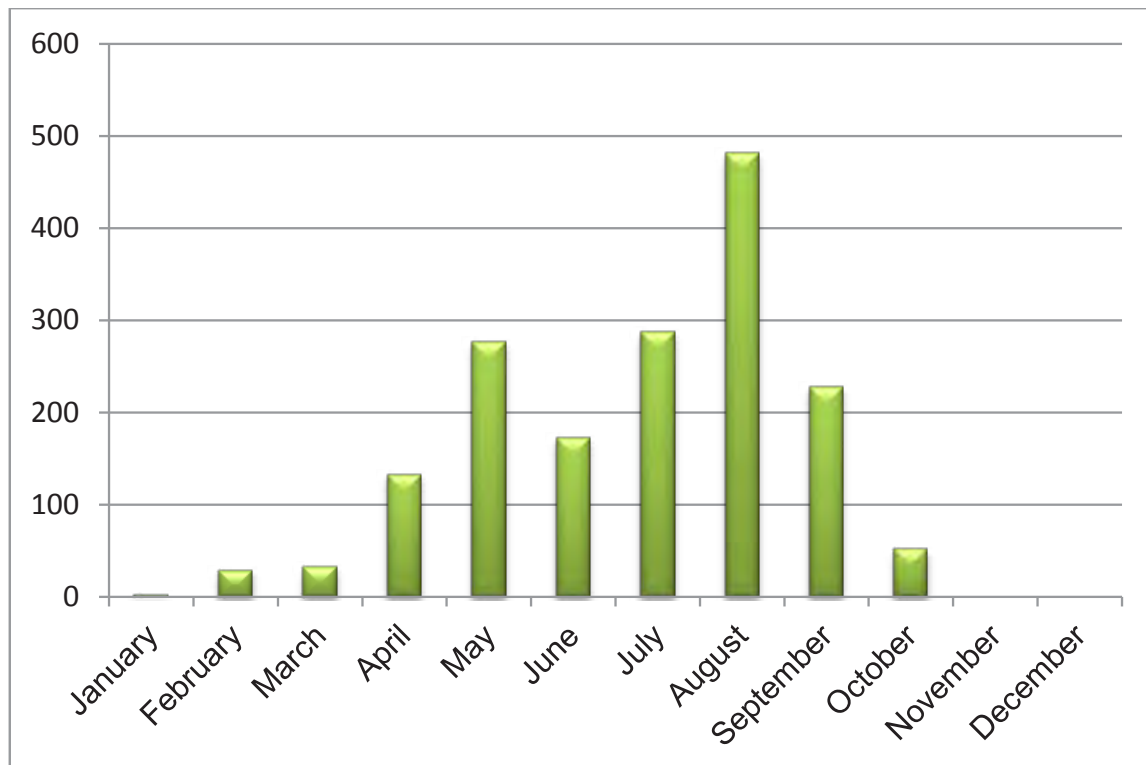
2013 Service Requests

Area	Number of Service Requests	Percentages
Bangor	5	0.3%
Berry Creek	48	2.9%
Biggs/E. Biggs	255	15.6%
Brush Creek	9	0.5%
Chico	246	15.0%
Clipper Mills	11	0.7%
Concow	3	0.2%
Dayton	4	0.2%
Durham	5	0.3%
Forbestown	11	0.7%
Forrest Ranch	11	0.7%
Gridley/East	221	13.5%
Hamilton City	4	0.2%
Honcut	16	1.0%
Lake Madrone	62	3.8%
Magalia	141	8.6%
Nelson	3	0.2%
Nord	1	0.1%
Oroville	270	16.5%
Palermo	15	0.9%
Paradise	251	15.3%
Richvale	18	1.1%
Stirling City	26	1.6%
Yankee Hill	1	0.1%
Totals	1637	100%

2013 Annual Service Requests



2013 Service Requests by Month



Vector and Vector-Borne Disease Surveillance

The definition of a vector is any animal capable of producing discomfort or injury, including, but not limited to, mosquitoes, flies, other insects, ticks, mites, and rats but not including domestic animals according to the California State Health and Safety Code, Section 2002(K). Surveillance of vectors is a vital component of the District's Integrated Vector Management (IVM) Program and a considerable amount of time and effort is devoted to conducting vector surveillance. The District's surveillance program consists of a scientific approach for locating vector populations usually focusing on mosquito-breeding sources, monitoring mosquito populations, and mosquito-borne disease. Data collected from the surveillance program is analyzed to determine maximum and minimum risk periods of public exposure to mosquito-borne disease, evaluates control efforts, and seasonal changes in relative abundance of mosquito species. Surveillance data is collaborated in the District's database which provides historical information on mosquito dynamics and mosquito-borne disease within the District.

The District utilizes an extensive surveillance program for both adult and immature (larval) mosquitoes. Throughout Butte County and the Hamilton City area of Glenn County, the District uses 26 New Jersey light traps, 21 gravid traps, over 40 CO₂ traps, and 7 sentinel chicken flocks to monitor adult mosquito populations and virus activity. District Mosquito and Vector Control Specialists monitor larval mosquito populations throughout the entire District on a daily basis utilizing a standard one-pint dipper. District Mosquito and Vector Control Specialists spend the majority of their day inspecting standing water such as rice, wetlands, storm drains, ponds, ditches, swimming pools, bird baths, fountains, seasonal and/or other man made containers for larvae.

The District utilizes an entomology department (Lab) that is staffed with an Entomologist and a Lab Assistant. The District's entomology department is responsible for the identification of the trapped mosquito collections and reporting the population numbers to the California Department of Public Health. The Lab conducts virus testing on live mosquitoes, dead wild birds, and sentinel chicken flocks. These tests are the District's eyes to monitor and detect mosquito-borne viruses in and around the county. The Lab also conducts scientific pesticide trials to monitor the chemicals effectiveness on targeted mosquitoes and to assess the possible effects on non-targets and trials on new chemical methodology and/or new chemicals. The Lab is also at your service to identify ticks, arachnids, and other insects/arthropods of public health significance.



Entomologist Eric Gohre checking a CO₂ trap



Checking a Gravid trap

Virus Surveillance

2013 Virus Surveillance Report

The District monitors for Western equine encephalitis (WEE), St. Louis encephalitis (SLE), California encephalitis (CE), and West Nile virus (WNV) activity by collecting blood samples from sentinel chicken flocks strategically placed throughout the District, collecting live mosquitoes trapped throughout the District, and collecting dead wild birds District wide.

Sentinel Chicken Flocks

Annually the District maintains seven sentinel chicken flocks of eleven birds each. The flocks are located in Palermo, Honcut, Gridley, Biggs, South Chico, West Chico, and Hamilton City. Bi-weekly blood samples are taken from the sentinel chickens by the entomology staff and sent to U.C. Davis for testing. The blood sample is tested for SLE, WEE, CE and WNV. In 2013, 57 of the 65 sentinel chickens from all 7 District flocks tested positive for WNV.



Mosquito Pools

Each week the District's entomology staff strategically places traps known as encephalitis virus surveillance (EVS) or carbon dioxide traps (CO2) around the District. Traps are posted overnight and retrieved the next morning and the collections are returned to the Lab for identification. The entomology staff will identify and sort the trapped mosquitoes and pool the collections for virus testing. A pool consists of 1 to 50 adult female mosquitoes of the same specie. Pooled mosquitoes are transferred to numbered vials and sent to the Center for Vector-Borne Disease Research (CVBDR) at the University of California, Davis. At the CVBDR lab the pools are tested for WEE, SLE, CE, and WNV. In 2013 the District sent 179 mosquito pool samples with 38 (33 in Butte County and 5 in Hamilton City) returning positive for WNV. This is the highest number of WNV positive mosquito pools ever recorded in the District service area.



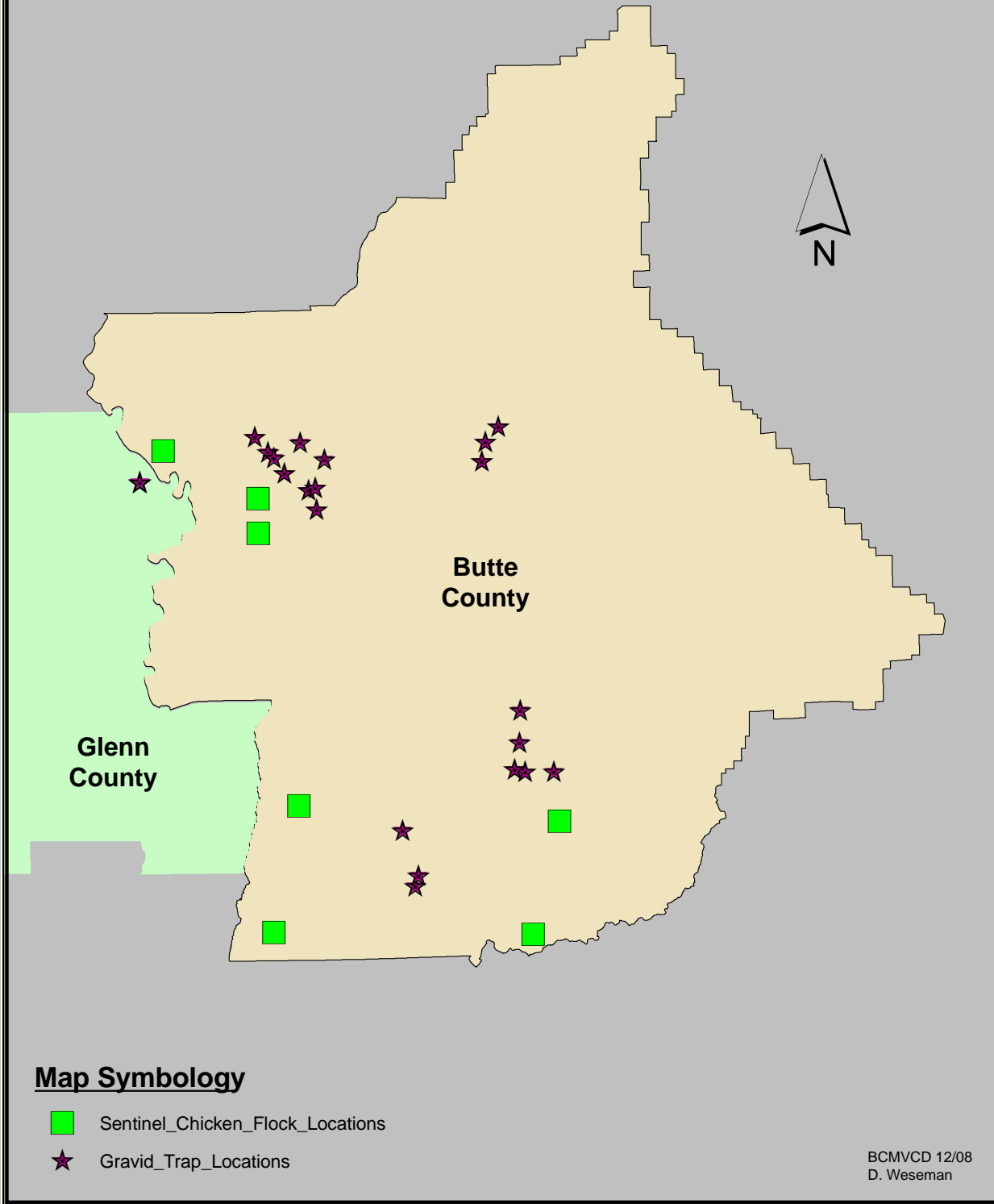
Dead Bird Surveillance and Testing

For more than nine years the District has participated in the California Department of Public Health's (CDPH) WNV dead bird testing program. County residents participate in the program by calling CDPH's dead bird hotline (1-877-WNV-BIRD) each time they find a dead bird in the District or by submitting an online form at one of these two websites, (www.westnile.ca.gov) or (www.BCMVCD.com). After a dead bird has been reported, CDPH notifies the District and District staff retrieves the bird and submits it for WNV testing.

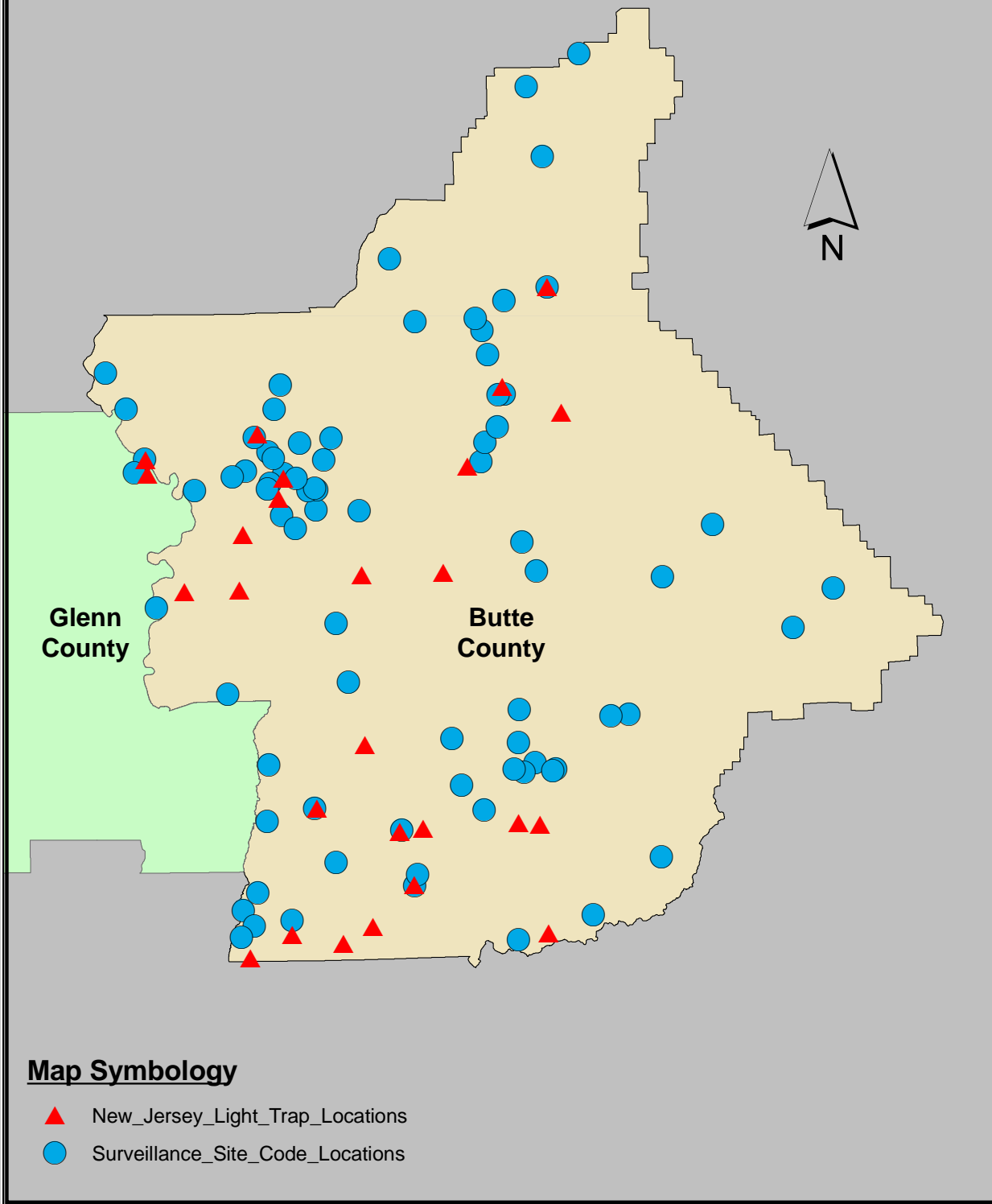
Butte County West Nile Virus Statistics

<i>Year</i>	<i>Humans</i>	<i>Horses</i>	<i>Dead Birds</i>	<i>Mosquito Pools</i>	<i>Sentinel Chickens</i>	<i>Squirrels</i>
2004	7	18	118	1	50	0
2005	25	7	79	4	15	0
2006	34	0	40	1	49	1
2007	16	0	27	5	32	0
2008	6	0	38	5	31	0
2009	2	0	13	5	36	0
2010	1	1	6	7	7	1
2011	3	0	0	1	20	0
2012	10	2	53	27	43	2
2013	24	0	42	38	57	1
Total	128	28	415	94	340	5

BCMVCD Sentinel Chicken Flock and Gravid Trap Locations



BCMVD New Jersey Light Trap Locations and Surveillance Site Code Locations

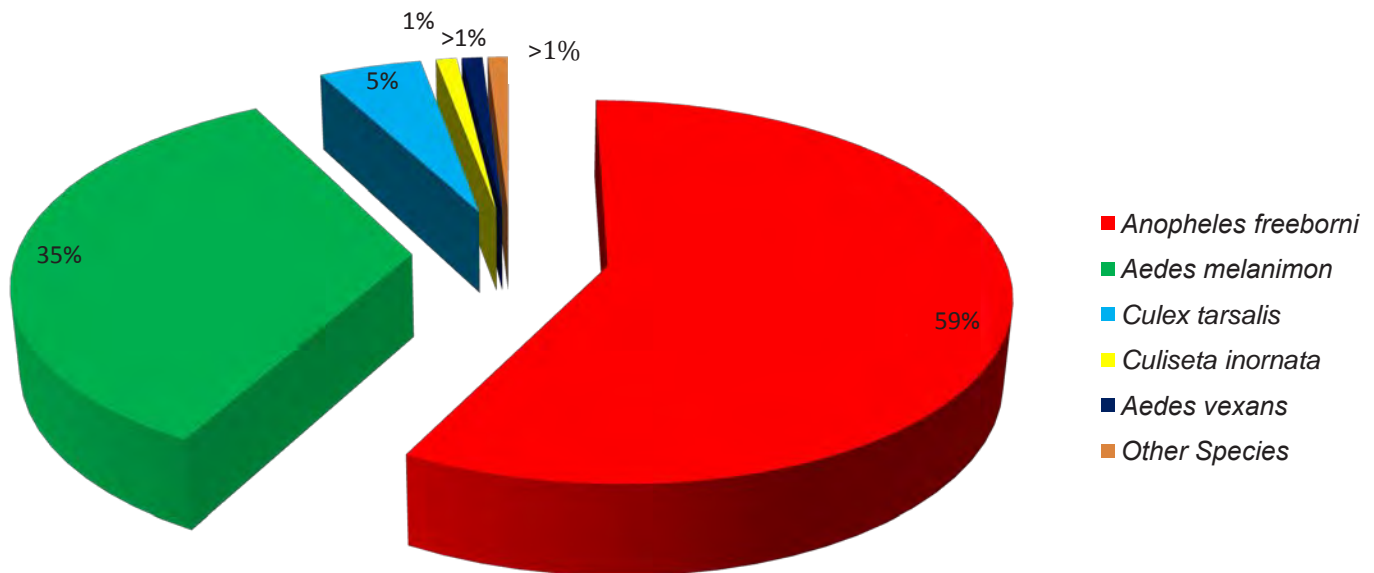


2013 New Jersey Light Trap Collections (Females Only) March 2013 - November 2013

Ranking	Mosquito Species	Number Collected	% (Rounded)
1	<u>Anopheles freeborni</u>	195,704	59%
2	<u>Aedes melanimon</u>	115,263	35%
3	<u>Culex tarsalis</u>	15,936	5%
4	<u>Culiseta inornata</u>	1,760	1%
5	<u>Aedes vexans</u>	848	>1%
6	<u>Culex pipiens</u>	722	>1%
7	<u>Culiseta incidens</u>	261	0%
8	<u>Aedes punctipennis</u>	69	0%
9	<u>Aedes sierrensis</u>	62	0%
10	<u>Aedes nigromaculis</u>	38	0%
11	<u>Culex stigmatosoma</u>	29	0%
12	<u>Aedes washinoi</u>	11	0%
13	<u>Anopheles franciscanus</u>	6	0%

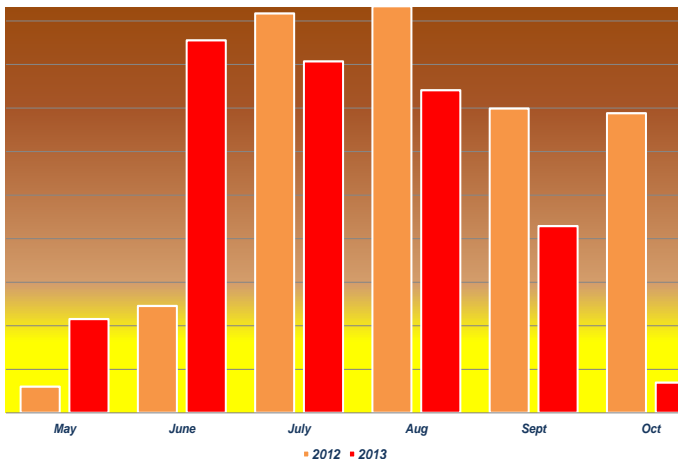
Total Identified = 330,709

100.00%

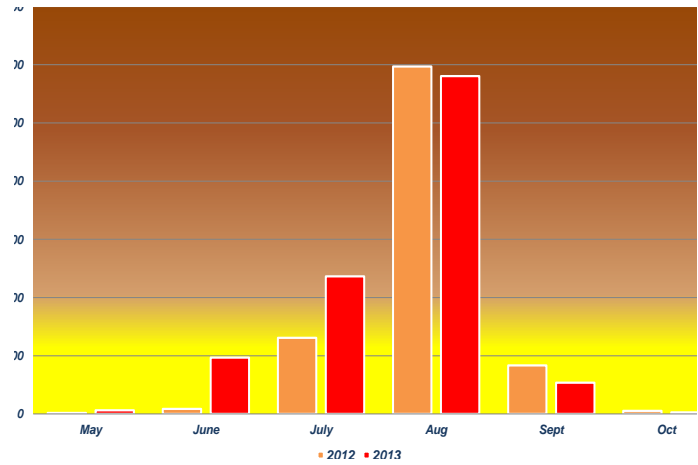


New Jersey Light Trap Seasonal Fluctuation of Vector-Borne Disease Vectors

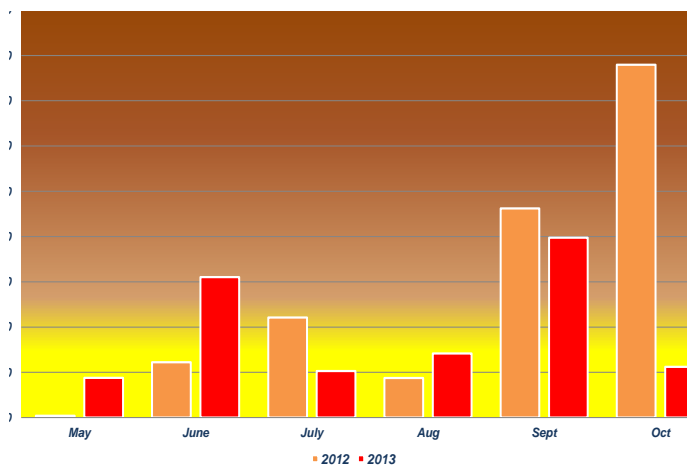
Culex tarsalis



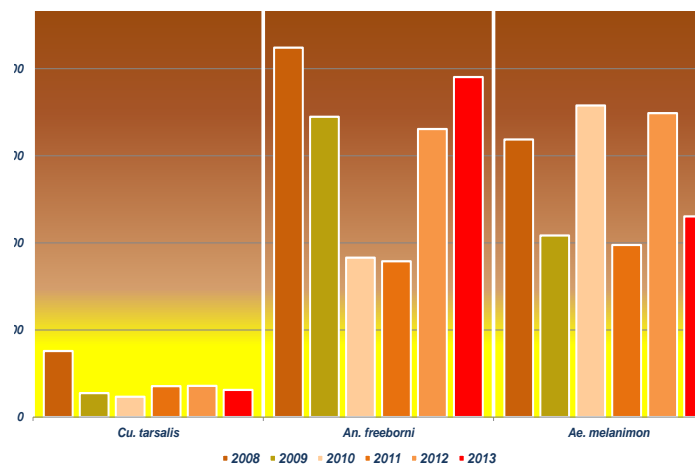
Anopheles freeborni



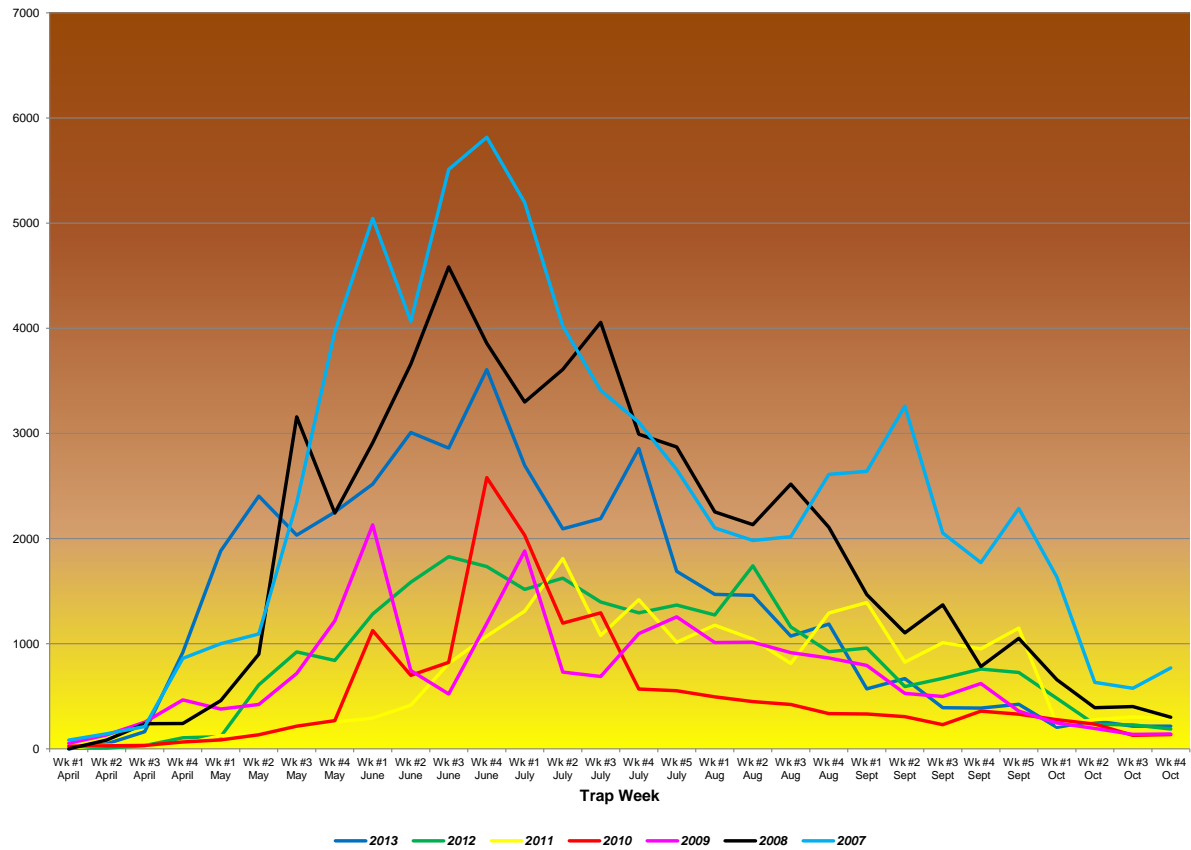
Aedes melanimon



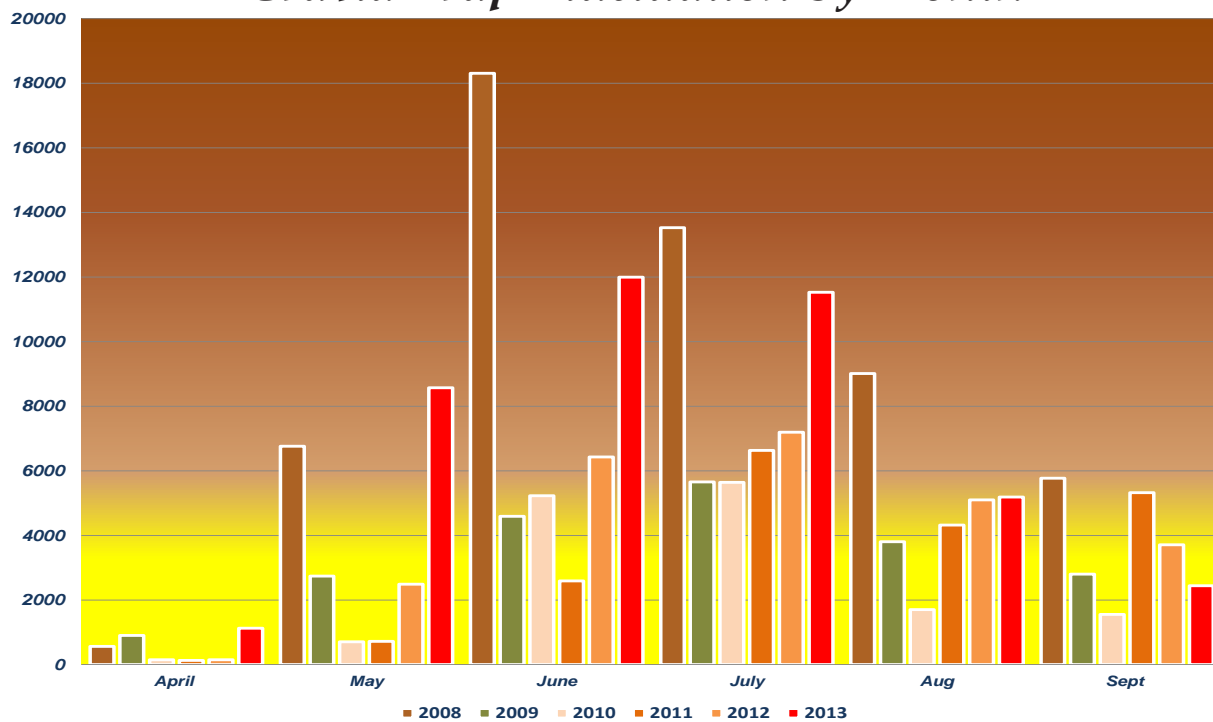
Annual Total Female Mosquitoes



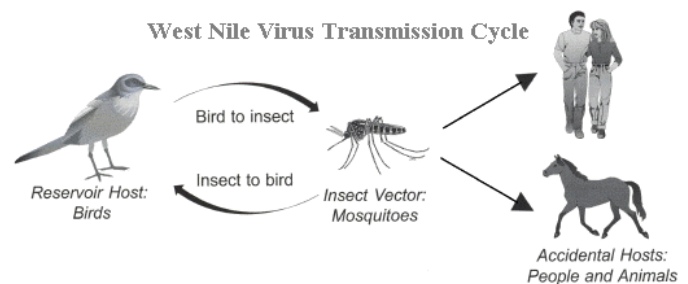
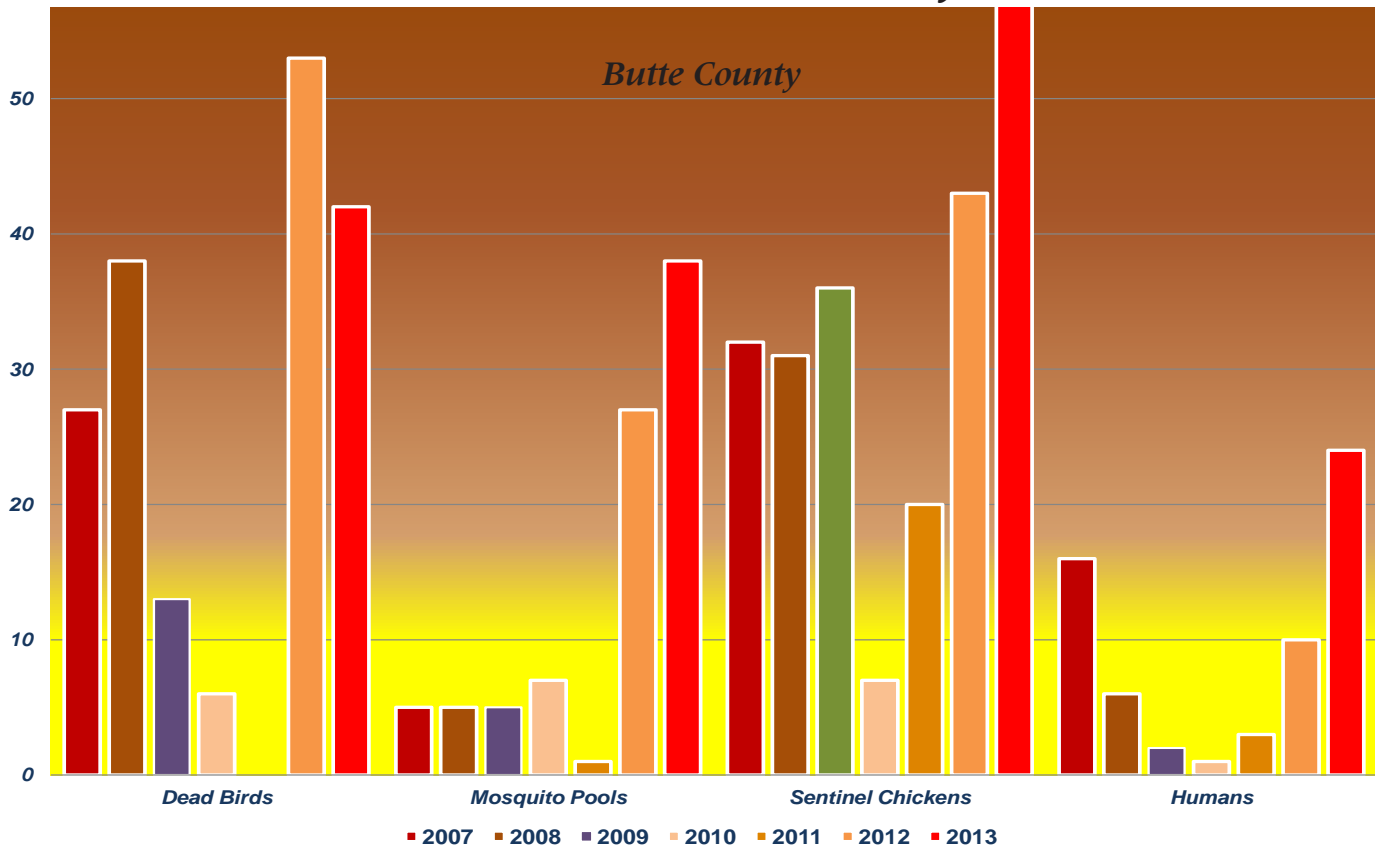
Gravid Trap Fluctuation by Week



Gravid Trap Fluctuation by Month



West Nile Virus Activity



West Nile Virus Symptoms

Serious Symptoms in a Few People

About one in 150 people infected with West Nile virus (WNV) will develop severe illness. The severe symptoms can include high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness, and paralysis. These symptoms may last several weeks, and neurological effects may be permanent. WNV infection can be fatal.

Milder Symptoms in Some People

Up to 20 percent of the people who become infected will display symptoms including fever, headache and/or body aches, nausea, vomiting, and sometimes swollen lymph glands or a rash on the chest, stomach, and back. Symptoms can last as little as a few days to several weeks.

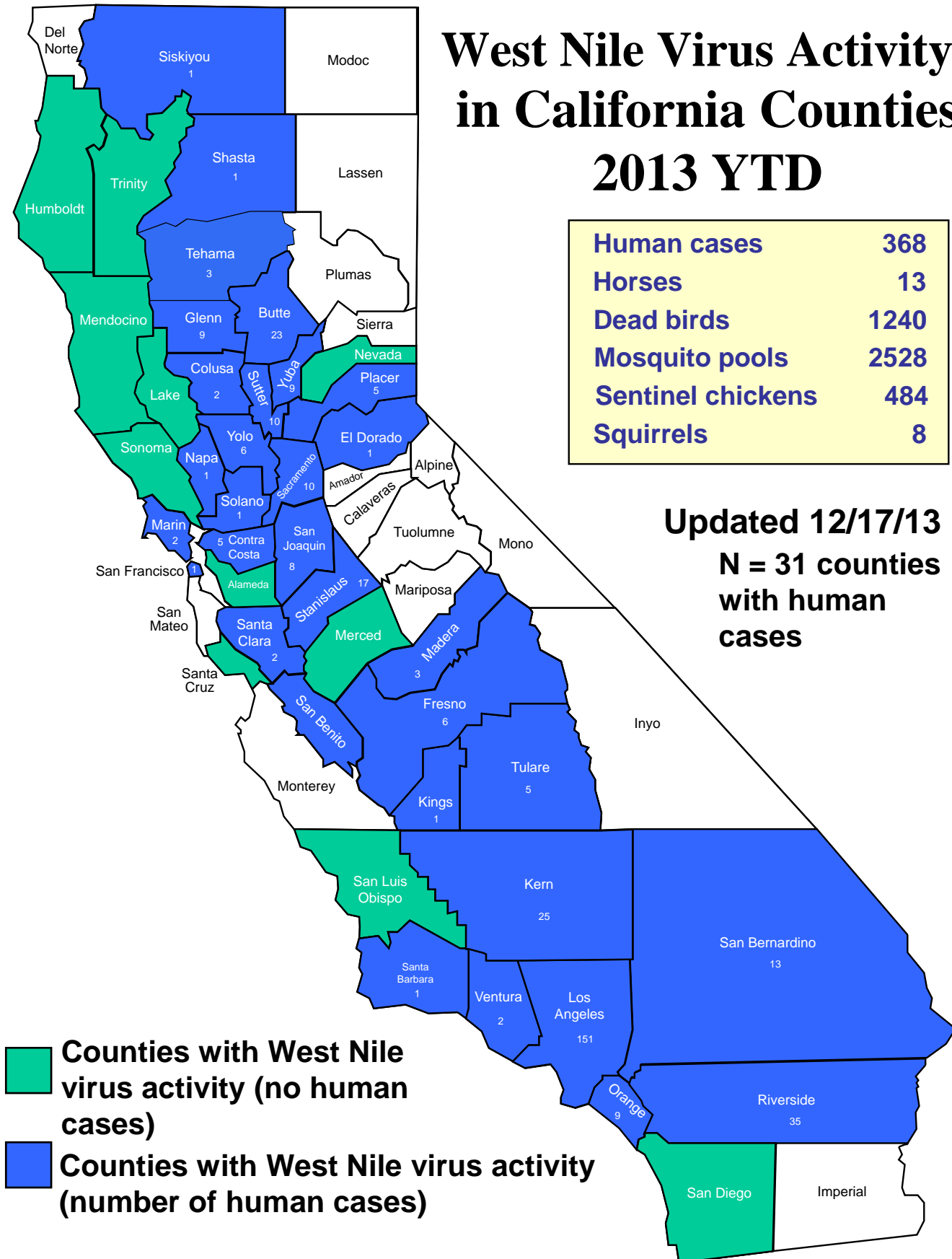
No Symptoms in Most People

Approximately 80 percent of people (about 4 out of 5) who are infected with WNV will not have any symptoms at all.

West Nile Virus Activity in California Counties 2013 YTD

Human cases	368
Horses	13
Dead birds	1240
Mosquito pools	2528
Sentinel chickens	484
Squirrels	8

Updated 12/17/13
N = 31 counties
with human
cases



Biological Control

Biological control is the intentional use of mosquito pathogens, parasites or predators to reduce the size of target mosquito populations to tolerable levels. The most popular and successful biological tool that is used by the District is the mosquitofish, *Gambusia affinis*. The District has tried other biological control methods and will continue to fully explore any new options that come along, but the most effective biological tool the District currently uses is the mosquitofish. Butte County Mosquito and Vector Control District maintains six fishponds at the Oroville Headquarters. These ponds produce hundreds of pounds of mosquitofish each year. The mosquitofish are routinely stocked and planted by District Mosquito and Vector Control Specialists to control mosquito populations in sources such as irrigation ditches, industrial, ornamental and artificial ponds, un-maintained swimming pools, semi-permanent and permanent urban sources, and at times in rice fields and wetlands. Mosquitofish are omnivorous and have a voracious appetite for mosquito larvae. The flattened head and protruding mouth enable the fish to readily prey on surface feeding mosquito larvae and pupae. A large female can consume up to 300 larvae per day! All ages, sexes, and sizes of these fish eat mosquito larvae, other small aquatic invertebrates, and algae. The fish are visual predators and feed during daylight hours.

Due to insecticide resistance and environmental concerns associated with chemical control methods, biological control methods are expanding as an effective tool used in the control of mosquito populations.

Mosquitofish (*Gambusia affinis*) 2013

<u>Mosq. Breeding Source Treated</u>	<u>lbs. of Fish Planted</u>	<u>Acres Treated</u>	<u>Apps. Made</u>
Stock Pond	2	3	11
Dredger Pit/ Ponds	3	18	13
Irrigation (Canal, Ditch, Pond,)	88	138	116
Sump	1	3	9
Managed Wetlands	157	1494	53
Seepage	2	4	7
Water Trough	6	11	67
Field Drain	26	64	73
Dist. Grounds/Fish Ponds	266	530	147
Residential Fish Pond	2	4	50
Swimming Pool/Spa	17	17	72
Residential Misc. Container	21	7	81
Public Domain/Flood Control	1	2	5
Freeway/Road Drain	1	2	8
Sewage Ponds	8	28	11
Service Requests	2	4	2
Retention Detention/Ponds	1	2	18
Industrial Commercial	14	2	115
Misc. Container/Storage Bins	6	3	6
Natural Sources/Wildlife Area	4	196	5
Rice	8	114	7
Pond, Seepage, Slough, Creek	57	78	62
Sentinel Fish Tanks	513	1026	92
Large Area/Many Source Type	26	51	21
Annual Totals	1231	3801	1051



Mosquitofish eating mosquito larvae

Did You Know? Mosquitoes are considered the deadliest “animal” in the world. The Anopheles mosquito, in particular, is dangerous because it transmits malaria, which kills more than one million people every year, primarily in Africa. Alexander the Great is believed to have died of malaria in 323 B.C.

Mosquitofish Pick Up Locations

Skyway Feed and Supply
5990 Foster Road
Paradise 877-1019

Foothill Mill and Lumber Company
1698 Wagstaff Road
Paradise 877-3395

Mendon's Nursery
5424 Foster Road
Paradise 877-7341

Paradise Pines True Value Hardware
14086 Skyway
Magalia 873-1008

C Bar D Feeds
3388 Hwy 32
Chico 342-5361

Magnolia Gift & Garden
1367 East Avenue
Chico 894-5410

Wilbur's Feed & Seed
139 Meyers Street
Chico 895-0569

The Pine's Yankee Hill
11300 Miller Flat Road
Oroville 534-1265
Hwy 70 just east Concow Road

Rosa's Nursery
585 Main Street
Hamilton City 826-0559

Harshbarger Ace Hardware
1626 Highway 99
Gridley 846-3625

District Office
5117 Larkin Road
Oroville 533-6038

Chico Substation (By Appointment)
444 Otterson Drive
Chico 342-7350

*Mosquitofish are not to be planted in creeks, streams, and rivers.



District fish tank



"Seining" a pond



Mosquitofish

Chemical Control

Chemical control is the use of target specific insecticides to reduce immature and adult mosquito populations. These chemicals are only applied when physical control, public education, and biological control methods are unable to keep mosquito populations tolerable or when emergency control measures dictate the use of chemicals to rapidly terminate or disrupt the transmission of disease to humans. There are two categories of chemicals used by the District, larvicides and adulticides. Larvicides target mosquito larvae and pupae. Adulticides target adult mosquitoes. The chemicals used by the District are registered with the United States Environmental Protection Agency (EPA), as well as the California Environmental Protection Agency (CAL EPA). The District relies mainly on larviciding as the primary means of chemical mosquito control. However, there are limitations to larviciding as a main control strategy. In Butte County where mosquito breeding occurs over large areas, the practical application of larvicides is not feasible and periodic adulticiding is necessary to protect nearby communities from the attack of adult mosquitoes. Also, there are areas that are environmentally sensitive and limit the use of larvicides. In these areas peripheral adulticiding is the only available option.



Ag-Cat treating a wetland for mosquito larvae



Fogger Calibration



Residual treatment



Calibration Training

<u>Materials</u>	<u>Amount of Materials</u>	<u>Acres Treated</u>	<u>Number of Applications</u>
Larvicides			
Abate 4E	0.02 gal.	2.00	2
Agnique	1.66 gal.	7.62	81
Altosid XR Briquettes	11.06 lbs.	0.19	41
Altosid Ingot	0.11 lbs.	0.01	1
Altosid SR-20	0.49 gal.	44.00	33
Fourstar CRG	20.00 lbs.	2.00	1
Golden Bear	766.99 gal.	262.08	1045
Natular G	74.50 lbs.	6.35	10
Natular G-30	40.00 lbs.	4.00	2
Natular T-30	32.63 lbs.	4.82	186
Spheratax SPH	1.76 lbs.	0.08	23
Vectobac 12AS	1656.16 gal.	23900.49	404
Vectobac G	65105.35 lbs.	7138.05	177
Vectobac GR	350.84 lbs.	38.98	1
Vectobac WDG	73.85 lbs.	236.34	3
Vectolex WDG	19.25 lbs.	26.50	28
Vectolex WSP	175.30 lbs.	7.96	538
Vectomax WSP	77.59 lbs.	3.61	307
		31685.08	2883
Adulticides			
Anvil 10+10	352.57 gal.	109432.01	1065
Kontrol	106.58 gal.	10554.00	268
Pyrethrin 5%	140.37 gal.	26933.00	307
Pyrethrin 12%	31.18 gal.	11275.05	79
Trumpet	479.96 gal.	60816.40	201
		219010.46	1920
Barrier Sprays			
Suspend	11.13 gal.	30.68	219
		30.68	219
Yellow Jacket Control			
Drione	0.19 lbs.	0.02	3
Knox Out 2 FM	0.11 gal.	1.07	88
		1.02	91
Herbicides			
Round Up Pro Max	2.50 gal.	4.08	20
		4.08	20
Aircraft Spraying			
Total Acres Treated	92,240		
Total Acres Rice	24,248		
Managed Wetlands	6,921		
Total Acres ULV	60,816		

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Going Green

In an effort to reduce its "carbon footprint" the District continually looks for ways to "go Green". One of the first steps in doing this was the purchase of an electric powered Zap pickup. This pickup is currently being used as a yard utility vehicle at the District headquarters in Oroville. This pickup is used for many applications where a gas powered pickup or a forklift were used in the past. Additionally, the pickup is used during mosquito season in urban areas for larval surveillance and control. The District has also purchased an electric powered forklift for its Chico substation. Another step in the District's going green plan was the purchase of four bicycles. The four bikes are used mainly in Chico to treat storm drains. These bikes are especially handy in the downtown Chico area where parking and accessibility can be an issue. The Mosquito and Vector Control Specialists that ride the bikes can triple their days workload, reaching many more mosquito populations in much less time.



Checking a storm drain via bicycle



Smart car

Programmatic Environmental Impact Report

In 2011, the District completed its Programmatic Environmental Impact Report (PEIR). The District held a public hearing to receive comments on the District's Draft PEIR on February 9, 2011. After receipt of comments from the State of California Department of Public Health, and from trustees, the draft PEIR was revised and a Final PEIR was available for review between February 10, 2011 & August 5, 2011. Upon conclusion of the second review period and a second public hearing on August 10, 2011 the District's Board of Trustees adopted the District's Final PEIR report compiled by Westech Company with changes and mitigations. This report will be used as an educational component for the District. Residents can view the PEIR on the District's website at www.BCMVCD.com.



Granular testing



Droplet testing

Tick Surveillance

Tick surveillance in Butte County is done primarily because of the diseases that ticks can transmit. In the United States ticks are known to transmit 14 human illnesses. The two that infect humans most often are Lyme disease and Rocky Mountain Spotted Fever (RMSF). Lyme disease is an infectious disease caused by a bacterium known as a *Borrelia burgdorferi*. People get Lyme disease when a tick infected with the Lyme disease bacterium attaches and feeds on them. The tick that is responsible for spreading Lyme disease in Northern California is the Western Black-legged tick. RMSF is a bacterial disease caused by the bacterium, *Rickettsia*. Transmission of the RMSF bacteria is primarily from the Pacific Coast tick. Both of these ticks can be readily found in Butte County.

District tick surveillance consists of “flagging” and identifying. “Flagging” is where a 3 x 2 piece of thick, fibrous cloth, is dragged along the edge of a trail or dirt road. The ticks attach themselves to the cloth while they are “questing” for a blood meal. Like a mosquito, the female tick needs a blood meal to lay her eggs. Once the ticks are attached to the cloth they are identified, counted, and recorded. This information can lead to risk assessment warnings to residents in areas that have high tick activity.



Tick “flagging”



Locating tick on the “flag”



Western Black Legged tick



California State Parks caution sign

Yellow Jacket Surveillance

Yellowjackets are medium sized black and yellow wasps (sometimes black and creme) that are often confused with honey bees, paper wasps, mud daubers, and other wasps. Yellowjackets are social insects that are considered beneficial. They can feed on garden pests and pollinate crops through daily foraging. Yellowjackets can become a public health concern because of their territorial behavior and their affinity for human food and drinks. Yellowjackets can restrict or prevent outdoor activities in areas such as campgrounds, picnic areas, and backyards.

The District will respond to reports of high yellowjacket activity. Mosquito and Vector Control Specialists will then inspect the area and decide if control is appropriate. Control measures may include placing traps or bait, treating nests with an approved insecticide, or physically removing the nest. All pesticide applications are made by state-certified technicians using materials that are registered for use by the Environmental Protection Agency.



Locating the nest entrance



"Dusting" the nest



110 pound nest that was dug up



Size comparison between queen (L) and worker (R)

District Shop

The District's shop provides the maintenance and repairs for 30 vehicles, 3 forklifts, 1 backhoe, 3 ATV's, 2 amphibious Tritons, 1 loader truck and 4 utility trailers. Additionally, the shop is responsible for the maintenance and repairs to the District's electric ULV foggers, gas ULV foggers, back cans, power sprayers, small engines such as chain saws, weed eaters, lawn mowers, etc. and other mechanical items.

The shop is also responsible for repairing and installing improvements to the District facilities and grounds when and where necessary. Often the shop will repair the District's security system, lighting fixtures, plumbing fixtures, and other items as needed.



District Air Operations

At the Oroville facility, the District employs one full time Pilot II. On average the planes make applications to over 150,000 acres each year. During down time, the 3 planes receive repairs and technological improvements such as new instruments and instrument panels, installation of new technology (altimeter, Satloc, Ag-Nav), repainting, replacing engine parts, and routine annual maintenance. The Pilot II also is responsible for renting a passenger plane and providing aerial surveillance flights over seasonally flooded wetlands and duck clubs for the District's Mosquito and Vector Control Specialists.



District Administration

Greeted by a nice smile and a pleasant tone, professional and courteous customer service is the number one priority for the District's administration staff. The District employs one full time Office Manager. The tasks of the administrative personnel involve serving the residents of Butte County and Hamilton City, as well as, the employees of the District. Accounting, budgeting, responding to telephone inquiries, maintaining public records, coordinating policies, and reporting to the Board of Trustees are just a few of the many duties the department performs.



2013 Butte County Mosquito and Vector Control District Board of Trustees

Name	Title	Area Represented	
Albert Beck	Board President	County District 1	Bill Connelly
Carl Starkey	Board Trustee	County District 2	Larry Wahl
Charles Bird	Board Vice President	County District 3	Maureen Kirk
Jack Bequette	Board Trustee	County District 4	Steve Lambert
Allan Seefeldt	Board Trustee	County District 5	Doug Teeter
Bo Sheppard	Board Trustee	City of Biggs	City Council
Larry Kirk	Board Trustee	City of Chico	City Council
Jerry Ann Fichter	Board Assistant Secretary	City of Gridley	City Council
Terry Mallan	Board Trustee	Town of Paradise	Town Council
Tom Anderson	Board Secretary	Hamilton City	Bd of Supervisors
Gordon Andoe	Board Trustee	City of Oroville	City Council

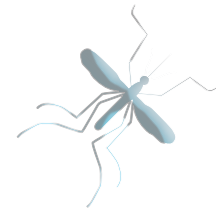
2013 Butte County Mosquito and Vector Control District Employees

Name	Title
Matt Ball	District Manager
Dan Moench	Assistant Manager
Del Boyd	Pilot II
Darlene Starkey	Office Manager
Eric Gohre	Entomologist II
Bill Kunde	Regional Supervisor
Doug Weseman	Public Information Officer
Jim Richards	MVCS
Beth Vice	MVCS
Phillip Henry	MVCS
Shane Robertson	MVCS
Don Lasik	MVCS
Aaron Goff	MVCS
Glen Williams	MVCS
AAron Lumsden	MVCS
Eric Dillard	MVCS
John Fox	MVC Assistant Seasonal
Patrick Self	Shop Assistant Seasonal
Anthony Visconte	MVC Assistant Seasonal
David Corson	Lab Assistant Seasonal
Frank Lopez	MVC Assistant Seasonal
Ed Upton	MVC Assistant Seasonal
Shane Cassity	MVC Assistant Seasonal
Justin King	MVC Assistant Seasonal
Nathalie Pronovost	MVC Assistant Seasonal
Alex Miller	MVC Assistant Seasonal

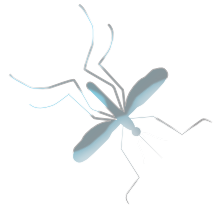
Assistant Manager Dan Moench Retires After 40 Years of Service

The District said farewell in December to Assistant Manager Dan Moench who had worked for the District for over 40 years. Dan started as a Mosquito and Vector Control Assistant Seasonal in 1973. He became a full time Mosquito and Vector Control Specialist in 1974. Dan was then promoted to Regional Supervisor in 1986. After 6 years in that position he was promoted to Assistant Manager. Dan was the District's Assistant Manager for 22 years. Dan's knowledge of mosquitoes, leadership skills, and job know how will be surely missed by the District. The District wishes Dan all the best during his retirement years!





2013 FINANCIALS



Butte County Mosquito and Vector Control District				
For The Year Ended June 30, 2013				
				Variance
				Favorable
		Budgeted	Actual	(Unfavorable)
Revenue		\$ 2,603,821	\$ 2,754,225	\$ 150,404
<u>SALARIES & BENEFITS</u>				
Salaries		\$ 1,267,000	\$ 1,278,378	\$ (11,378)
Workers Compensation		\$ 47,046	\$ 46,932	\$ 114
FICA & U I		\$ 113,500	\$ 105,795	\$ 7,705
Health Insurance		\$ 283,000	\$ 273,902	\$ 9,098
PERS		\$ 251,000	\$ 241,865	\$ 9,135
	TOTAL	\$ 1,961,546	\$ 1,946,872	\$ 14,674
<u>SERVICES & SUPPLIES</u>				
Gas & Oil		\$ 90,000	\$ 97,154	\$ (7,154)
Repairs & Parts-Airplane		\$ 13,000	\$ 19,260	\$ (6,260)
Repairs & Parts		\$ 25,000	\$ 17,408	\$ 7,592
Office Supplies		\$ 13,000	\$ 11,226	\$ 1,774
Education & Publicity		\$ 20,000	\$ 19,620	\$ 380
Insecticides		\$ 376,000	\$ 573,061	\$ (197,061)
Expendable Equipment		\$ 10,000	\$ 11,239	\$ (1,239)
Communications		\$ 13,000	\$ 13,285	\$ (285)
Travel		\$ 10,000	\$ 4,672	\$ 5,328
Utilities		\$ 20,000	\$ 16,177	\$ 3,823
Special Services		\$ 70,000	\$ 74,569	\$ (4,569)
Trustee Allowance		\$ 12,000	\$ 12,600	\$ (600)
General Insurance		\$ 70,000	\$ 66,924	\$ 3,076
Employee Trng & Dues		\$ 8,000	\$ 9,490	\$ (1,490)
District Fees and Permits		\$ 30,000	\$ 12,245	\$ 17,755
Miscellaneous		\$ 10,000	\$ 7,066	\$ 2,934
Research Supplies		\$ 23,000	\$ 23,020	\$ (20)
Alternate Technology		\$ 1,000	\$ -	\$ 1,000
Special Discretionary		\$ 10,000	\$ 15,078	\$ (5,078)
Gambusia		\$ 2,000	\$ 1,142	\$ 858
	TOTAL	\$ 826,000	\$ 1,005,236	\$ (179,236)
<u>CAPITAL OUTLAY</u>				
Bldg & Improvements		\$ 5,000	\$ -	\$ 5,000
Vehicles		\$ 11,000	\$ 30,060	\$ (19,060)
Spray Equipment		\$ 3,000	\$ 3,241	\$ (241)
Aircraft		\$ 13,000	\$ -	\$ 13,000
Office Equipment		\$ 1,000	\$ -	\$ 1,000
Laboratory Equipment		\$ 1,000	\$ -	\$ 1,000
Shop Equipment		\$ 1,000	\$ -	\$ 1,000
Education & Publicity		\$ 1,000	\$ -	\$ 1,000
Miscellaneous		\$ 1,000	\$ -	\$ 1,000
Communications		\$ 10,000	\$ 10,000	\$ -
	TOTAL	\$ 47,000	\$ 43,301	\$ 3,699
Appropriation for contingencies		\$ 705,637	\$ -	\$ 705,637
Grand Total		\$ 3,540,183	\$ 2,995,409	\$ 544,774
Excess(Deficiency) of				
Revenue over Expenditures		\$ (936,362)	\$ (241,184)	\$ 695,178
Fund Balance 2012			3,182,824	
Fund Balance 2013			2,941,640	

**Butte County Mosquito and Vector Control District
Balance Sheet
Governmental Funds
For The Year Ended June 30, 2013**

Assets			
Cash and Investments	2,641,500		
Accounts receivable	22,737		2
Interest receivable	5,073		
Inventories	314,275		0
Total Assets	2,983,585		1
Liabilities and Fund Balance			
Liabilities			
Accounts payable	12,370		3
Accrued Salaries and Benefits	29,575		
Total Liabilities	41,945		
Fund Balance			
Nonspendable:			
Reserved for imprest cash	11,500		F
Reserved for inventories	314,275		I
Committed to:			
General Reserve	450,000		N
Aircraft Engine	350,000		A
Capital outlay	550,000		N
Assigned to:			
Research	20,000		C
Vector borne Disease	100,000		I
Unassigned, reported in:			
General Fund	1,145,865		A
Total Fund Balance	2,941,640		L
Total Liabilities and Funds Balance	2,983,585		S
Reconciliation of the Balance Sheet of Governmental Funds to the Statement of Net Assets:			
Capital assets used in governmental activities are not financial resources and, therefore, are not reported in the funds		2,734,333	
Long term liabilities are not due in the current period and, therefore, are not reported in the governmental fund.		(2,632,552)	
Net Assets of Governmental Activities		3,043,421	

