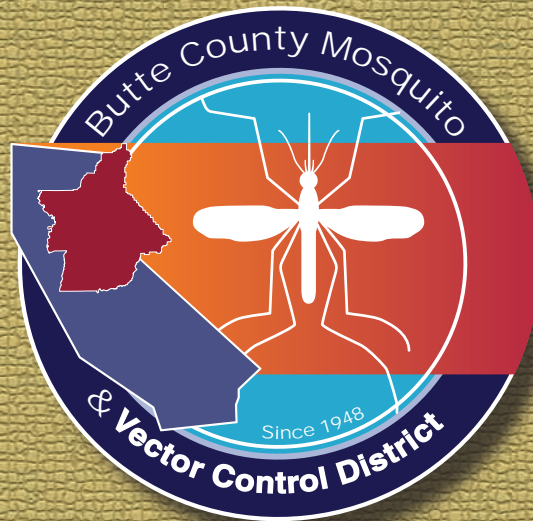
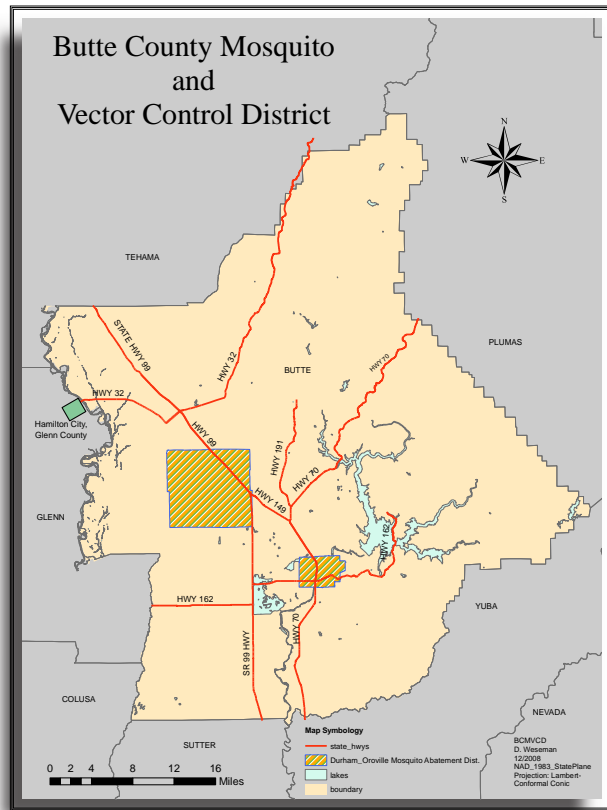


Butte County Mosquito and Vector Control District



**2008
Annual
Report**

BCMVCD Jurisdiction



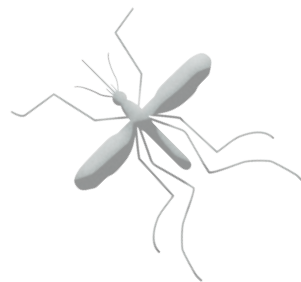
History

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.



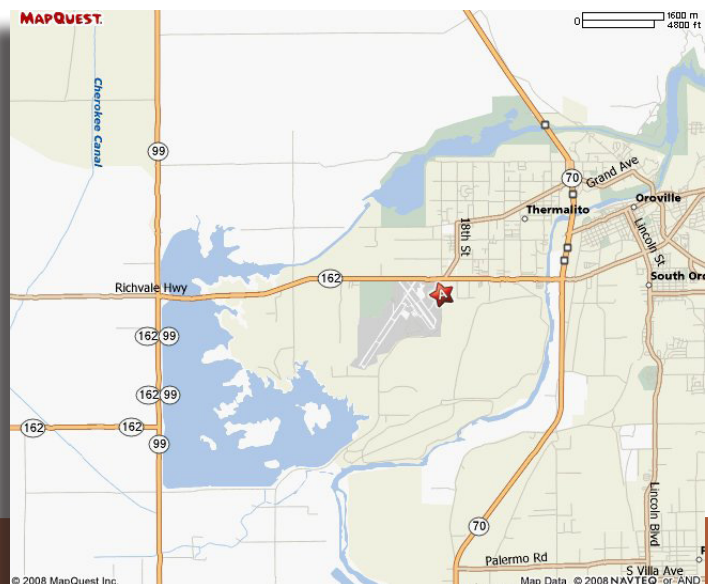
Mission

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.



Office Location

5117 Larkin Road
Oroville, CA. 95965



Foreword

I am pleased to submit the 2008 Annual Report for the Butte County Mosquito and Vector Control District. “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. 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 number one 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 our largest public health concern. In 2008 the state observed a larger increase of WNV human infections (411) than it did in 2007 (380) as of 12/15/2008. As the state human case count increased, Butte Counties human infection rate decreased from 34 in 2006 to 16 in 2007 to 5 in 2008.

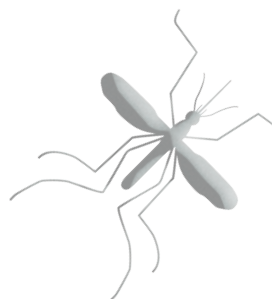
With the emergence of a more urban-based mosquito-transmitted virus such as, WNV, the District was faced with a wide variety of new operational challenges such as urban mosquito breeding. With the decline of the housing market continuing we again saw an increase in the number of vacant homes with abandoned swimming pools, spas, and other water features that were breeding 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 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.

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 out better ways to improve our programs to be prepared of future disease outbreaks that would be a threat to the health of Butte County residents. We look forward to providing our services to you in the future.

Respectfully,

Matthew C. Ball

Matthew C. Ball
District Manager



Board of Trustees

Back Row: Chairman Al Beck, Bill Thebach, Vice Chairman Lynn Vanhart, Assistant Secretary Charles Bird
Front Row: Jack Bequette, Allan Seefeldt, Jerry Anne Fichter, Terry Mallan
Seated: Secretary Tom Anderson
Not Pictured: Dan Hutfless



Staff

Left to right: Glen Williams, MCS; Phillip Henry, MCS; Del Boyd, Pilot; Jim Richards, MCS; Beth Vice, MCS; Mike Oldham, Regional Supervisor; Don Lasik, MCS; Aaron Lumsden, MCS; Shane Robertson, MCS; Aaron Goff, MCS; Not pictured: Pete Gibson, Mechanic;
(MCS: Mosquito Control Specialist)

Administrative Staff

Jodi Sneeringer, Receptionist; Doug Weseman, Public Education Coordinator; Matt Ball, District Manager; Dan Moench, Assistant Manager; Darlene Starkey, Office Manager; Eric Gohre, Entomologist



Mosquito Biology and Development

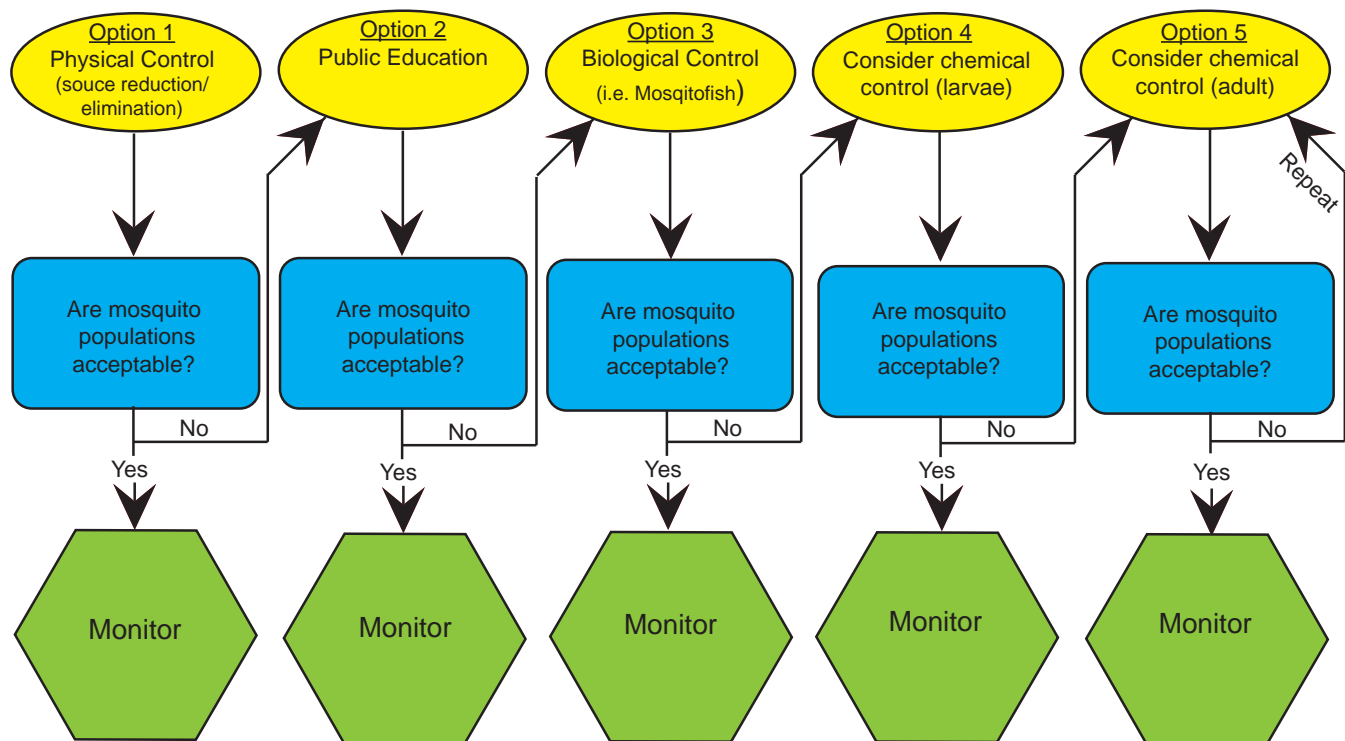
There are approximately 3,500 species of mosquitoes distributed worldwide. In California there are 53 species of mosquitoes and 25 of these are commonly found in Butte County. Mosquitoes, like other animals, must have water, food and some protection from the elements to survive. Mosquitoes undergo complete 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 its life cycle. The adult then lives between three weeks to a 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 Pest Management (IPM) Program

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common sense practices. The Districts IPM program uses current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest 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 IPM includes public education, physical control (source reduction and/or elimination), biological control, chemical control and monitoring.

Each time one of the District's state certified vector control technicians 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.



CO2 Trap



Gravid Trap

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 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 500 larvae per day! All ages, sexes, and sizes of these fish eat mosquito larvae, other small aquatic invertebrate insects, 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*) 2008

Mosquito Breeding Source Treated	Pounds of Fish Planted	Acres Treated	Applications Made
Wetlands	2	3	2
Natural Sources/Wildlife Areas	7.05	14.05	8
Irrigation Ponds	10.88	15.39	18
Canals	9.07	8.09	19
Retention & Detention Ponds	1.26	7.66	17
Freeway-Road Drains	0.38	0.3	5
Streams/Creeks	17	28.37	34
Dredger Pits/Ponds	9.19	31.25	16
Water Troughs	50.24	14.03	106
Sloughs	1.1	2.1	3
District Grounds/ Fish Ponds	140.88	30.1	83
Natural Sources/ Ponds	229.6	121.65	120
Residential Misc. Containers	21.68	4.29	86
Sewage Ponds	11.05	11.41	10
Duck Clubs	78	348.5	30
Ornamental Ponds	8.59	1.88	44
Swimming Pools	50.43	15.68	124
Depressions	2.13	0.26	3
Field Drains	16.74	14.82	52
Fish Ponds	18.67	24.52	139
Industrial Misc. Containers	7.95	9.72	14
Nurseries	0.03	0.01	1
Waste Ponds/Drains	0.5	1	1
Ditches	33.45	32.37	76
Wells	0.2	0.4	2
Totals=	728.07	740.85	1013



Mosquitofish eating mosquito larvae

Did you Know?

An adult female mosquitofish can eat up to **500** mosquito larvae in one day.

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 attack. 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 G164 flying ultra low volume mission at dusk.



Truck mounted fogger in the wetlands west of Gridley.



Did you Know?

Only female mosquitoes bite.

Materials	Amount of Materials	Acres Treated	Number of Applications
------------------	----------------------------	----------------------	-------------------------------

Larvicides

Abate 2BG	29249.38 lbs.	23,909.00	409
Agnique MMF	12.169 gal.	39.785	96
Altosid Briquettes	9.735 lbs.	12.63	14
Altosid Pellets	838.9996 lbs.	1233.212	960
Altosid Pellets WSP	168.995 lbs.	16.16	78
Altosid SBG	28867.60 lbs.	4005.2	89
Altosid XR Briquets	2.398 lbs.	0.91	4
Arosurf MSF	10.568 gal.	19.245	39
Diesel Oil	36.7 gal.	37.09	29
Dursban M	0.001 gal.	0	1
Golden Bear	1716.668 gal.	660.678	1404
Vectobac 12AS	1572.804 gal.	23895	407
Vectolex CG	17.85 lbs.	1	1
Vetolex WDG	14.999 lbs.	33.32	24
Totals=	62,518.87 gal./lbs.	53,863.23	3555

Adulticides

Anvil 10+10 ULV	134.869 gal.	21678.15	94
Anvil 2+ 2 ULV	337.5965 gal.	42872.07	306
Aquahalt	78.554 gal.	15658.9	48
Fyfanon ULV	12.6463 gal.	1127.61	16
Prentox 3%	13.7024 gal.	1003.96	15
Pyrethrin 5%	498.6567 gal.	82868.38	707
Pyrethrin 12	47.84836 gal.	20005.89	211
Trumpet EC	662.4184 gal.	89262.8	277
Totals=	1786.29166 gal.	274477.76	1674

Barrier Sprays

Baygon 70%	0.375 gal.	0.1	1
Baytex 7lb	0.654 lbs.	1.57	21
Dursban 4E	0.788 gal.	31.27	48
Totals=	1.817 gal./lbs.	32.94	70

Yellowjacket Control

Drione	0.06 lbs.	1.02	1
Knox Out 2 FM	0.128 gal.	230	25
Totals=	0.188 gal./lbs.	231.02	26

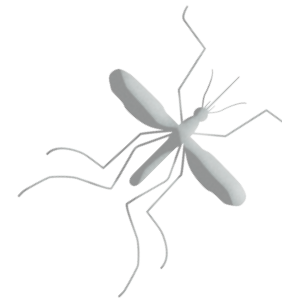
Herbicides

Amizol	0.79 gal.	0.62	4
Glyphosate Pro	3.502 gal.	3.83	16
Glypro Plus	0.094 gal.	0.2	1
Totals=	4.386 gal.	4.65	21

Totals= 64311.55 gal./lbs 328,609.60 5346

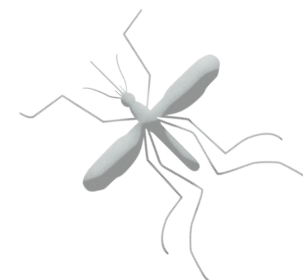
Aircraft Spraying

Total Sources Sprayed	1,182
Total Acres Treated	157,506
Total Acres Rice	23,484
Total Acres Duck Clubs	6,377
Total Acres ULV	127,429
Total Acres Other	216

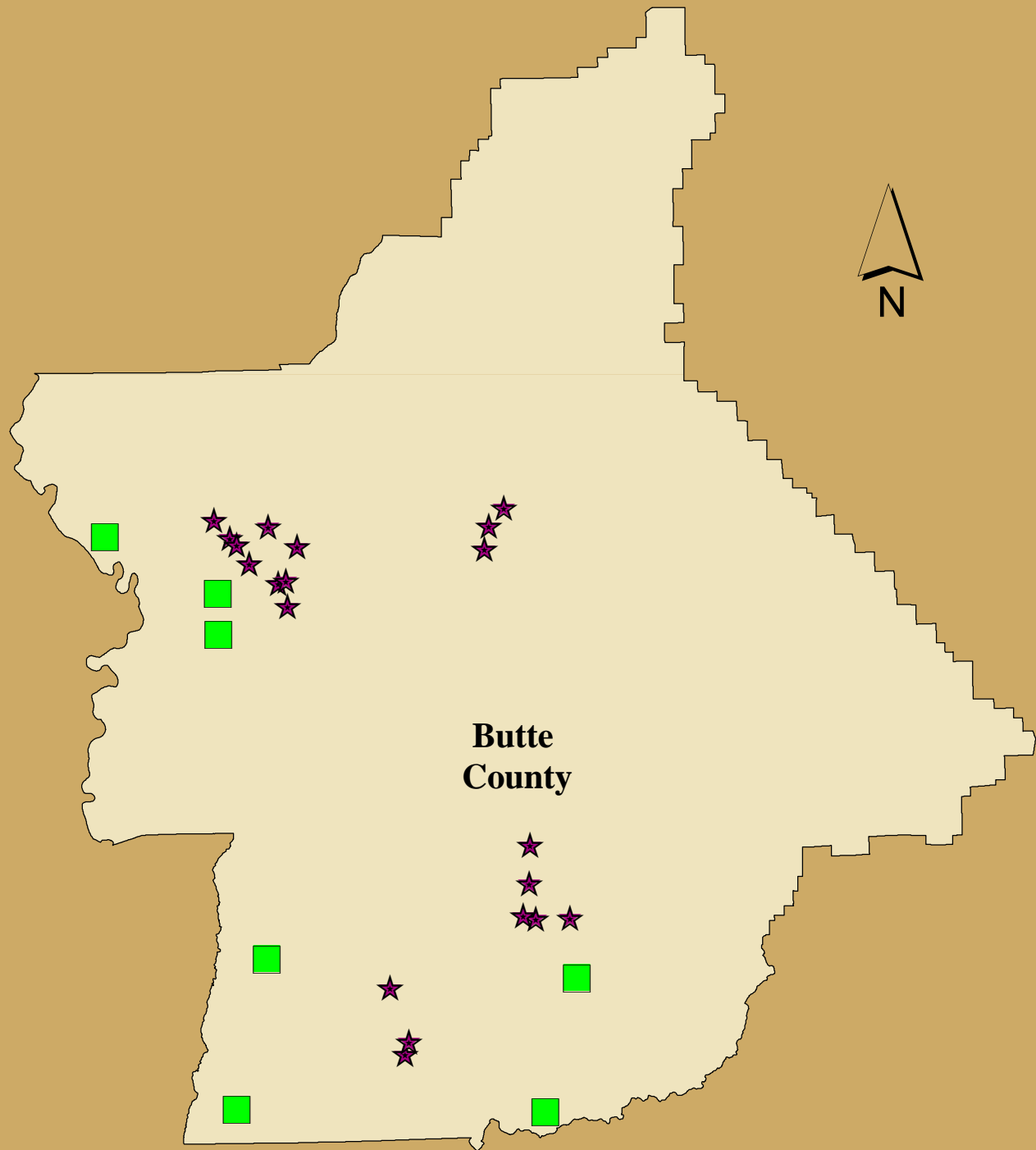


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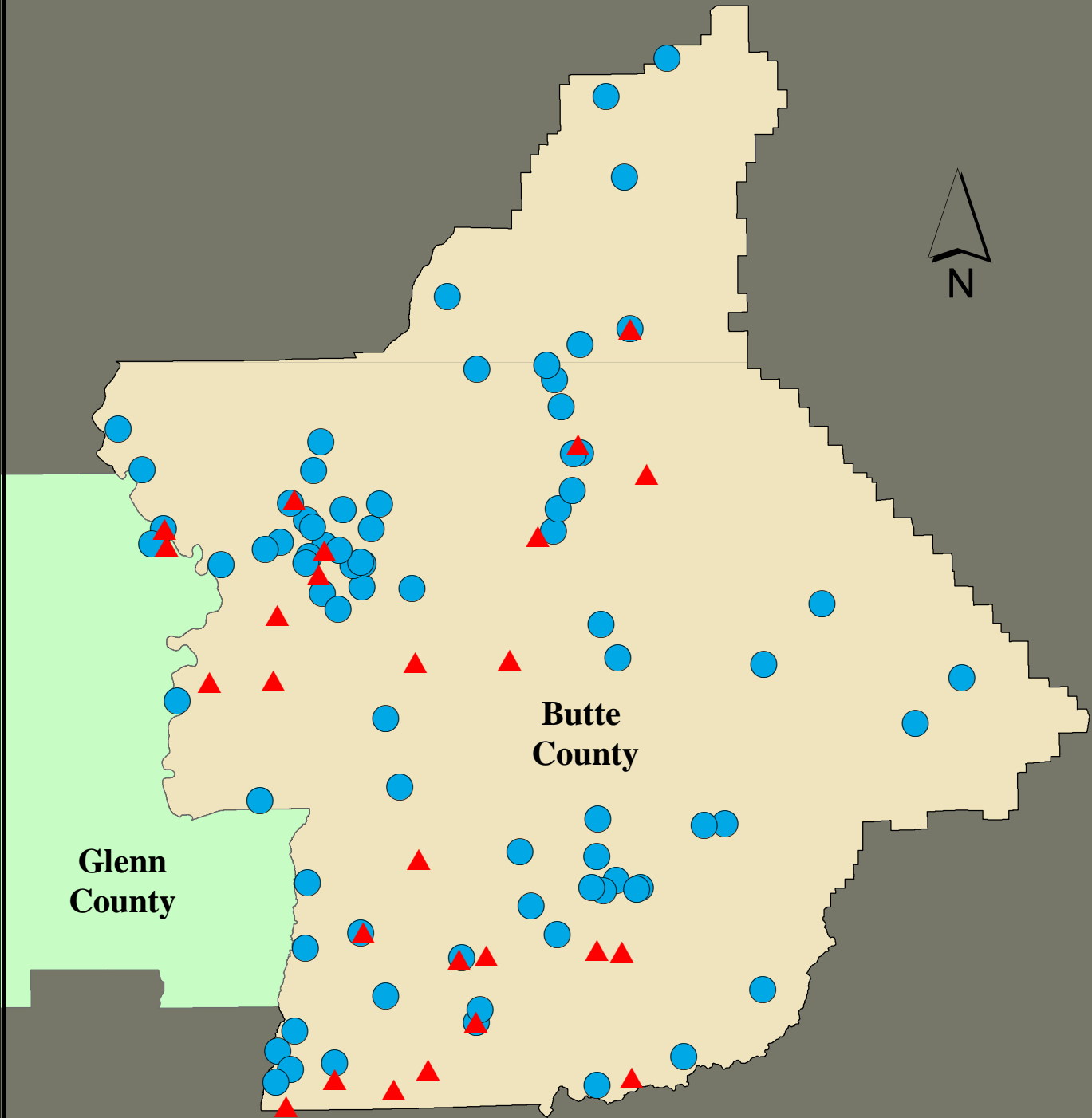
BCMVC D Sentinel Chicken Flock Locations and Gravid Trap Locations



Map Symbology

-  Sentinel_Chicken_Flock_Locations
-  Gravid_Trap_Locations

BCMVCDD New Jersey Light Trap Locations and Surveillance Site Code Locations



Map Symbology

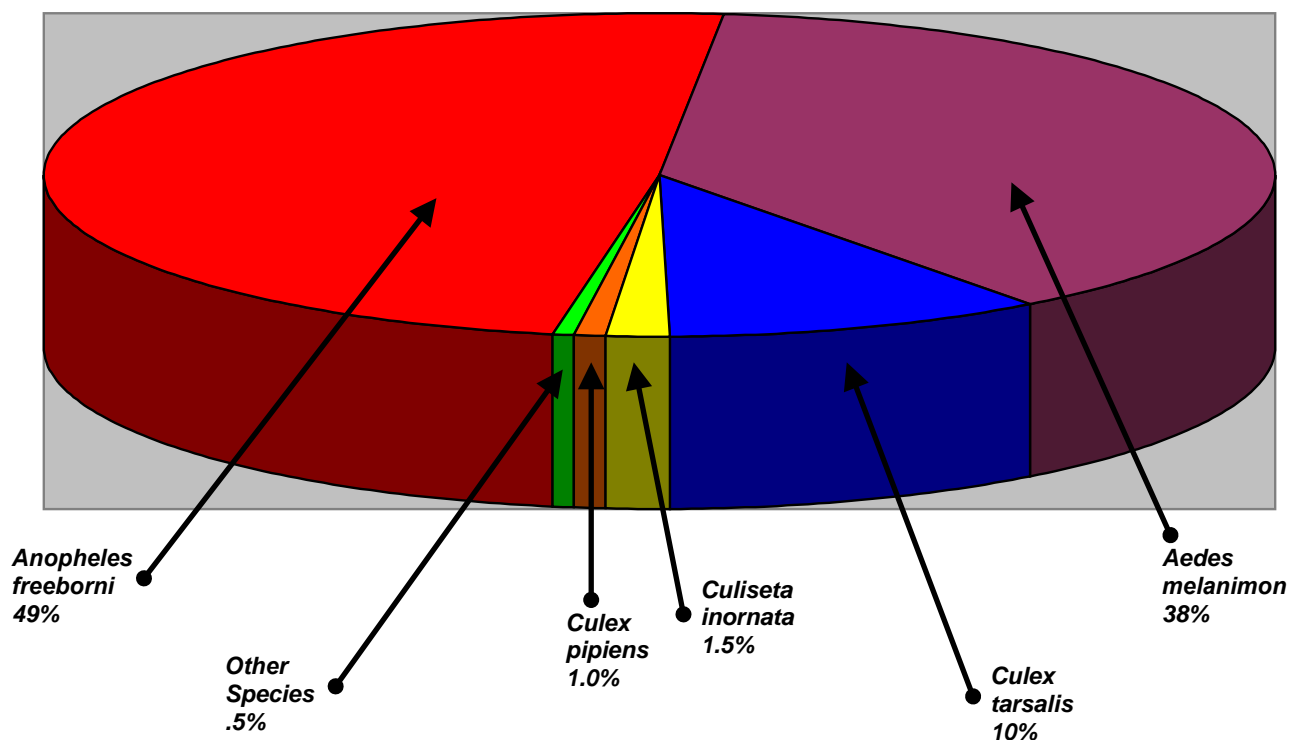
- ▲ New_Jersey_Light_Trap_Locations
- Surveillance_Site_Code_Locations

BCMVCDD 12/08
D. Weseman

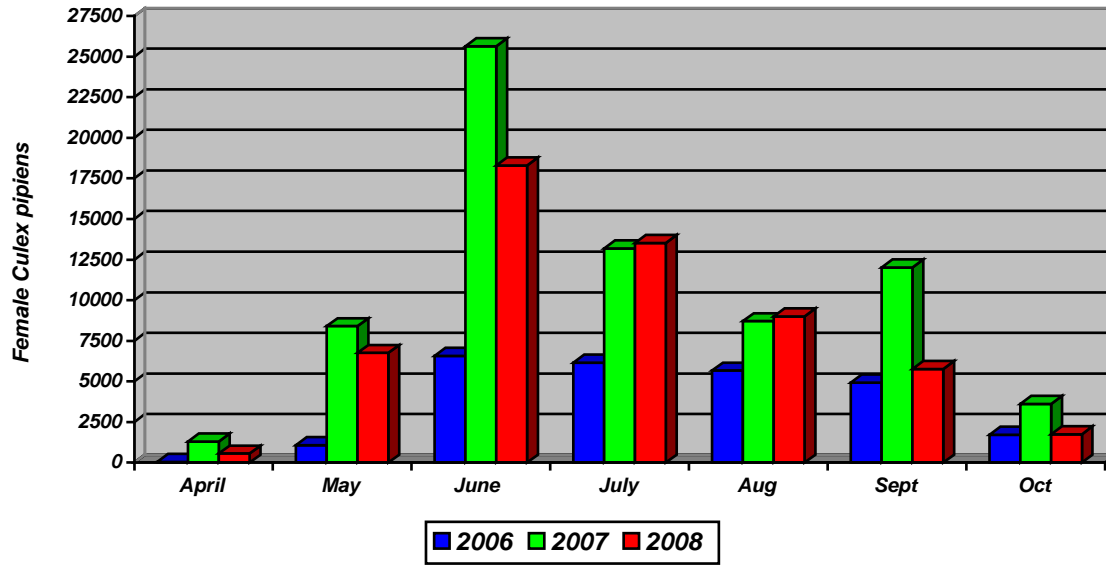
**2008 New Jersey Light Trap Collections (Females)
March 2008 – November 2008**

Ranking	Mosquito Species	Number Collected	% of Collection
1	<i>Anopheles freeborni</i>	211,537	49.2568%
2	<i>Aedes melanimon</i>	162,700	37.8850%
3	<i>Culex tarsalis</i>	42,634	9.9274%
4	<i>Culiseta inornata</i>	6,301	1.4672%
5	<i>Culex pipiens</i>	3,906	0.9095%
6	<i>Culex erythrothorax</i>	1,859	0.4328%
7	<i>Aedes nigromaculis</i>	188	0.0437%
8	<i>Culiseta incidens</i>	159	0.0370%
9	<i>Anopheles punctipennis</i>	110	0.0260%
10	<i>Aedes sierrensis</i>	28	0.0065%
11	<i>Anopheles franciscanus</i>	16	0.0037%
12	<i>Culex stigmatosoma</i>	12	0.0028%
13	<i>Aedes vexans</i>	6	0.0014%
14	<i>Aedes washinoi</i>	1	0.0002%
15	<i>Culex boharti</i>	0	0.0000%
16	<i>Culex thriambus</i>	0	0.0000%
17	<i>Culex restuans</i>	0	0.0000%
18	<i>Culiseta particeps</i>	0	0.0000%
19	<i>Aedes dorsalis</i>	0	0.0000%
20	<i>Aedes sticticus</i>	0	0.0000%

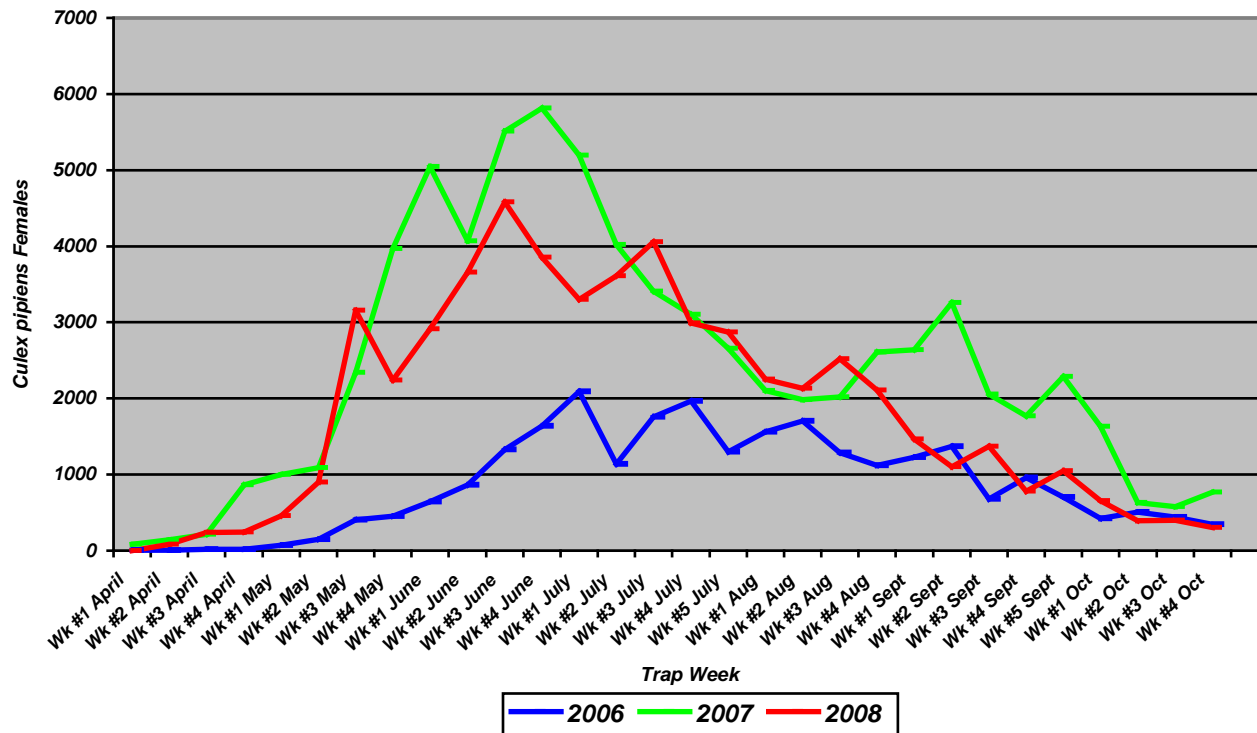
Total Identified = 429,457 100.00%



Gravid Trap Fluctuation By Month



Gravid Trap Fluctuation By Week



Virus Surveillance

2008 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 county, collecting live mosquitoes trapped throughout the county, and collecting dead wild birds county 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 2008, 31 sentinel chickens have tested positive for WNV from six flocks. Only one flock (Hamilton City) reported no positives for the 2008 season.



Sentinel Chicken

Mosquito Pools

Each week the Districts entomology staff strategically place traps known as encephalitis virus surveillance (EVS) or carbon dioxide traps (CO2) around the county. 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 2008 the District sent 67 mosquito pool samples with 5 returning positive for WNV.



Pooling Live Mosquitoes For Virus Detection

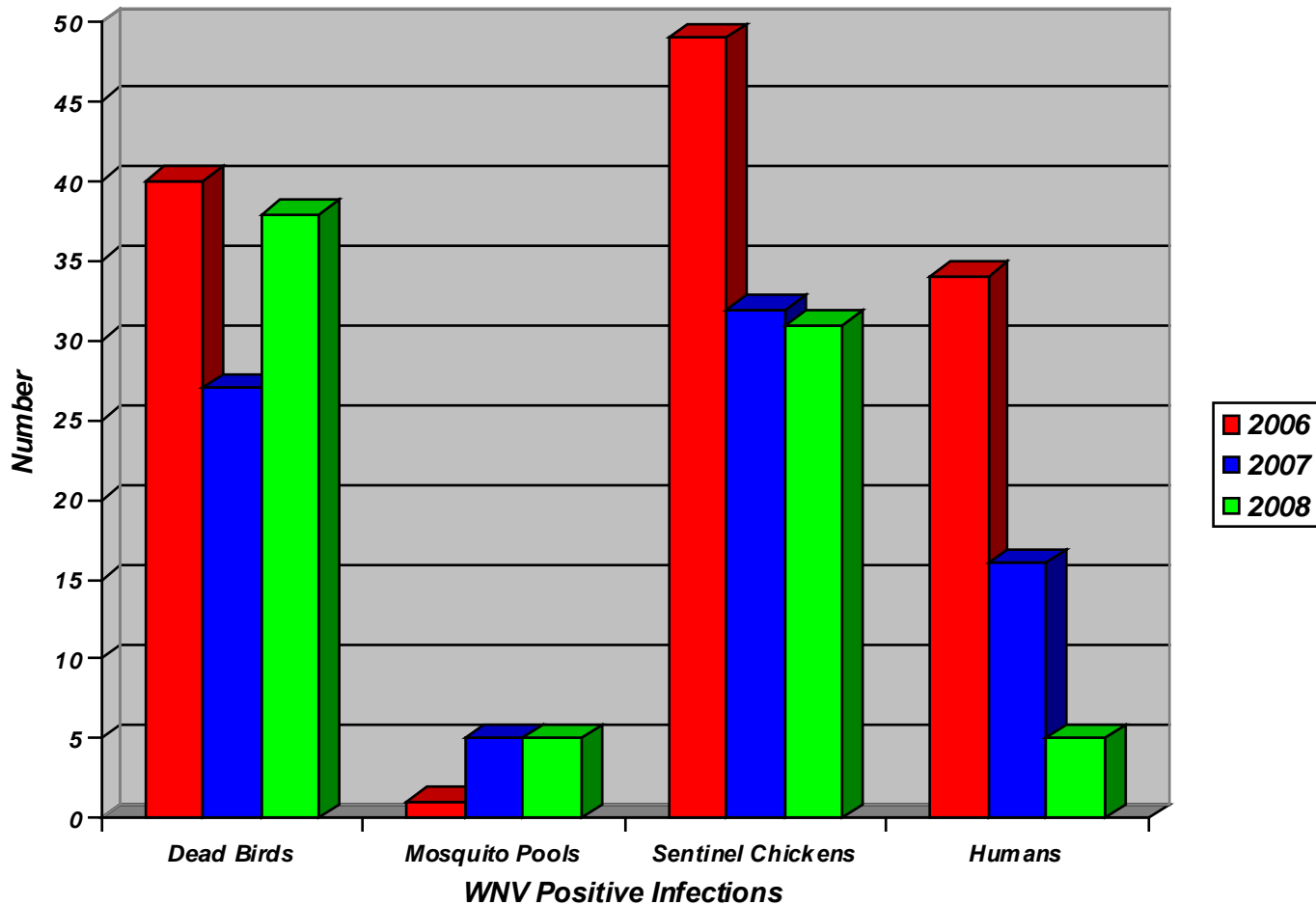
Dead Bird Surveillance and Testing

For more than five 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 county 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
Total	88	25	302	16	177	1

West Nile Virus Activity



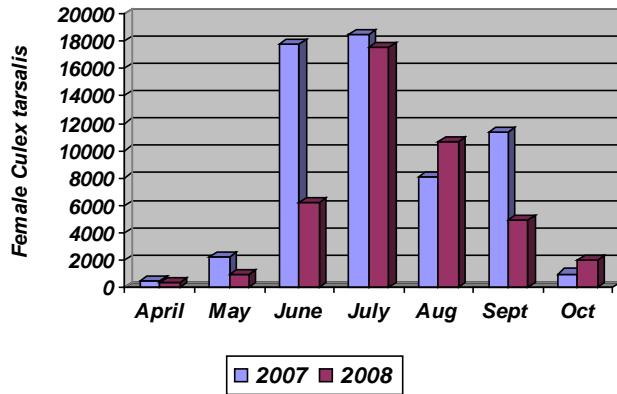
Did you Know?

There are approximately 3,500 species of mosquitoes distributed worldwide. More than 50 species reside in California and 25 species can be commonly found in Butte County.

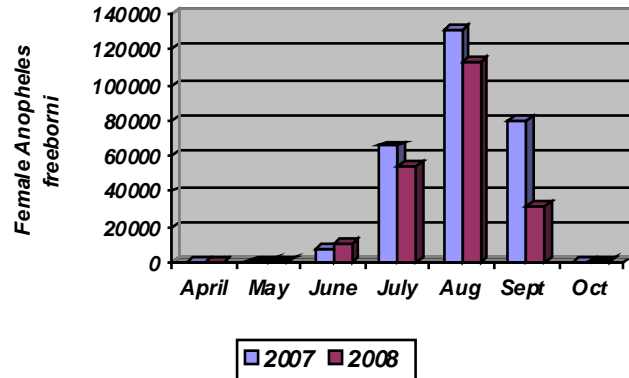
Mosquito Numbers in Butte County 2007 Versus 2008

Seasonal Fluctuation in Numbers of Mosquito Vectors of Disease in Butte County in 2008 Virus Surveillance Season

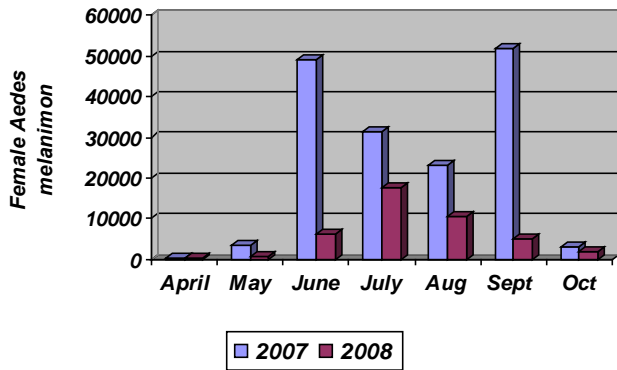
Culex tarsalis



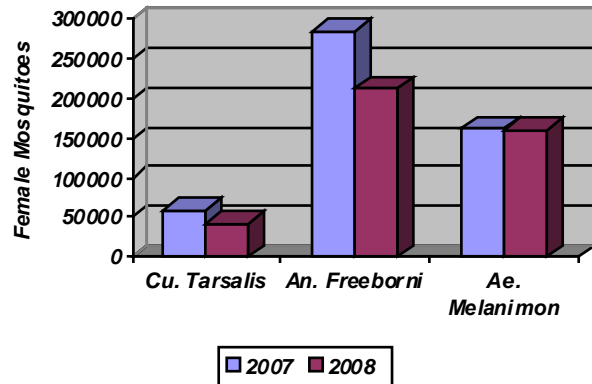
Anopheles freeborni



Aedes melanimon



Annual Total Female Mosquitoes

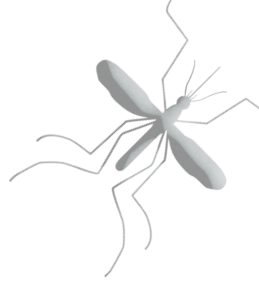


Did you Know?

Aedes melanimon eggs can survive for over 50 years.

Public Education Highlights

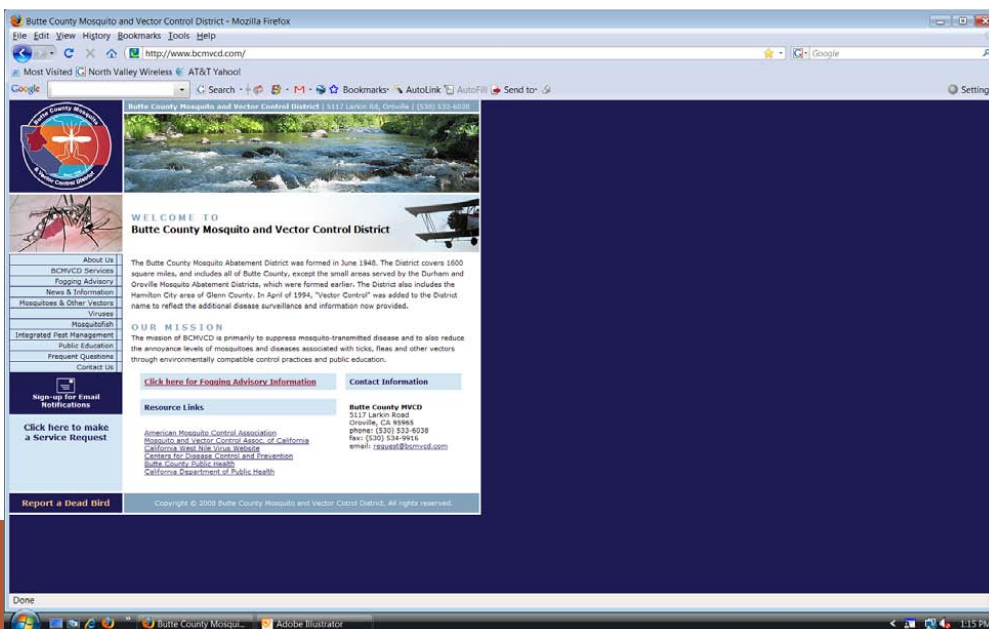
- Butte County Fair (Booth)
- Silver Dollar Fair (Booth)
- Berry Creek Berry Festival (Booth)
- Senior Fair, Chico Mall (Booth)
- Community Health and Safety Fair-Feather River Tribal Health Center (Booth)
- University Women, Gridley (Presentation)
- Rotary Club, Oroville (Presentation)
- Northern Sacramento Valley Wastewater Management, Chico (Presentation)
- Jarvis Gardens Senior Center, Chico (Presentation)
- 73 Classroom Presentations Throughout the County



Free brochures are available online at www.BCMVCD.com or at the District office



Students examining insects during classroom presentation



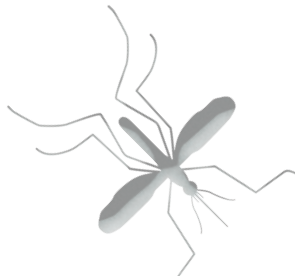
BCMVCD's new website was unveiled in 2008

www.BCMVCD.com



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Butte County Mosquito and Vector Control District				
For The Year Ended June 30, 2008				
				Variance
		Budgeted	Actual	Favorable
				(Unfavorable)
Revenue		\$ 2,410,698	\$ 2,930,500	\$ 519,802
<u>SALARIES & BENEFITS</u>				
Salaries		\$ 1,167,441	\$ 1,039,682	\$ 127,759
Workers Compensation		\$ 35,000	\$ 32,876	\$ 2,124
FICA & U I		\$ 102,000	\$ 92,404	\$ 9,596
Health Insurance		\$ 241,000	\$ 197,984	\$ 43,017
PERS		\$ 155,000	\$ 139,138	\$ 15,862
	TOTAL	\$ 1,700,441	\$ 1,502,083	\$ 198,358
<u>SERVICES & SUPPLIES</u>				
Gas & Oil		\$ 110,000	\$ 71,408	\$ 38,592
Repairs & Parts-Airplane		\$ 9,000	\$ 12,417	\$ (3,417)
Repairs & Parts		\$ 19,500	\$ 20,611	\$ (1,111)
Office Supplies		\$ 11,000	\$ 10,935	\$ 65
Education & Publicity		\$ 1,000	\$ 2,874	\$ (1,874)
Insecticides		\$ 473,900	\$ 255,756	\$ 218,144
Expendable Equipment		\$ 22,000	\$ 16,225	\$ 5,775
Communications		\$ 11,000	\$ 7,567	\$ 3,433
Travel		\$ 7,500	\$ 8,361	\$ (861)
Utilities		\$ 13,000	\$ 12,187	\$ 813
Rent		\$ 10,000	\$ 9,750	\$ 250
Special Services		\$ 49,780	\$ 59,771	\$ (9,991)
Trustee Allowance		\$ 12,000	\$ 11,100	\$ 900
General Insurance		\$ 83,000	\$ 71,643	\$ 11,358
Employee Trng & Dues		\$ 14,500	\$ 15,726	\$ (1,226)
Miscellaneous		\$ 12,000	\$ 7,963	\$ 4,037
Research Supplies		\$ 24,219	\$ 26,095	\$ (1,876)
Alternate Technology		\$ 4,000	\$ -	\$ 4,000
Special Discretionary		\$ 40,000	\$ 23,317	\$ 16,683
Gambusia		\$ 1,000	\$ 481	\$ 519
	TOTAL	\$ 928,399	\$ 644,187	\$ 284,212
<u>CAPITAL OUTLAY</u>				
Bldg & Improvements		\$ 15,000	\$ -	\$ 15,000
Vehicles		\$ 65,000	\$ 54,690	\$ 10,310
Spray Equipment		\$ 11,000	\$ 10,211	\$ 789
Aircraft		\$ 105,000	\$ 128,837	\$ (23,837)
Office Equipment		\$ 3,000	\$ -	\$ 3,000
Laboratory Equipment		\$ 9,700	\$ 8,171	\$ 1,529
Shop Equipment		\$ 2,000	\$ 1,247	\$ 753
Education & Publicity		\$ 3,608	\$ 1,700	\$ 1,908
Miscellaneous		\$ 7,000	\$ -	\$ 7,000
Communications		\$ 60,000	\$ 8,849	\$ 51,151
	TOTAL	\$ 281,308	\$ 213,705	\$ 67,603
Appropriation for contingencies		\$ 649,625	\$ -	\$ 649,625
Grand Total		\$ 3,559,773	\$ 2,359,976	\$ 1,199,797
Excess(Deficiency) of				
Revenue over Expenditures		\$ (1,149,075)	\$ 570,524	\$ 1,719,599
Fund Balance 2007			2,313,740	
Fund Balance 2008			2,884,264	
annual report 6-30-08				

2008 FINANCIALS

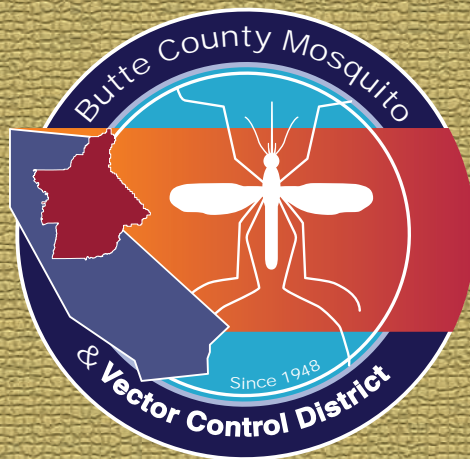
Butte County Mosquito and Vector Control District Balance Sheet Governmental Funds For The Year Ended June 30, 2008

Assets	
Cash and Investments	2,375,437
Accounts receivable	19,592
Interest receivable	20,796
Inventories	564,859
Total Assets	<u><u>2,980,684</u></u>

Liabilities and Fund Balance	
Liabilities	
Accounts payable	44,689
Accrued salaries and Benefits	51,731
Total Liabilities	<u>96,420</u>
Fund Balance	
Reserved for imprest cash	1,100
Reserved for inventories	564,859
Reserved, other	21,000
Unreserved, reported in:	
General Fund	2,297,305
Total Fund Balance	<u>2,884,264</u>
Total Liabilities and Funds Balance	<u><u>2,980,684</u></u>

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	921,685
Long term liabilities are not due in the current period and, therefore, are not reported in the governmental fund.	<u>(193,744)</u>
Net Assets of Governmental Activities	<u><u>3,612,205</u></u>



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