ANNUAL REPORT 2005

SACRAMENTO-YOLO
MOSQUITO
& VECTOR
CONTROL
DISTRICT

SACRAMENTO-YOLO
MOSQUITO & VECTOR CONTROL
DISTRICT

DEAR RESIDENTS, COLLEAGUES AND FRIENDS,

We are pleased to submit the 2005 Annual Report for the Sacramento—Yolo Mosquito and Vector Control District. The District continues to serve the residents of Sacramento and Yolo Counties by using sound methods of vector control. Integrating the principles of physical, biological, cultural and chemical control in a balanced approach maintains vector populations at levels that reduce annoyance and prevent disease transmission. The enclosed report outlines the work performed by the District to accomplish these objectives.

Preventing vector—borne disease outbreaks is a major responsibility of our District. West Nile virus (WNV), first detected in the United States in 1999, arrived within our District boundaries in June of 2004. The District responded by implementing our Mosquito and Mosquito—borne Disease Management Plan that was developed in coordination with the California Department of Health Services and the Centers for Disease Control and Prevention. District staff increased monitoring and treatments to areas of known virus activity, and we conducted ground and aerial adulticiding treatments to stop the transmission of WNV and to protect public health and welfare.

We are pleased to announce through this report that our plan did what it was designed to do. We will continue to address the challenge of West Nile virus, as well as the continual threat of mosquito—transmitted encephalitis, malaria and numerous tick—borne diseases. While this will increase the demands upon your District to provide these services, we believe our constituency deserves nothing less. We will continue to respond to your needs and address any vectored disease in a timely and fiscally responsible manner.

The District's aim, as indicated in our mission statement, "To provide safe, effective and economical mosquito and vector control for the residents of Sacramento and Yolo County," has been, and will continue to be, the foundation of all our activities.

We look forward to continuing to provide our services to you in the future. If you have any questions regarding this report or the services the District provides, please call us at 1–800–429–1022.

Sincerely,

David Brown,
District Manager

Sincerely,

Lyndon Hawkins,
2005 President, Board of Trustees

The District is governed by a Board of Trustees, each representing one of the incorporated cities or one of the counties within the District's boundaries. Each Trustee is appointed by a City Council Member or by the County Board of Supervisors. Board meetings are held at 1:15 p.m. on the third Tuesday of each month in Elk Grove

2005 BOARD OF TRUSTEES OFFICERS
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ADMINISTRATIVE OFFICE, CONTROL OPERATIONS, FISHERIES AND LABORATORY (SACRAMENTO COUNTY)
8631 Bond Road
Elk Grove, CA 95624
Phone: 1—800—429—1022
Fax: 916—685—5464

CONTROL OPERATIONS (YOLO COUNTY)
1234 Fortna Avenue
Woodland, CA 95695
Phone: 1—800—429—1022
Fax: 530—668—3403

PERSONNEL
Manager: David A. Brown
Assistant Manager: Gary Goodman
Administrative Manager:
Debbie Ackerman
Program Development Manager:
Kenneth W. Boyce
Secretary: Marj Maggiora

LABORATORY
Laboratory Director:
Dia—Eldin Elnaiem
Research Entomologist:
Glenn M. Yoshimura
Vector Ecologist: Marcia Reed
Microbiologist: Kara Kelley
Research Environmental Biologist:
Stan A. Wright
Laboratory Technicians:
Rosalie Kikuchi, David McClain, Katy Parise, Beatriz Perez, Stanley Roberts, Bob Rooker, Marti Towery

FISHERIES
Senior Fish Culturist: Woody Schon
Fish Culturist: Jeff Fairbanks

PUBLIC INFORMATION AND EDUCATION
Public Information Officer:
Jennifer Benito
Public Health Education Coordinator: Susan M. Maggy

WATER MANAGEMENT
Water Management Specialist:
John Fritz
Heavy Equipment Operators:
Carl Britschgi, Rick Ringor

MAPPING AND INFORMATION TECHNOLOGY
Mapping/Systems Coordinator:
Rhonda Laffey
Assistant Mapping/Systems Coordinator: Matt Farley

SHOP
Supervisor: Richard Dryden
Mechanics: Kevin Twitchell, Tom Wills

MOSQUITO CONTROL OPERATIONS, NORTH SACRAMENTO COUNTY
Field Supervisor: Gary Forrester
Field Technicians: Ron Burkhouse, Dennis Chan, Henry Estrada, John Fendick, Lisa Fitzgerald, Jeff Gay, Rick Herrera

MOSQUITO CONTROL OPERATIONS, SOUTH SACRAMENTO COUNTY
Field Supervisor: Paul Sanders
Field Technicians: Kevin Combo, Dave Dacy, Demetri Dokos, Will Hays, Tony Hedley, Guy Kachadorian, Bret Lonsway, Steve Simunich

MOSQUITO CONTROL OPERATIONS, NORTH YOLO COUNTY
Field Supervisor: Michael Fike
Field Technicians: Carrie Alwine, Myra Cradduck, Genneen Hughey, Mark Pipkin, Shannon Sai

MOSQUITO CONTROL OPERATIONS, SOUTH YOLO COUNTY
Field Supervisor: Garth Ehrke
Field Technicians: Garrett Bell, Danny Bickel, David Butler, Ted Holck, Jason Lloyd, Pete Marker

MOSQUITO CONTROL OPERATIONS, CATCH BASIN CREW
Field Supervisor: Randy Burkhalter
Catch Basin Crew: Blake Ellis, Tim Gee, Hugh Henderson, Michael Lehman, Frank Mendez, Soda Sanouvong, Tim Yuen, Grant White

SACRAMENTO–YOLO MOSQUITO AND VECTOR CONTROL

In 1915, the California Legislature adopted the "Mosquito Abatement Act" (now incorporated into the State Health and Safety Code, Chapter 5 of Division 3) which formed the basis for the creation, function and governing powers of Mosquito Abatement Districts.

On June 18, 1946, the Sacramento County—Yolo County Mosquito Abatement District was formed by joint resolution of the Board of Supervisors for Sacramento and Yolo Counties. The driving force behind the formation of the District was the public's need for protection against mosquito—borne diseases and relief from serious pest nuisance.

In July of 1990, the District Board voted by resolution to change the name of the District to the Sacramento—Yolo Mosquito and Vector Control District to better reflect the expanded services and responsibilities the District assumed regarding ticks, yellowjackets and other vectors.

INTEGRATED PEST MANAGEMENT

Mosquito and vector control is based on scientifically planned management tactics and control strategies that reduce the abundance of target pests in a timely manner. This method is commonly referred to as “integrated pest management.” This comprehensive program incorporates four basic methods: public relations and education, mosquito and vector surveillance, bio—rational control (biological and physical control) and chemical control (larvicides and adulticides).

PUBLIC RELATIONS AND EDUCATION

The primary objective of a public relations campaign and the school program is to educate and inform the public about mosquitoes and vector—borne diseases. Residents are encouraged to practice the District's **7Ds**. **DRAIN** any standing water that may produce mosquitoes. **DAWN** and **DUSK** are times to avoid being outdoors. These are the times when mosquitoes are most active. **DRESS** appropriately by wearing long sleeves and pants when outside. **DEFEND** yourself against mosquitoes by using an effective insect repellent, such as DEET, Picaridin or Oil of Lemon Eucalyptus. Make sure you follow label directions! **DOOR** and window screens should be in good working condition. This will prevent mosquitoes from entering your home. **DISTRICT** personnel are available to address any mosquito problem you may be experiencing by calling 1–800–429–1022 or visiting us online at FIGHTtheBITE.net.

MOSQUITO AND VECTOR SURVEILLANCE

The District closely monitors mosquito activity, climate change and virus activity by testing mosquitoes, sentinel chickens and wild birds for the presence of an arbovirus.

BIO–RATIONAL CONTROL

Bio—rational control is the prudent application of biological and physical control elements in a manner which achieves acceptable control levels without damaging wildlife or the environment. Biological control elements are natural predators, parasites or pathogens that can be used to achieve desired reductions in pest population levels. The most successful biological tool against immature mosquitoes in California is the mosquitofish, *Gambusia affinis*. When introduced to a mosquito breeding source, the mosquitofish quickly adapts, multiplies and becomes numerically capable of sustaining an effective control level. Physical control (environmental manipulation) is achieved by altering the major ecological components of the pest's environment. By manipulating breeding sources, we eliminate the opportunity for pests to reproduce.

CHEMICAL CONTROL

Chemical control is the judicious use of specific chemical compounds (insecticides) that reduce mosquito populations. Insecticides are applied when bio—rational methods are unable to maintain mosquito numbers below a level that is considered tolerable or when emergency control measures are needed to rapidly disrupt or terminate the transmission of disease to humans. Larvicides target mosquito larvae and pupae; adulticides are chemicals that eliminate adult mosquitoes.

PUBLIC RELATIONS AND EDUCATION

PUBLIC RELATIONS AND EDUCATION

The District's public information and education department strives to raise awareness of mosquitoes and of vector—borne diseases such as West Nile virus, Western Equine Encephalomyelitis, St. Louis Encephalitis, canine heartworm, malaria, Babesiosis and Ehrlichiosis by hosting information booths at several community events throughout Sacramento and Yolo Counties, providing lesson plans to various school districts and offering teacher workshops.

Students of all ages are encouraged to practice the District's **7Ds**. **DRAIN** any standing water that may produce mosquitoes. **DAWN** and **DUSK** are times to avoid being outdoors. These are the times when mosquitoes are most active. **DRESS** appropriately by wearing long sleeves and pants when outside. **DEFEND** yourself against mosquitoes by using an effective insect repellent, such as DEET, Picaridin or Oil of Lemon Eucalyptus. Make sure you follow label directions! **DOOR** and window screens should be

in good working condition. This will prevent mosquitoes from entering your home. **DISTRICT** personnel are available to address any mosquito problem you may be experiencing by calling 1–800–429–1022 or visiting us online at FIGHTtheBITE.net.

K–12 LESSON PLANS & TEACHER WORKSHOPS

The District's lesson plans address topics of mosquito biology, the medical significance of wasps, honeybees, ticks, and vector control. Students are engaged and inspired to learn more about mosquitoes and other vectors as well as additional services the District provides.

The District offers teacher workshops and works with school districts to provide continuing education credits for all credentialed teachers working in Sacramento and Yolo Counties. Workshop curriculum correlates with California content standards. Most workshops are two—to—three hours in length. Workshops are offered twice a year, in early spring and late fall.

FACILITY TOURS

The District offers free facility tours for the public. Please call 1–800–429–1022 to schedule an appointment.

COMMUNITY PRESENTATIONS

The District's state—certified technicians also provide mosquito control and prevention presentations to individuals of all ages. This program consists of visual presentations, practical demonstrations and a question—and—answer session. In addition, the District provides informational pamphlets and brochures on topics ranging from encephalitis, malaria and West Nile virus to red imported fire ants.

CONTINUING EDUCATION

The District employs vector control technicians certified by the California Department of Health Services. Certificates are renewed every two years after established continuing education requirements are met. The District's public health education coordinator tracks employees' continuing education units and helps organize the District's regional continuing education program and workshop.

FIRST ANNUAL OPEN HOUSE & MOSQUITO AND WEST NILE VIRUS PREVENTION DAY

On Saturday, June 18, the District held its first open house for the community. Topics for Mosquito and West Nile Virus Prevention Day ranged from reducing mosquitoes around the home to personal protection from mosquitoes.

All were invited to participate in a day full of fun activities, demonstrations, tours, raffles and prizes. Guest speakers included Sacramento County District 5 Board Supervisor Don Nottoli, Sacramento County Public Health Officer Dr. Glennah Trochet, West Nile survivor Elton Genter, BloodSource representative Leslie Botos, Sacramento—Yolo Mosquito and Vector Control District Board of Trustee Vice President Dave Tamayo and District Manager David Brown. Grantline Veterinary Hospital representative Dr. Naomi Peterson and District staff was also available to answer any additional questions. Over 900 members of the community attended the event.

COMMUNITY PARTNERSHIPS

In an effort to further educate and inform the public about mosquitoes and West Nile virus (WNV), the Sacramento—Yolo Mosquito and Vector Control District joined forces with the California Conservation Corps (CCC). For several weeks, the CCC distributed door hangers, flyers and educational material to the residents of Sacramento and Yolo Counties. The material provided information about mosquitoes—what to look for, how to protect yourself, and who to call for mosquito control issues. The California Conservation Corps successfully distributed 75,000 door hangers and educational materials.

COMMUNITY EVENTS ATTENDED

Affy Metrix Health and Safety Fair

African American Healthy Aging

CA Family Fitness Membership Appreciation

Center for Healthy Aging Summit

Child Action Health and Safety Expo

Child Safety Day

Citrus Heights Family Fun Day

Costco Employee & Customer Health Fair

Delta Pear Fair

DMV Health and Safety Fair

Elk Grove Creek Week Cleanup Day

Elk Grove Harvest Festival

Elk Grove Picnic Day

Elk Grove Senior Expo

Fair Oaks Harvest Day

Fight the Bite Night hosted by the Sacramento Knight's

Fight the Bite Night hosted by the Sacramento Rivercats

Folsom City Zoo Chicken Appreciation Day

Galt Spring Home & Garden Show

Galt Strawberry Festival

Harvest Day Fair

International Migratory Bird Day

KCRA Health and Safety Expo

Latino Healthy Aging Summit

Meadowview Safety Fair

Multicultural Women's Health Summit

Pacific Rim Festival

Rice Straw Products Expo

Sacramento City Employees' Health and Safety Fair

Sacramento City Fire and Police Community Celebration

Sacramento County Fair

Sacramento Creek Week Cleanup Day

Sacramento Filipino Festival

Sacramento Sirens' Health Awareness Day

Sacramento Sirens' Kids' Day

Sacramento Zoo Earth Day

Safetyville Family Safety and Health Expo

Stone Lakes Walk on the Wild Side

U.S. Postal Service Wellness Fair

Yeah Baby! Expo

Yolo County Fair

Yolo County Family Safety Day

MOSQUITO AND VECTOR SURVEILLANCE

The laboratory provides the following technical information to help guide efficient control of vector—borne diseases in Sacramento and Yolo Counties.

- Identification of arthropods significant to public health
- Surveillance of mosquitoes
- Encephalitis virus surveillance
- Malaria surveillance
- Tick surveillance
- Pesticide resistance management and calibration
- Research and special projects

IDENTIFICATION OF ARTHROPODS SIGNIFICANT TO PUBLIC HEALTH

A vector is an insect or any animal that transmits a disease to other animals or humans. Mosquitoes are successful vectors for West Nile virus, Western Equine Encephalomyelitis virus, St. Louis Encephalitis virus, canine heartworm and malaria, while ticks serve as the main transmitters of Lyme disease, Babesiosis and Ehrlichiosis. Fleas have the potential of carrying bacterium for the plague.

In 2005, most of the specimens collected by the District consisted of ticks and adult mosquitoes. The most prevalent adult mosquitoes, known to either transmit a disease or pose a significant public nuisance, consisted of *Anopheles freeborni* (Western Malaria Mosquito), *Culex tarsalis* (Encephalitis Mosquito), *Culex pipiens* (Northern House Mosquito) and *Aedes vexans* (Inland Floodwater Mosquito). The District also received ants, termites, springtails, wireworms, solitary, carpenter and digger bees, long—horned beetles, a scorpion, a tarantula hawk, honey bees, yellowjackets and land planaria.

SURVEILLANCE OF MOSQUITOES

The District's surveillance program provided a systematic approach of locating mosquito breeding sources and monitoring mosquito populations and mosquito—borne disease activity over time and space. Information obtained from the program includes: 1) seasonal changes in relative abundances of mosquito species 2) maximum and minimum risk periods of public exposure to mosquito—borne diseases 3) geographic and environmental distribution patterns of mosquito species and 4) evaluation of mosquito control activities. This historical database provided information on the dynamics of mosquitoes and mosquito—borne disease within the District's surveillance area.

The District used four types of traps—American Light Traps, Mosquito Magnet Traps, Gravid Traps and Red Boxes—which we set out in representative sites of all habitats in Sacramento and Yolo Counties.

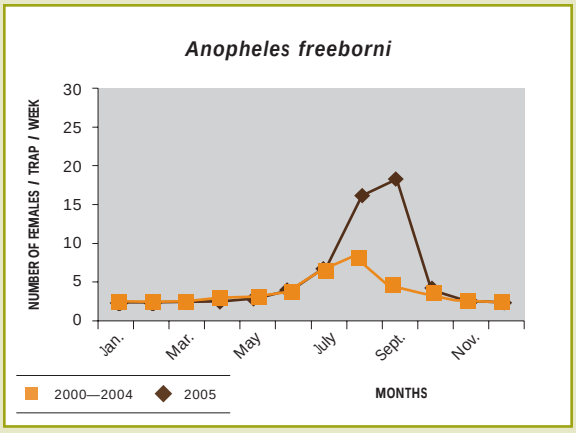
The American Light Trap captures nocturnally active mosquitoes, regardless of physiological or behavioral state. The Mosquito Magnet Trap captures host—seeking mosquitoes that are attracted to the carbon dioxide emissions that result from burning liquid propane. The Gravid Trap captures female mosquitoes that are looking to lay eggs in water rich in organic materials. Red Boxes sample resting adult mosquitoes. To avoid sampling bias, the laboratory uses a combination of techniques that allows collection of most species found in the area. The laboratory conducts a weekly survey of adult mosquitoes in Sacramento and Yolo Counties.

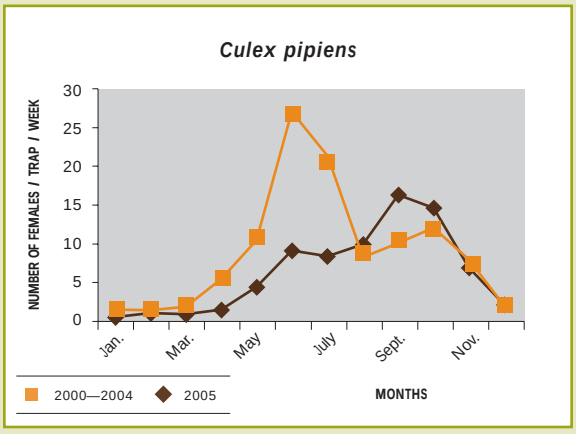
AMERICAN LIGHT TRAP COLLECTIONS OF MOSQUITO VECTORS OF DISEASES IN SACRAMENTO AND YOLO COUNTIES

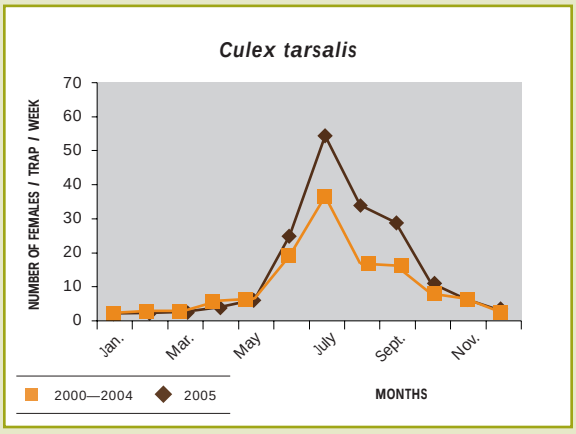
Comparison of the collection in 2005 to the 2000—2004 average. The figures on page 13 illustrate the climatic Normals and the seasonal fluctuation in the density of *Culex pipiens*, *Ochlerotatus melanimon*, *Anopheles freeborni*, *Culex tarsalis* and *Ochlerotatus sierrensis*, the main mosquito vectors of diseases in Sacramento and Yolo Counties in 2005, in relation to average mosquito abundance for the previous five years (2000—2005).

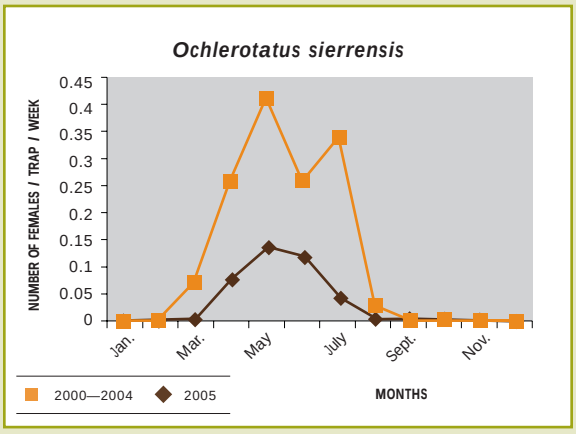
In 2005, Sacramento and Yolo Counties experienced exceptional weather conditions. Although winter rainfall was close to the winter rainfall average for the past five years (2000—2004), there was a remarkable increase in rainfall during late spring and early summer, with showers continuing through June. This was accompanied by a significant drop in temperature in May and June, followed by record high temperatures in July.

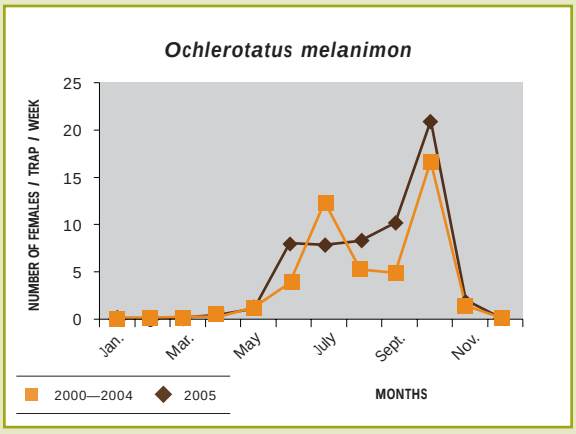
SEASONAL FLUCTUATION IN NUMBERS OF MOSQUITO VECTORS OF DISEASES IN SACRAMENTO AND YOLO COUNTIES 2000—2005



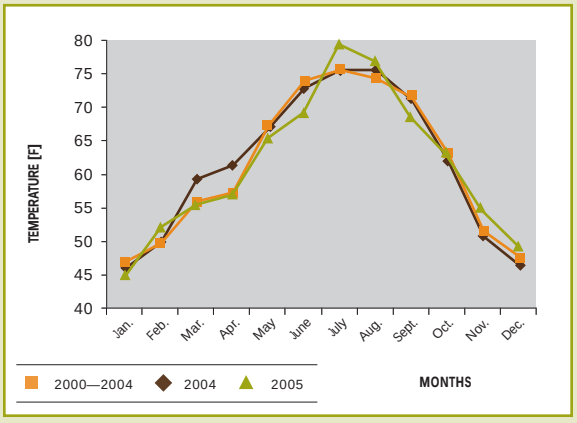




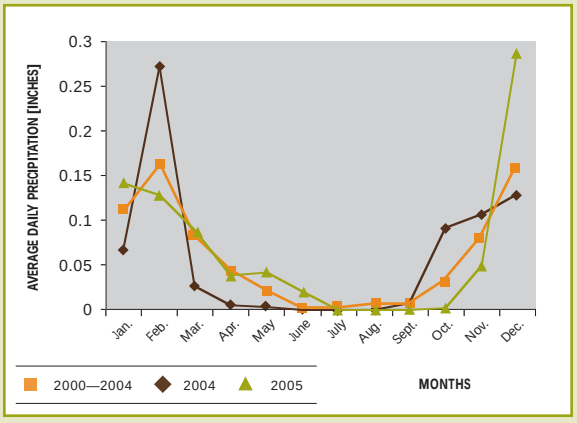




AVERAGE DAILY TEMPERATURE AT SACRAMENTO INTERNATIONAL AIRPORT



AVERAGE DAILY PRECIPITATION AT SACRAMENTO INTERNATIONAL AIRPORT (2000—2005)



The change of weather conditions in 2005 resulted in a dramatic change in mosquito population densities as compared to the previous five years. *Culex pipiens* showed an unprecedented increase in its population during the late spring and early summer, rising to almost five times its usual density in June through July. However, instead of sustaining the usual stable population during the summer, the number of *Cx. pipiens* had declined by August. This sudden premature decline in the population of *Cx. pipiens* in mid—summer was due to the intensive larviciding and adulticiding operations conducted in response to the West Nile virus epidemic conditions in Sacramento County.

Two other species that showed a significant increase in their population sizes were *Oc. sierrensis* and *Oc. melanimon*. *Oc. sierrensis* maintained a four fold increase in its population size, throughout the spring and early summer. Similarly, *Oc. melanimon* showed a clear peak in its density during June.

A rather surprising change in the populations of mosquitoes in Sacramento and Yolo Counties was evident for *An. freeborni* and *Cx. tarsalis*. These mosquitoes showed a significant drop in their population densities as compared to previous years. This was probably due to the great reduction in the areas of rice fields and the late cultivation of rice. Additionally, the intensive aerial spraying of larvicides and adulticides in the rice fields played a major role in reducing the populations of these mosquitoes.

A. AMERICAN LIGHT TRAP COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

In 2005, 37 American Light Traps were used to collect nocturnally active mosquitoes in fixed sites within Sacramento and Yolo Counties. The total number of mosquitoes collected by these traps was 98,700. Of these, there were 37,312 males and 61,388 females. The most abundant mosquito species encountered in American Light Trap collection was *Cx. tarsalis* (37%), followed by *Cx. pipiens* (27.8%), *Cs.*

2005 AMERICAN LIGHT TRAPS COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

AVERAGE PER TRAP

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*An punctipennis*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*	*Oc sticticus*	*Oc washinoi*	*Or signifera*
MALE	3.451	2.478	10.333	0.173	21.563	218.048	14.826	3.069	698.664	16.337	890.996	67.466	1.769	4.325	12.231	8.600	0
FEMALE	8.141	15.750	28.888	1.332	76.616	676.695	25.685	22.153	865.750	26.540	1095.239	407.103	11.789	3.910	8.593	22.674	0.173
TOTAL	11.593	18.229	39.222	1.505	98.180	894.744	40.511	25.974	1564.414	42.877	1986.235	474.569	13.559	8.111	21.453	31.274	0.173

TOTAL IN ALL TRAPS

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*An punctipennis*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*	*Oc sticticus*	*Oc washinoi*	*Or signifera*	TOTAL
MALE	67	46	1897	3	366	3911	256	53	12256	265	16423	1099	35	75	411	149	0	37312
FEMALE	146	271	3166	23	1295	12334	444	384	15143	452	20068	6664	246	69	288	392	3	61388
TOTAL	213	317	5063	26	1661	16245	700	437	27399	717	36491	7763	281	144	699	541	3	98700

2005 MAGNET TRAPS COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

AVERAGE PER TRAP

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*An punctipennis*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*	*Oc sticticus*	*Oc washinoi*	*Or signifera*
MALE	0	0	8.076	0	8.692	16.692	0	0.076	27.923	0.230	55.230	2.538	0.153	333.461	0.076	0.692	0
FEMALE	10.076	0.538	420.615	0.153	46.692	496.923	0.307	21.384	296.769	3.923	2686.923	449.230	3.692	120.615	22.846	6.076	0.076
TOTAL	10.076	0.538	428.692	0.153	55.384	513.615	0.307	21.461	324.692	4.153	2742.153	469.84	3.846	454.076	22.923	6.769	0.076

TOTAL IN ALL TRAPS

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*An punctipennis*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*	*Oc sticticus*	*Oc washinoi*	*Or signifera*	TOTAL
MALE	0	0	105	0	113	217	0	1	363	3	718	33	2	4335	1	9	0	5900
FEMALE	131	7	5468	2	607	6460	4	278	3858	51	34930	5840	48	1568	297	79	1	59629
TOTAL	131	7	5573	2	720	6677	4	279	4221	54	35648	5873	50	5903	298	88	1	65529

Inornata (16.5%), *Oc. melanimon* (7.9%), *An. freeborni* (5.1%) and *Cs. incidens* (1.7%). Other mosquito species were collected in small numbers, each accounting for less than one percent of the total collection.

B. MAGNET TRAP COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

During 2005, a total of 25 Mosquito Magnet Traps were used to collect host—seeking mosquitoes in Sacramento and Yolo Counties. A total of 65,529 mosquitoes were collected by these traps. Of these, 5,900 (6.5%) were males and 59,629 (93.5%) were females. The most frequently encountered mosquito species in the Magnet Trap was *Cx. tarsalis* (54.4%), followed by *Cs. inornata* (10.2%), *Oc. sierrensis* (9%), *Oc. melanimon* (9%), *Cx. pipiens* (6.4%) and *Cs. Incidens* (1.2%). Other mosquito species were collected in small numbers, each accounting for less than one percent of the total collection (refer to Wchart on page 15).

C. GRAVID TRAP COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

During 2005, a total of 10 Gravid Traps were used to collect mosquitoes in Sacramento and Yolo Counties. In our Gravid Traps, we used mosquito larval–rearing water that contains a mixture of ground rabbit pellets and Brewer's yeast. The trap is especially attractive to *Culex pipiens*, a highly important vector of West Nile virus. A total of 20,350 mosquitoes were collected by these traps. Most of these (18,840, or 92.6 %) were females. The most abundant species in the traps were *Cx. pipiens* (74%), followed by *Cs. incidens* (22.5%), *An. freeborni* (1.7%), *Cx. tarsalis* (1.5%), and *Cs. inornata* (0.3%). Other species were encountered in small numbers, each accounting for less than one percent of the total collection.

2005 GRAVID TRAPS COLLECTION OF MOSQUITOES IN SACRAMENTO AND YOLO COUNTIES

AVERAGE PER TRAP

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*
MALE	0	0.111	10.333	13.111	0.555	0	0	137.555	0	5.777	0	0	0.333
FEMALE	0	0	28.888	496.333	6.777	0	1.777	1537.333	0.888	20.777	0.222	0.111	0.222
TOTAL	0	0.111	39.222	509.444	7.333	0	1.777	1674.888	0.888	26.555	0.222	0.111	0.555

TOTAL IN ALL TRAPS

NAME	*Ae vexans*	*An franciscanus*	*An Freeborni*	*Cs incidens*	*Cs inornata*	*Cs particeps*	*Cx erythrothorax*	*Cx pipiens*	*Cx stigmatosoma*	*Cx tarsalis*	*Oc melanimon*	*Oc nigromaculis*	*Oc sierrensis*	TOTAL
MALE	0	1	93	118	5	0	0	1238	0	52	0	0	3	1510
FEMALE	0	0	260	4467	61	0	16	13836	8	187	2	1	2	18840
TOTAL	0	1	353	4585	66	0	16	15074	8	239	2	1	5	20350

MICROBIOLOGY

ENCEPHALITIS VIRUS SURVEILLANCE

Mosquitoes are trapped and collected from the field. The collected females are then pooled together by species. Each pool contains a minimum of one to a maximum of 50 mosquitoes per pool. Each sample is tested for the presence of St. Louis Encephalitis, Western Equine Encephalomyelitis and West Nile viruses by TaqMan real—time polymerase chain reaction (PCR).

A total of 2,300 mosquito pools were submitted and tested by the District. The first West Nile virus—positive pool was detected on June 28 and the last positive pool was collected on September 27. In 2005, a total of 147 pools tested positive for West Nile virus, with 128 pools from Sacramento County and 19 from Yolo County.

2005 SENTINEL CHICKEN TESTS

FLOCK LOCATION	NO. SAMPLES	WEE POSITIVE	SLE POSITIVE	WN POSITIVE
SACRAMENTO COUNTY				
Natomas	196	0	0	7
Folsom	181	0	0	0
Elk Grove	185	0	0	10
Hood	194	0	0	10
Galt	196	0	0	6
YOLO COUNTY				
West Sacramento	200	0	0	6
Merritt	181	0	0	8
Winters	194	0	0	5
Knights Landing	194	0	0	6
Dunnigan	197	0	0	1
2005 Results	**1918**	**0**	**0**	**59**

SENTINEL CHICKENS

The District maintained 10 flocks of chickens at unique locations within Sacramento and Yolo Counties.

Each flock of 10 chickens was bled twice a month from April through mid—October and monthly thereafter. The serum samples were tested for the presence of antibodies against the St. Louis Encephalitis, Western Equine Encephalomyelitis and West Nile viruses.

By strategically placing sentinel chicken flocks throughout both counties, the District was able to monitor and track virus activity. The first West Nile virus—positive chicken was detected on July 12, 2005. At the end of the sampling period, all 10 flocks had positive chickens and a total of 59 chickens tested positive for antibodies towards West Nile virus.

DEAD BIRDS

In collaboration with the California Department of Health Services (DHS), the District implemented a dead bird collection program to enable arbovirus detection in Sacramento and Yolo Counties. District staff were trained to safely collect and identify dead birds that were found by the public and reported to DHS. Dead bird samples were transported to the California Animal Health and Food Safety laboratory at the University of California, Davis campus where necropsies were performed on acceptable bird samples. All tissue samples were tested for West Nile virus at the University of California, Davis Vector—Borne Disease Research laboratory.

A total of 16,669 from our District were reported to the dead bird hotline. Due to the overwhelming response by the public the District was unable to pick—up all the

dead birds. As a result of the dead bird reports, mosquito control technicians were able to better focus their efforts in areas where virus activity had been detected.

The prominent bird collected through this program was the corvid family which included American Crows, Yellow—Billed Magpies and Western Scrub Jays. Other birds collected consisted of owls, hawks, finches and sparrows.

WILD BIRD ARBOVIRUS SURVEILLANCE

The purpose of this surveillance program is to monitor the relative encephalitis virus infection in avian reservoir hosts and to identify local enzootic virus transmission to help predict the threat of transmission to people.

The District started the wild bird encephalitis surveillance program in the spring of 1996.

During the last five years, the team has sampled more than 16,000 birds from 132 species to test for infection with arboviruses. Birds are captured using mist nets, crow traps, and ground traps. Each captured bird is aged, sexed, weighed, measured, and banded, and a small blood sample is collected. After processing, each bird is released. The District's overall recapture rate is just over 25 percent.

Detection of arbovirus antibodies in bird blood is accomplished using two tests: the enzyme—linked immunosorbent assay (ELISA), which identifies antibody—positive birds, and the plaque reduction neutralization test (NEUT), which is used as a second confirmation.

In 2005, the District's wild bird encephalitis surveillance program was conducted through a cooperative agreement with U.S. Fish and Wildlife Service on the Stone Lakes National Wildlife Refuge and with Dr. William Reisen of the University of California, Davis Center for Vector—Borne Disease. Dr. Reisen is the principal investigator of a statewide West Nile virus.

In 2005, the team surveyed 2,875 birds from 81 species during 87 field days. Wild bird sera were tested for three arboviruses: Western Equine Encephalomyelitis virus (WEEV), St. Louis Encephalitis virus (SLEV), and West Nile virus (WNV). The WNV antibody was detected in 2.5 percent of 2,750 wild bird blood samples for both tests (ELISA and NEUT). Confirmed positive samples were collected from 68 birds in 17 species: Rock Pigeon, House Finch, House Sparrow, Mallard, Snowy Egret, Black—crowned Night Heron, Black—headed Grosbeak, Mourning Dove, Cliff Swallow, Snow Goose, Western Scrub—Jay, Ring—necked Pheasant, California Quail, Spotted Towhee, Red—shouldered Hawk, Red—tailed Hawk and Cooper's Hawk. One Snow Goose was confirmed positive for WEEV in June 2005. This same goose was sampled in 2004 and found negative for WEEV.

Over the last two years, 25 wild bird species have been identified with WNV antibody. The majority (nearly 90 percent) of these birds were local, non—migratory residents, indicating that WNV became established in our resident species. Neo—tropical migrants gave the District an early indication that the virus had arrived, while resident wild birds provided an early warning of local virus activity weeks prior to our conventional detection using chickens and mosquito pools. In 2005, antibody rates were highest in juvenile House Finches, which contributed to nearly half of all detected antibody. This observation suggests that House Finches may be important contributors to local virus amplification.

Using wild birds as a surveillance tool provided a key to the progression of events as WNV invaded Sacramento County. Initially, colonial neo—tropical migrant birds appeared with antibody, followed several weeks later by a spread to resident wild birds, suggesting local amplification, and finally, the fall—arriving winter residents were detected with antibody. By continuing to monitor wild birds, we may learn which species help to establish and over—winter the virus.

MALARIA SURVEILLANCE

Malaria is a mosquito—borne disease, caused by a protozoan parasite that attacks red blood cells and destroys the cell during asexual reproduction. Malaria is transmitted to humans primarily by *Anopheline* mosquitoes. In Sacramento and Yolo Counties, there are two species of mosquitoes that can transmit the malaria parasite: *Anopheles freeborni* (the Western Malaria Mosquito) and *Anopheles punctipennis* (the Woodland Malaria Mosquito). Malaria cases are routinely reported to the District by the Sacramento and Yolo County Health and Human Services Departments.

The District laboratory responds to the reports by trapping mosquitoes for 24 hours in the area surrounding the malaria case. The mosquitoes are returned to the laboratory for identification, and all female *Anopheline* mosquitoes are tested for Malaria parasites. In 2005, the District received reports of six malaria cases between March and December. After the initial discovery of the malaria cases and subsequent trapping, the District did not capture any *Anopheline* mosquitoes; therefore, additional malaria testing was not warranted at that time.

LYME DISEASE SURVEILLANCE

The bacterium that causes Lyme disease is called *Borrelia burgdorferi*. The primary vector for Lyme disease for Sacramento and Yolo Counties is *Ixodes pacificus*, also known as the western black—legged tick. The table on page 20 summarizes the Lyme disease surveillance data of *Ixodes pacificus* ticks collected from November 2004 through May 2005.

SUMMARY OF SAC—YOLO MVCD 2004—2005 TICK SURVEILLANCE DATA

LOCATION	TOTAL TICKS	POOLS TESTED	POSITIVE POOLS	ESTIMATED MINIMUM INFECTION RATE
YOLO				
Cache Creek	257	23	3	1.2%
SACRAMENTO				
Ancil Hoffman	0	0	0	N/A
Mississippi Bar	66	12	1	1.5%
Negro Bar	19	13	0	0.0%
Nimbus Dam	38	9	2	2.7%
Snipes Park	68	13	0	0.0%
Willow Creek	46	10	0	0.0%
TOTAL	**494**	**80**	**8**	

Tick specimens were collected by dragging a flannel sheet along the side of a trail, a technique called flagging. The ticks were pooled and tested by indirect immunofluorescence assay (IFA). A sample was considered positive by IFA if one or more fluorescently stained spiral—shaped bacteria were present. Some positive samples were confirmed using a polymerase chain reaction assay and by culture in liquid media.

PESTICIDE MANAGEMENT AND CALIBRATION

Pesticide related activities in the laboratory focused on analyses of the effectiveness of the Ultra Low Volume (ULV) treatments during the year. Pre and post Encephalitis Virus Surveillance traps (EVS) which captured mosquitoes before and after treatment events, was performed in order to evaluate the aerial and ground mosquito adulticiding campaign. In addition, adult bioassay cages with live mosquitoes were used to monitor spraying efficacy. This data was then used to generate reports on the effects of the ULV, fogging and aerial spraying on the transmission of West Nile virus.

Laboratory staff calibrated and performed droplet size analysis on all ULV foggers to assure that appropriate amounts of control compounds are applied when the equipment is used in the field. A study was conducted at University Airport to determine the droplet spectra of the Micronair nozzles that are utilized in the agricultural adulticiding program. The volumetric median diameter of the droplets was 52 microns as measured with a Malvern laser.

Laboratory staff trained new laboratory and field technicians on pesticide safety, rice development, surveillance procedures, mosquito control issues and beneficial invertebrates. Staff also updated all field technician manuals with updated product labels.

RESEARCH AND SPECIAL PROJECTS

Upon request, the District provided wild—caught and/or colonized mosquitoes to a variety of researchers at University of California, Davis, the Arbovirus Field Station, Oregon State University, Johns Hopkins University and the California Department of Health Services for ongoing mosquito research. The District continued with its collaborative research project with Dr. William Reisen on the ecology of West Nile virus in California.

BIO–RATIONAL CONTROL

Bio—rational control is the prudent application of biological and physical control elements in a manner which achieves acceptable control levels without damaging wildlife or the environment. Biological control elements are natural predators, parasites or pathogens that can be used to achieve desired reductions in pest population levels. Physical control (environmental manipulation) is achieved by altering the major ecological components of the pest's environment. By manipulating breeding sources, we eliminate the opportunity for pests to reproduce.

MOSQUITOFISH, *GAMBUSIA AFFINIS*

The most successful biological tool against immature mosquitoes in California is the mosquitofish, *Gambusia affinis*. When introduced to a mosquito breeding source, the mosquitofish quickly adapts, multiplies and becomes numerically capable of sustaining an effective control level.

The mosquitofish, a live—bearing American fish, is utilized as a predator of mosquito larvae in many diverse aquatic habitats throughout the world. A comparatively small species, the full—grown females are usually less than 21⁄2 inches in total length, while males are typically under 11⁄2 inches. The muted silver and light olive green body color is common to both sexes. In addition, they are able to lighten or darken their body color pigmentation to more closely match their immediate environment.

GUPPIES, *POECILIA RETICULATA*

The guppy, *Poecilia reticulata,* has been used for biological mosquito control since World War I. It has been introduced almost all over the world from the areas of tropical South America to which it is indigenous. In many areas, the guppy has provided good control of mosquitoes in highly polluted sources, such as sewage pools, dairy lagoons, chicken ranch ditches and slightly acidic sources. Unlike the mosquitofish, the guppy's ability to reproduce or control mosquitoes is not reduced by low levels of dissolved oxygen.

THREESPINE STICKLEBACK, *GASTEROSTEUS ACULEATUS*

The District has raised and stocked the threespine stickleback, *Gasterosteus aculeatus,* since 1998, when our original stocks were seined from Grizzly Island Wildlife Area. During initial studies, we discovered that the threespine stickleback preferred to feed on benthic organisms (invertebrates living in or on the pond bottom).

Mosquito larvae are found on the surface of most sources and therefore not in the preferred feeding zone of this species. In most artificial containers—unused swimming pools and backyard ponds—there is not a benthic community, so the sticklebacks have to expand their feeding range to the surface.

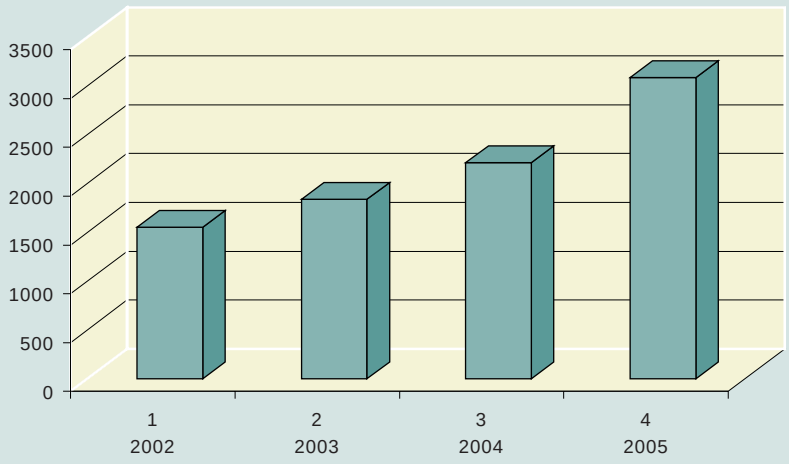
The District has had fair to good success in controlling mosquitoes in these types of sources. The District has also stocked large landscape lakes with these fish for the control of midges.

FISHERIES DEPARTMENT

The Fisheries Department is responsible for breeding mosquitofish and other fish species that prey on mosquito larvae. Mosquitofish are readily available for the District's field technicians and to the general public through the service request program.

The District constructed more than 24 ponds which produce over 4,000 pounds of fish annually. Today, the District is one of, if not the largest, mosquitofish producing facilities in the nation.

Fig. 1. Pounds of Mosquitofish used for Control from 2002 through 2005



2002 **1,551.50**	2003 **1,837.20**	2004 **2,212.50**	2005 **3,080.20**

BIOLOGICAL CONTROL DATA FOR 2005

RICE FIELDS STOCKED WITH MOSQUITOFISH

Number of fields:	151
Pounds of *Gambusia affinis**:	1,775
Acres Stocked:	7,017

WILDLIFE REFUGES AND DUCK CLUBS STOCKED WITH MOSQUITOFISH

Number of Fields:	26
Pounds of *Gambusia affinis*:	318
Acres stocked:	1,542

SOURCES STOCKED WITH GUPPIES

Number of sources:	408
Pounds of *Poecilia reticulata*:	44
Acres stocked:	31

SOURCES STOCKED WITH THREESPINE STICKLEBACK

Number of sources:	2
Pounds of *Gasterosteus aculeatus*:	3
Acres stocked:	6

MOSQUITOFISH SUPPLIED TO TECHNICIANS

Woodland Facility:	442 lbs
Elk Grove Facility:	886 lbs

SUMMARY OF ALL FISH PLANTS IN 2005

Number of Sources:	5,546
Pounds of Fish:	3,080
Acres Stocked:	12,199

**1 pound of fish equals approximately 450 fish*

WATER MANAGEMENT

The Water Management Department is an important function of the District's Integrated Pest Management program. The department's goal is to reduce the number of mosquito breeding sources, thus limiting the amount of pesticide applications. This goal is accomplished by using two methods.

METHOD I

The Water Management Department completed a feasibility assessment of existing drainage and access problems then implemented appropriate mechanical control solutions to both reduce and facilitate mosquito control applications.

The department used 2 backhoes, 2 tractors and mowing equipment to complete these objectives. This year the Water Management Department mowed 16 access sites and maintained 10,185 feet of irrigation drains and sumps with the backhoe.

METHOD II

The department worked closely with the city and county planning departments, land resource managers, farmers and the public on specific mosquito producing sites under their control in order to mitigate unnecessary mosquito breeding activity.

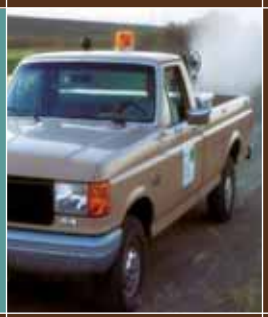
City and county agencies cleaned portions of 19 urban storm water drains and creeks by request from the department. Twenty—two letters, comments and guidelines were sent to planning departments and development consultants on projects of potential concern to the District.

HIGHLIGHTS

In conjunction with the District's laboratory, Yolo Bypass Wildlife Area and the University of California, Davis the department implemented a vegetation management study on the refuge to help identify ecological means to reduce mosquito breeding on wetlands as part of Assembly Bill 1982. Water management heavy equipment operators applied herbicides and dusted over 200 acres of Joint Grass on the Refuge.

The department worked with private duck club operators and refuge managers to secure a postponed fall flooding to reduce mosquito populations at a time when West Nile virus was still actively amplifying in the environment.

The District worked cooperatively with the California Rice Commission to create and distribute a Best Management Practice Document to all rice growers which endorses farming practices that minimize mosquito production in rice fields.



CHEMICAL CONTROL
[LARVICIDES AND ADULTICIDES]

Chemical control is the use of specific chemical compounds (insecticides) that eliminate adult and immature mosquitoes. It is applied when bio—rational methods are unable to maintain mosquito numbers below a level that is considered tolerable or when emergency control measures are needed to rapidly disrupt or terminate the transmission of disease to humans. Larvicides target mosquito larvae and pupae. Adulticides are insecticides that reduce adult mosquito populations. All products are registered with the California Environmental Protection Agency.

MOSQUITO AND VECTOR CONTROL OPERATIONS

Sacramento—Yolo Mosquito and Vector Control District provides year—round mosquito and vector control services to Sacramento and Yolo Counties. The two counties combined make up 2,013 square miles of urban, commercial and agricultural landscape. The District is divided into 26 zones, with state—certified technicians responsible for all aspects of mosquito and vector control, from surveillance to treatment.

During the winter months, control operations staff updated zone books, prepared for mosquito and vector season by recalibrating field vehicles and equipment and continued to monitor West Nile virus and other mosquito—borne disease activity by checking river seepage for immature mosquitoes, delivering dead birds to the University of California, Davis (UCD) for West Nile virus testing and performing general premise inspections for residential service requests. Control Operations staff also continued to educate and inform the public by distributing door hangers, brochures and information throughout the two counties. The outreach material highlighted the District's programs and services and contained West Nile virus information. Construction for the new vehicle storage building at the Woodland facility was completed.

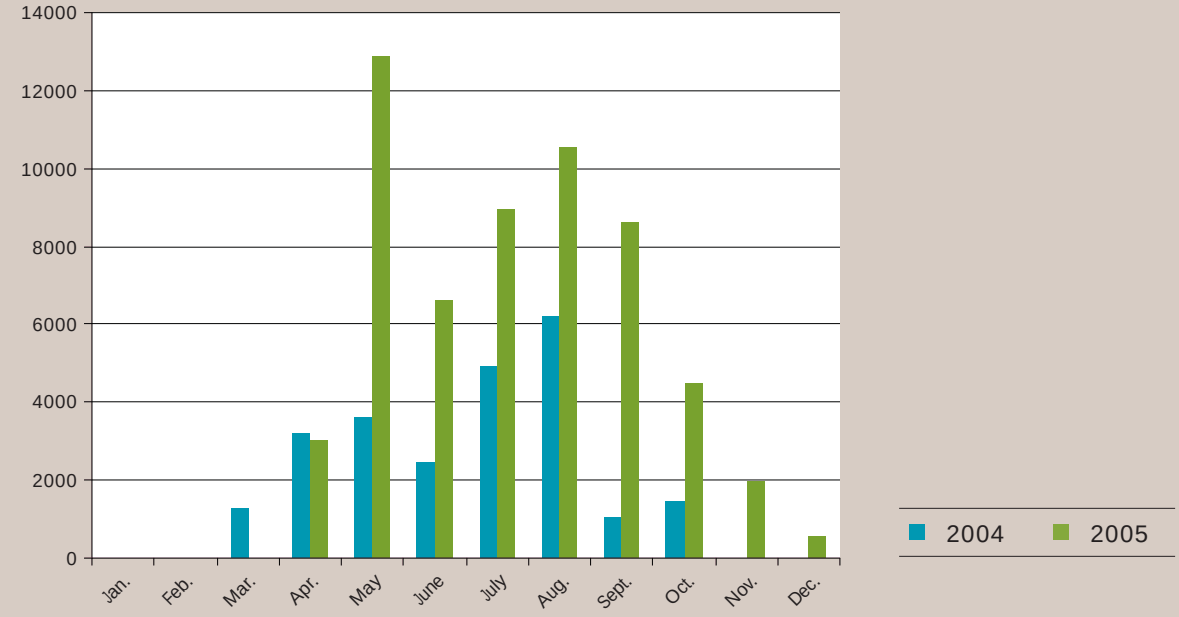
In early spring, technicians were deployed for service requests. Some technicians were assigned to general inspections of mosquito sources while others were responsible for setting up yellowjacket traps, inspecting and treating tree holes for *Oc. Sierrensis* (vector for canine heartworm) and obtaining information from rice growers. The catch basin crew also started treating the Sacramento downtown area at this time. The District continued to survey and inspect thousands of vernal pools and rain ponds at Stone Lakes National Wildlife Refuge. All treated sites were documented and geo—coded for our Geographical Information System (GIS). The most prevalent mosquito species found in these areas was *Cx. tarsalis*. The District continued to monitor several specific areas of concern ranging from wetlands, duck ponds, flooded pastures, rice fields, river seepages to natural creeks.

As the summer months steadily approached, District staff continued to monitor rice fields, yellowjackets, West Nile virus activity and dead bird reports. The detection of WNV in the wild bird population, mosquito pools, dead birds, equines and humans triggered a Level V response, which activated immediate treatment of all known larval sources within a one—mile radius of their detection. Additionally, potential ultra—low—volume (ULV) ground fogging and aerial spraying routes were mapped out in the infected areas. Mosquito control technicians continued to treat golf courses, parks and other areas where the public visits.

In mid—September, rice fields were drained, harvested and re—flooded for the upcoming duck season. This marked the beginning of the annual fall flooding season. The District responded by treating the area with truck mounted ultra low—volume spraying/fogging units.

Towards the end of the season, technicians continued to monitor West Nile virus activity by checking mosquito sources, delivering dead birds to UCD and performing general residential service requests. Meanwhile others updated zone books, recalibrated vehicles and equipment, and prepared for next season by disseminating door hangers, pamphlets and educational materials throughout the two counties. The beautification project for the entrance of the Elk Grove facility was completed. The last larval treatment of the year took place on December 29.

CATCH BASIN TREATMENT COMPARISON 2004 vs. 2005



By the end of the season, the District successfully treated over 16,000 known mosquito breeding sites and over 50,000 catch basins. Service requests had increased from 4,000 in 2004 to over 6,900 by the end of 2005.

WEST NILE VIRUS TIMELINE

On February 25, a Yellow—billed Magpie collected by the District in Sacramento County tested positive for West Nile virus (WNV). The District immediately initiated a Level II response by setting up additional mosquito traps in the area where the bird was found.

On March 11, 2005, a Brewer's Blackbird collected by the District in Yolo County tested positive for WNV. Again, the District responded by inspecting and treating the area where the bird was discovered.

By June 27, two American Crows collected in Sacramento County and one Western Scrub—Jay collected from Yolo County tested positive for the West Nile virus.

By July 8, the District's ongoing surveillance program had detected 11 WNV—positive mosquito pools*. Nine mosquito pools were collected from Sacramento County and two from Yolo County. The District responded by immediately inspecting and treating in and around areas where virus activity was detected.

On July 13 laboratory results from the District's sentinel chicken flocks came back positive for West Nile virus thus moving the District to a Level III virus activity alert.

**A mosquito pool is a collection of approximately 50 mosquitoes that are tested together for West Nile virus*

On Friday, July 29, 2005 the District continued to witness the expansion of WNV through growing numbers of positive mosquito pools, dead birds, equines and human cases. The District found 9 WNV—positive bird collections, 12 Encephalitis Virus Surveillance (EVS) traps with WNV—positive mosquito pools, 1 WNV—positive equine case and confirmation of 6 human cases.

As positive West Nile virus cases continued to increase, the District responded by completing its mosquito—borne disease report to determine the District's emergency response. The report indicated that an immediate response was needed to protect public health and welfare from the potentially fatal West Nile virus.

On Monday, August 8 the District conducted ground and aerial adulticiding efforts to help suppress the transmission of West Nile virus to humans and animals. The District employed two twin engine aircrafts to treat approximately 70,000 acres of urban areas in northern Sacramento County. Aerial treatments were conducted over three consecutive evenings. Immediately after the initial treatments for the northern portion of the county, the District witnessed a significant drop in infected adult mosquitoes. Ground—fogging units were also utilized for the interruption of disease transmission.

Approximately one week later the District attempted to treat the southern portion of Sacramento County. Treatments were attempted on August 11, 20, 21 and 22. Treatment was sporadic due to high winds. By the end of the scheduled treatments, the District was able to treat approximately 47,000 acres per evening.

MATERIALS USAGE

LARVICIDES	ACRES TREATED	AMOUNT OF MATERIAL	NO. OF APPLICATIONS
MATERIALS			
Vectobac 12AS	6,143	1093.17 gal.	6,259
Vectobac 12AS by Air	38,148	3716.23 gal.	354
Vectobac G	737	7105.25 lbs.	628
Vectobac G by Air	67,346	338000.75 lbs.	687
Vectolex CG	993	12295.35 lbs.	690
Vectolex CG by Air	825	10319.7 lbs	7
Vectolex WDG	52	52.05 lbs	85
Vectolex WDG by Air	590	885 lbs	18
Vectolex WSP	7	139.08 lbs	5,550
Altosid Pellets	3,823	14173.54 lbs	7,255
Altosid Pellets by Air	705	2835 lbs	8
Altosid Liquid	2,891	86.49 gal.	1,418
Altosid Liquid Concentrate by Air	1,793	14	18
Altosid XR Briquets	127	4436.71 lbs	32,454
Altosid XR—G	89	827.03 lbs	24
Altosid XR—G by Air	2,661	13305 lbs	20
GB 1111	108	529.6 gal.	321
Agnique MMF	126	96.35 gal.	8,707
ADULTICIDES			
Pyrethrins	1,021,298	5142.9 gal.	777
Pyrethroids	204	5.57 gal.	582
Trumpet EC	147,200	1150 gal.	70

	LARVICIDES	ADULTICIDES
AIRCRAFT SPRAYING TOTALS		
Acres treated	112,068	1,055,800

MATERIALS	ACRES TREATED	AMOUNT OF MATERIAL	NO. OF APPLICATIONS
YELLOWJACKET CONTROL			
Drione	462	11.2 lbs	147
PT 565 Plus XLO	3.45	6.37 gal.	256
KNOX OUT	20	0.0156 gal.	2

By the end of the season Sacramento County led the state of California with 177 human cases, one human fatality, 33 equine, 70 dead birds, 122 mosquito pools and 9 WNV—positive sentinel chickens (presence of anti-bodies). Yolo County had 12 human cases, 14 horses, 17 dead birds, 23 mosquito pools and 9 positive sentinel chickens.

MOSQUITO AND VECTOR CONTROL OPERATIONS

The District's primary goal is to protect public health by managing immature and adult mosquitoes so that they do not present a significant risk to our community. In the event that mosquito populations pose a threat or become a significant public nuisance, the District will respond by implementing the District's Mosquito and Mosquito—borne Disease Management Plan. This plan has been approved by the District's Board of Trustees. The following outlines the District's response plan:

LEVEL I – NORMAL SEASON

The District performs routine mosquito, mosquito–borne disease and public health pesticide efficacy surveillance activities. The District also attends community events, provides presentations and distributes outreach material to various community organizations.

LEVEL II – POSITIVE DEAD BIRD AND/OR MOSQUITO POOL

A response is initiated when the District's Microbiology Laboratory detects a mosquito—borne virus [i.e., West Nile virus (WNV), Western Equine Encephalomyelitis (WEE), St. Louis Encephalitis (SLE)] or when the California Department of Health Services (DHS) notifies the District of a mosquito—borne virus from a dead bird(s) or mosquito pool(s) within the District's boundaries.

LEVEL III – POSITIVE SENTINEL CHICKEN/ANIMAL

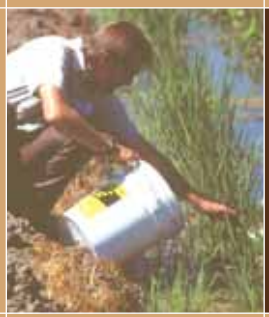
A response is initiated when the District's Microbiology Laboratory detects sera conversion to a mosquito—borne virus (i.e., WNV, WEE, SLE) in a sentinel chicken(s) or when DHS notifies the District of a mosquito—borne virus infected horse or other animal within the District's boundaries.

LEVEL IV – POSITIVE HUMAN CASE

A response is initiated when the Sacramento and/or Yolo County Public Health Laboratory officials notify the District that a human has locally acquired a mosquito—borne virus (i.e., WNV, WEE, or SLE) disease within the District's boundaries.

LEVEL V – MULTIPLE HUMAN CASES, EPIDEMIC CONDITIONS

A response is initiated when County Public Health Laboratory or DHS officials notify the District that multiple mosquito—borne virus (i.e., WNV, WEE, or SLE) infections have occurred in humans within a specific area or there is evidence that epidemic conditions exist. The epidemic area is defined as the geographic region in which human cases are clustered (incorporated city, community, neighborhood, or zip code). The District continues to assess the public health risk associated with the mosquito—borne virus (i.e., WNV, WEE, or SLE) by completing the Mosquito—borne Disease Report.



MAPPING AND INFORMATION TECHNOLOGY

The Mapping and Information Technology Department provides support for office staff and field technicians.

In 2005, the department mapped and tracked 79,309 applications of California Environmental Protection Agency—registered products, the release of mosquitofish, and the movement pattern of yellowjackets, which covered 1,316,220 acres. The Mapping and Information Technology Department also tracked more than 6,911 calls from residents requesting service. Three major wetland areas and just over 41,000 acres of rice were monitored for larval activity. The District tracked and mapped 16,669 dead birds reported from the California Department of Health Services, as well as 375 West Nile virus—positive sites such as dead birds testing positive, human or horse cases, or adult mosquito trap sites.

The District's Web site offered the public the ability to submit a request to be notified of adulticiding within their zip code. Interactive adulticide treatment area maps were added as aerial treatments began over urban areas.

The Mapping and Information Technology Department maintained 30 desktop computers, and 1 Windows based server. Wireless server connections were utilized within some office areas as well as a Virtual Private Network to the Districts satellite Woodland facility.

SHOP
SACRAMENTO–YOLO MOSQUITO AND VECTOR CONTROL

The District employs three Automotive Service Excellence—certified mechanics at the Elk Grove facility. The shop maintains 88 vehicles, 2 forklifts, 2 Argo all terrain vehicles, 7 quad—runners, 4 John Deere Gator utility vehicles, 6 utility trailers, 2 low—bed trailers, 2 wheel tractors, 2 back hoe tractors, 17 London ULV foggers, 11 Beecomist ULV foggers, 3 Electramist foggers and 2 turbine sprayers.

The shop is also responsible for repairing and installing various equipment, including chainsaws, weed eaters, hand cans, backpacks, spray guns and other items in need of repair.

• *Auto body/paint shop is located at the Woodland facility.*

SACRAMENTO–YOLO MOSQUITO AND VECTOR CONTROL ADMINISTRATION

The tasks of the administrative personnel of the Sacramento—Yolo Mosquito and Vector Control District involve serving the residents of Sacramento and Yolo counties as well as the employees of the District. 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. The department strives to provide quality professional service to the public and the employees of the District.

SACRAMENTO–YOLO MOSQUITO AND VECTOR CONTROL FINANCIALS

SACRAMENTO—YOLO MOSQUITO AND VECTOR CONTROL DISTRICT GOVERNMENTAL FUND BALANCE SHEET AND STATEMENT OF NET ASSETS JUNE 30, 2005

ASSETS	GENERAL FUND	ADJUSTMENTS (NOTE 7)	STATEMENT OF NET ASSETS
Cash and investments—Note 2	$ 6,774,331	$ —	$ 6,774,331
Accounts receivable	450,751	—	450,751
Interest receivable	36,118	—	36,118
Inventory	724,641	—	724,641
Funds with fiscal agent—Note 4	864,274	—	864,274
Capital assets, net of accumulated depreciation—Note 5	—	5,436,676	5,436,676
TOTAL ASSETS	$ 8,850,115	$ 5,436,676	$ 14,286,791
LIABILITIES			
Accounts payable and other accrued liabilities	$ 231,827	$ —	$ 231,827
Compensated absences	—	317,755	317,755
TOTAL LIABILITIES	$ 231,827	$ 317,755	$ 549,582
FUND BALANCES / NET ASSETS			
Reserved for funds with fiscal agent	$ 864,274	$ (864,274)	$ —
Reserved for inventory	724,641	(724,641)	—
Reserved for clean—up — Note 6	500,000	(500,000)	—
Reserved for Vector / Disease response	1,000,000	(1,000,000)	—
Reserved for West Nile Virus response	1,000,000	(1,000,000)	—
Reserved for working capital needs	2,000,000	(2,000,000)	—
Unreserved	2,529,373	(2,529,373)	—
TOTAL FUND BALANCES	8,618,288	(8,618,288)	—
TOTAL LIABILITIES AND FUND BALANCES	$ 8,850,115	$ (8,300,533)	$ 549,582
NET ASSETS			
Invested in capital assets			5,436,676
Unrestricted			8,300,533
Total net assets			$ 13,737,209

GOVERNMENTAL FUND STATEMENT OF REVENUE, EXPENDITURES AND CHANGES IN FUND BALANCES AND STATEMENT OF ACTIVITIES FOR THE YEAR ENDED JUNE 30, 2005

REVENUE	GENERAL FUND	ADJUSTMENTS (NOTE 7)	STATEMENT OF ACTIVITIES
Property taxes	$ 8,687,103	$ —	$ 8,687,103
Interest	122,327	—	122,327
Other tax revenue	45,073	—	45,073
Other	66,417	—	66,417
TOTAL REVENUE	$ 8,920,920	$ —	$ 8,920,920
EXPENDITURES			
Salaries and wages	$ 3,356,228	$ 59,981	$ 3,416,209
Insecticides	2,067,284	—	2,067,284
Employee benefits	1,210,466	—	1,210,466
Depreciation	—	370,015	370,015
Aircraft services	365,062	—	365,062
Printing and copying	252,150	—	252,150
Professional services	137,491	—	137,491
Motor vehicles and equipment maintenance	101,388	—	101,388
Structure and grounds maintenance	96,216	—	96,216
Gas and petroleum	89,898	—	89,898
Laboratory services	77,113	—	77,113
Insurance	87,586	—	87,586
Communications	81,574	—	81,574
Special department expenditures	81,106	—	81,106
Utilities	60,857	—	60,857
Office	57,742	—	57,742
Spray equipment and supplies	38,751	—	38,751
Capital outlay and replacement	173,951	(144,086)	29,865
Fish hatching supplies	19,454	—	19,454
Building improvements	459,838	(442,273)	17,565
Trustee expenditures	13,677	—	13,677
Accounting services	10,200	—	10,200
Materials and supplies	10,060	—	10,060
Rents and leases	2,752	—	2,752
Travel	2,508	—	2,508
Safety awards	1,770	—	1,770
Education program	841	—	841
TOTAL EXPENDITURES	8,855,963	(156,363)	8,699,600
Excess of revenue over expenditures	64,957		
Change in net assets		$ 156,363	$ 221,320
FUND BALANCES/NET ASSETS			
Beginning of year	8,553,331	—	13,515,889
End of year	$ 8,618,288	$ —	$ 13,737,209

STATEMENT OF REVENUE, EXPENDITURES AND CHANGES IN FUND BALANCES-BUDGET AND ACTUAL-GENERAL FUND YEAR ENDED JUNE 30, 2005

REVENUE	ORIGINAL BUDGET	AMENDED BUDGET	ACTUAL	VARIANCE—FAVORABLE (UNFAVORABLE)
Property taxes	$ 5,269,785	$ 7,726,486	$ 8,687,103	$ 960,617
Interest	155,670	155,670	122,327	(33,343)
Other tax revenue	144,527	144,527	45,073	(99,454)
Other	81,633	81,633	66,417	(15,216)
TOTAL REVENUE	$ 5,651,615	$ 8,108,316	$ 8,920,920	$ 812,604
EXPENDITURES				
Salaries and wages	$ 3,142,732	$ 3,224,178	$ 3,356,228	$ (132,050)
Insecticides	1,000,000	2,000,000	2,067,284	(67,284)
Employee benefits	1,044,766	1,221,641	1,210,466	11,175
Building improvements	450,000	450,000	459,838	(9,838)
Aircraft services	180,000	300,000	365,062	(65,062)
Laboratory services	67,865	95,000	77,113	17,887
Professional services	141,670	142,820	137,491	5,329
Motor vehicles and equipment maintenance	92,422	162,422	101,388	61,034
Gas and petroleum	80,000	90,000	89,898	102
Structure and grounds maintenance	60,000	70,000	96,216	(26,216)
Capital outlay and replacement	35,001	205,001	212,702	(7,701)
Insurance	—	81,000	87,586	(6,586)
Communications	57,000	57,000	81,574	(24,574)
Special department expenditures	64,198	64,198	81,106	(16,908)
Office	51,045	85,545	57,742	27,803
Utilities	65,000	65,000	60,857	4,143
Fish hatching supplies	10,470	35,000	19,454	15,546
Trustee expenditures	—	—	13,677	(13,677)
Accounting services	12,000	12,000	10,200	1,800
Materials and supplies	8,000	8,000	10,060	(2,060)
Rents and leases	4,000	4,000	2,752	1,248
Travel	—	—	2,508	(2,508)
Safety awards	5,000	5,000	1,770	3,230
Education program	30,655	265,027	252,991	12,036
TOTAL EXPENDITURES	6,601,824	8,642,832	8,855,963	(213,131)
Excess (deficiency) of revenue over expenditures	$ (950,209)	$ (534,516)	$ 64,957	$ 599,473
FUND BALANCE, Beginning of year			8,553,331	
FUND BALANCE, End of year			$ 8,618,288	

CREDITS

MANAGING EDITOR:
Jennifer Benito

ASSISTANT EDITORS:
Gary Goodman
Lupe Arroyo

CONTRIBUTING WRITERS:
David Brown, Jennifer Benito, Garth Ehrke, Dia-Eldin Elnaiem, Michael Fike, Gary Forrester, John Fritz, Kara Kelley, Rhonda Laffey, Marcia Reed, Paul Sanders, Woody Schon, Stan A. Wright

SACRAMENTO-YOLO
MOSQUITO & VECTOR CONTROL DISTRICT

Sacramento County
8631 Bond Road
Elk Grove, CA 95624
Phone: 1—800—429—1022
Fax: 916—685—5464
Web site: FIGHTtheBITE.net
Hours: 7:00 am to 3:30 pm

Yolo County
1234 Fortna Avenue
Woodland, CA 95695
Phone: 1—800—429—1022
Fax: 530—668—3403
Web site: FIGHTtheBITE.net
Hours: 7:00 am to 3:30 pm