

WEST NILE VIRUS

West Nile virus (WNV) is a potentially serious mosquito-borne virus transmitted by infected female mosquitoes. In Butte County *Culex tarsalis* and *Culex pipiens* are the common vectors of WNV. WNV is a flavivirus and is one of the most common viruses transmitted in the United States.

The virus has been found in Asia, Africa, Eastern Europe, and the Middle East for many years and was first detected in the United States in 1999 in New York City. Since its arrival it has spread all across the United States. West Nile virus is closely related to St. Louis Encephalitis virus also found in the United States.

West Nile virus has been found every year in Butte County since its arrival in 2004 and it appears it will be around for years to come.

Most frequently, WNV is spread by the bite of an infected female mosquito. Adult female mosquitoes are the vectors that become infected when they feed on infected birds. After the mosquito becomes infected they then can spread WNV to humans and other animals they feed on.



HOW DO WE PROTECT YOU?

The Butte County Mosquito and Vector Control District is aware of the issues of mosquito-borne illnesses and take the following actions to control mosquito populations:

- Identification and treatment of larval breeding sources.
- Surveillance to monitor mosquito population levels.
- Community-wide efforts to reduce adult mosquito abundance.
- Implementation of the best available science for mosquito management.
- Outreach to educate the public about mosquitoes and mosquito-borne disease.

HOW CAN YOU PROTECT YOURSELF FROM MOSQUITOES?

- Keep windows and door screens in good condition.
- Wear long sleeves and pants at dusk and dawn.
- Use an insect repellent approved by the EPA and recommended by the CDC.
- Minimize outdoor activities at dawn and dusk when mosquitoes are most active.
- Drain any standing water around your house.

Butte County Mosquito & Vector Control District

Since 1948

The District covers over 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.

OUR MISSION

The mission of BCMVCD 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.



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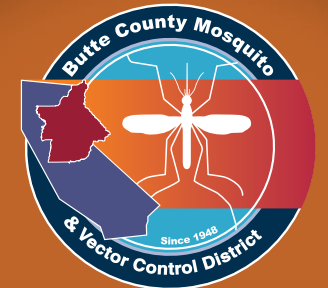
(530) 533-6038

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www.BCMVCD.com

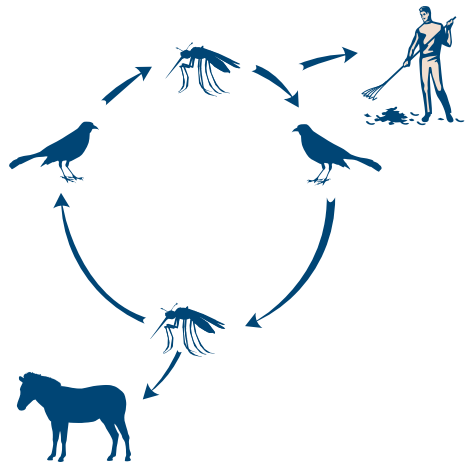
MOSQUITO-BORNE ILLNESSES OF CONCERN



WESTERN EQUINE ENCEPHALOMYELITIS

Western Equine Encephalomyelitis (WEE) is a virus that can be transmitted to humans and horses by mosquitoes. Mosquitoes can transmit several strains of the Encephalitis virus, but WEE is the most prevalent type in California.

Culex tarsalis, is the mosquito considered to be the primary vector of this disease. It is found in all California counties, and likes to breed in relatively clean, standing water sources such as wetlands, rice fields, cemetery urns, and backyard sources. *Aedes melanimon*, which breeds in wetlands and flooded pastures, has also been found to be a vector of the disease. Historically, both the San Joaquin and Sacramento valleys have been the regions where most WEE has occurred.



Encephalitis viruses are believed to be brought into the Central Valley by migrating wild birds, which are the natural reservoirs for the disease. When an uninfected mosquito bites an infected bird, the virus is transferred to the mosquito. The insect can subsequently transmit the virus to horses and humans through its bites.

Encephalitis cannot be transmitted directly from person to person, or from birds to people.

MALARIA

Malaria was introduced in the central valley of California in the 1800's. Many mosquito control districts were formed primarily to combat the disease thru controlling the *Anopheles freeborni* mosquito. Butte County Mosquito and Vector Control District was formed in 1948 to combat malaria. The combination of case recognition, treatment and successful mosquito abatement essentially eliminated malaria as a major health concern in the early 1900's. However persistent *Anopheline* abundance and repeated importation of malaria in infected immigrants and travelers poses a risk of transmission and re-establishment in our agricultural based, mosquito-friendly central valley.

Malaria transmission begins when parasites present in the bloodstream of a malaria infected human are ingested with the bloodmeal of a female *Anopheles* mosquito. These parasites then burrow through the mosquito's gut wall. Outside of the gut, they multiply for 8–14 days, after which they migrate to the mosquito's salivary gland. They remain there until the mosquito takes her next bloodmeal.

The parasites are transmitted to the next human in the small amount of salivary fluid secreted by the mosquito when feeding. After being transmitted into the bloodstream, the parasites travel to the liver, multiply, and then move out to attack red blood cells. Later during the infection the parasites become abundant enough to be picked up by another *Anopheles* mosquito during a bloodmeal. There are 4 different parasites that cause disease. The most serious is called *Plasmodium falciparum*, which can cause severe anemia, kidney failure, brain damage and death.

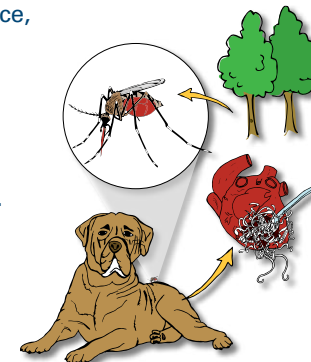


HEARTWORM

For northern California, the responsible vector is mainly the Western Treehole mosquito (*Aedes sierrensis*). Other mosquitoes capable of heartworm transmission include *Anopheles freeborni*, and *Aedes vexans*. *Aedes sierrensis* breeds in cavities that develop in trees able to retain rain or irrigation water usually known as treeholes. Often, older trees in city parks and residential yards and dense groupings of oaks in the foothills and mountains provide annual breeding grounds for springtime hatches of these mosquitoes.

Heartworm is a serious and potentially fatal disease affecting dogs. Infections have also been reported in cats, ferrets and other animals. Mosquitoes often pick up the parasite from foxes, coyotes or wolves where the disease can run rampant. Heartworm parasites (*Dirofilaria immitis*) are then transmitted to an animal through the bite of an infected mosquito. After the heartworm larvae have been transmitted to a dog or other animal, the larvae develop into immature adults and travel to the arteries surrounding the heart. This process takes up to 4 months.

The worms reach maturity in about 6 months. Adult worms may reach lengths of 6–14 inches and are usually found in the pulmonary artery near the right side of the heart and also in the lungs. Infections of several hundred worms have been reported, but this is very unusual. Infected cats have fewer and smaller worms than dogs. At maturity, the worms may reproduce, releasing offspring called microfilaria. These pathogens can be picked up by another mosquito during a blood meal. Inside the mosquito, the microfilaria develop into larva and can then be



transmitted to another animal. This is how the infection cycle is repeated again and again.

Infections with just a few worms can have serious consequences. So treating an infection through your veterinarian is important for re-establishing your pet's good health. Since most pets do not exhibit symptoms in the early stages of infection, annual testing at your vet's office is the best method for insuring early detection. Adult heartworms can be destroyed through a series of injections or in an emergency, removed through surgery.

There is no vaccine to prevent infections, but there are methods of prevention that are nearly 100% effective. Only your veterinarian can help you choose the right medication and prevention schedule for your pet.

ST. LOUIS ENCEPHALITIS

St. Louis Encephalitis (SLE) is one of the most common mosquito-borne viruses transmitted to humans in the United States. *Culex tarsalis* is the most common vector of SLE in Butte County. SLE virus is a flavivirus that was first detected in St. Louis, Missouri in 1933. SLE virus is diagnosed based on symptoms, physical findings, laboratory testing, and the possibility of exposure to infected mosquitoes.

There is no specific treatment for SLE. Treatment is based on symptoms, not the virus. SLE was detected in Butte County most recently in the mid 1990's with the detection of positive infected mosquitoes and sentinel chickens. The District still actively tests for this virus in mosquitoes and sentinel chickens.

