



# Napa County Mosquito Abatement District

◆ 90 years of fighting the bite! ◆

[www.napamosquito.org](http://www.napamosquito.org)

A Special Advertising Supplement



## Meet the Mosquitoes

While very few people get a description of the mosquito that bit them, there are many distinct species. NCMAD has identified 20 of them in Napa County, including a list of the 10 most wanted. They are:

### **Banded Foul Water Mosquito**

**(WNV vector)** – Common near wineries because of high organic content in waste ponds

### **Encephalitis Mosquito (WNV vector)**

– Common in fresh and brackish water, marshes and ditches

### **Fish Pond Mosquito**

– A small bucket can spoil the neighborhood

### **Little House Mosquito (WNV vector)**

– City mosquito, adaptable to different environments

### **Summer Salt Marsh Mosquito**

– Aggressive daytime biter, long-range flier

### **Washino's Willow Mosquito**

– Highly aggressive, especially in spring

### **Western Treehole Mosquito**

– No. 1 culprit spreading dog heartworm

### **Winter Marsh Mosquito**

– A heavyweight (3/8 of an inch), active in fall and spring

### **Winter Salt Marsh Mosquito**

– Aggressive daytime biter and long-distance flier

### **Woodland Malaria Mosquito**

– Foothill dweller likes shade and vegetation, can transmit malaria

- Then, there are the wrongfully accused. NCMAD sometimes gets mosquito calls that turn out not to be mosquitoes. Several types of midges (gnats) and the crane fly have somewhat similar appearances. However, they do not bite or carry diseases.
- Some may think the drought may have one positive effect in reducing mosquitoes. However, some mosquitoes need little water and, if anything, the drought may draw mosquitoes closer to populated areas where they are more likely to find water.

Wesley Maffei, director of the Napa County Mosquito Abatement District, says the district works hard to fight mosquitoes while protecting the environment.  
PHOTO BY ISRAEL VALENCIA



## Challenge Accepted

by Matt Jocks

For 90 years, this small government agency has covered vast spaces to fight mosquitoes in Napa County

A mosquito flying over Napa County sees nothing but opportunity. A human being, charged with the responsibility of controlling mosquitoes, sees plenty of challenge.

The vast open spaces of Napa County make the work of the eight-person staff at the Napa County Mosquito Abatement District never-ending. Open areas mean an almost limitless number of places for mosquitoes to breed free from human interference.

Since its formation in 1925, NCMAD has been dealing with this challenge.

The organization has used research and the evolving technologies in controlling mosquitoes and other vectors. It has used old-fashioned leg work, hitting the road every day to provide services to homeowners, farmers and those involved in the county's signature grape and wine industry.

Perhaps most importantly, it has collaborated with other entities. Because of the vast space and modest budget, partnerships with the California Department of Public Health, neighboring mosquito abatement districts and Napa's residents is, in the words of NCMAD

Board President Shelby Valentine, "not just valuable but essential."

The stakes are high. Mosquitoes are not just an annoyance but can carry a number of diseases, most notably West Nile virus. Since 2005, there have been three human cases of WNV recorded in Napa County.

**"We are very much a boots-on-the-ground, service-oriented organization."**

**Shelby Valentine**  
NCMAD Board President

However, the district must walk an ecological tightrope in doing its work. While the human population is sparse, the environmental regulations, paperwork and concerns are thick on the ground.

"You've got people on one side who say, 'Just do whatever it takes to get rid of the mosquitoes.' And you've got the people on the other side who

say, 'Whatever you do is going to be bad (for the environment),' says NCMAD Director Wesley Maffei.

NCMAD tries to limit its use of adulticides (chemicals designed to kill adult mosquitoes), though it can't be avoided in all circumstances, Maffei says. The emphasis is on elimination of the immature stages (larvae) through biological and limited chemical means as well as prevention, by eliminating breeding grounds. When chemicals are used, technology has allowed the district to precisely target their application and limit effects to nontarget organisms.

In addition to mosquitoes, the district also works to control yellow jackets, and provides information on ticks and some types of rodents. As with mosquitoes, open space is a challenge. Napa County has about 140,000 residents spread out over 789 square miles.

"We are very much a boots-on-the-ground, service-oriented organization," Valentine says. "It's a very bare-bones operation with eight employees. That works out to about 99 square miles per employee. So everyone changes hats multiple times during the day to make sure everything gets done."



# The History of the Napa County Mosquito Abatement District

**1923**

Concerned citizens address the Napa City Council about bad mosquito conditions and ask that something be done about the problem.



**1925**

The Napa County Board of Supervisors unanimously passes a resolution to form the Napa County Mosquito Abatement District.

The district holds its first board of directors meeting.



**1938**

Heavy infestations of malaria mosquitoes are reported to be breeding in Gordon and Wooden valleys. The district takes great care to eradicate the mosquitoes as quickly as they appear.



**1948**

First full-time laborer is hired to work with the superintendent of the district.



**2001**

The Napa River restoration project causes the district to relocate to a temporary location in American Canyon due to the loss of its building.



**1978**

Proposition 13 passes, resulting in funding and staffing being severely cut. The district would operate with a deficit for most of the 1980s.



**2003**

Local voters approve by 67.8% the additional funds for the district to provide new services, such as yellow jacket control, vector-borne disease monitoring and rodent and tick management advice.



**2004**

A full-time scientist and three additional field technicians are hired to provide additional services.

The district constructs its first permanent facility in American Canyon.



**1954**

The district leases land from the Napa Sanitation District and builds its first "home," a metal "butler"-type building.



**1947**

The U.S. Navy helps the district with a major mosquito infestation.



**1926**

Hiram Wyman is hired on as the superintendent, the district's first employee, who made a salary of \$175 per month and managed operations out of his garage.

The district purchases a boat from the U.S. Navy for \$75.



**1929**

The district purchases its first vehicle, a Ford Model A truck, for \$569.50.



1920s

1930s

1940s

1950s

1960s-1990s

2000s

2010-PRESENT



# The Threat Is Real



Preventing West Nile virus is the goal of mosquito abatement

by Matt Jocks

**M**osquitoes may be here for our blood. However, it's what they leave behind that has public health officials concerned.

Throughout history, the tiny mosquito has earned its reputation as the world's greatest killer. But while diseases like malaria have been nearly eliminated in industrialized countries like the United States, there are still potentially fatal illnesses carried by these insects.

Foremost among those is West Nile virus, a disease that attacks the nervous system. It was responsible for 29 deaths in California in 2014, matching the highest ever recorded total. The 798 human cases was the most in nine years.

The numbers fluctuate, but the trend is definitely upward. Over the past three years, there have been 1,656 cases statewide, compared to 381 in the previous three years.

Geographic patterns are difficult to detect. Napa County had no cases reported last year, but neighboring Yolo County had 10.

West Nile virus is primarily transmitted to humans through the bite of infected mosquitoes. The mosquito acts as a middleman, obtaining the virus primarily from infected birds. The dominant source in California has been American black crows, but jays, magpies and ravens also are significant sources.

Dr. Vicki Kramer, who heads the California Department of Public Health's Vector-Borne Disease section, said 80 percent of humans bitten will show no symptoms. More than 19 percent will experience flu-like symptoms, while fewer than 1 percent will develop serious complications. These can include high fever, headache, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, vision loss, numbness and paralysis.

Elderly patients and those with high blood pressure or diabetes are at higher risk.

For those who experience severe WNV symptoms, there is no specific medication or treatment. Patients can be hospitalized, where symptoms, such as breathing difficulties, can be treated.

There are basic precautions that can be taken to reduce exposure to the virus.

"Get rid of standing water," Kramer says. "That means dumping out buckets and taking care of places where sprinklers may be leaking or causing puddles. If water is going to be standing, such as a bird bath, it should be changed weekly. Swimming pools should be maintained.

"The second thing that can be done is that, if people are going to be outside, especially at dawn and dusk, they should wear insect repellent," she says. "This is even more important as we go into the summer months."

The Department of Public Health as well as the local mosquito abatement districts also urge residents to be on the lookout for, and to report, the location of dead birds, especially crows, ravens and blue jays.

West Nile is the dominant mosquito-borne illness on the radar in California, but not the only one.

St. Louis encephalitis, western equine encephalitis and malaria are spread by mosquitoes but have become rare in the United States. Dogs and, to a lesser extent, cats are at risk of heartworm, which can be spread from animal to animal by mosquitoes. The American Heartworm Association recommends annual testing. Preventative medication also is available.

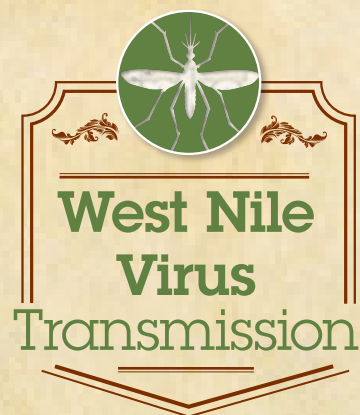


Ann Donohue analyzes mosquitoes in NCMAD's lab, ever vigilant for invasive species.  
PHOTO BY ISRAEL VALENCIA

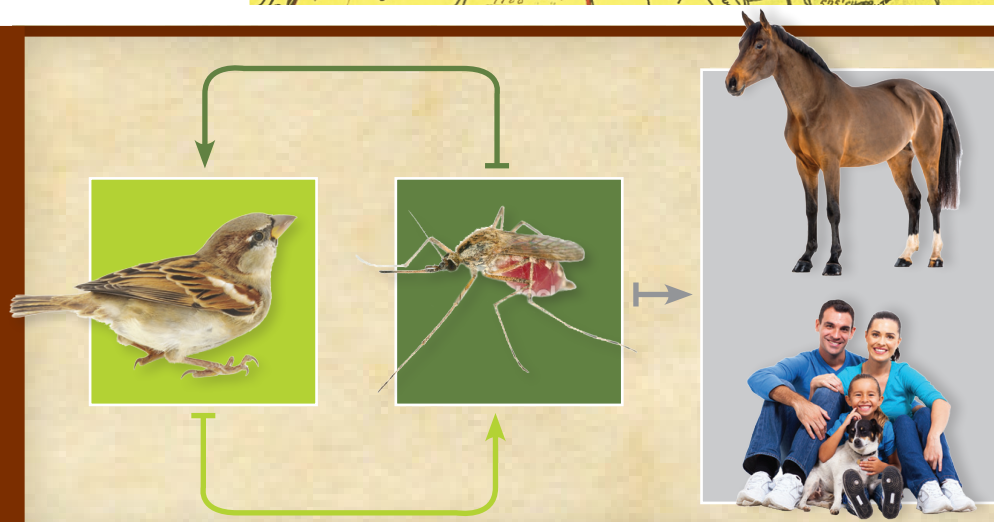
## Blast from the Past

Mosquito-transmitted diseases — such as West Nile virus, encephalitis, dog heartworm and malaria — have long been a concern. In the early days of the Napa County Mosquito Abatement District, malaria cases in the state of California jumped from 94 cases in 1936 to 783 cases in 1938.

**Malaria Case Is Reported**  
A disease not often encountered in the temperate climate of Napa County was reported to the health department last month.  
One case of malaria was reported.  
County Health Director Dr. Stanley Leland reported that the man who contracted the tropical illness is receiving complete treatment from a physician here. Dr. Leland emphasized citizens have "no reason to be perturbed" that other cases of malaria might result. He identified the malaria victim as Thomas Rasnos, 21, who arrived in Napa County a month ago from Guatemala. Rasnos went to work for a nursery near Calistoga, then fell ill.  
Rasnos had a case of malaria months ago in Guatemala, Dr. Leland reported. Malaria is a parasite carried by mosquitoes and is transmitted among humans by mosquito bites.  
It is not uncommon in tropical countries but has been virtually eradicated in the United States. Dr. Leland noted a siege of malaria once spread north to Canada, but the disease now has been controlled as far south as Mexico.  
The only way the case here could spread would be from a mosquito which had bitten Rasnos, Dr. Leland said.



Mosquitoes are the primary carriers of West Nile virus to humans, but they are the middleman. Mosquitoes obtain the virus by biting birds such as crows, ravens and blue jays that have become infected. By biting humans and horses, mosquitoes spread the virus. Humans and horses are considered "dead-end" hosts and cannot pass the virus to other biting mosquitoes.





by Matt Jocks

# Unwelcome Guests



NCMAD aware of invasive species and diseases they could bring

Asian tiger mosquito (*Aedes albopictus*)



Yellow fever mosquito (*Aedes aegypti*)



PHOTOS COURTESY CDC/JAMES GATHANY

California is a land of commuters and transplants. Some are more welcome than others.

With no shortage of native mosquitoes to deal with, the state's mosquito abatement districts and the Department of Public Health all have their eyes on newcomers. Two species, the yellow fever (*Aedes aegypti*) and Asian tiger (*Aedes albopictus*) mosquitoes have become established. A third, the Aussie mozzie (*Aedes notoscriptus*), has recently been found in Southern California.

These invasive species provide a glimpse of the challenges facing mosquito abatement districts. The resourcefulness and adaptability of these mosquitoes make control extraordinarily difficult.

The Asian tiger's eggs are durable enough that they likely made their way to the United States on cargo ships. They established a firm base in the southeast U.S., but have become

domestic highway travelers, mostly lodged in old tires. However, their appearance in California is thought to be directly from Asia.

**"The incidence of these diseases is very low. For now."**

**Dr. Vicki Kramer**  
California Department of Public Health

It was an easier path to California for the yellow fever mosquito, which is native to Central and South America. This species' resourcefulness makes it particularly challenging for control districts.

"They can breed in amounts of water that are very small," says

Wesley Maffei, director of the Napa County Mosquito Abatement District. "Immature yellow fever mosquitoes have actually been found inside plastic cups with just a small amount of water. They can be found in old beer bottles with a couple of swigs' worth of water. They are tough mosquitoes."

In addition to its namesake disease, the yellow fever mosquito can spread dengue fever and chikungunya diseases.

"The incidence of these diseases is very low," says Dr. Vicki Kramer, who heads the Vector-Borne Disease section of the California Department of Public Health. "For now."

Dengue and chikungunya are the two primary diseases carried by the Asian tiger.

Of the two newcomers, yellow fever mosquitoes have a head start, having been detected in eight California counties (but not Napa County). The Asian tiger has been found in several communities of Los Angeles County.

In the long run, however, that may change. In other areas of the United States, the Asian tiger has outcompeted the yellow fever for territory. The Asian tiger's spread may also be enabled by warming temperatures, allowing it to survive winters in a wider area.

The habits of the two newcomers give them the potential to spread their diseases quickly.

Both are drawn to the types of water sources found in suburban and urban environments, putting them in closer contact with human populations. And both bite during the daytime, when their blood sources, including people, are more readily available and often unprotected.

In Napa County, which is mostly rural, the district constantly monitors for the appearance of new species.

"There's not really anything pre-emptive to do beyond monitoring," says NCMAD Board President Shelby Valentine. "They really have to present themselves for us to deal with them."

## NCMAD's Most Wanted

Two non-native species have established homes in California.

### Yellow fever mosquito (*Aedes aegypti*)

**Description:** Black and white striped

**Egg locations:** Any standing water, including the smallest of containers

**When do they bite:** Primarily during the day, but can bite in well-lit areas at night

**Diseases carried:** Include dengue, chikungunya, West Nile and yellow fever

**Counties where detected in California:** San Mateo, Madera, Fresno, Tulare, Kern, Los Angeles, San Diego, Imperial

**Trivia:** Reported to have caused more American casualties than the enemy in the Spanish-American War

### Asian tiger mosquito (*Aedes albopictus*)

**Description:** Primarily black with a white stripe on the back and white leg scales

**Egg locations:** Standing water, often in urban areas (buckets, bird baths, tires), also tree holes

**When do they bite:** Daytime, primarily early morning and late afternoon

**Diseases carried:** Primarily dengue and chikungunya, although others include West Nile, La Crosse virus and some forms of encephalitis

**Counties where detected:** Los Angeles (multiple communities)

**Trivia:** Believed to have entered the U.S. in a shipment of old tires to Houston

## Blast from the Past

In 1947, U.S. Navy planes sprayed Napa, Marin, Sonoma and Solano counties with diesel oil. The mission, designated as "Operation Mosquito Bite," was an effort to end an unusual burst of mosquitoes that was also affecting Mare Island Naval Shipyard and the Hamilton Army Airfield.

**NAVY DROPS BOMBS ON NAPA COUNTY; TOES BITE THE DUST**

By [Name] Napa Daily Journal, Feb 14, 1947

Sonoma and Solano counties are the targets for a massive mosquito-biting campaign. In August 1946, upon a recommendation by the group, the U. S. Fish and Wildlife Service, the State Department of Public Health, and others. The mission, designated as "Operation Mosquito Bite," was an effort to end an unusual burst of mosquitoes that was also affecting Mare Island Naval Shipyard and the Hamilton Army Airfield.



# Minimizing Mosquitoes

by Mike Blount

Mosquito bites are more than just a nuisance. There's always a risk of mosquitoes spreading a potentially life-threatening disease, like West Nile virus. Although the risk is low, it is always a good idea to do your part in preventing mosquitoes. One way for residents to do this is to manage the water sources around their homes where mosquitoes can

lay eggs. Eliminating mosquito breeding grounds also helps Napa County Mosquito Abatement District reduce the amount of pesticides used in the environment. It's also a good idea to wear repellent to reduce your exposure to mosquito bites. Follow these tips to help NCMAD protect the public and yourself.



## How a Mosquito Grows

The mosquito goes through four very distinct stages of its life cycle:

by Mike Blount



actual size



actual size



actual size



actual size

### EGGS

When an adult female mosquito takes a blood meal, she will find a quiet place to rest and develop her eggs. Once she is ready, she will typically lay her eggs at the edge or on the surface of a water source. Each female is capable of laying several hundred eggs.

### LARVA

During this stage, the larva lives in water and comes to the surface only to breathe. Larvae feed on microorganisms and organic matter in the water. They shed their skin (molt) four times, growing larger each time.

### PUPA

After the fourth molt, the larva enters the pupa stage. During this stage, the pupa undergoes metamorphosis to become an adult mosquito — a process that can last up to three days. Pupae float close to the water's surface and can move quickly in water.

### ADULT

In one to three days, the adult is ready to emerge from the pupal skin. It will rest on the water surface until its body and wings are hardened and then fly away to begin its new life. As adults, male and female mosquitoes feed on plant juices. Only females require protein, which they get from blood. Some species will live only days, while others will survive for months.

All photos are greatly enlarged to show detail



# Stay Safe

by Mike Blount

## Managing mosquitoes around your home

**M**osquitoes don't need much to lay their eggs. Just standing water — inches of it is all it takes for larvae to develop. Be sure to inspect your property to eliminate or change water sources every few days. Here are some common areas around the home where mosquitoes can breed:

- Ornamental ponds
- Uncovered boats
- Pet water dishes
- Fountains
- Bird baths
- Tires
- Swimming pools
- Rainwater barrels
- Tarps
- Storm drains
- Rain gutters
- Open trash containers
- Wheelbarrows
- Low-lying areas on property
- Septic tanks
- Sumps

## Protecting Yourself

*Keeping mosquitoes at bay*

### Keep mosquitoes from making a meal out of you with these tips:

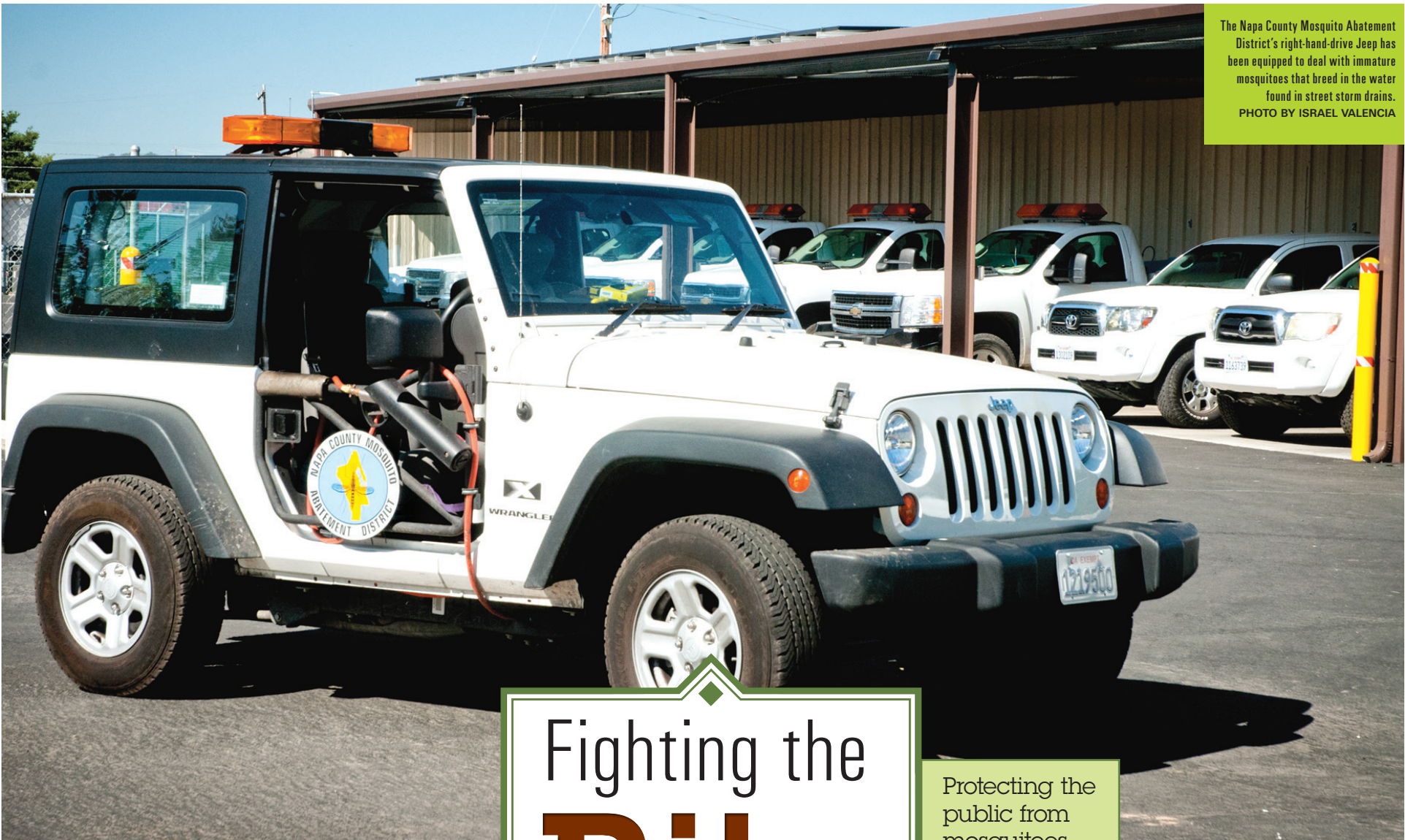
- Use mosquito repellent on uncovered skin and clothing. Be sure to test a small amount on your forearm first to be certain there is no allergic reaction.
- Wear loose or long-sleeved shirts and pants when outdoors.
- If you're camping, use mosquito netting and/or repellents to avoid getting bitten.
- Mosquitoes tend to be more active from dawn to dusk during the summer months. Try to minimize outdoor activities during this peak time.
- In a patio, gazebo or other enclosed space, citronella candles can help keep some species of mosquitoes away.

## Blast from the Past

Mosquito breeding places are often found in ground that is cracked from the sun. In this photo from 1928, mosquito breeding sites are sprayed by seasonal workers. Many of the cracks have since been eliminated by cultivation or development.





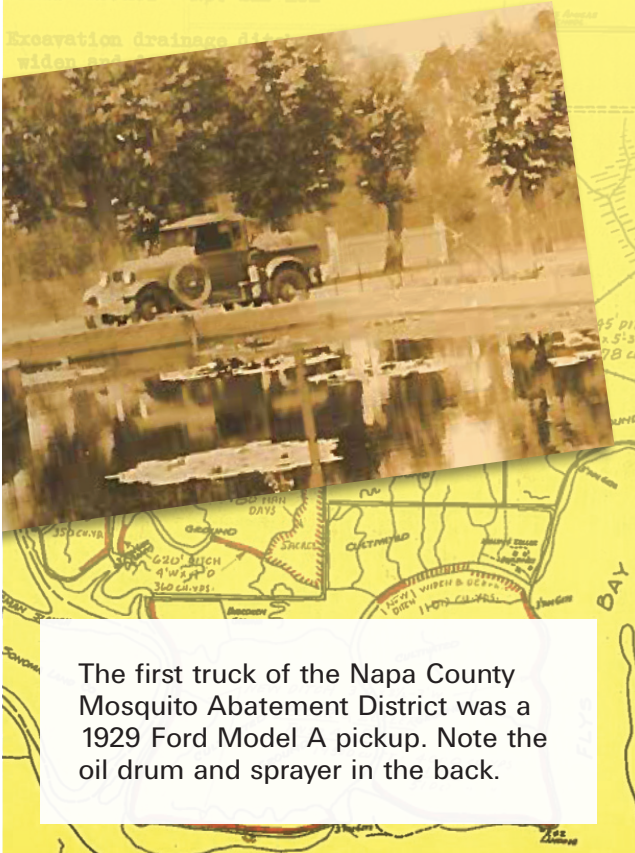


The Napa County Mosquito Abatement District's right-hand-drive Jeep has been equipped to deal with immature mosquitoes that breed in the water found in street storm drains.  
PHOTO BY ISRAEL VALENCIA

# Fighting the Bite

Protecting the public from mosquitoes

## Blast from the Past



The first truck of the Napa County Mosquito Abatement District was a 1929 Ford Model A pickup. Note the oil drum and sprayer in the back.

by Mike Blount

Since 1925, Napa County Mosquito Abatement District has controlled the mosquito population for residents in Napa County. The district provides a wide array of services that help minimize mosquito populations and reduce exposure to mosquito-borne illnesses like West Nile virus. But many are unaware of exactly what the district does to protect the public from mosquitoes.

### PHYSICAL CONTROL

Physical control is one of the most effective ways the district is able to reduce mosquitoes. Once an area where mosquitoes are breeding has been discovered, district employees enhance water circulation or, when appropriate, eliminate the water source, and then continue to monitor the location.

### SURVEILLANCE

Regular surveillance is conducted in areas that have been identified as mosquito breeding sites — these include creeks, storm drains, marshes and tire piles. The district also regularly tests for mosquito-borne diseases like West Nile virus throughout the county.

### PROPERTY ASSESSMENT

District employees can respond to public complaints about mosquitoes and assess the property for mosquito breeding sites. Finding and eliminating standing water where mosquitoes breed can bring the population to a more tolerable and healthful level for landowners, businesses and agencies.

### EDUCATION

Educating the public on how to eliminate breeding sources is extremely important. It reduces the public risk of exposure to mosquito-borne illnesses, and also reduces the amount of pesticides used to control mosquitoes. Napa County Mosquito Abatement District conducts presentations for businesses, schools and community organizations on how to prevent mosquitoes in the community.

### CHEMICAL CONTROL

The district uses physical control methods in conjunction with chemical control methods, such as insect growth regulators, bacterial by-products and surfactants that prevent mosquito larvae from becoming adults.

### BIOLOGICAL CONTROL

Mosquitofish that feed on mosquito larvae also are provided to citizens for their ponds and water gardens, where mosquitoes are known to breed.



Peter Ozorio with NCMAD holds a yellow jacket nest.  
PHOTO BY ISRAEL VALENCIA



## Yellow Jacket Control

by Mike Blount

**T**hough they are often confused with bees due to their similar appearance, yellow jackets are actually an aggressive species of wasp. Yellow jackets do not have barbs on their stingers, so they can sting more than once. They also can bite. When left alone, yellow jackets feed on other insects and sugars and starches. But in late summer — when a colony reaches peak population — workers begin scavenging for food. If the nest is near a public place, such as a park, school or campground, yellow

jackets will attack in groups to defend the queen if threatened.

Besides mosquitoes, Napa County Mosquito Abatement District receives more calls about yellow jackets than any other vector. The most effective means of managing yellow jacket populations is to eliminate their nests. If you locate a nest on your property, contact the district. A district staff person will come to the site in a protective suit to treat the nest with an insecticide, which will kill all members of the nest within 48-72 hours.



## Prevalent Vectors

How the district protects you from rodents and ticks

by Mike Blount

**I**n addition to mosquito and yellow jacket control, Napa County Mosquito Abatement District provides information on tick and rodent biology and control. If a resident suspects a tick or rodent infestation, staff can inspect the property or residence for the presence of rodents or ticks and make recommendations on what residents can do to manage them.

The best way to control rodents is by managing the habitat. Some common ways to do that include sealing pet food containers and fixing leaky faucets and water lines.

Rodent trapping or baiting should be handled by a licensed pest control company. Baiting could pose a risk to pets and other predators that may come into contact with a poisoned rodent and ingest it.

NCMAD also conducts tick surveillance and tests for tickborne diseases (e.g., Lyme disease) — transmitted by the bite of infected ticks — throughout the county. Because ticks rest on tall weeds and grass, and in leaf litter, it's best to keep vegetation cut and reduce leaf litter throughout the year.

## Blast from the Past

Originally the Napa County Mosquito Abatement District dealt only with mosquitoes. In the late 1990s, the district began to receive calls about yellow jacket nests. As a result of a property-owner-approved assessment in 2003, the district added yellow jacket services. Today the district responds to more than 150 service calls related to yellow jackets each year.







# Do No Harm



NCMAD's approach is kind to the environment (but not mosquitoes)

by Matt Jocks

**T**rying to battle one environmental hazard while not creating others is the constant balancing act being conducted by the Napa County Mosquito Abatement District.

Mosquitoes, carriers of potentially fatal diseases, are undoubtedly a health risk. So, too, were some of the chemicals that had long been used to combat them.

That is why NCMAD seeks to use other means to minimize mosquitoes and other vectors.

There are four broad categories of strategies used by the NCMAD: education, source reduction, biological control and chemical control.

While to some, mosquito control may conjure up images of spraying chemicals to kill the vectors, the reality is different.

"There are adulticides (chemicals used to kill adult mosquitoes), but that is something we always want to use as a last resort," says NCMAD Director Wesley Maffei. "For instance, there are some trees with tree holes filled with water on steep slopes, where there is no way to get to them. And with only eight [staff members], it's not physically possible to get to every treehole mosquito breeding location. Therefore, we will do limited adulticiding when we have to."

Prevention of breeding and going after larvae is the preferred method.

This begins with education because 140,000 residents can have a bigger effect than eight workers, no matter how hard the eight work. The district uses multiple methods to get the word out about reducing breeding sources such as standing water, trash piles and old tires.

Source reduction also includes the manipulation of mosquito habitats, though this also carries its own complications.

As an example, NCMAD Board President Shelby Valentine cited an animal known as the salt marsh harvest mouse. The animal and its habitat, the pickleweed marsh, are legally protected. But the pickleweed marsh also happens to be a favored breeding habitat for mosquitoes.

"It's a cute little mouse, but what do you do?" Valentine says.

Another weapon at the district's disposal is biological control. This includes the use of



Napa County Mosquito Abatement District worker Peter Ozorio takes a sample from a water source to inspect it for signs of mosquitoes.  
PHOTO BY ISRAEL VALENCIA

mosquitoes' natural predators, as well as pathogens and parasites that can prevent larvae from maturing.

When NCMAD does have to use chemicals, surveillance, with the aid of technology such as GPS, can allow for precise targeting.

The environmentally conscious approach of the NCMAD even extends to the very mission of its work.

**"I wouldn't be able to go to bed at night ... if we were not being ecologically responsible."**

**Shelby Valentine**  
NCMAD Board President

"You'll notice that it's called a mosquito abatement district, not mosquito eradication," Valentine says. "Mosquitoes are part of the food chain. It would not be responsible to eliminate a species from the environment and that's not our goal. Certain subsets that carry certain diseases, maybe."

Adhering to state regulations and their own mission to be environmentally responsible, the district chooses methods that are often labor-intensive. Still, it often battles negative stereotypes.

"I am the proverbial kneejerk liberal tree-hugger," Valentine says. "I initiated and pushed through a proposal to use a solar generating system. But it frustrates me sometimes that we are sometimes treated as the villains (in the environment).

"I wouldn't be able to go to bed at night, I'd be a nervous wreck if we were not being ecologically responsible."

## Spreading the Buzz

*How you are part of NCMAD's efforts*

In the fight to control mosquitoes and limit their harmful effects, NCMAD is trying to enlist every resident it can. As Board President Shelby Valentine says, "It won't work without it."

Often the knowledge is spread one by one when the district's eight employees do service calls. NCMAD takes a proactive approach with presentations to schools and civic groups, as well as ads in all the major local newspapers and the two local radio stations.

The quickest and easiest source of public knowledge is the district's website,

[napamosquito.org](http://napamosquito.org). Through it, NCMAD attempts to educate the public on its mission but, more urgently, the basics of how homeowners and farmers can help in the fight.

At an even more basic level, Valentine says, even reminding the public of the phone number for residents to call for information or a service call is essential to effective vector management.

**CONTACT THE DISTRICT FOR**  
Service calls

Public presentations

Information  
[napamosquito.org](http://napamosquito.org)  
(707) 553-9610

## Blast from the Past



In 1926, the district Board of Trustees approved the purchase of a boat from the U.S. Navy for \$75. The following year the district purchased an 8 horsepower Hicks engine for \$350. It was installed at the Mare Island Navy Yard for an additional \$95.





# Feels Like Home

Board member gives back to the district he grew up with

by Brittany Wesely

No one knows the Napa County Mosquito Abatement District quite like 73-year-old Chuck Carbone, whose involvement with the district began when he was just a boy in the 1940s.

The district had been in existence for nearly two decades, but the staff still consisted of just one person, Arthur "Ham" Emerick, who served as the district superintendent for a salary of \$200 per month. Emerick managed district operations and stored all of the supplies in the garage at his home. Young Carbone's childhood home was just across the alley.

"I used to play with the manager's dog," Carbone says. "I remember the district truck driving through and interrupting our evening football games in the alley."

In the early 1940s, Emerick began to hire high school teens to help clean out drainage ditches and eradicate mosquitoes. Carbone began working for the district in the summer of 1961 when he was 19 years old.

"I started out working there part time, spraying mosquitoes in the summer," Carbone says. "I got hired on full-time in '63. We had an old '49 [Ford] pickup truck. I remember that."

Having Carbone on the team was a major asset, says Wesley Maffei, director of the Napa County Mosquito Abatement District.

"Chuck is extremely knowledgeable, not only because he was born and raised in Napa, but because his family has a long, long history there," Maffei says. "His knowledge of the valley, his knowledge of how things have changed have been and continue to be really helpful."

Maffei fondly remembers working with Carbone. When the district would treat roadside ditches and city storm drains, it was best if two people worked together. One person would drive the vehicle while the other would spray with the wand. Carbone and Maffei did this often.

"We could cover more area more quickly when we worked together," Maffei says. "We spent a few summers doing that. His knowledge about the marshes was absolutely invaluable."

**"We work together.  
We play together.  
We are quite a family."**

**Wesley Maffei**  
Director of Napa County Mosquito  
Abatement District

After working for the district for 41 years, Carbone retired from his position as a vector biologist. But he couldn't stay away. Carbone joined the district board soon after.

"I guess maybe I feel I owe it to the guys," Carbone says.

This closeness of the team is the hallmark of the Napa County Mosquito Abatement District, Maffei says.

"When you're small like we are, it's important to be tight," Maffei says. "We work together. We play together. We are quite a family."

Chuck Carbone worked for the Napa County Mosquito Abatement District for 41 years, but his involvement with the district goes back to his childhood, when he lived right next door.  
PHOTO BY ISRAEL VALENCIA



## Blast from the Past



Chuck Carbone grew up next door to the Napa County Mosquito Abatement District, back when it was operated out of the superintendent's garage. Here is 3-year-old Carbone playing with the superintendent's dog.





From left, Peter Ozorio, James McLellan and Wesley Maffei of the Napa County Mosquito Abatement District  
PHOTO BY ISRAEL VALENCIA

# Join the Fight

Napa County Mosquito Abatement District has a long history of protecting the public from vectors. But they can't do it alone. Managing water around your home can keep mosquito populations from getting out of control and reduce the risk of transmitting a mosquito-borne illness. Together, we can keep mosquitoes and other vectors at bay.



15 Melvin Road  
American Canyon, CA 94503  
707-553-9610  
Monday – Friday, 8 a.m. – 4:30 p.m.  
[www.napamosquito.org](http://www.napamosquito.org)

Produced for Napa County Mosquito Abatement District by:  
N&R PUBLICATIONS (916) 498-1234 | [www.nrpubs.com](http://www.nrpubs.com)

## Here Are a Few of the Services We Offer:

- Mosquitofish provided free of charge to combat mosquito larvae in residential water sources
- On-site vector assessment and recommendations
- Public presentations on mosquito and vector control
- Regular monitoring of mosquito populations and mosquito-borne diseases through frequent surveillance and testing
- Yellow jacket control
- Information on tick control and disease surveillance
- Rodent inspection, advice and disease surveillance

## Blast from the Past

Until the early 1940s, the Napa County Mosquito Abatement District had a staff of one. It wasn't until 1948 that the district hired its first full-time laborer. In 1998, the district had four full-time personnel (seen here). Today the district has an eight-person staff.

