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Protect Yourself from Pests



Find out how you can fight the bite and avoid vector-borne illness

Raising Public Awareness

Curbing mosquito populations and health hazards with vector control



As temperatures rise, so do mosquito populations and the risk of infectious disease. However, through proactive control measures and personal protection, the summer doesn't have to bite.

"We do what is called an integrated vector management," said Joel Buettner, General Manager of Placer Mosquito and Vector Control District. "Basically, it's a science-based, decision-making process in which we monitor mosquito species, the abundance, where they are and if they're carrying West Nile Virus."

In addition to setting up traps at over 70 sites per week, Buettner and his team track mosquito populations using drones, public input and in-house testing.

"From that information, we determine what the risk is to the public," Buettner said. "As we determine area of high risk, we take appropriate preventative and responsive measures to manage that risk."

In Northern California, Butte, Nevada and Placer counties work together to employ a broad range of control methods that can vary as much as the territory those counties cover, which is home to more than 30 species of mosquitoes.

While the snowmelt mosquitoes found in snowy climates do not carry human diseases, they do like to bite people. Similarly, treehole mosquitoes in the foothills also like to bite people but tend to carry and transmit canine heartworm to dogs.

In western Placer County's urban areas and irrigated agriculture, the concern centers on California's two primary vectors of West Nile Virus, *Culex tarsalis* and *Culex pipiens*.

In 2018, 28 reported cases of West Nile Virus came from all three counties — the most since 2012. It's a public health risk that is manageable through detection, control and personal responsibility. This includes reducing or eliminating standing water on your property, not spending long stretches of time outside during dawn or dusk and, if doing so, wearing protective clothing and an effective insect repellent.

"Throughout history and around the world, mosquitoes have been closely associated with human civilization and have spread disease, and that's not going to change any time soon," Buettner said. "The more information we have about how we can prevent that risk, and help people to protect themselves, the safer we will all be."

With public awareness and action, alongside the ongoing efforts of vector control agencies, we all can enjoy summer safely.

"The more information we have about what the risk is and how people can protect themselves, the safer we will be."

Joel Buettner
General Manager, Placer Mosquito
and Vector Control District



Mosquito 101

From the dry plains to the snow-capped mountains, mosquitoes are buzzing about.

- ➔ **More than 30 species** of mosquitoes live throughout Butte, Nevada, and Placer counties — including *Culex tarsalis* and *Culex pipiens*, California's two primary vectors of West Nile Virus.
- ➔ *Culex tarsalis* and *Culex pipiens* prefer to get their blood meal from birds but will **opportunistically bite humans** and other animals when available.
- ➔ A mosquito may breed multiple times in its life and can lay **hundreds of eggs in rafts**, which float on top of still or standing water.
- ➔ Warmer temperatures **speed up a mosquito's life cycle**, which — based on the species and weather — can range from four days to a month.
- ➔ Some mosquitoes will "overwinter" — similar to hibernation — through the cold months and **emerge in spring** to lay eggs.
- ➔ Mosquitoes are **most active at dawn** and dusk.
- ➔ To protect yourself from mosquito bites, use an **EPA-registered repellent**, wear long clothing and when possible stay inside at dawn and dusk.

Living with West Nile Virus

West Nile Virus can be debilitating, far-reaching and long-lasting

After feeding off infected birds, mosquitoes can transmit West Nile Virus (WNV) to humans. While the Centers for Disease Control and Prevention (CDC) reports 80 percent of people infected will show no symptoms, others will experience flu-like symptoms including fever, headaches, muscle or joint pain and, occasionally, rashes.

The CDC reports only 1 in 150 people infected with WNV will develop a severe illness, but Wendi Landers wasn't comforted by the statistics when her mother began showing signs of WNV.

In August 2018, Landers arrived at her mother's house in Elverta to find her incoherent under the summer sun. Believing it to be dehydration, Wendi's mother was treated and released from the emergency room before being readmitted the following day with a 104 degree fever and bouts of incoherency.

"Back in the ER," Wendi said, "everything went downhill. Her brain started swelling and by Sunday morning she was in an almost comatose state."

After receiving a diagnosis of WNV encephalitis, Wendi's mother spent a month in the hospital and another month at a nursing facility.

"She had to relearn how to walk, eat, speak, use the restroom, bathe, get dressed, brush her hair," Wendi said.

The family saw gradual improvement and now, close to a year after contracting WNV, Wendi said her mother is about 80 percent back to where she was — though she still fatigues easily, has a spotty memory and can't live independently.

While WNV continues to take a physical and emotional toll on her mother, Wendi said the family is struggling to adjust to the role reversal for a woman who was once the heart and caregiver of their family and now needs care herself.

"We don't have our same mom back," Wendi said. "We're getting there, I just don't know if she's going to get to the point she was."

"We don't have our same mom back."

Wendi Landers
Daughter of West Nile
Virus survivor



Wendi Landers (above) wants people to know the dangers of WNV and how they can take precautions to avoid it.

Photo by Anne Stokes

Though the statistics may seem hopeful on paper, Wendi believes the real-life risk of WNV is too great and urges people to take precautions by wearing long clothing or repellent, reporting dead birds to local vector control for WNV testing and promptly seeing a physician if symptoms appear.

For more information about West Nile Virus, visit the Centers for Disease Control and Prevention at <https://www.cdc.gov/westnile/>.



After a long road to recovery, Debra Folsom (above) beat Lyme disease. She enjoys life again and strives to help others who've contracted the disease.

Photo by Emily Teague

Leaving Lyme Behind

Avoiding ticks is vital in preventing the spread of tick-borne diseases like Lyme

After returning from a ski trip in early 2010, Debra Folsom began to feel weak — as if she had the flu and it wouldn't go away. By the end of the year, Debra was in a wheelchair and would remain so for six years.

Experiencing extreme fatigue, neurological pain and severe anxiety, doctors initially diagnosed Debra with chronic fatigue syndrome after she falsely tested negative for Lyme disease. However, her condition only worsened.

Confined to her wheelchair, Debra found it necessary to hire someone to run her business and a caregiver to assist her husband in providing care. However, the toll Lyme disease took on her social life was one of the most debilitating.

"It's a very isolating situation," Debra says.

"Because of the neurological symptoms and anxiety, you can't

really socialize. It's just too overwhelming so you end up being alone."

In 2013, three years after the onset of her initial symptoms, Debra was correctly diagnosed positive with Lyme disease and began treatments. Over time, her condition finally improved.

These days, living in Chico, Debra's back into her active lifestyle while educating the public on ways to protect themselves from ticks. Avoiding ticks and the diseases they carry, like Lyme can be achieved by wearing long clothing and repellent, tucking your pants into your socks when hiking and always check tight-fitting clothing after walks in the wild.

"Having Lyme disease can be a very isolating situation."

Debra Folsom
Lyme disease
survivor

For more information about Lyme disease, visit the Centers for Disease Control and Prevention at <https://www.cdc.gov/lyme/>.

Check Around The House

Vector prevention starts in your own backyard — but doesn't end there

Outside



Uncovered boats

Clear out standing water. Cover with a tarp.



Potted plants

Flush water from saucers once a week or keep them filled with sand.



Pet dishes

Rinse and replace water twice a week.



Fish ponds

Stock with mosquitofish, clear excess vegetation.



Sprinklers

Don't over-irrigate landscaping — excess water can provide breeding habitat.



Rain gutters

Remove leaves, dirt and debris. Keep clean to maximize water flow and prevent standing water.



Trash bins

Dump any standing water, keep lids tight.



Tree holes

Inspect for water during the rainy season. If water is present, consult an arborist to determine the best method of eliminating water. You can also contact your mosquito control district for help.



Water troughs

Stock with mosquitofish or change the water weekly.



Barbecues

Keep covered so water does not collect inside of them.



Bird baths or fountains

Flush out completely once a week and refill.



Pools

Keep clean and filtered, keep water off the cover and stock with mosquitofish if no longer being maintained.



Spas and hot tubs

Keep clean, filtered and heated. If not in use, keep empty.



Tarps

Dry off water that collects after rain.



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Inside



Windows

Use your air conditioning so you can keep the windows closed and bugs out.



Screens

Fix any holes to keep mosquitoes outside.



Houseplants

Do not overwater plants and keep any plant saucers free from standing water.



Pet water dishes

Change the water often.



Under the sink

A leaky sink leads to standing water, which equals prime mosquito hatching ground.



Toilets

An unused toilet, like one in a house whose residents are on vacation, is a great place for mosquitoes to lay eggs. Residents should drain toilets if they go on an extended vacation.



Coffee makers (pods or pots)

Keep free of water when not in regular use, and rinse and clean water storage tanks once a week.



Buckets/containers

Keep water-free, store them upside down.



Tires

Dispose of properly or cover, so water does not collect inside. Drill drainage holes in tire swings.



Wheelbarrows

Dump standing water, store upside down.

On Your Person



EPA-Registered insect repellent

Use products containing DEET, Picaridin, IR3535, Oil of Lemon Eucalyptus, Para-menthane-diol or 2-undecanone.



Apply and reapply repellent as directed

When used as directed, they are safe for pregnant and breastfeeding women.

For babies and children, adults should spray repellent onto their hands and then apply to a child's face. Apply sunscreen first and repellent second.



Wear long-sleeved shirts and long pants

Treat items such as boots, pants, socks and tents with permethrin.

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Talk to your veterinarian

Pets can recommend the best tick prevention products for your dog and tell you about tick-borne diseases in your area.



Check your pets daily

Especially after they spend time outdoors, check dogs and cats for ticks.

If you find a tick on your pet, remove it right away.



Create a tick-free zone in your yard

Apply pesticides outside to reduce ticks.

Clear tall grasses and weeds and mow the lawn regularly.





Scott Schon (left) shows his wife and two young children how mosquitofish help control mosquito populations.
Photo by Anne Stokes

Proactive Protection

Simple steps can protect a home and family from being overrun by mosquitoes

Reliable Repellents

Keeping mosquitoes away can begin with finding a repellent that's right for you. To ensure the repellent is effective and safe, many professionals suggest looking for a United States Environmental Protection Agency (EPA) Registration Number on a repellent with one of the following ingredients:



➔ **DEET** — One of the oldest, most effective and most common ingredients in repellents, it protects against mosquito and tick bites. Ongoing studies suggest repellents with DEET are safe to use, as instructed, for any age.



➔ **Insect Repellent 3535 (IR 3535)** — Effective against certain mosquito species, deer ticks, body lice and biting flies, it has no known human or environmental health risks.



➔ **Picaridin** — Repelling mosquitoes, ticks, fleas and chiggers, this synthetic compound is meant to resemble the piperine compound found in plants that produce black pepper. Safe for human use, it is moderately toxic to fish.



➔ **Oil of lemon eucalyptus** — Naturally extracted from eucalyptus leaves or twigs or synthetically produced, for commercial products, it poses no known human or environmental risks. Not recommended for use on children under 3 years old. May need to reapply more often than other repellents.

At Placer Mosquito and Vector Control District, Scott Schon is in charge of the Biological Control Program and its unmanned aircraft drones — utilizing natural and artificial tools to monitor and control Placer County's mosquito populations. At home with his family, Schon takes his work personally.

As Lead Vector Control Technician, Schon also oversees the district's mosquitofish breeding facility in Roseville. With seven recirculating tanks, the program raises roughly 60,000 baby mosquitofish every year to be distributed to residents throughout Placer County, free of charge.

"We're mainly stocking contained sources," Schon said, "like horse troughs, unused swimming pools, ornamental ponds."

The fish, which eat mosquito larvae in the water, help to control mosquito populations near residents' homes, while Scott and his team use drones to gather data and take action in more remote areas.

"We use drones to take atmospheric readings to detect different weather patterns that may be beneficial to our spray operations," he said. "Other drones are waterproof, made to land in water, with a camera that sits underwater to detect the presence of mosquito larvae."

At home, Schon has a small pond on his property, which he maintains throughout the year to prevent it from becoming a breeding ground for mosquitoes.

"I make sure that my water is always recirculating," he said. "Typically, mosquitoes don't want to breed in moving water; they're looking for more still and stagnant water. And, aside from recirculating water, I have mosquitofish."

To protect his own family, Schon follows much of the advice he passes on to residents. In addition to cleaning and maintaining his swimming pool and gutters, he empties buckets and outside toys that have filled with rain or sprinkler water.

"Stop them from having a spot to reproduce and it makes [mosquito control] a lot easier," Schon said. "Once they're adults and they're all flying around, it's a little harder to control that."

To avoid being bitten by adult mosquitoes, Schon says that wearing long clothing or setting up a fan on a small patio — mosquitoes don't want to compete with the wind — can go a long way. And, when out hunting waterfowl, he prefers a mosquito repellent with DEET in it. Ultimately, if Schon knows mosquitoes

are out in force, he'll try to stay inside with his family at dawn and dusk, when mosquitoes are most active.

Following these simple habits, residents can protect themselves and their family from the yearly onslaught of mosquitoes — and they won't even have to take their work home with them.

"Stop them from having a spot to reproduce, and it makes [mosquito control] a lot easier."

Scott Schon
Lead Vector Control Technician,
Placer Mosquito and
Vector Control District



Ask the Expert

Q&A with Dr. Elizabeth Andrews, Public Health Biologist
with the Vector-Borne Disease Section of the California
Department of Public Health

BY ANNE STOKES

No one likes dealing with mosquitoes or ticks. But aside from being an annoyance, why is it important to control vector populations from a public health perspective?

It's important to control these populations because mosquitoes and ticks can potentially carry vector-borne diseases, such as West Nile virus or Lyme disease, respectively.

And these diseases can cause serious, long-term health issues, right?

They can if left untreated. In the case of Lyme disease, it's a treatable disease with antibiotics, but if you don't recognize the signs and symptoms early and it's left untreated, there could be serious long-term health consequences. Some of the mosquito-borne viruses may also cause serious health issues.

What are some of the methods districts use to control vector populations?

The vector control districts collect surveillance information, which helps them identify where and when they need to implement control measures such as applying pesticides. They are also using an integrated vector management approach and

performing environmental modifications to areas that produce mosquitoes. These may include water management practices such as ensuring water is moving freely and there isn't a lot of vegetation or other harborage for mosquito larvae. They also use biological control methods such as mosquitofish, which prey upon mosquito larvae and reduce mosquito populations.

Why is it important for residents to do their part as well?

If you've got an upturned trash can or other containers or areas in your yard where you see standing water, you're going to be seeing mosquitoes. If every resident could take a minute and look around their yard for these water sources, that would help drop the mosquito population eventually.

If you have long grasses, if you have wood piles stored up against the house, those provide homes for ticks. If you were to remove those and keep those things away from your home, you would hopefully be able to reduce the tick populations.

What can residents do to protect themselves from mosquitoes and ticks?

Personal protective measures are effective at preventing bites from mosquitoes and ticks. The first line of defense is to wear long sleeves and pants when you're going outdoors.

In addition to wearing appropriate clothing, the US Centers

for Disease Control and Prevention suggests using insect repellents with active ingredients that are registered by the Environmental Protection Agency (EPA). These are specifically DEET, picaridin, IR3535, Oil of Lemon Eucalyptus (OLE) and para-menthane-diol. If you're using these repellants against mosquitoes, make sure you're spraying your entire body, all your exposed skin including the back of your neck and hands. If you want to prevent tick bites, spray your legs, ankles and shoes. Ticks usually crawl onto people from the grass or the ground.

What are some common ineffective methods of mosquito and tick repellents?

Products not registered by the EPA are not known to effectively protect people from insect bites. Some examples are these are essential oil such as citronella, cedar, geranium, peppermint, and soybean oil.

Clip-on fans, wristbands, coils, candles and tabletop diffusers aren't the best products to prevent insect bites because they're only going to repel insects from that small area around the product, not your body. If you're outdoors and active in areas where there are mosquitoes and ticks, it's really best to use a repellent applied to the skin and clothing for personal protection.



For more information, visit the California Department of Public Health website at cdph.ca.gov/Programs/CID/DCDC/Pages/VBDS.aspx or send an email to VBDS@cdph.ca.gov

Protect Yourself Every Season

The best prevention is to plan early

SPRING

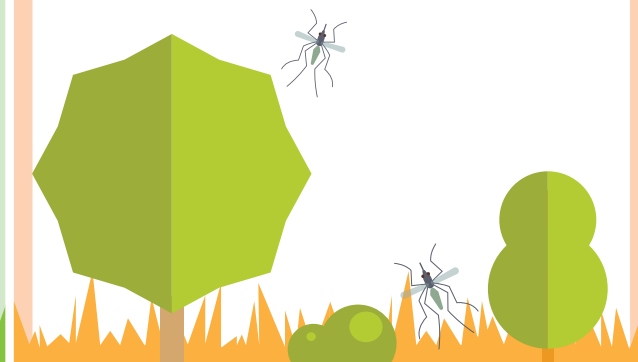
Ticks are rampant in the valley during the spring months. They tend to reside in tall grass and brush, so maintain a mowed lawn and remove any debris. Regular tick checks are advised, especially on pets and areas where your clothing is restricted.

Increased numbers of the fierce treehole mosquito kick off mosquito season in the Gold Country from Auburn to Colfax. Similarly, as the snow melts in the High Country, there is no shortage of mosquitoes. Discard sitting water from garbage cans, pet bowls and other outside sources to eliminate mosquito breeding sources.



SUMMER

The High Country continues to see a rampant mosquito population in the early part of the season. Mosquito numbers and West Nile Virus activity are at their peak in the summer throughout the western cities of the valley, like Roseville and Lincoln. Reduce your risk of getting bit with repellents, long sleeved clothing and avoiding outdoor activities at dawn and dusk.



FALL & WINTER

In the colder months, ticks carrying diseases are especially common in the Gold Country. The region also experiences a peak with nymphs — immature ticks — in the winter. The valley has a comparable trend as ticks are most common in the winter.

When ticks are prevalent, keep repellents handy and opt for light-colored clothing that allows you to quickly notice when a tick may have latched onto you. Remember, the quicker you notice a tick, the easier it is to remove them due to the cement-like substance they release to plant themselves onto your body.



Contact Your Local Office



Placer Mosquito and Vector Control District

📍 2021 Opportunity Drive
Roseville, CA 95678

☎ 888-768-2343 or 916-380-5444

@ placermosquito.org/contact-placer

Butte County Mosquito and Vector Control District Headquarters

📍 5117 Larkin Road
Oroville, CA 95965

☎ 530-533-6038 or 530-342-7350

@ bcmvcd.com/contact.php

Nevada County Environmental Health Mosquito and Vector Control

📍 950 Maidu Avenue
Nevada City, CA 95959

☎ 530-265-1500

@ env.health@co.nevada.ca.us