

2023-2024 KERN COUNTY GRAND JURY



**Kern Mosquito and Vector Control District
The Silent Superheroes, Biting Back With A Vengeance**

**Release Date
March 21, 2024**

KERN MOSQUITO AND VECTOR CONTROL DISTRICT

The Silent Superheroes



Source: Google images

Biting Back with a Vengeance

SUMMARY:

Did you know ... Mosquitoes are the deadliest animals on the planet? Bloodsucking mosquitoes spread a vast number of diseases and viruses.

There are 3,500 species of mosquitoes that spread over 50 different diseases worldwide. Kern County has four prominent species responsible for the transmission of several diseases that Kern Mosquito and Vector Control District (District) target and manage with state-of-the-art and ecofriendly measures.

Vectors (carriers of disease), including mosquitoes and roof rats, are targeted by the District to control their populations and to monitor and test for the presence of transmittable diseases.

The District's mission is *to protect the public's health through effective mosquito control, encephalitis virus surveillance, roof rat control, and public education.*

Without mosquito abatement districts, many deadly diseases would go unchecked or even become epidemic.

Community education and involvement are essential to the successful control of vectors. The public can be proactive by eliminating standing water, treating green pools, and using repellants, as well as reporting issues through the District's website: www.kernmosquito.com

PURPOSE OF INQUIRY:

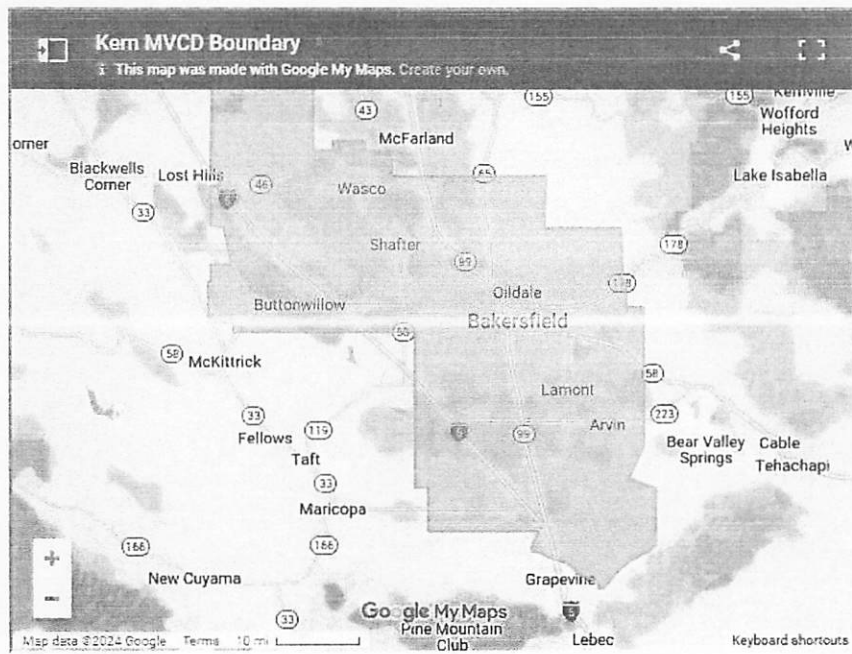
After an unusually wet winter, residents voiced concern regarding a potential onslaught of mosquitoes. Pursuant to Cal. Penal Code §933.5, the 2023-2024 Kern County Grand Jury (Grand Jury) initiated an investigation to gain insight into the effectiveness of the Kern Mosquito and Vector Control District.

METHODOLOGY:

The Grand Jury researched the internet, including the District's website, conducted interviews in person and by telephone, completed site visits, and attended a District Board Meeting. The Grand Jury reviewed financial documents as well as printed brochures produced and distributed by the District. Past Grand Jury reports were also reviewed.

DISCUSSION OF FACTS:

Of the over 3,500 species of mosquitoes worldwide, most are just a nuisance, but many are vectors, causing serious health risks to humans. There are 26 species of mosquitoes in Kern County, of which four are targeted by the District. Also targeted are roof rats, the major problem rat species in Kern County. The District is the largest of four vector battling districts within the County. The District, formed in 1917, encompassed 48 square miles and continued to grow over the years to its current 1,657 square miles.



Google map from District's website

Among the four targeted species, the *Aedes* mosquito, called the “ankle biter”, is the new species in town. It doesn’t ring the bell, but comes right in for breakfast, lunch, and dinner; bites you as its main course, and comes back for seconds and thirds!



Invasive *Aedes* Mosquito aka "ankle-biters"
Image from Kern Mosquito and Vector Control District's website

A. Mosquito-borne diseases (MBD) account for millions of infectious diseases worldwide, resulting in more than 500,000 deaths annually.

The following six MBDs that are a concern to Kern County residents:

1. **West Nile Virus (WNV)** is the most common MBD in the United States with about 22,000 cases reported annually. Its symptoms vary from fever to coma. Around 75% of infected people won’t show any symptoms. Those showing symptoms will usually recover within weeks. Of those infected with WNV, less than 1% develop severe symptoms like meningitis or encephalitis. Of that 1%, fewer than 10% result in fatalities.
2. **Dengue Fever**, caused by a virus, is transmitted by *Aedes* mosquitoes. There are approximately 96 million cases globally each year, resulting in 40,000 deaths. It is primarily a tropical disease, but has been spreading to Europe and North America. Symptoms of Dengue Fever mimic influenza with high fever. Most cases are mild, but severe forms can cause serious bleeding, shock, or death.
3. **Zika Fever** is a viral disease also spread by *Aedes* mosquitoes. Most cases lasting a week or two show mild symptoms of fever, headache, rash, and pink eye. However, pregnant women are at risk of passing the virus to the fetus, causing birth defects.
4. **St. Louis Encephalitis (SLE)** can also be a dangerous virus. Some infected people show flu-like symptoms; however, most don’t show any symptoms, going undiagnosed. SLE has a fatality rate of up to 20% among diagnosed patients due to inflammation of the brain or surrounding membranes.
5. **Chikungunya Virus** is yet another MBD affecting much of the world. It also manifests with flu-like symptoms, which run their course in a week or so. However, chronic joint pain can persist.
6. **Eastern Equine Encephalitis** occurs mostly in the Gulf States, and although very rare, is an extremely serious disease with a human mortality rate of 30%.

- B. There is no record of MBD deaths in Kern County as reported by the Centers for Disease Control (CDC).
- C. The District battles roof rats and mosquitoes every day with a workforce of 21 full-time employees and 45 seasonal employees.
- D. The District is funded through Kern County to provide mosquito abatement, with a tax-based budget of \$6.7 million per year.
- E. There is a \$2 tax assessment per District parcel to fund roof rat control, totaling \$318,000 per year.
- F. Currently, there are approximately 600 roof rat customers who receive property inspections and bait traps.
- G. Roof rats, although vectors of disease like Hantavirus, are primarily a nuisance, causing damage to wiring and contaminating food supplies.
- H. Single kill poisons used to control roof rats are **not** transferable to wild or domestic animals that scavenge carcasses.
- I. The District contracts twice a year for aerial surveillance, looking for green swimming pools.
- J. In 2023 four aerial applications for vector control of wetlands were conducted.
- K. During the housing decline of 2007, about 4,000 pools were abandoned in the District, which increased the reported cases of WNV to 142 from an average of 32 per year.
- L. In 2023, a total of 1,631 green pools were treated by the District.
- M. Unmaintained pools (where chlorine is not added), or unaerated stagnant ponds that will not be put back in use, may be treated with mosquitofish, supplied at no charge by the District. Each mosquitofish eats hundreds of larvae and pupae every day.
- N. The District maintains a website: www.kernmosquito.com, which includes:
 - 1. Contact information
 - 2. Board meeting agendas
 - 3. Informative brochures
 - 4. Frequently Asked Questions (FAQ)
 - 5. Explanation of abatement programs
 - 6. Disease information
 - 7. Request for Service links:
 - Report a Mosquito Problem

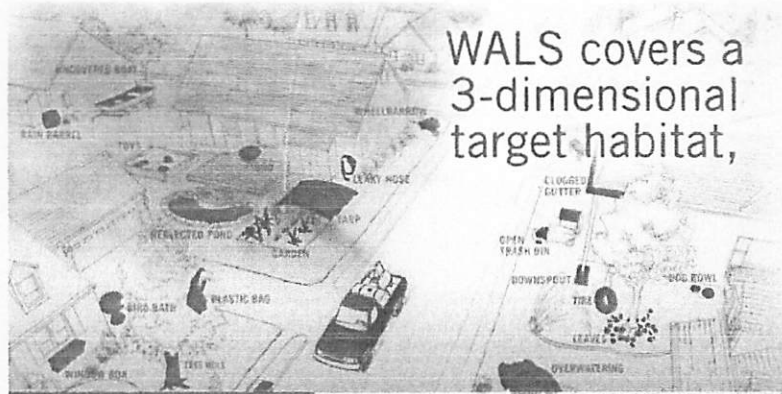
- Report a Green Swimming Pool
 - Request Mosquitofish
 - Report a Dead Bird
 - Request Roof Rat Service
 - Request a Presentation or Information Booth
- O. Public education services that are managed by the District’s Public Information Officer (PIO) include:
1. Brochure distribution
 2. School outreach
 3. Media utilized for informing the public of mosquito issues:
 - Social media platforms
 - Local television news channels in English and Spanish
 - Local radio stations
 - The Bakersfield Californian Newspaper
 - Billboards
 - Bus advertising
 4. Informational booths at expositions
 5. Outreach and educational presentations, which are free to agencies, associations, businesses, and community organizations
- P. The District owns 100 trucks deployed in the field during mosquito season (April through October) and serviced in the off season. The trucks are identified with a small District logo.



Photo taken by Grand Jury

- Q. District field employees are provided with Personal Protective Equipment (PPE), safety equipment, training (covering all aspects of duties), uniforms, and water jugs.

- R. It has been necessary in the past for crews to use their personal cell phones to communicate while in the field. Moving forward, they will be supplied with communication devices by the District.
- S. In 2022, Wide Area Mosquito Larvicide Spray (WALS) was incorporated into the District’s arsenal as a pilot program. Spray maps and schedules are available on the District’s website.



*WALS will be conducted during the night when people are indoors, to limit accidental exposure, even though BTI (*Bacillus thuringiensis israelensis* is a naturally occurring soil bacteria and is very target-specific to mosquitoes) is non-toxic to humans, birds, pets, fish, etc. We are hopeful it will provide Kern residents some relief as well.*

Source: District's website

- T. In addition to larvicides, female breeding mosquitoes are controlled with several types of traps that are baited with CO₂, artificial human scent, or stinky nutrient-rich water.



Scent Trap

Source: District's website

- U. While there is a vaccine against WNV for horses, there is no vaccine available for humans. The best prevention against WNV is avoiding mosquito bites. To decrease the risk of mosquito-transmitted infections the District recommends:
 1. Avoid mosquitoes at all times of the day.

2. Avoid mosquito-infested areas and use mosquito repellent on exposed skin.
 3. When choosing the best mosquito repellent to use, look for one of the following CDC and EPA (Environmental Protection Agency) approved ingredients: DEET, picaridin, IR3535, oil of lemon eucalyptus (OLE), para-menthane-diol (PMD), or 2-undecanone. A minimum of 25% active ingredient is recommended.
 4. Wear long-sleeved shirts and long pants whenever outdoors.
 5. Do not allow water to collect and stagnate in old tires, flowerpots, fountains, birdbaths, pet bowls, or other containers. These are prime breeding grounds for mosquitoes.
 6. Keep swimming pools operating properly; drain water from pool covers.
 7. Stock garden ponds with fish that eat mosquito larvae such as gambusia, goldfish, and others.
 8. Empty and scrub the walls of birdbaths and wading pools weekly to remove any attached mosquito eggs.
 9. Make sure that doors and windows have tight-fitting screens in good repair to keep mosquitoes out of your home.
- V. The District is governed by a board of eight Trustees. Four are appointed by the Kern County Board of Supervisors, and one each appointed by the cities of Shafter, Wasco, Arvin, and Bakersfield.
- W. The District fell behind in State and County financial audits required by CA Government Code §26909(2) starting in 2021 due to incompatible accounting practices between their third-party payroll service and their auditor. The 2021 audit has been completed and the 2022 and 2023 audits are in progress.

FINDINGS:

The Grand Jury finds that:

- F1. There is a correlation between an increase of green pools and more reported cases of WNV.
- F2. Mosquitofish are a viable tool to manage mosquito larvae in stagnant water.
- F3. The District is implementing a solution that is expected to bring its financial audits current, as required by code.
- F4. The District maintains an exceptionally informative website, including user friendly request for service forms.
- F5. The District's detailed recommendation of the proper type and use of mosquito repellants is an important tool for disease prevention.
- F6. The District's PIO is actively keeping the public educated with a plethora of information on mosquito awareness, contributing to the control of the mosquito population.

F7. A mascot would be a beneficial addition to the District's educational programs to increase public awareness.

F8. The District is doing an exemplary job with mosquito population reduction and disease control. Efforts this past season have resulted in significantly lower reported cases (16) of WNV in the District during the wettest year in 40 years.

F9. The District's truck decals could be more informative to create a more positive public perception.

COMMENTS:

The Grand Jury would like to thank the management and staff of the Kern Mosquito and Vector Control District. The District's employees patiently answered our questions and did an excellent job sharing their expertise with us.

We also enjoyed the relationship we developed with the District's resident cat, Oreo. Oreo is estimated to be 25 years old, and she seems to be a great morale builder for the District staff. Plus, she has probably been an excellent "mouser" for them.



Oreo
Photo by Grand Jury

RECOMMENDATIONS:

The 2023-2024 Kern County Grand Jury recommends that:

- R1. The District continue the diligent work to bring its audits current by June 30, 2025, and ensure a plan is in place to prevent future audits from becoming delinquent. (Finding 3)
- R2. By September 30, 2024, the District should consider formulating a plan to create, adopt and implement a friendly mascot in their public outreach programs. (Finding 8)
- R3. By September 30, 2024, the District should consider re-designing decals for its fleet of vehicles to increase positive public awareness. (Finding 9)

NOTES:

- The Kern Mosquito and Vector Control District should post a copy of this report where it will be available for public review.
- Persons wishing to receive an email notification of newly released reports may sign up at: <https://www.kerncounty.com/government/other-agencies/grand-jury>
- Present and past Kern County Grand Jury Final Reports and Responses can be accessed on the Kern County Grand Jury website <https://www.kerncounty.com/government/other-agencies/grand-jury>

RESPONSE DEADLINE: REQUIRED WITHIN 90 DAYS FROM:

- The Kern Mosquito and Vector Control District Board of Trustees
 - Findings 1 through 9 inclusive
 - Recommendations 1 through 3 inclusive
- **INVITED RESPONSES**
 - The Kern Mosquito and Vector Control District General Manager
- **RESPONSES ARE REQUIRED PURSUANT TO CAL. PENAL CODE §§933(c) AND 933.05 TO:**
- **PRESIDING JUDGE**
SUPERIOR COURT OF CALIFORNIA
COUNTY OF KERN
1415 TRUXTUN AVENUE, SUITE 212
BAKERSFIELD, CA 93301
- **FOREPERSON**
KERN COUNTY GRAND JURY
1415 TRUXTUN AVENUE, SUITE 600
BAKERSFIELD, CA 93301

Reports issued by the Grand Jury do not identify individuals interviewed. Cal. Penal Code §929 requires that reports of the Grand Jury not contain the name of any person or facts leading to the identity of any person who provides information to the Grand Jury.