

COACHELLA VALLEY MOSQUITO AND VECTOR CONTROL DISTRICT

INVASIVE MOSQUITO MANAGEMENT PROGRAM AND ARBOVIRUS RESPONSE PLAN 2023



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I. OBJECTIVE

The purpose of this document is to provide guidance to Coachella Valley Mosquito and Vector Control District staff on how to prepare for, conduct surveillance of, and respond to the detection of invasive mosquitoes in the Coachella Valley. Mosquito species of immediate concern are the container-breeding *Aedes aegypti* and *Aedes albopictus*, both of which have been detected in multiple areas of California, including Riverside County. This document was developed based on the California Department of Public Health (CDPH) "**Guidance for Surveillance of and Response to Invasive Aedes Mosquitoes and Dengue, Chikungunya, and Zika in California**" published in June 2014, revised several times, and most recently updated in January 2023.

<https://www.cdph.ca.gov/Programs/CID/DCDC/CDPH%20Document%20Library/InvasiveAedesSurveillanceandResponseinCA.pdf>

II. INTRODUCTION

The detections of *Aedes albopictus* (Los Angeles area 2011), *Aedes aegypti* (Central Valley and Bay Area 2013), and *Aedes notoscriptus* (Los Angeles area 2014) demonstrated that California is vulnerable to colonization by these highly invasive mosquito species. In October of 2015, *Aedes aegypti* was discovered in Riverside and San Bernardino Counties. These discoveries alerted District staff that the detection of one of these invasive species may occur at any time within the Coachella Valley.

Aedes aegypti mosquitoes were detected in the Coachella Valley in May 2016. Since that time, the District staff have determined that BG traps are the most effective for collecting adequate numbers, examined pesticide efficacy, reviewed physical control strategies, and honed communication methods to best meet the needs of a variety of community groups. This work has led to the selection of appropriate surveillance, control, and outreach strategies outlined in this management and response plan.

In an effort to protect residents and visitors from invasive mosquito species and the viruses they transmit, the District plans to exercise its full abatement powers and exemptions for vector control as specified in the "**The Cooperative Agreement between the California Department of Public Health and Local Vector Control Agencies.**"

https://www.cdpr.ca.gov/docs/enforce/mous/dhs_cac.pdf

The District prioritizes active virus transmission and public health risks. Depending on the needs in other vector programs, work to manage invasive mosquitoes not actively transmitting arboviruses may be considered as a lower priority than the management of

mosquitoes, invasive or native, actively transmitting arboviruses. Please review the [District's Mosquito-Borne Surveillance and Emergency Response Plan](#) for additional information on the surveillance and response for West Nile virus, St. Louis encephalitis virus, and western equine encephalomyelitis virus and the mosquitoes that vector these viruses.

III. ANNUAL TRAINING

In March of each year, the Vector Ecologist will coordinate mosquito species training with all Surveillance and Quality Control department staff. The training will include information on all known invasive mosquito species currently established or likely to establish in California. Upon completion of training staff should be able to:

1. Identify all life stages of invasive mosquito species.
2. Have knowledge of the biology and ecology of the invasive mosquito species.
3. Be current on the latest surveillance and control methods being used for invasive mosquitoes in California.

An annual training for Operations and Public Outreach Departments will be coordinated by the leaders of those departments with the Surveillance and Quality Control department. The training should include:

1. Biology and ecology of invasive mosquito species in California.
2. Current surveillance and control methods used against relevant invasive mosquito species and the current distribution of invasive *Aedes* species in California.
3. Service Request procedures when responding to a potential report of an invasive mosquito species.

IV. NOVEL INVASIVE MOSQUITO RESPONSE PLAN

The District has a long history of effectively controlling vectors and minimizing vector-borne disease. However, new and emerging vectors and vector-borne diseases pose greater challenges, and there is little likelihood of eradicating them with current techniques. To maintain its ability to proactively respond to vectors and vector-borne diseases, the District prioritizes and tracks global emerging vector-borne disease threats most likely to arrive in the Coachella Valley.

The Laboratory Manager reviews the potential for vector-borne disease transmission in the Coachella Valley; this review is shared with the District Board of Trustees and District leadership by February annually. By March, the Vector Ecologist will review and update the invasive mosquito surveillance plan as needed. Information is gathered through scientific literature; statewide and neighboring agency communications; and reports made at local and national meetings.

The Vector Ecologist will confirm the first detection of an invasive mosquito species in a new city or un-incorporated community. Then the Vector Ecologist will call for a special meeting immediately with the General Manager, Department Managers, and Field Supervisors. At this meeting, an initial assessment will be made and a post-detection response plan initiated. The Laboratory Manager will notify CDPH Vector-Borne Disease Section Biologists at the Ontario Field office.

V. INVASIVE *Aedes aegypti* MANAGEMENT PROGRAM

In the absence of evidence of the presence of arboviruses primarily transmitted by *Aedes aegypti* (such as chikungunya, dengue, yellow fever, and Zika), the following discusses the normal level response to the presence of *Aedes aegypti*.

1. Surveillance Response

BG traps are set one night per week at pre-defined trap locations throughout the season to monitor the detection area. When evaluations of control efforts are being considered, at least 8 BG traps per treatment plot will be set weekly at temporary locations.

Female mosquitoes are pooled together by city by week and sent monthly to the Davis Arbovirus Research and Testing (DART) facility from June to December for virus testing of chikungunya, dengue, and Zika viruses. A report of trap count results is sent to the District staff by the end of the next business day.

2. Operations Response

Service Requests

Each zone Vector Control Technician (VCT) will be responsible for responding to service requests in their zone. If the presence of mosquitoes is confirmed at the residence of the requestor, the Technician will inspect the property. During the property inspection, the VCT will focus on educating the resident in ways to prevent mosquito breeding on their property as well as performing both physical and chemical control (larval and adult) as necessary based on the results of the inspection.

If the service request load becomes too great due to service request volume or response to other arbovirus threats that impede the ability to respond to Invasive *Aedes* service, the VCT will request assistance from their supervisor.

***Aedes* Area of Interest**

When the VCT requests assistance from their supervisor (as outlined above), additional Operations employees will be sent to the area to assist. The focus of the *Aedes* area of interest may be initiated when one of three thresholds has been reached:

- VCT “first responders” to a neighborhood if a human or positive mosquito sample for invasive *Aedes* vectored disease is reported to the District (see section VI below).
- Supplement the surveillance and control efforts of Zone VCTs in areas that are experiencing above-average Service Requests, adult *Aedes aegypti* trap counts, or high concentration of positive larval lab samples.
- Initiate [abatement powers](#) for repeat offender properties.

Seasonal Area-Wide Applications

Annual planning for seasonal area-wide applications is performed during the winter planning period in conjunction with the District’s operations budget development.

When determining an area for area-wide applications for the coming season, the District’s IVM team analyzes monthly historical *Aedes aegypti* population data by city or unincorporated county area to forecast peak mosquito activity for the coming season. Then using GIS software, District staff define areas within cities or unincorporated areas with the highest *Aedes aegypti* activity by examining and visualizing service requests, larval samples, and invasive *Aedes* trap count data. Based on this data analysis, specific sites within the District are prioritized and targeted for area-wide application to drive down the forecasted peak in the coming season.

Once sites are determined and the budget for the coming fiscal year is approved by the Board of Trustees, the IVM team begins planning for the area-wide application to determine the most appropriate means of public outreach to the affected local government entities and residents of the area-wide application area as well as to finalize the means of application and method of efficacy assessment.

3. Outreach Response

Outreach will lead general awareness outreach initiatives regarding invasive *Aedes* mosquitoes, as follows:

- a. Provide invasive *Aedes* outreach materials to cities for distribution in city offices, newsletters, websites, and social media.
- b. Distribute invasive *Aedes* awareness materials at public events such as community, city, and school presentations, fairs, other community

- engagements, and one-on-one meetings with city, county, state, and federal officials.
- c. Include invasive *Aedes* as a topic in standard presentations and other outreach efforts.
 - d. Deliver *Aedes* detection programs designed for students in targeted elementary, middle, and high schools to teach students about invasive *Aedes*.
 - e. Provide Vector Control Technicians with informational materials to distribute during Service Requests with residents.
 - f. Post informational materials on District website page (www.cvmosquito.org) promoting awareness of invasive *Aedes* risk and prevention.
 - g. Promote awareness of invasive *Aedes* through social media channels.
 - h. Provide media with interviews and informational materials on the threat of invasive *Aedes*.

VI. RESPONSE TO AN ARBOVIRUS VECTORED BY *Aedes aegypti*

1. Initial Communication Plan

- a. Arbovirus reported in a person or *Aedes aegypti*
- b. Riverside County Department of Public Health or California Department of Public Health notifies Laboratory Manager of a suspected, probable, or confirmed case of invasive *Aedes*-vectored disease case in a person; or the Laboratory Manager or Vector Ecologist is notified by DART of a virus-positive sample of *Aedes aegypti*.
- c. The Laboratory Manager calls an Action Plan meeting of the General Manager, Operations Manager, Field Supervisor in charge of *Aedes* field response, IT Manager, Vector Ecologist, and Public Information Manager. The objective of the meeting will be to discuss the District's response to the specific detection. Due to the distribution of *Aedes aegypti* within the Coachella Valley, the District considers that any case of an invasive *Aedes*-vectored disease case may lead to local transmission. All cases are treated as if *Aedes* mosquitoes may be in the vicinity.
- d. Upon conclusion of the meeting, State and County Public Health officials and neighboring vector control agencies will be notified by the General Manager or designee of the District's planned response.
- e. The District will work collaboratively with the Riverside County Public Health Department and CDPH to issue a joint media release to raise awareness of an increased threat potential while acknowledging that no locally-acquired case has yet been confirmed.

2. Surveillance Response

- a. For human cases, the Vector Ecologist or a Biologist along with a Lead Technician or Field Supervisor will inspect the residence as well as any additionally named addresses to determine the presence of *Aedes* mosquitoes.
- b. For both human cases and the presence of virus-positive mosquitoes, Laboratory Department staff will conduct enhanced adult surveillance with BG traps distributed within a 450-foot radius around the address. Traps in an area will be monitored for 45 days following the final detection of a disease agent in a person or a mosquito sample.
- c. Any adult female *Aedes aegypti* mosquitoes will be sent to DART for arboviral testing.
- d. Inspections conducted by Laboratory staff where *Aedes* mosquitoes are found will be reported to Operations to coordinate treatment and follow-up inspection.

3. Operations Response:

- a. Door-to-door inspection notifications will commence within 48 hours of the District's Action Plan Meeting.
- b. Operations Department will post signage in the area indicating that a mosquito virus is in the area. Signs will be posted in areas where deemed necessary in order for residents to see the information.
- c. After notification of residential and business properties within the buffered area, Operations staff initiates larval mosquito surveillance throughout a 450-foot radius around the suspect-case residence or initial positive trap and monitored for 45 days. Control strategies will be implemented when appropriate conditions for mosquito development or resting are detected.
- d. Samples of mosquitoes should be collected and submitted to Laboratory staff for identification.
- e. If invasive *Aedes* are discovered, Operations staff will conduct mandatory door-to-door inspections of each property extending 450-foot radius area from the positive property following post-detection Invasive *Aedes* control protocol.
- f. If Operations staff is not able to access a property under mandatory door-to-door inspections because the resident is absent or refuses, Operations staff will

- i. Post the [Area Warrant](#) which will allow access after 24 hours from the date and time of posting.
- ii. Notify the appropriate law enforcement about the need for coordination.
- iii. Return 24 hours from posting of the [Area Warrant](#) on the property and attempt to contact the resident. If the resident is unwilling or unable to cooperate, the Operations staff may execute the Warrant to Inspect and Abate and follow the protocols described in said Warrant.

4. Public Outreach Response

- a. The Public Information Manager contacts the city manager and county supervisor's office in affected city, cities, or unincorporated areas to inform them that an invasive Aedes-transmitted virus has been detected and a door-to-door inspection operation will begin. The Public Information staff proceeds with stakeholder notification.
- b. The Public Information Department will use the most appropriate channels below to reach the affected neighborhood regarding the door-to-door campaign:
 - i. Door Hangers
 - ii. Geo-targeted digital messaging
 - iii. Townhall, community, city, and school meetings
 - iv. Fairs and other community engagements
 - v. One-on-one meetings with city, county, state, and federal officials
 - vi. Media interviews
 - vii. Neighborhood listservs
 - viii. Homeowner Associations (HOA) outreach email, postcards, or printed postings

5. Using Area-wide Applications as a Response

- a. No later than the third day following notification of a positive case, human or mosquito, the Laboratory Manager calls a meeting to include General Manager, IT Manager, Operations Manager, Field Supervisor(s) overseeing response, Public Information Manager, and the Vector Ecologist. At the meeting, the results of trap collections and inspections will be discussed.
- b. Aerial applications of larvicide will be made if traps in the affected neighborhood capture an average of more than 10 female Aedes mosquitoes per trap per night or if 40% of the properties inspected are found to have

more than 10 larval Aedes mosquitoes. Applications will cover a 1-mile square surrounding the index case.

- c. Truck-mounted or aerial larvicide applications may be made if more than 5 female Aedes mosquitoes per trap per night are captured or if 20% of the properties inspected are found to have more than 10 larval Aedes mosquitoes.
- d. Neighborhoods outside of a 1-mile radius of the human case will be evaluated. If more than 10 female Aedes mosquitoes per night are captured on a 2-week cycle, those neighborhoods may be scheduled for larvicide applications to reduce the risk of virus transmission.
- e. Once the determination that area-wide application is necessary:
 - i. The Laboratory Manager will direct staff to evaluate the efficacy of the application through trapping.
 - ii. The Operations Manager will direct staff to continue inspections and treat the properties where immediate control of mosquitoes is needed.
 - iii. The Operations Manager will notify the Riverside County Agricultural Commissioner, law enforcement, and, if needed, the Federal Aviation Administration of area-wide applications.
 - iv. The Public Outreach Department will update the District stakeholders.