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## Mosquito-Borne Arbovirus Response Plan

August 2016

### 1. Overview

The purpose of this document is to serve as a guide for the Alameda County Mosquito Abatement District (the District) in responding to the detection of birds and native mosquitoes that are infected with arboviruses (e.g. West Nile virus (WNV), Saint Louis encephalitis virus (SLE), or western equine encephalitis virus (WEE)). This document describes an enhanced surveillance and response plan for Alameda County, excluding the City of Albany, that is based upon assessing the risk of native mosquitoes transmitting WNV, SLE, or WEE to people. Several species of native mosquito are known to transmit WNV, SLE, and WEE, including: *Culex pipiens* (northern house mosquito), *Culex tarsalis* (western encephalitis mosquito), and *Culex erythrothorax* (tule mosquito). Because the breeding, dispersion, and control of mosquitoes native to Alameda County differ substantially from that of invasive mosquito species, a distinct response plan is needed for native mosquitoes that transmit arboviruses to people. The Mosquito-Borne Arbovirus Response Plan described herein was developed using the California Mosquito-Borne Virus Surveillance & Response Plan (revision published April 2015) that was prepared by the California Department of Public Health (CDPH), the Mosquito & Vector Control Association of California and the University of California (available via [www.cdph.ca.gov/programs/vbds](http://www.cdph.ca.gov/programs/vbds)), and knowledge of the environmental factors that drive mosquito abundance in Alameda County. A supplementary Invasive Aedes Mosquito Response Plan is described elsewhere.

### 2. Annual Training

Training should focus on all known mosquito species present in the County.

Upon completion of training, Operations and Lab Staff should be able to:

- Identify all life stages of native mosquito species.
- Have knowledge of the biology and ecology of the native mosquito species.
- Be current on latest surveillance and control methods used for native mosquitoes in California.

### 3. Mosquito Control.

Operations Staff inspect potential mosquito breeding sites and when appropriate, employ physical control (e.g. environmental management practices), biological control (e.g. mosquito fish), or chemical control (e.g. pesticides) to reduce the abundance of adult mosquitoes. Office or Lab Staff that hold current Vector Control Technician certifications issued by CDPH (Category A and B) may participate in mosquito control activities, when needed.

#### **4. Pre-Detection of Arboviruses in Native Mosquitoes and Birds Response Plan**

- A. **Mosquito Surveillance.** Dry ice-baited EVS traps ( $\text{CO}_2$  attractant) New Jersey Light Traps are placed throughout the County to monitor native mosquito abundance. Mosquito species that are collected in EVS traps which have the potential to transmit WNV, SLE, or WEE are typically tested in the District Lab for the presence of these viruses using reverse transcription quantitative polymerase chain reaction (RT-QPCR). Alternatively, mosquitoes may be sent to the Davis Arbovirus Research and Training (DART) Lab for testing. The results of the arbovirus tests are reported to CDPH.
- B. **Bird Surveillance.** Dead birds reported by County residents to CDPH are evaluated to determine suitability for arbovirus testing. Suitable dead birds are retrieved by District Staff and brought to the District Lab for arbovirus testing. Initially, a rapid analyte measurement platform test (*i.e.* RAMP test, an immunoassay) is typically employed to screen corvid birds for WNV infection. If the dead bird is found to contain WNV, it may be tested again using RT-QPCR to confirm the RAMP test, and to determine if the bird was also infected with SLE and WEE. If the dead bird is not a corvid, RT-QPCR will be used in place of the RAMP for arbovirus testing. Specimens collected from dead birds may be sent to the DART Lab for arbovirus testing. The results of the arbovirus tests are reported to CDPH.
- C. **Service Requests.** If a service request made by a County resident indicates biting mosquitoes, District Staff may inspect the site for mosquitoes, collect specimens to determine mosquito abundance and the species present, and employ control measures to reduce mosquito breeding at the site (Section 3).
- D. **Public Outreach.** The goal is to educate the community on the mosquitoes that can transmit WNV, SLE and WEE to humans. The focus is on prevention and detection by encouraging residents to eliminate or reduce potential mosquito breeding sources, and to report dead birds to CDPH ([http://westnile.ca.gov/report\\_wnv.php](http://westnile.ca.gov/report_wnv.php)).

#### **5. Post-Detection of Arboviruses in Native Mosquitoes and Birds Response Plan**

- A. **Confirmed Arbovirus in Dead Birds.** When testing of dead birds show them to contain WNV, SLE, or WEE, additional District Staff are deployed to place EVS traps around the site where the dead bird was collected, inspect the surrounding area for known and cryptic mosquito breeding sites, and employ physical, biological, or chemical control practices to reduce adult mosquito abundance (Section 3). Mosquitoes that are collected in the CDC EVS traps are tested in the District Lab for the presence of WNV, SLE, and WEE. If unusually high numbers of arbovirus-infected birds are found in a region or after the first detection of a WNV-infected bird in the County for the year, a press release may be made to advise persons in that area of increased risk for exposure to mosquito-borne arboviruses.
- B. **Confirmed Arbovirus in Mosquitoes.** When testing of mosquitoes collected in CDC EVS traps show them to contain arbovirus, additional CDC EVS traps are placed around the area where the infected mosquitoes were collected. Additional inspections may be conducted. Physical, biological, or chemical control measures may be employed at mosquito breeding sites to reduce adult mosquito abundance. If unusually high numbers of arbovirus-infected mosquitoes are found in a region or after the first detection of a WNV-infected mosquito the County for the year, a press release may be made to advise persons in that area of increased risk for exposure to mosquito-borne arboviruses. Lab Staff will generate maps that indicate the location of WNV-positive birds and mosquitoes.
- C. **Human Case.** When local public health agencies notify ACMAD of a suspected or confirmed case of WNV disease in humans, Lab Staff may place mosquito traps near to where the case resided and test the mosquitoes for the presence of WNV to determine if transmission of WNV is occurring between mosquitoes and birds in that area.