

Integrated Mosquito and Vector
Management Program Plan

APPENDIX

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INVASIVE AEDES MOSQUITO
RESPONSE PROTOCOL

Invasive Aedes Mosquito

Response Protocol

2016



**San Mateo County
Mosquito and Vector
Control District**
1351 Rollins Rd.
Burlingame CA 94010
(650) 344-8592
www.smcmvcd.org

No Ongoing Invasive *Aedes* Detections

1. Laboratory staff conducts routine surveillance for invasive *Aedes* April 1st through October 31st
 - a. 4 ovicups placed at each of 8 cemeteries throughout San Mateo County, monitored weekly
 - b. 4 ovicups placed at each of 4 plant nurseries throughout San Mateo County, monitored weekly
2. When responding to service request that suggest the presence of day-biting mosquitoes, operations staff will place a CO2 trap in the vicinity of the residence
3. Operations staff collects larval samples for identification from areas of past, potential, or suspected invasive *Aedes* infestation
4. Public Health Education and Outreach Officer conducts ongoing invasive *Aedes* prevention and reporting outreach
 - a. Invasive *Aedes* outreach material provided to cities for distribution
 - b. District website page (www.smcmvcd.org/invasive) promoting awareness of invasive *Aedes* risk
 - c. Social media messaging promoting awareness of invasive *Aedes* risk, including reporting of day-biting mosquitoes
 - d. Invasive *Aedes* awareness materials distributed at public events
 - e. Invasive *Aedes* included as a topic in standard presentations and other outreach efforts
5. Laboratory staff identifies any invasive *Aedes* larval specimens collected during routine larval mosquito surveillance, reporting any invasive *Aedes* detections to District Manager
6. Any invasive *Aedes* detected trigger initiation of the New Invasive *Aedes* Detection protocol

New Invasive *Aedes* Detection

1. Laboratory staff identifies suspected invasive *Aedes* specimens
2. Laboratory Director enters invasive *Aedes* detection into CalSurv
3. Laboratory Director contacts California Department of Public Health to report suspected invasive *Aedes* detection and sends specimens for confirmation
4. Internal Notification begins
 - a. Laboratory Director notifies District Manager of invasive *Aedes* detection
 - b. District Manager notifies department managers
 - c. Department managers notify their staff
 - d. District Manager notifies all members of Board of Trustees
5. Assistant Manager and/or Laboratory Director designates a detection area consisting of a 150-meter (0.2-mile) radius around the point of each new detection
6. Assistant Manager and/or Laboratory Director creates map of detection area
7. Public Health Education and Outreach Officer creates interactive map of detection area ([see Creating a Google MyMap for instructions](#))
8. External Notification
 - a. Assistant Manager notifies City Manager or alternate contact of affected city
 - b. Laboratory Director notifies CDPH, SMCHealth, and neighboring vector control agencies
9. Public Notification begins
 - a. Public Health Education and Outreach Officer drafts media release
 - b. Public Health Education and Outreach Officer uploads the media release to the District website
 - c. Public Health Education and Outreach Officer updates the invasive *Aedes* page on the District website
 - d. Public Health Education and Outreach Officer updates the District website's front page carousel with invasive *Aedes* content
 - e. Public Health Education and Outreach Officer sends the release to staff, media, legislators, and other contacts.
 - f. Public Health Education and Outreach Officer sends release via MailChimp email blast to media releases subscribers
 - g. Public Health Education and Outreach Officer posts on Nextdoor.com in all neighborhoods of affected city
 - h. Public Health Education and Outreach Officer posts on Facebook and Twitter via Hootsuite
10. Laboratory staff initiates enhanced adult and larval mosquito surveillance within the detection area
 - a. 30 AGO traps distributed throughout the detection area(s) monitored weekly
 - b. 5 BG traps distributed throughout the detection area(s) deployed for 48 hours weekly for 4 weeks
 - c. 50 ovicups distributed throughout the detection area(s) monitored weekly
 - d. 5 AGO traps distributed throughout the detection area(s) monitored weekly
 - e. 2 Faye traps distributed throughout the detection area(s) monitored weekly for 4 weeks
 - f. 30 EVS traps distributed throughout the detection area(s) monitored daily for 4 weeks
11. Operations staff will inspect all cemeteries within 0.5 mile of new invasive *Aedes* detection site(s).
12. Laboratory staff sends adult invasive *Aedes* samples to the DART laboratory at UC Davis for arboviral testing as resources permit
13. Adult invasive *Aedes* specimens are sent to Cornell University for genetic testing

14. Operations staff inspects each property within the detection area
 - a. Assistant Manager and/or Field Operations Supervisor contacts city manager or alternate contact in affected city or cities prior to inspections
 - b. Assistant Manager and/or Field Operations Supervisor contacts police department in affected city or cities prior to inspections
 - c. Public Health Education and Outreach Officer announces inspection area on Nextdoor.com 24-48 hours prior to inspection
 - d. Assistant Manager and/or Field Operations Supervisor divides the detection area into sections to facilitate inspection
 - e. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff notify each property within the detection area by door hanger that an they will return to conduct an inspection within 24-48 hours
 - f. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff inspect each property in the detection area
 - g. Inspection teams leave a door hanger indicating inspection results at each property
15. Each property treated in the course of inspection is listed as a mosquito site
16. Properties listed as mosquito sources are inspected every 6-12 weeks, depending on season and treatment, until the potential mosquito breeding issue is permanently resolved
17. Laboratory identifies egg, larval, and adult specimens collected during inspections and surveillance, reporting any invasive *Aedes* detections to District Manager
 - a. Egg specimens will be hatched in District laboratory
 - b. Egg specimens that fail to hatch will be sent to DART laboratory for genetic testing
 - c. Larvae and pupae will be identified in in District laboratory
 - d. Adult specimens will be identified in District laboratory
 - e. Laboratory staff preserves adult and larval samples for reference collection (if sufficient specimens area available)
 - f. Laboratory tests field-collected specimens for susceptibility to EPA-registered pesticides (if sufficient specimens are available)
18. Operations staff conducts immature and adult mosquito control using EPA-registered products and methods based on data from enhanced surveillance activities that provide reliable information on presence, relative abundance, and distribution within the urban environment.
 - a. Physical control: disposing of and dumping containers, drilling holes in anything that holds water with resident approval and increasing water flow to any potential breeding habitat
 - b. Hand larviciding: applying larvicides to any standing water or potential breeding site. These would include Bti, Spinosad and methoprene
 - c. Hand adulticiding: Pyrethrin/pyrethroids would be applied in localized areas if infestation was considered very small. Compliance with all residents to access properties would be crucial. (Malathion would be considered if resistance is identified)
 - d. Barrier treatments: residual pyrethrin/pyrethroids applied to residential vegetation
 - e. Truck-mounted adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified (Malathion would be considered if resistance is identified)
 - f. Aerial adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified and using aircraft was more cost-effective. (Malathion would be considered if resistance is identified)
 - g. Sterile male and male disseminated methods:
 - h. Experimental methods

Ongoing Invasive *Aedes* Detection

1. Laboratory identifies any invasive *Aedes* larval or adult specimens collected during inspections, reporting any invasive *Aedes* detections to District Manager
2. Laboratory staff conducts ongoing adult and larval mosquito surveillance within the detection area and reports any invasive *Aedes* detections to District Manager
 - a. Summer ongoing invasive *Aedes* surveillance April 1st through October 31st
 - i. 30 AGO traps distributed throughout the detection area(s) monitored weekly
 - ii. 4 BG traps distributed throughout the detection area(s) deployed for 48 hours weekly
 - iii. 65 ovicups distributed throughout the detection area(s) monitored weekly
 - b. Winter (November 1st through March 31st) ongoing invasive *Aedes* surveillance
 - i. 11 ovicups distributed throughout the detection area(s) monitored weekly
 - ii. 5 AGO traps distributed throughout the detection area(s) monitored weekly
3. Adult invasive *Aedes* specimens are sent to Cornell University for genetic testing
4. Assistant Manager maintains updated detection area map, increasing detection area as necessary
5. Public Health Education and Outreach Officer maintains interactive map of detection area ([see Creating a Google MyMap for instructions](#))
6. Assistant Manager maintains contact with City Manager or alternate contact of affected city or cities
7. Operations staff inspects each property within the detection area
 - a. Assistant Manager and/or Field Operations Supervisor contacts city manager or alternate contact in affected city or cities prior to inspections
 - b. Assistant Manager and/or Field Operations Supervisor contacts police department in affected city or cities prior to inspections
 - c. Public Health Education and Outreach Officer announces inspection area on Nextdoor.com 24-48 hours prior to inspection
 - d. Assistant Manager and/or Field Operations Supervisor divides the detection area into sections to facilitate inspection
 - e. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff notify each property within the detection area by door hanger that they will return to conduct an inspection within 24-48 hours
 - f. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff inspect each property in the detection area
 - g. Inspection teams leave a door hanger indicating inspection results at each property
8. Each property treated in the course of inspection is listed as a mosquito site
9. Properties listed as mosquito sources are inspected every 6-12 weeks, depending on season and treatment, until the potential mosquito breeding issue is permanently resolved
10. Operations staff conducts immature and adult mosquito control using EPA-registered products and methods based on data from enhanced surveillance activities that provide reliable information on presence, relative abundance, and distribution within the urban environment.
 - a. Physical control: disposing of and dumping containers, drilling holes in anything that holds water with resident approval and increasing water flow to any potential breeding habitat
 - b. Hand larviciding: applying larvicides to any standing water or potential breeding site. These would include Bti, Spinosad and methoprene

- c. Hand adulticiding: Pyrethrin/pyrethroids would be applied in localized areas if infestation was considered very small. Compliance with all residents to access properties would be crucial. (Malathion would be considered if resistance is identified)
 - d. Barrier treatments: residual pyrethrin/pyrethroids applied to residential vegetation
 - e. Truck-mounted adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified (Malathion would be considered if resistance is identified)
 - f. Aerial adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified and using aircraft was more cost-effective. (Malathion would be considered if resistance is identified)
 - g. Sterile male and male disseminated methods:
 - h. Experimental methods
11. Operations staff treats all cemeteries within the detection area monthly
12. Public Health Education and Outreach Officer conducts targeted invasive *Aedes* awareness outreach in affected city
- a. Information on new invasive *Aedes* detection provided to affected city or cities for distribution
 - b. Additional social media outreach to affected city or cities containing messages on container removal, other source reduction, personal protection, and general invasive *Aedes* awareness
 - c. If resources permit, District staff attend additional events in affected cities
 - d. If requested, District staff speak to city council of affected city or cities

Established Invasive *Aedes* Populations

1. District staff conducts seasonal assessments to identify areas with high invasive *Aedes* population levels or high levels of human biting nuisance reports
2. Laboratory staff establishes permanent trap sites to monitor invasive *Aedes* population levels throughout the service area
3. Laboratory staff establishes invasive *Aedes* colony within District laboratory with permit from California Department of Public Health
4. Laboratory tests field-collected and colony-reared specimens for susceptibility to EPA-registered pesticides (if sufficient specimens are available)
5. Assistant Manager maintains updated detection area map, increasing detection area as necessary
6. Public Health Education and Outreach Officer maintains interactive map of detection area ([see Creating a Google MyMap for instructions](#))
7. Assistant Manager maintains contact with City Manager or alternate contact of affected city or cities
8. Public Health Education and Outreach Officer conducts targeted invasive *Aedes* reduction outreach in affected city
 - a. Information on new invasive *Aedes* detection provided to affected city or cities for distribution
 - b. Additional social media outreach to affected city or cities containing messages on container removal, other source reduction, personal protection, and general invasive *Aedes* awareness;
 - c. If resources permit, District staff attend additional events in affected cities
9. Operations staff conducts routine inspections as a result of service requests
10. Operations staff initiates immature and adult mosquito control using EPA-registered products and methods based on data from enhanced surveillance activities that provide reliable information on presence, relative abundance, and distribution within the urban environment.
 - a. Physical control: disposing of and dumping containers, drilling holes in anything that holds water with resident approval and increasing water flow to any potential breeding habitat
 - b. Hand larviciding: applying larvicides to any standing water or potential breeding site. These would include Bti, Spinosad and methoprene
 - c. Hand adulticiding: Pyrethrin/pyrethroids would be applied in localized areas if infestation was considered very small. Compliance with all residents to access properties would be crucial. (Malathion would be considered if resistance is identified)
 - d. Barrier treatments: residual pyrethrin/pyrethroids applied to residential vegetation
 - e. Truck-mounted adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified (Malathion would be considered if resistance is identified)
 - f. Aerial adulticiding: Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified and using aircraft was more cost-effective. (Malathion would be considered if resistance is identified)
 - g. Sterile male and male disseminated methods:
 - h. Experimental methods
11. Laboratory identifies any invasive *Aedes* larval or adult specimens collected by operations staff
12. Laboratory staff conducts ongoing adult and larval mosquito surveillance throughout the service area
13. Each property treated in the course of inspection is listed as a mosquito site

Confirmed Case of Travel-Acquired Invasive *Aedes*-Vectored Disease

1. San Mateo County Health Department or California Department of Public Health notifies Laboratory Director of confirmed travel-acquired invasive *Aedes*-vectored disease case
2. Laboratory Director notifies District Manager
3. Laboratory staff initiates enhanced adult and larval mosquito surveillance
 - i. 10 ovicups distributed throughout a 200-meter radius around the residence of the patient, monitored weekly for 4 weeks
 - j. 3 AGO traps distributed throughout a 200-meter radius around the residence of the patient, monitored weekly for 4 weeks
 - k. 3 BG traps distributed throughout a 200-meter radius around the residence of the patient, deployed for 48 hours weekly for two consecutive weeks at
4. Laboratory staff identifies any invasive *Aedes* larval specimens collected during enhanced larval mosquito surveillance, reporting any invasive *Aedes* detections to District Manager
5. Laboratory staff sends adult invasive *Aedes* samples to the DART laboratory at UC Davis for arboviral testing
6. If residence of patient is located within existing invasive *Aedes* detection area, operations staff inspects each property within the detection area
 - a. Assistant Manager and/or Field Operations Supervisor contacts city manager or alternate contact in affected city or cities prior to inspections
 - b. Assistant Manager and/or Field Operations Supervisor contacts police department in affected city or cities prior to inspections
 - c. Public Health Education and Outreach Officer announces inspection area on Nextdoor.com 24-48 hours prior to inspection
 - d. Assistant Manager and/or Field Operations Supervisor divides the detection area into sections to facilitate inspection
 - e. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff notify each property within the detection area by door hanger that an they will return to conduct an inspection within 24-48 hours
 - f. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff inspect each property in the detection area
 - g. Inspection teams leave a door hanger indicating inspection results at each property
7. Any invasive *Aedes* detected trigger initiation of the New Invasive *Aedes* Detection protocol

Confirmed Case of Locally-Acquired Invasive *Aedes*-Vectored Disease

1. San Mateo County Health Department or California Department of Public Health notifies Laboratory Director of confirmed locally-acquired invasive *Aedes*-vectored disease case
2. Laboratory Director notifies District Manager
3. District Manager notifies department managers
4. Department managers notify their staff
5. District Manager notifies all members of Board of Trustees
6. Assistant Manager notifies City Manager or alternate contact of affected city
7. Laboratory Director notifies neighboring vector control agencies
8. Assistant Manager and/or Laboratory Director designates a surveillance area consisting of a 200-meter radius around the residence of the patient and any suspected exposure sites
9. Assistant Manager and/or Laboratory Director creates map of surveillance area(s)
10. Public Health Education and Outreach Officer creates interactive map of surveillance area(s) ([see Creating a Google MyMap for instructions](#))
11. Laboratory staff initiates enhanced adult and larval mosquito surveillance
 - l. 50 ovicups distributed throughout a 200-meter radius around the residence of the patient and any suspected exposure sites, monitored weekly for 4 weeks
 - m. 20 AGO traps distributed throughout a 200-meter radius around the residence of the patient and any suspected exposure sites, monitored weekly for 4 weeks
 - n. 3 BG traps distributed throughout a 200-meter radius around the residence of the patient and any suspected exposure sites, deployed for 48 hours weekly for two consecutive weeks
12. Laboratory staff identifies any invasive *Aedes* larval specimens collected during enhanced larval mosquito surveillance, reporting any invasive *Aedes* detections to District Manager
13. Laboratory staff sends adult invasive *Aedes* samples to the DART laboratory at UC Davis for arboviral testing
14. Operations staff inspects each property within 200 meters of residence of patient and any suspected exposure sites
 - a. Assistant Manager and/or Field Operations Supervisor contacts city manager or alternate contact in affected city or cities prior to inspections
 - b. Assistant Manager and/or Field Operations Supervisor contacts police department in affected city or cities prior to inspections
 - c. Public Health Education and Outreach Officer announces inspection area on Nextdoor.com 24-48 hours prior to inspection
 - d. Assistant Manager and/or Field Operations Supervisor divides the detection area into sections to facilitate inspection
 - e. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff notify each property within the detection area by door hanger that they will return to conduct an inspection within 24-48 hours
 - f. Inspection teams made up of Vector Control Technicians, Vector Control Aides (if available), and other available staff inspect each property in the detection area
 - g. Inspection teams leave a door hanger indicating inspection results at each property
15. Each property treated in the course of inspection is listed as a mosquito site
16. Properties listed as mosquito sources are inspected every 6-12 weeks, depending on season and treatment, until the potential mosquito breeding issue is permanently resolved
17. Laboratory identifies egg, larval, and adult specimens collected during inspections and surveillance, reporting any invasive *Aedes* detections to District Manager

- a. Egg specimens will be hatched in District laboratory
 - b. Egg specimens that fail to hatch will be sent to DART laboratory for genetic testing
 - c. Larvae and pupae will be identified in District laboratory
 - d. Adult specimens will be identified in District laboratory
 - e. Laboratory staff preserves adult and larval samples for reference collection (if sufficient specimens area available)
 - f. Laboratory tests field-collected specimens for susceptibility to EPA-registered pesticides (if sufficient specimens are available)
18. Operations staff conducts immature and adult mosquito control using EPA-registered products and methods based on data from enhanced surveillance activities that provide reliable information on presence, relative abundance, and distribution within the urban environment.
- a. Physical control- disposing of and dumping containers, drilling holes in anything that holds water with resident approval and increasing water flow to any potential breeding habitat
 - b. Hand larviciding- applying larvicides to any standing water or potential breeding site. These would include Bti, Spinosad and methoprene
 - c. Hand adulticiding -Pyrethrin/pyrethroids would be applied in localized areas if infestation was considered very small. Compliance with all residents to access properties would be crucial. (Malathion would be considered if resistance is identified)
 - d. Barrier treatments-
 - e. Truck-mounted adulticiding- Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified (Malathion would be considered if resistance is identified)
 - f. Aerial adulticiding- Pyrethrin/pyrethroids would be applied within the affected area in the event a large population was identified and using aircraft was more cost-effective. (Malathion would be considered if resistance is identified)
 - g. Sterile male and male disseminated methods
 - h. Experimental methods
19. Any invasive *Aedes* detected trigger initiation of the New Invasive *Aedes* Detection Protocol
20. Public outreach
- a. Public Health Education and Outreach Officer drafts media release
 - b. Public Health Education and Outreach Officer uploads the media release to the District website
 - c. Public Health Education and Outreach Officer updates the invasive *Aedes* page on the District website
 - d. Public Health Education and Outreach Officer updates the District website's front page carousel with invasive *Aedes* content
 - e. Public Health Education and Outreach Officer sends the release to staff, media, legislators, and other contacts.
 - f. Public Health Education and Outreach Officer sends release via MailChimp email blast to media releases subscribers
 - g. Public Health Education and Outreach Officer posts on Nextdoor.com in all neighborhoods of affected city
 - h. Public Health Education and Outreach Officer posts on Facebook and Twitter via Hootsuite

- i. Information on invasive *Aedes* prevention, invasive Aedes-vectorred illnesses, prevention of additional transmission and personal protection against mosquito bites is provided to affected city or cities for distribution
- j. Additional social media outreach to affected city or cities containing messages on container removal, other source reduction, personal protection, invasive Aedes-vectorred illnesses, prevention of additional transmission, and general invasive *Aedes* awareness
- k. District staff attend additional events in affected cities
- l. District staff speak to city council of affected city or cities