MOSQUITO ABATEMENT
ST. TAMMANY PARISH

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MOSQUITO ABATEMENT

ST. TAMMANY PARISH

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1 INTRODUCTION

1.1 MISSION

Our mission is to protect the health and quality of life of the residents of St. Tammany Parish by minimizing the risk of mosquito-transmitted diseases and managing nuisance mosquitoes to a tolerable level.

1.2 ACTION

We achieve this mission by sensitively monitoring mosquito abundance or indicators of mosquito-transmitted diseases and controlling larval and adult mosquitoes with environmental modification or the selective use of public health pesticides.

1.3 PLAN PURPOSE

The objective of this plan is to define the operational strategy and tactics for controlling nuisance and vector mosquitoes in St. Tammany Parish. Though this plan defines specific thresholds and triggers for certain activity, STPMAD withholds the right to provide mosquito management outside of the parameters of this document when certain circumstances dictate.

2 INTEGRATED MOSQUITO MANAGEMENT

St. Tammany Parish Mosquito Abatement operates under the best practices guidelines of Integrated Mosquito Management (IMM), which provides a multi-modal framework for achieving nuisance reduction and mosquito-transmitted disease risk mitigation. Public education, source reduction, surveillance, and pesticide applications (biological and chemical control agents) are all critical elements of IMM which STPMAD engages in to achieve its operational mission.

2.1 ARBOVIRUS SURVEILLANCE

2.1.1 Objectives

1. Timely detection of enzootic arbovirus transmission to guide intervention efforts to prevent human arbovirus infections.
2. Monitor, record, and analyze arbovirus occurrence and intensity to increase the local arbovirus ecology knowledge-base and inform intervention efforts.
3. Monitor, record, and analyze vector mosquito population parameters to increase the local vector ecology knowledge-base and inform intervention efforts.
4. Monitor the effectiveness of vector control efforts on enzootic arbovirus transmission.

Four arboviral pathogens, *Eastern equine encephalitis virus* (EEV), *La Crosse encephalitis virus* (LEV), *St. Louis encephalitis virus* (SLEV), and *West Nile virus* (WNV), have been historically observed and occasionally result in human infections in St. Tammany Parish, LA. Some of these pathogens (EEEV, SLEV, and WNV) share certain ecological similarities such as enzootic cycling (non-human animal

transmission) primarily among avian hosts and mosquito vectors. Though similarities exist among each pathogen, the intrinsic abilities of specific hosts and vectors to transmit pathogens along with local host and vector utilization patterns likely determine the spatial and temporal occurrence of enzootic transmission.

As the majority of observed arbovirus activity in St. Tammany Parish and the United States within the past decade has been due to WNV, the St. Tammany Parish Mosquito Abatement District's (STPMAD) Arbovirus Surveillance Plan (ASP) will focus on providing advanced detection of enzootic WNV transmission as an indicator of elevated risk of human WNV infection. Recent epidemics of Chikungunya virus (CHIKV) starting in 2014 and Zika virus in 2016 in the Western Hemisphere have required an adjustment to local arbovirus surveillance. Due to the emergence of these pathogens a separate response plan has been created to monitor for these pathogens and to mitigate the local risk of these pathogens. As arboviruses evolve continuously, arbovirus prevalence may exhibit high inter-annual variability with years of no observed transmission and years of marked human epidemics. As such this surveillance plan is intended to be revised in accordance with the changing epidemiological importance of arboviral pathogens in St. Tammany Parish as necessary.

Advanced detection of enzootic cycling of arboviral pathogens, such as WNV is critical to preventing human infections. Of the four traditional surveillance methods used to detect WNV in animal populations described by the Centers for Disease Control and Prevention (2013) only diagnostic testing of mosquitoes for arboviruses provides timely and reliable results at relatively low resource costs. For these reasons the collection and subsequent testing mosquitoes for arboviruses is the primary tactic employed by STPMAD for advanced warning of elevated human WNV risk.

2.1.2 Strategy

This Arbovirus Surveillance Plan has been drafted in accordance with the best practices and strategies outlined in several documents including the CDC publication *West Nile virus in the United States: Guidelines for Surveillance, Prevention, and Control* (2013) and the Association of State and Territorial Officials (ASTHO) publication *Before The Swarm: Guidelines for the Emergency Management of Mosquito-Borne Disease Outbreaks* (2008) as well as a synthesis of peer-reviewed scientific articles. Finally, the considerable knowledge of local arbovirus and vector ecology accumulated by STPMAD employees was used to draft the most sensitive and efficient arbovirus surveillance strategy.

2.1.3 Sample Frame

All areas within the political boundaries of St. Tammany Parish will be monitored for the risk of arbovirus transmission to humans. Since St. Tammany Parish is a relatively large parish with considerable land use diversity and focally dense human populations, a systematic spatially-stratified census-weighted sample strategy will be employed. This hybrid sampling strategy allows for optimal spatial coverage of the most densely populated regions of the parish while providing limited data from less populated areas. The primary disadvantage of this sampling strategy is that it may not be representative of human arbovirus risk across all space. The strategy chosen is intended to be the most *sensitive indicator* of potential human arbovirus risk in St. Tammany Parish – not necessarily *representative* of human arbovirus risk across the parish.

2.1.4 Spatial Resolution

Ideally mosquito trapping sites should be spaced in accordance with target species' flight ranges to ensure optimal spatial data resolution. For many mosquito species optimal trapping density might be less than 1 trap/km. Since high trapping density requires significant resources for the setting, collecting and processing of specimens, trap density decisions must balance spatial resolution with available resources. The trap density of the existing STPMAD surveillance network is 1 trap/22.1 sq. km (or 1 trap/8.5 sq. mi).

2.1.5 Temporal Resolution

The frequency in which the spatial sample frame is entirely sampled determines the temporal resolution of the arbovirus surveillance data. Though arbovirus-infected mosquito data is reported weekly, often the data is not collected within the entire sample frame with such resolution. The frequency with which certain sites are trapped within the existing STPMAD surveillance varies, but each site is generally trapped once on a two-week collection period between March and November, and in warm weather from November through February (predicted to be >58°F at 4PM and >45 F° overnight low).

2.1.6 Site Selection

There are approximately 100 sites in the existing STPMAD surveillance network, consisting of 9 CDC light traps and 85 NO LIGHT CDC traps. Each of the 94 sites are sampled once every two weeks.

In addition, heightened surveillance is performed at areas that experience a high concentration of outdoor human activity including ballparks and high school stadiums and ball fields. Routine inspections occur throughout the year to assess larval and adult mosquito presence and abundance at these sites. Evening landing counts are conducted at randomly selected ball parks to assess nighttime biting mosquito populations.

2.1.7 Target Species

The primary enzootic vector of WNV in St. Tammany Parish is *Culex quinquefasciatus*; therefore the arbovirus surveillance will primarily target the collection of this species. *Culex salinarius, Cx. erraticus, Cx. nigripalpus, Aedes albopictus,* and *Ae. vexans* may also be found in St. Tammany infected with WNV and may contribute to WNV transmission.

2.1.8 Collection Methods

CO_2-Baited (dry ice) CDC Light Traps (originally described by Sudia & Chamberlain, 1962) are the primary tool used to monitor populations of many vector mosquito species from a variety of habitats. Use of a light and dry ice which sublimates into CO_2 attracts many host-seeking mosquitoes. This trapping method tends to under-represent important vector and pestiferous mosquito species including *Cx. quinquefasciatus* and *Ae. albopictus*. Additional chemical lures can be added to CDC Light Traps to improve the collection of certain mosquito species. Octenol and Human Scent lure (lactic acid) may be used on occasion, but care should be taken to standardize trap lures to ensure data comparability.

Gravid Traps (originally described by Reiter, Jakob, & Mullenix, 1986) use organically enriched water to collect gravid *Cx. quinquefasciatus* mosquitoes which seek an oviposition habitat. Since most mosquitoes collected in gravid traps have already taken a blood meal, there is a greater likelihood that these mosquitoes may be infected with WNV. By targeting previously fed *Cx. quinquefasciatus*, the gravid trap has historically been considered to be the most sensitive trapping tool for detecting WNV.

An evaluation of the efficacy of CO_2-baited (dry ice) CDC light traps with the light bulb removed (hereafter NO LIGHT CDC trap) in 2017 and 2018 revealed that the NO LIGHT CDC traps collect a greater diversity of mosquito species, a greater abundance of vector species, and no statistical difference in the infection rate among mosquitoes collected than the CDC Gravid trap. The NO LIGHT CDC traps are now our primary tool for determining the presence of WNV among vector mosquito species.

Traps that collect eggs from ovipositing mosquitoes (ovitraps) are set to monitor container-breeding species from March – November each year. Year-to-year surveillance is performed in areas containing and immediately adjacent to known *Aedes aegypti* populations. Every third year ovitrap surveillance is expanded parish-wide to better document container-breeding species distribution. Additionally, as more container-breeding species invade Southern Louisiana and virus transmission is better understood, parish-wide surveillance may be needed.

Other collection methods that may occasionally be used for the detection of arboviruses include the New Jersey Light Traps, Nest Mosquito Traps (NMT), CDC Resting Box traps, and aspirators.

2.1.9 Collection Schedule

The specimen collection schedule is primarily dependent on the diagnostic testing schedule set by the Louisiana Animal Disease Diagnostic Laboratory (LADDL). Currently LADDL requires submission of mosquito pools by Wednesday for test result reporting on the following Friday. Availability of courier service provided by the Louisiana Department of Health and Hospitals will determine whether specimens are shipped on Wednesdays or on Mondays via FedEx. Traps will be set on Mondays and Thursdays by four individuals on Mondays and three on Thursdays at eight to ten locations per person each trap day. This results in 90-108 trap periods per two-week collection period.

2.1.10 Arbovirus Diagnostic Testing

Collected mosquitoes will be identified to species, enumerated, and pooled in accordance to the Louisiana Arboviral Surveillance Sampling Standards defined by the Louisiana Arboviral Working Group Sampling Committee (2013). Mosquito pools will be submitted to LADDL based on their weekly testing schedule, which generally requires specimens to be received by Wednesday for test resulting reporting on Fridays.

2.1.11 Data Entry

Mosquito population data (species, abundance, etc.) will be entered on to a database the day after it has been identified. Mosquito pool data will be entered onto the ArboNet database system as well as an internal spreadsheet file during the week of specimen submission.

2.2 Public Education

Our employees are trained entomologists and certified pesticide applicators. We are committed to educating citizens of St. Tammany regarding the threat posed by mosquitoes, how we respond to that threat throughout the year, and what individuals can do to protect themselves.

We routinely attend local festivals in order to educate our citizens about mosquitoes. We collaborate with the St. Tammany Parish School Board to teach mosquito biology and ecology throughout the year in schools across the parish. We have presented programs to local environmental groups, hobbyist

beekeepers, libraries, and frequently give tours of our facilities to citizens of St. Tammany. We collaborate with and provide training to government and non-profit agencies. Complementary to in-person education, we also maintain an educational website and social media site. In addition, we create original pamphlets, trifolds, and brochures for public distribution.

2.3 Source Reduction

Source reduction involves the removal of a potential breeding source, most often the dumping out of water from small containers in and around the house. Field biologists evaluate water sources as potential breeding sites throughout the day, and in cases where water can be removed from the system, source reduction is our first method of mosquito abatement. This occurs routinely throughout each weekday, but is particularly important when field biologists are responding to requests for service from our citizens.

Source reduction is a vital and environmentally friendly avenue of mosquito abatement, but it cannot be performed in isolation. Containers holding water around the house often are refilled by rain and sprinklers shortly after being dumped, resupplying mosquitoes with breeding sources soon after removal. Source reduction cannot work without public education regarding sources of stagnant water (gutters, ditch water, potted plants, tarps, general yard detritus, etc) and alternative methods of control.

2.4 Insecticide Applications

Insecticide applications are divided into two categories: insecticides that target larval mosquitoes (larvicides) and insecticides that target adult mosquitoes (adulticides). Insecticide applications are a last resort, but are frequently the only actionable way of achieving mosquito abatement. As WNV transmission is a perienneal problem in St. Tammany Parish, most of STPMAD's operations described in this plan are designed to mitigate the risk of WNV transmission to humans. Operational procedures designed to mitigate the risk of other mosquito-transmitted diseases are described in detail in the Chikungunya, dengue, or Zika virus Response Plan section.

2.4.1 Larvicide Applications

2.4.1.1 Septic ditch

St. Tammany Parish contains over 400 linear miles of septic ditches in which *Cx. quinquefasciatus* females, the primary WNV vector in the Parish, preferentially choose to lay their eggs within. Field biologists and larviciders surveil known breeding sites routinely throughout the week, and treat breeding ditches with varied products and at different rates depending upon time of the year and presence of WNV.

2.4.1.1.1 Frequency of application

As temperatures increase throughout the year, *Cx. quinquefasciatus* development time decreases (**Figure 1**), population abundance increases, and risk of WNV transmission increases. In response to these changing pressures, STPMAD has developed *Cx. quinquefasciatus* larval management thresholds throughout the mosquito season.

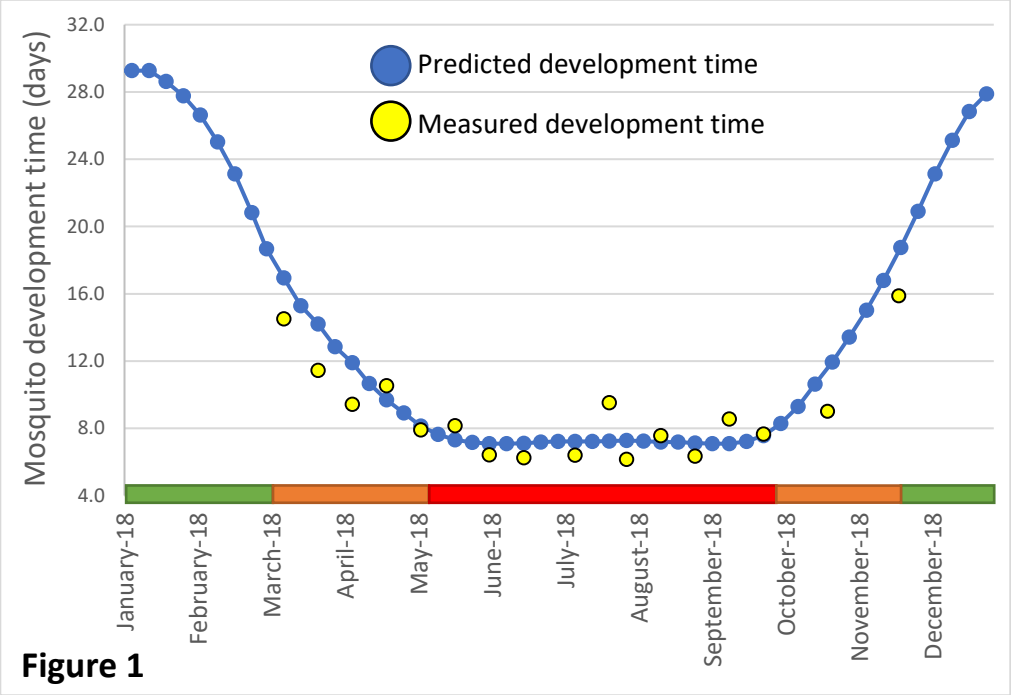

Figure 1

Tier 1 (Green) Development time > 15 days.
Justification: Low temperatures slow development, and cold weather mosquitoes (*Culex restuans, Culiseta inornata*) require infrequent control. Bti is used in cold weather months.
Duration: Approximately from Nov. 15 – Mar. 1
Tactics: Treat all ditches with Bti on an as-needed basis, or once every two weeks.
Workforce: Field biologists sufficient.

Tier 2 (Orange) Development time 8-15 days.
Justification: Rapid development and the onset of viral activity increases frequency of application.
Duration: Approximately from Mar. 1 – May 15 and Oct. 1 – Nov. 15
Tactics: Treat septic ditches with Bti at accelerated frequency, up to once per 5 days.
Workforce: Larviciders primarily treat with a 32-hour work week, supplemented by field biologists.

Tier 3 (Red) Development time ≤ 7 days, **or in response to WNV activity/holiday gaps**.
Justification: Most rapid development, highest adult abundance, and peak viral activity/onset of human cases requires highest frequency of application.
Duration: Approximately from May 15 – Oct. 1, or in response to public health emergencies.
Tactics: Treat with oil at least once every 5 days. Respond to human cases or holidays with residual septic larvicides. Larviciders treat with possible overtime.

2.4.1.2 Floodwater

Floodwater mosquitoes tend to emerge simultaneously in residential and wooded areas in response to rainfall. Floodwater mosquitoes are largely nuisance species, and are infrequently found to be important vectors of disease. The persistence and abundance of these mosquitoes can greatly impact resident's quality of life. Extended release larvicides such as Altosid briquettes (methoprene) are deployed in

ground pools. Field biologists take landing rates at known floodwater sites daily, which together with weekly trap data inform where floodwater mosquitoes may be originating from and where reapplication of larvicides may be necessary. All areas that hold water that are within a quarter mile of residence, dwelling, park or place of business are routinely assessed for the production of mosquitoes (see section 2.1.6). Standing water in ground pools is treated in February and again in the fall months if necessary. Due to high evapotranspiration rates in the spring, summer and fall these areas typically do not hold water during these seasons, but often will hold water in the winter and early spring.

2.4.1.3 Marsh

Marsh mosquitoes tend to emerge simultaneously and in large volumes on the coast in response to changes in the tide. While most marsh mosquitoes contribute to annoyance on the coast, generally these species are not important vectors of disease. Marsh inspections are performed bi-weekly by ground, truck, and airboat beginning in April and ending in October. When populations of mosquito larvae are found to be breeding, larvicides may be applied by hand, truck, airboat, or helicopter. All inspections and treatments within wildlife refuges are coordinated with the wildlife refuge manager.

2.4.1 Sewage package plants

Centralized sewage management facilities have been observed to produce large populations of mosquitoes when improperly maintained. In cooperation with Tammany Utilities, STPMAD inspects all known package plants for mosquito breeding at least twice per year, once in the spring and again in fall. When surveillance in neighboring areas indicates large populations of septic-preferring mosquitoes are present, field biologists reinspect and treat potentially breeding package plants with residual larvicides.

2.4.2 Door-to-door mosquito inspections

STPMAD will inspect individual residences within a neighborhood when WNV is detected repeatedly in an area or in response to large numbers of localized requests for service. Door-to-door inspections involve a team of field biologists gaining permission from residents to surveil and treat possible mosquito breeding sites on personal property.

2.4.3 Adulticide applications

Adult mosquito abundance and risk of virus transmission fluctuate throughout each mosquito season. STPMAD has developed adult mosquito management thresholds which trigger different control responses throughout the year, with a foundation in mosquito abundance, vector indices, and human cases of disease.

2.4.3.1.1 Frequency of application

As temperatures increase throughout the year, mosquito development time decreases, population abundance increases, and risk of virus transmission increases. In response to these changing pressures, STPMAD has developed adult mosquito management thresholds throughout the mosquito season. Applications are limited to when thresholds are met, and are performed to meet label requirements and minimize resistance development. Sites are eligible for retreatment every 10th day by same-type treatment (such as ground → ground) or every 5th day by inter-platform application (such as ground → aerial → ground). Spray thresholds range from highest risk (*Cx. quinquefasciatus* abundance, presence of WNV) to lowest risk (nuisance mosquito abundance).

2.4.3.2 Adulticide treatment thresholds

	Mosquito Transmitted Disease Thresholds						
Risk	Lower risk						Higher risk
Event	Public mosquito concerns	Nuisance mosquito count	*Culex salinarius* count	*Culex nigripalpus* count	*Culex quinq.* count	High mosquito landing rate	*West Nile virus* present
Spray threshold	>3 per zone/week	>500 per trap night	>85 per trap night	>150 per trap night	>39 per trap night	>7 adults/min	1 positive pool in zone

Tier 1 Manage nuisance mosquitoes to reasonable levels.
Justification: Performed year-round in response to nuisance presence: landing rates, trap counts.
Duration: Approximately from Nov. 15 – Mar. 1.
Tactics: Field biologists adulticide by ground in response to spray thresholds. Nighttime landing rates inform spray decisions.

Tier 2 Manage vector population abundance to moderate or low levels.
Justification: Increases in vector abundance requires additional spray events beyond nuisance numbers.
Duration: Approx. from Mar. 1 – May. 15 and Oct. 1 – Nov. 15.
Tactics: Field biologists, night drivers, and pilots adulticide by ground or aerial in response to spray thresholds. Nighttime landing rates inform spray decisions.

Tier 3 Manage average age of vector populations to minimize proportion of adult vectors more than 10 days old.
Justification: Vector populations are emerging more frequently, which allows more individiauls to acquire and transmit WNV. Treating areas with known activity will reduce risk of transmission.
Duration: Approx. from May 15 – Jun. 15 and Sep. 1 – Oct. 1; or when vector index >0.05.
Tactics: Adulticide by ground or aerial in response to spray thresholds.

Tier 4 Mosquito larvae emerge as quickly as they can; adults have had multiple opportunities for blood meals; control these vector populations to minimize numbers.
Justification: Most rapid development, highest adult abundance, and peak viral activity/onset of human cases requires highest frequency of application.
Duration: Approx. from Jun. 15 – Sep. 1, or in response to public health emergencies, or when vector index > 0.1
Tactics: Adulticide by ground or aerial in response to spray thresholds.

Tier 5 Response to disease epidemic.
Justification: Unprecedented arbovirus activity present in mosquitoes, animals, or humans requires drastic abatement in highly targeted areas.
Duration: Disease epidemic, vector index > 0.4
Tactics: Adulticide by ground or aerial in response to spray thresholds. Spraying conducted up to every night for three consecutive nightly missions.

2.4.3.1 Aerial adulticide requirements

Aerial application is performed under a strict set of criteria. Applications are not made prior to a half hour after sunset. Wind must be <18 mph at altitude for optimal deposition, with no forecasted storms for aerial safety concerns. Surveillance must indicate thresholds have been met that warrant application,

or WNV must be present within target populations. Individuals who request to be alerted prior to aerial sprays are notified by phone or email day of treatment.

2.4.3.2 Nighttime truck adulticide requirements

Truck adulticiding is primarily performed after sunset, when non-target insects are least active and mosquitoes are most active, ending no later than 3 hours post-sunset. Applications are performed under a strict set of criteria. Wind must be between 1 and 10 mph. Vehicle speed must not exceed 20 mph. Surveillance must indicate thresholds have been met that warrant application, or WNV must be present within target populations. Sprayer should be turned off in the vicinity of humans.

2.4.3.3 Daytime truck adulticide requirements

In compliance with label requirements and to prevent non-target effects, STPMAD only adulticides during the day under a strict set of criteria. Field biologists follow a flowchart to determine whether daytime adulticide is allowed:

1. Is the area you're in within a no-spray zone or does it contain STPMAD registered beehives?
    a. Yes? **No** spraying allowed unless emergency conditions (hurricane, WNV epidemic)
    b. No? Proceed to #2
2. Did you find at least 5 adult mosquitoes during your survey of the area?
    a. Yes: Proceed to #3
    b. No: **No** spraying allowed
3. Did you find at least 5 pollinators during your survey of the area?
    a. Yes: Proceed to #4
    b. No: Spraying **is** allowed
4. Can small areas with mosquitoes (and fewer than 5 pollinators) be treated by hand-spray unit?
    a. Yes: Treat only those areas with mosquitoes and fewer than 5 pollinators by hand
    b. No: Proceed to #5
5. Has *West Nile virus* been detected in mosquitoes, animals, and/or humans in St. Tammany Parish within the last month?
    a. Yes: Treatment by truck is allowed during the day, but discouraged if homeowner can wait until sunset, or alternative methods of control are available
    b. No: Treatment by truck is not allowed during the day, but can be scheduled for later that night or that week, after sunset.

2.4.3.4 Adulticide operations in parks and recreational facilities

Adulticide thresholds described above (section 2.4.3.2) are also applicable for all operations in parks and recreational facilities. In general, service requests, complaint calls, trap data, and landing rate data will all be used to determine when to treat the parks for adult mosquitoes.

Adulticide operations will be carried out by ATV, UTV, truck, fixed -wing plane, or helicopter. The preferred time to perform adulticide missions is 30 minutes after sunset. Recreational parks are difficult to treat at this time due to the amount of human traffic and outdoor activities. Adulticide missions will be conducted before sunrise or after sunset depending on the availability of park access and resident activity.

3 CHIKUNGUNYA, DENGUE OR ZIKA VIRUS RESPONSE PLANS

Local Risk

St. Tammany Parish has established populations of Chikungunya (CHIKV), Dengue (DENV), and Zika virus (ZIKV) vector species *Aedes aegypti* and *Ae. albopictus*. Focal populations of *Ae. aegypti* and widespread populations of *Ae. albopictus* in St. Tammany mean that there is some risk of local transmission of these viruses. These vectors are active seasonally from April to November in St. Tammany. Despite the presence of mosquitoes that can transmit these viruses, the risk of widespread local outbreaks of CHIKV, DENV, or ZIKV in St. Tammany is low due to relatively limited human contact with these mosquitoes. STPMAD is prepared to perform surveillance and mosquito control in response to imported or locally acquired human cases of CHIKV, DENV, and/or ZIKV. Currently, we do not expect widespread transmission of CHIKV, DENV, or ZIKV in St. Tammany Parish.

Disclaimer

The elements of this document should serve as a suggested basis for control decisions but should not preclude the consideration of additional contextual circumstances that may actually arise. We withhold the right to change any part of this document or response plan based on the local conditions at the time in which the control decisions are made. Additional control tactics may be implemented, or certain tactics may be ruled out at the discretion of the director.

I. In the event of notification of <u>an imported human case</u> of Chikungunya (CHIKV), Dengue (DENV), or Zika virus (ZIKV)…
   A. <u>In the region or neighboring parish</u>
      STPMAD will (pending availability of resources):
      1. Aid with vector surveillance to assess the risk of local transmission to mosquito vectors and/or determine whether local mosquito transmission has occurred.
      2. Aid with existing educational material.
      3. Discuss the possibility of using STPMAD mosquito control tools including airplane, and truck sprays.
   B. <u>In St. Tammany Parish</u>
      STPMAD will:
      1. Create a map of the area near the human case. Highlight areas to focus surveillance and control activities.
      2. Immediately begin vector surveillance near the human case to assess the risk of local transmission to mosquito vectors and/or determine whether local mosquito transmission has occurred. This should be conducted prior to mosquito control operations in the area. Surveillance should be conducted twice weekly at this site for at least 2 weeks or as indicated by trap data.

- Aspirate mosquito specimens for CHIKV/DENV/ZIKV testing (Prokopac and Nasci aspirators)
- Collect mosquitoes in traps (Mosquito Magnet) for CHIKV/DENV/ZIKV testing

3. Consider appropriate vector control activities near the human case.
   - Aerial application of mosquito adulticides
   - Special mix truck application of mosquito adulticides
   - Aerial application of mosquito larvicides
   - Door-to-door source reduction

4. Communicate among appropriate partners.
   - Parish president's office

5. Engage residents in door-to door general mosquito education and source reduction.
   - use existing general mosquito avoidance flyer or door hanger

II. In the event of notification of <u>a locally acquired human case</u> of Chikungunya (CHIKV), Dengue (DENV), or Zika virus (ZIKV)…

A. <u>In the region or neighboring parish</u>
STPMAD will (pending availability of resources):

1. Aid with vector surveillance to assess the risk of continued local transmission to mosquito vectors and the geographic extent of local transmission.
2. Aid with existing educational material.
3. Discuss the possibility of using STPMAD mosquito control tools including airplane, and truck sprays.

B. <u>In St. Tammany Parish</u>
STPMAD will:

1. Create a map of the area near the human case. Highlight areas to focus surveillance and control activities.
2. Immediately begin vector surveillance near the human case to assess the risk of continued local transmission to mosquito vectors and/or determine the geographic extent of transmission. This should be conducted prior to mosquito control operations in the area.
   - Aspirate mosquito specimens for CHIKV/DENV/ZIKV testing (Prokopac and Nasci aspirators)
   - Collect mosquitoes in traps (Mosquito Magnet) for CHIKV/DENV/ZIKV testing

3. Immediately begin vector control activities near the human case.
    - Aerial application of mosquito adulticides
    - Special mix truck application of mosquito adulticides
    - Aerial application of mosquito larvicides
    - Door-to-door source reduction

4. Communicate among appropriate partners.
    - Parish president's office
    - LA Office of Public Health

5. Engage residents in door-to door general mosquito education and source reduction.
    - Use CHIKV/DENV/ZIKV targeted messaging (e.g. flyer or door hanger)

4 REFERENCES CITED

Association of State and Territorial Health Officials. 2008. “Before the Swarm : Guidelines for the Emergency Management of Mosquito-Borne Disease Outbreaks.”

Centers for Disease Control and Prevention. 2013. “West Nile Virus in the United States : Guidelines for Surveillance, Prevention, and Control.”

Louisiana Arboviral Working Group. 2013. “Louisiana Arboviral Surveillance Sampling Standards.”

Reiter, Paul, W L Jakob, and D B Francy Andj B Mullenix. 1986. “Evaluation of the CDC Gravid Trap for the Surveillance of St. Louis Encephalitis Vectors in Memphis, Tennessee” 236: 209–212.

Sudia, W. D., and R. W. Chamberlain. 1962. “Battery-operated Light Trap, an Improved Model.” *Mosquito News1* 22 (2): 126–129.