

MOSQUITO ABATEMENT  
— ST. TAMMANY PARISH —

# QUARTERLY Report

2020





On the cover: Larviciders practice social distancing each morning as they line up, remaining inside their vehicle, for daily chemical fill-up.

## From the Director:



In our February Monthly Report, I discussed the ways in which St. Tammany Parish Mosquito Abatement was working to protect our employees and continue to provide excellent service to our residents. Since writing that report in early March, COVID-19 has changed nearly every aspect of our lives. Though our agency was able to weather the first two weeks of the stay-at-home order without nearly any change to the service we provide, some changes were inevitable.

### Here is what has changed:

1

**STPMAD Office has closed to the public.** Not that we get many visitors, but we formally closed our offices to the public following the Governor's and Parish President's orders. A skeleton crew of usually three employees man our administrative building to support our field crew of 35. The remainder of the administrative and laboratory teams are working from home.

2

**Suspended in-person service requests.** To protect our employees, we suspended all in-person, residential service requests effective April 6th. Prior to this, we completed 137 service requests in the first quarter of 2020. On several occasions homeowners refused to follow our instructions to stay inside their homes during a site inspection. Though we won't be visiting your house, we still want to know if you are experiencing a mosquito problem – we will use this information to determine where the airplane and trucks will spray. Let us know by filling out our online form (<https://stp-mad.org/service-request-form/>), call us (985) 643-5050, or email us at [info@stpmad.org](mailto:info@stpmad.org).

**137** ✓  
service requests  
completed

**3 No invasive sampling (dipping for mosquito larvae) in sewage-influenced ditches.** Field inspections for mosquitoes typically count the number of mosquitoes per pint-sized cup. These inspections are made with a long-handled dipper and focus on areas that our primary WNV vector inhabits – sewage effluent from residential sewage systems. Given the concern that the virus that causes COVID-19 may be transmitted via the fecal-oral route as was the original SARS virus, we have suspended all invasive sampling of sewage-influenced ditches.

**4 Enhanced larviciding.** Biologists, who normally field service requests during the daytime, are now collaborating with the larviciding crew spraying roadside ditches that are producing the southern house mosquito. This allows us better coverage of all known sources of mosquito production. It also allows us the ability to quickly cover areas that home-isolating employees traditionally inspected.

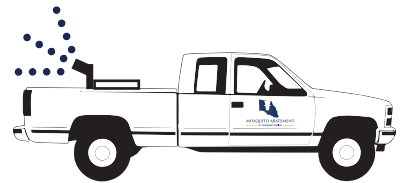


## What hasn't changed with our services:

**1 Mosquito trapping and data collection.** A key goal in 2020 was to ensure each of our 95 operational truck spray zones were represented by at least one trap location. To accomplish this, we added eight sites to the trap routes. Though home-isolation of a few high COVID-19-risk employees limited the number of available trappers, the rest of the crew has picked up the load and trapping continues unabated. To date we have collected over 33,965 mosquitoes (or 259.3 mosquitoes each time a trap was deployed). Most of these mosquitoes are the brackish water mosquito, *Culex salinarius*, which inhabits the coastal marshes along Lake Pontchartrain.

**2 Night spraying for adult mosquitoes.** Though the airplane did not actually fly in the first quarter of the year, it did fly on the first night on Q2 (April 1st) and is ready for seasonal abatement missions. Adulticide night trucks also started in mid-March and sprayed 47,515 acres during 47 missions.

**47,515**  
acres treated by ground



It is understandable that the attention of the world right now is focused on the COVID-19 outbreak, but **our team is focused on preventing the next viral outbreak such as West Nile or eastern equine encephalitis.** West Nile virus (WNV) season traditionally begins in May. However, the warm winter and warmest March on record may bring an earlier onset of WNV. Earlier virus isolations generally portend more severe human outbreaks of mosquito-transmitted viruses. Right now our hospitals need all of their capacity focused on COVID-19; we are working everyday to keep WNV at bay.

Yours in health,

Kevin A. Caillouet, Ph.D., M.S., P.H.  
Director



# The warm winter and warmest March on record may bring an earlier onset of WNV.

Taxonomist Lisa Rowley identifying mosquitoes while self isolating at home.



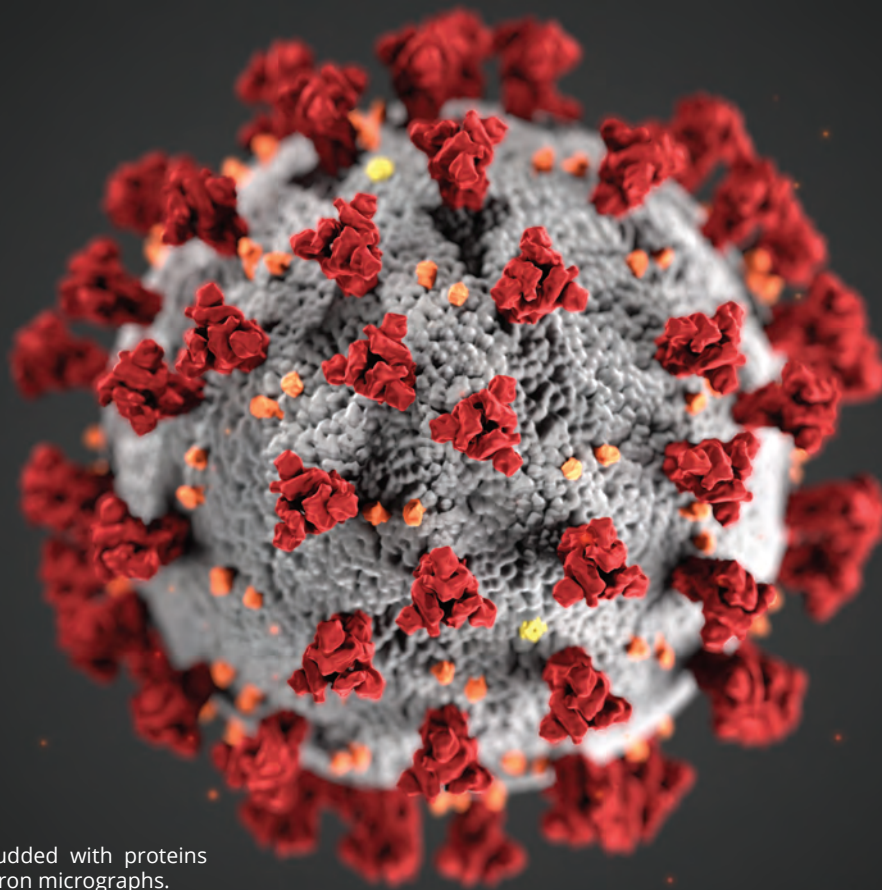
The first quarter of 2020. presented a very low-level risk of West Nile virus infection to people in St. Tammany Parish. A total of 23,403 mosquitoes were collected across St. Tammany and tested for WNV. Adult mosquitoes are collected using a variety of devices and tested in pools (or groups) via RT-PCR, by the Louisiana Arbovirus Disease Diagnostic Laboratory (LADDL) in Baton Rouge. None of the pools tested were positive for infection.

The Louisiana Department of Health has reported zero human cases of West Nile neuro-invasive disease year-to-date in St. Tammany for 2020. Last year, there were two reported human cases of WNV in St. Tammany Parish.

Twenty-three different species of mosquitoes were trapped in the first quarter. This was primarily influenced by a mild winter and early, warm spring. The top species pooled for virus testing in the first quarter were primary vector, *Culex quinquefasciatus* at 43.4% (10,155), secondary WNV vector, *Cx. salinarius* at 35.6% (8,343), and *Culex erraticus* at 13.7% (3,217)..







Coronavirus outer coat is studded with proteins that resemble a crown in electron micrographs.



Biologist Chad Kirkley inspects a residential sewage system.

## What is COVID-19?

COVID-19 is the name of the disease caused by a coronavirus first detected in the Hubei Province of China in December 2019. The virus responsible for this disease is being called SARS-CoV-2. It shares 82% of its genetic material (RNA) in common with SARS-CoV the virus responsible for the 2002-2003 outbreak of Sudden Acute Respiratory Syndrome (SARS).

Only five months have elapsed since the first cases of COVID-19 were detected, as such, documented evidence about how SARS-CoV-2 is transmitted, lasts on surfaces, or effective prevention is inferred from what is known about the original SARS virus or another closely related – MERS-CoV, the virus responsible for Middle East Respiratory Syndrome outbreak in 2012.

## Fecal-oral transmission of SARS-CoV-2

Both related viruses, SARS-CoV and MERS-CoV, were documented to have caused gastrointestinal symptoms in afflicted patients. SARS-CoV RNA was detected in patient stool for up to 30 days and fecal-oral transmission has been documented for this virus. Infectious virus was detected in sewage for up to 14 days at cooler temperatures and for fewer days at higher temperatures.

Though documentation of whether fecal-oral transmission of SARS-CoV-2 is possible remains to be determined, it has been detected in a U.S. patient's stool. In addition, similar gastrointestinal symptoms to SARS-CoV and MERS-CoV seem to indicate this is a probable route of transmission.

St. Tammany Parish's high proportion of not properly maintained residential sewage systems (septic systems), which produce prodigious numbers of the West Nile virus vector, *Culex quinquefasciatus*, are of concern during this COVID-19 outbreak. Open roadside ditches with homeowner sewage effluent may put our residents and our field inspection crew at risk to SARS-CoV-2. Our agency is collaborating with the Tulane National Primate Research Center, Tulane Department of Tropical Medicine, to research and investigate the risk of fecal-oral and mosquito transmission of SARS-CoV-2.

# Contrary to popular belief, mosquitoes are not living hypodermic needles.



*Aedes albopictus*, the Asian Tiger Mosquito, blood feeding on a human host. Photo was purchased through iStock by Getty Images.

## Mosquitoes and COVID-19

Back in the 1980s, rumor had it that mosquitoes were able to transmit human immunodeficiency virus (HIV), the pathogen that can lead to the development of AIDS. Scientists quickly determined this was false; mosquitoes weren't capable of transmitting the virus in the first place. A few decades later, when SARS threatened to become a worldwide pandemic, the same rumor (mosquitoes must be able to transmit it!) were rife. Within the first year, scientific papers verified that mosquitoes weren't a threat to SARS transmission.

The COVID-19 pandemic of 2020 has the same rumor-mill churning, with Facebook posts and news stories claiming mosquitoes help spread the virus. Undoubtedly, scientists are currently performing the same tests to verify those claims. However, past evidence indicates that mosquitoes are not capable of transmitting COVID-19. Why not?

SARS, as with many respiratory diseases, does not have a major presence in the human bloodstream. Primarily found in the lungs of an infected individual, the SARS virus was only ever detected in the bloodstream at a concentration of about 200 copies per ml of blood. That may sound high, but for reference, a mosquito requires a concentration of roughly 10,000 copies/ml in order to have the potential to become infected. Mosquitoes were highly unlikely to ever become infected with SARS from a human, which is one nail in the coffin for why mosquitoes are unlikely to carry COVID-19. What's that about mosquitoes getting infected, though?

Contrary to popular belief, mosquitoes are not living hypodermic needles. Thanks to the mosquito mouth being comprised of half-a-dozen different body parts, very little blood is retained on the proboscis (the "needle nose"). Unlike a used syringe, which can contain sufficient blood from a prior prick to infect another individual, the mosquito mouth simply doesn't contain enough blood to spread any pathogens. Additionally, a mosquito that bites an infected individual doesn't regurgitate blood into the next victim. The only way for a mosquito to infect someone down the line is for the mosquito itself to become infected. Just like in humans, most pathogens a mosquito imbibes are rapidly broken down by digestive enzymes. Only pathogens that can survive this process and infect the mosquito (meaning the mosquito gets sick, too) are capable of spreading to its salivary glands, and later being transmitted to another human. Very few pathogens fall in to this category; malaria, dengue virus, and Zika virus being notable examples.

Considering SARS, a pathogen with many similarities to COVID-19, was not transmissible by mosquitoes, in combination with how the mosquito infection cycle actually works, there is little risk of mosquitoes transmitting COVID-19. We will undoubtedly learn more over the coming months, but evidence of mosquito transmission of SARS-CoV-2 would surprise entomologists around the world, not just at St. Tammany Mosquito Abatement. If you have any doubt, the best protection against mosquito bites, whether for West Nile virus or anything else, is use of a personal repellent. Please visit the CDC website for information regarding EPA-approved repellents.



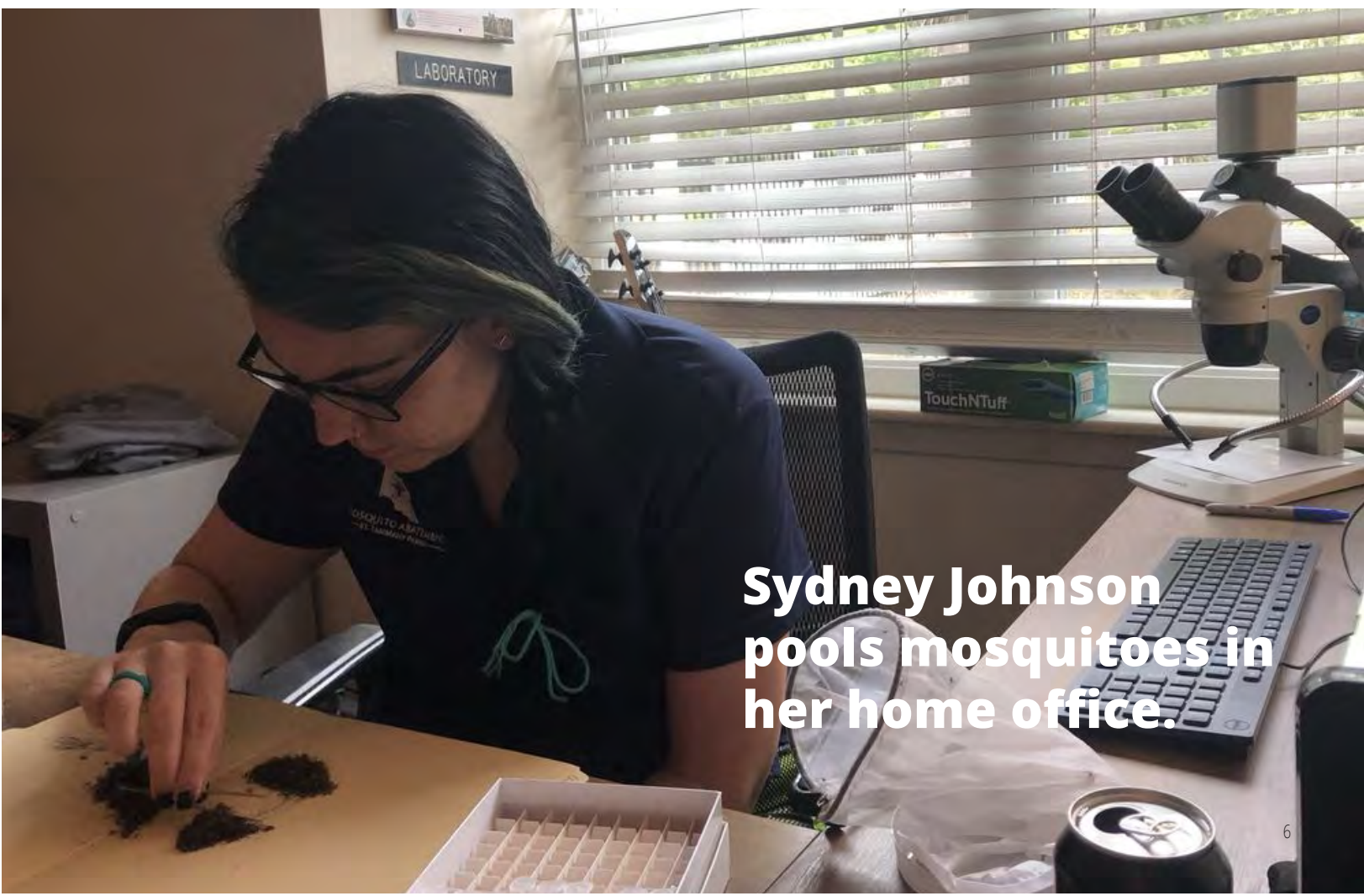
# Operating a Remote Lab

Mosquito surveillance and identification are a crucial part of operations at St. Tammany Parish Mosquito Abatement. Not only does surveillance indicate where mosquito problems are the worst in the parish, they dictate where our nightly spray missions are directed. Every week traps are placed across the parish in order to monitor mosquito species and abundance. Data gathered from traps helps field biologists locate mosquito problems, provide administration information needed to make spray decisions, and facilitate early detection of arbovirus activity through mosquito pooling.

Since COVID-19 precautions went into place in early March, our surveillance and identification protocol has changed. As usual, traps start coming back to the office around 9am-11am on Tuesdays and Thursdays. Field biologists send text messages to the lab when they have placed their traps into the freezer. An hour later, Taxonomist Lisa Rowley and Research Assistant Sydney Johnson collect the traps, staggering their

timing to avoid contact. They take extra precautions when picking up traps from the office by wearing gloves, sanitizing the freezer door, and sanitizing their hands. Once Sydney and Lisa return to their home offices, they identify mosquitoes, clean traps, create mosquito pools and enter data into our online database.

Google sheets are used to help coordinate pool numbers and keep both of them up-to-date on as the pooling progresses. Once all traps are finished, the mosquito pools need to be shipped to the Louisiana Animal Disease Diagnostic Laboratory for arbovirus testing. Taking extra precautions to maintain social distance and utilizing PPE, the mosquito pools are combined for shipment. Even though things are a little different now, mosquito traps continue to be identified, counted, and pooled in a timely manner for arbovirus detection and field operations.



**Sydney Johnson  
pools mosquitoes in  
her home office.**

# How Bad are the Mosquitoes?

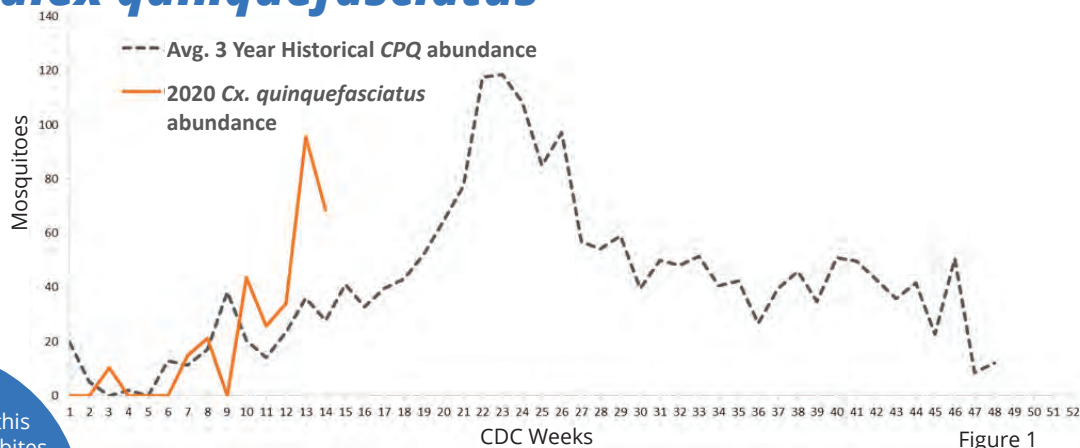
## *Culex quinquefasciatus*



### Common name:

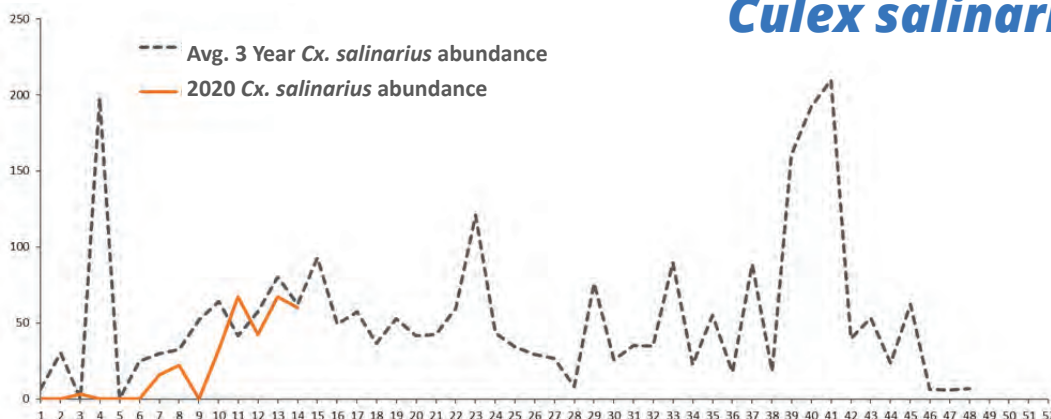
The southern house mosquito

As the primary local WNV vector this mosquito primarily bites birds and occasionally bites people. It prefers to lay its eggs in sewage-associated water. As it readily enters structures, it is named the "house" mosquito.



11,475  
trapped in Q1

## *Culex salinarius*



12,089  
trapped in Q1

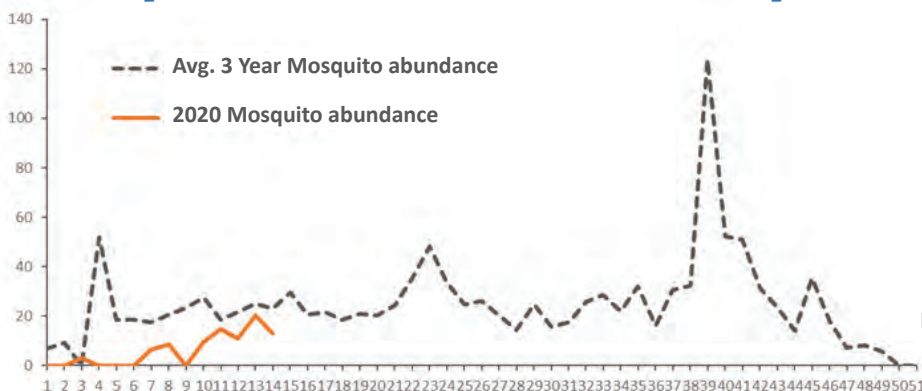


A serious pest that is produced in fresh to brackish marshes. It frequently bites large mammals including people and birds. Considered an important secondary WNV vector.

### Common name:

The brackish marsh mosquito

## Mosquito Abundance for all Species:



33,965  
total mosquitoes trapped in Q1

23 

# of different species found in Q1