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Fight the BITE

How you and mosquito abatement
can help control the mosquito population



Did you know...

Interesting facts about nature's little bloodsuckers

50:

Number of mosquito species that call St. Tammany Parish home

The four mosquitoes with the greatest potential to spread disease are

- *Aedes albopictus* (Asian tiger)
- *Culex salinarius*
- *Culex quinquefasciatus* (Southern house)
- *Aedes vexans*

The primary diseases spread by mosquitoes in St. Tammany Parish are West Nile virus, Eastern equine encephalitis and St. Louis encephalitis



5 million:

Number of mosquitoes per acre that one breeding site can produce

The Asian tiger mosquito breeds primarily in containers, including backyard items such as water bowls and bird baths.

The Southern house mosquito breeds primarily in areas such as roadside septic ditches.

Female mosquitoes are the only ones that bite (they need blood for egg production)

Greater than 55 degrees:

Temperature where mosquitoes become active. They are mostly inactive in winter.

500 feet – 20 miles: Range that mosquitoes can travel

Mosquitoes also bite your pets. They can transmit heartworms to dogs.

6 weeks: Average life span of a female mosquito.

1 week: Average life span of a male mosquito.

When a mosquito bites, it injects its saliva, which contains an anesthetic and an anti-coagulant to enable blood flow. The itch you feel is an allergic reaction to the saliva.

Reasons why mosquitoes may prefer to bite you: the scent of personal care products, such as perfume, deodorant or shampoo; heavier breathing (because mosquitoes are drawn by carbon dioxide); your body chemistry

Midges and crane flies are often incorrectly reported as mosquitoes.



Not mosquitoes!



Source: Bryan Massery, public information specialist, St. Tammany Parish Mosquito Abatement District



PHOTO COURTESY OF THE CENTERS FOR DISEASE CONTROL AND PREVENTION

Mosquitoes Don't Stand a Chance

District fights pesky insects with Integrated Mosquito Management approach

by Matt Jocks

The tools of the trade for mosquitoes haven't changed in millions of years: an appetite for blood, a long mouth tube to get it and the instincts to breed and feed.

The tools of the trade for those seeking to control the pests, however, are improving every day.

At the St. Tammany Parish Mosquito Abatement District, the Director, entomologists and biologists have moved well beyond what many consider to be the primary method of fighting mosquitoes — the spraying of pesticides. Their program is based upon scientific approaches that utilize Integrated Mosquito Management (IMM), which has several components that work together to efficiently and effectively control the mosquito population.

The most visible tool for battling bugs remains chemical control, done from the air and on the ground, along with the treatment of mosquito breeding sites to kill the mosquito larvae to prevent adult emergence. That, however, is linked closely with another major component of the program: surveillance. This is where mosquito control personnel monitor mosquito adult and larval population levels on a daily basis in order to determine treatment needs and the most appropriate methods for control. Surveillance also includes monitoring for the presence of mosquito-borne

viruses, such as West Nile virus, by testing adult mosquitoes for the presence of the virus.

Three other components of IMM — operational research, source reduction and public education — are also closely linked.

In addition to larviciding for the control of the mosquito larva, the reduction of breeding sources, such as artificial containers that collect water and breed the Asian tiger mosquito, is performed by District personnel along with the cooperation of residents who may harbor these mosquito breeding sources. To some extent, this is done at the District level, but the job is too massive for the STPMAD to do it alone. Because of that, a major component of IMM is public outreach, through the media and in presentations to schools and civic organizations.

"One of the most effective means is face-to-face meetings," says Bryan Massery, public information specialist at STPMAD, "When we go on inspections and actually show people the breeding sources, or when we do presentations, or when I actually bring mosquitoes for display, all of this has a positive impact on the public. When they see it, something just clicks. It triggers something where they really focus on what they can do."

The stakes are higher than avoiding annoyance. Mosquitoes can spread the West Nile virus, in addition to other forms of encephalitis.

Menacing Mosquitoes



Dr. Ronald Francis set up a veterinarian practice in Slidell before the formation of a mosquito abatement district. Francis says back then, many dogs did not live past five years of age because they were infected with heartworm transmitted by mosquitoes.

PHOTO BY JOSEPH BENNETT

Veterinarian shares what life was like before STPMAD

by Mike Blount

Imagine not being able to go outside and play baseball or fire up a grill to cook hamburgers without swarms of mosquitoes landing on you. What if you weren't able to sit on your back porch and enjoy the sunset without getting covered in several little bites? This is what life was like in St. Tammany Parish before the formation of a mosquito abatement district, according to veterinarian Dr. Ronald Francis.

When he first set up a veterinarian practice in Slidell in 1962, the mosquitoes were one of the first things he noticed about the area. With southeast Louisiana primarily consisting of marshland, mosquitoes were prevalent.

"A man called me and said he had a cow that was having trouble giving birth to a calf," Francis recalls. "When I went to examine the cow, mosquitoes were covering me from one end to the other."

To Francis, the mosquitoes weren't just a nuisance — they were a danger. Many dogs in the area didn't live past five years of age because they would be infected with heartworms, which are transmitted by mosquitoes. Treatment consisted of a series of arsenic-based injections to kill the worms living in the heart or artery, but would often damage the kidneys in the process.

Francis says the abundance of mosquitoes also caused an outbreak of equine encephalitis. Encephalitis was prevalent throughout St. Tammany Parish. In 1971, an invasion of Venezuelan equine encephalitis (VEE)

arrived from Texas into southeast Louisiana. With the help of county agents and local and federal veterinarians, the program resulted in the vaccination of 1,409 horses in 48 hours.

The situation wasn't much better for people, Francis says. In the late '60s, the National Aeronautics and Space Administration (NASA) was moving families from across the United States to Louisiana during the ramping up of the space program. Some families came from areas that didn't

have many mosquitoes. Going from dealing with few or no mosquitoes to being confronted by swarms was a harsh new reality for many of the families that transplanted to St. Tammany Parish, according to Francis.

"Many people became anemic or developed skin allergies after being bitten too many times," Francis says. "Realtors had a lot of problems selling houses in this area because the mosquitoes were so heavy. It was a bad situation."

"When I went to examine the cow, mosquitoes were covering me from one end to the other."

Dr. Ronald Francis
**Retired veterinarian with
Slidell Veterinarian Hospital**

Francis and a few other key officials, including representatives from government, real estate, the parish, the Chamber of Commerce and public health, decided to do something about it. In 1968, they formed the St. Tammany Parish Mosquito Abatement District with help from the NASA Michoud Assembly Facility and New Orleans Mosquito Control. A tax to fund the District was approved by an overwhelming 90 percent of voters. Francis says that they didn't have to push the voters too hard — everyone wanted relief from the mosquitoes.

Today, Francis says mosquitoes are much less of a nuisance in Slidell. Residents can enjoy going outside, thanks to the spraying, surveillance and prevention conducted by St. Tammany Parish Mosquito Abatement District.

"We went from 6,200 people to more than 200,000," Francis says. "A lot of that has to do with the space program, but it's also because of the improved living conditions. There are good schools. It's a good retirement community and there are a lot of civic clubs and sporting events. A lot of that is because of mosquito control."

The History of STPMAD

St. Tammany Parish experienced a boom in population in the late 1960s as the National Aeronautics and Space Administration (NASA) expanded the space program. Many families relocated to Louisiana from all over the country to work at the NASA Michoud Assembly Facility and were greeted by hordes of mosquitoes. Living in the area meant simple outdoor activities, such as grilling, playing sports and fishing, were nearly impossible to do without the nuisance of mosquitoes.

In 1968, the St. Tammany Parish Mosquito Abatement District was formed and approved by 90 percent of voters to levy and collect a small property tax for a 10-year period to help combat the pests in Wards 8 and 9. The District launched with a first-year budget and income of \$100,000. Every 10 years, voters renew the property tax for the District.

Today, STPMAD covers all of St. Tammany Parish and continues to keep more than 200,000 people in the parish free from dealing with threats from mosquitoes.



The Unlikely Threat

Woman shares her story of living with West Nile virus

by Mike Blount

In July 2013, Amanda Young was a healthy, happy and active person. The preschool teacher brought a lot of energy to her classroom every day. In the evenings, she taught dance and jogged up to four miles. So when she got an intense headache one day, she didn't think much of it at first.

"I never really missed a day of work so I pushed myself, but I was having a hard time even holding my head up," Young says. "I was even kind of falling asleep. By the end of the day, I just had to go home. I felt pretty bad."

"I just want people to know that West Nile virus is real and anyone can be affected by it."

Amanda Young
West Nile virus survivor

Young had never been "really sick" in her life. By that night, her symptoms had worsened to the point where she had to go to an urgent care center.

Her lymph nodes were swollen. She was pale. Despite looking visibly very sick, every test came back negative.

"My doctor didn't know what to do with me," Young says. "Nothing was jumping out at them. I never ran a fever. I was actually running cool at 95 or 96 degrees. She recommended going to a different hospital to get some blood work done."

Two weeks into her illness, Young's friends and family were very concerned about her condition. Several possible culprits were suggested, including West Nile virus. The symptoms matched. But Young's doctor still couldn't diagnose her.

"You hear about West Nile virus, but you think it's pretty unlikely you'll get it," Young says. "It's not one of those things you even think about. But I started to think I might have it."

According to the Centers for Disease Control and Prevention, about 80 percent of people who are infected with West Nile virus show no symptoms at all. One in five people who are infected will develop a fever that may include other symptoms such as headaches, body aches, joint pains, vomiting, diarrhea or a rash. Less than 1 percent of people develop a serious neurological illness, such as encephalitis or meningitis.

Almost three weeks into the illness, Young says her symptoms took a turn for

the worse. Her vision was blurred. She had the most intense headaches she had ever had. She was sleeping more and more. When she was awake, she was lifeless.

Once Young was finally able to see a neurologist nearly a month later, he finally confirmed what friends and family had suspected all along: She had West Nile virus. By then she was fighting for her life.

Months later she was able to return to some normal activity, yet she's still unable to work a full day. Young says she is a much different person today.



"I live with daily headaches, extreme fatigue, body aches and the left side of my body is still affected" Young says. "It varies each day. My doctor, who knew me before all this, says it's hard to see me like this. I try to stay optimistic. I have to, but I just want people to know that West Nile virus is real and anyone can be affected by it."

Amanda Young was diagnosed with West Nile virus in 2013.

PHOTO BY JOSEPH BENNETT

Life Cycle of WNV

West Nile virus is a mosquito-borne disease that can cause serious, sometimes fatal, neurological illness. West Nile virus is transmitted to humans by mosquitoes, although birds are the most commonly infected animal and serve as the primary reservoir host.

MOSQUITOES

Mosquitoes become infected after biting and feeding on a bird infected with West Nile virus.

HORSES

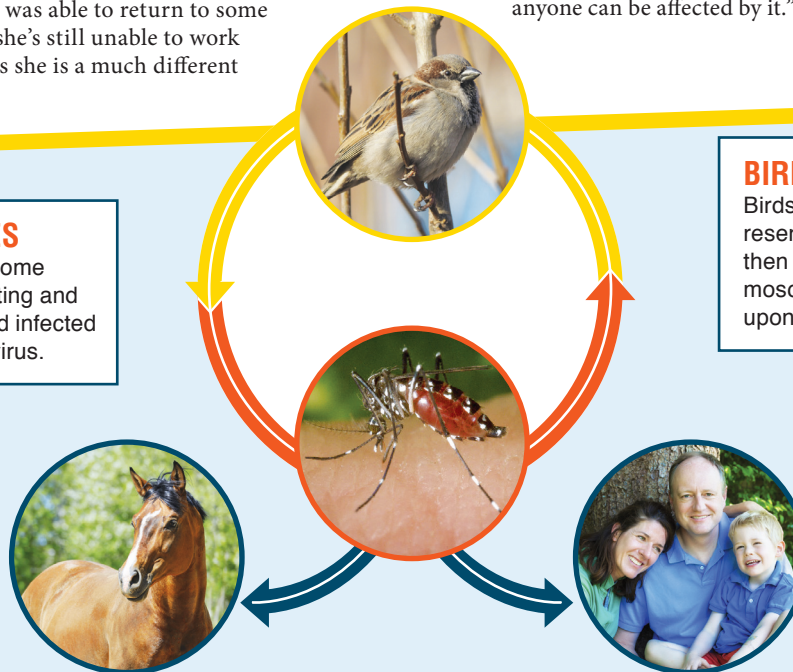
Infected mosquitoes can pass the virus on to horses. Infected horses cannot pass the virus to other horses.

BIRDS

Birds serve as the primary reservoir host. The virus can then be passed on to new mosquitoes when they feed upon the infected bird.

HUMANS

Infected mosquitoes also can pass West Nile virus to humans. Humans, like horses, are dead-end hosts, meaning they cannot pass the virus to other humans.



A New Era in Mosquito Control

Q&A with District Director Chuck Palmisano

by Matt Jocks

Chuck Palmisano has been the director of the St. Tammany Parish Mosquito Abatement District for 37 years. Here, he discusses the challenges, myths and strategies of mosquito control and how you and technology are helping win the battle against mosquitoes.

What is the biggest misconception people have about what the District does?

I think the public associates mosquito control with trucks going down the road spraying mosquitoes. And that is part of it, but there are so many other things we do in terms of mosquito and arbovirus surveillance, larvicide, and public education. We also conduct operational research, some of which involves efficacy tests and quality control, trying to be as cost-effective as possible.

On the subject of spraying, do you hear concerns about the safety of the pesticides?

All of the chemicals we use are labeled by the Environmental Protection Agency (EPA). Extensive testing for their effects on the environment, plants and mammals are conducted, which must meet with approval by the EPA. Any chemicals we use are used according to the label to make sure there is no unreasonable risk to the environment, humans or wildlife. We do get calls asking about what chemicals we use and we give them detailed explanations. The data is also available online.

How much of a role must the public play in the source reduction of mosquitoes?

I'd say the majority of that has to be done by the public. We cover an area close to 900 square miles. We can't cover all of that. We have to rely on the public to help reduce the source of mosquitoes, especially those that breed in artificial containers that are commonly found in and around residential areas and businesses.

Are public awareness and participation improving?

I think so. People are becoming more and more aware of how (the mosquitoes) develop and they see what they can do to help. I think the stories about the West Nile virus helped focus people. You really see it, especially when you go out to the homes. When the inspectors go out and actually show people the containers with the larvae and they can actually see it themselves, they know what they have to do. Everybody has to be reminded about these things from time to time.

What is the focus of your research efforts?

It helps us develop new and better strategies that are both more effective in controlling mosquitoes and more cost-effective. It helps us determine what application rate we should use, to avoid using an application rate that is more than is needed. There's always a potential risk that the mosquitoes will develop a level of resistance to the products that we use. Also, Dr. Kevin Caillouet, Research Entomologist, is conducting studies on the interactions of nesting birds and mosquitoes to help us to develop more effective strategies for reducing the risk for human transmission of West Nile virus.

What do you consider success in mosquito control?

We strive for 95-96 percent control and we achieve consistently in that range — 95-96-97 percent control.

How has abatement evolved over the years?

The best thing for us has been the technological improvements. Our airplanes are equipped with an on-board computer where we can put in the coordinates on a memory card of our spray zones. It also has an on-board, real-time weather system to show the wind speed and wind direction. The system provides information to the pilots as to where they are to set up their flight paths and offsets, so the chemical spray will be deposited within the established spray grid. These improvements make aerial spraying more effective and economical.

How about in terms of surveillance?

Early on before we had airboats, we had to walk the marsh to inspect it for mosquito breeding. This was labor-intensive and time-consuming. This is an example of how we have become more mechanized to increase efficiency. Also the use of GPS, computer programs and data storing and processing systems have made it easier to process and access data.

What are you seeing in terms of the long-term trends in the mosquito problem?

We will always have a mosquito problem here due to our topography and the many natural breeding areas. The challenge will be to effectively deal with emerging mosquito borne diseases such as chikungunya, dengue fever and others that are likely to be introduced to our area.

District Director Chuck Palmisano says technological advances, such as GPS and computers, have enabled the District to target its mosquito-fighting efforts.

PHOTO BY JOSEPH BENNETT



Leadership of STPMAD

ST. TAMMANY PARISH MOSQUITO ABATEMENT DISTRICT BOARD OF COMMISSIONERS

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William Hathaway, MPH, Sec./Tres.
Anthony Alfred
Peter Gerone, ScD
David Stuart

ADVISORY BOARD

Jake Abdalla, Legal Counsel
Ronald Francis, DVM
Robert Lowrie, ScD, MPH
Dawn Wesson, Ph.D

DIRECTOR

Charles Palmisano, MS, BCE

What the District Does

Reducing mosquitoes through Integrated Mosquito Management **by Matt Jocks**

Workers for the St. Tammany Parish Mosquito Abatement District can be found in planes and trucks, in the marshes, woodlands, and swamps. They also may be found in classrooms and town halls, on front porches and backyards and at testing sites. Their work uses the standards of Integrated Mosquito Management, which has several components:



CHEMICAL/BIOLOGICAL CONTROL

The STPMAD uses both larvicides, to prevent larvae from developing into adult mosquitoes, and adulticides, to kill the adults.

Larvae are treated primarily with bacterial agents that act specifically on mosquito larvae, as opposed to chemicals, either in the form of a granule or liquid. A synthetic juvenile hormone is also used to inhibit the larval mosquito's growth.

The larvicide program is divided into three categories of habitats: marshlands, woodlands and roadside septic ditches.

To kill adult mosquitoes, the STPMAD uses truck-mounted aerosol sprayers, as well as spraying from twin-engine airplanes and off-road vehicles. The trucks travel at low speeds (typically 15 mph) and the airplanes treat from an altitude of about 300 feet. An agricultural spray plane is used to spray the bacterial agent to kill the larvae breeding in the marshes. Operations are conducted at night, when mosquitoes are active and when there is typically less wind.



SURVEILLANCE

The primary surveillance tools used are traps. Liquid attractants, light and carbon dioxide are all used as bait, and a down draft, created by a motor and fan, catches the mosquitoes. Some traps are specifically designed for snaring disease-transmitting mosquitoes.

There are 62 permanent sites of the basic traps and, each week, the STPMAD also operate about 65 of the more specific traps geared toward collecting disease-transmitting mosquitoes. Each week about 80-120 adult mosquito pools are collected from the specific traps called gravid traps. These mosquitoes are tested for the presence of West Nile virus, Eastern equine encephalitis, and St. Louis encephalitis.

The District also regularly inspects more than 3,000 breeding sites for larval production, such as marshes, roadside ditches, woodlands, and containers.

Surveillance results are used to determine the areas that require treatments.

SOURCE REDUCTION

Although it is impractical for the STPMAD to function as the primary agency in removing breeding sites, it works with the public and other agencies to achieve this.

Some of the major breeding sites include containers that can collect water and ditches in which mosquitoes can use debris that clogs drainage lines as a breeding source. When major breeding sites such as these are discovered by inspectors, the STPMAD notifies the landowners and/or local agencies to address the problem.



RESEARCH

Ongoing research by the STPMAD is divided into two categories — mosquito susceptibility and operational research.

Mosquito susceptibility tests are designed to determine if larvae or adult mosquitoes are developing resistance to the chemical and biological materials being used to control them. They are conducted in laboratories and, in the case of adult mosquitoes, a wind tunnel to simulate spraying conditions.

Operational research seeks to improve techniques and to learn more about the mosquitoes and the diseases they carry. This is done by District personnel themselves and in conjunction with outside agencies and academic institutions.

PUBLIC EDUCATION

Because the area is so vast and includes so many potential breeding sites for mosquitoes, the STPMAD is dependent upon the public to play a major role in source reduction. To make the private citizens aware of that, and to give them the tools needed to do the job, the District has an ongoing public education and outreach program.

At younger age levels, the District conducts regular presentations in schools and hosts field trips at its headquarters. The STPMAD also has a lesson course on mosquito biology and control, for fourth- and fifth-grade science teachers to teach to their students.

The STPMAD also makes presentations to homeowners groups and civic organizations. These are designed to both give and receive information, as District personnel can learn about specific problems or developments.

Updates and alerts also are provided by the District to media outlets.



PHOTOS COURTESY OF STPMAD

What You Can Do

Reducing mosquito breeding sites around your home

You may not realize it, but your property could be prime real estate for mosquitoes. Help control the mosquito population by eliminating containers that hold standing water, where mosquitoes lay their eggs. Watch out for these common sources:

ORNAMENTAL PONDS:

Stock with mosquitofish, which eat mosquito larvae

OVERWATERED LAWNS

TOYS:

Such as wagons, kiddie pools, buckets

PLANT SAUCERS

RAIN BARRELS:

Use approved rain collectors with mesh or plastic covers

RAIN GUTTERS:

Check for clogs

BOATS AND RECREATIONAL VEHICLES:

Water can collect on protective tarps

TREE HOLES:

Drain and fill with mortar

OLD TIRES

BIRD BATHS:

Replace water at least once a week

PET DISHES:

Change water every two days

TRASH:

Mosquitoes can breed in sources as small as a soft drink bottle cap

TRASH CANS:

Water can collect in lids

WHEEL RUTS, PUDDLES OR DITCHES

Protect Yourself!

Three easy steps for repellent use

1. FIND THE RIGHT REPELLENT



- Use products with the active ingredients DEET, Picaridin, oil of lemon eucalyptus, or IR3535
- Consider how long you'll be outdoors — labels specify how long protection will last
- For children, DEET is EPA-approved for ages 2 months and older. Oil of lemon eucalyptus should NOT be used on children under 3. Always follow label instructions.

2. APPLY IT PROPERLY



- Apply only to exposed skin and/or clothing
- Do not spray directly into face; spray on hands then apply to face
- Don't use on cuts or irritated skin
- Do not spray in enclosed areas
- Follow label instructions on when to reapply
- For children, do not allow them to handle repellent and do NOT apply to children's hands. Apply it to your hands and then apply to child.

3. ENJOY THE OUTDOORS!



- When returning indoors, wash treated skin and clothes with soap and water
- Store repellents in a locked cabinet out of the reach of children
- Make sure to apply during dusk and dawn, the primary times for mosquito activity



Mosquito Control Matters

St. Tammany Parish Mosquito Abatement District is here to serve you by reducing mosquitoes and the harmful diseases they spread.

CONTACT THE DISTRICT TODAY!



SERVICE:

Request an inspector to visit your home and evaluate a potential mosquito problem.



UPDATES:

Visit the website for updates on mosquito control activity and events.



PRESENTATIONS:

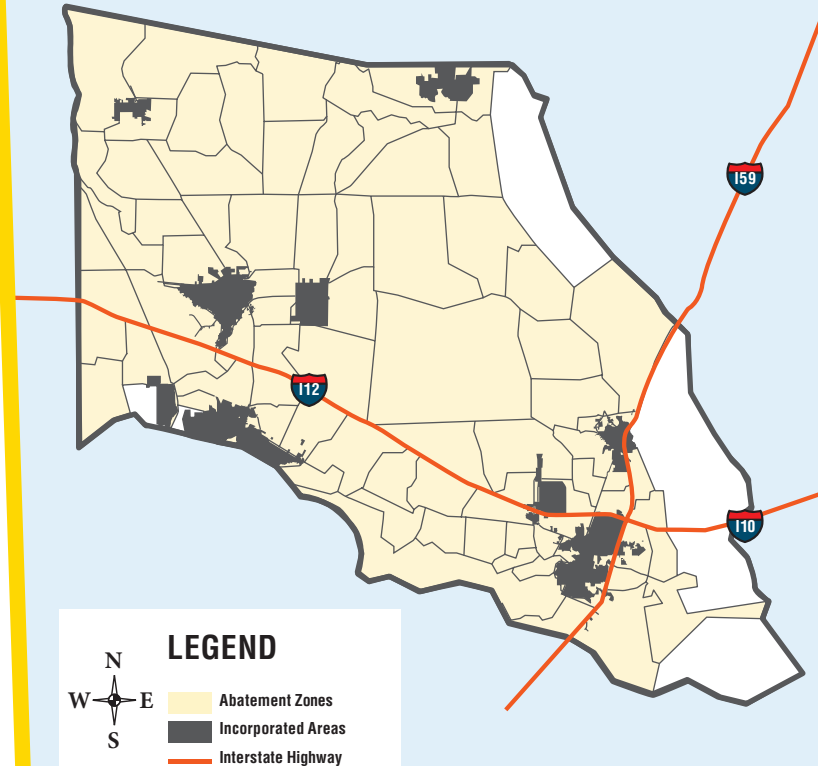
Have a district representative come to your school, home-owners association, church or other community group to give a mosquito talk.



62512 Airport Road, Building 23
Slidell, LA 70460
Web: www.stpmad.org
Phone: 985-643-5050
Email: info@stpmad.org

Service boundaries

St. Tammany Parish Mosquito Abatement District serves all of St. Tammany Parish.



Produced for St. Tammany Parish Mosquito Abatement District
by N&R Publications, www.newsreviewpublications.com