



MOSQUITO CONTROL SERVICES, LLC

**JEFFERSON PARISH
ANNUAL REPORT
2019**

The following is a report to the Jefferson Parish Council on its mosquito control program for the period of January through December, 2019. A detailed report of the yearly activities follows this narrative.

Climatic conditions consisting of cooler seasonal temperatures and minimal rainfall during the first portion of the year translated into numbers of springtime mosquitoes that were somewhat lower than those seen during the previous few years. Mosquito populations, however, rebounded during the summer months to mirror that of other years with several peaks after rain events and troughs in response to abatement efforts. This cyclical pattern of flooding rainfall followed by hot dry conditions provided optimal breeding conditions for our aggressive pest mosquitoes. As a response, additional emphasis was placed on larval mosquito abatement in floodwater areas throughout the summer months to further reduce the pest mosquitoes brought on by the seasonal weather. The fall of 2019 was marked by above average temperatures and ample rainfall that extended the mosquito season well into November with several blooms in breeding and adult mosquitoes appearing late in the year. Again, abatement efforts were tailored and augmented to address the conditions and late year peaks. As a whole, the total mosquito numbers observed in 2019 were roughly 15% lower than those observed during the previous year. This occurrence was largely the result of the temperature delay at the beginning of the mosquito season and that our area was not significantly impacted by a major hurricane event during the year.

Except for peaks in the mosquito population observed following smaller storm events, Mosquito Control Services was able to maintain mosquito populations at acceptable levels throughout most of the year. Hatches of mosquitoes were normally all but suppressed after several days. There were periods when adult mosquitoes became a significant problem but through control efforts these populations were reduced in as timely a manner as possible, albeit through considerable effort as outlined in this report:

LARVICIDING

Although this aspect of the mosquito control program may not be noticed by the bulk of the public, larviciding is one of the most critical parts of any mosquito control program. It is simply defined as the use of agents to control the larval or immature mosquitoes. This year, most of these larviciding treatments were “natural” with little or no impact on non-target species. Inspectors used several types of bacteria that when sprayed into water are toxic to immature mosquitoes and, for practical purposes, little harm to other organisms. Crews relocated hundreds to thousands of the native mosquito fish (*Gambusia affinis*) into semi-permanent and permanent water sites low in organic content for the control of larval mosquitoes. These top-feeding fish have a vigorous appetite, each fish can consume more than 250 larvae a day, and are a good means of extended control. Insect growth regulating hormones and surface films were also employed to prevent the immature mosquitoes from becoming adults.

Each of these larviciding methods mentioned has a different mode of action and several of them work by attacking specific stages of larval development. As a result, crews were able to target specific types or stages of larvae with the product best suited for the particular situation. During the 2019 season, inspectors treated more than 41,000,000 square feet of surface water with low impact larvicides. Supplemental control was provided by using herbicides to facilitate drainage. More than 2 million linear feet of roadside ditch were treated to aid control.

Use of larvicides effectively reduces the number of mosquitoes that emerge as adults. It is, however, impossible to address all of the immature mosquitoes prior to emergence. Those mosquitoes that escaped larviciding measures were controlled through spray operations known as adulticiding.

ADULTICIDING

Ground and aerial adulticiding is the control of adult mosquitoes using, truck-mounted, hand-held, ATV mounted or aerial sprayers. During the 2019 season, adult mosquitoes were experienced in quantities approximately fifteen percent lower than that of the previous year. This observance was partly due to cold and unfavorable conditions during the first quarter of the year that delayed mosquito population amplification. Most of the remainder of the mosquito season was as expected with periodic peaks in the population being observed following heavy rains and as a result of the large weather events. A wetter and warmer than normal fall extended the season beyond the fall holidays and caused several late blooms in the adult mosquitoes nearly offsetting the springtime reductions. Several adulticiding methods and variations in frequency were needed to expeditiously address the adult mosquitoes when populations exceeded expected levels.

Truck-mounted sprayers are the part of the program with which people are most familiar. Although it is just one aspect of our integrated pest management program, it is one with visible results. These truck-mounted units are effective in controlling mosquitoes in areas accessible by roadways. This year, truck sprayers treated more than 550,000 acres and covered more than 15,000 linear miles of road.

Twin engine aircraft supplemented ground efforts by treating more than 42,000 acres that were otherwise inaccessible. These sprayers were vital in combating large mosquito hatches due to heavy rain events or for helping to suppress disease mosquito populations.

EXPERIMENTAL PROGRAMS

Testing of the effectiveness of chemicals or efficacy testing was performed on the mosquito control products used during the spray season. Caged mosquitoes were subjected to adulticides in operational conditions in order to test the effectiveness of aerial and truck applied products. Larval chemicals were tested in the field at label rates with pre and post counts defining control. Individual tests were performed on the control products at varying rates. Our lab expanded testing efforts in 2019 examining additional product rates and/or formulations. Eighteen experiments were performed using mosquitoes caught and reared in Jefferson Parish. All operational rates were tested and achieved favorable results in excess of ninety percent mortality.

As part of their tests, our laboratory staff analyzed the effectiveness of mosquito insecticides over time. These bottle bioassay or resistance experiments were performed on our mosquito adulticide products. Adult mosquitoes were introduced into a pesticide-coated bottle and observed over specific time intervals until all mosquitoes had died. A graph of mortality was produced for each adulticide tested. These graphs were compared to the graphs of past years and used to help guide our staff in operational product selection and rotation.

ENCEPHALITIS SURVEILLANCE

During the 2019 season, gravid adult mosquitoes and sentinel flocks of chickens were again used as indicators of encephalitis activity. Since several of our mosquito-borne encephalitis diseases cycles involve birds, they often appear in the chicken population prior to humans or other animals. For this reason, representative chicken flocks were maintained in 22 locations throughout the Parish. Three birds were placed in each flock and blood samples were taken every week from June through October. Flocks were sampled in a staggered pattern to provide more uniform coverage. The Arboviral Division of the Florida State Health Laboratory confirmed all resultant samples. Adult mosquitoes that had already taken a blood meal were also collected each week from January through December. These mosquitoes were also sent to the LSU Animal Disease Diagnostic Laboratory and tested for several types of encephalitis. Any encephalitis follow-up mosquito samples were retained and tested in our laboratory for quicker results. Upon receipt of any positive indications, the control measures outlined in the expanded virus protocol were initiated.

This year, as in the past, West Nile Virus Encephalitis (WNV) was the most common type found with Eastern Equine Encephalitis (EEE) and St Louis Encephalitis (SLE) appearing in certain regions. Total human cases of encephalitis across the nation were much lower than epidemic years, but cases of Eastern Equine Encephalitis were significantly higher than anticipated. Most of the Eastern Equine activity was outside Louisiana being observed in Florida, the Northeast and in the Midwest. West Nile Encephalitis disease activity was approximately 20% that of peak years with 626 people infected resulting in 54 deaths. The highest numbers of cases were

experienced in California and Arizona with 225 cases occurring in California and 174 in Arizona. In our State, encephalitis activity in humans was roughly half the amount seen in previous years. Positive bird and mosquito sample activity was also lower than that of the previous few years. Louisiana observed 20 human WNV cases and two of them resulted in fatalities. Jefferson Parish observed no human cases and saw light encephalitis presence in birds and mosquitoes. Ten events were initiated due to mosquito-borne disease activity. Our encephalitis suppression protocol was initiated upon receipt of each positive confirmation.

PUBLIC EDUCATION

It is the goal of our public education program to help the parish residents identify and eliminate breeding sites in their own backyards. Again, as in previous years, several different methods were employed in order to reach a wide number of people. Although each of our staff members takes an active role in the education of the parish residents, several individuals on our staff specialize in the field of Biological Education. Through the use of interactive PowerPoint presentations, we have been able to more effectively convey material to schools, civic associations, network television/radio, and general meetings. We have used this technology to increase public awareness of mosquitoes, their breeding sites, and the diseases they transmit. More than thirty presentations were made during the year reaching out to more than a thousand students and adults.

Additional education was provided by radio public service announcements encouraging people to take precautions when exposed to mosquito biting times and to eliminate potential mosquito harborage and breeding sites around their home. Many of these PSA's were used just prior to the peak of encephalitis season in August. Our crews further spread the message by using door-to-door distribution of pamphlets during the encephalitis season. The staff used these distributions as an opportunity to visually inspect the yards of residents for any obvious mosquito breeding. These inspections with literature distribution proved to be very effective as many people were educated first-hand on potential mosquito problems.

Sincerely,

Steven Pavlovich
Entomologist