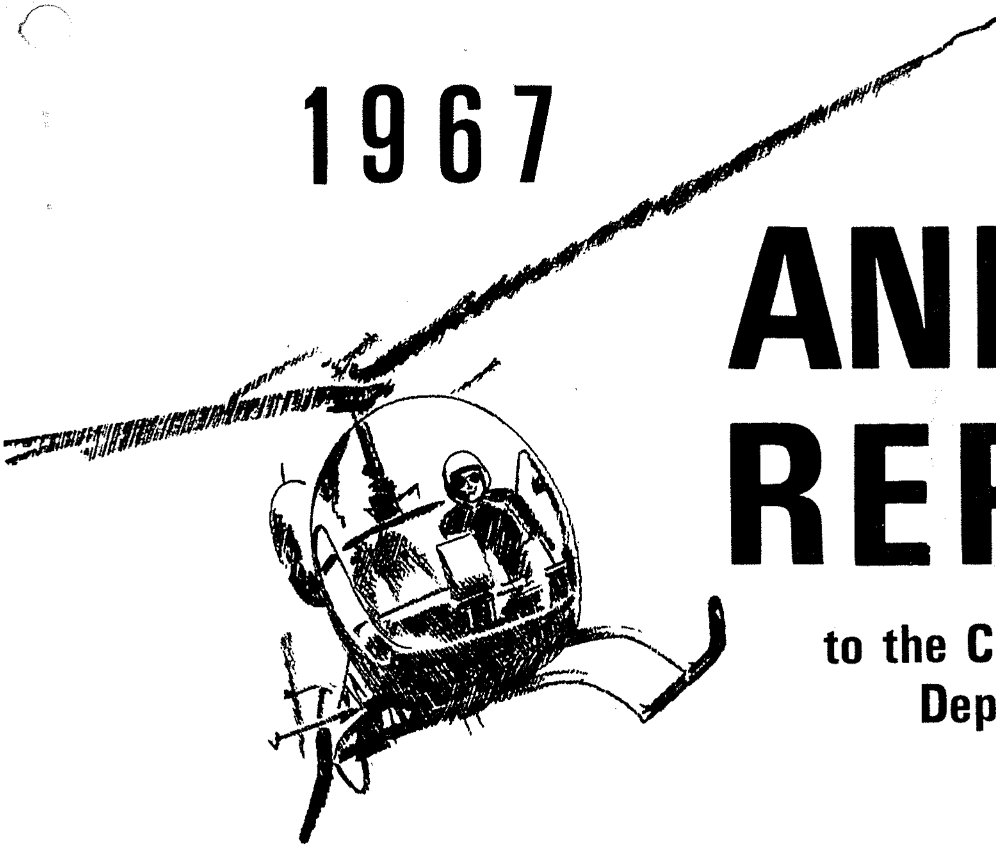
1967

ANNUAL REPORT

to the City of New Orleans
Department of Health



from the division of

MOSQUITO CONTROL

CITY OF NEW ORLEANS · DEPARTMENT OF HEALTH
NEW ORLEANS, LOUISIANA 70126
DIVISION OF

Mosquito Control

GEORGE T. CARMICHAEL, ADMINISTRATIVE DIRECTOR
6601 LAKESHORE DRIVE, ON THE AIRPORT 241-2370

Annual Report

1967

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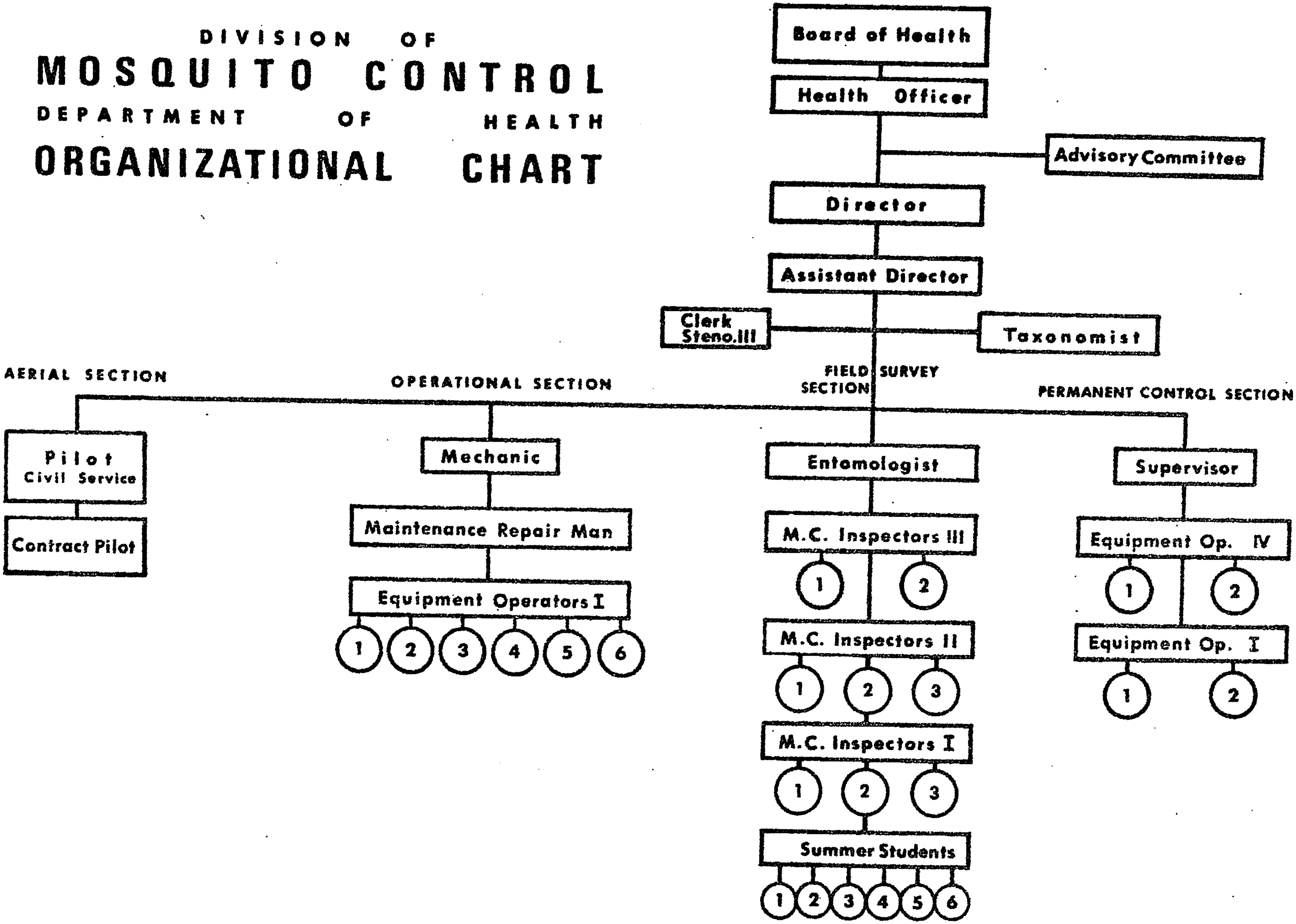


ANNUAL REPORT - 1967

The highlight of 1967 would have to be the occupation of the new headquarters and operational building at 6601 Lakeshore Drive. This building was completed the latter part of 1966, and the staff and operation moved into the new headquarters the first of January 1967. The quarters consist of an administration building with laboratories and an 80' x 80' operational building to house the shop and operational phase of the control program. The architectural design and construction of the building was extremely good, and the efficiency of the program is reflected by the surroundings of the new building. The landscaping around the headquarters building was performed as a courtesy by the Park and Parkway Commission of the City. A dedication was held on the 30th of June, at which time approximately 100 guests were present. The Mayor and the President of the Orleans Levee Board both made talks at the dedication services.

An Encehpalitis Surveillance Program was designed for the Metropolitan New Orleans Area and presented to the State Board of Health for their acceptance and recommendations. The Program was put into effect the first of March and provided an excellent surveillance for the presence of encephalitis virus in the New Orleans area throughout the summer months. This is one of the most complete surveillance programs protecting any city in the U. S. A complete detail of this Program is included in the report.

Of great assistance to the control program throughout the year was the installation of a 2-way radio system with call letters KGL-590, connecting the Mosquito Control Headquarters and the Health Department in City Hall. Mobile radios are installed in three administrative vehicles and a total of seven portable systems are available for use when and where needed. Twenty vehicles have lock type racks and high gain antennas installed so that the portable system can be used in these vehicles. This allows for the radio to be used several times in a 24-hour period in different vehicles.

The C-47 airplane obtained during 1966 from the U. S. Air Force through the Louisiana Surplus Property Agency was completely painted in the orange and white colors of the Mosquito Control equipment. A spray system was installed in the aircraft with the material for the system being supplied by the California Chemical Company. The system was designed so that applications down to one-half ounce per acre would be possible. This system was evaluated several times during the year with test flights to determine swath, particle size, etc. This system, we feel, will be a valuable tool in our program in the future. Also, an ultra low volume spray system was evaluated from time to time throughout the year. The evaluation of these systems supplemented the normal use of our aircraft for larviciding and adulticiding.

The evaluation of a low volume larviciding oil (Flit MLO), manufactured by the Humble Oil Company, was conducted during the summer months of 1967. This larviciding oil, which has a detrimental effect on all stages of mosquitoes, from eggs through adult, was used in many test plots throughout the year. By fall, this material was receiving routine usage in our control program.

The permanent control program got under way during 1967 with the delivery of our first amphibious dragline. A 3/8-yard Little Giant dragline with a 1/2 cu.yd. bucket was mounted on amphibious tanks by the Quality Marsh Equipment Company and delivered in mid-summer. The dragline was put into use in the most prolific breeding areas.

An unfortunate accident occurred on June 29, when a car collided with a truck on U. S. Highway 90 east of the City of New Orleans. Actress Jayne Mansfield and two male companions were killed in the accident. A Mosquito Control fogging truck was in the vicinity at the time of the accident, and it was erroneously reported throughout the nation that the Mosquito Control fogging truck was involved in the accident.

The month of August, when a heavy density of salt marsh mosquitoes can be expected to occur in several parts of the Parish, was selected as the month ot evaluate control techniques used in our program. An evaluation can best be conducted when a larger density of mosquitoes is available. The results of our evaluation were most gratifying and revealed an extremely high percentage of mosquitoes being killed by each technique used.

A Domestic Mosquito Control Program was started for the first time during 1967, in which an established program for Culex mosquitoes would be evaluated throughout the year. This program was centered around the activity in both Audubon Park and City Park, and progress to date on this program has been most satisfactory.

The Mosquito Control Program received excellent coverage by both newspapers and television stations throughout 1967. Monthly news articles in the paper kept the public informed of our activities and an editorial in the newspapers in mid-summer was extremely complimentary to the control efforts. WWL-TV Channel 4 also has a TV editorial complimentary to Mosquito Control, as well as a two-part report to the people on mosquito control. This report covered about seven minutes each evening on two consecutive days following the news, and gave the public complete news coverage of the activities of our program.

The first six months of 1967 produced a below-normal rainfall for almost each month, and a gradual drought condition prevailed throughout the entire New Orleans area during this time. This produced many conditions which proved to be most undesirable from a mosquito control standpoint. The drought lowered the water table in the marshes and provided hundreds of additional acres for oviposition by the mosquitoes. Drought conditions were broken during the latter part of June, and throughout the remainder of the year rainfall was above normal. The over-all rainfall for the entire year was exactly normal, or approximately 60 inches of rain. These conditions produced eight separate broods of salt marsh mosquitoes, which were reflected in our adult density survey. The control program for the year was considered satisfactory since very few of these mosquitoes were allowed to reach populated areas. This, we term, a successful control year.

A detailed report of each activity of the Mosquito Control Program is included for your study.

Respectfully submitted,

George T. Carmichael

George T. Carmichael
Mosquito Control Administrator

GENERAL ENTOMOLOGICAL REPORT

The mosquito is an insect known to undergo complete metamorphosis, i.e., it undergoes transformation from egg to larvae, to pupae, to adult. Of these four, it is the larval stage that provides the mosquito's heel of Achilles. Since this stage is most susceptible to toxic chemical action and since the multitudes that comprise the mosquito breed are concentrated in the breeding area during this time, it is well suited for control measures.

Flood water mosquitoes, such as *Aedes sollicitans*, usually remain as larvae for about four days during the summer months. Since not only the exact location but also the extent and density of each brood must be defined before treatment can ensue, time becomes our most precious commodity.

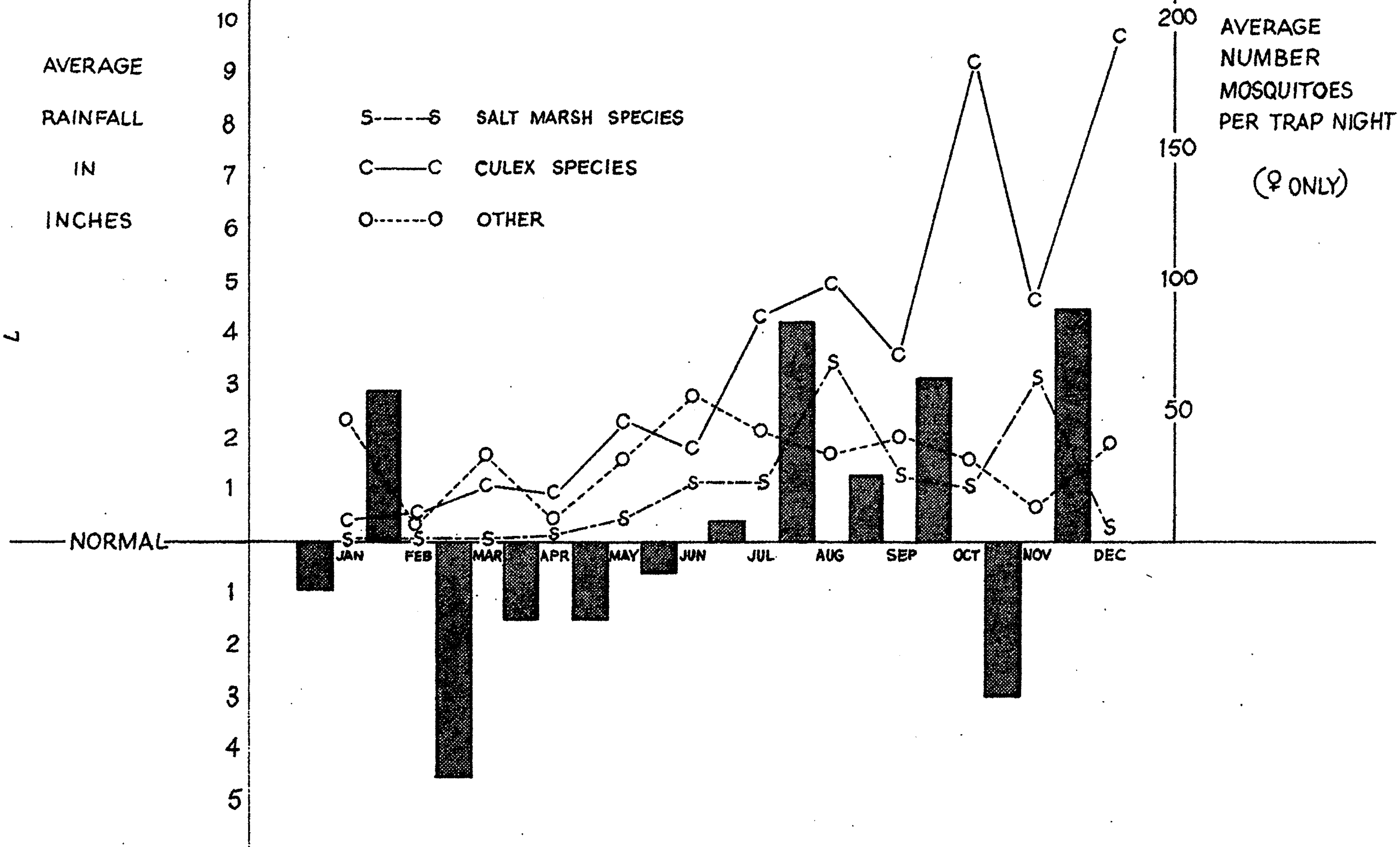
The direct effect of rainfall on mosquito production is illustrated in Figure I. Mosquito densitites as measured by the average number of adults captured per trap night are plotted along with average rainfall for 1967. Mosquito density remained rather low during the early months of the year as rainfall was below normal (February indicates above normal rainfall; however, nearly the entire month's recipitation occurred on one day). As precipitation approached normal and more breeding became flooded, mosquito production increased.

Thus, locating mosquito broods is directed by rainfall patterns. In order to determine rainfall patterns, 60 rain gauges located in strategic locations throughout the Parish are operated by private citizens. Rainfall in excess of 0.5 inch is reported by telephone, thus areas of heaviest rainfall are quickly established. With the limited time allowed in locating and treating mosquito larvae, the inspection of known and/or susptected breeding areas within a given rainfall pattern are given priority.

Aircraft are used in the inspection of marshland within the rainfall pattern. A fixed-wing aircraft is first sent to establish which of the known or suspected breeding areas have flooded. This information is relayed to an inspection team utilizing a helicopter equipped with floats. This team collects specimens for laboratory identification, determination of brood density, and recommends appropriate control measures. Using this technique, vast acreages may be inspected in a matter of hours while using a minimum of manpower. In 1967 fixed-wing aircraft were used in inspection for a total of 40 hours; helicopter inspection accounted for 39.9 hours. The use of fixed-wing aircraft substantially reduces the cost of marsh inspection by dictating the assignments of the more costly helicopter.

FIGURE I

THE AVERAGE NUMBER OF ADULT FEMALE MOSQUITOES OF VARIOUS SPECIES COLLECTED PER TRAP NIGHT IN RELATION TO AVERAGE RAINFALL IN INCHES ABOVE AND BELOW NORMAL. ORLEANS PARISH, LOUISIANA, 1967.



Inspection of urban areas is likewise guided by rainfall. Here the inspector is directed to pre-determined breeding sites as indicated on aerial photographs. Each breeding site has an assigned code number. Using these code numbers, the inspector is able to direct larviciding crews to any given site that requires treatment, and continue his inspection assignment without interruption. The mapping and inspecting of such sites account for nearly 4,000 man-hours and required more than 12,000 miles of travel during 1967.

In order to further increase inspection efficiency, the Parish was divided into five topographically similar areas. One biologist or inspector was assigned to each of these areas. It became his responsibility to become thoroughly familiar with all breeding sites within his area, to know which sites might be regarded as indicative of conditions prevailing in nearby breeding sites, and to report any changes occurring that might affect mosquito breeding. In general, his extensive knowledge of the breeding sites within his area led to faster, more efficient handling of broods.

The actual treating of larvae was attached with both ground and aerial equipment. Diesel fuel formulated with Triton X-45 was applied with the Division's two 260-gallon larviciding rigs. These trucks delivered in excess of 2,700 gallons of diesel larvicide to breeding areas. Aerial larviciding, as might be expected, carried the brunt of larviciding. While attacking any single brood, the Division's Pawnee destroyed more mosquitoes in one day than the average man is likely to see in a lifetime. In 19 days of treatment, nearly 27 tons of 7.5% Paris green pellets were distributed at the rate of 15 pounds per acre.

In addition to the use of conventional larviciding chemicals, Paris green for aerial and diesel fuel for ground larviciding, the Division participated in the testing and utilization of a new larviciding oil known as Flit MLO. Because this material is effective at a rate of 4 gallons per acre as compared to 10 gallons per acre of diesel, new avenues of application were possible. More than 7,000 gallons of the new material was applied aerially in combatting larvae. This represents the first use of an oil as an aerial larvicide; results were most gratifying.

The advantage of a low volume oil larvicide were realized also in the use of ground equipment. Two portable larviciding rigs were constructed using only a 55-gallon drum as a storage tank to provide sufficient material for an entire day of treatment. Each rig is entirely self-contained and may be positioned in any service vehicle in a matter of minutes, thus eliminating the need for a specialized truck. When larviciding activities are not in progress, the rig is removed and the truck freed for other duties. There is also a weight advantage to be gained in that the lighter load enables the vehicle to negotiate areas denied the heavier specialized larviciding rigs.

The success of Flit prompted the further testing of diesel as an aerial larvicide. Formulation ratios of diesel to Triton X-45 was altered (2 quarts of Triton x-45 per 100 gallons diesel oil), and the material applied at 2-4 gallons per acre. Preliminary results were most promising, yielding upwards of 85% control in some cases. More than 9,000 gallons of the new diesel fuel formulation was applied to breeding areas. This new formulation, as well as Flit, will be subject to additional tests in 1968.

While control efforts are most advantageous when the mosquito is still in its larval stages, it is not possible to contain an entire brood before adult emergence. Various factors prevent this, such as time, size of brood, etc. Occasionally, it is even advisable to allow adult emergence. This is especially true in the case of permanent water breeders, which are often found in low concentrations over a vast area of marshland.

The control of adult mosquitoes must be handled in much the same way as that of the larval form, that is, control measures must be directed to areas of highest adult concentration. In order to obtain this information, various techniques are employed, including light traps, landing rates, and truck traps.

Twenty-five New Jersey light traps were operated 2,320 trap nights to collect more than 273,000 adult female mosquitoes for an average of 118 mosquitoes per trap night. Table I shows the number and percentage of each species collected per trap night for the entire year. Flood water mosquitoes, such as _A. sollicitans_ and _A. vexans_ against which most larval control activities were directed, comprised but 13.5% and 7.7% of the collections, respectively. _Culex salinarius_, a permanent water mosquito which breeds throughout the entire year, accounted for 61.5% of the total catch. In general, owing to its breeding habits, it is more feasible to control _C. salinarius_ in its adult stage. This, coupled with the fact that it breeds throughout the year, accounts for its dominance in light trap collections.

Table II shows the average number of adult female mosquitoes collected per trap night in each of the six zones of the Parish. These zones are illustrated in Figure II. As indicated, the South and North Central Zones contained the least number of mosquitoes throughout the year. Within these two zones are concentrated the bulk of the population. The highest mosquito densities were recorded in the South Shore-Michoud and Chef Menteur-Lake St.Catherine Zones, which are relatively unpopulated.

Information obtained from light traps was augmented with landing rate counts. These counts, numbering more than 23,000, were taken twice a week on the same days light trap catches were col-

ZONES: ALGIERS - (blank) · S. CENTRAL - (diagonal hatch) · N. CENTRAL - (reverse diagonal hatch) · EASTERN - (vertical lines) · SO. SHORES, MICHOUD - (horizontal lines) · CHEF, L. ST. CATHERINE - (dots)

DATE 1967

TABLE I

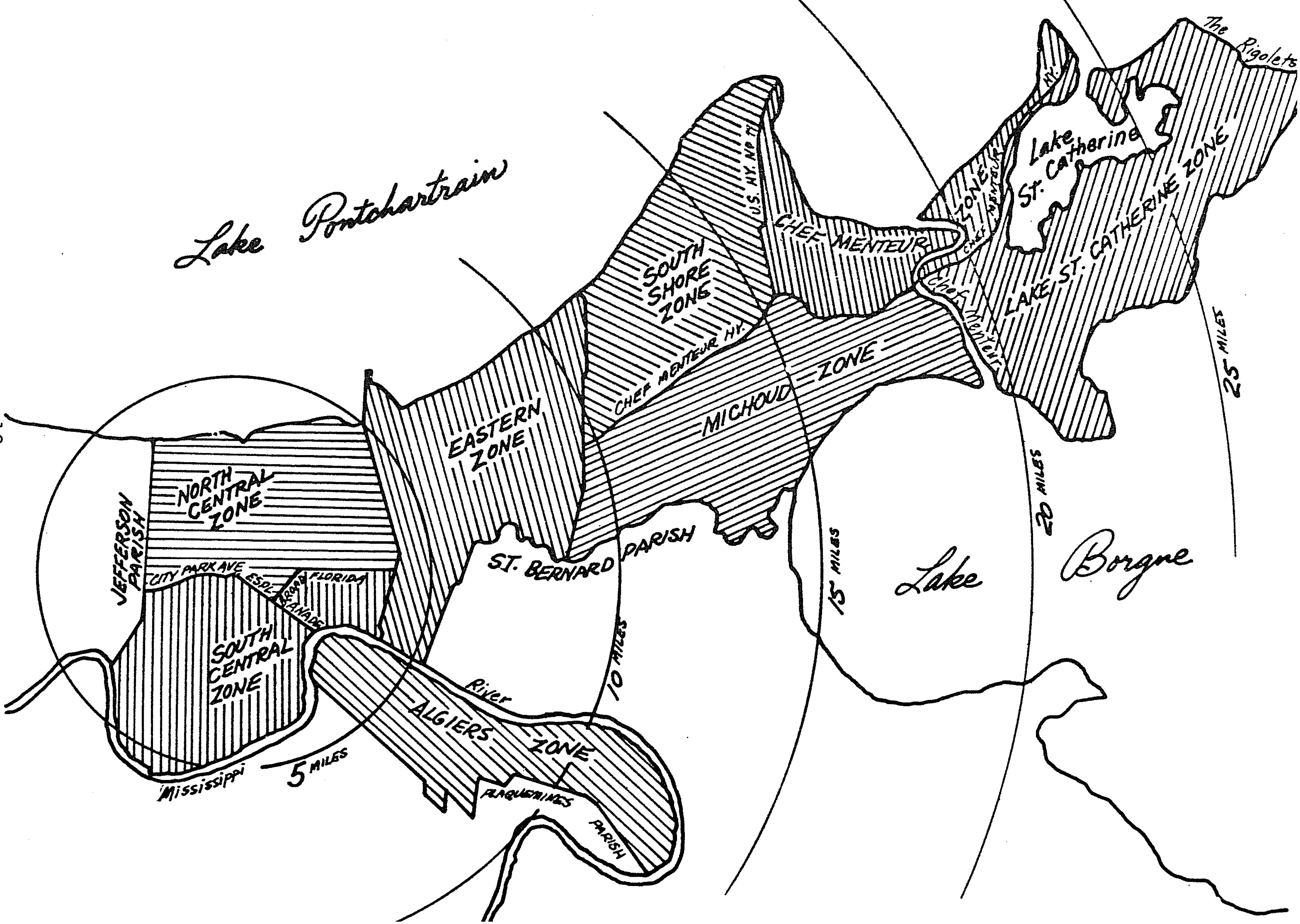
	TOTAL		AEDES		ANOPHELES		CULEX		CULIS.	MANS.	PSOR.	OTHER	OTHER	OTHER	OTHER	NO
	MALE	FEMALE	SOLL.	VEX.	CRUC.	QUAD.	QUINQ.	SAL.	INOR.	PERT.	CONF.	SPP.	SPP. AN.a.	SPP. A.taen	SPP.	COL
1. LOWER ALGIERS	671	8,411	10/1062	119/614	9/336	2/190	9/162	517/5683	2/217	0/14	1/40	1/55	1/17	0/21		11
2. MIDDLE ALGIERS	214	4,602	0/102	80/1086	1/71	2/19	0/1	122/3149	4/141	1/4	0/8	3/16	1/1	0/4		9
3. UPPER ALGIERS	246	1,111	1/38	175/527	3/13	0/8	0/23	65/427	1/49	0/3	1/10	0/12		0/1		9
4. CAFFIN AVE	62	234	0/10	14/82	2/8			45/118	1/10	0/1		0/2		0/3		7
5. VIEUX CARRÉ	119	235	0/10	34/53	2/9	0/1		77/124	5/31	0/1	1/0	0/5		0/1		10
6. IRISH CHANNEL	245	414	2/1	60/148	0/14	1/3	0/3	178/206	1/10	2/17	0/1	1/11				10
7. NAPOLEON	190	779	0/13	63/389	1/29	1/3		123/271	0/38	0/19	0/2	2/14	0/1			9
8. AUDUBON	60	106	1/3	22/51	2/6	1/2		32/20	0/3	0/19		2/2				9
9. CITY PARK	172	1,119	0/54	36/451	0/14		0/1	125/522	3/26	0/4	7/38	1/7		0/2		8
10. LAKEWOOD	168	645	0/20	36/361	1/6	3/6		128/210	0/25	0/6	0/6	0/2		0/3		9
11. WEST END	214	1,338	1/143	91/582	1/20	0/8		121/464	0/58	0/5	0/42	0/9	0/1	0/6		8
12. LSUNO	469	2,082	1/41	153/1122	3/35	2/10	1/9	302/751	6/95	0/4	0/3	1/11		0/1		10
13. PEOPLES AVE.	380	3,459	4/63	66/1163	5/155	0/4		296/1887	8/163	0/4	0/10	1/9		0/1		7
14. EADS	138	565	0/11	34/292	1/19	2/2	3/4	96/210	0/13	0/3	0/2	2/5		0/4		9
15. GENTILLY E.	90	523	2/97	19/165	4/40	0/6	3/4	58/180	0/8	0/1	1/5	2/9	1/2	0/6		7
16. LAKEFRONT AIRP.	884	3,240	1/59	404/1431	16/92	4/24		403/1426	45/151	0/4	2/15	8/18	0/5	1/15		10
17. LITTLE WOODS	1047	15,437	11/1116	75/1932	72/1162	1/82	0/3	879/10 635	4/184	0/26	1/60	4/120	0/5	0/112		10
18. VILLAGE DE L'EST	118	5,452	13/492	17/1830	1/118	1/23	0/1	70/2749	5/125	0/5	0/31	6/48	4/18	1/12		9
19. BIENVENUE	1142	12,466	17/2440	84/1308	109/1928	13/181	11/8	861/6191	5/273	0/12	0/14	40/60	0/7	2/44		10
20. MICHOUD	2071	50,198	6/5570	282/5371	199/8486	5/592	270/970	1194/26 632	28/396	2/105	10/69	50/1586	9/125	16/296		10
21. POWERS JCT.	841	39,794	33/4749	13/1014	43/4863	8/296	0/8	654/27371	61/471	0/291	4/131	25/269	0/246	0/85		9
22. SOUTH SHORE	2872	34,778	59/3144	34/218	571/2645	4/23	0/1	2162/28108	41/315	0/56	0/16	1/39	0/150	0/68		9
23. CHEF MENTEUR	1360	20,907	76/1611	27/470	123/4534	0/19		1127/13709	2/176	1/9	0/10	2/42	0/217	2/110		8
24. GREENS DITCH	2132	50,791	69/14289	26/376	351/3815	0/179	0/1	1622/27452	30/1485	0/31	4/22	1/60	20/2625	9/456		8
25. RIGOLETS	790	14,751	144/1796	7/136	80/1905	3/23		540/9863	11/361	0/1	0/36	3/12	2/580	0/38		8
TOTAL	16,695	273,437	451/36,934	1971/21,172	1600/30,323	53/1,704	297/1,199	11,797/168,353	263/4,824	6/645	32/571	156/2,423	38/4000	31/1289		232
PERCENT ♀																

TABLE II - Average number of adult females collected per trap night per zone, Orleans Parish, Louisiana, 1967

Zone	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total 1967
	Number Collections/Average												
Algiers	25/ 8	23/ 8	27/ 4	24/ 16	25/ 55	24/ 83	20/ 133	26/ 110	22/ 76	25/ 40	22/ 23	26/ 44	289/ 49
S.Central	37/ 1	40/ 2	42/ 1	39/ 2	41/ 8	42/ 5	36/ 4	36/ 5	39/ 5	34/ 7	38/ 4	43/ 3	467/ 4
N.Central	49/ 3	46/ 3	50/ 5	36/ 9	42/ 29	47/ 27	41/ 27	50/ 29	47/ 26	46/ 27	40/ 14	44/ 9	538/ 17
Eastern	57/ 6	30/ 10	29/ 10	30/ 12	33/ 65	23/ 89	23/ 107	31/ 128	35/ 149	35/ 124	29/ 31	34/ 64	389/ 63
S. Shore-Michoud	33/ 17	30/ 30	35/ 102	36/ 80	28/ 193	35/ 373	29/ 466	35/ 512	31/ 490	36/ 733	31/ 303	36/ 791	395/ 347
Chef Ment.-L.St.Cath.	18/ 46	23/ 80	21/ 86	20/ 86	23/ 234	22/ 197	19/ 528	19/ 773	22/ 275	22/ 557	23/ 391	27/ 671	259/ 334
Predominant Species	A 54% C 35%	A 53% C 21% D 21%	A 87% D 9%	A 54% B 19%	A 68% E 11%	A 33% B 24%	A 46% E 24%	A 46% E 33%	A 44% E 19%	A 82% D 9%	A 80% D 8%	A 82% D 10%	

A - *Culex salinarius*
B - *Aedes vexans*
C - *Culiseta inornata*
D - *Anopheles crucians*
E - *Aedes sollicitans*

Fig. II **MOSQUITO SURVEY AREAS ORLEANS PARISH, LOUISIANA**



lected. Travel involved in obtaining light trap and landing rate information accounted for 19,596 miles, nearly the distance traveled in circumnavigating the equator.

Adult density information was also gathered through the use of truck traps during the latter part of the season. Seventy-nine truck trap runs, each averaging approximately 6 miles in length, were made in 1967, with an average of 70.5 adult female mosquitoes collected per run.

Guided by adult density information obtained through the various techniques, adulticiding operations were carried out by means of thermal fog ground units, as well as conventional and ultra low volume spray from aircraft. These operations are discussed in detail later in this report. The success of these control measures is clearly indicated in a comparison of the average number of adult female mosquitoes collected per trap night per zone for 1966 and 1967. The four most heavily populated zones, Algiers, South Central, North Central, and Eastern, showed a 45% reduction in mosquitoes in 1967.

With regard to the problem presented by the breeding habits of C. salinarius, a rather unusual phenomenon was observed in 1967. Extremely high densities of this species were discovered associated with a particular type of vegetation. These observations were made late in the year when only the autumnal form of the plants was available, thus identification was not possible. The situation was repeatedly encountered, and is the only instance thus far known to us of concentrated breeding of this species. We have for some time tried to account for the large quantities of this species encountered in light traps. Larvae may be collected from vast areas, but only in low concentrations, and did not seem to account for the population of adults. The high densities of C. salinarius recently discovered may furnish a break-through in the control of this species since high concentrations in a relatively limited area afford ideal control conditions. The ecology associated with these breeding sites will be studied more closely in 1968.

Respectfully submitted,

Wayne C. Machado

Wayne C. Machado
Assistant Mosquito
Control Administrator

DOMESTIC MOSQUITO CONTROL REPORT

Establishment of an inspection method must be the first step to a good domestic mosquito control program. To facilitate inspection, the Parish was divided into sections that enabled us to label and record the suspicious areas that were found. Some of the existing boundaries of the Parish were used and the remainder were conjured by us. Each area was given a different capital letter of the alphabet as a convenient and workable designation. From this point, a street to street inspection was conducted by the personnel of Orleans Parish Mosquito Control. Every ditch, swale, pothole, or potential breeding area was recorded and a permanent record was made of each one. Repeated visits to these suspicious areas resulted in elimination or establishment of a positive breeding focus that must be inspected and treated on a regular schedule. Because of the prolific nature of our most important domestic mosquito, Culex quinquefasciatus, these breeding grounds are visited every two weeks, checked for mosquito larvae, and treated if necessary.

These established breeding areas serve as a focal point for locating our resting stations. Resting stations are dark, damp, hide-aways that the adult mosquitoes utilize during the day. We locate these resting stations as close to the known breeding area as possible because the range of "quinqs" is limited to a few blocks. Resting stations serve as a source of live adult mosquitoes to be tested for arbovirus activity. During the summer months these resting stations are visited every two weeks. In addition to the above mentioned use, these resting stations are also a first-hand method of determining concentrations of adult mosquitoes that are not attracted to our light traps.

While in the process of evaluating Humble's new Flit Larviciding Oil, we discovered a constant harborage of mosquito larvae. In years past, before underground drainage was installed, ditches were the only means of draining excess rain water. That section of the City designated H (St. Charles Avenue to the River and Louisiana Avenue to the Greater New Orleans Expressway) still has an abundance of these open ditches in use. In order to allow pedestrian traffic to cross these ditches, culverts were installed on the corners. These culverts were buried at the level of the ditches, but with use they sank below the level of the bottom of the ditches. These culverts were found to hold water and breed mosquitoes long after the ditches had dried. Our portable power sprayers are used to cast the larviciding oil into these culverts, thus giving us control where previously these larvae were allowed to continue their normal life cycle. Treatment of artificial container breeding has been enhanced by a small, portable mist blower that allows us to treat large areas without actually going to each individual container.

Larviciding with oil or chemicals is not always the answer for killing mosquito larvae. A graphic illustration of this can be found in a chemical production plant located near Audubon Park. Waste water is a by-product of their chemical production, buried culverts carry this waste from inside the plant out to the open drainage ditches. Treatment of these open ditches can only result in a 50% kill, half of the breeding area cannot be reached because the water is enclosed in the buried culverts. In this case, mechanical control by complete flushing is the only practical treatment. We are, at present, negotiating with the officials of the chemical plant to secure an agreement to flush their ditching system every 14 days during the summer months.

Another step forward for our urban anti-mosquito program took place in September of this year. Mosquito Control's Director, the Audubon Park Commission, and the Superintendent of Audubon Park combined their abilities and came up with a helping hand for our urban mosquito control program. Through the cooperation of the Park officials, one of the Park's employees was assigned to us for training in mosquito breeding detection and control. A complete survey of Audubon Park was conducted by their representative and the personnel of Orleans Parish Mosquito Control, and it was found that most of the breeding could be controlled through mechanical methods. By increasing the water flow in the animal drinking troughs, most of the mosquito breeding inside the zoo was eliminated. To combat the breeding areas that could not be controlled by mechanical means, we have supplied the Park with larviciding oil to treat the breeding areas when they are found to contain mosquito larvae. Dippers and vials to collect and hold the mosquito larvae for our lab to identify will also be supplied. Included as a regular inspection will be checking the restrooms for resting adult mosquitoes. Audubon Park owns a portable fogging machine and Mosquito Control will supply the fog mix necessary to fog the restrooms when high concentrations are found. Large areas of water found breeding will be stocked with predacious minnows.

A new system of labeling ditches that are breeding is of special interest. Each square block in every area will be designated with a number. In the H area, where over 42% of our domestic work takes place, labeling the ditches that breed has been a problem. A simple two number system will enable a man to locate the exact breeding area and treat without the complication of a confusing, ever-changing lettering system. This is an improvement suggested and developed by our inspectors. Such valuable suggestions are welcomed, and we look forward to more of the same in the future.

Respectfully submitted,

Edgar S. Bordes, Jr.

Edgar S. Bordes, Jr.
Entomologist

FOGGING OPERATIONS REPORT

The fogging operations during 1967 showed an increase of approximately 15% over the 1966 operation. This increase in operations can be attributed to two factors. The first is the Sagamo tachographs which were installed in all seven of the fog-trucks. These units record the exact number of miles fogged as well as the distance to and from the fogging areas. The vehicle speed during the fogging and the number of stops made by the driver are also recorded. These records are then evaluated and corrections in speed and application rates are made, if necessary. The second factor which helped increase the operation was the new fogging time, from midnight to 7:00 A.M. The effectiveness of the fog is determined by the length of time the fog remains near the ground. The temperatures from midnight to about 7:00 A.M. are the coolest of the day and the fog remains in the cool air next to the ground where it is most effective. Another reason for observing the new fogging time is safety of operation. The vehicular as well as pedestrian traffic at this time is at a minimum.

In the Tifa thermal fog units, a 4% Malathion and diesel oil mixture is used in the adulticide operations. The units are calibrated to deliver 40 gallons of chemical per hour. The trucks are driven at a truck speed of 5 mph and can effectively control the mosquito population within a one-block or 350 foot area along the route of the truck.

The fogging operation began in the outlying areas of the Parish, then as the temperatures increased, the mosquito populations began to move into the City proper, and fogging operations within the populated area of the City also increased. The Eastern Zone received the greatest number of fog-miles, followed by the North Central, the South Central, and the Algiers Zones, in that order.

There were a total of 762 fog-nights in which 86,087 gallons of 4% formulation were utilized.

Weather conditions are an important factor in the fogging operation. For example, fogging operations in winds exceeding 9 mph are ineffective due to a wide scattering of fog particles and limited mosquito activity. Since the fog particles must come in contact with the mosquito to kill it, these two conditions make such a contact remote. Fogging activities are also affected by temperature. There is very little mosquito activity below 60° F.; consequently, there is little chance of a mosquito coming in contact with a fog particle. Therefore, when these two conditions exist, fogging operations become economically impractical.

Man hours	2,969
Hours fogged	1,618.5
Gal. insecticide used	86,087
Gal. gas used	4,416.1
Quarts oil	38.5
Gal. propane	8,270.5
Miles traveled	23,764.8
Acres fogged	183,304
Insecticide cost @ .30/gal.	$25,932.71
Labor cost	$ 6,302.57
Cost of oil & gas	$ 793.22
Cost of propane	$ 931.44
Total cost	$33,959.94

AERIAL REPORT

The aerial section of the Mosquito Control Program participated in the control of both larval and adult mosquitoes. The Division's Pawnee-235 flew a total of 416 hours during 1967. While other materials were tested and eventually put into operational use, Paris green and Malathion remained the staple chemicals throughout the year.

Paris green formulated as a 7.5% mixture was applied at a rate of 15 pounds per acre to approximately 3600 acres. Nearly 54,000 pounds of the material was dispersed in 98 flight hours. One or more flagmen were used to facilitate application whenever possible.

One hundred forty-five hours were required to deliver the 4% Malthion adulticiding formulation. In all, nearly 23,000 gallons of this material was dispersed at the rate of 3 quarts per acre. The month of May accounted for 70 flight hours and more than 5,000 gallons of this formulation, most of which was applied over Village de l'Est and along the Chef Menteur Highway.

In additon to the 4% Malathion formulation used in adult mosquito control, technical Malathion and Dibrom were used in ultra low volume rates. Much testing was accomplished during the year to determine the most effective swath width, particle size, and density. It was decided that the Pawnee could best distribute Malathion at the rate of 3 ounces per acre. A compressed air system was designed for the craft, which utilized more than 697 gallons of technical Malathion.

While some technical Dibrom was used in the Pawnee, the vast majority (173 gallons) was distributed by the Division's C-47. This craft, donated in late 1966 by the U.S.A.F., was refitted with an elaborate spray system and tested during the late summer of 1967. The system, which was designed with safety being paramount, is capable of treating approximately 300 acres per minute at a rate of 1/2 to 1 ounce Dibrom per acre.

A new larviciding technique was also introduced in 1967, aerial application of a larviciding oil. More than 8700 gallons of Flit MLO applied at the rate of 2 to 4 gallons per acre were used in treating mosquito larvae. In addition, approximately 8000 gallons of #2 diesel fuel, formulated with 2 quarts of Triton X-45 per 100 gallons, were dispersed in controlling immature mosquitoes. Results given with both oils were most satisfactory.

467 hours flying @ $7.50/hr.	$ 3,342.50
5 hours flying contract pilot for C-47 @ $25.00/hr.	125.00
395 hours loading or flagging	1,251.00
22,214 gals. 4% Malathion adulticiding spray @ 30¢/gal.	6,664.20
46,100 lbs. Paris green pellets @ 11¢/lb.	5,071.00
173 gals. technical Dibrom @ $25.00/gal.	4,325.00
8,780 gals. Flit MLO @ 40¢/gal.	3,512.00
8,130 gals. diesel/Triton X-45 larviciding formulation @ 12.75¢/gal.	868.00
697 gals. technical Malathion @ $5.40/gal.	3,763.80
	$ 28,922.50

Respectfully submitted,

TERRY HAYES

Terry Hayes
Pilot

ENCEPHALITIS SURVEILLANCE

Several virus diseases which affect the central nervous system of man and cause encephalitis, an inflammation of the brain, are transmitted by mosquitoes. The bird serves as the natural host of the viruses with the mosquito as the principal vector. There are several days in which an infected bird may have active virus in its blood. If a mosquito bites this bird within the time, it may reinfect other birds it bites and continue the cycle. When the number of infected birds reaches approximately 10% of the population, the virus may tend to spill over into the human population. Our Surveillance Program is designed to detect virus activity in our area before it reaches epidemic proportions and break the cycle by intense mosquito control.

In cooperation with the Louisiana State Board of Health, our Mosquito Control's Surveillance Program samples adult mosquitoes and sentinel as well as wild bird bloods. Surveillance began in March and continued through November, with special emphasis in June, when encephalitis infections are most likely to occur. In order of importance, St. Louis Encephalitis (SLE), Eastern Equine Encephalitis (EEE), and Western Equine Encephalitis (WEE) were under surveillance during the year.

Adult mosquito sampling began in March and continued through August. Only suspected important vectors such as *Culex quinquefasciatus*, *C. salinarius*, *Aedes sollicitans*, and *A. vexans* to a lesser degree, were tested for presence of encephalitis virus. These mosquitoes were caught by means of CDC light traps and manual and mechanical aspirators. CDC light traps were operated in six areas of the Parish and supplemented with approximately three pounds of dry ice to insure high yields. The traps were run twice a week every other week during the Program. Aspirators were used for the collection of *C. quinquefasciatus*, the primary vector of St. Louis Encephalitis, in adult mosquito resting areas. All mosquitoes were identified and separated to species to comprise pools of which numbered approxinately 100 individuals. The year accounted for 107 pools which were sent to the State Laboratories for testing. No virus isolations were detected for the year.

Four locations in the Parish were selected for sentinel chicken flocks. One hundred chicks, two to three weeks old, were screened for encephalitis antibodies prior to selection. The four cages contained 10 chickens each and were bled at two week intervals from March through September. A .5 cc blood sample, mixed with .5 cc of standard diluent, was removed from each bird and sent to the Laboratories for testing. All chickens were tagged to maintain individual records. Laboratory results indicated no significant encephalitis virus in the Parish.

Wild birds received the greatest emphasis in the Surveillance Program. A total of 1,517 bloods were taken from 27 locations throughout the Parish. Mist nets, Havahart sparrow traps, and baited walk-in traps were employed for the capturing of birds. The trapping areas were pre-baited with cracked corn for several days before trapping to increase bird activity. One week each month, except for three weeks of June, were used for trapping. All birds were released unharmed after the removal of .5 cc of blood, except for 23 specimens of waterfowl which were taken by shotgun. House sparrows and domestic pigeons, which have been incriminated from past epidemics as the main hosts for St. Louis Encephalitis, were banded to obtain information in future captures. These sparrows and pigeons accounted for 70% of the total birds captured. Table I shows the species and numbers of all birds captured during 1967.

All blood samples were sent to the State Laboratories for Hemagglutination Inhibition (HI) screening for virus antibodies. A 3% to 4% positive HI test for SLE, EEE, and WEE is expected, but not considered significant, since such incidence can be caused by non-specific inhibitors. A 10% HI positive rate is considered significant and may indicate an impending epidemic. Table II shows all positive bird bloods, total birds bled per month, and percentage positive per month. During November a 15.8% positive was recorded, but this per cent was not considered important due to the small number of bloods collected. The blue jay proved to have the highest per cent positive per bird tested. This bird also has recently been incriminated as an infectuous reservoir for St. Louis Encephalitis by the Florida State Board of Health.

Respectfully submitted,

Patrick L. Rieth

Patrick L. Rieth
Biologist

TABLE I

Common Name	Scientific Name	Total No. Collected
1. Blue jay	Cyanocitta cristata	147
2. Blue-winged teal	Anas discors	5
3. Boat-tailed grackle	Cassidix mexicanus	5
4. Bob-white quail	Colinus virginianus	1
5. Brown thrasher	Taxostoma rufum	16
6. Cardinal	Richmondena cardinalis	43
7. Coot	Fulica americana	5
8. Cowbird	Molathrus ater	7
9. Crested flycatcher	Myiarchus crinitus	2
10. Domestic chicken		19
11. Domestic pigeon	Columba livia	133
12. Downy woodpecker	Dendrocopus pubescens	2
13. Hairy woodpecker	Dendrocopus villosus	1
14. House sparrow	Passer domesticus	930
15. Loggerhead shrike	Lanius ludovicianus	2
16. Mallard	Anas platyrhynchos	6
17. Meadow lark	Sturnella magna	2
18. Mockingbird	Mimus polyglottos	30
19. Mottled duck	Anus fulvigula	2
20. Mourning dove	Zenaidura macoura	31
21. Nighthawk	Chordeiles minor	1
22. Orhcard oriole	Icterus spurius	9
23. Pintail	Anas acuta tzitzihoa	1
24. Purple grackle	Quiscalus quiscula	13
25. Purple martin	Pronge subis	1
26. Red-wing blackbird	Agelaius phoeniceus	60
27. Savannah sparrow	Passerculus sandwichensis	1
28. Shoveller	Spatula clypeata	4
29. Starling	Sturnus vulgaris	21
30. Towhee	Pipilo erythrophthalmus	1
31. Tufted titmouse	Parus bicolor	1
32. Whitethroated sparrow	Zonotrichia albicollis	5
33. Wood thrush	Hylocichla mustelina	4
34. Yellow-billed cuckoo	Coccyzus americanus	1
35. Yellow-shafted flicker	Colaptes auratus	5
	Total	1,517

TABLE II

Month	Species	*Sex/ Age**	Virus & Titre			Total birds/ % Positive
			SLE	EEE	WEE	
March	Pigeon	U/I	1:8			101 / 4.0%
	Blue jay	U/M		1:20	1 10	
	Blue jay	U/M		1:10		
	Blue jay	U/M		1:10		
April	House sparrow	F/I		1:80	1:10	214 / 3.2%
	House sparrow	F/I		1:20	1 10	
	House sparrow	F/I		1:40	1:10	
	Cowbird	F/M		1:20		
	House sparrow	U/I		1 40	1:10	
	Downy woodpecker	F/M		1:10		
	Cowbird	F/M		1 80	1:20	
May	House sparrow	F/I		1:20		201 / 2.4%
	House sparrow	F/M		1:20		
	House sparrow	F/I		1:10		
	House sparrow	U/M	1:40			
	House sparrow	U/I		1:40		
June	House sparrow	M/I		1:40		596 / 0.5%
	Blue jay	U/I		1:20		
	Blue jay	U/M			1:20	
July	Pigeon	M/M			1:10	210 / 1.4%
	Red-wing blackbird	M/I	1:10			
	Blue jay	U/I			1:10	
August						81 / 0%
Sept.	Pigeon	M/I		1:10	1:10	95 / 1.1%
October						0 / 0%
November	Blue wing teal	U/U		1:10		19 / 15.8%
	Mallard	M/U			1:10	
	Mallard	F/U			1:10	

* U = Undetermined
F = Female
M = Male

** I = Immature
M = Mature

EXPENDITURES FOR SURVEY OPERATIONS

Light trap operations

2,551 light trap collections	
830 man hours	$ 1,725.49
11,151 miles traveled @ 3¢ per mile	334.53
Cost of light trap collections	2,060.02

Landing rate counts

23,201 landing rate counts made	
652 man hours	1,719.83
8,442 miles traveled @ 3¢ per mile	253.26
Cost of landing rate counts	1,973.09

CDC light trap operation

53 light trap collections	
176 man hours	665.27
2,101 miles traveled @ 3¢ per mile	63.03
Cost of light trap collections	728.30

Identification of mosquitoes

302,378 mosquitoes identified	
366 man hours	909.01
Cost of mosquito identification	909.01

Mapping and field survey

3,915 man hours	9,263.69
12,289 miles traveled @ 3¢ per mile	368.67
49.1 hrs. airplane rental for inspection	602.85
Cost of mapping and field survey	10,235.21

Ground larvicide

1,365 man hours	3,352.27
5,816 miles traveled @ 3¢ per mile	174.48
2,772 gal. #2 diesel oil @ 10¢ per gallon	277.20
625 gals. Flit @ 40¢ per gallon	250.00
Cost of ground larviciding	4,053.95

Rain gauge maintenance

None

Catch basin inspection

None

Truck trap operation

79 runs made		
38 man hours		97.91
598 miles traveled @ 3¢ per mile		17.94
Mosquitoes collected - females	2,812	
males	272	
Average female catch per run	90.7	
Cost of truck trap operation		115.85

Light trap maintenance

102 man hours	229.50
459 miles traveled @ 3¢ per mile	13.77
Cost of light trap maintenance	243.27

Resting stations

334 man hours	818.32
1,312 miles traveled @ 3¢ per mile	39.36
Cost of resting stations	857.68

Bird blood sampling/encephalitis surveillance

1,517 wild bird blood samples	
560 sentinel chicken blood samples	
1,381 man hours	3,889.57
3,003 miles traveled @ 3¢ per mile	90.09
Cost of bird blood sampling	3,979.66

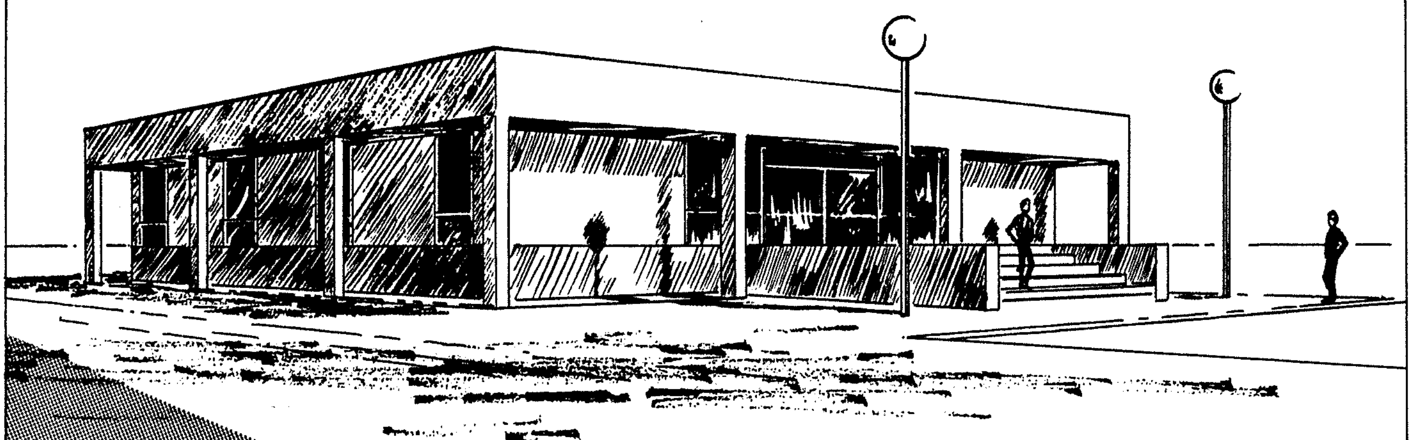
General office work

7,070 man hours	19,761.81
229 miles traveled @ 3¢ per mile	6.87
Cost of general office work	19,768.68

ANNUAL REPORT

to the

CITY of NEW ORLEANS
DEPARTMENT of HEALTH



by the DIVISION OF MOSQUITO CONTROL

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