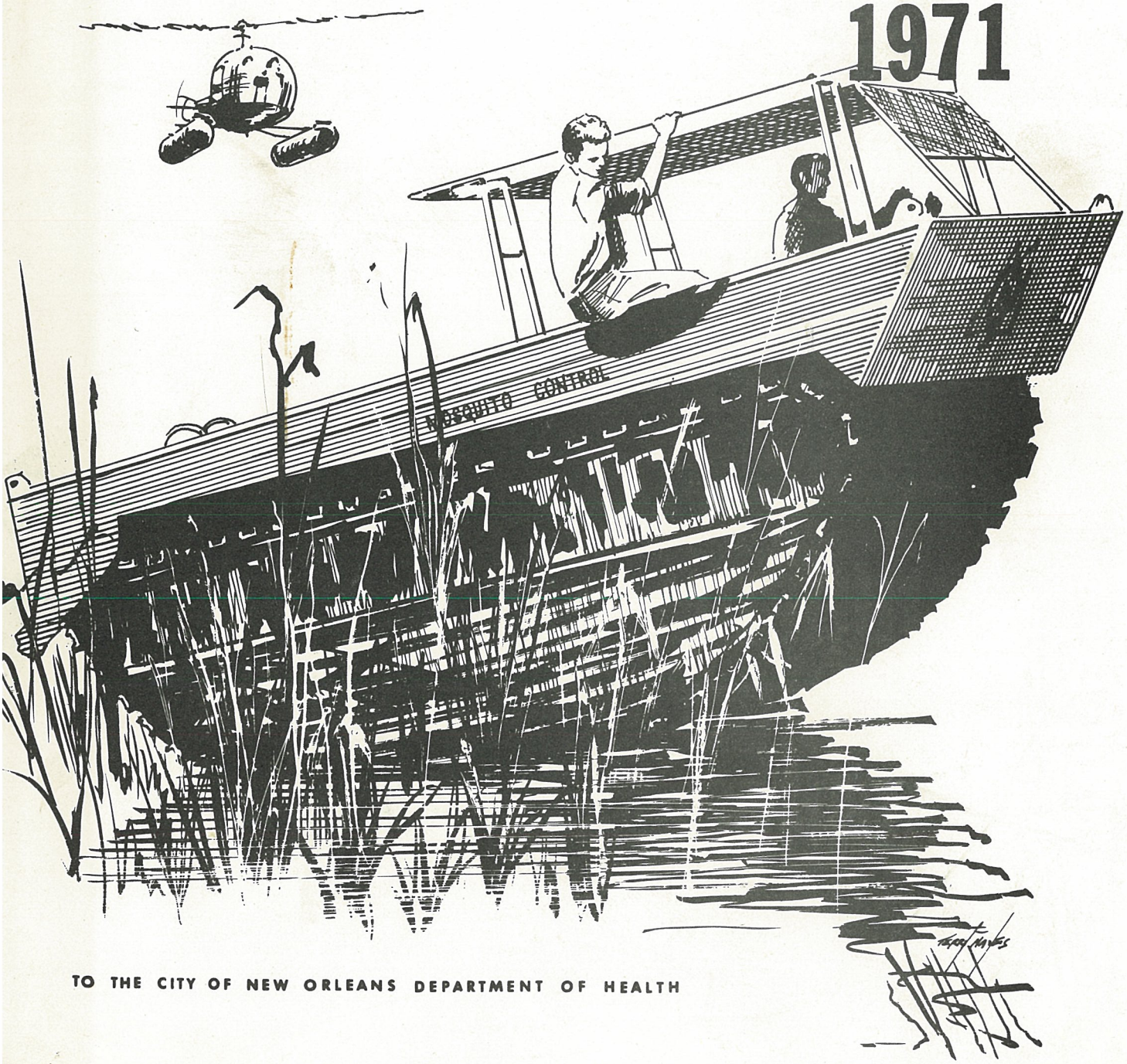
MOSQUITO CONTROL ANNUAL REPORT 1971



TO THE CITY OF NEW ORLEANS DEPARTMENT OF HEALTH

CITY OF NEW ORLEANS
DEPARTMENT OF HEALTH
DIVISION OF MOSQUITO CONTROL
6601 LAKESHORE DRIVE
NEW ORLEANS, LA. 70126

MOON LANDRIEU
MAYOR

GEORGE T. CARMICHAEL
ADMINISTRATIVE DIRECTOR

1971 ANNUAL REPORT

D E D I C A T I O N

We, the members of the staff of the Division of Mosquito Control, dedicate this Annual Report to the Mayor's Advisory Committee on Mosquito Control for their dedication and support of the efforts of our operation during 1971.

Mr. Donald F. Rowland, Chairman
Vice-President, New Orleans East, Inc.

Mr. William E. Wunderlich, Vice-Chairman
Corps of Engineers, Retired

Mr. Harry Batt, Sr.
President, Pontchartrain Beach Amusement Park

Honorable Philip C. Ciaccio,
Councilman, District "E"

Dr. Doris H. Thompson,
Director of Health

Honorable Nat G. Kiefer,
Senator

Mr. Lester J. Lautenschlaeger,
Director of Recreation

Mr. Charles W. Nutter, (replacing Mr. Lautenschlaeger)
Director of Recreation

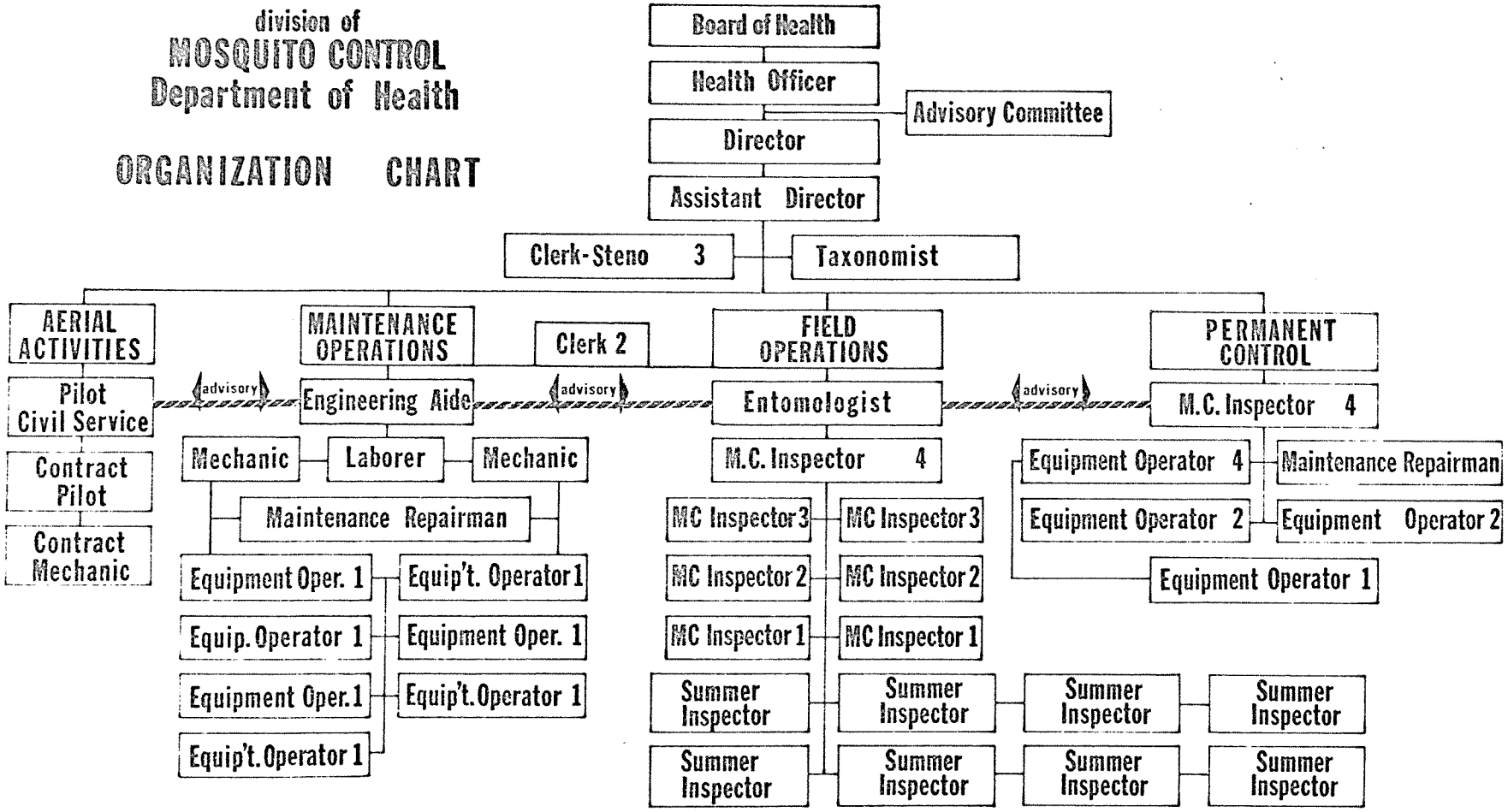
Dr. Harold G. Scott, (appointed-November, 1971)
Director, Environmental Health Services

George T. Carmichael

George T. Carmichael,
Mosquito Control Administrator

division of
MOSQUITO CONTROL
Department of Health

ORGANIZATION CHART



MOSQUITO CONTROL - 1971 ANNUAL REPORT

The highlights of the Mosquito Control Program of the City of New Orleans for 1971 were determined mainly by the rainfall and other climatic conditions of the year. The first eight months of 1971 were extremely dry and the deficit of accumulative rainfall was approximately 12" through the first eight months of the year. During this time, very few floodwater mosquitoes were hatched, and the control activities were extremely effective when applied to the single isolated broods. The mosquito density during the year ranged down to approximately 10% of the average for the past seven years. The density of mosquitoes throughout the parish remained at this extremely low level until September, when the drought broke and approximately 15" of rain fell. The last four months, September through December, the mosquito counts throughout the eastern portion of the parish remained about normal or average for the past seven years.

During 1971 the permanent control program received increased attention and increased budget for this operation. We have established a "Permanent Control Specialist" position, and a Biologist from our inspection staff has been training for the last two years to take over this position. The Permanent Control activities are centered around the work of the amphibious dragline and two backhoes and to date our Source Reduction Program has 10,821 acres under permanent control. A new addition was added to the Source Reduction operation during the year with the procurement of a dump truck through Surplus Property and the purchase of a crawler-dozer to use in what we refer to as our

"small fill" areas. The dumptruck is loaded with surplus material from U. S. Gypsum Plant at no cost to our program and the material is hauled to small breeding areas throughout the City that have been located through actual larval collections from the inspection program. The material is dumped in the area and leveled with the small crawler-dozer. A sidelight to this program was revealed when we found that the waste material being obtained from U. S. Gypsum from their wallboard plant was an extreme alkaline material. This alkaline material, when placed in a breeding area, resulted in a very high pH of the rainwater that did accumulate in the area. This high alkaline pH also acted as a deterrent for mosquito production and in every instance where this fill has been used for control measures we have found a complete absence of flood water breeding in the area. The cost of this operation has been approximately 70¢ per yard of material.

A training course was conducted at the State Office Building as a cooperative venture with Louisiana Mosquito Control Association, the State of Louisiana Board of Health, and the U. S. Public Health Service. The one-week training course in mosquito control was attended by all of the inspectors from the Orleans Parish Mosquito Control program and the benefits of this training course have been recognized throughout the year from increased performance of our personnel. In addition to the formal training course, several in-house training sessions were conducted by various members of our staff.

The familiar thermal fogging operations of the program were phased out during 1971, with the exception of two fogging trucks that have been maintained for special operation assignment, but the routine ground adulticiding operation

was carried out throughout the year by ground ULV LECO type spray equipment. This equipment was mounted on the fogging trucks and slightly modified for our operations. The reduced cost resulting from the use of ground ULV has been significant and has resulted in a tremendous savings to our program.

The aerial control activities through 1971 have been extremely rewarding and some of the highlights of this program included the utilization of Beecomist spray nozzles for ULV application on the Grumman Ag-cat. This was an extremely effective treatment method and was used for several weeks before one of the cone nozzles of the Beecomist disintegrated. The use of the Beecomist has not been continued until this problem can be further investigated.

Throughout the year the utilization of the DC-3 ultra-low volume aircraft was an extremely important part of our control activity. The aircraft was used for large coverage of populated areas in Orleans Parish and also in connection with the Venezuelan Equine Encephalitis problem. We operated for one week under contract to the U. S. Department of Agriculture from the Lake Charles Airport treating Liberty County in Texas. Contracts were also drawn and treatment was performed, in Plaquemines Parish, Jefferson Parish and St. Tammany Parish. In Plaquemines Parish and St. Tammany Parish Dibrom at 3/4 oz. per acre was applied, and in Jefferson Parish Malathion at the rate of $2\frac{1}{2}$ oz. per acre was utilized.

The adult density surveys that have normally been carried out in the mosquito control program were intensified during the year 1971 with the addition of new methods of survey. The most useful method employed during the year has been the CO_2 landing rate count. This has been conducted daily in two different areas: the Little Woods area and the Algiers area of the

City. This technique was used seven days a week, and was complimented with the daily utilization of truck traps. These two methods were supplemented with the normal landing rate and New Jersey light trap methods used bi-weekly throughout the year. The utilization of the CO_2 landing rates revealed such interesting results on the movement and activity of the mosquitoes that most of our control activities were geared to the results from this survey technique. Immediate mosquito activity was revealed through this technique and the utilization of control methods in those areas where mosquito build up was the highest resulted in a reduced amount of control methods needed and therefore, the savings in the amount of material utilized. It is estimated that the use of this technique has resulted in between $10,000 and $15,000 savings to the City.

Throughout the year the Encephalitis Surveillance program was conducted as planned and scheduled and the results were negative for St. Louis, Eastern and Western virus activity. The summer Venezuelan Equine Encephalitis epidemic resulted in increased control activities of all our programs. In Orleans Parish we found a total of 110 stables and 750 horses within the City limits. All of these stables were inspected and sprayed and an area within four city blocks of each stable was intensively inspected for mosquito breeding. The DC-3 flights with ULV maintained the mosquito density at an extremely low level throughout this epidemic period.

The most fascinating highlight of 1971 has been the cooperation of Orleans Parish Mosquito Control Program with NASA and the investigation of the utilization of remote sensing for detecting mosquito breeding areas in the marshes. NASA flew a 150 acre test area in the eastern part of the parish

on September 28 utilizing six (6) remote sensing cameras. In addition to the flight information obtained from NASA, the water samples taken from the area have been analyzed, the ground truthing of vegetation in the area has begun by the Orleans Parish Mosquito Control personnel, and soil sample analysis is also being obtained to correlate with the aerial information. The test area will be studied throughout 1972 and additional remote sensing flights by NASA are planned.

ENTOMOLOGICAL REPORT - 1971

The climate of Orleans Parish is influenced, in a large degree, by the many water surfaces provided by lakes and rivers, and by the proximity to the Gulf of Mexico. Throughout the year, these water areas modify the relative humidity and temperature conditions, decreasing the range between the extremes. High humidity and stable temperatures are very important to an insect, such as a mosquito, that has to undergo a complicated life cycle while exposed to the elements. Combine these stable climatological conditions with rainfall that averages 60 inches a year and vast areas of marsh exposed to tidal action and one can readily recognize the ideal conditions that exist in Orleans Parish for a native resident, the mosquito.

Recognizing the importance of climatological conditions and the variation of same, Orleans Parish Mosquito Control initiated the use of weather monitoring instruments to record pertinent information in conjunction with the daily adult density surveys. Daily adult density surveys have been in use two full mosquito seasons and have been a very valuable tool in assigning and evaluating our adulticiding programs. Further refinement of the daily

surveys took place in May of 1971, a microhygrometer (to measure relative humidity), an anemometer (to measure wind speed), a light meter (to measure reflected light) and a thermometer were arranged in a small wooden box so they could be taken into the field and used at each adult survey site. With the daily adult survey we can determine the exact species of mosquito that poses a problem. By measuring and recording the climatological conditions we can determine the validity of the survey and the feasibility of assigning treatment. Base line information provided by the area universities tells us, to the nanogram (one billionth of a gram), how much insecticide is needed to kill that particular species of mosquito. Combine this ecological information and it could well constitute the most efficient application of mosquito control techniques practiced anywhere.

Mosquito population densities are determined by a vast web of environmental and biological influences. Possibly the most important single factor in the lattice work of causation is the presence or absence of water. The presence of water and a temperature range above 65°F in Orleans Parish will elicit the egg-laying response of the adult female permanent water mosquito even in the month of December.

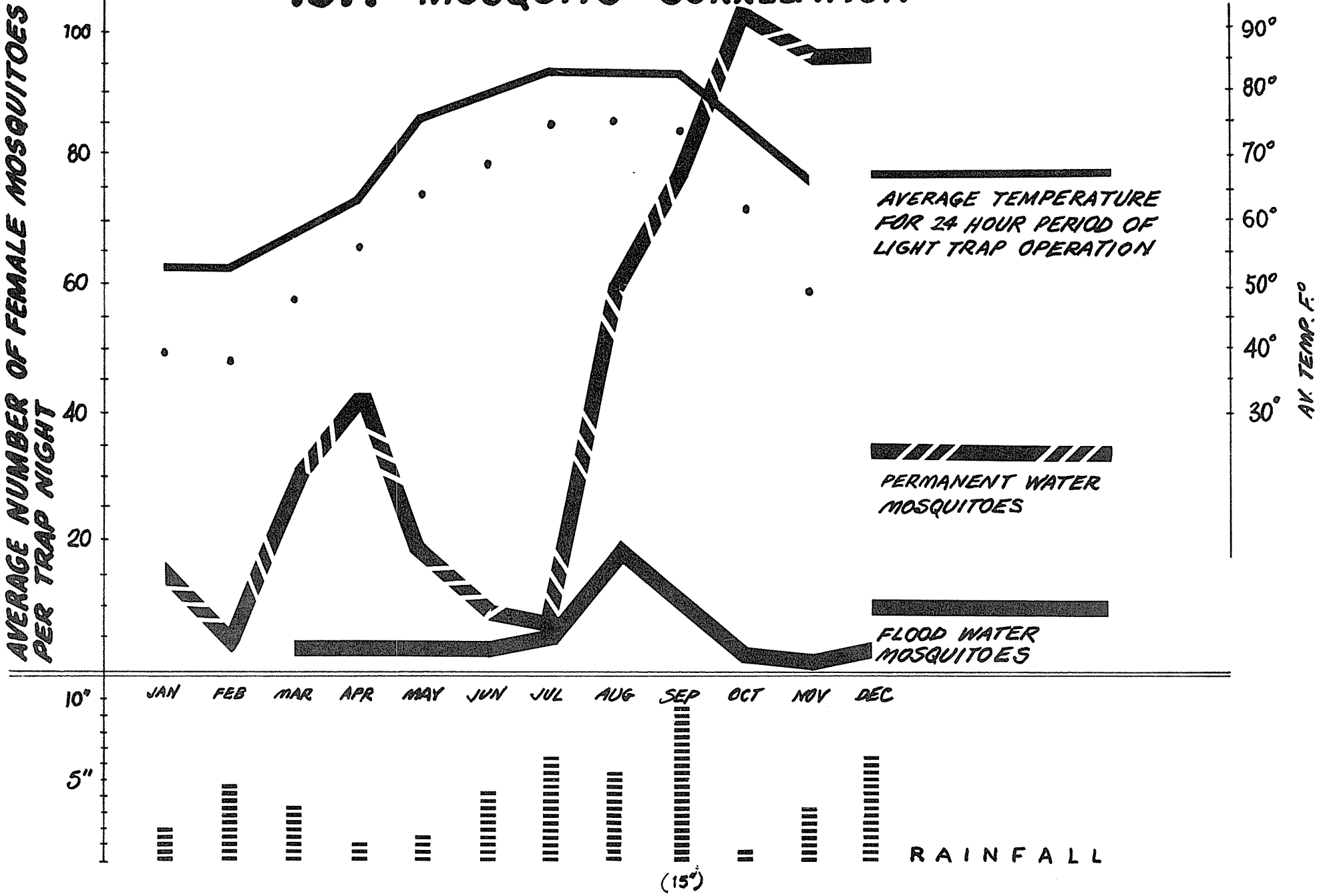
Floodwater mosquitoes are somewhat more predictable and will peak in activity during the warm months. The year 1971 is best summarized by the enclosed graph Fig. 1. There was a peak in permanent water mosquitoes in April. Drought conditions through April and May reduced all populations to the lowest on record. Less than 1/10 of the average light trap collections was recorded during May, June and July. To further reduce adult mosquitoes, Orleans Parish was repeatedly blanketed by ground and air operations in an attempt to reduce any Venezuelan Equine Encephalitis transmission possibility.

August marked the beginning of a different trend in mosquito activity. Light trap collections during the month of August rivals the total activity of the four previous months. In addition to the increase in permanent water mosquitoes, we experienced a large brood of floodwater mosquitoes. Continued heavy rainfall through September reduced the numbers of oviposition sites and the floodwater species (Aedes sollicitans and Aedes vexans) were not able to reach their full potential as the major pestiferous species of Orleans Parish.

Mild weather conditions, through the remainder of 1971 were responsible for an abnormal build-up of mosquitoes that breed in standing water. Permanent water-breeding mosquitoes in Orleans Parish bascially overwinter as fertile females. As the season changes from winter to spring, these fertile females become active and fulfill their role as perpetuators of their kind by laying their eggs on the surface of a suitable body of water. Considering temperature as a major factor, the life cycle of these mosquitoes accelerates through the summer months and begins to slow down in the fall, then the normal reproduction cycle stops, if the winter is severe enough. The normal fall and winter slowing down of the life cycle of the permanent water-breeding mosquito did not occur in Orleans Parish in 1971. As evidenced by Fig. 1., there exists a potential mosquito problem just waiting for the ideal conditions produced by the many water surfaces proximate to Orleans Parish. The mosquito problem did not end in December and will definitely carry over one of our most substantial seed-broods witnessed by the Division of Mosquito Control.

A study was initiated the latter part of the season to further understand our adult surveillance. The weather obviously affects the accuracy of any

1971 MOSQUITO CORRELATION



survey technique, so data is being collected to set the upper and lower limits of mosquito activity as influenced by relative humidity, temperature, wind speed, wind direction, overhead light intensity, and time of day. This project will be evaluated and reported on at the end of the 1972 season.

DOMESTIC MOSQUITO CONTROL

Due to the below average rainfall in our area until August, much of the inspectors' time was placed on Culex quinquefasciatus inspection. A molasses plant in the Vieux Carré that was producing large numbers of "quinks" was located. Following treatment of this area, the "quink" population in the surrounding area dropped. This was probably the foci of "quink" breeding in that area.

It is interesting to note that the big "quink" breeding ground was located due to a light trap located several city blocks from there. "Quink" males had appeared in the light trap for four or five weeks so a block to block search was made in that area, subsequently finding the foci of breeding in that area.

The threat of an Equine Encephalitis outbreak in our area precipitated a massive effort to reduce mosquito populations to a safe level in any area with horses. As a result, in less than three weeks over 1,000 individual residences, surrounding 110 horse stables, representing 750 horses, were inspected and larvicided as necessary.

This year saw the full implementation of our self contained inspection vehicles. Five pick-up trucks were equipped with larviciding units holding 55 gallons of surface active diesel. Each truck is also equipped with a

one gallon hand sprayer for small or inaccessible areas. This setup allows the inspectors to treat immediately any larvae they find in urban areas.

MARSH INSPECTION

This was the first year that helicopter flights were taken on a scheduled basis. Once a week during the mosquito season a one hour helicopter flight into the marsh was taken. This enabled the inspectors to inspect areas and familiarize themselves with the marsh. It paid dividends by finding breeding areas that were previously unmapped.

Enlarged and more detailed maps of the marsh area were prepared for the fixed wing aerial inspections. Thus more detailed and accurate records of flooding and drying conditions are possible.

DOMESTIC MOSQUITO CONTROL REPORT - 1971

DOMESTIC FLOODWATER INSPECTION AND TREATMENT

Areas inspected - - - - - - - - - - - - - - - - -	7,453
Areas positive for breeding - - - - - - - - - -	763
Areas negative for breeding - - - - - - - - - -	6,691
Man-hours inspecting and treating - - - - - -	2,072
Miles traveled- - - - - - - - - - - - - - - - - -	14,960
Gallons larviciding oil used- - - - - - - - - -	1,889

DOMESTIC PERMANENT WATER INSPECTION AND TREATMENT

Areas inspected - - - - - - - - - - - - - - - - -	4,378
Areas positive for breeding - - - - - - - - - -	420
Areas negative for breeding - - - - - - - - - -	3,958
Man-hours inspecting and treating - - - - - -	1,942
Miles traveled- - - - - - - - - - - - - - - - - -	5,740
Gallons larviciding oil used- - - - - - - - - -	199

FIELD OPERATIONS - 1971

Adult Survey and Treatment

Increased adult mosquito surveys dominated much of the years' field activities. One of the important facets of the surveys is the comparison of different species of mosquitoes each survey technique sampled. An example of the variations obtained are shown in Fig. 2. It is important to note the following observations, which have been reported in the literature numerous times: (1) New Jersey Light Traps were selective for *Culex salinarius*; (2) Truck mounted traps collected almost equal numbers of *Culex salinarius* and *Aedes sollicitans*; and (3) Landing rates, fortified with carbon dioxide release, attracted *Aedes vexans* most. Realizing the limitations or advantages of different survey methods helped to access the true mosquito population at any given time.

Adult mosquito surveys were operated seven days a week from May to October. The schedule followed was:

No. Counts Daily	Type Survey	No. Counts Weekly
24	CO_2 Landing Rates	168
21	Landing Rates	105
19 miles	Truck Trap	133 miles
28 traps bi-weekly	Light Traps	56
75 bi-weekly	Landing Rates	150
148 + 19 miles	Total Counts	479 + 133 miles

With the aid of intensive daily adult surveillance, treatment timing and evaluation were more precise. The light traps and truck traps were of

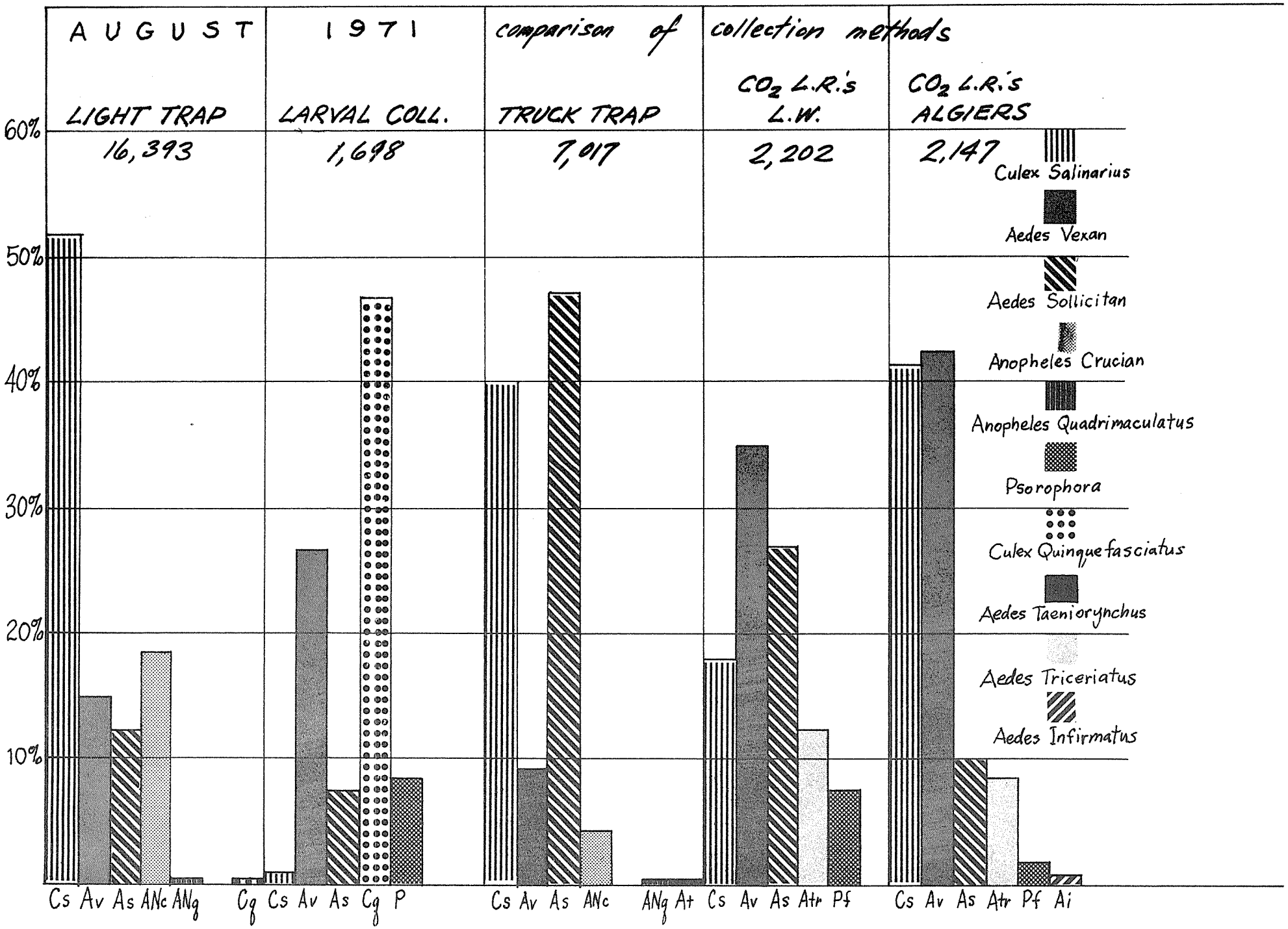

AUGUST 1971 comparison of collection methods
LIGHT TRAP
16,393
LARVAL COLL.
1,698
TRUCK TRAP
7,017
CO_2 L.R.'s L.W.
2,202
CO_2 L.R.'s ALGIERS
2,147
60%
50%
40%
30%
20%
10%
Culex Salinarius
Aedes Vexan
Aedes Sollicitan
Anopheles Crucian
Anopheles Quadrimaculatus
Psorophora
Culex Quinquefasciatus
Aedes Taeniorynchus
Aedes Triceriatus
Aedes Infirmatus
Cs Av As ANc ANg
Cg Cs Av As Cg P
Cs Av As ANc
ANg At Cs Av As Atr Pf
Cs Av As Atr Pf Ai

FIG. TWO

S. CENTRAL - EASTERN - CHEF, L. ST. CATHERINE

F E M A L E S

LOCATION	TOTAL		AEDES		ANOPHELES		CULEX		CULIS.	MANS.	PSOR.	OTHER	N
	MALE	FEMALE	SOLL.	VEX.	CRUC.	QUAD.	QUINQ.	SAL.	INORN.	PERT.	CONF.	SPP.	CO
1. LOW. ALGIERS		6,795	274	336	358	730	16	4,736	308	1	6	30	8
2. MID. ALGIERS		6,217	63	1,092	84	114	29	4,798			12	25	8
3. UP. ALGIERS		1,788	18	312	53	36	11	1,245	48		47	18	9
4. CAFFIN AVE.		1,157	7	176	32	13	184	682	37			26	9
5. VIEUX CARRE		771	7	50	7	30	373	279	11			14	9
6. IRISH CHANN.		350	2	93	17	9	77	134				18	9
7. NAPOLEON		216	2	82	10	4	23	76	8			11	8
8. AUDUBON		457	2	112	92	50	50	136	6			9	9
9. CITY PARK		522	4	123	34	3	40	259	27	1	2	29	8
10. LAKEWOOD		943	7	281	66	21	8	506	72			16	10
11. WEST END		1,201	28	127	67	7	10	899		3	2	12	11
12. LSUNO		344	15	128	34	9	20	102	8	0		28	7
13. PEOPLES AVE.		600	9	183	44	18	7	256	68	1	1	13	7
14. PADS		154	4	42	3	3	10	82	3			7	8
15. GENTILLY E.		845	138	324	39	8	29	286	7	2	2	10	8
16. LAKE AIRP.		1,770	29	568	105	23	15	858	72	3	10	87	9
17. LITTLE WOODS		1,228	22	215	93	29	6	740	79	17	2	25	9
18. VIL. deL'EST		56	451	378	73	18	2	5100	40	104	12	76	12
19. BIENVENUE		1,954	94	188	228	83	17	1255	50	6		33	9
20. MICHOUD		9,726	167	90	828	227	16	7976	87	66	14	255	10
21. POWERS JCT.		14,640	119	102	1335	119	12	11647	273	780	7	246	8
22. SO. SHORE		3,603	73	16	490	62	1	2747	123	48	2	41	9
23. CHEF MENTEUR		13,436	231	71	3677	123	4	8754	278	208	3	87	8
24. GREENS DITCH		26,660	1121	86	7294	309	6	16028	1103	41	55	617	9
25. RIGOLETS		7,404	494	62	1566	84	11	4426	573	3	10	175	9
26. BONITA DR.		1,822	39	332	97	25	7	1210	79	2	2	29	8
TOTAL		119,256	3911	6354	16932	2209	1004	81724	3479	1390	211	2042	24
PERCENT ♀			3%	5%	14%	1%		68%	2%	1%		1%	

CONTROL OPERATIONS - 1971

Light Trap Operation

2,515	light trap collections	
799	man-hours on light trap collections	$ 2,115.04
7,259	miles @ 3¢ per mile	217.77
	Cost of light trap operation	$ 2,332.81

Landing Rate Counts

14,533	landing rates	
2,828	man-hours on landing rates	$ 7,639.46
29,442	miles @ 3¢ per mile	883.26
	Cost of landing rate counts	$ 8,522.72

Truck Trap Operation

571	man-hours on truck traps	$ 1,885.81
5,045	miles @ 3¢ per mile	151.35
	Cost of truck trap operations	$ 2,037.16

Identification of Mosquitoes

151,854	mosquitoes identified	
19,135	larvae identified	
713	man-hours identifying mosquitoes and larvae	$ 2,045.46
	Cost of identification	$ 2,045.46

Light Trap Maintenance

486	man-hours on light trap maintenance	$ 1,222.17
1,616	miles @ 3¢ per mile	48.48
	Cost of light trap maintenance	$ 1,270.65

Inspection and Mapping

4,548	man-hours inspecting and mapping	$ 12,005.06
18,295	miles traveled @ 3¢ per mile	548.85
	Cost of inspection and mapping	$ 12,553.91

Ground Larviciding

941	man-hours ground larviciding	$ 2,462.08
4,608	miles traveled @ 3¢ per mile	138.24
8,133	gallons diesel @ 11.5¢ per gallon	93.53
	Cost of ground larviciding	$ 2,693.85

CDC Light Trap Operation

NONE

Resting Stations

99	man-hours resting stations	$ 264.33
505	miles traveled @ 3¢ per mile	15.15
	Cost of resting stations	$ 279.48

Bird Trapping

1,234	man-hours bird trapping	$ 3,295.73
2,199	miles traveled @ 3¢ per mile	65.97
	Cost of bird trapping	$ 3,361.70

Sentinel Chickens

519	man-hours sentinel chickens	$ 1,430.29
1,693	miles traveled @ 3¢ per mile	50.79
	Cost of sentinel chickens	$ 1,481.08

Permanent Control

620	man-hours permanent control	$ 1,767.41
1,020	miles traveled @ 3¢ per mile	30.60
	Cost of permanent control	$ 1,798.01

Calibration

91	man-hours on calibration	$ 268.20
	Cost of calibration	$ 268.20

General Office Work

1,122	man-hours on general office work	$ 3,126.92
	Cost of general office work	$ 3,126.92

Shop Work

333	man-hours on shop work	$ 901.42
	Cost of shop work	$ 901.42

Miscellaneous

457	man-hours on miscellaneous jobs	$ 1,132.58
1,582	miles traveled @ 3¢ per mile	47.46
	Cost of miscellaneous jobs	$ 1,180.04

Personnel Training

270	man-hours on training and & instruction	$ 675.00
	Cost of training & instruction	$ 675.00

particular importance in timing as both surveys collect males. Knowing that adult males emerge first, one can predict with some accuracy when the entire brood has emerged. Treatment is not started when the initial population increase is noticed; instead 48 hours after the first males appear it is assumed 100% emergence is complete.

The CO_2 landing rates are of importance in areas were Aedes vexans are prevalent. It is economically desirable to survey for adults during normal working hours thereby reducing overtime pay. The CO_2 activates the mosquitoes and one is able to get a measure of the population during the normal working day. Collection of the adults attracted by the CO_2 is necessary so that species involved can be identified accurately in the laboratory.

The evaluation of all adulticiding has been possible by using the adult density surveys. The majority of the treatments during the year gave 85 - 90% control for a minimum of three to four days. In one instance in a mixed urban, wooded area (Little Woods) it was noted that use of fog trucks resulted in only a 40% reduction in the adult population. Subsequent aerial treatment two days later over the wooded areas in that section only gave a 35% reduction. The following brood of Aedes vexans was treated with fog trucks and aerially in a 14 hour period with a resulting 85-90% control. This pointed out that if conditions were such that both ground and aerial equipment were not used simultaneously, it is not justifiable to treat with only one method in this area.

FOGGING REPORT - 1971

Adult mosquito populations in Orleans Parish during 1971 were such that the ground adulticiding operation spanned only 4 months, beginning in July

and ending in October. Reasons for this relatively short mosquito season have been discussed in other sections of this report. Although the mosquito season was a short one, it resulted in an increase of 23% in the total miles fogged. This increase was due in large part by the V.E.E. outbreak in the western part of the state. To eliminate any possibility of an outbreak starting in Orleans Parish the entire city was fogged on a routine basis.

July was the first month in which the fog trucks were used to combat adult mosquito populations. It was also the debut of Orleans Parish Mosquito Control's L.E.C.O. cold aerosol fog generator. This is an entirely new concept in applying insecticides. More technical research and field testing went into the development of the L.E.C.O. ULV fogger than any other fogger manufactured. It eliminates traffic hazards as there is no impervious blanket of fog produced. At a short distance from the machine the ULV mist becomes invisible. The ULV unit also reduces air pollution as the volume of material dispersed is 97.7% less than that dispersed by conventional thermal foggers. By using less insecticide, no diesel, and eliminating the cost of formulating, the operating cost of ULV units is about 1/3 that of thermal fogging. The new units are driven at 10 miles per hour as opposed to 5 miles per hour for our thermal foggers and can therefore cover more area in a shorter time.

The new foggers have proven to perform as anticipated. Our fogging program has made some really substantial operational and economical improvements over the previous year. These figures will show the increased efficiency of the operation; a 17% <u>reduction</u> in man-hours (labor), a 26% <u>reduction</u> in hours fogged, a 75% <u>decrease</u> in gallons of insecticide used,

resulting in a 61% reduction in insecticide cost (some thermal fogging was used) and an overall 20% reduction in labor cost. These figures become more significant when one also sees an increase of 23% in miles fogged and a really gratifying 53% decrease in the overall cost of fogging over 1970.

Total man hours		1,318.31
Hours fogged		652.3
Gallons formulation used		8,078
Gallons used 95% Malathion		544
Total miles traveled		1,169.70
Miles fogged		5,481.2
Insecticide cost	$	6,052.36
Labor cost	$	2,617.60
Cost of oil and gas	$	285.23
Total cost of Fogging	$	8,955.19

ENCEPHALITIS SURVEILLANCE - 1971

The possibility of mosquito borne encephalitis is monitored in Orleans Parish during periods when the various arboviruses are overtly active. Many of our indigenous and migratory birds, as well as some small wild animals act as natural hosts during the season of active transmission.

Mosquitoes are carriers of more of these etiological agents than any other group of vectors. Furthermore in birds there is a prolonged viremia of sufficient titer to infect feeding mosquitoes.

Overwintering of arboviruses remains an enigma. The viruses in these reservoir animals are thought by some epidemiologists to lie dormant in the internal organs. When periods of stress to the individual occurs - stress such as migration, breeding and nesting, metabolism increases and the viruses recirculate in the peripheral blood stream of the host in quantities

sufficient to infect mosquitoes during a blood meal. Several wild ducks are taken each winter by mosquito control personnel in an effort to shed some light on this problem - so far the tests are inconclusive.

Due to the near tropic climate in our area mosquitoes probably do not have a prolonged extrinsic incubation period. This necessitates early detection using every means available to us. Serology is done both on wild birds trapped throughout the Parish and our sentinel chicken flocks. All blood samples are checked by the State Board of Health for encephalitis antibodies and virus isolations may be attempted from mosquito pools.

The purpose of the Encephalitis Surveillance Program is one of detection, to be aware of the severity of the virus activity before clinical cases are manifest in humans.

By knowing the species of mosquito and its biocoenosis, our control operation can be put into full effect in the target areas for intensification of preventive measures. Target areas are defined by the use of light traps, truck traps, CO_2 collection, landing rate stations, rain gauges and close attention to the tide table, along with aerial observation of standing water in the marsh area. The seasonal cycle of viral activity was low in our parish. The peak period of potential hazard passed in early fall - routine surveillance was terminated October first.

Indigenous Birds bled this season:

House Sparrow	(*Passer domesticus*)
Rock Dove	(*Columba livia*)
Mockingbird	(*Minus polyglottos*)
Cardinal	(*Richmondena cardinalis*)
Blue Jay	(*Cyanocitta cristata*)

Brown Thrasher	(Toxostoma refum)

Migratory Birds bled this season:

Yellow Warbler	(Dendroica petechia)
Blue Winged Warbler	(Vermivora pinus)
Great Crested Flycatcher	(Myiarchus crinitus)
Bronze Head Cowbird	(Molothrus ater)
Poule d'eau	(Fulica Americana)
Pintail	(Anas acuta)
Greyduck	(Anas strepera)
Widgeon	(Mareca Americana)
Lesser Scaulp	(Aythia affinis)
Green Wingteal	(Anas carolinensis)
Blue Wing teal	(Anas discors)
Spoonbill	(Ajaja ajaja)
Mallard	(Anas platyrhynchos)

The following table is a recapitulation of this year's activities:

Type Specimen	No. Samples 1971	No. Samples Positive 1971	% Positive Samples 1971
Sentinel Chicks	221	1	.45
Indigenous Birds	466	5	1.0
Migratory Birds	93	15	16.1
Totals	795	21	2.6

AERIAL ACTIVITIES - 1971

The year 1971 proved to be quite active for both aircraft operated by Mosquito Control.

The Grumman was flown a total of 123.8 hours. The breakdown of this flight time is as follows:

Larviciding	3.5	hours
Material dispensed	400	gallons diesel oil
	12,000	lbs. Paris Green
Adulticiding	117.5	hours
Material dispensed	22,935	gallons 8% Malathion
	151.6	gallons Technical Malathion
Total area treated with adulticiding chemical	100,836	acres
Maintenance and test flights accounted for	2.8	hours

There were no major mechanical problems on the Grumman for the whole season and only one operational cancellation due to a minor malfunction of the engine ignition system.

The Douglas was flown a total of 169.5 hours. This was the first time that the multi-engine aircraft was utilized more than the single engine aircraft since Orleans Parish Mosquito Control began operations.

The breakdown of multi-engine flight time is as follows:

Training, Maintenance & Cross County	82.0	hours
Operational spraying (adulticiding)	87.5	hours
Total	169.5	
Material dispensed	3,046	gallons technical dibrom 14
	1,558	gallons technical Malathion
Total area treated	596,361	acres

There were no operational cancellations due to mechanical malfunctions, in spite of the fact that the aircraft was vandalized on two separate occasions.

The highlight of the season was the utilization of the Douglas on an emergency basis for treatment of areas other than Orleans Parish, in connection with the V.E.E. epidemic. The U. S. D. A. and surrounding parishes paid more than $26,000.00 to N. O. M. C. for the services of this aircraft and crew.

DRAGLINE REPORT - 1971

The dragline continues to be Mosquito Control's chief tool to control the mosquito breeding in the marshy rural areas of Orleans Parish. It is capable of operating in areas where a man couldn't even walk, and the tiny mosquito is king. The conditions under which the machine is operated, and the digging techniques which must be followed in order to construct an effective mosquito control project make this a very unique operation.

The machine operated in area V-27 for the first 3 months of 1971. This is an area within the levee system of Orleans Parish. It was one of the largest, and most prolific mosquito breeding areas in the parish. Its completion adds another 1,250 acres to our expanding list of acres under permanent control. Upon completion of the V-27 project the machine was inspected and all necessary repairs were made. The machine was then moved to area X-30. This is an area outside of the levee system and the mosquito breeding here is influenced by tidal action and rainfall. As the area is subject to tidal action, which in Southeastern Louisiana is very unpredictable,

depending mainly upon wind direction, a control project was designed to eliminate this factor. Several plans were discussed and finally a plan which will utilize a system of weirs and ditches was decided upon. The weirs will allow the normal and high tides to move into and out of the area, but will not allow low tides to drain the areas and expose vast areas of moist soil to oviposition by salt marsh mosquitoes. Behind the weirs will be a system of ditches which will carry aquatic predators throughout the area. These ditches and the many ponds in the area, which will all be connected, will also serve as breeding and nursery areas to many aquatic animals, as well as being excellent waterfowl habitat.

The dragline dug a total of 39,860 linear feet of ditch and 18,959 cubic yards in 1971 as compared to 27,800 linear feet and 11,006 cubic yards in 1970. This is a 31% increase in linear feet and a 41% increase in cubic yards. This is very gratifying improvement in this aspect of our permanent control program.

Total hours	1,074
Total digging hours	555.3
% digging time	51.7
Total linear feet dug	39,860
Total cubic yards dug	18,958.56
Cost of fuel oil and oil	$ 76.67
Miscellaneous cost	$ 560.98
Salary cost	$ 5,446.73
Total cost	$ 6,084.38
Cost per linear foot	$ .152
Cost per cubic yard	$ .32
Linear feet per digging hour	71.78
Gallons fuel oil	431

BACKHOE REPORT - 1971

The backhoe is one of Orleans Parish Mosquito Control's answer to the urban and semi-urban mosquito breeding problem. This machine is so versatile that it can operate in a lot or a swamp, by raising the machine up on the loader and dipper stick and swerving along like an inch-worm. In several areas our machines have been vandalized. The degree of damage has ranged from stolen batteries, to the malicious destruction of all exposed gauges and filters. It had gotten to a point where we had to bring the machines out of the areas each.day. This was a tremendous strain on the operators, but we finally finished those problem areas and moved on. Both operators were lost for one month due to illness. The digging operation was halted for another month while one operator served jury duty and the other worked on the machines in the shop. However, with all of the parts problems, illness, jury duty and maintenance we managed to increase our linear foot and cubic yard production by 13 and 68.5 percent respectively. The totals went from 42,000 linear feet to 48,229 and from 4,415 cubic yards to 13,972.

PERMENENT CONTROL - 1971

Areas completed since June, 1967.

(Areas under drainage)	P-1	5 acres
	T-1	45 "
	U-1	10 "
	U-4	48 "
(Holding ditches)	U-5	140 "
	U-6	45 "
	U-7	18 "

V-2	200	"
V-3	7	"
V-4	75	"
V-27	1,250	"
W-27	25	"
X-1	8	"
X-10	60	"
X-11	468	"
X-14	85	"
X-15	206	"
(Impoundment) Blind Lagoon Area	8,101	
TOTAL	10,821	

Personnel	1	Permanent Control Supervisor
	1	Equipment Operator IV
	2	Equipment Operators II
	1	Equipment Operator I
	1	Maintenance Repairman

Equipment 1 Little Giant 3/8 yd. amphibious dragline, equipped with a 1/2 yd. bucket.

2 Allis Chalmers 615 backhoes

1 Case 350 dozer-crawler

1 Chevrolet 6 yd. dumptruck

1 Ford 1/2 ton pickup - 4 wheel drive

1 International 1/4 ton pick up

1 Ford 1/4 ton pickup

Total value of equipment approximately $70,000.

DUMPTRUCK-CRAWLER - 1971

The dumptruck and crawler are Orleans Parish Mosquito Control's source reduction (Permanent Control) tools in the urbanized areas of the parish. These pieces of equipment are used to fill and grade the numerous breeding areas in and around populated neighborhoods. The procedure is, once an area has been convicted of producing consistant, large numbers of mosquitoes, the

landowner is contacted and permission requested to enter upon said property for the purpose of eliminating the mosquito breeding source. We utilize our 5 years of inspection records to determine which areas receive priority. (Only the mosquito breeding source is filled, not the entire area.)

In the past we have waited for dry weather to start filling and grading operation. However, time and weather conditions have shown that periods of dry weather are not very predictable or frequent. Therefore, we have decided to tow our crawler with the dumptruck and work them together so that if the truck gets stuck, the crawler can pull it out. This will give us more working days than we have been enjoying.

Man-hours on dumptruck	473
Man-hours on crawler	88
Total miles	975.6
Total cubic yards	4,847
Cost of fuel and oil	$ 152.72
Salary cost	$ 1,637.89
Miscellaneous cost	$ 42.05
Total cost	$ 1,832.66
Cost per cubic yard	$ .695
Total truck loads	458