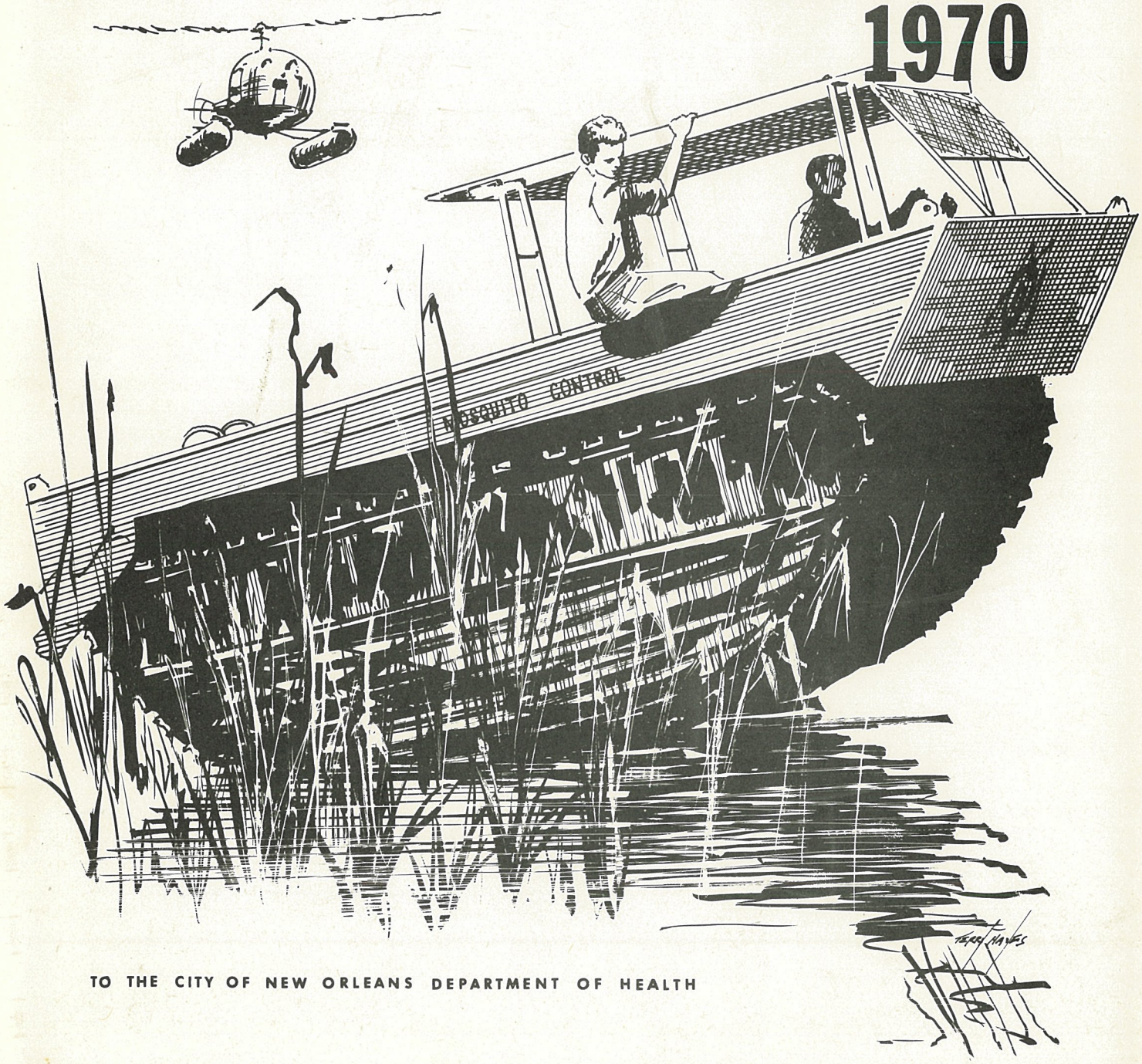
SANDY

MOSQUITO CONTROL ANNUAL REPORT 1970



TO THE CITY OF NEW ORLEANS DEPARTMENT OF HEALTH

MOON LANDRIEU
MAYOR

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

GEORGE T. CARMICHAEL
ADMINISTRATIVE DIRECTOR

1970 ANNUAL REPORT

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Director of Health

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George T. Carmichael

George T. Carmichael,
Mosquito Control Administrator

Source reduction, improved survey techniques, efficient abatement work and favorable rainfall patterns all played a part in the most successful year to date, for Orleans Parish Mosquito Control. Average light trap collections over the past six years indicate a steady reduction in mosquito populations. From a high of 220 mosquitoes per trap operation in 1965 down to 37 mosquitoes per trap operation in 1970 is a substantial reduction.

1965	220 mosquitoes per trap
1966	105 mosquitoes per trap
1967	117 mosquitoes per trap
1968	78 mosquitoes per trap
1969	50 mosquitoes per trap
1970	37 mosquitoes per trap

The first major peak in mosquito activity occurred in the month of May (see fig. 1). Heavy rainfall in the month of March followed by drought conditions during the month of April allowed an accumulation of permanent water breeding mosquitoes. High temperatures during the month of May allowed these permanent water breeders to complete their life cycle at an accelerated pace. The combination of these elements was responsible for the build up of permanent water mosquitoes in May.

Favorable rainfall patterns for floodwater mosquito production occurred most noticeably on three occasions during the year. April was a dry month (see fig. 1) and many fine oviposition sites were made available for Aedes sollicitans and Aedes vexans to deposit their eggs. Nearly seven inches of rain fell on these fertile breeding sites the

MONTHLY ACCUMULATIVE RAINFALL

	AVERAGE RAINFALL	ACCUMULATIVE AVERAGE	1970	TOTAL TO DATE	DEVIATION FROM NORMAL
JANUARY	4.19	4.19	3.99	3.99	-0.20
FEBRUARY	4.56	8.75	2.47	6.46	-2.29
MARCH	4.94	13.69	7.65	14.11	+0.42
APRIL	4.85	18.54	0.82	14.93	-3.61
MAY	4.58	23.12	6.72	21.65	-1.47
JUNE	5.28	28.40	4.59	26.24	-2.16
JULY	6.59	34.99	9.14	35.38	+0.39
AUGUST	5.89	40.88	8.39	43.77	+2.86
SEPTEMBER	5.48	46.36	5.88	49.65	+3.29
OCTOBER	3.18	49.54	4.63	54.28	+4.74
NOVEMBER	3.21	52.75	0.90	55.18	+2.43
DECEMBER	4.70	57.45	3.16	58.34	+0.89

following month. The peak floodwater mosquito activity, as recorded by our light traps, occurred the following month of June (see fig. 1). Save the first day of June the remainder of the month received less than one inch of rain, thus another drought period was created and heavy oviposition should have occurred. November was the other drought period followed by three inches of rain in December but as the previous drought followed by rainfall condition, very little change in floodwater mosquito production occurred. Mild weather conditions and proper rainfall patterns should have produced much higher light trap tabulations. Source reduction and prudent abatement methods were responsible for maintaining control over the mosquito hoards.

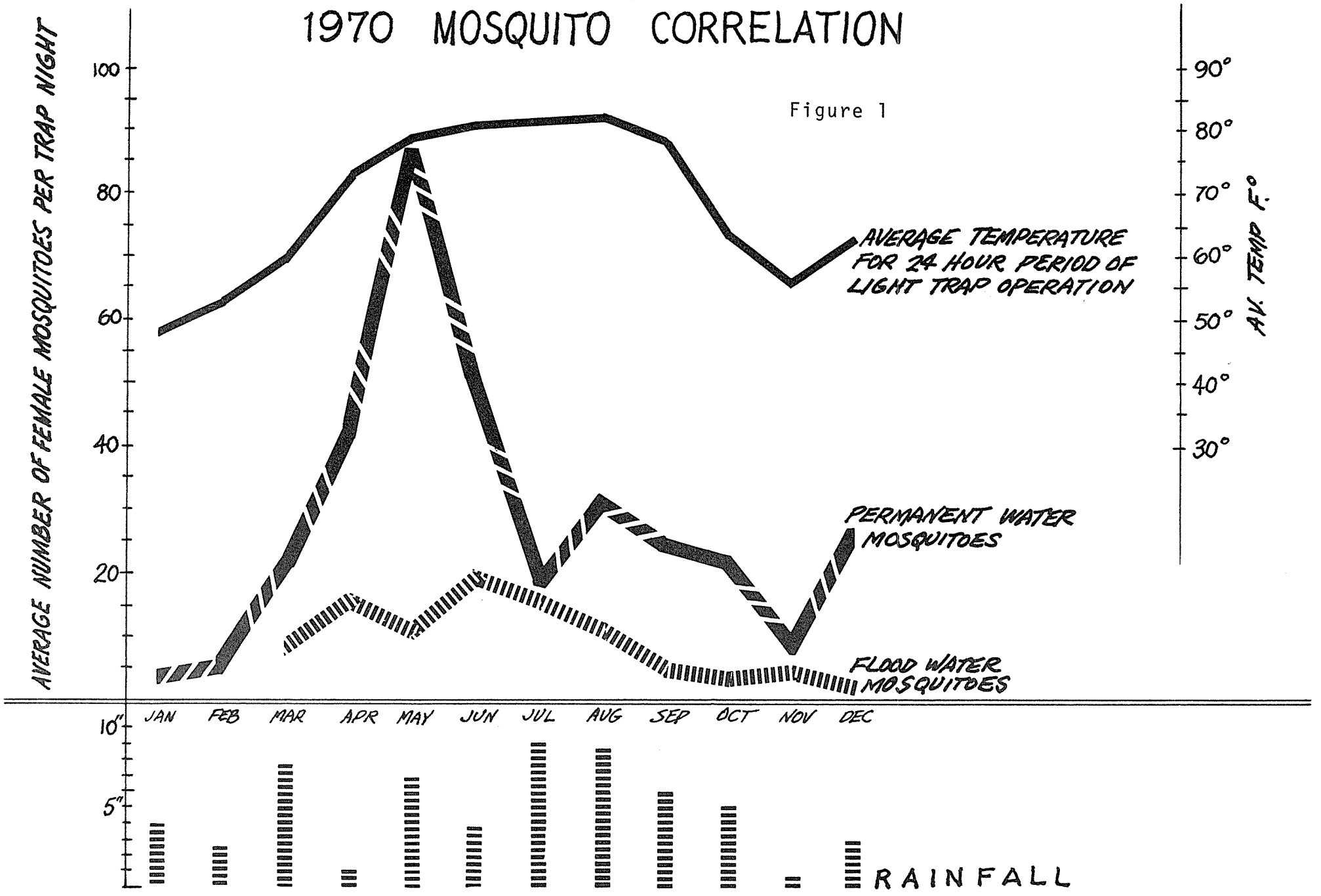
Population studies on a daily basis, as described in the Daily Adult Density Survey Report, will give us a better understanding of the mosquito population of Orleans Parish. Improvements for the upcoming mosquito season will include such information as relative humidity recorded at the landing rate stations, a hand-held annemometer to measure the wind speed at each location, cloud cover will be measured with a light meter and temperature will be measured at each landing rate location. To understand your adversary will better allow you to conquer him.

ADULT DENSITY SURVEY

In order to effect a more comprehensive study of mosquito production, migration, accumulation and control the division initiated an expanded program of adult density survey. Four different survey methods were

1970 MOSQUITO CORRELATION

Figure 1



devised to monitor the mosquito population of Orleans Parish on a daily basis. New Jersey light traps equipped with an electric eye was one survey tool chosen. The purpose of the photo-sensitive cell was to activate the trap at dusk and turn it off at dawn and allow each trap the same time period to collect adult mosquitoes. Another survey method employed was a 3 minute carbon dioxide release as an attractant to entice the adult female mosquito to become active. These specimens are collected and returned to our lab for positive identification. A third means of adult density survey was the Truck Trap. Truck Trap operations begin 30 minutes after sunset and sampled 74,000 cu. ft. of air space per mile or 1,000,000 cu. ft. of air space per hour. Both male and female mosquitoes are captured in this truck-mounted mosquito trap and returned to our lab for identification. The fourth method of survey used was the standard man-biting count. The methodology employed in this survey is one man counting the number of mosquitoes that attach themselves below the waist of the inspector over the duration of three one minute landing rate counts in a given area.

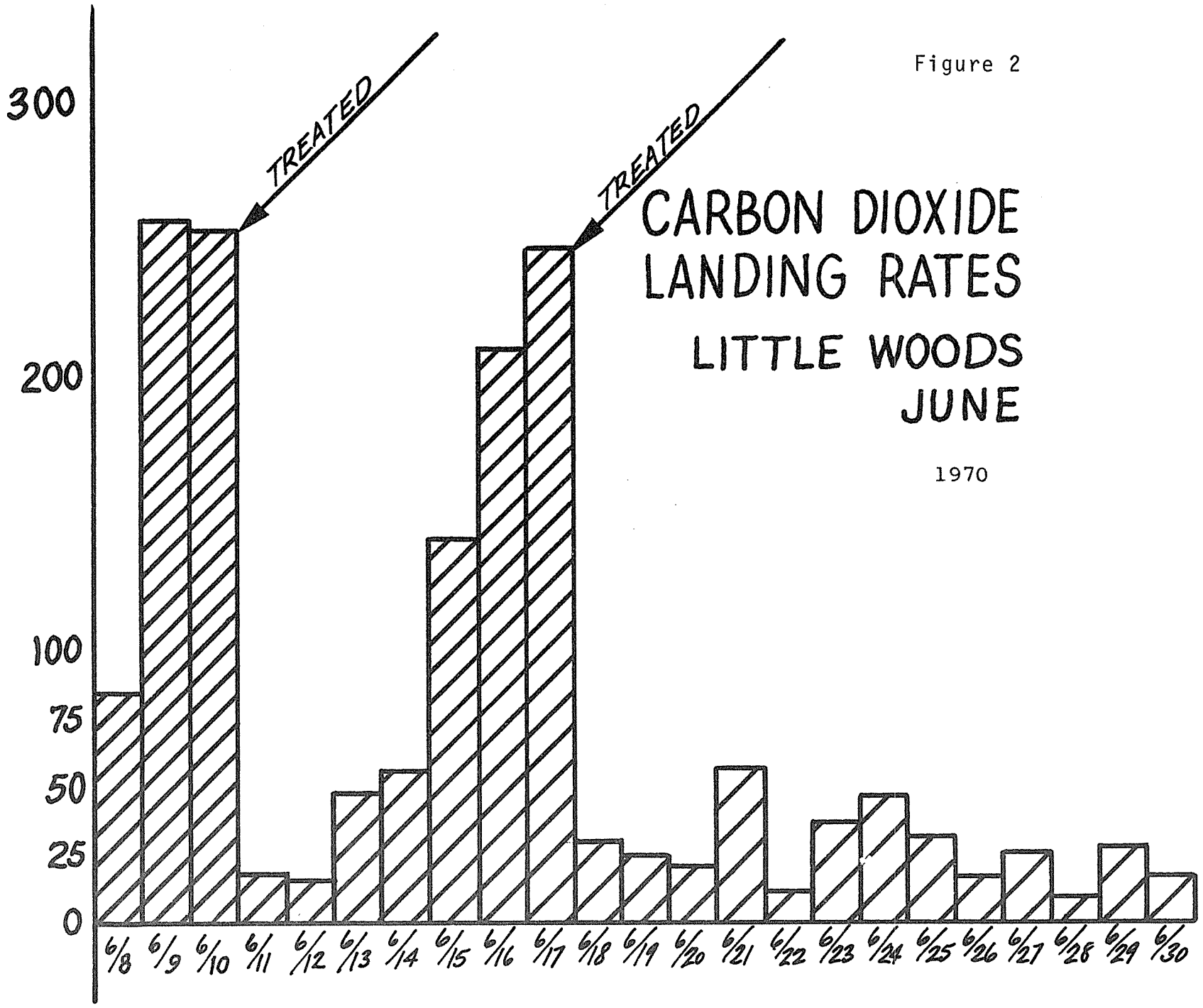
After the completion of six consecutive months of daily adult density survey and utilizing these daily mosquito counts for assignment of treatment and evaluation of treatment a new concept in adulticiding was established. There was never any doubt that treatment of adult mosquitoes would be much more effective if it could be correlated with peak mosquito population activity. Because of the manpower drain involved in surveying for the six or eight pestiferous mosquito species in Orleans Parish, each of which has its own particular life cycle and activity peaks, a survey

of this magnitude did not seem feasible. A definite location was chosen to conduct the comparison of the four methods of adult survey. The area selected was 2 miles wide and 7 miles long and approximately 8,500 acres in area. The treatment techniques evaluated were one qt. per acre of 8% Malathion solution as recommended by Dr. Jack Rodgers of the Florida State Board of Health Research Laboratory and 1.5 to 2.0 oz. per acre of technical grade Malathion.

Both treatment techniques evaluated were extremely successful when properly applied. Only one method of survey was deemed futile, the electric-eye activated light traps were too expensive to maintain. The photo sensitive cell was not as reliable as we expected and the mosquito catches were not reliable. The CO_2 landing rates were our best indicator of Aedes vexans and the woods species such as Psorophora ferox, Aedes infirmatus, (see fig. 2.) Aedes atlanticus and Aedes triseriatus. Standard man-biting counts were conducted primarily for Aedes sollicitans detection and most of the sollicitans treatments were based on these landing rate counts. The final survey method employed seemed to be the best suited for our needs in Orleans Parish (see fig. 3 & 4). A truck trap can cover the fringe areas of the parish during peak activity periods and capture both male and female mosquitoes. For the upcoming 1971 season we expect to have two truck traps in operation, one on the marshy fringe areas and the other in the interior wooded sections.

Measurable advantages achieved through Daily Adult Density Survey were first a savings in manpower and money due to the accurate timing of adulticiding activities. Chemical applications were held to a minimum because complete emergence was assured before treatment was assigned.

Figure 2


CARBON DIOXIDE
LANDING RATES
LITTLE WOODS
JUNE
1970
TREATED
TREATED
300
200
100
75
50
25
0
6/8
6/9
6/10
6/11
6/12
6/13
6/14
6/15
6/16
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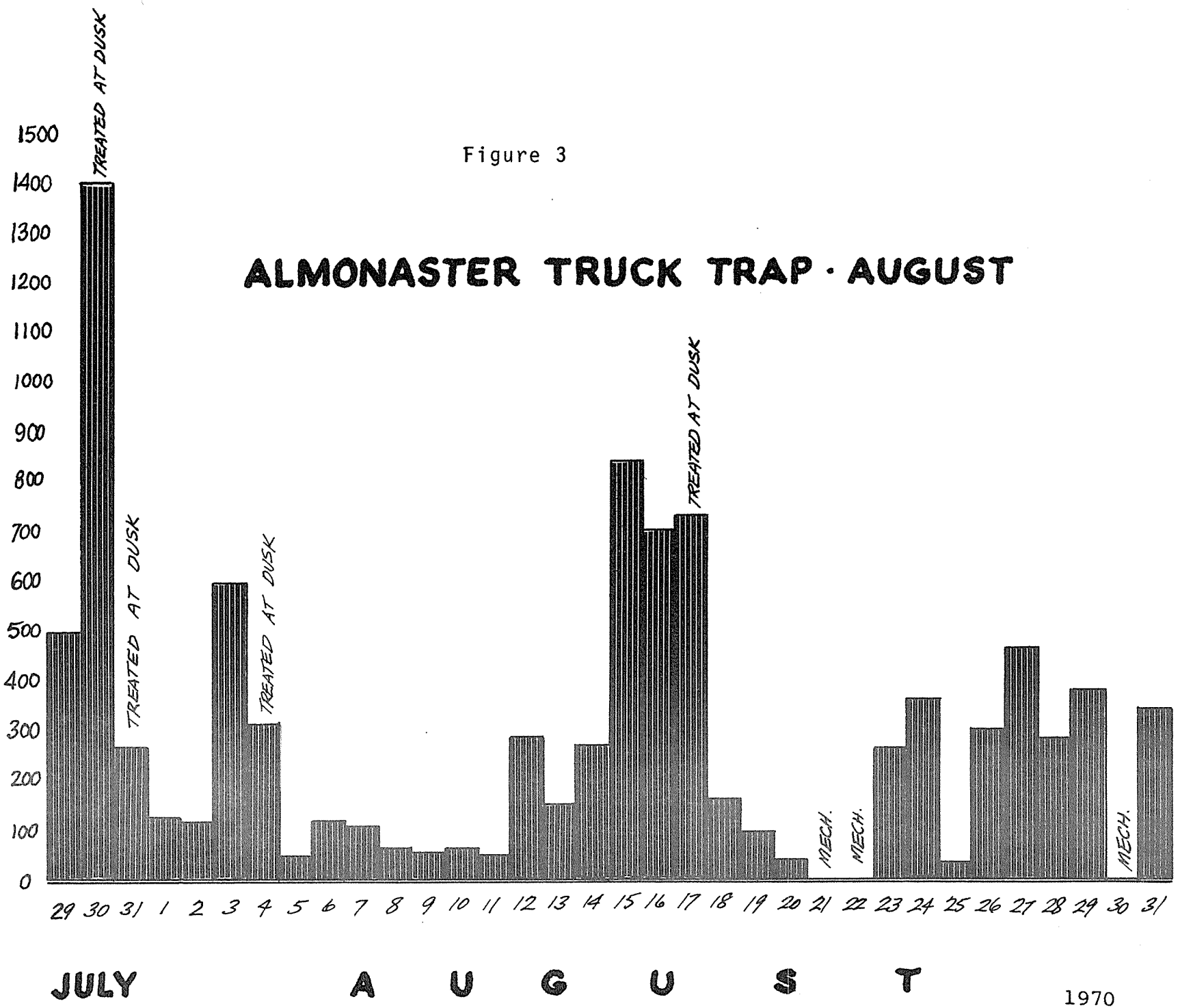
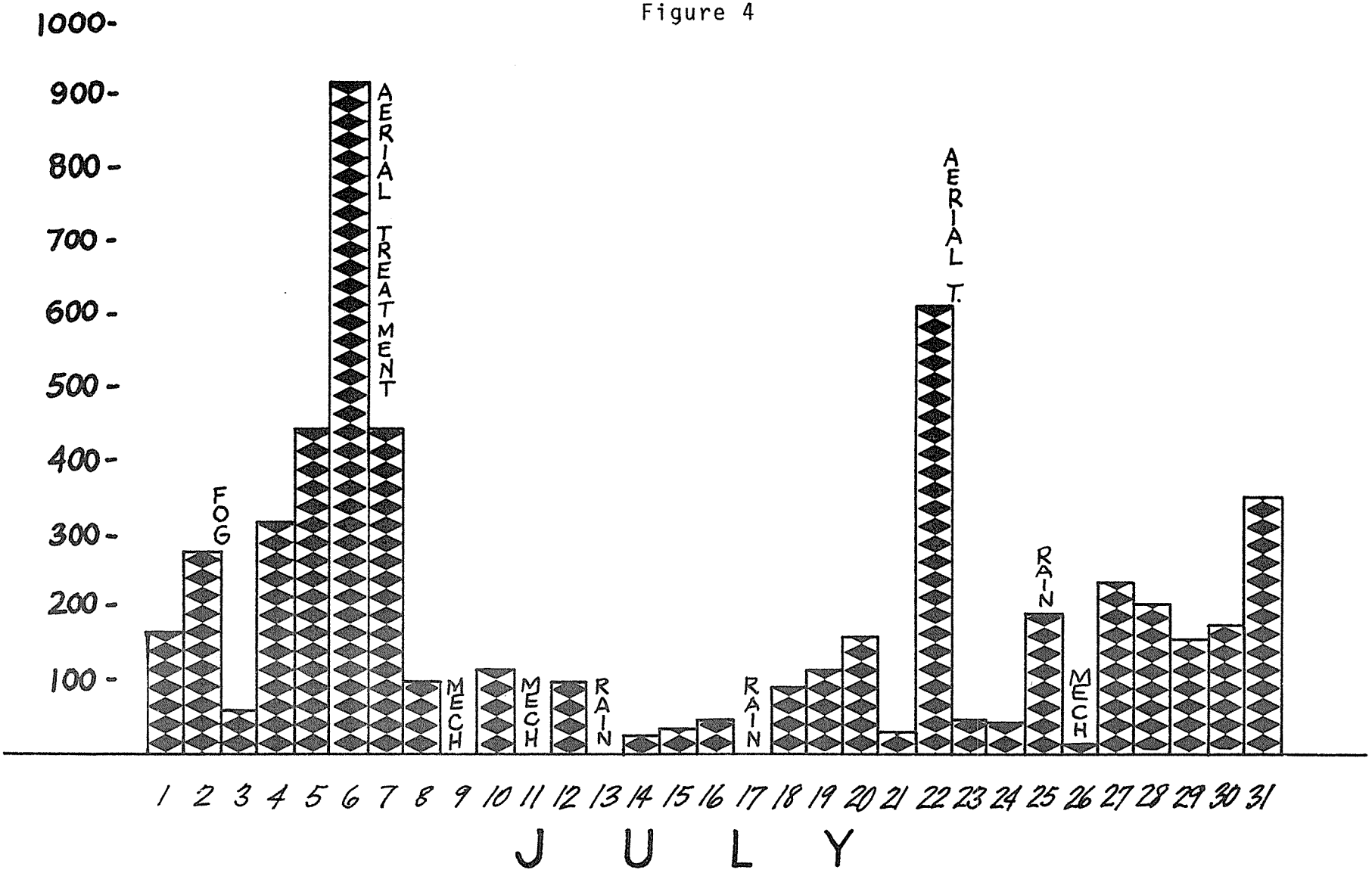
6/30

Figure 3


ALMONASTER TRUCK TRAP · AUGUST
1500
1400
1300
1200
1100
1000
900
800
700
600
500
400
300
200
100
0
TREATED AT DUSK
TREATED AT DUSK
TREATED AT DUSK
TREATED AT DUSK
MECH.
MECH.
MECH.
29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31
JULY
A U G U S T
1970

JULY TRUCK TRAP LITTLE WOODS

Figure 4



1970

ZONES ALGIERS N. CENTRAL- SO. SHORE, MICHOUD-
S. CENTRAL- EASTERN- CHEF, L. ST. CATHERINE-

1970

LOCATION	TOTAL		AEDES		ANOPHELES		CULEX		CULIS.	MANS.	PSOR.	OTHER	NO.
	MALE	FEMALE	SOLL.	VEX.	CRUC.	QUAD.	QUINQ.	SAL.	INORN.	PERT.	CONF.	SPP.	COLL
1. LOW. ALGIERS	253	5,036	5/ 327	27/ 507	7/ 496	0/ 149	1/ 0	205/ 3407	7/ 124	0/ 12	0/ 3	6/ 11	90
2. MID. ALGIERS	149	2,437	1/ 20	39/ 483	0/ 21	0/ 8	1/ 0	93/ 1838	4/ 26	0/ 1	10/ 37	1/ 3	86
3. UP. ALGIERS	90	1,916	0/ 26	34/ 688	1/ 28	0/ 3	0/ 2	43/ 1101	9/ 50	0/ 1	1/ 12	2/ 5	89
4. CAFFIN AVE.	173	757	0/ 4	60/ 324	3/ 13	1/ 0	25/ 18	73/ 360	6/ 29	0/ 1	0/ 1	5/ 7	97
5. VIEUX CARRE	185	491	0/ 2	59/ 217	0/ 8		23/ 31	96/ 206	7/ 25		0/ 2		97
6. IRISH CHANN.	79	291	0/ 1	15/ 132	0/ 10	0/ 1	37/ 49	25/ 78	0/ 10	0/ 1		2/ 9	89
7. NAPOLEON	423	880	0/ 2	305/ 686	1/ 10	0/ 2	27/ 14	55/ 131	0/ 12	25/ 13	0/ 2	10/ 8	70
8. AUDUBON	25	55		7/ 26	0/ 3	0/ 1	7/ 13	10/ 8	0/ 2	0/ 1		1/ 1	64
9. CITY PARK	158	570	0/ 16	22/ 274	1/ 14	0/ 4	25/ 25	93/ 197	6/ 15	2/ 0	3/ 42	6/ 10	78
10. LAKEWOOD	53	328	0/ 4	28/ 233	1/ 7	0/ 1	2/ 2	18/ 52	1/ 10		0/ 11	3/ 8	69
11. WEST END	120	233	5/ 8	72/ 134	1/ 7	0/ 1	4/ 0	36/ 61	0/ 13			2/ 9	71
12. LSUNO	281	659	1/ 11	107/ 403	7/ 44	0/ 6	41/ 18	97/ 136	4/ 20		1/ 3	23/ 18	100
13. PEOPLES AVE.	506	2,993	2/ 37	343/ 1952	2/ 96	0/ 13	6/ 16	147/ 755	6/ 99	0/ 5	0/ 8	0/ 12	80
14. EADS	62	360	3/ 8	36/ 216	0/ 5		1/ 17	20/ 99	0/ 10		0/ 2	2/ 3	67
15. GENTILLY E.	63	562	1/ 50	32/ 297	3/ 38	0/ 9	2/ 10	22/ 147	2/ 8	0/ 1	1/ 0	0/ 2	66
16. LAKE AIRP.	447	2,250	1/ 27	113/ 1334	3/ 43	0/ 15	75/ 13	217/ 486	16/ 296	0/ 4	1/ 9	21/ 23	94
17. LITTLE WOODS	204	3,098	0/ 30	60/ 1071	6/ 347	3/ 296	16/ 26	112/ 1060	0/ 68	1/ 184	0/ 3	6/ 13	89
18. VIL. deL'EST	60	796	1/ 43	36/ 481	1/ 26	0/ 14	0/ 1	19/ 205	0/ 9	0/ 14	0/ 1	3/ 2	65
19. BIENVENUE	151	842	1/ 45	75/ 257	7/ 98	0/ 65	1/ 1	45/ 317	19/ 50	0/ 7		3/ 2	99
20. MICHOUD	501	7,283	1/ 220	7/ 198	41/ 1120	0/ 98	0/ 1	326/ 4249	0/ 72	79/1194	0/ 7	47/124	90
21. POWERS JCT.	411	8,754	1/ 207	5/ 125	4/ 1143	0/ 119		300/ 5161	12/ 200	76/1656		13/143	72
22. SO. SHORE	1,346	3,663	5/ 183	9/ 40	236/ 1277	0/ 30		1031/ 1870	0/ 50	63/ 185	0/ 1	2/ 27	73
23. CHEF MENTEUR	2,405	13,539	339/ 702	62/ 140	238/ 3873	2/ 105		1645/ 8058	29/ 165	85/ 458	0/ 1	5/ 47	92
24. GREENS DITCH	1,618	13,581	139/ 997	63/ 137	433/ 4352	2/ 444	0/ 4	916/ 6780	53/ 579	6/ 72	2/ 3	4/213	93
25. RIGOLETS	274	3,123	17/ 306	21/ 87	84/ 1166	0/ 15		143/ 1220	3/ 229	4/ 50	0/ 7	2/ 43	88
26. BONITA DR.	265	5,631	1/ 88	74/ 2827	2/ 210	0/ 52		134/ 2066	43/ 314	0/ 25	0/ 10	11/ 39	85
TOTAL	10,302	80,128	524/3364	1711/13242	1077/14455	8/1451	294/261	5921/40048	224/2485	341/3885	19/165	180/772	2153

Very few repeat treatments were necessary except when low temperatures and high winds interferred with the mosquitoes normal activity cycle. But the true value achieved by daily survey lies in the fact that each and every abatement operation is based on sound daily adult density survey and assignment and evaluation is continuous. Justification of an assignment to adulticide an area can be reinforced and deemed necessary by extremely accurate and reliable field and laboratory information recorded on a daily basis.

DOMESTIC LARVAL SURVEY

Mosquitoes reared in urban areas have the potential of annyoing many people soon after emergency to adults, therefore, much emphasis is placed on controlling these species as larvae. At the end of the year we had 457 known areas that produce floodwater mosquito larvae. In addition to the floodwater areas, 225 areas are known to breed permanent water mosquitoes. These breeding areas range in size from a few square feet to several acres and are all located in urban areas.

Our inspection force has the ability to inspect and treat all of the known floodwater breeding areas within five days after a rain. This is the minimum time from egghatch to adult emergence.

During 1970 a lot of effort was devoted to locating new or previously unknown breeding areas in the city. This task is never ending with the development of new subdivisions and new construction. The acquisition of new aerial photographs was a big asset for this project.

Training of our inspectors was revitalized during the fall of the year.

Seven training sessions of three hours each were held at two-week intervals to further acquaint the inspectors with background information so they can do a better job. Some of the responsibilities of these men include:

1. Light Trap Collections
2. Landing Rate Counts
3. CO_2 Landing Rate Counts
4. Truck Trap Survey
5. Fixed Wing Inspection
6. Helicopter Inspection
7. Larval Inspection
8. Larviciding
9. Mapping
10. Taxonomy
11. Bird Trapping/Encephalitis Surveillance and Sentinel Flock Maintenance

The training is of utmost importance since many of our expenditures are based on the reports brought back from the field by the group.

DOMESTIC MOSQUITO CONTROL REPORT

DOMESTIC FLOODWATER INSPECTION AND TREATMENT

Areas inspected	8,744
Areas positive for breeding	1,089 (12%)
Areas negative for breeding	7,685 (88%)
Man-hours inspecting and treating	2,445
Miles traveled	12,908
Gallons larviciding oil used	2,565

DOMESTIC INSPECTION AND TREATMENT

Areas inspected	3,496
Areas positive for breeding	247 (7%)
Areas negative for breeding	3,249 (93%)
Man-hours inspecting and treating	1,167
Miles traveled	4,195
Gallons larviciding oil	192

MARSH LARVAL SURVEY

The use of a fixed winged observation plane on a weekly schedule was fully implemented during the year with a total of 51 flights during 1970. There were only 2 saltmarsh mosquito broods that were not detected in time to effect a larviciding program.

The weekly observation flight enabled us to minimize helicopter inspection by knowing exactly where the water was that needed inspecting.

An unusually wet year raised the water table and reduced the number and size of the broods in the marsh. This is reflected in the small number of Aedes sollicitans caught in the light traps for 1970.

Additional fixed winged inspections are planned for 1971 to supplement the scheduled weekly flight. The scattered thundershowers which characterize this area during summer months were resp onsible for the two broods that were not detected.

The renovation of the marsh buggy during the year was a big asset to follow up the helicopter inspections and also to evaluate the larviciding program.

ENCEPHALITIS SURVEILLANCE

The annual precipitation in Orleans Parish was unusually low. This phenomenon reduced mosquito population densities, thus contributing to low levels of virus activity in wild birds and the sentinel chick flocks.

Collections of adult mosquitoes from day-time resting stations were suspended early, as indication of virus activity was low. These adult mosquitoes were collected and identified as to species then sent to the State Board of Health Lab for attempted isolation of specific types of

viral encephalitis. Serum from the sentinel flocks were submitted on a bi-monthly basis to monitor virus activity from May to September in five locations throughout the Parish. Wild birds were also bled on a bi-monthly schedule. The State Lab checked thses bloods for antibodies to Eastern, Western, and St. Louis Encephalitis. We are deeply appreciative of the cooperation and courtesy of the State Board of Health.

Including 1970, four full years of encephalitis surveillance were completed by Mosquito Control in conjunction with the State Board of Health. This was accomplished by a survey of both vectors and hosts of the virus. Blood samples were taken from wild birds and strategically placed sentinel birds to screen for virus antibodies and live mosquitoes of know and suspected vector species were collected in attempts to isolate viruses.

The following chart will show the total collections, results, and expenditures for the years. An average of $5,274.58 was spent each year in the surveillance operations. This was quite a bargain to pay to detect or combat a possible epidemic in the City.

The percentage of positives, as show in the chart, ranged as high as 2.4% in 1970; however, this remains within the acceptable level which is 5.0%. Only three pools of mosquitoes were assembled this year due to the unusually low mosquito populations.

It may be noted that in the last two years the number of blood samples was lowered. This was done to prevent field collections from outdistancing laboratory testing; however, this is still a sufficient number of samples for surveillance purposes.

SUMMARY OF FOUR YEARS OF ENCEPHALITIS SURVEILLANCE BY THE NEW ORLEANS MOSQUITO CONTROL

	1967	1968	1969	1970	TOTAL TO DATE
No. of Wild Bird Bloods	1,517	2,656	993	642	5,808
No. of Positives	26	57	7	12	102
% of Positives	1.7%	2.1%	0.7%	1.9%	1.8%
SLE	3	41	1	4	49
EEE	17	4	4	5	30
WEE	6	12	2	3	23
COST OF WILD BIRD BLOODS	$ 2,985.26	$ 3,559.13	$ 2,973.77	$ 2,902.41	$12,420.57
No. of Sentinel Chicken Bloods	601	525	472	330	1,928
No. of Positives	7	6	7	8	28
% of Positives	1.2%	1.1%	1.5%	2.4%	1.9%
SLE	0	3	1	1	5
EEE	0	0	2	7	9
WEE	7	3	4	0	14
COST OF SENTINEL CHICKEN BLOODS	$ 994.42	$ 936.50	$ 1,699.07	$ 1,368.43	$ 4,998.42
No. of Mosquito Pools	145	116	40	3	306
No. of isolates	0	0	0	0	0
Mosquito Species:					
A. sollicitans	10	3	1	0	14
A. vexans	5	3	7	1	16
A. taeniorynchus	3	1	1	0	5
C. salinarius	117	73	23	2	215
C. quinquefasciatus	10	35	0	0	45
M. perturbans	0	1	10	0	11
COST OF MOSQUITO POOLS	$ 1,585.98	$ 1,083.80	$ 932.60	$ 76.96	$ 3,679.34
TOTAL COST/YEAR	$ 5,565.66	$ 5,579.43	$ 5,605.44	$ 4,347.80	$21,098.33

PERMANENT CONTROL

Permanent control, at source reduction, has made many advances during the past year. In addition to its 3/8 yard Little Giant amphibious dragline, Orleans Parish Mosquito Control has added two Allis Chalmers 615 backhoes, one Chevrolet 6-yard dump truck, and has ordered a small crawler dozer to its list of Permanent Control equipment. To coordinate and operate this equipment, Orleans Parish Mosquito Control has organized a spearate division to deal with source reduction. At the present time, this division is made up of one Mosquito Control Inspector IV, one Equipment Operator IV, two Equipment Operators II, one Equipment Operator I and a maintenance repairman.

To determine which areas receive priority for source reduction we call upon our five years of inspection records. These records indicate which areas have been the most serious and consistant mosquito breeding areas. Once the priorities are established the Permanent Control crew inspects the area and decide how to best eliminate the problem. There are many control techniques to choose from and this is fortunate for each area is different and requires its own specially designed system. Some of the techniques which could be used are impoundments, weirs, dams tidegates, drainage ditches, holding (or reservoir) ditches, filling and grading. Many of the areas require combinations of the above techniques. Once the area is completed it is still inspected to determine if the control measures were adequate or where additional work is needed. To date Orleans Parish Mosquito Control has a total of over 10,000 acres of once prolific breeding under permanent control. Over 129,000 linear feet of ditch were due to accomplish this task. Our Blind Lagoon impoundment now provides over

8,000 acres of outdoor recreation area, which was formerly a giant mosquito breeder. 140 acres are controlled by the holding (or reservoir) ditch techniques. These ditches are designed to hold water the year round. They are either stacked or have their own aquatic predators which eat any mosquito larvae which may hatch in the area. The rest of the acreage under permanent control utilizes the drainage system technique, or a combination of drainage and holding ditch design.

PERMANENT CONTROL OPERATIONS

DRAGLINE REPORT

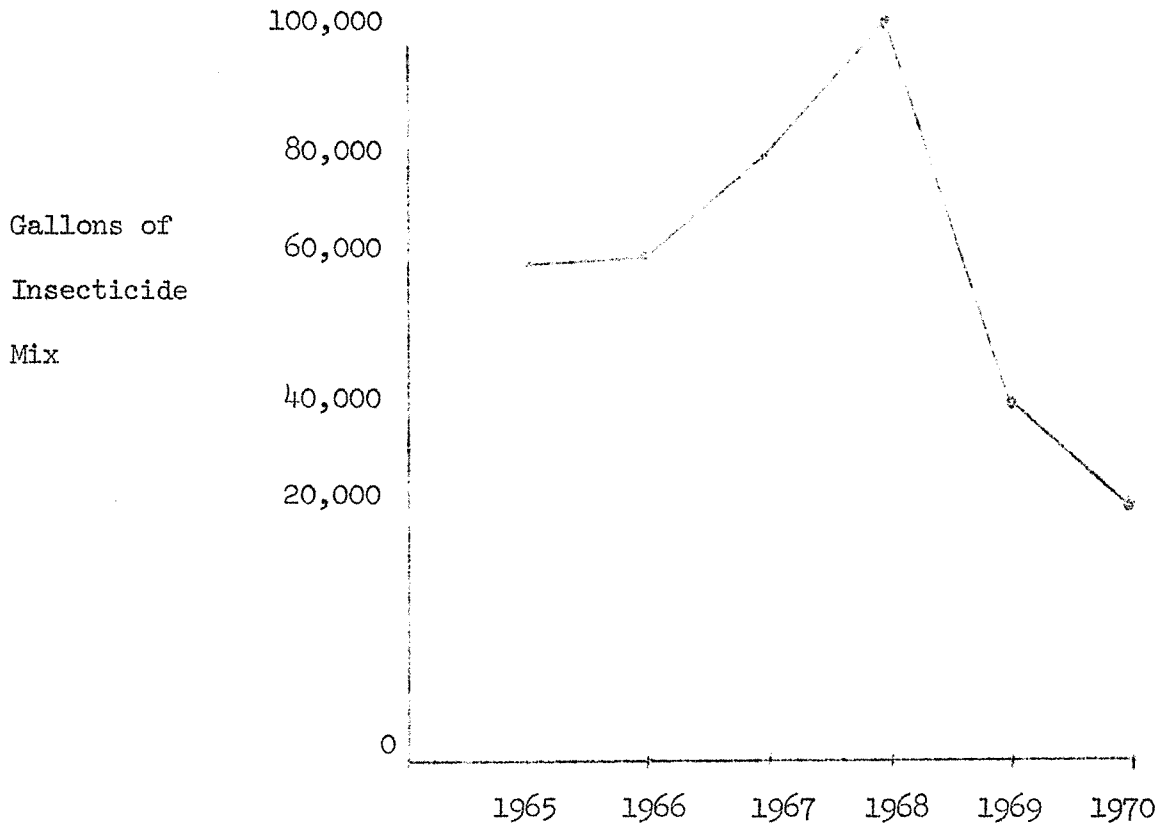
Total hours		703.0
Total dig hours		362.0
Per cent time digging		50%
Total linear feet dug		27,800.0
Total cubic yards dug		11,006.0
Fuel oil cost	$	65.43
Salary	$	4,074.00
Miscellaneous operational cost	$	401.20
Total operational cost, 197-	$	4,511.52
Cost per linear foot	$	.16
Cost per cubic yard	$	.37
Average ditch size		3' x 5'
Linear ft. per digging hour		74.0
Cubic yd. per digging hour		30.0

BACKHOE REPORT

Total hours		695.0
Total dig hours		550.0
Per cent time digging		60%
Total linear feet dug		42,000.0
Total cubic yards dug		4,415.0
Fuel oil Cost	$	53.65
Salary cost	$	3,583.33
Miscellaneous operational cost	$	85.39
Total operational Cost, 1970	$	3,445.19
Cost per linear foot	$	.10
Cost per cubic yard	$	.71
Linear ft. per digging hour		76.0
Cubic yd. per digging hour		8.0

FOGGING REPORT

Fogging activities during 1970 were the lowest of any year since the inception of mosquito control in 1964. As would be expected at this point in development of Orleans Parish Mosquito Control abatement or temporary control measures are on the decline while source reduction or permanent control measures are on the increase. As a result of the expanded source reduction program and intensive adult density survey the mosquito problem is arrested before the most expensive and least effective control measure need be activated. The following grap will illustrate the reduction of fog truck use as the gallons of insecticide used are plotted over the past six years.



Abatement activities peaked in 1968 and have been on the decline ever since. A leveling off period should occur over the next few years. As the development of New Orleans East takes place qnd man moves his habitat into

the marsh continued fogging will be necessary.

Ground adulticiding is in the process of changing. New techniques are on the horizon for the upcoming year. Specifically a very safe, completely bio-degradable insecticide, Malathion has been labeled for use in ground Ultra Low Volume treatment. Specific requirements established by the manufacturer must be met by each mosquito control district that desires to employ this new technique. Orleans Parish Mosquito Control has been approved and the new ULV method will be in use next year. By using air as the insecticide carrier the burning of diesel oil for a carrier can be completely eliminated. In addition to a monitary savings of 60 to 70%, the two ounce per minute output does not create any driving hazard whatsoever. This revolutionary new concept of ground adulticiding will further increase the efficiency of mosquito control operations in Orleans Parish.

FOGGING REPORT

Fog Nights	192.0
Man-hours	1,277.0
Fogging Hours	884.0
Gallons Insecticide	37,204.0
Insecticide cost	$ 14,886.00
Labor Cost	$ 3,246.00
Cost of gasoline and oil	$ 340.82
Gallons of propane used	4,025.0
Cost of propane	$ 515.45
Totals miles traveled	10,833.0
Total miles fogged	4,262
TOTAL COST	$ 18,988.27

AERIAL ACTIVITIES - 1970

The aerial activities for 1970 showed great progress in effeciency and effectiveness, particularly in the adulticiding operations where new formulations were adopted and new techniques were evaluated. The Florida State Board of Health Research Laboratory recommendation of one quart per acre of approximately 8% Malathion in diesel oil was evaluated with our Ag-cat and found to be very effective. The reduction from three to one quart per acre increased acres covered and decreased ferry time.

The desirable Ultra Low Volume system for a single engine plane has been the goal of most mosquito control programs. The use of a venturi to accomplish U.L.V. (1-3 oz. per acre) was tried on several occasions but a consistance performance could not be obtained. It is still our opinion that the system can be made to work. In further pursuit of single-engine U.L.V., a revolving porour metal sleeve was tested with very favoralbe results. Essentially the sintered - Nead sleeve allows the liquid to flow through as a very fine ribbon and the revolving action of the cylinder breaks the chemical into very fine droplets. This method also shows much promise and additional testing and improvements could make the Beecomist an operational tool of the future.

Mosquito activity was at a very low ebb during 1970 and this reduced activity was reflected our DC-3 operations. Only one operational treatment flight was needed during the year and the remainder of DC-3 flight time was utilized for research and normal maintenance.

Increased aerial survey for mapping, inspection and photography accounted for an additional 60 hours for flight time. In addition to survey flights for mosquito control activities we are also providing aerial

support for the Pollution Control Section of Environmental Health. Most of the Pollution Control surveys can be made to coincide with the scheduled Mosquito Control inspection flights. Expanded aerial survey, with both fixed-wing aircraft and helicopters, will be an objective for the upcoming years.

Aerial Larviciding

Areas treated with Parish Green		1,100 acres
Areas treated with Larviciding oil		3,434 acres
16,500 lbs. Parish Green used @ .10/lb.	$	1,650.00
13,735 gallons oil with surfactant @ .11/gal.	$	1,510.85
33 Pilot Hours @ $8.00/hr.	$	264.00
Loading cost (manpower and travel)	$	157.75
Miscellaneous costs	$	660.00
Total cost for aerial larviciding	$	4,242.60
Cost per acre ... Parish Green	$	1.90/A
Cost per acre ... Larviciding Oil	$	.62/A

Aerial Adulticiding

Areas treated with 8% Malathion		115,612 acres
28,903 gallons Malathion 8% @ .61/gal.	$	17,630.83
203 Pilot hours @ $8.00/hr.	$	1,624.00
Loading cost (manpower and travel)	$	609.00
Miscellaneous costs	$	4,060.00
Total cost for aerial adulticiding	$	23,923.83
Cost per acre	$	.21/A

Aerial mapping, inspection, photography accounted for 60.25 hours

Airplane rental	$	1,205.00
Pilot pay	$	482.00
GRAND TOTAL	$	28,166.43

DC-3 Operations

Areas treated		15,654/A
240 gallons technical Malathion @ $6.15/gal.	$	1,476.00
31 contract Pilot hours @ $25.00/hr.	$	775.00
Loading and crew costs	$	350.00
Operation and maintenance costs, insurance, etc.	$	2,790.00
	$	5,391.00

CONTROL OPERATIONS - 1970

Light Trap Operation

2,362	light trap collections		
993	man-hours on light trap collections	$	2,608.46
10,188	miles @ 3¢ per mile		304.64
	Cost of light trap operation	$	2,913.10

Landing Rate Counts

19,047	landing rates		
1,999	man-hours on landing rates	$	5,271.13
16,055	miles @ 3¢ per mile		482.55
	Cost of landing rates	$	5,753.68

Truck Trap Operation

1,216	man-hours on truck traps	$	1,368.66
4,305	miles traveled @ 3¢ per mile		129.15
	Cost of truck trap operation	$	1,497.84

Identification of Mosquitoes

141,925	mosquitoes identified		
10,945	larvae identified		
604	man-hours identifying mosquitoes and larvae	$	1,622.30

Light Trap Maintenance

318	man-hours on light trap maintenance	$	859.56
1,717	miles traveled at 3¢ per mile		51.54
	Cost of light trap maintenance	$	911.10

Inspection and Mapping

4,511	man-hours inspecting and mapping	$	11,874.33
17,256	miles traveled @ 3¢ per mile		574.68
	Cost of inspection and mapping	$	12,422.01

Ground Larviciding

2,617	man-hours ground larviciding	$ 1,510.29
2,470	miles traveled @ 3¢ per mile	68.01
1,893	gallons diesel @ 11.5¢ per gallon	217.69
	Cost of ground larviciding	$ 1,795.99

CDC Light Trap Operation

NONE

Resting Stations

NONE

Bird Trapping

958	man-hours bird trapping	$ 2,820.93
2,716	miles traveled @ 3¢ per mile	81.48
	Cost of bird trapping	$ 2,902.41

Sentinel Chickens

391	man-hours on sentinel chickens	$ 1,343.38
735	miles traveled at 3¢ per mile	22.05
	Cost of sentinel chickens	$ 1,365.43

Permanent Control

879	man-hours on permanent control	$ 3,589.22
210	miles traveled at 3¢ per mile	14.85
	Cost of permanent control	$ 3,604.07

Calibration

8.5	man-hours on calibration	$ 96.53
	Cost of calibration	$ 96.53