

The Present Mosquito Control Situation in Delaware

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*Reprinted from the Proceedings of the 27th Annual Meeting of the New Jersey
Mosquito Extermination Association, held at Atlantic City, March 20-22, 1940*

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It was with some hesitation that I accepted the invitation extended by the Secretary of this Association to speak briefly on the subject of "1939 Mosquito Control Accomplishments in Delaware." If the happenings of the past year are viewed in the usual way, very little or nothing has been done. The accomplishments, whatever they may be, certainly cannot be expressed in the customary terms of number of linear feet of ditch dug or cleaned, of other control structures installed, or of the total spray-gallons of larvicide used in the treatment of breeding places.

For more than a year, now, control activities in Delaware have been practically at a standstill. Ditching operations on a State-wide basis, which commenced in October 1933, were brought to conclusion in November 1938. Within this period and mainly by means of Civilian Conservation Corps labor, approximately 2,199 miles (or 11,609,664 linear feet) of ditch had been dug on an area estimated at 44,468 acres, or 44.7 percent of the marsh area of the State. This acreage, largely in Sussex and Kent Counties, represents, probably, about 65 percent of the marshes which are serious mosquito-breeding areas. All this work was carried on under the supervision of the Delaware Mosquito Control Commission. It is, in every sense, a notable achievement made possible, as you well know, by the fortuitous circumstances which permitted the expenditure of relief funds for this purpose.

By a legislative act, approved September 5, 1939, the State Highway Department was authorized and directed to assume and continue the work for the control and elimination of mosquitoes heretofore conducted by the Mosquito Control Commission.

In view of the fact that I have been closely in touch with the mosquito-control movement in Delaware since its inception, I have decided to trace herein the succession of events which reached a climax in 1939, with the thought that a review of the local situation might indicate a course of procedure in such work less likely to meet with reverses of this kind.

Delaware is an agricultural state. The population of its three counties is predominantly rural. The well-being of the many towns and smaller communities throughout its length and breadth has been dependent for years upon the thrift of farming folk. These people are conservative both in thought and in action. They are self-reliant. It is only in the face of a real emergency that they look to others for help. They are not likely to be stampeded when confronted with any problem of far reaching importance. Neither they nor their elected representatives are inclined to embark upon a course of action concerning which there is question either as to its necessity or as to their ability to finance the expenditures involved. Accordingly, although rural progress in Delaware has been slow, the advances which have been made have been substantial in character. These outstanding

traits of the Delawarean have already influenced significantly the mosquito-control movement in that State and will undoubtedly prove to be the principal factor determining future developments.

The basic survey of the mosquito-control problem in Delaware made in 1932 by the Department of Entomology of the Delaware Station was undertaken at the special request of resort interests and not in response to a general feeling on the part of the rural population that action must be directed immediately toward elimination of the mosquito nuisance.

Following this survey and in a normal course of events, mosquito control would probably have been taken in stride, so to speak, as has been the case with the construction of modern schools and the extension of concrete highways throughout the State. However, it was destined otherwise. In October 1933, the first of several Civilian Conservation Corps units were allocated to Delaware for mosquito-control work. The result of the large-scale operations, which were thus made possible has been an advance in mosquito control within a period of but 5 years comparable to that obtained on equal areas in other states during the last 20 years.

Prior to the assignment of these units to Delaware, the Director of the Federal Emergency Conservation Commission insisted that the State comply with several requirements. It became necessary for the Governor to assume at once certain obligations on behalf of the State. The most important of these were the responsibility for local administration of the camps and for supervision of control activities and the assurance that all improvements would be maintained. It had been taken more or less for granted by both Federal and State authorities that the University, which had sponsored this movement, would accept the responsibility of administration and supervision. The failure to do so, at that time and subsequently as well, has been due to the stand maintained thus far by the Director that active participation in control activities is not a function of the Agricultural Experiment Station and that it might involve the institution politically. Insofar as the mosquito-control movement itself is concerned, this has proved most unfortunate.

So, of necessity and by legislative act, late in the year 1933 the Delaware Mosquito Control Commission came into being, the members of which were to serve for a term of 18 months. After that time and by another act, the Commission was continued on a permanent basis. Although having representation from both the Agricultural Experiment Station of the University of Delaware and the State Board of Health, it was in name and in fact a political body.

Even in the early months of its existence it should have been readily apparent to the discerning eye that the mosquito-control movement over which it was supposed to exercise some degree of guidance was bound to bog down eventually in the mire of well-meant but too aggressive action. I have every respect for the members of this Commission with whom it was my privilege to be associated for several years, I still marvel at the unlimited energy of the man who served as its Executive Officer and Engineer, at the orderly precision with

TABLE 1

Summarized Collection Records for Mosquito Trap Located at Lewes, Delaware, During the Months, May to September, Inclusive, Years, 1932 to 1939, Inclusive, and Comparative Climatological Data¹ for the Months, April to September, Inclusive, for the Same Years.

Year	Nights in Operation	Total Species ²	Total Mosquitoes	Average Number per Night	Number and Percent Salt-Marsh Species	Number and Percent—								
						Anopheles				Aedes				
						punctipennis	quadrinaculatus	walkeri	crucians†	vexans	canadensis	sollicitans†	cantator†	taeniorhynchus†
1932	97	11	3148	32.4	2891 91.8	4 *	87 2.8			30 0.95	2280 72.4	308 9.8	185 5.9	
1933	164	16	8545	52.1	7731 90.5	30 *	5 *	1992 23.3		48 0.6	20 *	3721 43.55	584 6.8	1283 15.0
1934	126	16	1634	13.0	1296 79.3	2 *	2 *	30 1.8		71 4.3	1 *	814 49.7	329 20.1	46 2.8
1935	85	15	249	2.9	126 50.6	1 *	1 *	7 2.8		64 25.7		105 42.2	1 *	4 1.6
1936	82	11	394	4.8	303 76.9	1 *		14 3.55		44 11.2		174 44.2	9 2.3	91 23.1
1937	112	18	2006	17.9	1564 78.0	7 *	2 *	252 12.6		166 8.3		854 42.6	54 2.7	50 2.5
1938	114	17	5690	49.9	4297 75.5	19 *		481 8.45		318 5.6		1454 25.55	10 *	78 1.4
1939	143	15	1870	13.1	1502 80.3	24 1.3		191 10.2		119 6.4	2 *	837 44.75	52 2.8	75 4.0

¹Records for Millsboro (located 15 miles southwest of Lewes) from Climatological Data, Maryland and Delaware Section, U. S. Weather Bureau, Baltimore.

²22 species.

†Determinations by Donald MacCreary.

*Less than 0.5 percent.

‡Salt-marsh species.

TABLE 1—(Continued)

All Species†										Precipitation in Inches		Temperature Departure from the Normal in Degrees F.		
triseriatus	atlanticus	mitchellae	Culex				Theobaldia melanura	Psorophora ciliata	Psorophora columbiae	Mansonia perturbans	Uranotaenia sapphirina		Orthopodomyia signifer	Total
			apicalis	pipiens	restuans	salinarius‡								
				212 6.7	31 1.0	1 *	4 *	6 *				20.61	- 2.76	+ 2.9
			50 0.6	442 5.2	1 *	151 1.8	3 *	1 *	44 0.5	170 2.0		39.02	+15.65	+11.8
		1 *	10 0.6	114 6.9	1 *	77 4.7			12 0.7	111 6.7	13 0.8	40.10	+16.73	+10.4
	1 *	3 1.2		18 7.2	9 3.6	2 0.8	19 7.6	10 4.0	4 1.6			34.35	+10.98	- 2.5
			7 1.8	30 7.6	15 3.8			2 0.5	7 1.8			25.07	+ 1.65	+ 3.7
1 *	1 *		12 0.6	41 2.0	4 *	354 17.6	2 *	179 8.9	18 0.9	8 *	1 *	33.32	- 9.90	+ 0.7
	2 *	1 *	5 *	203 3.6	1 *	2274 40.0	1 *	2 *	817 14.35	18 *	6 *	34.68	+10.04	+ 2.8
		1 *	6 *	102 5.45		347 18.55	3 *	65 3.5	38 2.0	8 *		25.75	+ 2.32	+ 7.5

which he conducted its business, and at his ability to marshal and to keep engaged the large forces at his command. But the fact remains that the procedure which he was permitted to follow and the plans for the future of this effort were obviously not in line with rural ways or thinking in Delaware.

From the very outset the utilization of CCC manpower for this purpose was attended by too much ballyhoo, and achievements, even minor ones, were overpublicized. Generally speaking, if an extensive project for regional betterment such as this is successful, the resulting benefits are more or less self-evident to the communities concerned. The summarized data on mosquito prevalence at Lewes, Delaware, for the years 1932 to 1939, inclusive, presented in table 1 herein, are necessary to us, as mosquito-control workers, since they provide factual evidence of carefully executed operations. But there can be nothing more conclusive with respect to accomplishments than the simple knowledge on the part of those who live in southern and central Delaware that, as the work progressed, there were noticeably fewer and fewer mosquitoes. These people did not need to be told nor did they want to be told that here was a job well-done. The more comfortable outdoor conditions throughout the treated area, during the summers of 1935 and 1936, were the best and the only advertisement necessary as to the effectiveness of the mosquito-control campaign.

With the passing of each year, the handwriting on the wall became clearer and clearer for those who would read. It was not long before Delaware, unfortunately, assumed the appearance of an arena in which wildlife enthusiasts and the proponents of mosquito control engaged in a wordy but absolutely futile tussle. It was, nevertheless, the beginning of the end. The last CCC camp designated for mosquito-control operations in the State was withdrawn in November 1938.

Thereupon commenced what may well be called "the period of great uncertainty," which did not end until September 1939. With Federal aid no longer available, every effort was made to secure the necessary local support, but without success. The budget requested from the State by the Commission for 1939-40 was \$141,790 and for 1940-41, \$95,420, an indefensible total in every respect and especially so in view of the economical mood of the current General Assembly. The Governor recommended an appropriation of \$45,000 for each year of the present biennium, and the Legislature finally granted but \$3,500, despite the fact that the results of a State-wide straw vote taken by the Commission showed that 93.57 percent of the ballots returned were marked as favorable to the continuance of mosquito-control work. Two bills introduced by the Commission, one of which redefined and would have broadened its powers and the other which would have permitted the utilization of prison labor in Sussex County for such operations, failed of passage. The resort towns of Rehoboth Beach and Lewes, from a community standpoint two of the principal beneficiaries of the mosquito-control movement, were then solicited to provide funds for local maintenance work. It was impossible for

them to do so because of limited budgets. Every possibility of financial assistance had apparently been explored and to no avail.

It was at about this time that the late Mr. Robert Fechner, Director of the Civilian Conservation Corps, Washington, entered the local picture. On May 12, 1939, he ordered the discontinuance on June 30 of three of the four CCC camps remaining in Delaware as a disciplinary action following the failure of the Legislature to provide sufficient funds for the maintenance of mosquito-control work, an obligation which had been set forth, you will recall, and finally assumed by the State in the original negotiations with the previous administration. The camps in question included two agricultural drainage units and one working under the supervision of the State Forestry Commission. Mr. Fechner subsequently postponed the abandonment of these camps until September 30, pending possible favorable action on the question of maintenance funds by the Legislature at its last-scheduled meeting on August 1. In the meantime, a figure of \$25,000 had been settled upon as the minimum sum satisfying this requirement. An appropriation of this amount was included in the bill finally passed by the General Assembly, which was entitled "An act authorizing and directing the State Highway Department to assume and continue the work for the control and elimination of mosquitoes, heretofore conducted by the Mosquito Control Commission; authorizing and directing the Mosquito Control Commission to transfer and deliver to the State Highway Department all of its machinery, tools, and equipment, together with all maps, charts, and records, and providing a penalty for failure to transfer same; and providing an appropriation therefor." This bill was approved by the Governor on September 5, 1939; its provisions were complied with by the Delaware Mosquito Control Commission on September 15; and, on September 26, Mr. Fechner signed the order continuing two of the drainage camps that had been slated for removal. The forestry unit was withdrawn. Thus was ended a most interesting chapter in the history of mosquito-control work in Delaware. As to the future of the movement your guess is as good as mine.

The incidents in Delaware during the past few years, which have just been recited, are not without value. Experiences such as these cannot help but impress those of us engaged in public work with the importance of being able at all times to interpret accurately the wishes of those whom we serve. The projects with which we permit ourselves to become identified should be spontaneous in character, otherwise our labors may be in vain. They should reflect an actual and widespread need and must be kept constantly attuned to possible changes in local thinking. Procedure should be carefully developed and critically and frequently reviewed. The personnel involved should be selected with particular thought to the avoidance of friction with other enterprises, the objectives of which are probably no less worthy. The difficulties which have beset mosquito control of late, if examined in this light, are largely of its own making, and the criticism to which such activities have been subjected is not wholly unjustified. We should be the first and not the last to realize where our program is weak. If

a mosquito-control operation does more or does less than it is supposed to do, it is our duty and not the responsibility of workers in other fields to determine beyond question both its possibilities and its limitations. Mosquito control requires no justification other than relief from annoyance to man and animals. The measures designed to achieve this end are for the most part scientifically sound. They should be carried out in a manner constantly featured by a common-sense regard for other programs equally dependent upon popular support.