EASTERN ASSOCIATION OF MOSQUITO CONTROL WORKERS

A discussion meeting was held in Pennsylvania on May 5th, 1942 at which the following papers were presented before the members and guests:

Random observations and hypotheses concerning the relations of fish and mosquitoes

By Mr. John T. Nichols, Curator of Recent Fishes, American Museum of Natural History, New York City

My summer residence for the past 32 years has been on the south shore of Long Island, a mostly tidal area facing the broad waters of Moriches Bay to east, and narrower waters between mainland and beach to the south, bordered all around by salt. Several short creeks which used to be quite water flow to the bay.

This has been a mosquitoey locality. Mosquitoes always common, in most years sufficiently abundant to annoy persons not acclimated to them, not infrequenty occurred in such dense swarms as to be a pest. My knowledge of mosquitoes is just sufficient to differentiate the handsomely colored salt marshy, from another more uniformly brownish species, together make up the bulk of the population. has never been reason to suspect that any malaria were present.

Mosquito swarms usually occur in muggy periods rains. Aside from any increase directly trace to the weather their number has varied up and from unknown natural causes and there have been relatively mosquitoless unexplained years. Hence relations which one attempts to draw with this or factor can only be tentative. I have occasionally
seen mosquitoes on the marshes early in the season carrying a red mite, and have noticed that in such seasons there were relatively few mosquitoes later in the season. This again may be coincidence.

Mosquito wrigglers are sought as live food by many or most small fishes. The efficiency of a fish as a mosquito destroyer usually depends on its being small enough and abundant enough, and the young of some species are pretty efficient though the adults are too large. Number of years ago I was on a Florida "river" which seemed as though it should have been mosquitoey, but quite without mosquitoes. A reason was not far to see; its borders were literally alive with viviparous topminnows, especially Gambusia, well known as a destroyer of mosquito wrigglers. I furthermore believe that the abundance of these little fish was correlated with an abundance of large-mouth bass out in the channel. The bass no doubt preyed on them, but held down any smaller fish which might have followed them into shallow water and reduced their numbers, as the bass did not.

This situation came to mind later in thinking of similarly small fish, namely Lucania, which occurred in small numbers in the freshwater creeks at my Long Island locality, where there were also somewhat larger predatory fishes, notably the brook pickerel which was common and very likely held down the numbers of smaller species. As an experiment I introduced large-mouth bass in the waters. It followed that the pickerel decreased, Lucania and perhaps other small fishes increased considerably, and there were several years relatively free from mosquitoes. How much this proves and how much it was due to coincidence I don't know, but believe both were fact. Likely in part from lack of proper spawning grounds the bass faded out. For the past 10 years with Moriches Bay open to the ocean, bay and creeks have become progressively more saline, and the old fresh-water balance...
It is generally recognized that fish are an efficient mosquito control, but not how important the balance of fish life may be in such matters. In Florida on Long Island as indicated, large-mouth bass were an anti-mosquito factor. But I have recently been aware that successful introduction of large-mouth bass into some of the suburban lakes has seriously increased mosquitoes, the beneficial ones in this case presumably destroying the mosquito-destroyers instead of their enemies.

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There is one factor in our periodic great abundance of mosquitoes which it seems could not be confused locally. Mosquitoes doubtless drifted into the marshes on the prevailing Southwest wind from the stretch of marshes which border the south bays of Long Island west of us, and accumulated in the shrub growth. When mosquitoes had been very troublesome, strong winds from the north or the east relieved them. In the last year or two they have been considerably less than average, and there is no doubt in my mind that extensive ditching all along the south shore is a considerable factor in their decrease.

As I see it the immediate effect of this ditching was to give small fishes (mostly Fundulus), access to otherwise isolated pools in the marsh, immediately increasing the number of wrigglers. A second effect is gradual with the passage of years is to dry up the marsh, and change the character of the marsh. After 2 years of ditching our own marsh is becoming absolutely dry and firm, even though it is completely surrounded by occasional storm tides. This second effect may or may not be desirable from the point of view of mosquito-control, it is very undesirable from that of other wild life.

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One other observation may have a bearing on the general problem. For 5 years or so we have had a small shallow, artificial fresh-water pond, which was made the edge of the marsh by damming a swamp. This is frequented by wild ducks. Sometimes for 2 or 3 weeks in late summer most of it is mud with water only in the deeper parts, and in somewhat isolated pools. Least terns and other birds at such times take out a large part of the grown fish population, concentrated within their reach. Offhand it might now seem to be a danger spot. However, at this time I have found fish fry, a very abundant type of more or less predaceous water bugs, and wrigglers in any of its water. May we deduce as a general rule that it is not temporarily isolated pools (which will contain a concentration of corrective agents) that make a condition favorable for mosquitoes? If this is the case should not the objective be to ditch a marsh so that as its water rises all parts of it will be accessible to the residual fish-life of its deeper parts, rather than so as to drain off its waters?

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These observations are too cursory and too little critical to prove one or another hypothesis. They may serve to emphasize the conviction that successful control of mosquitoes, or any other animal, should rest on an understanding of the existing balance of life, and where possible, work with not against it.

Observations on Some Relations of Mosquito Control Ditching to Marsh Birds

By Mr. Aretas A. Saunders, Fairfield, Connecticut

The various different problems that come under term conservation are not as successful as they might