

Long-Term Study of Nontarget Effects of Mosquito Larvicides

Status Report: Feb. 2002

Background: The Wright County nontarget study sites were a set of 27 wetlands in Wright Co., Minnesota, that were selected for study by the Natural Resources Research Institute (Duluth, MN) in 1988 for a project directed by an independent panel of scientists with funding from the Metropolitan Mosquito Control District in St. Paul, MN.

Study design: The wetlands were studied for 3 years prior to treatment and then assigned to 3 treatment groups (Bti, methoprene sand, or untreated control), and treated 6 times in every year starting in 1991 and continuing through the end of 1999.

Results from first 3 years of treatment: Results from sampling done in 1988-1993 showed there was no difference between treated and untreated sites for measures of zooplankton, breeding Red-winged Blackbirds, or the bird community inhabiting the wetlands (Niemi et al. 1999, Hanowski et al. 1997). For macroinvertebrates in samples of core sediments, Hershey et al. (1998) reported significant decreases in insects, mostly in the Chironomidae (non-biting midges), in the later sampling dates from 1992 and especially 1993, but not in 1991.

Results from 7th and 8th years of treatment: Macroinvertebrate sampling was repeated by Drs. M. Balcer and K. Schmude of Lake Superior Research Institute, Superior, WI, in 1997 and 1998. The more recent sampling found generally high numbers of insects and other invertebrates in all the sites. The only difference between treated and untreated sites was lower populations of some groups within the Chironomidae in treated sites, but other Chironomid groups were higher, resulting in no difference in Chironomid numbers or biomass as a whole (Schmude and Balcer 1997, Balcer et al. 1999). Statistical analysis for LSRI was done by Ann Lima, who also did the analysis for the previous NRRI study. Analysis of dosage data collected by Dr. Lyle Shannon (Univ. of Minn., Duluth) for both studies suggests higher than planned doses in 1992 and 1993 may have contributed to the difference in results.

Most members of the independent Scientific Peer Review Panel (SPRP) that oversaw the original 1988-1993 studies continued to direct and review the 1997-1998 work. This Continuation Panel includes Drs. R. Anderson (US-EPA), S. Hurlbert (San Diego State University), R. Moon (Univ. of Minn.), W. Schmid (Univ. of Minn.), M. Zicus (Minn. Dept. of Nat.

Res.), K. Simmons, and J. Helgen (Minn. Pollution Control Agency), and MMCD Technical Advisory Board member D. Belluck. Additional reviews of the results were solicited from other wetland invertebrate specialists including Drs. M. Berg (Loyola Univ.), R. W. Merritt (Mich. State), L. Ferrington Jr. (Kansas State), W. Walton (UC-Riverside), R. Newman (Univ. of Minn.), and J. P. Gathman (Mich. State), as well as from A. Hershey (now at Univ. of North Carolina). Members of the Continuation Panel, in conjunction with Dr. Mary Balcer, are working on a journal publication covering the 1997-1998 results.

REFERENCES

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