AMPHIBIAN MONITORING DURING 1971 MATACIL TRIALS IN NEW BRUNSWICK

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[illegible] of our 1969 and 1971 [illegible] monitoring studies [illegible] four principal types of data [illegible] (1) actual counts [illegible] (2) [illegible] observations [illegible] and [illegible]

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We monitored frogs and tadpoles from May 29 to June 11, 1971, near Richibucto, New Brunswick, in an attempt to assess the immediate effects of experimental aerial Matacil spraying on these amphibians. Frogs and their larvae are abundant vertebrates in New Brunswick forest ponds and ditches during the period in spring when forest insecticides are applied to control the spruce budworm; these amphibians are therefore exposed to toxic chemicals during their critical reproductive period. Frogs and tadpoles are important links in both terrestrial and aquatic food chains, where they are eaten by many other vertebrates.

STUDY AREA AND METHODS

This study was carried out in Block M1 (between Kent Junction and Richibucto) and Block M2 (just west of Mortimer and Harcourt). Block M1 was sprayed with an emitted dosage of 1.5 oz. Matacil in 0.15 USG Panasol per acre on the morning of June 5, and Block M2 received 1.5 oz. Matacil wettable powder in 0.15 USG summer oil per acre on the evening of June 10. Both were operational-size blocks of approximately 12,500 acres each. Three census sites were located in Block M1 and four in Block M2; there were two control sites, both located between Block M1 and Richibucto. In addition, experimental sites of one block served as controls when the other site was sprayed. Experimental census sites received a good dosage of spray as evidenced by spray cards set out at each site just prior to spraying.

The methods used in 1971 are essentially those of our 1969 and 1970 New Brunswick spray monitoring studies. We gathered four principal types of data for our assessment of immediate pesticide effect: (1) actual counts of numbers of frogs of each species found at selected census sites during specified times of day and night; (2) post-spray observations on caged and [illegible] (3) post-spray observations were made on these caged specimens.

free-living frogs and searches for dead individuals; (3) post-spray observations on caged and free-living tadpoles; and (4) information on frog calling activity during the nights of the study.

A total of 2509 individual observations was made on frogs and toads during census counts, by species as follows: green frog (Rana clamitans), 1237; leopard frog (Rana pipiens), 934; American toad (Bufo americanus), 6; unknown, 332. Census areas were selected at roadside ditches and ponds and their boundaries clearly marked. Frogs were enumerated in the afternoons and again at night by walking around and/or through each census area and counting numbers of each species seen. Individuals which moved too rapidly to be specifically identified were counted as "unknown". Night counts were made using 6-volt flashlights. This technique allowed rapid identification and counting with very little disturbance of the census areas, and enabled us to make one complete circuit of the nine sites in about four hours.

Post-spray searches for dead or abnormally-acting frogs and tadpoles were made at and near the census sites in Block M1 soon after the morning spraying on June 5 and again during the census that afternoon. The census sites and nearby areas in Block M2 were searched after the June 10 evening spray and also the next morning. Control sites were also searched after each spraying.

Cages made from plastic trays covered with aluminium screening were filled with known numbers of tadpoles prior to spraying at each site where tadpoles could be caught, and the caged tadpoles were then returned to the water. Post-spray observations were made on these caged specimens.

This year only one frog, a Rana pipiens, was caged during spraying, in contrast with previous years when attempts were made to expose a large variety of caged reptiles and amphibians to the aerial spray.

Notes were made of frog vocal activity during nights when censuses were made. These notes are sketchy but serve to indicate the presence in the area of the species involved. Numbers of individuals calling could rarely be determined.

RESULTS

Numbers of green frogs at control and experimental census sites remained approximately the same or increased slightly during the course of our study. Day-to-day fluctuations in number could have resulted from variable factors such as temperature, rainfall, wind and migrations of several kinds. There were no changes in numbers after spraying which could definitely be attributed to the effects of Matacil. Counts of leopard frogs were more variable than those of green frogs; no changes in the numbers of this species could be traced to Matacil. Observations on other frog and toad species were too few to allow interpretation.

No abnormal post-spray behavior of free-living frogs was noted in the vicinity of the census sites, nor did the caged Rana pipiens show any untoward effects of its exposure to the spray. Only one dead frog, a Rana clamitans, was found during the entire study; it died before the first block was sprayed.

Prior to the June 5 spray, thirty small tadpoles were caged at site 4 within Block M1 and thirty at control site 1. At approximately three hours after spraying three of the tadpoles at site 4 were dead; there was no further mortality when the cages were checked again two-and-a-half

hours later. All tadpoles at site 1 survived.

Only large tadpoles were found in Block M2; sixteen were caged at site 7 and three at site 8 prior to spraying. Forty small tadpoles at site 1 were used as controls. There was no mortality at the experimental sites or the control site fourteen to sixteen hours after spraying.

Small choruses of the spring peeper (Hyla crucifer), were heard each night throughout the study areas. The American toad was also heard almost every night at scattered sites. A few green frog calls were noted. No correlation could be made between chorus activity and Matacil spraying.

CONCLUSIONS

Aerial forest spraying of Matacil in June, 1971, at an emitted dosage rate of 1.5 oz. in 0.15 USG Panasol or summer oil per acre had a negligible effect on frogs and tadpoles in the two spray blocks studied. Future spray programs carried out at similar rates and under similar conditions should pose no immediate hazard to frogs, although a few tadpoles in shallow-water areas may be killed. The techniques employed in this study attempted to assess only the immediate post-spray hazard to amphibians; long-term effects of spraying at this dosage are unknown.