EFFECTS OF FOREST SPRAYING OF SUMITHION ON BIRDS AND AMPHIBIANS IN NEW BRUNSWICK

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Abstract

Pre- and post-spray bird counts were made in a forest area operationally sprayed twice with Sumithion at 2 oz in 0.15 U.S.G./acre. Census data revealed no marked decrease in the numbers of birds after spraying. Three intoxicated birds were found, two of which died in captivity a few hours later. No carcasses were found nor any other evidence that birds had been adversely affected by the spray. Post-spray searching in an additional six areas treated in the same manner failed to indicate that birds had been poisoned. There was no observable effect on frogs and toads in a pond sprayed once with Sumithion at 2 oz in 0.15 U.S.G./acre.

The Canadian Wildlife Service was able to monitor operational spraying of Sumithion in only one of the blocks treated during the 1969 spruce budworm control program in New Brunswick. The following brief reported is concerned with observations of the effects on forest birds and amphibians.

By virtue of its accessibility and proximity to field headquarters, Block #167, about 4 miles northeast of Doaktown, was selected for monitoring. A 2-mile transect was marked in the centre of the block along a road oriented roughly at right angles to the planned flight path of spray aircraft. Bird counts were made before and after spraying in the manner described in previous submissions to this Committee. Control counts were made in an area south of Muzroll Brook about 7 miles southeast of Doaktown. Sprayed areas were searched for evidence of bird intoxication. The bird counts are summarized in Tables 1 and 2 and the population indices derived from them are presented in Table 3.

Block #167 was sprayed on the evening of June 1 with 2 oz Sumithion in 0.15 U.S.G. formulation/acre. Subsequent re-drawing of spray block boundaries resulted in the transect falling in 2 blocks (666 and 667). Block #666, containing the western 1/3 of the transect, was re-sprayed on the morning of June 9 with 2 oz Sumithion in 0.15 U.S.G./acre. Block #667, containing the eastern 2/3 of the transect, was re-sprayed in the same manner during the evening of June 10. Total dosage was thus 4 oz active ingredient in 0.30 U.S.G./acre.

Table 1. Bird count results, Operational Area Sumithion 167 (666 & 667)

Species*	Number of birds recorded on								
	May 24	May 27	May 28	June 1	June 5	June 9	June 10	June 11	June 12
				First spray application (entire transect) - evening of June 1		Second spray application (western one-third of transect) - morning of June 9		Second spray application (eastern two-thirds of transect) - evening of June 10	
Yellow-bellied sapsucker	5	6	7	9	11	10		7	8
Least flycatcher	0	3	3	6	5	3		8	7
Eastern wood pewee	0	0	0	2	3	3		1	3
Olive-sided flycatcher	0	0	0	2	1	1		1	1
Blue jay	0	0	3	1	3	1		2	3
Boreal chickadee	2	2	2	4	3	3		1	2
Red-breasted nuthatch	1	2	3	1	2	2		2	1
Winter wren	5	4	5	6	4	4		4	4
Robin	12	10	11	11	13	8		13	11
Swainson's thrush	3	3	3	7	4	7		7	5
Veery	0	1	2	4	6	6		5	4
Ruby-crowned kinglet	14	11	13	9	8	8		6	9
Vireo spp.	1	1	2	0	2	1		1	0
Tennessee warbler	12	8	6	15	15	25		23	21
Parula warbler	3	2	3	1	1	0		3	1
Magnolia warbler	11	10	9	5	8	6		6	6
Cape May warbler	3	1	3	1	1	0		1	2
Myrtle warbler	3	2	3	0	1	2		0	2
Blackburnian warbler	2	2	4	2	2	2		1	1
Bay-breasted warbler	4	6	9	7	7	7		6	5
Ovenbird	28	22	19	22	24	24		30	26
Brown-headed cowbird	5	7	5	2	4	3		4	3
Rose-breasted grosbeak	2	3	6	3	9	6		8	7
Purple finch	5	12	13	13	13	11		13	7
Slate-colored junco	8	8	9	8	5	7		8	6
Chipping sparrow	1	10	6	2	2	3		2	4
White-throated sparrow	20	16	23	21	16	17		17	12

* Those recorded consistently, after initial arrival on operational area, at least up to time of first spray application.

Table 2. Bird count results, Control Area

Species*	Number of birds recorded						
	June 1	June 2	June 3	June 6	June 9	June 11	June 14
Yellow-bellied sapsucker	7	13	11	6	13	11	8
Least flycatcher	15	9	12	10	8	9	15
Eastern wood pewee	0	1	0	3	5	7	7
Olive-sided flycatcher	0	3	0	3	2	4	3
Black-capped chickadee	4	4	1	4	1	1	0
Red-breasted nuthatch	5	6	2	2	5	2	1
Brown creeper	4	7	5	3	2	0	0
Winter wren	7	9	9	5	6	4	7
Hylocichla spp.	12	7	9	12	8	11	15
Ruby-crowned kinglet	6	2	4	3	2	2	0
Vireo spp.	1	3	2	4	4	4	3
Tennessee warbler	22	14	24	17	18	24	33
Parula warbler	3	3	5	5	4	3	7
Magnolia warbler	10	4	14	9	8	9	7
Cape May warbler	0	1	3	2	3	1	5
Black-throated blue warbler	2	2	2	2	2	2	3
Myrtle warbler	5	3	2	3	2	1	1
Black-throated green warbler	5	6	8	1	1	4	3
Blackburnian warbler	5	4	8	6	3	5	7
Bay-breasted warbler	13	10	13	8	7	6	3
Ovenbird	7	11	13	15	13	15	14
Yellowthroat	7	2	2	2	1	3	0
Canada warbler	2	3	4	5	3	1	8
American redstart	8	2	8	10	6	6	9
Rose-breasted grosbeak	2	1	4	7	8	6	1
Slate-colored junco	3	4	3	4	1	1	3
White-throated sparrow	29	34	24	24	26	24	17

* Only those recorded consistently, after initial arrival on control area.

Table 3. Population indices

Operational Area Sumithion 167*

	May			June				
	24	27	28	5	9	10	11	12
Birds/minute	3.1	3.2	3.6	3.2	3.8	3.2	3.4	3.5
Songs/minute	16	15	14	15	17	16	17	16
Total species	29	29	34	32	34	33	38	33

Control Area

	June						
	1	2	3	6	9	11	14
Birds/minute	2.1	1.6	1.8	1.9	1.6	1.6	1.7
Songs/minute	10	7	10	10	9	12	12
Total species	34	35	36	39	39	38	34

* Entire transect sprayed on evening of June 1. Western one-third of transect sprayed on morning of June 9. Eastern two-thirds of transect sprayed on evening of June 10.

Five man-hours of searching on the morning of June 2 failed to reveal any evidence of bird poisoning. On the evening of June 10, 2 intoxicated chipping sparrows were captured by hand in the zone sprayed for the second time on the morning of the preceding day. Both birds died during the night. A third chipping sparrow, flying weakly and falling forward on the ground, narrowly avoided capture. No marked decrease in the numbers of any bird species was detected after spraying. Population indices remained quite constant during the period, May 24 to June 12, in which bird counts were made.

As time and availability of observers permitted, post-spray searching was carried out in parts of 6 other spray blocks. The timing of and amount of effort devoted to these activities are summarized in Table 4. The searched portions of Block #217 and Block #222 were sprayed 3 times at 2 oz/acre. The searched areas of the other 4 blocks were sprayed twice at 2 oz/acre. No carcasses were found and no evidence of bird poisoning detected in any of the blocks. Birds of 4 species continued to incubate eggs in 5 nests in Block #658 after spraying.

Table 4. Summary of post-spray searches

Spray block	Spray history of part searched	Timing of search	Results		
217	May 29 a.m. June 5 p.m. June 17 a.m.	June 17 p.m. 3 man-hours	Birds apparently unaffected		
222	May 30 a.m. June 6 a.m. June 17 a.m.	June 17 p.m. 5 man-hours	"	"	"
643	Second spray- June 20 p.m.	June 21 p.m. 5 man-hours June 22 a.m. 2 man-hours	"	"	"
651	Second spray- June 17 p.m.	June 18 p.m. 5 man-hours	"	"	"
653	Second spray- June 17 a.m.	June 17 p.m. 2 man-hours	"	"	"
658	Second spray- June 19 a.m.	June 20 p.m. 4 man-hours	"	"	"

"Census" data and post-spray searches indicated that operational spraying of Sumithion in New Brunswick in 1969 presented no serious hazard to the forest avifauna, although in localized areas a few birds were able to pick up lethal amounts of the insecticide. These conclusions agree with those drawn after monitoring the same treatment in New Brunswick and Newfoundland in 1968.

In an effort to determine if Sumithion, applied under operational conditions, has any gross effects on amphibian populations, a pond on the floodplain on the south side of the Southwest Miramichi River, about 3.5 miles east of Doaktown, was censused for frogs and toads during the period May 31 to June 11, 1969. The pond lay in Block No. 167, sprayed on the evening of June 1 with 2 oz. Sumithion in 0.15 U.S.G./acre. Subsequent redrawing of block boundaries placed the pond in Block No. 666, sprayed on the morning of June 9 with 2 oz. Sumithion in 0.15 U.S.G./acre.

Spray detection cards laid along the pond indicated good spray coverage on the second application (June 9). No spray cards were used on the first application (June 1), but from ground observation it appeared that the spray aircraft had their booms off when they passed over the pond. Therefore, total dosage of Sumithion applied to the pond was probably 2 oz. in 0.15 U.S.G./acre, on the morning of June 9.

A census consisted of walking slowly once around the pond during the evening and counting all frogs and toads seen in the water and on the shore. Results are given in Table 5.

Table 5. Counts of frogs* and toads** in a Sumithion-sprayed pond

Date	Time(ADT)	Temp(°F)	Number of individuals recorded		
			Frogs	Toads	Total
May 31	22:30	49	6	2	8
June 1	22:30	45	4	10	14
2	23:00	55	4	4	8
4	20:30	55-65	2	2	4
5	19:30	65-70	15	0	15
8	evening	65-70	22	0	22
		sprayed during morning of June 9			
9	evening	60-65	20	0	20
10	20:00	70	32	0	32
11	20:30	60-65	30	0	30

* Primarily Rana clamitans
** Bufo americanus

No amphibian mortality was observed at any time, and the census data, while variable, give no grounds for supposing Sumithion applied operationally, in the morning, at the rate of 2 oz. in 0.15 U.S.G./acre has any effect on frogs and toads.