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ENVIRONMENTAL MONITORING ON  
NEW BRUNSWICK FORESTS  
1975-1976

by

B. B. McLeod

File Report # 49

August 1976

A report to the New Brunswick  
Department of Natural Resources

Chemical Control Research Institute  
Ottawa, Ontario

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Chemical Control Research Institute  
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Forestry Directorate  
25 Pickering Place  
Ottawa, Ontario  
K1A 0W3

20 August 1976

Mr J.C. Baird  
Wildlife Biologist  
Department of Natural Resources  
P.O. Box 6000  
Fredericton  
New Brunswick.

Dear Mr Baird,

Please forgive the long delay in getting this information down to you, however, I hope it may still be of some use to you. As I recall from our phone conversation, you wished a brief overview of the activities of this Section as well as a review of the 1975 environmental impact programme. Our group, the Environmental Effects unit has a dual function at the Chemical Control Research Institute, a research programme and a surveillance monitoring programme.

As pesticides are very much a part of forest management across Canada today, it is essential to know the population and ecological consequences of these pesticides on forest fauna. The objective of the research unit then may be catagorized as follows:

- (i) To catalog the short and long term effects of chemical insecticide applications on the ecology and population dynamics of small forest vertebrates, and selected invertebrates, in terrestrial and aquatic ecosystems.
- (ii) To evaluate various procedures of insecticide treatment in terms of impact upon the small vertebrate and related components of the treated ecosystems.

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- (iii) To assist in evolving chemical control procedures that will, where possible, minimize the disturbance to desirable components of the vertebrate fauna by preserving as many components of the environment as possible, and maintain an environment of sufficient quality to protect the vertebrate component and associated biota.

In addition to our research programme we also carry out environmental monitoring of forest spraying operations across Canada. This programme involves the following:

- (i) monitoring the ecological effects of operational and experimental forest spraying.
- (ii) to assist Provincial forestry and wildlife services (as in the case of Quebec, Manitoba and British Columbia) to either set up and carry out the ecological monitoring of forest spraying operations or advise and assist in the organizing, training and supervising of monitoring teams being established by agencies outside the Canadian Forestry Service.
- (iii) experience has shown that environmental effects resulting by forest insect control operations are very difficult to evaluate or substantiate. The Ecological Effects unit maintains an emergency team which responds to requests to investigate reports of bird, fish or mammal kill ascribed to the spray programme.

I hope that this brief review of our programme here at the Institute will be sufficient for your needs. If you should desire to go into any of the items mentioned in any greater detail please do not hesitate to call us.

Yours truly,

Bruce McLeod  
Operations Manager  
Ecological Effects

1975 LARVALCIDE MONITORING PROGRAMME

In 1975, we monitored bird populations in 4 treatment and 1 untreated control plot in the Juniper area. Treatments of both fenitrothion and phosphamidon were applied to experimental plots in treatment blocks 531 and 528 and budworm control operations in treatment blocks 525 and part of 528. The spray regime monitored was as follows:

<u>Treatment block number</u>	<u>Date of application</u>	<u>Insecticide applied</u>	<u>Dosage rate (oz/acre)</u>
531 (experimental)	May 29	phosphamidon	2.5
	June 4	phosphamidon	2.5
		fenitrothion	2.5
	June 16	phosphamidon	2.5
	June 22	fenitrothion	4.0
528 (experimental)	May 29	phosphamidon	2.5
	June 4	fenitrothion	2.5
	June 15	phosphamidon	2.5
	June 22	fenitrothion	4.0
528 (operational)	May 29	phosphamidon	2.5
	June 4	fenitrothion	2.5
	June 15	phosphamidon	2.5
525 (operational)	May 29	phosphamidon	2.5
	May 30	fenitrothion	2.5
	June 19	phosphamidon	2.5

On June 4, applications of phosphamidon and fenitrothion were

applied to experimental block 531 within a period of 20 minutes. On operational block 525, phosphamidon was applied in the evening of May 29 and fenitrothion on the morning of May 30.

### RESULTS

Experimental plot 531: a slight decline in population activity (sightings and song) was recorded on the second day after the May 29th application of phosphamidon. Kinglet populations were the most affected where approximately 50% of the ruby and golden-crowned kinglets disappeared. A rush of migrants on the 3rd day after treatment repopulated the vacant territories (Tables I and III). In the evening of June 4 within a 20 minute period an application of phosphamidon followed by an application of fenitrothion was applied to block 531. A drastic reduction in bird populations occurred on the 2nd day after treatment and remained low for at least 5 days. Low populations on the control plot (day 14) resulted when the population census was carried out late in the morning. Ruby- and golden-crowned kinglets disappeared from the treatment plot and the populations of warblers such as the Cape May, Myrtle, blackpoll and Canada, were reduced as were white-throated sparrows, and pine siskins (Tables I and III). Treatments carried out on June 16 and 22 did not affect the birds of this plot. Populations of ruby-crowned kinglets did not return to the pre-spray levels, (Tables I, II, III and IV).

Experimental plot 528: a drastic reduction in populations occurred following the application of fenitrothion on June 4. Winter wren, American robin, Magnolia warbler, Cape May warbler, blackburnian warbler, bay breasted warbler, yellowthroat and pine siskin populations declined when compared to population trends of the untreated control plot.

Operational block 528: The phosphamidon treatment of May 29 caused a minor reduction in numbers of red-breasted nuthatches and ruby-crowned kinglets, (Table VII). No other damage was sustained during this treatment.

Fenitrothion applied on June 4 caused a reduction in a number of species, namely the parula warbler, Magnolia warbler, blackburnian warbler, bay-breasted warbler and Canada warbler (Table VII). The third application, phosphamidon on June 15 did not cause any further damage.

Operational block 525: The operation of May 29th and 30th using phosphamidon followed by fenitrothion caused a reduction in bird activity the day following the second treatment (Table IX). This decrease was very short lived and activity increased from day +2 onward. On June 19, an application of phosphamidon was applied to block 525 resulting in a drastic reduction in bird populations starting the second day after treatment (Tables X and XI). Ovenbird, American redstart, junco and white-throated sparrows numbers were either missing after treatment or were reduced significantly.

Table I  
Forest bird population census  
Untreated control plot  
Juniper, New Brunswick  
May 26-June 10  
1975

Family	Species	Pre-spray				Post-spray treatment 1					Post-spray treatment 2				
		May	May	May	Daily	May	June	June	June	Daily	June	June	June	June	Daily
		26	27	29		30	1	2	3		6	8	9	10	
		-3	-2	0-	ave	+1	+3	+4	+5	ave	+2	+4	+5	+6	ave
Tetraonidae	Ruffed Grouse	0	0	0	0.0	0	2	0	0	0.5	0	0	0	0	0.0
Trochilidae	Ruby-throated Hummingbird	0	0	0	0.0	0	0	0	0	0.0	1	0	0	0	0.3
Alcedinidae	Belted Kingfisher	0	0	0	0.0	0	1	0	0	0.3	0	0	0	0	0.0
Picidae	Flicker	1	0	0	0.3	2	0	0	0	0.5	0	0	0	0	0.0
	Yellow-bellied Sapsucker	0	0	1	0.3	0	0	0	0	0.0	1	0	0	1	0.5
Tyrannidae	Yellow-bellied Flycatcher	0	0	0	0.0	0	6	2	2	2.5	2	2	4	4	2.5
	Least Flycatcher	1	0	2	1.0	8	6	2	8	6.0	0	0	0	2	0.5
	Eastern Wood Pewee	0	0	2	0.3	0	0	0	0	0.0	2	0	0	0	0.5
Corvidae	Gray Jay	2	0	2	1.3	0	0	0	0	0.0	0	0	0	0	0.0
	Blue Jay	0	0	0	0.0	1	4	0	1	1.5	0	0	0	3	0.8
Paridae	Black-capped Chickadee	7	0	0	2.3	11	4	6	6	6.8	5	0	4	10	4.8
	Boreal Chickadee	0	0	0	0.0	2	0	3	0	1.3	0	0	0	3	0.8
Sittidae	Red-breasted Nuthatch	0	0	0	0.0	2	0	0	2	1.0	0	0	4	4	2.0
Troglodytidae	Winter Wren	2	0	4	2.0	0	2	2	6	2.5	2	2	0	4	2.0
Turdidae	American Robin	4	2	6	4.0	1	3	7	6	4.3	10	1	3	5	4.8
	Wood Thrush	20	2	12	11.3	4	4	8	10	6.5	4	2	0	6	3.0

Table I Cont'd

Family	Species	Pre-spray				Post-spray treatment 1					Post-spray treatment 2				
		May	May	May	Daily	May	June	June	June	Daily	June	June	June	June	Daily
		26	27	29		30	1	2	3		6	8	9	10	
		-3	-2	0-	ave	+1	+3	+4	+5	ave	+2	+4	+5	+6	ave
	Hermit Thrush	0	0	0	0.0	0	2	0	0	0.5	2	0	0	2	1.0
	Swainson's Thrush	2	0	5	2.3	5	15	1	8	7.2	6	2	2	1	2.7
	Veery	4	0	3	2.3	3	5	3	5	4.0	7	0	0	1	2.0
Sylviidae	Golden-crowned Kinglet	0	0	0	0.0	0	0	0	2	0.5	0	0	2	2	1.0
	Ruby-crowned Kinglet	4	6	4	4.7	4	6	2	2	3.5	4	2	0	4	2.5
Bombycillidae	Cedar Waxwing	0	4	0	1.3	0	0	0	0	0.0	0	0	0	0	0.0
Vireonidae	Solitary Vireo	2	4	2	2.7	0	0	0	0	0.0	0	0	0	2	0.5
	Red-eyed Vireo	0	0	0	0.0	0	2	0	8	2.5	2	2	2	2	2.0
Parulidae	Tennessee Warbler	16	20	20	18.7	6	10	10	4	7.5	0	0	2	2	1.0
	Nashville Warbler	2	2	4	2.7	4	4	2	2	3.0	6	2	6	6	5.0
	Parula Warbler	4	4	4	4.0	6	4	6	6	5.5	10	0	2	6	4.5
	Magnolia Warbler	8	4	6	6.0	14	6	2	14	9.0	6	2	4	12	6.0
	Cape May Warbler	0	0	0	0.0	0	0	0	0	0.0	0	0	0	2	0.5
	Myrtle Warbler	2	4	0	2.0	0	4	4	4	3.0	2	0	2	4	2.0
	Black-throated Green Warbler	6	10	8	8.0	14	10	2	4	7.5	4	4	0	8	4.0
	Blackburnian Warbler	2	0	4	2.0	4	16	4	6	7.5	6	4	6	10	6.5



Table I Cont'd

Family	Species	Pre-spray				Post-spray treatment 1					Post-spray treatment 2				
		May	May	May	Daily	May	June	June	June	Daily	June	June	June	June	Daily
		26	27	29		30	1	2	3		6	8	9	10	
		-3	-2	0-	ave	+1	+3	+4	+5	ave	+2	+4	+5	+6	ave
Icteridae	Bay-breasted Warbler	6	14	18	12.7	14	14	2	4	8.5	20	4	4	8	9.0
	Blackpoll Warbler	0	0	0	0.0	0	0	0	0	0.0	2	2	0	2	1.5
	Ovenbird	14	14	16	14.7	22	18	18	12	17.5	0	4	12	16	7.5
	Northern Waterthrush	4	4	0	2.7	4	6	2	4	4.0	4	4	2	0	2.5
	Canada Warbler	0	0	2	0.7	2	8	4	4	4.5	6	2	8	8	6.0
	American Redstart	4	8	6	6.0	10	10	8	10	9.5	10	8	12	8	9.5
	Rusty Blackbird	0	0	0	0.0	0	0	0	1	0.3	0	0	0	0	0.0
	Common Grackle	0	0	0	0.0	0	0	0	0	0	0	1	0	0	0.3
Fringillidae	Rose-breasted Grosbeak	12	12	12	12.0	12	4	10	14	10.0	10	2	0	12	6.0
	Evening Grosbeak	0	3	0	1.0	0	0	0	4	1.0	10	0	4	0	3.5
	Purple Finch	2	2	2	2.0	0	4	4	2	2.5	0	0	2	2	1.0
	American Goldfinch	0	0	1	0.3	1	0	0	0	0.3	0	0	0	2	2.0
	Junco	4	2	2	2.7	0	2	2	4	2.0	2	6	0	4	3.0
	Chipping Sparrow	2	0	2	1.3	2	0	0	0	0.5	0	0	0	2	0.5
	White-throated Sparrow	14	15	14	14.3	2	6	8	14	7.5	10	7	4	6	6.8
	Song Sparrow	2	0	0	0.7	0	2	2	2	1.5	0	0	2	2	1.0
	TOTALS:	153	136	164	151.0	160	190	126	181	164.3	156	65	97	178	124.0

Table II  
Forest bird population census  
Untreated control plot  
Juniper, New Brunswick  
June 8-26  
1975

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 10	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-7	-6	-5	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Tetraonidae	Ruffed Grouse	0	0	0	2	0.5	0	2	0	0	1	0.6	0	0	0	0	0.0
	Ruby-throated Hummingbird	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Alcedinidae	Belted Kingfisher	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Picidae	Yellow-shafted Flicker	0	0	0	0	0.0	0	0	0	1	0	0.2	0	0	0	0	0.0
	Yellow-bellied Sapsucker	0	0	1	0	0.2	0	0	0	0	1	0.2	0	0	0	0	0.0
Tyrannidae	Yellow-bellied Flycatcher	2	4	4	2	3.0	0	0	2	0	4	1.2	0	0	0	0	0.0
	Least Flycatcher	0	0	2	6	2.0	2	2	0	2	4	2.0	2	4	0	0	1.5
	Eastern Wood Pewee	0	0	0	0	0.0	0	0	2	0	0	0.4	0	0	0	0	0.0
Corvidae	Gray Jay	0	0	0	0	0.0	0	0	1	0	0	0.2	0	0	0	0	0.0
	Blue Jay	0	0	3	0	0.8	0	2	0	8	6	3.2	1	0	1	0	0.5
Paridae	Black-capped Chickadee	0	4	10	4	4.5	3	2	1	0	3	1.8	0	1	0	4	1.3
	Boreal Chickadee	0	0	3	0	0.8	0	0	0	1	0	0.2	0	0	0	0	0.0
Sittidae	White-breasted Nuthatch	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Red-breasted Nuthatch	0	4	4	2	2.5	4	2	0	0	2	1.6	0	2	0	0	0.5
Troglodytidae	Winter Wren	2	0	4	2	2.0	0	2	2	2	2	1.6	4	4	4	0	3.0
Turdidae	American Robin	1	3	5	11	5.0	6	6	9	8	9	7.8	7	10	6	13	9.0

Table II Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 10	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-7	-6	-5	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Sylviidae	Wood Thrush	2	0	6	8	4.0	8	6	6	4	4	5.6	6	16	7	6	8.8
	Hermit Thrush	0	0	2	2	1.0	0	0	0	2	2	0.8	0	2	0	2	1.0
	Swainson's Thrush	2	2	1	2	1.8	2	2	6	6	2	3.6	0	2	6	0	2.0
	Veery	0	0	1	1	0.5	3	6	4	8	6	5.4	7	6	2	2	6.3
	Golden-crowned Kinglet	0	2	2	2	1.5	0	0	0	0	0	0.0	0	0	0	0	0.0
Bombycillidae	Ruby-crowned Kinglet	2	0	4	2	2.0	2	2	2	2	4	2.4	4	6	4	4	4.5
	Cedar Waxwing	0	0	0	0	0.0	0	7	7	0	0	2.8	4	0	2	4	2.5
Vireonidae	Solitary Vireo	0	0	2	4	1.5	0	2	0	0	2	0.8	0	0	0	0	0.0
	Red-eyed Vireo	2	2	2	4	2.5	4	2	2	2	2	2.4	0	2	0	2	1.0
Parulidae	Black and white Warbler	0	0	0	2	0.5	2	2	2	0	0	1.2	2	0	2	0	1.0
	Tennessee Warbler	0	2	2	0	1.0	0	6	2	0	0	1.6	0	0	0	0	0.0
	Nashville Warbler	2	6	6	10	6.0	6	8	12	10	6	8.4	6	6	4	10	6.5
	Parula Warbler	0	2	6	2	2.5	2	2	6	4	4	3.6	6	4	2	4	4.0
	Magnolia Warbler	2	4	12	4	5.5	4	4	2	4	10	4.8	4	4	2	4	3.5
	Cape May Warbler	0	0	2	2	1.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Myrtle Warbler	0	2	4	2	1.5	0	2	2	0	0	0.8	2	2	2	0	1.5

Table II Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 10	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-7	-6	-5	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Icteridae	Black-throated Green Warbler	4	0	8	6	4.5	4	4	4	4	0	2.4	8	6	4	0	4.5
	Blackburnian Warbler	4	6	10	18	9.5	14	14	14	14	8	12.8	4	12	2	0	4.5
	Bay-breasted Warbler	4	4	8	4	4.0	0	0	2	2	4	1.6	0	2	0	2	1.0
	Blackpoll Warbler	2	0	2	0	1.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Ovenbird	4	12	16	12	11.0	18	16	12	16	12	14.8	8	20	12	4	11.0
	Northern Waterthrush	4	2	0	6	3.0	4	4	4	0	0	2.4	2	2	2	2	2.0
	Canada Warbler	2	8	8	6	6.0	2	4	2	2	2	2.4	2	2	2	0	1.5
	Redstart	8	12	8	12	10.0	4	8	6	6	6	6.0	10	12	8	4	8.5
	Rusty Blackbird	0	0	0	0	0.0	4	1	1	0	1	1.4	0	0	0	0	0.0
	Common Grackle	1	0	0	0	0.3	0	0	0	0	0	0.0	0	0	0	0	0.0
Fringillidae	Brown-headed Cowbird	0	0	0	0	0.0	2	0	2	0	0	0.8	4	4	0	4	3.0
	Rose breasted Grosbeak	2	0	12	4	6.5	5	9	7	2	10	6.6	10	14	6	10	10.0
	Evening Grosbeak	0	4	0	4	2.0	0	2	3	4	2	2.2	0	6	0	0	1.5
	Purple Finch	0	2	2	0	1.0	0	2	0	0	2	0.8	2	2	2	0	1.5
	Pine Siskin	0	0	0	2	0.5	0	0	0	0	6	1.2	0	0	0	0	0.0

Table II Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 10	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-7	-6	-5	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Unidentified birds	Slate-coloured Junco	6	0	4	4	3.5	2	6	4	10	4	5.2	4	2	4	0	2.5
	Chipping Sparrow	0	0	2	2	1.0	2	0	0	0	2	0.8	2	2	2	2	2.0
	White-throated Sparrow	7	4	6	8	6.3	6	6	10	12	10	8.8	6	8	6	4	6.0
	Song Sparrow	0	2	2	0	1.0	0	0	0	0	0	0.0	0	0	0	0	0.0
		0	0	0	2	0.5	2	0	0	2	2	1.2	0	2	0	0	0.5
	Totals:	65	93	175	163	124.0	114	139	131	130	135	129.8	120	157	96	87	115.0

Table III

Forest bird population census  
 Juniper, New Brunswick  
 Treatment block 531  
 May 27-June 9  
 1975

Family	Species	Pre-spray			Post-spray treatment 1					Post-spray treatment 2				
		May	May	Daily	May	May	June	June	June	Daily	June	June	June	June
		27	28		30	31	1	2	3		5	6	8	9
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+1	+2	+4	+5
Trochilidae	Ruby-throated Hummingbird	0	0	0.0	0	0	2	1	0	0.6	0	0	0	0
Picidae	Yellow-bellied Sapsucker	0	0	0.0	0	1	0	0	0	0.2	1	0	0	2
	Yellow-bellied Flycatcher	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0
Tyrannidae	Least Flycatcher	0	0	0.0	2	0	0	2	0	0.8	2	0	0	0
	Eastern Wood Pewee	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0
	Olive-sided Flycatcher	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0
Paridae	Black-capped Chickadee	0	4	2.0	2	0	1	3	0	1.2	1	0	0	0
Sittidae	Red-breasted Nuthatch	2	2	2.0	0	0	6	4	4	2.8	2	2	0	0
Troglodytidae	Winter Wren	4	6	5.0	6	2	4	4	0	3.2	0	2	0	2
Mimidae	Brown Thrasher	0	0	0.0	0	2	0	0	0	0.4	0	0	0	0
	American Robin	5	4	4.5	4	7	4	3	5	4.6	4	1	2	3
Turdidae	Wood Thrush	0	0	0.0	0	0	2	0	0	0.4	0	0	0	0
	Swainson's Thrush	3	3	3.0	3	6	2	7	0	3.6	2	1	2	1
Sylviidae	Golden-crowned Kinglet	4	8	6.0	2	2	4	8	6	4.4	8	0	0	0
	Ruby-crowned Kinglet	8	10	9.0	0	4	10	6	6	5.2	4	2	0	0
Bombycillidae	Cedar Waxwing	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0

Table III Cont'd

Family	Species	Pre-spray			Post-spray treatment 1						Post-spray treatment 2				
		May	May	Daily	May	May	June	June	June	Daily	June	June	June	June	Daily
		27	28		30	31	1	2	3		5	6	8	9	
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+1	+2	+4	+5	ave
Vireonidae	Solitary Vireo	0	2	1.0	0	0	2	4	0	1.2	0	0	0	0	0.0
Parulidae	Tennessee Warbler	12	14	13.0	20	2	24	17	28	18.0	19	8	4	9	8.0
	Nashville Warbler	4	0	2.0	0	0	4	10	2	3.2	2	0	0	0	0.4
	Parula Warbler	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0	0.0
	Magnolia Warbler	2	2	2.0	2	4	6	8	4	4.8	8	6	0	2	3.2
	Cape May Warbler	0	0	0.0	4	8	8	8	8	7.2	6	2	0	2	2.0
	Myrtle Warbler	0	2	1.0	2	0	0	4	4	2.0	2	0	0	2	0.8
	Black-throated Green Warbler	4	0	2.0	0	4	4	4	8	4.0	2	2	0	2	1.2
Parulidae	Blackburnian Warbler	0	0	0.0	2	0	0	0	0	0.4	0	0	0	0	0.0
	Bay-breasted Warbler	2	2	2.0	6	4	10	10	8	7.6	6	2	0	0	1.6
	Blackpoll Warbler	0	0	0.0	2	2	4	6	6	4.0	6	0	0	0	0.0
	Ovenbird	6	8	7.0	8	10	10	4	6	7.6	8	2	4	2	3.2
	Northern Waterthrush	0	4	2.0	0	2	2	2	0	1.2	2	2	2	2	1.6
	Yellowthroat	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0	0.0
	Canada Warbler	0	0	0.0	2	0	0	2	8	2.4	0	0	0	0	0.0
	American Redstart	0	0	0.0	0	0	0	4	0	0.8	0	0	0	0	0.0

Table III Cont'd

Family	Species	Pre-spray			Post-spray treatment 1					Post-spray treatment 2				
		May	May	Daily	May	May	June	June	June	Daily	June	June	June	June
		27	28		30	31	1	2	3		5	6	8	9
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+1	+2	+4	+5
Icteridae	Red-winged Blackbird	2	0	1.0	2	0	2	0	0	0.8	0	0	0	0
	Common Grackle	0	0	0.0	0	1	0	0	0	0.2	0	0	0	0
	Brown-headed Cowbird	0	0	0.0	0	0	0	0	0	0.0	0	0	2	2
	Rose-breasted Grosbeak	0	0	0.0	4	2	0	6	0	2.4	1	0	0	0
	Evening Grosbeak	0	2	1.0	2	3	0	6	8	3.8	5	0	0	4
Fringillidae	Purple Finch	4	2	3.0	2	6	4	0	2	2.8	6	0	6	6
	Pine Siskin	0	0	0.0	0	0	2	3	4	1.8	0	0	0	0
	Slate-coloured Junco	0	3	1.5	2	6	2	0	2	2.4	7	4	0	0
	Chipping Sparrow	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0
	White-throated Sparrow	20	14	17.0	12	10	12	14	15	12.6	8	8	4	12
	TOTALS:	82	92	87.0	91	88	131	156	134	120.0	112	44	26	53



Table IV  
Forest bird population census  
Juniper, New Brunswick  
Treatment block 531  
June 8-26  
1975

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 15	June 16	Daily	June 17	June 18	June 20	June 21	June 22	Daily	June 23	June 24	June 25	June 26	Daily
		-8	-7	-1	0-	ave	-5	-4	-2	-1	0-	ave	+1	+2	+3	+4	ave
Trochilidae	Ruby-throated Hummingbird	0	0	0	1	0.3	0	0	0	0	0	0.0	0	0	0	0	0.0
Picidae	Yellow-bellied Sapsucker	0	2	0	0	0.5	0	0	0	0	0	0.0	0	0	0	0	0.0
Tyrannidae	Yellow-bellied Flycatcher	0	0	2	0	0.5	4	2	0	0	0	1.2	0	0	0	0	0.0
	Least Flycatcher	0	0	2	2	1.0	2	2	0	0	0	0.8	2	0	0	0	0.5
	Eastern Wood Pewee	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Olive-sided Flycatcher	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Paridae	Black-capped Chickadee	0	0	1	0	0.3	2	4	0	0	0	1.2	1	1	0	0	0.5
Sittidae	Red-breasted Nuthatch	0	0	2	0	0.3	2	2	0	2	2	1.6	2	0	2	2	1.5
Troglodytidae	Winter Wren	0	2	2	4	2.0	8	6	2	2	2	4.0	4	8	4	8	6.0
Mimidae	Brown thrasher	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Turdidae	American Robin	2	3	2	2	2.3	2	3	2	3	3	2.6	2	2	0	0	1.0
	Swainson's Thrush	2	1	5	25	8.3	9	15	20	18	22	16.8	18	10	16	16	15.0
Sulviidae	Ruby-crowned Kinglet	0	0	0	0	0.0	0	2	2	0	2	1.2	2	4	0	2	2.0
Bombycillidae	Cedar Waxwing	0	0	0	0	0.0	0	0	6	0	0	1.2	0	0	0	0	0.0

Table IV Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 15	June 16	Daily	June 17	June 18	June 20	June 21	June 22	Daily	June 23	June 24	June 25	June 26	Daily
		-8	-7	-1	0-	ave	-5	-4	-2	-1	0-	ave	+1	+2	+3	+4	ave
Vireonidae	Solitary Vireo	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Parulidae	Tennessee Warbler	4	9	16	24	13.3	18	6	12	12	8	11.2	10	14	12	12	12.0
	Nashville Warbler	0	0	6	6	3.0	10	2	6	6	6	6.0	8	8	4	8	7.0
	Parula Warbler	0	0	0	2	0.5	0	2	0	0	0	0.4	0	2	0	0	0.5
	Magnolia Warbler	0	2	4	6	3.0	6	4	2	4	2	3.6	2	2	4	4	3.0
	Cape May Warbler	0	2	2	4	2.0	2	0	4	2	2	2.0	2	2	2	2	2.0
	Myrtle Warbler	0	2	0	2	1.0	4	0	2	2	0	1.6	2	0	0	2	1.0
	Black-throated Green Warbler	0	2	0	0	0.5	0	0	0	0	0	0.0	0	0	0	0	0.0
	Blackburnian Warbler	0	0	0	0	0.0	2	0	0	2	0	0.8	0	0	0	0	0.0
	Bay-breasted Warbler	0	0	2	4	1.5	2	2	0	2	6	2.4	6	8	6	4	6.0
	Blackpoll Warbler	0	0	2	0	0.5	0	0	0	0	0	0.0	0	0	0	0	0.0
	Ovenbird	4	2	2	6	3.5	2	4	6	6	6	4.8	8	8	8	8	8.0
	Northern Waterthrush	2	2	2	2	2.0	2	0	0	0	2	0.8	0	0	0	0	0.0
	Yellowthroat	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Canada Warbler	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	American Redstart	0	0	0	0	0.0	0	0	4	2	2	1.6	0	0	2	2	1.0

Table IV Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 8	June 9	June 15	June 16	Daily	June 17	June 18	June 20	June 21	June 22	Daily	June 23	June 24	June 25	June 26	Daily
		-8	-7	-1	0-	ave	-5	-4	-2	-1	0-	ave	+1	+2	+3	+4	ave
Icteridae	Red-winged Blackbird	0	0	2	0	0.5	0	0	0	0	0	0.0	0	1	0	0	0.3
	Common Grackle	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	0	0.0
	Brown-headed Cowbird	2	2	0	0	1.0	0	0	0	0	0	0.0	0	0	0	0	0.0
Fringillidae	Rose-breasted Grosbeak	0	0	0	0	0.0	0	0	0	0	0	0.0	0	2	0	0	0.5
	Evening Grosbeak	0	4	0	2	1.5	8	2	0	0	4	2.8	0	4	0	2	1.5
	Purple Finch	6	6	4	2	3.6	4	4	6	0	0	2.8	4	2	2	2	2.5
	Pine Siskin	0	0	0	0	0.0	4	5	0	0	0	1.8	1	0	1	6	2.0
	Slate-coloured Junco	0	0	5	0	1.3	2	4	2	2	6	3.2	2	3	0	2	1.8
	Chipping Sparrow	0	0	0	0	0.0	0	0	2	2	0	0.8	0	0	0	0	0.0
	White-throated Sparrow	4	12	10	14	7.5	16	6	8	10	12	10.4	8	6	10	16	10.0
	Totals:	26	53	73	118	67.5	101	77	86	77	89	86.0	84	87	73	98	85.5

Table V  
Forest bird population census  
Treatment block 528 (experimental plot)  
Juniper, New Brunswick  
May 27-June 9  
1975

Family	Species	Pre-spray 1			Post-spray treatment 1					Post-spray treatment 2			
		May	May	Daily	May	May	June	June	June	Daily	June	June	June
		27	28		30	31	1	2	3		6	8	9
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+2	+4	+5
Trochilidae	Ruby-throated Hummingbird	1	0	0.5	0	0	1	0	0	0.2	0	0	0
Picidae	Yellow-bellied Sapsucker	0	0	0.0	0	1	0	1	1	0.6	0	0	0
	Downy Woodpecker	2	0	1.0	0	0	0	0	0	0.0	0	0	0
Tyrannidae	Yellow-bellied Flycatcher	0	0	0.0	0	0	0	0	0	0.0	0	2	0
	Least Flycatcher	6	0	3.0	8	2	2	2	2	3.2	2	0	0
Corvidae	Blue Jay	0	0	0.0	0	0	0	0	2	0.4	0	0	0
Paridae	Black-capped Chickadee	0	0	0.0	10	1	1	7	5	4.8	0	4	0
Sittidae	Red-breasted Nuthatch	4	2	3.0	5	2	2	2	2	2.6	0	4	4
Troglodytidae	Winter Wren	6	6	6.0	2	4	4	4	2	3.2	0	0	2
Turdidae	American Robin	2	3	2.5	8	2	2	4	2	3.6	0	0	0
	Swainson's Thrush	0	1	0.5	6	2	8	1	9	5.2	1	5	0
Sylviidae	Ruby-crowned Kinglet	8	4	6.0	2	2	6	2	6	3.6	0	5	5
Vireonidae	Solitary Vireo	8	4	6.0	4	2	4	8	6	5.2	1	4	4
Parulidae	Tennessee Warbler	8	6	7.0	10	9	14	12	12	11.4	4	0	0
	Nashville Warbler	0	0	0.0	2	0	2	0	0	0.8	0	0	0
	Parula Warbler	2	2	2.0	4	0	0	6	6	3.2	0	4	8

Table V Cont'd

Family	Species	Pre-spray 1			Post-spray treatment 1					Post-spray treatment 2				
		May 27	May 28	Daily	May 30	May 31	June 1	June 2	June 3	Daily	June 6	June 8	June 9	Daily
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+2	+4	+5	ave
Parulidae (cont'd)	Magnolia Warbler	6	6	6.0	6	0	6	6	4	4.4	0	2	6	2.7
	Cape May Warbler	4	0	2.0	0	0	6	2	2	2.0	0	0	2	0.7
	Myrtle Warbler	2	0	1.0	4	0	2	2	4	2.4	0	2	2	1.3
	Black-throated Green Warbler	14	0	7.0	16	2	6	6	6	7.2	6	2	8	5.3
	Blackburnian Warbler	0	2	1.0	6	2	4	6	6	4.8	2	0	4	2.0
	Bay-breasted Warbler	8	8	8.0	18	10	16	10	18	14.4	6	4	8	6.0
	Ovenbird	16	12	14.0	12	8	14	4	12	10.0	4	8	4	5.3
	Mourning Warbler	0	0	0.0	0	0	0	0	0	0.0	2	0	0	0.7
	Yellowthroat	2	2	2.0	2	2	2	2	2	2.0	0	0	0	0.0
	Wilson's Warbler	0	0	0.0	2	0	0	2	0	0.8	0	0	0	0.0
	Canada Warbler	0	2	1.0	2	2	4	2	4	2.8	0	2	0	0.7
	American Redstart	0	4	2.0	2	0	2	2	4	2.0	1	0	0	0.3
Icteridae	Rusty Blackbird	0	0	0.0	0	0	0	0	2	0.4	0	1	0	0.3
	Brown-headed Cowbird	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0.0
Fringillidae	Rose-breasted Grosbeak	2	2	2.0	8	0	0	2	0	2.0	0	0	0	0.0
	Evening Grosbeak	4	4	4.0	10	3	0	8	14	7.0	2	0	4	2.0

Table v Cont'd

Family	Species	Pre-spray 1			Post-spray treatment 1					Post-spray treatment 2			
		May	May	Daily	May	May	June	June	June	Daily	June	June	June
		27	28		30	31	1	2	3		6	8	9
		-2	-1	ave	+1	+2	+3	+4	+5	ave	+2	+4	+5
Fringillidae (cont'd)	Purple Finch	6	8	7.0	10	8	6	4	10	7.6	0	6	4
	Pine Siskin	6	0	3.0	2	4	3	0	0	1.8	0	0	0
	American Goldfinch	0	0	0.0	2	0	0	0	0	0.4	0	0	0
	Slate-coloured Junco	2	4	3.0	2	2	4	4	0	2.4	2	0	2
	Chipping Sparrow	1	0	0.5	0	0	0	0	2	0.4	0	0	0
	White-throated Sparrow	16	16	16.0	14	10	10	8	14	11.2	6	8	10
Unidentified birds		0	0	0.0	0	2	1	0	0	0.6	0	0	0
	Totals:	136	98	122.0	180	82	132	121	159	134.8	39	63	77

Table VI  
Forest bird population census  
Treatment block 528 (experimental plot)  
Juniper, New Brunswick  
June 9-26  
1975

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 6	June 8	June 9	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-9	-7	-6	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Trochilidae	Ruby-throated Hummingbird	0	0	0	1	0.3	0	0	0	0	0	0.0	0	0	0	0	0.0
Picidae	Yellow-bellied Sapsucker	0	0	0	0	0.0	0	0	0	0	1	0.2	0	0	2	3	1.3
Tyrannidae	Eastern Kingbird	0	0	0	0	0.0	0	0	0	0	0	0.0	2	0	0	0	0.5
	Yellow-bellied Flycatcher	0	2	0	0	0.5	0	0	0	2	0	0.4	2	0	0	2	1.0
	Least Flycatcher	2	0	0	2	1.0	2	0	0	0	0	0.4	0	0	0	0	0.0
	Eastern Wood Pewee	0	0	0	0	0.0	2	2	0	4	0	1.6	0	0	0	0	0.0
	Olive-sided Flycatcher	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	2	0	0.0
Corvidae	Gray Jay	0	0	0	2	0.5	0	0	0	0	1	0.2	0	0	0	0	0.0
	Blue Jay	0	0	0	1	0.3	0	0	0	0	0	0.0	0	0	0	0	0.0
Paridae	Black-capped Chickadee	0	4	0	0	1.0	0	2	2	0	0	0.8	0	0	0	2	0.5
Sittidae	Red-breasted Nuthatch	0	4	4	4	3.0	2	2	0	0	0	0.8	2	0	2	0	1.0
Troglodytidae	Winter Wren	0	0	2	2	1.0	6	6	6	2	6	5.2	6	6	4	4	5.0
Turdidae	American Robin	0	0	0	1	0.3	0	3	6	1	4	2.8	5	2	3	3	3.3
	Swainson's Thrush	1	5	0	16	5.5	12	18	10	14	8	12.4	12	10	12	14	12.0
Sylviidae	Ruby-crowned Kinglet	0	5	5	4	3.5	0	2	0	2	6	2.0	0	0	2	0	0.5
Vireonidae	Solitary Vireo	1	4	4	0	2.3	0	0	0	0	0	0.0	2	0	0	0	0.5

Table VI Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 6	June 8	June 9	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-9	-7	-6	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Parulidae	Tennessee Warbler	4	0	0	0	1.0	2	2	2	2	2	2.0	0	4	4	2	2.5
	Nashville Warbler	0	0	0	0	0.0	0	0	0	0	0	0.0	0	2	0	0	0.5
	Parula Warbler	0	4	8	10	5.5	6	4	6	4	2	4.6	6	0	2	2	2.5
	Magnolia Warbler	0	2	6	12	5.0	0	2	8	4	4	3.6	2	2	2	2	2.0
	Cape May Warbler	0	0	2	0	0.5	0	0	0	0	0	0.0	2	0	0	0	0.5
	Myrtle Warbler	0	2	2	0	1.0	0	0	2	2	0	0.8	0	2	0	0	0.5
	Black-throated Green Warbler	6	2	8	8	6.0	12	0	8	8	10	7.6	8	4	4	10	6.5
	Blackburnian Warbler	2	0	4	10	4.0	4	4	6	6	4	4.8	4	4	10	2	5.0
	Bay-breasted Warbler	6	4	8	14	8.0	12	8	8	8	8	8.8	16	14	6	8	11.0
	Ovenbird	4	8	4	4	5.0	14	12	12	4	10	10.4	14	10	8	14	11.5
	Mourning Warbler	2	0	0	2	1.0	0	0	0	0	0	0.0	0	10	2	0	0.5
	Yellowthroat	0	0	0	2	0.5	2	2	2	2	2	2.0	2	2	2	2	2.0
	Canada Warbler	0	2	0	0	0.5	0	0	2	2	4	1.6	2	0	0	2	1.0
	American Redstart	1	0	0	2	0.8	2	0	4	4	0	2.0	0	2	4	2	2.0
Icteridae	Rusty Blackbird	0	1	0	0	0.3	0	0	0	0	0	0.0	0	0	0	0	0.0
Fringillidae	Rose-breasted Grosbeak	0	0	0	0	0.0	0	0	0	0	2	0.4	2	0	0	2	1.0



Table VI Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					Post-spray treatment 4					
		June 6	June 8	June 9	June 15	Daily	June 16	June 17	June 18	June 20	June 21	Daily	June 23	June 24	June 25	June 26	Daily
		-9	-7	-6	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+3	+4	ave
Fringillidae (Cont'd)	Evening Grosbeak	2	0	4	4	2.5	4	0	0	2	0	1.2	4	0	2	0	1.5
	Purple Finch	0	6	4	6	4.0	6	6	6	4	2	4.8	4	4	2	2	3.0
	Pine Grosbeak	0	0	0	0	0.0	0	0	0	0	2	0.4	0	0	2	2	1.0
	American Goldfinch	0	0	0	0	0.0	0	0	0	0	0	0.0	1	1	2	1	1.3
	Slate-coloured Junco	2	0	2	0	1.0	2	2	4	2	4	2.8	4	2	2	4	3.0
	White-throated Sparrow	6	8	10	10	8.5	6	10	16	2	8	8.4	4	10	6	10	7.5
	Totals:	39	63	77	119	74.5	96	87	111	81	100	95.0	106	81	91	87	91.3

Table VII  
Forest bird population census  
Treatment block 528 (operational plot)  
New Brunswick  
May 25-June 10  
1975

Family	Species	Pre-spray					Post-spray treatment 1					Post-spray treatment 2				
		May	May	May	May	Daily	May	May	June	June	June	Daily	June	June	June	June
		25	26	27	29		30	31	1	2	3		5	6	9	10
		-4	-3	-2	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+5	+6
Trochilidae	Ruby-throated Hummingbird	0	0	0	0	0.0	1	2	0	0	0	0.6	0	0	0	0
Picidae	Yellow-shafted Flicker	2	0	0	1	0.7	0	0	1	0	0	0.2	0	0	0	0
	Yellow-bellied Sapsucker	6	6	1	0	3.2	3	2	3	1	0	1.8	0	1	0	1
	Yellow-bellied Flycatcher	0	0	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0
Tyrannidae	Least Flycatcher	0	2	0	4	1.5	0	2	4	2	2	2.0	0	0	0	2
	Olive-sided Flycatcher	0	0	0	0	0.0	2	0	2	2	0	1.2	0	0	0	0
Corvidae	Blue Jay	0	0	4	0	1.0	0	0	0	2	0	0.4	0	1	0	0
Paridae	Black-capped Chickadee	1	3	3	2	2.2	3	2	2	2	3	2.4	0	1	0	1
Sittidae	White-breasted Nuthatch	0	0	4	0	1.0	0	0	0	0	0	0.0	0	0	0	0
	Red-breasted Nuthatch	6	6	10	6	7.0	4	2	2	4	7	3.8	3	2	4	2
Certhiidae	Brown Creeper	0	0	0	0	0.0	0	0	0	0	1	0.2	0	0	0	0
Troglodytidae	Winter Wren	8	4	4	6	5.5	4	0	4	2	4	2.8	4	2	2	0
	American Robin	2	2	0	0	1.0	1	0	0	0	3	0.8	4	4	0	2
Turdidae	Hermit Thrush	0	0	0	0	0.0	4	2	0	0	0	1.5	0	0	0	0
	Swainson's Thrush	1	3	2	2	2.0	2	1	3	2	1	1.8	0	1	0	0
	Veery	0	0	0	0	0.0	0	1	0	0	0	0.2	0	0	0	0

Table VII

Cont'd

Family	Species	Pre-spray					Post-spray treatment 1					Post-spray treatment 2				
		May	May	May	May	Daily	May	May	June	June	June	Daily	June	June	June	June
		25	26	27	29		30	31	1	2	3		5	6	9	10
		-4	-3	-2	0-	ave	+1	+2	+3	+5	+6	ave	+1	+2	+5	+6
Sylviidae	Golden-crowned Kinglet	0	2	0	2	1.0	2	2	0	2	0	1.2	0	0	2	2
	Ruby-crowned Kinglet	10	4	2	8	6.0	6	2	2	6	4	4.0	4	2	2	2
Bombycillidae	Cedar Waxwing	0	0	5	2	1.7	0	0	0	0	0	0.0	0	0	0	0
Vireonidae	Solitary Vireo	10	2	0	0	3.0	2	0	4	2	4	2.4	8	5	0	6
	Red-eyed Vireo	0	0	0	2	0.5	0	0	0	0	0	0.0	0	2	0	0
Parulidae	Tennessee Warbler	12	10	10	8	10.0	12	4	6	6	8	7.2	4	2	4	0
	Nashville Warbler	0	0	0	4	1.0	0	0	2	4	0	1.2	2	0	0	2
	Parula Warbler	6	2	10	2	5.0	0	2	6	16	8	6.4	0	2	2	4
	Magnolia Warbler	2	8	6	12	7.0	10	2	10	12	8	8.4	4	0	6	0
	Cape May Warbler	4	4	4	4	4.0	6	2	4	6	0	3.4	0	0	6	2
	Black-throated Blue Warbler	0	0	2	0	0.5	0	4	0	0	0	0.8	2	2	0	0
	Myrtle Warbler	2	6	2	2	3.0	4	0	2	4	0	2.0	0	4	2	4
	Black-throated Green Warbler	2	6	12	18	9.5	4	4	4	11	2	5.0	2	6	2	4
	Blackburnian Warbler	2	2	4	2	2.5	8	0	15	6	10	7.8	0	0	2	2
	Bay-breasted Warbler	2	6	6	6	5.0	14	6	12	8	6	9.2	2	2	4	2
	Blackpoll Warbler	0	0	0	2	0.5	4	0	4	4	4	3.2	0	0	0	0

Table VII Cont'd

Family	Species	Pre-spray					Post-spray treatment 1						Post-spray treatment 2				
		May 25	May 26	May 27	May 29	Daily ave	May 30	May 31	June 1	June 2	June 3	Daily ave	June 5	June 6	June 9	June 10	Daily ave
		-4	-3	-2	0-		+1	+2	+3	+5	+6		+1	+2	+5	+6	
Parulidae	Ovenbird	10	6	12	6	8.5	6	8	12	14	12	10.4	8	4	4	6	5.5
	Yellowthroat	2	4	2	0	2.0	0	0	0	0	0	0.0	0	0	2	2	1.0
	Canada Warbler	2	2	4	2	2.5	2	2	6	10	8	5.6	4	0	0	4	2.0
	American Redstart	0	0	0	2	0.5	8	0	0	4	4	3.2	0	0	2	0	0.5
Icteridae	Rusty Blackbird	0	0	0	0	0.0	4	4	1	0	0	1.8	0	1	0	0	0.2
	Common Grackle	0	0	0	0	0.0	0	1	0	0	0	0.2	0	0	0	0	0.0
	Brown-headed Cowbird	0	0	0	0	0.0	4	0	2	0	0	1.2	0	2	4	6	3.0
Fringillidae	Rose-breasted Grosbeak	4	2	2	3	2.7	6	0	6	0	2	2.8	2	0	0	0	0.5
	Evening Grosbeak	0	4	4	0	2.0	4	2	0	0	0	1.2	2	0	0	4	1.5
	Purple Finch	4	2	8	8	5.5	4	2	6	6	8	5.2	2	2	2	0	1.5
	Pine Grosbeak	0	0	0	0	0.0	0	0	0	2	0	0.4	0	0	0	0	0.0
	Pine Siskin	0	0	0	0	0.0	0	0	0	0	0	0.0	0	0	0	10	1.5
	Slate-coloured Junco	0	4	0	0	1.0	0	0	2	6	0	1.6	0	1	0	2	0.7
	White-throated Sparrow	8	2	9	8	6.7	6	7	11	2	6	6.4	6	4	0	2	3.0
	Totals:	108	104	132	124	117.0	132	68	139	150	115	120.8	63	53	52	68	59.0

Table VIII  
Forest bird population census  
Treatment block 528 (operational plot)  
New Brunswick  
June 6-21  
1975

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					
		June 6	June 9	June 10	June 15	Daily ave	June 16	June 17	June 18	June 20	June 21	Daily ave
		-9	-6	-5	-0		+1	+2	+3	+5	+6	
Trochilidae	Ruby-throated Hummingbird	0	0	0	0	0.0	0	0	1	0	0	0.2
Alcedinidae	Belted Kingfisher	0	0	0	0	0.0	2	0	0	0	0	0.4
Picidae	Yellow-shafted Flicker	0	0	0	0	0.0	1	0	0	0	0	0.2
	Yellow-bellied Sapsucker	1	0	1	0	0.5	0	0	2	0	0	0.4
Tyrannidae	Eastern Phoebe	0	0	0	2	0.5	0	0	0	0	0	0.0
	Yellow-bellied Flycatcher	0	0	0	2	0.5	0	0	0	0	0	0.0
	Least Flycatcher	0	0	2	4	1.5	4	2	4	2	0	2.4
	Eastern Wood Pewee	0	0	0	0	0.0	0	2	0	0	0	0.4
Corvidae	Gray Jay	0	0	0	2	0.5	0	0	0	0	0	0.0
	Blue Jay	1	0	0	0	0.3	0	0	0	1	0	0.2
Paridae	Black-capped Chickadee	1	0	1	0	0.5	2	3	3	0	1	1.8
	Boreal Chickadee	0	0	0	0	0.0	0	0	0	0	1	0.2
Sittidae	Red-breasted Nuthatch	2	4	2	0	2.0	4	4	4	0	2	2.8
Troglodytidae	Winter Wren	2	2	0	8	3.0	6	0	2	0	0	1.6
Turdidae	American Robin	4	0	2	4	2.5	4	1	5	0	2	2.4

Table VIII Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					
		June 6	June 9	June 10	June 15	Daily ave	June 16	June 17	June 18	June 20	June 21	Daily ave
		-9	-6	-5	-0		+1	+2	+3	+5	+6	
Turdidae	Swainson's Thrush	1	0	0	3	1.0	0	8	12	6	4	6.0
	Veery	0	0	0	0	0.0	0	0	0	2	2	0.8
Sylviidae	Golden-crowned Kinglet	0	2	2	0	1.0	0	0	0	0	0	0.0
	Ruby-crowned Kinglet	2	2	2	6	3.0	2	4	0	2	2	2.0
Vireonidae	Solitary Vireo	5	0	6	0	2.8	2	0	0	0	0	0.4
	Red-eyed Vireo	2	0	0	0	0.5	0	0	0	0	0	0.0
Parulidae	Tennessee Warbler	2	4	0	6	3.0	4	2	0	0	2	1.6
	Nashville Warbler	0	0	2	0	0.5	0	0	0	2	2	0.8
	Parula Warbler	2	2	4	2	2.5	0	0	0	0	10	2.4
	Magnolia Warbler	0	6	0	3	2.3	2	2	2	4	0	2.0
	Cape May Warbler	0	6	2	4	3.0	6	4	6	6	0	4.4
	Black-throated Blue Warbler	2	0	0	2	1.0	0	0	0	0	0	0.0
	Myrtle Warbler	4	2	4	0	2.5	0	2	2	4	0	1.6
	Black-throated Green Warbler	6	2	4	4	4.0	4	2	2	0	0	2.0
	Blackburnian Warbler	0	2	2	4	2.0	2	2	6	10	6	5.2

Table VIII Cont'd

Family	Species	Pre-spray treatment 3					Post-spray treatment 3					
		June 6	June 9	June 10	June 15	Daily ave	June 16	June 17	June 18	June 20	June 21	Daily ave
		-9	-6	-5	-0		+1	+2	+3	+5	+6	
Parulidae	Bay-breasted Warbler	2	4	2	2	2.5	0	2	0	4	0	1.2
	Ovenbird	4	4	6	4	4.5	6	6	4	4	6	5.2
	Yellow-throat	0	2	2	0	1.0	0	0	0	2	2	0.8
	Canada Warbler	0	0	4	4	2.0	2	4	6	0	0	2.4
	American Redstart	0	2	0	4	1.5	0	0	2	2	0	0.8
Icteridae	Red-winged Blackbird	0	0	0	0	0.0	1	0	0	0	0	0.2
	Rusty Blackbird	1	0	0	3	1.0	1	0	2	2	0	1.0
	Brown-headed Cowbird	2	4	6	0	3.0	2	0	4	0	0	1.2
Fringillidae	Rose-breasted Grosbeak	0	0	0	4	1.0	1	0	0	0	0	0.2
	Evening Grosbeak	0	0	4	8	3.0	5	0	2	3	0	2.0
	Purple Finch	2	2	0	1	1.3	4	2	4	0	0	2.4
	Pine Siskin	0	0	4	5	2.3	4	0	2	0	4	2.0
	American Goldfinch	0	0	0	0	0.0	1	0	0	1	1	0.6
	Slate-coloured Junco	1	0	2	0	0.8	2	3	4	0	2	2.2
	White-throated Sparrow	4	0	2	10	4.0	6	2	5	8	8	5.8
	Song Sparrow	0	0	0	0	0.0	0	0	2	0	0	0.4
Totals:		53	52	68	104	69.3	82	57	88	65	57	69.8

Table IX  
 Forest bird population census  
 Treatment block 525 (operational plot)  
 Juniper, New Brunswick  
 May 25-June 5  
 1975

Family	Species	Pre-spray 1					Post-spray 1					Daily ave.
		May 25	May 26	May 27	May 29	Daily ave.	May 31	June 1	June 2	June 3	June 5	
		-4	-3	-2	-0		+1	+2	+3	+4	+6	
Trochilidae	Ruby-throated Hummingbird	0	0	0	0	0.0	1	0	0	0	0	0.2
Picidae	Flicker	0	0	0	1	0.3	0	0	0	0	0	0.0
	Yellow-bellied Sapsucker	3	2	1	0	1.5	0	0	1	0	1	0.4
Tyrannidae	Least Flycatcher	2	2	4	4	3.0	2	2	2	0	2	1.6
	Eastern Wood Pewee	0	2	0	0	0.5	0	0	0	2	4	1.2
Corvidae	Blue Jay	0	2	0	0	0.5	0	0	0	0	0	0.0
Paridae	Black-capped Chickadee	0	2	4	0	1.5	6	3	1	3	3	3.2
Sittidae	White-breasted Nuthatch	2	0	2	0	1.0	0	0	0	0	0	0.0
	Red-breasted Nuthatch	14	1	4	4	5.8	0	0	4	7	0	2.2
Certhidae	Brown Creeper	0	0	0	0	0.0	0	0	0	1	0	0.2
Troglodytidae	Winter Wren	0	0	2	0	0.5	0	0	0	0	0	0.0
Turdidae	American Robin	0	0	4	2	1.5	0	0	0	3	2	1.0
	Hermit Thrush	2	0	2	2	1.5	2	0	2	0	0	0.8
	Swainson's Thrush	3	2	5	4	3.5	1	8	2	2	0	2.6
Sylviidae	Ruby-crowned Kinglet	2	2	0	2	1.5	2	2	4	0	0	1.6



Table IX Cont'd

Family	Species	Pre-spray 1					Post-spray 1					Daily ave.
		May 25	May 26	May 27	May 29	Daily ave.	May 31	June 1	June 2	June 3	June 5	
		-4	-3	-2	-0		+1	+2	+3	+4	+6	
Vireonidae	Solitary Vireo	2	2	2	0	1.5	0	0	0	4	0	0.8
	Red-eyed Vireo	0	2	0	0	0.5	2	4	6	2	6	4.0
Parulidae	Tennessee Warbler	4	0	2	4	2.5	0	2	0	2	0	0.8
	Nashville Warbler	4	0	0	0	1.0	0	0	0	0	0	0.0
	Parula Warbler	10	2	6	4	5.5	4	8	6	10	0	5.6
	Magnolia Warbler	8	8	6	6	7.0	4	6	0	6	4	4.0
	Cape May Warbler	2	0	0	4	1.5	0	2	4	2	2	2.0
	Black-throated Blue Warbler	6	2	4	0	3.0	6	0	4	2	2	2.8
	Myrtle Warbler	4	2	0	0	1.5	0	0	0	0	0	0.0
	Black-throated Green Warbler	6	10	8	12	9.0	8	8	8	12	8	8.8
	Blackburnian Warbler	4	2	4	6	4.0	2	15	14	8	2	8.2
	Bay-breasted Warbler	4	2	2	4	3.0	4	4	8	6	4	5.2
	Blackpoll Warbler	0	0	0	0	0.0	0	2	2	2	0	1.2
	Ovenbird	14	10	16	4	11.0	4	10	12	14	10	10.0

Table IX Cont'd

Family	Species	Pre-spray 1					Post-spray 1					
		May 25	May 26	May 27	May 29	Daily ave	May 31	June 1	June 2	June 3	June 5	Daily ave
		-4	-3	-2	-0		+1	+2	+3	+4	+6	
	Canada Warbler	4	8	4	4	5.0	2	4	4	2	0	2.4
	American Redstart	8	8	4	6	6.5	4	4	8	12	8	7.2
	Icteridae Rusty Blackbird	0	0	1	0	0.3	0	0	0	0	0	0.0
Fringillidae	Rose-breasted Grosbeak	0	4	4	3	3.8	2	8	6	4	4	4.8
	Evening Grosbeak	0	2	2	2	1.5	2	8	0	0	0	2.0
	Purple Finch	0	2	2	4	2.0	2	4	2	4	0	2.4
	Junco	0	0	0	0	0.0	0	0	2	0	0	0.4
	White-throated Sparrow	10	2	4	4	5.0	1	6	6	4	0	3.4
	TOTALS:	118	83	99	86	96.5	61	110	108	114	62	91.0

Table X  
 Forest bird population census  
 Untreated control block (for 525, late application)  
 Juniper, New Brunswick  
 June 15-24  
 1975

Family	Species	Pre-spray					Post-spray					
		June	June	June	June	Daily	June	June	June	June	June	Daily
		15	16	17	18	ave.	20	21	22	23	24	ave.
		-4	-3	-2	-1		+1	+2	+3	+4	+5	
Trochilidae	Ruby-throated Hummingbird	0	0	0	0	0.0	0	0	0	0	0	0.0
Picidae	Yellow-shafted Flicker	0	0	0	0	0.0	1	0	0	0	0	0.2
	Yellow-bellied Sapsucker	0	0	0	0	0.0	0	1	0	0	0	0.2
Tyrannidae	Yellow-bellied Flycatcher	2	0	0	2	1.0	0	4	0	0	0	0.8
	Least Flycatcher	6	2	2	0	2.5	2	4	2	2	4	2.4
	Eastern Wood Pewee	0	0	0	2	0.5	0	0	0	0	0	0.0
Corvidae	Gray Jay	0	0	0	1	0.3	0	0	0	0	0	0.0
	Blue Jay	0	0	2	0	0.5	8	6	0	1	0	3.0
Paridae	Black-capped Chickadee	4	3	2	1	2.5	0	3	2	0	1	1.2
	Boreal Chickadee	0	0	0	0	0.0	1	0	0	0	0	0.2
Sittidae	White-breasted Nuthatch	0	0	0	0	0.0	0	0	0	0	0	0.0
	Red-breasted Nuthatch	2	4	2	0	2.0	0	2	2	0	2	1.2
Troglodytidae	Winter Wren	2	0	2	2	1.5	2	2	2	4	4	2.8

Table X Cont'd

Family	Species	Pre-spray					Post-spray					Daily ave.
		June	June	June	June	Daily ave.	June	June	June	June	June	
		15	16	17	18		20	21	22	23	24	
		-4	-3	-2	-1		+1	+2	+3	+4	+5	
Turdidae	Wood Thrush	8	8	6	6	7.0	4	4	4	6	16	6.8
	Hermit Thrush	2	0	0	0	0.5	2	2	0	0	2	1.2
	Swainson's Thrush	2	2	2	6	3.0	6	2	4	0	2	2.8
	Veery	1	3	6	4	3.5	8	6	4	7	6	6.2
Sylviidae	Golden-crowned Kinglet	2	0	0	0	0.5	0	0	0	0	0	0.0
	Ruby-crowned Kinglet	2	2	2	2	2.0	2	4	6	4	6	4.4
Bombucillidae	Cedar waxwing	0	0	7	7	3.5	0	0	6	4	0	2.0
Vireonidae	Solitary Vireo	4	4	2	2	3.0	2	2	0	0	2	1.2
	Red-eyed Vireo	4	4	2	2	3.0	2	2	4	0	2	2.0
Parulidae	Black and White Warbler	2	2	2	2	2.0	0	0	0	0	0	0.4
	Tennessee Warbler	0	0	6	2	2.0	0	0	0	0	0	0.0
	Nashville Warbler	10	6	8	12	9.0	10	6	6	6	6	6.8
	Parula Warbler	2	2	2	6	3.0	4	4	6	6	4	4.8
	Magnolia Warbler	4	4	4	2	14.0	4	10	2	4	4	4.8
	Cape May Warbler	2	0	0	0	0.5	0	0	0	0	0	0.0

Table X Cont'd

Family	Species	Pre-spray					Post-spray					Daily ave.
		June 15	June 16	June 17	June 18	Daily ave.	June 20	June 21	June 22	June 23	June 24	
		-4	-3	-2	-1		+1	+2	+3	+4	+5	
Icteridae	Myrtle Warbler	2	0	2	2	1.5	0	0	0	2	2	0.8
	Black-throated Green Warbler	6	4	4	4	4.5	4	0	6	8	6	4.8
	Blackburnian Warbler	18	14	14	14	15.0	14	8	4	4	12	8.4
	Bay-breasted Warbler	4	0	0	2	1.5	2	4	2	0	2	2.0
	Blackpoll Warbler	0	0	0	0	0.0	0	0	0	0	0	0.0
	Ovenbird	12	18	16	12	16.5	16	12	14	8	20	12.0
	Northern Waterthrush	6	4	4	4	4.5	0	0	2	2	2	1.2
	Canada Warbler	6	2	4	2	3.5	2	2	2	2	2	2.0
	American Redstart	12	4	8	6	7.5	6	6	10	10	12	8.8
	Rusty Blackbird	0	4	1	1	1.5	0	1	0	0	0	0.2
	Common Grackle	0	0	0	0	0.0	0	0	0	0	0	0.0
	Brown-headed Cowbird	0	2	0	2	1.0	0	0	2	4	4	2.0
Fringillidae	Rose-breasted Grosbeak	4	5	9	7	6.3	2	10	7	10	14	8.6
	Evening Grosbeak	4	0	2	3	2.3	4	2	2	0	6	2.8
	Purple Finch	0	0	2	0	0.5	0	2	0	2	2	1.2

Table X Cont'd

Family	Species	Pre-spray					Post-spray					Daily ave.
		June	June	June	June	Daily ave	June	June	June	June	June	
		15	16	17	18		20	21	22	23	24	
		-4	-3	-2	-1		+1	+2	+3	+4	+5	
	Pine Siskin	2	0	0	0	0.5	0	6	0	0	0	1.2
	American Goldfinch	0	1	0	0	2.5	0	1	0	0	0	0.2
	Slate-coloured Junco	4	2	6	4	4.0	10	4	4	4	2	4.8
	Chipping Sparrow	2	2	0	0	1.0	0	2	0	2	2	1.2
	White-throated Sparrow	8	6	6	10	7.5	12	10	8	6	8	8.8
	Song Sparrow	0	0	0	0	0.0	0	0	0	0	0	0.0
	Totals	163	114	139	131	136.8	130	135	113	120	157	131.0

Table XI  
 Forest bird population census  
 Treatment block 525 (late application)  
 Juniper, New Brunswick  
 June 14-24  
 1975

Family	Species	Pre-spray 2					Post-spray 2					Daily ave.
		June 15	June 16	June 17	June 18	Daily ave.	June 20	June 21	June 22	June 23	June 24	
		-4	-3	-2	-1		+1	+2	+3	+4	+6	
Trochilidae	Ruby-throated Hummingbird	0	0	1	0	0.3	0	0	0	0	0	0.0
Picidae	Yellow-bellied Sapsucker	0	0	0	0	0.0	0	0	0	0	2	0.4
Tyrannidae	Eastern Wood Pewee	0	2	2	2	1.5	0	0	0	0	0	0.0
Corvidae	Gray Jay	0	0	0	0	0.0	0	0	0	0	2	0.4
	Blue Jay	2	0	0	0	0.5	0	0	1	0	0	0.2
Paridae	Black-capped Chickadee	3	0	2	2	1.8	0	0	2	0	1	0.6
Sittidae	Red-breasted Nuthatch	0	4	4	0	2.0	0	0	0	0	2	0.4
Troglodytidae	Winter Wren	0	0	0	0	0.0	0	0	0	0	2	0.4
Turdidae	American Robin	0	2	0	2	1.0	0	2	2	0	6	2.0
	Swainson's Thrush	5	0	8	6	4.8	10	0	6	16	4	5.2
Sylviidae	Ruby-crowned Kinglet	4	0	0	0	1.0	2	0	0	2	0	0.8
Bombycillidae	Cedar Waxwing	0	0	0	0	0.0	0	0	2	0	0	0.4
Vireonidae	Solitary Vireo	0	0	0	0	0.0	0	0	2	0	0	0.4

Table XI Cont'd

Family	Species	Pre-spray 2					Post-spray 2					Daily ave.
		June 15	June 16	June 17	June 18	Daily ave.	June 20	June 21	June 22	June 23	June 24	
		-4	-3	-2	-1		+1	+2	+3	+4	+6	
Parulidae	Red-eyed Vireo	4	4	2	4	3.5	2	0	0	0	0	0.4
	Parula Warbler	4	8	2	4	4.5	2	8	2	0	6	3.6
	Magnolia Warbler	4	2	2	4	3.0	2	0	0	2	0	0.8
	Cape May Warbler	0	2	0	2	1.0	2	0	0	0	2	0.8
	Black-throated Blue Warbler	6	2	0	2	2.5	0	2	0	0	0	0.4
	Myrtle Warbler	2	0	0	0	0.5	2	0	2	0	0	0.8
	Black-throated Green Warbler	12	8	6	8	8.5	6	4	6	10	8	6.8
	Blackburnian Warbler	8	10	6	8	8.0	12	2	6	2	2	4.8
	Ovenbird	4	8	8	8	5.0	12	4	6	6	10	7.6
	Canada Warbler	8	4	0	4	4.0	4	0	4	2	6	3.2
	American Redstart	4	6	6	10	6.5	8	0	2	4	8	4.4
Icteridae	Mourning Warbler	0	0	0	0	0.0	0	0	0	0	2	0.4
	Rusty Blackbird	1	0	0	0	0.3	2	0	0	0	0	0.4
	Brown-headed Cowbird	0	2	0	0	0.5	0	0	0	0	2	0.4
Fringillidae	Purple Finch	3	4	0	2	2.2	2	2	0	0	0	0.8



Table XI Cont'd

Family	Species	Pre-spray 2					Post-spray 2					
		June	June	June	June	Daily ave	June	June	June	June	June	Daily ave
		15	16	17	18		20	21	22	23	24	
		-4	-3	-2	-1		+1	+2	+3	+4	+6	
	Junco	0	2	0	2	1.0	0	0	0	0	0	0.0
	White-throated Sparrow	6	2	0	0	2.0	6	2	0	0	0	1.6
	Rose-breasted Grosbeak	0	3	0	0	0.8	6	2	0	0	2	2.0
	Totals	80	75	49	70	68.5	80	28	43	34	67	50.4

## DISCUSSION

There is little doubt that the bird component (especially the kinglet and certain warblers) suffered population losses resulting from applications of phosphamidon and fenitrothion in those experimental plots designed for the eradication of budworm populations. Losses were also recorded when applications of these two insecticides were accidentally introduced into plot 531 within a 20 minute period and also after a phosphamidon treatment on plot 528 on June 19. The damage to the bird component was of short duration (1 season) as census data collected a year later indicates that the more insecticide sensitive species such as the kinglets had established breeding and foraging territories on all the 1975 treatment plots.

All the plots monitored in the Juniper area in 1975 were resurveyed in May 1976. Population censuses were carried out between May 19th and 21st in order to avoid the 1976 budworm control operations in that area. Emphasis was placed in trying to determine if the environment had been so damaged on plots 531 and 525 that such species as the ruby-crowned kinglet would be absent from the old treatment area. The data from Tables XII to XVI indicates that although less than half of the bird component had migrated into the census plots (as compared to one week later in 1975), a normal complement of kinglets was present.

Table XII  
Forest bird population census  
Untreated control plot  
Juniper, New Brunswick  
May 1976

Family	Species	May 19	May 20	May 21	Daily ave
Picidae	Downy Woodpecker	2	0	0	0.7
Corvidae	Blue Jay	2	0	0	0.7
Paridae	Black-capped Chickadee	0	0	2	0.7
	Boreal Chickadee	0	1	0	0.4
Troglodytidae	Winter Wren	0	4	2	2.0
Turdidae	American Robin	3	4	7	4.7
	Wood Thrush	6	4	4	3.4
Sylviidae	Ruby-crowned Kinglet	6	4	4	3.4
Vireonidae	Solitary Vireo	0	2	0	0.7
	Red-eyed Vireo	2	0	0	0.7
Parulidae	Nashville Warbler	0	4	0	1.4
	Magnolia Warbler	4	2	0	2.0
	Black-throated Blue Warbler	2	0	0	0.7
	Myrtle Warbler	2	2	0	1.4
	Black-throated Green Warbler	2	0	0	0.7
	Bay-breasted Warbler	2	0	6	2.7

Table XII Cont'd

Family	Species	May 19	May 20	May 21	Daily ave
Fringillidae	Ovenbird	8	10	6	8.0
	Northern Waterthrush	6	2	6	4.7
	Canada Warbler	0	2	0	0.7
	American Redstart	0	4	2	2.0
	Rose-breasted Grosbeak	2	6	4	4.0
	Purple Finch	4	0	0	1.4
	Slate-coloured Junco	2	1	0	1.0
	White-throated Sparrow	2	2	2	2.0
Totals:		57	54	45	52.0

Table XIII  
Forest bird population census  
Treatment block 531 (experiment plot)  
Juniper, New Brunswick  
May 1976

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Picidae	Common Flicker	2	0	0	0	0.5
Corvidae	Gray Jay	0	2	0	0	0.5
Troglodytidae	Winter Wren	4	2	4	0	2.5
Turdidae	American Robin	0	1	2	3	1.5
	Hermit Thrush	0	1	0	1	0.5
Sylviidae	Golden-crowned Kinglet	2	8	2	5	4.1
	Ruby-crowned Kinglet	6	10	4	0	5.0
Vireonidae	Solitary Vireo	2	0	2	4	2.0
Parulidae	Tennessee Warbler	2	0	0	0	0.5
	Magnolia Warbler	6	6	2	2	4.0
	Cape May Warbler	6	4	4	4	4.5
	Myrtle Warbler	6	6	4	2	4.5
	Black-throated Green Warbler	6	0	0	0	1.5
	Bay-breasted Warbler	0	2	0	0	0.5
	Ovenbird	2	2	2	2	2.0
	Northern Waterthrush	4	0	0	0	1.0

Table XIII Cont'd

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Icteridae	Red-winged Blackbird	0	0	0	2	0.5
Fringillidae	Evening Grosbeak	0	4	0	0	1.0
	Purple Finch	2	0	2	2	1.5
	Pine Grosbeak	0	2	0	0	0.5
	Slate-coloured Junco	2	2	2	2	2.0
	White-throated Sparrow	8	8	2	0	4.5
Totals:		60	60	32	29	45.2

Table XIV  
 Forest bird population census  
 Treatment block 528 (experimental plot)  
 Juniper, New Brunswick  
 May 1976

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Picidae	Common Flicker	2	0	0	0	0.5
	Yellow-bellied Sapsucker	0	0	0	1	0.3
Corvidae	Gray Jay	2	0	0	0	0.5
Paridae	Black-capped Chickadee	4	0	0	0	1.0
Troglodytidae	Winter Wren	0	2	0	2	1.0
Turdidae	American Robin	4	0	0	0	1.0
Sylviidae	Golden-crowned Kinglet	0	0	0	6	1.5
	Ruby-crowned Kinglet	4	4	4	6	4.5
Vireonidae	Solitary Vireo	2	2	4	2	2.5
	Red-eyed Vireo	2	0	0	0	0.5
Parulidae	Parula Warbler	0	2	0	0	0.5
	Magnolia Warbler	0	0	2	2	1.0
	Black-throated Blue Warbler	0	0	2	0	0.5
	Myrtle Warbler	2	0	2	0	1.0
	Black-throated Green Warbler	12	4	6	2	6.0
	Blackburnian Warbler	2	0	0	4	1.5
	Bay-breasted Warbler	2	0	0	0	0.5
	Ovenbird	4	10	4	0	4.5



Table XIV Cont'd

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Fringillidae	Rose-breasted Grosbeak	3	2	0	0	1.3
	Evening Grosbeak	3	0	0	0	0.8
	Purple Finch	0	2	2	2	1.5
	Slate-coloured Junco	2	0	2	4	2.0
	White-throated Sparrow	10	2	8	6	6.5
Totals:		60	30	36	37	42.3

Table XVI  
Forest bird population census  
Treatment block 525 (operational plot)  
Juniper, N.B.  
May 1976

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Paridae	Black-capped Chickadee	1	0	3	0	1.0
Turdidae	American Robin	2	2	0	0	1.0
	Swainson's Thrush	0	3	7	0	2.5
Sylviidae	Golden-crowned Kinglet	0	0	4	0	1.0
	Ruby-crowned Kinglet	6	4	2	2	3.5
Vireonidae	Solitary Vireo	0	2	2	3	1.8
Parulidae	Parula Warbler	8	6	6	0	5.0
	Cape May Warbler	0	2	0	0	0.5
	Black-throated Blue Warbler	2	2	2	0	1.5
	Black-throated Green Warbler	6	8	8	0	5.5
	Blackburnian Warbler	4	0	0	0	1.0
	Bay-breasted Warbler	4	4	4	0	3.0
	Ovenbird	8	8	20	8	11.0
Fringillidae	Rose-breasted Grosbeak	0	2	0	0	0.5
	Evening Grosbeak	0	0	3	0	0.8
	Purple Finch	0	0	6	2	2.0
	Chipping Sparrow	0	2	0	0	0.5
	White-throated Sparrow	1	0	4	4	2.3
Totals:		42	45	81	19	46.8

Table XV  
Forest bird population census  
Treatment block 528 (operational plot)  
Juniper, N.B.  
May 1976

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Picidae	Yellow-shafted Flicker	0	0	2	0	0.5
	Yellow-bellied Sapsucker	2	0	0	1	0.8
Corvidae	Blue Jay	0	4	1	0	1.3
Paridae	Black-capped Chickadee	5	3	3	0	2.3
Troglodytidae	Winter Wren	2	4	4	4	3.5
Turdidae	American Robin	6	5	8	4	5.8
	Swainson's Thrush	0	2	1	0	0.8
Sylviidae	Golden-crowned Kinglet	2	0	2	2	1.5
	Ruby-crowned Kinglet	4	4	6	2	4.0
Vireonidae	Solitary Vireo	4	4	4	5	4.3
Parulidae	Tennessee Warbler	0	0	2	0	0.5
	Parula Warbler	4	4	2	0	2.5
	Magnolia Warbler	0	0	2	4	1.5
	Cape May Warbler	2	0	0	0	0.5
	Myrtle Warbler	0	0	2	0	0.5
	Black-throated Green Warbler	4	2	4	2	3.0
	Blackburnian Warbler	2	0	0	0	0.5

Table XV

Cont'd

Family	Species	May 18	May 19	May 20	May 21	Daily ave
Parulidae cont'd	Bay-breasted Warbler	4	4	2	0	2.5
	Ovenbird	8	4	8	8	7.0
	Northern Waterthrush	0	2	2	0	1.0
	Yellowthroat	2	2	2	2	2.0
	American Redstart	2	2	0	0	1.0
Icteridae	Brown-headed Cowbird	1	2	0	0	0.8
Fringillidae	Purple Finch	4	2	4	2	3.0
	Pine Grosbeak	0	0	2	0	0.5
	Slate-coloured Junco	0	1	0	0	0.3
	White-throated Sparrow	6	4	4	10	6.0
Totals:		64	55	67	46	58.0

## 1976 Monitoring Programme

Ecological Effects monitoring teams from the C.C.R.I. were involved in a variety of experimental and operational programmes in the province of New Brunswick in 1976.

A summary of these treatments and the environmental monitoring programme carried out is described in Table XVII.

Table XVII

Insecticide treatment and environmental monitoring programmes carried out  
in New Brunswick in 1976

Insecticide treatment	Forest components monitored		
	Breeding birds	Small mammals	Aquatic fauna
<u>Dimecron</u> - larvalcide experiments, Chipman, N.B.	X	X	X
<u>Dimecron</u> - adulticide experiments Acadia, N.B.	X		X
<u>Fenitrothion</u> - operational	X	X	X
<u>Seven-4-oil</u> experimental	X		
<u>Orthene</u> - experimental	X		
1975 experimental and operational plots, Juniper area	X		
<u>Matacil</u> experimental adulticide	X		X

## RESULTS

Data is in the process of being compiled and interpreted so the results at this time must be regarded as preliminary.

Ruby-crowned kinglet populations were virtually eliminated in those experiments employing Dimecron at the dosage rates of 4 oz AI/acre and severely depressed at 3 oz AI/acre. No damage is apparent on those plots receiving 2 oz AI/acre in the Dimecron larvalcide experiments or in multiple applications of 1 oz AI/acre. Orthene and Seven-4-Oil applications do not appear to have caused any appreciable damage but stressed birds were observed on the Matacil adulticide plot but does not appear to have resulted in bird mortality. Kinglets re-occupied plots where experimental and operational programs had drastically reduced numbers in 1975. Bird populations in fenitrothion operational blocks monitored did not apparently suffer any adverse effects. Small mammal trap data is in the preliminary stages of assessment but indicates that the small mammal component was not affected by any of the treatments monitored.

Stream survey data is not available at this date for preliminary analysis.