BVRJ
634.909711
BCMF
PRO
1989
MR 4
C.2

634.909/711 BCMF/PRO 1989/
HUMPHREYS, P.
PESTICIDE USE IN BRITISH
COLUMBIA FORESTRY, 1988
BVRJ c. 2 ma Main.....

PESTICIDE USE

IN BRITISH COLUMBIA FORESTRY

1988

by

P. Humphreys
Protection Branch

British Columbia Ministry of Forests
Victoria, British Columbia
Forest Service Internal Report
PM-PB-42

Not for Publication

June 1989

(The contents of this report may not be cited in whole or part without the written approval of the Director, Protection Branch, Ministry of Forests 31 Bastion Square, Victoria, B.C. V8W 3E7)

TABLE OF CONTENTS

	Page
LIST OF FIGURES AND TABLES	ii
FORWARD	iv
INTRODUCTION	1
RESULTS OF THE 1988 B.C. FORESTRY PESTICIDE USE SURVEY	3
REGIONAL SUMMARIES	
VANCOUVER	15
PRINCE RUPERT	27
PRINCE GEORGE	35
KAMLOOPS	45
NELSON	54
CARIBOO	61
DISTRICT SUMMARIES	
VANCOUVER	17
PRINCE RUPERT	28
PRINCE GEORGE	37
KAMLOOPS	47
NELSON	55
CARIBOO	62
DISCUSSION AND CONCLUSIONS	76
ACKNOWLEDGEMENTS	77

LIST OF TABLE AND FIGURES

TABLES

Number		Page
I	The Status of 1988 Pesticide Use Applications and Permits issued by the Pesticide Control Branch.....	5
II	The Status of Appealed 1988 Pesticide Use Permits as Determined by the B.C. Environmental Appeal Board.	6
III	Provincial Summary of Area (ha) Treated and Active Ingredient (kg a.i.) Used by Pesticide, 1988.....	7
IV	Regional Summary of Area (ha) Treated by Pesticide, 1988.	11
V	Regional Summary of Area (ha) Treated by Control Purpose, 1988.	12
VI	Regional Summary of Area (ha) Treated by Method of Application, 1988.	13
VII	Provincial Summary of Area (ha) Treated by Control Purpose, 1988.	67
VIII	Provincial Summary of Area (ha) Treated by Method of Application, 1988.	70
IX	Area (ha) Treated with Herbicides and Insecticides for Forestry Purposes, 1978-1988.	73

FIGURES

Number		Page
1.	Pesticide Use in Percent by Area (ha) Treated, 1988.....	9
2.	Pesticide Use in Percent by Active Ingredient (kg a.i.) Applied, 1988.	10
3.	Provincial Summary of Area (ha) Treated with Pesticides by Forest Region, 1988.	14
4.	Provincial Summary of Area (ha) Treated with Pesticides by Control Purpose, 1988.	69
5.	Provincial Summary of Area (ha) Treated with Pesticides by Method of Application, 1988.	72
6.	Area (ha) Treated with Herbicides for Forestry Purposes, 1978-1988.	74
7.	Area (ha) Treated with Insecticides for Forestry Purposes, 1978-1988.	75

FOREWORD

"This report is the latest in a series of internal reports generated as a result of a cooperative survey project that began in 1981, between the B.C. Council of Forest Industries, the B.C. Ministry of Environment (Pesticide Control Branch) and the B.C. Ministry of Forests (Protection Branch). Information displayed in these reports is obtained from all forestry pesticide permit holders, on an annual basis, by the Pesticide Control Branch and represents only those permits that were valid in 1988. Data includes how much (kg of active ingredient) of each pesticide was applied over how much area (hectares treated); area treated by control purpose and method of application; forest region and district summaries of pesticide use, as well as herbicide and insecticide use trends from 1978-1988.

INTRODUCTION

This is the eighth report of its kind published since 1981.

The series originated from a cooperative project by the B.C. Council of Forest Industries, the B.C. Ministry of Environment (Pesticide Control Branch) and the B.C. Ministry of Forests (Protection Branch) to establish annual records of pesticide application to B.C. forest and range lands.

In 1983, the Pesticide Control Branch initiated a requirement of all pesticide use permit holders to submit follow-up reports on a calendar year basis. This data[1] is summarized, in tables[2] and graphs, on the following pages and includes the following information:

1. Numbers of 1988 forestry permit applications submitted; withdrawn; denied; cancelled and appealed.

2. Environmental Appeal Board decisions on all appealed permits.

3. Provincial summary of area (ha) treated and active ingredient (kg a.i.) used by individual pesticide.

4. Forest region and district summaries of area (ha) treated by pesticide, control purpose and method of application.

5. Provincial summaries of area (ha) treated by control purpose and method of application.

6. Area (ha) of forest land treated with herbicides and insecticides, 1978-1988.

All of the information listed above is further differentiated by the user (i.e., B.C. Forest Service or forestry industry).

1. This report was based upon all follow-up data recieved as of June 1989.

2. Totals in ha may differ slightly from table to table (i.e. 1 - 5 ha) because of rounding.

RESULTS[1] OF THE 1988 PESTICIDE USE SURVEY

In 1988, 596 forestry pesticide use applications were submitted to the Pesticide Control Branch. 585 permits with a start year of 1988 were issued during the same period, 317 to the B.C. Forest Service and 268 to other forestry users (Table I).

Twenty permits were appealed in 1988. The Environmental Appeal Board decisions on these permits were as follows: two supported, two amended, zero cancelled. Appeal Board decisions on 10 permits are still pending (Table II).

The herbicide glyphosate was the most widely used forestry pesticide and was applied to approximately 34 096 hectares (ha) of forest land, 78% of the total area treated with pesticides in 1988. 2,4-D was applied to 4 572 ha, hexazinone to 2 168 ha and Bacillus thuringiensis to 1989 ha (Table III, Figure 1).

In terms of kilograms of pesticide active ingredient (kg a.i.) applied, the two most heavily used pesticides were glyphosate (47 792 kg a.i.) and 2,4-D (5 068 kg a.i.), (Table III, Figure 2).

Summaries of pesticide use by individual Forest Regions and Districts are shown on pages 11 - 66.

Approximately 30 850 ha (70%) of the total provincial area treated with pesticides was located in the Prince George and Vancouver forest regions. The Kamloops, Prince Rupert, Nelson and Cariboo Forest Regions accounted for, respectively 4 562 ha (10%), 4 546 ha (10%), 2 283 ha (5%), and 1 523 ha (3%), (Table IV, Figure 3).

Herbicide applications to control unwanted vegetation for the purpose of ensuring the survival of crop trees, or enhancing their growth, continues to be the most common type of forestry operation involving pesticides.

Herbicides were applied to 34 029 ha for brushing and conifer release operations and 4 033 ha to prepare harvested sites for planting. Site rehabilitation and weed seed tree control applications were conducted on 924 ha and 356 ha, respectively. Insecticides were applied to 2 146 ha. Other forestry pesticide operations included rangeland weed control (690 ha), and right-of-way maintenance (1 568 ha), (Table VII, Figure 4).

Pesticides were applied aerially to approximately 21 962 ha of forest land. This area was divided almost equally between applications involving helicopters and those involving fixed-wind aircraft. Twelve thousand and forty one hectares were treated using various tree injection methods, while backpack sprayers and vehicle mounted sprayers were used to apply pesticides to approximately 9 747 ha (Table VIII, Figure 5).

A total of 43 814 ha of B.C. forest and range land were treated with pesticides in 1988. The B.C. Forest Service treated 19 255 ha (44%) and forest industry was responsible for 24 559 ha (56%).

TABLE I
THE STATUS OF 1988 PESTICIDE USE APPLICATIONS AND PERMITS ISSUED BY THE PESTICIDE CONTROL BRANCH

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
APPLICATIONS SUBMITTED	320	276	596
APPLICATIONS WITH-DRAWN OR DENIED	3	8	11
PERMITS ISSUED (TOTAL)	317	268	585
PERMITS CANCELLED REVOKED OR SUSPENDED BY THE PESTICIDE CONTROL BRANCH	60	31	91

TABLE II
THE STATUS OF APPEALED 1988 PESTICIDE USE PERMITS
AS DETERMINED BY THE B.C. ENVIRONMENTAL APPEAL BOARD

	B.C. FOREST SERVICE	FOREST INDUSTRY	TOTAL
PERMITS APPEALED	14	6	20
APPEALED PERMITS CANCELLED/REVOKED	0	0	0
APPEALED PERMITS AMENDED	1	1	2
APPEALED PERMITS SUPPORTED	2	0	2
APPEALS WITHDRAWN	1	5	6
DECISION PENDING	10	0	10

TABLE III PROVINCIAL SUMMARY OF AREA (ha) TREATED AND ACTIVE INGREDIENT (kg a.i.) USED BY PESTICIDE, 1988[1].

	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
PESTICIDE	ha treated	kg a.i. applied	ha treated	kg a.i. applied
acephate	20.0	23.0		
benomyl	0.2	0.2		
B.t.[2]	1775.0	4231.0	214.0	509.0
carbaryl	0.4	8.0	30.0	70.0
dichlorprop	0.5	1.0	49.0	14.0
cypermethrin	5.0	0.4		
dimethoate	0.006	0.2		
hare repellents[3]			20.0	0.2
glyphosate	14947.0	23138.0	19149.0	24654.0
hexazinone	444.0	1103.0	1724.0	1775.0
imadazolinon			0.3	0.03
fosamine	10.0	36.0	15.0	108.0

TABLE III PROVINCIAL SUMMARY OF AREA (ha) TREATED AND ACTIVE INGREDIENT (kg a.i.) USED BY PESTICIDE, 1988[1].

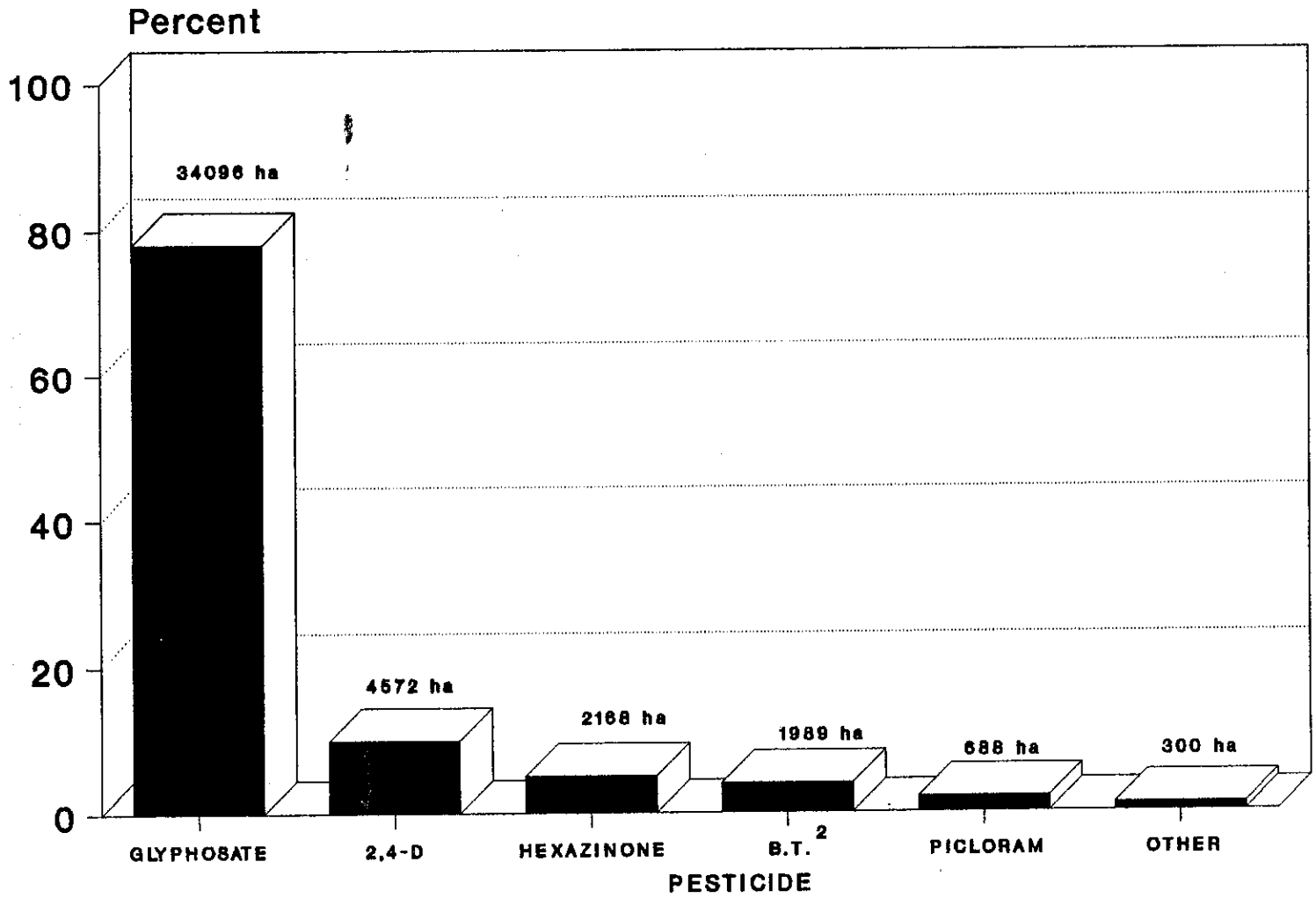
	B.C. FOREST SERVICE		FORESTRY INDUSTRY	
PESTICIDE	ha treated	kg a.i. applied	ha treated	kg a.i. applie
metalaxyl	0.2	0.2		
mineral oil	6.0	205.0		
MSMA	70.0	420.0	10.0	20.0
oxydemeton	0.007	0.05		
oxyfluorfen	0.6	0.4		
permethrin	0.02	0.001	16.0	1.0
picloram	688.0	362.0	0.1	0.001
putrescent egg solids	0.5	0.1	40.0	6.0
simazin			0.4	1.0
deer repellents[3]			4.0	0.02
triadimefon	0.002	0.007		
triclopyr	0.4	2.0	1.0	13.0
2,4-D	1287.0	1903.0	3285.0	3165.0
vole repellents[3]			1.0	0.005

1 Totals in this table may not exactly agree with Forest Region and District summaries, as some treatments included here were done in several regions. Data presented includes pesticides applied to rangeland administered by the B.C. Forest Service.

2 Bacillus thuringiensis.

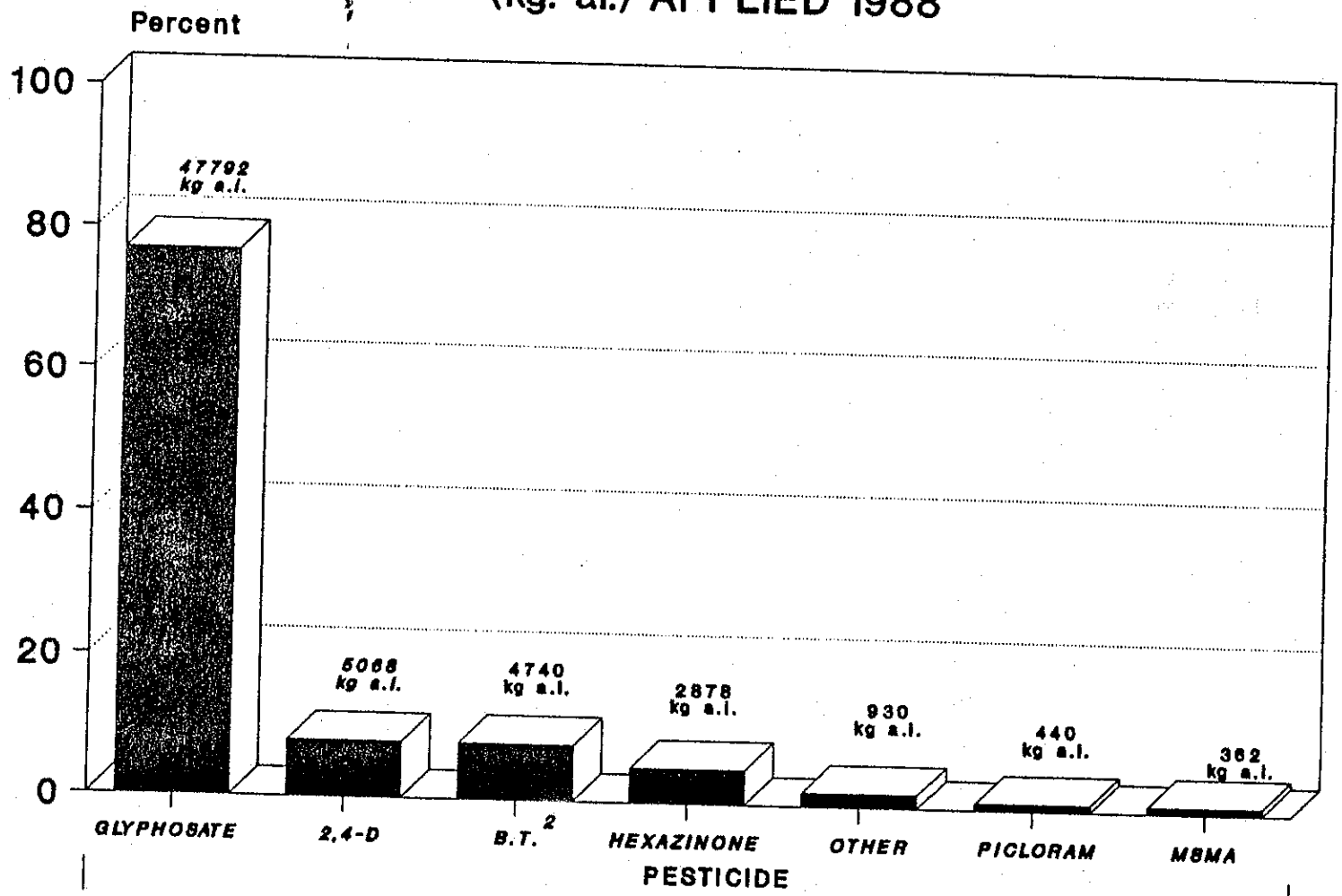
3 Please refer to Forest District reports for actual chemicals used.

PESTICIDE USE
IN PERCENT (ha) TREATED, 1988[1]



1 B.C. FOREST SERVICE & IND. COMBINED
2 BACILLUS THURINGIESIS

PESTICIDE USE
IN PERCENT ACTIVE INGREDIENT
(kg. ai.) APPLIED 1988 [1]



1 B.C. FOREST SERVICE & IND. COMBINED

2 BACILLUS THURINGIENSIS

TABLE IV REGIONAL SUMMARY OF AREA (ha) TREATED BY PESTICIDE, 1988

BCFS AND FOREST INDUSTRY

FOREST REGION	glyphosate	2,4-D	hexazione	picloram	B.t.	Others	Totals	%
VANCOUVER	10556.0	4570.0	0.04	0.03	14.0	105.0	15245.0	35.0
PR. RUPERT	3957.0	0.0	582.0	0.0	0.0	7.0	4546.0	10.0
PR. GEORGE	14117.0	0.0	1245.0	49.0	144.0	50.0	15605.0	36.0
KAMLOOPS	2238.0	2.0	6.0	495.0	1728.0	94.0	4563.0	10.0
NELSON	2005.0	0.0	0.0	138.0	103.0	37.0	2283.0	5.0
CARIBOO	1181.0	0.0	334.0	6.0	0.0	2.0	1523.0	4.0
TOTALS	34054.0	4572.0	2167.0	688.0	1989.0	295.0	43765.0	100.0
(%)	78.0	10.0	5.0	2.0	4.0	1.0	1.0	

TABLE V REGIONAL SUMMARY OF AREA (ha) TREATED BY CONTROL PURPOSE, 1988

BCFS AND FOREST INDUSTRY

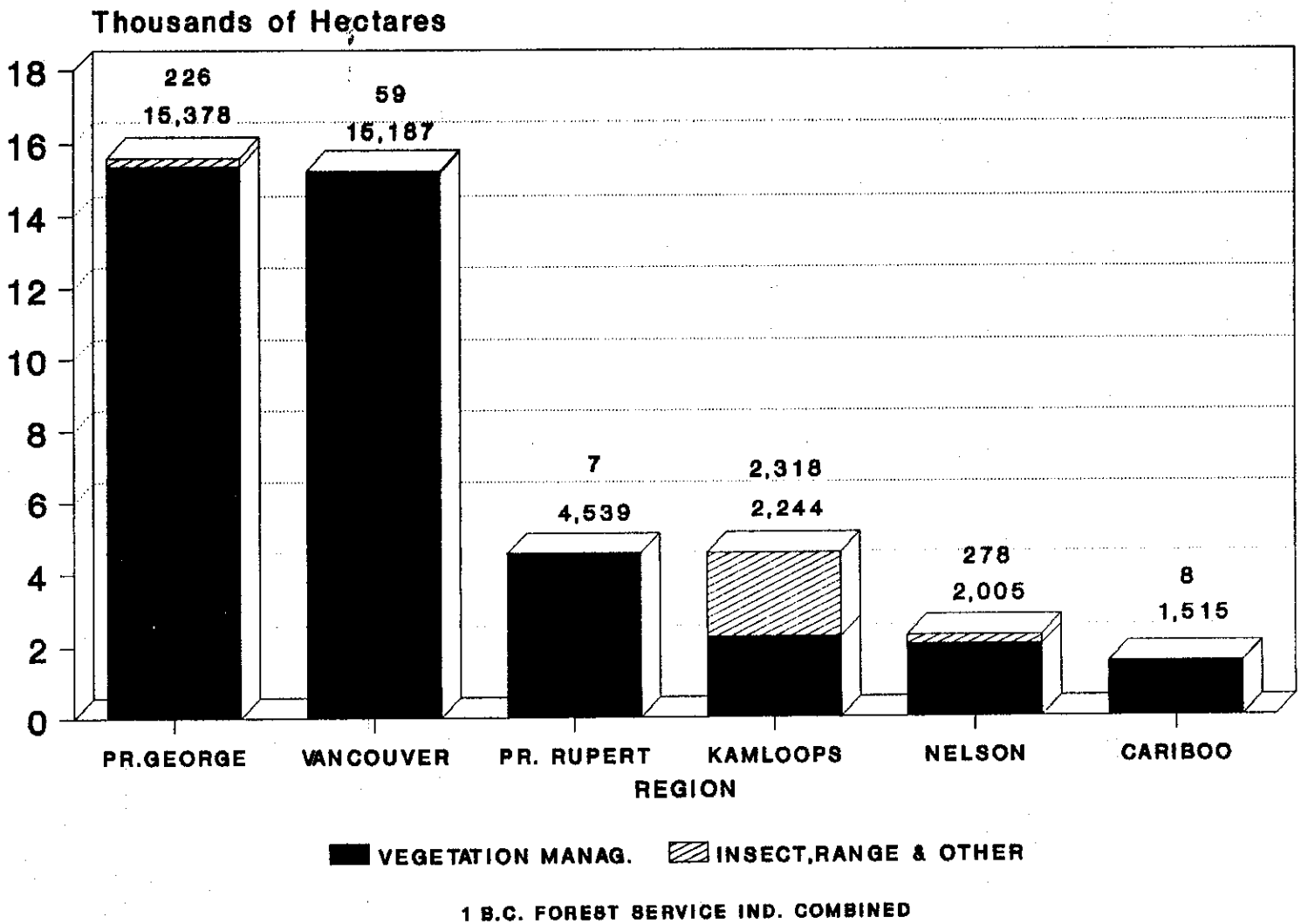
FOREST REGION	VEGETATION MANAGEMENT	INSECT MANAGEMENT	RANGE MANAGEMENT	OTHERS	TOTALS
VANCOUVER	15187.0	14.0	0.0	45.0	15246.0
PR. RUPERT	4539.0	6.0	0.0	1.0	4546.0
PR. GEORGE	15378.0	157.0	49.0	20.0	15604.0
KAMLOOPS	2244.0	1821.0	497.0	0.002	4562.0
NELSON	2005.0	140.0	138.0	0.2	2283.0
CARIBOO	1515.0	2.0	6.0	0.0	1523.0
TOTALS	40868.0	2140.0	690.0	66.0	43764.0
(%)	93.0	5.0	2.0	0.2	100.0

TABLE VI REGIONAL SUMMARY OF AREA (ha)
TREATED BY METHOD OF APPLICATION, 1988

BCFS AND FOREST INDUSTRY

FOREST REGION	AERIAL SPRAY	GROUND APPLICATION	STEM INJECTION	TOTALS
VANCOUVER	4707.0	2872.0	7666.0	15245.0
PR. RUPERT	2926.0	1614.0	6.0	4546.0
PR. GEORGE	10190.0	2892.0	2523.0	15605.0
KAMLOOPS	2365.0	1463.0	736.0	4564.0
NELSON	1121.0	196.0	966.0	2283.0
CARIBOO	597.0	782.0	144.0	1523.0
TOTALS	21906.0	9819.0	12041.0	43766.0
(%)	50.0	22.0	28.0	100.0

AREA TREATED WITH PESTICIDES
PROV. SUMMARY BY FOREST REGION 1988



1 B.C. FOREST SERVICE IND. COMBINED

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	693.0	dichlorprop		0.2	
		glyphosate	471.0	207.0	
		hexazinone		0.04	
		triclopyr		0.1	
Conifer Release	2145.0	fosamine		10.0	
		glyphosate	301.0	86.0	506.0
		2,4-D		8.0	1234.0
Nursery Fungus	0.2	benomyl		0.2	
		metalaxyl		0.002	
Nursery Weed		oxyfluorfen		0.1	
Site Preparation	925.0	glyphosate	874.0	22.0	
		2,4-D	29.0		
Site Rehabilitation	82.0	glyphosate	82.0		
Vertebrate Control	0.5	Putrescent egg solids		0.5	
Sub-totals	3845.0		1771.0	344.0	1740.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTIO
FOREST INDUSTRY:					
Brushing	4496.0	dichlorprop	44.0		
		glyphosate	1884.0	713.0	610.0
		picloram			0.03
		2,4-D	44.0		
Conifer Release	4833.0	glyphosate	499.0	330.0	2726.0
		simazine		0.4	
		2,4-D			1278.0
Pre-harvest Brushing	7.0	glyphosate			7.0
Site Preparation	482.0	glyphosate	451.0	31.0	
Insect Control	14.0	B.t.	14.0		
Right-of-Way	1523.0	dichlorprop		5.0	
		glyphosate		756.0	
		2,4-D		658.0	104.0
Site Rehabilitation	1.0	triclopyr		1.0	
Vertebrate Control	44.0	putrescent egg solids		40.0	
		deer repellent		4.0	
Sub-totals	11400.0		2936.0	2538.0	5926.0
Totals	15245.0		4707.0	2872.0	7666.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Chilliwack (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	224.0	glyphosate	211.0	13.0	
Conifer Release	278.0	2,4-D			103.0
		glyphosate	175.0		
Site Preparation	891.0	2,4-D	29.0		
		glyphosate	862.0		
Sub-totals	1393.0		1277.0	13.0	103.0
FOREST INDUSTRY:					
Brushing	534.0	2,4-D	44.0		
		dichlorprop	44.0		
		glyphosate	406.0	40.0	
Conifer Release	65.0	glyphosate	65.0		
Pre-harvest Brushing	5.0	glyphosate			5.0
Site Preparation	419.0	glyphosate	398.0	21.0	
Sub-totals	1023.0		957.0	61.0	5.0
Totals	2416.0		2234.0	74.0	108.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Maple Ridge (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	56.0	glyphosate	53.0	3.0	
Nursery Fungus	0.2	benomyl		0.2	
Nursery Weed	0.2	oxyfluorfen		0.1	
Sub-Totals	56.0		53.0	3.0	
Forest Industry:					
Brushing	15.0	2,4-D			0.1
		glyphosate		14.0	1.0
		picloram			0.03
Insect Control	14.0	B.t.[1]	14.0		
Sub-Totals	29.0		14.0	14.0	1.0
Totals	85.0		67.0	17.0	1.0

1 Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Squamish (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	169.0	glyphosate hexazinone	151.0	18.0 0.04	
Conifer Release	296.0	glyphosate		58.0	238.0
Sub-totals	465.0		151.0	76.0	238.0
FOREST INDUSTRY:					
Brushing	337.0	glyphosate	293.0	14.0	30.0
Conifer Release	70.0	glyphosate	70.0		
Right-of-Way	13.0	glyphosate		13.0	
Sub-totals	420.0		363.0	27.0	30.0
Totals	885.0		514.0	103.0	268.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Sunshine Coast (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	59.0	glyphosate	17.0	42.0	
Conifer Release	206.0	glyphosate	126.0		80.0
Site Preparation	34.0	glyphosate	12.0	22.0	
Site Rehabilitation	82.0	glyphosate	82.0		
Sub-totals	381.0		237.0	64.0	80.0
FOREST INDUSTRY:					
Brushing	539.0	glyphosate	483.0	56.0	
Conifer Release	102.0	glyphosate	92.0	10.0	
Site Preparation	42.0	glyphosate	42.0		
Vertebrate control	4.0	deer repellent[1]		4.0	
Sub-totals	687.0		617.0	70.0	
Totals	1068.0		854.0	134.0	80.0

1 3 - propyl 1 -1, 2 dithiolane

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Duncan (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	70.0	2,4-D	14.0		
		glyphosate	39.0	17.0	
Sub-totals	70.0		53.0	17.0	
FOREST INDUSTRY:					
Brushing	690.0	glyphosate	146.0	361.0	183.0
Conifer Release	850.0	2,4-D			243.0
		glyphosate		55.0	552.0
Right-of-Way	392.0	2,4-D		333.0	
		glyphosate		59.0	
		dichlorprop		5.0	
Site Preparation	17.0	glyphosate	8.0	9.0	
Vertebrate Control	40.0	putrescent egg solids		40.0	
Sub-totals	1989.0		154.0	862.0	978.0
Totals	2059.0		207.0	879.0	978.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Port Alberni (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTIC
B.C. FOREST SERVICE:					
Brushing	6.0	glyphosate triclopyr		6.0 0.1	
Nursery Fungus	0.2	metalaxyl		0.002	
Sub-totals	6.0			6.0	
FOREST INDUSTRY:					
Brushing	1881.0	2,4-D glyphosate	285.0	75.0	1151.0 370.0
Conifer Release	256.0	glyphosate		130.0	126.0
Right-of-Way	244.0	2,4-D glyphosate		108.0 136.0	
Sub-totals	2381.0		285.0	449.0	1647.0
Totals	2387.0		285.0	455.0	1647.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Campbell River (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	108.0	2,4-D		0.2	
		dichlorprop		0.2	
		glyphosate		108.0	
Conifer Release	1037.0	2,4-D		8.0	991.0
		fosamine		10.0	
		glyphosate		28.0	
Vertebrate Control	0.5	putrescent egg solids		0.5	
Sub-totals	1145.0			155.0	991.0
FOREST INDUSTRY:					
Brushing	122.0	2,4-D			50.0
		glyphosate	27.0	19.0	26.0
Conifer Release	1694.0	2,4-D			842.0
		glyphosate		80.0	772.0
		simazine		0.4	
Pre-harvest Brushing	2.0	glyphosate			2.0
Right-of-Way	201.0	2,4-D		46.0	
		glyphosate		155.0	
Site Preparation	8.0	2,4-D		4.0	
		glyphosate	3.0	1.0	
Sub-totals	2027.0		30.0	305.0	1692.0
Totals	3172.0		30.0	460.0	2683.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Port McNeill (09)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Conifer Release	311.0.	2,4-D glyphosate			129.0 182.0
Sub-totals	311.0				311.0
FOREST INDUSTRY:					
Brushing	378.0	glyphosate	244.0	134.0	
Conifer Release	763.0	glyphosate	272.0	55.0	436.0
Right-Of-Way	544.0	2,4-D glyphosate		168.0 376.0	
Site Preparation	1.0	triclopyr		1.0	
Sub-totals	1686.0		516.0	734.0	436.0
Totals	1997.0		516.0	734.0	747.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Mid Coast (10)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
FOREST INDUSTRY:					
Right-of-Way	20.0	2,4-D		3.0	
		glyphosate		17.0	
Totals	20.0			20.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: VANCOUVER (2) FOREST DISTRICT: Queen Charlotte Islands (111)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECT
B.C. FOREST SERVICE:					
Conifer Release	17.0	2, 4-D			11.0
		glyphosate			6.0
Subtotals	17.0				17.0
FOREST INDUSTRY:					
Conifer Release	1033.0	2,4-D			193.0
		glyphosate			840.0
Right-of-Way	104.0	2,4-D			104.0
		glyphosate		0.2	
Subtotals	1137.0			0.2	1137.0
Totals	1154.0			0.2	1154.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	2221.0	glyphosate hexazinone	1130.0	800.0 291.0	
Conifer Release	258.0	glyphosate	104.0	154.0	
Insect Control	6.0	MSMA			6.0
Site Preparation	182.0	glyphosate	180.0	2.0	
Site Rehabilitation	270.0	glyphosate	270.0		
Sub-totals	2937.0		1684.0	1247.0	6.0
FOREST INDUSTRY:					
Brushing	1275.0	glyphosate hexazinone	909.0	75.0 291.0	
Conifer Release	148.0	glyphosate	148.0		
Site Preparation	185.0	gluphosate	185.0		
Vertebrate Control	1.0	Vole repellent		1.0	
Sub-totals	1609.0		1242.0	367.0	
Totals	4546.0		2926.0	1614.0	6.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Lakes (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECT
B.C. FOREST SERVICE:					
Brushing	752.0	glyphosate hexazinone	284.0	177.0 291.0	
Insect Control	1.0	MSMA			1.0
Site Preparation	97.0	glyphosate	97.0	0.4	
Sub-totals	850.0		381.0	468	1.0
FOREST INDUSTRY:					
Brushing	291.0	hexazinone		291.0	
Sub-totals	291.0			291.0	
Totals	1141.0		381.0	759.0	1.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Morice (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	550.0	glyphosate	182.0	368.0	
Insect Control	4.0	MSMA			4.0
Site Preparation	2.0	glyphosate		2.0	
Totals	556.0		182.0	370.0	4.0
FOREST INDUSTRY:					
Brushing	762.0	glyphosate	687.0	75.0	
Conifer Release	87.0	glyphosate	87.0		
Sub-totals	849.0		774.0	75.0	
Totals	1405.0		956.0	445.0	4.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Bulkley (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	784.0	glyphosate	585.0	199.0	
Conifer Release	104.0	glyphosate	104.0		
Insect Control	1.0	MSMA			1.0
Sub-totals	889.0		689.0	199.0	1.0
FOREST INDUSTRY:					
Brushing	182.0	glyphosate	182.0		
Conifer Release	61.0	glyphosate	61.0		
Site Preparation	185.0	glyphosate	185.0		
Sub-totals	428.0		428.0		
Totals	1317.0		1117.0	199.0	1.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Kispiox (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Site Preparation	83.0	glyphosate	83.0		
Totals	83.0		83.0		

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Kalum (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTIO
B.C. FOREST SERVICE:					
Brushing	101.0	glyphosate	79.0	22.0	
Site Rehabilitation	270.0	glyphosate	270.0		
Totals	371.0		349.0	22.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: North Coast (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	34.0	glyphosate		34.0	
Conifer Release	154.0	glyphosate		154.0	
Subtotals	188.0			188.0	
FOREST INDUSTRY:					
Brushing	40.0	glyphosate	40.0		
Vertebrate Control	1.0	vole repellent[1]		1.0	
Subtotals	41.0		40.0	1.0	
Totals	229.0		40.0	189.0	

1 3 Propyl - 1, 2 Dithiolane + 2 Propylthietane

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE RUPERT (3) FOREST DISTRICT: Cassiar (09)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Insect Control	0.1	MSMA			0.1
Totals	0.1				0.1

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	3296.0	glyphosate	2910.0	384.0	
		hexazinone	0.4	1.0	
		triclopyr	0.2	0.5	
		dichlorprop		0.3	
Conifer Release	465.0	hexazinone		0.6	
		glyphosate	224.0	240.0	
Nursery Weed	0.5	oxyfluorfen		0.5	
Insect Control	157.0	MSMA			7.0
		B.t.	144.0		
		mineral oil		6.0	
Pre-harvest Brushing	1113.0	glyphosate			1113.0
Range Management	49.0	picloram		49.0	
Site Preparation	866.0	glyphosate	621.0	245.0	
Site Rehabilitation***	253.0	glyphosate	253.0		
Sub-totals	6200.0		4153.0	927.0	1120.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTIO
FOREST INDUSTRY:					
Brushing	4857.0	glyphosate	3521.0	340.0	
		hexazinone		996.0	
Conifer Release	1921.0	glyphosate	1761.0	145.0	15.0
Insect Control	0.2	MSMA			0.2
Pre-harvest Brushing	1911.0	glyphosate	358.0		1388.0
		hexazinone		165.0	
Right-of-Way	45.0	fosamine		15.0	
		glyphosate		30.0	
Site Preparation	533.0	glyphosate	397.0	54.0	
		hexazinone		82.0	
Site Rehabilitation	118.0	glyphosate		118.0	
Vertebrate Control	20.0	hare repellent[1]	20.0		
		hexazinone			
Subtotals	9405.0		6037.0	1965.0	1403.0
Totals	15605.0		10190.0	2892.0	2523.0

1 1.3 propyl -1, 2-dithiolane, 2. isopentemyl methyl sulfide, 3. 2,2 - dimethylthietane, 4. pinosylvin

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Prince George (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	648.0	glyphosate hexazinone triclopyr	504.0 0.4 0.2	143.0	
Insect Control	0.03	MSMA			0.03
Nursery Weed	0.5	oxyflorfen		0.5	
Pre-harvest Brushing	1113.0	glyphosate			1113.0
Range Management	3.0	picloram		3.0	
Site Preparation	57.0	glyphosate	57.0		
Site Rehabilitation	222.0	glyphosate	222.0		
Sub-totals	2043.0		784.0	146.0	1113.0
FOREST INDUSTRY:					
Brushing	868.0	glyphosate hexazinone	849.0	19.0	
Conifer Release	1231.0	glyphosate	1086.0	145.0	
Pre-harvest Brushing	621.0	glyphosate			621.0
Site Preparation	266.0	glyphosate	264.0	2.0	
Vertebrate Control	20.0	hare repellent[1]		20.0	
Sub-totals	3006.0		2199.0	186.0	621.0
Totals	5049.0		2983.0	332.0	1734.0

[1] 1. 3 propyl - 1, 2 - dithiolane 2.isopentemyl methyl sulfide
3. 2, 2 - dimethylthietane 4.pinosylvin

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: McBride (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	99.0	glyphosate	99.0		
Range Management	19.0	picloram		19.0	
Site Rehabilitation	31.0	glyphosate	31.0		
Subtotals	149.0		130.0	19.0	
FOREST INDUSTRY:					
Brushing	301.0	glyphosate	124.0	177.0	
Insect Control	0.2	MSMA			0.2
Site Preparation	24.0	glyphosate		24.0	
Subtotals	325.0		124.0	201.0	0.2
Totals	474.0		254.0	220.0	0.2

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Vanderhoof (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	217.0	glyphosate	217.0		
Conifer Release		hexazinone		0.6	
Insect Control	6.0	MSMA mineral oil		 6.0	0.1
Range Management	2.0	picloram		2.0	
Sub-totals	225.0		217.0	8.0	0.1
FOREST INDUSTRY:					
Conifer Release	15.0	glyphosate			15.0
Pre-harvest Treatment	358.0	glyphosate	358.0		
Site Preparation	52.0	glyphosate	24.0	28.0	
Site Rehabilitation	118.0	glyphosate		118.0	
Sub-totals	543.0		382.0	146.0	15.0
Totals	768.0		599.0	154.0	15.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort St. James (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTIO
B.C. FOREST SERVICE:					
Brushing	882.0	glyphosate hexazinone triclopyr	835.0	46.0 1.0 0.5	
Insect Control	7.0	MSMA			7.0
Site Preparation	244.0	glyphosate	244.0		
Subtotals	1133.0		1079.0	47.0	7.0
FOREST INDUSTRY:					
Brushing	1898.0	glyphosate hexazinone	1558.0	31.0 309.0	
Conifer Release	515.0	glyphosate	515.0		
Pre-harvest Brushing	633.0	glyphosate			633.0
Right-of-Way	45.0	fosamine glyphosate		15.0 30.0	
Site Preparation	53.0	hexazinone		53.0	
Sub-totals	3144.0		2073.0	438.0	633.0
Totals	4277.0		3152.0	485.0	640.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: McKenzie (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	0.2	dichlorprop		0.2	
Conifer Release	240.0	glyphosate		240.0	
Site Preparation	515.0	glyphosate	270.0	245.0	
Sub-totals	755.0		270.0	485.0	
FOREST INDUSTRY:					
Brushing	1175.0	glyphosate hexazinone	375.0	132.0 668.0	
Pre-harvest Brushing	165.0	hexazinone		165.0	
Site Preparation	138.0	glyphosate hexazinone	109.0	 29.0	
Sub-totals	1478.0		484.0	994.0	
Totals	2233.0		754.0	1479.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1987
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Dawson Creek (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTI
B.C. FOREST SERVICE:					
Brushing	484.0	glyphosate	337.0	147.0	
Range Management	17.0	picloram		17.0	
Sub-totals	501.0		337.0	164.0	
FOREST INDUSTRY:					
Brushing	535.0	glyphosate	535.0		
Conifer Release	160.0	glyphosate	160.0		
Sub-totals	695.0		695.0		
Totals	1196.0		1032.0	164.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort St. John (08)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	549.0	glyphosate	502.0	47.0	
Range Management	8.0	picloram		8.0	
Site Preparation	50.0	glyphosate	50.0		
Sub-totals	607.0		552.0	55.0	
FOREST INDUSTRY:					
Brushing	80.0	glyphosate	80.0		
Pre-harvest Brushing	134.0	glyphosate			134.0
Sub-totals	214.0		80.0		134.0
Totals	821.0		632.0	55.0	134.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: PRINCE GEORGE (4) FOREST DISTRICT: Fort Nelson (09)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJEC
B.C. FOREST SERVICE:					
Brushing	417.0	glyphosate	416.0	1.0	
Conifer Release	224.0	glyphosate	224.0		
Insect Control	144.0	B.t.[1]	144.0		
Sub-totals	785.0		784.0	1.0	

1 Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C FOREST SERVICE:					
Brushing	510.0	glyphosate	67.0	443.0	
		hexazinone		0.2	
Conifer Release	723.0	glyphosate	256.0	363.0	100.0
		hexazinone		4.0	
Insect Control	1591.0	acephate		20.0	
		B.t.	1528.0		
		carbaryl		0.4	
		MSMA		22.0	21.0
Range Management	497.0	picloram		495.0	
		2,4-D		2.0	
Nursery Fungus	0.002	triadimefon		0.002	
Site Preparation	69.0	glyphosate		67.0	
		triclopyr		0.06	
		hexazinone		2.0	
Site Rehabilitation	200.0	glyphosate	200.0	0.2	
Weed Seed Tree	356.0	glyphosate			356.0
Sub-totals	3946.0		2051.0	1419.0	477.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
FOREST INDUSTRY:					
Brushing	359.0	glyphosate	67.0	44.0	248.0[1]
		2, 4-D			0.07
		imadazolinon			0.3
		picloram			0.06
Pre-harvest Brushing	10.0	glyphosate			10.0
Site Preparation	17.0	glyphosate	17.0		
Insect Control	230.0	B.t.	200.0		
		carbaryl	30.0		
		MSMA			0.3
Sub-totals	616.0		314.0	44.0	259.0
Totals	4562.0		2365.0	1463.0	763.0

1 158.0 ha included here that does not appear in district summaries as it represents treatments scattered throughout the region.

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Clearwater (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	141.0	glyphosate hexazinone		141.0 0.2	
Conifer Release	198.0	glyphosate		198.0	
Insect Control	85.0	B.t.	85.0		
Range Management	27.0	picloram		27.0	
Site Preparation	8.0	glyphosate triclopyr		8.0 0.06	
Site Rehabilitation	0.2	glyphosate		0.2	
Subtotals	459.0		85.0	374.0	
FOREST INDUSTRY					
Brushing	44.0	glyphosate		44.0	
Subtotals	44.0			44.0	
Totals	503.0		85.0	418.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Kamloops (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTI
B.C. FOREST SERVICE:					
Brushing	48.0	glyphosate hexazinone	20.0	28.0 0.03	
Conifer Release	0.6	glyphosate		0.6	
Insect Control	890.0	B.t. MSMA	889.0		2.0
Range Management	256.0	picloram		256.0	
Site Preparation	60.0	glyphosate hexazinone		58.0 2.0	
Weed Seed Tree	38.0	glyphosate			38.0
Sub-totals	1293.0		909.0	345.0	40.0
FOREST INDUSTRY:					
Insect Control	200.0	B.t.[1]	200.0		
Sub-totals	200.0		200.0		
Totals	1411.0		1109.0	264.0	38.0

1 Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Salmon Arm (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	47.0	glyphosate	47.0		
Conifer Release	213.0	glyphosate hexazinone	69.0	40.0 4.0	100.0
Insect Control	149.0	B.t.	149.0		
Nursery Fungus		triadimefon		0.002	
Range Management	8.0	picloram		8.0	
Weed Seed Tree	76.0	glyphosate			76.0
Sub-totals	493.0		265.0	52.0	176.0
FOREST INDUSTRY:					
Insect Control	30.0	carbaryl	30.0		
Pre-harvest Brushing	10.0	glyphosate			10.0
Sub-totals	40.0		30.0		10.0
Totals	533.0		295.0	52.0	186.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Vernon (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	173.0	glyphosate		173.0	
Conifer Release	48.0	glyphosate		48.0	
Insect Control	225.0	acephate		20.0	
		carbaryl		0.4	
		MSMA			5.0
		B.t.[1]	200.0		
Range Management	31.0	picloram		31.0	
Weed Seed Tree	2.0	glyphosate			2.0
Sub-totals	479.0		200.0	272.0	7.0
FOREST INDUSTRY:					
Insect Control	0.3	MSMA			0.3
Sub-totals	0.3				0.3
Totals	479.0		200.0	272.0	7.0

1 Bacillus thuringiensis

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Penticton (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Insect Control	13.0	MSMA			13.0
Range Management	16.0	picloram 2,4-D		14.0 2.0	
Weed Seed Tree	240.0	glyphosate			240.0
Sub-totals	269.0			16.0	253.0
FOREST INDUSTRY:					
Brushing	90.0	2, 4-D glyphosate imadazolinon picloram			0.07 90.0 0.3 0.06
Sub-totals	90.0				90.0
Totals	357.0			14.0	343.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Merritt (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	101.0	glyphosate		101.0	
Conifer Release	35.0	glyphosate		35.0	
Insect Control	22.0	MSMA		22.0	
Range Management	147.0	picloram		147.0	
Sub-totals	305.0			305.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: KAMLOOPS (5) FOREST DISTRICT: Lillooet (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Conifer Release	228.0	glyphosate	187.0	41.0	
Insect Control	206.0	B.t. MSMA	205.0		1.0
Range Management	12.0	picloram		12.0	
Site Preparation	1.0	glyphosate hexazinone		1.0 1.0	
Site Rehabilitation	200.0	glyphosate	200.0		
Subtotals	647.0		592.0	54.0	1.0
FOREST INDUSTRY:					
Brushing	67.0	glyphosate	67.0		
Site Preparation	17.0	glyphosate	17.0		
Subtotals	84.0		84.0		
Totals	731.0		676.0	54.0	1.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	363.0	glyphosate	318.0	30.0	15.0
Nursery Fungus	0.2	metalaxyl		0.2	
Insect Control	115.0	MSMA B.t. permethrin	103.0	0.02	12.0
Pre-harvest Brushing	930.0	glyphosate			930.0
Range Management	138.0	picloram		138.0	
Site Preparation	409.0	glyphosate	409.0	0.02	
Sub-totals	1955.0		830.0	168.0	957.0
FOREST INDUSTRY:					
Brushing	163.0	glyphosate	151.0	12.0	
Conifer Release	140.0	glyphosate	140.0		
Insect Control	25.0	permethrin MSMA[1]		16.0	9.0
Sub-totals	328.0		291.0	28.0	
Totals	2283.0		1121.0	196.0	966.0

1 This area is not shown in Forest District summaries as it represents treatments scattered throughout Nelson Forest Region.

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Cranbrook (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Range Management	47.0	picloram		47.0	
Totals	47.0			47.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Invermere (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Insect Control	12.0	MSMA			12.0
		permethrin		0.02	
Range Management	9.0	picloram		9.0	
Site Preparation	0.02	glyposate		0.02	
Totals	21.0			9.0	12.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Golden (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Insect Control	0.1	MSMA			0.1
Sub-totals	0.1				0.1
FOREST INDUSTRY:					
Brushing	163.0	glyphosate	151.0	12.0	
Conifer Release	140.0	glyphosate	140.0		
Insect Control	16.4	permethrin		16.0	
Sub-totals	319.0		291.0	28.0	
Totals	319.0		291.0	28.0	0.1

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Revelstoke (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	348.0	glyphosate	318.0	30.0	
Site Preparation	278.0	glyphosate	278.0		
Totals	626.0		596.0	30.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Boundary (06)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	15.0	glyphosate			15.0
Insect Control	103.0	B.t.	103.0		
		MSMA			0.2
Pre-harvest Brushing	930.0	glyphosate			930.0
Range Management	82.0	picloram		82.0	
Site Preparation	131.0	glyphosate	131.0		
Totals	1261.0		234.0	82.0	945.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: NELSON (6) FOREST DISTRICT: Kootenay Lake (07)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Nursery Fungus	0.2	metalaxyl		0.2	
Totals	0.2			0.2	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: REGIONAL TOTAL (00)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C FOREST SERVICE:					
Brushing	144.0	hexazinone glyphosate		144.0 0.3	
Insect Control	2.0	MSMA			2.0
Range Management	6.0	picloram		6.0	
Site Preparation	226.0	glyphosate		84.0	142.0
Sub-totals	378.0			234.0	144.0
FOREST INDUSTRY:					
Brushing	547.0	hexazinone glyphosate		190.0 357.0	
Conifer Release	447.0	glyphosate	447.0		
Site Preparation	151.0	glyphosate	150.0	1.0	
Sub-totals	1145.0		597.0	548.0	
Totals	1523.0		597.0	782.0	144.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: Quesnel (01)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	144.0	hexazinone		144.0	
Sub-totals	144.0			144.0	
FOREST INDUSTRY:					
Brushing	190.0	hexazinone		190.0	
Conifer Release	447.0	glyphosate	447.0		
Site Preparation	151.0	glyphosate	150.0	1.0	
Sub-totals	788.0		597.0	191.0	
Totals	932.0		597.0	335.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: Williams Lake (02)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Brushing	0.3	glyphosate		0.3	
Range Management	6.0	picloram		6.0	
Site Preparation	140.0	glyphosate			142.0
Subtotals	148.0			6.0	142.0
FOREST INDUSTRY:					
Brushing	80.0	glyphosate		80.0	
Subtotals	80.0			80.0	
Totals	228.0			86.0	142.0

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: Horsefly (03)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Site Preparation	84.0	glyphosate		84.0	
Subtotals	84.0			84.0	
FORESTY INDUSTRY:					
Brushing	147.0	glyphosate		147.0	
Subtotals	147.0			147.0	
Totals	231.0			231.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: 100 Mile House (04)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
FOREST INDUSTRY:					
Brushing	130.0	glyphosate		130.0	
Totals	130.0			130.0	

SUMMARIES OF PESTICIDE USE BY FOREST REGION AND DISTRICT, 1988
BCFS AND FOREST INDUSTRY

FOREST REGION: CARIBOO (7) FOREST DISTRICT: Chilcotin (05)

TREATMENT PURPOSE	TREATMENT AREA (ha)	PESTICIDES	AREA (ha) BREAKDOWN BY TREATMENT METHODS		
			AERIAL SPRAY	GROUND APPLIC.	STEM INJECTION
B.C. FOREST SERVICE:					
Insect Control	2.0	MSMA			2.0
Totals	2.0				2.0

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1988

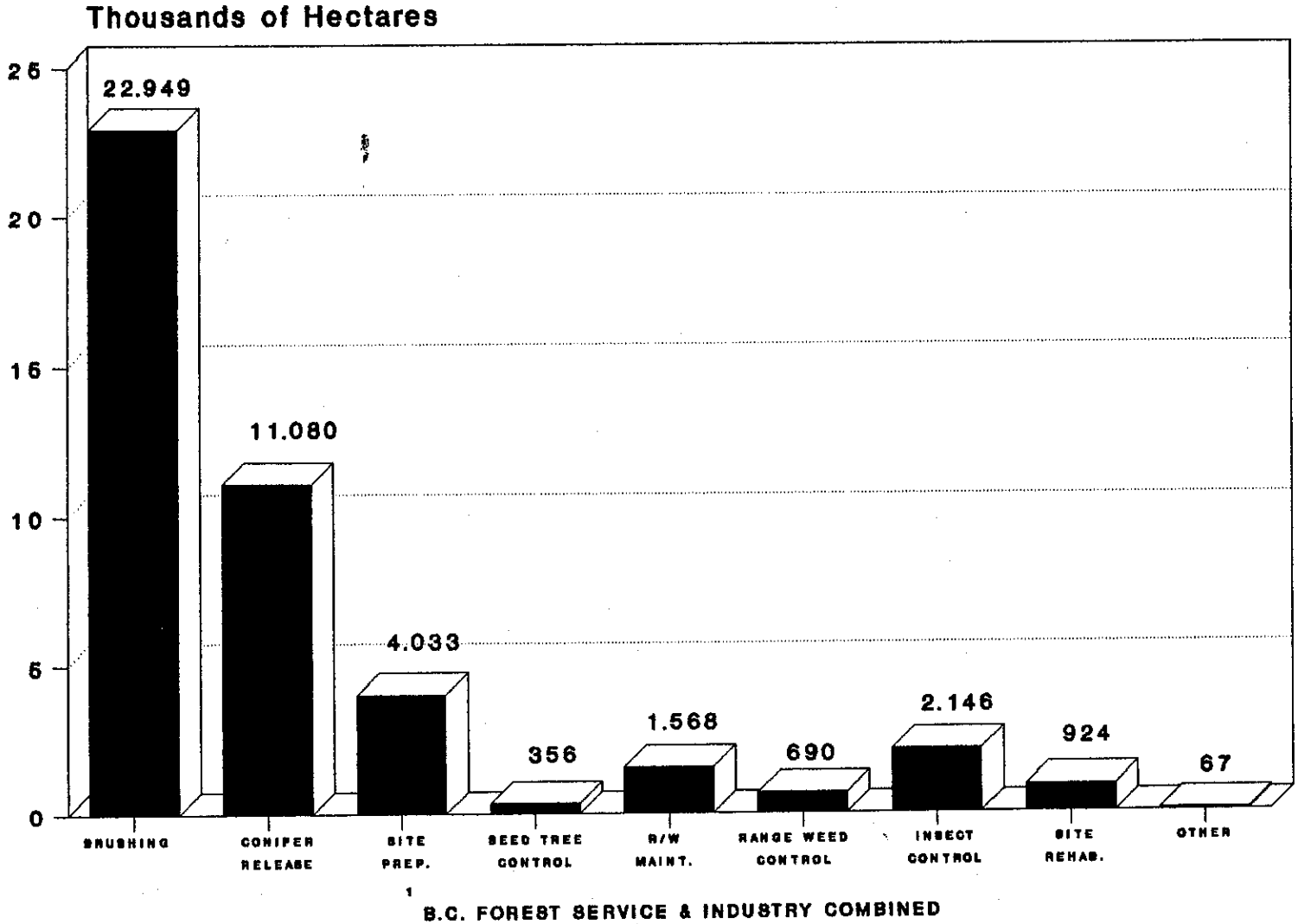
PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
BRUSHING[1]	dichlorprop	0.5	44.0
	glyphosate	8818.0	10748.0
TOTAL:	hexazinone	437.0	1642.0
22949.00	imadazolinon		0.3
	picloram		0.1
	triclopyr	0.3	
	2,4-D	14.0	1245.0
CONIFER RELEASE	fosamine	10.0	
	glyphosate	2334.0	6211.0
TOTAL:	hexazinone	5.0	
11080.0 ha	2,4-D	1242.0	1278.0
	simazine		0.4
INSECT	acephate	20.0	
CONTROL	B.t.	1775.0	214.0
	carbaryl	0.4	30.0
TOTAL:	cypermethrin	5.0	
2146.0 ha	dimethoate	0.006	
	MSMA	70.0	10.0
	permethrin	0.02	16.0
	mineral oil	6.0	
	oxydemeton	0.007	
RANGE WEED	picloram	688.1	
CONTROL	2,4-D	2.0	
TOTAL: 690.0 ha			
RIGHT-OF-WAY	fosamine		15.0
MAINTENANCE	glyphosate		786.0
	2,4-D		762.0
TOTAL:1568.0 ha	dichlorprop		5.0
SITE	glyphosate	2634.0	1286.0
PREPARATION	hexazinone	2.0	82.0
	triclopyr	0.06	
TOTAL:4033.0 ha	2,4-D	29.0	

TABLE VII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY CONTROL PURPOSE, 1988

PURPOSE	PESTICIDES	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
SITE REHABILITATION TOTAL: 924.0 ha	glyphosate	805.0	118.0
	triclopyr		1.0
WEED SEED TREE CONTROL TOTAL: 356.0 ha	glyphosate	356.0	
FUNGUS CONTROL[3] TOTAL: 0.4 ha	benomyl	0.2	
	metalaxyl	0.2	
	triadimefon	0.002	
VERTEBRATE CONTROL TOTAL: 66.0 ha	deer repellent[4]		4.0
	hare repellent[4]		20.0
	vole repellent[4]		1.0
	putrescent egg solids[5]	0.5	40.0
NURSERY WEED TOTAL: 0.6 ha	oxyfluorfen	0.6	

[1] Includes both forest nursery and forest treatments
[2] Bacillus thuringiensis
[3] Includes nursery treatments
[4] Please refer to district summaries for actual chemical used
[5] Deer repellent

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY CONTROL PURPOSE, 1988 [1]



[1] B.C. FOREST SERVICE & INDUSTRY COMBINED

TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
TREATED BY METHOD OF APPLICATION, 1988

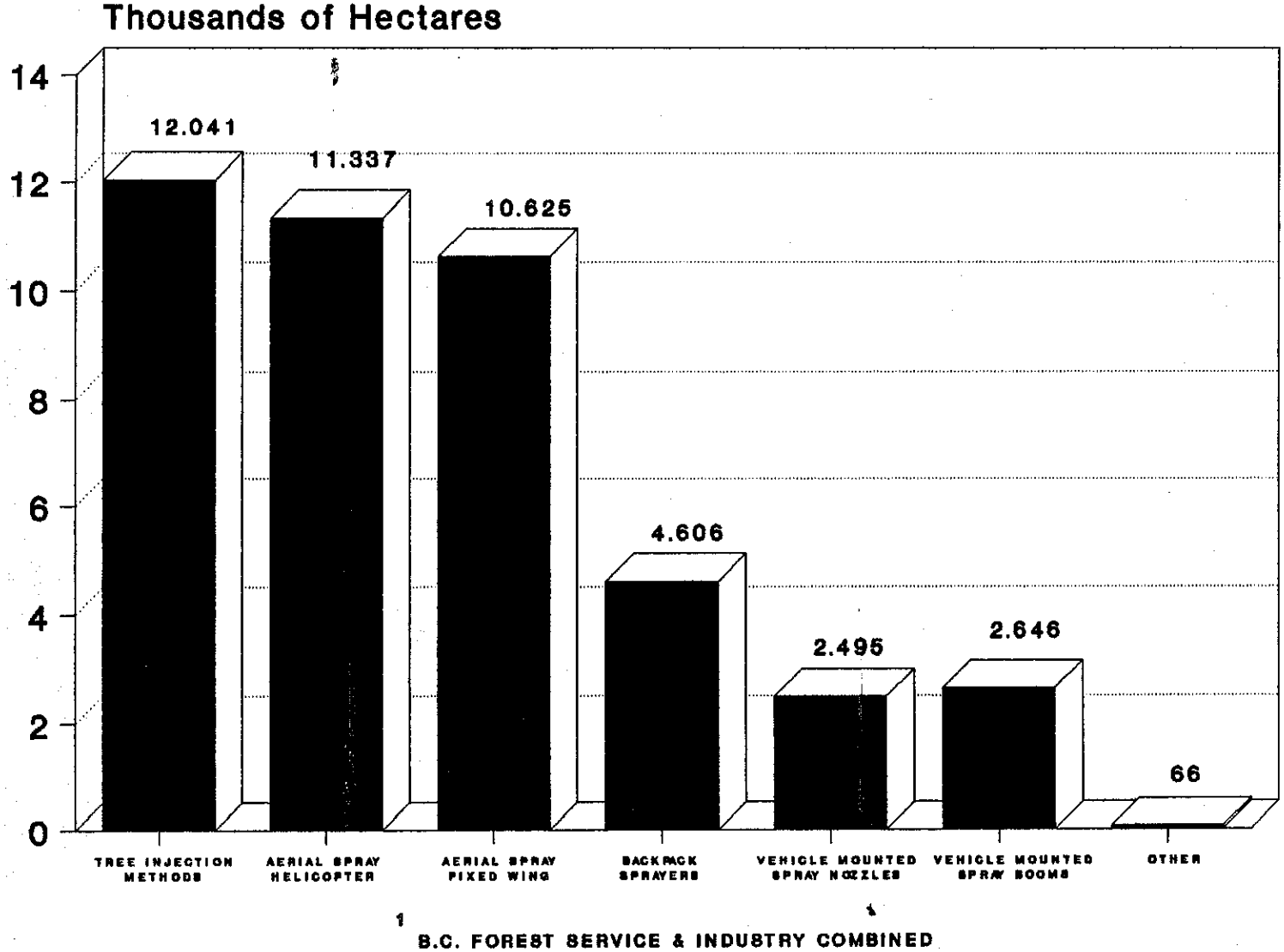
METHOD OF APPLICATION	PESTICIDES USED	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
AERIAL SPRAY HELICOPTER	glyphosate	6352.0	4854.0
	2,4-D	43.0	44.0
	dichlorprop		44.0
TOTAL: 11337.0 ha			
AERIAL SPRAY FIXED WING	hexazinone	0.4	
	B.t.[1]	1775.0	214.0
	carbaryl		30.0
TOTAL:	glyphosate	2320.0	6285.0
10625.0 ha	triclopyr	0.2	
BACKPACK AND HAND HELD SPRAY EQUIPMENT[2]	acephate	20.0	
	carbaryl	0.4	
	dichlorprop	0.3	
	glyphosate	1672.0	941.0
	hexazinone	202.0	1724.0
TOTAL:	mineral iol	6.0	
4606.0 ha	MSMA	22.0	
	picloram	0.5	
	simazine		0.4
	triclopyr	0.2	1.0
	permethrin	0.02	16.0
TREE INJECTION/ CUT SURFACE TREATMENTS[3]	glyphosate	3163.0	5006.0
	MSMA	47.0	9.0
	2,4-D	1234.0	2582.0
	picloram		0.1
TOTAL:	imadazolinon		0.3
12041.0 ha			

TABLE VIII PROVINCIAL SUMMARY OF AREA (ha)
BY METHOD OF APPLICATION, 1988

METHOD OF APPLICATION	PESTICIDES USED	B.C. FOREST SERVICE ha treated	FOREST INDUSTRY ha treated
VEHICLE MOUNTED SPRAY BOOMS[4]	cypermethrin	5.0	
	dichlorprop	0.2	
	fosamine	10.0	
	glyphosate	600.0	1076.0
TOTAL:	oxyfluorfen	0.6	
2646.0 ha	picloram	383.0	
	2,4-D	8.0	563.0
VEHICLE MOUNTED SPRAY NOZZLES[5]	acephate	0.006	
	dichlorprop		5.0
	dimethoate	0.006	
	fosamine		15.0
TOTAL:	glyphosate	840.0	989.0
2495.0 ha	hexazinone	242.0	
	oxydemeton	0.007	
	picloram	303.0	
	triadimefon	0.002	
	2,4-D	2.0	99.0
OTHER	benomyl	0.2	
	glyphosate	0.4	
TOTAL:	metalaxyl	0.2	
66.0 ha	putrescent egg solids[6]	0.5	40.0
	deer repellents[7]		4.0
	hare repellents[7]		20.0
	vole repellents[7]		1.0

1 B.t. = Bacillus thuringiensis
2 Includes mistblowers, ultra low volume sprayers, spot guns and granule spreaders.
3 Involves hack and squirt, frill and squirt and cut stump treatments. Includes brush saws, lance injectors, and hypo hatchets.
4 Any fixed system which involves a boom with one or more nozzles attached to create a continuous broadcast spray. (Source: Pesticide Control Branch).
5 Any system which involves tank, hose and nozzle. Nozzle is hand held and can be selectively directed. (Source: Pesticide Control Branch).
6 Deer repellent
7 Please refer to Forest Distric summaries for actual chemicals used.

PROVINCIAL SUMMARY OF AREA (ha) TREATED WITH PESTICIDES BY METHOD OF APPLICATION, 1988 [1]



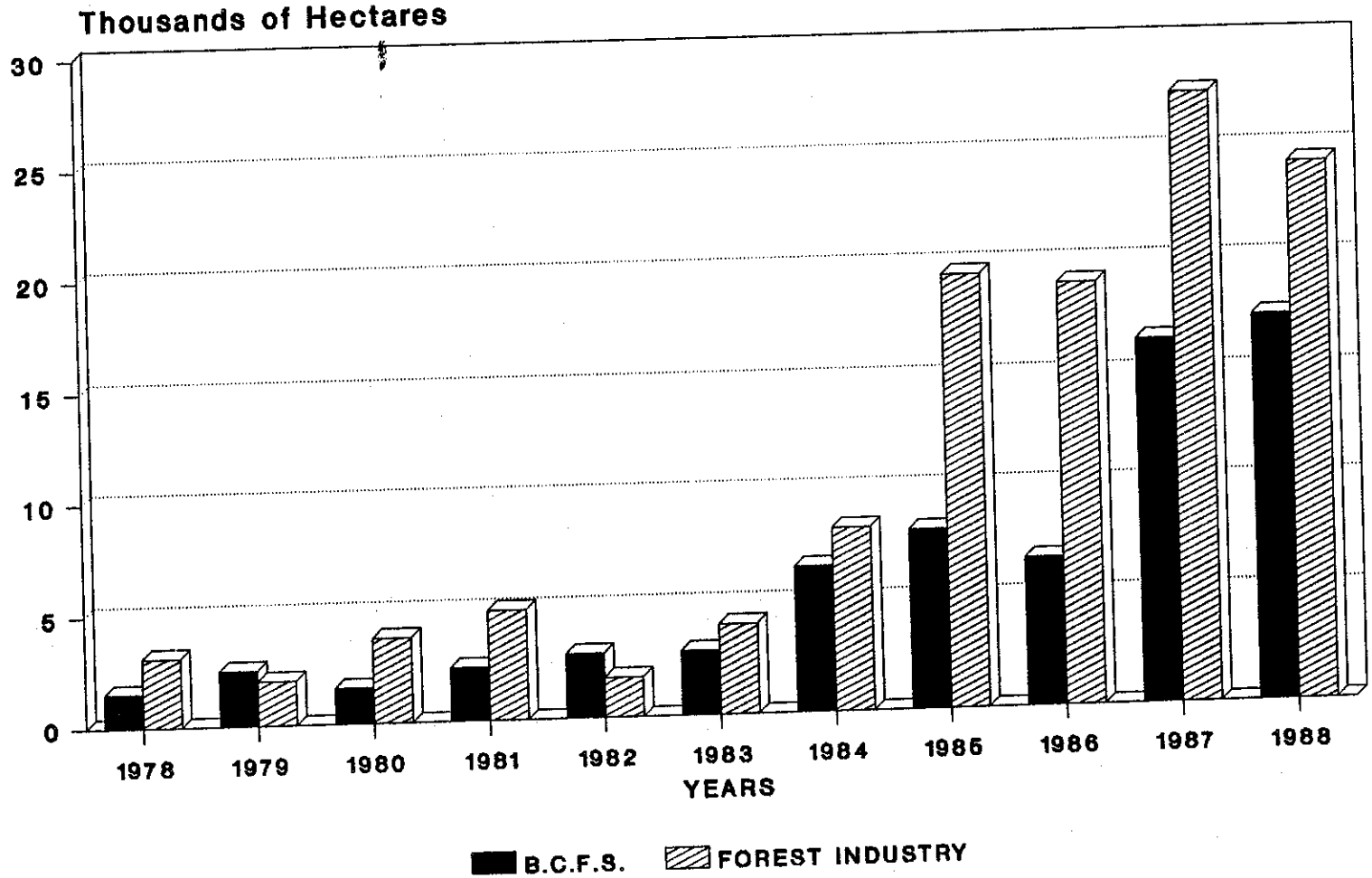
[1] B.C. FOREST SERVICE & INDUSTRY COMBINED

TABLE IX TOTAL AREA (ha) TREATED WITH HERBICIDES AND INSECTICIDES FOR FORESTRY PURPOSES, 1978 - 1988

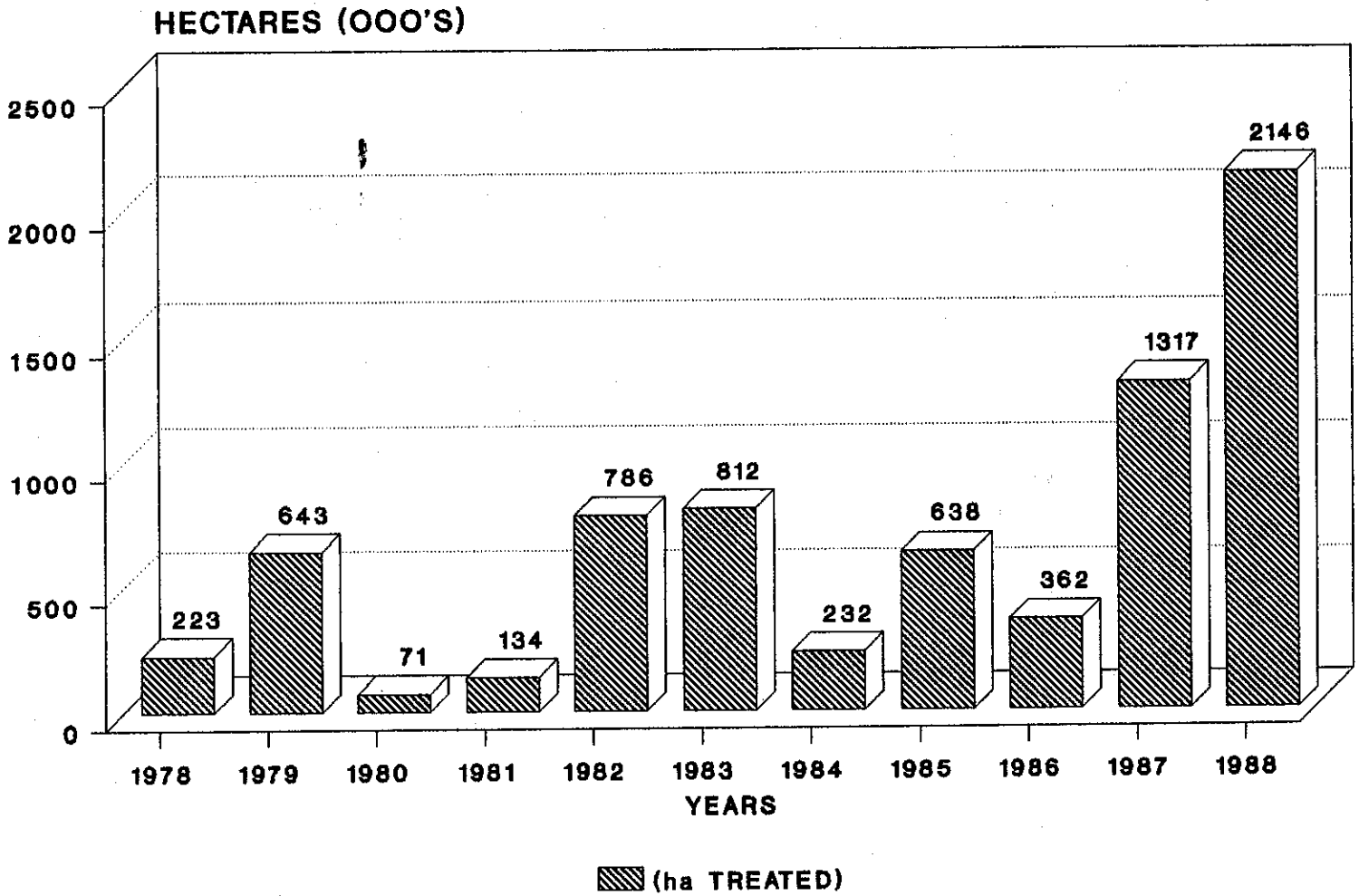
YEAR	B.C. FOREST SERVICE		FOREST INDUSTRY		TOTALS	
	HERB.	INSECT.	HERB.	INSECT.	HERB.	INSECT.
1978	1 347.0	223.0	3 065.0	0.0	4 412.0	223.0
1879	2 256.0	64.0	1 840.0	0.0	4 096.0	64.0
1980	1 614.0	1.0	3 412.0	70.0	5 026.0	71.0
1981	2361	134.0	4 232.0	0.4	6 593.0	134.0
1982	2 630.0	786.0	1 636.0	0.1[1]	4 266.0	786.0
1983	2 586.0	807.0	3 595.0	5.0	6 181.0	812.0
1984	6 184.0	199.0	7 709.0	33.0	13 893.0	232.0
1985	8 018.0	612.0	19 133.0	26.0	27 151.0	638.0
1986	6 434.0	162.0	18 487.0	200.0	24 921.0	362.0
1987	1 5705.0	136.0	26 791.0	282.0	42 496.0	418.0
1988	17378.0	1876.0	24 224.0	270.0	41 602.0	2146.0

[1]Area treated was less than 0.1 ha.

AREA TREATED WITH HERBICIDES
FOR FORESTRY PURPOSES 1978-1988



AREA TREATED WITH INSECTICIDES
FOR FORESTRY PURPOSES 1978-1988 [1]



1 B.C.FOREST SERVICE & IND. COMBINED

DISCUSSIONS AND CONCLUSIONS

Pesticides were applied to 43 813 ha of B.C. forest and rangeland in 1988. Levels of forestry pesticide applications remained similar to those of 1987, when a total area of approximately 43 846 ha was treated. There was an increase in 1988, in the use of hexazinone and 2,4-D - approximately 1 000 ha in each case.

Brushing operations to ensure seedling survival and conifer release were conducted on 30 175 ha in 1987 and 34 029 ha in 1988. Site preparation treatments reported for 1988 (4 033 ha) covered less than half the area reported in 1987 (8 533 ha). All other types of pesticide treatments remained at about the same levels as the previous year, with the exception of insecticides. B.t. was applied to 1 989 ha in 1988, an increase of approximately 877 ha. B.t. was used mainly for the control of the spruce budworm infestations in the Prince George and Kamloops Forest Regions.

Application of pesticides by fixed-wing aircraft increased noticeably in 1988. Approximately 10 625 ha were treated using fixed-wing aircraft in 1988, as compared to 6 546 ha in 1987. Areas treated by helicopter remained approximately the same for both years. Areas treated in 1988 by other pesticide application methods remained similar to those treated by corresponding methods in 1987.

1Figures cited here for 1987 have been revised to include a B.t. application to 898 ha in the Kamloops Forest Region which was reported too late to be included in the original 1987 pesticide use report.