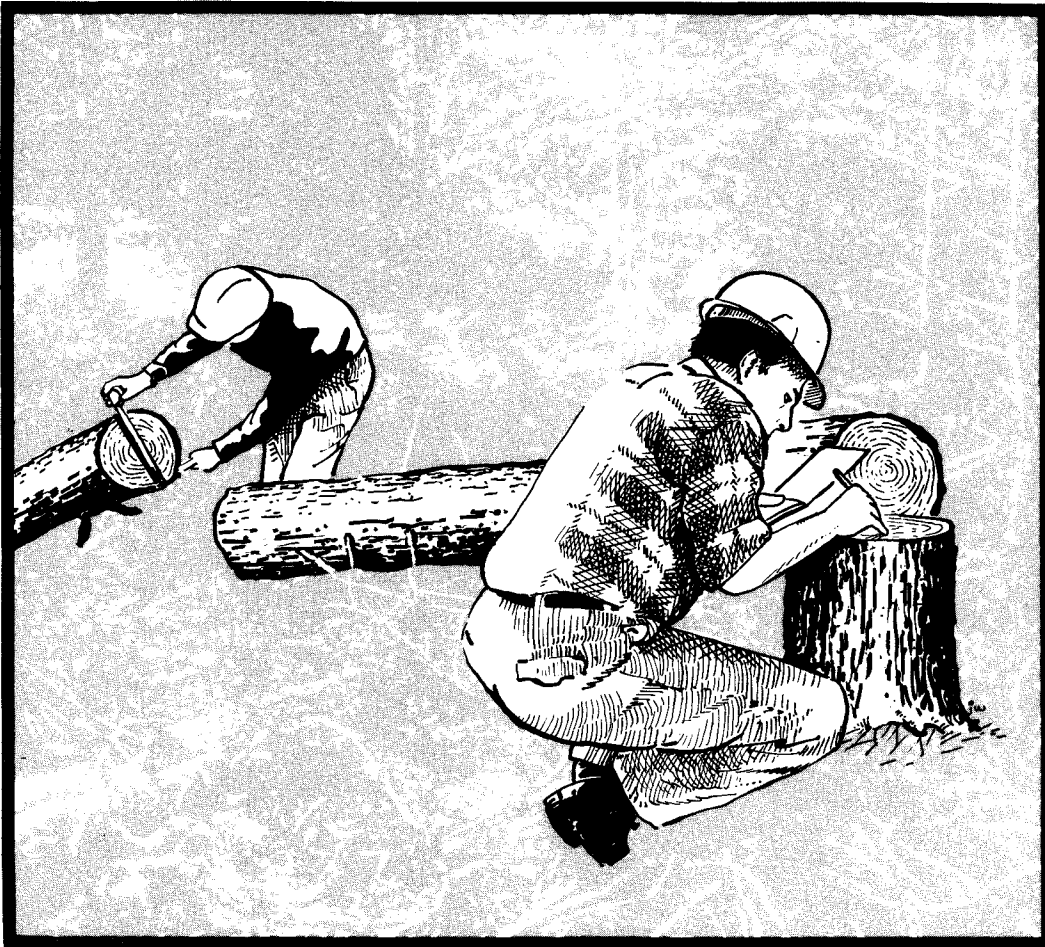




Forest Insect and Disease Conditions

Prince George Forest Region
1982

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SUMMARY

This report outlines forest pest conditions in the Prince George Forest Region for 1982, listed by host and in order of importance. An attempt is made to forecast the trends of potentially damaging pests.

The spruce beetle epidemic continued with 2 million m³ of mature white spruce killed over 57 500 ha, down slightly from 1981.

Mountain pine beetle killed 16,000 white and lodgepole pine, up from 8,000 in 1981, mainly in the Rocky Mountain Trench south of McBride.

Two-year-cycle spruce budworm infestations in alpine-fir-white spruce stands in the Bowron-Willow rivers area collapsed.

A pest of recently burned clearcuts, black army cutworm, severely defoliated newly planted seedlings and herbaceous growth over 130 ha at four locations in the Prince George TSA, for the first time since 1978.

Lodgepole pine, white spruce and alpine fir were severely discolored by winter drying for the second consecutive year at scattered locations throughout the Region.

The number of mature alpine fir recently killed by the bark beetle-disease complex, Dryocoetes-Certocystis, increased to 8 300 ha in the Takla-Williston lakes area.

Spruce weevil killed an average of 11% of the white spruce terminals in the young stands examined in the Region.

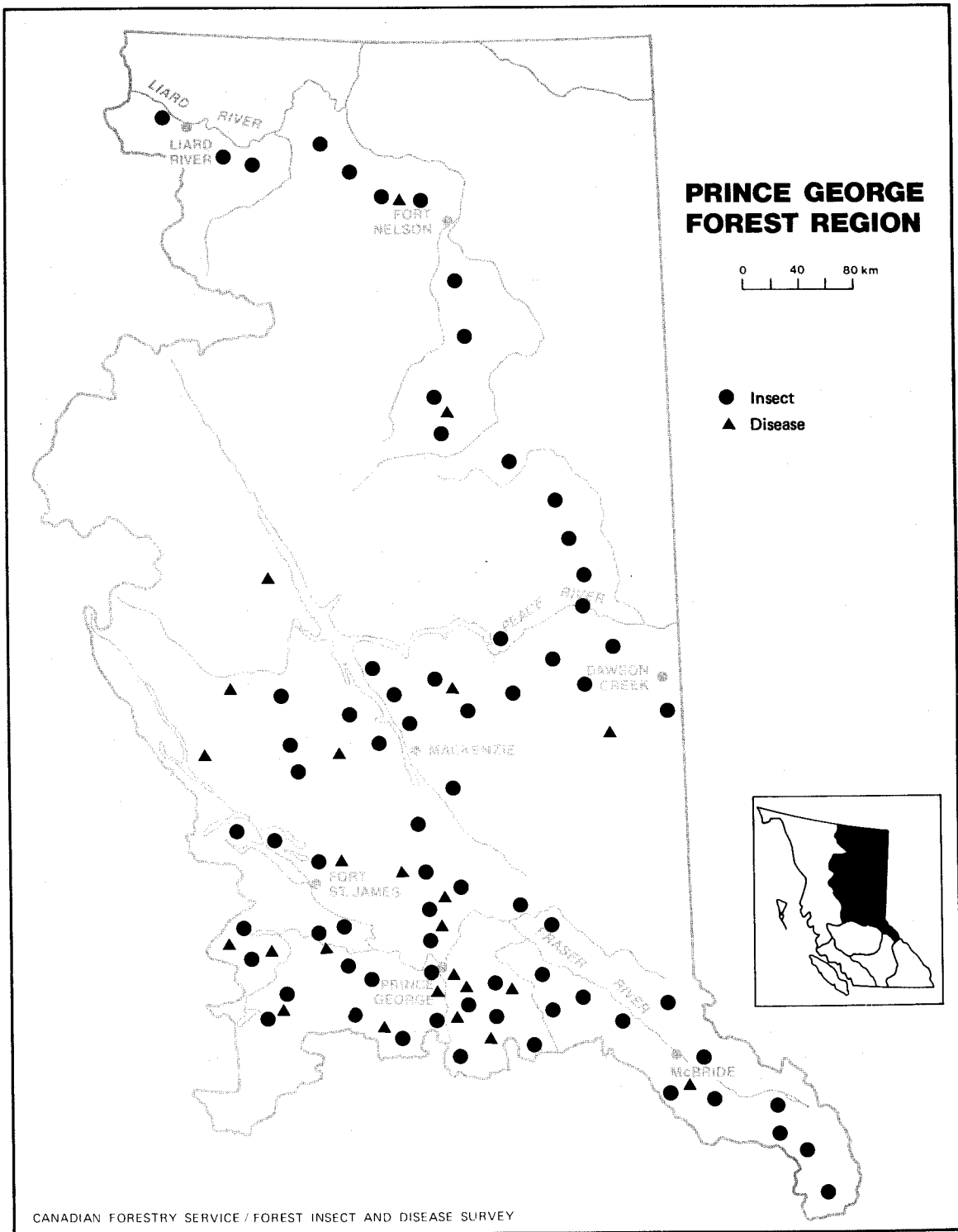
Large aspen tortrix defoliation declined to scattered patches of light defoliation in the Chetwynd-Dawson Creek-Muncho Lake area.

Gypsy moth, pheromone baited traps revealed no population of this deciduous defoliator in the Prince George-McLeod-McBride Lake area.

Seventeen second growth stands were examined for pest problems at widespread locations in the Region.

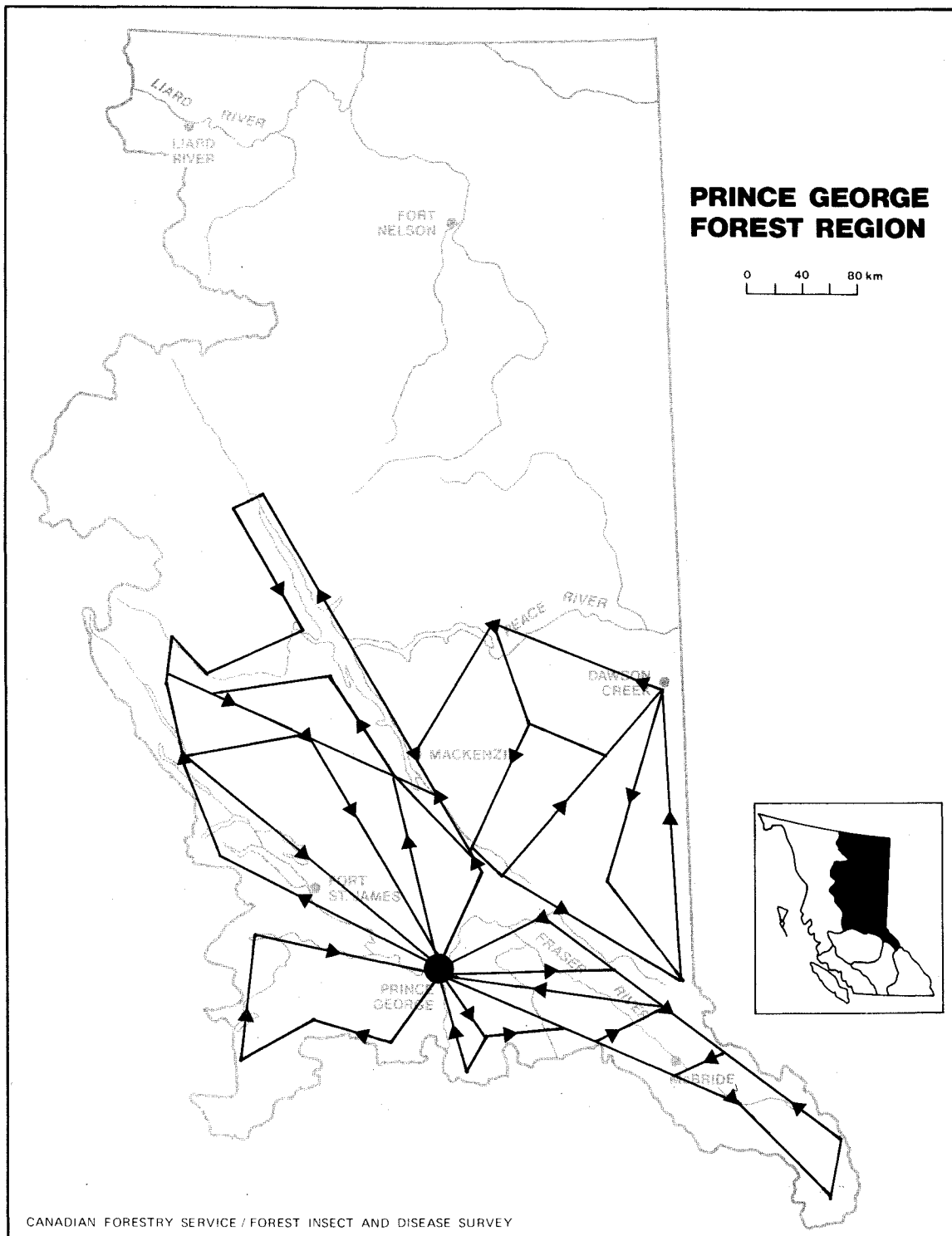
The field survey extended from May 25 to September 25, during which time 300 pest collections were made at numerous locations by FIDS staff (Map 1). The number of three-tree beating samples that contained larvae increased to 65% from 43% in 1981.

Aerial surveys by fixed wing aircraft mapped pest damage during August 3-8 and September 15 and 16; 42.6 hours of flying time was supplied by the B.C. Ministry of Forests (Map 2).



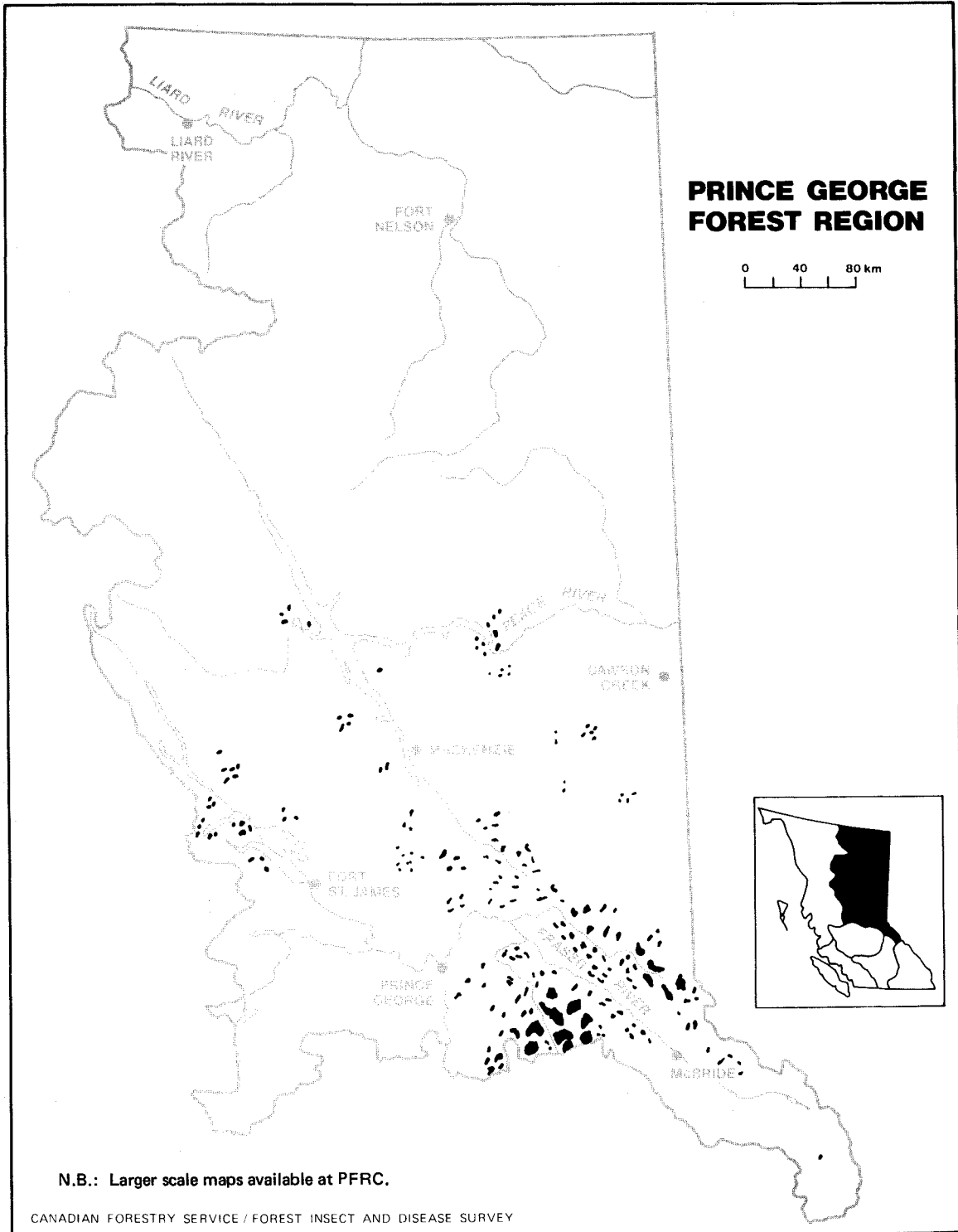
Map 1

Locations where one or more forest insect or disease samples were collected, 1982



Map 2

Area covered by aerial surveys to map bark beetle and defoliator infestations, 1982



Map 3

Areas of recently killed white spruce
as determined by aerial surveys, 1982

SPRUCE PESTS

Spruce beetle, Dendroctonus rufipennis

The spruce beetle outbreak in mature white spruce stands continued in the Prince George Region in 1982 over 57 500 ha, slightly less than the 59 000 ha mapped in 1981 (Map 3). The intensity of tree mortality varied with less than 5% (light) over 30 650 ha; between 6 and 30% (moderate) over 14 300 ha and more than 31% (severe) over 12 550 ha (Table 1). The major portions of the epidemic persisted in the Bowron and Willow river drainages; near Stony Lake, along Stephanie, Indian Point, Haggan and Pinkerton creeks and Slender Lake. Elsewhere, in the McGregor and Torpy river drainages, tree mortality increased but the area of the infestation did not.

TABLE 1. Area and intensity of spruce beetle outbreak, Prince George Forest Region, 1982.

<u>Timber Supply Area</u> Location	Supply Block	<u>1/Intensity and area (ha)</u>			Total (ha)
		Light	Moderate	Severe	
<u>PRINCE GEORGE TSA</u>					
Middle River	B	120	0	0	120
Stuart-Trembleur lakes	C	810	190	490	1 490
McLeod L. - Parsnip R.	E	3 410	310	0	3 720
Bowron - Willow rivers	G	5 900	9 680	10 340	25 920
McGregor R.	H	13 900	3 630	1 720	19 250
Prince George	I	20	0	0	20
Subtotal		24 160	13 810	12 550	50 520
<u>TFL 30</u>					
Fraser R. - Seeback Cr.		1 220	210	0	1 430
Subtotal		1 220	210	0	1 430
<u>McBride TSA</u>					
Goat R.	A	1 900	110	0	2 010
Holmes R.	B	620	0	0	620
Small Cr.	F	90	0	0	90
Canoe Reach	H	10	0	0	10
Morkill R.	I	1 160	20	0	1 180
Subtotal		3 780	130	0	3 910
<u>Mackenzie TSA</u>					
Mackenzie	A	80	0	0	80
Mesilinka R.	I	120	0	0	120
Manson R.	M	110	0	0	110
Nation R.	N	15	0	0	15
Modeste L.	O	30	0	0	30
Subtotal		355	0	0	355

....Continued

TABLE 1. continued

Timber Supply Area Location	Supply Block	1/Intensity and area (ha)			Total (ha)
		Light	Moderate	Severe	
<u>Peace TSA</u>					
Tumbler Ridge	5	60	10	0	70
Portage Mtn.-Hulcross Cr.	7	800	120	0	920
Sukunka	7	250	0	0	250
Subtotal		1 110	130	0	1 240
TOTAL		30 625	14 280	12 550	57 455

1/
Intensity: Light 1 - 5% stems killed
Moderate 6 - 30% stems killed
Severe 31%+ stems killed

Localized infestations of 40-200 ha were recorded for the first time in the Peace TSA at Tumbler Ridge, Gwillim Lake and Sukunka River, south of Chetwynd; north of Chetwynd, infestations were mapped at Portage Mountain near Hudson's Hope, southwest along Hulcross, Alvin, Gething and Johnson creeks and in the Moberly River valley. Infestations in the Peace TSA were smaller than those southwest of Prince George and had obviously resulted from blowdown found next to each localized spot. Except for a 300 ha infestation at Firth Lake, 80% of the infestation in the McLeod-Summit lakes area consisted of small spots, 20 ha or less, of light mortality.

In the Fort St. James Forest District three areas of severe mortality covered nearly 800 ha at Tarnezell Creek. Smaller areas (10-40 ha) of light mortality were scattered over 500 ha along lakes and valleys from Inzana Lake to Trembleur and Stuart lakes. In the McBride TSA, there was an 800 ha increase in light and moderate mortality from 700 ha in 1981, mainly up Cushing and Goat creeks and in the Morkill River Valley but remained unchanged at 800 ha in Milk River and West Twin Creek. Localized 20 - 40 ha pockets of light mortality totalling 150 ha were recorded along Small Creek and south of Ptarmigan Creek along McNaughton Lake, for the first time.

Prism plots on cruise lines were established in 13 mature white spruce stands in Prince George and McBride TSA's to assess the beetle population, intensity of attack and volume of white spruce killed (Table 2). An average of 50% of the white spruce (which averaged 53 cm dbh) were killed. The remaining unattacked spruce averaged 42 cm dbh which illustrates the preference of the beetle for larger diameter trees. In the Stony Lake - Indianpoint Creek area and the Bowron River - Haggan Creek triangle where the trees have been attacked for four consecutive years, 64 - 96% of the white spruce has been killed.

TABLE 2. Results of spruce beetle cruises, Prince George Region, 1982.

Location	Percent of stems per ha ^{1/}					Total No. of	
	Healthy	Current	Red	Grey	Partial	Stems	Plots
<u>McGregor River</u>							
East of Severeid Creek	87	1	5	4	3	124	20
Cargill Creek	74	1	3	21	1	84	20
West of Kitchi Creek	63	10	13	13	1	92	25
			21				
<u>Willow River</u>							
Stony Lake	29	38	11	7	15	187	20
Slender Lake	36	15	19	28	2	142	20
			30				
<u>Lower Bowron River</u>							
Purden Lake Prov. Park	81	1	9	5	4	142	30
Saw Creek	66	11	12	8	3	131	30
			21				
<u>Upper Bowron River</u>							
West of Haggan Creek	20	3	31	45	1	124	20
Eighteen Mile Bridge	4	68	8	19	1	205	20
South of Wendle Creek	25	5	35	31	4	50	20
Wendle Creek	66	16	1	5	12	199	20
Indian Point Creek	29	11	7	52	1	186	20
Pinkerton Creek	88	2	6	3	1	104	20
			88				

- 1/ Current - attacked and killed in 1982
 Red - attacked and killed in 1980, 81
 Grey - attacked and killed prior to 1980
 Partial - successfully attacked in 1982 only on part of the stem.

Current attack averaged 14% (range 1 - 68%) with the most severe occurring in the Stony Lake and the Upper Bowron River areas. In that area near the Eighteen-Mile Bridge, 68% of the spruce were currently attacked and near Stony Lake, 38%. In the remaining 11 areas, current attack averaged 7%.

Brood assessments in the 13 stands showed that beetles are numerous and healthy so the outbreak is expected to continue. An average of 25 larvae were recorded in two - 225 cm² bark samples from each of 250 trees. As 80% of the progeny were larvae, this indicates mainly a two-year life cycle. Woodpecker predation of larvae was minimal, however this and insect predation can occur over the winter and can reduce localized infestations.

The volume loss was calculated from the average volume loss per hectare for each intensity class, light, moderate, severe, from the prism

cruises, multiplied by the estimated number of hectares of mortality by intensity from aerial surveys. The volume losses from trees attacked in 1980/81 (red trees) was over 2 million m³ (Table 3). The total loss from up to four years of spruce beetle attack (grey and red trees) was much larger, 4.7 million m³ (Appendix I). The greatest volume loss was in the Bowron and Willow river drainages in Supply Blocks G and H where 89% of the total 1982 volume (red trees) for the Region occurred.

The volume loss from trees attacked in 1980/81 is equivalent to approximately 29,500 homes based on an average of 70 m³ per home. This represents 14% of the annual allowable cut for the Region.

The incidence of current attack in 1983 will be low since 70% of the 1982 beetle progeny were two-year-cycle. White spruce mortality is expected to increase in 1983 in many areas, especially in the upper Bowron and Willow river valleys. However, in the McGregor and Sukunka river drainages, Portage Mountain, Tumbler Ridge and on the west side of the Rocky Mountain Trench to McBride, smaller increases are forecast.

There was very little recent windfall in 1981/82, however, small numbers of felled trees were common along cut area fringes in the Willow and Naver river drainages. A small, 100 ha, patch of spruce and pine was blown down on the west slope of Mt. Bergeron, north of Tumbler Ridge. The windthrow in this area is not expected to cause a large buildup of populations because of the small tree diameter and small spruce component.

TABLE 3. Volume of white spruce killed by spruce beetle, 1980 and 1981, Prince George Forest Region, 1982.

Timber Supply Area Location	Supply Block	Volume loss (m ³) ^{1/}			Total (m ³)
		Light	Moderage	Severe	
<u>Prince George TSA</u>					
Middle River	B	1,368	0	0	1,368
Stuart-Trembleur lakes	C	9,234	9,158	40,131	58,523
McLeod L. - Parsnip R.	E	38,942	14,942	0	53,884
Bowron-Willow rivers	G	67,260	466,576	846,846	1,380,682
McGregor R.	H	158,460	174,966	140,868	474,294
Prince George	I	228	0	0	228
	Subtotal	275,492	665,642	1,027,245	1,968,979
<u>TFL 30</u>					
Fraser R. - Seebach Cr.		13,908	10,122	0	24,030
	Subtotal	13,908	10,122	0	24,030
<u>McBride TSA</u>					
Goat R.	A	21,660	5,302	0	26,962
Holmes R.	B	7,068	0	0	7,068
Small Cr.	F	1,026	0	0	1,026
Canoe Reach	H	182	0	0	182
Morkill R.	I	13,224	964	0	14,188
	Subtotal	43,160	6,266	0	49,426
<u>Mackenzie TSA</u>					
Mackenzie	A	912	0	0	912
Mesilinka R.	I	1,368	0	0	1,368
Manson R.	M	1,276	0	0	1,276
Nation R.	N	182	0	0	182
Modeste L.	O	364	0	0	364
	Subtotal	4,102	0	0	4,102
<u>Peace TSA</u>					
Tumbler Ridge	5	684	578	0	1,262
Portage Mtn.-Hulcross Cr.	7	9,120	5,784	0	14,904
Sukunka R.	7	2,872	0	0	2,872
	Subtotal	12,676	6,362	0	19,038
	TOTAL	349,338	688,392	1,027,845	2,065,575

^{1/} Based on avg. vol./ha of - Light 11.4 m³/ha
Moderate 48.2 "
Severe 81.9 "

Two-year-cycle spruce budworm, Choristoneura biennis

Light defoliation of the current foliage of alpine-fir and white spruce occurred in patches totalling 200 ha in the Upper Willow River drainage along the boundary with Cariboo Forest Region. There was no defoliation in the Bowron and Holmes river drainages where light current growth defoliation occurred in 1981. Less than 1% of buds were infested at six areas defoliated in 1981. Based on low larval populations this year, defoliation is not expected in the minimal feeding year, 1983.

Sirococcus shoot blight, Sirococcus strobilinus

At least two shoots, terminal and/or laterals, were infected on 65% of the 2 m white spruce in a 100 ha plantation near Goodson Creek, a tributary of the McGregor River. The blight is mainly a nursery problem affecting Sitka and white spruce, lodgepole and ponderosa pine seedlings often causing mortality. It is also common in western hemlock forests, however, damage is usually restricted to curled branch tips and is not considered a serious problem.

Spruce weevil, Pissodes strobi

The wilted curled terminals on white spruce regeneration, characteristic of infestations of spruce weevil, averaged 11% based on examinations of 100 trees at 16 locations throughout the Region in 1982 (Table 4). Chronic areas of repeated weevilling east of Hodda Lake near the Parsnip River for example, has resulted in bushy crowns and lost height growth. There was evidence that about 70% more leaders were attacked in 1982 than in 1981, possibly due to favourable climatic factors.

TABLE 4. The location, size and percent of white spruce attacked by spruce weevil in 1982, Prince George Forest Region.

Location	Average tree height (m)	Percent Current Attack
Red Rock (seed orchard)	2	10
Goat R.	2	5
Hodda Cr.	7	10
Holmes R.	2.5	20
Davie L.	3	20
Parsnip R.	5	30
Hixon Cr.	3	15
Hixon Cr. (seed orchard)	10	5
Upper Naver Cr.	2.5	5
Fisher L.	7	5
Aleza L.	2	7
Sinclair Mills	5	9
Table R.	2	6
Anzac R.	3.5	15
Cluculz L.	3	10
Westlake L.	3	5
AVERAGE	3.9	11

PINE PESTS

Mountain pine beetle, Dendroctonus ponderosae

The number of recently killed lodgepole and western white pine doubled in 1982 to approximately 16,000 trees on 1 600 ha (Table 5). Nearly 7,000 western white pine were killed along McNaughton Lake south of Valemount. More than 9,000 lodgepole pine were contained in two major areas; north of Valemount at Swift Creek, 4,600 trees, and the remainder scattered throughout the Fort St. James - Takla Lake area in pockets up to 100 trees. A large 100 ha infestation continued near Tachie River south of Trembleur Lake and new small infestations were located at Carrier Lake (50 trees) and Blackwater River (35 dead trees).

TABLE 5. The area, number and volume of pine killed by mountain pine beetle, Prince George Forest Region, 1982.

<u>Timber Supply Area</u> Location	Supply Block	Tree sp.	Area(ha)	Number of Trees	Volume 1/ (m ³)
<u>Prince George TSA</u>					
Takla L.	B	1P	60	160	50
Fort St. James	C	1P	600	3,100	1,090
McLeod L.	E	1P	4	10	5
Blackwater R.	F	1P	80	40	10
Subtotal			744	3,310	1,155
<u>McBride TSA</u>					
McNaughton L.	H	1P	430	5,690	1,990
McNaughton L.	H	wwP	410	6,860	5,110
Subtotal			840	12,550	7,100
<u>Mackenzie TSA</u>					
Williston L.	A	1P	10	100	30
Germansen R.	K	1P	1	10	5
Subtotal			11	110	35
<u>Peace TSA</u>					
Chetwynd	4	1P	5	30	10
Subtotal			5	30	10
TOTAL			1 600	16,000	8,300

1/ Volume calculation based on an avg. single tree volume of: 1P - .35 m³
wwP - .75 m³

The infestations are expected to continue and possibly expand in 1983 in areas where mature susceptible lodgepole and western white pine exists.

Lodgepole pine dwarf mistletoe, Arceuthobium americanum

Mistletoe infected lodgepole pine were common throughout the Region causing branch mortality and growth loss. Areas of severe infection include: from Valemount to Tete Jaune Cache where 100% of the 25 m lodgepole pine over approximately 200 ha are infected with severe brooming and branch mortality caused by squirrel feeding on infested swellings west of Prince George along the Nechako River across from the confluence with the Chilako River, there was a 300 ha patch of severely infested 20 m lodgepole pine; north along Highway 39 from the Parsnip River crossing approximately 100 ha of 20 m height lodgepole pine was 100% infected, resulting in smaller brooms and 5% branch mortality.

Pine twig beetle, Pityophthorus sp.

An estimated 5% of the branch tips were killed over 20 ha of 3 m natural regeneration lodgepole pine at Stony Lake. These insects cause only branch and twig mortality and are not economically important.

Lodgepole pine needle cast, Lophodermella concolor

In contrast to 1981 when infection of 1980 foliage was widespread in the Region, only one localized 20 ha area near Hixon Creek was lightly discolored by this disease. Approximately 20% of regeneration lodgepole pine to 3 m height had 30% of the 1981 foliage infected. Infected needles are usually cast prematurely and there is no permanent damage to the trees.

ALPINE FIR PESTS

Western balsam bark beetle - disease complex, Dryocoetes - Ceratocystis

A major increase in number and area of recently killed alpine fir to 24,000 trees over 8 300 ha from 315 ha in 1981 occurred in the Stuart-Takla-Germansen lakes area (Table 6). Although most of the recently killed trees were an abnormally bright red compared with the characteristic brick red of the trees mapped in 1981, it doesn't necessarily indicate any trend in the infestation.

TABLE 6. Area and number of alpine-fir recently killed by western balsam bark beetle-disease complex, Prince George Forest Region, 1982.

Location	Area (ha)	No. of trees
Narrow L.	190	100
George Cr.	800	100
Hixon Cr.	600	200
Tatelkuz L.	1 600	6,000
Natazutlo L.	40	100
Carbon Cr.	800	1,000
Weston Cr.	700	1,550
Redslide Peak	900	5,000
Humphrey Cr.	800	3,650
Silver Cr.	500	1,500
Groundhog Cr.	200	1,000
Twenty Mile Cr.	100	100
Tliti Cr.	200	500
Takla L.	100	600
Leo Cr.	400	2,000
Middle R.	50	100
Corless Bay	320	500
TOTAL	8 300	24,000

As a result of increased emphasis on the management and utilization of high elevation alpine fir stands, ground examinations will be done in 1983.

Western blackheaded budworm, Acleris gloverana

There was no defoliation in the Upper Parsnip River area but there was an increase in the average number of larvae per positive beating sample to 6 and a maximum of 15. In past infestations this was the number of larvae in beating collections preceeding years of light defoliation, which means there could be visible defoliation in 1983. The last infestation severely defoliated alpine fir and white spruce in the McLeod Lake area in 1973-74.

A shoot blight, Delphinella sp.

This fungus discolored up to 65% of the current growth of up to 60% of alpine fir in lower elevation stands throughout the Region. The damage, which resembled two-year-cycle spruce budworm feeding from a distance, occurred in the upper Willow River valley where 50% of current

growth on 30% of the trees was affected. Also, in the Pine Pass area and near Tudyah Lake, 65% of the current growth on 60% of the trees was infected, while at Pass Lake 20% of the current growth was infected on 30% of the trees. The disease varies annually, favored by moist spring weather conditions and may reoccur annually depending on weather conditions.

PESTS OF NATURAL AND SECOND GROWTH STANDS AND PLANTATIONS

Several forest pests caused significant damage in 16 of 17 immature stands examined throughout the Region.

Of the 6 white spruce stands examined, 60% were damaged by spruce weevil, Pissodes strobi, which infested an average of 5% of the trees. Twenty-five percent of the spruce stems in 20% of the stands were infected by a shoot blight, Sirococcus strobilinus which curled the branch tips. Approximately 50% of the trees in 20% of the stands examined were lightly infected by the aphid Pineus sp.

Of the 11 lodgepole pine stands examined, the major pest was western gall rust, Endocronartium harknessii, which infected 30% of the trees in 60% of the stands.

Other minor pests included: Warrens collar weevil, Hylobius warreni, which killed 2% of the trees at Pennefather Creek; Atropellis canker of pine, lodgepole pine dwarf mistletoe Arceuthobium americanum and snow, which caused branch breakage, affected 10-30% of the trees at Ness Lake, Parsnip River and Pennefather Creek respectively.

DOUGLAS-FIR PESTS

A bud blight, Dichomera gemmicola

The disease severely infected 15 m Douglas-fir trees in the Red Pass area east of Tete Jaune Cache where up to 80% of buds were killed on 100% of the trees over 10 ha. At Cluculz Lake 20% of the buds were killed on a single affected tree. This disease, which can cause growth loss and a bushiness of growth, is not widespread since the distribution of Douglas-fir is restricted to patches in the southern part of the Region.

WESTERN HEMLOCK PESTS

Western hemlock looper, Lambdina f. lugubrosa

Defoliation was not recorded in 1982, but three-tree beating samples from western hemlock and white spruce stands contained more larvae than in 1981. The average number of larvae per positive beating increased to 3.4 larvae from 0 in 1981 on western hemlock and to 2.7 larvae from 0 on white spruce. The last infestation in 1954-55 severely defoliated western hemlock stands in several creek drainages near McBride. Since then, population levels have remained low and no defoliation has been observed.

MULTIPLE HOST PESTS

Black army cutworm, Actebia fennica

Black army cutworm, a pest of recently burned logged areas, severely defoliated newly planted seedlings and herbacious growth in at least five areas. The infestations, from 20 to 60 ha, occurred at McLeod Lake and Stephanie Creek, north and south of Prince George, Kalder Lake and Dog Creek near Fort St. James and south of McBride (Table 7).

Larval feeding began shortly after snow-melt and continued until the third week of June and defoliated an average of 80% of the seedlings and herbacious ground cover.

The number of pupae counted in 900 cm² duff samples every 25 m on transects through the infestations ranged from 15 to 40 which indicated potentially damaging population at all areas (Table 7).

Bird and rodent predation, parasites, and climate could affect population, also availability of herbacious ground cover in early spring could reduce the effect on newly planted conifer seedlings. Pre-planting surveys of planting sites will minimize the damage to seedlings in 1983.

Five pheromone baited sticky traps in an uninfested recently (1981) burned area adjacent to the infested cut blocks at McLeod Lake attracted and caught an average of 20 moths per trap. This indicates a possible population there in 1983, if the weather conditions are favourable in the spring.

Larval and pupal collections for parasites and diseases showed light, less than 20% parasitism, and no diseases.

TABLE 7. Area, percent defoliation and population level of black army cutworm, Prince George Forest Region, 1982.

Location	Area (ha)	Percent Defoliation	Average Number of pupae/900 cm ² duff
Stephanie Cr. CP 106A	25	70	40
Dog Cr. CP 30	20	90	15
Kalder Lake	25	80	15
McLeod Lake	60	90	40

Porcupine damage

Lodgepole pine, alpine fir and white spruce were girdled and killed by porcupines feeding at scattered locations throughout the Region. At Goodson Creek, a tributary of the McGregor River, 60% of the mature alpine fir and white spruce were killed over four hectares. Immature 2-5 m lodgepole pine were killed in 10-20 ha patches at: Wolverine River, 40% of trees, Ole Creek near Williston Lake, 20%; and, at Ingenika, 15% of trees. Mature lodgepole pine were also killed in three 10 - 20 ha spots totalling 145 trees at Nation River and near Wolverine River where 40 trees were killed in one area.

Winter drying

Lodgepole pine, white spruce and alpine fir were severely discolored as a result of winter drying at scattered locations throughout the Region. A dramatic change of temperature occurred on January 14, 1982 following two days of abnormally warm weather (3.5° and 4.7° C) when an arctic front passed and the temperature dropped 14.3° C in 45 minutes. This drastic cooling to freezing from warm temperatures could have caused the winter drying.

An estimated 2 500 ha of lodgepole pine were severely discolored in a 200 m wide elevation band at Fawnie Dome southwest of Vanderhoof and near Gwillim Lake south of Chetwynd. "Parch blight" type of winter drying where only the windward side is discolored, occurred over 50 ha at Hixon Creek and 100 ha east of Williston Lake; from Pine Pass to Chetwynd; north of Fort St. John to Pink Mountain and from Summit Lake to Fireside along the Alaska Highway. Although permanent damage is not expected, secondary bark beetles such as Ips. spp. may attack weakened trees.

CONE AND SEED PESTS

An average of 59% of the white spruce and 23% of the alpine fir seed collected at 17 locations in the Region was destroyed by cone and seed insects (Table 8). Forty-seven percent of the white spruce seed was destroyed by spruce cone borer, Hylemya sp. Seed midges and a fir cone maggot Earcmyia sp. together damaged 23% of the alpine fir seed.

TABLE 8. Percent seed destroyed by cone and seed insects, Prince George Forest Region, 1982.

Location	Tree sp.	Hylemya sp., Spiral spruce cone borer						Total
		Cydia sp., Spruce seedworm						
		Megastigmus sp., seed wasp						
		Earomyia sp., fir cone maggot						
		Seed midges						
Fisher L.	wS	27	23	1	0	1	52	
Sinclair Mills	"	42	1	0	0	0	43	
Pennefather Cr.	"	35	0	0	0	0	35	
Torpy R.	"	68	1.5	0	0	0	69	
Anzac R.	"	38	13	0	0	0	51	
Wendle Cr.	"	54	16	0	0	0	70	
Summit L.	"	38	24	0	0	0	62	
Bowron R.	"	62	12	0	0	0	74	
Hodda L.	"	47	6	9	0	0	62	
Lodi L.	"	80	0.5	0	0	0	80	
Naver Cr.	"	13	23	0	0	0	36	
Aleza L.	"	35	2	0	0	0	37	
Carp. L.	"	72	21	0	0	0	93	
McLeod L.	a1F	0	0	0	38	6	44	
Lodi L.	"	0	0.5	0	0	20	3	
Hodda L.	"	0	0	0	0	3	3	
Fisher L.	"	0	0	0	37	5	42	
Average wS							59%	
a1F							23%	

DECIDUOUS PESTS

Large aspen tortrix, Choristoneura conflictana

Light defoliation of trembling aspen occurred for the fourth consecutive year in the northeastern part of the region, greatly reduced in area and intensity from 1981. Small 20 ha patches and single trees were lightly defoliated from Chetwynd to Moberly Lake, and east along the Hart Highway to Dawson Creek and from Fort St. John to Fort Nelson. Between Fort Nelson and Muncho Lake, populations were very low but light defoliation of single branches was prevalent. The decline was attributed to a high incidence (75%) of larval disease and parasitism in 1981.

Gypsy moth, Lymantria dispar

Sticky traps baited with Gypsy moth pheromone were set out at 15 locations in provincial parks and Department of Highways rest areas in the Prince George, McLeod Lake, Dawson Creek and McBride areas. All traps showed negative results.

APPENDIX I. Total volume loss of white spruce killed by spruce beetle,
1978-81, Prince George Forest Region, 1982. (grey & red)

Timber Supply Area Location	Supply Block	Volume loss (m ³)			Total (m ³)
		Light	Moderate	Severe	
<u>Prince George TSA</u>					
Middle River	B	3,756	0	0	3,756
Stuart-Trembleur Lakes	C	25,353	14,706	102,165	142,224
McLeod L.-Parsnip R.	E	106,920	23,994	0	130,914
Bowron-Willow rivers	G	184,670	749,232	2,155,890	3,089,792
McGregor R.	H	435,070	280,962	358,620	1,074,652
Prince George	I	626	0	0	626
Subtotal		756,395	1,068,894	2,616,675	4,441,964
<u>TFL 30</u>					
Fraser R. - Seebach Cr.		38,186	16,254	0	54,440
Subtotal		38,186	16,254	0	54,440
<u>McBride TSA</u>					
Goat R.	A	59,470	8,514	0	67,984
Goat R.	B	19,406	0	0	19,406
Holmes R.	F	2,817	0	0	2,817
Small Cr.	H	500	0	0	500
Canoe Reach	I	36,308	1,548	0	37,856
Morkill R.					
Subtotal		118,501	10,062	0	128,563
<u>Mackenzie TSA</u>					
Mackenzie	A	2,504	0	0	2,504
Mesilinka R.	I	3,756	0	0	3,756
Manson R.	M	3,505	0	0	3,505
Nation R.	N	500	0	0	500
Modeste L.	O	1,001	0	0	1,001
Subtotal		11,266	0	0	11,266
<u>Peace TSA</u>					
Tumbler Ridge	5	1,878	928	0	2,806
Portage Mtn.-Hulcross Cr.	7	25,040	9,288	0	34,328
Sukunka R.	7	7,887	0	0	7,887
Subtotal		34,805	10,216	0	45,021
TOTAL		959,153	1,105,426	2,616,675	4,681,254

1/ Based on data obtained from prism cruises in September, 1982.
Avg. vol/ha light: 31.3 m³/ha
moderate: 77.4 "
severe: 208.5 "

Canada

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1983