

Forest Insect and Disease Survey

PEST REPORT

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Status of Spruce Beetle

Nelson Forest District

1970

by

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In 1967, infestations of spruce beetle were detected in mature Engelmann spruce stands in the southeast sector of Nelson Forest District. The epidemic expanded rapidly and by fall of 1969, the beetle had killed a considerable volume of timber in the East Kootenay region. The 1968 infestations were mainly concentrated in the Flathead, Wigwam, Bull, Wildhorse and Elk drainages over some 16,000 acres; the toll was 40-million cubic feet of beetle-killed Engelmann spruce. Although the epidemic declined in 1969, new damage was observed in the drainages of Kootenay Lake and Lardeau, Kidd and Kettle rivers.

Following meetings of the East Kootenay Pest Control Committee, personnel of the B. C. Forest Service and Forest Industry combined forces during the spring and summer of 1970 to survey spruce-beetle-damaged stands in Fernie, Elko, Cranbrook, Canal Flat, Invermere and Creston Ranger Districts. Their objectives were to determine salvage potential, establish logging priorities and assess the potential expansion of active beetle infestations. Their cruises showed the spruce beetle population at a low density in most of the stands attacked during early stages of the epidemic. Where beetles persisted, logging and burning has been carried out to suppress the pest locally.

In August 1970, field officers of the Canadian Forestry Service surveyed many of the mature spruce stands in Nelson Forest District from aircraft in order to detect new or previously unrecorded infestations. In general, there was little change in the extent of previously recorded infestations east of the Purcell Range; however, scattered groups of 1969-attacked trees were noted in the Elk, Columbia and Kootenay drainages.

Six newly detected areas of 1969 beetle infestations and some previously unrecorded 1968 infestations were mapped. At Bruer Creek, in the Upper Kettle drainage, five groups of 1969-attacked trees were within an estimated 250 acres, and scattered attacked trees were on a larger area. At Placer Creek, 20% of the merchantable spruce on 300 acres had been attacked in 1969. Heavy 1969 attacks occurred at Pork Creek and Howser Ridge in the Lardeau District, all west of the Purcell Mountains. In the eastern portion of Nelson Forest District, moderate to heavy 1969 attacks were noted at Kilmarnock and Line creeks in the Fording River drainage (maps attached).

Previously unmapped 1968-attacked trees were observed along Maryland Creek and two other tributaries of Summit Creek in Creston Ranger District - Mohr Creek and Fording River. Trees attacked in 1970 had not discolored and could not be detected from the air.

Cruise strips, with prism plots every two chains, were run by Canadian Forestry Service officers on seven selected areas to determine the percentage of merchantable trees attacked in 1970, 1969 and earlier, and to assess the potential for further attack within the stand. The heaviest 1970 attacks occurred at Placer Creek, where up to 36% of the spruce had been attacked. Other areas of moderate to heavy 1970 attack were: Pork Creek 33%, Bruer Creek 20%, and Howser Ridge 17% in the western portion of the District, and Line Creek 18% in the east. Table 1 shows the percentage of trees attacked in prism plots on the cruise strips.

Population assessment was done by counting the number of spruce beetle larvae and adults in one square foot of bark, below breast height, on a number of trees on each cruise strip. Where 1969 and 1970 attacks had occurred, larvae and adults were fairly numerous in the trees examined. In some areas, beetle development had accelerated due to the warm, dry summer, and at Pork Creek and Howser Ridge many of the 1970 brood had reached the adult stage (Table 2). Therefore, those in the adult stage in the fall of 1970 would be ready to fly and attack in the spring of 1971.

Discussion

A spruce beetle epidemic struck the mature Engelmann spruce stands in the Flathead region of Nelson Forest District in 1967 and 1968, causing considerable tree mortality (Andrews et al, 1969) (Collis et al, 1970). By 1970, the beetle population in the Flathead had subsided, although a fair population persisted in the Fording drainage, and possibly also in a few other undetected pockets east of the Purcell Mountains. There was a lag of a year or two in significant attacks on spruce stands west of the Purcell Range where a fairly numerous population is now overwintering in standing trees at Bruer and Placer creeks, and at Pork Creek and Howser Ridge. Apparently the unusually warm summer accelerated beetle development, for a moderately high percentage of the progeny from the 1970 attack was in the adult stage in October. These adults should be ready to fly in 1971, as well as adults from trees attacked in 1969.

Windfalls were scarce in all areas examined, so the major source of beetles will be the 1969-70 attacked trees. If no significant windfall occurs before next summer, the 1971 attacks will be on standing mature and overmature spruce trees presumably close to those currently infested. Trees partially attacked in 1969 and 1970 will be particularly susceptible to re-attack.

There were no obvious signs of stress in the spruce even though temperatures during June, July and August were two to six degrees above normal and precipitation from 25 to 50% below the 10 year average. However, it could have been sufficiently droughty in some stands to predispose trees to beetle attack in 1971.

In conclusion, a small number of infestations, particularly those west of the Purcell Range will continue and further tree mortality will follow. All mature stands of Engelmann spruce in the Nelson Forest District should be examined for spruce beetle in 1971.

References

- Andrews, R. J. and A. C. Molnar. 1969. Status of spruce beetle, Nelson Forest District. Information Report BC-X-31, Department of Fisheries and Forestry, Victoria, B. C.
- Collis, D. and J. W. E. Harris. 1970. Status of the spruce beetle in British Columbia, 1969. Information Report BC-X-40, Department of Fisheries and Forestry, Victoria, B. C.

Table 1

Spruce Trees on Prism Plots in Spruce Beetle Infestations,
 Nelson Forest District, September 1970
 (Per cent of number of trees)

Location	Healthy	Year attacked			
		1970	1970 partial ^{1/}	1969	Pre 1969
Kilmarnock Cr.	54	-	5	31	10
Line Cr.	26	-	18	52	4
Bighorn Cr.	49	0	0	0	51
Placer Cr.					
1	44	36	1	10	9
2	86	3	1	4	6
Bruer Cr.					
1	67	8	12	6	7
2	80	8	2	4	6
Pork Cr.	19	33	0	34	14
Howser Ridge	52	13	4	22	9

^{1/} Presumably these trees will die through ensuing attacks by spruce beetles or other bark beetles.

Table 2

Average Number of Spruce Beetles per Square Foot in Base of Sample Trees,
Nelson Forest District, September, 1970

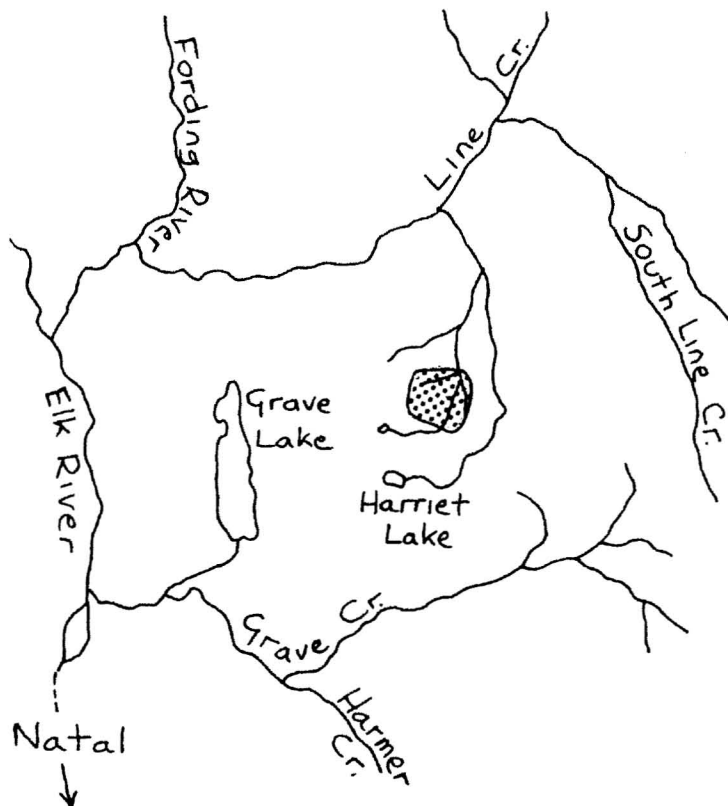
Area	1970 attack		1969 attack	
	Larvae	Adults	Larvae	Adults
Kilmarnock Cr.	-	-	1	50
Line Cr.	5	40	0	40
Bighorn Cr. ^{1/}	0	0	0	0
Placer Cr.	100+	20+	50	5 ^{2/}
Bruer Cr.	50+	10	5	30
Pork Cr.	50+	50+	0	30+
Howser Ridge	50+	50+	0	30+

^{1/} Infestation subsided in this area; no 1969 or 1970 attacks observed on strip.

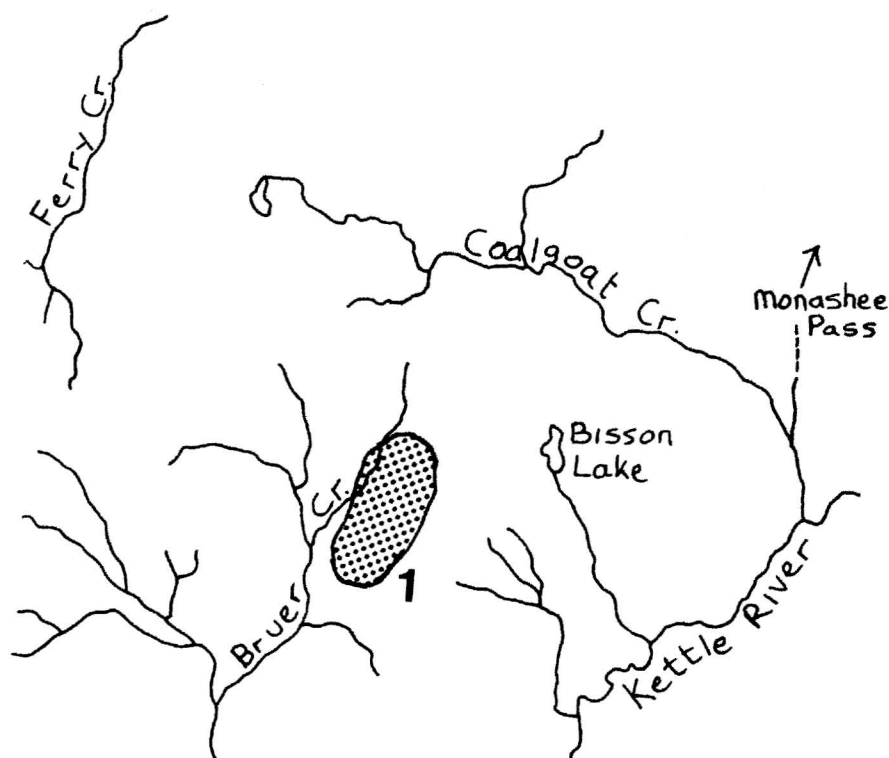
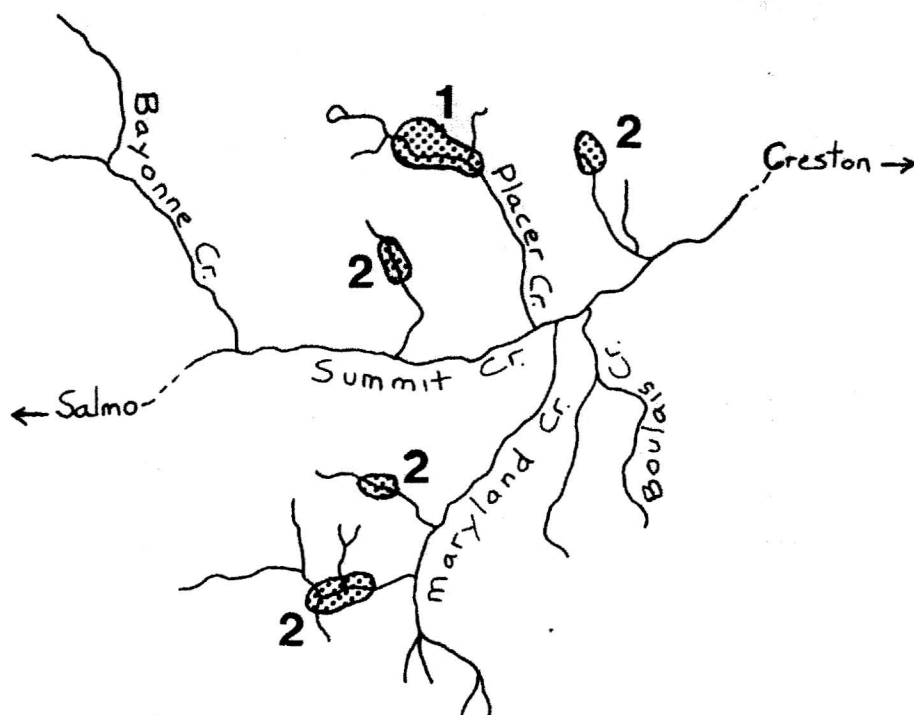
^{2/} Trees strip attacked in 1969 and re-attacked in 1970.

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Areas of 1969-70 Spruce Beetle Attack Fording River Drainage



Areas of Spruce Beetle Attack
Creston Skyline & Kettle River Drainage
(1) 1969-70 (2) 1968 or earlier



Areas of 1969-70 Spruce Beetle Attack Lardeau Area

