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WESTERN WHITE PINE ON VANCOUVER ISLAND

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AND RURAL DEVELOPMENT

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INTRODUCTION

Red-topped western white pine, Pinus monticola Dougl., were observed with unprecedented occurrence on Vancouver Island from 1957 to 1961. This mortality was caused predominately by mountain pine beetle, Dendroctonus ponderosae Hopk., involving size and age classes of pine not significantly affected by white pine blister rust, Cronartium ribicola J. C. Fisch. In June 1962, five hours of aerial survey over southern Vancouver Island confirmed that the problem was widespread and that a significant volume of timber was involved. Additional areas of mortality were subsequently recorded as far north as Nimpkish Lake.

This report summarizes the results of surveys made in 1962, 1963, and 1964 of the principal white pine mortality areas on Vancouver Island. Cruise strips were run in these stands and data obtained on tree mortality.

METHODS

In the fall of 1962 a survey was initiated to determine infestation trends and volume loss. For convenience, the infestation was summarized by geographical units in which conditions were reasonably similar. These regions were as follows (see map):

^{1/} Forest Research Technicians, Forest Insect and Disease Survey, Victoria.

1. Sooke - The Esquimalt and Nanaimo Railway Land Grant north to the Port Renfrew Road and East to Sooke Lake.
2. San Juan - the area west of the E. and N. Railway Land Grant and north to the San Juan Valley.
3. Carmanah - the coastal regions extending northwest from Port San Juan to Clo-oose.
4. Fleet River - the Fleet River drainage including the area from Maid Lake east to the upper San Juan River.
5. Koksilah - the area north and east of the Koksilah River including the Koksilah Ridge.
6. Englishman River - The area north from the Nanaimo Lakes to Englishman River Falls Park, west along Englishman River including the Moriarity Creek drainage, and south to Labour Day Lake.
7. Nimpkish - the Nimpkish River drainage and the Oktwanch River drainage as far south as Muchalat Lake.
8. Buttle Lake - the drainages emptying into Buttle Lake from approximately the E. and N. Railway Land Grant boundary south to Myra and Henshaw creeks.
9. Mt. Washington - the Oyster River drainage, the Forbidden Plateau, Mt. Washington, and small areas near Comox Lake.
10. Muchalat - the drainages lying to the south of Muchalat Inlet and from Marchlee Bay west to the Mooyah River.

A total of approximately 16 hours of fixed-wing aircraft and 5 hours of helicopter time was used from 1962 to 1964 to delineate the infested areas. Twenty-seven one-chain-wide strips, totalling 380 acres,

were run in the infested areas during the three years. At two locations tree counts were made and volumes calculated over an undetermined area. White pine 6 inch d.b.h. and over were tallied as "grey dead", "red-topped dead", "green attacked" or "green not attacked". The "grey dead" category was applied to dead trees which still retained small twigs and bark. In most cases, cruise figures from each infested region for the three years were combined and the resulting averages applied to the total area of each region. Figures for stem and volume loss in this report were not corrected for cull factor, natural mortality or mortality caused by other agents or current logging.

RESULTS AND DISCUSSION

Data from 27 cruise strips run in 10 infested regions on Vancouver Island from 1962 to 1964 are summarized in Table 1. Estimates of tree volume loss over the infested areas are shown in Table 2.

Eighty-one per cent of the total western white pine volume in the appraised areas was found to have been recently killed. The loss varied from 96 to 896 cu. ft. per acre. From 4.0 to 61.2 per cent of the original pine stems remained in infested stands. South of the Parksville-Alberni highway, losses were fairly consistent in the regions; 84.9 per cent of the stems and 87.9 per cent of the volume had been lost. North of this line there was greater variation in attack intensity. The number of stems dead of Buttle Lake, Mt. Washington, Nimpkish, and Muchalat were 38.8, 48.7, 79.6, and 95 per cent of the pine, respectively, and average mortality was 57.1 per cent. In all but one region, stem

losses ranged from 1.5 to 6.6 trees per acre. The one exception was the San Juan region where 15.2 stems per acre were dead.

It will be seen from these mortality figures that the relative significance of the infestation must decline in the next few years. In most areas the majority of the white pine had already died and only light mortality could continue. The results indicate that light annual mortality will probably continue in the Rithet Creek drainage of the Sooke region, and at Koksilah. No "green attacked" or "red-topped dead" trees were found at Fleet River, indicating that the attack may be declining.

Mortality at Englishman River was nearly 100 per cent. The infestation at Mt. Washington was still active in 1964 but was slowed by a low beetle flight in that year due to a late spring and an unusually cool summer. The percentage mortality was the lowest at Buttle Lake and, as indicated by the low number of "green attacked", mortality in the next few years should be light. In the Nimpkish Valley, 16 per cent by volume of the pine tallied were "green attacked" and mortality is expected to continue.

The low numerical occurrence of white pine in the affected stands has made salvage logging impractical except where cedar pole or advance logging were already being carried out. Sound pine should continue to be salvaged where possible or most of the remaining volume of this species may be lost from the expected yield.

SUMMARY

The majority of White pine on Vancouver Island have been killed by the mountain pine beetle. An estimated loss of some 144,000,000 cubic feet was sustained over an area of approximately 338,244 acres. Losses are expected to continue until most merchantable white pine are killed.

Table 1

Condition of Western White Pine Trees on Cruise Strips, Vancouver Island, 1962-1964

Region	Strip location	Acres sampled	No. trees			Green attack	Total dead	Green not attacked	Per cent stems dead
				Grey	Red				
Sooke	Rithet Creek	24.0	110	47	3	1	51	59	46.3
	Leech River Trail	17.0	117	83	13	1	97	20	82.9
	Muir Mtn.	9.4	164	137	12	1	150	14	91.4
	Jordan Meadows	10.0	93	70	4	1	75	18	80.6
	Totals	60.4	484	337	32	4	373	111	77.1
San Juan	Jordan River	8.0	388	346	1	1	348	40	89.7
	Port Renfrew	11.0	161	109	14	2	125	36	77.6
	Mosquito Creek	23.0	184	163	2	0	165	19	89.7
	Totals	42.0	733	618	17	3	638	95	87.0
Carmanah	Camper Creek	14.4	123	115	0	0	115	8	93.5
	S. of Clo-oose	8.8	62	38	1	0	39	23	62.9
	Totals	23.2	185	153	1	0	154	31	83.2
Fleet R.	Fleet River	5.5	19	13	0	0	13	6	68
	Maid Lake	11.5	45	33	0	0	33	12	75
	Dimple Lake	10.0	1	1	0	0	1	0	100
	Totals	27.0	65	47	0	0	47	18	72
Koksilah	Koksilah Ridge	14.4	88	58	4	4	66	22	75
Englishman R.	Bk. 155	16.7	82	79	0	0	79	3	96

Table 1 (Continued)

Region	Strip location	Acres sampled	No. trees	Grey	Red	Green attack	Total dead	Green not attacked	Per cent stems dead
Mt. Washington	Piggott Creek	28.3	91	21	7	9	37	54	40.7
	Oyster River	4.0	32	7	3	4	14	18	43.8
	Dove Creek	6.0	35	18	3	0	21	14	60.0
	Mt. Washington	10.5	35	20	2	0	22	13	62.9
	Totals	48.8	193	66	15	13	94	99	48.7
Buttle Lake	Marblerock Creek	12.5	44	31	2	1	34	10	77.3
	Phillips River	16.8	66	11	4	0	15	51	22.7
	Ralph River	17.8	78	22	2	0	24	54	30.7
	Totals	47.1	188	64	8	1	73	115	38.8
Muchalat	Matchlee Bay	18.3	51	48	2	0	50	1	98.0
	Muchalat Inlet	14.5	30	19	0	8	27	0	90.0
	Totals	32.8	81	67	2	8	77	1	95.0
Nimpkish Valley	Noomas Creek	1.1	23	9	1	7	17	6	73.9
	Duncan	19.8	67	38	7	5	50	17	74.6
	Klaklakama Ridge	20.8	38	22	9	3	34	4	89.4
	Upper Woss Road	26.0	73	38	11	10	59	14	80.8
	Totals	67.7	201	107	28	25	160	41	79.6

Table 2

Summary of Estimated White Pine Volume Loss,
Vancouver Island, 1964

Region	Total acres	Av. stems		Estimated vol. dead (cu. ft.)	
		Per acre	Dead per acre	Per acre	Total
Sooke	74,904	8.0	6.2	477.2	35,744,189
San Juan	41,984	17.5	15.2	895.9	37,613,446
Carmanah	40,704	7.9	6.6	408.9	16,643,866
Fleet River	31,744	2.4	1.7	257.1	8,161,382
Koksilah	17,296	6.1	4.6	366.1	6,330,336
Englishman R.	23,152	4.9	4.7	574.9	13,310,085
Mt. Washington	44,200	3.9	1.9	265.1	11,717,420
Buttle Lake	24,120	3.9	1.5	96.1	2,317,932
Muchalat	16,240	2.3	2.3	242.7	3,941,448
Nimpkish	23,900	3.0	2.4	327.0	7,815,300
Tree count areas:					
South Fork Nanaimo River - 1076 trees at 223 cu. ft. each					239,948
Englishman River Bk 143- 1422 trees at 170 cu. ft each					241,740
Totals	338,244				144,077,092

