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WESTERN HEMLOCK LOOPER IN BRITISH COLUMBIA 1991 AND FORECAST FOR 1992

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Forest Insect and Disease Survey

Defoliation of mature to overmature western hemlock - western red cedar stands by the western hemlock looper, Lambdina fiscellaria lugubrosa, increased to 50 200 ha in 266 infestations in four forest regions (Table 1), up from 1115 ha in 1990. Eleven percent of the area was severely defoliated, with the loss of most or all foliage on most trees, 44% was moderate, extending down through the mid-crowns, and 45% was light, limited mainly to upper crowns. The major increase was over 36 000 ha in the Kamloops Forest Region from none in 1990. About 200 ha of severe defoliation at Hankins Creek, near McBride in the Prince George Forest Region, was reported by the B.C. Forest Service.

Defoliation is forecast to continue in 1992 in, or adjacent to, most stands defoliated in 1991, based on egg sampling at 25 sites in three regions (Table 2, Map 1).

Table 1. Current defoliation by the western hemlock looper in British Columbia. Forestry Canada, Forest Insect and Disease Survey, 1991.

Forest Region	Number of Infestations	Area defoliated (ha)			Total 1991	Total 1990
		Light	Moderate	Severe		
Cariboo	25	5000	700	-	5700	200
Kamloops	97	14 000	17 875	4200	36 075	-
Nelson	143	3660	3490	1075	8225	915
Prince George	1	-	-	200	200	-
Total	266	22 660	22 065	5475	50 200	1115

Cariboo Forest Region

The area of defoliation increased to over 5700 ha, up from 200 ha in 1991, in 25 separate infestations in the eastern part of the Williams Lake TSA. Defoliation was mostly moderate including 250 ha on the Lynx Peninsula at Quesnel Lake, up from trace in 1990. Three new areas of moderate defoliation totaled 700 ha from Bouldery Creek west to Horsefly Lake, where moderate defoliation covered 100 ha in 1990, and east of Quesnel Lake from Killdog Creek to Stranger Lake and the regional boundary. Areas of light defoliation totaled about 5000 ha in 22 separate infestations from near Lynx Peninsula, Niagara Creek, Lynx Creek, in patches over 860 ha between Quesnel and Horsefly lakes, east of Quesnel Lake, and Bouldery Creek to Horsefly Lake.

Sawflies, Neodiprion spp., saddleback looper Ectropis sp., and rusty tussock moth, Orgyia a. badia, larvae were also common and contributed slightly to the overall defoliation in some areas.

Kamloops Forest Region

Defoliation was recorded for the first time in the region since 1984 over 36 000 ha in 97 infestations in the North Thompson and Adams river drainages and in Wells Gray Provincial Park. Severe defoliation occurred over 4200 ha from Blue River to the Albreda River, near Tumtum Lake, and along Hobson Lake. Moderate defoliation occurred in the upper Adams and North Thompson river drainages, and near Messiter Summit. Light defoliation covered 14 000 ha in 44 areas south of Tumtum Lake, along Oliver, Gold and Gollen creeks, at Azure Lake, and adjacent to moderately or severely defoliated areas.

Nelson Forest Region

The area of defoliation increased nine-fold to 8225 ha from 900 ha in 1990, the first year of defoliation. Severe defoliation occurred over 20% and moderate over more than 60% of the area of old growth stands along the Revelstoke Lake reservoir between Downie Creek and Mica. Light defoliation occurred along Revelstoke Lake and in some side drainages as far south as Frisby Ridge, and near Wood Arm, Redrock Peninsula, Encampment, Yellow, and Potlatch creeks areas of McNaughton Lake.

FORECAST

Based on egg samples from 25 areas in three forest regions, defoliation is forecast to be severe at 11, mostly in the Kamloops and Nelson regions, moderate at 2, and light or only trace at the remainder (Table 2, Map 1). Severe defoliation is forecast to occur mostly at previously defoliated sites on the Lynx Peninsula area in the Cariboo Region, at 5 sites in the North Thompson River Valley in the Kamloops Region, and at 5 sites north of Revelstoke in the Nelson Region. The outbreak near McBride was not sampled due to lack of access.

The high incidence of parasitism (avg. 30%) in samples from parts of the Kamloops region may contribute to population reductions and limit the outbreak. In previous outbreaks, when 30% or more egg parasitism occurred populations frequently collapsed the following year.

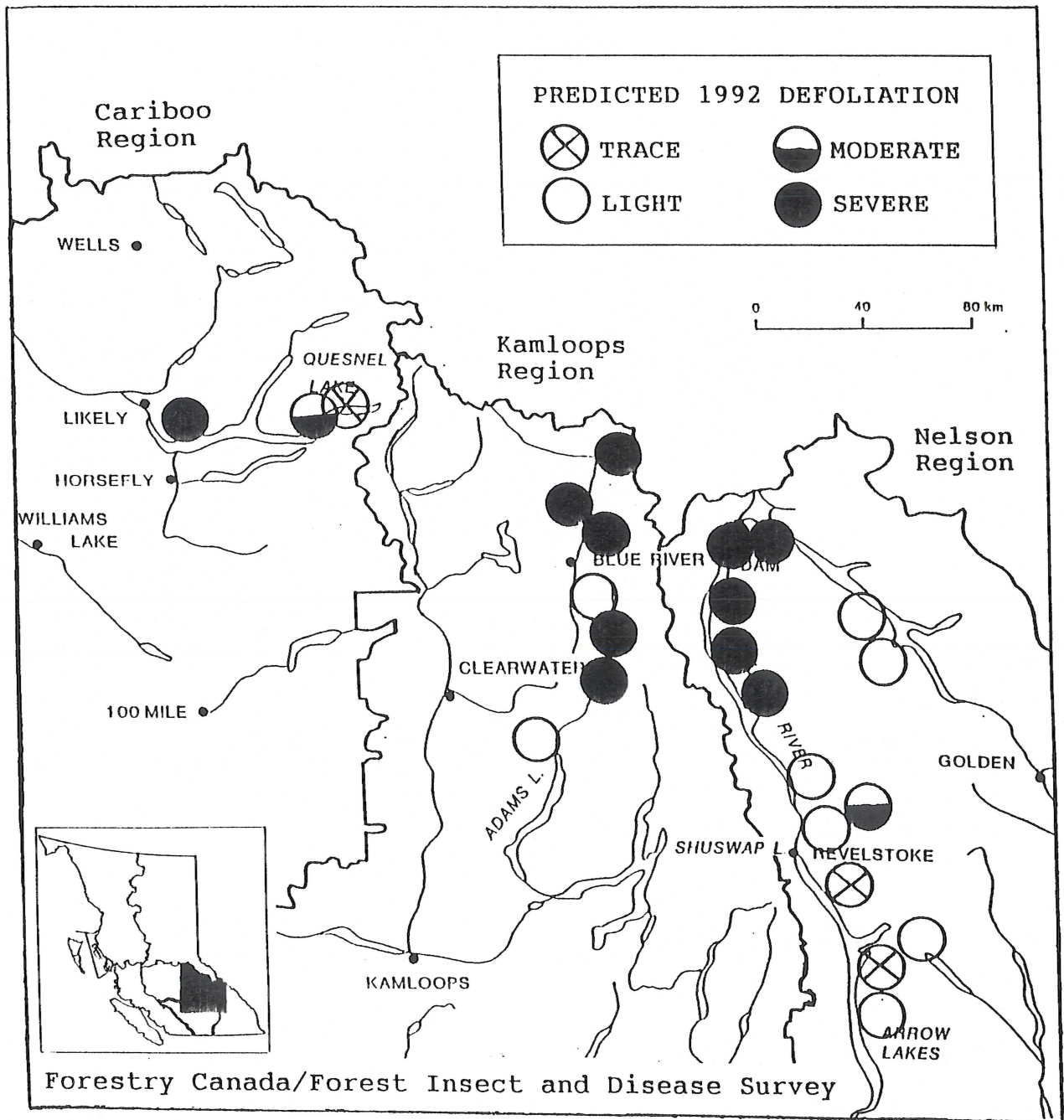
Table 2. Results of fall egg sampling to forecast defoliation by the western hemlock looper in 1992. Forestry Canada, Forest Insect and Disease Survey, 1991.

Location	Average Number Eggs Per 100 g Lichen				Percent Parasitism ¹	Predicted 1992 ² Defol.
	Healthy	Parasitized	Infertile	Old		
CARIBOO FOREST REGION						
Bouldery Creek	4	0	0	3	0	trace
Bouldery Creek	35	8	0	7	19	moderate
Lynx Peninsula	71	13	1	24	15	severe
KAMLOOPS FOREST REGION						
Gollen Creek	15	2	1	4	12	light
North Foam Creek	15	7	0	6	32	light
Mud Lake	80	56	2	24	41	severe
Adams R.- Finn Cr.	96	20	2	16	17	severe
Miledge Creek	113	112	4	40	50	severe
Lempriere	145	50	1	16	26	severe
Tumtum Lake	162	66	7	40	29	severe
NELSON FOREST REGION						
Galena Bay	2	0	0	6	0	trace
Akolkoex R.	4	3	0	0	43	trace
St. Leon Cr.	6	0	0	6	0	light
Illecillewaet R.	8	1	0	6	11	light
Smith Cr. (Km 108)	9	3	0	5	25	light
Trout Lake	10	0	0	4	0	light
Gold River	22	4	1	4	15	light
Martha Creek	26	6	0	1	19	light
Martha Creek	16	4	0	4	20	light
Tangier River	46	11	2	6	19	moderate
Mica	120	42	0	27	26	severe
Goldstream River	160	13	6	13	7	severe
Redrock Harbour	184	29	7	13	13	severe
Bigmouth Creek	297	111	4	36	27	severe
Downie Creek	363	113	3	23	24	severe

¹ Percentage of current eggs parasitized based on discoloration during extraction by hot water treatment.

² Defoliation prediction thresholds:
 trace: < 5 healthy eggs
 light: 5-26 healthy eggs
 moderate: 27-60 healthy eggs
 severe: 61+ healthy eggs

Six outbreaks have been recorded in the Interior at intervals of about 8 to 9 years. These have usually caused defoliation for 2 to 3 years before collapsing rapidly. The last outbreak was 1982-84. Previous infestations have caused extensive top-kill and scattered mortality. In older stands, trees that are 100% defoliated are usually killed, while those 80% or more defoliated frequently die, or succumb later to secondary agents.



Map 1. Forecast of 1992 defoliation by the western hemlock looper in British Columbia, based on egg surveys.