SURVEY BULLETIN

Forest Insect and Disease Conditions in Ontario
Spring 1992

Forestry Canada Forêts Canada

Canada

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Spring 1992

This is the first of three bulletins describing forest insect and disease conditions in Ontario to be issued by the Forest Insect and Disease Survey Unit (FIDS) of Forestry Canada, Ontario Region.

Dave Roden

CONGRATULATIONS DAVE!

Dave Roden, FCOR/FIDS, Insect Damage Appraisal Officer defended his Ph.D. thesis in mid-February, 1992, at Michigan State University, East Lansing, Michigan. The title of Dave's thesis was "Behaviour and Development of Larval Gypsy Moth, *Lymantria dispar* (L.) on Trees of the Upper Great Lakes Forests".

SPECIAL SURVEYS IN 1991

Seed Orchard Survey

This survey was initiated in 1990 to gather baseline data on pest problems associated with seed orchards in northern Ontario and continued in 1991. The results of the 1991 field survey are listed below.

Insects: – The spruce budworm (*Choristoneura fumiferana*) was the most prevalent insect pest and was present in all the white and black spruce plantations. The proportion of trees infested varied from 1 to 100% and average defoliation ranged from <1 to 39%. The heaviest infestation was in the McPherson white spruce seed orchard in Geraldton District, where 100% of the trees were infested, with an average of 39% defoliation. The yellowheaded spruce sawfly (*Pikonema alaskensis*) was found in four black spruce seed orchards and two white spruce seed orchards. The incidence of attack ranged from 6 to 12% and defoliation of infested trees varied from 4 to 20%. The white pine weevil (*Pissodes strobi*) was found in five black spruce, four jack pine, three white spruce and one white pine seed orchard. The incidence of leader attack ranged from 0.7% at the Aidie Creek black spruce orchard in Kirkland Lake District to 19.7% at the Island Lake tree improvement area in Chapleau District. Similar leader damage was caused by the eastern pine shoot border (*Eucosma gloriola*) which attacked jack pine plantations in Hallam Township, Espanola District; Lumsden Township, Sudbury District and Gurd Township, North Bay District. The incidence of leader attack was 14.0, 7.3 and 1.3%, respectively. Other insects which were encountered in the survey but did not cause appreciable damage were the spruce coneworm (*Dioryctria reniculelloides*), spruce shootworms (*Zeiraphera* spp.), sawyer beetles (*Monochamus* spp.), jack pine tip beetle (*Conophthorus banksianae*), pine needle scale (*Chionaspis pinifoliae*) and pine spittlebug (*Aphrophora cribrata*).

Diseases: – Few diseases were encountered in the 1991 survey. *Armillaria* root rot, the most serious disease found, was present in five black spruce and two jack pine seed orchards. Although the infection rate was low, in the 2% range, the disease is having a serious impact by annually killing this proportion of the crop trees. The spruce needle rusts (*Chrysomyxa ledi* and *C. ledicola*) were found in three black spruce and one white spruce seed orchard. This is a reduction in incidence from 1990 when the diseases were encountered in seven black spruce and six white spruce seed orchards. Foliar damage in the infected trees was quite low, in the 2% range, in all the affected plantations.

Cover photo: Barry Smith prepares to leave for the field.

White pine blister rust was found on 1.3% of the trees in the white pine seed orchard in Gurd Township, North Bay District. A needle rust (*Coleosporium asterum* [Dietel] Sydow) was recorded on 12% of the trees in the jack pine seed orchard in Hallam Township, North Bay District and a needle cast (*Davisomycella ampla* [J. Davis] Darker) was observed on 24% of the trees in the jack pine seed orchard in Lumsden Township, Sudbury District. Diplodia tip blight (*Diplodia* sp.) occurred on 2% of the trees in the Morson black spruce seed orchard in Fort Frances District, and spruce broom rust (*Chrysomyxa arctostaphyli* Dietel) affected 2% of the Skurban Lake black spruce seed orchard in Sioux Lookout District.

Abiotic problems encountered during the survey included frost damage, which caused low levels of foliar damage in two black spruce seed orchards, and wind damage, which destroyed or severely injured 10% of the trees in the Beauregard black spruce seed orchard in Red Lake District.

SURVEYS PLANNED FOR 1992

Regular surveys for native and introduced pests and abiotic conditions will be maintained in 1992 along with the more specialized surveys described below.

Maple Health Studies

The North American Maple Project, a joint Canada–U.S. study, will be continued in 1992. The study is aimed at investigating the condition of sugar maple in operating sugar bushes and undistributed stands throughout the range of the species in North America. The Forest Insect and Disease Survey (FIDS) of Forestry Canada, Ontario Region maintains 24 plots in which various parameters relating to site and stand conditions are measured. In addition, pest conditions within the stand are monitored along with the current crown condition of each tree. The data produced is used to measure the rate of change in the condition of sugar maple.

In addition to the above, FIDS maintains a system of 130 25-tree maple plots throughout Ontario to further monitor the health of this species. A total of 105 of these plots will be monitored again in 1992 and 25 will be dropped to provide time to establish 25 additional oak plots.

Oak Health Studies

For a number of years, a group of 13 oak plots comprised of 100 trees each has been maintained in southern Ontario. The plots were originally set up to follow the status of oak that had been severely defoliated by oak leaf shredder, but have since been maintained to monitor the overall health of this tree species. Recent concern about the health of oak in Ontario, particularly in areas suffering from the effects of gypsy moth defoliation and drought damage, has prompted the establishment of additional oak study plots. Some 25 plots will be established this year throughout the range of oak in the province.

Pheromone Studies

Pheromone studies have been carried out for some time on a variety of pests in order to test and develop their use as survey tools.

In 1992, the spruce budworm pheromone trapping program will be expanded. The black army cutworm study will also be continued along with a pheromone trapping program for gypsy moth in northern Ontario parks. Pheromone studies on oak leaf shredder and gypsy moth in southern Ontario will be suspended this year.

MAJOR INSECT FORECASTS FOR 1992

Forecasts for the following major insects, which were carried in the fall *Survey Bulletin* are repeated here as a reminder for the upcoming summer season. Also included are revisions to preliminary data that was presented in the summer 1991 *Survey Bulletin* in which further checks disclosed minor errors.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

In 1991, the area of moderate-to-severe defoliation totaled 9,065,781 ha, an increase of 2.2 million ha over the previous year. Most of the defoliation occurred in the Northwestern and North Central regions, with smaller areas of defoliation in Northern Region and in southern Ontario. Egg-mass surveys in the late summer of 1991 showed an overall decline in egg-mass densities. Nevertheless egg-mass densities remain sufficiently high that moderate-to-severe defoliation will probably recur throughout most of the area damaged in 1991. In Northwestern Region, population levels will likely remain high, with some expansion along the northern edge of the outbreak in the Red Lake and Sioux Lookout districts. There may also be a slight increase along the southern edge of the outbreak in Fort Frances District.

Population levels are also expected to remain high in North

Central Region, although defoliation levels may begin to decline in southern and eastern Thunder Bay District and southwestern Nipigon District.

Widespread defoliation is not expected in the northeastern part of the province but some expansion may occur along the eastern edge of the outbreak in the Hearst and Wawa districts. New pockets of defoliation may also appear in both the Northern and Northeastern regions.

Table 1. Gross area of moderate-to-severe defoliation by the spruce budworm in Ontario from 1989 to 1991.

District	Area of moderate-to-severe defoliation (ha) 1989	1990	1991
Northwestern Region			
Ignace	419,620	314,071	351,536
Dryden	902,750	815,547	700,085
Sioux Lookout	586,772	523,344	589,537
Fort Frances	199,084	6,720	39,830
Kenora	897,779	859,395	865,468
Red Lake	199,054	228,747	299,329
Total	3,205,059	2,747,824	2,845,785
North Central Region			
Atikokan	482,208	410,377	550,264
Thunder Bay	597,382	1,273,723	1,861,617
Nipigon	940,513	1,087,868	1,403,210
Terrace Bay	624,724	761,251	1,081,938
Geraldton	389,750	493,011	1,146,368
Total	3,034,577	4,026,230	6,043,397
Northern Region			
Hearst	0	6,392	123,130
Northeastern Region			
Wawa	0	0	41,716
North Bay	0	0	10
Sudbury	0	0	70
Total	0	0	41,796
Algonquin Region			
Algonquin Park	0	2,815	11,640
Central Region			
Huronia	0	0	9[a]
Lindsay	0	0	2[a]
Maple	0	0	4[a]
Total	0	0	15
Southwestern Region			
Wingham	0	0	18[a]
Total	6,239,636	6,783,261	9,065,781

[a] based on ground observations

In southern Ontario, infestations in the northwestern corner of Algonquin Park may expand somewhat and new pockets of defoliation may become evident but widespread defoliation is unlikely.

Table 1 summarizes the extent of moderate-to-severe defoliation in the province in 1991. The table shown in the summer *Survey Bulletin* mistakenly included some 2,360 ha in Moosonee District in the Hearst District total. The revised figures show 120,770 ha of moderate-to-severe defoliation in Hearst District and 2,360 ha in Moosonee District.

The Ontario Ministry of Natural Resources (OMNR) aerially sprayed 55,140 ha (not the approximately 65,000 ha reported in the 1991 summer *Survey Bulletin*, which was based on preliminary figures) of budworm-damaged stands in the North Central and Northern regions with *Bacillus thuringiensis* (Berliner) (*B.t.*).

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The total area of moderate-to-severe defoliation by the forest tent caterpillar increased to 18,870,518 ha in 1991. Most of the defoliation occurred in northern and northwestern Ontario but smaller infestations also persisted in the central and southern parts of the province. Egg-band counts indicate that moderate-to-severe defoliation will likely persist in the southern parts of the Red Lake and Sioux Lookout districts as well as in large areas in the Ignace, Atikokan, Thunder Bay and Nipigon districts. Moderate-

to-severe defoliation is also expected in southern Geraldton District, and the southern parts of the Hearst and Kapuskasing districts. New infestations may develop in southwestern Cochrane District. Populations, and consequently defoliation, will probably decline in the Fort Frances and Kenora districts and in southern Dryden District.

In the central part of Ontario, infestations will likely decline in the Sault Ste. Marie, Blind River, Espanola and North Bay districts, but will probably persist in central Sudbury District.

Infestations are also expected to decline in southern Ontario, particularly in Owen Sound District, but pockets of defoliation may persist in northern Parry Sound District and parts of the Tweed, Minden, Carleton Place and Napanee districts.

The defoliation table in the summer *Survey Bulletin* contained a mistake in the 1990 total for Bancroft District, which read 260 ha rather than 5,560 ha. This in turn changed the 1990 total for Algonquin Region to 197,470 ha and the provincial total to 9,485,708 ha. The correct figures are shown in Table 2.

Table 2. Gross area of current moderate-to-severe defoliation by the forest tent caterpillar in Ontario from 1989 to 1991.

District	Area of moderate-to-severe defoliation (ha)			
	1988	1989	1990	1991
Northwestern Region				
Dryden	610	564,902	974,160	1,185,900
Fort Frances	257,305	1,048,876	1,080,680	1,056,860
Ignace	0	12,403	577,960	1,146,300
Kenora	15,070	553,487	965,400	1,024,036
Red Lake	0	0	37,954	940,840
Sioux Lookout	0	450	436,703	3,386,280
Total	272,985	2,180,118	4,072,857	8,740,216
North Central Region				
Atikokan	28,160	423,404	816,998	565,366
Geraldton	0	180	74,730	1,227,585
Nipigon	560	8,535	176,686	1,955,390
Terrace Bay	690	4,255	35,065	125,284
Thunder Bay	4,230	19,739	310,307	1,716,802
Total	33,640	456,113	1,413,786	5,590,427
Northeastern Region				
Blind River	102,852	208,878	200,445	68,338
Espanola	415,273	615,345	657,717	140,322
North Bay	856,053	1,031,622	145,570	59,912
Sault Ste. Marie	26,560	16,107	102,669	3,045
Temagami	252,650	160,770	330	0
Sudbury	442,274	843,409	849,127	541,260
Wawa	12,087	80,143	499,697	847,431
Total	2,107,749	3,056,274	2,455,555	1,660,308
Northern Region				
Chapleau	0	300	0	0
Hearst	10,550	150,438	789,396	1,580,289
Kapuskasing	0	7,482	85,981	762,729
Moosonee	0	0	46,446	90,015
Timmins	0	0	170	495
Total	10,550	158,220	921,993	2,433,528
Algonquin Region				
Algonquin Park	62,579	171,988	330	0
Bancroft	148,125	212,540	260	300
Bracebridge	330,845	174,171	39,106	9,272
Minden	268,633	267,576	49,675	63,830
Parry Sound	408,302	390,886	102,714	15,376
Pembroke	39,425	102,795	85	0
Total	1,257,909	1,319,956	194,470	88,778
Eastern Region				
Brockville	0	720	22,020	23,548
Carleton Place	3,835	11,847	14,367	24,336
Cornwall	445	0	0	1,238
Napanee	190	81,248	78,479	64,268
Tweed	121,174	345,104	215,441	215,633
Total	125,644	438,919	330,307	329,023
Central Region				
Lindsay	47,752	132,578	350	1,236
Huronia	104,240	124,513	29,166	325
Maple	0	2,130	1,335	551
Total	151,992	259,221	30,851	2,112
Southwestern Region				
Owen Sound	4,760	46,290	62,889	26,116
Total	3,965,229	7,915,111	9,485,708	18,870,508

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Jack pine budworm populations increased markedly in 1991, with a total area of 133,618 ha of moderate-to-severe defoliation recorded. The infestations were located in northwestern Ontario in Red Lake District and on the boundary between Thunder Bay and Ignace districts, and in southern Ontario in northern Parry Sound District and adjacent areas of the Sudbury and Espanola districts.

Egg-mass surveys indicate that infestations in most of the above areas are likely to persist in 1992. In northwestern Ontario, infestations in Red Lake District will probably persist, with some possible expansion to the east. Infestations on the Thunder Bay–Ignace districts border will remain high, with the possibility of expansion to the south of the area affected last year. In southern Ontario, moderate-to-severe defoliation will recur in northern Parry Sound District and there may be some expansion in the area affected in adjacent areas in the Sudbury and Espanola districts. Egg-mass samples also forecast moderate-to-severe defoliation at single locations in the Nipigon, Geraldton and Blind River districts.

Table 3 shows the gross area of moderate-to-severe defoliation by the jack pine budworm. Previously, 6,000 ha of defoliation in Sudbury District was included with the total for Parry Sound District. The corrected totals are 8,708 ha in Sudbury District and 51,276 ha in Parry Sound District.

Table 3. Gross area of moderate-to-severe defoliation by the jack pine budworm in 1990 and 1991.

	Area of moderate-to-severe defoliation (ha)	
District	1990	1991
Northwestern Region		
Red Lake	655	69,903
Sioux Lookout	10	20
Ignace	0	1,721
Total	665	71,644
North Central Region		
Thunder Bay	0	870
Northeastern Region		
Espanola	0	810
Sudbury	0	8,708
North Bay	0	290
Total	0	9,808
Algonquin Region		
Parry Sound	29,660	51,276
Bancroft	0	20
Total	29,660	57,294
Grand total	30,325	133,618

Gypsy Moth, *Lymantria dispar* (L.)

In 1991, the total area of moderate-to-severe defoliation by this insect was 347,415 ha, up from 77,648 ha the previous year. The most widespread and severe defoliation occurred in Simcoe District of Southwestern Region, in the Niagara, Maple, Lindsay and Huronia districts of Central Region, and in the Parry Sound, Bracebridge, Minden and Pembroke districts of Algonquin Region. Population declines were recorded in the Tweed and Napanee districts of Eastern Region.

Egg-mass surveys by OMNR and Forestry Canada personnel indicate that population declines are likely in many of the more heavily infested areas described above. This fact notwithstanding, the insect will, no doubt, continue to extend its range north and west and infestations in the northern and western extremes of its range will continue to expand and intensify.

The table of gypsy moth defoliation in the summer *Survey Bulletin* showed figures of 85,405 and 43,079 ha of moderate-to-severe defoliation in the Bracebridge and Parry Sound districts, respectively. This was an error involving the boundary between the districts and the corrected figures of 75,837 ha in Bracebridge District and 52,647 ha in Parry Sound District are included in Table 4.

In 1991, OMNR aerially sprayed *B.t.* on 36,600 ha of gypsy moth-infested stands. A value of 34,000 ha was reported in the 1991 summer *Survey Bulletin.*

Table 4. Gross area of moderate-to-severe defoliation by the gypsy moth in Ontario, 1987–1991.

Region	District	Gross area of defoliation (ha)				
		1987	1988	1989	1990	1991
Eastern	Tweed	3,329	16,089	39,096	1,259	1,085
	Napanee	4,781	6,198	15,001	4,086	4,285
	Carleton Place	1,355	3,918	2,634	143	105
	Brockville	2,099	1,865	12,250	395	85
	Cornwall	0	0	0	0	90
	Total	11,564	28,070	68,981	5,883	5,650
Algonquin	Algonquin Park	0	0	0	172	1,172
	Bracebridge	0	0	0	4,359	75,837
	Pembroke	0	124	1,154	7,148	16,554
	Bancroft	111	370	15	13,133	6,110
	Minden	0	0	65	5,056	56,163
	Parry Sound	0	0	0	9,367	52,647
	Total	111	494	1,234	39,235	208,483
Central	Cambridge	0	0	0	3,323	15,432
	Huronia	0	0	0	2,418	65,775
	Lindsay	888	861	4,071	1,118	11,418
	Niagara	0	28	2,177	19,474	30,718
	Maple	0	0	370	2,291	6,110
	Total	888	889	6,618	28,624	129,453
Southwestern	Aylmer	0	0	0	30	230
	Chatham	0	0	0	20	80
	Simcoe	115	240	4,807	3,856	3,078
	Total	115	240	4,807	3,906	3,388
Northeastern	Espanola	0	0	0	0	56
	Sudbury	0	0	0	0	385
	Total	0	0	0	0	441
Grand total		12,678	29,693	81,640	77,648	347,415

Blowdown

The table summarizing blowdown damage in the summer 1991 *Survey Bulletin* contained several errors. A corrected table appears below.

Table 5. Summary of blowdown damage in Ontario in 1991.

District	Area within which damage occurred (ha)
Northwestern Region	
Kenora	55,155
Red Lake	111,770
Sioux Lookout	13,190
Dryden	7,615
Ignace	19,985
Total	207,715
Northern Region	
Kapuskasing	15,855
Cochrane	13,910
Timmins	7,395
Kirkland Lake	5,350
Chapleau	5,590
Gogama	1,300
Total	49,400
Northeastern Region	
Temagami	1,340
Grand total	258,455

FIELD ASSIGNMENTS

There have been a number of changes in the deployment of FIDS field staff in 1992. Bill Biggs has been transferred from Angus to Sioux Lookout, where he will assume the duties of regional supervisor for Northwestern Region. He will be replaced at Angus by Bob Sajan, who will take over supervisory duties for the Central and Southwestern regions. Ed Czerwinski will transfer from St. Williams to Kemptville, replacing Alan Keizer, who moves to Geraldton, and Simon Melbourne will move from Geraldton to St. Williams. Paul Bolan will transfer from Chalk River to Fort Frances, replacing Holger Brodersen, who moves to Chapleau. Steven Payne will move from Chapleau to Chalk River.

A complete list of FIDS field staff and their assignments in 1992 follows. Photographs of the field staff and a map showing the locations of field headquarters are also included.

G.M. Howse
Chief, Forest Insect and Disease Survey

Michael J. Applejohn
Head, FIDS Ranger

June 1992

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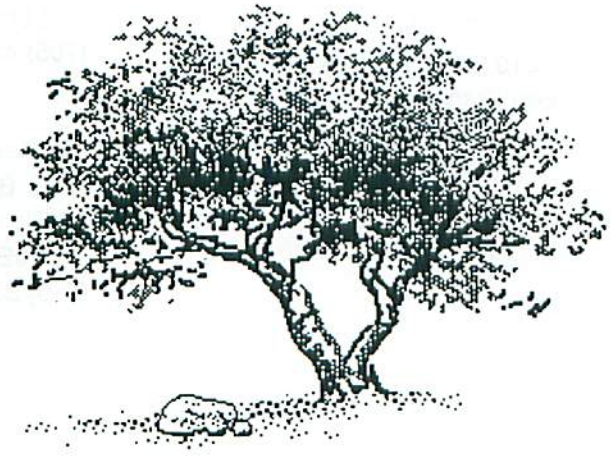

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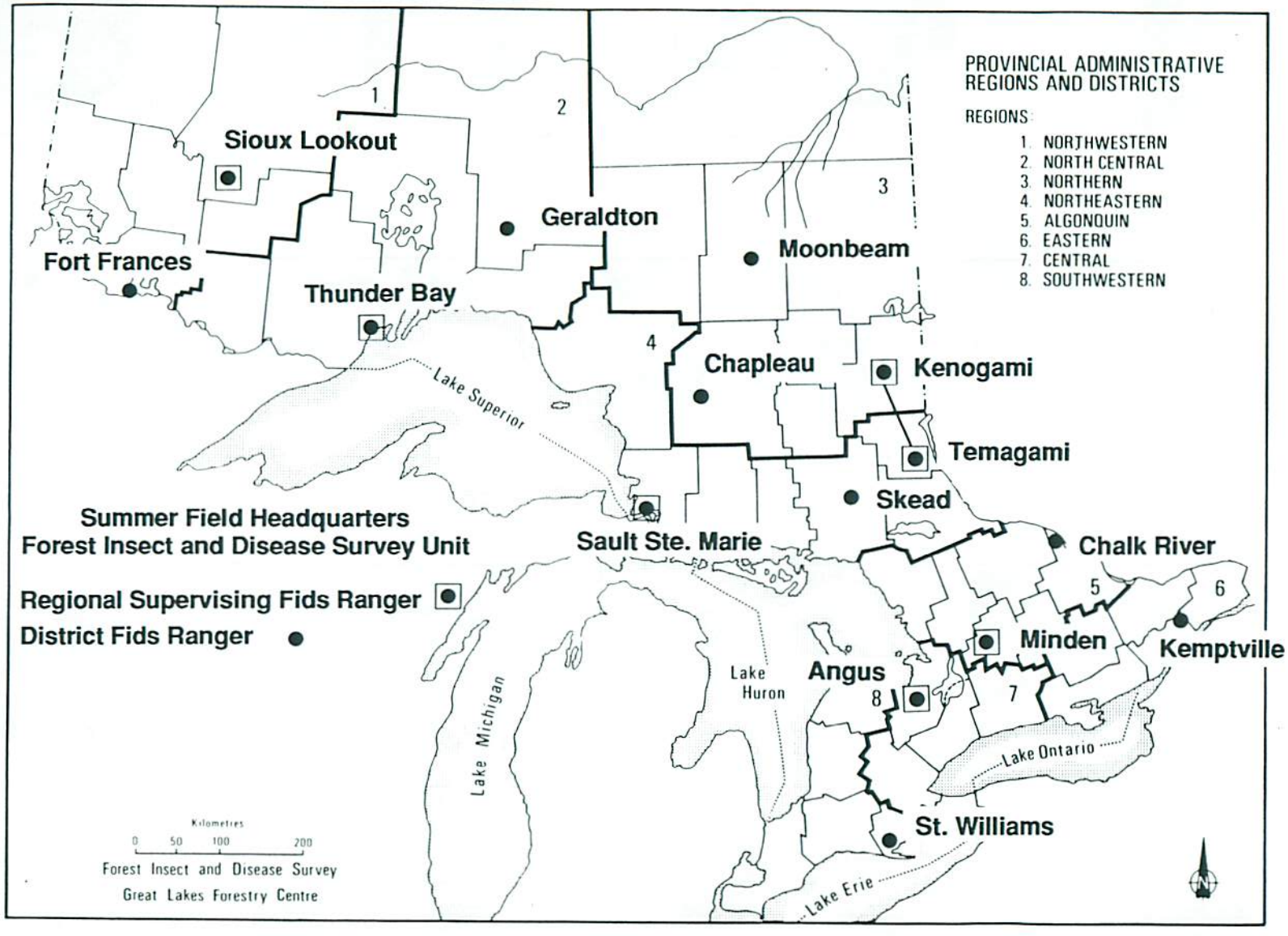
PROVINCIAL ADMINISTRATIVE
REGIONS AND DISTRICTS
REGIONS:
1. NORTHWESTERN
2. NORTH CENTRAL
3. NORTHERN
4. NORTHEASTERN
5. ALGONQUIN
6. EASTERN
7. CENTRAL
8. SOUTHWESTERN
Sioux Lookout
Geraldton
Moonbeam
Fort Frances
Thunder Bay
Chapleau
Kenogami
Lake Superior
Temagami
Skead
Summer Field Headquarters
Forest Insect and Disease Survey Unit
Sault Ste. Marie
Chalk River
Regional Supervising Fids Ranger
District Fids Ranger
Minden
Kemptville
Lake Huron
Angus
Lake Michigan
Lake Ontario
St. Williams
Lake Erie
Kilometres
0 50 100 200
Forest Insect and Disease Survey
Great Lakes Forestry Centre

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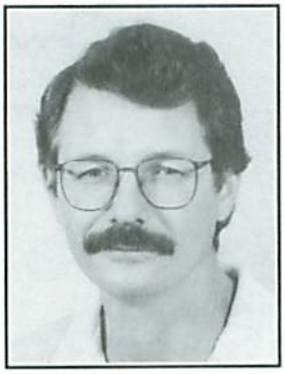

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