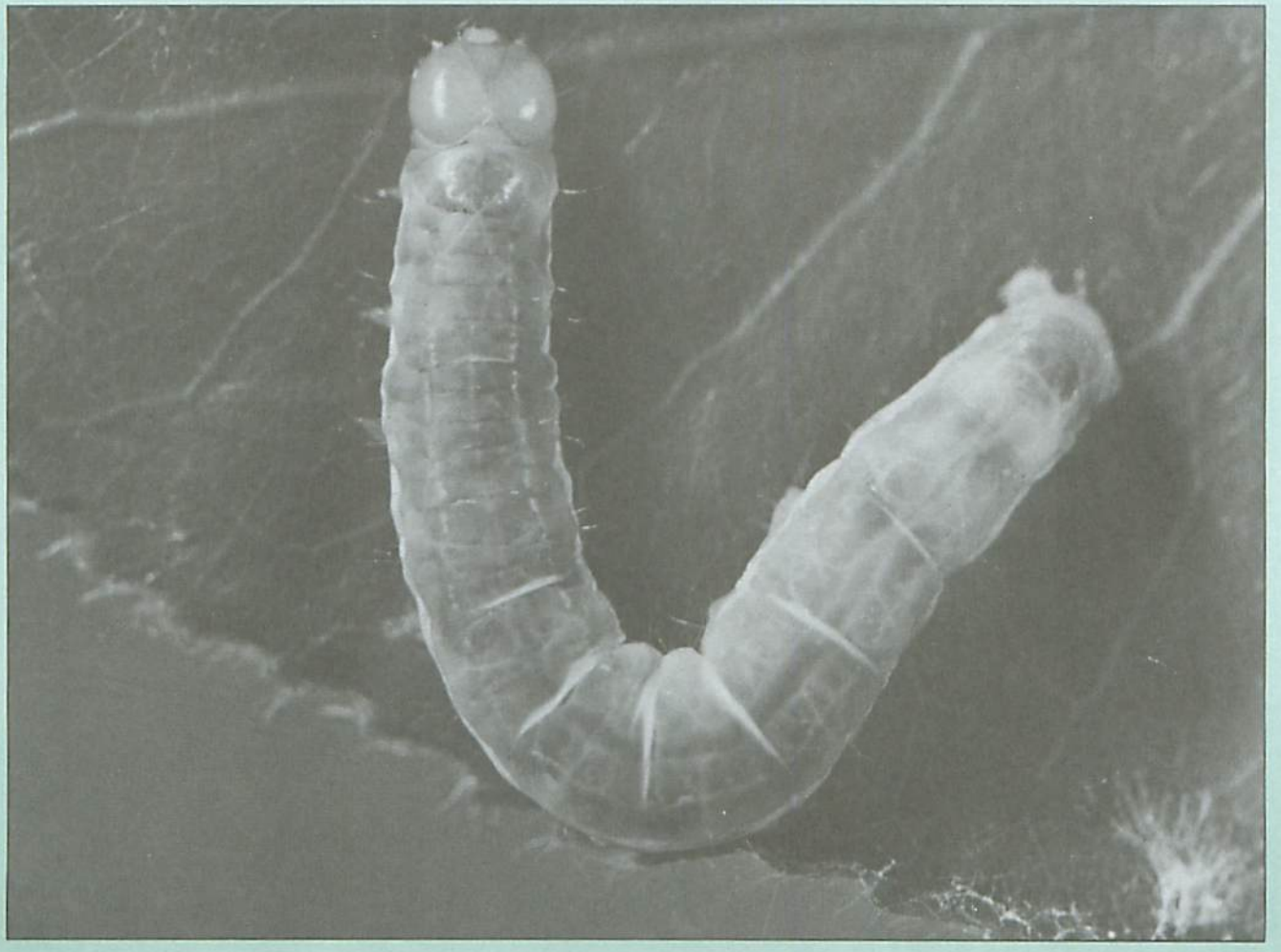
SURVEY BULLETIN

Forest Insect and Disease Conditions in Ontario

Summer 1995



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FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Summer 1995

This is the second of three bulletins produced annually by the Forest Insect and Disease Survey (FIDS) Unit of Natural Resources Canada, Canadian Forest Service–Sault Ste. Marie. It describes the results of surveys for insect, disease, and abiotic damage in Ontario's forests. The period covered by this bulletin is from early May to mid-July. The latter half of the field season, from mid-July to September, will be covered by the fall *Survey Bulletin*. Data presented herein are preliminary and may change as new information and further analysis become available.

OVERVIEW

Wide variations in weather patterns in late 1994 and early 1995 stressed trees in large areas of Ontario. Late fall and early winter temperatures were unusually warm until the end of December; thus many trees did not harden off properly. Cold weather in January and February was followed by unseasonably warm weather in March. Cool weather, with late frosts in May and early June, was replaced by unusually warm weather in the latter part of June and early July. As a result, insect development, which lagged early in the season, accelerated to normal.

Frost damage was prevalent in a number of areas in the northern part of the province, and wind damage occurred sporadically throughout a large section of south central Ontario. Population declines were evident for the eastern spruce budworm (*Choristoneura fumiferana* Clem.) and the jack pine budworm (*Choristoneura pinus pinus* Free.), but increases were recorded for the forest tent caterpillar (*Malacosoma disstria* Hbn.) and the gypsy moth (*Lymantria dispar* [L.]). An unusually heavy infestation of the aspen twoleaf tier (*Enargia decolor* [Wlk.]) occurred in northeastern Ontario. Information on these and other pests follows.

FOREST INSECTS

Eastern Spruce Budworm, *Choristoneura fumiferana* Clem.

In 1995 the area affected by the eastern spruce budworm declined sharply for the third consecutive year. The provincewide total of moderate to severe defoliation, as mapped by ground and aerial surveys, was 3 450 483 ha. This compared with 4 266 656 ha in 1994. Increases in the area infested in the Sioux Lookout, Dryden, and Hearst districts were more than offset by large declines in the Fort Frances, Nipigon, Red Lake, and Thunder Bay districts, and by smaller declines in the Wawa and Kenora districts (Table 1) (Fig. 1). In northwestern Ontario, infestations increased in area and intensity east and northeast of Lac Seul in the Sioux Lookout District. As well, they extended into the Sturgeon Lake area of the eastern Dryden District. There was a lessening in the intensity of the infestation in the Red Lake District, with damage classed as moderate rather than severe, and some reduction was noted in the infestation in the Trout Lake–Ball Township area. There was also a reduction in the area affected between Umfreville Lake and Wade in the Kenora District, but elsewhere infestations remained largely the same as last year. There was a marked budworm decline in the eastern part of the Fort Frances District, where populations collapsed in the area east of Namakan Lake, in the central part of Quetico Provincial Park, and in the Marmion Lake area. Infestations remained heavy in the western part of the Fort Frances District and along the Highway 11 corridor between Calm Lake and French Lake. A new pocket of defoliation was mapped along the American border north of Knife Lake and west of Saganaga Lake. Infestations declined markedly in the eastern and southern parts of the Thunder Bay District, but an irregular area of moderate to severe defoliation persisted in the central part of the district from the northwest coast of Lake Superior near the city of Thunder Bay north to the Cheeseman and Mooseland lakes area. In the Nipigon District infestations on the west side of Lake Nipigon collapsed; only one small area persisted on the northeast side of the lake between Mount St. John and Inspiration Lake. Many pockets of infestation, which occurred in 1994 in the eastern Nipigon District between Lake Nipigon and the Selwyn Lake–Stevens area, collapsed in 1995. Only a few scattered patches of defoliation persisted north and south of Manitouwadge. On the eastern edge of the outbreak, infestations expanded somewhat in the southwestern corner of the Hearst District, but subsided slightly in the northwest corner of the Wawa District.

In northeastern Ontario there was a slight increase in the area affected by

Cover photo: Larva of the aspen twoleaf tier *Enargia decolor* (Wlk.).

Table 1. Gross area of moderate to severe defoliation caused by the eastern spruce budworm in Ontario, 1992–1995.

Region / District	Area (ha) 1992	1993	1994	1995
Central				
Algonquin Park	26 900	20 405	57 405	33 672
North Bay	1 545	10 468	27 995	28 269
Sault Ste. Marie	965	4 639	915	2 713
Sudbury	1 365	9 150	22 640	26 371
Bancroft	0	0	0	1 828
Pembroke	0	0	0	30
	30 775	**44 662**	**108 955**	**92 883**
Northeast				
Chapleau	0	0	0	2 695
Cochrane	11 205	11 647	0	0
Hearst	458 578	268 208	42 245	53 413
Wawa	1 621 297	1 370 822	241 340	221 446
	2 091 080	**1 650 677**	**283 590**	**277 554**
Northwest				
Dryden	853 616	997 273	507 450	601 490
Fort Frances	424 784	422 244	506 878	373 401
Kenora	867 632	850 187	571 555	513 141
Nipigon	2 399 493	2 583,644	355 699	95 569
Red Lake	805 912	638 964	559 847	392 031
Sioux Lookout	533 554	556 122	367 437	576 055
Thunder Bay	1 588 892	1 247 302	1 004 558	521 802
	7 473 883	**7 295 736**	**3 873 424**	**3 073 489**
Southern				
Cambridge	0	0	20	0
Kemptville	10	85	570	5 638
Maple	2	0	0	7
Midhurst	12	17	97	97
Tweed	0	0	0	815
	24	**102**	**687**	**6 557**
Total	**9 595 762**	**8 991 177**	**4 266 656**	**3 450 483**

the small infestation on the Sudbury–North Bay district boundary in the vicinity of the village of Warren. A small, new infestation was found on the Whitefish Lake Indian Reserve and several small pockets recurred on Manitoulin Island in the Sudbury District. One large pocket and several small patches of new infestation were mapped in the Ramsey Lake area between Hall and McPhail townships, Chapleau District. In the Sault Ste. Marie District, several small pockets of defoliation were discovered in the McCarthy Lake area, southeast of Elliot Lake and north of Thessalon in Kirkwood Township. The infestation in the city of Sault Ste. Marie and environs enlarged somewhat in 1995.

In southern Ontario new infestations were mapped south and east of Arnprior. Existing infestations increased in size and intensity in Gloucester Township and in the Larose Forest area of Clarence and Cambridge townships in the Kemptville District. Small, new infestations were mapped north of Havelock in the Tweed District and a new infestation was discovered in the Coboconk area of the Bancroft District. Small pockets of infestation persisted in a number of widely separated white spruce (*Picea glauca* [Moench] Voss) plantations in the Midhurst and Maple districts.

Egg-mass surveys to predict defoliation and population trends of the spruce budworm in 1996 are currently underway. The results of these will be presented in the fall *Survey Bulletin.*

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

The total area of moderate to severe defoliation caused by the jack pine budworm in 1995 declined to 293 292 ha from the 419 344 ha recorded in 1994. Again, most of the infestation was in the Central Region although several small areas of damage, totaling 4 332 ha, were recorded in the Timmins and Chapleau districts of the Northeast Region. Nearly all of the decline occurred in the Sudbury District, where the area of moderate to severe defoliation was reduced from 277 129 ha to 116 031 ha. This was offset somewhat by increases in the Algonquin Park, North Bay, Parry Sound, Pembroke and Sault Ste. Marie districts, and by a new infestation in the Chapleau District. There were small decreases in the Temagami and Timmins districts (Table 2).

Large areas of defoliation, which occurred across the northern half of the Sudbury District in 1994, broke into numerous small patches of damage.

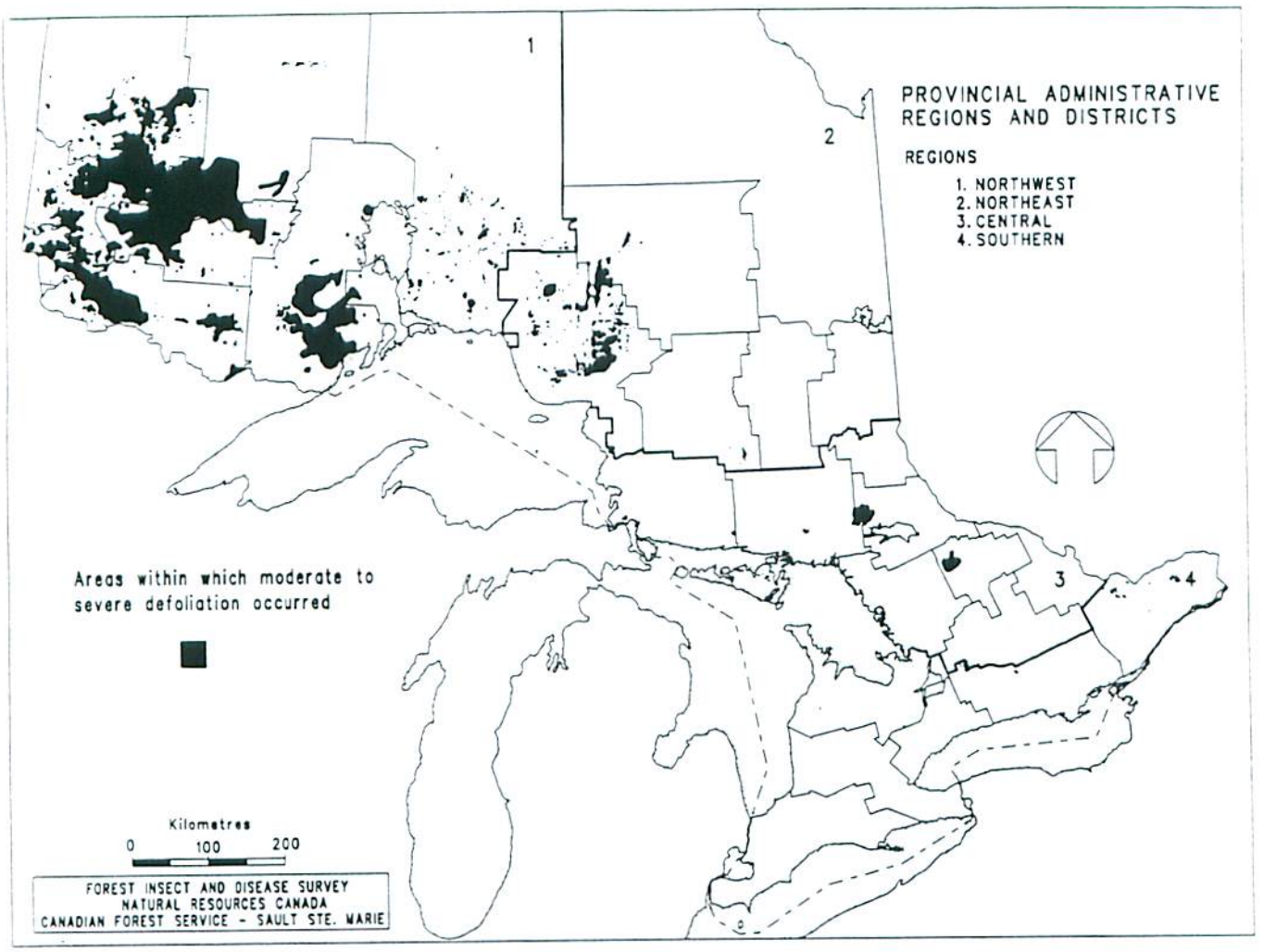

Figure 1. Spruce budworm, Choristoneura fumiferana *(Clem.), defoliation in 1995.*

These infestations also declined in intensity as much of the defoliation was moderate rather than severe. In the southern part of the Sudbury District jack pine (*Pinus banksiana* Lamb.) stands in the Cox, Delamere, Allen, and Bigwood townships were heavily damaged as part of a large infestation that extended south along the Georgian Bay coast to the area of Point au Baril in the Parry Sound District. This same infestation was mapped eastward as far as Blair Township, Parry Sound District, and northeast in a long arm along the French River to Lake Nipissing in the North Bay District. In the central part of this infestation, between the hamlet of Britt and the Naiscoot River, large white pine (*Pinus strobus* L.) were heavily defoliated and some mortality was evident. There were numerous, small pockets of defoliation around the west end of Lake Nipissing in the North Bay and Sudbury districts (Fig. 2). In addition to the large infestation along Georgian Bay in the Parry Sound District, there were several sizeable areas of damage in the Shawanaga–East Burpee–Ferguson townships area and one large pocket around the adjoining corners of East Mills, Wilson, McKenzie, and Ferrie townships.

Infestations in the Algonquin Park District were centered around Lake Traverse. Small pockets of damage were also noted on the south boundary of Guthrie Township and the east boundary of Stratton Township. In the Pembroke District a number of small infestations occurred along the Highway 17 corridor between Chalk River and Pembroke. Infestations were also recorded near Bissett Creek and Mackay. There were several pockets of defoliation north of Golden Lake and one south of Highway 62 in Alice Township.

The infestation in Sagard Township, Sault Ste. Marie District, expanded somewhat into the adjacent Poulin Township. The infestation in Westbrook and Vrooman townships, Timmins District, declined slightly. A small, new infestation was mapped in jack pine stands in the adjoining corners of Nimitz, De Gaulle, Reaney, and Strom townships, Chapleau District.

The Ontario Ministry of Natural Resources (OMNR) and E.B. Eddy Forest Products conducted aerial spraying operations on approximately 50 200 ha of jack pine stands. These

Table 2. Gross area of moderate to severe defoliation caused by the jack pine budworm in Ontario, 1992–1995.

Region / District	Area (ha) 1992	1993	1994	1995
Central				
Algonquin Park	495	380	1 590	6 312
Bancroft	30	0	0	0
North Bay	16 379	19 035	25 052	27 289
Parry Sound	77 551	91 645	106 898	129 272
Pembroke	2 704	4 202	3 875	7 077
Sault Ste. Marie	0	1 095	1 240	2 962
Sudbury	60 349	165 840	277 129	116 031
Temagami	0	50	110	17
	157 478	**282 247**	**415 894**	**288 960**
Northeast				
Chapleau	0	0	0	1 256
Timmins	0	0	3 450	3 076
	0	**0**	**3 450**	**4 332**
Northwest				
Red Lake	693	0	0	0
	693	**0**	**0**	**0**
Total	**158 704**	**282 247**	**419 344**	**293 292**

were located in the Upper and Lower Spanish River forest management agreement areas and in the Sudbury and Spanish River Crown management units. Foray 76B was applied between 18 and 25 June.

Egg-mass surveys to determine jack pine budworm population trends in 1996 are currently underway. The results of these will be presented in the fall *Survey Bulletin.*

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

There was an increase in the area affected by the forest tent caterpillar in 1995. The total area of moderate to severe defoliation was 243 125 ha, up from 166 060 ha in 1994 (Table 3). The largest infestation occurred west of the town of Cochrane in adjacent areas of the southwest Cochrane District and the southeast Hearst District. It also extended slightly into the northern Timmins District in the vicinity of Geary and Mahaffy townships (Fig. 3). Several sizeable pockets of defoliation were mapped south of the town of Cochrane in the Lamoure–Mann townships area of the Cochrane District. A cluster of small patches of defoliation was mapped along the Porcupine River east and west of Bigwater Lake in the northern Timmins District.

Several pockets of new infestation, totaling 1 338 ha, were recorded in the Kemptville District. These were located in the Winchester Bog in Mountain Township, east of Edwards in Cumberland and Osgoode townships, east of Vars in Cumberland Township, and in the Moose Creek Bog in Roxborough Township. A high proportion of larvae in these infestations was diseased. Small numbers of larvae were reported on ornamental poplar trees and bur oak (*Quercus macrocarpa* Michx.) in the town of Fort Frances, Fort Frances District.

Egg-band counts to forecast 1996 population trends will be carried out later in the field season, but large adult moth flights recorded in the city of Timmins in July may indicate some southward spread of the infestation in that area next year.

Gypsy Moth, *Lymantria dispar* (L.)

Gypsy moth populations in Ontario began rebounding in 1995 after 3 successive years of decline. The total area of moderate to severe defoliation increased to 19 879 ha from the 5 645 ha recorded in 1994 (Table 4). The most widespread defoliation occurred in the Sudbury District in numerous pockets clustered around the city of Sudbury from the Whitefish Lake Indian Reserve to the Falconbridge–Capreol townships area (Table 5, Fig. 4). Most of the defoliation was noted on white birch (*Betula papyrifera* Marsh) and trembling aspen (*Populus tremuloides* Michz.). To a lesser extent red oak (*Quercus rubra* L.) growing on exposed, rocky ridges was also infested. Single small pockets of defoliation were mapped on the north side of Finn Bay in the Killarney Provincial Park and along Highway 17 near the town of Webwood in the Sudbury District. The insect was found for the first time in infestation proportions in the Sault Ste. Marie District. Here, nine small pockets of moderate to severe defoliation were mapped in the vicinity of Lake Duborne and Granary Lake north of the town of Blind River. These infestations occurred mostly on scattered red oak and to a lesser extent on white pine and white birch growing on rocky hill tops.

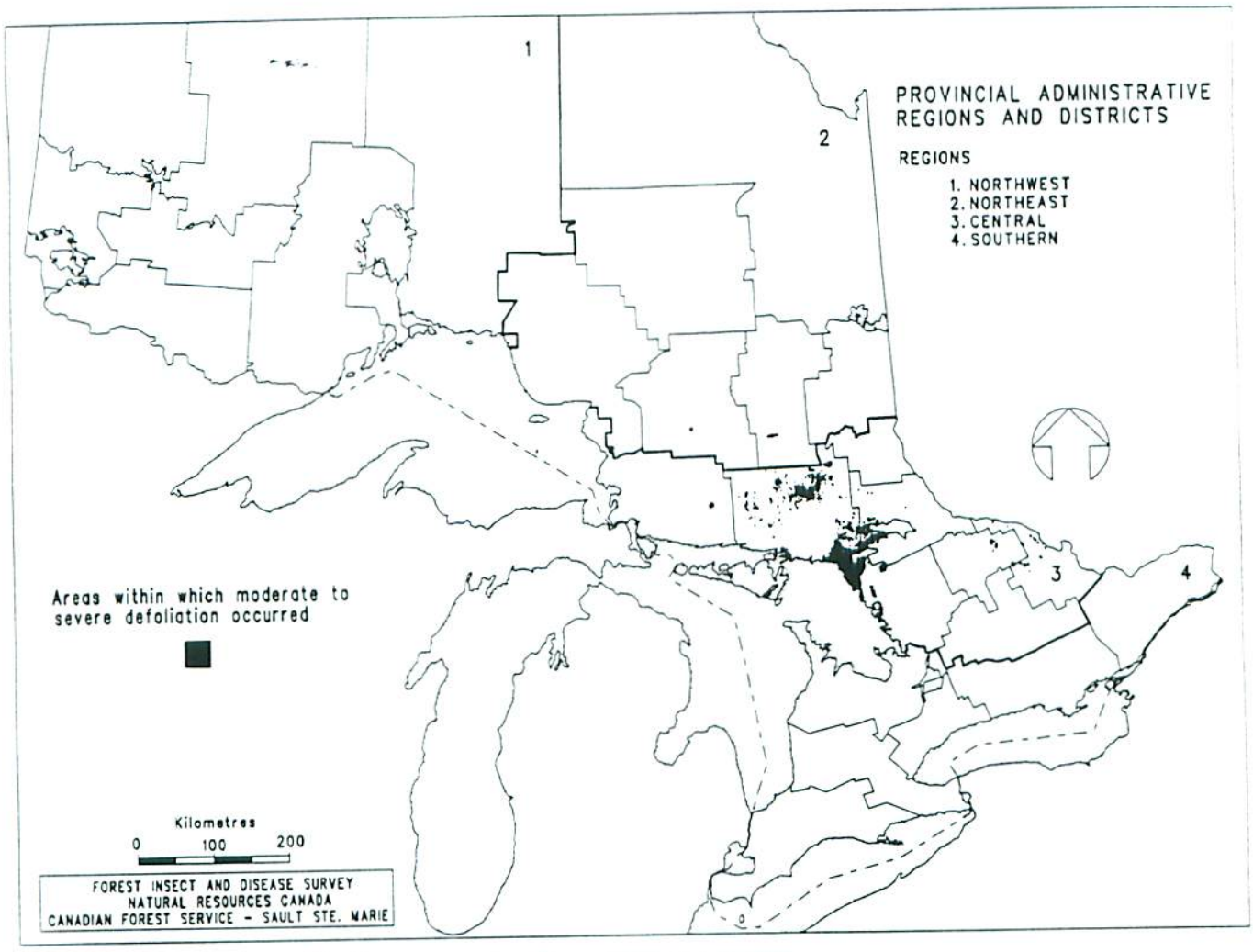

Figure 2. Jackpine budworm, Choristoneura p. pinus *Free., defoliation in 1995.*

New, heavy infestations were mapped in the Parry Sound District. In total, 2 413 ha of red oak and trembling aspen were severely defoliated between the Naiscoot River and the southern part of the Magnetawan Indian Reserve. In the Aylmer District, small infestations that occurred in Moore and Mosa townships in 1994 collapsed in 1995. Similarly, the small pockets of infestation that occurred in the Pinery Provincial Park last year declined to light intensity. New infestations, totaling 208 ha, were aerially mapped midway between the towns of Harrow and Kingsville in adjoining areas of Colchester South and Gosfield South townships. Much of this defoliation was in mature hardwood stands having a high oak content.

Pine False Webworm, *Acantholyda erythrocephala* (L.)

Increased populations of this insect were observed in parts of southern Ontario. In the western part of the Midhurst District, heavy infestations in Holland and Sullivan townships caused severe damage to a number of eastern white pine and Scots pine (*Pinus sylvestris* L.) plantations. Feeding larvae caused 45 to 90 percent loss of old foliage, and new foliage losses ranged from 5 to 50 percent. In Oro Township, in the eastern Midhurst District, approximately 89 ha of red pine (*Pinus resinosa* Ait.) and white pine were heavily infested for the third consecutive year. In this area a severely infested 24-ha block of semi-mature red pine was clear-cut in the fall of 1994. Tops of the cut trees were left on the ground in the hope that spring-emerging adults would oviposit on them rather than on nearby healthy trees. The strategy appeared to work—numerous adults laid eggs on the tops and these subsequently hatched, but the emerging larvae died as the cut tops dried out. Infestations that occurred in 1994 to the east of the main block in Oro Township collapsed in 1995. A contributing factor to this collapse may have been large flocks of the common grackle (*Quiscalus quiscula*), which were observed feeding on the larvae. In Hope Township, Tweed District, infestations increased in size and intensity. A number of eastern white pine and red pine plantations in this area sustained 100 percent loss of old foliage; damage

Table 3. Gross area of moderate to severe defoliation caused by the forest tent caterpillar in Ontario, 1993–1995.

Region / District	Area (ha) 1993	1994	1995
Central			
Bancroft	31 628	0	0
North Bay	19 025	0	0
Sudbury	34 810	0	0
	85 463	**0**	**0**
Northeast			
Chapleau	1 520	0	0
Cochrane	141 389	116 720	165 988
Hearst	358 541	49 340	72 329
Timmins	0	0	3 470
Wawa	31 457	0	0
	532 907	**166 060**	**241 787**
Southern			
Kemptville	22 473	0	1 338
Tweed	14 413	0	0
	36 256	**0**	**1 338**
Total	**655 256**	**166 060**	**243 125**

to new foliage ranged from 5 to 75 percent. Increased webworm populations were evident in the Kemptville District, where the most severe damage was recorded in a Scots pine plantation in Oxford-on-Rideau Township. Here, defoliation averaged 50 percent. A 20-ha red pine plantation in McMurrich Township, Parry Sound District, was heavily infested for the third consecutive year. While still alive, the trees in this plantation have virtually no foliage. Scattered young ornamental red pine in the city of Sudbury sustained moderate to severe foliage loss, and young red pine and white pine ornamentals in the town of Blind River and the city of Sault Ste. Marie were lightly defoliated.

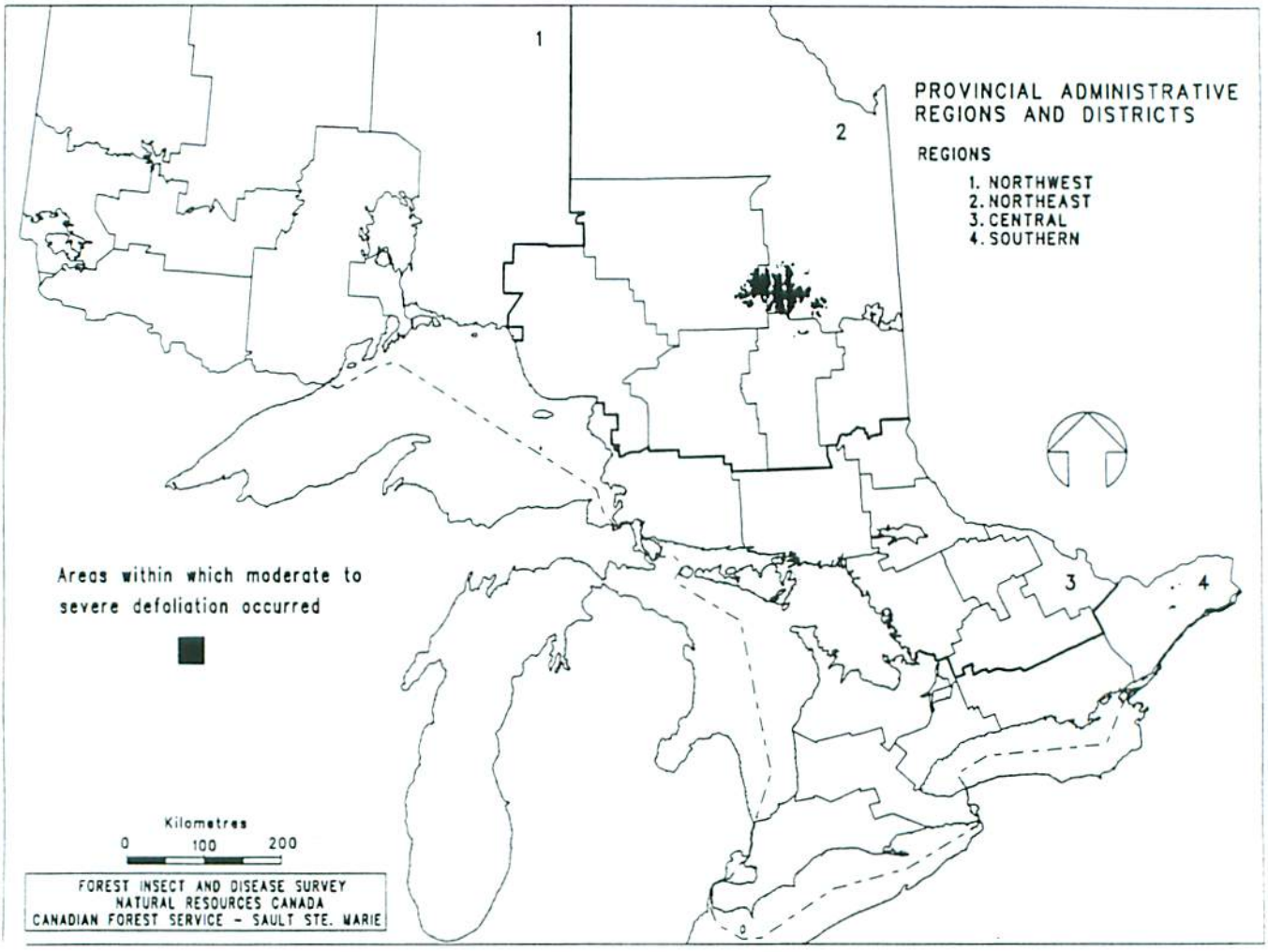

Figure 3. Forest tent caterpillar, Malacosoma disstria *Hbn., defoliation in 1995.*

Table 4. Gypsy moth infestations in Ontario, 1981–1995.

Year	Gross area of moderate to severe defoliation (ha)
1981	1 450
1982	4 870
1983	40 954
1984	80 624
1985	246 342
1986	160 776
1987	12 678
1988	29 693
1989	81 640
1990	77 648
1991	347 415
1992	34 460
1993	9 784
1994	5 645
1995	19 879

Table 5. Gross area of moderate to severe defoliation by the gypsy moth in Ontario, 1993–1995.

Region / District	Area (ha) 1992	1993	1994	1995
Central				
Algonquin Park	591	0	0	0
Bancroft	13 205	0	0	0
Parry Sound	1 513	0	0	2 413
Pembroke	2 301	0	0	0
Sudbury	3 502	6 645	5 543	17 033
Sault Ste. Marie	0	0	0	225
	21 112	**6 645**	**5 543**	**19 671**
Southern				
Aylmer	123	2 357	102	208
Cambridge	225	0	0	0
Maple	3 986	304	0	0
Midhurst	1 036	349	0	0
Tweed	7 978	129	0	0
	13 348	3 139	102	208
Total	**34 460**	**9 784**	**5 645**	**19 879**

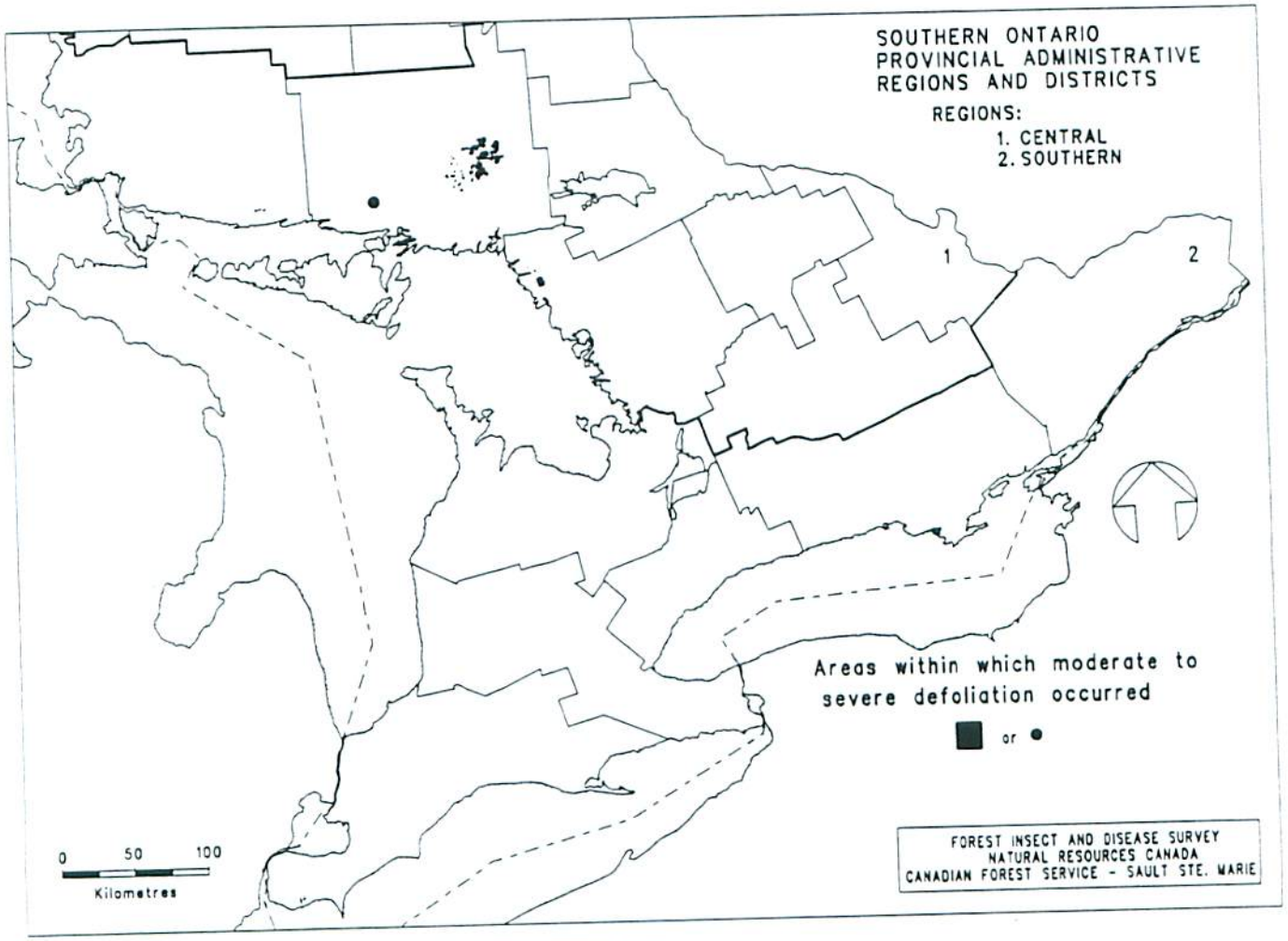

Figure 4. Gypsy moth, Lymantria dispar *(L.), defoliation in 1995.*

Oak Leaf Shredder, *Acleris semipurpurana* (Kft.)

Populations of this potentially serious pest increased in the Sault Ste. Marie District for the second consecutive year. Red oak in the city of Sault Ste. Marie and environs sustained an average of 60 percent defoliation. A similar level of defoliation was recorded on the fringes of stands along Highway 555 in Striker Township and in the Maple Ridge area of Thessalon Township. However, damage levels in the interior parts of these stands was reduced to the 10 to 20 percent range. Oak stands along the Melwel Road in Day Township, and on the Chiblow Lake Road in Patton Township, also sustained 10 to 20 percent defoliation.

In southern Ontario, two small pockets of oak leaf shredder infestation were detected in Tiny Township, Midhurst District. Here, 12- to 14-m red oak in a cottage subdivision along the Georgian Bay shoreline sustained moderate to severe defoliation. Defoliation within these stands was quite varied. Extensive surveys of oak forests in this area, which was heavily damaged in the 1970s, failed to locate any other infestations.

Larger Boxelder Leafroller, *Archips negundana* (Dyar)

Increased populations of this pest, feeding in conjunction with the fall cankerworm, (*Alsophila pometaria* [Harr.]) caused severe defoliation (up to 100 percent) on ornamental Manitoba maple (*Acer negundo* L.) in the towns of Sioux Lookout and Hudson, Sioux Lookout District and in Kenora, Kenora District. The leafroller also caused 30 to 50 percent defoliation of Manitoba maple in the towns of Dryden and Ignace in the Dryden District.

Cedar Leafminers, *Argyresthia thuiella* (Pack.) and *Coleotechnites thujaella* (Kft.)

This insect complex caused varying degrees of damage to eastern white cedar (*Thuja occidentalis* L.) stands in a number of areas in southern Ontario. The heaviest infestations occurred along the Kawartha lakes, from the vicinity of Canal Lake in Carden Township and southeast to Clear Lake in Smith Township. Cedar stands in this area sustained up to 75 percent defoliation. Scattered cedar stands in the eastern and western Midhurst District and the northern Maple District suffered somewhat lower levels of damage. Foliar damage in the 30 percent range was mapped in cedar stands along the St. Lawrence River between Brockville and Cornwall in the Kemptville District.

Jack Pine Resin Midge, *Cecidomyia resinicola* (O.S.)

For the fourth consecutive year this tiny insect caused widespread damage to young jack pine on the fringes of stands in the Sioux Lookout and Dryden districts. Medium to high midge populations were present in the Dryden Tree Nursery breeding orchard, and branch tip mortality at many locations was in the 75 to 100 percent range.

Large Aspen Tortrix, *Choristoneura conflictana* (Wlk.)

The large infestation of this insect, which occupied some 177 330 ha in adjoining parts of the Wawa, Hearst, and Chapleau districts in 1994, collapsed in 1995. Only a few areas of light defoliation were recorded in the northeast corner of the Wawa District. In the Pays Plat area of the Wawa District, 600 ha of mature trembling aspen stands were infested. A new pocket of defoliation, about 300 ha in size, was mapped along the Jackpine River on the east side of the Kama Hills, Nipigon District. Similarly, a small patch of defoliation was observed at the north end of Helen Lake. A small, 20-ha pocket of moderate defoliation was mapped south of Johnston Corners in Goulbourn Township, Kemptville District. The total area of moderate to severe defoliation was 920 ha in 1995. This compared with 197 756 ha in 1994.

Larch Casebearer, *Coleophora laricella* Hbn.

Populations of this pest increased in the eastern part of the province during 1995. The most severe damage occurred in the Midhurst, Maple, and Tweed districts, where a number of tamarack (*Larix laricina* [Du Roi] K. Koch) stands and European larch (*Larix decidua* Mill.) plantations were heavily attacked. Defoliation was often in the 80 to 100 percent range. Scattered pockets of medium or heavy infestation were also evident in the Kemptville District. Here, defoliation levels occasionally reached 100 percent. In the Algonquin Park and Pembroke districts, where populations rebounded after declining in 1993 and 1994, defoliation in natural tamarack stands ranged from 37 to 78 percent. Increased insect populations were also reported at three locations in the Parry Sound District and in a number of areas in the southern parts of the North Bay, Sudbury, and Sault Ste. Marie districts. Defoliation in these areas was less intense, generally ranging from 20 to 40 percent. Occasionally, it reached 75 percent on individual trees.

Introduced Pine Sawfly, *Diprion similis* (Htg.)

Surveys for the first generation of this pest indicate reduced populations in the Parry Sound District. Low numbers of larvae were found along the Georgian Bay coastline in the Dillon–Snug Harbour area, where heavy infestations for the past 2 years have killed a number of mature, shoreline white pine. Increased, but still low, sawfly populations were observed in a white pine seed orchard in Snowdon Township, Bancroft District and in a number of widely separated points in the Sault Ste. Marie District.

Aspen Twoleaf Tier, *Enargia decolor* (Wlk.)

This early-season defoliator caused widespread damage to trembling aspen stands throughout much of northeastern Ontario in 1995. The

gross area of moderate to severe defoliation was 4 802 965 ha.

The main infestation, totaling 4 003 460 ha, extended from the vicinity of the township of Kapuskasing east through parts of the Chapleau, Timmins, and Kirkland Lake districts to the Quebec border, and south through the Sudbury, Temagami, and North Bay districts. A narrow band reached into the northern Parry Sound District (Fig. 5). Another large infestation (738 036 ha) extended from the vicinity of Trout Lake, near the city of North Bay, through the eastern corner of the North Bay District and the central Algonquin Park District to the northern parts of the Bancroft and Pembroke districts. A third, smaller infestation (39 186 ha) extended from the Otter Lake area in Gooderham Township, east to the Ottawa River on the Quebec border in the northeast North Bay District. A few small pockets of damage occurred along the edge of the main infestation in the Chapleau District and in the Parry Sound District as far south as Carling Township. Light infestations were reported in the northeast corner of the Sault Ste. Marie District.

Satin Moth, *Leucoma salicis* (L.)

This introduced pest caused severe defoliation of Carolina poplar (*Populus eugenei* Simon-Louis) and European white or silver poplar (*Populus alba* L.) in a number of areas in the Kemptville, Tweed, Maple, and Midhurst districts. Damage was most evident on roadside plantings along Highways 400 and 27 between Toronto and Barrie in the Maple and Midhurst districts, and along Highway 401 between Oshawa and Cobourg in the Maple and Tweed districts. Heavy infestations were also reported on ornamental and boulevard trees at Canadian Forces Base Borden, and on ornamental and windbreak trees in the Stayner and Creemore areas of the Midhurst District. Defoliation, often in the 100 percent range, occurred sporadically on ornamental and windbreak trees in the Kemptville District.

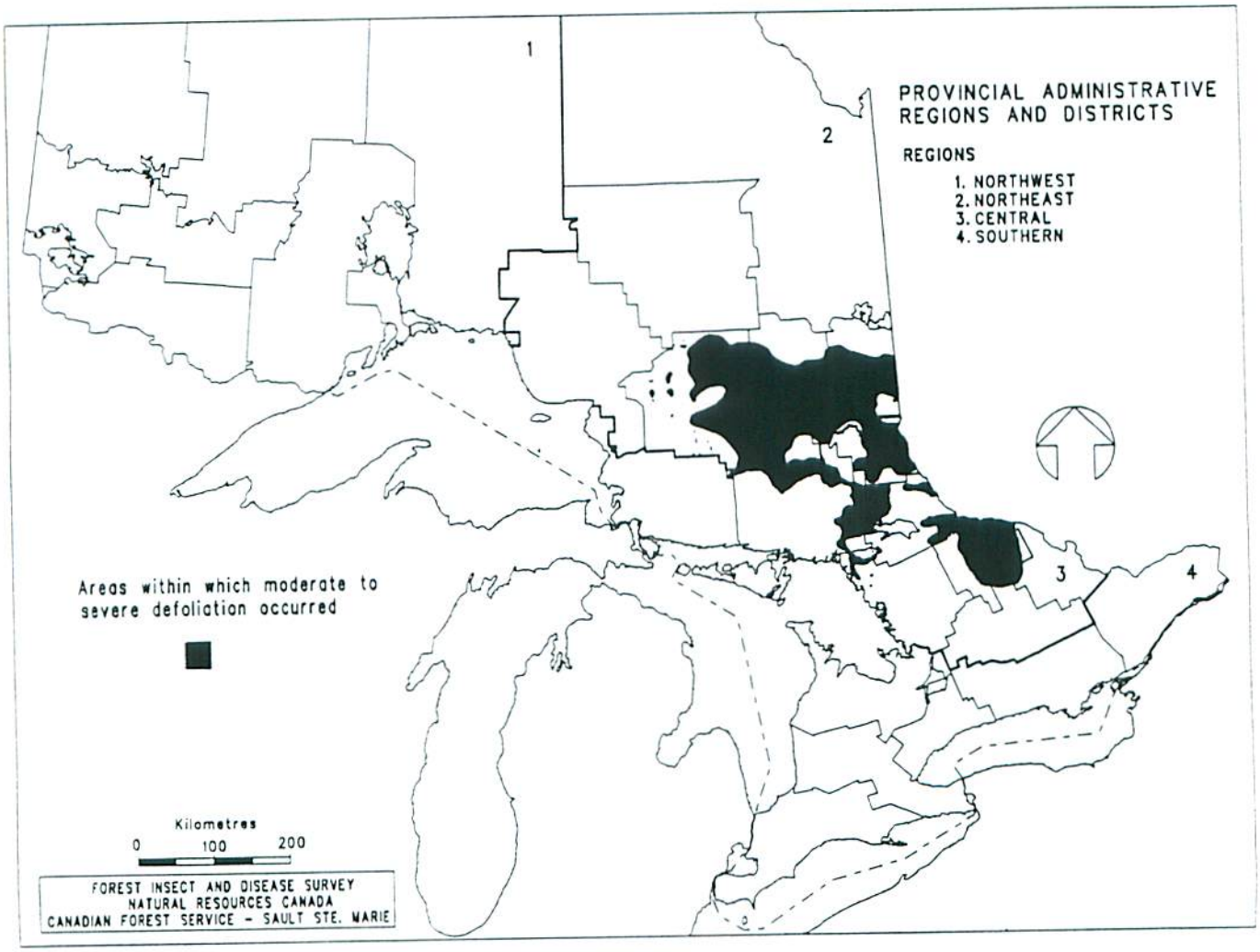

Figure 5. Aspen twoleaf tier, Enargia decolor *(Wlk.), defoliation in 1995.*

Balsam Fir Sawfly, *Neodiprion abietis* complex

This early-season pest was prevalent in a number of areas in northwestern and eastern Ontario. In the Thunder Bay District, larval feeding caused approximately 40 percent defoliation of balsam fir (*Abies balsamea* [L.] Mill.) stands in the Shebandowan–Huronia Lake area, east of English River in Inwood Township, between Nolalu and Sandstone Lake in Devon Township, and in the Cloud Lake–Moose Hill area of Scoble Township. Similar defoliation levels were reported along Highway 11 east of Rainy River and along the southern portions of the Manion Lake and Turtle River roads in the Fort Frances District.

In eastern Ontario, a number of small stands in Bagot and McNab townships, Pembroke District, sustained defoliation ranging from 50 to 60 percent. Defoliation in the 40 percent range was reported in balsam fir stands south of Arnprior in the Kemptville District. Populations declined in previously infested areas of the Bancroft District, but defoliation averaging 40 percent persisted in some stands in Cardiff and Monmouth townships. The insect was also reported in low numbers in a few areas in the Sault Ste. Marie and Sioux Lookout districts.

Pine Sawflies, *Neodiprion nanulus nanulus* Schedl., *N. pratti banksiana* Roh., and *N. pratti paradoxicus* Ross.

The red pine sawfly (*Neodiprion nanulus nanulus*) attacked jack pine stands in a number of areas in Devon Township, Thunder Bay District. Defoliation ranged from 2 to 50 percent in affected areas. A few colonies of this insect were also observed on red pine trees at the Ontario Ministry of Natural Resources air base at Sioux Lookout.

The blackheaded jack pine sawfly (*N. pratti banksiana*) was found in increased numbers in the Sioux Lookout, Dryden, Fort Frances, and Thunder Bay districts. The highest populations were in the southern Fort Frances District between the Manion Lake Road and the village of Mine Centre. Jack pine in the 1- to 12-m range sustained an average of 40 percent defoliation; however, individual trees or small clumps of trees had between 70 and 100 percent foliage loss. Scattered roadside jack pine along Highway 599 in the English River area of the Dryden District had defoliation levels in the 50 percent range, and small, fringe jack pine along Highway 642 in Drayton Township, Sioux Lookout District, suffered similar defoliation. A single 10-ha plantation of 5-m jack pine in Alice Township, Pembroke District, sustained an average of 12 percent defoliation.

The closely related jack pine sawfly (*N. pratti paradoxicus*) caused severe defoliation of some 1 881 ha of jack pine stands in the Kaladar area of the Tweed District and to 250 ha north of Brockville in the Kemptville District. Numerous small jack pine plantings in the area from Brockville and Arnprior east to the Quebec border in the Kemptville District were also attacked. Defoliation ranged from 20 to 80 percent. Increased sawfly populations were reported from the Pembroke District, where defoliation in affected stands ranged from 27 to 72 percent. An infestation in Methuen Township, Bancroft District, where defoliation was very heavy in 1994, declined somewhat. However, foliar damage persisted in the 40 to 50 percent range. This insect also infested scattered jack pine trees in the town of Espanola in the Sudbury District. Here, defoliation was in the 15 to 95 percent range.

Serpentine Leafminer, *Phyllocnistis populiella* Cham.

Unusually heavy infestations of this pest of trembling aspen were reported in northwestern Ontario. The greatest infestation occurred in the northeast Nipigon District, where severe foliar damage was aerially sketch mapped over 88 740 ha. Trees affected ranged in size from small regeneration to approximately 20 m in height. Elsewhere, in the western Nipigon District, small areas of moderate damage were encountered along the Little Sturge Lake Road and at Kilometre 46 on the Black Sturgeon Road.

A small infestation (1 ha) on the Escape Creek Road in the Thunder Bay District revealed foliar damage in the 75 percent range. A very heavy infestation caused 100 percent foliar damage to sapling-sized trembling aspen in a 3-ha area near Badesdawa Lake, north of the town of Pickle Lake in the Sioux Lookout District.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* Roh.

The yellowheaded spruce sawfly is a serious pest of young white spruce and black spruce (*Picea mariana* [Mill.] BSP.) growing in open situations. Trees occurring in young plantations, in windbreaks and shelterbelts, as ornamentals, and on stand fringes are most susceptible.

Early surveys have shown increased sawfly populations in northeastern Ontario in the Timmins and Kirkland Lake districts, the southern Cochrane District, and in the northern Temagami District. Average defoliation was in the 30 to 40 percent range, but reached as high as 100 percent on individual trees and on small clumps of trees. Infestations were less widespread but still severe in several areas of the North Bay and Sudbury districts. Widespread, light infestations were also reported in the Fort Frances and the southern Kenora districts. The highest populations caused 70 percent defoliation of white spruce in the town of Kenora.

In southern Ontario, sporadic heavy infestations occurred in the Algonquin Park District. The heaviest damage was on young white spruce along the Highway 60 corridor in Sproule Township. Here, defoliation averaged 80 percent. A similar situation prevailed in the Parry Sound, Bancroft, and Pembroke districts. The most severe damage in these districts occurred in a white spruce plantation in Blair Township, Parry Sound District, where heavy defoliation caused

5 percent mortality along with a high number of dead and dying tops. High sawfly populations, and defoliation up to 90 percent, were reported in Lanark Township, Kemptville District, and in numerous locations in the western part of the Tweed District.

Early Aspen Leafcurler, *Pseudexentera oregonana* (Wlsm.)

Populations of this early-spring pest declined drastically for the second consecutive year. The total area of moderate to severe defoliation was 5 250 ha. This compared with 399 390 ha in 1994. Nearly all of the moderate to severe defoliation was located in the Timmins District, with numerous small pockets of defoliation east and west of the city of Timmins between Lemon Hill and Nighthawk Lake. A single, small pocket of moderate to severe defoliation (<1 ha) was reported in Clute Township, Cochrane District, and a few small patches of defoliation were noted in Leitch Township, Cochrane District.

Other Noteworthy Insects

A low population of the pine root collar weevil (*Hylobius radicis* Buch.) was found in the Nungesser Road jack pine progeny test in the Sioux Lookout District.

Adult feeding by the whitespotted sawyer (*Monochamus s. scutellatus* [Say]) caused varying levels of branch and twig mortality and low main stem damage on 6-year-old jack pine over a 120-ha area south of Sowden Lake, Dryden District.

The gray willow leaf beetle (*Tricholochmaea decora decora* [Say]) caused severe defoliation of willow (*Salix* spp.) trees in a large area between Lake of the Woods and the English River, Kenora District.

The cottony maple scale (*Pulvinaria innumerabilis* [Rathv.]) caused varying levels of defoliation on ornamental silver maple (*Acer saccharinum* L.) in and around the city of Windsor in the Aylmer District.

High populations of the eastern blackheaded budworm (*Acleris variana* [Fern.]) caused approximately 30 percent defoliation in a 2-ha stand of eastern hemlock (*Tsuga canadensis* [L.] Carr) near Leonard Lake in Monck Township, Parry Sound District. The insect also caused light defoliation in eastern hemlock trees near Flinton, in Kaladar Township, Tweed District and near Temperance Lake in Rear of Yonge and Escott townships, Kemptville District.

Spruce bud moths (*Zeiraphera* spp.) caused new shoot damage as high as 80 percent on white spruce trees in the city of Sault Ste. Marie, on the Garden River First Nation lands, in St. Joseph and Lewis townships, and in the village of Iron Bridge in the Sault Ste. Marie District.

Increased activity by the sugar maple borer (*Glycobius speciosus* [Say]) was noted in sugar maple (*Acer saccharum* Marsh.) plots in Van Koughnet and Laird townships, Sault Ste. Marie District.

High numbers of the birch–aspen leafroller (*Epinotia solandriana* [L.]) caused 50 percent foliar damage to semimature white birch and trembling aspen at Rainbow Falls and Rossport provincial parks, Nipigon District. The same insect caused 15 percent foliar damage to a small stand of 6-m white birch in the Overnight Road area of the Red Lake District.

TREE DISEASES

Scleroderris Canker Disease, *Gremmeniella abietina* (Lagerb.) M. Morelet

European Race

The annual detection survey for the European race of this fungus was carried out again in 1995. No significant spread from previously infected areas was discovered. However, damage appears to have intensified within some infected pine plantations in the Bancroft and Parry Sound districts. This was particularly evident in McMurrich Township, Parry Sound District and in Mayo Township, Bancroft District. Thus far in the 1995 season, 38 collections have been positively identified as the European race.

North American Race

The North American race of scleroderris canker disease was collected at 15 of the same locations where the European race was found in the Parry Sound and Bancroft districts. It was also found at varying infection levels at seven other locations in these two districts. Infection levels reported in young red pine and Scots pine plantations at scattered locations in the North Bay, Sault Ste. Marie, Hearst, Cochrane, Temagami, and Kirkland Lake districts were generally low, but there were exceptions. In Olrig Township, North Bay District, infections persisted in a 10-ha, 2.7-m red pine plantation. Here, 21 percent of the trees were infected. In Van Koughnet Township, Sault Ste. Marie District, 40 percent of the 2.3-m red pine were infected in a 4-ha plantation. A new infection discovered in a small (0.5-ha) red pine plantation in Tarentorus Township, Sault Ste. Marie District, revealed 28 percent of the trees as being infected. Infection levels of 6.3 percent and mortality of 1.3 percent occurred in a 75-ha jack pine plantation in Dempsay Township, Cochrane District.

Armillaria Root Rot, *Armillaria ostoyae* (Romagn.) Herink

As usual, there were widespread reports of this disease in young conifer stands and plantations. Infection levels in 1995 were quite low, however, with less than 2 percent of the trees affected at the majority of sites. In Machin Township, Hearst District, 3.3 percent of the 1.2-m white spruce in a 25-ha plantation were infected. In the Evelyn Township family test site in the Timmins District, 2.7 percent of the 1.9-m jack pine were damaged in a 5-ha area. The disease killed a patch of five trees in a 14-m red pine plantation in Uxbridge Township, Maple District.

Pine Needle Rust, *Coleosporium asterum* (Dietel) Syd. & P. Syd.

Pine needle rust was encountered sporadically across the province on jack pine and red pine. Although infection levels were often high (100 percent in some cases), actual foliar damage was usually quite low. One of the more serious infections encountered during 1995 was at the Clay Hill plantation site in Booth Township, Nipigon District. Here, 89 percent of the 1.7-m jack pine sustained an average of 66 percent foliar damage over an area in excess of 100 ha. In Elgie Township, Hearst District, young jack pine 1.7 m in height were 100 percent infected. Defoliation averaged 55 percent over a 500-ha site. A 5-ha jack pine plantation in Ledger Township, Nipigon District, sustained an average of 40 percent foliar damage on 70 percent of the trees. Similarly, a 1.5-ha red pine plantation in Morson Township, Fort Frances District, suffered an average of 25 percent foliar damage on 70 percent of the trees.

Sweet Fern Blister Rust, *Cronartium comptoniae* Arthur

Sweet fern blister rust is commonly found in jack pine stands in Ontario wherever its alternate hosts, sweet fern (*Comptonia peregrina* [L.]) and sweet gale (*Myrica gale* L.), occur. The disease causes basal stem cankers, which often girdle and kill young trees and distort the growth of older stems. The heaviest infection reported in 1995 was at one location in Calvert Township, Cochrane District. Here, 15 percent of the 21-m roadside buffer jack pine had stem cankers. In an adjacent 10-ha, 1.1-m jack pine plantation, 7 percent of the young trees sustained basal stem cankers. Low infection levels of the disease were also reported in the Kenora, Red Lake, Timmins, Temagami, and Kirkland Lake districts.

White Pine Blister Rust, *Cronartium ribicola* J.C. Fischer

There were widespread reports of this disease, but infection rates in 1995 appeared to be somewhat lower than in recent years. The most severe damage reported was in a 5-ha plantation of 1.7-m white pine in Lyndoch Township, Pembroke District. Here, 27 percent of the trees were infected. In Strathroy Township, Temagami District, 18.6 percent of the 0.9-m trees were infected. The incidence of infection at other reported locations ranged from <1 percent to 14 percent. At one location near Penelope Lake in Snow Township, Sault Ste. Marie District, the disease caused branch and main stem cankers on two mature white pine. Many tree crowns appeared to be in poor condition in this stand.

Tar Spot Needle Cast, *Davisomycella ampla* (Davis) Darker

An increased incidence of this foliage disease was evident in jack pine stands in several areas of Ontario in 1995. It was most prevalent in the Algonquin Park and Pembroke districts. Evaluations revealed that 30 to 60 percent of the trees were affected and that foliar damage levels ranged from 35 to 55 percent. In Firstbrook Township, Temagami District, 61 percent of the trees in a 2.5-m, 5-ha jack pine stand sustained average foliar damage of 30 percent. Numerous other stands in the Temagami, Timmins, and Kirkland Lake districts were infected, but showed slightly lower levels of damage. Foliar damage as high as 100 percent was recorded on fringe trees and on individual and small clumps of trees at a number of locations in the Sioux Lookout and Dryden districts. The disease was also observed at low-damage levels in the Fort Frances, Thunder Bay, Sault Ste. Marie, Red Lake, Chapleau, and Kenora districts.

Western Gall Rust, *Endocronartium harknessii* (J.P. Moore) Y. Hirats.

This gall-causing rust is common on jack pine throughout Ontario, particularly in young stands. Infections are considered severe when galls occur on the main stem or on more than 25 percent of the branches. There were widespread reports of the disease in 1995. The most severe damage occurred in the Sioux Lookout District, where the proportion of severely galled trees was in the 8 to 10 percent range in young stands in the Moose Lake and Stanzhikimi Lake areas. An increased incidence of gall rust was evident in the Temagami, Kirkland Lake, and Timmins districts. Here, the proportion of diseased trees was as high as 16 percent, and severely galled trees ranged from about 1 to 5 percent. Examination of a heavy infection at Coli Lake, Red Lake District, revealed that 22 percent of the trees were infected. At the Raith family test site in Robson Township, Thunder Bay District, 17 percent of the 2.9-m trees were infected. The disease was also reported from the Kenora, Fort Frances, Chapleau, Hearst, Cochrane, Sault Ste. Marie, and Wawa districts.

ABIOTIC DAMAGE

Frost Damage

Unusually cold temperatures at a number of locations in northern Ontario during early June damaged the new growth on many coniferous species, particularly white spruce and balsam fir. The most widespread, severe damage was in the Hearst District. Damage reported to young white spruce and balsam fir was often 100 percent, and up to 28 percent of the new shoots were killed. Severe damage also occurred at several locations in the eastern Thunder Bay District and in the western Nipigon District. Here, some young white spruce plantations had 100 percent of the trees affected and new shoot damage ranged from 80 to 100 percent. Less severe damage was commonly observed on white spruce and balsam fir, and occasionally on black spruce, in the remainder of northern Ontario as well as in the Parry Sound and Bancroft districts in southern Ontario. Frost damage was recorded on white ash (*Fraxinus americana* L.) and black ash (*Fraxinus nigra* Marsh.) at a number of widespread locations in the Kemptville, Tweed, Maple, and Midhurst districts.

Winter Drying

This condition, caused by warm weather in late winter and early spring, results in a loss of moisture from conifer foliage. Frozen roots and stems cannot replace the moisture and the needles and buds dry out and die.

There were relatively few reports of winter drying in 1995. A number of red pine plantations in the Huntsville–Sundridge area of the Parry Sound District were affected, but the most severe damage was reported in Strong Township. Here, a single 5-ha plantation averaged 22 percent foliar damage to 79 percent of the trees. Assessment of young white pine trees at one location in Ledger Township, Nipigon District, revealed that 90 percent of the trees were affected; foliar damage was 50 percent.

Blowdown

Severe storms in late 1994 resulted in the blowdown of approximately 1 058 ha of jack pine, black spruce, white birch, eastern white pine, and cedar in three areas in the Fort Frances District. These were located near Eyelid Lake east of Manitou Stretch, east and west of Pettit Lake, and in the area between Caliper Lake and Weld Lake. Severe thunder storms on 13 and 14 July caused scattered blowdown of ornamentals in the Midhurst, Maple, Tweed, Parry Sound, and Bancroft districts. In a few areas, forest trees were also affected. The most severe damage was in Havelock Township, where an estimated 800 ha of sugar maple and eastern white pine were blown over. High winds also caused scattered damage to forest trees in the Garden River First Nation lands, and in the Echo Bay–Echo Lake area of the Sault Ste. Marie District.

Other Noteworthy Diseases

Diplodia tip blight (*Sphaeropsis sapinea* [Fr.] Dyko & B. Sutton) caused varying degrees of damage to ornamental Austrian pine (*Pinus nigra* Arnold), red pine, mugho pine (*Pinus mugho* Turra), and Scots pine in a number of areas in the Midhurst and Maple districts.

Several small infections of ink spot of aspen (*Ciborinia whetzelii* [Seaver] Seaver) were reported from the Sioux Lookout and Dryden districts.

Light foliar damage caused by American spruce–raspberry rust (*Pucciniastrum americanum* [Farl.] Arthur) was found on 39 percent of the white spruce over a 3-ha area in Laurier Township, Parry Sound District.

Butternut canker (*Sirococcus clavigignenti-juglandacearum* V.M.G. Nair, Kostichka & Kuntz) caused varying degrees of damage to butternut trees at several locations in the Midhurst and Kemptville districts.

Increased levels of Dutch elm disease (*Ophiostoma ulmi* [Buisman] Nannf.) were reported on white elm (*Ulmus americana* L.) in the Tweed, Kemptville, and Fort Frances districts.

A light infection of the needle cast (*Isthmiella faullii* [Darker] Darker) was reported on roadside balsam fir at Milkshake Lake on the Sibley Peninsula, Thunder Bay District.

Fomes root rot (*Heterobasidion annosum* [Fr.:Fr.] Bref.) continued to cause small pockets of mortality in red pine stands in Larose Forest, Kemptville District.

Low levels of damage by aspen shoot blight (*Venturia macularis* [Fr.:Fr.] E. Müll. & Arx) were reported in young trembling aspen stands in the Red Lake, Kenora, Fort Frances, Kemptville, and Tweed districts.

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November 1995

ISSN 0832-7173