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FORESTRY BULLETIN

June - July, 1975

FOREST INSECT AND DISEASE CONDITIONS IN ONTARIO

Disease Survey Officer, Henry Gross (left) and Senior Pathology Technician, Ed Buchan (right) demonstrate survey procedures for Scleroderris canker disease to technician trainee, Hugh Evans. (photo taken in the Chapleau District)

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The Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The spruce budworm situation in Ontario has worsened considerably.

South of the French River and Lake Nipissing, boundaries of moderate-to-severe defoliation changed slightly from those of 1974, but within the area mapped (Fig. 1) most stands of spruce and fir again came under severe attack by feeding budworm. The total area increased from 2,200,000 ha (5.5 million acres) in 1974 to 2,500,000 ha (6 million acres) in 1975. The increase resulted mainly from an extension of the outbreak in the Algonquin Region, namely in Boyd and Pentland townships in the north and in Bagot and McNab townships near Arnprior. Feeding damage was again only light in a large area south of Pembroke in spite of high egg counts made in 1974, but four small new infestations were found west of the main outbreak, three in the Parry Sound District and one in the Bracebridge District. In stands of fir and spruce infested longest in the Algonquin Region, mortality of balsam fir and white spruce is advancing.

In the three most southerly regions the spruce budworm again proved troublesome. In the Eastern Region, more or less continuous infestation was mapped in the northern part of the Tweed District. South and east of this, infestation was conspicuous almost everywhere that host trees occurred. In the Central Region, continuous defoliation occurred in the northern part of the Lindsay District and in the southern part budworm feeding damage was much more evident than in 1974. In the Southwestern Region, owing to a heavy moth influx in 1974, defoliation of white spruce was severe throughout the Bruce Peninsula and stands of white spruce and Norway spruce in other parts of the Region showed feeding damage ranging from light to severe. In these regions three major forest nurseries were affected, St. Williams, Midhurst and Kemptville, and control actions were required.

The outbreak in northeastern Ontario was almost half again as large as it was in 1974 with populations rated extreme over an enormous area between Lake Superior in the west and the Ontario–Quebec border in the east (Fig. 1). Some 11,000,000 ha (27.2 million acres) have been affected compared with 7,500,000 ha (18.5 million acres) in 1974. Generally, the boundaries of continuous infestation extended up to 50 km (30 miles) north and south of boundaries in 1974 and a large new infestation was mapped around Lake Abitibi. New infestations were also detected considerable distances from the northern fringe of the outbreak (e.g., near Hornepayne and Kapuskasing), and also in the Pukaskwa area south of Marathon in the White River District. New infestations between Mattawa and the southern end of Lake Temiskaming resulted in a merging of the northeastern and southeastern segments of the outbreak. Other major changes were the southward advance of the outbreak to the North Channel in the Sault Ste. Marie and Blind River districts and somewhat less spectacular extensions to the south in the Sudbury District. Whereas we concentrated on defoliation mapping during June and early July, numerous stands in the "grey phase" were also recorded. These are stands in which insufficient foliage remains on the trees to reveal budworm feeding activity. Mortality is progressing in these areas but not nearly as rapidly as expected, owing in part to the virtual absence of the balsam fir bark beetle, *Pityokteines sparsus* Lec. Much more work remains before any meaningful information can be gathered on tree mortality.

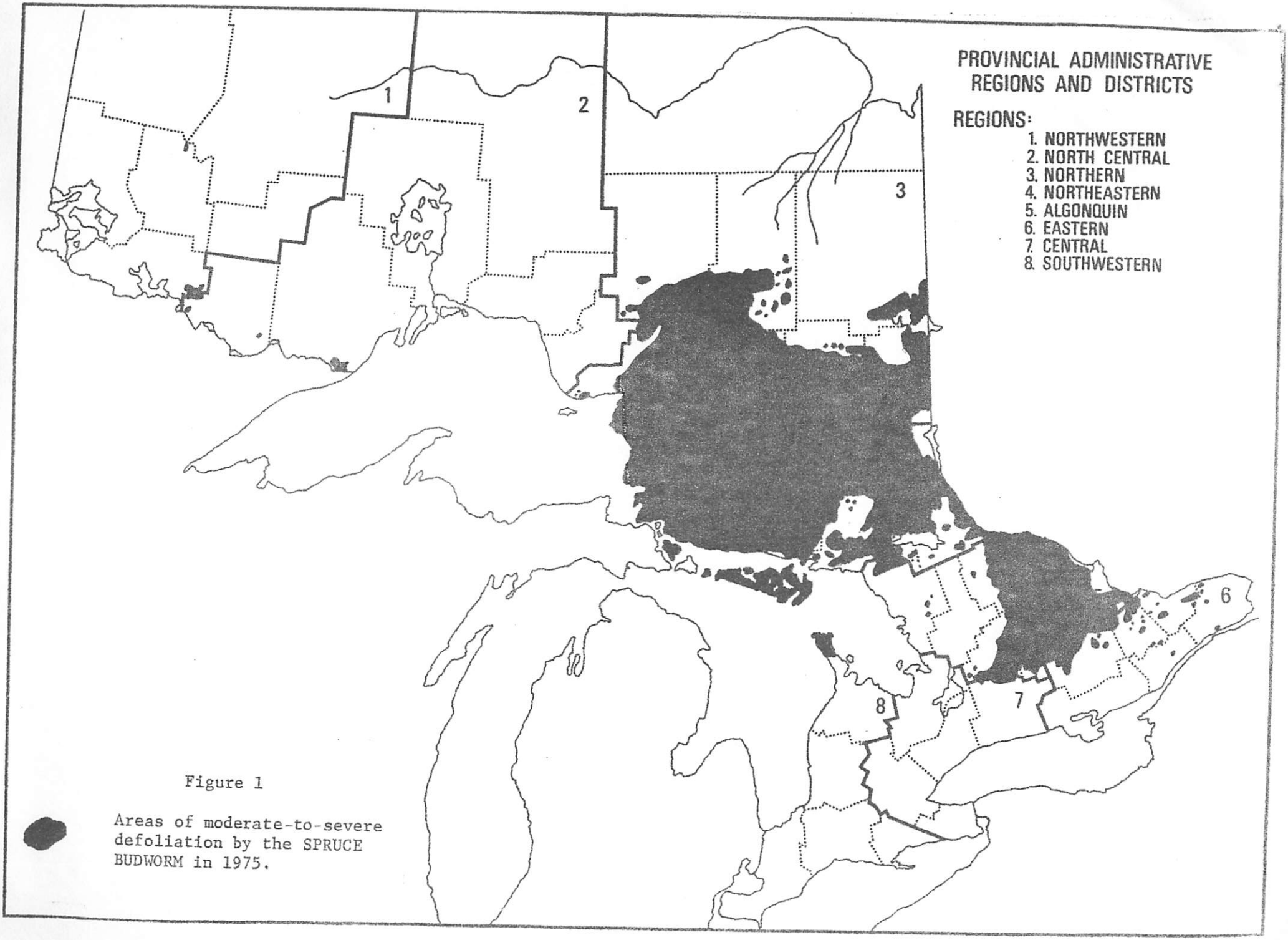

Figure 1

Areas of moderate-to-severe defoliation by the SPRUCE BUDWORM in 1975.

West of Lake Nipigon, where much effort has been devoted to the detection and delineation of spruce budworm feeding injury, two infestations of note are known. One, treated in 1975, was located around Bennett Lake in the Fort Frances District. Here defoliation was mapped over roughly 11,000 ha (27,000 acres), but most of this had developed before sprays were applied. Egg counts now under way will reveal the level of surviving populations in this area. Secondly, a new infestation of 6,700 ha (16,500 acres) was found along the Pigeon River south of Thunder Bay. Two small pockets of defoliation are also known in the Atikokan District, one east of Namakan Lake, the other near Kawa Bay on Kawnipi Lake. These four infestations are all that are known. Elsewhere, populations appear to be increasing over much of northwestern Ontario but generally they remain low. What this population change means remains to be seen.

In summary, the current spruce budworm outbreak now covers a total area of 13,600,000 ha (33,700,000 acres) in the province. Weather conditions during May and June, 1975 were extremely favorable for the survival of spruce budworm and consequently infestations attained or exceeded forecast levels. Warm sunny weather prevailed from early May when overwintered larvae began to feed and continued through the periods of larval feeding, moth flight and egg hatching. Phenological development was earlier than usual (by 2 weeks or more), a condition which minimizes the effect of factors such as bird predation, parasitism, etc., which tend to hold down populations. A growing proportion of balsam fir and white spruce trees that have been infested for many consecutive years in northeastern Ontario and in the Algonquin Region are now dead and the picture is changing rapidly.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

In all but one region infestations of this pest intensified and expanded, new infestations occurred, and numbers increased generally (see Fig. 2 for locations of moderate-to-severe defoliation of broad-leaved trees).

In the Northwestern Region, a large new moderate-to-heavy infestation appeared in the southwestern part of the Red Lake District, extending from the Ontario-Manitoba border east to Red Lake and spilling over into the northern part of the Kenora District. Scattered pockets of moderate-to-severe defoliation occurred north of the above infestation and southeast of Red Lake. Trembling aspen was also defoliated in and around the town of Kenora and the infestation that had been centered around Dryden since 1972 persisted and caused moderate-to-severe defoliation within an area of approximately 670 km^2 (260 sq. miles).

Meanwhile, infestations in the North Central Region virtually collapsed owing to poor egg hatch with relatively small areas of defoliation located in Bicknell, Boyce and Bell townships in the extreme eastern part of the Geraldton District. Some defoliation also occurred in and around the town of Atikokan. The appearance of tent caterpillar infestations in the towns of Kenora and Atikokan is thought to be due to the influx of egg-laden female moths from the west in 1974.

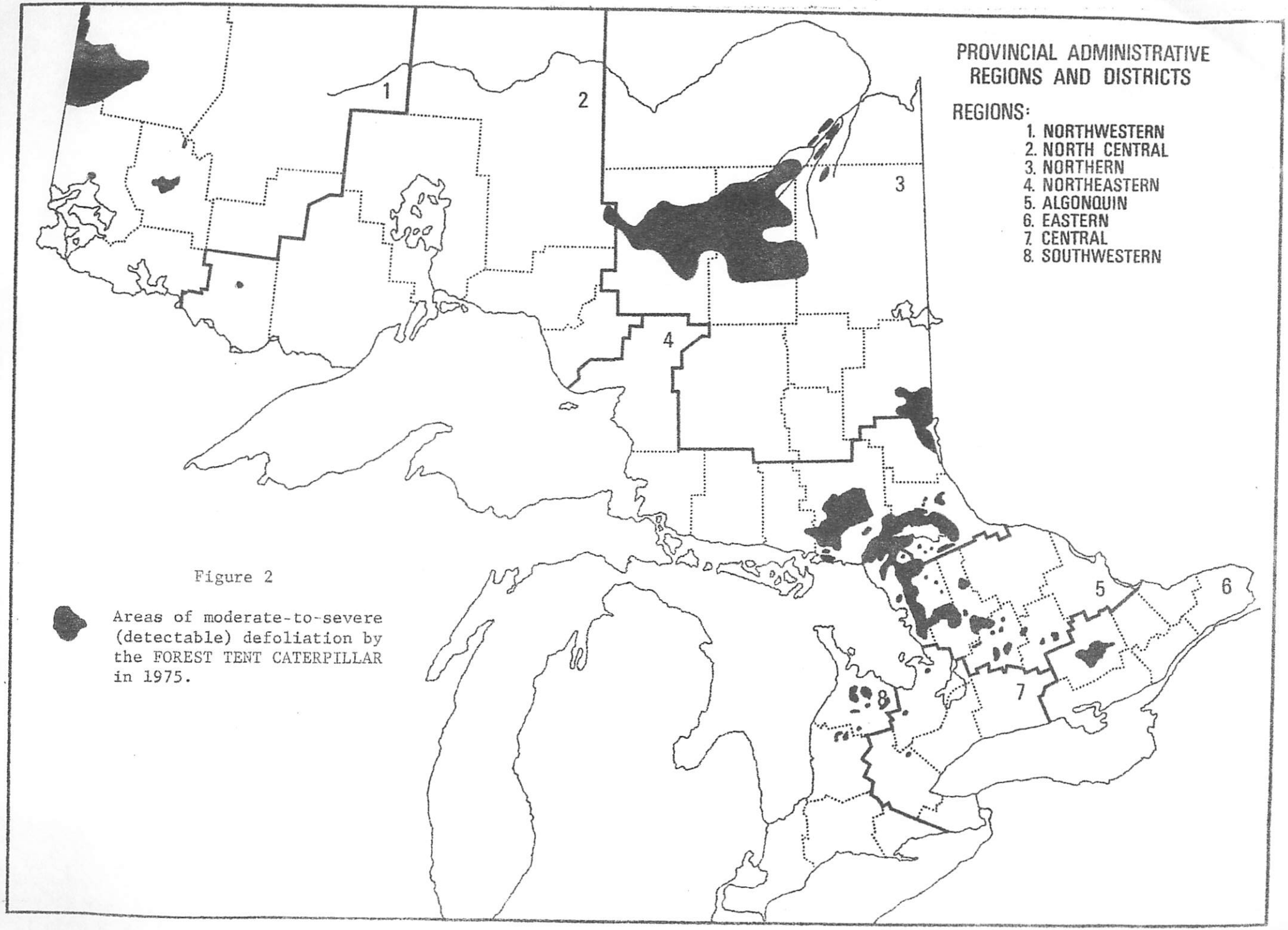

Figure 2

Areas of moderate-to-severe (detectable) defoliation by the FOREST TENT CATERPILLAR in 1975.

In the Northern Region, infestations continued to build up. The 1974 Hearst infestation expanded eastward and northward into the Kapuskasing, Cochrane and Moosonee districts and now covers 18,600 km^2 (7,200 sq. miles). In the Thorneloe–New Liskeard area where heavy defoliation of aspen has occurred for the past 3 years the infestation expanded slightly northward in the Kirkland Lake District.

In the Northeastern Region, infestations also continued to build up in parts of the North Bay and Sudbury districts, particularly around Sudbury where complete defoliation of some stands was evident by late May. A large infestation around Lake Nipissing merged with another one covering parts of the Parry Sound and Bracebridge districts. New patches of moderate-to-severe defoliation were mapped in the last-named districts as well as in the Bancroft and Minden districts.

In the Eastern Region, infestations in the Kaladar area expanded to cover approximately 900 km^2 (350 sq. miles). A population buildup was also evident in the Central Region, especially in the Huronia and Cambridge districts. Moderate-to-heavy infestations continued and expanded on sugar maple in the Owen Sound and Wingham districts of the Southwestern Region.

Beyond the boundaries of mapped defoliation in the province, caterpillars and their feeding were commonplace.

Aspen Leafroller, *Pseudexentera oregonana* Wlshm.

High numbers of this insect in conjunction with other leafrollers caused heavy defoliation of aspen stands within approximately 2,800 km^2 (1,100 sq. miles) in the southeastern part of the Thunder Bay District. Extensive defoliation also occurred in the same parts of the Kirkland Lake and Timmins districts of the Northern Region where heavy defoliation was caused by the large aspen tortrix in 1974. Tortrix populations this year declined appreciably. In the Northeastern Region small pockets of defoliation were evident at two locations in the Blind River District and at one location in the Sault Ste. Marie District. In the Central Region, moderate-to-severe defoliation of aspen trees was reported in the Angus–Base Borden area and south of Bradford. Reports received from other districts indicated light numbers.

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

Extensive infestations this year were confined largely to the Northeastern and Algonquin regions. Sizeable patches of infestation were mapped in parts of the North Bay, Sudbury and Espanola districts including Manitoulin Island. The same thing was evident in the Algonquin Park, Bancroft and Pembroke districts of the Algonquin Region.

Blotch Miner on Poplar, *Lithocolletis ontario* Free.

Widespread browning of young aspen trees appeared in northeastern Ontario during late July, especially in the Kirkland Lake, Timmins, Gogama and Chapleau districts of the Northern Region and in several townships of the Algonquin Park District.

American Aspen Beetle, *Gonioctena americana* (Schaef.)

Scattered pockets of moderate or heavy infestation occurred on aspen in the Geraldton, Timmins, Kirkland Lake, Chapleau, Sudbury, Espanola and Bracebridge districts.

Cedar Leafminers, *Argyresthia canadensis* Free., *A. aureoargentella* Brower, *A. thuiella* Pack. and *Pulicalvaria thujaella* (Kft.)

Severe infestations again made themselves very evident on eastern white cedar in southern Ontario, from the Owen Sound and northern part of the Wingham districts eastward through Cambridge and Maple districts of the Central Region, into the western part of the Lindsay District, and from there northward into Bracebridge, Minden and Bancroft districts of the Algonquin Region. *Argyresthia thuiella* was generally the most abundant of the four species of leafminers involved. Numbers declined over 1974 in the Simcoe, Aylmer and Chatham districts of the Southwestern Region as well as in the eastern townships of the Lindsay District. The outbreak continued to show evidence of collapse in the Eastern Region.

European Pine Sawfly, *Neodiprion sertifer* Geoff.

Numbers of this sawfly were again generally low in the Southwestern and Central regions, although an occasional moderate infestation was recorded. High populations were present in several plantations in the Lindsay District, and in the Bancroft District this insect was confined to four plantations as in 1974. On Manitoulin Island, where the pest is being closely watched and its history on Scots pine is well known, populations edged upward slightly.

A heavy infestation at Sandbanks Provincial Park, Prince Edward County, was successfully controlled by the aerial application of a polyhedral virus. This project was carried out by the Ontario Ministry of Natural Resources in cooperation with the Insect Pathology Research Institute (pathological aspects) and the Great Lakes Forest Research Centre (entomological timing and evaluation).

Blackheaded Budworm, *Acleris variana* Fern.

Numbers of blackheaded budworm appeared to be on the increase in parts of the North Central Region in 1974 and 1975. Populations were again monitored by means of quantitative beating samples but so far damage has barely

reached levels detectable through aerial reconnaissance. In southern Ontario a medium infestation was reported on large white spruce trees in Wellesley Township of the Cambridge District and light numbers were found in three or four townships of the Huronia District.

Balsam Fir Sawfly, *Neodiprion abietis* complex

Browning of balsam fir foliage, which to the inexperience eye resembles that caused by spruce budworm, was evident along the north shore of Lake Nipissing from Caldwell Township east to Commanda Township and at several locations south of North Bay in the Northeastern Region. The same condition occurred in the southeastern part of McNab Township in Pembroke District and defoliation occurred at several other locations in the Algonquin Park and Eastern regions. The insect also defoliates white spruce but here the feeding is not so evident.

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* (Roh.)

This perennial defoliator of open-grown spruce trees again caused moderate-to-severe defoliation at scattered locations across Ontario but particularly in the northern parts of the Southwestern and Central regions.

Survey personnel assisted with the timing and assessment of a successful aerial control operation carried out over 105 ha (260 acres) by the Ontario Ministry of Natural Resources at Balsam Lake Provincial Park using fenitrothion at the rate of 280 g/ha (4 oz. per acre). A few small areas that were missed were sprayed using ground equipment.

Basswood Looper, *Erannis tiliaria* Harr.

High populations persisted in Lake Superior Provincial Park and caused heavy defoliation of yellow birch and white birch over an area of roughly 2,000 km^2 (800 sq. miles) of the Wawa District. This represents a major development of the outbreak which appeared over a much smaller section of the park in 1974. Light damage was evident from Lake Superior Provincial Park across the Sault Ste. Marie District to Bright Township in the Blind River District. Populations appeared to be on the increase in the Espanola and North Bay districts as well. Farther to the east deciduous trees were heavily defoliated along the Ottawa River in Rolph Township in the Pembroke District, and at two locations in the Algonquin Provincial Park. Elsewhere within the range of this insect in Ontario larvae were found more commonly than usual.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Reports of severe damage to white birch foliage by this leaf miner have been coming in, particularly from southern Ontario. We expect more reports of damage caused by subsequent generations of miners and therefore will include a general summary for the province in our next bulletin.

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

Spring weather conditions appeared favorable for this insect, which feeds voraciously in early spring among the expanding leaves of oak. In the Northeastern Region oak trees within an area of roughly 3,900 km^2 (1,500 sq. miles) showed evidence of defoliation, extending from Palmer Township north of Sault Ste. Marie and running easterly to Spragge Township in the Blind River District. Pockets of moderate-to-severe defoliation were noted on Manitoulin Island in the Espanola District. In the Algonquin Region pockets of defoliation were mapped in the Petawawa—Deep River area as well as in Algonquin Provincial Park and in the Bancroft District. In the Central Region moderate-to-severe defoliation occurred in the Uxbridge—Ballantrae area of the Maple District, in Tiny, Oro, Vespra and Floss townships in the Huronia District, and in the Ganaraska—Durham County forests in the Lindsay District. This is the fifth year of defoliation at the last-named location and tree mortality is evident. In the Eastern Region, variable damage was reported in the northern extremities of the Tweed, Lanark and Ottawa districts.

Bruce's Spanworm, *Operophtera bruceata* Hlst.

This periodic forest pest stripped sugar maple trees near Robertson Lake in the Sault Ste. Marie District and sugar maple and yellow birch trees in parts of the southeastern Bracebridge District. Several infestations of less severe proportions were also recorded.

Satin Moth, *Stilpnotia salicis* Linn.

This pest, first found in Ontario in 1972, again defoliated silver poplar immediately north and northeast of Cornwall. Two new infestations were found in 1975, one near Casselman in Russell County and the other on lombardy poplar south of Ottawa.

TREE DISEASES

Needle Droop of Red Pine

In early June severe browning of red pine foliage was reported in a number of plantations in the Northeastern and Northern regions. No disease-causing pathogens were isolated from samples submitted. During July all known occurrences in the Sault Ste. Marie, Blind River, Espanola and Sudbury districts were studied by Disease Survey Officer, H.L. Gross in company with appropriate field technicians to ascertain cause. Damage was confined mainly to the needles and buds that had developed in 1974. Dead needles were bright reddish brown and usually bent sharply downward beneath the needle sheath area. Symptoms were the same in all respects as those described in scientific literature for "needle droop of red pine" (Patton, R.F. and A.J. Riker. 1954. Needle droop and needle blight of red pine. J. For. 52(6):412-418). These workers attributed

the condition to physiological drought brought on by a serious internal water deficit when needles had almost completed growth but were still succulent (in this case, about late July, 1974). By July, 1975 most trees affected were developing normal new shoots but many terminal shoots and side branches were dead.

Affected plantations were located near Iron Bridge (80 ha, or 200 acres), in the Kirkwood Management Unit north of Thessalon (40 ha, or 100 acres), in Poulin and Tweedle townships north of Elliot Lake (20 ha, or 50 acres) in the Blind River District, in Lorne Township near Nairn (0.8 ha, or 2 acres) in the Espanola District and in Hanner Township 19 km (12 miles) north of Sudbury (40 ha, or 100 acres) in the Sudbury District. The same condition was reported at a few places in the Chapleau District of the Northern Region.

Conditions that aggravate needle droop of red pine are probably so narrow that they are not likely to occur in 1975 and so far no new damage has been reported.

Ink Spot of Aspen, *Ciborinia whetzelii* (Seaver) Seaver

This foliage disease was found most commonly in the Chapleau, Timmins, Kirkland Lake, Sault Ste. Marie, Blind River and North Bay Districts. Infection levels were mainly light or moderate.

Anthracnose, *Gloeosporium* sp.

This disease was reported at various locations in the Central Region, mainly on sugar maple and ash trees growing singly or along roadsides. Defoliation was light to moderate.

Leaf and Twig Blight of Aspen, *Pollaccia radiosa* (Lib.) Bald. & Cif.

This twig blight was reported from a number of districts but damage was mainly trace or light and confined to young trembling aspen.

Winter Browning

Moderate browning of Scots pine was reported near Makoman and Dorion and of red pine in Paipoonge Township, Thunder Bay District. Elsewhere in the North Central Region damage was rated severe in red pine plantings in O'Meara Township, Geraldton District, and at several locations in the Terrace Bay District. No further damage was reported to young jack pine in the southeastern part of the Atikokan District or the southwestern part of the Thunder Bay District where severe browning had been reported in 1974.

Hail Damage

Moderate damage occurred within an 80-ha (197.6-acre) stand of balsam fir in Barker Township in the Kapuskasing District.

Rodent Damage

Girdling of the bark near ground level was reported at several locations in the Pembroke District in the Algonquin Region. In a jack pine plantation in South Algona Township 80% of the trees were affected.

Fume Damage

Beyond the area of fume damage northeast of the town of Wawa, damage symptoms were noted on large white spruce trees for a distance along Highway 101 east of Wawa.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

Special emphasis is being given to a one-year survey to determine the occurrence of this disease throughout the range of jack pine in Ontario. Analysis of data is incomplete but the disease appears to be absent, or present at the trace level, in the northern half of the Northwestern Region and all of the North Central Region where sweetfern does not grow. An alternate host, sweetgale, occurs throughout Ontario but is confined to wet habitats. Highest levels of cankered trees were recorded in the districts of Chapleau, Gogama, Timmins and Kirkland Lake in the Northern Region. A high level of damage was also reported at one location in the Fort Frances District in the Northwestern Region. Low and moderate damage readings were reported from the Sudbury District and the Algonquin Region.

White Pine Blister Rust, *Cronartium ribicola* Arth.

White pine blister rust is being evaluated in approximately 40 randomly selected plantations in southern Ontario. So far, damage levels seem to be mainly light to moderate but high levels were found at several locations in the Minden and Lindsay districts.

High damage levels were again reported from the Northwestern Region.

Red Pine Shoot Blight, *Sirococcus strobilinus* Preuss

Evaluations of this disease on red pine showed lower infection levels in the Dryden and Fort Frances districts in the Northwestern Region but little change in the Thunder Bay and Atikokan districts of the North Central Region.

Jack Pine Needle Rust, *Coleosporium asterum* (Diet.) Syd.

A general decline in damage levels has been reported to date. The most severe occurrences this year were in Minary Township in the Fort Frances District, where 40% of the new foliage of jack pine was destroyed, and in a few stands in the Hearst and Cochrane districts (30%).

We regret to announce the passing on August 12 of Raymond "Ray" L. Bowser following heart surgery in Toronto.

Ray was a Ranger in the Chapleau District from 1954 to 1958 and in the Lake Huron District from 1959 to 1966. He was assigned to Angus in 1967 where he played an important role as a Supervisor of Survey activities in much of southern Ontario. Ray will be long remembered for his pleasant disposition, his conscientious nature and his capabilities as a field observer. He will be greatly missed.

W. L. Sippell
Head
Forest Insect & Disease Survey Unit

L. L. McDowall
Chief of
Survey Technicians

August 15, 1975