FOREST INSECT AND DISEASE SURVEYS IN THE NORTHERN SURVEY REGION

(FOREST DISTRICTS: COCHRANE, KAPUSKASING AND GERALDTON)

1970

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FOREST RESEARCH LABORATORY

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SURVEY HIGHLIGHTS

In 1970, the working unit for surveying forest insect and disease conditions in Ontario was changed from an individual technician assigned to a forest district, to a survey team led by an experienced supervisor and consisting of one to three additional technicians. Each team covered three to six forest districts. The Northern Survey Region, which was designated to include three forest districts, was staffed by a 2-man team as follows:

Geraldton and western
Kapuskasing districts: - H. R. Foster, Supervisor

Cochrane and eastern
Kapuskasing districts: - J. Hook

This report deals with the more important, or potentially more important, forest insect and tree disease conditions found by the team in 1970.

The status of the spruce budworm, the most important insect in the Region is presented on a province wide scale. Highlights of this insect in the Northern Survey Region were the heavy infestation along the southern part of the Spruce Falls Paper Company limits in the Kapuskasing District, the failure of large infestation to develop in the southern part of the Cochrane District, and the very low population levels or absence of the insect elsewhere in the Region. However favourable weather conditions prevailed for two years in most of the Region and egg surveys in 1970 showed that extensions of the infestation can be expected to the north and west in 1971. Populations of the birch skeletonizer increased to near outbreak proportions in the Geraldton and Kapuskasing districts and defoliators of trembling aspen increased in the southern part of the Region. New distribution records were established for the mountain-ash sawfly, European spruce sawfly and the birch leaf miner, all introduced insects.

Infections of ink spot disease of poplar occurred in over 170,000 acres of trembling aspen in the Region. Scleroderris canker of pine, a serious threat to young stands of jack and red pine, Hypoxylon canker of poplar that causes considerable loss in mature trembling aspen stands, foliage diseases of spruce and rust forming cankers on jack pine were other major diseases. The mortality caused by Armillaria root rot in planted pole-sized black spruce in the Spruce Falls Paper Company limits drew attention to the importance of root diseases in cutover areas.

H. R. Foster,
Supervisor,
Northern Survey Region.

INSECTS

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Infestations of this insect increased considerably in the western parts of Geraldton and Kapuskasing districts but remained at low intensity levels in the Cochrane District in 1970. Medium to heavy infestations each covering approximately 100 square miles, occurred in the Abitibi limits north of Sturgeon River and in the Domtar limits east of Beardmore. Smaller pockets were observed south of Highway 11 along the Goldfields Road, in the Caramat-Hillsport area, and at points east of Longlac to the Kapuskasing border. In the Kapuskasing District heavy infestation extended from Nagagami River east to Carey Lake and from Rogers Township south to Nagagamisis Lake in an area of about 500 square miles. Small areas of heavy infestation occurred south and west of Hornepayne. Infestations in the Cochrane District remained at very low levels.

Large Aspen Tortrix, *Choristoneura conflictana* Wlk.

Population levels of this defoliator of trembling aspen increased in the southwest part of the Geraldton District. Light populations occurred along Highway 17 from Nipigon east to Kama Bay. At this point high populations were present along the base of a high cliff that runs north from Lake Superior. It was speculated that the egg laden moths moving eastward were stopped by the cliff and deposited their eggs on the mature trembling aspen at the lower elevation. Population levels increased to heavy in about 150 square miles in the southwest corner of Division 43 and in English Township in the Cochrane District.

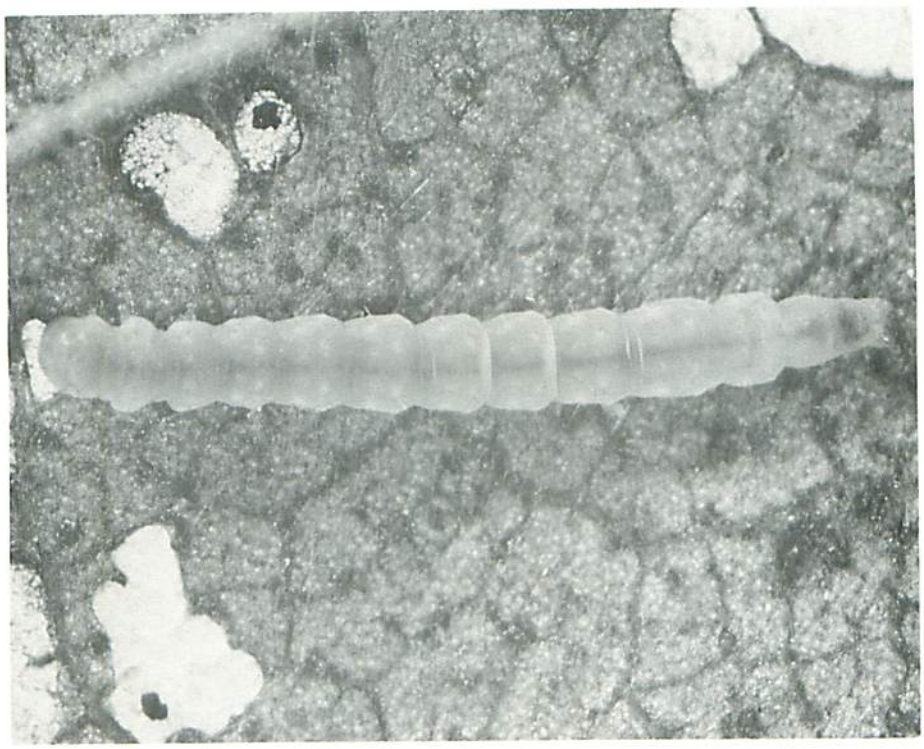
Spruce Budworm, *Choristoneura fumiferana* Clem.

The importance of this pest and the widespread damage it caused in 1970 led to a separate report outlining its activities on a province-wide basis. Specific information summarizing the various outbreaks is provided in Information Report O-X-147 included herein.

Larch Casebearer, *Coleophora laricella* (Hbn.)

Small numbers of the larch casebearer have been collected for several years in the Geraldton, Kapuskasing and Cochrane districts but populations have not reached the high levels encountered farther to the south in the Province of Ontario. Low populations occurred in 1970 near Lydia Lake, Pays Plat and in Croll Township in the Geraldton District and in Calvert Township in the Cochrane District. Trace population levels were observed at several additional points in the above districts and near Remi Lake in the Kapuskasing District.

BIRCH SKELETONIZER



Larva feeding on leaf

Severe defoliation of white birch trees

European Spruce Sawfly, *Diprion hercyniae* (Htg.)

This introduced pest which threatened stands of white spruce in eastern Canada in the 1930's has become established in parts of the Northern Survey Region. Low populations were found along the southern part of the Geraldton District with the highest numbers of larvae in the Nipigon area in 1970. To the north sampling proved negative in the Geraldton District but new distribution records were made in Teetzel, Frost and Gourlay townships in the Kapuskasing District. The European spruce sawfly has been collected commonly in the Cochrane District and in the past decade has spread into the unsurveyed areas north of Little Abitibi Lake.

A Noctuid, *Enargia decolor* Wlk.

Infestations of this leaf tier and defoliator of trembling aspen increased appreciably in three large areas in the Region in 1970.

Medium to heavy defoliation occurred in about 200 square miles south and east of Iroquois Falls. Light to medium defoliation occurred in the Cochrane District in the southwest corner of Division 43.

The infestation in the Kapuskasing District was heavy on young trembling aspen along the Hornepayne Road and light on mature trees in the area. Light infestations also occurred south of Hornepayne and at points west of Nagagami River to Pagwa.

Birch Leaf Miner, *Fenusa pusilla* (Lep.)

This introduced pest of young white birch on ornamental trees resulted in numerous extension calls. New distribution records were established near Pays Plat, Cosgrave Lake and in Sandra Township, all in the Geraldton District. Light infestations were common on white birch trees in the southern part of the Cochrane District. In the Kapuskasing District a light infestation occurred in a park in the town of Kapuskasing.

Pine Engraver Beetle, *Ips pini* (Say)

An occasional side effect of strip cutting of pulpwood stands is the buildup of high populations of the pine engraver beetle. This happened in the Kimberly-Clark pulpwood operations in Bain Township in 1970. Large numbers of beetles attacked young healthy trees growing along the haul road and mature trees in the adjacent uncut strip and some light tree mortality of both young and mature jack pine was observed.

Yellow-headed Spruce Sawfly, *Pikonema alaskensis* Roh.

Defoliation by the yellow-headed spruce sawfly in white spruce plantations was heavy at Driftwood River, moderate at Greenwater Lake in the Cochrane District and light at the Radar Base near Lowther in the Kapuskasing District. Light to heavy defoliation occurred on black and white spruce ornamentals in towns across the Region. This insect's affinity for ornamentals in the populated areas was the leading cause for extension calls.

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Heavy infestations occurred in Ledger, Croll and Errington townships, at several points between Beardmore and Geraldton, and at scattered locations in the southern part of the Geraldton District. Infestations of the larch sawfly were less prevalent in the Kapuskasing District where defoliation was limited to scattered young tamarack trees in the Shekak, Pagwa and Opasatika river areas. In the Cochrane District heavy infestations occurred in the unsurveyed area northwest of Moosonee, east of Little Abitibi Lake to the Quebec border and in Robb Township. Medium infestation occurred on planted tamarack in Sheraton Township.

Mountain-ash Sawfly, *Pristiphora geniculata* (Htg.)

Although of little economic importance the buildup and spread of this introduced insect showed an interesting and changing pattern across the Northern Survey Region. Pockets of heavy defoliation occurred in Keefer, Tisdale, Steele and Scapa townships in the older portions of the infestation. Elsewhere in the Cochrane District and the eastern part of the Kapuskasing District light defoliation was common. Farther west new distribution records were established in Studholme, Kohler and Clavet townships in the western part of the Kapuskasing District, and at Neys Park, Terrace Bay and near Klotz Lake in the Geraldton District.

Amber-marked Birch Leaf Miner, *Profenusa thomsoni* Konow

Browning of white birch foliage was reduced at all sample points in the Region in 1970 (Table 1). However, infestations were mainly heavy from Nagagami River to Hearst, medium at the south end of the Chain of Lakes Road, and light at several other points in the Kapuskasing District. Infestations at Caramat, Pamela Lake, Ashmore and Dale townships in the Geraldton District were reduced from medium in 1969 to light in 1970.

TABLE 1

Summary of Damage Caused by the Amber-marked Birch Leaf Miner in the Northern Survey Region in 1969 and 1970 (Based on the examination of 100 white birch leaves taken at random from three trees at each location)

Location (area by district)	Av. d.b.h. of sample trees in inches	Per cent of leaves infested 1969	1970
Geraldton District			
Pamela Lake	5	51	31
Caramat	3	75	19
Kapuskasing District			
Frost	4	100	43
McMillan	5	100	48
Fauquier	5	33	21
Cochrane District			
Tisdale	4	40	3
Timmins	3	7	0
Hillary	3	37	6
Evelyn	3	27	2
Mortimer	4	22	7

Spruce Foliage Worms, *Zeiraphera* spp.

Population levels of spruce foliage worms increased appreciably at several points in the Region in 1970. White spruce trees were severely defoliated for about 10 miles along the northern end of the Hornepayne Road in the Kapuskasing District. The discoloration was easily discernible from the air and the appearance of white spruce resembled trees in the first year of heavy attack by the spruce budworm. A medium infestation of *Zeiraphera canadensis* Mut. occurred on plantation white spruce near Marathon in the Geraldton District.

TABLE 2

Other Noteworthy Insects

Insect	Host(s)	Remarks
Acleris variana Fern.	wS	A few larvae on mat samples in the Region.
Archips cerasivorana (Fitch)	cCh	Scattered colonies in the Region.
Dimorphopteryx melanognathus Roh.	wB	Reduced to trace in Geraldton District.
Epinotia solandriana Linn.	wB	Low population at Rainbow Falls Park in the Geraldton District.
Gonioctena americana Schaef.	tA	Light defoliation in the Nipigon and Schreiber areas, Geraldton District.
Hemichroa crocea Four.	Al, wB	Heavy infestation in the South Porcupine area, Cochrane District.
Malacosoma californicum pluviale Dyar	pCh	Low population at many points in the Region.
Monoctenus sp.	ewC	Light at many points in the Geraldton District and near Schumacher in the Cochrane District.
Phratura hudsonia Brown	tA	Reduced to trace levels at Rainbow Falls Park, Geraldton District.
Pikonema dimmockii Cress.	wS	Low numbers at several points in the Geraldton District.
Pissodes strobi Peck.	wS, bS jP, wP	Light damage observed throughout the Region.

TREE DISEASES

Dwarf Mistletoe, *Arceuthobium pusillum* Pk.

Dwarf mistletoe occurred on black spruce trees at several points along Highway 11 east of Longlac to the Geraldton border. An area of light infection occurred three miles west of Flynn Lake.

In the Kapuskasing District pockets of moderate to severe infection occurred along Highway 11 from Fraser to Nagagami rivers although the overall infection level was light. An evaluation a few miles east of the Fraser River showed 62 per cent of the black spruce was infected by *A. pusillum* Pk. Elsewhere in the Kapuskasing District high levels of infection occurred in Buchan Township, and light levels in Clouston, Gill, Stoddart and Studholme townships. Moderate levels of infection occurred on mature white and black spruce trees along the Mattagami River three miles north of the Kipling Hydro Dam.

The only record of the disease in the Cochrane District was a light infection in a black spruce swamp in German Township.

Armillaria Root Rot, *Armillaria mellea* (Vahl ex Fr.) Kummer

This pathogen which has been collected at scattered points throughout the Region is now causing concern in black spruce plantations in the Kapuskasing District. Forestry personnel of the Spruce Falls Paper Company reported that the disease was widespread in black spruce plantings on their limits. Preliminary investigation showed light tree mortality caused by the fungus in an 18-year-old plantation in Teetzel Township. In some instances tree roots were almost completely rotted off but needles remained green without other symptoms to indicate the serious damage. With over 18 million trees planted in the Spruce Falls Paper Company limits this could become a major problem.

In Geraldton District, light tree mortality occurred in regeneration and plantation jack pine trees at many points. Examination of the root systems showed the majority of the trees had copious white mycelial fans under the bark symptomatic of Armillaria root rot. Observations in August revealed abundant fruiting around old jack pine and black spruce stumps at several locations.

This disease has been collected in the past 9 years from both deciduous and coniferous hosts at numerous widely scattered points in the Cochrane District. In recent years it has caused light tree mortality in planted jack and red pine in Sheraton and Timmins townships.

Yellow Witches' Broom of Spruce, *Chrysomyxa arctostaphyli* Diet.

Brooms caused by this organism observed rarely in the Cochrane and eastern part of the Kapuskasing districts, increased in incidence farther west and were found at many points in the Geraldton District. Low levels of infection occurred in a 20-acre stand of black spruce and jack pine near Pays Plat. Multiple brooming on some black spruce caused tree mortality at this well-drained, sandy site.

Needle Rusts of Spruce, *Chrysomyxa ledi* (Alb. & Schw.) dBy and *C. ledicola* Lagh.

The moderate to severe infection of approximately 250 square miles in the Auden to Lake Nipigon area in Division 28 in the Geraldton District in 1969 declined to light intensity in 1970. Other moderate and severe infections in the district decreased to light or trace levels of intensity in 1970, although the incidence of the disease, generally remained high. Moderate infection occurred on young black spruce trees in Teetzel Township in the Kapuskasing District. Trace to light infection occurred on black and white spruce trees in the Cochrane-Smooth Rock Falls-Wade Lake area in the Cochrane District.

Ink Spot Disease of Poplar, *Ciborina whetzelii* (Seaver) Seaver

The incidence, infection levels and areas affected by this disease of trembling aspen increased considerably in the Northern Survey Region. Moderate to severe infections occurred in approximately 170,000 acres and is shown by district and locality in Table 3.

TABLE 3

Summary of Areas in Which the Ink Spot Disease of Poplar Caused Severe Browning of Trembling Aspen Foliage in 1970

Location (Area by district)	Age class of sample trees	*Level of infection in 1970	Total area affected in acres
Geraldton District			
Hillsport	Pole	M - H	2,000
Beardmore east	Pole to mature	M - H	10,000
Longlac east	Mature	M - H	5,000
Kapuskasing District			
McMillan	Mature	H	1,000
Gill	Pole to mature	H	5,000
Studholme	Mature	H	2,000
Lisgar	Pole	H	2,000
Cochrane District			
Smooth Rock Falls	Mixed	M - H	50,000
Cochrane	Mixed	M - H	15,000
Iroquois Falls east	Mature	M - H	20,000
Kamiskotia Lake	Mixed	M - H	10,000
Night Hawk Lake	Mature	M - H	50,000

* M - moderate
H - heavy

In the Geraldton District moderate to severe infection occurred in the Hillsport area, for about 20 miles east of Beardmore, and in pockets east of Longlac along Highway 11. In the Kapuskasing District high levels of infection occurred in McMillan, Gill, Studholme and Lisgar townships. The largest areas of infection were observed in the Cochrane District where severe infection occurred in 23 townships. Main areas of infection were located south and west of Night Hawk Lake, west of Smooth Rock Falls, south of Cochrane, southeast of Iroquois Falls and in the Kamiskotia Lake area. Elsewhere in the Region light infections were common.

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

Moderate infections on jack pine trees in Sandra Township and at Limestone Lake in the Geraldton District in 1969 were reduced to light in 1970. Light infection recurred on young jack pine trees near the Schumacher tower in the Cochrane District. Although this rust was not readily found on the pines it was widely distributed on aster, the alternate host.

Comandra Blister Rust, *Cronartium comandrae* Pk.

Field identification and assessment problems were difficult at Cosgrave Lake and near Marathon where fruiting spores of both *C. comandrae* Pk. and *C. comptoniae* Arth. were collected. Moderate to severe infections of rusts were recorded at both locations, and the former was by far the more prevalent. Other infection levels in the Geraldton District were moderate in Exton Township and light at Mileage 15 on the Blueberry Road north of Longlac. This disease has not been collected in the Kapuskasing or Cochrane districts.

Sweetfern Blister Rust, *Cronartium comptoniae* Arth.

Although moderate to severe infection was reported in four townships in the Geraldton District in 1969, other rust forming cankers on jack pine were found in these locations in 1970 and accurate field assessment was difficult. However, infection by *C. comptoniae* Arth. was assessed as light in Sandra, Pic, Exton and Errington townships and at Cosgrave Lake. Severe infections recurred along the Texas Gulf Road north of Timmins and along gravel eskers from Nellie to Lipsett lakes in the Cochrane District. The disease has not been collected in the Kapuskasing District.

One hundred jack pine trees were tagged in Murphy Township in 1963 and the amount of sporulation recorded annually for each tree (Table 4). Although some trees sporulated each year, others showed considerable variation in the number of years of sporulation. Some trees, scarred by the disease prior to establishing the plot, went five or more years before producing sporophores.

TABLE 4

Summary of Sporulation in Jack Pine Trees by the Sweetfern Blister Rust in Murphy Township, Cochrane District, from 1963 to 1970

Year	1963	1964	1965	1966	1967	1968	1969	1970
Per cent of trees that produced sporophores	27	30	21	15	23	23	18	11

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

White pine blister rust caused light tree mortality in scattered young white pine trees in the southern part of the Cochrane District. Light tree mortality also occurred in white pine plantations in Sheraton Township, Cochrane District, in Wicksteed and Studholme townships, Kapuskasing District, and in Sandra Township, Geraldton District.

Gall Rust of Hard Pines, *Endocronartium harknessii* (J. P. Moore) Y. Hiratsuka

Disease evaluation showed moderate infection by this organism in about 2,000 acres of pole-sized jack pine in Exton Township in the Geraldton District (Table 5). Trace to light infection occurred in several young stands in cutover areas in the district. In the Cochrane District moderate levels of infection occurred in about 50 acres in McArthur Township, also light infection was noted in plantations in Timmins and Sheraton townships. A few galls were observed in the Kapuskasing District, but the status of the disease was not established.

TABLE 5

Summary of Incidence and Infection Levels of a Rust on Jack Pine in the Geraldton District in 1970

Location	Area affected in acres	Per cent of incidence	Level of infection
Exton Township	2,000	23	Moderate
Sturgeon River	750	10	Light
Longlac, 10 miles northeast	150	10	Light
Goldfields Road, Mileage 60	150	3	Trace
Catlenite Road, Mileage 63	100	4	Trace

Leaf Blight on Balsam Poplar, *Linospora tetraspora* G. E. Thompson

Infection levels of this leaf blight on balsam poplar have declined from the peak levels reached in 1968. The disease was common in the Geraldton District with moderate infection along the Auden Road, at Mileage 66 on the Goldfields Road and along Highway 11 near the Kapuskasing border. In the Kapuskasing District heavy infection occurred at many points from Clavet to Fournier townships. Little change occurred in the Cochrane District and high infection levels were recorded at many points on young balsam poplar.

A Rust on Jack Pine, *Peridermium stalactiforme* Arth. & Kern

Disease evaluation showed moderate infection levels in about 1,000 acres of jack pine in Exton Township. The occurrence of the disease was assessed on the presence of the long linear scars since the actual fruiting of the fungus was quite low in 1970. The fungus was identified in collections from plantations near Marathon where the typical scars were scarce. Several checks in the Caramat area where fire scars were plentiful, failed to isolate the disease. Although typical scars were observed in the Kapuskasing and Cochrane districts the disease was not found.

A Rust on Balsam Fir, *Pucciniastrum epilobii* Otth

The high level of infection along the Truax Road north of Longlac in 1969 was reduced to light intensity in 1970. Light infection occurred on regeneration balsam fir in cutover areas north of Nakina. Low infection occurred north of Calstock in the Kapuskasing District and south of Smooth Rock Falls in the Cochrane District.

Scleroderris Canker of Pine, *Scleroderris lagerbergii* Gremmen

Scleroderris canker of pine is a potential threat to young jack pine stands in the Geraldton District especially in regeneration at Cosgrave Lake and at the junction of the Hillsport and Manitouwadge roads where infection levels and tree mortality were severe. Damage by the disease has already reduced the stocking of jack pine along the Manitouwadge Road below adequate numbers of stems per acre. However, trees in many other areas where infection levels were low in 1970, are now large enough to survive attack by the disease and future losses should not be serious (Table 6). Evaluations at 4 out of 5 check points were negative. Infection levels that were high three years ago in the Kimberly-Clark Nursery dropped sharply to trace levels. This reduction may be partly attributed to the pruning of lower branches and sanitation of dead trees in the red pine compartment dividers.

TABLE 6

Summary of Incidence and Infection Levels of Scleroderris Canker of Pine in Jack Pine Stands in the Geraldton District in 1970

Location	Total area affected in acres	Per cent incidence of attack	Infection level
Mi. 65 Catlenite Road	-	Nil	Negative
Mi. 60 Goldfields Road	150	18	Light
Sturgeon River, south	750	Trace	Trace
Longlac, 10 miles north	-	Nil	Negative
Stevens, south	100	80	Severe
Cosgrave Lake	200	82	Severe
Hillsport Road	1,000	80	Severe
Kowkash, east road	500	20	Light
Kowkash, west road	1,000	20	Light

Infections in jack, white and red pine plantings in Wicksteed and Studholme townships in the Kapuskasing District decreased to trace levels.

Although there was a paucity of fruiting bodies in 1970, considerable flagging of red and jack pine branches was observed in German, Sheraton and Stimson townships in the Cochrane District. Infection levels continued to decline in red pine plantations in Whitesides, Dundonald and Adams townships.

Hail Damage

Severe hail damage was recorded on all species of trees in a small cutover area south of Georgia Lake in the Geraldton District. A stand of young balsam fir in the area showed almost total bud mortality on the windward side of the trees and generally 75 per cent mortality on the leeward side of the trees. Tree mortality in 1970 was restricted to small white spruce, willow and trembling aspen. Light damage occurred in a small area near Fillet Lake north of Nakina.

Frost Damage

Severe frosts that occurred during early spring when buds were swelling and prior to opening killed large numbers of buds on balsam fir and white spruce. Damage of this type was observed at several points in the southwestern part of the Cochrane District. Severe damage occurred on white spruce trees at the South Porcupine cabin. Elsewhere in the Region very cold weather delayed bud opening until late May, and typical shoot damage caused by frost after the buds had opened was minimal.

TABLE 7

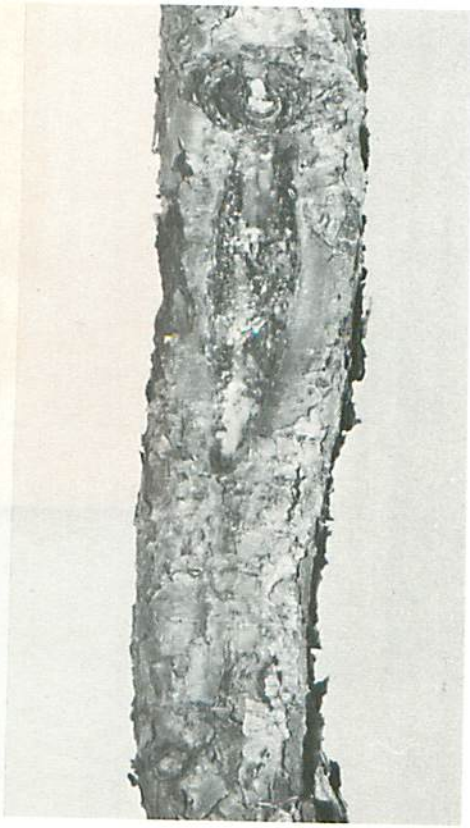
Other Noteworthy Tree Diseases

Organism	Host(s)	Remarks
Davisomycella ampla (Davis) Darker	jP	Light infection in Sandra Township, Geraldton Dist.
Hypoxylon mammatum Wahl. Miller	tA	Continued as a major cause of loss in the Northern Survey Region
Pollaccia elegans Serv.	bPo	Light to heavy infection occurred on young open-grown hosts in the Region.
Pollaccia radiosa (Lib.) Bald. & Cif.	tA	Occurred commonly at numerous points in the Region.
Polyporus tomentosus Fr.	bS	Abundant fruiting on stumps in Eilber Township, Kapuskasing District.
Valsa kunzei Fries	wP	Low infection in Sandra Twp., Geraldton District.
Winter Browning	rP, jP	Considerable winter browning occurred in plantations in the Region.

SCLERODERRIS CANKER

Lower branch dieback on red and jack pine trees

Branch dieback on jack pine



Stem canker on red pine