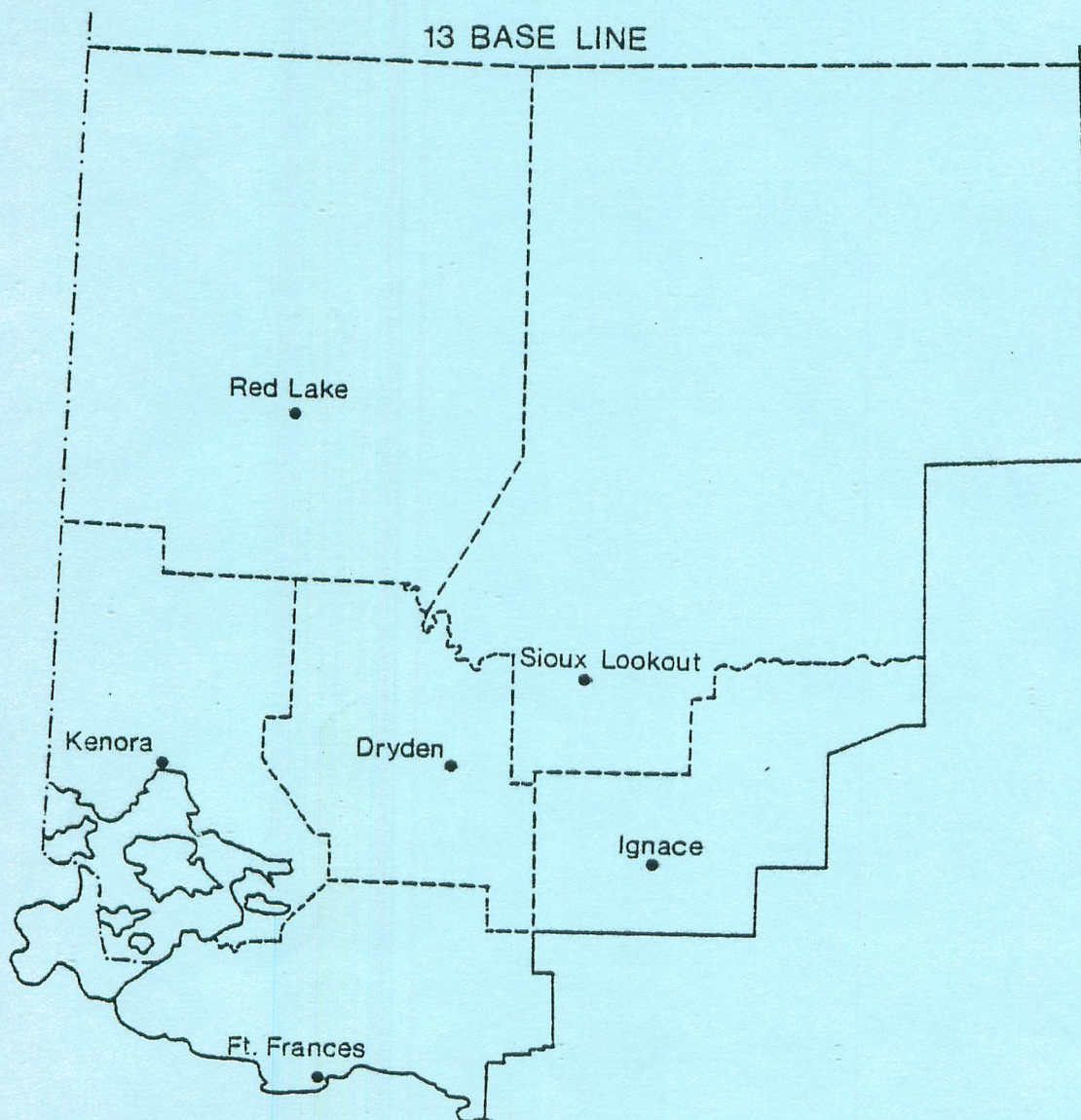


Results of forest insect and disease surveys in the NORTH WESTERN REGION of Ontario, 1979



CARRIED OUT BY THE GREAT LAKES FOREST
RESEARCH CENTRE IN CO-OPERATION WITH
THE ONTARIO MINISTRY OF NATURAL RESOURCES

SURVEY HIGHLIGHTS

The following information covers the most important insect and disease conditions in the Northwestern Region for 1979.

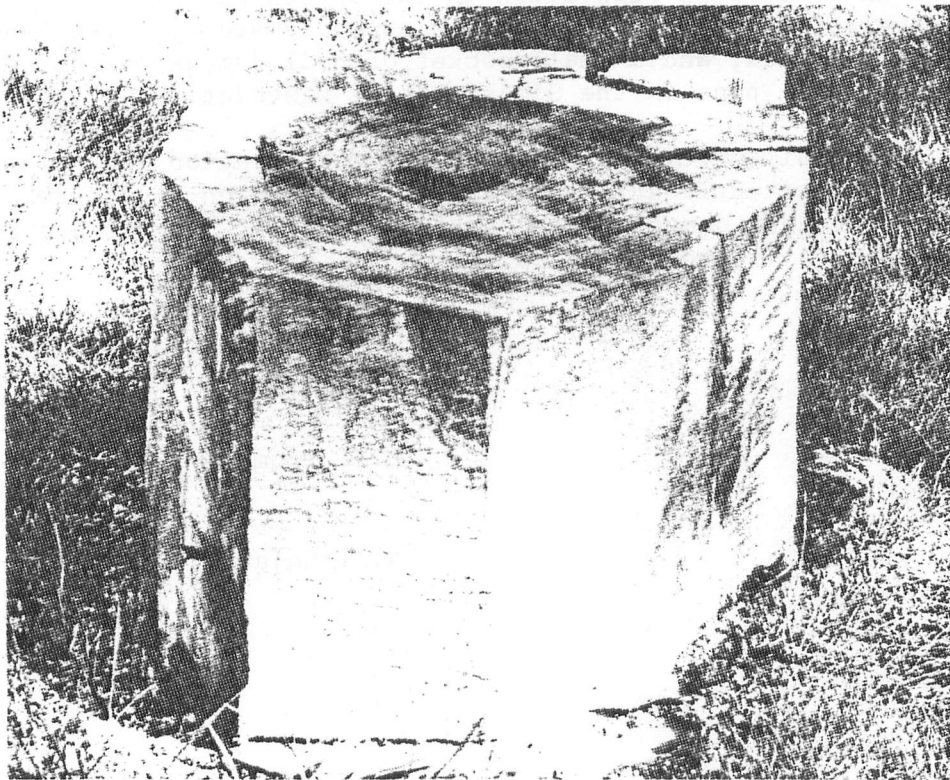
The area within which moderate-to-severe defoliation by the forest tent caterpillar was reported declined by approximately 85% and further reductions can be expected in 1980. The area of spruce budworm infestation increased by an estimated 8%. The aspen leafroller infestation all but collapsed, leaving only one small pocket in the southern portion of the Fort Frances District. Low populations of the jack pine budworm were detected along the Ontario-Manitoba border, north of Lake of the Woods, Kenora District. Adult sawyer beetle damage was reported on fringes of cutover areas for the second consecutive year in the Sioux Lookout District, and for the first time in the Ignace District. A small infestation of boxelder leafroller occurred in the immediate vicinity of the town of Fort Frances.

Surveys for Dutch elm disease revealed an increasing incidence level within the Fort Frances area and a slow westerly spread of this disease. A sanitation program for Scleroderris disease of pine was conducted in a red pine plantation in the Dryden District. A decrease in the level of damage to regeneration aspen caused by a leaf and twig blight was reported, and a small pocket of hail damage was detected in regeneration jack pine in the Sioux Lookout District.

A special survey was conducted in regeneration jack pine at 12 randomly selected locations throughout the Region to determine the incidence of leader damage caused by four specific insects and four diseases commonly found on jack pine.

M.J. Thomson

R.J. Sajan



Frontispiece: Two pest problems occurring in the Northwestern Region.
(top) typical stand damage caused by a heavy infestation of jack pine budworm (*Choristoneura pinus pinus* Free.)
(bottom) debarked elm stump, part of the Dutch elm disease (*Ceratocystis ulmi* [Buism.] C. Moreau) sanitation program within the town of Fort Frances.

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INSECTS

Boxelder Leafroller, *Archips negundana* Dyar

There was a marked increase in population levels of this leafroller and damage caused by it in the southern portion of the Region, with the heaviest defoliation occurring within the town of Fort Frances. Open-growing and ornamental Manitoba maples (*Acer negundo* L.) were completely denuded of foliage throughout the western portion of the town.

Light-to-moderate defoliation occurred and was sampled as far west of the main infestation as Woodyatt Township. Throughout this area, bur oak (*Quercus macrocarpa* Michx.) were also damaged by this insect. Similar defoliation was detected on Manitoba maples growing within the town of Sioux Lookout.

A second insect, the fall cankerworm, *Alsophila pometaria* (Harr.), was also collected in high numbers throughout the Fort Frances area and was considered to be a contributing factor to the total defoliation.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

The results of damage surveys, population sampling, and egg-mass counts have been included with those of other regions in a special report by G.M. Howse et al. (Report O-X-310). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1979 and gives infestation forecasts for the province for 1980.

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

Aerial surveys in the western portion of the Kenora District in 1978 revealed two pockets of heavy infestation of jack pine budworm at Eaglenest Lake in Manitoba, adjacent to the Ontario border. Because of the location of these infestations and the easterly direction of the prevailing winds in the area, an extensive aerial and ground survey was conducted to determine if this insect had infested jack pine (*Pinus banksiana* Lamb.) stands in the western half of the Kenora District in 1979. As a result, light defoliation was detected at scattered points throughout the area surveyed.

In conjunction with this survey, egg-mass counts and percent defoliation were recorded at 10 locations to determine probable population levels for 1980 throughout the area. Results of this survey revealed a range of 1-4% defoliation at seven points and egg masses at five points in numbers capable of causing light and light-to-moderate defoliation in 1980 (Table 1).

Heavy budworm defoliation over three years causes top kill and/or entire tree mortality in pole-size stands (see Frontispiece). This level of damage was recorded in southeastern Ontario as a result of budworm defoliation in the late 1960s.

Table 1. Summary of jack pine budworm egg-mass counts and percent defoliation in 1979 and infestation forecasts for 1980 in the Northwestern Region (counts based on examination of six 61 cm [24 in.] branch tips at each location).

Location	Avg DBH of sample trees (cm) ^a	Defoliation (%)	Total no. of egg masses	Infestation forecast for 1980 ^b
Kenora District				
Glass Twp	15	1	3	L-M
High Lake	18	1	2	L-M
Malachi Lake	25	4	4	L-M
Tetu Lake - south end	15	1	1	L
Tetu Lake - north end	10	1	3	L-M
Umfreville Lake	18	1	0	nil
Dogtooth Lake	25	1	0	nil
Lount Lake	25	0	0	nil
Silver Lake	25	0	0	nil
Sand Lake - south end	18	0	0	nil

^a 1 cm = 0.39 in.

^b L = light; M = moderate

Greenstriped Mapleworm, *Dryocampa rubicunda rubicunda* Fabr.

For the second consecutive year a small infestation of this maple defoliator occurred in the Windy Point-Commissioners Bay area of the Fort Frances District. The total area defoliated did not appear to increase; however, the percentage of defoliation did intensify, with most of the red maples (*Acer rubrum* L.) in the infestation being completely denuded of foliage. This heavy defoliation resulted in many inquiries from concerned cottage owners in the area.

In the Bears Pass area, approximately 24 km (15 mi) east of this infestation, a second area of moderate defoliation was detected. Damage in this area was most noticeable on roadside regeneration along the Armstrong Road.

Eastern Pineshoot Borer, *Eucosma gloriola* Heinrich

Surveys in jack pine regeneration stands at scattered points in the Region in 1979 showed that, although the insect was common (Fig. 1), populations remained at a low level as was the case in the previous two years. Results of quantitative sampling at nine locations showed that an average of 2.8% of the terminals were destroyed by this insect (Table 2). Attacks were also observed on lateral shoots in each stand sampled; however, damage to host trees caused by lateral attacks is negligible, and therefore numbers of attacks were not recorded.

Aspen Leafblotch Miner, *Lithocolletis ontario* Free.

There was a marked decrease in population levels of this leafblotch miner on trembling aspen (*Populus tremuloides* Michx.) after three consecutive years of high populations at scattered locations in the southern half of the Region. Surveys revealed that small pockets of heavy infestation persisted in the southeastern portion of the Fort Frances District and one pocket was also detected near Fitchie Lake in the Sioux Lookout District; however, no heavy infestations could be found in either Ignace or Dryden districts where they were present in 1978. Elsewhere, only small numbers were detected and these were usually confined to open-growing or fringe trees.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The area infested by the forest tent caterpillar decreased by approximately 85% in 1979. Aerial mapping revealed moderate-to-severe defoliation of aspen (*Populus* spp.) stands within approximately 21 200 km² (8,200 mi²) of forest land compared with 145 000 km² (56,000 mi²) in the previous year. The current infestation was confined to the southern half of the Region, leaving Red Lake District free of caterpillar infestation for the first time in six years (Fig. 2). Small pockets of moderate-to-severe defoliation occurred for the second consecutive year south of the main body of infestation in the southern portion of the Fort Frances District; however, there was little change in the total area infested.

The main body of infestation extended from the town of Barwick in the southwestern part of the Fort Frances District, north of the Canada-United States border to Lake of the Woods at the mouth of the Rainy River, then northwest to the west side of Big Island. From this point the infestation boundary ran northeast through Lac Seul at Eagle Island to the north side of North Bamaji Lake, thence in a southerly direction to Carling Island in Lake St. Joseph to the village of Savant Lake, through Sturgeon and Shikag lakes to the Martin Siding area, then west to Gulliver Lake on the Ignace-Atikokan district

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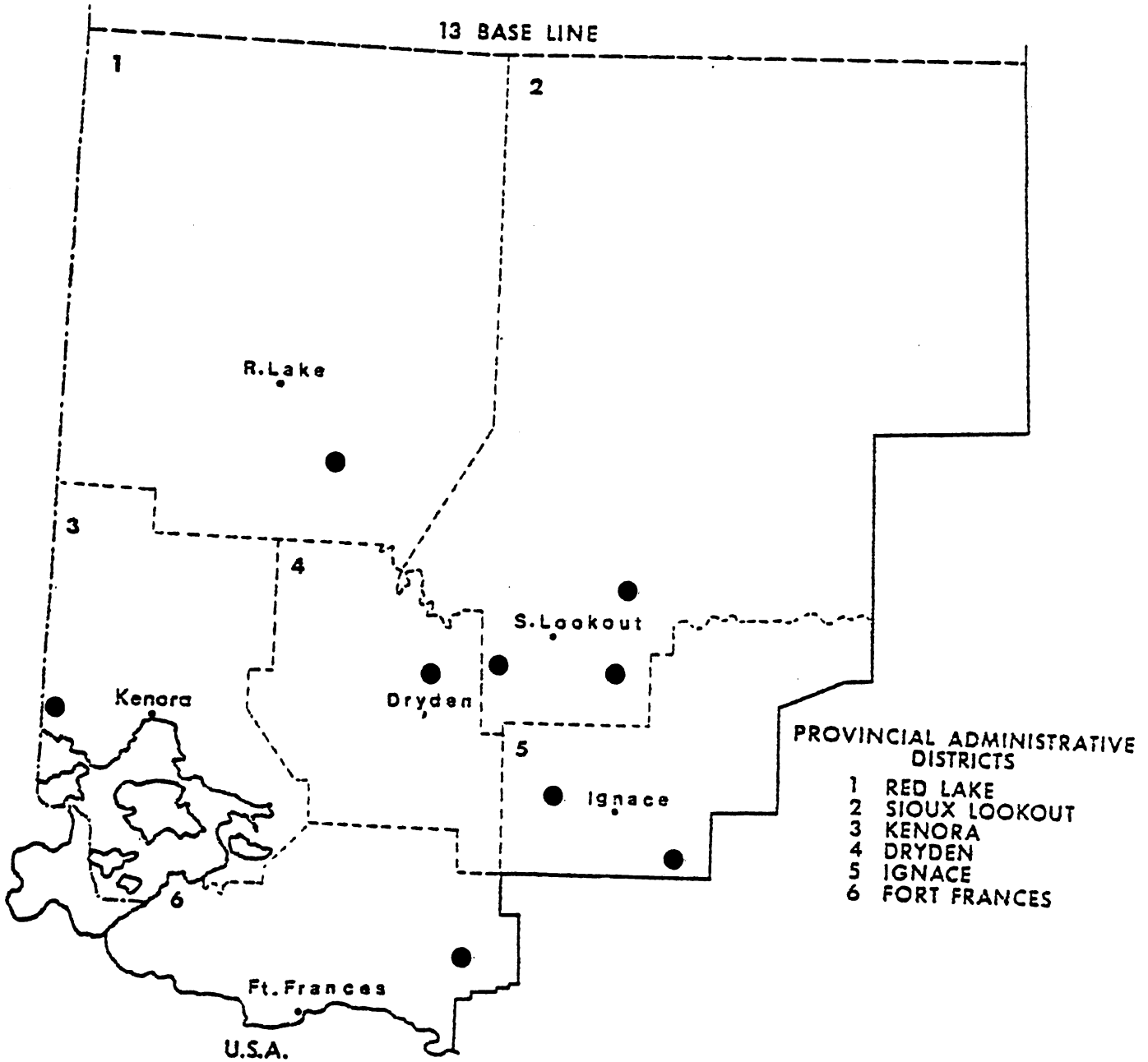


Fig. 1. EASTERN PINESHOT BORER

Locations where damage occurred in 1979. ●

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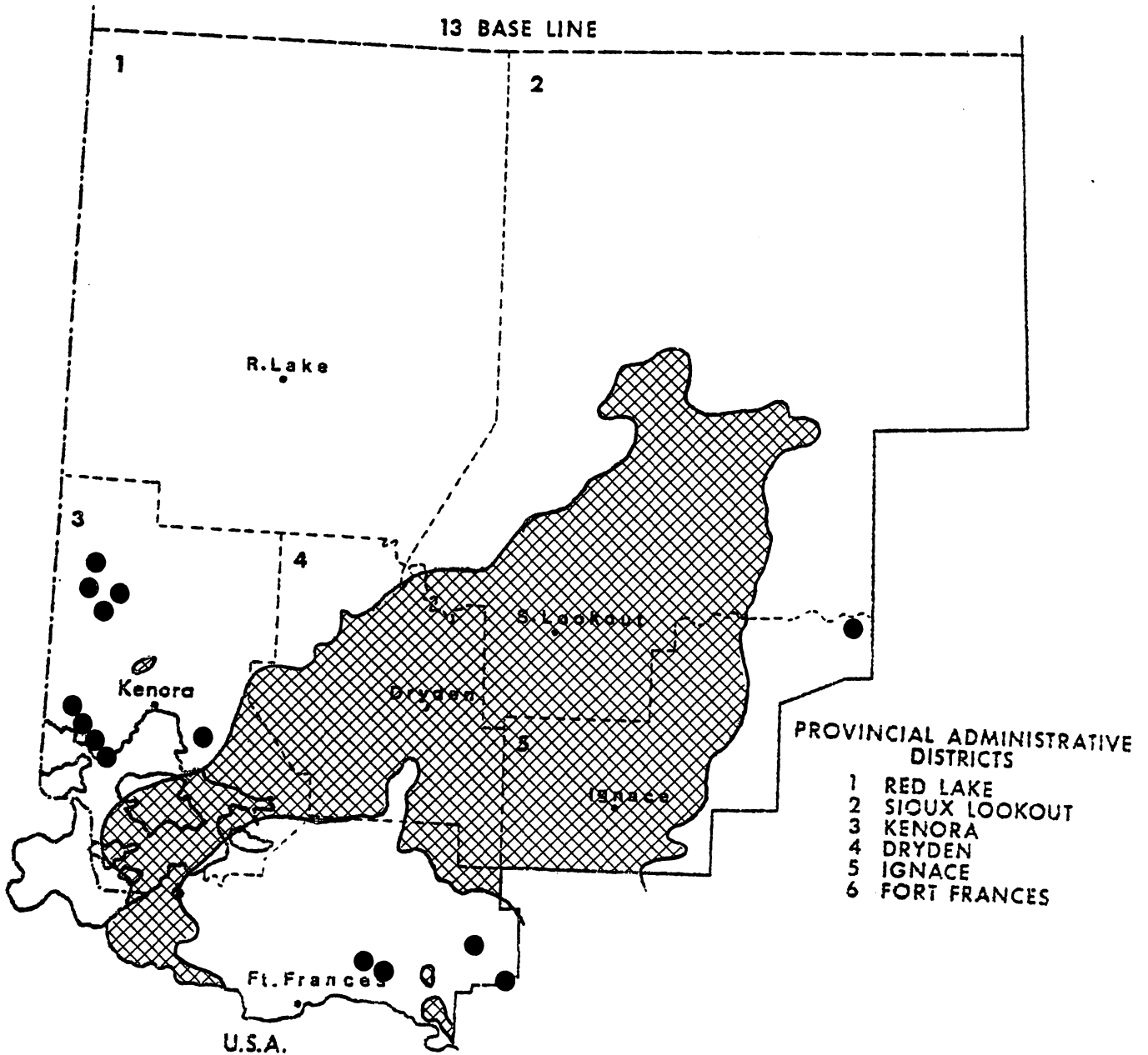




Fig. 2. FOREST TENT CATERPILLAR

Areas where defoliation of aspen occurred in 1979

Moderate to severe . . .  or 

boundary. The southern boundary of the infestation remained much the same as in the previous year when it extended from near Mount Lake on the Fort Frances-Atikokan district boundary northwest to the south end of Eagle Lake in Dryden District, then southwest to the eastern shore of Lake of the Woods near the town of Sioux Narrows. From this point it ran southward to the Canada-United States border at Barwick.

Larval populations were extremely high and there was a high incidence of larval migration in many aspen stands in the southeastern part of Sioux Lookout District, the eastern part of Dryden District, and the western part of Ignace and Fort Frances districts. Defoliation of aspen and white birch (*Betula papyrifera* Marsh.) reached close to 100% in many stands where high larval migration occurred. High numbers of a parasite, *Sarcophaga aldrichi* Park., were present throughout the infested area. Cocoon dissections at 10 scattered points revealed a decrease of 3% over the previous year in the incidence of moth emergence, marking four consecutive years of declining moth populations. Emergence averaged 16% and ranged from a low of 6% at Sioux Lookout to a high of 33% at Smirch Lake in the southwestern corner of Ignace District (Table 3). Parasitism was responsible for 83% of the moth emergence failure and 1% failed from disease infections or unknown causes.

Counts were made of the number of overwintering egg bands on trembling aspen at 15 scattered points in the infested area (Fig. 3). These counts revealed a marked decrease in average numbers of egg bands per sample point over the previous year, i.e., 23 in 1979 compared with 54 in 1978. The highest numbers of egg bands were found at sample points in Ignace and Fort Frances districts where infestations have been heavy only over the past two years (Table 4). The results of these counts indicate that infestations will decrease in the older part of the infested area in Sioux Lookout, Kenora and Dryden districts, and an eastward and southeastward extension in the infestation can be expected in the Ignace District and in the western portion of the Fort Frances District.

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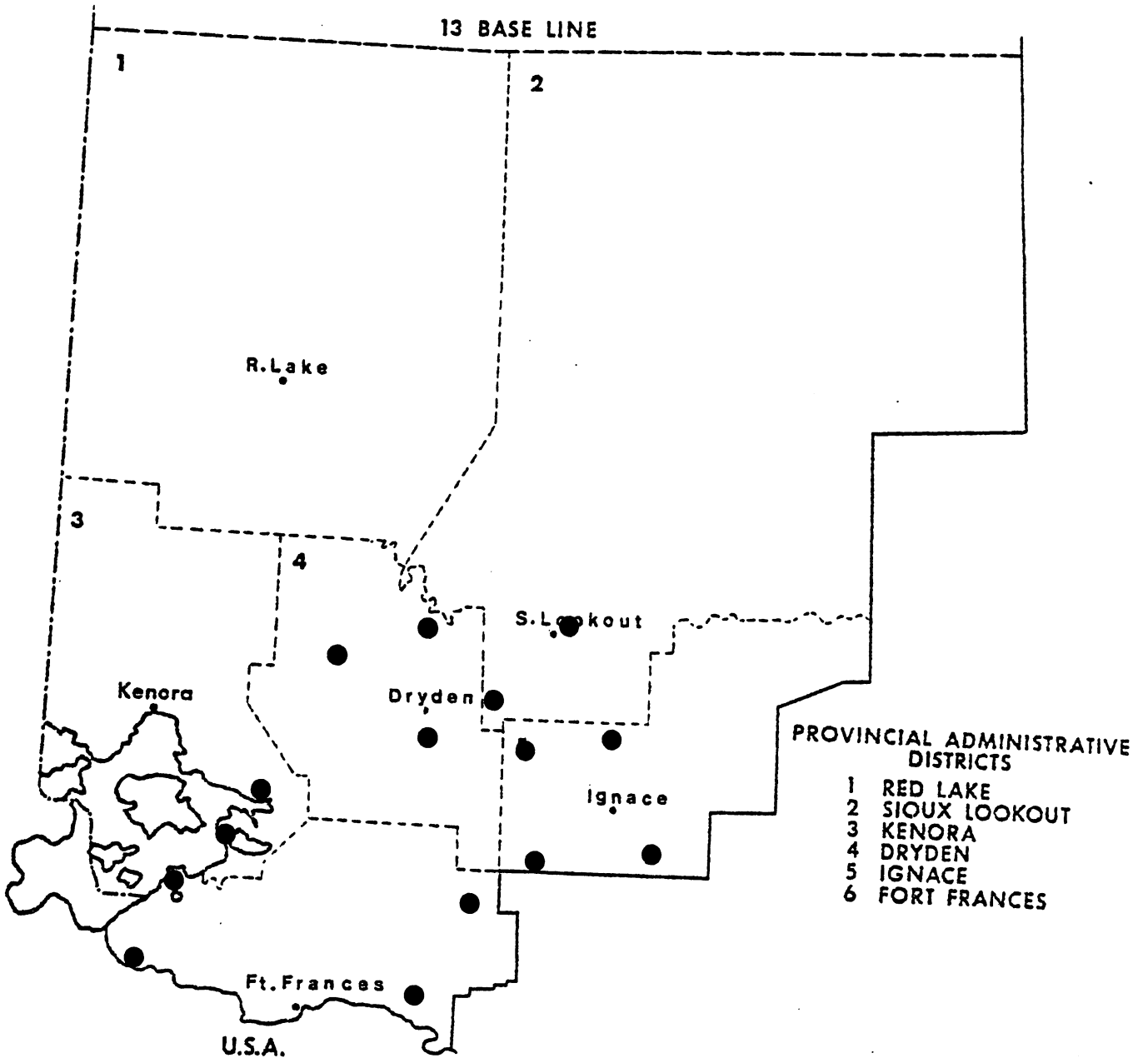


Fig. 3. FOREST TENT CATERPILLAR
Location of egg-band counts in
each district in 1979 ●

Table 2. Summary of damage by the eastern pineshoot borer in the North-western Region in 1979 (counts based on the examination of 100+ randomly selected jack pine trees [3-6 cm^a DBH] at each location).

Location	Avg tree ht (m) ^b	Trees with terminal shoot damage (%)
Red Lake District		
Pakwash Lake*	3.3	2
Sioux Lookout District		
Goodie Lake	5.3	1
Lookout Lake	3.5	2
Vermilion River*	0.8	3
Kenora District		
Gundy Lake Rd*	4.5	3
Dryden District		
Rugby Twp*	1.7	9
Ignace District		
Martin Siding	3.5	1
Pinafore Lake	1.5	2
Fort Frances District		
Manion Lake Rd*	4.0	3

^a 1 cm = 0.39 in.

^b 1 m = 3.28 ft

* Damaged leader survey

Table 3. Results of forest tent caterpillar cocoon dissections in 1979 in the Northwestern Region (100 cocoons dissected at each location).

Location	Parasitized (%)	Diseased or unknown (%)	Adult emergence (%)
Sioux Lookout District			
Sioux Lookout area	93	1	6
Kenora District			
Atikwa Lake	78	0	22
Hwy 71 at Berry Cr	93	0	7
Dryden District			
Jct of Hwys 17 & 594	92	0	8
Dryden Airport	89	0	11
Ignace District			
Suzanne Lake	79	3	18
Smirch Lake	61	6	33
Gulliver River	84	1	15
Fort Frances District			
Lake of the Woods Prov. Pk.	74	0	26
Worthington Twp	86	0	14

Table 4. Summary of forest tent caterpillar egg-band counts and infestation forecasts for 1980 in the Northwestern Region (counts based on the examination of one to three trembling aspen trees at each location).

Location	Avg DBH of sample trees (cm) ^a	No. of trees examined	Avg no. of egg bands per tree	Infestation forecast for 1980
Sioux Lookout District				
Echo Twp	13	3	5	light
Sioux Lookout Airport	13	3	5	light
Kenora District				
Hwy 71 at Berry Cr	13	3	12	moderate
Hwy 71 at Whitefish Bay	13	3	5	light
Dryden District				
Buller Twp	14	3	6	light
Van Horne Twp	12	1	18	severe
Williams Bay Lac Seul	13	3	6	light
Ignace District				
Suzanne Lake	13	1	27	severe
Smirch Lake	15	1	33	severe
Raven Lake	15	1	50	severe
Savant Lake	13	3	2	light
Fort Frances District				
Atwood Twp	13	1	29	severe
Lake of the Woods Prov. Pk.	15	1	136	severe
Jones Lake	14	3	4	light
Mine Centre	15	3	6	light

^a 1 cm = 0.39 in.

Sawyer Beetles, *Monochamus* sp.

Damage caused by high populations of adult sawyer beetles feeding on branches and twigs of jack pine and black spruce (*Picea mariana* [Mill.] B.S.P.) recurred for the third consecutive year in the Northwestern Region (Fig. 4). The preferred host was jack pine; however, black spruce was also damaged when mixed with the above species.

The most severe damage occurred on fringes of jack pine stands beside clear-cut areas east and southeast of Sowden Lake in the Ignace District. Less severe damage was observed on fringes of mixed jack pine and black spruce stands in a strip-cut area approximately 48 km (30 mi) south of Savant Lake, also in the Ignace District, and on fringes of clear-cut areas 20 km (12 mi) northwest of Savant Lake and in a small cutover area 24 km (15 mi) northeast of Pickle Lake in the Sioux Lookout District. Examination of a hail-damaged regeneration jack pine stand at Fork Lake, 74 km (46 mi) northwest of Sioux Lookout in mid-September revealed recent light damage by sawyer beetles feeding on branches and twigs of hail-damaged trees. Damage caused by adult beetles was generally confined to strips 20-40 m deep along the exposed fringes of stands. Severe branch and twig mortality was evident in badly damaged stands and some tree mortality is likely in 1980.

Northern Pitch Twig Moth, *Petrova albicapitana* (Busck.)

An unusually high population of this insect was found in a young jack pine plantation in the Vermilion River area, approximately 32 km (20 mi) north of Sioux Lookout in the Sioux Lookout District. A survey revealed that 65% of the trees were attacked by one to three larvae even though the average height of the trees in the plantation was only 0.8 m (2.5 ft). Surveys at numerous points elsewhere revealed that the insect was widely distributed in the Region and more common than in the past several years.

In the larval stage this insect feeds under a mass of pitch, generally at an internode or base of the terminal. This feeding very often girdles and thus kills the branch or terminal, and results in serious damage to small trees when populations are high, as in the plantation described above.

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

High populations of this sawfly recurred for the fourth consecutive year at widely scattered points in the southern half of the Region (Fig. 5).

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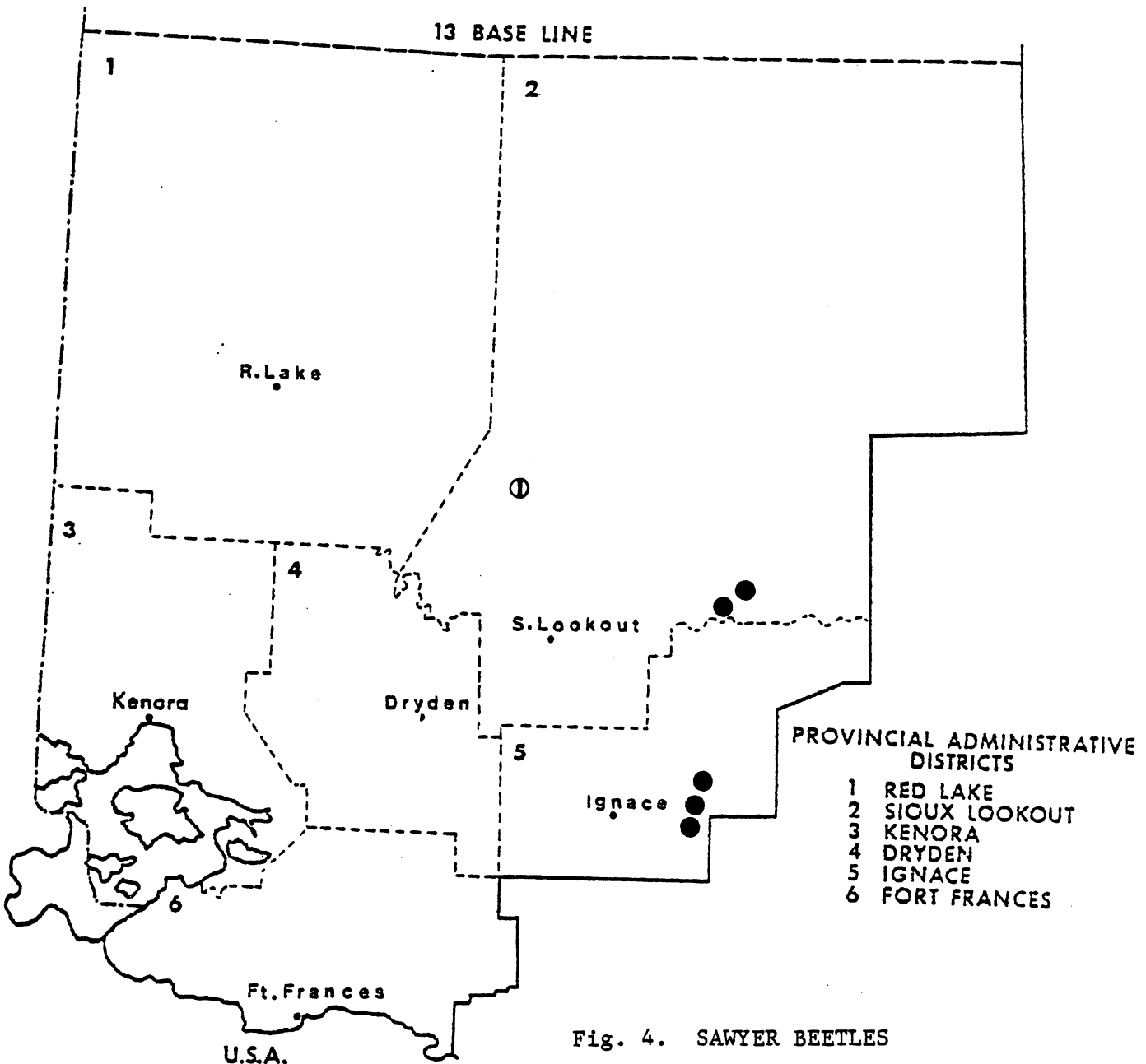


Fig. 4. SAWYER BEETLES

Locations where damage to jack pine occurred in 1979

Moderate to severe ●
Light ①

NORTHWESTERN REGION

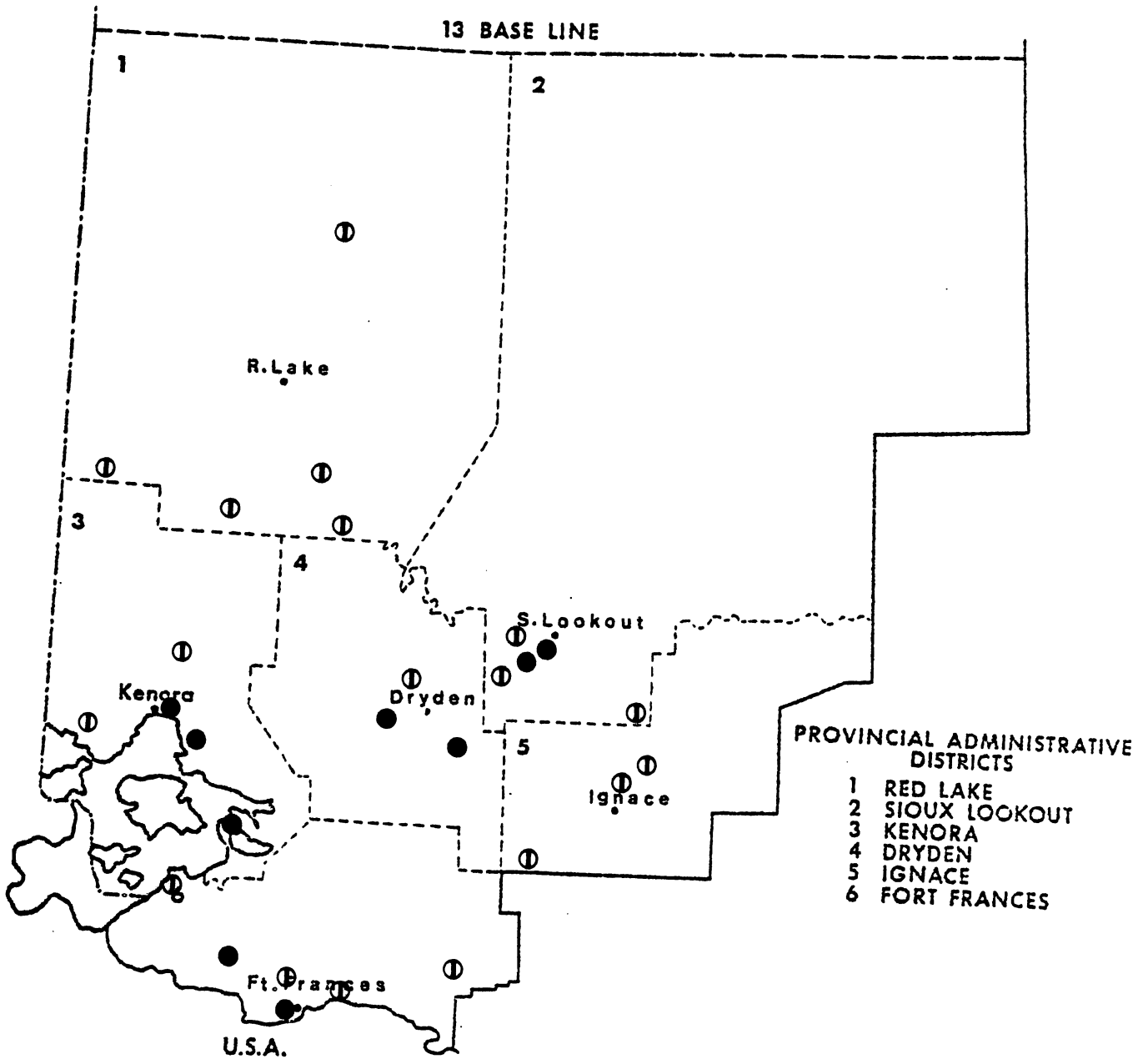


Fig. 5. YELLOWHEADED SPRUCE SAWFLY

Locations where defoliation of spruce occurred in 1979

Moderate to severe ●
Light ⊕

Pockets of heavy infestation were observed on open-growing planted white spruce (*Picea glauca* [Moench] Voss) in the vicinity of Sioux Lookout and at Ojibway Provincial Park, Sioux Lookout District, and on planted hedgerows in Potts and Crozier townships, Fort Frances District. Natural regeneration was also heavily infested at scattered points along highways 17 and 105, Dryden District and in Jaffray, Le May and Tweedsmuir townships, Kenora District. Light tree mortality occurred for the second consecutive year in a hedgerow in Potts Township, Fort Frances District. Small numbers of lightly infested trees were found at scattered points elsewhere in each district in the Region.

White Pine Weevil, *Pissodes strobi* (Peck)

Damage surveys and quantitative sampling in jack pine regeneration stands showed little change in the incidence of weevil attack over the previous year. The average number of leaders killed at 11 points evaluated was 3.0%, compared to 2.7% in 1978 (Table 5). The highest incidence of damage was recorded on the Manion Lake Road where 8% of the leaders were weeviled. General surveys throughout the remainder of the Region revealed small numbers of weevil-damaged trees at scattered points as far north as the 13th baseline (Fig. 6).

Larch Sawfly, *Pristiphora erichsonii* (Htg.)

Although little change was observed in the distribution of this sawfly over the previous year, there was an increase in populations in 1979. Small pockets of moderate-to-heavy infestations were found in Ignace Township and at Young Lake, Ignace District, and near Borups Corners, Dryden District. Severe defoliation occurred in the pocket of infestation in Ignace Township. Elsewhere in the southern half of the Region larval colonies were common in many stands, especially in Ignace District and the eastern part of Dryden District (Fig. 7).

Table 5. Summary of damage by the white pine weevil in the North-western Region in 1979 (counts based on the examination of 100+ randomly selected jack pine trees [3-5 cm^a DBH] at each location).

Location	Avg tree ht (m) ^b	Trees weeviled (%)
Red Lake District		
Dixie Lake Rd	2.3	7
Sioux Lookout District		
Lookout Lake	2.0	1
McAree Twp	2.5	1
Goodie Lake	2.0	4
Kenora District		
Gundy Lake Rd*	4.5	4
Dryden District		
Britton Twp*	5.0	4
Buller Twp	4.5	1
Gullwing Lake Rd	2.1	1
Ignace District		
Martin Siding	3.0	1
Pinafore Lake	1.5	2
Fort Frances District		
Manion Lake Rd*	4.0	8

^a 1 cm = 0.39 in.

^b 1 m = 3.28 ft

* Damaged leader survey

Aspen Leafroller, *Pseudexentera oregonana* Wlsh.

There was a marked decrease in the total area of moderate-to-severe defoliation of aspen (*Populus* spp.) by this leafroller. In 1978, damage occurred over 3 600 km² (1,400 mi²) whereas this season only 41 km² (16 mi²) of heavy defoliation was mapped in the Fort Frances

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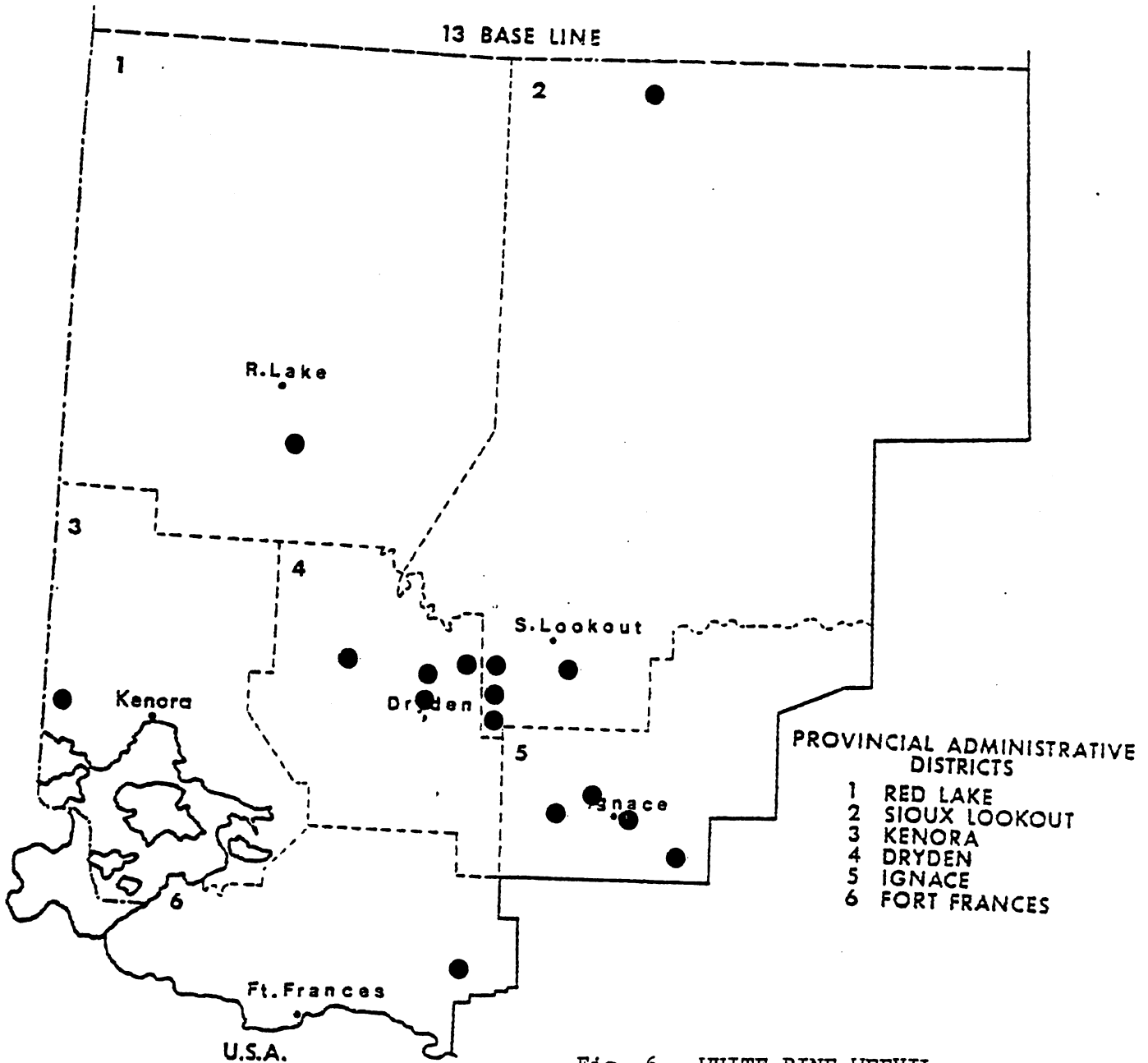


Fig. 6. WHITE PINE WEEVIL

Locations where damage occurred in 1979 ●

NORTHWESTERN REGION

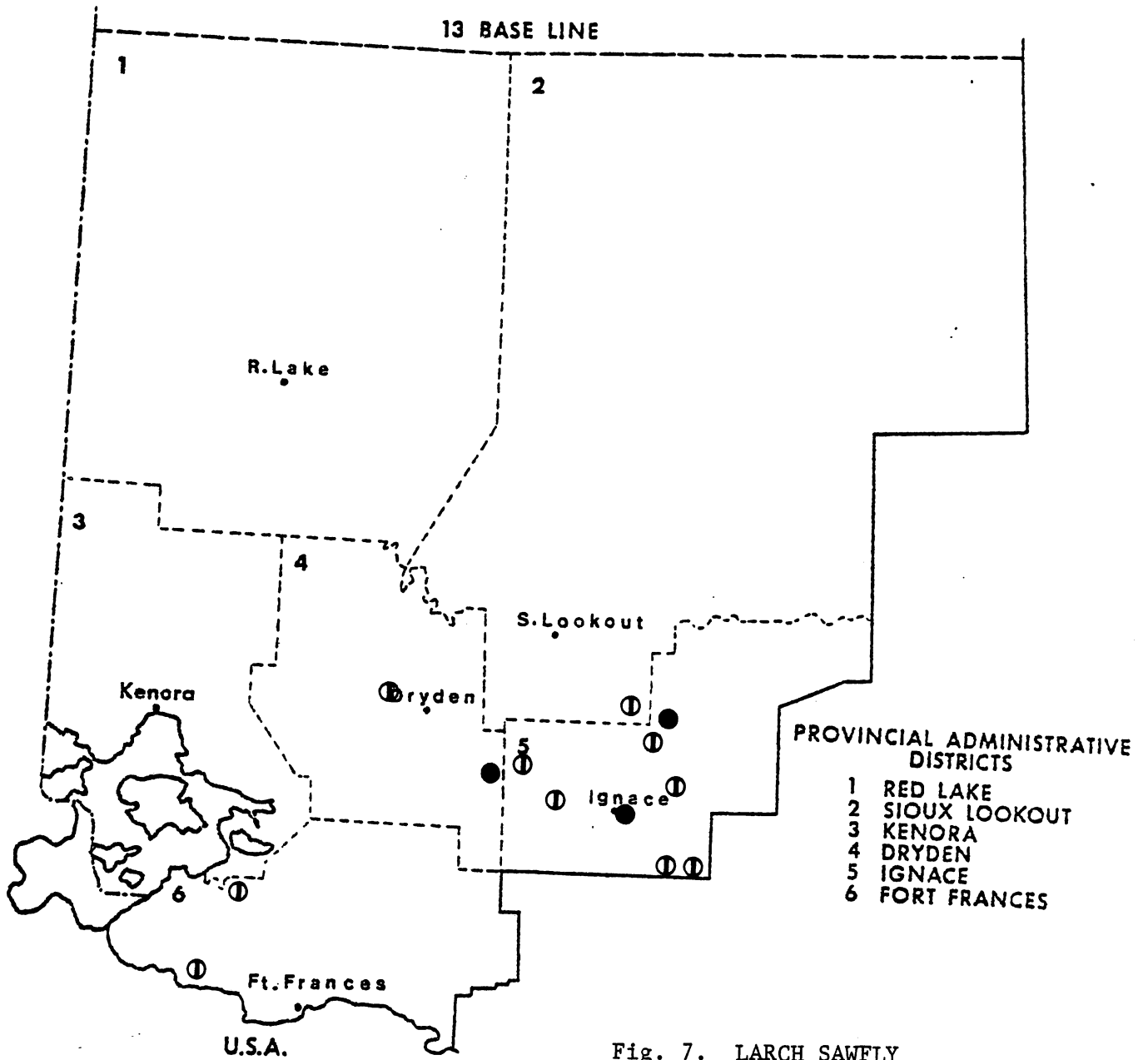


Fig. 7. LARCH SAWFLY

Areas where defoliation of larch occurred in 1979

Moderate to severe ●

Light ①

District. The area defoliated encompassed the southern portions of Dobie and Carpenter townships, with two additional smaller pockets to the immediate south in Lash Township. High numbers were also collected from Halkirk Township, east of the town of Fort Frances and from the area infested by the forest tent caterpillar, *Malacosoma disstria* Hbn., in Atwood and Worthington townships.

Trace defoliation, attributed to this leafroller, was detected at numerous scattered points throughout the Region and as far north as the Windigo Lakes area of the Sioux Lookout District.

The poplar leafroller, *Sciaphila duplex* Wlsh., was collected in low numbers at many of the same sample points throughout the southern portion of the Region.

Table 6. Other forest insects.

Insect	Host(s)	Remarks
<i>Altica ambiens alni</i> Harr. Alder flea beetle	Al	extremely high populations near Pinafore Lake, Ignace District
<i>Anomogyna elimata</i> Gn. Variable climbing cutworm	wS, bF	small numbers at four points in Ignace District and at one point in Red Lake District
<i>Archips cerasivoranus</i> (Fitch) Uglynest caterpillar	pCh	common on roadside and open-growing cherry trees at many points in the southwestern portion of the Fort Frances District
<i>Diprion similis</i> (Htg.) Introduced pine sawfly	wP, jP	trace populations in Claxton Twp and at Kaiarskons Lake, Fort Frances District-- a northern extension of the known range
<i>Fenusa pusilla</i> (Lep.) Birch leafminer	wB	small numbers at three scattered points in Ignace District, and at Windy Point and in the town of Fort Frances, Fort Frances District

(continued)

Table 6. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Gracillaria cuculipennella</i> Clem. Privet leafminer	bAs	a rare insect in Ontario, collected at Moar Lake, 270 km north of Vermilion Bay where it was last recorded in 1957
<i>Hyphantria cunea</i> Dru. Fall webworm	Al, wB	trace levels of damage detected at Caliper Lake Provincial Park, Fort Frances District, and in McMeekin Twp, Kenora District
<i>Malacosoma americanum</i> F. Eastern tent caterpillar	pCh	one colony collected on roadside trees in Tovell Twp, Fort Frances District-- first record in North-western Ontario
<i>Neodiprion maurus</i> Roh. Redheaded pine sawfly	jP	one colony collected at Nango Lake on the 13th baseline, northern Sioux Lookout District
<i>Neodiprion nanulus nanulus</i> Schedl Red pine sawfly	rP, jP	small number of colonies on red pine in Echo Twp, Sioux Lookout District, and on jack pine at Bears Pass, Fort Frances District
<i>Neodiprion pratti banksianae</i> Roh. Jack pine sawfly	jP	trace populations at widely scattered points in Red Lake, Sioux Lookout, Kenora and Fort Frances districts
<i>Neodiprion virginianus</i> complex Redheaded jack pine sawfly	jP	trace populations in Boys Twp, Kenora District, in Melgund Twp, Dryden District and along Hwy 11 at Little Turtle Lake Rd, Fort Frances District
<i>Pikonema dimmockii</i> (Cress.) Greenheaded spruce sawfly	wS	low numbers collected in beating samples in Red Lake, Sioux Lookout and Fort Frances districts

(continued)

Table 6. Other forest insects (concluded).

Insect	Host(s)	Remarks
<i>Pleroneura brunneicornis</i> Roh. Balsam shootboring sawfly	bF	small numbers on current shoots damaged on codominant trees in Southworth Twp, Dryden District
<i>Pseudaletia unipuncta</i> Haw. Armyworm	Grass	heavy infestations caused damage to lawns in the towns of Sioux Lookout and Fort Frances; minimal damage observed in Dryden Forest Station
<i>Pseudexentera cressoniana</i> Clem. Oak leafroller	bO	moderate damage on fringe and open-growing trees in Woodyatt Twp, Fort Frances District, and at Nestor Falls, Kenora District
<i>Tetralopha robustella</i> Zell. Pine webworm	jP	trace damage observed in Devonshire Twp, Kenora District, and in Watten Twp, Fort Frances District

TREE DISEASES

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

Armillaria root rot is commonly detected causing trace mortality and damage in stands throughout the Region. Data from the special survey of high-value jack pine stands in 1979 were consistent with the findings of previous years when trace mortality was observed in evaluated stands at one point in both the Red Lake and Fort Frances districts (Table 7).

Table 7. Summary of damage caused by *Armillaria* root rot (*Armillaria mellea*) in jack pine stands examined in the Northwestern Region in 1979 (counts based on the examination of 150 randomly selected trees at each location).

Location	Avg tree ht (m) ^a	Current mortality (%)
Red Lake District		
Hwy 105 south of Pakwash Prov. Pk.	3.3	1
Dixie Lake	2.9	0
Sioux Lookout District		
Goodie Lake	5.3	0
Snag Lake	0.9	0
South of Vermilion River	0.9	0
Kenora District		
Jones Rd at Silver Lake	7.0	0
Gundy Twp	4.5	0
Dryden District		
Rugby Twp	1.7	1
Britton Twp	5.0	0
Ignace District		
Valora Crossing	5.5	0
Fort Frances District		
Manion Lake Rd	4.0	0
Burriss Twp	1.5	0

^a 1 m = 3.28 ft

Dutch Elm Disease, *Ceratocystis ulmi* (Butism.) C. Moreau

In 1979, surveys conducted in the Fort Frances District for Dutch elm disease indicated a slow, westerly spread of the disease. Although the disease was successfully cultured from trees at only two new locations in the vicinity of Fort Frances. Mature elm (*Ulmus* spp.) growing along Rainy River in Roddick Township and within the village of Emo produced the typical flagging by mid-July and are probably affected.

The town of Fort Frances began a control program to reduce the population levels of the native elm bark beetle (*Hylurgopinus rufipes* Eichh.), the main vector of Dutch elm disease in northwestern Ontario. All dead or dying material, i.e., branches or entire trees, were removed and stumps were debarked (see Frontispiece) to eliminate possible breeding sites of this beetle. In addition, basal portions of elms were sprayed with the insecticide Dursban 2E to destroy adults tunneling into the tree seeking winter hibernation sites.

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

General surveys revealed that this needle rust was common in low-lying black spruce stands, causing trace levels of foliar damage. In 1978 foliage evaluations completed in the Dixie Lake area of the Red Lake District showed that 22% of the trees were infected and foliar damage averaged 25%. This year the percentage of trees affected rose to 70% but the percentage of foliage damaged dropped to 2%. In five additional areas in the Region where this needle rust was evaluated, incidence of trees affected ranged from 3% in Kingsford Township to 83% east of Mine Centre, Fort Frances District. However, in all areas evaluated only 1-2% of the foliage was damaged.

Elsewhere in the Region the disease was commonly observed on fringe trees causing trace damage (Fig. 8).

A Needle Rust of Pine, *Coelosporium asterum* (Diet.) Syd.

This foliar rust of pine was common in the southern portion of the Region, causing trace damage. The incidence recorded this year is the highest since 1974, when similar damage levels were evaluated at five points, also in the southern half of the Region.

The percentage of trees affected ranged from 10% in MacNicol Township, Kenora District and in Dance Township, Fort Frances District, to 79% in Burdiss Township, Fort Frances District. A Jack pine regeneration stand in Burdiss Township had foliar damage averaging 8%. At all other stands examined, foliar damage was 1% or less.

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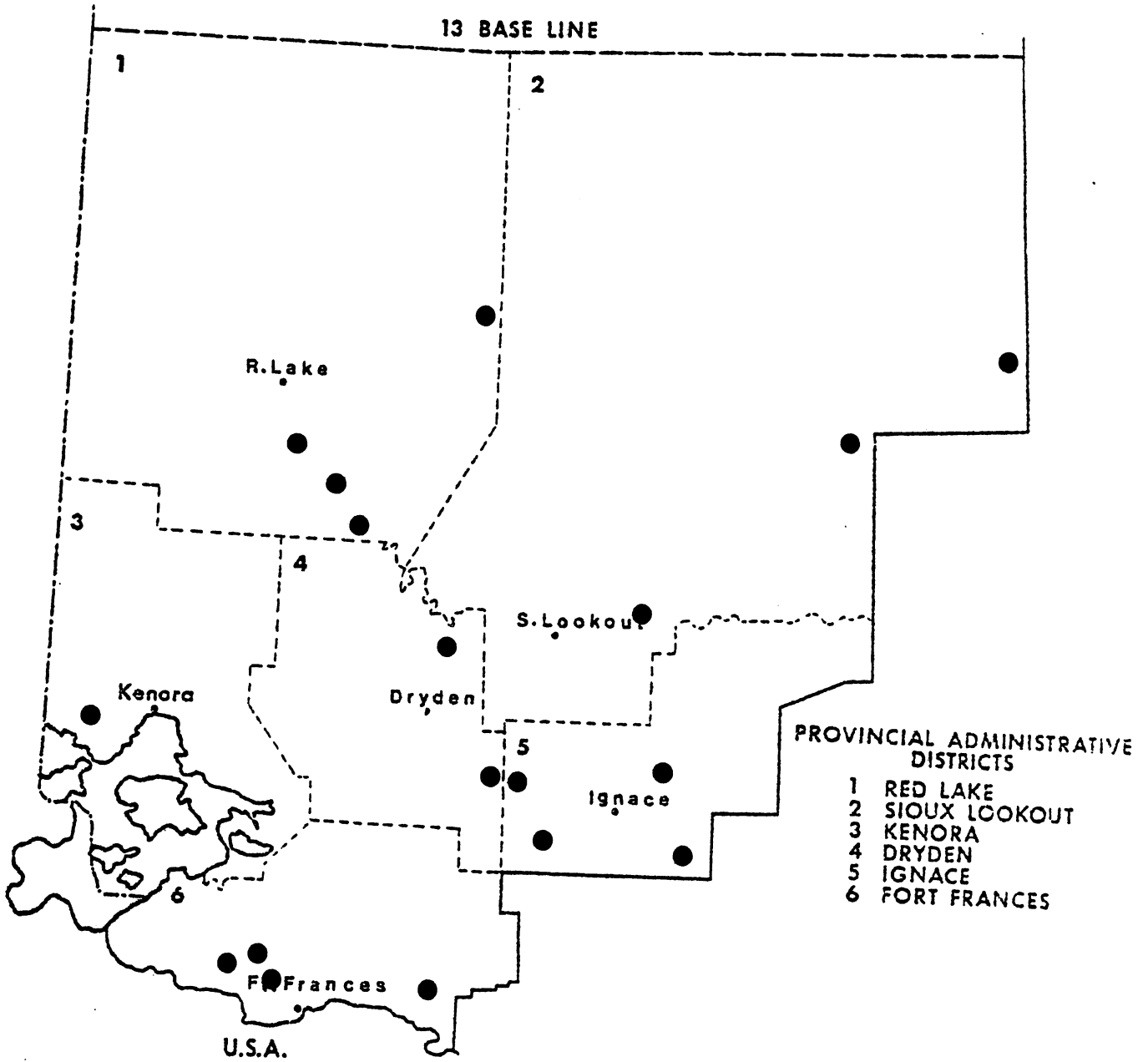


Fig. 8. NEEDLE RUSTS OF SPRUCE

Locations where trace levels of foliar

damage occurred in 1979 ●

Stem Rusts, *Cronartium* sp.

As part of the high-value jack pine survey, evaluations were completed at 12 sample points for stem rusts. Because of the timing of the survey, the fruiting bodies of the stem rusts, which are required for positive identification, were unattainable. Therefore, all cankers were simply identified as *Cronartium* sp. Because of the incidence of the alternate hosts sweetfern (*Comptonia peregrina* [L.] Coult.) and sweet gale (*Myrica gale* L.) it was assumed that the majority of cankers found were caused by sweetfern blister rust (*Cronartium comptoniae* Arth.). Two additional possibilities were comandra blister rust (*Cronartium comandrae* Pk.) and stalactiform blister rust (*Cronartium coleosporioides* Arth.), which have been detected occasionally in the Region.

The incidence of stem rusts detected in the survey ranged from 0% to a high of 7% in the Dryden District (Table 8). Trees with cankers detected on the stem were considered to be severely affected because mortality may occur in younger trees, and also because there is appreciable cull in mature trees that have stem cankers.

Jack Pine Needle Cast, *Davisonmycella ampla* (Davis) Darker

As part of the special survey conducted in high-value jack pine stands, evaluations were completed at 12 randomly selected locations in the Region for this particular needle cast. Symptoms of this disease were not observed in any of the selected stands. However, trace defoliation by this needle cast was recorded elsewhere in the Region.

Trace defoliation was detected south of Minnitaki in Aubrey Township, Dryden District, on young open-growing jack pine. In the Gulliver River area of the Ignace District, similar damage levels were recorded on 12 m (40 ft) jack pine. In the Fort Frances District, trace levels of damage were detected on fringe and open-growing trees in Mather Township, south of Finland, and along Highway 11 in Watten Township.

Table 8. Summary of damage caused by stem rusts (*Cronartium* sp.) in jack pine stands examined in the Northwestern Region in 1979 (counts based on the examination of 150 randomly selected trees at each location).

Location	Avg tree ht (m) ^a	Trees affected (%) ^b
Red Lake District		
Dixie Lake	2.9	0
Hwy 105 south of Pakwash Prov. Pk.	3.3	0
Sioux Lookout District		
Goodie Lake	5.3	0
Snag Lake	0.9	0
South of Vermilion River	0.8	0
Kenora District		
Jones Rd at Silver Lk.	7.0	3
Gundy Twp	4.5	0
Dryden District		
Britton Twp	5.0	7
Rugby Twp	1.7	1
Ignace District		
Valora Crossing	5.5	0
Fort Frances District		
Manion Lake Rd	4.0	1
Burriss Twp	1.5	0

^a 1 m = 3.28 ft

^b Stem cankers

Western Gall Rust of Hard Pines, *Endocronartium harknessii* (J.P. Moore)
Darker

This gall rust of hard pines was included in the special survey of jack pine conducted this year throughout the Region. The incidence varied from 43% in the Red Lake District to 0% in the Fort Frances District (Table 9).

Galls on the main stem can eventually cause mortality; hence, these trees are rated as being severely infected. Occurrence of severely affected trees was highest (23%) in the Red Lake District. In 11 other areas evaluated this type of damage averaged only 2% (a range of 0 to 4%).

Elsewhere in the Region this disease was detected and sampled at numerous points (Fig. 9). Damage levels were similar to those recorded for the majority of plots in the special survey.

Table 9. Summary of damage caused by western gall rust of hard pines in the Northwestern Region in 1979 (counts based on the examination of 150 randomly selected trees at each location).

Location	Avg tree ht (m) ^a	Trees affected (%)	Trees severely affected ^b (%)
Red Lake District			
Dixie Lake	2.9	43	23
Hwy 105 south of Pakwash Prov. Pk.	3.3	7	3
Sioux Lookout District			
Goodie Lake	5.3	18	4
Snag Lake	0.9	4	4
South of Vermilion River	0.8	3	3
Kenora District			
Jones Rd at Silver Lk	7.0	38	0
Gundy Twp	4.5	3	1
Dryden District			
Britton Twp	5.0	25	1
Rugby Twp	1.7	7	3
Ignace District			
Valora Crossing	5.5	12	4
Fort Frances District			
Manion Lake Rd	4.0	33	1
Burriss Twp	1.5	0	0

^a 1 m = 3.28 ft

^b Stem galls

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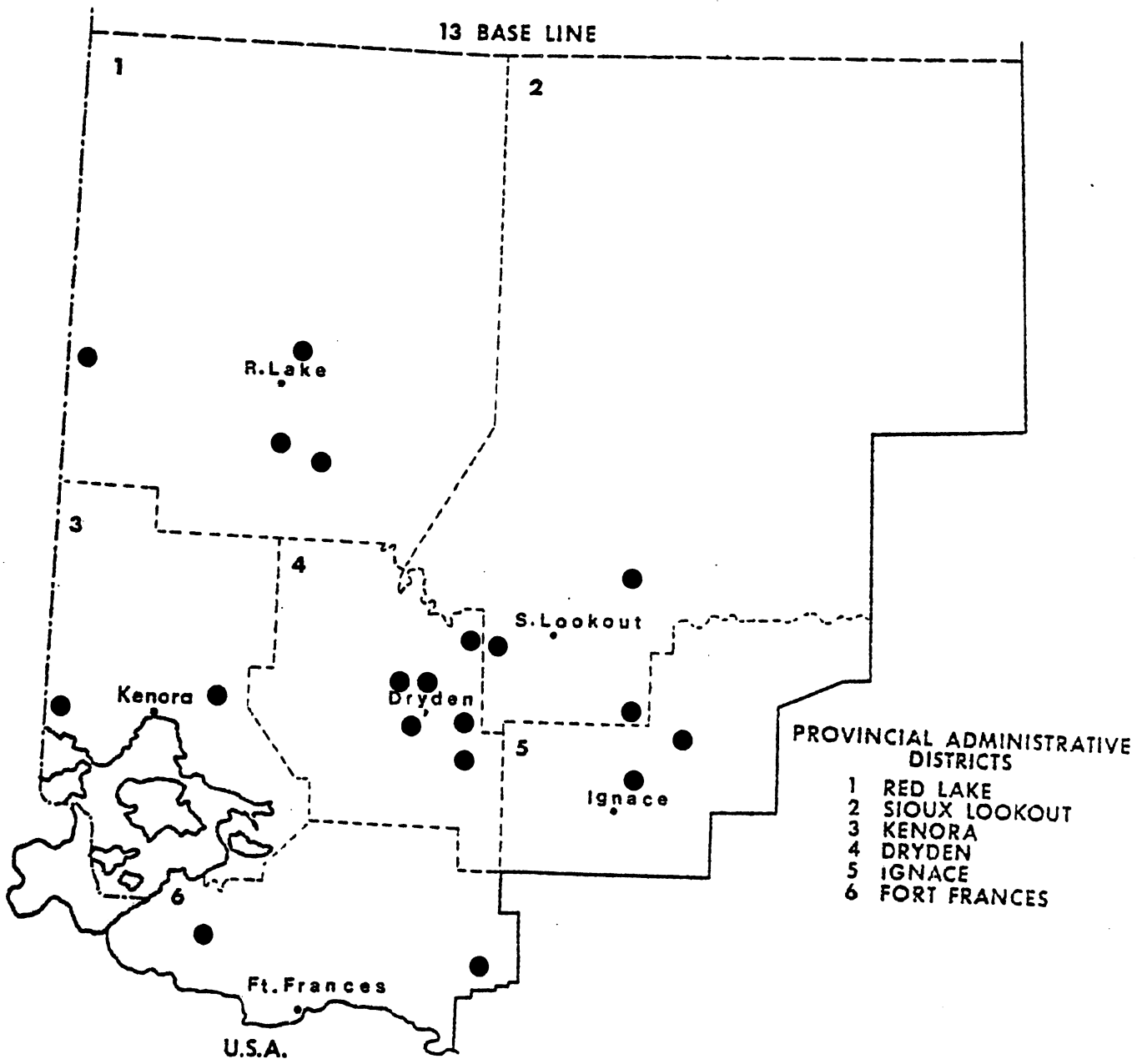


Fig. 9. WESTERN GALL RUST OF HARD PINES

Locations where damage was sampled in

1979 ●

Scleroderris Disease of Pine, *Gremmeniella abietina* (Lagerb.) Morelet

General surveys conducted in both planted and natural pine regeneration did not reveal any new infection centres of this disease in 1979. An evaluation of red pine (*Pinus resinosa* Ait.) planted in Aubrey Township, Dryden District, where the disease was first detected in 1978, revealed that 5% of the seedlings were affected. Because of the potential effect this disease has on pine regeneration, the Ontario Ministry of Natural Resources at Dryden conducted a sanitation program in the planted area consisting of the removal and burning of seedlings with disease symptoms, i.e., foliar symptoms, dead branches or cankers.

In the Pineimuta River area of the Sioux Lookout District considerable mortality is still occurring in the heavily overstocked natural jack pine regeneration stands. However, the trees that have survived the infection to date appear to have growth rates comparable to those of uninfected stock in adjacent areas (20 to 25 cm [8 to 10 in.]). Similar observations were made in the Lysander Lake area where infections were first detected in 1970.

Aerial observations indicated no apparent change from previous years in the area affected or damage levels in regeneration jack pine in the Wavell Lake area, Red Lake District.

Leaf and Twig Blight of Aspen, *Venturia macularis* (Fr.) Müller & Arx
(= *Pollaccia radiosa* [Lib.] Bald. & Cif.)

The incidence of this leaf and twig blight remained very high in the southern portion of the Region. Club tops on aspen regeneration, resulting from repeated terminal kill, were observed in the following locations: east of Pinewood in Morley Township, along the Bat Lake Road, and at Windy Point, in the Fort Frances District. Regeneration south of Cook Lake in Britton Township and south of Borups Corners in Melgund Township, Dryden District, shows similar damage levels (Fig. 10).

Stands examined in the northern portion of the Region showed a decline since 1978 in the percentage of trees affected. In the Red Lake District, the percentage of trees affected declined from 87% in 1978 to 43% in 1979. Similarly, in the Sioux Lookout District, damage declined from 62% to 49% (Table 10).

Elsewhere, at scattered points in the Region, the disease was detected causing varying degrees of damage on regeneration aspen.

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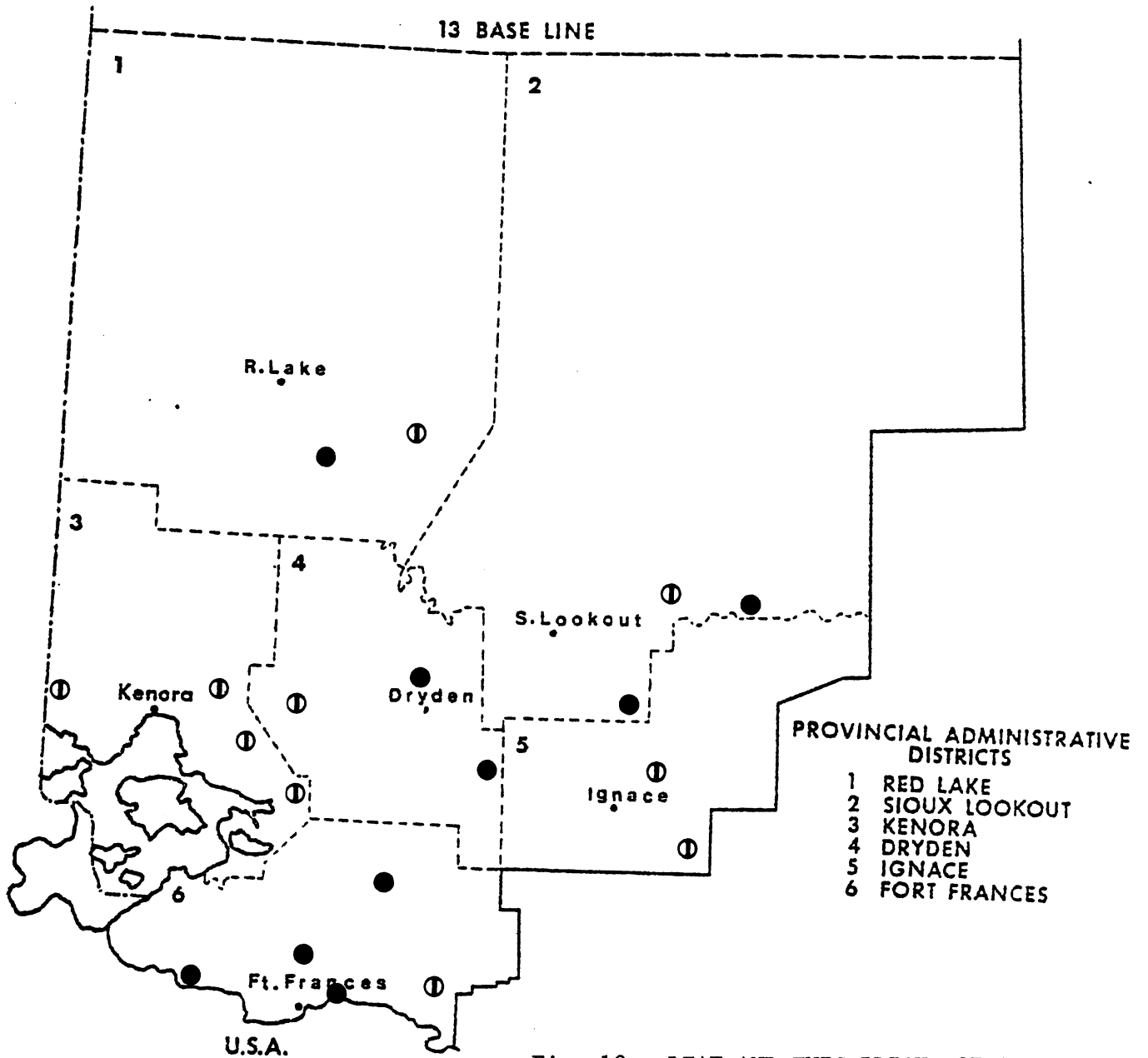


Fig. 10. LEAF AND TWIG BLIGHT OF ASPEN

Locations where damage occurred to aspen in 1979.

Moderate to severe ●

Light ①

Table 10. Summary of damage caused by leaf and twig blight of aspen in the Northwestern Region in 1979 (counts based on the examination of 100+ randomly selected trees at each location).

Location	Tree ht (m) ^a	Trees diseased (%)	Terminal shoot mortality (%)
Red Lake District			
Chukuni River Rd	2.0	43	8
Sioux Lookout District			
Snag Lake	2.0	49	8
Marchington River	2.0	6	0
Kenora District			
Hillock Lake	1.6	25	10

^a 1 m = 3.28 ft

Hail Damage

Aerial and ground surveys in the Fork Lake area 74 km (46 mi) north of Sioux Lookout, Sioux Lookout District revealed that a hail storm which occurred in late 1978 or early 1979 caused severe damage to regeneration jack pine through an area of approximately 8 km² (5 mi²) of forested land. Serious injury to branches of trees exposed to the west and considerable branch mortality were evident by mid-August. Similar damage that occurred near Madden Lake in the Red Lake District in 1978 caused heavy tree mortality in the area by late summer of 1979; therefore, considerable tree mortality is likely over the next 1-2 years.

During the first week of September, 1979, a severe hail storm occurred in the vicinity of the village of Pickle Lake, Sioux Lookout District. Because the hailstones were reported to be very large, damage to trees in the path of this storm may have been severe.

Table 11. Other forest diseases.

Organism	Host(s)	Remarks
<i>Aureobasidium pullulans</i> (d By.) Arn.	rP, muP	secondary fungi collected from damaged trees at Kathlyn Lk, Sioux Lookout District and in Zealand Twp, Dryden District, and on ornamental pine at the OMNR office in Sioux Lookout, Sioux Lookout District
<i>Ciborinia whetzeli</i> (Seaver) Seaver Ink spot of aspen	tA	heavy damage observed in Melgund Twp, Dryden District, and trace-to-light damage at Savant Lk, Sioux Lookout District, and at Suzanne Lk, Ignace District
<i>Cytospora chrysosperma</i> (Pers.) Fr. Cytospora canker	tA	trace damage to regeneration aspen in Zealand Twp, Dryden District
<i>Cytospora friesii</i> Sacc.	bF	trace damage on fringe trees in Mather Twp, Fort Frances District
<i>Cytospora</i> sp.	rP	collected in area where unknown pathogen killed one-year-old shoots in 1978 at Kathlyn Lk, Sioux Lookout District
<i>Diplodia pinea</i> (Desm.) Kickx Diplodia tip blight	rP	common on understory pine at Caliper Lk Prov. Pk., Fort Frances District
<i>Lophium mytilinum</i> (Pers.) Fr.	jP	secondary fungi collected from jack pine mortality at Snakeweed Lk, Red Lake District, and at Pashkokogan Lake, Sioux Lookout District
<i>Lophodermium pinastri</i> (Schrad. ex Hook.) Chev. Needle cast of pine	rP	moderate defoliation in Echo Twp, Sioux Lookout District

(continued)

Table 11. Other forest diseases (concluded).

Organism	Host(s)	Remarks
<i>Phacidium abietis</i> (Dearn.) Reid & Cain Snow blight	wS, bF	approx. 10,000 rising 2-0 seedlings lost at the OMNR Forest Station, Dryden District, and on fringe balsam fir at Duff Lake, Fort Frances District
<i>Pucciniastrum epilobii</i> Otth. Balsam fir needle rust	bF	trace defoliation at Detector Lk and 1.0 km north of Ear Falls, Red Lake District, also southwest of the Sturgeon River, Ignace District
<i>Rhizina undulata</i> Fr. Rhizina root rot	ground	collected at a recently burned site 1 km south of Nagron Lake, Sioux Lookout District
<i>Sirococcus strobilinus</i> Preuss. Shoot blight of red pine	rP	trace damage at Victoria Lk, Ignace District, Grassy Portage Bay; Fort Frances District, and Blue Lk Prov. Pk., Dryden District