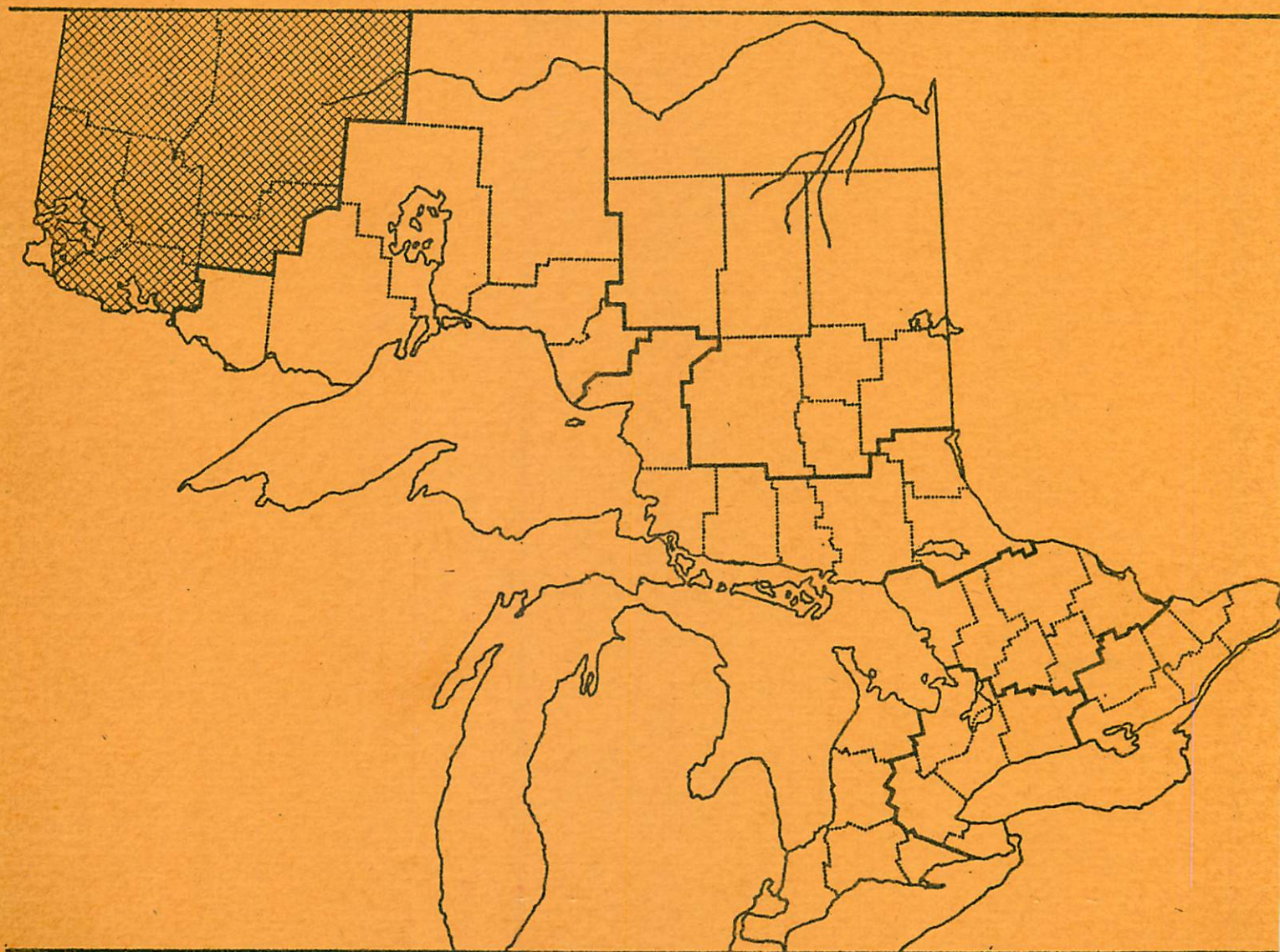


# FOREST INSECT AND DISEASE SURVEYS IN THE NORTHWESTERN REGION OF ONTARIO, 1977

M.J. THOMSON and R.J. SAJAN

CANADIAN FORESTRY SERVICE





FOREST INSECT AND DISEASE SURVEYS  
IN THE NORTHWESTERN REGION  
OF ONTARIO, 1977

M. J. THOMSON AND R. J. SAJAN

GREAT LAKES FOREST RESEARCH CENTRE  
SAULT STE. MARIE, ONTARIO  
CANADIAN FORESTRY SERVICE  
DEPARTMENT OF THE ENVIRONMENT

MARCH 1978

*Copies of this report may be obtained  
from*

*Information Office,  
Great Lakes Forest Research Centre,  
Canadian Forestry Service,  
Department of the Environment,  
Box 490, Sault Ste. Marie, Ontario.  
P6A 5M7*



Frontispiece. Typical elm deterioration caused  
by the Dutch elm disease,  
*Ceratocystis ulmi* (Buism.) C. Moreau.

## SURVEY HIGHLIGHTS

This report describes the more important forest insect and tree disease conditions in the Northwestern Region in 1977. The area infested by spruce budworm increased by 40% over 1976 and there was a twofold increase in the extent of forest tent caterpillar infestations. The area infested by an aspen leafroller increased markedly and caused severe defoliation of some aspen stands. Unusually high populations of adult sawyer beetles caused severe damage and some tree mortality in jack pine and spruce stands at five points and a rare pill beetle infestation occurred in spruce seedling beds in the Dryden Forest Station. Severe damage was caused in the seedling beds by ravens pulling seedlings while feeding on pill beetle larvae and pupae.

No snow mold damage was found in seedling beds or on wind-breaks as in previous years in the Dryden Forest Station. Sanitation measures taken in midsummer and an application of fungicide in the late fall of 1976 undoubtedly contributed to the control of this fungus disease.

In the southern portion of the Region jack pine and red pine stands on high sites suffered drought damage over an area more than twice the size of that recorded in 1976. *Gremmeniella* ( $\equiv$  *scleroderris*) canker of pine was discovered for the first time in the immediate Sioux Lookout area and surveys for Dutch elm disease in the southern part of the Region located one infected tree in the town of Fort Frances. A special survey to determine the incidence and damage levels of diseases affecting sapling-sized aspen regeneration originating from sucker growth was conducted within selected stands at 10 widely separated points.

M. J. Thomson  
Supervisor

#### ACKNOWLEDGMENTS

The assistance and excellent cooperation extended to the authors by personnel of the Ontario Ministry of Natural Resources, forest industry and private individuals during the 1977 field season are gratefully acknowledged.

## TABLE OF CONTENTS

	Page
<b>INSECTS . . . . .</b>	<b>1</b>
Spruce Budworm, <i>Choristoneura fumiferana</i> . . . . .	1
Pill Beetle, <i>Cytilus alternatus</i> . . . . .	1
Eastern Pineshoot Borer, <i>Eucosma gloriola</i> . . . . .	1
Aspen Leafblotch Miner, <i>Lithocolletis ontario</i> . . . . .	1
Forest Tent Caterpillar, <i>Malacosoma disstria</i> . . . . .	2
Sawyer Beetles, <i>Monochamus</i> sp. . . . .	3
Yellowheaded Spruce Sawfly, <i>Pikonema alaskensis</i> . . . . .	4
White Pine Weevil, <i>Pissodes strobi</i> . . . . .	6
Larch Sawfly, <i>Pristiphora erichsonii</i> . . . . .	6
Aspen Leafroller, <i>Pseudexentera oregonana</i> . . . . .	7
Other Forest Insects . . . . .	7
 <b>TREE DISEASES . . . . .</b>	 <b>10</b>
Dutch Elm Disease, <i>Ceratocystis ulmi</i> . . . . .	10
Needle Rusts of Spruce, <i>Chrysomyxa ledi</i> and <i>C. ledicola</i> . . .	10
Ink Spot of Aspen, <i>Ciborinia whetzellii</i> . . . . .	10
Cytospora Canker, <i>Cytospora chrysosperma</i> . . . . .	11
Western Gall Rusts of Hard Pines, <i>Endocronartium harknessii</i> .	12
Gremmeniella ( $\equiv$ Scleroderris) Canker of Pine, <i>Gremmeniella abietina</i> . .	12
Hypoxyton Canker, <i>Hypoxyton mammatum</i> . . . . .	12
Leaf and Twig Blight of Aspen, <i>Venturia macularis</i> . . . . .	13
Nursery Problem, Multiple Leader . . . . .	13
Drought Damage . . . . .	15
Root and Basal Rots on Stems of Aspen . . . . .	15
Other Forest Diseases . . . . .	16

## APPENDIX

## INSECTS

### 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-280). This report provides a complete description and analysis of developments in the spruce budworm situation in Ontario in 1977 and gives infestation forecasts for the province for 1978.

### Pill Beetle, *Cytillus alternatus* Say

An infestation of this beetle indirectly resulted in a loss of approximately three quarters of a million rising 2-0 black spruce (*Picea mariana* [Mill.] B.S.P.) seedlings at the Dryden Forest Station. The beetle larvae feed on the roots of the seedlings and during July caused a small percentage of the loss. However, the major loss occurred as a result of ravens (*Corvus corax* Linnaeus) feeding on the larvae and pupae of the beetle. The ravens pulled small clumps of seedlings from the ground to expose the larvae and pupae entangled in the root systems.

The damage caused by the feeding ravens was overcome by the installation of "bangers", devices that emit a loud noise, similar to a shotgun blast, at predetermined intervals, and this frightened the birds out of the compartments.

Damage to nursery seedlings in Ontario caused directly by the pill beetle has been reported only once previously and that was in 1967 at the Ontario Ministry of Natural Resources Forest Station at Gogama.

### Eastern Pineshoot Borer, *Eucosma gloriola* Heinrich

Damage surveys in young jack pine (*Pinus banksiana* Lamb.) stands at six points in the Region in 1977 showed that an average of 2.5% of terminal leaders were damaged, a decrease from 1976 when 7% of the terminals were destroyed (Table 1). As in the previous year lateral shoots were also commonly attacked; however, as damage to host trees caused by lateral attacks is negligible, numbers of attacks were not recorded.

### Aspen Leafblotch Miner, *Lithocolletis ontario* Free.

Heavy infestations of this leafblotch miner were again evident on trembling aspen (*Populus tremuloides* Michx.) regeneration in the southern portion of the Ignace District and southeastern portion of the Fort Frances District. Moderate-to-heavy damage was recorded in the Edison Lake and Borups Corners areas of Dryden District (see

Appendix, Fig. A1). A decrease was evident in the southwestern portion of the Sioux Lookout District. Low levels of damage were observed at various points elsewhere in the Region.

Table 1. Summary of damage on regeneration jack pine by the eastern pineshoot borer in four districts of the Northwestern Region (counts based on the examination of 100+ randomly selected trees 3-6 cm<sup>a</sup> DBH)

Location	Avg DBH of sample trees (cm) <sup>a</sup>	Percent of trees with damaged leaders
Sioux Lookout District		
Goodie Lake	3	4
Dryden District		
Satterly Twp	5	1
Ignace District		
Hwy 599 at Crystal River	4	1
Martin Siding	4	3
Paguchi Lake	5	4
Fort Frances District		
Manion Lake Rd	4	2

<sup>a</sup> 1 cm = 0.39 in.

#### Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

The forest tent caterpillar infestation more than doubled for the third consecutive year. Aerial mapping revealed moderate-to-severe defoliation of aspen stands within approximately 59 570 km<sup>2</sup> (23,000 mi.<sup>2</sup>) of forest land in the Red Lake, Sioux Lookout, Kenora and Dryden districts compared with 24 605 km<sup>2</sup> (9,500 mi.<sup>2</sup>) in 1976. Small pockets of new moderate-to-severe defoliation were mapped beyond the perimeter of the above infestation in the southwest corner of the Ignace District. A band of light defoliation occurred along the eastern boundary of the main body of infestation from north of Sioux Lookout southward to Borups Corners and the southeast end of Dinorwic Lake. Light defoliation was also mapped at the Lake of the Woods Provincial Park in the northwest corner of the Fort Frances District (see Appendix, Fig. A2).



In the Red Lake and Kenora districts the infestation extended east of the Ontario-Manitoba boundary from the Canada-United States border northward to at least the 13th baseline where mapping was discontinued. Defoliation was observed in all aspen stands from the Ontario-Manitoba boundary eastward along the baseline to near Mortley Lake, a distance of approximately 121 km (75 mi.). From this point the infestation boundary ran southeasterly to the northeast side of Cat Lake then southerly to Bamaji Lake, through Lac Seul at White Pine Point to the south end of Wabigoon Lake, encompassing the infestations previously reported in the Dryden area. From this area the boundary ran westerly to Silver Lake northeast of Kenora and then southward to reach the Canada-United States border near Bigsby Island in Lake of the Woods.

Larval populations were extremely high in many aspen stands in the defoliated area. For example, aspen was completely denuded of foliage when the buds flushed in mid-May in the Red Lake area. Adjacent white birch (*Betula papyrifera* Marsh.) stands in the area were also 90-100% defoliated. Severe defoliation also occurred in some instances in balsam poplar (*Populus balsamifera* L.) stands growing close to aspen stands. As a result of the severe early defoliation, larval migration to other species occurred, and heavy larval mortality resulting from starvation was observed by late May.

Small numbers of dead late-instar larvae, collected at South Scot Lake in Kenora District and at Sumach Lake in Red Lake District, proved to be lightly infected with a nuclear polyhedral virus, a disease commonly found when infestations are on the decline or about to decline.

Cocoon dissections at five points revealed that, over all, moths emerged from 40% of the cocoons. Emergence ranged from a low of 20% in the Red Lake area to a high of 51% in the Kenora and Dryden areas (Table 2).

Counts were made of the number of overwintering egg bands on trembling aspen within and along the eastern fringe of the infestation (Table 3). These indicate that the infestation will likely recur through much of the Red Lake and Kenora districts and extend eastward through a larger portion of the Sioux Lookout and Dryden districts. The southern portion of the Ignace District and the northwestern part of the Fort Frances District will also be infested (see Appendix, Fig. A3).

Sawyer Beetles, *Monochamus* sp.

High populations of adult sawyer beetles feeding on the bark of branches and twigs of coniferous tree species caused severe branch and twig mortality, as well as some tree mortality at numerous points across northern Ontario.

In the Northwestern Region, damage occurred in mixed black spruce and jack pine stands at four points north of Savant Lake Village in the Sioux Lookout District and in a pure jack pine stand on the west central side of Vanessa Lake in Ignace District. Damage caused by the adult beetles was generally confined to the fringes of stands up to 40 m (2 chains). However, in a strip cutting area along the Marchington Access Road approximately 2 1/2 km (15 mi.) northwest of Savant Lake damage occurred throughout entire blocks of standing trees. Severe branch and twig mortality and light tree mortality were evident in the affected areas by mid-August and more damage may be found in the spring of 1978.

Table 2. Results of forest tent caterpillar cocoon dissections in 1976 and 1977 in the Northwestern Region (100 cocoons dissected at each location).

Location	Parasitized (%)		Diseased or Unknown (%)		Adult emergence (%)	
	1976	1977	1976	1977	1976	1977
Red Lake District						
Bruce Lake	45	72	4	8	51	20
Red Lake	8	58	4	7	88	35
Sioux Lookout District						
Hudson	-	58	-	2	-	40
Kenora District						
Hwy 17 at Kenora	33	45	18	4	49	51
Dryden District						
Hwy 17 at Eagle R.	49	40	5	9	46	51

Yellowheaded Spruce Sawfly, *Pikonema alaskensis* Roh.

An increase in population levels and damage occurred in the southern part of the Region for the second consecutive year, particularly in the Fort Frances District (see Appendix, Fig. A4).

Owing to repeated severe defoliation of white spruce (*Picea glauca* [Moench] Voss) windbreaks along Highway 71 near Finland in the Fort Frances District, low levels of mortality have occurred. Severe

defoliation also occurred in windbreaks along Highway 611 in Miscampbell Township, and on young, open-grown spruce along Highway 11, east of Reef Point, and west of the town of Stratton, also in the Fort Frances District, and on planted white spruce in Rushing River Provincial Park, Kenora District. New infestations caused moderate-to-severe defoliation in young spruce plantations in Britton and Rugby townships in Dryden District.

Light defoliation occurred at Lake of the Woods Provincial Park, Fort Frances District, Raven Lake, Burk Township, Ignace District, and on ornamentals scattered throughout the town of Kenora, Kenora District.

Table 3. Summary of forest tent caterpillar egg-band counts and infestation forecasts for 1978 in the Northwestern Region (counts based on the examination of one to three trembling aspen trees at each location).

Location	Avg no. of sample trees (cm) <sup>a</sup>	No. of trees examined	Avg no. of egg bands per tree	Infestation forecast for 1978
Red Lake District				
Bruce Lake	11	1	61	severe
Red Lake	12	1	21	severe
Sydney Lake	16	1	80	severe
Sioux Lookout District				
Echo Twp	13	1	23	severe
Nango Lake	13	1	28	severe
Sioux Lookout	16	1	44	severe
Kenora District				
Dogtooth Lake	16.5	3	15	severe
Dryden District				
Doré Lake	20	1	120	severe
Stewart Lake	15	1	89	severe
Ignace District				
Smirch Lake	16	1	151	severe
Suzanne Lake	12	3	3	moderate
Fort Frances District				
Lake of the Woods Prov. Pk	10	3	9	severe
Caliper Lake	13	3	0	nil

<sup>a</sup> 1 cm = 0.39 in.

### White Pine Weevil, *Pissodes strobi* (Peck)

There was virtually no change in the incidence of weevil-attacked pines (*Pinus* spp.) in the Region in 1977. The average number of tree leaders affected in the eight regeneration pine sites evaluated was 4.5%, compared to 4.4% in 1976 (Table 4). The heaviest damage was recorded in Satterly Township, Dryden District, where 9% of the leaders of regeneration jack pine were weeviled.

Table 4. Summary of damage by the white pine weevil in the Northwestern Region in 1976 and 1977 (counts based on the examination of 100+ randomly selected jack pine trees (3-5 cm<sup>a</sup> DBH) at each location)

Location	Trees weeviled (%)	
	1976	1977
Sioux Lookout District		
Drayton Twp	3	2
Dryden District		
Buller Twp	2	4
Satterly Twp	-	9
Ignace District		
Basket Lake Rd	1	2
Hwy 599 at Crystal R.	3	4
Martin Siding	3	4
Paguchi Lake	8	5
Fort Frances District		
Bowes Camp Rd	6	6

<sup>a</sup> 1 cm = 0.39 in.

### Larch Sawfly, *Pristiphora erichsonii* Htg.

Populations continued to decline throughout most of the Region except in the southern part of the Fort Frances District where a slight increase was recorded.

A small pocket of moderate-to-severe defoliation was detected on young open-grown roadside larch (*Larix* spp.), and on ornamentals planted around the park headquarters at Caliper Lake Provincial Park.

Trace levels of damage were found in larch stands examined in Crozier, Dobie, Barwick and Watten townships and along Bowes Camp Rd in the Glenorchy area of the Fort Frances District.

Aspen Leafroller, *Pseudexentera oregonana* Wlsh.

A marked increase was noted in population levels and area infested by this leafroller in the Fort Frances District over those reported in 1976. Approximately 1 295 km<sup>2</sup> (500 mi.<sup>2</sup>), extending westerly from the town of Fort Frances to Morley Township, and north from the Canada-United States border to Potts Township, were moderately to severely defoliated (see Appendix, Fig. A5).

An additional 2 070 km<sup>2</sup> (800 mi.<sup>2</sup>), extending easterly from the eastern edge of the infestation described above to the Fort Frances-Atikokan boundary, were lightly defoliated. Small pockets of moderate-to-severe defoliation were observed at various points throughout the area of light infestation.

Trace levels of defoliation were observed at scattered locations in the northern part of the Fort Frances District, and extending into the southern parts of Dryden and Kenora districts.

Table 5. Other forest insects

Insect	Host(s)	Remarks
<i>Apion simile</i> Kby. White birch cone weevil	wB	commonly found on birch catkins at widely scattered points throughout the Region
<i>Coleophora laricella</i> Hbn. Larch casebearer	tL	low numbers detected on roadside windbreaks in Lash Twp, Fort Frances District
<i>Diprion similis</i> (Htg.) Introduced pine sawfly	jP	high populations recorded on open-grown ornamentals east of Pinewood, Dilke Twp, Fort Frances District

(continued)



Table 5. Other forest insects (continued)

Insect	Host(s)	Remarks
<i>Dryocampa rubicunda rubicunda</i> Fabr. Greenstriped mapleworm	rM	light defoliation west of Mine Centre along Hwy 11, and at Potts Lake, Potts Twp, Fort Frances District
<i>Eupareophora parca</i> (Cress.) Spiny ash sawfly	bAs	occasional colonies on fringe trees in the Windy Point area of Fort Frances District
<i>Fenusa pusilla</i> (Lep.) Birch leafminer	wB	light damage to regeneration at Hartman Lake, Dryden District, and along Hwy 642, Ignace District
<i>Hyphantria cunea</i> Dru. Fall webworm	pCh, Al	scattered colonies observed along the Dryberry Lake Rd, Kenora District, OMNR Forest Station Rd, Dryden District, and along Hwy 11, west of Bears Pass, Fort Frances District
<i>Lecanium</i> sp. Lecanium scale	wE, bAs, mM	commonly found in the southern portions of Dryden and Fort Frances districts
<i>Malacosoma californicum pluviale</i> Dyar Western tent caterpillar	W, pCh bPo	scattered colonies detected at various locations throughout the Region
<i>Neodiprion abietis</i> complex Balsam fir sawfly	bF	trace damage levels recorded at Crow and High lakes, Kenora District, and along Hwy 599 south of the English River, Ignace District
<i>Neodiprion nanulus nanulus</i> Schedl Red pine sawfly	rP	low numbers recorded south of Kathlyn Lake on young red pine regeneration in the Sioux Lookout District

(continued)

Table 5. Other forest insects (concluded)

Insect	Host(s)	Remarks
<i>Neodiprion virginianus</i> complex Redheaded jack pine sawfly	jP	scattered colonies on fringe trees at Richard Lake, Kenora District, Edison Lake, Dryden District, and along Hwy 17 at the English River, Ignace District
<i>Nymphalis antiopa</i> L. Mourningcloak butterfly	W, tA	occasional colonies detected at Smock Lake, Sioux Lookout District, and on ornamentals in the town of Kenora, and south of Borups Corners, Dryden District
<i>Petrova albicapitana</i> (Busck.) Northern pitch twig moth	jP	common and widely distributed throughout the Region
<i>Pineus</i> sp. Aphid	jP	a rare type of aphid was detected affecting .4-.8 hectares (1-2 acres) of jack pine regeneration at Paguchi Lake, Ignace District.
<i>Profenusa thomsoni</i> (Konow) Ambermarked birch leafminer	wB	light infestation detected at Pepall Lake, Red Lake District; low numbers collected at Wilkie, Otatakan, and Shabuskwia lakes in the Sioux Lookout District
<i>Pseudaletia unipuncta</i> Haw. Armyworm	Grass	heavy infestation on newly sodded lawn of the OMNR Office in Dryden

## TREE DISEASES

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

This devastating elm disease, which has virtually eliminated the elm tree in most of southern and central Ontario, was detected for the first time in the Northwestern Region in 1977. Detection surveys carried out through the range of elms in the Region found only one infected tree within the town of Fort Frances in the Fort Frances District.

The disease is spread by spore-laden adult native elm bark beetles (*Hylurgopinus rufipes* Eichh.) feeding on the bark of branches. Once the fungus enters the healthy tree through these feeding sites, it grows through the tree's water-conducting vessels, which soon become plugged. As a result, the branch and eventually the entire tree die (see Frontispiece). External symptoms of an early infection are usually evident by late June to early July when the foliage will suddenly wilt, turn yellow, then brown, and drop prematurely. The internal symptoms are long, discontinuous brown streaks in the outer sapwood of small branches and twigs. Mortality often occurs very rapidly in young, fast-growing trees, whereas larger, older trees may survive the initial attack and take two or more years to die. These dead and dying elms are breeding sites for the bark beetles, and prompt removal and disposal of such material, either by burning or by burying to a depth of 15 cm (6 in.), is recommended.

This new infection centre is an extension of the known range of Dutch elm disease in Ontario. The important factor that will likely influence the spread of the disease in the future is the high concentration of elm trees near the centre. Similar conditions prevail along the Rainy River; therefore, a westerly spread is expected in this area.

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

Surveys for these foliage diseases showed that infection was common in spruce stands and was widely distributed through the northern half of the Region; however, foliage damage was negligible at all points where sampling was carried out except at the OMNR Forest Station at Dryden. There, a rust disease evaluation on spruce windbreaks, seed and transplant beds revealed that the incidence of infection was as high as 94% and foliar damage was as high as 22% in the windbreaks. Only traces of infection and damage could be found in the seed and transplant beds, however.

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

Surveys for *C. whetzelii*, a foliage disease of aspen and other aspen diseases, were carried out in 10 selected regeneration stands and at widely scattered points elsewhere in the Region.

Surveys revealed a marked increase in the incidence and infection level of this disease over the past several years. Diseased trees were found in four of the 10 selected stands and at six points elsewhere. The incidence of infection ranged from 1% to 98% and the level of foliar damage from 1% to 80% (Table 6).

Table 6. Summary of defoliation caused by ink spot of aspen in seven regeneration aspen stands in the Northwestern Region in 1977 (counts based on the examination of 100+ trees in 5-10 randomly selected sample plots at each location).

Location	Tree ht (m) <sup>a</sup>	Trees affected (%)	Defoliation (%)
Sioux Lookout District			
Drayton Twp	4	31	57
McAree Twp	3	15	3
Snag Lake	2	1	1
Dryden District			
Melgund Twp	7	98	80
Ignace District			
Suzanne Lake	3	63	3
Savant Lake	4	63	6
Fort Frances District			
Claxton Twp	9	1	1

<sup>a</sup> 1 m = 3.28 ft

Cytospora Canker, *Cytospora chrysosperma* (Pres.) Fr.

Cytospora canker usually attacks only weakened or low-vigor trees, but occasionally, during extremely dry periods, which seem to favor the disease, it is capable of causing damage in vigorous stands.

In the 10 widely scattered regeneration aspen plots in the Region that were examined for this canker, it was detected in two plots at trace levels of incidence and damage. However, the two plots affected, one in Claxton Township and the other along Highway 11, south of Olive Station,

in the Fort Frances District, are both in the drought-affected areas of the District. More damage to aspen regeneration may occur in the future if drought conditions persist in the area.

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

A marked decrease in the incidence of infection in 2-0 jack pine transplant stock lifted for outplanting was noted in the spring of 1977 at the OMNR Forest Station at Dryden. Careful examination of stock in the sorting sheds prior to shipment showed only a very small incidence of gall infection compared with an incidence of 10 to 15% in the previous year. Elsewhere this disease was common in many jack pine stands in the Region; however, no change in the level of damage compared with previous years occurred. Over the past three to four years an extensive rebuilding program has been carried out to improve nursery beds, i.e., levelling and adding as much as 13 cm (5.07 in.) of a mixture of topsoil and peat. It is possible that the enriched condition of these beds has contributed to the decline in the incidence of infection in outplanting stock.

Gremmeniella ( $\equiv$  Scleroderris) Canker of Pine, *Gremmeniella abietina*  
(Lagerb.) Morelet ( $\equiv$  *Scleroderris lagerbergii* Gremmen)

Annual detection surveys are carried out to find new infection centres of this disease and rate the condition of known affected stands. The disease was recorded for the first time in the immediate Sioux Lookout area in 1977 when a culture made from one of three samples consisting of several small whole red pine (*Pinus resinosa* Ait.) trees submitted to the Great Lakes Forest Research Centre revealed the presence of infection. Elsewhere, surveys in the northwestern part of the Sioux Lookout District, where large tracts of regeneration jack pine had previously suffered heavy mortality, revealed near-normal growth in well stocked stands at Lysander Lake and at the Pipestone River where trees are now in the 2-3 m (6.6-9.8 ft) height class. A marked decrease in current mortality and increased annual growth were also noted in a stand 0.5-1.0 m (1.6-3.3 ft) high in the Pineimuta River area where more than 75% of trees sampled in 1974 were either infected or recently dead.

Hypoxylon Canker, *Hypoxylon mammatum* (Wahl.) Miller

In conjunction with the diseases of aspen regeneration survey, disease evaluations were carried out for Hypoxylon canker at 10 widely scattered points throughout the Region. Approximately 3,260 saplings, with an average height of 2.2 m (7.2 ft), were examined and the canker was not detected.



The annual evaluation of a 200-tree permanent sample plot in a semimature aspen stand in Drayton Township, Sioux Lookout District, showed the disease to be present at a continuing low level.. The tally revealed 4% of the trees affected, 3% severely, and 1.5% current mortality.

Although this disease is common in semimature and mature aspen stands in many locations in the Region, the results of the aspen regeneration survey would indicate the disease to be of negligible importance in aspen regeneration in northwestern Ontario.

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

Surveys to determine the incidence and damage levels of this leaf and twig blight were carried out in conjunction with a disease survey in sapling-sized aspen stands in 1977. Foliage disease evaluations were conducted in 10 selected stands and general sampling was carried out at 15 additional widely scattered points (see Appendix, Fig. A6).

The disease was common in each of the 10 stands and at each additional sample point. In the evaluated stands the incidence of infection and terminal shoot mortality averaged 71% (range 31-100%) and 51% (range 32-90%) respectively (Table 7). General sampling at the remaining points revealed that the disease was common but generally at a low level except on roadside trees near Hudson where 68% terminal shoot mortality occurred.

Tree height is reduced when terminal shoot mortality occurs, as lateral shoots competing for a terminal leader position cause crooked or multiple stems and reduced height growth.

#### Nursery Problem, Multiple Leader

Evaluations were made in three compartments of the OMNR Forest Station at Dryden to determine the incidence level of seedlings with more than one main leader. A compartment of rising 2-0 red pine was the most severely affected, with 49% of the seedlings having multiple leaders. The compartment of rising 2-0 black spruce examined showed 14% affected, and a compartment of rising 2-0 white spruce which was evaluated on two different dates during the growing season revealed 8% in May, and 10% in August. Samples taken during August revealed no apparent pathological cause for this condition.

Table 7. Summary of damage caused by leaf and twig blight of aspen in 10 regeneration trembling aspen stands in the Northwestern Region in 1977 (counts based on the examination of the total number of trees in 10 randomly selected sample plots at each location).

Location	Tree ht (m) <sup>a</sup>	No. of trees examined	Trees diseased (%)	Terminal shoot mortality (%)
Red Lake District				
Chukuni R. east of Hwy 105	2.2	279	80	49
Chukuni R. east of Hwy 105	2.0	366	77	50
Sioux Lookout District				
Snag Lake	1.9	361	24	8
McAree Twp	3.3	194	69	38
Kenora District				
Dryberry Lake Rd at Mi. 14	2.0	370	86	77
Dryden District				
Melgund Twp	2.1	520	100	90
Britton Twp	1.5	441	97	87
Ignace District				
Ilsley Twp	1.9	265	53	32
Fort Frances District				
Claxton Twp	2.9	234	31	0
Hwy 11 south of Olive Siding	1.9	235	92	79

<sup>a</sup> 1 m = 3.28 ft

### Drought Damage

Aerial and ground surveys in the southwestern part of the Region revealed that deterioration of pines continued for the third consecutive year. As in previous years the heaviest damage occurred on the high, rocky, shallow soil sites. The area of damage increased from 420 km<sup>2</sup> (160 mi.<sup>2</sup>) in 1976 to approximately 1 965 km<sup>2</sup> (756 mi.<sup>2</sup>) in 1977 (see Appendix, Fig. A7).

Surveys for bark beetles and wood borers which attack trees in the early stages of deterioration were carried out in a deteriorating red pine stand at Pipestone Lake and in a jack pine stand at Kaiarskons Lake, both in the Fort Frances District. Small numbers of wood borers, *Monochamus* sp. and bark beetles, *Ips grandicollis* Eichh., were found in the red pine stand, and another bark beetle, *Ips pini* Say, was detected in low numbers in the jack pine stand.

### Root and Basal Rots on Stains of Aspens

A special disease survey was conducted to determine the incidence and distribution of diseases affecting sapling-sized regeneration aspen growing in cutover areas in 1977. Suitable stands were selected at 10 points in the Northwestern Region and sampling was carried out in 10 randomly selected sample plots in each stand to determine the incidence of root and basal rots or stains at each point. Field examination of the 100 samples taken, one from each sample plot, revealed that 50% of these had rot or stain in the roots. Each affected sample was submitted to the Great Lakes Forest Research Centre in Sault Ste. Marie for further examination and culturing to determine the incidence and species of fungi causing the rot or stain. Preliminary data show that 26% of the samples were affected in the basal area of the stems and 44% were affected in the root systems (Table 8). These percentages could increase when the culturing data are available at a later date.

Table 8. Summary of rot and stain surveys in 10 regeneration trembling aspen stands in the Northwestern Region in 1977 (counts based on the examination of 10 randomly selected trees at each location).

Location	Tree ht (m) <sup>a</sup>	Trees affected (%)	Trees with basal portion of stem affected stain and/or rot (%)	Trees with root systems affected stain and/or rot (%)
Red Lake District				
Chukuni River				
- E. of Hwy 105	2.2	80	40	80
Chukuni River				
- E. of Hwy 105	2.0	60	10	60
Sioux Lookout District				
Snag Lake	1.9	80	10	70
McAree Twp	3.3	80	60	50
Kenora District				
Dryberry Lake Rd				
- Mile 14	2.0	10	10	0
Dryden District				
Melgund Twp	2.1	70	70	60
Britton Twp	1.5	40	20	40
Ignace District				
Ilisley Twp	1.9	30	20	30
Fort Frances District				
Claxton Twp	2.9	40	20	40
Hwy 11, south of				
Olive Siding	1.9	10	0	10

<sup>a</sup> 1 m = 3.28 ft

Table 9. Other forest diseases

Organism	Host(s)	Remarks
<i>Armillaria mellea</i> (Vahl. ex Fr.) Kummer Shoestring root rot	jP	low damage levels causing mortality in jack pine regeneration south of Goodie Lake, Sioux Lookout District
<i>Aureobasidium pullulans</i> (d By.) Arn. Needle droop of pines	rP	detected in a severely deteriorating young red pine plantation in Sioux Lookout, and in semimature red pine in Echo Twp, Sioux Lookout District
<i>Melampsorella caryophyllacearum</i> Schroet. Yellow witches' broom of balsam fir	bF	common at trace levels at numerous points throughout the Region
<i>Phyllosticta sorbi</i> West Leaf spot on ash	aMo	trace damage to foliage detected along shore line of Paddy Lake, and in Skey Twp, Ignace District, and at Superior Junction, Sioux Lookout District
<i>Pollaccia elegans</i> Serv. Leaf and twig blight of balsam poplar	tA	trace incidence at Emarton Lake, Red Lake District
<i>Pucciniastrum epilobii</i> Otth Balsam fir needle rust	bF	trace damage levels to foliage at numerous points throughout the northeast portion of the Region
<i>Septoria populicola</i> Pk. Leaf spot of balsam poplar	bPo	common on regeneration at Lake of the Woods Provincial Park, Fort Frances District
Winter browning	bF, rP	moderate damage levels along the north side of roadways and openings in Sioux Lookout and Kenora districts; light damage to red pine windbreaks at OMNR Forest Station, Dryden District



## APPENDIX

# NORTHWESTERN REGION

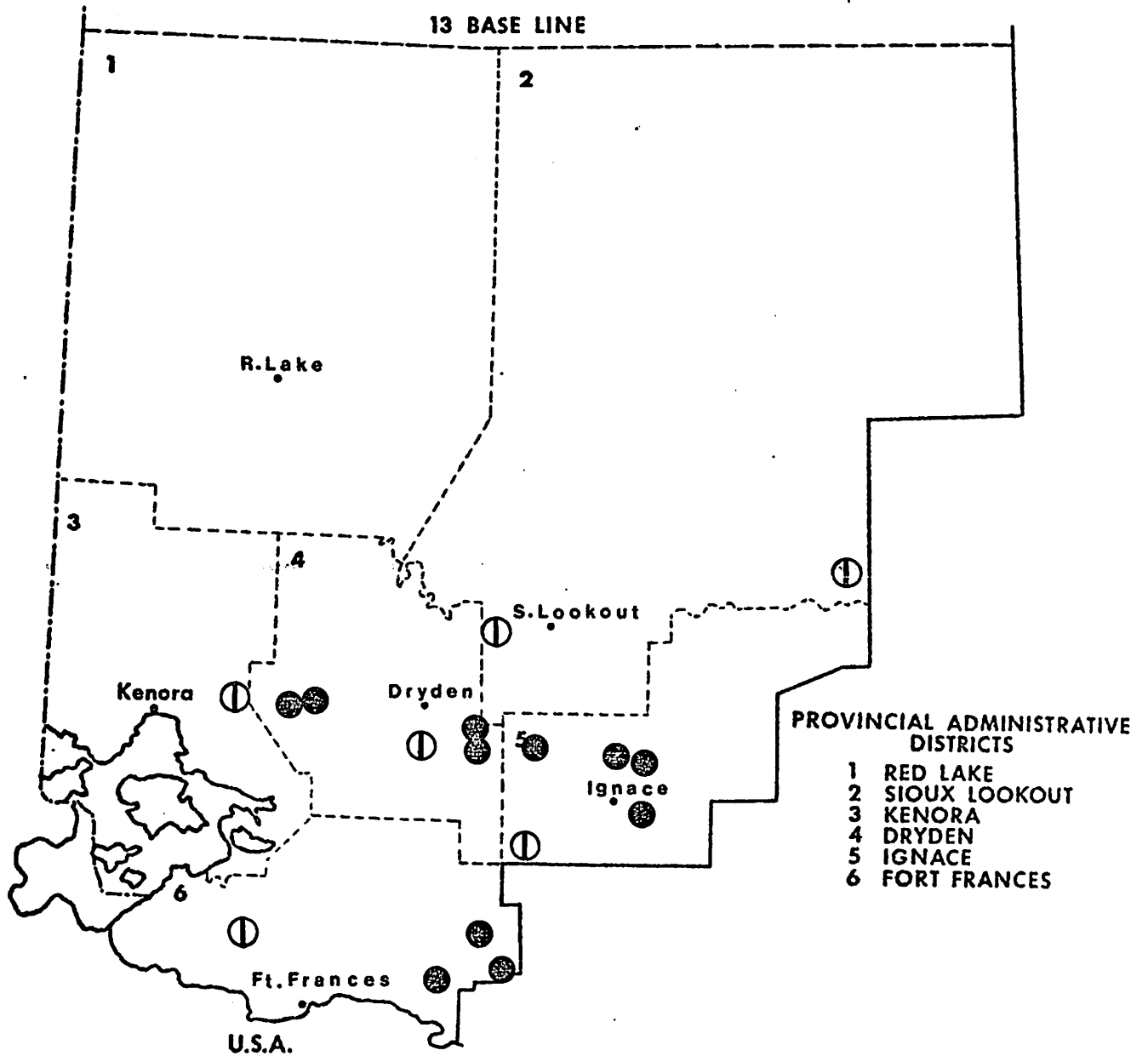


Fig. A1. ASPEN LEAFBLOTCH MINER

Locations at which browning of trembling aspen foliage occurred in 1977

Moderate to heavy . . . . . ●

Light . . . . . ①

# NORTHWESTERN REGION

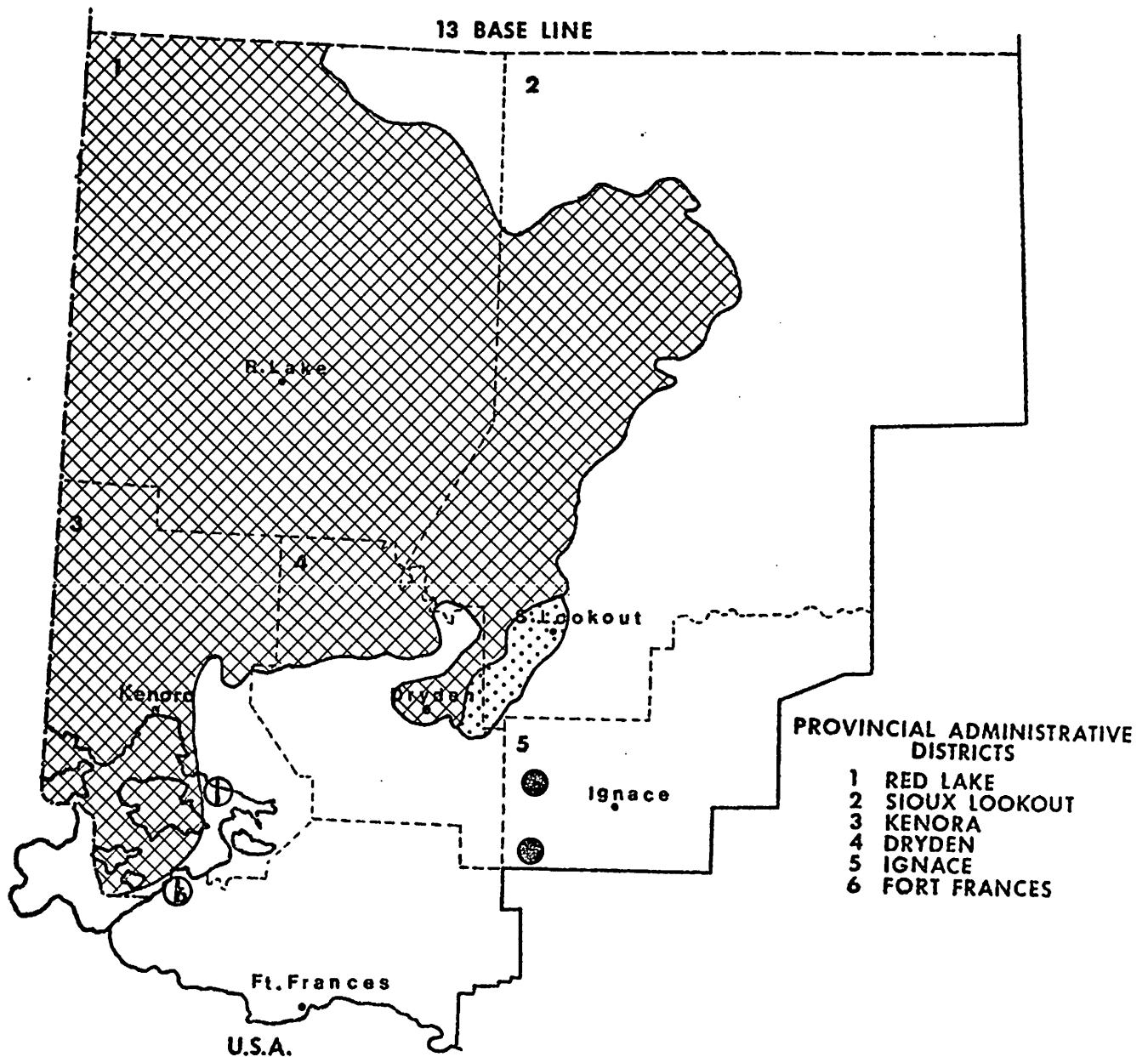






Fig. A2. FOREST TENT CATERPILLAR

Areas within which defoliation of aspen occurred in 1977

Moderate to severe . . .  or   
Light . . . . .  or 

# NORTHWESTERN REGION

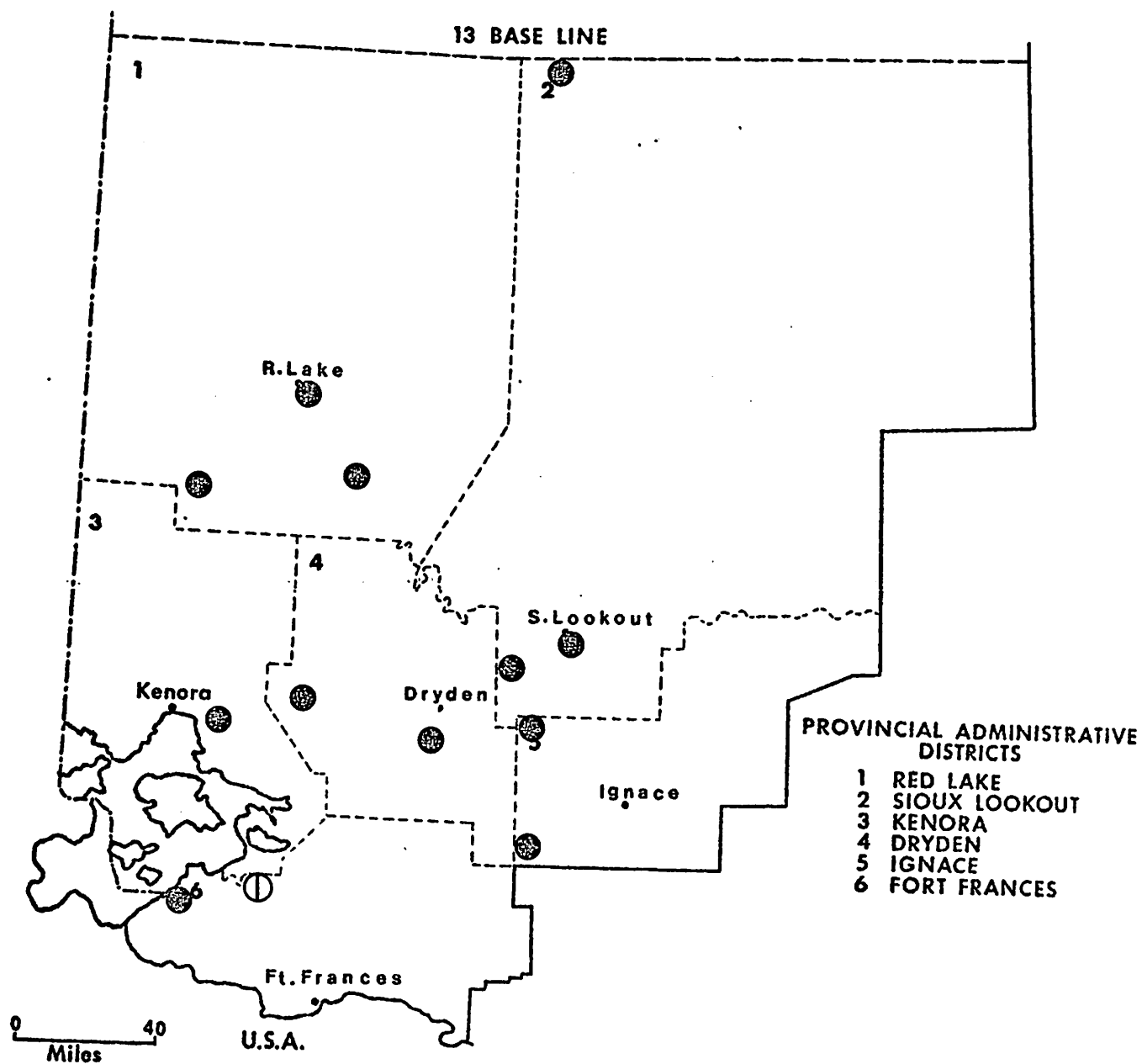


Fig. A3. FOREST TENT CATERPILLAR

Location of egg-band counts in each district.

# NORTHWESTERN REGION

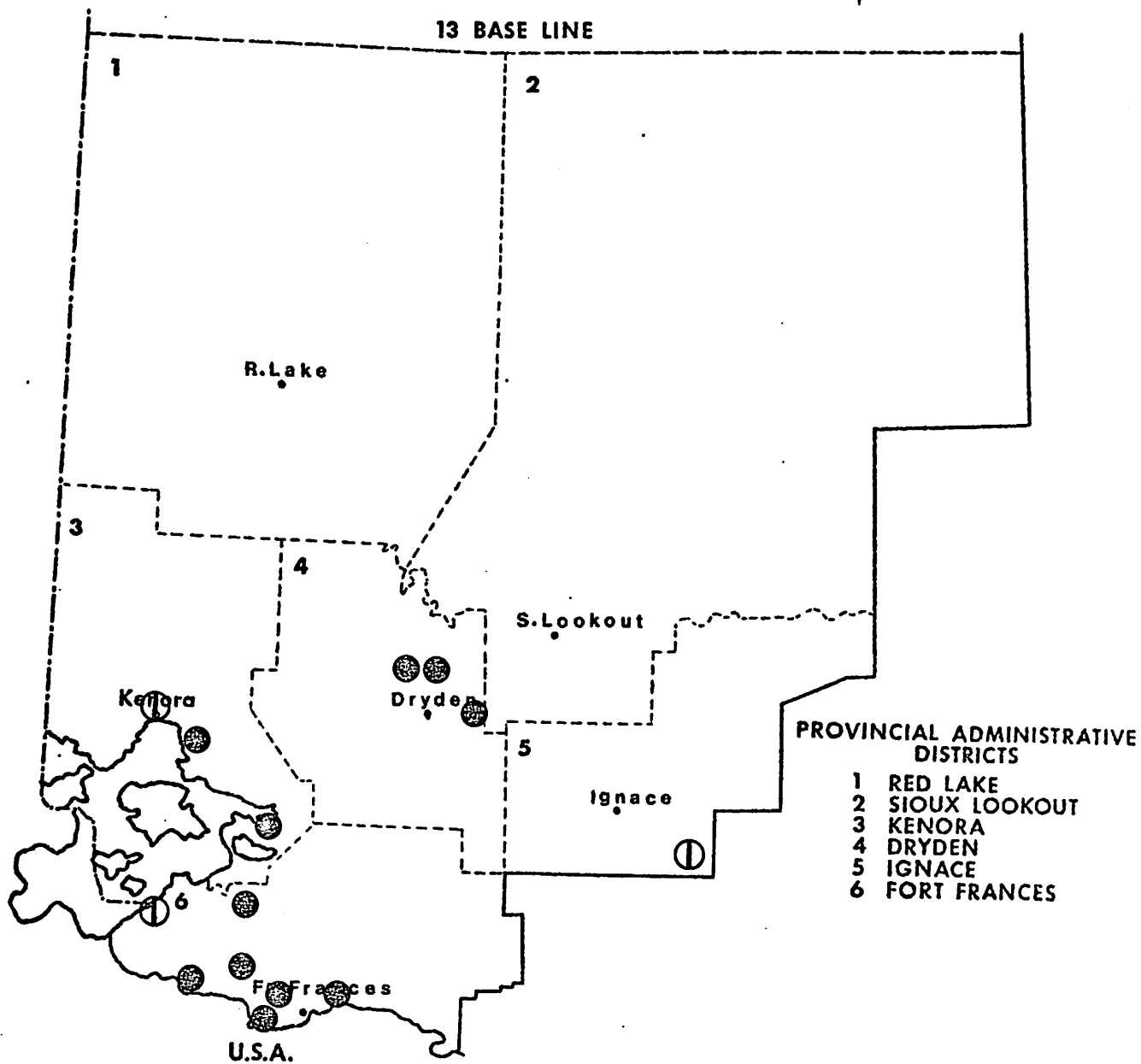


Fig. A4. YELLOWHEADED SPRUCE SAWFLY

Locations at which defoliation of spruce occurred in 1977

Moderate to heavy . . . . . ●

Light . . . . . ①



# NORTHWESTERN REGION

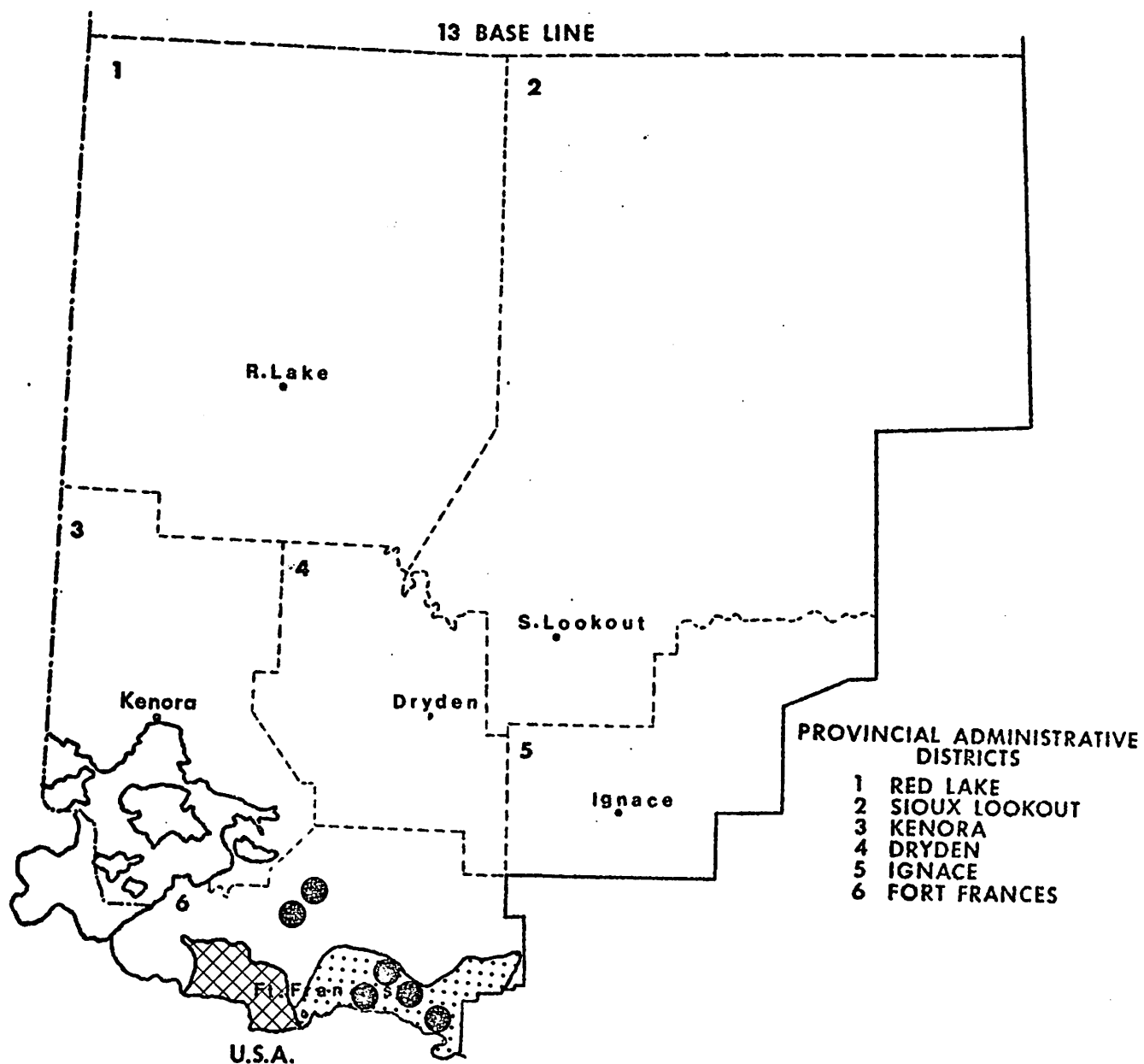




Fig. A5. ASPEN LEAFROLLER

Areas within which defoliation of aspen occurred in 1977

Moderate to severe . . . . .  or 

Light . . . . . 

# NORTHWESTERN REGION

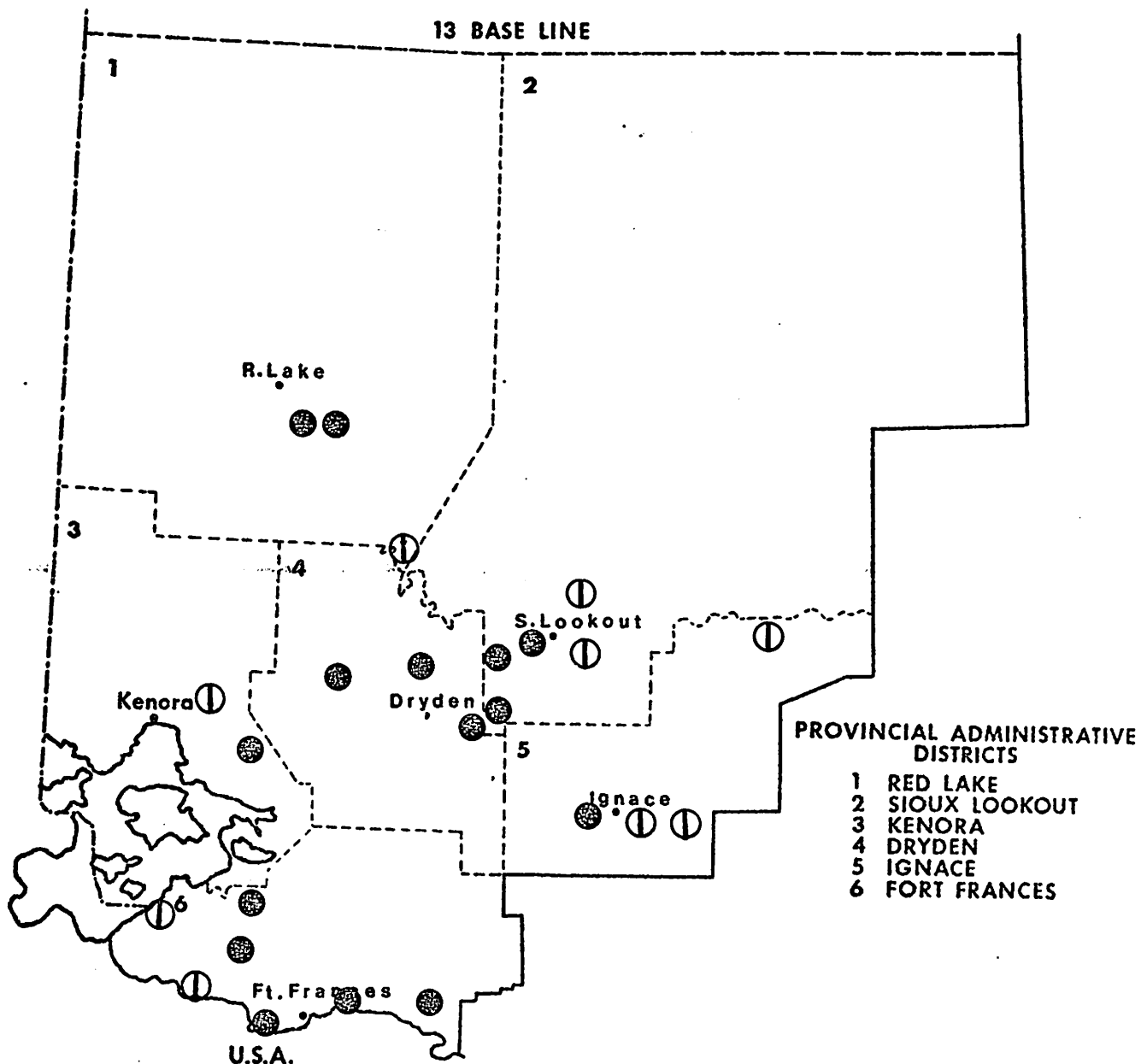


Fig. A6. LEAF AND TWIG BLIGHT OF ASPEN

Locations where damage to leaves and twigs of aspen was recorded in 1977

Moderate-to-heavy . . . . . ●

Light . . . . . ①

# NORTHWESTERN REGION

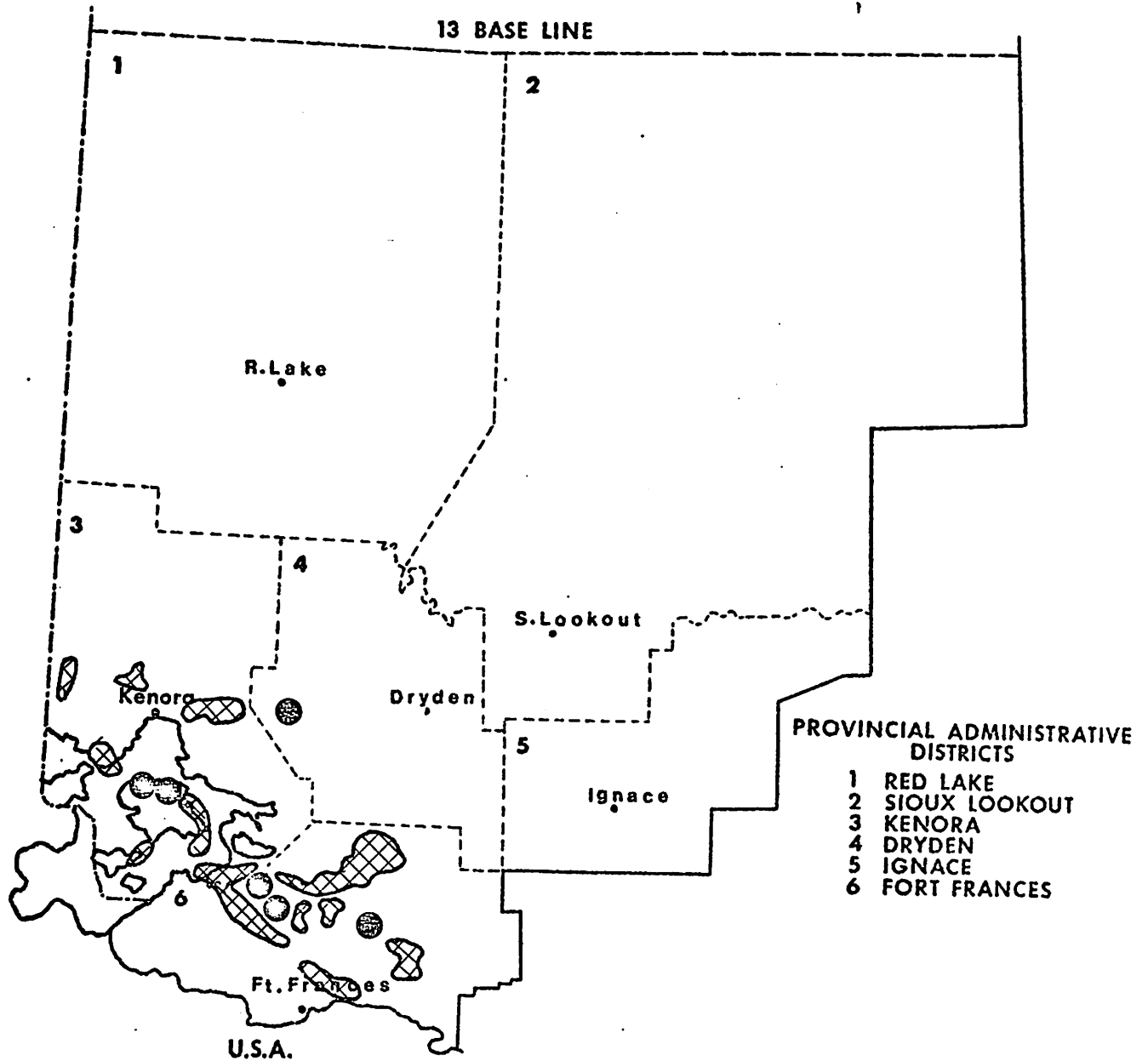


Fig. A7. DROUGHT DAMAGE

Areas where pine mortality due to drought is occurring

