

FOREST HEALTH CONDITIONS
IN THE
NORTHWEST REGION OF ONTARIO
2002

*Forest Districts: Dryden, Fort Frances,
Kenora, Nipigon, Red Lake,
Sioux Lookout, and Thunder Bay*

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OVERVIEW

The following report deals with the forest health conditions in the Northwest Region of Ontario, as defined by the Ontario Ministry of Natural Resources (OMNR) administrative boundaries for 2002. The report is divided into three sections: 1) major forest disturbances, 2) forest health plot monitoring, and 3) quarantine pests.

Forest health information is obtained through the monitoring of a variety of established plots. In the northwest these plots include jack pine health plots and spruce/fir health plots.

Exotic pests are monitored under a Memorandum of Understanding (MOU) with the Canadian Food Inspection Agency and trapping and surveys were conducted for gypsy moth in the region. Moths were captured at three locations in 2002.

An agreement between the OMNR and the CFS provided for six contract OMNR Field Technicians to work in partnership with the six Forest Health Officers of the FHMU for 6 months of the year centering around the summer field season. This co-operative work on monitoring the state of health of Ontario forests through forest health plots, major forest disturbance surveys and exotic pest investigations has resulted in an enhanced forest health monitoring effort and report.

Under the section of major forest disturbances the Bruce spanworm and birch skeletonizer were very prominent in 2002. The gray willow leaf beetle populations remained high but in different parts of the region compared with the areas infested in 2001. Spruce budworm damage was found in a few locations in the Fort Frances District. There was a major reduction in the size of the forest tent caterpillar infestation and the amount of damage caused by the aspen webworm was also down. Spruce needle rust and shoot blight incidence levels were high again this year in the western part of the region. The area within which the snow/wind storm took place in Nipigon and Thunder Bay districts was mapped and two other occurrences of high winds resulted in additional blowdown.

The forest health monitoring jack pine and spruce/fir plots were retallied. In a departure from other years just a regional summary is included in this report for these plots.

The cooperation and assistance provided by the staff of OMNR, various forest industries, and other CFS staff are gratefully acknowledged.

If further information is required about data collected in the Northwest Region please contact one of the CFS report authors. Visit our home page on the World Wide Web at: <http://www.glfc.forestry.ca>

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MAJOR FOREST DISTURBANCES

Insects

Birch Skeletonizer, *Bucculatrix canadensisella* Cham.

Population levels of the birch skeletonizer increased in 2002 in the Nipigon and Thunder Bay districts. A total area of 2 459 843 ha was mapped in the Northwest Region (Fig. 1).

Feeding damage on white birch (*Betula papyrifera* Marsh.) by this tiny larva results in the removal of leaf tissue (parenchyma) on the underside of the leaf leaving the ribs untouched. Initially the foliage assumes a bleached appearance. Then as the damaged leaves dry-out they turn a reddish brown often causing them to drop prematurely. Repeated severe attacks may cause some loss of twigs and a minor reduction in annual radial increment. However, because the damage takes place late in the growing season there is usually no detrimental effect on the host other than an unsightly appearance.

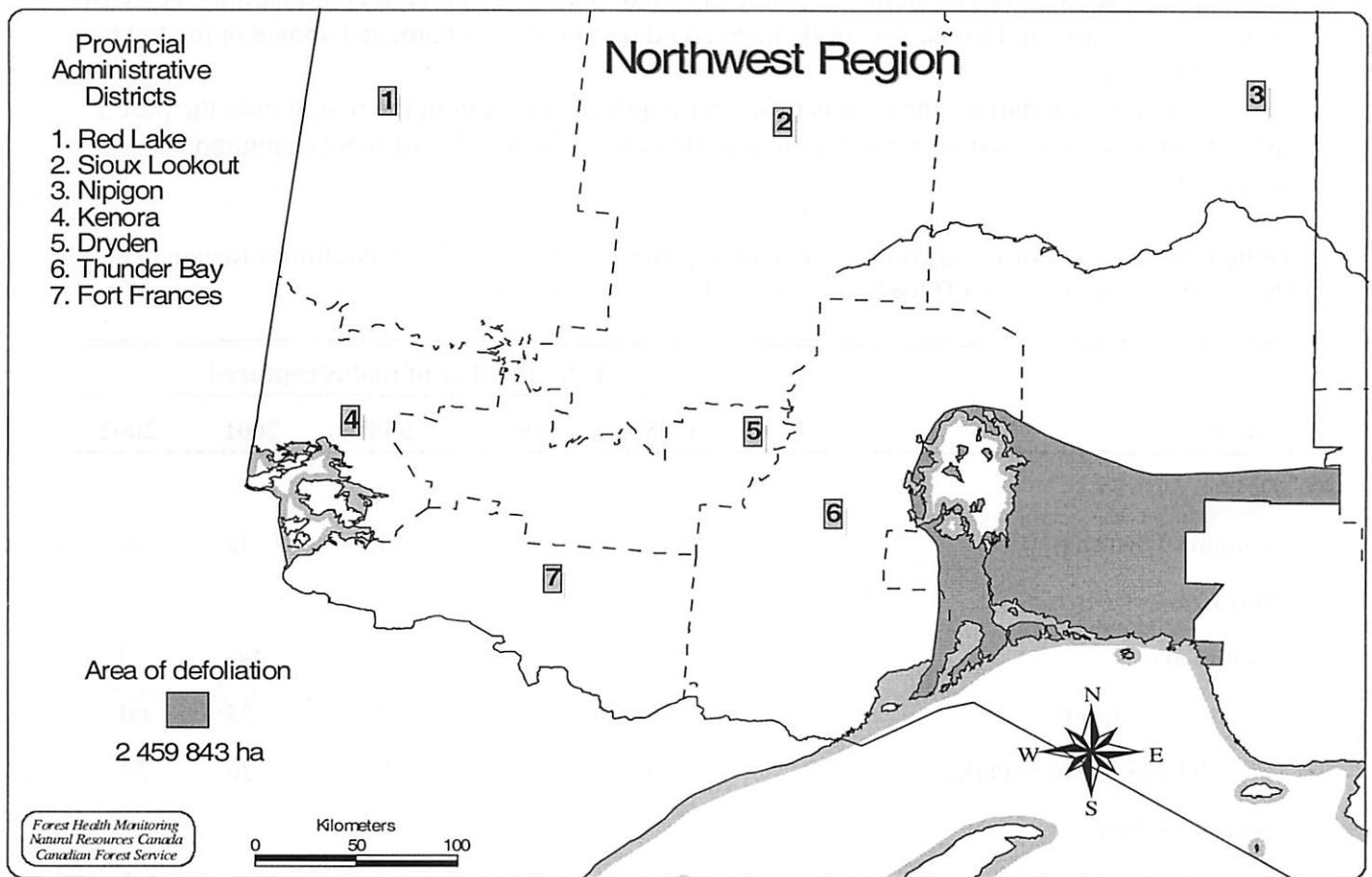


Figure 1. Area within which moderate to severe defoliation caused by birch skeletonizer (*Bucculatrix canadensisella* Cham.) occurred in 2002.

All of the southern part of the Nipigon District was infested, covering a gross area of 2 295 932 ha. The northern infestation boundary was along a line parallel to Highway 11 approximately 15 km to the north of the highway. At the town of Geraldton the line headed north to the northeast corner of Lake Nipigon. Everything south of this area to the shore of Lake Superior, including the Black Bay Peninsula and some of the major islands, was infested. In the Thunder Bay District the damage was confined to the eastern edge of the district (163 911 ha). Damaged stands were mapped over the Sibley Peninsula and all along the western shoreline of Lake Nipigon.

Spruce Budworm, *Choristoneura fumiferana* (Clem.)

There was a small resurgence of spruce budworm populations in the Fort Frances District in 2002. Defoliation has not been detected in the region since 1999. Severe defoliation was observed on balsam fir (*Abies balsamea* [L.] Mill.) and white spruce (*Picea glauca* [Moench] Voss) along the shorelines of many of the islands in Lake of the Woods south of the Aulneau Peninsula. Moderate insect populations were detected in a white spruce seed orchard located east of the town of Emo and low levels of damage could be found on ornamental spruce in the town of Fort Frances.

Table 1 summarizes the results of moth trapping carried out in the region over the past 5 years. Compared with last year there were ten sites where the number of moths captured increased.

Table 1. Results of spruce budworm pheromone trapping at 18 locations in the Northwest Region of Ontario from 1998 to 2002. (Three traps were used at each location.)

Location	Total number of moths captured				
	1998	1999	2000	2001	2002
<i>Dryden District</i>					
Langton Township	149	93	63	39	76
<i>Fort Frances District</i>					
Calm Lake	57	39	19	49	31
Claxton Township	165	63	7 ^a	23	60
French Lake (Quetico Park)	0	5	12	26	23
<i>Kenora District</i>					
Haycock Township	187	131	45	83	26 ^b
<i>Nipigon District</i>					
Catlonite Road	7	9	20	38	95

Table 1. Results of spruce budworm pheromone trapping at 18 locations in the Northwest Region of Ontario from 1998 to 2002. (Three traps were used at each location.)

Location	Total number of moths captured				
	1998	1999	2000	2001	2002
<i>Nipigon District</i>					
Grain Township	22	18	8	11 ^b	7
Parent Township	37	15	16	1	88
Windigokan Lake	9 ^b	11	8	15	27
<i>Red Lake District</i>					
Goldpine Road (replaces Burma Lk Rd)	-	-	-	-	91
<i>Sioux Lookout District</i>					
Burma Lake Road	37	32	14	19	Cut
Foley Lake	8	17	15	10 ^b	23
Lomond Township	19	34	17	10	Lost
Pape Lake	46	24	44	17	25
<i>Thunder Bay District</i>					
Buzzer Lake	13	0	3	5	12
Fallis Township	13	2	5	5 ^b	12
Fowler Township	6	3	2	5 ^b	10
Milkshake Lake	5	0	0	7 ^b	2

^a Two traps missing

^b One trap missing

Jack Pine Budworm, *Choristoneura pinus pinus* Free.

There was no defoliation by the jack pine budworm found in the Northwest Region in 2002, the last recorded infestation was in 1992. Egg mass sampling to check for signs of an insect population for the next year were carried out at the Jack Pine Health Plots. The sampling was carried out in the intermediate and mature age class jack pine (*Pinus banksiana* Lamb.) stands. Branches were sampled from a total of 32 sites, six in each of Dryden, Fort Frances, and Kenora districts; and seven in each of Red Lake and Sioux Lookout districts. No defoliation or egg masses were found at any of the locations.

Forest Tent Caterpillar, *Malacosoma disstria* Hbn.

There was a major reduction in the amount of defoliation caused by the forest tent caterpillar in 2002. The gross area of moderate to severe defoliation now covers 5 821 879 ha. The reduction in the amount of mapped defoliation across the Northwest Region was over 4 million hectares (Table 2). There was a significant shift of the infestation in an easterly direction (Fig. 2), resulting in increased amounts of damage in Thunder Bay and Nipigon districts. In the Thunder Bay District alone the size of the infestation increased by slightly over 1.5 million hectares, whereas the infestations in the Kenora and Red Lake districts were greatly reduced or completely collapsed, respectively. With the late arrival of warm temperatures defoliation of trembling aspen (*Populus tremuloides* Michx.) and white birch stands was on average two weeks later than normal.

The northeast corner of the infestation originated in the Savant Lake area of the Sioux Lookout District and advanced in a southeasterly direction across the Thunder Bay District to the south end of Lake Nipigon in the Nipigon District. This part of the infestation was not a contiguous line but was comprised of a few large pockets. The southern boundary of the moderate to severe defoliation was mapped in the Nipigon, Thunder Bay and Fort Frances districts from the Nipigon River west to include most of Quetico Provincial Park. The main body of the infestation then tracked north well into the Dryden District to the Basket Lake area. A significant arm of damage was mapped in the western part of the Dryden District and from here small pockets extended into the Kenora and Fort Frances districts. The remainder of the northern boundary of the main infestation was located in the Sioux Lookout District from McAree Township to the Hooker Lake area. Some scattered pockets were also mapped outside the main body of the infestation (Fig. 2).

Table 2. Gross areas of moderate to severe defoliation caused by the forest tent caterpillar in the Northwest Region of Ontario from 1997 to 2002.

District	Area of moderate to severe defoliation (ha)					
	1997	1998	1999	2000	2001	2002
Dryden	9 639	68 911	661 302	1 655 278	2 053 529	1 389 513
Fort Frances	0	0	93 339	1 832 570	2 351 938	643 256
Kenora	273	20 548	189 795	1 222 642	1 657 053	2 685
Nipigon	0	0	0	717	10 755	363 406
Red Lake	987	18 749	171 569	530 163	1 940 113	0
Sioux Lookout	0	8 181	122 727	421 986	1 166 290	530 450
Thunder Bay	0	1 834	242 392	307 422	1 307 598	2 892 569
Annual Totals	10 899	118 223	1 481 124	5 970 778	10 487 279	5 821 879

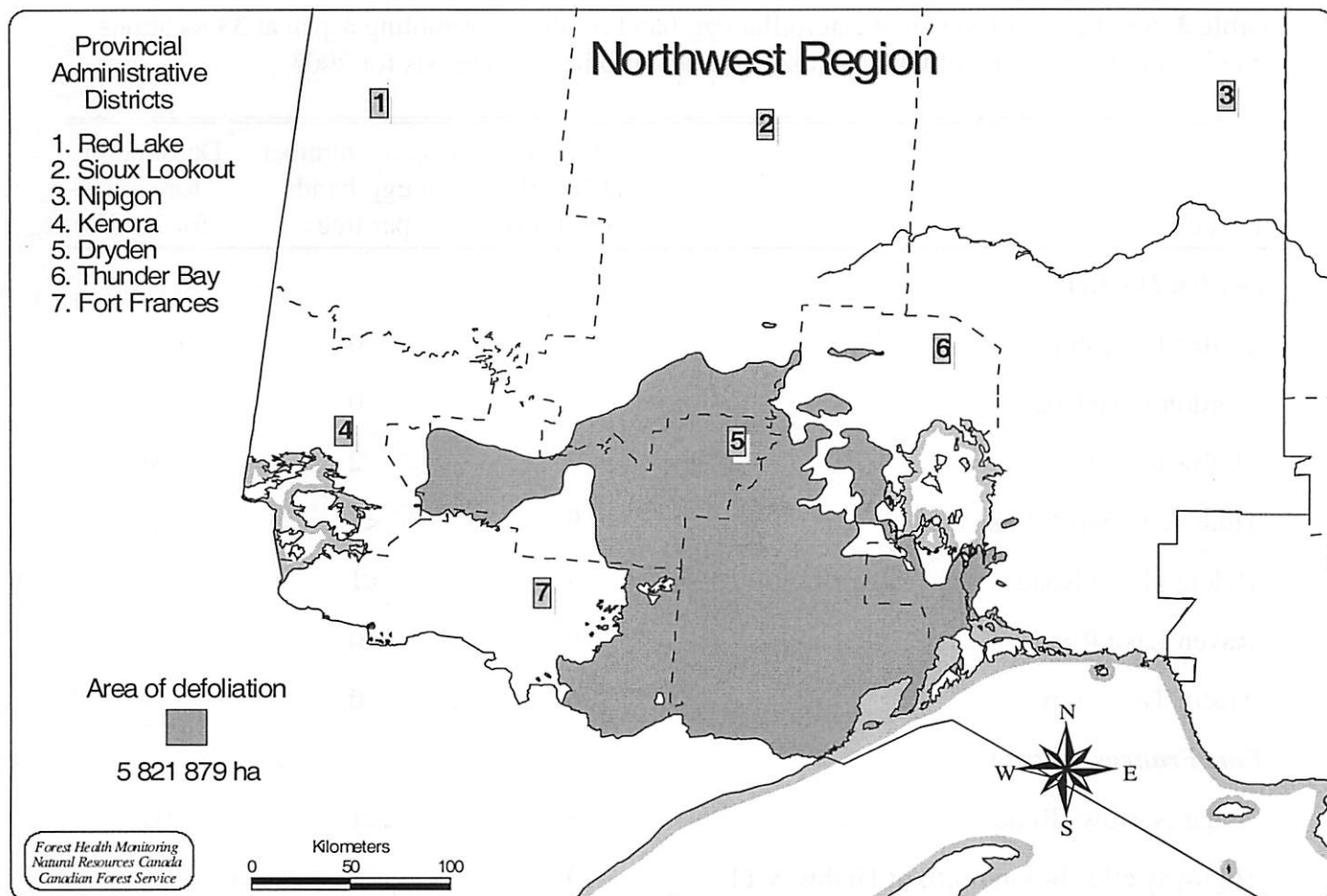


Figure 2. Area within which moderate to severe defoliation caused by the forest tent caterpillar (*Malacosoma disstria* Hbn.) occurred in 2002.

A total of 33 stands were sampled for the presence of egg bands for the purpose of forecasting the population levels for 2003 (Table 3). It appears that within the main body of the infestation population levels sufficient to cause moderate to severe defoliation will persist (Fig. 3). It does not appear there will be any major expansion of the current infestation boundary. However, there may be some limited enlargement in the southwest portion of the Nipigon District.

Table 3. Summary of forest tent caterpillar egg-band counts on trembling aspen at 33 locations in the Northwest Region of Ontario in 2002, with defoliation forecasts for 2003.

Location	Average DBH ^a of trees (cm)	Average number of egg-bands per tree	Defoliation forecast for 2003 ^b
<i>Dryden District</i>			
Buller Township	9	0	N
Gordon Lake Road	8	0	N
Highway 599	7	2	M
Hodgins/Lawcett Lake area	9	<1	L
Raleigh Lake Road	9	<1	L
Raven Lake Road	9	0	N
Tustin Township	6	0	N
<i>Fort Frances District</i>			
Cedar Narrows Road	8	<1	L
Highway 622, 14 km north of Highway 11	9	1	L
Highway 622, 30 km north of Highway 11	9	1	L
Highway 502 at Scattergood Lake	7	0	N
Turtle River Road	8	0	N
<i>Kenora District</i>			
Highway 105 at old rail road	13	0	N
<i>Nipigon District</i>			
Highway 17 at Fire Hill Creek	7	10	S
Highway 17 at Gravel River	10	4	M
Highway 11, 16 km south of Beardmore	7	23	S
Highway 801	6	1	L
Leopard Lake Road km 24	9	1	L

Table 3. Summary of forest tent caterpillar egg-band counts on trembling aspen at 33 locations in the Northwest Region of Ontario in 2002, with defoliation forecasts for 2003.

Location	Average DBH ^a of trees (cm)	Average number of egg-bands per tree	Defoliation forecast for 2003 ^b
<i>Sioux Lookout District</i>			
Echo Township - Mine Road	15	4	M
Highway 516 at Lewis Lake	14	5	M
Highway 516 at Patterson Lake	10	7	S
Highway 599 at Fitchie Lake Access Road	14	0	N
Lynx Lake Road at CN tracks	12	0	N
McDougall Bay Road km 12	12	1	L
Sioux Lookout OMNR Fire Centre	12	4	M
Syme Township - 702 Road	12	5	M
Vermilion River Road km 41	12	0	N
<i>Thunder Bay District</i>			
Graham Road km 30	10	6	S
Highway 11 at Windigoostigwan Lake	10	8	S
Highway 11, 12 km east of Kashabowie	8	5	M
Michener Township	10	25	S
Scoble Township	8	1	L
Stedman Township	10	3	M

^aDBH = diameter at breast height

^b N = nil, L = light, M = moderate, S = severe

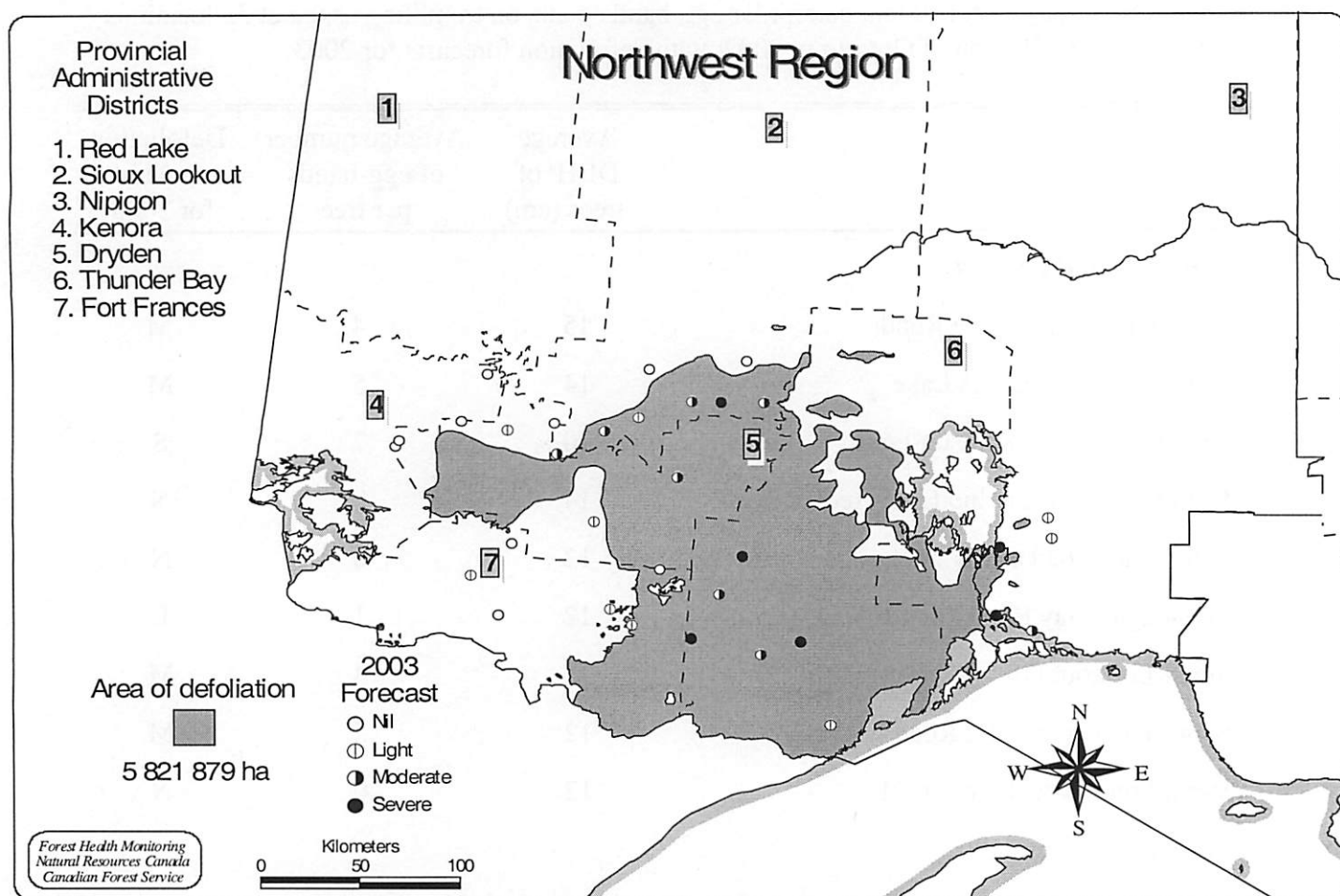


Figure 3. Infestation forecasts for 2003 for the forest tent caterpillar (*Malacosoma disstria* Hbn.) overlaid on the 2002 infestation map.

Bruce Spanworm, *Operophtera bruceata* (Hulst)

The Bruce spanworm, an early season defoliator primarily of trembling aspen when present in the boreal forest, caused widespread defoliation across much of the Kenora District and in widely scattered pockets in the Fort Frances District. Aerial sketch mapping recorded 260 613 ha of defoliation in the Kenora District and 4 074 ha in the Fort Frances District (Fig . 4). The largest and most continuous area of defoliation occurred in the Kenora District. It covered an area from the village of Nestor Falls northwest across the Aulneau Peninsula and westward to the Manitoba Border. The boundary then swept northeast to Big Sand Lake, southeast to Atikwa and Rowan lakes, and west to Nester Falls. Numerous pockets of defoliation were mapped outside the main infestation, some as far east as the town of Atikokan in the Fort Frances District. The largest group of pockets were found around Umfreville, Separation, Grassy Narrows and Maynard lakes in the northeast portion of the Kenora District. The forests around Sioux Narrows sustained the heaviest damage with 100 percent defoliation of aspen and white birch with even the deciduous understory affected.

The first instance of this insect causing severe damage to trembling aspen in the

Northwest Region was reported around the town of Nipigon in 1976 with the infestation peaking in 1978 resulting in 26 700 ha of damage. Subsequent infestations occurred in the southern parts of Thunder Bay and Fort Frances districts from 1986 to 1989. The largest infestation was recorded in 1988 when 680 455 ha of defoliation was mapped.

In a normal year insect hatching coincides with the flushing of the buds in the spring. But if development is delayed by a colder than normal spring, similar to what was experienced in 2002, the buds are devoured before they fully open. This type of feeding is potentially more detrimental to the trees because they take longer to recover. The defoliation caused by the Bruce spanworm added to the stress caused by the last 5 years of defoliation by forest tent caterpillar and 2 years of drought-like conditions recorded in 1997 and 1998. All of these factors have greatly reduced the vigor of the forest within these areas. Although most trees were able to re-foliate by mid July some trees did not produce a normal set of leaves and they appeared thin the remainder of the season. Any further stress in this area could have the potential to cause branch dieback and possibly whole tree mortality.

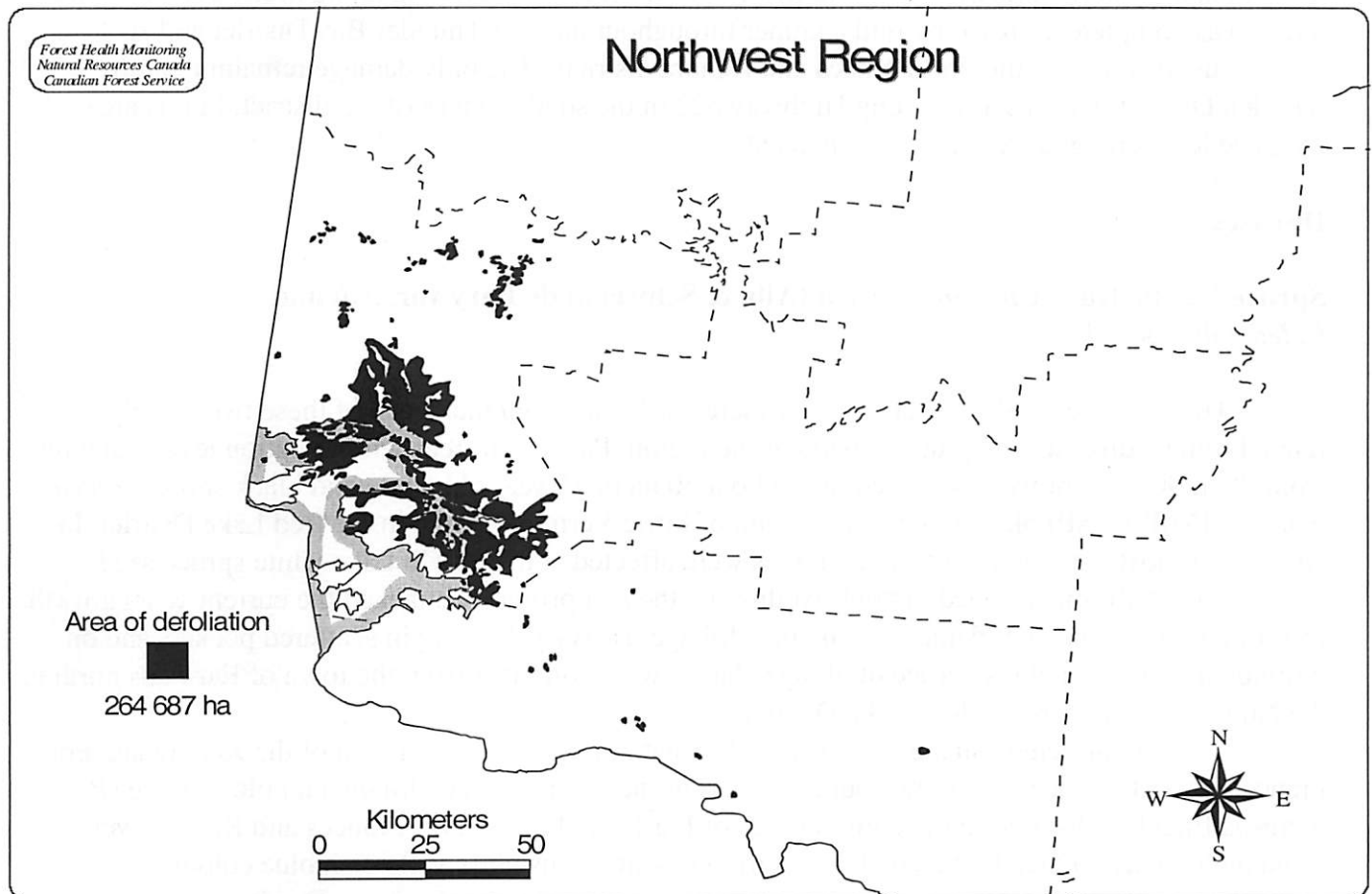


Figure 4. Area within which moderate to severe defoliation caused by the Bruce spanworm (*Operophtera bruceata* [Hulst]) occurred in 2002.

Aspen Webworm, *Pococera applastella* (Hulst)

Population levels of this late season pest of poplar were much lower than those observed over the past two years. The main reason for this decline was the reduction in the amount of damage caused by the forest tent caterpillar earlier in the summer. Aspen webworm populations have been mirroring those of forest tent caterpillar for the past few years. The webworm has had a preference to feeding in trees defoliated by tent caterpillar that foliated later in the season. In 2002 scattered pockets of moderate to severe defoliation (45-75%) by the aspen webworm were found in the southeast part of the Sioux Lookout District and at numerous locations in the eastern portion of the Dryden District. Low levels of feeding were observed in many other aspen stands in the Sioux Lookout and Dryden districts.

Gray Willow Leaf Beetle, *Tricholochmaea d. decora* (Say)

There was a gray willow leaf beetle population explosion last year in the central portion of the Northwest Region. This year high levels of insect activity was still present but it shifted mainly to the eastern and western parts of the region. Most willow (*Salix* sp.) growing along roadways and in wet areas was completely brown by mid summer throughout most of Thunder Bay District and at numerous locations in the Fort Frances and Kenora districts. The only damage remaining in the Dryden District was observed along Highway 622 in the southern part of the district. In this area damage levels ranged from 50 to 100 percent.

Diseases

Spruce Needle Rust, *Chrysomyxa ledi* (Alb. & Schwein.) de Bary var. *ledi* and *C. ledicola* Lagerh.

This was the third consecutive year there has been a high incidence of these two closely related foliage diseases of spruce in parts of the region. Patches of trees with infection levels ranging from 75 to 90 percent were scattered throughout 50 ha of 15 year old white and black spruce (*Picea mariana* [Mill.] BSP) planted at the south end of Little Vermilion Lake in the Red Lake District. In addition, almost 100 percent of the 2 m trees were affected at the Bawlb Lake white spruce seed orchard in the aforementioned district. At this site the rust primarily attacked the current years growth resulting in 75-90 percent damage to the new foliage. Heavy yellowing in scattered pockets and on individual white and black spruce of all age classes was prominent from the town of Ear Falls north to the Nungesser Lake area in Red Lake District.

Severely affected foliage was observed on natural spruce across much of the Kenora and Fort Frances districts, especially in the southwest part of the latter district. Ornamental blue spruce (*P. pungens* Engelm.) located in the communities of Ear Falls, Ignace, Fort Frances and Rainy River came under heavy attack by this pathogen turning them an unsightly yellowish blue colour.

Damage levels were not as high or common in the Sioux Lookout and Dryden districts. The disease could be found on numerous host but usually at very low infection levels (usually <10%). There were the occasional 2 to 3 m black spruce encountered with noticeable discolouration in the two districts.

Shoot Blight, *Venturia macularis* (Fr.:Fr.) E. Müll. & Arx

The incidence of shoot blight on trembling aspen was once again high in the western half of the Northwest Region. The symptoms of this disease are present in the early summer and are found on the tips of branches mainly on young regeneration trees (less than 3 m tall). The tips of infected twigs are black and brittle, resembling a “shepherd’s crook”. Another cool wet spring was favourable toward the development of this pathogen. Almost all young aspen regeneration throughout Fort Frances, Kenora, Sioux Lookout, Red Lake and Dryden districts was affected to some extent. In some cases 100 percent of the shoots were diseased on trembling aspen regeneration across various cutovers. Older age classes of host were found affected but generally at low levels.

Abiotic Damage

Blowdown

Two separate occurrences of high winds caused tree damage in the northern portion of the Kenora District and in the southwest corner of the Dryden District (Fig. 5). The first occurred on June 10th around the town of Kenora with damage to individual trees or in pockets of less than five hectares. The second windstorm occurred on July 1st and resulted in damage over an area 9 501 ha in size. This damage was aerially mapped in numerous pockets of various sizes in a wide swath running from west to east across the Kenora District. The blowdown damage seemed to be concentrated in three main areas. The first and most westerly area occurred around Umfreville Lake, the second area was found in the Separation Lake area and extended east towards Grassy Narrows. The last and most easterly area affected was east of Highway 105 south of Cedar Lake and with some scattered pockets extending into the Dryden District in the Amesdale area.

Snow/Wind Damage

The full extent of the damage (> 3 million hectares) caused by a storm that occurred on the 24th and 25th of October 2001 was mapped in June of 2002 (Fig. 6). A preliminary investigation of the damage caused by the heavy wet snow and high wind was done in December 2001. However, additional snow cover made detailed mapping impossible. Moderate to severe damage was found covering an area of 1 190 532 ha in the northern parts of the Thunder Bay and Nipigon districts. Light levels of damage were found in an area totalling 1 956 450 ha surrounding the area of heavier damage including to a lesser extent damage in the Sioux Lookout District.

The damage was mainly to conifer species, specifically spruce, balsam fir and jack pine. Some hardwoods were affected but to a lesser degree. Damage was in the form of snapped off, bent over, and completely flattened trees. Many stands of mature spruce had the top one third of their crowns snapped off and younger trees growing in lower stocked stands were bent over. The heaviest areas were observed in small isolated pockets where a large proportion of the trees were completely down or the main stems were broken, usually below the crown. Very scattered small pockets of bent over

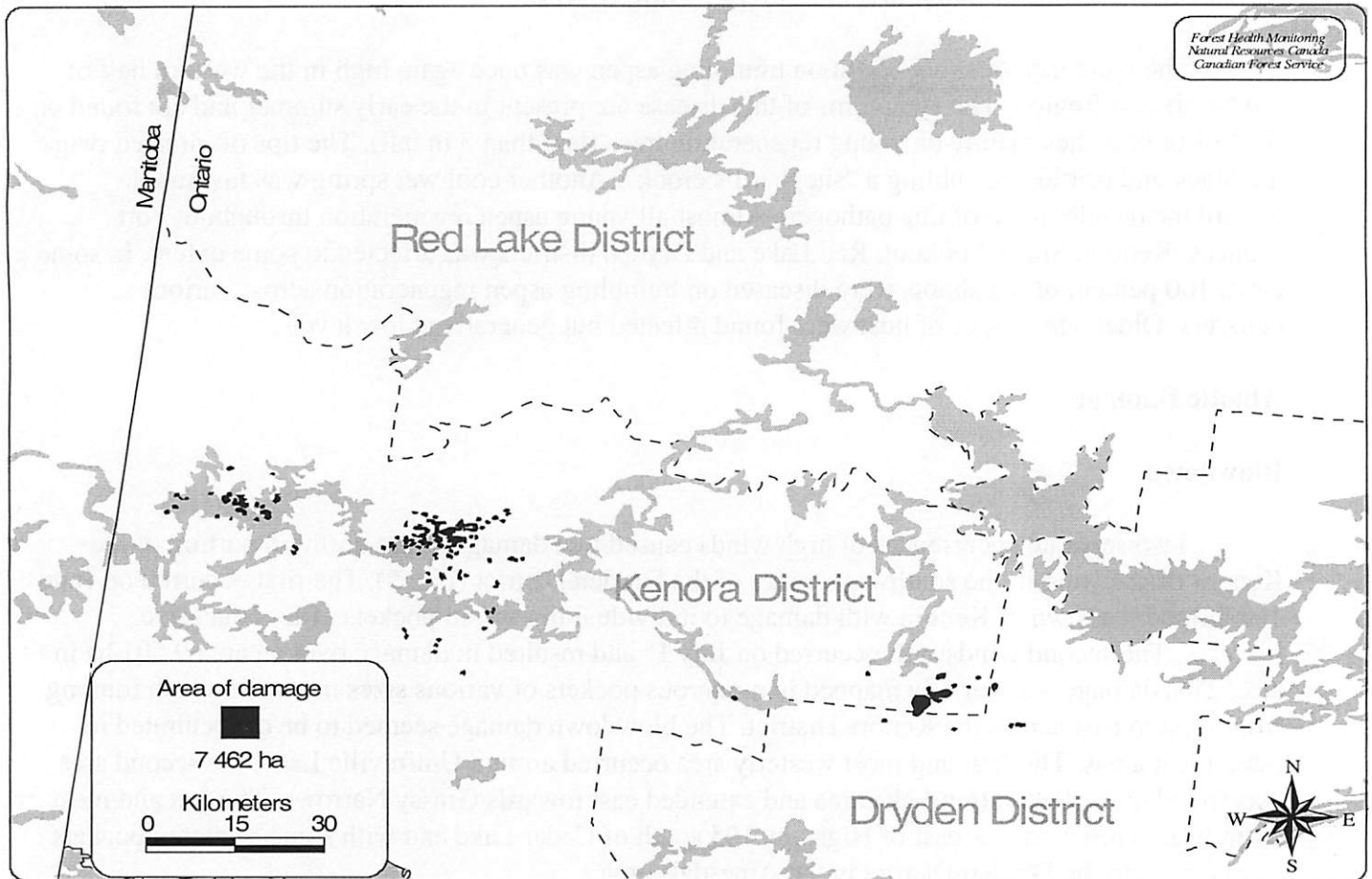


Figure 5. Area within which blowdown damage occurred in the Kenora and Dryden districts in 2002.

and downed trees were observed in the southeastern portion of the Sioux Lookout District. In addition throughout this same area pole-size trees of all species were bent over along roadways and some jack pine averaging 5 m tall had their tops broken off.

Observations of Other Forest Pests

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

This particular occurrence of pine false webworm that was first detected in 2001 in a jack pine breeding orchard at the OMNR Resource Centre, Thunder Bay District persisted this year and caused significant damage to the 2-3 m trees. At this site all the jack pine were affected to some degree with approximately 50 percent of them having moderate to severe defoliation levels ranging from 50 to 90 percent. Indeed some of the trees only had tufts of foliage remaining at the ends of their branches. The orchard was sprayed with Malathion in mid July. However, most of the defoliation had already been completed by this time. Scattered incidences of insect feeding was observed on young jack pine, eastern white pine (*Pinus strobus* L.) and red pine (*P. resinosa* Ait.) in

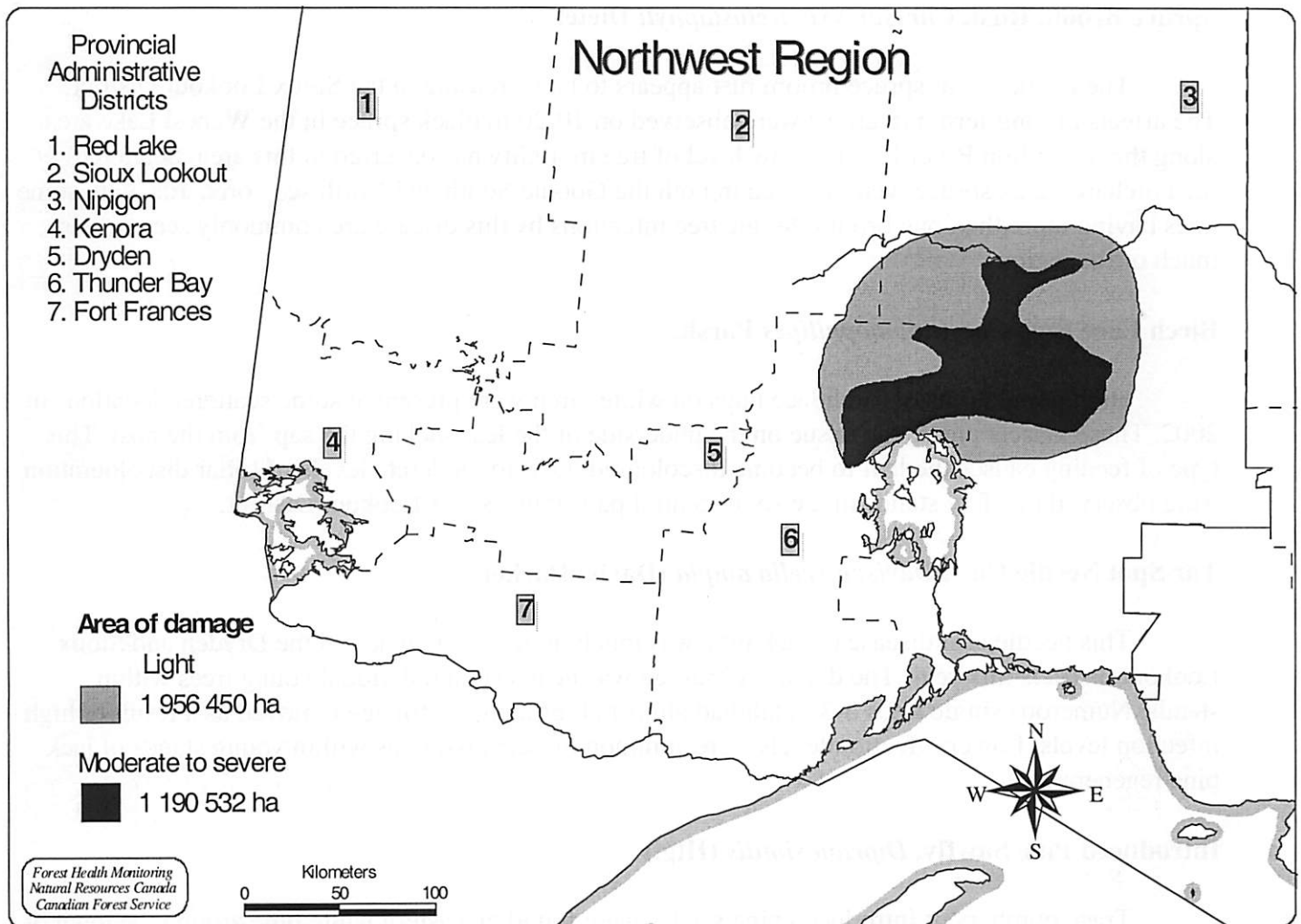


Figure 6. Area within which snow/wind damage occurred in the Thunder Bay, Nipigon and Sioux Lookout districts in 2001 but was mapped in 2002.

the surrounding area but at low levels.

An extension of this insect's range was recorded in the Northwest Region in 2002. Heavy feeding was found on six 3 m red pine in the town of Sioux Lookout in the Sioux Lookout District.

Fall Cankerworm, *Alsophila pometaria* (Harr.)

Noteworthy populations of fall cankerworm returned to some of the towns in the Northwest Region. Moderate to severe defoliation of urban Manitoba maple (*Acer negundo* L.) of all sizes was observed in the communities of Sioux Lookout and Hudson, Sioux Lookout District; in Dryden and Ignace in the Dryden District. High populations were also observed in the towns of Fort Frances and Kenora in the Fort Frances and Kenora districts, respectively.

Spruce Broom Rust, *Chrysomyxa arctostaphyli* Dietel

The incidence of spruce broom rust appears to be increasing in the Sioux Lookout District. The effects of long-term infections were observed on 10-20 m black spruce in the Wapese Lake area along the Vermilion River Road. A low level of tree mortality has occurred in this area. Scattered seed orchard black spruce were infected in both the Goodie South and North seed orchards, with some trees having more than one broom. Single tree infections by this disease are commonly seen across much of the region.

Birch Lace Bug, *Corythucha pallipes* Parsh.

High populations of birch lace bugs on white birch were present at some scattered locations in 2002. These insects pierce the tissue on the underside of the leaf sucking the sap from the host. This type of feeding causes the leaf to become discoloured. Low to moderate levels of foliar discolouration were observed in a few stands in the south central part of the Sioux Lookout District.

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

This needle cast disease of jack pine was much more common across the Dryden and Sioux Lookout districts this year. The damage observed was heaviest on individual young trees within stands. Numerous single trees 2-3 m tall had almost all of their old foliage removed as a result of high infection levels. Lower infection levels were common on scattered trees within young stands of jack pine regeneration.

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

Trace numbers of introduced pine sawfly were found on eastern white pine around the town of Kenora in the Kenora District. Similar populations were present on jack pine west of the village of Mine Centre along Highway 11 in the Fort Frances District.

Birch Leafminer, *Fenusa pusilla* (Lep.)

Foliar browning caused by birch leafminer was found throughout the Thunder Bay District in 2002. Field observations from the ground revealed damage at sufficient levels to cause noticeable browning at numerous points in the district.

Fall Webworm, *Hyphantria cunea* (Drury)

Population levels of this late season insect were up this year. Single tents on a range of hardwood tree and shrub species were common across the five western districts in the region. The predominant host appeared to be white birch and willow. Tents were very conspicuous along Highways 72 and 516 in the Sioux Lookout District and along the Highway 601 corridor in the Dryden District.

Dook's Needle Blight, *Lophophacidium dooksii* Corlett & Shoemaker

Noticeable foliar browning (50-75%) was present on a few eastern white pine in and around the town of Sioux Lookout in the Sioux Lookout District. Lower damage levels were common on scattered individual pine in the Dryden and Sioux Lookout districts.

Redheaded Jack Pine Sawfly, *Neodiprion virginiana* complex

Population levels of the redheaded jack pine sawfly increased across the Red Lake, Sioux Lookout, and Dryden districts. This insect has not been mentioned in a report since 1994. The trees most affected were generally small jack pine averaging about 3m in height and they were usually found growing along the fringes of stands.

Severe defoliation (50-100%) of old foliage was observed on scattered individual trees adjacent to Highways 516 and 72 in the Sioux Lookout District and similarly along Highway 105 in the Red Lake District. Damage was also prominent along the Highway 17 corridor in the Dryden District particularly in the eastern part of the district. Throughout all of the above areas it was not uncommon to see trees with all of their old needles gone. Lower insect numbers resulting in patchy feeding patterns were common across the three districts.

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

Relatively high populations of yellowheaded spruce sawfly were observed on young roadside regeneration black and white spruce along most major roadways in the Sioux Lookout, Dryden, Red Lake, and Thunder Bay districts. Damaged trees were particularly noticeable along Highway 72 in the Sioux Lookout and Dryden districts. Black and white spruce ranging in size from 0.1-2 m tall were damaged with some of the trees completely stripped of their foliage. Varying levels of defoliation were also observed on ornamental spruce in the town of Sioux Lookout.

White Pine Weevil, *Pissodes strobi* (Peck) and Eastern Pine Shoot Borer, *Eucosma gloriola* Heinr.

Population levels of these insects were up again this year. Both these insects attack the terminal of young trees with the shoot borer preferring jack pine and the weevil found on a range of pine and spruce species. It was common to see roadside white and black spruce with weevil damage along all major highways in the five western districts in the Northwest Region. The combination of weevil and shoot borer caused some noteworthy damage in jack pine regeneration. This damage was particularly noticeable in the Coli Lake area, Red Lake District, at the south end of the Vermilion River Road, Sioux Lookout District, and in Mafeking Township in the Dryden District. In a 20 ha plantation of 2 m jack pine 5 percent of the trees were attacked by eastern pine shoot borer in Kingsford Township, Fort Frances District.

Spearmarked Black Moth, *Rheumaptera hastata* (L.)

High populations of the spearmarked black moth were detected at a few locations in the Red Lake and Sioux Lookout districts. Moderate to severe (40-80%) leaf browning of white birch was present along the Nungesser Road south of Coli Lake with the damage extending west to the south end of Little Vermilion Lake in the Red Lake District. In the Sioux Lookout District similar damage levels were also found in the Mills Lake area along Highway 516, and at the south end of the Moose Lake Road.

FOREST HEALTH MONITORING

Jack Pine Health Plots

Jack pine constitutes a major component of the conifer trees growing in Northwestern Ontario and therefore is a very important commercial species. The first group of jack pine plots were established in 1992 with some additional ones installed the following year. The number of plots examined was reduced in 1999 and currently there are 32 plots being monitored in the Northwest Region (Fig. 7). Initially the goal of these plots was to gather data on the impact of jack pine budworm from which a set of guidelines could be produced to serve as a jack pine management tool. Over the years the general condition of the trees has been evaluated and there has not been any noteworthy jack pine budworm damage found.

In a departure from other years there is only one table in this report that summarizes the tree condition for all the plots in the northwest (Table 4). If information is required on a plot by plot basis please contact the authors from Natural Resources Canada. Various pests have contributed to the decline and death of some trees but generally the percentage of trees in the moderate and severe categories has been low. The principal causes of tree mortality have been *Armillaria* root rot, *Armillaria ostoyae* (Romagn.) Herink, blowdown, and snow/ice damage. In 2002 alone one or more of these conditions resulted in the death of 15 trees. The western gall rust, *Endocronartium harknessii* (J.P.Moore) Y. Hirats. continues to be the principal pest found on the living trees. This year 3 percent of the living trees had varying levels of infection by this disease. There were no major insect defoliators found causing damage in the plots in 2002.

Table 4. Summary of the crown condition and tree mortality in the jack pine health plots from 1996 to 2002 in the Northwest Region of Ontario. (Counts based on the examination of 50 jack pine trees at each plot.)

Year	No. of trees	Crown condition ^a (%)					
		Healthy	Light	Moderate	Severe	New dead	Old dead
1996	4299	96.0	0.7	0.2	0.1	1.5	1.4
1997	2739	90.8	2.9	0.3	0.1	2.2	3.7
1998	2650	90.7	2.6	0.4	0.4	1.3	4.5
1999	1600	87.0	3.0	0.4	0.1	2.8	6.7
2000	1598	76.7	10.9	1.0	0.4	1.5	9.5
2001	1600	74.2	11.1	1.3	0.5	2.0	11.0
2002	1600	69.9	13.0	1.8	0.4	1.8	13.0

^a Healthy = <25% current and old defoliation; Light = 25% to 50% total defoliation; Moderate = 51% to 75% total defoliation; Severe = >75% total defoliation; New dead = trees that died in the current year from natural causes; Old dead = cumulative mortality, trees dead when the plot was installed are included.

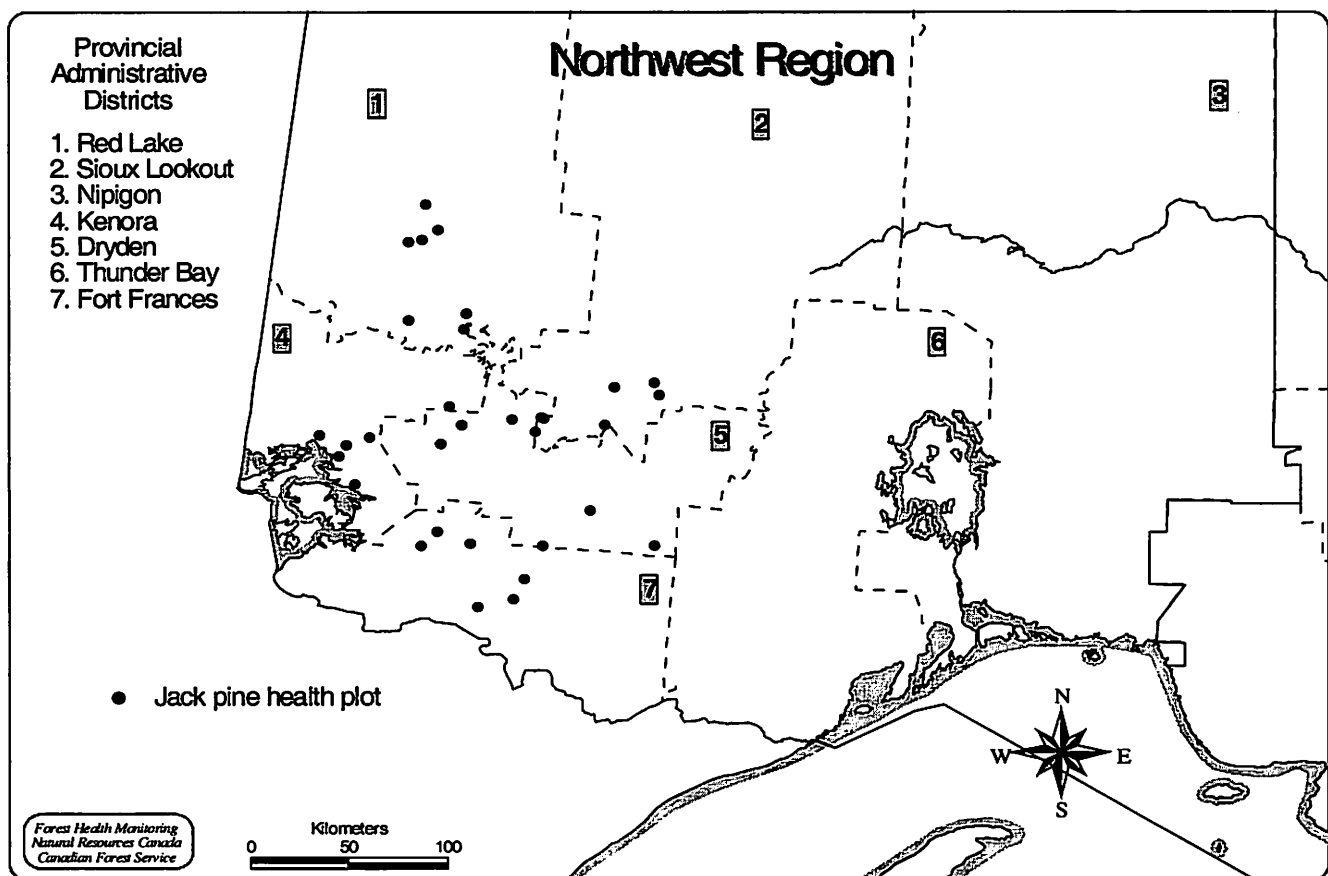


Figure 7. Locations of the jack pine health plots in 2002.

Spruce/Fir Health Plots

The spruce/fir plots were originally established in 1993 to monitor the impact the spruce budworm would have on its principal hosts - balsam fir, white spruce, and black spruce. The plots represented stand variables such as age, site, and spruce/fir composition. In 1996 a standardized evaluation system was introduced (Table 5), and in 1998 information on all of the other tree species present in the plots was recorded. White birch and trembling aspen were the most important hardwoods and their information is summarized in Table 6. The number of plots has been reduced, in 2002 a total of 25 stands were examined (Fig. 8). In a departure from other years there is only one table in this report that summarizes the tree condition for all the plots in the northwest. If information is required on a plot by plot basis please contact the authors from Natural Resources Canada.

It can be seen in Table 5 that in the earlier years the effects of the last spruce budworm infestation were still having impact on the conifer host. Trees weakened by defoliation were prone to attack by *Armillaria* root rot, bark beetles and sawyer beetles, all of which resulted in the death of the tree. In recent years the overall condition of the conifers has improved, the rate of decline has slowed. Most of the current tree mortality was caused by abiotic influences such as blowdown and snow/ice damage. Major defoliators were not a factor in tree health in 2002. There were a number of minor biotic and abiotic influences, but none causing noteworthy stress.

The condition of the two hardwood hosts in the plots has changed little over the past 5 years (Table 6). The greatest impact has been from *Armillaria* root rot, stem cankers, blowdown, and various insect defoliators. The forest tent caterpillar has had the biggest impact on trembling aspen over the past few years.

Table 5. Summary of the crown condition and tree mortality for three coniferous hosts in the spruce/fir health plots from 1996 to 2002 in the Northwest Region on Ontario.

Tree species	Year	No. of trees	Crown condition ^a (%)					
			Healthy	Light	Moderate	Severe	New dead	Old dead
Balsam fir	1996	2807	14.7	13.4	10.0	5.5	16.3	40.2
	1997	2189	9.1	11.8	1.8	0.4	4.6	72.4
	1998	1409	24.4	3.8	1.2	0.5	5.3	64.8
	1999	934	29.2	2.8	0.4	0.3	2.9	64.3
	2000	935	19.5	9.1	1.9	0.4	1.9	67.2
	2001	936	17.4	11.8	0.7	0.3	0.6	69.1
	2002	814	16.5	11.8	0.9	0.4	1.5	69.1
White spruce	1996	382	30.9	36.1	8.4	3.9	5.0	15.7
	1997	227	42.3	17.2	2.2	1.3	2.2	34.8
	1998	199	47.2	10.6	5.0	3.0	6.0	28.1
	1999	122	66.4	2.5	0.8	0.0	2.5	27.9
	2000	122	44.3	19.7	3.3	0.0	2.5	30.3
	2001	122	44.3	18.0	1.6	0.0	3.3	32.8
	2002	108	44.4	14.8	0.9	0.0	0.9	38.9
Black spruce	1996	637	73.6	15.7	0.3	0.3	2.5	7.5
	1997	428	73.4	9.6	0.2	0.0	1.9	14.9
	1998	388	87.9	0.8	0.0	0.0	2.3	9.0
	1999	304	86.5	1.3	0.0	0.0	0.7	11.5
	2000	304	77.6	7.9	0.3	0.3	1.6	12.2
	2001	304	74.0	9.9	1.0	0.0	1.3	13.8
	2002	268	73.9	7.1	0.8	0.4	2.6	15.3

^a Healthy = <25% current and old defoliation; Light = 25% to 50% total defoliation; Moderate = 51% to 75% total defoliation; Severe = >75% total defoliation; New dead = trees that died in the current year from natural causes; Old dead = cumulative mortality, trees dead when the plot was installed are included.

Table 6. Summary of the crown condition and tree mortality for two deciduous hosts in the spruce/fir health plots from 1998 to 2002 in the Northwest Region of Ontario.

Tree species	Year	No. of trees	Crown condition ^a (%)					
			Healthy	Light	Moderate	Severe	New dead	Old dead
White birch	1998	253	77.1	1.6	3.9	0.8	0.8	15.8
	1999	208	79.8	2.4	4.8	0.0	0.5	12.5
	2000	208	74.0	4.8	3.4	1.9	2.9	13.0
	2001	209	73.2	3.4	4.3	0.5	2.9	15.8
	2002	206	71.8	3.9	3.4	1.0	1.0	18.9
Trembling aspen	1998	428	84.6	3.3	1.2	0.2	0.9	9.8
	1999	292	77.1	7.9	2.7	0.7	1.4	10.3
	2000	289	72.0	7.3	6.6	1.0	1.4	11.8
	2001	292	63.0	12.0	8.9	1.7	1.4	13.0
	2002	281	63.0	9.6	8.9	2.1	2.1	14.2

^a Healthy = <15% dead branches and twigs; Light = 16% to 25% dead branches and twigs; Moderate = 26% to 75% dead branches and twigs; Severe = >76% dead branches and twigs; New dead = trees that died in the current year from natural causes; Old dead = cumulative mortality.

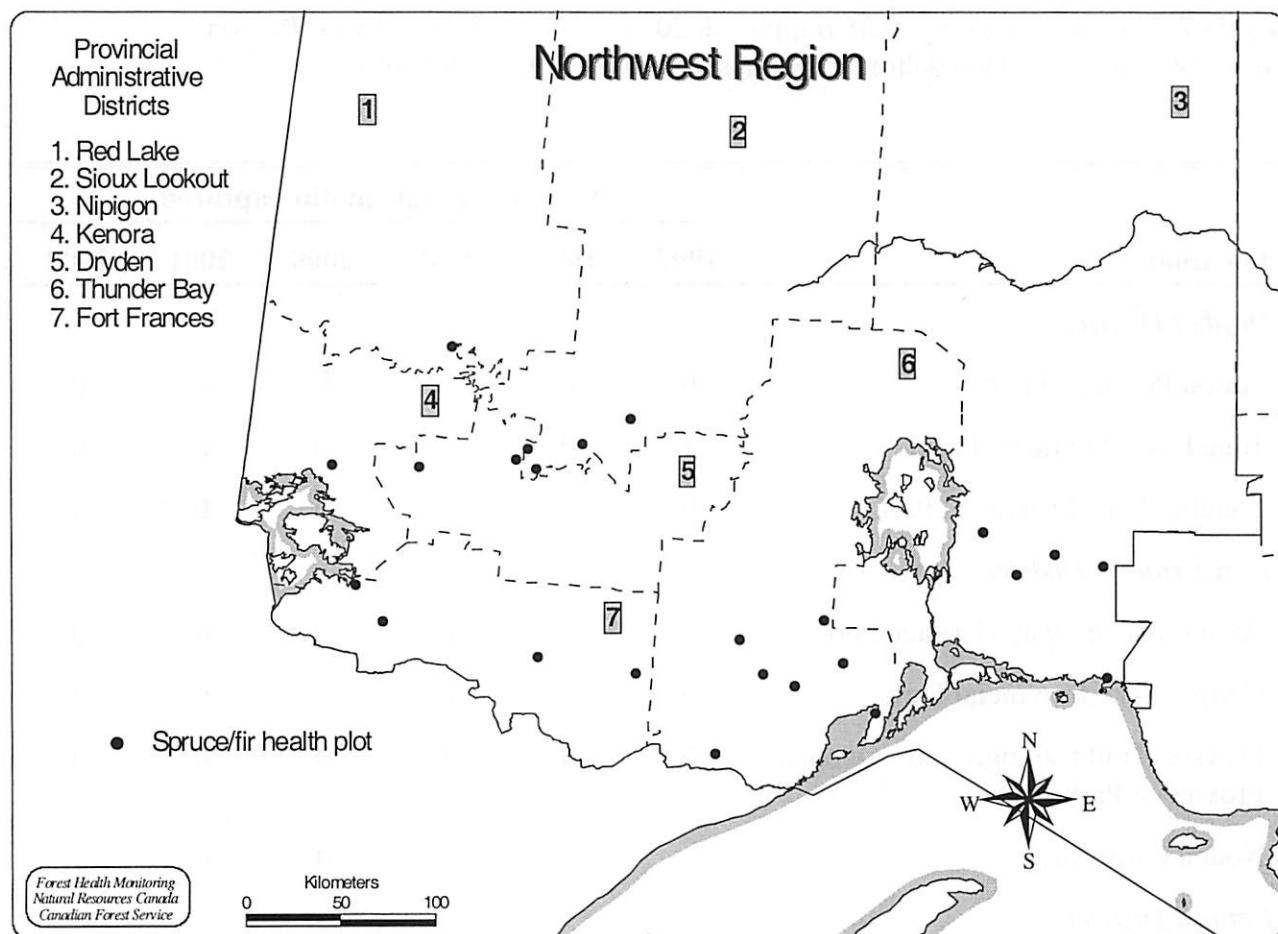


Figure 8. Locations of the spruce/fir health plots in 2002.

QUARANTINE PESTS

Gypsy Moth, *Lymantria dispar* (L.)

A gypsy moth trapping program was carried out once again throughout the Northwest Region. A total of 20 locations that have vehicular traffic from the United States and other parts of Canada were used as trap sites (Table 7). Two deltoid-type, sticky, pheromone traps baited with a lure were used at each site. The purpose of these traps is to attract and capture male gypsy moth adults. This survey is to act as an early detection tool for the presence of gypsy moth. In 2002 there were three locations where moths were caught (Fig. 9). Three moths were found in the traps at Rainbow Falls Provincial Park in Nipigon District and one each at Sleeping Giant Provincial Park and at the Pigeon River Border Crossing in the Thunder Bay District.

Table 7. Summary of gypsy moth trapping at 20 locations in the Northwest Region of Ontario from 1997 to 2002. (Two deltoid-type traps were used at each location)

Location	Number of male moths captured					
	1997	1998	1999	2000	2001	2002
<i>Dryden District</i>						
Aaron Provincial Park	0	0	0	0	0	0
Blue Lake Provincial Park	1	0	0	0	0	0
Sandbar Lake Provincial Park	0	0	0	0	0	0
<i>Fort Frances District</i>						
Assabaska Ojibway Heritage Park	0	0	0	0	0	0
Caliper Lake Provincial Park	0	0	0	0	0	0
Dawson Trail Campground - Quetico Provincial Park	0	0	1	0	0	0
Noden Causeway	-	-	-	0	0	0
<i>Kenora District</i>						
Rushing River Provincial Park	0	0	0	0	0	0
Sioux Narrows Provincial Park	0	0	0	0	0	0
<i>Nipigon District</i>						
Leunenburger's - Nakina	1	0	0	0	0	0
MacLeod Park	0	0	0	0	0	0
Neys Provincial Park	0	0	0	0	1	0
Nipigon Tourist Information Centre	-	-	-	0	0	0
Rainbow Falls Provincial Park	0	0	0	0	0 ^a	1
Rosspoint Provincial Park	0	0	0	0	1	0
<i>Red Lake District</i>						
Pakwash Provincial Park	0	0	0	0	0	0

Table 7. Summary of gypsy moth trapping at 20 locations in the Northwest Region of Ontario from 1997 to 2002. (Two deltoid-type traps were used at each location)

Location	Number of male moths captured					
	1997	1998	1999	2000	2001	2002
<i>Sioux Lookout District</i>						
Ojibway Provincial Park	0	0	0	0	0	0
<i>Thunder Bay District</i>						
Kakabeka Falls Provincial Park	0	0	0	0	0	0
Pigeon River Border Crossing	-	-	-	0	0	1
Sleeping Giant Provincial Park	0	0	0	0	0	1

^a One trap missing

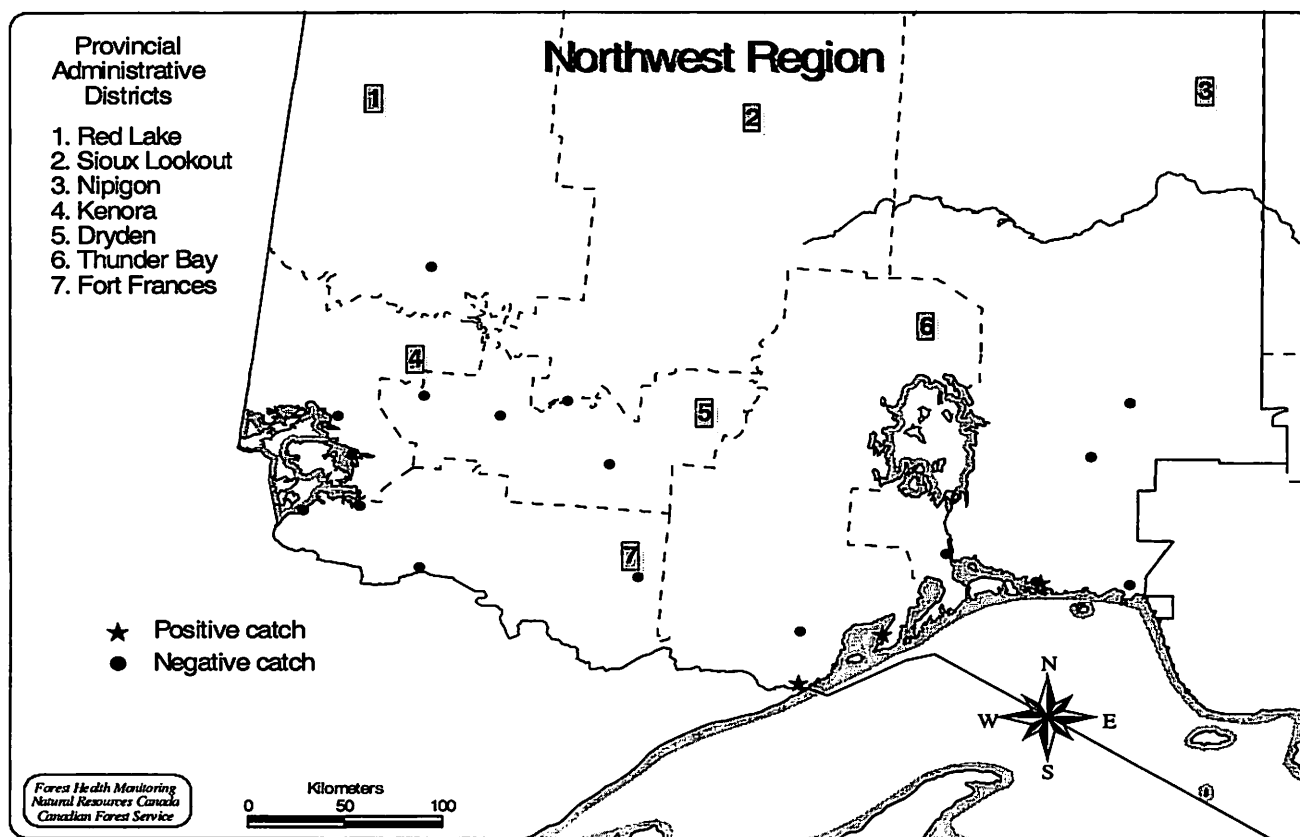


Figure 9. Locations of the gypsy moth (*Lymantria dispar* [L.]) pheromone trap sites in 2003.