

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

CASE INCIDENT RECORD

1. ORGANIZATION CODE 1 7 0 0		2. ORGANIZATION (PARK) NAME Acadia National Park		3. LOCATION CODE 0 3 0 0		4. CASE/INCIDENT NO. 1	
5. LOCATION OF INCIDENT Park Wide				6. WHEN DID IT OCCUR?	MO. 1	DAY 1	YR. 82
				24 HOUR TIME 10 00	HRS. 10	MIN. 00	7. DAY OF WEEK 2
8. OFFENSE/INCIDENT CODE 4 2 0 3 0 0		9. NATURE OF INCIDENT Animals and Wildlife Insects		10. HOW REPORTED			
11. REPORTED BY				12. ADDRESS		13. PHONE (HOME BUSINESS)	
14. RECEIVED BY				15. WHEN RECEIVED: DATE		16. TIME BROADCAST	
18. INVESTIGATED BY Norman E. Fletcher				19. OFFICER/RANGER NO. 0 2 0 3		17. WHEN INVESTIGATED DATE 8/20/82 TIME	
				20. WHEN CLEARED DATE		DISPOSITION 21.	

22. INVOLVED PERSONS	23. ADDRESS	24. PHONE	25. SEX	26. RACE	27. AGE	28. DATE OF BIRTH
1						
2						
3						
4						

29. DETAILS OF INCIDENT

The Alder flea beetle *Altica ambigua* var. *albi* caused defoliation to the alder throughout Acadia National Park. The defoliation runs from very light to very heavy. (see attached map for some locations). The beetle apparently is usually scarce but are known to occur periodically in large numbers. Parker Snowden, Entomologist of the U.S. Forest Service will investigate further.

*Confirmed by Parker Snowden
9/10/82*

30. QUANTITY	31. PROPERTY STOLEN OR DAMAGED	32. ESTIMATED VALUE	RECOVERED	
			33. DATE	34. VALUE
35. PROPERTY CODE HIGHEST VALUE		36. TOTAL	37. TOTAL	00
INVESTIGATED BY (Signature and Date)		APPROVED BY (Signature and Date)		
<i>Norman E. Fletcher 8/20/82</i>		<i>Parker Snowden 9/10/82</i>		

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

CASE INCIDENT RECORD

1. ORGANIZATION CODE 1 7 0 0		2. ORGANIZATION (PARK) NAME Acadia National Park		3. LOCATION CODE 0 1 0 0		4. CASE/INCIDENT NO. 8/23/82	
5. LOCATION OF INCIDENT Cadillac Mountain				6. WHEN DID IT OCCUR? MO. 08 DAY 23 YR. 82		7. DAY OF WEEK 2	
8. OFFENSE/INCIDENT CODE 4 2 0 3 00		9. NATURE OF INCIDENT Animals and Wildlife Trees		10. HOW REPORTED N/A			
11. REPORTED BY Norman E. Fletcher		12. ADDRESS		13. PHONE HOME BUSINESS		17. WHEN INVESTIGATED DATE 8/23/82 TIME 1100	
14. RECEIVED BY		15. WHEN RECEIVED: DATE		16. TIME BROADCAST		17. WHEN INVESTIGATED DATE TIME	
18. INVESTIGATED BY Norman E. Fletcher		19. OFFICER/RANGER NO. 0 2 0 3		20. WHEN CLEARED DATE 8/23/82 TIME 1500		DISPOSITION 21.	

22. INVOLVED PERSONS	23. ADDRESS	24. PHONE	25. SEX	26. RACE	27. AGE	28. DATE OF BIRTH
1						
2						
3						
4						

29. DETAILS OF INCIDENT

On 8/23/82 at 1100 Norman E. Fletcher and Steve Minson set out to find a Jack Pine stand as requested by the Critical Areas Program Manager. We Traversed the South Ridge between Eagle's Crag and the summit, we found no jack pine. We concentrated on the south east ridge north of Eagles Crag. There was a large pitch pine stand at this location.

30. QUANTITY	31. PROPERTY STOLEN OR DAMAGED	32. ESTIMATED VALUE	RECOVERED	
			33. DATE	34. VALUE
36. TOTAL		00	37. TOTAL	
36. TOTAL		00	37. TOTAL	
INVESTIGATED BY (Signature and Date)		APPROVED BY (Signature and Date)		
[Signature] 8/26/82		[Signature] 8/26/82		

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

CASE INCIDENT RECORD

1. ORGANIZATION CODE 7 0 0		2. ORGANIZATION (PARK) NAME Acadia National Park			3. LOCATION CODE 3 0 0		4. CASE/INCIDENT NO. 8 2 1 2	
5. LOCATION OF INCIDENT Cadillac Mountain				6. WHEN DID IT OCCUR? MO. 0 8 DAY 2 3 YR. 8 2		24 HOUR TIME HRS. 1 2 MIN. 0 0		7. DAY OF WEEK 2
8. OFFENSE/INCIDENT CODE 4 2 0 3 0 0		9. NATURE OF INCIDENT Animals and Wildlife Insects			10. HOW REPORTED WTA			
11. REPORTED BY				12. ADDRESS		13. PHONE { HOME BUSINESS		
14. RECEIVED BY				15. WHEN RECEIVED: DATE		16. TIME BROADCAST		17. WHEN INVESTIGATED DATE 8/2/82 TIME 200
18. INVESTIGATED BY Norman E. Fletcher				19. OFFICER/RANGER NO. 0 2 0 3		20. WHEN CLEARED DATE 8/22/82 TIME 300		DISPOSITION 21.

22. INVOLVED PERSONS	23. ADDRESS	24. PHONE	25. SEX	26. RACE	27. AGE	28. DATE OF BIRTH
1						
2						
3						
4						

29. DETAILS OF INCIDENT

An infestation of Neodiprion dyari Roh. a saw fly larvae on Pitch Pine at Cadillac Mountain. Some Trees found to be completely defoliated approximately 5% of the stand) and while 10% were moderately defoliated and the remaining lightly or not defoliated. The stand is located on a ridge approximately 1/2 mile from the summit on the east ridge approximately covering 5 acres. (SEE ATTACHED MAP). The pitch pine may be seen from the south ridge trail. Parker Snowden U.S. Forest Service Will investigate further.

*Confirmed by Parker Snowden
9/10/82*

30. QUANTITY	31. PROPERTY STOLEN OR DAMAGED	32. ESTIMATED VALUE	RECOVERED	
			33. DATE	34. VALUE
36. TOTAL		00	37. TOTAL	
38. PROPERTY CODE OF HIGHEST VALUE		39. INVESTIGATED BY (Signature and Date)		
		APPROVED BY (Signature and Date)		

DUTCH ELM DISEASE THERAPY

by James L. Sherald and Garold F. Gregory

The virulence of Dutch elm disease (DED) has long precluded therapy as a practical, routine component of DED management programs. However, successful therapy has been achieved through pruning (May and Douglas 1944, Marsden 1952, Campana 1975, Himelick and Cepelcha 1976), and through fungicide injections (Gregory et al. 1973, Kondo et al. 1973). More recently, the combination of pruning and chemotherapy has been found to be more effective than either of the techniques used alone (Campana and Gregory 1976, Gregory and Allison 1979).

In 1975 the Ecological Services Laboratory of the National Capital Region (NCR) of the National Park Service, in cooperation with the USDA Forest Service, Forest Insect and Disease Laboratory, Delaware, Ohio, initiated a 3-year case study of DED therapy in NCR. The purpose of the study was to determine if integrated therapy, pruning plus fungicide injections, could be a reliable, practical procedure for reducing DED losses and saving high value elms.

Materials and Methods

The study was conducted in NCR-Central, which includes the National Mall, the White House, Lafayette Park, the Jefferson and Lincoln Memorials, as well as other parks, streets, and monument grounds within the federal enclave of Washington, D.C.

From 1975 through 1977 approximately 2,260 elms were examined for DED symptoms. Trees exhibiting symptoms were tagged and samples collected for culture and identification of *Ceratocystis ulmi*. Elms with 30%, or less, wilt received therapy.

Trunks were injected with MBC.HCI (methy
2-benzimidazole carbamate hydrochloride) in 1975 and 1976, and with Lignasan BLP (methy
2-benzimidazole carbamate phosphate) in 1977: Trunk injections were made at 3 grams/liter, 2 liters/2.54 cm dbh, which is approximately 7.5 times the labeled rate of most commercial formula-

tions of Lignasan BLP. Injections were made at 70 p.s.i. with a Spartan Power Sprayer (FMC Corporation, Model 3320(33-C) equipped with a 49 liter translucent polyethylene carboy as the fungicide reservoir (Fig. 1). To facilitate dosage preparation, the carboy was calibrated in liters/cm dbh. When necessary, additional fungicide could be added to the carboy without stopping the injection. Injector heads, hoses, and manifolds were the same as those developed by the USDA Forest Service (Gregory and Jones 1975). Injector heads were placed at ground level at approximately 15 cm intervals around the base of the trunk. Whenever possible, heads were inserted into root-flares.

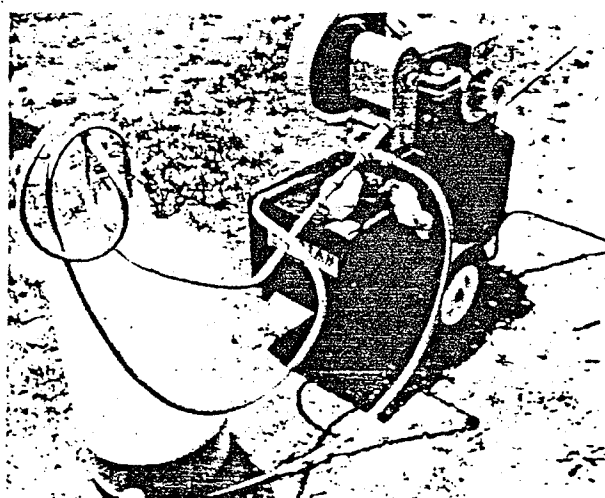


Fig. 1. Spartan sprayer injection apparatus.

Frequently, when wilt was localized in one or two limbs, limb injections were performed (Fig. 2). Injector heads were placed at 10 cm intervals around the circumference of the infected limb at a major notch well below the wilted segment. Limb injections were made at 6 grams/liter, 1 liter/2.54 cm limb diameter in 1975 and 1977, and at 12 grams/liter in 1976. Whenever possible, limb injections were made prior to pruning; however, when pruning occurred first, limbs were injected

at the next major crotch below the pruning cut. Although an attempt was made to prune all diseased limbs beyond discolored sapwood, this was not always possible.

All treated trees were examined for DED symptoms through 1979.

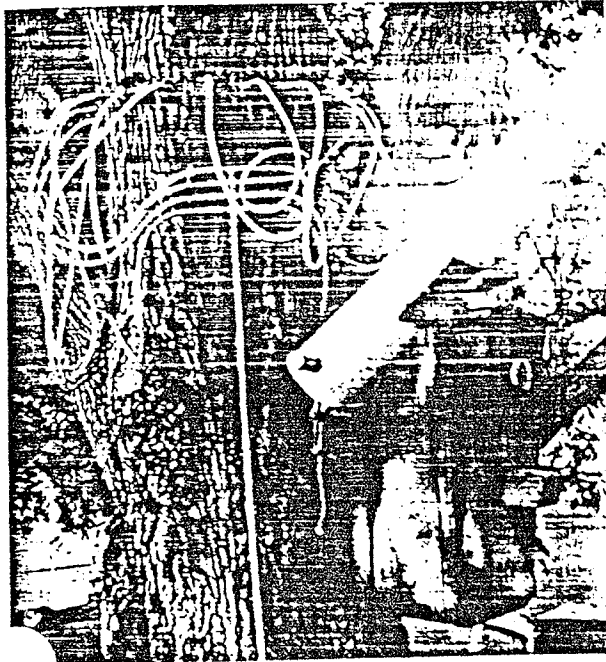


Fig. 2. Elm limb prepared for pressure injection.

Results and Discussion

Within the study area the DED incidence for 1975, 1976 and 1977 was 2.6, 2.2 and 3.2% respectively. Of the 185 elms infected during the study, 86 (47%) exhibited over 30% wilt and were removed. Thus, slightly more than half of the trees infected each year exhibited 30% or less

wilt and received therapy (Table 1). Therapy was provided to 98 trees, mean ddb 88.9 cm, during the 3 year program. Average injection time for trunks and limbs was 60 and 40 minutes respectively.

In 1979, 57 (55.1%) of the treated trees were free of wilt and apparently recovered from DED. Forty-four had to be removed following a recurrence of DED (Table 1). Symptoms were arrested in most trees for the remainder of the season following treatment. However, recurrences were noted in treated trees as late as 4 years following therapy. Although recurring infections were not traced, it is likely that the original infection remained latent following treatment. Later recurrences could reflect the fungistatic nature of MBC (Janutolo and Stipes 1976), the varying sensitivity of *C. ulmi* to MBC, the inability of some trees to completely and permanently wall-off the pathogen, or a combination of these possibilities. When initial therapy has not been successful, yet the residual infection has not reached the bole of the tree, repeated therapy may be successful. Repeated injection could effect more nearly complete distribution of fungicide in the outer sapwood. Of 11 trees treated in 1975 and retreated in 1976 following a recurrence of the disease, 5 were still free of wilt in 1979.

Limb, as well as trunk, injections were given to 62 of the 98 trees treated. Sixty percent of these trees were saved compared with 47% of those receiving only a trunk injection. Limb injections increase the likelihood of fungicide being present in the vicinity of any residual infection which remains following pruning. This could account for the greater success with combined trunk and limb injections.

Table 1. Summary of Dutch Elm Disease in the National Capital Region, Washington, D.C.

Year	No. infected	No. treated ^a	% Treated	Treated and lost ^b					Total treated & lost	Total treated & remaining	% Treated remaining
				1975	1976	1977	1978	1979			
1975	60	29 (30) ^c	50.0	0	8	4	4	1	17	12	41.4
1976	51	27	52.9	—	2	3	2	4	11	16	59.2
1977	74	42	56.7	—	—	8	6	2	16	26	61.9
Total:	185	98 (99) ^c	Ave. 53.5	Total:					44	54	Avg. 55.1

^aRemoved after severe recurrence of Dutch elm disease

^bTree exhibiting 30% or less wilt received treatment

^cOne tree lost because of storm damage 1975

Sixty-wilt at 20%, and 2). The 10%, or 2-4 years 9 trees

Table 2. 30% Therapy

% Wilt
10
20
30

There reduce the trees s individu 4).

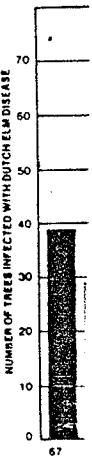


Fig. 3. 1975 th

The tion & can l camp are re

Sixty-six of the treated trees had 10%, or less, wilt at the time of treatment. Twenty-three had 20%, and only 9 were judged to have 30% (Table 2). Therapy was most successful on trees in the 10%, or less, category, with 39 free of disease 2-4 years after treatment. However, even 5 of the 9 trees with 30% wilt were cured (Table 2).

Table 2. Status of Elms with 10%, 20%, and 30% Wilt Receiving Dutch Elm Disease Therapy.

% Wilt	Number of elms			% remaining
	treated	lost	remaining	
10	66	27	39	59.1
20	23	13	10	43.5
30	9	4	5	55.6

Therapy treatment during the 3-year study reduced DED losses by 29% and saved 55% of the trees treated. Although the total number of trees saved is not great, (Fig. 3) the value of the individual specimens saved, is immeasurable (Fig. 4).

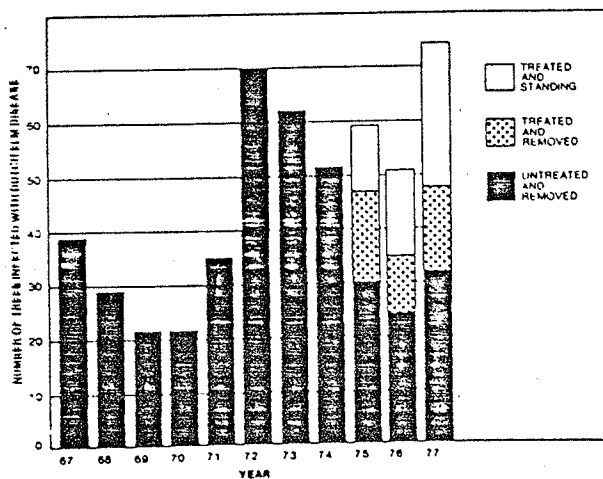


Fig. 3. Dutch elm disease incidence in the study area, 1967-1977. DED therapy was performed from 1975 through 1977.

Therapy is by no means a substitute for sanitation and methoxychlor sprays. However, therapy can be a valuable tool for communities, college campuses, and park authorities where arborists are responsible for managing small, high value elm

populations where infections can be detected early and where special attention can be given to individual trees. Table 3 lists some guidelines which can be used in managing a therapy program.

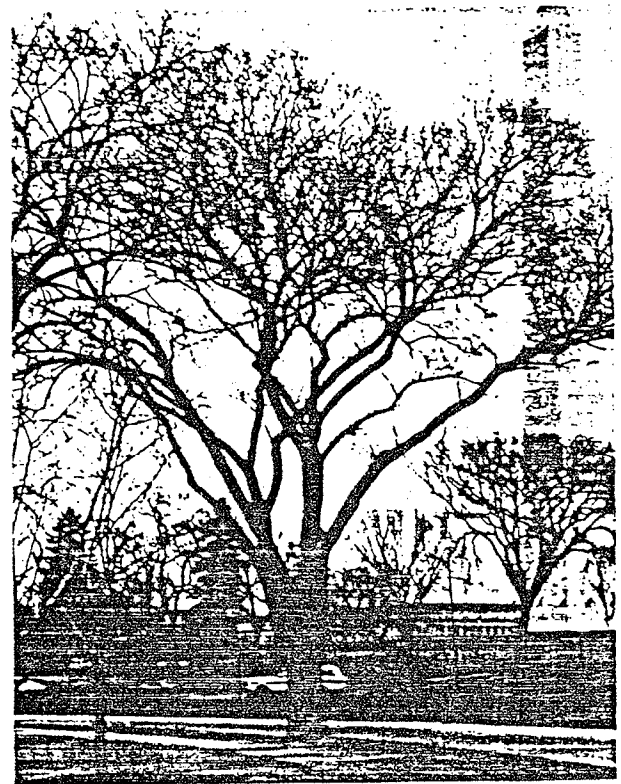


Fig. 4. American elm near the Washington Monument which received Dutch elm disease therapy in 1977 and has shown no further symptom progression.

Table 3. Guidelines for Dutch Elm Disease Therapy.

1. Thoroughly examine elms for DED symptoms from May through September.
2. Immediately evaluate infected elms for therapy.
 - a. Reserve therapy for high value elms with 10% or less wilt. Poor risk trees, those with greater than 10% wilt, and older trees with deteriorating crowns and generally poor vigor, should be removed immediately.

Poorly shaped specimens, trees aesthetically unacceptable after radical pruning, or trees located in insignificant locations, should be removed and treatment reserved for more valuable specimens.

- b. Therapy should not be performed when vascular discoloration extends into the main trunk.

Small "windows" cut in the bark of the limb and in the trunk below the wilted segment help determine the extent of sapwood discoloration.

3. Immediately provide therapy to selected elms.

- a. Inject fungicide into the trunk and the infected limb.
b. Prune the infected limb 1-3 days after injection.

(1) There should be at least 5' and preferably 10' between the last visible sapwood discoloration and the pruning cut.

(2) If discoloration extends into the main trunk, the tree should be removed.

4. Closely examine treated elms for symptom recurrence.
5. Elms with recurring infections should be evaluated for further treatment or removed.
6. Maintain complete records on each therapy case.

Records should include: Tree location, dbh, percent and location of symptoms, date of treatment, amount of fungicide injected, and time required for treatment. A photographic record for each tree can be very useful.

Literature Cited

- Campana, Richard J. 1975. *Tracing Dutch elm disease infections for depth of infection following excision of infected branches*. Proc. Am. Phytopathol. Soc. 2:95 (Abstr.).
Campana, R.J. 1976. *The demise of elms following successful arrest of symptoms of Dutch elm disease by chemical injections*. Proc. Am. Phytopathol. Soc. 3:302-303 (Abstr.).
Campana, R.J. and G.F. Gregory. 1976. *Dutch elm disease control by pressure-injected solubilized MBC HCl and excision of infected branch systems*. Proc. Am. Phytopathol. Soc. 3:325 (Abstr.).

- Gregory, G.F., T.W. Jones and P. McWain. 1973. *Pressure injection of methyl-2-benzimidazole carbamate hydrochloride solution as a control for Dutch elm disease*. U.S. Dep. of Agric. For. Serv. Res. Note NE-176. 9pp.
Gregory, G.F. and T.W. Jones. 1975. *An improved apparatus for pressure-injecting fluid into trees*. U.S. Dep. of Agric. For. Serv. Res. Note NE-214. 6pp.
Gregory, G.F. and J.R. Allison. 1979. *The comparative effectiveness of pruning versus pruning plus injection of trunk and/or limb for therapy of Dutch elm disease in American elms*. J. Arboric. 5:1-4.
Himelick, E.B. and D.W. Cepelacha. 1976. *Dutch elm disease eradication by pruning*. J. Arboric. 2:81-84.
Janutolo, D.B. and R.J. Stipes. 1976. *Toxic effects of methyl-2-benzimidazole carbamate (MBC), MBC.HCl, MBC-H₃PO₄ and nystatin to Ceratocystis ulmi*. Can. J. Plant Sci. 56:967-970.
Kondo, E.S., D.N. Roy, and E. Jorgensen. 1973. *Salts of methyl-2-benzimidazole carbamate (MBC) and assessment of their potential in Dutch elm disease control*. Can. J. For. Res. 3:548-555.
Marsden, D.H. 1952. *Pruning elms affected with Dutch elm disease*. Phytopathology 42:113-114 (abstr.).
May, C. and W.R. Douglas. 1944. *Some factors affecting the value of pruning for Dutch elm disease*. Arborist's News 9:33-35.

Plant Pathologist
Ecological Services Laboratory
National Capital Region
National Park Service
Washington, D.C.

and

Principal Plant Pathologist
USDA Northeastern Forest Experiment Station
Delaware, Ohio



United States Department of the Interior RECEIVED
NATIONAL PARK SERVICE ACADIA NATIONAL PARK

IN REPLY REFER TO:

North Atlantic Region
15 State Street
Boston, Massachusetts 02109

MAY 27 '82

May 24, 1982

N50 (NAR-OS)

Division	Initiate	Date
Superintendent		
Operations Admin.		
Admin. Officer		
Chief Ranger		
Resource Mgr.		
Chief Woodchopper		
Chief Maintenance		
Personal Clerk		
Purchasing Agent		
Chief Typist		
Secretary		
File		

Copy
my copy

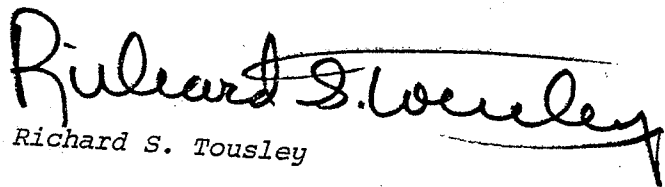
Memorandum

To: Superintendents, North Atlantic Region
Attention: Resource Management Specialists

From: Associate Regional Director, Management and Operations,
North Atlantic Region

Subject: North Atlantic Forest Pest Conditions Report

The subject report, which includes our Region, is enclosed for your information.


Richard S. Tousley

Enclosures 2

1981

NORTHEASTERN AREA
FOREST PEST CONDITIONS

Summary of the Status of the
Major Forest Insect and Disease Pests

for

Connecticut (CT)	Missouri (MO)
Delaware (DE)	New Hampshire (NH)
Illinois (IL)	New Jersey (NJ)
Indiana (IN)	New York (NY)
Iowa (IA)	Ohio (OH)
Maine (ME)	Pennsylvania (PA)
Maryland (MD)	Rhode Island (RI)
Massachusetts (MA)	Vermont (VT)
Michigan (MI)	West Virginia (WV)
Minnesota (MN)	Wisconsin (WI)

The information for this report was supplied by State Forestry Agencies and the USDA Forest Service (Northeastern Area, State and Private Forestry, Forest Pest Management Staff, at the Portsmouth, NH, Morgantown, WV and St. Paul, MN Field Offices)

Prepared by:
M. Miller-Weeks
Pathologist
Portsmouth Field Office

In 1981, the most significant pest problems were caused by insect defoliators, especially the gypsy moth, spruce budworm, forest tent caterpillar and saddled prominent. Together these insects caused defoliation on over 21 million acres of hardwoods and conifers. The gypsy moth defoliated nearly 13 million acres. This was the largest outbreak of the pest ever to occur.

The major disease problems continue to be Scleroderris canker, beech bark disease, oak wilt, and white pine blister rust. Several new pests including the pine wood nematode, European larch needlecast, and European larch canker are causing concern.

These and other pest problems are listed alphabetically in either the "Status of Diseases" or "Status of Insects" section.

Thanks to all for their help and contributions.

STATUS OF DISEASES

Disease	Host	Location and Remarks
Anthracnose <u>Gnomonia</u> spp.	ash, oak sycamore	IN - Statewide; heavy defoliation of sycamore, heaviest year since 1974. NJ - Scattered. PA - Widespread. WV - Increased to moderate level throughout the state.
Armillaria root rot <u>Armillaria mellea</u> (Vahl ex Fr.) Kummer	conifers and hardwoods	Areawide - In VT invading dying sugar maple defoliated by saddled prominent.
Ash dieback	ash	OH - Occurring throughout the state. IN - Severe in northeast. MO - Nine counties statewide. PA - Northcentral part of state, 1000+ acres; 20% mortality in some stands.
Ash leaf rust <u>Puccinia</u> <u>peridermiospora</u> (Ell. & Tr.) Arth.	ash	MD - Heavy in some areas. PA - Southeastern part of state; 100% defoliation in and around Philadelphia.
Aspen leaf bronzing (cause unknown)	trembling aspen, bigtooth aspen, hybrid poplars	MN - Hubbard and Betrami Counties. WI - 20 to 30 locations; some branch mortality, first observed 1973.
Beech bark disease <u>Cryptococcus</u> <u>fagisuga</u> Lind. and <u>Nectria</u> <u>coccinea</u> var. <u>faginata</u> Loh. Wats. and Ay.	American Beech	New England, NY, NJ, PA - The disease continues to spread southward into southern PA and NJ. Scale popula- tions are variable. WV - The disease was found here for the first time this year. Over 70,000 acres in Randolph and Pocahontas Counties were found infested with the scale insect, associated with the fungus <u>Nectria galligena</u> Bres.
Butternut canker <u>Sirococcus</u> <u>clavigignenti-</u> <u>juglandacearum</u> Nair, Kotichka, Kuntz.	butternut	IA - Throughout the host species range. WI - Southwest; some healthy trees in generally infected sites tagged for resistant stock, 32% mortality in surveyed plots.

Disease	Host	Location and Remarks
<u>Diplodia tip blight</u> <u>Diplodia pinea</u> (Desm.) Kickx.	Austrian, jack red, Scots pine	IN - Statewide; tree and branch mortality of ornamentals. IA, MI, NJ - Scattered. MD - Scots pine plantations in 2 westerly counties. MA - Martha's Vineyard; 400 acres of ornamental plantings, salvaging. MN - Heavy infections of current year shoots in Itasca and St. Louis Counties (minor in 4 other northern counties). MO - Most severe on large Austrian pines. PA - Incidence increasing, 10 to 80% branch mortality on scattered trees throughout the state. WV - Heavy damage to individual trees. WI - Loss of 300,000 seedlings in Wilson and Griffith State Nurseries. At one nursery infection rate is 34%, up from 1% in 1980.
<u>Dutch elm disease</u> <u>Peratocystis ulmi</u> (Buism.) C. Mor.	elm	Throughout Northeastern States - The disease continues to cause mortality of forest and urban elms. Incidence of the disease has greatly increased in MN and the upper peninsula of MI, while in ME a second "wave" of in- fection is devastating the remaining live trees. Mortality of younger trees continues in VT. In WI it is estimated that 50 percent of the population was lost from 1956 to 1978 and of the remaining larger elms 80 to 90 percent are infected. Through a demonstration project in that state 20 million of the 500 million cu. ft. of timber killed has been utilized.
<u>Dwarf mistletoe</u> <u>Arceuthobium</u> <u>pusillum</u> Pk.	black spruce red spruce	ME - Along the coast. MN - Northern part of state. NH - Several red spruce stands in WMNF infected. WI - Local problem in the north.

Disease	Host	Location and Remarks
Lophodermium needlecast <u>Lophodermium pinastri</u> (Schrad. ex Hood) Chev.	Scots, red white pine	MI - Severe infection in Wyman Nursery. MO - Occasional problem. VT - Heavy damage to a Scots pine plantation in Bennington County. WV - Light damage in several Scots pine plantations.
Maple decline	sugar maple	ME - Roadside and forest trees; combina- tion of winter damage and defoliation stress. MI - Marquette and Menominee Counties, upper peninsula. MO - Throughout the state. NY - Roadside, forest and sugarbush tree decline extreme in Oneida, Lewis, St. Lawrence, Franklin, Essex and Clinton Counties; mortality and reduced quantity and quality of sap occurring. WI - North; scattered mortality and top-kill.
oak wilt <u>Ceratocystis</u> <u>fagacearum</u> (Bretz) Hunt (Map 2)	oak	IL, IA, OH, WV - Throughout the state, incidence same as previous year. IN - Scattered trees infected; 1,000 to 5,000 bd. ft. lost in Greene County. MD, PA - Moving into eastern part of state. MI - New area in Menominee County (upper peninsula). MN - Widespread in the southern half of the state, causing numerous problems for homeowners and small woodlot owners. MO - Only scattered cases found, down dramatically from damaging levels of past years. WI - Southern half of the state; previous infection centers enlarging, but no new infection sites.
Pinewood nematode <u>Bursaphelenchus</u> <u>xylophilus</u> (Steiner and Buhrer) Nickle (Map 3)	20 species of pine, cedar, spruce, tamarack European larch, balsam fir	Found in all 20 Northeastern Area States except RI, ME, and NH (found in 34 states nationwide) - The nematode, former- ly thought to have been introduced from Japan, is now believed to be native to the US. This is based on preserved specimens collected in Louisiana in 1934. Thus, damage from this pest will probably not increase drastically.

Disease	Host	Location and Remarks
European larch canker <u>Lachnellula</u> <u>willkommii</u> (Hartig) Dennis (Map 1)	tamarack	ME - Stands in six towns along the coast in Washington County were found infected, oldest cankers observed were 7 years old. This is the first finding of the disease in the United States since the infection discovered in 1924 in MA was eradicated.
European larch needlecast <u>Mycosphaerella</u> <u>laricina</u> (Hart.) Neg.	European larch	IA - Infection found in 2 counties, including the Yellow River State Forest. MI - Found in 1 county. WI - First US find was here in 1980. Now located in 4 counties (Trempealeau, Polk, LaCrosse, Grant) encompassing 3 plantations (16 acres) and Wilson State Nursery. Some branch and top dieback occurring.
European larch needle blight (cause unknown)	European larch	NY - Oswego County; larch needles dropped prematurely in August and trees refoliated. PA - 50 acres in 4 central counties; 10 to 95% defoliation.
Fir-fern rust <u>Uredinopsis</u> <u>mirabilis</u> (Pk.) Magn.	balsam fir	ME - Most severe infection in many years in some Christmas tree plantations. VT - Moderate to heavy infection of Christmas trees in scattered locations; lighter than previous years.
<u>Fomes pini</u> (Thore) Lloyd	European larch	NY - Two State owned plantations in Franklin County (13 acres) infected; area clearcut.
Hypoxyton canker <u>Hypoxyton mammatum</u> (Whal.) Mill.	aspen	Throughout host range, causing tree mortality in young stands in VT.
Larch decline	tamarack	ME, NH, NY, VT - Scattered mortality and accelerating general decline of larch throughout natural range. In VT mortality occurring over 8,000 acres.

Disease	Host	Location and Remarks
Rhabdocline needlecast <u>Rhabdocline</u> <u>pseudotsugae</u> Syd.	Douglas fir	ME - Heavy damage in many Christmas tree plantations.
Sapstreak of maple <u>Ceratocystis</u> <u>coerulescens</u> (Munch)	sugar maple	MI, WI - Killing a few forest trees. NY - Causing tree mortality in 2 northern sugarbushes. VT - One sugarbush tree found infected.
Scleroderris canker <u>Gremmeniella</u> <u>abietina</u> (Lagert.) Morelet (Map 4)	Scots, jack and red pine	As in 1980, the spread of Scleroderris canker was reduced in all the affected States in 1981. The more virulent European strain of the fungus has not been found in the Lake states, only in NY, VT, NH and ME. ME - No new infections. NH - No infection found since initial find in 1978. NY - Only 1 new town (in Clinton County) added to the quarantine which includes 13 counties, scattered heavy infection. A dual infection period in 1981 due to warm temperatures in February increased the infection rate and may result in increased spread of the disease next year. VT - No new towns found infected; 55 towns are now quarantined (94 plantations encompassing 767 acres, with tree mortality occurring on only 40 acres). MI, MN, WI - Infection down; hard to find infection in known stands; no new tree mortality in infected plantations.
Septoria leaf spot <u>Septoria musiva</u> Pk.	balsam poplar	MN - 200,000 acres defoliated in 13 northern counties.
Sirococcus shoot blight <u>Sirococcus strobilinus</u> Preuss.	red pine	In the following areas mortality of understory seedlings and saplings and shoots of understory trees is occurring. Severity increased in 1981. MI - Upper peninsula; Ottawa National Forest MN - Northern part of state; Superior National Forest. WI - Northern areas; N. Highland State Forest, Nicolet National Forest.

Disease	Host	Location and Remarks
Spruce decline	spruce	NY - Essex, Clinton, Franklin, St. Lawrence, Jefferson and Lewis Counties; mortality occurring over vast areas.
<u>Verticillium wilt</u> <u>Verticillium albo-</u> <u>atrum</u> Reinke & Berth.	elm	VT - Dying elms in Addison County.
White pine blister rust <u>Cronartium ribicola</u> Fisch	eastern white pine	ME - Moderate to heavy infection on ribes; 37,000 acres scouted, isolated treatment. MI, MN, WI - Still the major disease problem of white pine. VT - Low level; 10 acres eradicated, will eradicate near state nursery in Essex.
White pine root decline <u>Verticicladiella</u> <u>procera</u> (Kend.)	eastern white pine	IL - Found in most plantations on Shawnee NF. IN - Mortality in Christmas tree plantations; decrease over past years. PA - Statewide; 2 to 3% current infection, 10% mortality, decreasing. WV - Continued problem in plantations.
Winter injury	all species	ME - Death of many ornamental and fruit trees. PA - Half the state; 90% mortality in some spruce plantations. VT - Entire stands browned up, especially on southern slopes.

STATUS OF INSECTS

Insect	Host	Location and Remarks
Aspen leafroller complex Large aspen tortrix <u>Choristoneura</u> <u>conflictana</u> (Walker) <u>Anacampsis</u> sp.	aspen	MI - Most stands in lower peninsula severely defoliated; some top kill and tree mortality occurring.
Birch leaf roller <u>Ancyliis discigerana</u> Walker	yellow birch	VT - 7,500 acres in Essex County defoliated.
Birch leaf miner <u>Fenusa pusilla</u> (Lepeletier)	white, gray birch	VT - Throughout the State.
Birch skeletonizer <u>Buccalatrix</u> <u>canadensisella</u> Chambers	white birch	MN, VT, WI - Late season defoliation; scattered throughout these states. MI - Heavy defoliation in upper peninsula.
Black turpentine beetle <u>Dendroctonus</u> <u>terebrans</u> (Olivier)	Japanese, Scots pine	MA - Building on south shore of Cape Cod, stable on Martha's Vineyard and Nantucket Island.
Eastern tent caterpillar <u>Malacosoma</u> <u>americanum</u> (Fabricius)	cherry	IN - Southern part of State; no population increases, no mortality expected. IA - Heavy infestations Statewide. MO - High populations (5 to 10 webs per tree) scattered over 3 million acres in south. OH - Scattered. VT - Populations much reduced. WV - All time high populations.
Elm spanworm <u>Ennomos subsignarius</u> (Hubner)	elm, beech basswood, birch	MI - 500,000 acres in northern portion of the lower peninsula; heavy beech defoliation, mortality expected; populations collapsed in upper peninsula.

Insect	Host	Location and Remarks
European pine sawfly <u>Neodiprion sertifer</u> (Geoffrey)	Austrian, Scots red pine	IN - 4,000 acres affected in south. IA, MO - Scattered infestations, moderate to heavy. MI - Second year of high populations in the lower peninsula. WI - 1,600 acres scattered heavy defoliation in 12 southernmost counties
Fall cankerworm <u>Alsophia pometaria</u> (Harris)	red oak and other hardwoods	ME - In association with gypsy moth and leaf-tier-roller complex; some crown dieback; dramatic increase in population level over last year.
Fall webworm <u>Hyphantria cunea</u> (Drury)	hardwoods	Area wide - Defoliation up slightly over last year, heavy in IN and WV.
Forest tent caterpillar <u>Malacosoma disstria</u> Hubner	hardwoods	Populations increased in all areas in 1981. ME - Almost one half million acres were defoliated, infestation four times larger than previous year; affecting primarily poplars, thus basically a nuisance problem. MN - Widespread in northeast, nearly one million acres were defoliated and mortality is occurring in areas defoliated in the past four years. NY - Epidemic in Delaware County; large sugarbush areas are affected. VT - Populations increased statewide; defoliation twice as much as last year, dieback in some areas defoliated three years; mortality in some sugarbushes; chemically treated 600 acres of sugarbushes, mostly in Lamoille County. WI - 1.4 million acres defoliated in six northernmost counties, population is increasing and moving southeast, so far little mortality. MD - Associated with other defoliators on 200,000 acres. MI - Moderate defoliation in upper peninsula.
(Map 5) (Table 1)		
Greenstriped mapleworm <u>Dryocampa rubicunda</u> (Fabricius)	red, silver maple	MA - Increasing in west, found in areas of saddled prominent defoliation. ME - Eastern part of State; declined this year. MO - Jackson County.

Insect	Host	Location and Remarks
Gypsy moth <u>Lymantria dispar</u> (L.) (Map 6) (Table 2)	hardwoods and some conifers	In the northeastern US, nearly 13 million acres were defoliated, an increase of almost 8 million acres compared to 1980. This is the largest outbreak ever. Generally infested area - includes all or part of eleven states from MD to ME. Defoliation in every state affected increased greatly, except for NY where defoliation was already high last year with over 2 million acres defoliated. States where defoliation increased by over one million acres include CT, MA, NH, and PA. Outside generally infested area - the gypsy moth has been reported in 18 other states including: IL - Moth catches in thirteen counties, heaviest around Chicago. MI - Parts of five counties infested, defoliation on eighteen acres. MN - Moths detected in Minneapolis/St. Paul and Rochester. MO - Moths detected in four counties. OH - Moths found in numerous areas throughout the State. WV - Eastern panhandle infested. WI - Moths detected in Madison area.
Introduced pine sawfly <u>Diprion similis</u> (Hartig)	white, Scots, red pine	ME - South central; scattered light to moderate populations. MI - Isolated reports, lower peninsula. MN - Local outbreaks annually. VT - Scattered light defoliation.
Jack pine budworm <u>Choristoneura pinus</u> Freeman	jack pine	MI - 550,000 acres in the lower peninsula infested; outbreak levels on Huron and Maniste National Forests, much more severe than last year. MN - Endemic levels. WI - 140,000 acres, mostly light to moderate defoliation in two northernmost counties. No mortality of pole size timber occurring.
Larch casebearer <u>Leopphora laricella</u> Hubner	larch	VT - Scattered along Champlain Valley, populations collapsed from heavy 1980 infestations.

Insect	Host	Location and Remarks
Larch sawfly <u>Pristiphora</u> <u>erichsonii</u> (Hartig)	larch	MN - Light defoliation in northern counties. VT - Central part of State; light defoliation.
Loopers <u>Erannis tiliaria</u> (Harris) <u>Phigalia titea</u> (Cramer)	hardwoods	IN - Epidemic; 140,000 acres defoliation in 17 counties, central portions of State. MD - Associated with other defoliators on 200,000 acres. MO - From one county near St. Louis in 1979 to almost entire southern portion of the State in 1981. OH - Scattered defoliation. VT - 4,700 acres in Addison County; occurs with gypsy moth. WV - 1.5 million acres defoliated.
Maple leafcutter <u>Paraclemensia</u> <u>acerifoliella</u> (Fitch)	sugar maple	MI - 1000 acres heavily infested; lower peninsula. NH - Southern half of State, populations building; increasing infestations in sugarbushes along the Connecticut River, especially Sullivan County. VT - Declining populations, only 6,600 acres compared with 25,000 acres in 1980.
Maple trumpet skeletonizer <u>Epinotia acerella</u> (Clemens)	sugar maple	MI - Heavy populations throughout the upper peninsula. VT - Light to moderate defoliation. WI - Northern half of State, 100,000 acres heavy to severe defoliation.
Nantucket pine tip moth <u>Rhyacionia frustrana</u> (Comstock)	pitch pine	MA - Infestation in southeastern part of State; stable on Cape Cod, building in Plymouth County (along with pine needle miner and pine looper). MD - Ongoing problem in young pine plantations.
Oak leaf tier <u>Croesia semipurpurana</u> (Kearfott)	oaks	MO - Light to moderate populations. MD - Central part of State; homeowner complaints. MA - Declining after two year buildup; overrun by gypsy moth. IN - Associated with loopers.

Insect	Host	Location and Remarks
Oak mortality complex of oak leaf roller <u>Archips</u> spp., Twolined chestnut borer <u>Agilus bilineatus</u> (Weber), <u>Armillaria</u> <u>mellea</u> root rot	oak	IN - South central part of State; scattered mortality. MI - Central lower peninsula, losses of a few to many trees per acre. Chippewa Co. in upper peninsula.
Pine tussock moth <u>Dasychira pinicola</u> (Dyar)	jack, red pine	MN - Endemic over 5000 acres jack pine in Pine County. WI - Infestation two years old and increasing; 60,000 acres in two northernmost counties, 10,000 acres with scattered mortality and top kill.
Red pine scale <u>Matsucoccus resinosae</u> Bean & Godwin (Map 7)	red, Japanese, Chinese pine	CT - Throughout western part of State; still south of natural range of red pine, spreading 1 to 2 miles per year (also a report of adelgid injury caused by <u>Pinus boernerii</u> Annard) NJ - Passaic and Bergen Counties along the NY border. NY - Found this year in northern Orange County, spreading 3 miles per year north and west; infestation is consistently severe, kills trees rapidly (4 to 5 years after infestation). PA - Recently reported at the Morris Arboretum in Philadelphia.
Saddled prominent <u>Heterocampa guttivitta</u> (Walker) (Map 8) (Table 3)	northern hardwoods	ME - Increased 17 fold over 1980 infestation; some branch mortality, tree mortality expected next year. MA - Berkshire area, western part of State; increased infestation. NH - Encompasses 7 counties, especially Sullivan County; record infestation, second year of heavy defoliation, branch dieback and tree decline. NY - No significant defoliation occurred in 1981. VT - Defoliation down by 10,000 acres; tree mortality occurring over 2,000 acres, mostly in Windham and Windsor Counties.

Insect	Host	Location and Remarks
Saratoga spittlebug <u>Aphrophora</u> <u>saratogensis</u> (Fitch)	red, jack, Scots pine	MI - Low populations building slightly; northern portion of lower peninsula, only 1 area at damaging level. MN - At low populations in plantations; Some plantations damaged in Betrami and Mahroven Counties. WI - Isolated pockets; declining populations.
Southern pine beetle <u>Dendroctonus</u> <u>frontalis</u> Zimmerman	loblolly pine	MD - 10 acres detected and clearcut, beetle activity low in 1981.
Spruce budworm <u>Choristoneura</u> <u>fumiferana</u> (Clemens) (Map 9) (Table 4)	Spruce and fir	In 1981 the budworm defoliated 4.4 million acres, 2 million less than 1980. In the Lake States only 355,000 acres were defoliated, compared to 1.4 million acres in 1980. ME - 4 million acres moderate to severe defoliation, lessened since peak of 1978; egg deposits in sprayed areas low to moderate, egg deposits reduced in west central part of state even with little spray, mortality occurring in unsprayed areas including buffer zones, 200,000 acres with 50%+ mortality of host type dead or moribund, 1.16 million acres treated in 1981 (carbaryl, acephate, Bt). MI - Population collapse in scattered light infestations lower peninsula; mortality throughout upper peninsula, heaviest in Iron County. MN - Lake and St. Louis Counties, little defoliation in Cook and Carlton Counties; slight decrease in populations from last year; salvage operations continue. NH - Acres defoliated decreased by 50% from 1980; stand deterioration over 42,000 acres, half of which contains 50% or more dead tops and many dead trees, damage now occurring on smaller stands of fir on small ownerships, salvage harvesting.

Insect	Host	Location and Remarks
Spruce budworm (continued)	spruce and fir	VT - Slight decrease in acres reported defoliated, somewhat due to heavy salvage cuts, populations stabilized; in Orleans County estimated loss of 448,000 cords per year. WI - Collapse of epidemic population, numerous larval and pupal parasites.
White pine weevil <u>Pissodes strobi</u> (Peck)	white, jack, Scots pine	Areawide - Continuous problem. MI - High levels on Marquette Forest. MN - Northern counties; jack pines less than 8 ft. in height infested, up to 160 trees per acre affected. VT - Stable at moderate levels, damaging Scots pine near white pine in New Haven. WI - Scattered white and jack pine in northwest.
Yellow-headed spruce sawfly <u>Pikonema ataskensis</u> (Rohwer)	white spruce	MN - Varying populations in north, primarily on ornamentals.
Zimmerman pine moth <u>Dioryctria</u> <u>zimmermani</u> (Grote)	red pine	IN - Minor damage, ornamental trees. MI - Lower peninsula; growth reduction in heavily hit stands, mostly trees greater than 30 ft. in height; infestation more severe than 1980. WI - Central and southern counties; severe tree deformity in heavily attacked stands; high parasitism of late instar larvae, population declining.

Table 1. Extent of tree defoliation caused by forest tent caterpillar (Malacosoma disstria) in the Northeastern Area, 1981.

State	Acres Defoliated
Maine	457,000
Minnesota	890,000
New York	200,000
Vermont	117,000
Wisconsin	1,400,000

Table 2. Recent trend in the acreage of aerially detected tree defoliation caused by gypsy moth (Lymantria dispar) in the Northeastern Area and acres sprayed under the Federal-State Cooperative Suppression Program in 1981.^{1/}

State	Acres defoliated		Trend	1981 Federal-State Cooperative Suppression Program Acres Sprayed ^{2/}
	1980	1981		
Connecticut	381,868	1,482,216	+1,100,348	-
Delaware	0	500	+ 500	-
Maine	221,220	655,841	+ 434,621	465
Maryland	3	8,826	+ 8,826	-
Massachusetts	907,075	2,826,095	+1,919,020	-
New Hampshire	183,999	1,947,236	+1,763,237	-
New Jersey	411,975	798,790	+ 386,815	75,825
New York	2,449,475	2,303,915	- 145,560	63,917
Pennsylvania	440,500	2,527,753	+2,087,253	178,230
Rhode Island	43,830	272,556	+ 228,726	22,625
Vermont	41,327	48,979	+ 7,652	-
Total	5,081,272	12,872,7072	+7,790,938	341,062

^{1/}Information provided by cooperating State agencies and USDA APHIS and Forest Service.

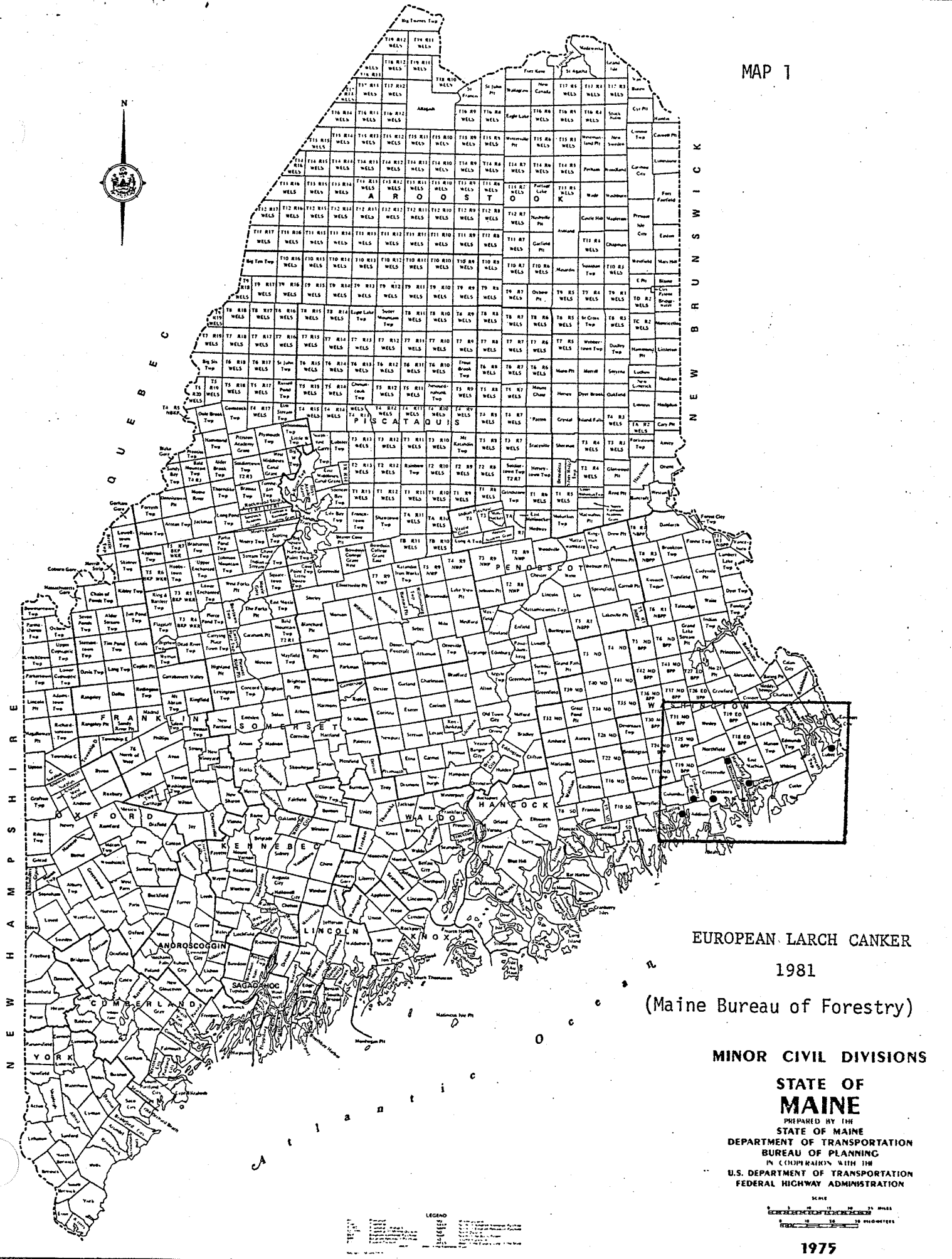
^{2/}Gypsy Moth Federal-State Cooperative Suppression Projects - 1981.
(Additional areas were sprayed privately in several of the affected states outside of the cooperative program.)

Table 3. Extent of tree defoliation caused by saddled prominent (Heterocampa guttivitta) in the Northeastern Area, 1981.

State	Acres defoliated
Maine	187,000
Massachusetts	173,000
New Hampshire	522,000
Vermont	26,700

Table 4. Recent trend in acreage of aerially detected tree defoliation caused by spruce budworm (Choristoneura fumiferana) in the Northeastern Area.

State	<u>Acres Defoliated</u>		Trend
	1980	1981	
Maine	5,000,000	4,000,000	-1,000,000
Michigan	859,000	161,000	- 698,000
Minnesota	103,000	110,000	+ 7,000
New Hampshire	90,000	42,000	- 48,000
Vermont	111,000	94,000	- 17,000
Wisconsin	439,000	84,000	- 355,000
Total	6,602,000	4,491,000	-2,111,000



EUROPEAN LARCH CANKER

1981

(Maine Bureau of Forestry)

MINOR CIVIL DIVISIONS

STATE OF
MAINE

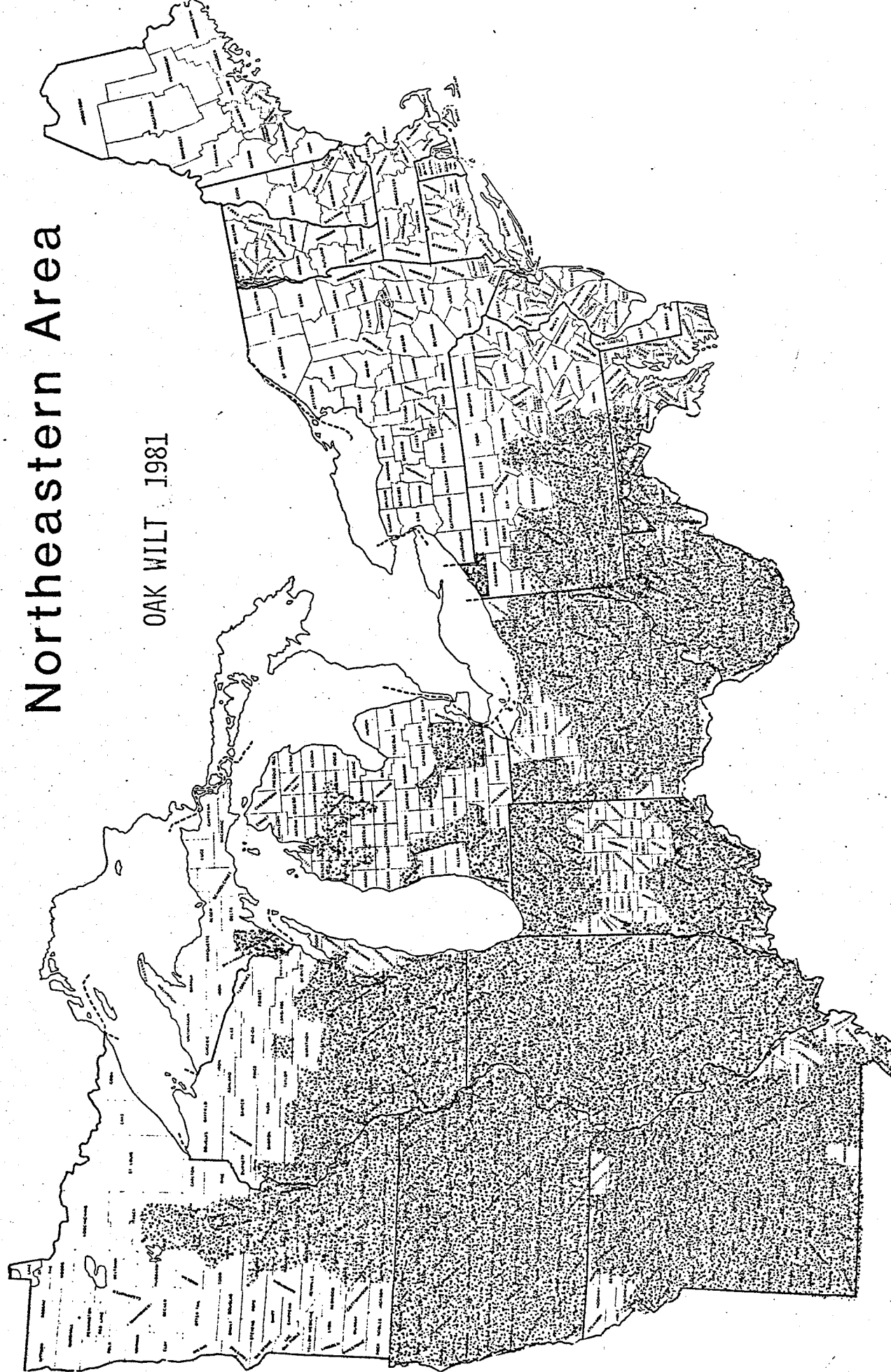
PREPARED BY THE
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
BUREAU OF PLANNING
IN COOPERATION WITH THE
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

SCALE
0 5 10 15 20 MILES
0 5 10 15 20 KILOMETERS

1975

Northeastern Area

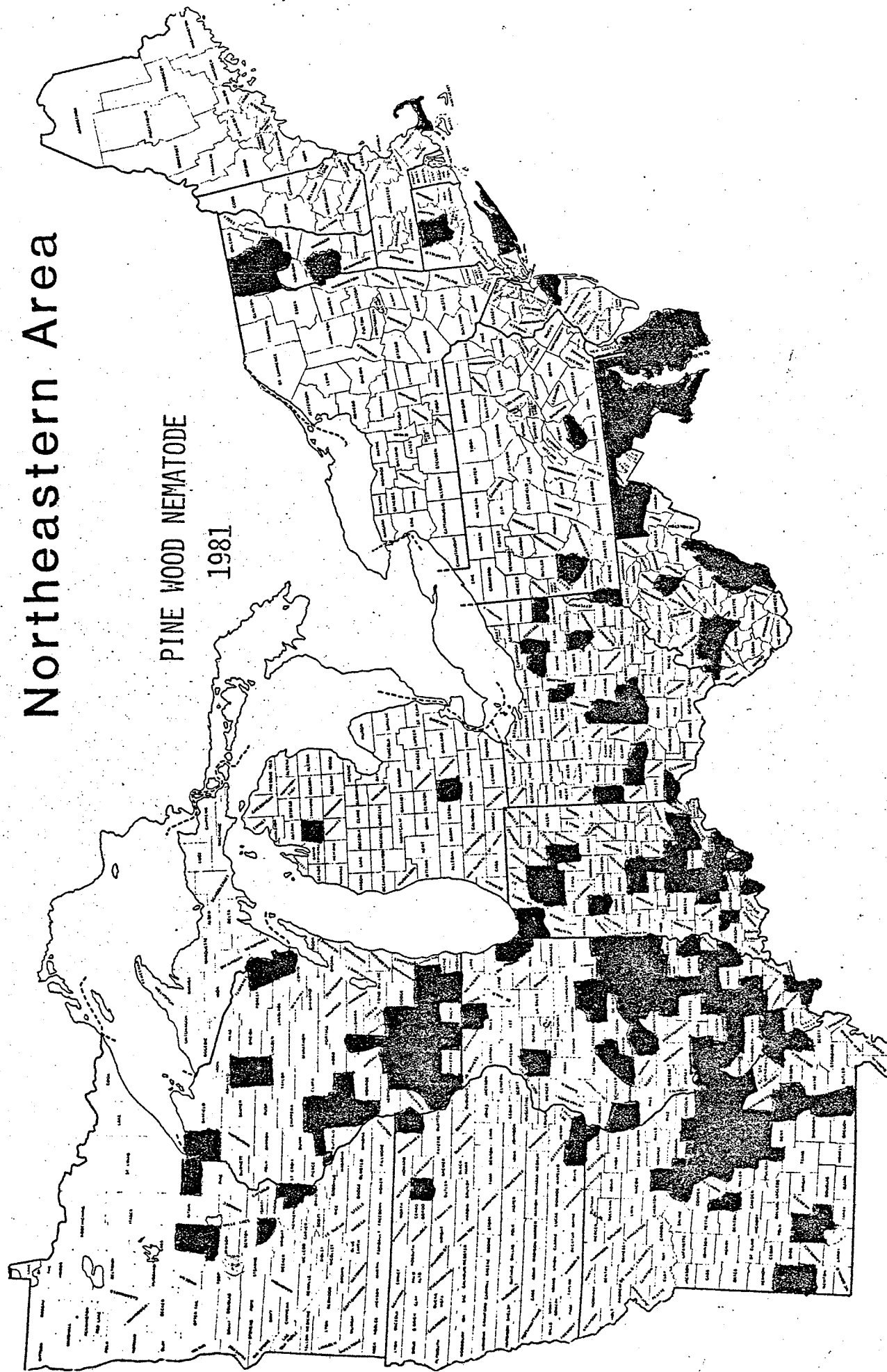
OAK WILT 1981



Northeastern Area

PINE WOOD NEMATODE

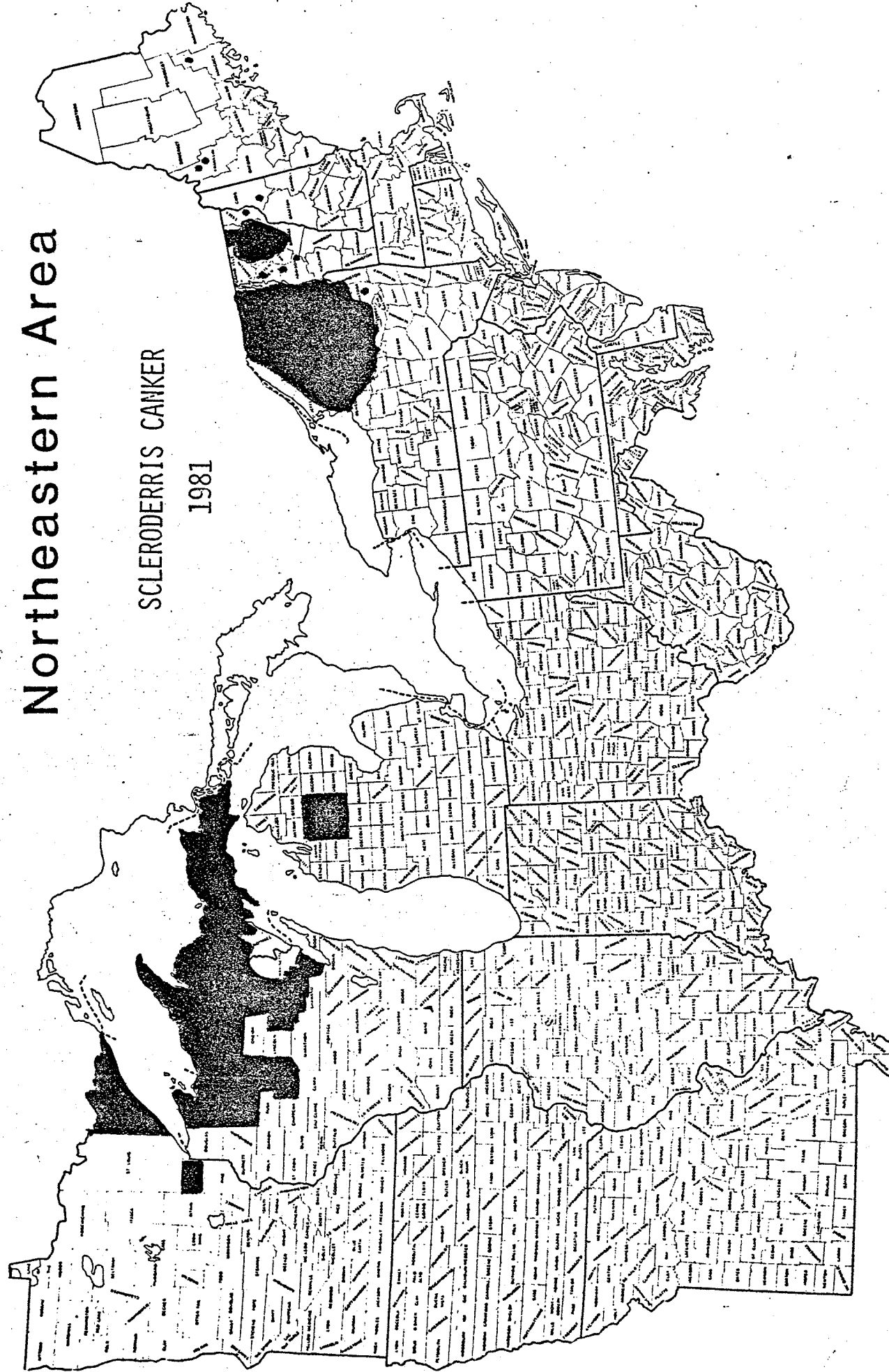
1981



Northeastern Area

SCLERODERRIS CANKER

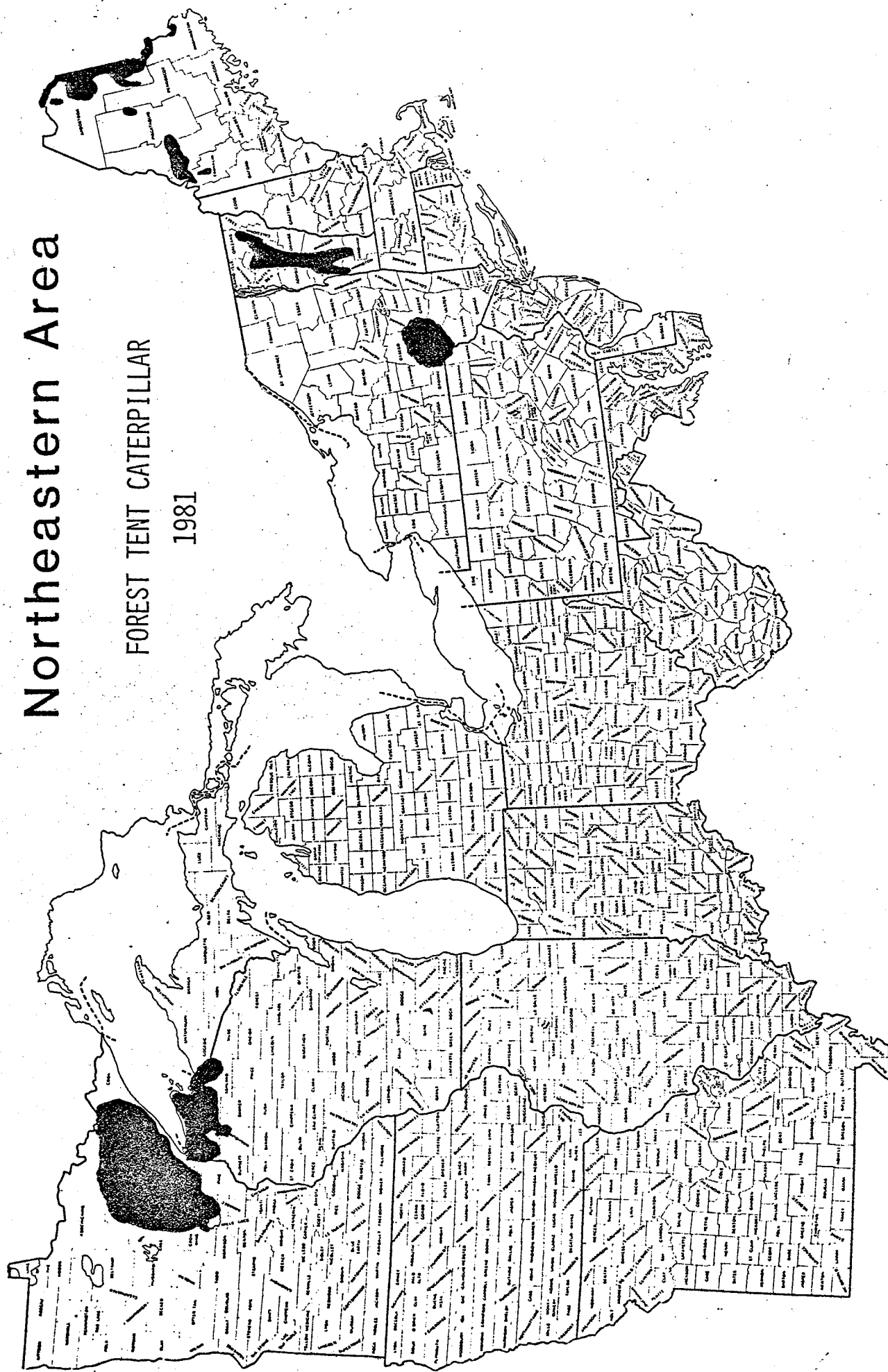
1981



Northeastern Area

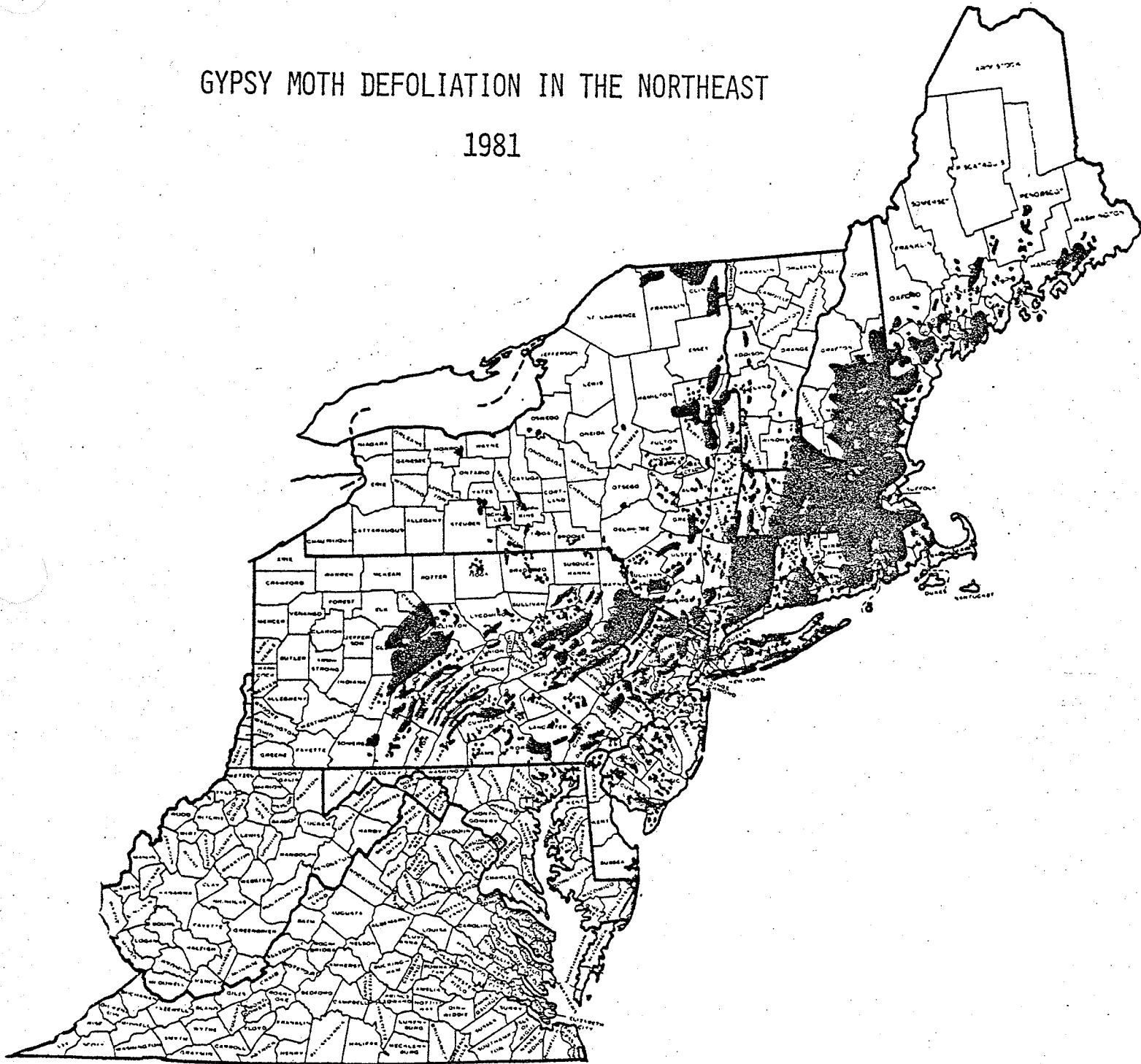
FOREST TENT CATERPILLAR

1981



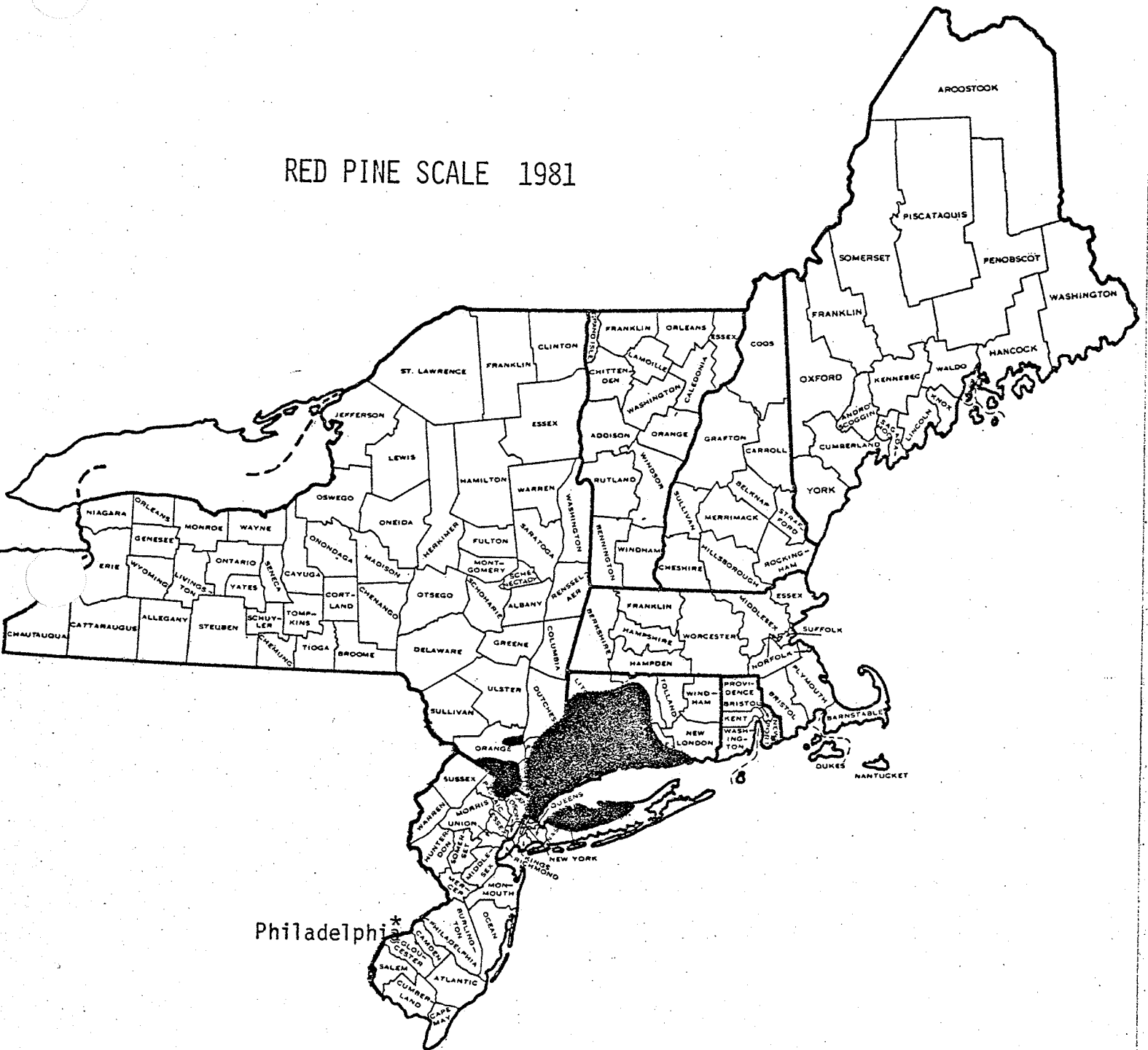
GYPSY MOTH DEFOLIATION IN THE NORTHEAST

1981

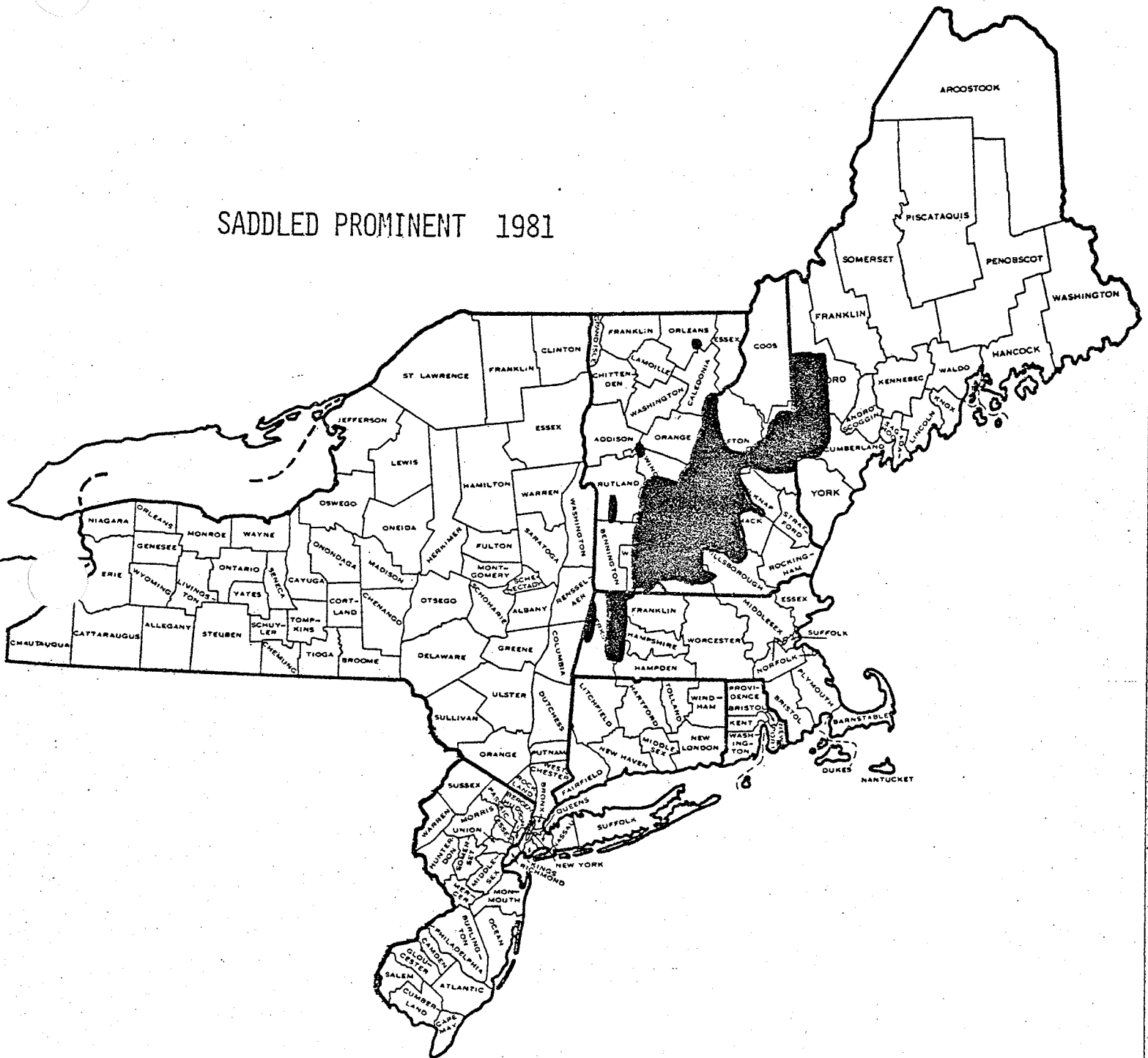


(PREPARED BY USDA FOREST SERVICE BASED ON STATE SURVEYS)

RED PINE SCALE 1981

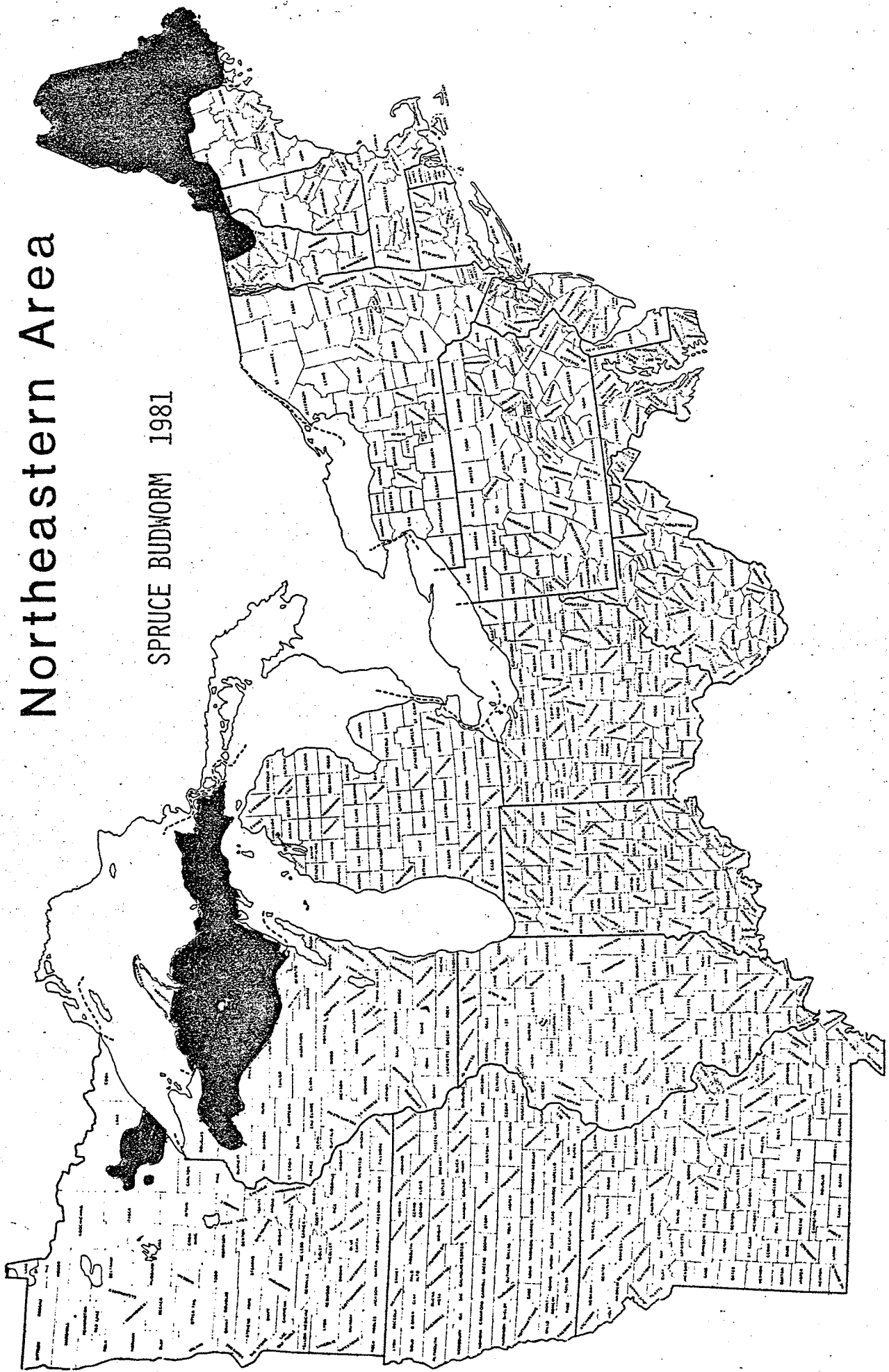


SADDLED PROMINENT 1981



Northeastern Area

SPRUCE BUDWORM 1981



Spruce Budworm Spray Project To Include 6 Townships in County

Maine's first all-voluntary Spruce Budworm Suppression Project is expected to begin about May 21 according to Kenneth G. Stratton, director of the Maine Forest Service.

"As a result of the new Spruce Budworm Management Act which took effect Oct. 1, 1981, all 963,000 acres in the 1982 Spruce Budworm Suppression Project was volunteered by the landowners or land managers," Stratton said.

The Maine Forest Service plans to treat approximately 819,200 acres of spruce-fir forest with the chemical insecticide carbaryl (Sevin-4-Oil). A biological insecticide Bt (*Bacillus thuringiensis*) will be applied to another 99,200 acres. An additional 45,500 acres will be treated with another chemical insecticide acephate (Orthene). The Maine Forest Service entomology division has cooperated with landowners in determining high hazard areas which need protection.

The areas in Hancock County to be sprayed are all townships in the northern region. The townships to be included in the Spruce Budworm Suppression Project in Hancock

County included Township 3 ND, Township 28 MD, Township 34 MD, Township 39 MD, Township 40 MD, and Township 41 MD.

The Forest Service will use Sevin-4 Oil in T3 ND, T39 MD, T40 MD, T41 MD, and T34 MD; Orthene in T40 MD and T34 MD; and, Bt in T34 MD and T28 MD.

The 1982 project will continue the movement away from multi-engine planes toward small aircraft and helicopters. Two C-54 multi-engine planes, 18 single engine light spray planes, and 5 Bell 212 Jet helicopters plus approximately 15 small monitor, guide, and administrative craft will fly on the project. Planes will be based at Presque Isle, Millinocket, Jackman, and Red Pine airports. Heliports will operate in southern and northern Aroostook County, Washington County, and the Rangeley area of Western Maine.

The \$7.8 million program budget will be funded by a landowner excise tax with the federal government paying 12.5 percent of the entire project. Landowners participating in the 1982 project are: Baskahegan Company, Baxter

State Park, Boise Cascade Paper Co., Coburn Land Trust, Diamond International, Georgia Pacific Corp., Great Northern Paper Co., International Paper Co., Prentiss and Carlisle, St. Regis Paper Co., Scott Paper Co., Seven Islands Land Co. and the Maine Bureau of Public Lands.

Maine's planned spray acreage represents about one-tenth of the total acreage, roughly 10 million acres, that will be sprayed for spruce budworm control in North America. New Brunswick and Quebec represent more than 80 percent of that total with 5,510,000 and 3,194,860 acres respectively. Newfoundland plans to spray 226,500 acres; Nova Scotia, 51,960 acres; and Ontario, 10,130 acres.

Spraying operations are scheduled to commence around mid-May and end by June 20. For further toll-free information call weekdays (9 a.m. to 4 p.m.) 1-800-322-0305 and beginning May 17 daily between 6 a.m. and 8 p.m. 1-800-322-0307 or write Richard Dyer, Public Information Specialist, Department of Conservation, State House Station #22, Augusta 04333.

Ellsworth American
5-6-82