

1984-85 FOREST TENT CATERPILLAR IMPACT SURVEY - VERMONT

<u>PERCENTAGE OF SUGAR MAPLE BASAL AREA</u>				
<u>No. of YEARS</u>	<u>DEFOLIATED</u>	<u>DEAD/DYING</u>	<u>RANGE</u>	<u>WITH</u>
				<u>25-75%</u>
				<u>CROWN DIEBACK</u>
3 (MORTALITY)	8	0 - 60	20	0 - 60
3	5	0 - 24	9	0 - 33
2	3	0 - 13	13	0 - 40
1	1	0 - 3	9	0 - 37
0	0.4	0 - 2	4	0 - 13

1984-85 FOREST TENT CATERPILLAR IMPACT SURVEY

AVERAGE PERCENTAGE OF SUGAR MAPLE BASAL AREA

No. OF STANDS	DEAD	CROWN DIEBACK				
		>75%	51-75%	26-50%	1-25%	0
		-MORTALITY STRATUM-				
40	6	2	8	12	46	26
		-DEFOLIATED 3 YEARS-				
14	2	3	2	7	45	41
		-DEFOLIATED 2 YEARS-				
16	3	0.3	3	10	52	32
		-DEFOLIATED 1 YEAR-				
13	0.4	1	2	7	45	45
		-NON DEFOLIATED-				
16	0.2	0.2	2	2	24	72

Preliminary Results (1/86)

Preliminary Results (1/86)

1984-85 FOREST TEXT CATERPILLAR
IMPACT SURVEY

mostly
trees 6" up

Ave Percentage of Sugar Maple Basal Area

No of stands stands	Dead	With			1-25%	Dieback
	Dead	>75%	50-75%	25-50%	0	
- MORTALITY STRATUM -						
40	6	2	8	12	46	26 ⁷²
Range	0 - 44					
- DEFOLIATED 3 YEARS -						
14	2	3	2	7	45	41 ⁸⁶
Range	0 - 11					
DEFOLIATED 2 YEARS						
16	3	0.3	3	10	52	32 ⁸⁴
Range	0 - 13					
DEFOLIATED 1 YEAR						
13	0.4	1	2	7	45	55 ⁹⁰
Range	0 - 3					
NON DEFOLIATED						
16	0.2	0.2	2	2	24	72 ⁹⁶
Range	0 - 2					

FOREST TENT IMPACT SURVEY - POINT DATA

STAND

POINT NO. (01-05)

DATE mo. day 19

INSTRUCTIONS

1. Count all stems in 10 BAF prism plot except trees dead a long time (bark sloughing, branches missing)
2. Rate dieback as percent of live crown present before defoliation
3. Rate canopy position at time of defoliation
4. Tally five points per stand.

TREE	DBH	SL	PL	SP	DK	CP
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SL = Sawlogs to nearest 8'
PL = Pulpwood to nearest 4'

GEN. INFORM. (optional)

FOREST TYPE

STOCK LEVEL

I. DAMAGE
A B

III. SITE
A B

IV. SOILS
A B
C D

VI. REPROD.
A B

VII. YEARS SINCE THINNING
A B

- (SP) SPECIES
- 01 - N.W.
 - 02 - Fir
 - 03 - Hemlock
 - 04 - R. Pine
 - 05 - W. Pine
 - 06 - No.
 - 07 - Spruce
 - 08 - Soft
 - 09 -
 - 10 - W. Pine
 - 11 - Asp.
 - 12 - Bass
 - 13 - Beech
 - 14 - W. Pine
 - 15 - Y. Pine
 - 16 - Bur
 - 17 - R. Pine
 - 18 - Sug.
 - 19 - Red
 - 20 - Ha
 - 21 - No.
 - 22 - Will

- FOREST TYPE CODES
- 11 - Asp., W. Birch
 - 20 - W. Pine, R. Oak, W. Ash
 - 21 - W. Pine
 - 22 - W. Pine
 - 23 - Hemlock
 - 25 - Sug. Maple, Beech, Y. Bir.
 - 27 - Sug. Maple
 - 31 - R. Spruce
 - 33 - Spruce-Fir
 - 37 - W. Cedar
 - 39 - Ash, Elm, R. Maple
 - 54 - R. Oak, Brasswood, W. Ash
 - 0 - Open

- (CP) CANOPY POSITION CODES
- 1 - Dominant-Codominant
 - 2 - Suppressed

- (DK) DIEBACK
- 0 Healthy
 - 1 < 25%
 - 2 25-50%
 - 3 50-75%
 - 4 > 75%
 - 5 Dead

- STOCKING LEVEL
- 0 - nonstocked (less than 100)
 - 1 - seed sapling poor
 - 2 - seed sapling med.
 - 3 - seed sapling well
 - 4 - pole timber poor
 - 5 - pole timber med.
 - 6 - pole timber well
 - 7 - saw timber poor
 - 8 - saw timber med.
 - 9 - saw timber well
- Form by W. Moulton

FOREST TENT IMPACT SURVEY - STAND DATA

USGS Quad ACREAGE STAND

INSTRUCTIONS

DATE mo. day 19 FOREST TYPE STOCKING LEVEL

Stand acreage, number and category will be provided. If stand falls in a sugarbush, note, and select another point.

- I. Defoliation A B
 A. # Years defoliated
 B. # Years since last defoliation
 II. Site: A B
 A. Slope
 B. Aspect

Determine site quality for maple based on site index at center point.

- III. SITE QUALITY: A B
 A. 1 site I (60 cu. ft/yr.), 2 site II (50 cu. ft/yr.), 3 site III (40 to 50 cu. ft/yr.), 4 site IV. (less than 50)
 B. Determined by: 1 measurement, 2 soils, 3 est., 4 other
 IV. SOILS: A B C D
 A. Moisture movement through soil; 1 poorly drained, 2 moderately well drained, 3 well drained
 B. Surface characteristics; 1 ledgy, 2 moderately stony, 3 very stony, 4 sandy, 5 wet, 6 undulating, 7 smooth.
 C. Soil Depth; 1 shallow to bedrock, 2 shallow to hardpan, 3 moderate, 4 deep.
 D. Stand Geography; 1 steep side hill, 2 moderate side hill, 3 rolling, 4 swamp, 5 mtn. top, 6 plateau, 7 conc, 8 flat.

v. Defoliation Confidence Determined by: 1. Known information, 2. Records, 3. Best Guess

vi. Elevation in: hundreds of feet

vii. Years since thinning
 99 = unthinned

viii. Stand category
 1. Control, 2. Defoliation, 3. Dieback

PLOT CREW _____
 GEN. INF. SHEET COMPLETED BY _____
 Notes to be printed on printout _____
 Grid Coordinates _____
 Town _____
 Owner (if known) _____

PROCEDURE FOR POINT SELECTION - HARDWOOD SURVEY

1. FIFTEEN 7½-MIN QUADS HAD KNOWN DIEBACK FROM FTC
 FORTY-THREE 15-MIN QUADS HAD ~~FD~~ FTC DEFOLIATION
 BUT NO KNOWN DIEBACK
2. 5 RANDOMLY SELECTED DIEBACK QUADS (3-S; 2-N)
 10 RANDOMLY SELECTED DEFOL QUADS (4-S, 6-N)
3. OUTLINE DEFOL'S DIEBACK AREAS
~~40~~ SELECT # OF PLOTS IN EACH QUAD PROPORTIONAL
 TO AFFECTED AREA IN QUAD

40 DIEBACK POINTS	(24-S, 16-N)
40 DEFOL POINTS	(16-S, 24-N)
20 CONTROL POINTS	(10-S, 10-N)

DEFOL POINTS ARE FROM NON-DIEBACK AREAS IN
 DIEBACK QUADS AS WELL AS DEFOL QUADS.

CONTROL POINTS WILL BE LOCATED IN STATE LANDS
 WHERE POSSIBLE

VT. FOREST
& PARKS
NOV 26 '84
N. SPRINGFIELD

H. B. Teillon, Chief
Forest Resource Protection

Hardwood Decline Survey

Page 1 of 2

Ronald Kelley
Forest Protection Specialist

21 November 1984

Barb Burns and I met on 20 November and discussed how we should proceed from here. We decided that our first priority for 1985 should be to complete the survey begun in 1984 and about half-completed. The procedures that we recommend are:

1. Continue to randomly locate the remainder of the 40, 40 (increase to 42) and 20 (decrease to 14?) plots, respectively, within the mortality, defoliation and control strata. Plots will be randomly selected from several possible points laid out within areas delineated on previously selected aerial survey quadrangles, but edges (i.e. outer $\frac{1}{4}$ of area) will continue to be avoided to reduce possible sketch-mapping error.

2. Since differences are apparent when data already taken are separated by number of years defoliated, further stratify the defoliation stratum into defoliated one, two or three years, with 14 plots in each substratum.

3. Control plots (only three done in 1984) will be selected by placing point overlays over non-defoliated forests on our selected topographic maps and randomly selecting one of these points. The number of control plots can probably be reduced to 14 to correspond with the substratum numbers mentioned in section two. Northern hardwood type will be confirmed for each point by using aerial photographs and re-selecting points that do not fall into this type.

4. Once the data has been analyzed, volume losses and crown condition information can be multiplied by acres in the following categories to obtain an estimate of statewide impact:

- a. mortality stratum data x acres sketch-mapped as containing mortality;
- b. data from areas defoliated one, two or three years x total acres defoliated one, two or three years, respectively*, minus acres mapped as mortality;
- c. data in (a) and (b) can be adjusted by subtracting background losses as determined by control plot data.

*These acres can be most easily obtained by making transparent overlays of the 1:250,000 scale topograph maps containing our summary defoliation records and sandwiching these together to determine areas of overlap.

*an
afterthought
Do you
agree?*

H. B. Teillon, Chief
Forest Resource Protection

Hardwood Decline Survey
Page 2 of 2

Ronald Kelley
Forest Protection Specialist

21 November 1984

Regarding the possible use of aerial photography to determine hardwood decline, Barb and I have different inclinations. I would prefer to piggy-back this to the decline survey already begun by requesting photography of the areas we've already selected, plus perhaps some additional non-defoliated areas to bring the number of control plots up to 40. Then use data from ground plots already established to determine volume, tree condition, species composition, etc. for trees counted in photo plots. Ground-truthing for number of trees dead in photo plots compared to ground plots, Barb and I agreed, could be most easily obtained by randomly selecting from only those photo plots that are reasonably accessible and contain or are adjacent to some easily distinguished landmark.

Barb is not convinced that the increased precision obtained by using aerial photography is justified by the extra amount of time required to use it, especially in regards to obtaining ground-truth information. She also is leaning toward requesting that any aerial photography application be geared toward an overall assessment of hardwood decline in Vermont, separate from defoliator impact.

At any rate, we decided to forgo a recommendation on this until we have looked at the hardwood decline photography that was taken last summer to determine its applicability. If we decide that we want to go the photography route, this can be taken in 1985, with ground data obtained in 1986. In the meantime, we can complete the defoliation impact ground survey in 1985, as well as the re-survey of 40 sugarbush decline plots (Barb is doing the narrative on this).

jr
cc: Barbara Burns