

# FOREST ENVIRONMENTAL PROTECTION

USDA • FOREST SERVICE • NORTHERN REGION

State & Private Forestry • Missoula, MT 59801

(Report) No. 75-18

5200  
October 1975

SUPPLEMENTAL EGG MASS DATA  
FROM A DOUGLAS-FIR TUSSOCK MOTH INFESTATION  
NORTH OF POLSON, MONTANA--APRIL 1975.

by

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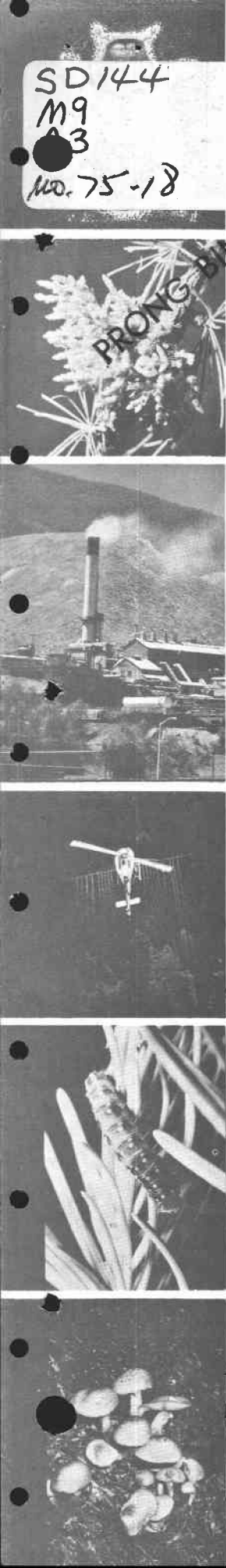
## ABSTRACT

A supplemental Douglas-fir tussock moth egg mass evaluation was made within three quarter sections north of Polson, Montana, during April 1975. These areas were being considered for a pilot control project of a nucleopolyhedrosis virus spray. Results from the April evaluation showed these areas no longer qualified as sites for pilot control projects.

## INTRODUCTION

A Douglas-fir tussock moth, *Orgyia pseudotsugata* McD., infestation was detected along the south shore of Flathead Lake in western Montana during 1974. Egg mass surveys were made in September 1974 and new egg masses were collected to determine egg viability, egg parasitism, and degree of virus in first instar larvae (Tunnock, et al., 1974). Results of this evaluation indicated noticeable defoliation may occur during 1975 on 1,920 acres and lighter defoliation could be scattered over 4,460 acres of Douglas-fir, *Pseudotsuga menziesii* (Mirb.) Franco, north of Polson, Montana, (Tunnock, 1975). Three quarter sections-- T. 23 N, R. 20 W. Sec. 9 NE; T. 23 N, R. 20 W. Sec. 3 NW; and T. 24 N, R. 21 W, Sec. 35 NE--in this area had sufficiently high projected larval populations and low virus levels to be considered as potential areas for a pilot control project using nucleopolyhedrosis virus (Tunnock, 1975).

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These quarter sections were further evaluated and new egg masses collected for assessment during April 1975.

#### METHODS

Within each quarter section, five plots were sampled. A plot consisted of a cluster of eight Douglas-fir, each 30 to 50 feet in height.

Four limbs from midcrown of each sample tree were removed. Foliated portion of each limb was measured for length and width (at widest point) and all new egg masses found on the limbs were collected in each plot. These egg masses were incubated to facilitate egg hatch and assayed as described by Tunnock (1975).

#### RESULTS

Within quarter section 9 NE, new egg masses per 1,000 square inch foliage ranged from 0.26 to 0.54 and averaged 0.37. They ranged from 0.04 to 0.57 and averaged 0.34 per 1,000 square inches foliage in quarter section 3 NW. New egg masses per 1,000 square inches foliage ranged from 0 to 0.48 and averaged 0.17 within quarter section 35 NE (Table 1). Average new egg masses per 1,000 square inches foliage increased slightly in quarter sections 9 NE and 3 NW from the September survey, but decreased from 0.69 in September to 0.17 in April in quarter section 35 NE (Table 1). It was obvious the one plot sampled in September happened to be placed in a "hot spot" in 35 NE.

Table 2 shows estimated larvae per 1,000 square inches of foliage, after mortality factors were subtracted, changed from the winter evaluation to the April evaluation in the three quarter sections. They increased from 47.0 to 57.0 in 9 NE and from 47.7 to 52.1 in 3 NW, but decreased substantially from 94.3 to 24.3 in 35 NE.

#### DISCUSSION

For areas to qualify for a pilot control project of nucleopolyhedrosis virus, it was suggested by Thompson<sup>2/</sup> they contain at least 50 larvae per 1,000 square inches of foliage and not much more than a 1.0 percent virus level. Although quarter sections 9 NE and 3 NW contain adequate larval densities, virus levels of 3.5 and 3.2 percent are sufficiently high to cause naturally induced virus mortality before results of a virus spray could be determined. Larval density in quarter section 35 NE is not high enough to be a treatment area. Natural mortality factors would reduce this low population too quickly for adequate analysis.

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<sup>2/</sup> Thompson, C. G., Insect pathologist, Pacific Northwest Forest and Range Experiment Station, Forestry Sciences Lab., Corvallis, Oregon. Personal conversation during meeting in March 1975.

Table 1.--Douglas-fir tussock moth egg mass densities within three quarter sections north of Polson, Montana--April 1975.

<u>Location</u>	<u>New egg masses per 1,000 sq. in. foliage<sup>a</sup></u>	<u>September 1974 egg mass density</u>
T. 23 N, R. 20 W, Sec. 9 NE		
Plot 1	0.29	
Plot 2	.39	
Plot 3	.40	
Plot 4	.54	
Plot 5	.26	
Average	<u>.37</u>	<u>0.36</u>
T. 23 N, R. 20 W, Sec. 3 NW		
Plot 1	.04	
Plot 2	.23	
Plot 3	.48	
Plot 4	.45	
Plot 5	.57	
Average	<u>.34</u>	<u>0.28</u>
T. 24 N, R. 21 W, Sec. 35 NE		
Plot 1	.23	
Plot 2	.16	
Plot 3	.48	
Plot 4	.05	
Plot 5	.00	
Average	<u>.17</u>	<u>0.69</u>

a. New egg masses over 0.10 per 1,000 square inches foliage indicate noticeable defoliation will probably occur in that area.

Table 2.--Partial life-table based on Douglas-fir tussock moth egg masses collected north of Polson to predict larval densities in three quarter sections during 1975.

(1) Plot location	(2) Collection date	(3) New egg masses/ 1,000 sq. in. foliage	(4) Mean number eggs/ mass	(5) Eggs/ 1,000 sq. inches (2 X 3)	(6) Percent non-viable eggs	(7) Percent egg parasitism	(8) Percent virus	(9) Estimated larvae/ 1,000 sq. in. after mortality <sup>a</sup>
T 23 N, R 20 W, S 9 NE	April 1975	0.37	174.3	64.5	7.5	1.1	3.5	57.0
	October 1974	.36	149.8	53.9	11.3	1.1	.6	47.0
T 23 N, R 20 W, S 3 NW	April 1975	.34	184.9	62.9	10.7	3.3	3.2	52.1
	October 1974	.28	183.6	51.4	6.7	.0	.6	47.7
T 24 N, R 21 W, S 35 W	April 1975	.17	171.9	29.2	12.7	4.2	.2	24.3
	October 1974	.69	153.4	105.8	9.6	.6	1.5	94.3

a. Risk of defoliation is high in area if estimated larval density exceeds 20 larvae per 1,000 square inches of foliage or if virus levels are less than 30 percent in class III or IV areas or less than 50 percent in class I or II areas.

Results from winter and spring evaluations predict the Douglas-fir tussock moth infestation within the Lower Flathead Valley will terminate by fall 1975. There will be some spots of heavy defoliation scattered within areas of light or noticeable defoliation during 1975.

REFERENCES CITED

- Tunnock, S., J. E. Dewey, S. Kohler, and S. Haglund, 1974. Evaluation of a Douglas-fir tussock moth outbreak in the Lower Flathead Valley, Montana. USDA Forest Serv., State and Private Forestry, Missoula, Mont., Rpt. 74-24.
- Tunnock, S., 1975. Impact of egg viability, egg parasitism, and virus on 1975 Douglas-fir tussock moth defoliation potential in the Lower Flathead Valley, Montana. USDA Forest Serv., State and Private Forestry, Missoula, Mont., Rpt. 75-9.