

September 7, 1990

N-14

George Saufley, Forestry Technician
Forest Pest Management, USFS
Northeastern Area State and Private Forestry
Cor. Concord and Mast Rds.
P.O. Box 640
Durham, New Hampshire 03824

ADMINISTRATIVE	
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DIRECTOR	
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LAND RESOURCES	
ENGR & MAINT	
RES MGMT & VP	
ARD, P&RP	
CULTURAL RESOURCES	
ENVIRONMENTAL COMP	
PLANNING & DESIGN	
TOURISM & RECREATION	

Dear George:

Enclosed please find the results of the gypsy moth egg mass monitoring this year at Saratoga. The burlap banding technique was used in the same fashion and locations as in the past. Milk carton traps were placed at the same location. The traps will be sent to you at the same time as this letter, under a separate package.

The egg mass survey that Michelle Frank and I conducted last month found very little sign (up to 200/acre in the worst area) and therefore expect no outbreak next spring.

If you have any questions, please do not hesitate to call me at (518) 664-9822.

Sincerely,

James P. Schaberl
Resource Management Specialist

NAR
Received
10/30

Enclosure(s)

cc:
Carol DiSalvo, NAR IPM Coordinator

SARATOGA NHP GYPSY MOTH EGG MASS SURVEY-1990

Site #1. Ranger Station Area

<u>Tree # & DBH</u>		<u>Egg Masses Found</u>
1. Oak	12.6"	0
2. Oak	31"	0
3. Oak	18"	0
4. Oak	3"	0
5. Oak	18.6"	0

Site #2. Tour Road Stop #3

1. Oak	11.8"	0
2. Oak	12"	0
3. Oak	42"	0
4. Oak	19"	0
5. Oak	7"	1

Site #3. Tour Road Stop #7

1. Oak	29"	0 (burlap down)
2. Oak	8.6"	0
3. Hickory	8"	0
4. Oak	17"	0
5. Oak	11"	0

Site #4. Tour Road Stop #8

1. Oak	18"	0
2. Oak	17"	0
3. Oak	20"	0 (burlap down)
4. Oak	16"	0
5. Oak	26"	0 (burlap down)

Site #5. Tour Road Stop #10

1. Aspen	12"	0
2. Oak	21"	0
3. Oak	4"	0
4. Oak	11.6"	0
5. Oak	6"	1

United States
Department of
Agriculture

Forest
Service

Northeastern Area
State and Private
Forestry

Cor. Concord & Hast Rds.
P. O. Box 640
Durham. NH 03824

Reply To: 3420

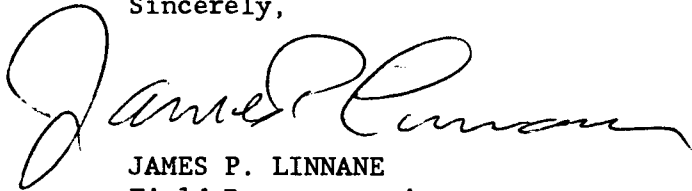
Date: September 13, 1990

William Gibson, Chief Park Ranger
National Park Service
Saratoga National Historic Park
RD #2/Box 33
Stillwater, NY 12170-0033

Dear Bill:

Enclosed for your information is a report on our 1990 Gypsy Moth Biological
Evaluation of the Park. Please contact Michelle Frank or myself at
(603-868-5719/5576) if you require any further information.

Sincerely,



JAMES P. LINNANE
Field Representative
Forest Pest Management

Enclosure

cc:
FPM Radnor



**UNITED STATES
DEPARTMENT OF
AGRICULTURE**

**Potential Defoliation
by Gypsy Moth on
Saratoga National
Historic Park in 1990**

Forest Service

Biological Evaluation

Northeastern Area

September 1990

**Prepared by: Michelle S. Frank, Entomologist, USDA Forest Service, Forest
Pest Management, P.O. Box 640, Durham, New Hampshire.**

ABSTRACT

Gypsy moth egg mass surveys were conducted on the Saratoga National Historic Park on 20 August 1990. All five major Park areas had egg mass (EM) per acre estimates of less than 1000. The two trouble spots in 1989, Burgoyne's Headquarters and Fraser Burial Site, had 440 and 920 EM per acre respectively. These numbers are within acceptable limits. Overall, the population appears to be declining in the Park. It is recommended that Park personnel make informal egg mass surveys in these areas to keep appraised of any population buildup in the future.

INTRODUCTION

Saratoga National Historic Park encompasses 2458 acres, of which 1546 acres are forested. The woodland areas are managed to enhance the "historic environment" of the Park. The Park's current strategy is to keep the land in the same condition it was in during the Battle of Saratoga in 1777 or to restore the land to that condition. Severe gypsy moth defoliation could cause dieback or mortality in trees the Park intends to keep or it may disrupt certain "viewsheds" for visitors.

Gypsy moth egg mass surveys were conducted at Saratoga National Historic Park on August 20, 1990. The mean number of egg masses on the areas surveyed was 272 per acre. The Burgoyne's Headquarters area and Fraser Burial Site were the only two areas out of five with egg mass counts. All other Park areas had zero egg mass per acre counts.

Estimates for gypsy moth defoliation for the coming year are difficult to make. However, some generalizations can be made about healthy gypsy moth populations and future defoliation (Reference: Guides for Predicting Gypsy Moth Damage for Forest Landowners). Population estimates of less than 500 egg masses per acre would be expected to cause <25% defoliation, 500-1000 egg masses per acre cause 25-40% defoliation, 1100-1500 egg masses per acre cause 42-65% defoliation, and 2000 egg masses per acre can cause 100% defoliation. Trees can refoliate with "moderate" defoliation (40-50%) but usually will not refoliate. When the percent defoliation reaches 60%, trees will tend to refoliate and use up starch reserves.

METHODS

A total of 15 fortieth acre fixed radius plots were sampled for gypsy moth egg masses in five major areas of the park. These were the visitors' center, the "American River Fortifications", "Arnold Monument", "Burgoyne's Headquarters", and "Fraser Burial Site and Trail". At each plot, the total number of egg masses seen by observers was recorded. From these counts mean number of egg masses per acre was calculated.

RESULTS AND DISCUSSION

Of the five areas surveyed, three had zero egg mass per acre counts: the Visitor's Center, Arnold Monument, and the American River Fortifications (Table 1).

Table 1. Mean egg mass per acre estimates for five areas of Saratoga National Historic Park.

	MEAN EGG MASSES PER ACRE	
SITE	YEAR	
	1989	1990
1. Visitor's Center	200	0
3. American River Fortifications	333	0
7. Arnold Monument	013	0
8. Burgoyne's Headquarters	3988	440
10. Fraser Burial Site and Trail	5148	920

No more than 10 percent defoliation should occur in these 3 areas in 1991, though any larvae blown in from other areas, if any, could increase the defoliation. The acreage of the three areas is roughly 1000.

Very high egg mass per acre densities were found at Burgoyne's Headquarters and the Fraser Burial Site and Trail in 1989, but the 1990 survey showed a reduced number of egg masses in both sites. The current year's egg masses are also much smaller (dime sized) than last year's egg masses (quarter or larger). Even without the numbers, the decreased size indicates that the population is weakened and on a downward trend. It is easily possible that there will be no noticeable defoliation. The acreage involved in these two areas is relatively small, 40 acres at Burgoyne's Headquarters and 235 at the Fraser Burial Site and Trail.

MANAGEMENT ALTERNATIVES

Four management alternatives are recommended in the 1985 Final Environmental Impact Statement for Gypsy Moth. The alternatives include "No Action", "Chemical Insecticide Treatment", "Biological Insecticide Treatment", and "IPM Approach (selected)".

1. No Action

In this alternative, no costs are incurred from insecticidal spray applications and environmental impacts due to insecticidal treatments can be avoided. This should always be considered. There are always chances that abiotic and biotic factors will have adverse effects on the gypsy moth population. Examples of this include severe winter weather or a fungus (*Entomopahga maimaiga*) which in 1989 and 1990 caused extensive larval mortality in many areas. The primary disadvantage of this alternative is the risk of defoliation (unsightly trees). Hardwood mortality rarely occurs before the third year of defoliation. Another disadvantage, which must be considered in places with large numbers of visitors, is the potential allergic reactions to gypsy moth hairs on the larvae and from droppings.

2. Chemical Insecticide Treatment

Chemical insecticides are generally effective in terms of insect kill. This occurs quickly and provides foliage protection. A list of acceptable chemical insecticides can be found in the Gypsy Moth EIS.

3. Biological Insecticide Treatment

The most common biological insecticide used against the gypsy moth is *Bacillus thuringiensis* (*Bt.*). The gypsy moth nucleopolyhedrosis virus is also registered for use against this pest, however, it is not produced in sufficient quantities for general use. Biological insecticides are considered safe for humans and most other organisms, however, *Bt* will kill other caterpillars as well as gypsy moth if they feed on treated foliage. Timing of treatments with biological insecticides is critical, and if applied correctly, biologicals also provide good foliage protection. There are several formulations of *Bt* that can be selected for use against the gypsy moth.

4. Integrated Pest Management (selected)(IPM)

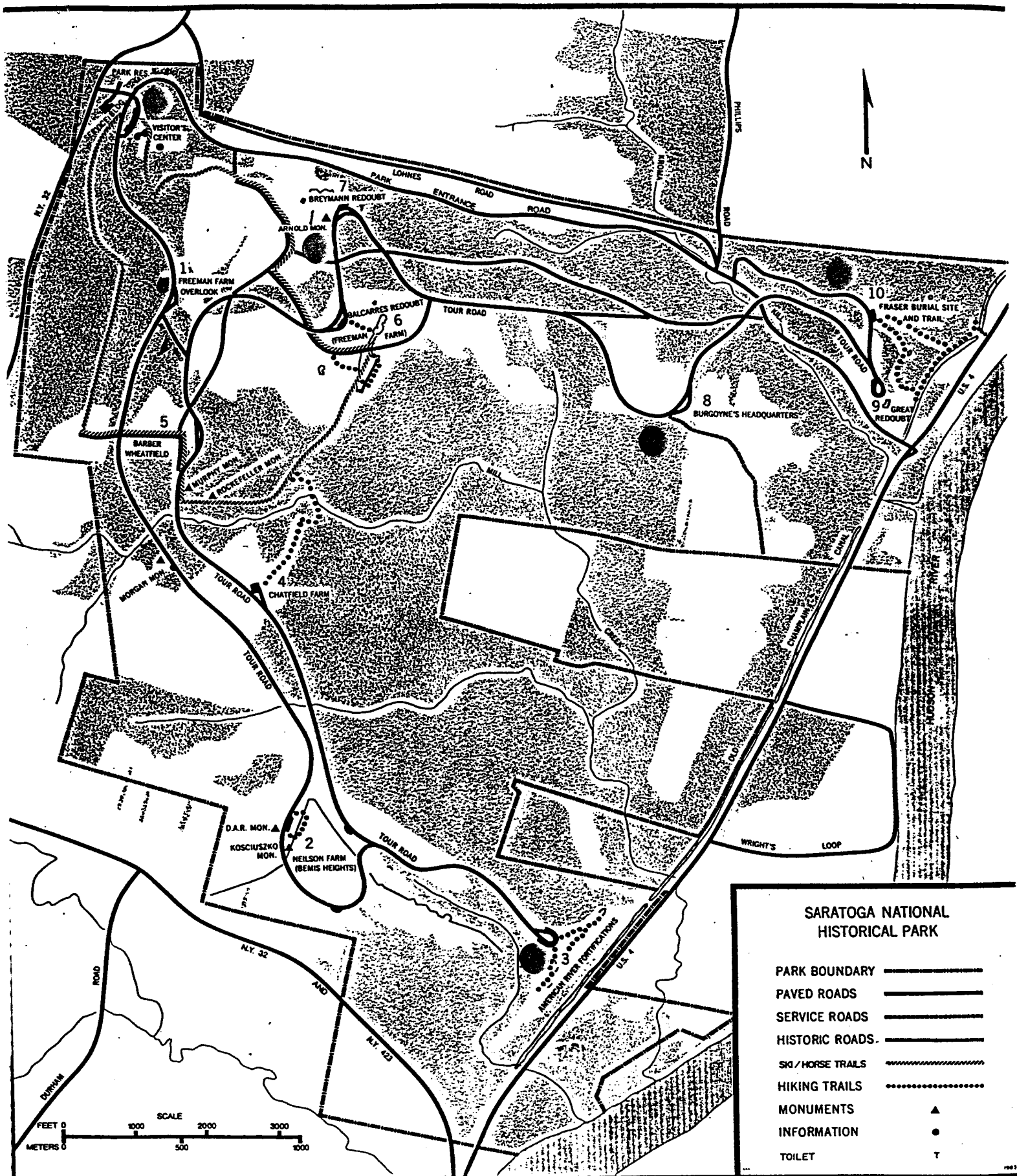
Components of an IPM strategy include quarantines, inspections, biological and/or chemical insecticide application, parasite and predator management, application of gypsy moth pheromone, release of sterile or partially sterile life stages, and forest stand manipulation. Field and pilot tests are being conducted on the application of pheromone, parasite/predator management, sterile or partially sterile life stage releases, and forest stand manipulation. These components are not yet operational. However, IPM approaches can be developed, and with sufficient time, will include the above components. IPM strategies must be decided upon well in advance of gypsy moth outbreaks.

RECOMMENDATIONS

All areas of the Park have egg mass per acre counts under 1000 and egg mass size has also decreased, indicating a declining population. The defoliation in 1990 was also minimal (10 to 30 percent). No intervention is recommended for 1991. However, gypsy moth tends to have recurring outbreaks every seven to ten years. This cyclic nature means that the Park will experience a gypsy moth problem in the future. It is recommended that the Park annually examine important areas for egg masses, recording the results. This would give warning when the population is increasing.

LITERATURE CITED

United States Department of Agriculture. Guides for Predicting Gypsy Moth Damage for Forest Landowners. Forest Service, Northeastern Area, pamphlet NA-FB/p-25.



Map 1. 1990 Gypsy moth egg mass survey sites.