

**PUBLIC RESPONSE TO A
PROPOSED GYPSY MOTH MANAGEMENT
CONTROL PROGRAM IN THE
SOUTHERN UNIT OF THE KETTLE
MORaine STATE FOREST**

**Jordan B. Petchenik
Bureau of Integrated Science Services**



**Bureau of Integrated Science Services
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707-7921**

Miscellaneous Publication PUB-SS-976 2002

For additional information on this study, please contact:

Jordan B. Petchenik
Wisconsin Department of Natural Resources
Bureau of Integrated Science Services
101 S. Webster Street, SS/BW
Madison, WI 53707

(608) 266-8523

e-mail address:

Jordan.Petchenik@dnr.state.wi.us

Production Credits

Edited by Dreux J. Watermolen

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.

This publication is available in alternative format (large print, Braille, audio tape. etc.) upon request. Please call (608) 266-0531 for more information.

CONTENTS

3 Principal Findings

7 Introduction

7 Methods

8 Results and Discussion

9	Participants' Knowledge of Gypsy Moths
9	What Do People Know about Gypsy Moths and What Have They Seen?
10	General Questions and Concerns about Gypsy Moths and Their Management
14	Public Tolerance of Gypsy Moths
14	Nuisance Tolerance
17	Tolerance for Tree Defoliation
19	Tolerance for Tree Mortality
21	Forest Management Issues
21	The Need for a Gypsy Moth Plan
23	Reasons for a Control Plan
24	Forest Composition
27	Areas for Protection
29	Gypsy Moth Management versus Other Forest Issues
31	Funding a Gypsy Moth Management Program
32	Methods of Control
32	Preferred Method for Controlling Gypsy Moths
34	Least Preferred Gypsy Moth Control Techniques
35	Opinions on the General Use of Pesticides
37	Spray Program Issues
37	Concerns about a Spray Program
39	Spray Program Information
43	Spray Program Notification
44	Homeowner Issues
44	What are Homeowners Willing to do on Their Own Property?
45	Questions and Concerns about a Spray Program
49	Appendix A: Alternative Management Cards
53	Appendix B: Photographs



PRINCIPAL FINDINGS

We conducted five focus groups to assess public response to various gypsy moth management alternatives within the Southern Unit of the Kettle Moraine State Forest (SUKM) and to gather information on how the public might respond to a new gypsy moth management plan. Here, we provide a brief summary of our 15 key findings. Specific responses to each part of the focus group discussions are presented in the "Results and Discussion" section of this report.

Importance of a Gypsy Moth Management Program

1. The focus group participants believe that gypsy moths are a serious threat to the Southern Unit of the Kettle Moraine State Forest.

People want forest managers to understand that they feel strongly about gypsy moth management as it relates to the preservation of the forest. It is unclear, however, where gypsy moth control ranks compared to other environmental issues. Many discussion participants felt that gypsy moth management should be the forest manager's top priority, while others recognized links and overlaps between gypsy moths and other forest management issues. Other people believed that gypsy moth management is not the most important forest management issue or that it is not yet a top concern.

Gypsy Moth Management Issues

2. The participants believe that a gypsy moth management plan is essential.

Forest visitors want to have a gypsy moth control plan in place to ensure the protection of the SUKM. Though unfamiliar with gypsy moth management control methods and concerned about the consequences of those methods, people feel that forest managers need to take a proactive approach to protect and maintain the forest. Discussion participants' opinions regarding the reasons for gypsy moth control are varied, but it is clear that they expect action.

3. Forest visitors support the use of Btk (*Bacillus thuringiensis* var. *kurstaki*) to control gypsy moths in the Southern Unit of the Kettle Moraine State Forest.

Discussion participants overwhelmingly support the use of Btk over other gypsy moth management options. Though some people have concerns about the safety and efficacy of the bacterial pesticide, they still feel that Btk is the most acceptable gypsy moth control and/or the least objectionable of the choices available. Participants considered doing nothing about the gypsy moths the most objectionable option, followed closely by the use of Dimilin. Clearly, the participants expect something to be done to protect the forest, keeping environmental and health consequences in mind.

Forest Management Issues

4. The significance of gypsy moth-induced change in forest composition is unclear.

People appreciate different aspects of the SUKM and have varying opinions on the importance of an oak-dominated forest. It is unclear, therefore, what impact forest composition change may have on visitors' enjoyment of the forest.

5. Forest visitors are unable to provide clear guidelines for what areas of the forest should be considered a priority for gypsy moth protection.

Many people feel that, given budget constraints, high use areas of the forest, such as campgrounds and trails, should be given special protection from gypsy moths. In contrast, other people believe that low use areas of the forest should be more of a priority because of their rarity and natural beauty. Still others consider the entire forest a priority area. A few people are able to name specific areas that they feel need protection, but most are not.

Spray Program Issues

6. The public is very concerned about the potential health consequences of a gypsy moth spray program.

People are worried about the effects of any pesticide that might be sprayed in the SUKM. They are anxious about the health consequences of pesticide spraying and the impact that pesticides may have on non-target organisms and the environment. Discussion participants voiced many concerns regarding the potential side effects and impacts on human health, particularly for asthmatics and children.

7. Opinions regarding the value and safety of pesticides are mixed.

Beliefs about the safety and effectiveness of pesticides vary among the participants. Some people feel that pesticides are an acceptable and appropriate method for controlling unwanted insects, while other people are supportive of their use but concerned about the potential health consequences. Still others are suspicious of safety claims and apprehensive about any pesticide use.

8. Forest visitors want advance notice of any gypsy moth spraying.

Clearly, people feel that they have a right to know the details of a spray program before any pesticide spraying is done in the forest. People expect specific information regarding the reasons for spraying, any possible health risks associated with the pesticides, and the potential impacts on the environment and non-target organisms. Discussion participants had many suggestions regarding how information could be presented to the public, including notification at registration, postings and pamphlets within the forest, phone or computer access, news releases, and direct mailings. It is not clear, however, how much notification and time specificity the public expects.

Gypsy Moths and Forest Recreation

9. It is uncertain how gypsy moth activity may impact forest visitation.

Depending on the severity of a gypsy moth infestation, people may or may not alter their plans to visit the forest. Some discussion participants plan to continue their normal use of the forest and do not feel that gypsy moth activity would have an impact on their enjoyment of the forest. Other people, however, believe that the presence of high populations of caterpillars would lead them to alter their recreational activities.

Public Tolerance of Gypsy Moths

10. It is unclear how the nuisance aspects of gypsy moth larval activity may affect forest recreation.

It is unclear how forest visitors might react to high populations of gypsy moth larvae. Discussion participants expressed varying degrees of concern about the presence of caterpillars and the accumulation of frass in recreational areas of the forest. Some people did not believe that gypsy moth larval activity would bother them, while others felt that larval activity would definitely have an impact on their enjoyment and use of the forest.

11. People are concerned about gypsy moth defoliation in the forest.

Discussion participants expressed concern about moderate to high defoliation and worried about the impact that it may have on their enjoyment of the forest. Only a few people, however, believed that the presence or prior knowledge of defoliation would lead them to alter their recreational plans.

12. People are unwilling to tolerate gypsy moth induced tree mortality in the forest.

In all of the discussions, people considered any level of tree mortality resulting from a gypsy moth infestation as unacceptable. They preferred to focus on preventative measures.

Homeowner Issues

13. Homeowners are unsure what they would be willing to do to control gypsy moths on their property.

Homeowners have many questions and concerns about gypsy moths and gypsy moth management. Their lack of knowledge regarding the subject makes them unable to speculate about the nature and extent of their future control efforts.

14. Homeowners are concerned about how a gypsy moth spray program would work and how it would be financed.

Homeowners expressed a need for more information regarding the details of how spray programs are implemented. In the focus group discussions, specific concerns were raised about how a spray program would be organized and by whom, and how such a program would be financed. Opinions on who should pay for spraying on private land near the SUKM were mixed. Some homeowners worried about the cost versus effectiveness of a spray program. Concerns were also raised about area landowners that decide not to participate in a spray program. A few homeowners did not believe that a spray program was necessary.

Questions and Concerns

15. The general public is uninformed/uneducated on the subject of gypsy moths.

Discussion participants reported that they had heard of gypsy moths, but that they were uninformed regarding basic gypsy moth issues. They felt that the public should be given more information about gypsy moths and gypsy moth management techniques. After receiving general information about the potential impacts of a gypsy moth infestation in the forest, people wanted to know more about gypsy moths, their effects on the forest, and how they can be managed. In addition, people were concerned about the goals and implementation of a control program.

NOTE: The number and types of questions raised in the discussions illustrates the need for more and/or better public education on the subject. This lack of knowledge could be a significant obstacle to gaining public support for any gypsy moth management program.

INTRODUCTION

Biologists predict that increasing gypsy moth populations will reach levels resulting in severe defoliation and tree mortality in southeast Wisconsin within the next few years. The Southern Unit of the Kettle Moraine State Forest (SUKM) represents one of the largest tracts of forested land in southeast Wisconsin. In order to develop a plan to manage gypsy moth defoliation on this property, the Wisconsin Department of Natural Resources' Bureau of Forestry and Integrated Science Services initiated a research agenda to assess the public's response to gypsy moth management within this southern forest.

Specifically, we conducted focus group research to collect public response to various gypsy moth management alternatives within the SUKM and gather information on how the public might respond to a new gypsy moth management plan. The focus groups provided opportunities for the participants to describe their attachment (i.e., history and experiences) to the SUKM and then offer opinions and voice any concerns they may have about a gypsy moth control plan.

METHODS

Staff sociologists from the Wisconsin Department of Natural Resources' (DNR) Bureau of Integrated Science Services conducted five focus groups with primary users of and residents (homeowners) within the SUKM. A total of 38 people participated, with each group being a mix of men and women. Table 1 presents the groups along with their location and number of participants. Focus group discussions generally followed the outline presented in Table 2. Each focus group was audio-taped and a verbatim transcript (representing qualitative data) was produced.

Table 1. *Focus group composition, location, and number of participants.*

Group	Location	No. Participants
Mountain bikers	Madison	7
Day users	Madison	8
Horse riders	SUKM	8
Homeowners	SUKM	8
Campers	Milwaukee	7

Table 2. *General outline used in focus group discussions.*

- Recent experiences with and attractions to the SUKM.
- Awareness of and experience with gypsy moths.
- Tolerance for tree defoliation, tree mortality, and moth nuisance.
- Preferred (least objectionable) gypsy moth control method.
- Acceptance of aerial spraying.
- Affect a gypsy moth outbreak might have on future visits to the SUKM.
- The importance of gypsy moth suppression relative to other issues within the SUKM.

A comment on focus group research. Focus groups are small groups of 7-10 people brought together under the guidance of trained moderators to discuss specific topics, with the purpose of generating insights and ideas into concepts under consideration. Unlike survey research, focus groups allow participants to listen and to respond to one another, as well as to the moderators. Focus groups also give participants a chance over a two-hour period to think about and to comment on their experiences and concerns.

It should be kept in mind that the 38 people interviewed for this study do not constitute a random sample of the thousands of people who visit the SUKM each year. Although similar stories and themes emerged during these discussions, results should be treated with caution and may not represent the public at large. This is in keeping with the purpose of focus groups: to generate insights and ideas rather than statistical data that can be projected to the population as a whole.

Focus groups generate narrative information rather than the numerical data that characterizes survey research. Using a content analysis process, researchers independently review the focus group transcripts to identify and summarize recurrent themes. These themes constitute the major sections within the report, which makes extensive use of participant comments that are included (presented in *Italics*) to typify the types of comments heard during the discussions.

Some specific procedures used. In every discussion group, participants were shown photographs of gypsy moth larvae crawling on picnic tables and outbuildings (see Appendix B). People were informed that the photographs represented a severe gypsy moth outbreak and the potential situation in the SUKM if the gypsy moth population is left unchecked. Larval nuisance aspects were explained, including the accumulation of frass and the allergenic nature of the caterpillar hairs. In each discussion, except with the homeowners, participants also were given five cards describing various gypsy moth management techniques. The text of each card included a brief explanation of the control method and a list of some of the advantages and disadvantages of that method. The cards were edited after the first discussion for clarity. Subsequent discussions used the cards that are presented in Appendix A. Participants were asked to carefully read the cards and put them in order of personal preference. A discussion of the most preferred and the least preferred methods followed.

RESULTS AND DISCUSSION

Results and discussion are presented under the following six broad topic headings:

- Participants' Knowledge of Gypsy Moths (page 9)
- Public Tolerance of Gypsy Moths (page 14)
- Forest Management Issues (page 21)
- Methods of Control (page 32)
- Spray Program Issues (page 37)
- Homeowner Issues (page 44)

For each section, we present key observations and illustrative quotations from participants.

PARTICIPANTS' KNOWLEDGE OF GYPSY MOTHS

What Do People Know About Gypsy Moths And What Have They Seen?

Key Observation - It was clear that most people had very little knowledge of gypsy moths coming into the discussions.

Although participants reported that they had heard of gypsy moths and that many of them had been exposed to some kind of information (e.g., mailed pamphlets in the Madison area regarding aerial spraying, news media in the Milwaukee area, and displays at Devil's Lake State Park), they were admittedly uninformed about gypsy moth issues. This lack of knowledge could be an obstacle to gaining public support for any gypsy moth management program. Examining what people have seen and where they have received their information is important to understanding their questions and concerns regarding gypsy moths and gypsy moth management.

What people have seen or noticed. The people who reported that they had personally seen gypsy moths or gypsy moth related activities in Wisconsin didn't immediately realize what they had observed unless they had been educated on the subject.

I've seen the spraying, the planes go by, in Madison, here.

All I know is, at my place up north, the DNR was putting out boxes to collect the gypsy moths. They have been doing that for the past five or six years.

I got sprayed every day on the way to work [in Madison] so I finally asked someone what's going on.

Other people believed that they had noticed gypsy moth activity in the Kettle Moraine State Forest only after viewing photographs of the gypsy moth in various life stages and hearing a brief introduction regarding the effects of a gypsy moth infestation in a hardwood forest.

I believe I did notice a tree that was defoliated [in the Southern Unit of the Kettle Moraine] and I was wondering if it was sick.

This summer I noticed a lot of holes [in the leaves], but I'm not sure what it was.

We saw a lot of traps when we were out hiking. I think we saw some of the egg [masses] on the trees.

This participant moved to Wisconsin after spending many years in Connecticut. His comments to the group foreshadow what Wisconsin may face if the migration of gypsy moths continue unchecked.

I've lived here for just nine and a half years, moved here from Connecticut and 15 years ago it was practically total devastation of the forest by the gypsy moth...It's unbelievable. They denuded the whole forest of deciduous trees...It was the middle of July and August and there was nothing, just branches.

Where people have received gypsy moth information. Participants cited the media as a source of information regarding gypsy moths. In addition, several people stated that they had received informational pamphlets in the mail and/or seen postings in their neighborhood association newsletters.

I just read an article in the Milwaukee Journal-Sentinel saying that Milwaukee has a heavy infestation of [gypsy] moths. I saw that last summer.

Well, I was aware of what they were doing [regarding the spraying in Madison]. I pay attention, listen to the radio, and there was a story on how there was going to be gypsy moth spraying.

The nature center at Devil's Lake has a nice display of what [gypsy moths] looks like and what it does. That's the place where I've seen the most on it, actually.

The neighborhood association where I live [Madison] actually posted the spraying in their newsletter.

People need more information. People recognized that they knew little about gypsy moths and gypsy moth management issues. They felt that they, and the general public, needed to become better informed.

I need to be educated on the gypsy moths.

I've heard the word, but have no clue what they are.

I would just like to know what they do.

I asked about six people what those little boxes, the traps, were before anyone knew.

Nobody knows [about the gypsy moth]. I think the problem goes to public education.

General Questions And Concerns About Gypsy Moths And Their Management

Key Observation - Throughout the discussions, people's questions and concerns indicated that they were uneducated on gypsy moth issues.

The number and types of questions brought up in the discussions illustrates the need for additional and/or more effective public education regarding gypsy moths. People had heard of the gypsy moth but didn't understand what it is and the effect that it could have on the forest. Coming into the discussions, most people didn't realize the importance of the issue or the scope of the problem. Once people became aware of the impact that the gypsy moth could have on the forest environment and their own personal enjoyment of the forest, they were concerned about what could be done and the potential consequences of any control or management program.

What are gypsy moths and what do they do? People had many questions about what gypsy moths look like and what they might have noticed in the forest.

How big are they?

When do they turn into moths?

Which ones are the males? The white or the dun colored [moths]?

Is that what those little holes [in the leaves] are?

Many people who had heard about gypsy moths and thought that they knew something about them were actually misinformed. Gypsy moths were confused with other forest insects, particularly the forest tent caterpillar.

Were they indigenous to the area?

Are they an endangered species?

Don't they eat the bark of the trees?

They affect pines, too, don't they?

Are those the caterpillars that fill the trees with webs?

Other questions and concerns focused on the gypsy moth life cycle and the pattern of outbreaks.

Is the [larval stage] their dangerous stage?

How long does [the larval activity] last?

Isn't everything a degree sort of thing? So, do they come in slowly and all at once explode?

Do [gypsy moth outbreaks] run in cycles? Are they here one year and gone the next or are they here to stay?

What are the effects and what is the scope of the problem? Many of the questions people asked in the discussions focused on how a gypsy moth outbreak might affect the trees.

Do they actually kill the tree or just defoliate it?

The next year [after defoliation] these trees should come back, right?

How long would it take for [complete defoliation] to happen?

What's the long term affect [of defoliation] on the trees?

People were also concerned about how the gypsy moth might affect their recreational plans and lessen their enjoyment of the forest.

If the picnic tables are like this, [covered with caterpillars and frass], is the whole ground like this?

For the campers, I was thinking that you would set up your camping gear and tent and then you're going to have a nice clean-up when you get back home. You're going to have bug guts all over the bottom of your tent.

If there are no leaves [due to defoliation], will the trails erode even more than they do after a hard rain?

If there are only small pockets of tree defoliation, is the DNR going to let us ride [horses] through them?

In addition, people wanted to understand the scope of the problem and the current situation in the forest.

Would these get to the density of the tent caterpillars in some areas?

Is the Southern Unit of Kettle Moraine the only place with a [gypsy moth] problem?

How serious is it in the state forest right now?

Some people raised concerns for the areas surrounding the forest.

Just thinking that one little section of [the forest] is going to be affected is probably a little naïve.

We've all said that we use the Kettle Moraine park because of its close proximity, and I only live 30 miles away. That's close enough that it's not going to be a dramatic difference between here and [where I live].

From my experience in Connecticut, it was not just an isolated area; it was the entire state. Some areas were worse than others, but they were everywhere. I see it as a regional problem, not just a park problem.

What can be done? Once informed about the current situation and the potential future problems, people wanted to know what could be done to protect the forest. The groups made it clear that preventing tree defoliation was a primary concern.

Are there preventative options?

Do they have a system to stop them?

What can be done [about the caterpillars]? If I call the DNR and say, 'Do something,' what can they do?

Is there something you can do to stop the caterpillars so it doesn't get to this point [of defoliation]?

Are we saying this [defoliation] is preventable or not? Are we saying this is how it's going to be when we camp?

You're asking me to put up with something that, if it can be prevented and there is not a lot of cost, why not prevent it altogether?

I would have to ask, 'How can we prevent [defoliation] so it does not happen at all? And how do we know if the cure is not worse than the problem?'

People also questioned the history of gypsy moth management and wanted to know how the situation was handled in other areas.

How come they couldn't control the progression of the moths from Massachusetts to Michigan? ...They aren't even slowing down the spread.

If it was this bad out east and they couldn't stop it what are we going to do?

Do they spray out east?

How has the East Coast been doing [selective protection] for the past 30 years?

What have the eastern states been doing [about tree mortality]? Planting new species of trees? Or are they still planting hardwoods?

Some people questioned gypsy moth management techniques and expressed doubt about the ability to prevent defoliation.

If [the defoliation in] this picture was preventable, why does it look like this?

You mentioned this is a worse case scenario, the Michigan photos. Is this after suppression? Didn't they know this was coming?

Other people questioned the need to manage the gypsy moths at all.

Maybe I'm not following this, but why is there such an interest in controlling the gypsy moths if it's only a month's time and [the trees] do regenerate the leaves?

PUBLIC TOLERANCE OF GYPSY MOTHS

Nuisance Tolerance

Key Observation - People had mixed reactions to the nuisance aspects of gypsy moth larval activity in recreational areas of the forest.

When asked for their reactions to the photographs and information presented, people responded with varying degrees of apprehension and concern. Some people expressed little to no concern about the hypothetical situation. A few people were unsure how they would react or were mildly concerned. Many people were alarmed by the photos and uneasy about the potential impact on their enjoyment of the forest. Other people worried about the extent of the nuisance and how an outbreak might cause problems after a visit to the forest.

Gypsy moth larvae are not a nuisance. Some people seemed to have a high tolerance for larval activity. They stated that the presence of caterpillars and frass would not bother them and that they would simply clean up the areas that they wanted to use.

No problem. I would just wipe them off the picnic table or eat on the ground.

The picnic table wouldn't bother me near as much as just looking at the trees and not having leaves.

[I would] learn how to destroy them and then clean off the picnic table.

If I was with a large group and we came to picnic, we would tolerate something like that. You come to expect stuff like that in the outdoors.

I'm still going to ride [my horse] because it's the only place without cars.

I would [still go camping]. I've gone to Devil's Lake when the lake was closed and no one could go in it and we had to find things for the kids to do when the main thing was to go swimming.

I would still go camping, too. Part of the reason I go camping is because I enjoy teaching kids about the outdoors and [the gypsy moth outbreak] it's something that's happened.

Of course I would go camping. The larger question is, do we do nothing and take the risk? Whatever, we'll still have people camping no matter what is done. I don't think that [doing nothing] is the approach to take. Everyone's still going camping; it's great family time and we all have reasons why we go.

I guess we see signs for swimmer's itch and we are still there. We're still there with the geese.

I'd still go hiking. It wouldn't change my plans.

Some people responded to the hypothetical gypsy moth situation by comparing it to their experiences with other nuisance insects.

I just kind of remember living up near Oshkosh with the mayflies hatching. It would be that kind of thing; you drive down the road with your windshield wipers on and houses would be covered with them. But you kind of knew it was for a set amount of time and you kind of just went on. It was kind of like, 'Well now the mayflies are hatching and everything's all yucky.' You just kind of ignored it. And so I guess if I had a cabin...well except for the trees...it would be no problem.

Kind of like earwigs in Madison, basically. For the past couple of years they are all over your house and after a while you just kind of get used to them.

My house was totally infested with Asian beetles last year. I just went around everyday and vacuumed them up. If this caterpillar thing lasted three weeks, I'd deal with it.

Gypsy moth larvae are bothersome. Some people believed that the caterpillars would be a nuisance but did not seem to be overly concerned about the potential situation. These people thought that they might alter their recreation plans in certain circumstances.

When you're out in nature you just have to deal with the bugs and so forth, but this seems like nature out of balance. I guess it wouldn't bother me, but if I were taking my niece or nephew for a picnic, it would bother me; it would be disgusting.

I guess if it were me and after biking, after the fact, I would just not use the picnic table.

Yes, [I would still camp], until it got really, really bad.

The first year I go there, I can't imagine it's going to be this bad right away. So, if the problem progresses then I would cut down on how often we go. If there are just some on the table then just brush them off and wash the table.

High populations of gypsy moth larvae are unacceptable. Many people became upset while viewing the nuisance photographs. They stated that they would definitely alter their recreational activities if the situation in the SUKM was at the level depicted in the photographs. These people believed that they would alter either the timing, length of stay, and/or number of visits to the forest. The presence of caterpillars seemed to be the most important factor in their decision.

I would have to say I'm in complete disagreement with all of this. There's no way [I would picnic]; I'd be completely grossed out.

What would we do if we came across these conditions? I can guarantee you we would walk away from [the picnic table]. You could wipe them off and the next second they would be covered again.

This is bad; just gross.

I'd pack it up and go home. That would be too much; there's no way.

It's not very pretty. I have a cabin up near Minocqua and they had a caterpillar problem up there and it looked just like the pictures. They were dropping from the trees; it was raining caterpillars. It was just awful.

This would gross me out! I would not want to picnic at all. Little kids would be scared to death.

I would alter my decision [regarding when to camp].

There are certain times of the year I wouldn't want to walk in the woods because I don't want caterpillars falling on me.

If I knew it was going to look like that [photo] I would not go there. I wouldn't want to be stepping on those bugs all the time and I wouldn't want them dropping in my hair.

I would certainly cut my use of the area if it did get really bad. I suppose it could make mountain biking interesting, I guess!

If we have to deal with this and all the droppings by the lake, the geese, if it got as bad as the geese droppings we would probably start going elsewhere.

I would not camp. If there were just a few, okay. But if they are all around the picnic area, are you going to walk on caterpillars? I would not go.

Buy me another campsite. If I pulled up and saw that, I would expect another campsite. If all the sites are like that, then you have a serious problem.

We go camping so often that I would not want to camp if the picnic table looked like that.

Concerns about gypsy moth larval activity. Some people, particularly among the campers, worried about the extent of the nuisance and wondered if they would be bringing problems home with them after a visit to the SUKM.

If the picnic table looks like this, you're not going to be able to go barefoot because the ground has got to be just covered with them.

We leave a lot of stuff out, under the camper, and they would get pretty messed up.

If you're walking on them, you are carrying them into the camper and into the tents, on your feet, you know.

The problem would be your camping equipment. The pop-up camper might get infested and then you go back home and open it up and have half your stuff covered.

Tolerance For Tree Defoliation

Key Observation - Most people were bothered by the idea of defoliation, but most did not feel that it was important enough to cause them to alter their future visitation plans.

Photos of severely defoliated trees were shown to the discussion group participants. People were informed that the pictures depicted a worst-case scenario in an area that had not been treated for gypsy moths. Defoliation was defined and explained. People were told that defoliation itself usually will not kill a healthy tree, but that it may weaken it and make it more susceptible to disease and other pests. People were also told that a defoliated tree will produce new leaves the same season, but that the leaves will be smaller and lighter green. Considering the photos and the information that they were given, the groups were asked to discuss their reactions to defoliation. Most people stated that they would be bothered by defoliation and concerned about how it might impact on their enjoyment of the forest. Only a few, however, felt that defoliation would cause them to alter their visitation plans.

Defoliation is a serious problem. Many people expressed serious concern about moderate to high defoliation. Hikers and campers, in particular, worried about how defoliation would affect their activities in the forest. Even so, few people indicated that prior knowledge of defoliation would cause them to cancel visits to the forest.

I can endure the infestation of these things; I just wouldn't have a picnic or something. But we live in Wisconsin and we look at bare trees most of the year. The last thing you want to see is to go outside and see trees with no leaves. You wait all year for that.

Setting up a tent in June or August, it's a nice 90 degree day, and you're sitting in the direct sunlight. It doesn't sound real appealing.

Trees give you shelter. That's the feeling I get.

Mountain biking is going to be less affected than a lot of other activities in the park. If I were going to go mountain biking I probably still would go, but if I were to go hiking I probably would be like, 'Oh man it's not worth going hiking, with no leaves on the trees like this; it's too disgusting.'

Mountain biking, you really don't pay attention as much because you're going so fast and you may hit a tree. But if I went for a hike, you listen to the sounds of the wind in the grass and on the trees. I would probably be obsessed with what happened to these leaves; that would dominate my thought process while hiking. I wouldn't be able to relax. I would think this is awful and it would probably taint my future visits.

Defoliation is bothersome. Some people felt that defoliation would affect their enjoyment, but they did not feel that it would be a serious deterrent to visiting the forest.

Most of us would understand it's a natural process. So, if we see some moderate defoliation, it's probably not going to be bothersome. But if we see a picture like this, a whole grove with no leaves, it's going to bother us.

My major concern is that I don't want the trees hurt for the long run. I can deal with three weeks of ugliness in my life. If I'm going to ride the trail for the next 20 years, I don't want the trail to look like that forever.

Getting a picnic table like in your picture and trees with no leaves, it would take a little bit away from the experience.

I would still ride but it wouldn't be much of an aesthetic experience. Nothing is going to keep me from [horseback] riding.

A few people were not sure if gypsy moth induced defoliation would change their use of the forest. They wondered about the extent of any gypsy moth outbreak and how the surrounding recreational areas would look in comparison to the SUKM.

From a horse standpoint, I'm more passive and the bikers are more physical... We go more for beauty. That's what we are truly riding for. Some of it is what can the horse do, the challenge, but a lot of it is we pick pretty places to ride. So, if it no longer was a pretty place we would probably check it off our list. But if everything looks bad, everything within a 60 mile day ride area, if they are all looking bad then what do you do?

So if there was a situation where the Southern Kettles were completely defoliated and other property was perfectly fine, then you're most likely not going to go [to the SUKM]. But if the entire region is devastated, everything else we see around us, then I'm not exactly sure what I would and would not do. It kind of puts a different light on it basically. I guess I still don't know.

Defoliation is not a concern. Some people, particularly the mountain bikers, did not believe that defoliation would diminish their experiences in the forest. These people stated that gypsy moth defoliation would have a limited effect on their enjoyment and that it would not cause them to alter their visitation plans.

If I'm going out on a mountain bike, why would trees without leaves affect my plans?

I could deal with no leaves for one year.

Most people would not care about [defoliation]; they would care if trees would die.

If just a temporary problem, that's different. My issue is not leaves on the trees, its dead trees.

I'm just a day user and if I went thee to go mountain biking, which I would, and it was totally defoliated, I would bike anyway.

I'm still going to [horseback] ride.

Tolerance For Tree Mortality

Key Observation - In all of the discussions, people were unable to imagine a tolerance level for tree mortality.

When asked about their willingness to tolerate some tree mortality in the forest, people became bothered with the line of questioning and wondered why the situation might get to that point. They were more interested in focusing on preventative measures than imagining hypothetical situations.

Gypsy moths should be stopped prior to tree mortality.

If defoliation is a step to mortality, why let it progress to that point?

What's the cost of treating [for gypsy moths] versus replanting trees? Isn't it cheaper to stop it in the first place?

I would hate to see any tree lost because of this.

Some people, particularly the campers, stressed that their enjoyment of the forest would be compromised by tree mortality. Some of these people felt that tree mortality might cause them to change their use of the forest.

[Tree mortality] would make a big difference because we were all talking about how we don't like all the sun. We want shade trees.

My husband likes the shade. When we go to Ottawa, he's like, 'Oh, not Ottawa; there's no shade.' So when we go, I try and get a site with a tree that is big enough for him to sit under it on a sunny day.

We would go there because of our [horseback] rides, our endurance rides, because that's where it is. But to go there for pleasure camping, probably not.

Knowing that things were in that condition, I wouldn't specifically go there for the purpose of having a picnic or something like that.

If I knew I was going to be out mountain biking in the bare sun for a couple of hours and it was hot out, I probably wouldn't go.

Homeowners stated that they would be upset if they lost trees on their property due to gypsy moth activity. Almost all homeowners, however, felt that the threat of tree mortality was a fact of nature.

Certain trees give your property a certain look, and if that changed, your home changes; it wouldn't be as pleasant. But if that's something that happens in nature, you deal with it and keep moving on.

I wouldn't move because a bunch of trees died.

There are certain trees that are always in peril. The elms went a while ago; others have gone. If you know there is a peril to a certain species of tree and it's coming, you want to do something about it. You don't want to lose your trees; its part of the value of your property. It's why we live out here.

FOREST MANAGEMENT ISSUES

The Need For A Gypsy Moth Management Plan

Key Observations - Everyone in the discussions agreed that a gypsy moth management plan is essential.

In each discussion, all of the participants felt that a plan needed to be in place to control the gypsy moths and protect the forest. Being uneducated on the subject of gypsy moth management, people were not exactly sure what the forest managers should do, but stressed that something “needs to be done.” In addition, participants also expressed concern about the consequences of a control program.

Gypsy moths need to be controlled. After learning about the potential effects of a gypsy moth infestation in the forest, people wanted the forest managers to take action.

I guess I'd expect them to do something about it. I'd want them to take some action.

It strikes me as being a pretty easy decision. If you decide you want to keep the oaks, you spray the gypsy moths.

Targeting the problem now and planning for the future seems the best thing to do.

The way I would approach this is, what is going to be the best overall strategy? And if that means there is going to be two years where there is going to be more caterpillar poop on the picnic tables but that means that the next ten years you're going to be better overall, it seems that is how you would go.

I think [gypsy moth management] is a priority because it's cyclical...It won't just go away.

From what I'm hearing, this is not just a matter of three weeks and no real damage. You don't know that. You don't know how bad it's going to get...We need to stop it before it's out of control.

The forest needs to be protected. In each discussion, the participants were asked to talk about what they expected the forest managers to do about the gypsy moths. It was clear that people expected the forest to be protected and maintained in some way.

I think if there was destruction I would want the park to do something. But if they were like the Asian beetles where there doesn't seem to be any known destruction besides being annoying, I would not expect the park to do anything. If I knew the caterpillars were destroying the forest, I would hope the park would do something.

If there is a good option that doesn't throw everything out of balance then you should be proactive and eliminate the problem before it gets out of hand. Or control it before it gets out of hand, because if it does get out of hand then you're reacting to it.

I say spray it all. Protect the whole forest.

Best case scenario is like nothing at all, like they didn't come into the forest. But even if in the middle of the forest, if it was off the main trails, that those trails were eaten up by those things. I think they should [protect] the whole park because it all is public recreation area, even if nobody is there. You can't just let it go.

What would cure the problem most effectively while having the lowest impact on the entire environment? Whatever that may be, if it means wiping down the campgrounds or wiping out the bike trails, fine. If that's the best solution and it will save everything for years to come, then everything can be reestablished.

The forest has to be there; that's why I come.

When it's upon you, that's when it becomes a big deal. The reason to go to the Kettle Moraine is the forest. I walk in the woods; I ride my bike in the woods. It's a high priority for me in my life.

Concerns about control. Although everyone in the discussions supported a gypsy moth management plan, some people expressed concern about the impact of the control methods.

I guess that depends on what the options are. Because right now, if you can spray and kill them and not harm anything else, go for it. But if it kills all other living creatures then the answer is no.

Ladybugs and caterpillars I'm not worried so much about. Aesthetics or whatever. But I don't want to see everything else killed off and throw everything out of balance.

In addition, people expressed a need for general information regarding gypsy moth control methods and the goals of a management program.

So, when they spray, what are they trying to do?

What are they spraying and what's the effect on other things?

Also, some people questioned the effectiveness of gypsy moth control efforts.

The 'do nothing' card, it says the population periodically collapses due to overpopulation. Does the act of trying to suppress the population actually maintain the population? Because now they aren't overpopulating and they can maintain an even keel of five moths per tree or whatever?

Well, how effective are any of these [pesticides]? In fact, are these controls or are they a degree of control? If you take the worst one and sprayed, that would wipe the gypsy moth out? They would never have any effect, then, in the areas you treated?

I don't think cost is the most important question [regarding a control program]. I think efficiency is. It sounds like it isn't working real well because it's still going on.

If the forest was going to be sprayed with pesticides of any kind, people wanted general information about how a spray program would work and how the public would be notified.

How often would you have to use the pesticides? Every year?

How far in advance would you know about spraying?

How would spraying information be communicated? When, where?

Reasons For A Control Plan

Key Observation - Discussion participants expressed many different reasons why they felt that gypsy moths need to be controlled.

Everyone in the discussions agreed that a gypsy moth management plan is needed, but various reasons were stated.

Gypsy moths are not native. Many people expressed concern over the fact that gypsy moths are an exotic species.

That's not part of nature; that's nature out of balance. They are not indigenous creatures; they're from Europe or wherever and there's probably a natural way to keep them in balance, some sort of predator.

It's not native; it's an introduced species and it takes out trees. That affects birds and animals. So, once you see the bigger picture, I think the 'do nothing' approach is hard to stand up for. Especially, since it's not native.

The beauty of the SUKM needs to be protected. Some people were worried about diminished aesthetic beauty of the forest and its impact on their enjoyment of the forest.

My argument would be we have public lands so people can go in and enjoy them and they are diminishing so quickly and people go to them largely to enjoy the trees and foliage. You want to see leaves in the summer and you want them to turn colors in the fall. I guess if you decide the thing is a pest and not natural, kill the damn thing!

Southeastern Wisconsin is an area where 60 or 70 percent of the population is from Madison, Milwaukee, and Sheboygan County, that area. The Kettle Moraine is what we have; I would prefer to see our little piece of paradise taken care of.

Gypsy moth activity may lower visitation and reduce forest revenue. This participant was nervous about the economic effects of a gypsy moth infestation in the forest.

If people aren't going there and paying fees you don't have the money to run the forest. Lovers of the forest area can't ignore [the problem].

The SUKM can be a model for other areas. One person thought the Southern Unit should set a precedent for the management of other state forests and parks.

That's important because if the forest manager doesn't do anything it could have a trickle down effect. Whatever course of action they choose for Kettle Moraine could have a big effect on what the other parks can do and want to do.

A management program can serve as a public relations tool. Another person pointed out that visible signs, such as moth traps, of an ongoing gypsy moth control effort in the forest could be an opportunity for educating visitors and showing the public that something was being done to protect the forest.

If I was camping and saw those traps I would think that's pretty neat because it would show that steps are being taken. Whereas, if they are spraying and you see them, the caterpillars, and it has been sprayed and it's rained, you might think they aren't doing anything about this.

Forest Composition

Key Observation - Discussion participants had diverse opinions regarding the importance of gypsy moth-induced forest composition change.

When asked to describe what they liked best about the Southern Unit, many people talked about the diversity of plant life and ecosystems within the forest. For some people, the closed canopy of the forest was considered the most important feature. After hearing a brief description of gypsy moth impacts on the forest and the potential forest composition change away from oaks, people expressed varying opinions on the importance of an oak-dominated forest. Finally, people discussed the value of an oak regeneration program.

Diversity within the forest is important. Many people felt that the diversity of the area was the most outstanding feature of the Southern Unit. They appreciated the different types of trees and the various ecosystems within the forest.

When I go hiking, which is fairly frequently...that's when you appreciate the rolling hills and the pastoral nature and you get the oaks and pines. I don't care for the pines as much because they don't look as natural to me, although I like the smell and the carpet. But it's beautiful though; you go for a three-hour hike and you feel like you've gone through a prairie, through oak and also through pine and some other things as well. It's very pretty.

I think of the different trails, too, the different types of trees; there are some oak savannas and some little pine bogs, and even the prairies.

Great old-growth deciduous forest in lots of areas. The hiking areas, you have planted pine forests. At the Scuppernong trail you have the peat moss beds.

I think one of the nice things about the Kettle Moraine forest versus, say, the Hayward forest, is the diversity. Up north it all seems the same.

I like the canopy on a hot day. But, when it's cool like today, it's nice to have the open area.

Maintaining the forest is important. Other people focused specifically on the forested areas and emphasized the importance of a closed canopy.

For me, mountain biking a forest is a lot different than mountain biking not in a forest, like in a prairie or something. I feel that part of the experience is being in the forest and that's something I really enjoy and it's really quite different if you're not in a forest.

The tree mortality risk is the biggest thing for me. I'm not too worried about the nuisance stuff, like the picnic tables and all that. The tree mortality and the possibility of switching from oaks to buckthorn or whatever over the long term seemed like a pretty big downside.

I like the way it is, personally. I would hate to see [the forest] change.

Oaks are important. Some people stated that oak trees are an important factor in their personal enjoyment of the forest.

I've seen plenty of old oaks when I hike. Oaks are kind of like works of art by themselves and they are beautiful trees so they command your attention, particularly the older ones. There's some that I don't know how old they are but I imagine they are at least 150 years old, perhaps; they are pretty massive.

The oak forest is different because it's more open than a maple forest. It provides more open areas for wildlife; it's a more interesting woods to participate in... Yes it would diminish the experience not to have the oaks.

When I go up north, it's old white pine forest and I like that just as well. In the Kettle Moraine, I like the oak trees. It's why I go there.

[I like] the big burr oaks; they are so magnificent.

It would diminish the experience not to have oaks.

Oaks don't matter. Some other people, however, were not aware of the oak trees and/or did not consider them essential.

I can't [describe the oak growth in the forest]. I don't pay attention to it.

When I mountain bike I don't really pay attention to the trees because if you take your mind off the trail you'll hit a tree or something.

I don't have to have oaks, just a tree to ride under.

The forest just kind of looks like Wisconsin to me. Don't spend much time thinking about the oaks.

Some people preferred the planted pine areas of the forest to the oak-dominated forest.

I can't say I honestly know in the park where all the oak trees are but I can think of one or two stands that we ride through. To me I think primarily of pines; that's what comes to mind when I [horseback] ride there.

My favorite part of the trail is under the pine boughs. Smells great and beautiful.

Importance of an oak regeneration plan. Most people were confused about the concept of an oak regeneration program and found it difficult to assess the necessity of having a reactive plan in place.

If we are going to lose the oaks like we lost our elm trees, let's talk about reforestation with something that's resistant.

There is no point in regenerating if they will just be killed again.

If you let the gypsy moths kill the oaks and you decide to replant oaks, that just seems like not a wise use of taxpayer money.

You're talking about a forest that most of us will never see; our children will.

This person stressed the importance of maintaining a native forest.

It's important to me that it's a native tree... [Transition to buckthorn]; that's not acceptable.

Areas For Protection

Key Observation - Most people felt that forest managers should make high use areas of the forest a priority for gypsy moth protection.

When asked if there were specific areas of the forest that should be targeted for protection from gypsy moths, most people who expressed an opinion suggested the high use areas such as campgrounds and trails. Some people felt that it was more important to target low use areas instead. Others were unable to prioritize areas of the forest and believed that the entire forest should be protected. A few people pointed to specific places within the forest that they would like to see receive special attention.

Protect high use areas. Most people who expressed an opinion felt that the areas that visitors use the most should be the highest priority for forest managers. They wanted these high use areas to be protected from gypsy moths.

The obvious answer is areas that people see and use.

The parking lot areas; lots of people only go 20 or 30 yards from the parking lot for picnics.

Low use is places I don't go! Let's be honest; I want places I go to be beautiful.

Many people specifically mentioned the campground areas.

Along the mountain bike trails it probably wouldn't make any difference but in the campsite if I'm staring at the devastation with the sunlight beating down on my head I would definitely go home with this bad impression.

I would be more concerned with the camping and the picnic areas [than around the trails].

Prioritize the campsites and then, perhaps, the surrounding areas of the water holes and the swimming facility. I mean it's about us enjoying this experience and not having the spraying affect the experience of the weekend.

Got to be the campground.

Other people mentioned the trail system.

We would be more concerned with anything along the trails.

How about [targeting] the trails?

High use is hiking and biking trails.

A couple of people wanted to target the areas around the lakes.

I think the trails by the lake.

More people use the swimming areas than camp because you have the weekend picnickers coming out. They are going to want that to be their priority.

Protect low use areas. In contrast, other people felt that it was more important to prioritize the low use areas of the forest because of their rarity and natural beauty.

I say preserve the areas people do not go to. Preserve the forest, not the beaches, not the trails, not the campgrounds; that's trashed anyways. It's just a strip of hard packed pavement going through the forest, basically. The trail's packed so hard; that's why nothing can grow there and nothing is growing around the campgrounds. I say preserve the low use areas because that's where I go.

As far as I'm concerned, the most beautiful areas are not the high use areas. I would not be willing to give that up, just because it's a low use area. That's not right.

A few people mentioned targeting the oak trees.

Oak groves seem rather rare. You drive down the road and see spots that have survived deforestation and farm fields, but they seem fairly rare things especially in Southern Wisconsin. ...All the more reason to protect them is my point.

Target the oak groves and don't worry about the other areas.

Protect the entire forest. Many people were unable to prioritize areas of the forest and felt that the entire property should be protected from gypsy moths, rather than specific areas.

It's such a big park. I think it would be hard for any of us to say that certain parts would be okay and this one wouldn't.

Personally, I'd like to see all the areas saved.

I think the entire Southern Kettle Moraine forest should be a priority area.

Also, people worried that treatment of selected areas within the forest may not be effective or even possible.

Are you saying you do have that flexibility, to treat some areas and not others?

Are you suggesting that you can treat this in small pockets? Because it seems to me that if you treat it, you would have to treat it all over because it moves around.

The other thing is that if this [defoliation] happens in the forest, we, being neighbors of the forest, it's going to happen in our backyard, too. How is the state going to handle it for everybody else?

My question would be, if you decide to treat the Kettle Moraine area or further north, what happens if you don't treat the national forest? Is this still effective if our next-door neighbor is doing nothing?

Protect specific areas. When asked to consider forest budget constraints, a few people were able to name specific areas within the forest that they felt should be targeted for gypsy moth protection.

Kennedy Hill; its all oaks and beautiful trees. It's a hill by ZZ.

South of ZZ on the part of the trailer park area.

Ottawa Lake, Scuppernong trail. That area is probably the most used area. Whitewater Lake is another area, and maybe where the ranger station is also.

The Ice Age Trail that goes through the park.

A couple of people made it clear that not all areas are suitable for pesticide spraying.

I would like you to not spray over the water where we go swimming. I still have concerns with it on the skin and swallowing it when it's on the water.

I say, keep [pesticides] away from the high use areas.

Gypsy Moth Management Versus Other Forest Issues

Key Observation - Most people feel that gypsy moth management should be a priority.

Many people believed that gypsy moth control should be the forest managers' priority above all other issues. Other people saw links between gypsy moth management issues and other environmental issues in the forest. Some people felt that while gypsy moth management and control is important, there are other issues in the forest that are of greater priority.

Gypsy moths are the most important forest management issue. Many discussion participants thought that gypsy moth management is more important than any other forest issue.

If it's really going to kill big plots of trees, yeah, it's more important than trail maintenance or having people educate other people to pick up their own trash and stuff.

The overall conservation of the forest is much more important than a couple trails and their maintenance. Because that's the whole point, anyways, to have a nice secluded area that's away from the city for people to enjoy.

If we had a deforestation like we saw on those photos it would be on top of my list. The other issues seem to be luxury issues, petty concerns.

Most of those problems are minor inconveniences. Gypsy moths are a priority.

I'd make it a top three issue.

The other [problems] could be handled by volunteers. The DNR should focus on saving the forest.

It would have to be a top priority, along with trail erosion.

Gypsy moths are part of a bigger problem. Some people saw links and overlaps between the gypsy moths and other forest management issues that were brought up in the discussions.

The invasive plants [have] a devastating affect on the forest... but I'd put [gypsy moths] above all those [other management issues]. If you did have complete deforestation, none of those things would really matter.

This person summarized the links noted by his fellow discussants.

If we lose the leaves on the trees and lose the trees there will be more trail erosion. We probably won't have to worry about logging debris; there might not be any logging. Replanting would be an issue because we would have to replant trees that have died or weakened. If any good comes of the gypsy moths I would hope they help eliminate some of the invasive species, but that would probably be their last choice, right? And definitely habitat for the birds and animals of the forest, it would overlap on that. Tent caterpillars, you said we could probably eliminate those. Pines versus hardwoods, we would have a lot less hardwoods and a lot more pines if we had an invasion of the gypsy moths.

Gypsy moths are not the most pressing forest management issue. Some people believed that gypsy moth management is important, but that it is not the most important issue that the forest managers should be concerned with.

The cleanliness and the maintenance [is of greater importance]. I will sacrifice a few leaves for cleanliness.

If we had to pick something [more important than] the spraying of the caterpillars, it would be putting electrical [camp]sites on non-reservable sites.

The only thing I would see as more important is more of an enforcement issue for the water skiers and the bikes on trails, because those I don't view as taking a lot of expenditure of manpower, it's just enforcing what's there.

Other people did not believe that the gypsy moths were a long-term concern or felt that they were not yet a concern that the forest managers needed to be worried about.

With the gypsy moths, I think you're talking about something that has an immediate effect and, yes, it is going to affect some of the issues we brought up, but there is a way to control it that is short-term... With erosion and the invasive species, these are long-term things that need to have a long-range plan. Gypsy moths are more of a short-range thing where you have an immediate plan that you can put into effect... With the gypsy moths, you might have year's worth of work to bring them under control, but it's always just a short period of time. You're not going to eliminate erosion with just one year.

Right now, [the gypsy moth] is not affecting any one of us.

Funding A Gypsy Moth Management Program

Key Observations - People did not believe that funding a gypsy moth control program would be a problem.

Most people who expressed an opinion thought that raising forest user fees could fund a gypsy moth management program. Some people thought that there should be enough money available in the budget to protect the entire forest if funds were allocated properly.

I think we have the resources. I know the budget is tight, but with increased fees the DNR should be able to get the funds they need. This is why we have state parks and state forests. They should be protected.

I would pay a higher user fee to help pay for this.

Raise the fees and treat the whole forest.

Some of it is proper use of funds... Spend money on things that are important, and this strikes me as being important. I guess I don't mind if there is one less park bench or one less picnic table or no stairs walking down to the lake and if the park rangers don't drive brand new Explorers right away.

METHODS OF CONTROL

Preferred Methods For Controlling Gypsy Moths

Key Observation - The vast majority of people in the discussions supported the use of Btk to control gypsy moths.

The overwhelming majority of participants stated that they preferred the use of Btk for gypsy moth management over the other choices. A small minority of people chose Gypchek and several others chose mechanical control or Dimilin. No one preferred to do nothing.

Use of Btk (*Bacillus thuringiensis var. kurstaki*). When given a choice between different gypsy moth control techniques, and after weighing the advantages and disadvantages of each, most people found Btk to be the most acceptable (or least objectionable). Environmental and economic concerns seemed to be the overriding factor in their decision.

Naturally occurring, low cost; there did not seem to be a lot of disadvantages to this one.

It seems the least dramatic. It has the fewest side affects on other organisms.

The disadvantages seemed to be minimal compared to the other choices.

I've got the Btk for number one for the reason that compared to some of the other ones it does not seem to have the severe disadvantages

I went with Btk also. I just tried to weigh the positive impacts against the negatives...It seems the simplest and the cheapest.

Btk was first; it seems the least dramatic. It has the fewest side affects on other organisms.

I had Btk, too. I like that it doesn't have an impact on the environment.

Likewise, Btk. It's natural and the cost issue because we will be paying for it. It takes care of it. At least it's natural.

Other people were unable to make a decision or stated a preference for Btk but were less enthusiastic in their support.

I couldn't decide between the Btk and the Gypchek because they both seemed to be effective with no impact on the environment other than [to] the gypsy moths and people.

It was the least objectionable of all of them.

Even though Btk was the preferred control technique, many people still expressed concerns about the pesticide and asked for more information regarding its effectiveness.

It just sort of saves the leaves and does not kill the gypsy moths. It would not be a permanent solution.

If you spray Btk, would you always have to spray or just spray once and [gypsy moths] are gone forever?

The Btk says it's better at protecting the foliage, so would you have to do it every ten years or so?

Too much spraying...If it rains, you have to do it over.

Has it been effective in other areas?

This person wondered if Btk would be suitable for multiyear applications. His assumption was that Btk would have to be “rotated” with other control measures.

It strikes me that you're going to need a combination of things because the long term effects of some of these was rapidly broken down UV and most of the spraying was going to do that. My first choice was the Btk as well. It seemed to be effective and although it did have affects clearly it wasn't going to be the solution every year. You would have to rotate like crop rotation or something like that. But this struck me as being the most effective.

Use of Gypchek (Nucleopolyhedrosis virus). Several participants chose the virus Gypchek as their preferred gypsy moth management technique. The people who preferred this method were concerned about pesticides in the environment.

I chose Gypchek because it says here, 'It only affects the gypsy moth.' The other pesticides, I didn't agree with because they seem to do damage to other animals and there was potential for them to get into the groundwater supplies. Even though it's the most expensive, it seems to be the most effective. If we are talking about being proactive, this is the best choice.

If you're going to do it you might as well do it right. If you can get them early in the spring that's probably the best thing, and this one didn't seem to be as hard on other things in the forest.

Concerns were raised about the effectiveness of this management technique as well. In addition, a couple of people were worried about the potential problems for asthmatics.

It is a virus, the NPV, and it seems like species are pretty good at genetically altering themselves at some point to defend against what once was wiping them out.

It might not be as effective in some areas or as some other pesticides might be.

My only concern was the allergic or asthmatic response in people and how long is the affect after spraying. Is it a day or two days? Would you have to close the park?

Use of Mechanical Control. Several other people felt that mechanical control was the best way to manage the current gypsy moth population. Others expressed a preference for this method due to their aversion to pesticide spraying, but acknowledged that this wasn't a viable option.

I think that's where you would start. At this point I don't think there are that many [gypsy moths] out there. At some point you would have to progress to something else.

I had mechanical control because I'm not real big on chemicals, but I changed it because where are you going to get the manpower to go out and check the traps?

I don't think the mechanical [control] will work but I really don't want the spraying.

Use of Dimilin/Mimic. Even though most people did not support the use of Dimilin over the other options, a few people acknowledged its advantages.

It's long lasting and a single spray is effective, not toxic to other animals.

It's something that can work in a large area. The others seem like they are for small areas of containment.

Least Preferred Gypsy Moth Control Techniques

Key Observation - Doing nothing about the gypsy moths was considered the most objectionable option, followed closely by the use of Dimilin.

When asked to prioritize the five different gypsy moth management techniques by preference, "Do Nothing" and Dimilin were consistently and evenly ranked last by participants in the discussions. A couple of people felt that mechanical control was more objectionable and considered it ineffective and a waste of time and money. No one voiced objections to the use of Gypchek or Btk.

Do Nothing. Surprisingly, not a single person offered "Do Nothing" as his/her gypsy moth management technique of choice. In fact, this option garnered the least support of any of the techniques. Many of the people in the discussions found doing nothing to be the most objectionable choice. Participants in the day user discussion were the most opposed to this choice.

It does not seem like an option to just let nature take its course.

With 'Do Nothing' I think you would probably have a greater loss.

I think you have to do something.

I weighed all of the advantages and disadvantages – compared it to the Dimilin and I came up with 'Do Nothing' as my least choice. I kept thinking of the zebra mussels and we did nothing there.

Use of Dimilin/Mimic. The people who opposed the use of Dimilin for gypsy moth management voiced strong concerns about its effects on non-target organisms and the environment. Many of the people in the discussions found Dimilin to be the least preferred or most objectionable choice. The people in the horseback rider discussion were the most opposed to the use of this pesticide.

The Mimic solution seems pretty nasty to me.

It affects birds and mammals, everyone; it's terrible. It kills every forage-feeding insect for the entire growing season. It's going to mess up everything in the water, crustaceans. It's napalm. You can't go in the environment after you treat it with this stuff.

It affects too many other insects.

I'm very uncomfortable about it getting in the water.

Opinions On The General Use Of Pesticides

Key Observation - Discussion participants expressed many different opinions regarding the value and safety of pesticide use.

A wide range of opinions was voiced when people were asked to discuss their feelings about pesticides in general. Some people felt that pesticides are valuable for controlling unwelcome insects and safe to use. Other people admitted that they did not know much about pesticides and/or were unsure about their safety and effectiveness. Some people expressed deep concern about pesticide safety and did not consider pesticides an appropriate control method.

For some, pesticides are an acceptable method of control. Some people stated that, when used properly, pesticides are a safe and effective method of controlling unwanted insects.

I use pesticides at home, and I think part of that is my age. I no longer have the time or energy to combat it any other way.

I'm an old Iowa farmer, so I think we use them without the knowledge and respect that we should have for them. Used properly, I think they are effective and not a problem.

In an area as large as the state forest, and with today's better understanding of pesticides and the kind of controls they have, and you know what they affect, where they affect the DNA of different species, that is a better option and is going to be more effective in the long run.

The decision to use pesticides must be made cautiously. Many people were unsure about pesticide safety and expressed environmental concerns while acknowledging the benefits of pesticides.

I'm not familiar with what the chemical is [to control gypsy moths]. To me, the issue is if that chemical is something that's going to be harmful. If there is no danger to me or long term harm to the environment, then spray it.

I think if you can find a natural biologic that is going to attack that species and only that species, that is the preference. If you can find something like that... You want to avoid spraying indiscriminately.

We are against pesticides too, but there have been times we have been camping where it was so atrocious that we got out the Deep Woods Off and sprayed because it was like, 'Oh my God these things are driving us crazy.' There are certain times you'll use them to have a comfort zone. We've had flies biting so bad that you couldn't move and we ended up spraying because you couldn't go outside.

We don't have any other way to fight some insects, so some of it has to be used. As little as possible. I hate to think we are inhaling stuff that's not natural.

We have all heard the horror stories with pesticides. I'm sure there are some success stories as well. And they are appropriate sometimes. I'm not sure, but they are something we can't take lightly.

All pesticides are dangerous. Other people were suspicious of safety claims and fearful of all pesticides.

I'm against using them if there is any other alternative, because years ago they used them and said they are fine. Then, years down the road, they find out there are health hazards.

I'm pretty much against pesticides, too. People pretty much use them for everything...I think it's ridiculous.

I worry about the long term effect of stuff. My father has cancer from inhaling DDT and we make chemicals that are much more heinous than that these days.

What kind of exposure are we getting? Our government once told us Agent Orange was okay. I guess I'm not real trustworthy on having things dropped from the sky.

SPRAY PROGRAM ISSUES

Concerns About A Spray Program

Key Observation - People had many concerns about how a spray program might have an impact on the health of humans, animals, and the environment.

Many people were concerned about the health effects of any pesticides that might be used in a gypsy moth spray program. They worried about side effects and had questions about the history of spray programs. Specific concerns were voiced regarding the potential effects on asthmatics and children. Horseback riders expressed opinions on how a spray program could affect their horses. Some homeowners had questions about how a spray program may have an impact on their property and the properties of other landowners in the area. In addition, a few people were concerned about the effects on non-target organisms in the forest.

General health concerns. People had many questions as to whether a spray program would be hazardous to their health. They wanted to know more about other gypsy moth spray programs and wondered if there were any records of long-term health studies.

What side effects does this have on humans?

No side effects or rashes? How long have they been doing this?

Have they tracked people that have been sprayed to check their health?

How often do they spray? How about cancer rates? Is anybody even documenting?

Some people felt that they would only be worried under certain circumstances. Their concerns focused on the specific pesticide that was being sprayed and whether or not they were given appropriate notice of the spraying.

It depends what you're spraying. If you're spraying Btk then I'm not so worried; if you're spraying the Dimilin/Mimic you probably want to know and not go to the [SUKM].

If I had food on the table and wasn't aware of it [the spraying] until it started, I would be upset. Otherwise, I don't think I would be upset.

This person questioned how other forest visitors would react to the spraying.

If it's guaranteed that it's okay for us, I would not have a problem. I would probably stay in my camper or tent when they are spraying. But you will have people that will be real fanatical about it; they will want their money back.

Concerns for asthmatics. Specific concerns were raised regarding people with respiratory problems.

What is the level of respiratory problems people would experience, say, in comparison to Milwaukee smog, for instance?

I [have asthma], and have other allergies as well. That's why I asked if the park would have to be closed.

I have asthma, so I don't want any spraying to occur unless I can be warned in advance.

Concerns for children. People also worried about the potential health effects for children.

So, if you spray, is that a danger to the little kids?

I think notification at the park, at the trailheads, would be prudent just to let people know what it is. Because, as a parent with little kids, you know, if somebody is flying overhead and dropping something on me I want to know what it is.

Concerns for horses. People who use the forest for horseback riding did not seem to be overly concerned about a spray program harming their animals. Given advance notice, they felt that anyone who was concerned about either the planes or the pesticides could make arrangements to keep their horses out of the area.

I don't think it [spraying from planes] bothers the horses.

We could post on the trailheads that the spraying would occur on the mornings of this week... I was thinking that horses would be the only thing seriously spooked by a small plane coming in 50 feet over the tree tops and that would be sufficient to cover your particular concerns.

I think all you have to do is post that an area has been sprayed at such and such a time and will be sprayed at such and such a time... Here's the days and here are the times and if you have concerns call this number. If you want your animal inside, then put them in. I don't see this as being a problem.

Landowner concerns.

Some homeowners were concerned about how pesticides might affect the health of their animals and the quality of their water supply. One person worried about how a spray program would address the needs of organic farmers in the area.

[What is the] effect on animals, livestock? What is it going to do to our water supply?

Is there something else here that we don't know about? Is the DNR afraid that if they spray and, say, the spray gets onto Mike's property and his horse dies; are they afraid of that?

What do you do with people like, say, organic farmers in the area? They are very restricted and that's their livelihood. What happens to them?

Concerns for non-target species. In addition to the concerns that were already raised about pesticides in general and about specific pesticides, a few people again voiced concerns about the effects of a spray program on non-target organisms in the area.

[I am concerned about] wildlife.

[What about] birds, other moths, butterflies?

Spray Program Information

Key Observation - In all of the discussions, people had ideas about the types of information needed about a spray program and many different suggestions on how the information could be presented to the public.

It was clear that people expected advanced notification about any gypsy moth spray program. They wanted information about why the SUKM was being sprayed, any potential health risks, impacts on the environment, and how they can deal with the situation. People had many ideas about how this information could be obtained by forest visitors, and there were differing opinions on the amount of responsibility that should be placed on individuals to find this information themselves. Suggestions for where and when to obtain information included notification at registration, postings and pamphlets throughout the SUKM, phone or computer access, news releases, and direct mailings.

Types of information needed. People stated that they would like specific information about the reasons for spraying before the onset of any gypsy moth suppression program. They felt that this kind of information would also be helpful for gaining public support for the program. In particular, people wanted prior notification of any potential health risks.

We need to know if you guys spray on Thursday and we come out Friday and go camping and if I get it on my skin that it's not going to hurt me. And how do you spray? Do you spray when the campers are in the campgrounds?

[Make] a very informational pamphlet saying we've been using it since the 1960's and there are no known health hazards to it.

Other people felt that the public needed assurance that spraying would not adversely affect wildlife.

When you inform people, it is important that you tell people the effects on wildlife.

In addition, a couple of people wanted information about what they could do to clean up their camping and picnic areas.

I would like information when I came in [to the SUKM], if there was a high moth population like that at any point. Just sort of commonsensical; that you can get rid of the caterpillars in this way, clean up with this, just sort of some general information.

Getting information to the public. Many people felt that the most effective way to get information to forest visitors would be through a handout at registration or when people buy their trail passes and vehicle stickers.

When you buy your sticker or pass they could give it to you then.

When you come here and get your park sticker you get your flyer, and that same flyer could be posted as you pull into the campground. [That way,] if you don't call for trail conditions and you don't visit the website and you're just going for the day, you are warned in advance.

The newspaper, trail pass, vehicle stickers, give a notification when the people purchase these. Then everybody would be notified.

When you buy your sticker. Anyone coming into the park needs a sticker, so inform them then.

I suggest that when you register, you get rules about the park. Maybe one of the things you should get is notification that, 'Sometime during the year we will be spraying. Check our website for more information.' So that when you plan to go, just check the website.

Some people thought that it would be more effective to hand out a pamphlet to visitors when they came to the forest or post information at the entrance to the forest.

I imagine that for campers coming into the campground, you would hand them a pamphlet saying we are going to be spraying.

When you pull in for that week of camping, you have to hand them a pamphlet giving them all the information saying we anticipate spraying this weekend.

You're going to have to give us some sort of pamphlet or paperwork when we check in. I wouldn't want to hear it through a loud speaker.

Everybody has to go through the gate, so you have a bulletin board with answers to the questions right there.

At the check-in point, you could have a little sign that says, 'It's Friday; we sprayed on Tuesday,' or something to that effect.

Some participants thought that photographs, similar to the ones used in the discussions, were an ideal way to communicate the potential danger of a gypsy moth infestation.

Had we not seen the pictures we would have no clue [about the impacts of gypsy moths]. We'd think, 'Oh there's a couple of bugs. We live with bugs; this is not bad.' When you show people what they [gypsy moths] have done, I don't think you'll have a camper that will oppose the spraying.

You can have pictures by the bathrooms showing if we don't spray, this is what can happen. Then the people will understand and they will allow it.

NOTE: This idea generated enthusiastic approval from the group.

Several people believed that the best place to display spray information is at the trailheads and in the forest newsletter.

A trailhead area would be a good notification site.

Post at the trailheads.

The park paper that they do. Just put it in there. You just run it every year and the people that frequent the park will figure it out. If one person asks a question, maybe someone else read the answer.

The paper and post at the trailheads and at the DNR office.

Others suggested a spray information hot line or information available by computer, putting the responsibility for knowing the spray schedule and related issues directly on the forest user.

They should put the responsibility on us, on the user, because if you're not in the mindset of using the park, getting a letter in the mail won't work. The user needs to take responsibility.

How about an 800 number you could just call?

How about the trail condition hot line? I always call that if there is any question about the trail conditions. It makes you think, 'Well it hasn't rained for the last week, they might be spraying.'

We have so many scattered web sites now, with all the parks we have, that we need a more centralized method to check information. Then your marketing tool becomes so well known that everyone would get in the habit of checking that.

From a personal perspective you can e-mail, give us a web site to click onto and see what those issues are.

We always make our reservations on the computer and maybe you could put a little blurb on there that this campground is having a problem and the times that they are spraying.

They could put us on an e-mail list.

It was acknowledged, though, that a web site alone may not be the most effective method for reaching everyone.

I would not solely rely on the web site to see if they are going to spray.

Many campers thought that they could easily be informed about spraying when they called to reserve their campsites through Reserve America.

You can't even send out a newsletter or anything because who knows who camps. I'm thinking about us, and if I came in today and you said you're spraying tomorrow, that's fine. We would just leave the campsite or go into the camper. Anybody that reserves, you have a list through Reserve America, so you notify them.

Could you do something with [Reserve] America? When you make your reservations, make the general statement that spraying may occur during the year. And a pamphlet at the campground more specific to the times.

Community newspapers were a commonly suggested medium for getting program information to the public.

Just issue a news release. They'll cover it; they live for that stuff.

It sounds like the spraying would affect more than just campers, though. I guess I would prefer to see something on the news or in the newspaper, a general announcement that this is the action plan and this is when it will occur. And when you get to the campground, a little notice saying when the spraying will happen.

How about a general statement saying we will be spraying in May or June, watch your newspaper?

A notice from the state that goes in the newspapers.

Several people, especially among the homeowners, believed that the best way to get information to them would be through a mailing.

I'd rather be notified by mail.

If it's particular areas, by mail would be nice.

Wouldn't it be as simple as sending people letters, in advance, for the areas you are going to be spraying?

When I lived in Vermont, they sent out schedules of spraying so you could close your windows or whatever.

A letter is the best.

Spray Program Notification

Key Observation - People stressed that they wanted to know about any gypsy moth spraying before it happened, but various timeframes were preferred.

Everyone in each discussion group stated that they wanted to be notified about any spraying beforehand. The amount of time prior to spraying that was considered appropriate varied. Some people only needed to know that spraying might occur in the forest at some time during the year. Others felt more comfortable knowing specific times when spraying was likely to occur.

Notification is necessary. People want to be made aware of the spray program before any spraying is done.

We probably don't want our things out on the table when they are spraying. We want a window of time.

If you had a ballpark time frame, then you knew you were going in at your own risk and if you are willing to deal with the planes flying low, I wouldn't have a problem with that.

I would like to know in advance.

I would want to know prior to coming to the park. For me, I would be freaked out if they recently sprayed.

The appropriate timeframe for notification is subjective. An announcement that spraying may occur in the forest at some time during the spring or summer was considered sufficient notice for some people.

Make it a general policy. Like, during these months we are going to spray for gypsy moths. Not so much on the exact days and times they are going to do it, but just as a general policy that they do spray.

Everybody that applies for a trail pass, the DNR gives them a piece of paper [stating] that 'Spraying will occur at some point this year. Please check ahead if you are concerned.'

Other people felt that they would require more specificity in order to plan their activities.

We [horseback riders] need weeks [notice]. Many events are planned months in advance.

You could be more specific. 'We think we'll spray in May; if you're concerned about it, call ahead.'

HOMEOWNER ISSUES

What Are Homeowners Willing To Do On Their Own Property?

Key Observation - Homeowners were uncertain as to what methods they might use to help control gypsy moths on their property.

Participants in the homeowners' group were shown photos and given a brief description of several gypsy moth management techniques that could be used by private landowners to protect their property in the event of a gypsy moth infestation. These techniques included mechanical control methods, hiring a professional arborist, and participation in a local spray program. Throughout the discussion, participants raised many questions and concerns about gypsy moth control. Due to their lack of knowledge regarding the subject, participants were unable to speculate about the nature and extent of their future gypsy moth control efforts. The number and types of questions raised in the discussion illustrate the need for more and/or better public education on the subject.

Homeowners had numerous questions about gypsy moth control. Most of the discussion participants had questions and could not predict how they would react to a gypsy moth infestation. Some people needed general information about tree health and control methods.

How can you tell if a tree is healthy?

[Do you mean] You could selectively take care of some trees on your property?

Is it possible for us to use the traps just to see how bad it is on our land?

Many people had questions and concerns specifically about arborists.

How much does it cost [to hire an arborist]?

Once you inject, how long does that last?

I guess [the decision to hire an arborist] depends on the cost and how many trees you have.

A few homeowners tried to speculate on their possible participation. This person stated that he would be willing to use mechanical control methods on his property.

We would do this [collection band].

Another person speculated that homeowners might take a reactive approach.

A lot of landowners would change the species of trees that they grew on their land [if there was high mortality], trying to get more tolerant species.

Still, another person felt that mechanical controls were not feasible for homeowners with large lots.

Everyone here has at least three acres and these methods don't seem to make a lick of sense to anybody with more than two oak trees on their property.

Questions And Concerns About A Spray Program

Key Observation - Homeowners expressed many concerns about how a spray program would work and how it would be financed.

A brief introduction about gypsy moth control spray programs was presented to the group of homeowners. In the discussion that followed, people expressed many opinions about how such a program should be run and who should pay for it. In addition, concerns were raised about area homeowners who might not want their property sprayed and how management of the forest would affect the cost and effectiveness of a spray program on the surrounding private land.

Who should direct a spray program on private land? Most of the discussion participants felt that, in order for it to be effective, the government should take responsibility for organizing any gypsy moth control spray program.

If people are given a choice of spraying or not spraying they will balk on paying and the infestation will go on and you have not gotten anywhere.

I think that if you leave it up to the individual homeowners it won't be effective.

[A spray program] should work through the state, and anyone who doesn't want to participate, it could go around them.

So, unless the state, and I'm not in favor of big government at all, but unless the state controls the program it won't work.

Sounds like it should be a community-based thing.

Who should finance a spray program on private land? Some people stated that the state should pay for a spray program to control gypsy moths on private land surrounding the forest.

The state [should pay for a spray program]. We all pay taxes.

The DNR could pay for it. They did raise our taxes because of our property bordering the forest. So, you're getting additional money right there from the property owners.

A few people suggested that a spray program could be financed with tax dollars.

It should go back on the tax roll again. Because if he has 80 trees and I have ten trees he should pay for his 80 trees and I should pay for ten.

When you say the state should take care of it, that's a misnomer. We are going to get taxed for it one way or another.

Other people thought that a spray program on private land should be paid for by the participating landowners.

I disagree. If it's just private land, they should pay for it.

If it's just private land then the landowner should pay for it.

One person felt that there should be cost sharing for any spraying of the area surrounding the forest.

I think that being a landowner next to the forest, I have a responsibility to pick up a certain percent of the cost to benefit my own property.

A couple of people wanted to be assured of the effectiveness of a spray program in relation to cost.

Cost is important, but it goes back to effectiveness.

Is there a figure to break it down to a 40-acre parcel, and the cost and effectiveness?

Several people had questions about how other communities had dealt with the issue.

Who has been picking up the cost [on the east coast] and what is the cost for the landowner?

What portion of a 40-acre plot did the federal government pay?

Did the state fund any of this?

Who should pay for a 250-foot buffer? Discussion participants were asked to consider a scenario where forest managers would not treat the forest for gypsy moths, but nearby private landowners could participate in a spray program. In this situation, a 250-foot buffer could be sprayed into the forest to protect the private land from infestation from the neighboring public land. When asked who should pay for this buffer zone, opinions were mixed.

The federal government [should pay for a 250-foot forest buffer].

I think it should be a cost sharing [if a 250-foot buffer is included in the private spraying].

If the infestation was bad enough, I would [pay to] spray a [250-foot forest] border, depending on cost.

Concerns about non-participants in a spray program area. Several people wondered how a spray program would work if not everyone in an area wanted to participate.

What if everyone in the area wanted to participate [in a spray program] except one property? How easy would it be for the sprayers to exclude one property?

What do you do about a scenario where the state is going to do the spraying and you have a landowner in the middle of the block that does not want the spray?

One person was concerned that non-participants may compromise the effectiveness of a spray program.

What is the potential [for reinfestation] if your neighbor doesn't protect their land?

Forest management and implications for private landowners. Some people were concerned about gypsy moth problems on their land as a result of migration from the forest. They worried that problems might be worse on private land if the forest is left untreated and felt that they would not have as many problems if the forest managers were to take a proactive approach and spray for gypsy moths.

If it's my private land, I'm responsible for my land. But the state forest is right next-door and that's an asset for everyone. Maintaining the state forest so pests don't migrate onto my property is their responsibility.

If the state doesn't control the forest, the moths will just move from the forest to my land. It's not just a private landowner problem.

If the state forest controls it first, we shouldn't have a problem as homeowners.

Maybe you guys should spray your forest before we spray ours?

Questioning the need to spray at all. Though a minority in the group, a couple of homeowners felt that spraying private land to control gypsy moths was not an important issue because they believed that there wasn't a problem.

First of all, you have to have a problem to fix and I don't have a problem.

Let's worry about it when we have the problem.



APPENDIX A: ALTERNATIVE MANAGEMENT CARDS

Do Nothing **“Let nature take its course”**

Advantages

- No direct impact on non-target organisms
- Gypsy moth populations periodically collapse, naturally, as a result of overpopulation, starvation, viral or fungal infection, and decreased reproduction
- No direct cost
- Can benefit trees by thinning forests that are overgrown

Disadvantages

- Risk of heavy defoliation and/or tree mortality which could alter wildlife habitat in forests by changing vegetation structure, cover, food, and availability of prey
 - Moderate to heavy defoliation may alter water quality, microclimate, and soil
 - Caterpillars may cause allergic reactions in some people
 - Potential for forest composition change away from oaks
 - Caterpillars and droppings may be a nuisance and interfere with recreational activities
-

Mechanical control

Manually removing gypsy moth eggs and/or larvae by scraping egg masses off of trees, oiling egg masses, or capturing and destroying caterpillars with burlap hiding bands or sticky bands.

Advantages

- No direct effect on non-target organisms

Disadvantages

- Time and labor intensive
 - Effective only where a few trees require protection - impractical and ineffective for entire forests
 - Must be maintained on a daily basis in the spring
-

Gypchek (NPV)

A disease (Nucleopolyhedrosis virus), naturally occurring in gypsy moth populations, produced in labs in concentrated form and sprayed on forests.

Advantages

- Specific to the gypsy moth and does not affect other caterpillar species or any other non-target organisms that might be present in treatment areas
- Can trigger NPV epidemic earlier than would normally occur, causing collapse of gypsy moth population

Disadvantages

- Available in very limited quantities and extremely expensive to produce
 - Produced by the U.S. Forest Service - not available commercially
 - Can be less effective than other pesticides
 - Generally only used against high gypsy moth populations
 - Older caterpillars are not as susceptible to the virus
 - Can raise allergic or asthmatic responses in people
-
-

Btk

A bacterium (*Bacillus thuringiensis* var. *kurstaki*) that occurs naturally in the soil and causes crystals to form in the mid-gut of caterpillars that ingest it.

Advantages

- No impacts on mammals, birds, fish, insects other than spring feeding caterpillars, and other non-target organisms
- Rapidly broken down by UV light (sunlight); persistence is typically less than one week
- Low cost

Disadvantages

- Can affect many other types of foliage feeding caterpillars, but populations of native species generally recover or recolonize an area within 2 years
 - Rapidly broken down by UV light (sunlight); persistence is typically less than one week
 - Must be reapplied if it rains after spraying
 - Not effective on older caterpillars
-
-

Dimilin / Mimic (synthetic molting hormone)

A synthetic growth regulator that blocks the production of chitin, the primary component of the exoskeleton of insects and crustaceans.

Advantages

- More effective and longer lasting than most sprays due to very slow degradation by UV light
- Affects all foliage feeding insects for the entire growing season
- Will kill older caterpillars

Disadvantages

- Low toxicity to birds and mammals, but kills non-target insects and crustaceans and prevents the formation of mushrooms
 - Effects on aquatic invertebrates prevents use near water and wetlands; pesticide on leaves that fall into water can remain toxic to aquatic invertebrates for 2 years
 - Slowly degraded by UV light (sunlight)
 - Will kill all foliage feeding insects for the entire growing season
-



APPENDIX B: PHOTOGRAPHS

Photographs are numbered in the order that they were shown to focus group participants.

1



3



2



4



5



6



7



8



9



10



11



12



13



14



15



16

