

Decision Notice and Environmental Assessment

Wisconsin Gypsy Moth
Suppression Program, 2009

Wisconsin Department of Natural
Resources and USDA Forest Service

**USDA FOREST SERVICE
AND
WISCONSIN DEPARTMENT OF NATURAL RESOURCES**

**COOPERATIVE GYPSY MOTH SUPPRESSION
2009**

ENVIRONMENTAL ASSESSMENT

FOR

**ADAMS, BROWN, COLUMBIA, DANE, FOND DU LAC, GREEN LAKE, JEFFERSON,
JUNEAU, KENOSHA, MARATHON, MARINETTE, MARQUETTE, MENOMINEE,
MILWAUKEE, OUTAGAMIE, RACINE, ROCK, SAUK, SHAWANO, WALWORTH,
WASHINGTON, WAUSHARA AND WINNEBAGO COUNTIES**

April 2009

**For Information or Copies
of this Document Contact:**

**Andrea Diss-Torrance
Gypsy Moth Program Coordinator
Wisconsin DNR
101 South Webster Street
Madison, WI 53707-7921
Phone: 608-264-9247**

**Steven Katovich
Forest Entomologist
Northeastern Area,
State and Private Forestry
USDA, Forest Service
1992 Folwell Avenue
St. Paul, MN 55108
Phone: 651-649-5261**

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1.0 PURPOSE AND NEED FOR ACTION

1.1 Proposed Action

The Wisconsin Department of Natural Resources (DNR) proposes a cooperative project with the United States Department of Agriculture Forest Service (USDA-FS) to suppress gypsy moth populations in portions of 23 Wisconsin counties: Adams, Brown, Columbia, Dane, Fond du Lac, Green Lake, Jefferson, Juneau, Kenosha, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Racine, Rock, Sauk, Shawano, Walworth, Washington, Waushara and Winnebago counties. Infestations proposed for treatment cover an estimated 10,563 acres at 135 locations (Table 1).

The preferred alternative is: One aerial application of the bacterial insecticide *Bacillus thuringiensis* var. *kurstaki* (Btk) or one aerial application of the gypsy moth nucleopolyhedrosis virus (Gypchek). Btk or Gypchek would be applied when gypsy moth caterpillars are in the first to third instars, in early May through early June.

Table 1. Proposed 2009 suppression treatment sites in Wisconsin. The threshold number of egg masses per acre to be eligible for the suppression program is 500 for residential areas and 1000 for rural areas.

COUNTY	TREATMENT BLOCK NAME	DESCRIPTION OF BLOCK	ACRES	EGG MASSES PER ACRE	TREATMENT
ADAMS	Adams 1	Roche-A-Cri State Park	49	1133	Btk 36 CLU/ac Foray 48F or B
	Adams 2	Preston	29	800	Btk 36 CLU/ac Foray 48F or B
	Adams 3	WI Dells 2 state lands	140	1626	Btk 36 CLU/ac Foray 48F or B
	Adams 4	WI Dells 3 state lands	112	1626	Btk 36 CLU/ac Foray 48F or B
BROWN	Brown 1	Suamico-Pittsfield	29	612	Btk 36 CLU/ac Foray 48F or B
	Brown 2	Suamico 2	206	508	Btk 36 CLU/ac Foray 48F or B
	Brown 3	Hobart 1	50	630	Btk 36 CLU/ac Foray 48F or B
	Brown 4	Hobart 2	53	600	Btk 36 CLU/ac Foray 48F or B
	Brown 5	DePere, St Norbert College	26	2533	Btk 36 CLU/ac Foray 48F or B
	Brown 6	DePere, Ridgeway Blvd	69	1090	Btk 36 CLU/ac Foray 48F or B
	Brown 7	DePere, Legion Park	23	1253	Btk 36 CLU/ac Foray 48F or B
	Brown 8	Rockland	26	3960	Btk 36 CLU/ac Foray 48F or B
COLUMBIA	Columbia 1	Arlington	28	1720	Btk 36 CLU/ac Foray 48F or B
	Columbia 2	Dekorra	36	2360	Btk 36 CLU/ac Foray 48F or B
	Columbia 3	Wyocena	21	1173	Btk 36 CLU/ac Foray 48F or B
DANE	Dane 1	Madison 1, Westward Woods	21	680	Btk 36 CLU/ac Foray 48F or B
	Dane 2	Madison 2, Old Sauk Rd.	21	1840	Btk 36 CLU/ac Foray 48F or B
	Dane 3	Madison 3, Parkwood Glen	22	1000	Btk 36 CLU/ac Foray 48F or B
	Dane 4	Madison 4, Faircrest	94	3250	Btk 36 CLU/ac Foray 48F or B
	Dane 5	Madison 5, Glen Oak Hills Park	93	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 6	Madison 6, Oak Park Heights	182	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 7	Madison 7, Meadowood	21	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 8	Madison 8, Nakoma	308	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 9	Madison 9 Westmorland Park	17	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 10	Madison 10, Hoyt Park	213	1400	Btk 36 CLU/ac Foray 48F or B

	Dane 11	Madison 11, Forest Hill	73	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 12	Madison 12, University Heights	79	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 13	Madison 13, Todd Dr.	27	1000	Btk 36 CLU/ac Foray 48F or B
	Dane 14	Madison14, Ardsley Dr	16	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 15	Madison 15, Goodman Park	21	1000	Btk 36 CLU/ac Foray 48F or B
	Dane 16	Madison 16, Olin Park	34	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 17	Madison 17, Allis School	65	3240	Btk 36 CLU/ac Foray 48F or B
	Dane 18	Madison 18, Acewood Park	37	1000	Btk 36 CLU/ac Foray 48F or B
	Dane 19	Madison 19, Elvehjem School	22	520	Btk 36 CLU/ac Foray 48F or B
	Dane 20	Madison 20, Schenk School	27	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 21	Madison 21, St Dennis School	25	1000	Btk 36 CLU/ac Foray 48F or B
	Dane 22	Madison 22, Kennedy School	35	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 23	Madison 23, Crescent Oaks	24	2000	Btk 36 CLU/ac Foray 48F or B
	Dane 24	Madison 24, Worthington Park	32	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 25	Madison 25, Carpenter-Ridgeway	44	3000	Btk 36 CLU/ac Foray 48F or B
	Dane 26	Madison 26, Sherman School	41	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 27	Madison 27, Warner Park	131	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 28	Madison 28, Berkley Park	20	2840	Btk 36 CLU/ac Foray 48F or B
	Dane 29	Town of Middleton	127	2833	Btk 36 CLU/ac Foray 48F or B
	Dane 30	City of Middleton, Sacs Woods	483	1760	Btk 36 CLU/ac Foray 48F or B
	Dane 31	Monona 1	123	4000	Btk 36 CLU/ac Foray 48F or B
	Dane 32	Monona 2	52	3500	Btk 36 CLU/ac Foray 48F or B
	Dane 33	Shorewood Hills	74	2370	Btk 36 CLU/ac Foray 48F or B
	Dane 34	Madison, Arboretum	24	4800	Btk 36 CLU/ac Foray 48F or B
	Dane 35	Lake Kegonsa State Park 1	96	1760	Btk 36 CLU/ac Foray 48F or B
	Dane 36	Lake Kegonsa State Park 2	40	4693	Btk 36 CLU/ac Foray 48F or B
FOND DU LAC	Fond du Lac 1	Fond du Lac	23	1120	Btk 36 CLU/ac Foray 48F or B
	Fond du Lac 2	Fond du Lac, Mary Hill Park	27	960	Btk 36 CLU/ac Foray 48F or B
GREEN LAKE	Green Lake 1	Seneca	39	12680	Btk 36 CLU/ac Foray 48F or B
	Green Lake 2	Berlin	257	1680	Btk 36 CLU/ac Foray 48F or B
	Green Lake 3	Brooklyn	62	2320	Btk 36 CLU/ac Foray 48F or B
	Green Lake 4	Brooklyn	20	6120	Btk 36 CLU/ac Foray 48F or B
	Green Lake 5	Brooklyn	79	2160	Btk 36 CLU/ac Foray 48F or B
	Green Lake 6	Marquette	0	2800	Btk 36 CLU/ac Foray 48F or B
	Green Lake 7	Green Lake	63	3800	Btk 36 CLU/ac Foray 48F or B
JEFFERSON	Jefferson1	Oakland	36	960	Btk 36 CLU/ac Foray 48F or B
JUNEAU	Juneau 1	WI Dells 1 State Lands	59	1466	Btk 36 CLU/ac Foray 48F or B
KENOSHA	Kenosha 1	Bristol 1	118	1366	Btk 36 CLU/ac Foray 48F or B
	Kenosha 2	Bristol 2	39	15333	Btk 36 CLU/ac Foray 48F or B
	Kenosha 3	Bristol 3	69	2680	Btk 36 CLU/ac Foray 48F or B
	Kenosha 4	Kenosha, 55 th St	20	8666	Btk 36 CLU/ac Foray 48F or B
	Kenosha 5	Kenosha, 22 nd Ave	31	4800	Btk 36 CLU/ac Foray 48F or B
	Kenosha 6	Pleasant Prairie, Lakeshore	39	3200	Btk 36 CLU/ac Foray 48F or B
	Kenosha 7	Pleasant Prairie, 107 th St	39	866	Btk 36 CLU/ac Foray 48F or B
	Kenosha 8	Pleasant Prairie, Cooper Rd 1	24	11533	Btk 36 CLU/ac Foray 48F or B
	Kenosha 9	Pleasant Prairie, Cooper Rd 2	24	11400	Btk 36 CLU/ac Foray 48F or B
	Kenosha 10	Salem	20	8666	Btk 36 CLU/ac Foray 48F or B
	Kenosha 11	Twin Lakes	34	613	Btk 36 CLU/ac Foray 48F or B
	Kenosha 12	Wheatland	37	2333	Btk 36 CLU/ac Foray 48F or B

MARATHON	Marathon 1	Rothschild	70	560	Btk 36 CLU/ac Foray 48F or B
	Marathon 2	Kronenwetter	517	2000	Btk 36 CLU/ac Foray 48F or B
MARQUETTE	Marquette 1	Pleasant Lake (adjoins Waushara 2)	12	560	Btk 36 CLU/ac Foray 48F or B
	Marquette 2	McNamara	23	960	Btk 36 CLU/ac Foray 48F or B
	Marquette 3	Winkleman	20	1388	Btk 36 CLU/ac Foray 48F or B
	Marquette 4	Comstock Lake	38	840	Btk 36 CLU/ac Foray 48F or B
	Marquette 5	Buffalo Lake	28	572	Btk 36 CLU/ac Foray 48F or B
	Marquette 6	Baker	87	1100	Btk 36 CLU/ac Foray 48F or B
MARINETTE	Marinette 1	Gov. Thompson State Park	127	960	Btk 36 CLU/ac Foray 48F or B
MENOMINEE	Menominee 1	Menominee 1	106	1973	NPV 4x10 ¹¹ OB/ac Gypchek
	Menominee 2	Menominee 2	180	593	NPV 4x10 ¹¹ OB/ac Gypchek
	Menominee 3	Menominee 3	129	580	NPV 4x10 ¹¹ OB/ac Gypchek
MILWAUKEE	Milwaukee 1	Jackson Park	110	3200	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 2	Kern Park	22	2064	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 3	Sheridan Park	70	630	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 4	Sherman Park	21	773	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 5	Wilson Park	77	5820	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 6	Washington Park	78	1010	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 7	Riverside Park	21	2640	Btk 36 CLU/ac Foray 48F or B
	Milwaukee 8	Wright Park	55	1120	Btk 36 CLU/ac Foray 48F or B
OUTAGAMIE	Outagamie 1	Appleton, Erb Park	39	2333	Btk 36 CLU/ac Foray 48F or B
	Outagamie 2	Appleton, Pierce Park	63	2240	Btk 36 CLU/ac Foray 48F or B
	Outagamie 3	Appleton, Tellulah Park	54	2740	Btk 36 CLU/ac Foray 48F or B
RACINE	Racine 1	Burlington	21	2666	Btk 36 CLU/ac Foray 48F or B
ROCK	Rock 1	Beloit, Riverside Dr.	291	13485	Btk 36 CLU/ac Foray 48F or B
	Rock 2	Beloit, Lesson Park	161	6133	Btk 36 CLU/ac Foray 48F or B
	Rock 3	Center 1	51	8000	Btk 36 CLU/ac Foray 48F or B
	Rock 4	Center 2	52	2920	Btk 36 CLU/ac Foray 48F or B
	Rock 5	Janesville, Lustig Park	38	1040	Btk 36 CLU/ac Foray 48F or B
	Rock 6	Janesville, Rollingwood	23	986	Btk 36 CLU/ac Foray 48F or B
	Rock 7	Milton, Camp Wakonda	20	8413	Btk 36 CLU/ac Foray 48F or B
SAUK	Sauk 1	Devils Lake State Park 1	480	2222	Btk 36 CLU/ac Foray 48F or B
	Sauk 2	Devils Lake State Park 2	124	8240	NPV 4x10 ¹¹ OB/ac Gypchek
	Sauk 3	Devils Lake State Park 3	145	1392	Btk 36 CLU/ac Foray 48F or B
	Sauk 4	Mirror Lake State Park	33	1293	Btk 36 CLU/ac Foray 48F or B
	Sauk 5	Rocky Arbor State Park	210	1713	Btk 36 CLU/ac Foray 48F or B
SHAWANO	Shawano 1	Westcott	93	1900	Btk 36 CLU/ac Foray 48F or B
	Shawano 2	Westcott	27	1000	Btk 36 CLU/ac Foray 48F or B
	Shawano 3	Westcott	95	2000	Btk 36 CLU/ac Foray 48F or B
	Shawano 4	Westcott	849	1147	Btk 36 CLU/ac Foray 48F or B
	Shawano 5	Westcott	21	1000	Btk 36 CLU/ac Foray 48F or B
WALWORTH	Walworth 1	Genoa City	39	6080	Btk 36 CLU/ac Foray 48F or B
	Walworth 2	Richmond, Lake Lorraine	66	2040	Btk 36 CLU/ac Foray 48F or B
	Walworth 3	Linn, Lake Shore	80	1000	Btk 36 CLU/ac Foray 48F or B
	Walworth 4	Linn, Highway 50	23	1560	Btk 36 CLU/ac Foray 48F or B
	Walworth 5	Linn, West Blackpoint	31	1000	Btk 36 CLU/ac Foray 48F or B
	Walworth 6	Linn, Linn Rd	44	13760	Btk 36 CLU/ac Foray 48F or B
	Walworth 7	Linn, Linn Lake	68	13893	Btk 36 CLU/ac Foray 48F or B

	Walworth 8	Mukwonago, Lake Beulah	62	1480	Btk 36 CLU/ac Foray 48F or B
	Walworth 9	Big Foot Beach State Park 1	63	620	Btk 36 CLU/ac Foray 48F or B
	Walworth 10	Big Foot Beach State Park 2	34	586	Btk 36 CLU/ac Foray 48F or B
	Walworth 11	Big Foot Beach State Park 3	26	933	Btk 36 CLU/ac Foray 48F or B
WASHINGTON	Washington 1	West Bend 1	94	2193	Btk 36 CLU/ac Foray 48F or B
	Washington 2	West Bend 2	45	680	Btk 36 CLU/ac Foray 48F or B
WAUSHARA	Waushara 1	Coloma	26	3000	Btk 36 CLU/ac Foray 48F or B
	Waushara 2	Coloma	23	3333	Btk 36 CLU/ac Foray 48F or B
	Waushara 3	Coloma	35	3333	Btk 36 CLU/ac Foray 48F or B
	Waushara 4	Coloma	22	4000	NPV 4x10 ¹¹ OB/ac Gypchek
	Waushara 5	Richford	26	3333	Btk 36 CLU/ac Foray 48F or B
	Waushara 6	Saxeville	20	3333	Btk 36 CLU/ac Foray 48F or B
	Waushara 7	Leon	106	3666	Btk 36 CLU/ac Foray 48F or B
WINNEBAGO	Winnebago 1	UW Oshkosh	129	3664	Btk 36 CLU/ac Foray 48F or B
ADAMS	4 blocks	1 community, 2 state parks	340		
BROWN	8 blocks	5 communities	482		
COLUMBIA	3 blocks	3 communities	85		
DANE	36 blocks	5 communities, 1 state park	2628		
FOND DU LAC	2 blocks	1 community	50		
GREEN LAKE	67 blocks	5 communities	520		
JEFFERSON	1 block	1 community	36		
JUNEAU	1 block	1 state park	59		
KENOSHA	12 blocks	6 communities	494		
MARATHON	2 blocks	2 communities	587		
MARQUETTE	6 blocks	6 communities	208		
MARINETTE	1 block	1 state park	127		
MENOMINEE	3 blocks	1 community	415		
MILWAUKEE	8 blocks	1 community	454		
OUTAGAMIE	3 blocks	1 community	156		
RACINE	1 blocks	1 community	21		
ROCK	7 blocks	4 communities	636		
SAUK	5 blocks	3 state parks	992		
SHAWANO	5 blocks	1 community	1085		
WALWORTH	11 blocks	4 communities, 1 state park	413		
WASHINGTON	2 blocks	1 community	139		
WAUSHARA	7 blocks	4 communities	258		
WINNEBAGO	1 block	1 community	129		
Foray (Btk)	130 blocks		10002		
Gypchek (NPV)	5 blocks		561		
STATEWIDE	135 blocks	54 communities, 8 state parks	10563		

1.2 Project Objective

The project objective is to prevent defoliation in excess of 50 percent of the normal leaf complement of trees within the treatment blocks.

1.3 Need for Action

Gypsy moth, *Lymantria dispar* (L.) (Lepidoptera: Lymantriidae), is an exotic insect to North America. Gypsy moth caterpillars are able to feed on the leaves of a wide variety of trees and shrubs. In the Great Lakes region, highly preferred hosts include oaks, aspens, paper birch, basswood and willows; all very common trees in Wisconsin. High numbers of gypsy moth caterpillars can cause a substantial public nuisance including some adverse effects on human health, and a reduction in tree growth and overall tree health. Following large outbreaks, some tree mortality can occur, especially when outbreaks persist in any given area for 2-3 successive years or if defoliation is accompanied by other stresses such as drought. Widespread caterpillar outbreaks can alter water quality, wildlife habitat, microclimate, and soil fertility (USDA 1995, see Appendix G).

Since the gypsy moth was accidentally introduced into Massachusetts in 1869, it has steadily expanded its range west and southward and is now established in about one-third of the potentially susceptible habitat in the U.S. Gypsy moth first became established in eastern Wisconsin in the early 1990's and since that time it has become well entrenched across the eastern half of the state.

The Wisconsin DNR, an approved federal cost-share recipient agency within the state, has asked for assistance to deal with increasing gypsy moth populations and the Forest Service is authorized (by the Cooperative Forestry Assistance Act of 1978, amended by the 1990 Farm Bill) to provide it.

1.4 Decisions to be Made and Responsible Officials

The preferred alternative in this document proposes participation by the USDA-FS as a cooperater with the Wisconsin DNR. The responsible official for the USDA-FS must decide on the following:

1. Should there be a cooperative suppression program in 2009?
2. Is the proposed action likely to have significant impacts requiring further analysis in an Environmental Impact Statement (EIS)?

The responsible official for the USDA-FS is:

Michael Prouty, Field Representative
USDA-FS, Northeastern Area, State and Private Forestry
1992 Folwell Avenue,
St. Paul, MN 55108

The responsible official will make a decision in mid-April, 2009 to ensure timely funding for an effective program that meets the state's objectives.

The cooperating state agency official is:

Matthew J. Frank, Secretary
Wisconsin DNR
101 South Webster Street

1.5. Scope of the Analysis

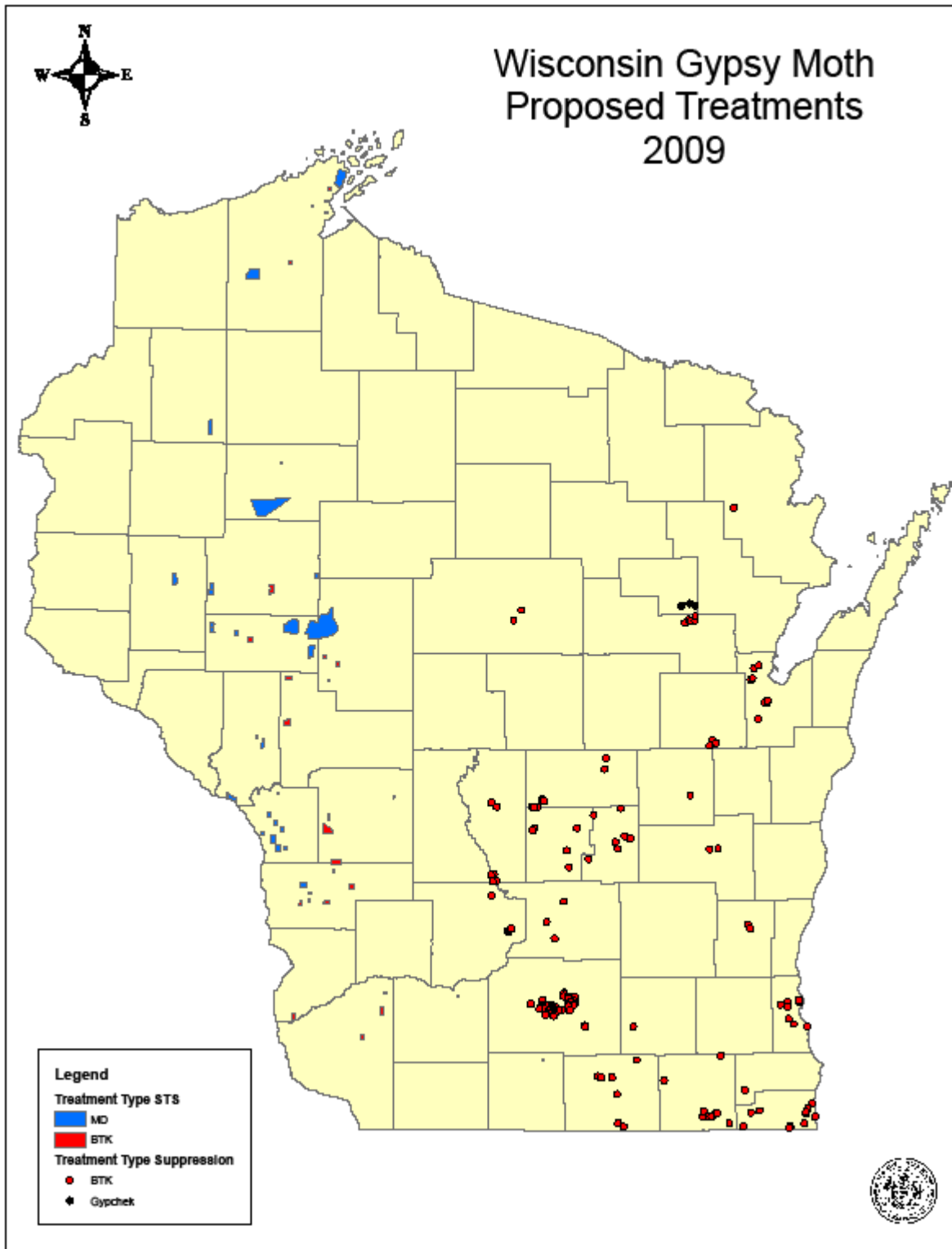
A final environmental impact statement (FEIS), developed by USDA-FS in cooperation with USDA-Animal and Plant Health Inspection Service (USDA-APHIS), entitled Gypsy Moth Management in the United States: A Cooperative Approach was made available in November 1995 (USDA 1995). The Record of Decision (ROD) for the FEIS was signed in January of 1996. The ROD selected alternative 6, which included three management strategies - suppression, eradication, and slow-the-spread. This alternative allows the USDA-FS to provide technical and financial assistance to support eradication, suppression and slow-the-spread strategies for gypsy moth management under various gypsy moth population scenarios. The status of gypsy moth populations in an area determine the appropriate gypsy moth management strategy to utilize and are defined as: uninfested, generally infested, or transition. Adams, Brown, Columbia, Dane, Fond du Lac, Green Lake, Jefferson, Juneau, Kenosha, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Racine, Rock, Sauk, Shawano, Walworth, Washington, Waushara and Winnebago counties are defined as generally infested so suppression activities are appropriate (USDA 1995, Vol. II, P. 2-4 to 2-6). The treatment options available for use within federally funded gypsy moth suppression projects under alternative six of the FEIS are: the biological insecticide *Bacillus thuringiensis* var. *kurstaki* (Btk), the chemical pesticide diflubenzuron (trade name Dimilin®), and the gypsy moth nucleopolyhedrosis virus (NPV, trade name Gypchek®) (USDA 1995, Vol.II p.2-15).

The FEIS examined the environmental and human factors (FEIS 1995, Vol. II, Chapter 3 & 4) that might be affected by the alternatives considered for gypsy moth management (FEIS 1995, Vol. II, Ch. 2). The environmental factors analyzed included the following biological and physical factors: the range of gypsy moth host vegetation, nontarget organisms (including other insects, fish, wildlife, soil organisms, and rare or endangered species), forest condition, water quality, microclimate, and soils.

The human factors analyzed included the following social and economic factors: human health and safety (the potential for human exposure to, and subsequent risk from the use of insecticides), perceptions and behaviors, (the impact that tree defoliation and tree mortality caused by gypsy moth larvae feeding can have on recreationists), and economic characteristics (impact that larval nuisance, tree defoliation, and tree mortality may have on recreation, property values, aesthetic values, and the timber resource).

This Environmental Assessment (EA) is tiered to the FEIS. The purpose of tiering is to eliminate repetitive discussions of the issues addressed in the FEIS (40 CFR, 1502.20 and 1508.28 in Council on Environmental Quality 1992). Thus, throughout this EA, many references to material in the FEIS will be used. This allows the EA to focus on issues specific to the action proposed. This EA documents the site-specific environmental analysis of the impacts of suppressing gypsy moth populations in cooperation with the WI DNR in 2009 at 135 locations consisting of approximately 10,563 acres in Adams, Brown, Columbia, Dane, Fond du Lac, Green Lake, Jefferson, Juneau, Kenosha, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Racine, Rock, Sauk, Shawano, Walworth, Washington, Waushara and

Figure 1. Map of locations in Wisconsin where gypsy moth treatments are proposed for 2009 in the Slow the Spread and Suppression programs. Suppression locations are indicated by a dot because of their small size.



Winnebago counties. Wisconsin is also proposing a cooperative gypsy moth project under the Slow-the-Spread (STS) strategy in 2009 in counties not considered generally infested. The Wisconsin Department of Agriculture, Trade and Consumer Protection (WI DATCP) serves as the lead state agency for that proposed project. The objectives of an STS strategy are different than those of suppression. The project areas are usually well separated since it is typical for populations to require several years between establishment and the development of outbreaks eligible for suppression (Figure 1). The blocks proposed for suppression treatment are to the east of the area in which the STS program is active, in counties in which gypsy moth has been established for some years. Because of the differences in objectives and the fact that the programs do not overlap in area, separate environmental assessments were developed, this one covers suppression projects and the other EA covers the STS projects.

1.6 Summary of Public Involvement and Notification

The National Environmental Policy Act requires public involvement and notification for all projects utilizing federal funds that may have an effect on the human environment (40 CFR, 1506.6 in Council of Environmental Quality 1992).

The Wisconsin Cooperative Gypsy Moth Program has been seeking public input since 1990. During that time numerous public meetings have been held in areas of the state where various treatments have been proposed and conducted. These meetings have been with both public officials and with the general public. In addition, the Wisconsin Program maintains a toll free telephone line (1-800-642-MOTH) to address questions or concerns about any on-going activities. Residents can also view information on all aspects of the suppression program and STS programs on the WI state gypsy moth web site (<http://gypsymoth.wi.gov>). From 1990 through 2000, the Wisconsin Cooperative Program focused on slowing the establishment and spread of low level gypsy moth populations in Wisconsin. The public input through 2000 focused on that strategy. As of 2001, a new strategy for suppressing outbreak populations of caterpillars was proposed for counties generally infested with gypsy moth. Much of the public input from past years is still valid and was used in large part to develop issues and concerns discussed in this EA. However, because the suppression objectives are quite different, scoping efforts were made to identify any new issues or concerns related to the proposed suppression project.

In the Wisconsin gypsy moth suppression program, coordinated by the WI DNR, there are three parts to the public notification effort that applicants (counties) to the DNR must complete for eligibility for treatment and cost sharing. 1) The applicant must hold a local meeting at which information on the proposed treatment, the product to be used, when spraying is likely to take place and the area that will be treated is presented. The presenter must also explain how to register an objection to the treatment of the landowner's property for withdrawal of that property from the treatment area and answer all questions from the audience. 2 & 3) The applicant must publish a legal notice and make a press release covering the above information. The Department also strongly urges applicants to make a direct mailing to all residents of the proposed spray block that includes all the above information.

In 2009 all counties fulfilled the Wisconsin requirements for public notification and some sent direct notification to the proposed spray block residents. Public meetings were held in the towns shown in Table 2. Press releases and public notices were distributed. As public interest in the subject of gypsy moth can be high in these counties, articles have run in the local papers as well as reports on radio and TV.

Table 2. Public informational meeting locations, dates and attendance for proposed 2009 suppression treatments.

DATE	COUNTY	COMMUNITIES PARTICIPATING	NUMBER ATTENDING
2/9	Adams	Friendship, Preston, Dells of the Wisconsin State Natural Area	1
2/4	Brown	Hobart	6
2/9	Columbia	Portage, Arlington, Dekorra, Wyocena	7
2/9	Dane	Madison, City of Middleton, Town of Middleton, Monona, Shorewood Hills, UW Madison Campus and Arboretum, Lake Kegonsa State Park	25
2/9	Fond Du Lac	Fond Du Lac	0
2/12	Green Lake	Green Lake, Seneca, Berlin, Brooklyn, Marquette,	8
2/12	Jefferson	Jefferson, Oakland	3
2/11	Kenosha and Racine	Bristol, Kenosha, Pleasant Prairie, Salem, Twin Lakes, Wheatland, Burlington	25
2/10	Marathon	Rothschild, Kronenwetter	4
2/10	Marquette	Westfield, Pleasant Lake, McNamara, Winkleman, Comstock Lake, Buffalo Lake, Baker	3
2/11	Marinette	Stephenson, Gov Thompson State Park	2
2/17	Menominee	Keshena, Legend Lake	2
1/28	Milwaukee	Milwaukee	5
2/10	Outagamie	Appleton	0
2/5	Rock	Town of Milton, Janesville, Center, Beloit	5
2/10	Sauk	Baraboo, Devils Lake, Mirror Lake, and Rocky Arbor state parks, Dells of the Wisconsin State Natural Area	2
2/3	Shawano	Shawano, Westcott	5
2/4	Walworth	Elkhorn, Richmond, Linn, Mukwonago	25
2/10	Washington	West Bend,	0
2/2	Waushara	Wautoma, Coloma, Richford, Saxeville, Leon	0
2/17	Winnebago	Oshkosh	1

Information gathered during the 2009 public meetings, from public meetings held in previous years, from comments collected on the interim rule, along with material collected from resource professionals, industry, and environmental groups was used to develop issues and concerns related to this project. Two broad categories were developed; 1) issues used to formulate alternatives, and 2) other issues and concerns.

1.7 Issues Used To Formulate the Alternatives

Each of the major issues is introduced in this section. Discussion pertaining directly to each issue as it relates to the alternatives can be found in Chapters 3.0 and 4.0.

Issue 1. Effects on Human Health and Safety. Four major concerns exist under this issue, 1) the potential risk of an aircraft accident, 2) the risk of a pesticide spill, 3) the

direct risk of Btk or NPV to humans and 4) the effect of gypsy moth outbreaks on people.

Issue 2. Effects on Nontarget Organisms and Environmental Quality. Will the use of Btk impact organisms other than gypsy moth? If Btk is not applied, will the presence of very high level gypsy moth populations have an impact on other organisms or environmental quality? What effects will spraying the same area for a second year have on recovery of non-target organisms?

Issue 3. Effects on Resource Values. There are potential impacts (economic, aesthetic and social) on resource values both when gypsy moth infestations are allowed to develop unchecked and when suppression activities occur.

1.8 Other Issues and Concerns

Other issues and concerns were used to develop mitigating measures, management requirements and constraints. The issues and concerns are posed as questions below and answered in Appendix A. Mitigating measures are noted for all of the concerns in Appendix A.

- How does Btk affect the gypsy moth and what happens to it in the environment?
- Are other biological control tactics being used?
- Why can't Gypchek be used on all spray blocks?
- Will the public be notified prior to aerial application?
- Will privacy for residents be maintained during post-treatment assessment?
- Could spraying affect school children?
- Will Foray spot car finishes?
- What are the inerts in Foray?

1.9 Summary of Authorizing Laws and Policies

Authorization to conduct treatments for gypsy moth infestations is given in the Plant Protection Act of 2000 (7 U.S.C. section 7701), and the Cooperation with State Agencies in Administration and Enforcement of Certain Federal Laws (7 U.S.C. section 450).

The Cooperative Forestry Assistance Act of 1978 (P.L. 95-313) provides the authority for federal and state cooperation in managing forest insects and diseases. The law recognizes that the nation's capacity to produce renewable forest resources is significantly dependent on non-federal forestland. The 1990 Farm Bill (P.L. 101-624) reauthorizes the basic charter of the Cooperative Forestry Assistance Act.

The National Environmental Policy Act (NEPA) of 1969 requires detailed environmental analysis of any proposed federal action that may affect the human environment. The courts regard federally funded state actions as federal actions.

As a cooperator, DNR is responsible for program implementation, assessment, and analysis. Rule NR47, subchapter IX governs Wisconsin DNR's gypsy moth suppression program including criteria for participation in the treatment program and awarding of federal cost sharing. DNR has the state authority [ss. 26.30(6m)] authorizing the establishment of a program for the suppression of gypsy moth. DNR will act in cooperation with DATCP in the implementation of the spray program. Evaluation of the Wisconsin suppression program will be the responsibility of DNR.

The Federal Insecticide, Fungicide and Rodenticide Act of 1947, as amended, known as FIFRA, requires insecticides used within the United States be registered by the United States Environmental Protection Agency (EPA).

Section 7 of the Endangered Species Act prohibits federal actions from jeopardizing the continued existence of federally listed threatened, endangered or candidate species or adversely affecting critical habitat of such species.

Wisconsin endangered and threatened species within proposed treatment areas must be identified (ss. 29.604, NR 27).

Section 106 of the National Historical Preservation Act and 36 CFR Part 800: Protection of Historic Properties, requires the State Historic Preservation Officer be consulted regarding the proposed activities. The State Historic Preservation Officer has stated that suppression treatments of Foray and Gypchek pose no potential affect on historical properties (letter on file at the WI Department of Agriculture, Trade and Consumer Protection).

Wisconsin State law requires an environmental assessment for the proposed use of pesticide or biological control agents (ATCP 3). This environmental analysis will meet the requirements of both Federal and State environmental laws.

Aerial applicators must meet Wisconsin pesticide law (ATCP 29) to provide safe, efficient, and acceptable application of pesticides.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

Alternatives are developed in this chapter. Each alternative is discussed relative to the objectives of the proposed action, and impacts are summarized for each alternative.

2.1 Process Used to Formulate the Alternatives

Information pertinent to developing alternatives for managing the gypsy moth situation in Wisconsin was solicited from a number of groups: Wisconsin DNR and DATCP, USDA-FS, USDA-APHIS, University of Wisconsin, other interested parties, and the public. Alternatives were developed to treat gypsy moth populations in Wisconsin under the suppression strategy discussed in the FEIS.

The FEIS and Record of Decision that this document is tiered to, allows the USDA-FS to assist in conducting suppression activities. The FEIS lists the treatment options available for the suppression strategy (USDA 1995, Vol. II, p.2-15). The following three treatment options may be considered: 1) *Bacillus thuringiensis* var. *kurstaki* (Btk), 2) diflubenzuron (Dimilin®), and 3) nucleopolyhedrosis virus (Gypchek®).

2.2 Treatment Options Eliminated from Detailed Study

The following treatment options that were available under the FEIS were eliminated from consideration:

- Use diflubenzuron to suppress gypsy moth populations in Wisconsin in 2009

The label for diflubenzuron prohibits its use over wetlands, which are common in many parts of Wisconsin. Therefore, its use was not considered in this program in 2009.

2.3 Alternatives Considered in Detail

- **Alternative 1. The NO ACTION ALTERNATIVE.** The Wisconsin DNR would not receive financial assistance from the USDA-FS to conduct cooperative gypsy moth suppression treatments in 2009.

Alternative 2. THE PREFERRED ALTERNATIVE (Proposed Action). The USDA-FS would provide financial and technical assistance on approximately 10,816 acres in 23 Wisconsin counties: Adams, Brown, Columbia, Dane, Fond du Lac, Green Lake, Jefferson, Juneau, Kenosha, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Racine, Rock, Sauk, Shawano, Walworth, Washington, Waushara and Winnebago counties. Infestations proposed for treatment cover an estimated 10,563 acres at 135 locations (Table 1). The preferred treatment option would be one aerial application of the bacterial insecticide *Bacillus thuringiensis* var. *kurstaki* (Btk) or the viral insecticide NPV. The Btk formulation is Foray 48F or Foray 48B undiluted at a dose of 36 billion Cabbage Looper Units (CLU's) per acre per application in 96 fluid ounces. The NPV formulation is Gypchek at a dilution of 4×10^{11} viral occlusion bodies per acre in 1 gallon Carrier 38A per acre. The Wisconsin DNR would facilitate the treatment. Low-flying fixed-wing aircraft would be used in all counties to apply the treatments. Applications would be made in May or early June during the time period when gypsy moth early instar caterpillars are feeding.

2.3.1 Mitigating Measures that Apply to Alternative 2

Under Alternative 2, measures would be taken to mitigate possible treatment impacts. Specific safety procedures and guidelines are presented in the 2009 Safety Plan. Copies are available from the addresses listed on the title page of this EA.

One of the primary functions of the Cooperative Gypsy Moth Program in conducting aerial spray operations is to make sure the safest possible project is conducted and the least possible impact to non-target organisms occurs. To achieve these objectives, the following has been done or will be done:

1. Public information meetings were held in participating counties to inform the public about the proposed action, answer questions, and record any concerns. Directions on how to register an objection to treatment were also provided. Notification of the meetings was made to elected officials and through news releases to local newspapers, radio, and television stations. See Table 2 for locations and attendance of these meetings.
2. Residents located in some spray blocks were notified of the proposed action via direct mailing in February. The mailing included: information on the insecticide used (Btk), when the application is likely to take place, a description of the area proposed for treatment, and where to get more information or to register an objection to treatment of property.
3. Residents are given the option of obtaining advance notification the day before a spray is scheduled in their area by calling the 1-800-642-MOTH number which will be updated daily with the next day's planned activities during the spray period.
4. Residents may sign up for daily email updates during the spray period. The message will include what areas are planned to be sprayed the next day and what areas were completed that day.
5. The Wisconsin Program maintains a toll-free telephone line (1-800-642-MOTH), a portal for gypsy moth questions and the DNR hosts a website which includes information on the suppression program to address questions or concerns about any on-going activities.
6. The WI DNR will cooperate with the WI DATCP to have personnel at airports to ensure that the Btk is applied properly in accordance with label directions. In addition, aerial and ground based observers will be used to ensure that only designated areas are treated.
7. Pilots will be thoroughly briefed on treatment site locations.
8. Planes will be guided using differential global positioning systems (DGPS) with a real-time display. A real-time display will be located at the command center so program managers can monitor the spray program. If distances are too great for the signal to reach the command center, a real time GPS is located at the airport the planes are working out of and location information will be available from program staff working there.
9. Pilots are instructed not to treat open water such as lakes, and visible rivers. They are instructed to treat forested areas.
10. Ground personnel will be equipped with two-way radios to communicate with observation aircraft, which can, in turn, communicate with spray aircraft.
11. Spraying will be done in conditions that minimize drift.

12. Label directions will be carefully adhered to and protective clothing will be worn by mixers and pilots when required.

13. Tankers with Btk at mix/load areas will be guarded and/or secured to prevent vandalism.

14. Press releases detailing spray plans for an area will go out before spraying is done.

15. Consultations with Wisconsin Department of Natural Resources, Bureau of Endangered Resources and USDA Fish and Wildlife Service will be done to determine if treatment blocks overlap with known locations of state or federally listed threatened and endangered species.

16. A security plan has been developed to protect and secure airplanes, pesticides and personnel.

2.4 Comparative Summary of Alternatives

	ALTERNATIVE 1 No Federal Funding	ALTERNATIVE 2 Btk or Gypchek Treatment
ISSUE 1 Human Health And Safety	With no federal funding, the cities or private individuals may still treat. Private citizens would likely apply more toxic insecticides than Btk or Gypchek. Gypsy moth itself can create human health problems, especially when high populations are present.	Risk to human health from Btk or Gypchek is minimal. The risk of an aircraft crashing and/or a serious pesticide spill occurring does exist, but it is very slight. Measures will be taken to minimize the chance of an accident. The state program has taken steps to prevent any attempted attacks or sabotage.
ISSUE 2 Nontarget Organisms and Environmental Quality	Gypsy moth outbreaks can change the local forest by reducing the oak component (killing some oak trees) and opening stands to periods of increased light penetration. This favors growth of invasive plants such as buckthorn, non-native honeysuckles and garlic mustard among others. Some native insects would be directly impacted by loss of food and habitat due to defoliation caused by gypsy moth feeding. Private spray programs would likely exist and these could harm native species.	Btk will kill some non- target lepidoptera species in the treatment areas. This impact would likely be short-term since the treatment areas are scattered and relatively small in size. Areas treated for a second year make up about 3,156 acres of the total 10,563 (30% the total). 2,108 of those acres are urbanized and therefore not suitable habitat for a large variety of lepidoptera. The remaining acres are in high use areas of state parks such as campgrounds, picnic areas, or natural attractions. While treatment in 2008 was successful in preventing defoliation, the population continued to build outside the treated areas and re-infested the blocks. Gypchek affects only gypsy moths so non-target impacts are not expected.
ISSUE 3 Resource Values	Tree death is possible, though this generally requires more than one year of defoliation. Large numbers of caterpillars will impact recreation use in the short-term, specifically during June. Picnic tables and playground equipment may be	Btk or Gypchek applications should reduce caterpillar numbers below nuisance levels for most people. Trees should be protected through maintenance of their leaves.

covered with insect frass and caterpillars. Aesthetic quality may be impacted, leaves will be eaten.
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3.0 AFFECTED ENVIRONMENT

The affected environment is defined by the scope of the analysis as presented in Section 1.5 and is limited to those communities where the WI DNR has requested USDA-FS cooperation to suppress high gypsy moth populations. Each participating entity (county or community) has the option of whether or not to participate and they must meet the participating guidelines established by WI DNR. Thus, only proposed activities in Adams, Brown, Columbia, Dane, Fond du Lac, Green Lake, Jefferson, Juneau, Kenosha, Marathon, Marinette, Marquette, Menominee, Milwaukee, Outagamie, Racine, Rock, Sauk, Shawano, Walworth, Washington, Waushara and Winnebago are considered. Cumulative or overlapping effects are unlikely to occur between this suppression program and the proposed gypsy moth Slow-the-Spread project in Wisconsin as the sites are at a distance from the STS treatments (Figure 1).

3.1 Characteristics of Forest Trees Vulnerable to Gypsy Moth Damage

The aspen (3.3 million acres) and oak-hickory (2.9 million acres) forest types make up about 42 percent of the total forested acres in the state of Wisconsin (Raile, 1985). These two forest types would be the most heavily impacted by gypsy moth. Wisconsin's forests also contain large numbers of other tree species that are considered good hosts for gypsy moth, including basswood, paper birch, tamarack and apple. Willow is another tree/shrub species, highly favored by gypsy moth, which is widely abundant in Wisconsin's many wetland areas and in urban landscapes. This abundance of favored food type in Wisconsin makes gypsy moth population growth a major concern. The proposed treatment sites all have oak and other favored species as major tree components.

3.2 Land Use Characteristics and Human Activities of Proposed Treatment Areas.

Maps of the proposed treatment sites are in Appendix B. Brief descriptions of the treatment blocks follow in Table 3.

Table 3: Land use and descriptions of 2009 proposed treatment blocks (Block #'s Correspond to Table 1).

Type	Description	Blocks
Rural Residential	Property sizes vary from 0.5 to 5 acres, with the canopy cover varying from 50 to 100%. These properties are in subdivisions built into preexisting woodlots and forests. The most common tree species in these areas are oaks (bur, white, red, black and pin), crabapple, lindens, maples, ash, blue spruce, willow. Individual trees are of high value to homeowners, many are under chronic stress due to poor care and challenging site conditions. Large, mature trees contribute significantly to most properties and would be difficult to replace.	Adams 2 Brown 1-4, 8 Columbia 1- 3 Fond Du Lac 2 Green Lake 3-5, 7 Jefferson 1 Kenosha 1-3, 10, 12 Marquette 1-5 Racine 1 Rock 3, 4, 6 Shawano 1-5 Walworth 1, 2, 4, 5, 8

		Waushara 1- 7
Urban, Suburban and Small Town Residential	Property sizes vary from 0.33 to 1 acre these blocks may also include small city parks, campuses or cemeteries in addition to residential areas. Canopy cover varies from 50 to 100%. The most common tree species in these areas are oaks (bur, white, red, black and pin), crabapple, linden, maples, ash, blue spruce, willow, birch. Many trees grow over mowed lawns preventing access to the trees by natural enemies of gypsy moth such as deer mice and ground beetles. Individual trees are of high value to homeowners, many are under chronic stress due to poor care and challenging site conditions. Mature trees contribute significantly to most properties and would be impossible to replace and expensive to remove.	Brown 5 -7 Dane 1-15, 17-33 Fond Du Lac 1 Kenosha 4- 9, 11 Marathon 1, 2 Menominee 1-3 Rock 1, 2, 5 Walworth 3, 6, 7 Washington 1, 2 Winnebago 1
Woodlot	Dominated by oak though other species may be present	Green Lake 1, 2 Marquette 6
State, County, and Municipal Parks and Private Recreational Lands	These parks and recreational lands vary in size from 20 to more than 10,000 acres. All have woodlands and/or parklands dominated by oaks (red, white, black, pin, and bur), maples, basswood, aspen, birch, willows, pines, hemlock. High use areas may have ornamental species such as crabapples. These areas have heavy use for picnicking, camping, hiking and other recreational opportunities for state residents and visitors.	Adams 1, 3, 4 Dane 16, 34, 35, 36 Juneau 1 Marinette 1 Milwaukee 1-8 Outagamie 1-3 Rock 7 Sauk 1-5 Walworth 9-11

3.3 Site Specific Concerns Related to Issues Used to Formulate the Alternatives

Issue 1. Human Health and Safety - Private residences and structures are on or in close vicinity of all proposed suppression sites. Public facilities are common in and around the parks.

A number of the sites contain schools or they are located nearby. Btk and Gypchek, as used in gypsy moth programs, are not known to cause any medically documented adverse health effects for the general human population (FEIS, Appendix F; Also, see references on human health studies under references cited).

Press releases, a public meeting and in some cases direct mailing to residents within the treatment boundaries or notification by block organizers informed residents of the treatments scheduled for mid-May through early June. Newspaper, radio and television media will be briefed throughout the treatment period so the public can receive current treatment time and date information. A toll free telephone number (1-800-642-MOTH) is maintained by the Wisconsin Gypsy Moth Cooperative Program that can be accessed by the general public for updates on treatment activity. The general public may also sign up for daily email notification on planned and completed spray activities.

Issue 2. Nontarget Organisms and Environmental Quality

Most of the 2009 suppression sites are located in urban or suburban residential settings. Therefore, those sites do not contain high quality habitat for any rare or unusual lepidopteran species. The rural sites proposed for treatment are a small fraction of the acreage of that type of habitat in the region and thus treatment is unlikely to threaten a species of limited range within the treatment blocks. There are several

large state properties, portions of which will be treated this year because defoliation poses a threat of heavy mortality and permanent conversion of the natural community with the loss of dominant tree species. On these state properties, if valued oaks are lost due to defoliation it is likely other species would replace them. Hemlocks are threatened in the WI Dells State Natural Area because they grow below oaks in narrow gulches. One year of defoliation from larvae that move from the oaks could cause the loss of keystone hemlocks and the rare communities they support.

All sites were checked against the Natural Heritage Inventory (NHI) which includes reported locations of rare species in Wisconsin. See also Section 3.4 below. A heron rookery located within a campground in the Sauk 1 spray block will be sprayed to prevent gypsy moth from finding refuge from treatment in the understory of the rookery and moving out to re-infest the campground. The Bureau of Endangered Resources was consulted and gave approval for this as this rookery was safely over-flown in the last two years and this and other rookeries have been over-flown during nest surveys in the past with no detrimental effect. Btk has no direct or indirect affect on herons.

Issue 3. Resource Values

Trees, specifically mature oak trees, have a high value in urban landscapes. Gypsy moth caterpillars feed not only on oak leaves but also on a large array of trees and landscape plants. Other resources can be degraded by large caterpillar populations and accumulations of frass (insect waste products). These resources might include recreational equipment such as picnic tables, and playgrounds. Aesthetic values can be reduced in neighborhoods, parks, recreational areas and campgrounds if trees are defoliated in mid-summer. Many rural properties are purchased in part for the opportunity for hunting deer and turkey. Defoliation of oaks can reduce the acorn crops and this may reduce the productivity of these properties for hunting.

3.4 Threatened and Endangered Species

The major nontarget concern is the effect of Btk on other members of the insect order Lepidoptera (butterflies and moths). The U.S. Fish and Wildlife Service has reviewed and commented on the proposed project. The Wisconsin DNR, Bureau of Endangered Resources also reviewed the project. Comments from the Fish and Wildlife Service and the Wisconsin DNR are on file at DNR where they can be reviewed. The USDA-FS has provided the U.S. Fish and Wildlife Service a Biological Assessment for this project covering Karner blue butterfly and eastern prairie fringed orchid.

The state listed phlox moth (*Schinia indiana*) was recorded in or near Menominee County blocks 1, 2, and 3 so the gypsy moth specific insecticide Gypchek will be used on these blocks. The state threatened red shouldered hawk has been recorded as nesting in Mirror Lake State Park in the past so Sauk 4 will be surveyed for nesting red shouldered hawks in April prior to spraying. If a nest is found it will be avoided by 250 meters or a distance specified by the Bureau of Endangered Resources. Bald eagles are no longer a federally listed species; however active nests are still located and avoided at a distance negotiated with the U.S. Fish and Wildlife Service.

The federally listed Karner blue butterfly (*Lycaeides melissa samuelis*) in WI is a unique exception to the normal process for handling endangered lepidopterans in suppression programs. In WI, the Karner blue is being conserved through a statewide Habitat

Conservation Plan (HCP). In this plan, areas that contain significant populations and favorable habitat are managed for long-term suitability for the butterfly by state and federal property managers. These areas are designated Biological Recovery Zones (BRZ). The U.S. Fish and Wildlife Service recognizes that if these BRZ's are managed and maintained in perpetuity for Karner blues, incidental take of individual Karners blues outside the BRZ's does not jeopardize the long-term survival of the species. In addition, small private landowners are considered to be voluntary partners under the HCP and have incidental take coverage under a statewide permit. This permit allows private individuals in WI to take Karner blues in the process of normal land management activities such as farming or forest protection. In the WI Gypsy Moth Suppression Program, this results in the U.S. Fish and Wildlife allowing the use of Btk insecticide outside of BRZ's on private land even if Karner blues are present. The BRZ's include the core recovery properties as well as land within five miles of a Karner blue observation on the core property that has a high potential for Karner blues. If a suppression treatment is proposed that occurs within a BRZ, the gypsy moth specific insecticide Gypchek can be used to treat that block. If only a small part of the block extends onto a BRZ and there is no suitable habitat within or near the block for Karner blues, a treatment with Btk may be negotiated. In 2009, two spray blocks were proposed within a Karner blue BRZ. Waushara 4 occurred entirely within a BRZ and had habitat suitable for Karner blue adjacent to the block, it will be treated with Gypchek. Green Lake 1 had only a few acres within a BRZ and no suitable habitat for Karner blues occurred in the proposed block. It will be treated with Btk following approval of the U.S. Fish and Wildlife Service.

3.5 Cultural and Historical Resources

The State Historical Society has stated the sprays used in suppression have no impacts on historical buildings.

4.0 ENVIRONMENTAL CONSEQUENCES

This section is the scientific and analytic basis for the comparison of alternatives. It describes the probable consequences (impacts, effects) of each alternative on selected environmental resources.

4.1 Comparison of Environmental Consequences of Alternatives Considered in Detail

Issue 1. Human Health and Safety.

Alternative 1 would result in no cooperative suppression project. However, it is possible that the participating communities and individuals would still have a treatment program. This could be aerially or ground based. The insecticide used may or may not be Btk. Gypchek is not available to private spray programs. Further, if the communities do not sponsor a treatment program, then residents in the area may apply any of a variety of insecticides to protect trees and reduce nuisance. Therefore, the health and safety concerns associated with Btk application may not exist but they may be replaced by real concerns of more toxic insecticides.

The scenario of not treating gypsy moth infestations at this time could lead to some problems with human health effects associated with gypsy moth presence (FEIS, Figure

4-1, p. 4-16). Gypsy moth outbreaks have been associated with adverse human health effects, including skin lesions, eye irritation, and respiratory reactions. Gypsy moth caterpillars can become a serious nuisance that could cause psychological stress in some individuals (FEIS, p. 4-9).

Alternative 2 -- A slight risk of an accident or spill always exists when conducting aerial application programs. However, considerable planning and training are done annually to mitigate this risk. The Wisconsin Cooperative Gypsy Moth Program has aerially treated hundreds of thousands of acres since 1990. During that time period, no aircraft accidents, only three spills of Btk, and one emergency landing of a spray plane have occurred. The spills occurred on the pesticide loading areas and were contained. No environmental contamination occurred. In 1997, a spray plane experienced engine trouble. In order to land safely the pilot dumped approximately 140 gallons of Btk insecticide on an alfalfa field adjacent to the airport runway. There were no injuries, no property damage, and no damage to the environment.

To further reduce risk associated with aerial spraying, a work and safety plan is required prior to program implementation. The program uses a second aircraft, an aerial observation plane, during periods of application to specifically improve communications between the aerial applicator, ground observers and the command center.

Aerial applicators are required to meet Wisconsin Pesticide Law (ATCP29) to provide safe, efficient, and acceptable applications of pesticide. In addition, the Federal Aviation Administration requires that the applicator file an acceptable flight plan for any treatments conducted over areas with congested air space, basically urban areas.

Btk is not considered a threat to human health. The Human Health Risk Assessment conducted for the FEIS states the following; On the basis of both the available epidemiology studies as well as the long history of use, no hazard has been identified for members of the general public exposed to Btk formulations (FEIS, page 4-15, Appendix F; Also, see Health Studies under references cited). Appendix F of the FEIS provides a detailed analysis of the risks posed to humans by Btk. Glare and O'Callaghan (2000) provide a comprehensive review of *Bacillus thuringiensis*, including Btk. They conclude (p. 118) with this statement, "After covering this vast amount of literature, our view is a qualified verdict of safe to use".

Due to the manufacture of Gypchek from infected gypsy moth larvae, skin and eye irritation is possible from insect parts but is not likely to be greater than that due to the high population of gypsy moth larvae already present at the proposed treatment sites (FEIS, page 5-9, Appendix F; Reardon et al 1996). Appendix F of the FEIS provides a detailed analysis of the risks posed to humans by Gypchek.

Issue 2. Nontarget Organisms and Environmental Quality.

Alternative 1 -- Gypsy moth defoliation and subsequent tree mortality can affect nontarget organisms by changing habitats on a local scale. Heavy defoliation can limit food for other leaf feeding species, including other lepidopterans. However, it can also create new habitat for some species by creating snags (dead trees or large dead branches) and increasing understory plant development through increased light penetration into defoliated areas. Short- and long-term changes in nontarget species have been shown for moderate and heavy defoliation (FEIS, 4-47 and 4-50). An

Ecological Risk Assessment (FEIS, Appendix G) examined gypsy moth impacts on a wide variety of species including mammals, birds, reptiles, amphibians, fish, insects, mollusks, crustaceans, and other invertebrates. Further discussion of gypsy moth and its impact on forest conditions can be found in the FEIS (p. 4-41 and 4-74).

Alternative 2 – No significant toxicity of Bt strains to any species of bird has been recorded (Glare and O’Callaghan 2000). Toxicity to fish is low (FEIS, p. 4-55). No toxicity data are available on reptiles and amphibians though Btk is not believed to pose a hazard to these organisms (FEIS, p. 4-52). Btk does not harm garden plants; in fact, it is a common garden use insecticide against caterpillars such as the cabbage looper.

Btk selectively kills members of the insect order Lepidoptera that are actively feeding as caterpillars at or soon after the period of application. Its negative impacts on other arthropods are minimal (Melin and Cozzi 1989, Glare and O’Callaghan 2000). It is, therefore, more "selective" than many insecticides that kill a wider array of insects. However, concerns do exist over its possible negative impact on native caterpillars, which may occur in the proposed treatment areas. Field studies document that Btk treatments reduce the number and species of adult lepidoptera the year of a spray. However, field studies in Oregon and West Virginia also document that recovery to pre-spray numbers occurs after 1 to 2 years (Miller 1990, Sample et al 1993).

A detailed discussion of Btk and non-target lepidoptera is presented in the FEIS (p. 4-52 to 4-55, and Appendix G) and in Glare and O’Callaghan (2000, p. 53-54). Btk may have an indirect effect on some other organisms by reducing their food resource, the caterpillars, pupae, or adult moths and butterflies that they feed on. Any effects on vertebrates due to reduction in food availability are probably subtle, especially for mammals and birds that are very mobile. Populations of some gypsy moth parasites and some general lepidopteran parasites may be reduced, due to the reduction in number of hosts caused by a Btk spray (FEIS, Appendix G p. 5-7).

The FEIS (p.4-55) notes that Btk is unlikely to affect most aquatic invertebrates.

Where federal or state threatened or endangered species that would be affected by Btk were found to occur, the gypsy moth specific insecticide Gypchek could be used. Gypchek has been extensively tested and has no known effect on other species of lepidopterans, other invertebrates or vertebrates (FEIS, Appendix G p.5-18).

Issue 3. Resource Values.

Alternative 1. If no treatments are done, defoliation of greater than 50 percent on most preferred host trees within the proposed treatment areas is likely to occur. Surveys conducted in these areas found egg mass numbers in excess of 500 per acre in residential and areas of high use by people and 1000 per acre in woodlands. These levels are great enough to cause considerable defoliation and nuisance. Each gypsy moth egg mass contains between 300-1,000 eggs. Defoliation in excess of 50% can cause hardwood trees to re-leaf or reflush new leaves. Re-leafing uses starch reserves in root systems that trees normally rely on for making defensive compounds and for growth. This can cause trees to lose vigor and make them more susceptible to other insects or pathogens that can eventually kill branches or in some cases kill trees. In general, it would take 2 or 3 years of defoliation and re-leafing to kill most trees. Mature trees, if they die, take many years to replace and they are also very expensive

to remove. Many trees in parks and landscapes are stressed from soil compaction, lawn pesticides, and construction damage. These trees are more likely to die following defoliation by caterpillars.

During and following defoliation, negative financial impacts are likely to occur for recreational related industries such as parks and campgrounds. Large populations of caterpillars can cause problems from waste products (frass) that can cover picnic tables, playground equipment, and other recreational resources.

Alternative 2. Using Btk or Gypchek is likely to maintain the current tree condition by significantly reducing gypsy moth populations in the treatment blocks. Some defoliation may still occur but levels should be well below 50%, the level at which refoliation occurs. Some caterpillars would be likely to occur in the treatment blocks so some individuals may still complain about nuisance. However, this should be much less than would occur under alternative 1.

4.2 Summary of Alternatives Considered in Detail

Alternative 2 offers the greatest probability of meeting the project objective. Alternative 1 (no action) would likely result in significant defoliation of host trees such as oaks, birches, lindens, apples and willows. Tree decline, especially of oak species, is likely to occur if gypsy moth populations defoliate more than 50 percent of the leaves on susceptible tree species. This decline could eventually result in some tree mortality. Treatment using Btk (alternative 2) should also significantly reduce nuisance populations of gypsy moth caterpillars.

Human health issues exist with both alternatives. If no cooperative suppression program occurs (alternative 1) the general public is likely to respond by treating yard trees and shrubs with an array of insecticides. Communities or individuals may also decide to sponsor a treatment program without federal or state participation. This could include an insecticide more toxic than Btk or Gypchek. Further, some human health concerns may occur related to high populations of gypsy moth caterpillars (skin lesions, eye irritation, and respiratory reactions, as well as psychological stress in some individuals). The vast majority of evidence indicates that Btk and Gypchek are safe to use. A slight risk of an aircraft accident does exist but safety measures are stressed.

4.3 Cumulative Effects

Cumulative effects are not likely to occur as a result of this year's treatments. Two factors act against the development of cumulative effects such as the development of resistance or the local extinction of susceptible moth or butterfly species. First, the area sprayed comprises only a small fraction of the area where gypsy moth is established in the state as landowners choose to spray only those properties of very high value. The WI suppression program requires the entire cost of treatment to be paid prior to treatment which encourages a conservative approach to spraying. Even at the parks, only a portion of the property is being treated and this in the highest use areas. Blocks are typically surrounded by a larger untreated area. Secondly, exposure of any one area is not long lasting. Only one application of a non-persistent insecticide, Btk, is done each year. Most areas are only treated once or two years in a row. Outbreaks

that would necessitate spraying should persist only one to three years in an area with about ten years between outbreaks.

Areas treated for a second year make up about 3,156 acres of the total 10,563 (30% the total). 2,108 of those acres are urbanized and therefore not suitable habitat for a large variety of lepidoptera. The remaining acres are in high use areas of state parks such as campgrounds, picnic areas, or natural attractions. As with the urbanized areas, most of these habitats are not ecologically diverse.

Other aerial sprays of Btk and Gypchek are planned as part of Wisconsin's Slow-the-Spread project, but all of these are at a distance from the proposed suppression blocks. Gypchek is specific to gypsy moth and no cumulative effects are anticipated with this material.

4.4 Irretrievable and Irreversible Commitment of Resources

Irreversible commitments are those that cannot be reversed, except perhaps in the extreme long term. The classic example would be extinction of a species. Irretrievable commitments are those that are lost for a period of time.

It is doubtful either alternative would lead to any irreversible commitment of natural resources. However, if alternative 1, the no action alternative, is selected, some tree mortality will probably occur in the near future. This could be considered irretrievable, especially if tree mortality occurs in residential areas and parks.

5.0 LIST OF PREPARERS

Andrea Diss-Torrance, Gypsy Moth Program Coordinator, Wisconsin Department of Natural Resources, Madison, Wisconsin.

EA Responsibility: Participated in all aspects of the environmental assessment process.

Experience and Education: Sixteen years experience with the DNR, 11+ years as the gypsy moth program specialist, 5 years as a district forest pest specialist in Green Bay. Ph.D., University of Massachusetts; M.S., University of Michigan; B.A. Mt. Holyoke College.

Steven Katovich, Entomologist, USDA Forest Service, Northeastern Area State and Private Forestry, Forest Health Protection, St. Paul, Minnesota.

EA Responsibility: Participated in reviewing and editing the environmental assessment.

Experience and Education: Nineteen years experience with the U.S. Forest Service as an entomologist and two years with the Wisconsin Department of Natural Resources. Ph.D., University of Minnesota; M.S. University of Wyoming; B.S., University of Wisconsin Stevens Point.

6.0 PERSONS AND AGENCIES CONSULTED

The overall Wisconsin Cooperative Gypsy Moth Program has been ongoing since 1990. Much of the information gathered over that time period is still very relevant in 2009. Therefore, the contacts listed below may not have been contacted in the past year or in direct regards to this suppression proposal.

Individuals and Organizations Consulted for Technical Information

Dr. Victor Mastro, USDA-APHIS
Donna Leonard, USDA-FS
Dr. Richard Reardon, USDA-FS
Dr John Podgwaite, USDA-FS
Dr. Andrew Liebhold, USDA-FS
Michael Connor, USDA-FS
John Kyhl, USDA-FS
Cathy Carnes, US Fish and Wildlife Service
US Fish and Wildlife Service, Green Bay Field Office
JoAnn Cruse, USDA-APHIS
Dr. Kenneth Raffa, Univ. of Wisconsin-Madison
Dr. Daniel Mahr, Univ. of Wisconsin-Madison
Dr. Bill McNee, WI DNR
Todd Lanigan, WI DNR
Mark Guthmiller WI DNR
Colleen Robinson Klug WI DNR
Virginia Mayo Black WI DNR
Dave Lentz, WI DNR
James Pardee, WI DNR
Drew Feldkirchner, WI DNR
Lisie Kitchel, WI DNR
Bill Smith, WI DNR
Ron Eckstein, WI DNR
Pat Manthy, WI DNR
The WI DNR Eagle & Osprey Advisory Team
WI DNR - Bureau of Endangered Resources
Melody Walker, WI DATCP
Nick Clemens, WI DATCP
Chris Lettau, WI DATCP
John Domino, WI DATCP
Nkauj Vang, WI DATCP
Wisconsin State Historical Society
Sherman Banker, State Historical Society

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APPENDIX A

ISSUES AND CONCERNS NOT USED TO FORMULATE THE ALTERNATIVES

How does Btk affect gypsy moth and what happens to it in the environment? Btk is a gram-positive, spore-forming, crystal-producing member of the bacterial genus *Bacillus*. The mode of action is complex. The larvae must ingest Btk delta-endotoxin. The crystalline protoxin is dissolved and activated in the insect gut before exerting its effects. The high pH of the insects gut and the insects gut proteases dissolve and convert the inactive protoxin to an active toxin. The toxin then binds to specific receptors on the cells in the insects gut. This disrupts the gut integrity and leads to the death of the insect from starvation and septicemia. A combination of bacterial infection and starvation usually cause the death of the larva in 7 to 10 days. For a summary on Btk see the review article by Reardon et al.(1994)¹ that specifically discusses Btk for managing gypsy moth or see the FEIS (p. 7-14).

Studies indicate that Btk spores can persist in soil for several months depending on the soil type, soil flora, and other factors such as pH, moisture, and solar radiation (FEIS p. 7-16). Under favorable conditions, formulations of Btk that are presently available can remain viable against gypsy moth on foliage for 7 to 10 days. Normally, however, Btk is quickly degraded by ultraviolet light and loses potency after 3 to 5 days. Btk rarely persists in aquatic environments for longer than a few weeks (FEIS, p. 7-17).

Are other biological control tactics being considered in the Wisconsin Gypsy Moth Program? A program of establishing natural enemies of gypsy moth that could reduce the impact of this pest has been developed and is being implemented by the Wisconsin Cooperative Gypsy Moth Program. Releases of parasites and a fungal disease of gypsy moth have been done in Wisconsin since 1997. Biological control was not a major effort in the eradication and slow-the-spread strategies because natural enemies are not considered a viable technique in eradicating (eliminating) and slowing the spread of gypsy moth populations. In eastern and central counties where suppression activities are now occurring, biological control efforts have been extensive. Currently, 6 non-native natural enemies of gypsy moth are known to be established in eastern and central Wisconsin: *Entomophaga maimaiga*, *Ooencyrtus kuvanae*, Gypsy Moth Nucleopolyhedrosis virus, *Cotesia melanoscela*, *Pimpla disparis* and *Compsilura concinnata*. The first four are specific to gypsy moth or largely so and DNR staff have actively introduced these species into and around the state. *Compsilura concinnata* and *Pimpla disparis* are generalist parasitoids and have spread on their own from populations in the east or introductions in Illinois and Minnesota. Biological control agents are not released in Wisconsin without completion of a Wisconsin Environmental Assessment and finding of no significant impact by DATCP.

¹Reardon, R., N. Dubois and W. McLane. 1994. *Bacillus thuringiensis* for managing gypsy moth: a review. USDA Forest Service, National Center of Forest Health Management, FHM-NC-01-94, 32 pp.

Why can't Gypchek be used on all spray blocks? Gypchek is unusual in that it must be produced in living caterpillars instead of fermentation vats like the Btk based insecticides. Caterpillars must be raised, infected and the virus collected from the dead insects. Because production is so labor intensive and thus expensive, Gypchek is not commercially viable. Instead, a limited amount of Gypchek is produced each year by the U.S. Forest Service as a public service to allow treatment of gypsy moth while avoiding killing endangered lepidopterans in the treated area. The limited amount produced each year must be shared by all states in both the Gypsy Moth Suppression and Slow The Spread programs. Because we must share this limited national resource, the WI suppression program reserves the use of Gypchek to those blocks where a state or federally threatened or endangered species that would be affected by a Btk insecticide is present or near. Gypchek may also be requested (though it may not be granted by the Forest Service) for use on State Natural Areas where there are compelling reasons for its use, such as the presence of declining but not yet listed lepidopterans.

Public notification prior to aerial application. A primary concern is the public being informed about treatment dates and times so that their activities can be planned accordingly.

Response. Newspaper, radio and television media will be briefed throughout the treatment period so residents can receive general information on the spray program where to go to get treatment time and dates for their area. A toll free telephone number (1-800-642-MOTH) is maintained by the Wisconsin Gypsy Moth Cooperative Program that can be accessed by the general public for updates on treatment activity. Information on the suppression program including maps of treatments sites is available on the DNR gypsy moth website. The suppression program provides daily emailed updates on the progress and planned spraying to residents that have signed up for this service.

Maintain privacy for residents during post-treatment evaluation on private property. Post treatment surveys to evaluate success or failure are required.

Response. Surveys for evaluating the success of a suppression treatment do not require entry onto private property. The project objective is to maintain greater than 50% of the leaf cover. This can be evaluated from a distance.

Could spraying affect school children? As discussed in the FEIS and in Sections 3.0 and 4.0 of this document, Btk is considered to be of no threat to human health. However, since the potential for possible application onto school children exists, especially in these urban areas during the time period when school buses are collecting students, measures have been prepared to reduce the likelihood of this occurring.

Mitigating measure. A special notification effort will be made to inform schools and through them, parents, on the safety of the insecticides used, how to avoid exposure and where to get information on when treatments will take place in their area so that they can choose to avoid exposure.

Will Btk spot car finishes and houses? Spreader-sticker compounds added to some Btk formulations can blemish painted car surfaces.

Response. The Btk formulation used in this program are not known to permanently spot car finishes.

What are the inerts in Btk formulations?

Response. Products based on Bt contain a large percentage of bacteria and fermentation medium. However, they also contain additives that improve product stability and other desirable traits such as flowability. The additives are often referred to as an inerts. Most of the inerts are product specific and are considered proprietary information by the manufacturers of Bt products. Though not made public, the inerts are reviewed by the US EPA for safety purposes.

Btk inerts are discussed in the FEIS, appendix F, Human Health Risk Assessment, p 4-4. The FEIS mentions that Novo Nordisk prepared a brief summary of the issues associated with the use of inerts in Foray 48B. Foray 48B is a mixture of Btk and fermentation materials, which comprise almost 90% of the product. The added inerts include materials to inhibit the growth of bacterial or fungal contaminants. These additives are approved for use in foods in both the United States and Canada. The Foray 48F produced by Valent and used in this year's suppression program is a further development of the Novo Nordisk Foray 48B. Foray 48F was first developed by Abbot Laboratory and the FEIS states that all inerts in the Abbot formulation are in category 4 and generally recognized as safe. No volatile solvents are used.

APPENDIX B

MAPS OF 2009 PROPOSED TREATMENT AREAS