

ENVIRONMENTAL ASSESSMENT

Minnesota Cooperative Spongy Moth (*Lymantria dispar*)

Project Slow-the-Spread

United States Forest Service, State Private and Tribal Forestry
Minnesota Department of Agriculture



CARLTON, CHISAGO, FILLMORE, HOUSTON, ISANTI, PINE AND ST. LOUIS COUNTIES OF MINNESOTA

MAY 2024

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1.0 Purpose and Need for Action

1.1 Proposed Action

As part of the spongy moth Slow-the-Spread (STS) Program, the Minnesota Department of Agriculture (MDA) proposes a cooperative project with the U. S. Forest Service's State, Private and Tribal Forestry (Forest Service, SP&TF) to treat spongy moth (*Lymantria dispar*) populations in Minnesota that are along an area referred to as the STS Action Area (also known as STS Action Zone). The 2024 STS Action Area in Minnesota is shown in Figure 1.

The proposed action is to treat 42 sites in across seven counties totaling approximately 170,000 acres in 2024. Seven sites totaling 2,961 acres in Carlton and St. Louis County will be treated with bacterial insecticide *Bacillus thuringiensis subsp. Kurstaki* (BtK). Three sites will have a single application, and the other four will have two applications. The second application would be 7-14 days after the first. 35 sites in Carlton, Cambridge, Fillmore, Houston, Isanti, Pine, and St. Louis County, totaling 167,183 acres will be treated with mating disruption (MD). The MD treatments will be applied in a single aerial application between late June and mid-July.

All proposed treatment blocks are comprised of a mix of private, state, or other public ownership. All proposed treatment acres across all land ownerships are considered in this Environmental Assessment.

1.2 Project Objective

The objective of the Minnesota Cooperative Slow-the-Spread (STS) Project is to slow the spread and buildup of spongy moth populations that are located within or in very close proximity to the STS Action Area in Minnesota.

1.3 Need for Action

Spongy moth also known as *Lymantria dispar*, is an exotic insect to North America. Spongy moth caterpillars 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 common trees in Minnesota. High numbers of spongy moth caterpillars can cause a substantial public nuisance 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 two to three successive years. Widespread caterpillar outbreaks can alter water quality, wildlife habitat, microclimate, and soil fertility (SEIS, Appendix L).

The STS Program is a national program that aims to reduce the spread of spongy moth from its natural rate of spread of approximately 20 km/yr to less than 7 km/yr. The STS Program has identified and recommends the proposed sites be treated. The STS Program includes a detailed protocol for selection and prioritization of treatment sites at the website [Slow the Spread of *L. dispar*](#)

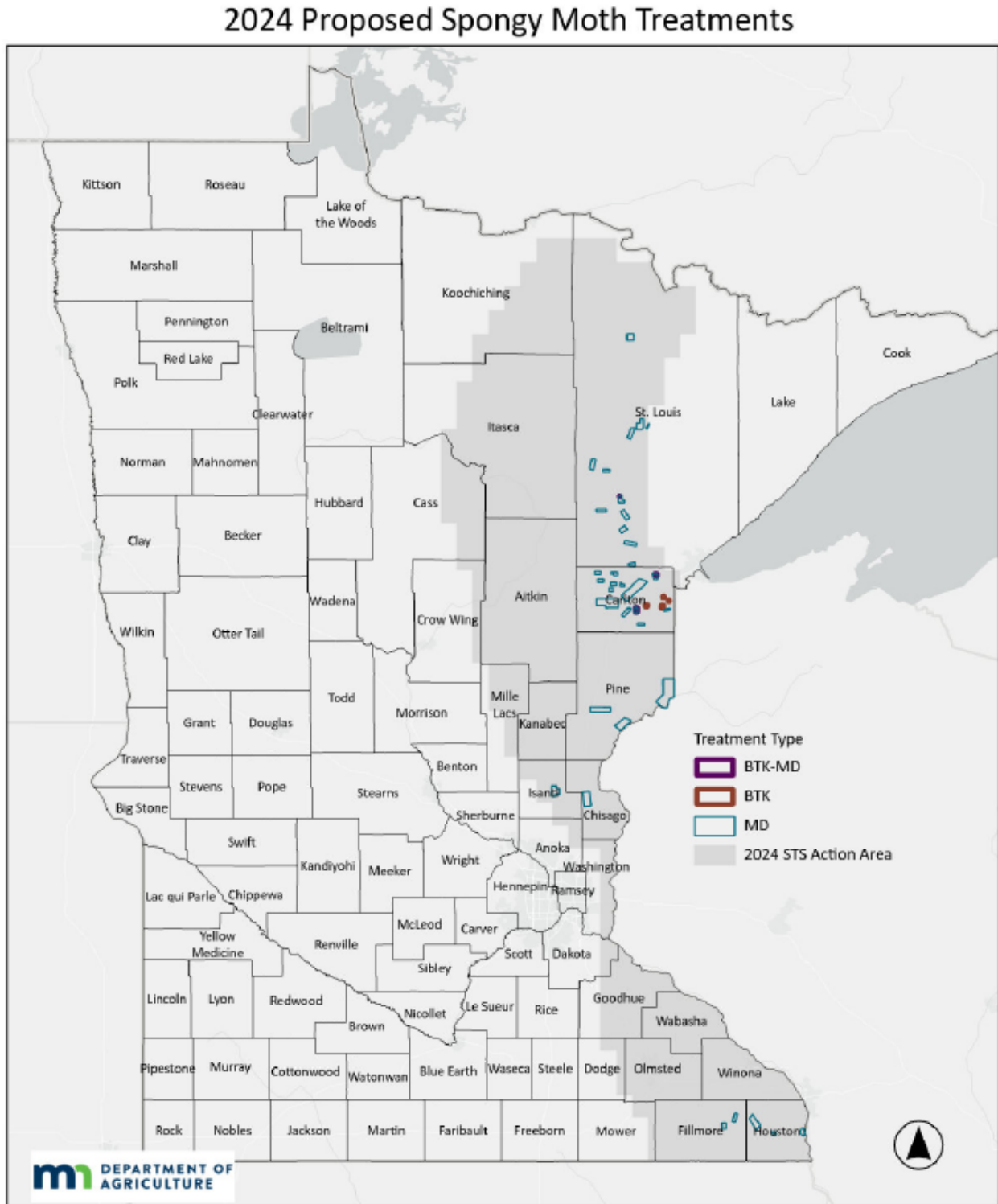
The MDA completed a "2023 Minnesota *L. dispar* Program, Summary Report" that documents the moth catch and alternate life stage data that was used to support 2024 treatment recommendations. A copy of that report is on file at the MDA. The Minnesota Spongy Moth Program Advisory Committee (SMPAC) reviewed and concurred with the proposed 2024 treatment plan. See Sections 6.0 and 7.0 for SMPAC members.

Table 1. Proposed treatment locations by county, treatment type and dosage, number of applications, and estimated acres for 2024. MD treatment is aerial application of a mating disruptant.

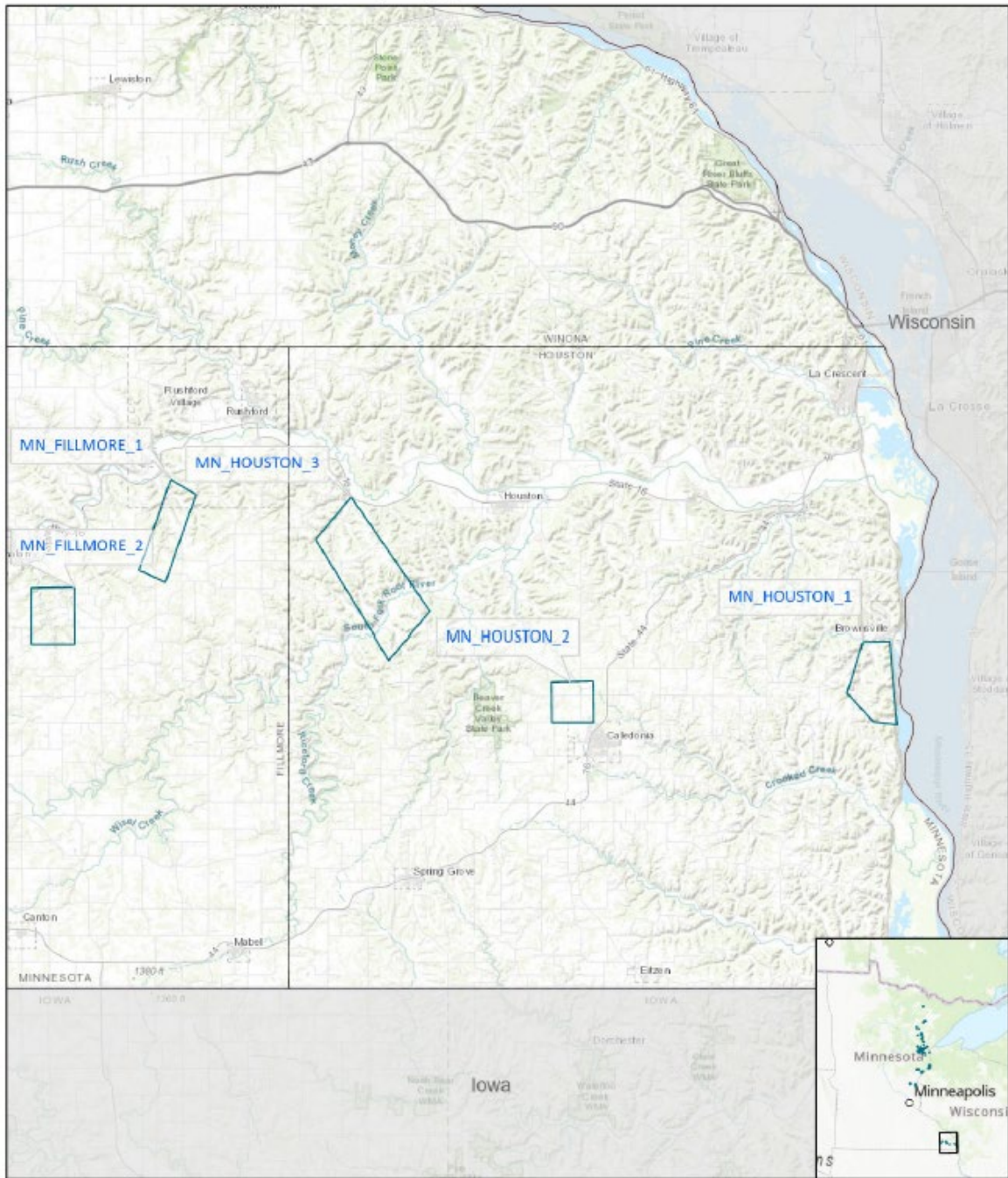
Treatment Site	County	Treatment	Dosage	Applications	Acres
Carlton_1	Carlton	BtK	24BUI	1	362
Carlton_2	Carlton	BtK	24BUIx2	2	157
Carlton_3	Carlton	BtK	24BUIx2	2	273
Carlton_4	Carlton	BtK	24BUIx2	2	594
Carlton_5	Carlton	BtK	24BUIx2	2	525
Carlton_6	Carlton	BtK	24BUI	1	975
Carlton_7	Carlton	MD	6 grams/acre	1	801
Carlton_8	Carlton	MD	6 grams/acre	1	1474
Carlton_9	Carlton	MD	6 grams/acre	1	2949
Carlton_10	Carlton	MD	6 grams/acre	1	16741
Carlton_11	Carlton	MD	6 grams/acre	1	18391
Carlton_12	Carlton	MD	6 grams/acre	1	938
Carlton_13	Carlton	MD	6 grams/acre	1	1458
Carlton_14	Carlton	MD	6 grams/acre	1	1539
Carlton_15	Carlton	MD	6 grams/acre	1	1836
Carlton_16	Carlton	MD	6 grams/acre	1	1558
Carlton_17	Carlton	MD	6 grams/acre	1	1289
Carlton_18	Carlton	MD	6 grams/acre	1	2711
Carlton_19	Carlton	MD	6 grams/acre	1	1963
North branch	Chisago	MD	6 grams/acre	1	10029
Fillmore_1	Fillmore	MD	6 grams/acre	1	2433
Fillmore_2	Fillmore	MD	6 grams/acre	1	2146
Houston_1	Houston	MD	6 grams/acre	1	2637
Houston_2	Houston	MD	6 grams/acre	1	1546
Houston_3	Houston	MD	6 grams/acre	1	7077
Cambridge	Isanti	MD	6 grams/acre	1	6294
Pine_1	Pine	MD	6 grams/acre	1	9272
Pine_2	Pine	MD	6 grams/acre	1	9207
Pine_3	Pine	MD	6 grams/acre	1	27676

Treatment Site	County	Treatment	Dosage	Applications	Acres
St.Louis_1	St. Louis	BtK	24BUI	1	75
St. Louis_2	St. Louis	MD	6 grams/acre	1	1768
St. Louis_3	St. Louis	MD	6 grams/acre	1	3718
St. Louis_4	St. Louis	MD	6 grams/acre	1	2938
St. Louis_5	St. Louis	MD	6 grams/acre	1	3396
St. Louis_6	St. Louis	MD	6 grams/acre	1	2611
St. Louis_7	St. Louis	MD	6 grams/acre	1	3312
St. Louis_8	St. Louis	MD	6 grams/acre	1	1503
St. Louis_9	St. Louis	MD	6 grams/acre	1	3393
St. Louis_10	St. Louis	MD	6 grams/acre	1	3582
St. Louis_11	St. Louis	MD	6 grams/acre	1	4979
St. Louis_12	St. Louis	MD	6 grams/acre	1	669
St. Louis_13	St. Louis	MD	6 grams/acre	1	3349
Total					170,144

Figure 1. Location of 2024 proposed STS treatment blocks in Minnesota. Treatment blocks are drawn to scale.



Proposed Spongy Moth Treatments 2024

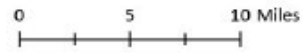


ESRI, TerraMetrics, Garmin, FGL, NOAA, USGS, EPA, USFWS, Esri Canada, Esri, HERE, DeLorme, (2013), IGN, Esri, USGS, Aero, Esri, 10000

Houston Fillmore County Group



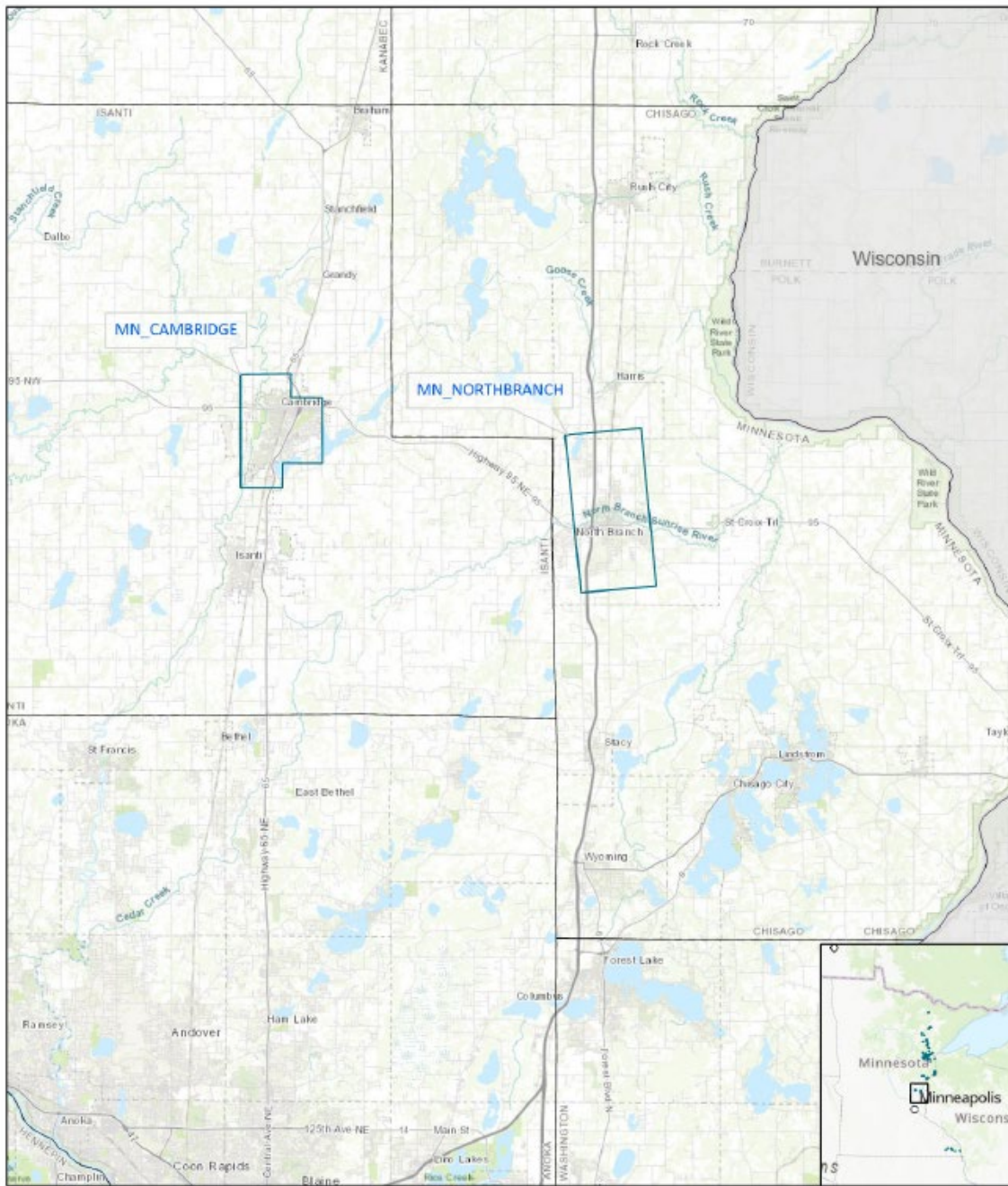
Author: E Borchardt
 Date: 1/25/2024
 MN Dept. Ag & STSS Foundation



Proposed Treatment

- MD
- BTK
- BTK-MD

Proposed Spongy Moth Treatments 2024



Chisago Isanti County Group

Proposed Treatment

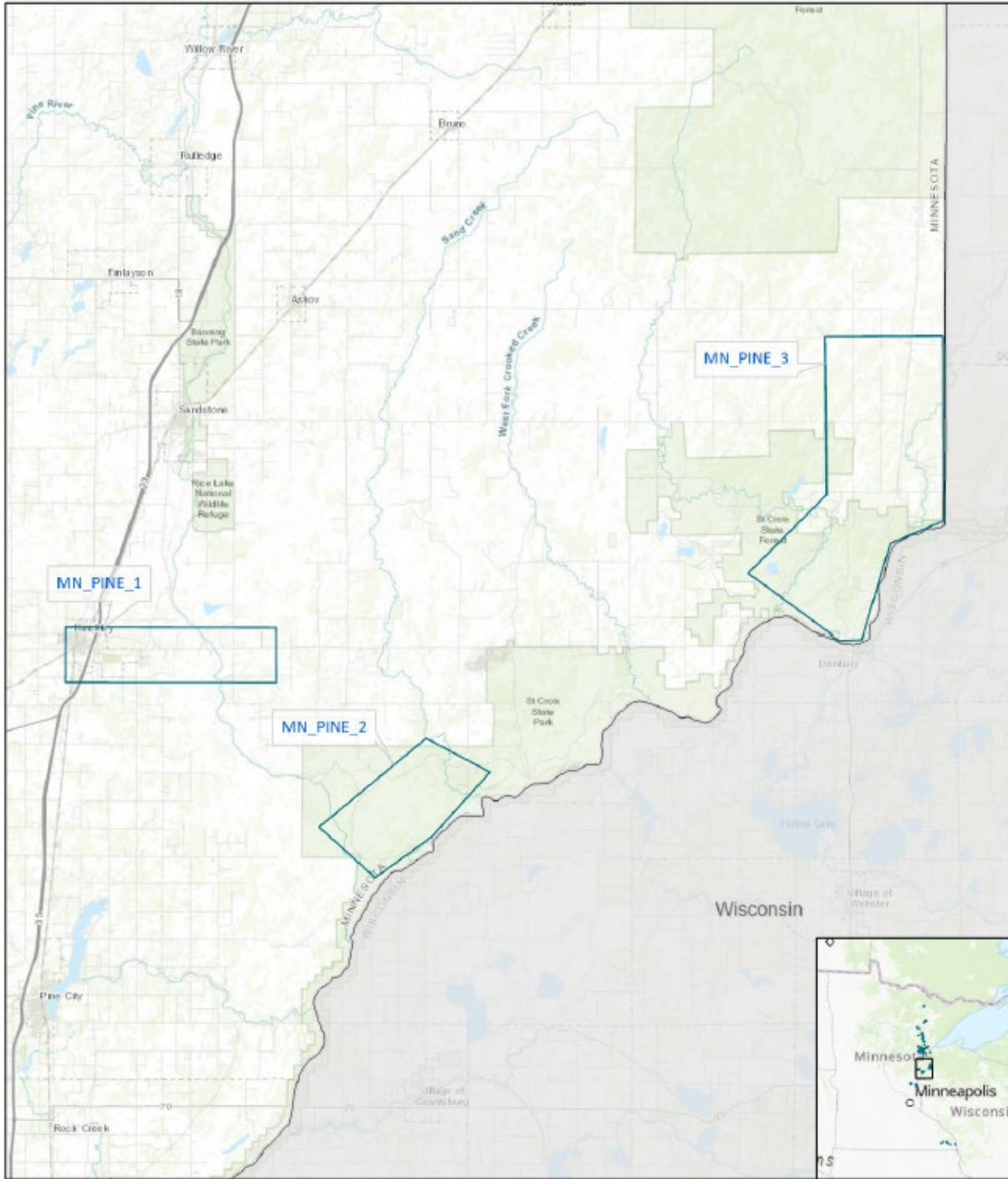
- MD
- BTK
- BTK-MD

mi DEPARTMENT OF AGRICULTURE

Author: E Borchardt
Date: 1/25/2024
MN Dept. Ag & STSS Foundation

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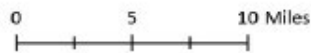
Proposed Spongy Moth Treatments 2024



Esri, TerraMetrics, Garmin, FGD, NOAA, USGS, EPA, USFWS, Sani Canada, Esri, HERE, DeLorme, USGS, NOAA, EPA, IGN, Swire, SionGlobe, Swire, SionGlobe



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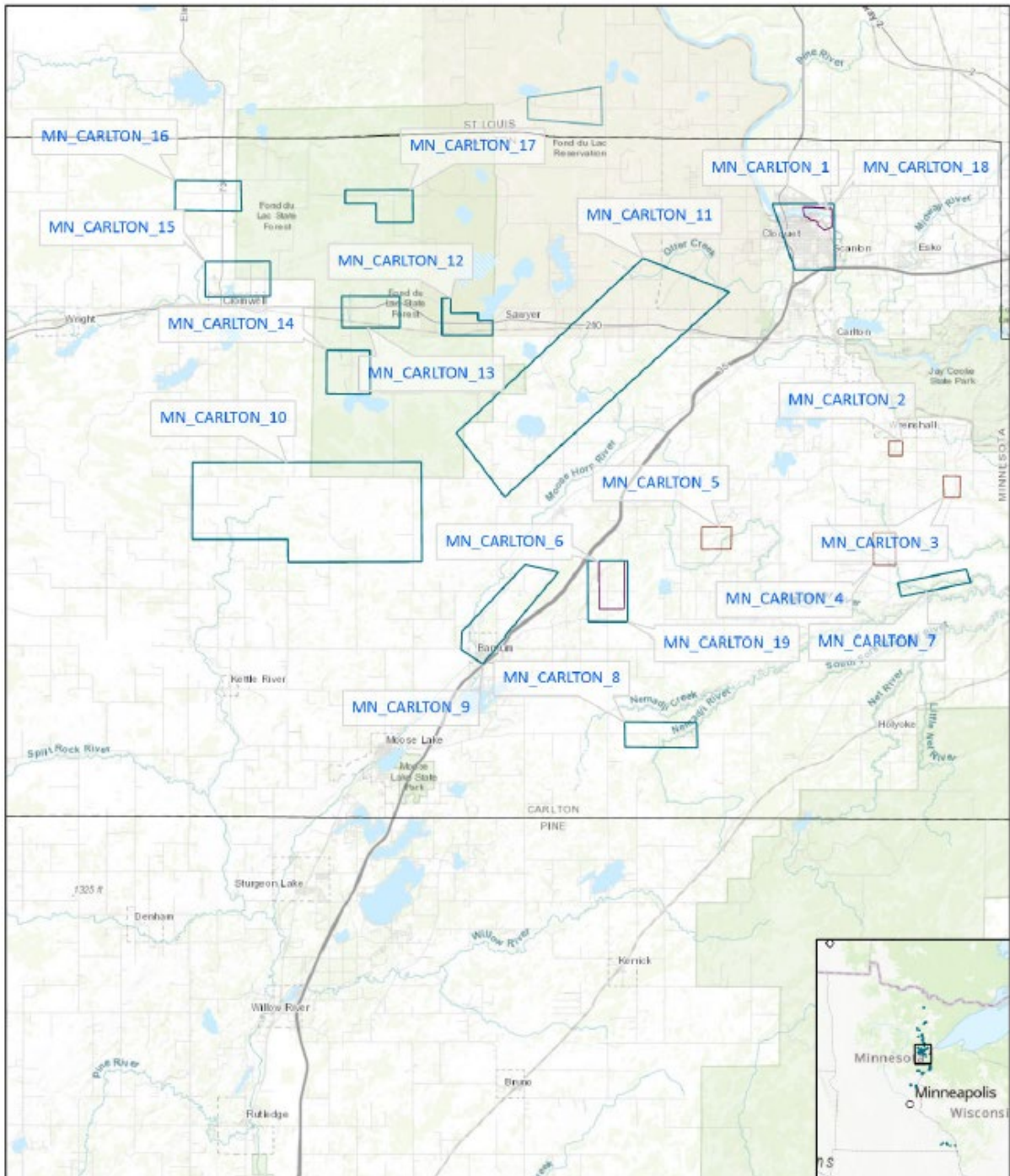


Pine County Group

Proposed Treatment

- ▭ MD
- ▭ BTK
- ▭ BTK-MD

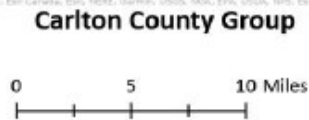
Proposed Spongy Moth Treatments 2024



Map: TomTom, Garmin, FDO, NOAA, USGS, EPA, USFWS, Ontario State Rep., Province of Ontario, Esri, HERE, Garmin, USGS, NOAA, EPA, USGS, EPA, Esri, USGS



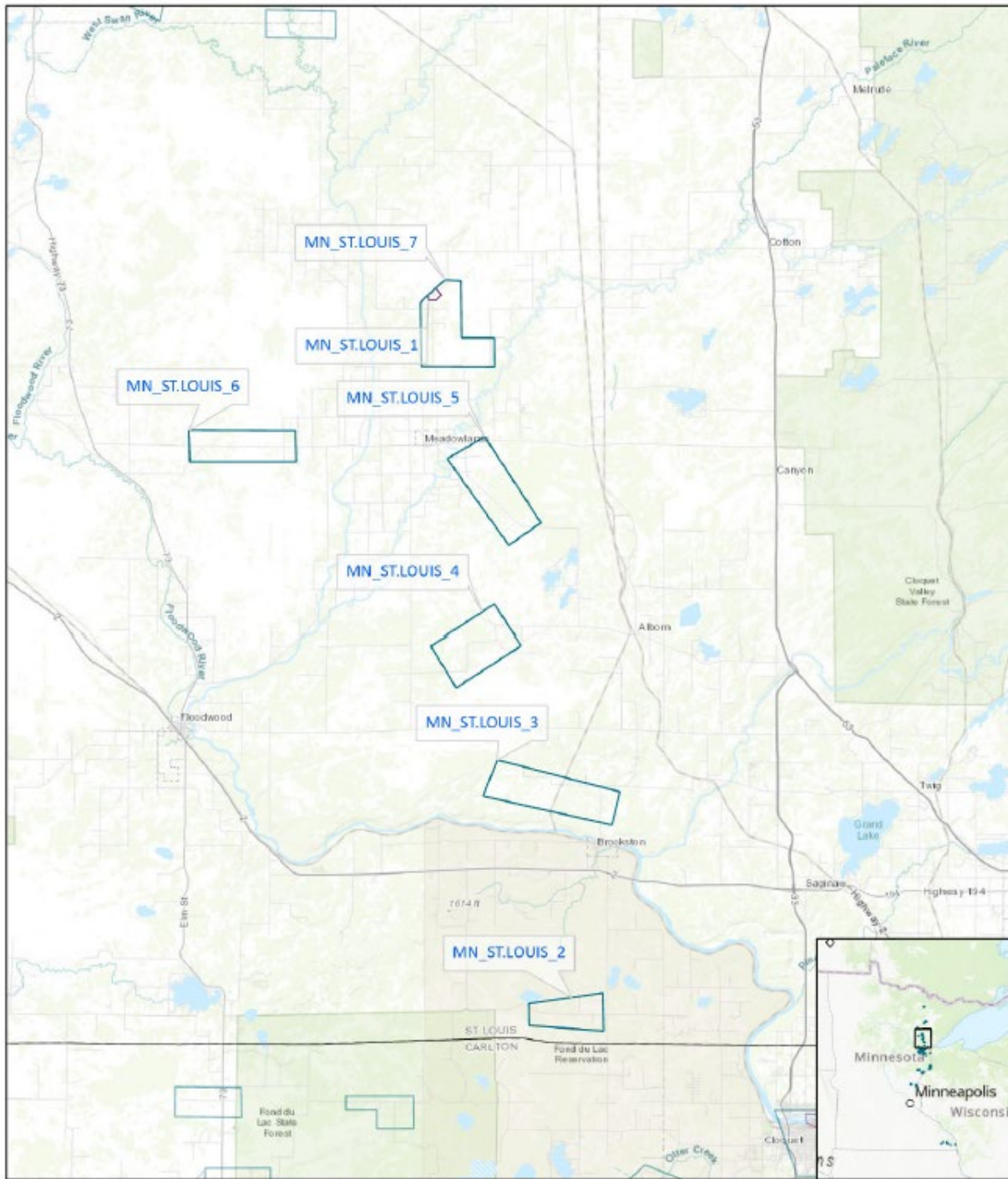
Author: E Borchardt
 Date: 1/25/2024
 MN Dept. Ag & STSS Foundation



Proposed Treatment

- MD
- BTK
- BTK-MD

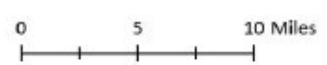
Proposed Spongy Moth Treatments 2024



Map: TomTom, Sources: NAD, NAD83, UTM, SRS, USFWS, Ontario Base Map, Province of Ontario, Esri, 2019, Corine, 2020, 2019, SRS, UTM, SRS, Esri, 2020



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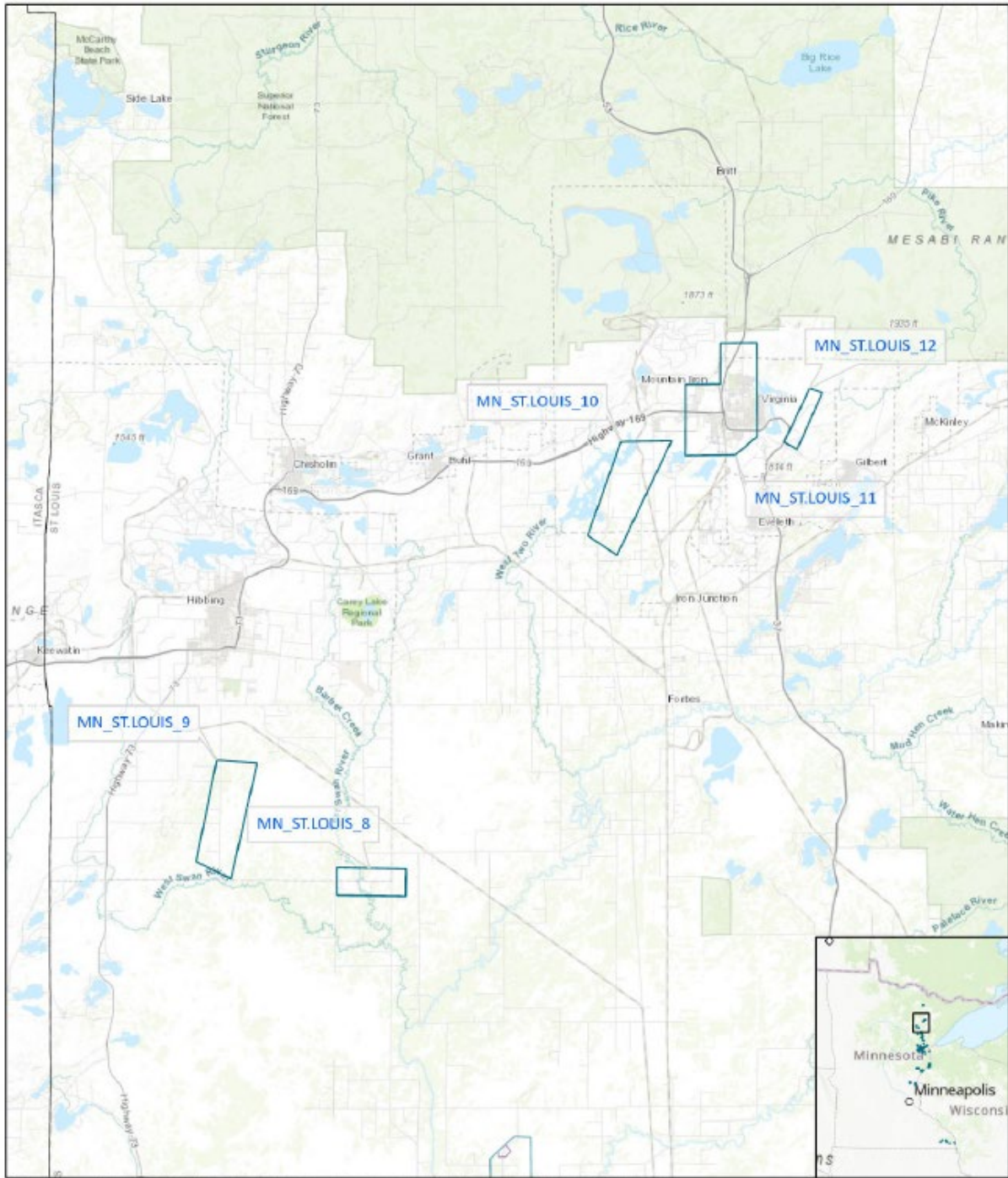


St. Louis County South

Proposed Treatment

- MD
- BTK
- BTK-MD

Proposed Spongy Moth Treatments 2024



Esri, DeLorme, Garmin, IGN, NOAA, USGS, EPA, USFWS, Ordnance Survey, Province of Ontario, Esri Canada, Esri, IBM, Swatch, USGS, NOAA, EPA, USGS, Esri, USGS



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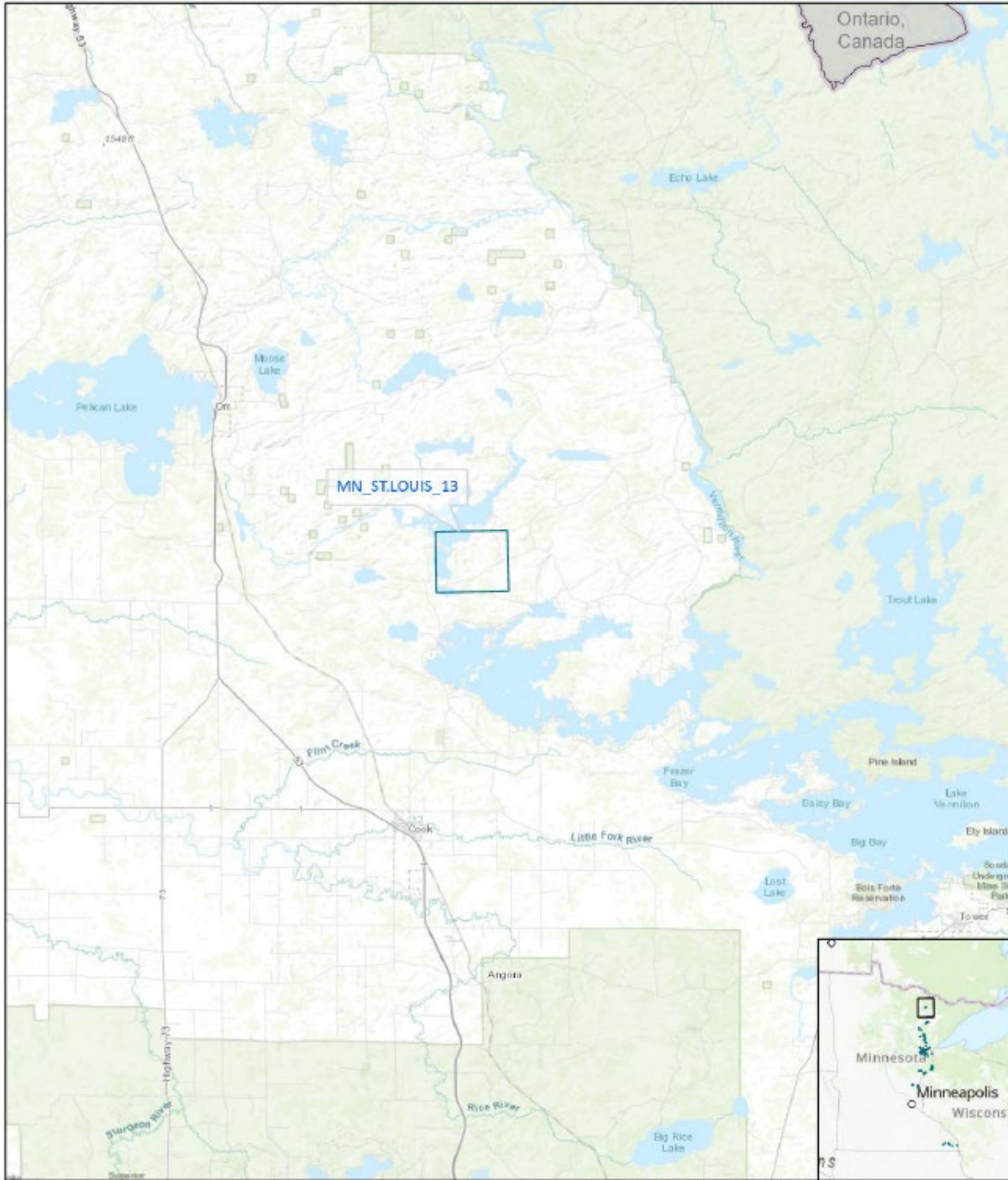
St. Louis County Central



Proposed Treatment

- MD
- BTK
- BTK-MD

Proposed Spongy Moth Treatments 2024

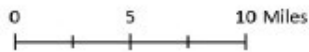


Esri, DeLorme, Garmin, MD, NOAA, USGS, SPL, USFWS, Ontario Base Map, Province of Ontario, Esri Canada, Esri © OpenStreetMap contributors, HERE, Garmin, USGS, NSA, NGA, IGN, IGP, AARC, IGN, Esri, USGS

St. Louis County North



Author: E Borchardt
Date: 1/25/2024
MN Dept. Ag & STSS Foundation



Proposed Treatment

- MD
- BTK
- BTK-MD

1.4 Decisions to be Made and Responsible Officials

The proposed action involves participation by the Forest Service, SP&TF as a cooperator with the MDA. The responsible official for the Forest Service, SP&TF must decide the following:

- Should there be a cooperative treatment program, and if so, what type of treatment options should be used?
- Is the proposed action likely to have any significant impacts requiring further analysis in an Environmental Impact Statement (EIS)?

The responsible official for the Forest Service, SP&TF is

Gina Jorgensen, Field Representative
USDA, Eastern Region Forest Service, State Private & Tribal Forestry
1992 Folwell Ave.
St. Paul, MN 55108

The responsible official for the Forest Service, SP&TF will decide before early May to ensure timely implementation for an effective program that meets the State's objectives if the action alternative is selected. This decision is not subject to appeal. If there are no significant impacts, this will be documented in a Decision Notice (DN) and Finding of No Significant Impact (FONSI) or other appropriate decision document, issued by the Forest Service, SP&TF responsible official. If significant environmental impacts are found and the project is to continue, an Environmental Impact Statement (EIS) would be required.

The responsible state official for implementing the STS Spongy Moth Program is:

Mark Abrahamson, Plant Protection Division Director
Minnesota Department of Agriculture
625 Robert Street North
St. Paul, MN 55155-6448

1.5 Scope of the Analysis

Since 1996, the United States Department of Agriculture (USDA) has carried out its *L. dispar* management responsibilities through the U. S. Forest Service, and U.S. Animal and Plant Health Inspection Service (APHIS) and pursuant to a programmatic decision based on a 1995 Environmental Impact Statement (EIS) for *L. dispar* management. The Record of Decision (ROD) for that EIS was signed in January, 1996. It allowed three management strategies – suppression, eradication, and slow the spread. The 1995 EIS was updated with a final Supplemental Environmental Impact Statement (SEIS), titled “Gypsy Moth Management in the United States: A Cooperative Approach,” dated August 2012. The ROD for the SEIS was signed by the Forest Service in November 2012. It maintains the three strategies of suppression, eradication, and slow the spread. These strategies depend upon the infestation status of the area: generally infested, non-infested, and transition. Counties involved in this environmental assessment (EA) are within areas considered non-infested or transition (Carlton, Chisago, Fillmore, Houston, Isanti, Pine, and St. Louis).

Implementation requires that site-specific environmental analysis be conducted, and public input gathered to identify and consider local issues before any federal slow the spread projects are authorized and implemented. Site-specific analyses are tiered to the programmatic SEIS and documented in accordance with agency National Environmental Policy Act (NEPA) implementing procedures. As part of the analyses conducted for the SEIS, human health and ecological risk assessments were prepared (SEIS, Volumes III and IV). The purpose of tiering is to eliminate repetitive discussions of the issues addressed in the SEIS (40 CFR, 1502.20 and 1508.28 in Council on Environmental Quality, 1992).

This EA provides a site-specific analysis of the alternatives and environmental impacts of treating spongy moth populations. The 42 proposed sites for treatment in 2024 include portions of Carlton, Chisago, Fillmore, Houston, Isanti, Pine, and St. Louis counties in Minnesota.

1.6 Summary of Public Involvement and Notification

The MDA compiled a contact list of local leaders in each proposed treatment block. An email was sent to the local leaders’ listserv to inform them of upcoming outreach activities. Printed materials were attached to these emails to provide leaders with the necessary information to answer questions about *L. dispar* treatments. In person presentations were made to the County Board of Commissioners for Carlton, Fillmore, Houston, and Pine County. Presentations to City Councils for Cambridge, North Branch, Hibbing, Hinckley, and Virginia. Three virtual presentation was given to state citizens on April 4. MDA hosted five in person informational open houses. The MDA mailed informational postcards to property owners inside proposed treatment block boundaries. A second postcard will be sent as a reminder to residents as BtK treatment date approaches. The second postcard will remind residents that there will be low-flying aircraft on the treatment dates. Local law enforcement, emergency care facilities, poison control, and the 911 system will be notified prior to application.

There were eight opportunities for the public to interact with the MDA through public informational meetings on the proposed treatments. Offering five meeting times with in-person and three virtual options gave citizens multiple opportunities to be involved.

Public Meetings and Open Houses

Location	Date
Pine County Board of Commissioners	February 6
Carlton County Board of Commissioners	February 6
Fillmore County Board of Commissioners	February 13
City of Hinckley City Council	February 13
City of Virginia City Council	February 20
City of Hibbing City Council	February 21
Houston County	February 27
City of Cambridge	March 4
City of North Branch	March 26
City of Hinckley Open House	April 1
Carlton County Open House	April 2
Southern MN Open House, Caledonia	April 3
Three Virtual Informational Meetings	April 4
North MN Open House, Virginia	April 8
Central MN Open House, North Branch	April 9

Information gathered from local leaders and residents in 2024 and from public meetings held in previous years, along with material collected from resource professionals, industry, and environmental groups were 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 2, 3 and 4.

Issue 1. Human Health and Safety. Four major concerns exist under this issue: (1) the risk of an aircraft accident, (2) the risk of a pesticide spill, (3) the direct risk of mating disruption exposure to humans, and (4) the effect of future spongy moth outbreaks on people.

Issue 2. Effects on Non-target Organisms and Environmental Quality. The major concerns under this issue are: 1) the impact of treatment materials to the environment and non-target organisms, including threatened and endangered species that may be in the treatment sites, and 2) the future impacts of spongy moth defoliation on the forest resources, water quality, wildlife, and other natural resources.

Issue 3. Economic and Political Impacts of Treatment vs. Non-Treatment. Spongy moth outbreaks can have significant economic impacts due to effects on the timber resources, nursery and Christmas tree producers, and recreational activities. An additional economic and political impact is a spongy moth quarantine that can be imposed to regulate movement of products from the forest, nursery, and recreational industries within infested areas to un-infested areas.

Issue 4. Likelihood of Success of the Project and the Minnesota Program. 1) What is the likelihood of success within the treatment blocks? 2) What is the likelihood of slowing the spread of spongy moth? 3) How does that likelihood affect the alternatives proposed?

1.8 Other Issues and Concerns

There are issues and concerns that have been expressed by the public both in 2024 as well as in past years. Many of these do not relate directly to the major issues listed in the previous section. More frequent comments and questions are listed below. In some cases these were used to develop mitigating measures, management requirements, and constraints. Further information on the following bullets can be found in Appendix A.

- How does Btk affect *L. dispar* and what happens to it in the environment?
- How will *L. dispar* treatments affect beekeeping?
- Do Btk *L. dispar* treatments harm monarch butterflies?
- Will *L. dispar* treatments affect pets?
- What does *L. dispar* eat?
- What are they doing for *L. dispar* in WI?

- What is the Slow-the-Spread Program and where do I get more information on that program?
- Are biological control tactics being considered in the Minnesota *L. dispar* Program?
- What is done to maintain privacy for residents during post-treatment trapping projects on private property?
- What is Foray 48B?
- Is Btk and Foray 48B safe?
- Should people with weakened immune systems or people with allergies or asthma be concerned?
- How might I be exposed to Btk?
- Will children going to school be subject to spraying?
- Will Btk or mating disruptant spot car finishes?
- What are the inerts in Btk formulations?
- Will *L. dispar* become resistant to Btk?
- If the establishment of *L. dispar* populations are inevitable, why manage now?
- Is gluten included in the Btk product (Foray) that would be applied?

1.9 Summary of Authorizing Laws and Policies

State

The Minnesota State Statutes Chapter 18G, Plant Protection and Export Certification, authorizes the MDA to conduct detection and eradication projects for plant pests.

The Minnesota Department of Agriculture Pesticide Control Law Chapter 18B provides the state statutes governing pesticide application.

All portions of this project on all state- and privately-owned lands will be conducted in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and are operating under Minnesota Pesticide General Permit number MNG87B000.

Federal

Authorization to conduct treatments for spongy moth infestations is given in the Plant Protection Act of 2000 (7 U.S.C. section 7701 et.seq.).

The Cooperative Forestry Assistance Act of 1978 provides the authority for the USDA and state cooperation in management of 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 2018 Farm Bill (P.L. 11-334, Sec 8[16 U.S.C. 2104]) reauthorizes the basic charter of the Cooperative Forestry Assistance Act of 1978.

The Forest Service and APHIS cooperate on state spongy moth projects based on a Memorandum of Understanding between the two federal agencies. USDA Departmental *L. dispar* Policy (USDA 1990) assigns the Forest Service and APHIS responsibility to assist states in protecting non-federal lands from spongy moth damage.

The National Environmental Policy Act (NEPA) of 1969 (P.L. 91-190), 42 USC 4321 et. seq. requires a detailed environmental analysis of any proposed federal action that may affect the human environment.

The Federal Insecticide, Fungicide, and Rodenticide Act of 1947, (7 USC 136) 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 of 1973, as amended (16 USC 1531 et. seq.) prohibits federal actions from jeopardizing the continued existence of federally listed threatened or endangered species or adversely affecting critical habitat of such species.

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.

Executive Order #12898. Consistent with this Executive Order, the Forest Service considered the potential for disproportionately high and adverse human health or environmental effects on any minority or low-income populations. The proposed treatment sites have been determined based on spongy moth finds using STS protocols. The proposed treatment itself will have minimal effects, and it will not have disproportionate effects to any minority or low-income population.

2.0 Alternatives Including the Proposed Action

Alternatives are developed in this chapter. Some alternatives are eliminated from further consideration, while others are selected for detailed consideration.

2.1 Process Used to Formulate the Alternatives

The Record of Decision (ROD) for the SEIS that this document is tiered to maintains the three strategies for spongy moth management (eradication, slow the spread, and suppression) that were allowed in the 1995 *L. dispar* management EIS. Therefore, the Forest Service can assist in funding and carrying out slow the spread projects. The ROD for the SEIS adds the insecticide tebufenozide to the previous list of six approved treatments from the 1995 EIS. Therefore, seven treatments can be considered for use in developing treatment alternatives under the slow the spread strategy: mating disruption; mass trapping; sterile insect technique; and the insecticides tebufenozide, diflubenzuron, BtK, and Gypchek.

Information pertinent to developing alternatives for managing the spongy moth situation in Minnesota was solicited from a number of groups (see 6.0 Persons and Agencies Consulted), including the public (see 1.6 Summary of Public Involvement and Notification). However, the framework for proposing and selecting appropriate treatment alternatives was developed within the STS Program.

2.2 Treatment Options Eliminated from Detailed Study

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

Diflubenzuron (Dimilin). The label for diflubenzuron (Dimilin) prohibits its use over wetlands and directly to water. Treatment sites contain ponds, lakes, marshes, rivers, and/or wetlands. Therefore, Dimilin is not considered for this project. In future projects, it may be evaluated for use.

Gypchek. Gypchek is a *L. dispar* specific virus product. It has proven effective at reducing *L. dispar* at higher population levels but has not been consistently successful in eliminating low level populations. It is an expensive alternative with a limited supply and is only used in environmentally sensitive areas, generally those with threatened or endangered lepidopterans, which could be impacted by other treatment options, specifically dimilin, Btk and tebufenozide (USDA 2012a, Vol. II, App. A, pp. 3 to 4). Because of this, Gypchek was not considered for this project. In future projects, it may be evaluated for use.

Tebufenozide (Mimic). The label for Tebufenozide (Mimic) prohibits its use over wetlands and water. Ponds, lakes, marshes, rivers, and/or wetlands are present in some treatment areas. Treatment sites contain ponds, lakes, marshes, rivers, and/or wetlands. Therefore, Mimic is not considered for this project. In future projects, it may be evaluated for use.

Sterile insect technique. The SEIS documents the use of sterile insects for elimination of isolated spongy moth populations. It also documents the obstacles of using this alternative — the limited release period; need to synchronize production of mass quantities of sterile pupae; and the logistical difficulties of repeated release over a 4-week period (SEIS, Appendix A, pp. 7-8). Based on these constraints, sterile insect release was not considered. In future projects, it may be evaluated for use.

Mass trapping. This option was eliminated for three reasons. First, the cost of mass trapping is significantly higher than mating disruption applications. Second, the logistics for placing and maintaining nine traps per acre — the recommended number — over large infestations is extremely difficult. And third, control over large areas by this method has not been demonstrated as feasible.

2.3 Alternatives Considered in Detail

Alternative 1. THE NO ACTION ALTERNATIVE

The Forest Service, SP&TF would not cooperate with the MDA in conducting proposed treatments in 2024. This would include financial assistance for the treatment proposal. Local spongy moth populations would likely build and spread to surrounding areas. This is not a preferred alternative because damage and regulatory action would occur sooner than if other alternatives are selected.

Alternative 2. THE PREFERRED ALTERNATIVE

The Forest Service, SP&TF and MDA would cooperate in 2024 in applying Btk and mating disruption treatments. Treatments would occur on 42 proposed treatment areas: using Btk on 7 sites, and mating disruption on 35 sites (see Table 1). Btk and the mating disruptant would be applied by low-flying aircraft. This alternative proposes that funding would be made available by the Forest Service, SP&TF for STS treatments on approximately 170,141 acres at 42 sites in 7 counties.

In proposed Btk treatment blocks, the product Foray 48B, containing the active ingredient Btk, would be applied as a single application in three blocks, and in two applications spaced 7-14 days apart in the other four treatment blocks. The Foray 48B applications are at a dose of 24 billion Cabbage Looper Units (CLUs) per acre per application in 64 fluid ounces. Applications would be made in May to late June during the time period when *L. dispar* early instar caterpillars are feeding. A small number of acres (estimated at 10 to 15 percent) may be retreated if heavy rain occurs soon after an application.

Mating disruption applications would use the active ingredient disparlure. Mating disruption treatments would occur in late June to late July, just prior to the flight period of male spongy moth moths. Disparlure would be applied at a rate of either 6 or 15 grams active ingredient per acre. The rate used is dependent on available funding and local population density of spongy moths. The 6 gram rate has been used successfully and is generally selected.

Treatment decisions are driven largely by local spongy moth population levels. A combination of number of male moths caught and the ease of locating egg masses and other life stages can be used to estimate relative population levels and thereby influence the proposed treatment type. Mating disruption works well at low-density populations where male moths have a difficult time locating and mating with widely dispersed females. As local populations build, more and more female moths are around, so male moths no longer need to rely on the pheromone to find females, they can visually locate them. Once this occurs, insecticide treatments, such as BtK or Gypchek become a more reliable treatment product.

2.3.1 Mitigating Measures that Apply to Alternative 2

Under this alternative, measures would be taken to mitigate possible treatment impacts. Specific safety procedures and guidelines will be presented in a required 2024 Safety Plan.

One of the primary functions of the Cooperative Spongy 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 would be done if this alternative was selected:

- Public information efforts inform the public about the proposed action, answer questions, and consider input. Notification of meetings are made to different elected officials and through mailings to affected parties as well as news releases to local media and postings to web sites. Just prior to treatment, local safety authorities will be reminded of treatment.
- Residents and businesses with a mailing address within proposed treatment blocks are notified of the proposed action via direct mailing prior to application. The mailing informs residents of the type of program that is planned. Information includes maps of the treatment areas, how low the aircraft will be flying, the type of product to be used, and why treatment is being proposed.
- Residents and other interested parties are given the option of obtaining advance spray notification by calling the toll free Report A Pest voicemail (888-545-MOTH), which will be updated frequently with planned treatment activities. Residents and other interested parties may also sign up for email notifications regarding the proposed treatment activities.

- The MDA and/or Forest Service, SP&TF will have personnel at airports and/or helispots to ensure that the treatment products are used in accordance with label directions and other appropriate laws. Mixers, loaders, and pilots will wear protective clothing when required and will have the required applicator/handler licenses for their role in the project. Prior to the start of treatment, aircraft will undergo a safety review and be calibrated to ensure accurate application rates. A Work and Safety Plan is required before treatments can begin.
- Pilots will be thoroughly briefed on treatment site locations. Pilots are instructed not to treat open water such as lakes, ponds, open water wetlands, and visible rivers. They are instructed to treat only forested areas. During treatment applications, applicators will be instructed to turn the booms off when flying over open water.
- Planes will be guided using differential global positioning systems (DGPS). Automatic flight following equipment is also used to monitor aircraft during flight ferrys and application to ensure safety.
- Ground personnel will be equipped with cell phones to communicate with the command center. Employees of state and federal agencies monitoring the treatments will receive training on treatment methods and will be provided outreach information to assist with answering questions from the public.
- Weather conditions such as wind speeds, precipitation, temperature, relative humidity, and foliar moisture will be monitored within the treatment areas to ensure that treatment products are applied according to the manufacturer's guidelines.
- During the treatments, ground observers will monitor the application for accuracy within the site boundaries, swath width, and drift. Application information (e.g. swath widths, spray-on and spray-off, acres treated, and altitude) will be downloaded to an operations-based computer. The treatment sites will be monitored, post-treatment, to determine the effectiveness of the treatments.
- All mix/load areas will be guarded and/or secured to prevent vandalism.
- Consultations with Minnesota Department of Natural Resources (DNR), Natural Heritage Inventory personnel, and the United States Department of Interior (USDI) Fish and Wildlife Service are done to minimize the likelihood of impacts to state or federally listed threatened and endangered (T&E) species.
- Known bald eagle nest locations will be provided to pilots to heighten awareness of potential conflicts. Flight lines will be altered to avoid nest disturbance where required.
- The State Historic Preservation Officer has been consulted regarding the proposed activities and possible effects on historic sites.

2.4 Comparative matrix of the environmental consequences of the alternatives

ISSUE	ALTERNATIVE 1	ALTERNATIVE 2
ISSUE 1 Human Health and Safety	Spongy moth in itself can create health problems. With no federal funding, the state would still likely have a treatment program, though reduced in size. Therefore, the discussion under alternative 2 would apply here as well.	Risk to human health from mating disruptant is minimal. The risk of an aircraft crashing and/or a serious pesticide spill occurring does exist, but it is slight. Measures will be taken to minimize the chance of an accident.
ISSUE 2 Effects on Non-target Organisms and Environmental Quality	Future outbreaks would change some local forest ecosystems by reducing the oak component and opening stands to periods of increased light penetration. Some native insects would be directly impacted by loss of food and habitat due to leaf loss caused by spongy moth feeding.	Mating Disruption is highly specific to spongy moth. No non-target impacts should occur.
ISSUE 3 Economic and Political Impacts of Treatment vs. Non-Treatment	Regulatory activity would need to be considered in infested counties. More widespread infestations would result in economic losses to the forestry and tourism industries. Funds will need to be obtained to deal with future suppression projects.	Since known infestations are being treated, the need for quarantine restrictions for Carlton and St. Louis counties would not be considered at this time. Future projects are still likely and funding sources will need to be developed. Spray projects are often controversial, and some complaints, comments, and questions will circulate into the political and economic arenas.
ISSUE 4 Likelihood of Success of the Project and the State Program	Spongy moth populations would likely expand in any untreated area making future control more difficult and costly.	Treatments should result in success in the treatment sites. However, more infestations are likely to be found and new infestations will occur. This would likely result in future projects. Eventually spongy moth will become widely established across Minnesota even if Alt. 2 is followed. However, statewide spread and buildup should be significantly delayed by following this alternative.

3.0 Affected Environment

3.1 Description of the Proposed Treatment Sites

All sites are evaluated to characterize land type, identify aerial hazards, and identify potential site issues, especially as they pertain to major issues. Table 2 summarizes the 2024 treatment sites. Any of the treatment areas could have recreational activities underway at the time of treatment, including walking, hiking, fishing, and camping. Maps of proposed treatment areas are shown in Appendix B.

Table 2. Description of the 2024 proposed BtK and Mating Disruption sites. Land use is divided into six general categories: Woody Wetlands/Emergent herbaceous wetlands (B), Herbaceous/Shrub/scrub (BR), Forest (F), Hay/Pasture (H), Developed (U), Open water (W). Population density at each site is generalized as high, medium, or low. Each site is defined as urban or non-urban and schools within treatment blocks are noted.

BtK Sites

Block Name	Land Use	Population Density	Urban (Y/N)	School (Y/N)	County
Carlton_1	B/BR/F/H/U/W	Low	Y	N	Carlton
Carlton_2	BR/F/H	Low	N	N	Carlton
Carlton_3	B/BR/F/H	Low	N	N	Carlton
Carlton_4	B/BR/F/H	Low	N	N	Carlton
Carlton_5	B/BR/F/H/W	Low	N	N	Carlton
Carlton_6	B/BR/F/H/W	Low	N	N	Carlton
St. Louis_1	BR/F/W	Low	N	N	St. Louis

Mating Disruption Sites

Block Name	Land Use	Population Density	Urban (Y/N)	School (Y/N)	County
MN_CAMBRIDGE	B/BR/F/H/U/W	High	Y	Y	Isanti
MN_CARLTON_10	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_11	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_12	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_13	B, BR, F, H	Low	N	N	Carlton
MN_CARLTON_14	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_15	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_16	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_17	B, BR, F	Low	N	N	Carlton
MN_CARLTON_18	B, BR, F, H, U, W	High	Y	Y	Carlton
MN_CARLTON_19	B, BR, F, H, W	Low	N	N	Carlton
MN_CARLTON_7	B, BR, F	Low	N	N	Carlton
MN_CARLTON_8	B, BR, F	Low	N	N	Carlton

MN_CARLTON_9	B, BR, F, H, U	Med	Y	Y	Carlton
MN_FILLMORE_1	BR, F, H	Low	N	N	Fillmore
MN_FILLMORE_2	BR, F, H	Low	N	N	Fillmore
MN_HOUSTON_1	BR, F, H, W	Low	N	N	Houston
MN_HOUSTON_2	BR, F, H	Low	N	N	Houston
MN_HOUSTON_3	B, BR, F, H	Low	N	N	Houston
MN_NORTHBRANCH	B, BR, F, H, U, W	High	Y	Y	Chisago
MN_PINE_1	B, BR, F, H, U, W	Med	Y	Y	Pine
MN_PINE_2	B, BR, F, H, W	Low	N	N	Pine
MN_PINE_3	B, BR, F, H, W	Low	N	N	Pine
MN_ST.LOUIS_10	B, BR, F, H, W	Low	N	N	St. Louis
MN_ST.LOUIS_11	B, BR, F, H, U, W	High	Y	Y	St. Louis
MN_ST.LOUIS_12	B, BR, F, W	Low	N	N	St. Louis
MN_ST.LOUIS_13	B, BR, F, W	Low	N	N	St. Louis
MN_ST.LOUIS_2	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_3	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_4	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_5	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_6	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_7	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_8	B, BR, F, H	Low	N	N	St. Louis
MN_ST.LOUIS_9	B, BR, F, H	Low	N	N	St. Louis

Majority of the sites occur in rural forested or agricultural landscapers with low population density. There are some sites with high population densities (Cambridge, Carlton_18, North Branch, and St.Louis_11) and these are addressed with specific attention to public information and treatment timing. Advanced treatment notification and outreach are sent directly to local government unit, presentations to all local government units, work directly with public information officers in those areas ensures public is well notified. Treatment operations are structured to time applications for the early morning to minimize disturbance.

3.2 Threatened and Endangered Species

The Minnesota Department of Natural Resources (DNR) Division of Ecological and Water Resources reviewed the proposed activities. The DNR evaluates the program regarding state listed threatened and endangered species, as well as species considered rare or of special concern by the state. If requested, modifications to treatment sites can be made to accommodate concerns highlighted during this review process. The DNR concurred with the MDA assessment of no impact to state-listed endangered or threatened species. Copies of the correspondence with the DNR are on file at the MDA.

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

such species. This project is considered a federal action. To avoid any negative impacts to federally listed species, or their critical habitat, the FS, SP&TF did consider possible treatment effects to Listed Species in counties with treatment blocks. An informal Section 7 consultation between the Forest Service, SP&TF and the USDI Fish and Wildlife Service (FWS) was completed. FWS concurred with the finding that the 2024 Slow-the-Spread Spongy Moth Program in Minnesota, may affect, but is not likely to adversely affect the northern long-eared bat, tricolored bat, rusty patched bumble bee and monarch butterfly. In addition, the FS SP&TF determined that the 2024 Slow-the-Spread will have no effect on Canada lynx; gray wolf; higgins eye pearlymussel, salamander mussel, sheepnose mussel, spectaclecase mussel, prairie bush clover, and Canada lynx critical habitat. Copies of the correspondence with the Forest Service, SP&TF and FWS are on file at the MDA.

3.3 Cultural and Historical Resources

The National Historic Preservation Act provides specific guidance for the preservation of prehistoric and historic resources when federal actions may have an adverse impact on these resources. In Minnesota, the State Historic Preservation Officer (SHPO) was informed of the proposed action. The Minnesota State Historic Preservation Office has agreed that no historic properties would be affected by the proposed undertaking. Correspondence regarding this consultation is on file at the MDA.

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. We assume federal and state agencies act in agreement in selecting the same alternative.

4.1 Comparison of Environmental Consequences of Alternatives Considered in Detail

Issue 1. Human Health and Safety

Alternative 1. For this alternative, there would be no cooperative project, therefore risk of an aircraft accident or human contact with the mating disruptant would not exist. However, future impacts by spongy moth to human health will occur sooner under Alternative 1 than if treatments are used to slow the spread of these spongy moth populations. Spongy moth outbreaks have been associated with adverse human health effects, including skin lesions, eye irritation, and respiratory reactions (SEIS, Appendix L, pp. 3-1 to 3-4). Spongy moth caterpillars can become a serious nuisance that can cause psychological stress or anxiety in some individuals (SEIS, Appendix L, pp. 3-4 to 3-5).

Alternative 2. The toxicity of insect pheromones used in mating disruption to mammals is relatively low and their activity is target specific. Therefore, the EPA requires less rigorous testing of these products than of conventional insecticides. Risk to human health due to exposure to disparlure, the active ingredient used in mating disruption applications, is discussed in the Disparlure Human Health Risk Assessment in the SEIS (Appendix. H, pp. 3-1 to 3-10). Once absorbed through direct contact, disparlure is very persistent in humans, and individuals exposed to disparlure may attract adult male spongy moths for prolonged periods of time. This persistence is viewed as a nuisance and not a health risk (SEIS, Appendix. H, pp. 3-9). In acute toxicity tests, disparlure was not toxic to mammals (SEIS, Appendix H, pp. 4-1 to 4-8) therefore no effects to human health are anticipated.

Mating disruptant applications would be conducted using spray aircraft. A slight risk of an accident or spill always exists when conducting aerial application programs. Considerable planning and training are done annually to mitigate this risk. Since the beginning of the MDA *L. dispar* Program in 1973, more than 1 million acres have been treated aerially. During that time period, no aircraft accidents or treatment product spills, and no emergency landings or crashes of application or observation aircraft have occurred. There were no injuries, no property damage, and no damage to the environment. To further reduce any risk associated with aerial spraying, a work, safety and security plan is required prior to program implementation. These detailed plans are prepared annually and outline all safety and emergency procedures to be used.

Further, aerial applicators meet Federal and Minnesota Department of Agriculture Pesticide Law requirements to provide safe, efficient, and acceptable applications of pesticide. See section 2.3.1 for additional safety and mitigation measures for this project.

The effect of spongy moth outbreaks on humans would be delayed using this alternative.

Issue 2. Effects on Non-target Organisms and Environmental Quality

Both alternatives would have impacts on forest ecosystems in Minnesota.

Alternative 1 - The “no action alternative” would likely result in a more rapid build-up of spongy moth populations and defoliation of susceptible forested areas, especially oak and aspen dominated forests. In other parts of the northeastern U.S., spongy moth outbreaks have changed the structure of some forest ecosystems by killing a portion of the oak component and encouraging tree species that spongy moth caterpillars avoid, such as red maple (SEIS, Chapter 4, pp. 4-10). Spongy moth outbreaks in North America have not resulted in widespread loss of oak, rather a subtle change in many locations towards a more mixed forest. In Minnesota forests, maples and white pine should become more prevalent as spongy moth caterpillars focus their feeding on oaks and aspen. The SEIS notes that spongy moth infestations generally result in tree mortality losses of less than 15% of total basal area, with much of this occurring in oaks that are suppressed or intermediate in crown position at the time of widespread defoliation (Appendix L, p. 4-1).

Spongy moth defoliation and subsequent tree mortality can affect non-target organisms. This is discussed in some detail in the SEIS (Appendix L, and Chapter 4, Section 4.3). Widespread leaf loss caused by the feeding of millions of caterpillars and the loss of some trees, especially oak trees, has a variety of impacts on the environment. Some of these changes are detrimental to certain species and other species are favored by what occurs during and after spongy moth outbreaks. SEIS Chapter 4 (Section 4.3) discusses changes to soil condition, microclimate, water quality, water yield, acorn production, and other environmental factors that are impacted by the loss of leaf tissue, the waste material produced by large number of feeding caterpillars, and the tree mortality that can follow outbreaks. Some species of mammals, birds, terrestrial invertebrates, fish and aquatic invertebrates are negatively impacted by spongy moth related feeding. Other species however, are either not impacted or find conditions altered to their benefit. As an example, acorn production can drop during and immediately following an outbreak and this can reduce populations of white-footed mice. But, dead trees favor some species of birds that use dead wood as nesting sites or locations to forage for wood or bark-infesting insects that thrive in dead and dying trees.

It should be noted that in 2024 defoliating populations are not expected in any of the proposed STS treatment sites in Minnesota. The STS Program targets treatments at very low spongy moth population levels. It may be several years before local spongy moth numbers rise to damaging levels, with or without treatments in 2024.

Alternative 2 – Using mating disruption is likely to maintain the forest condition in the short-term (5 to 10 years) by eliminating spongy moth populations in the treatment sites, thus keeping populations from expanding and causing defoliation. However, in the long term (10 to 15 years), spongy moth will likely become more widely distributed in Minnesota even if this alternative is followed (See Issue 4).

Disparlure may indirectly help in maintaining existing forest conditions, water quality, microclimate, and soil condition by delaying spongy moth population increases (SEIS, Chapter 4, p. 19).

The Ecological Risk Assessment for disparlure (SEIS, Appendix H) notes that there is limited data available on the toxicity of disparlure but based on available data the toxicity profile in terrestrial animals does not suggest that disparlure is likely to cause adverse effects at plausible levels of exposure. Disparlure appears to be essentially nontoxic to mammals and birds. In addition, it is not likely to cause toxic effects in aquatic species. Disparlure is able to disrupt mating in some closely related species of moths other than spongy moth. However, all of these species are Asian or Eurasian, and not known from

North America. There is no basis for asserting that mating disruption would occur in other nontarget species in North America, including nontarget insects, specifically native Lepidoptera.

Issue 3. Economic and Political Impacts of Treatment vs. Non-Treatment

Alternative 1 – If no treatments were applied, the likely action would be to implement quarantine in the 2024 counties in the near future. Quarantine would regulate movement of firewood, logs, other timber products, mobile homes, recreational vehicles, trees, shrubs, Christmas trees, and outdoor household articles. This could create a financial impact to industries that deal with these products.

If current populations are not treated, they will continue to reproduce and grow in size. Defoliation is likely to become noticeable in the future, but it would be difficult to predict exactly when noticeable defoliation would occur. Requests for federal assistance to suppress spongy moth would be likely when defoliation occurs. Suppression projects are generally more expensive in total dollars than eradication projects because much larger areas are treated. The economic impact to state budgets would increase, as responsible agencies would need to administer and fund these suppression projects.

Following defoliation, negative financial impacts are likely to occur for recreational industries such as resorts and campgrounds. Homeowners, private woodland owners, and forest-based industries could be impacted by spongy moth treatment costs, tree mortality, and adverse human health effects.

Alternative 2 – If treatments are applied, regulatory action is not likely to occur in the near future and the impacts listed under Alternative 1 would be delayed. Economic analyses from the Slow the Spread Program (STS) demonstrated the use of Btk, mating disruption and other STS technology reduced the spread of *L. dispar* by as much as 60 percent (Sharov et al. 2002, p. 32). Assessment of the economic feasibility of STS shows that over a 20-year period, the Benefit-Cost Ratio is 3:1, under conservative assumptions (Sills 2007).

Issue 4. Likelihood of Success of the Project

Alternative 1 – Male moth trapping results and other surveys do indicate that spongy moth populations are spreading into previously un-infested areas of Minnesota, western Wisconsin, and Iowa. These populations are very likely to persist and expand if no treatments are done.

Alternative 2 – Substantially reducing spongy moth populations within the treatment blocks using mating disruption, as proposed in alternative 2, is likely. Complete and permanent eradication of spongy moth from Minnesota is not feasible. This is due to many factors, but mainly to the fact that widespread spongy moth populations exist in Wisconsin and Michigan counties that are not far removed from the eastern counties of Minnesota. Further, repeated trap catches over a number of years across Cook and Lake Counties indicate that *L. dispar* is established in those two counties. There will be continued unintentional introductions from humans moving spongy moth life stages from these and other infested areas. Continued reintroduction would likely result in future projects. However, this alternative is much more likely to slow the spread and buildup of defoliating populations across the state than the “no action alternative”.

Mating disruption and other STS technology has proven to be very effective in slowing the spread of spongy moth. The STS Program has been evaluated since 1990 and has reported substantial declines in

spread rate (Sharov et al., 2002; Sharov and Liebhold, 1998), further evaluation of spread rate is reported in annual STS reports found at: [STS Web Site](#)

The STS Program has been very active in Wisconsin where numerous treatment blocks using both Btk and mating disruption have occurred since the year 2000. The WI Spongy Moth Program has reported on treatment success and failure by treatment block over the last several years. Success rates in excess of 90 percent have been the norm for Btk and mating disruption treatments (as reported in Wisconsin spongy moth STS EA's from 2013-2023).

4.2 Summary of Alternatives Considered in Detail

Mating disruption applications are not viewed as posing any significant risk to human health or safety. A slight risk of an aircraft accident does exist but this is very small and safety and mitigation measures will be implemented.

Under alternative 1 (no action) spongy moth populations are likely to continue to persist, reproduce and expand in population size. Local and eventually long-distance spread from these areas would be likely. Some tree mortality, especially of oak species, is anticipated if spongy moth becomes established. The long-term trend in future stands with spongy moth present would be away from oaks toward forests containing species less preferred by spongy moth caterpillars. This would most likely mean more red maple, sugar maple and pine in many areas. It is predictable that change is likely. In some areas this change may be positive, and in other areas, negative. Regulatory activity (most likely a county based quarantine) would need to be considered in Carlton and St. Louis counties under this alternative.

Alternative 2 (proposed action) offers the greatest probability of meeting the stated objective (see section 1.2). No non-target impacts are anticipated in the mating disruption blocks.

Alternative 2 does delay the immediate economic and political impacts created by any expansion of a federal spongy moth quarantine, and it does offer the best chance for slowing the spread and buildup of spongy moth populations in the state. Thus, the economic and nuisance impacts associated with spongy moth should be delayed over a longer time period. This should allow the orderly development of a well-balanced program. The STS Program has documented slower spread rates nationwide since its inception compared to historical rates of spread.

4.3 Cumulative Effects

Cumulative effects are the incremental impacts of the action when added to past, present, and reasonably foreseeable actions.

No cumulative effects are anticipated with mating disruption treatments, since disparlure is very specific to *L. dispar*. In 2024 98% of proposed Minnesota treatment acres would use mating disruption.

Cumulative effects could occur under some scenarios that include widespread Btk applications over very large areas and repeated Btk applications over the same areas within a few years. To date, Minnesota has not had widespread Btk treatment activities. In 2021, Btk was applied to only two Btk treatment blocks statewide. One block was in Winona county (1,144 acres) in southeast Minnesota; the other was in St. Louis county (631 acres) in northeast Minnesota.

In 2022 there was one Btk treatment within the New Duluth block in St. Louis County that was treated earlier in 2021 (631 acres). In 2022, 75 acres of that 2021 block was retreated. This retreatment does increase the likelihood of cumulative effects. However, no Btk treatments were proposed in this area in 2023, and the treated area is very small when compared to the local forested area occurring over the urbanized Duluth landscape. In 2023 no Btk treatments were conducted in Minnesota as part of the STS project. Given the irregularity of Btk treatments proposed, and Btk blocks are typically small, It is very unlikely that cumulative effects would occur under this scenario. If Btk blocks are proposed that overlap or are adjacent to recent Btk blocks, cumulative effects in the area may become more likely.

Based on the discussion above, no cumulative effects would be anticipated. Cumulative effects may become more likely if spongy moth treatment activity, especially Btk treatment, increases in frequency and scale in future years in Minnesota.

5.0 List of Preparers

Kimberly Thielen Cremers, Pest Mitigation and Regulatory Response Unit Supervisor, Minnesota Department of Agriculture, St. Paul, MN. GYMPAC member.

EA Responsibility: Prepared information and reviewed the EA.

Experience and Education: 20 years of experience in *L. dispar* management with the Minnesota Department of Agriculture. Geographical Information Systems (GIS) Certificate and B.S., St. Cloud State University, General Biology.

Erich Borchardt, Invasive Species GIS Coordinator, Minnesota Information Technology Services Department, St. Paul, MN.

EA Responsibility: Participated in data analysis and map creation.

Experience and Education: 19 years of experience at the Minnesota Department of Agriculture as invasive species GIS survey and management support. B.A., St. Cloud State University, Geography.

Danielle DeVito Pest Mitigation and Regulatory Coordinator, Pest Mitigation and Regulatory Response Unit, Plant Protection Division, Minnesota Department of Agriculture, St. Paul, MN.

EA Responsibility: Prepared information for and reviewing the environmental assessment.

Experience and Education: 12 years at the Minnesota Department of Agriculture with experience in invasive pest detection and management. B.S., Minnesota State University, Mankato, Ecology and Environmental Science.

Patrick Engelken, Forest Entomologist, US Forest Service, Region 9 State, Private and Tribal Forestry, Forest Health Protection, St. Paul, Minnesota.

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

Experience and Education: 4 years of experience with the Forest Service as an entomologist, 1 year experience as a research technician at Michigan State University, M.S., Michigan State University in entomology; B.S., Washburn University, Biology.

6.0 Persons and Agencies Consulted

A number of people, groups, and agencies have been contacted in years prior to 2024. The information, comments and concerns obtained in past years are still valid in many cases. Therefore, some of the names listed below were not necessarily contacted in 2024. SMPAC members are noted with a * (two additional members are noted in section 5.0).

Individuals and Organizations Consulted for Technical Information

Minnesota DNR-Natural Heritage and Nongame Research Program, St. Paul, MN

US Department of Interior, Fish and Wildlife Service, Ecological Services, Minneapolis, MN

US Department of Interior, Fish and Wildlife Service, Upper Mississippi River NWR

US Army Corp of Engineers, Property manager Upper Mississippi River NWR

Minnesota State Historical Society St. Paul, MN

William Farhat*, USDA State Plant Health Director

Liza McCarthy*, Minnesota DNR, Division of Parks, St. Paul, MN

Laura Van Riper*, Minnesota DNR, Division of Ecological & Water Resources, St. Paul, MN

John Hiebert, Minnesota DNR, Division of Fish and Wildlife, St. Paul, MN

Tom Coleman, USFS State and Private Forestry, STS Program Manager, Asheville, NC

Valent BioSciences, Elginburg, Ontario, Canada

Deanna Scher, Minnesota Department of Health, St. Paul MN

Brian Aukema*, University of Minnesota, St. Paul MN

Tylor Kasper, 1854 Treaty Authority

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APPENDIX A - Other Issues and Concerns (see section 1.8)

How does Btk affect *L. dispar* 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 the Btk delta-endotoxin. The crystalline protoxin is dissolved and activated in the insect gut before exerting its effects. The high pH of the insect's gut and the insect's gut proteases dissolve and convert the inactive protoxin to an active toxin. The toxin then binds to specific receptors on the cells in the insect's 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 larvae in seven to 10 days. For a summary on Btk, there is a review article by Reardon and others (1994)¹ that specifically discusses Btk for managing *L. dispar*.

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. Under favorable conditions, formulations of Btk that are presently available can remain viable against *L. dispar* on foliage for seven to 10 days. Normally, however, Btk is quickly degraded by ultraviolet light and loses potency after three to five days. Btk rarely persists in aquatic environments for longer than a few weeks. A Btk environmental risk assessment can be found in the SEIS Appendix F.

How will Btk treatments affect organic farms?

Foray 48B is OMRI (Organic Material Review Institute) listed. It may be used in certified organic production or food processing according to the USDA National Organic Program Rule.

How will *L. dispar* treatments affect beekeeping?

Neither treatment product will have any detrimental effect on bees.

Do Btk *L. dispar* treatments harm monarchs?

Btk would not harm an adult monarch. However, Btk could kill a monarch caterpillar if the caterpillar eats Btk soon after application. Most of the monarch caterpillar production in Minnesota is occurring much later in the summer than are the planned Btk treatments. In most instances, Btk treatments occur before most monarchs arrive, lay eggs, and egg hatch occurs in the spring. So, some risk does exist but it should be minimal.

Will Btk harm garden plants?

Btk does not harm garden plants. In fact, it is a common garden insecticide used against caterpillars such as the cabbage looper.

Will *L. dispar* treatments affect pets?

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

Btk and mating disruptant would not be expected to have any adverse impacts on pet animals such as dogs, cats (all mammals), birds, or fish.

What does *L. dispar* eat?

L. dispar caterpillars eat the leaves on a wide variety (over 500 species) of trees and shrubs. However, certain species are favored and fed on more readily than others. Favored hosts include oaks, trembling aspen, and willows. See a [list of *L. dispar* food preferences](#)

What are they doing for *L. dispar* in WI?

Wisconsin has well established *L. dispar* populations across the eastern 2/3rds of the state. They have been an active participant with the STS Program since its inception. Wisconsin has treated in excess of 200,000 acres annually in recent years, mostly using mating disruption and Btk treatments. For background on the Wisconsin *L. dispar* Program visit their [L. dispar web site](#)

What is the Slow-the-Spread Program and where do I get more information on that program?

See the following web site: [STS web site](#)

Are biological control tactics being considered in the Minnesota *L. dispar* Program? Biological control is not a major effort in the STS Program because natural enemies are not considered a viable technique in eradication (eliminating) and slowing the spread of *L. dispar* populations.

As *L. dispar* numbers expand in the state, the use of biological control agents will be evaluated and some will very likely be proposed as a functioning part of an integrated pest management program against *L. dispar*.

What is done to maintain privacy for residents during post-treatment trapping projects on private property?

Pheromone baited traps are used within the treatment sites to monitor success or failure. In many cases, this would entail entering private property to place and monitor traps.

Trappers will attempt to meet with residents at their door prior to setting traps. If a homeowner is adamant in not wanting a trap on their property, every effort will be made to locate the trap in another location.

What is Foray 48B?

Foray 48B is the commercial product containing Btk. The inert, or inactive, ingredients used in Foray 48B are certified organic food-grade ingredients and contain no petroleum solvents. The product is certified organic by the Organic Materials Review Institute (OMRI). The Foray 48B Btk is not genetically engineered and the product is gluten free.

Is Btk and Foray 48B safe?

Btk has a proven safety record with people, pets, birds, fish, livestock, and other insects such as bees; and has been registered and re-registered many times by the Environmental Protection Agency (EPA) for use in the U.S., to use on more than 200 food and fiber crops

Should people with weakened immune systems or people with allergies or asthma be concerned?

Although we don't have evidence that Btk will affect any given group of people, individuals with a weakened immune systems or serious food allergies may choose to avoid any potential for exposure by staying indoors during and at least 30 minutes after the treatment, or leaving the area during the application.

How might I be exposed to Btk?

Day to day, people are exposed to Btk through contact with soil in the natural environment or through their diet, at very low levels. If you eat fresh fruits or vegetables, you probably have already ingested this bacterium. It is commonly used on commercial and organic food crops. In this project you could be exposed during the application process, via the air during and very soon (first 30 minutes) after application. After application Btk dries and adheres to leaf and other surfaces, it is likely to persist on outside surfaces for several days before degrading. People could be exposed during this time period if they rub or directly contact a surface where Btk was deposited.

Will children going to school be subject to spraying?

As discussed in the SEIS and in Section 4.1 of this document, Btk and mating disruption are considered to be of no threat to human health. However, since the potential for possible application onto school children exists, especially in urban areas during the time period when school buses are collecting students, measures have been prepared to reduce the likelihood of this occurring.

Btk treatments in northern Minnesota may occur as late as mid-June, after schools have completed their school year. Mating disruption treatments occur in mid-summer, when schools are not in session. If schools are not in session the following mitigating measure would not be implemented.

(Mitigating measure) During the month of May and the first week of June, project personnel will work with the local school district to determine school start times and bus routing. All efforts will be taken to assure spraying will not occur while children are in school or at bus stops awaiting pick up. School properties, if necessary, will be treated during times school is not in session, nor 30 minutes prior or after school starts or is dismissed.

Will Btk or mating disruptant spot car finishes?

There is nothing in the Btk product proposed for use that would cause damage to automobile finishes. The product is formulated to stick to the surface of leaves when it dries.

Therefore, it is easiest to remove from any surface while it is still wet. To remove dried Foray from any surface, soak the dried droplets with water and then sponge or wipe with a soft cloth. A cleaning product normally labeled for car washing may be needed if the dried spray has been on the surface for a while. Mating disruptant treatment products use a waxy substrate embedded with *L. dispar* pheromone. The product will not harm the paint of your car. If you notice mating disruptant droplets on your car, wash it with a mild detergent and water like you would with road grime.

What are the inerts in Btk formulations?

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 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 SEIS, appendix F (p. 3-14 and 3-15).

Will *L. dispar* become resistant to Btk?

It is very unlikely that forest insects will build up resistance to Btk. In forestry, only a very small area of the total forest is sprayed, and that area will likely not receive more than two or three treatments over the entire lifespan of the trees. The pest population exposure to Btk is, therefore, extremely low.

If the establishment of *L. dispar* populations are inevitable, why manage now?

See section 1.3 Need for Action

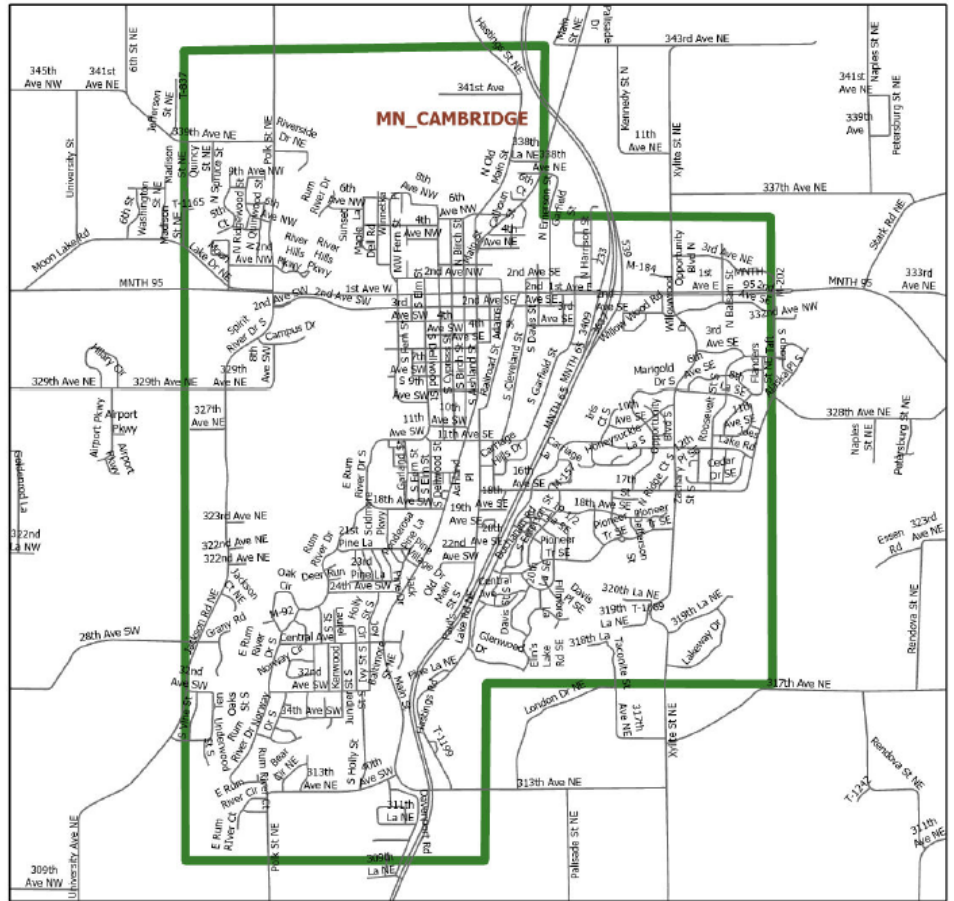
Is gluten included in the Btk product (Foray) that would be applied?

Foray contains water, residues of food crops that are used to grow the Btk, and food additives. The additives are approved for use in food by the US Food & Drug Administration (FDA) and are found naturally in foods or made for use in food products. Most people encounter these additives in beverages, foods, and cosmetics. According to the company that makes Foray there is no wheat or gluten in the product.

APPENDIX B - Maps of Treatment Blocks



Listed alphabetically by county block name

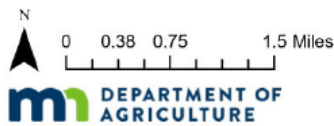
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Layer

Management

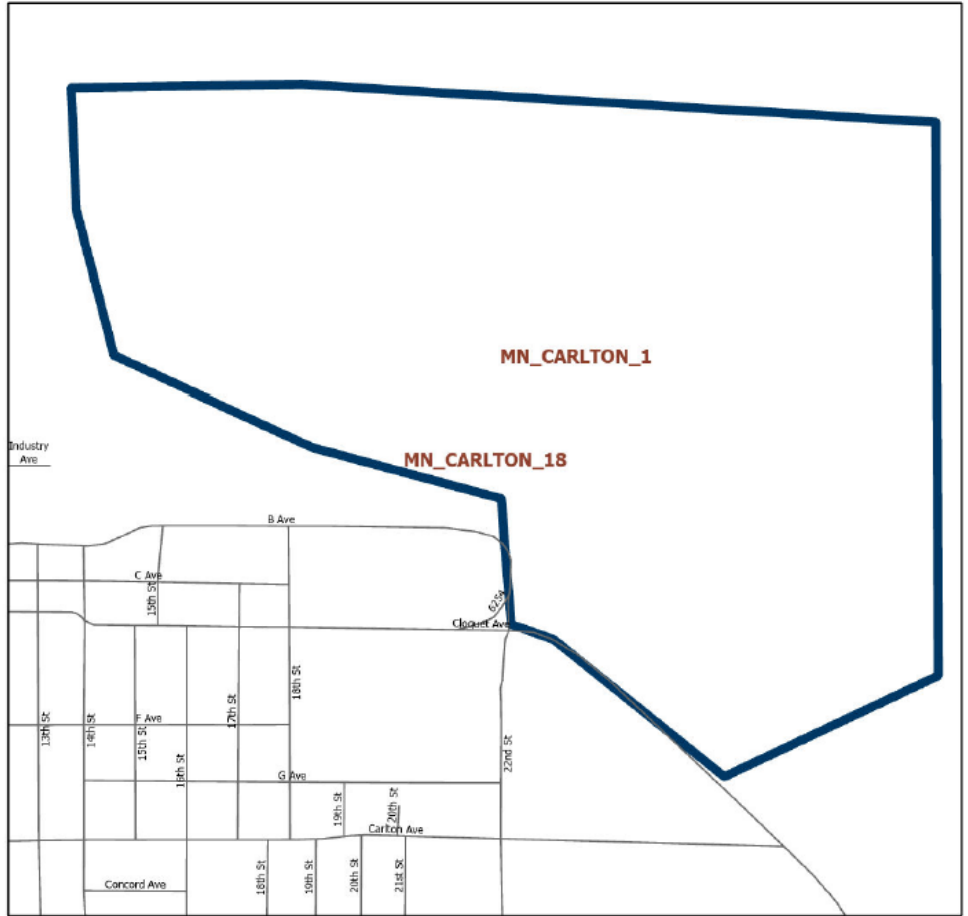
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-  Btk



2024 Spongy Moth Proposed Treatment Site MN Carlton 1



- Layer
Management
- Mating Disruption
 - BtK



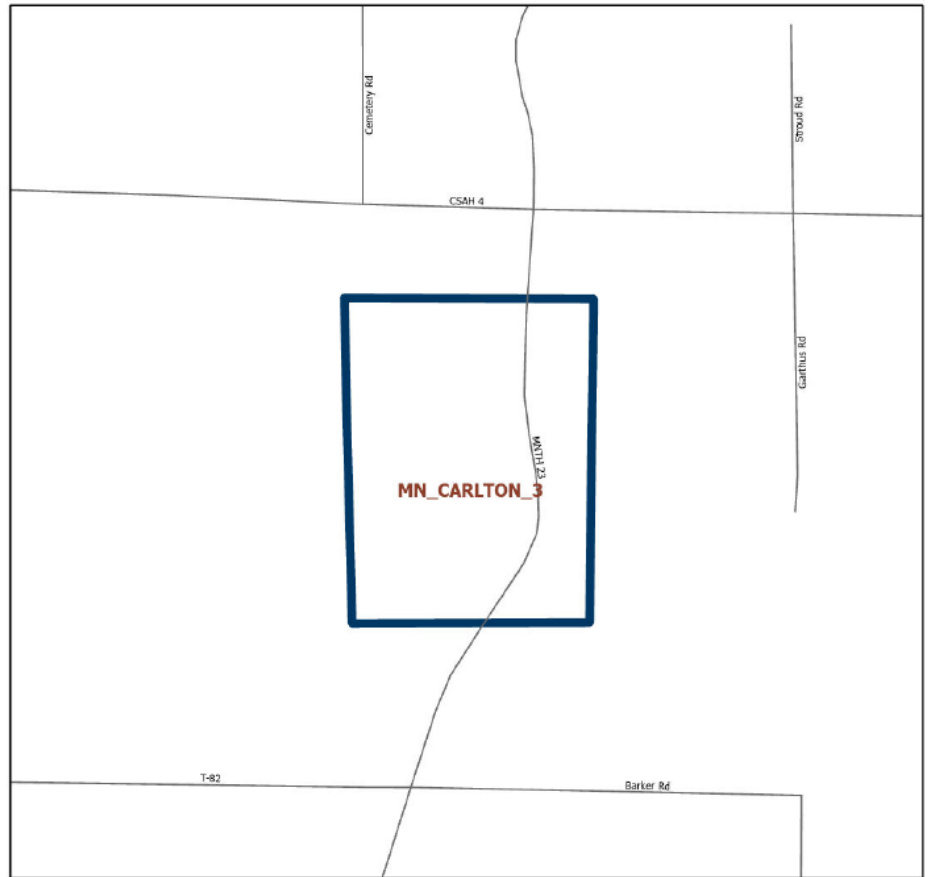
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- Layer
- Management
-  Mating Disruption
 -  BtK



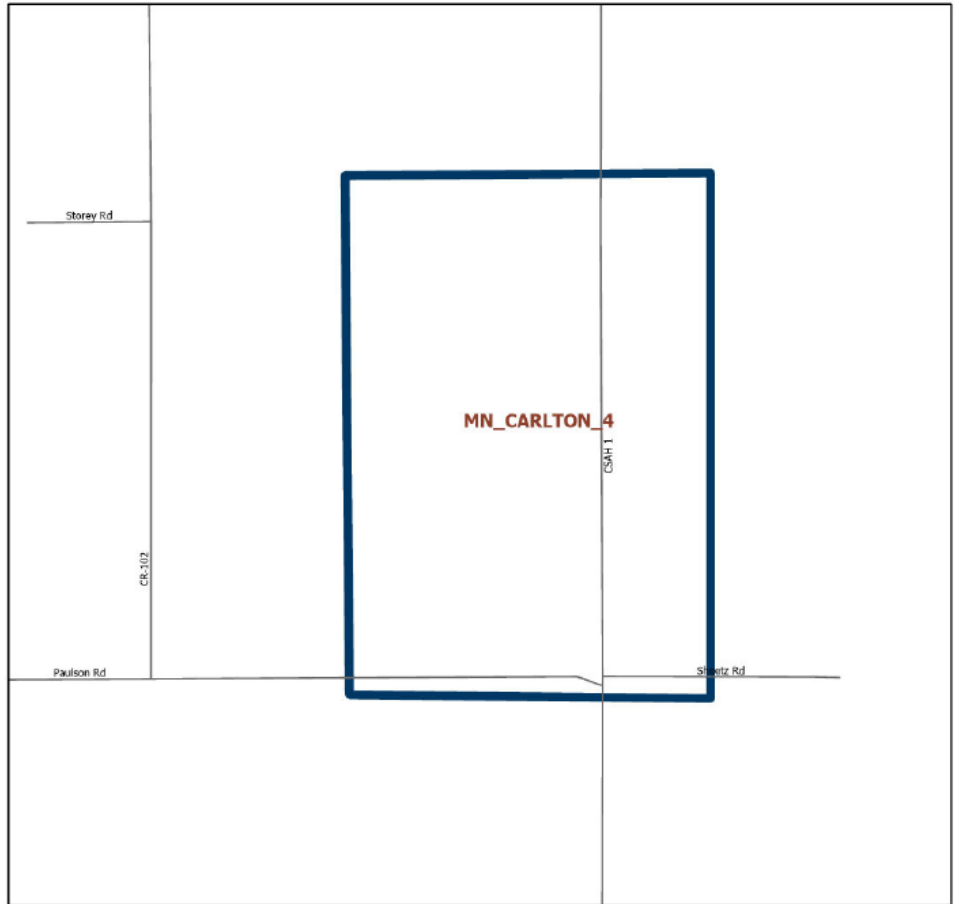
2024 Spongy Moth Proposed Treatment Site MN Carlton 3



- Layer
Management
-  Mating Disruption
 -  BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 4



Layer

Management

-  Mating Disruption
-  BtK



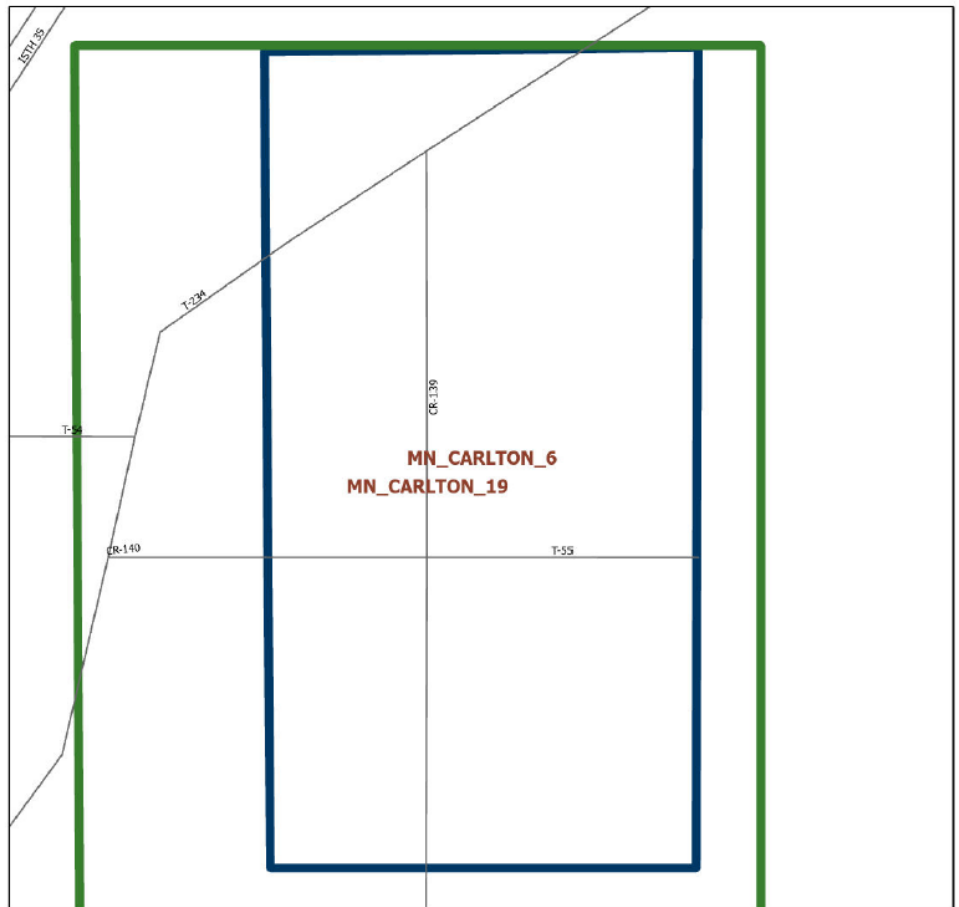
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- Layer
- Management
- Mating Disruption
 - BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 6



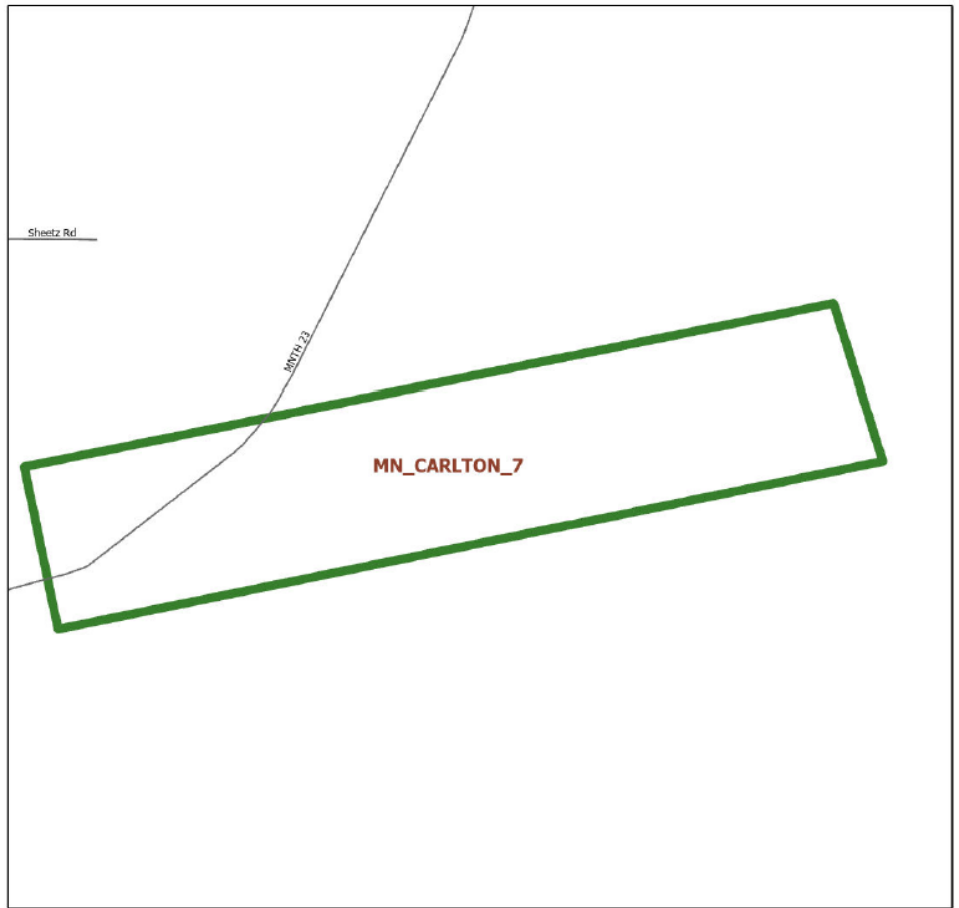
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Management

-  Mating Disruption
-  BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 7



Layer

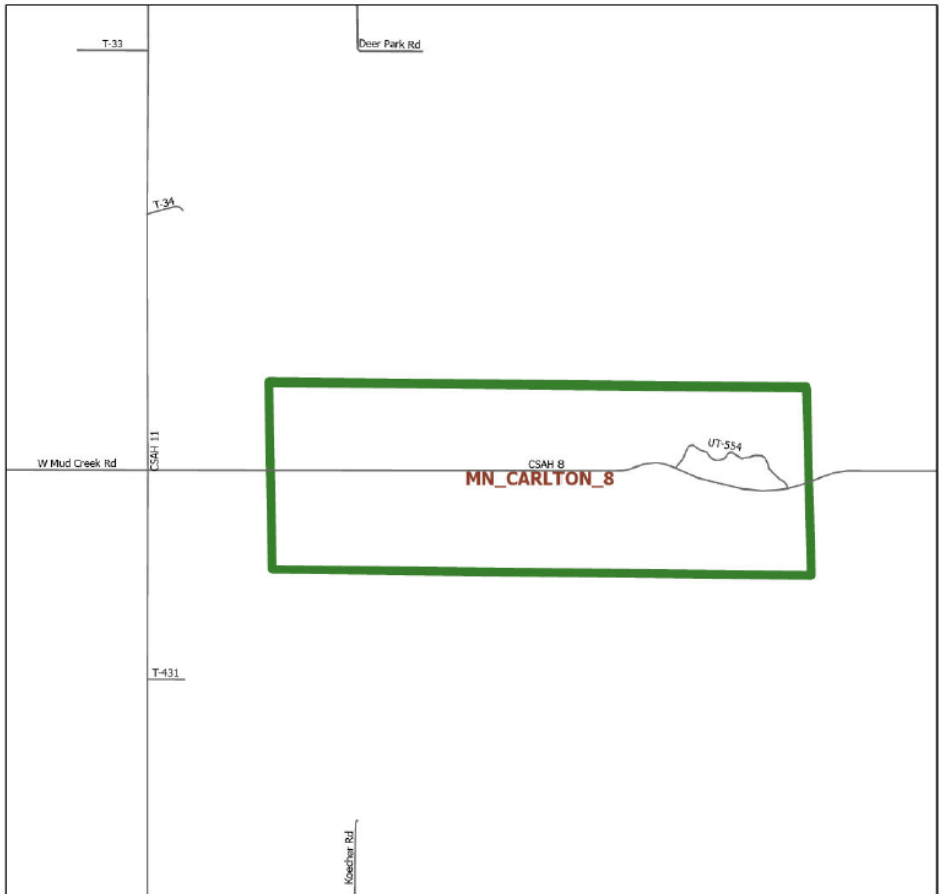
Management

 Mating Disruption

 BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 8



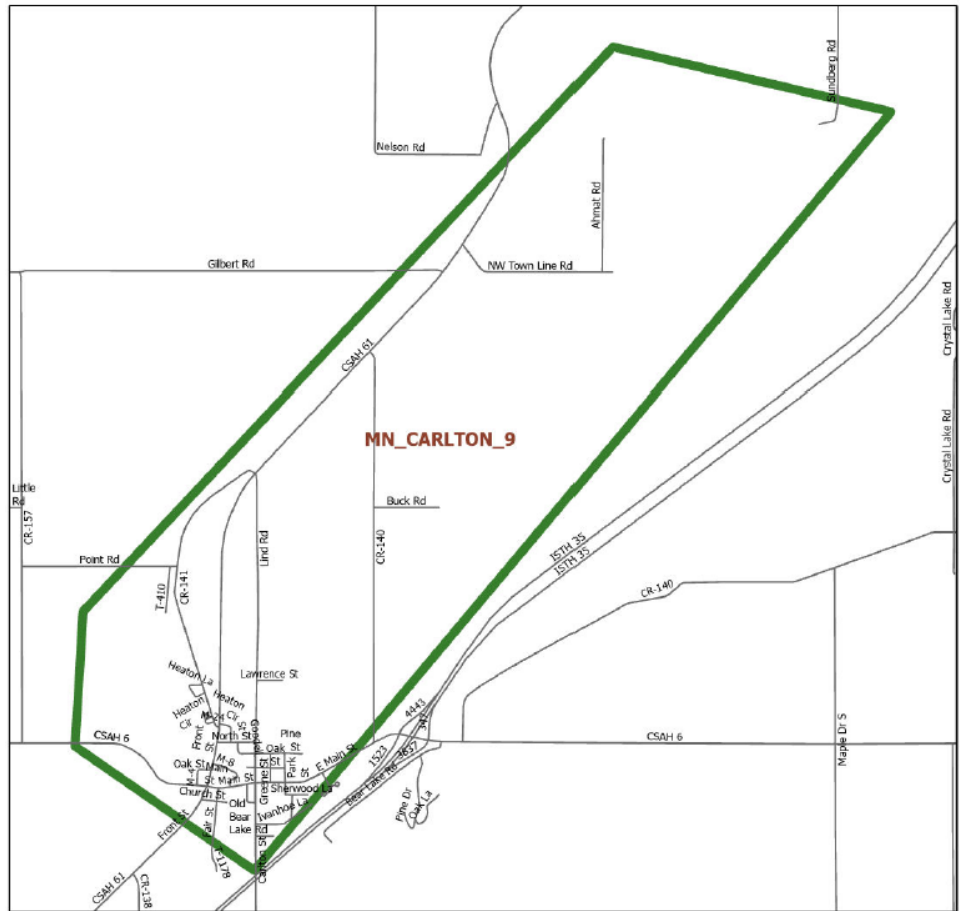
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Management

-  Mating Disruption
-  BtK



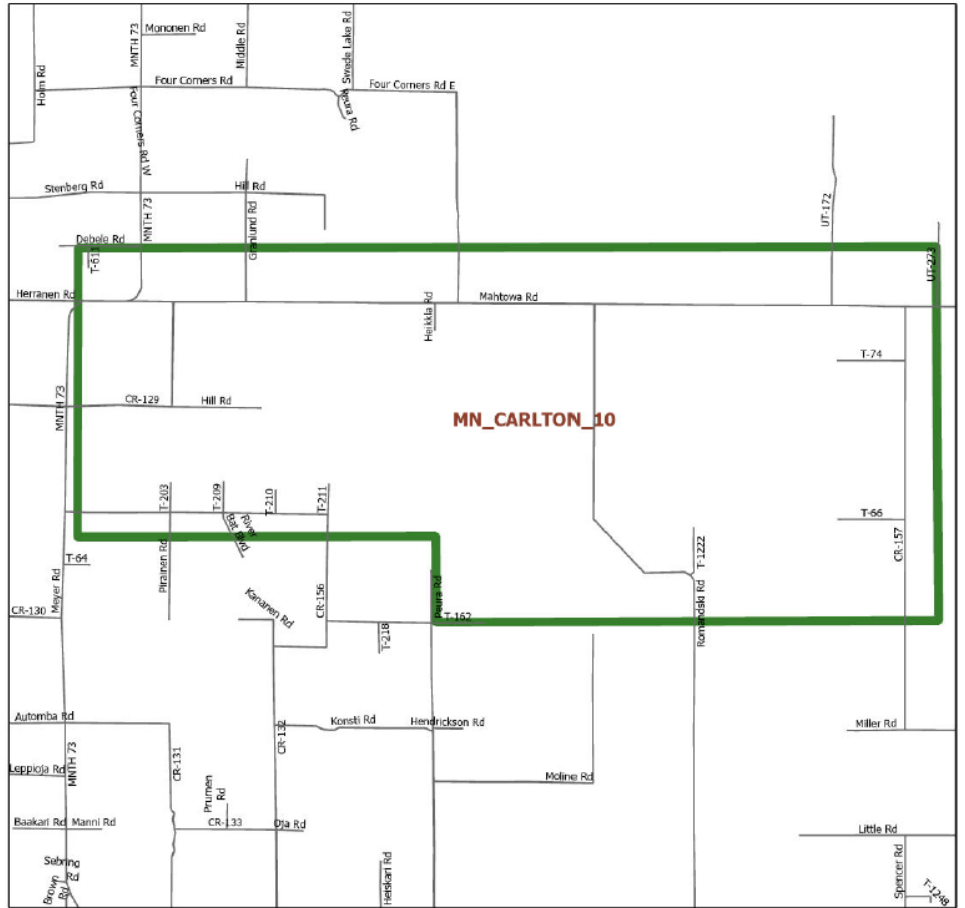
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- Layer**
- Management**
-  Mating Disruption
 -  BtK



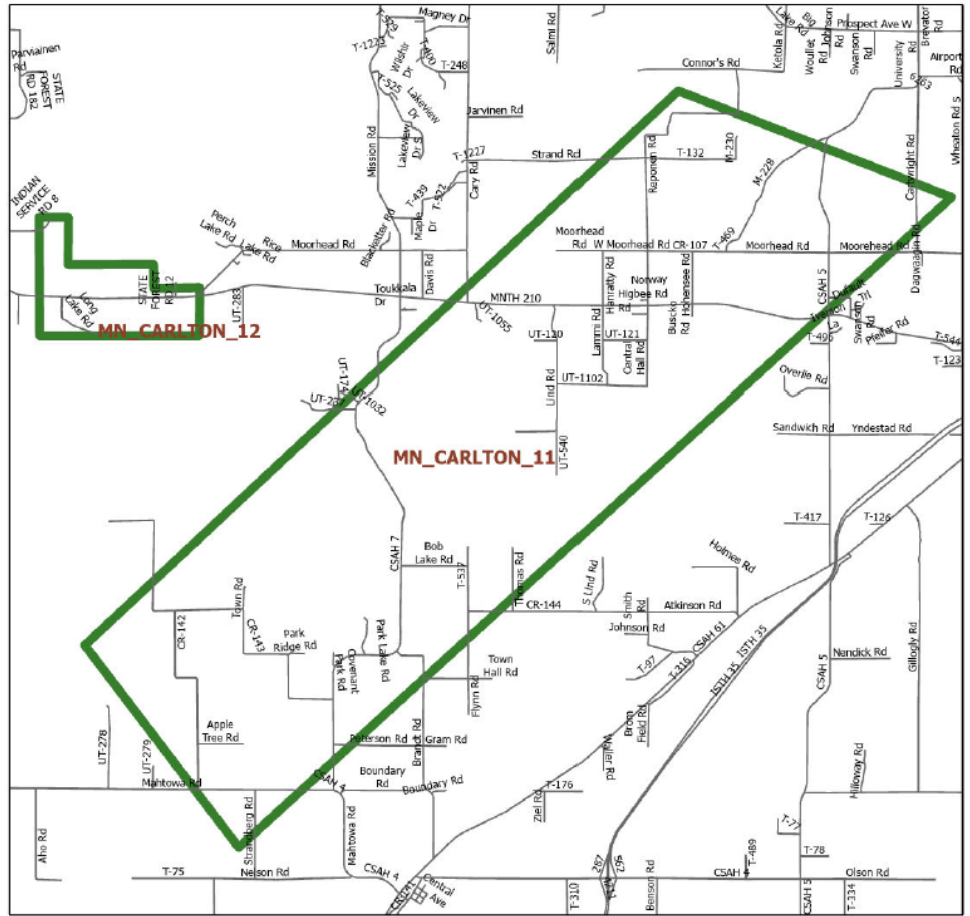
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- Layer
- Management
 - Mating Disruption
 - BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 11



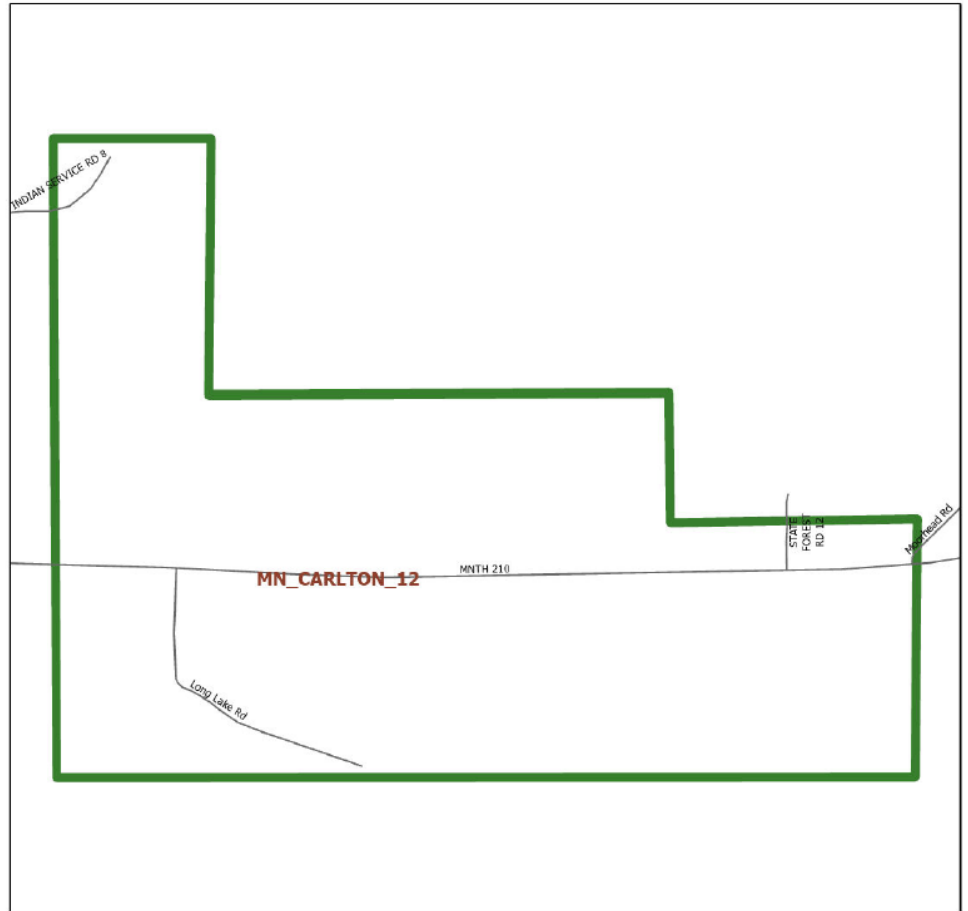
- Layer
Management
-  Mating Disruption
 -  BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 12



- Layer
Management
-  Mating Disruption
 -  BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 13

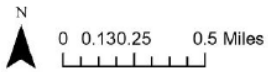


Layer

Management

 Mating Disruption

 BtK



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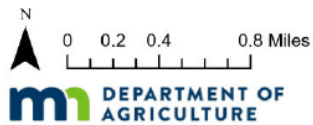
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Layer

Management

-  Mating Disruption
-  BtK




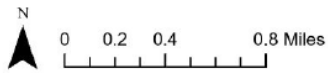
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Layer

Management

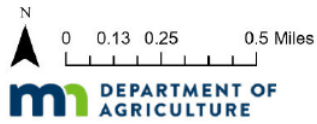
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-  BtK



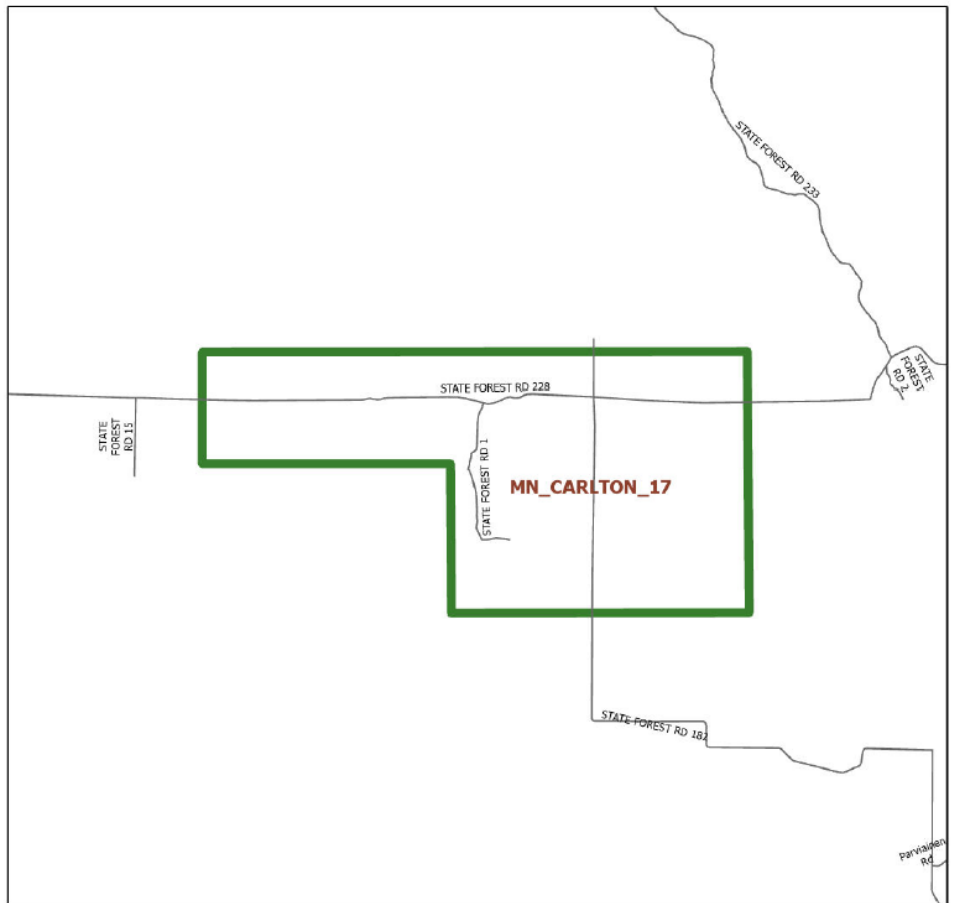
2024 Spongy Moth Proposed Treatment Site MN Carlton 16



- Layer
Management
-  Mating Disruption
 -  BtK



2024 Spongy Moth Proposed Treatment Site MN Carlton 17



Layer

Management

-  Mating Disruption
-  BtK



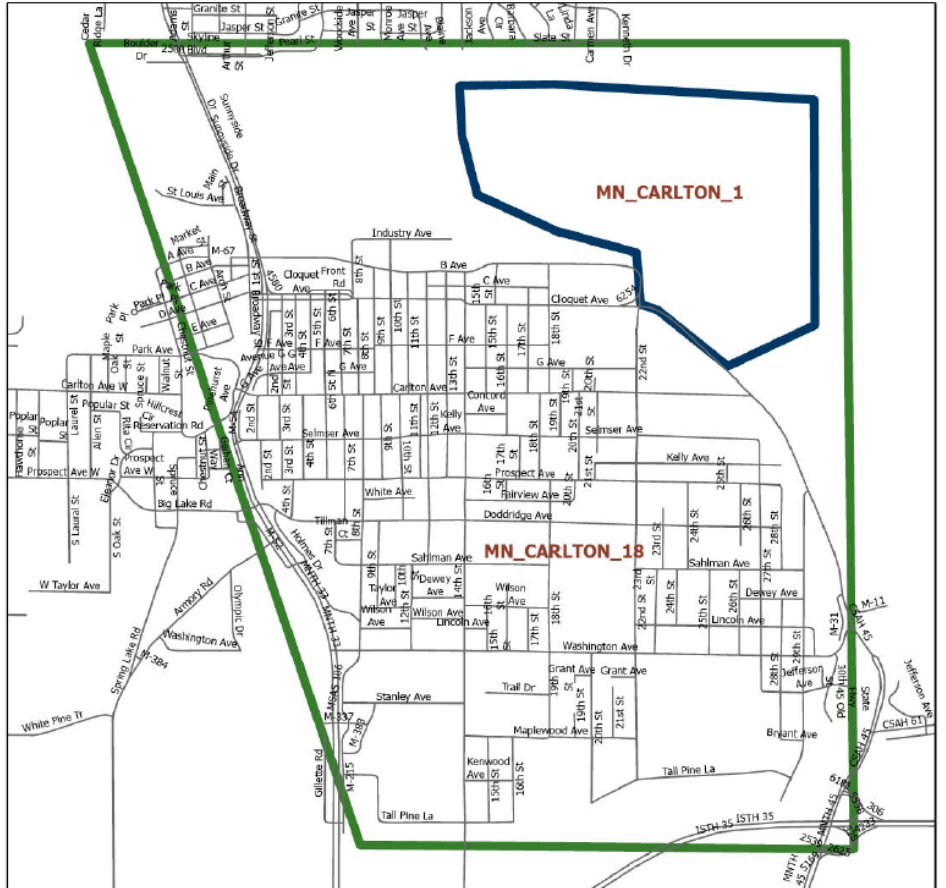
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Layer

Management

-  Mating Disruption
-  Btk





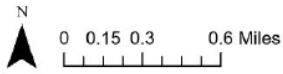
2024 Spongy Moth Proposed Treatment Site MN Carlton 19



Layer

Management

-  Mating Disruption
-  BtK

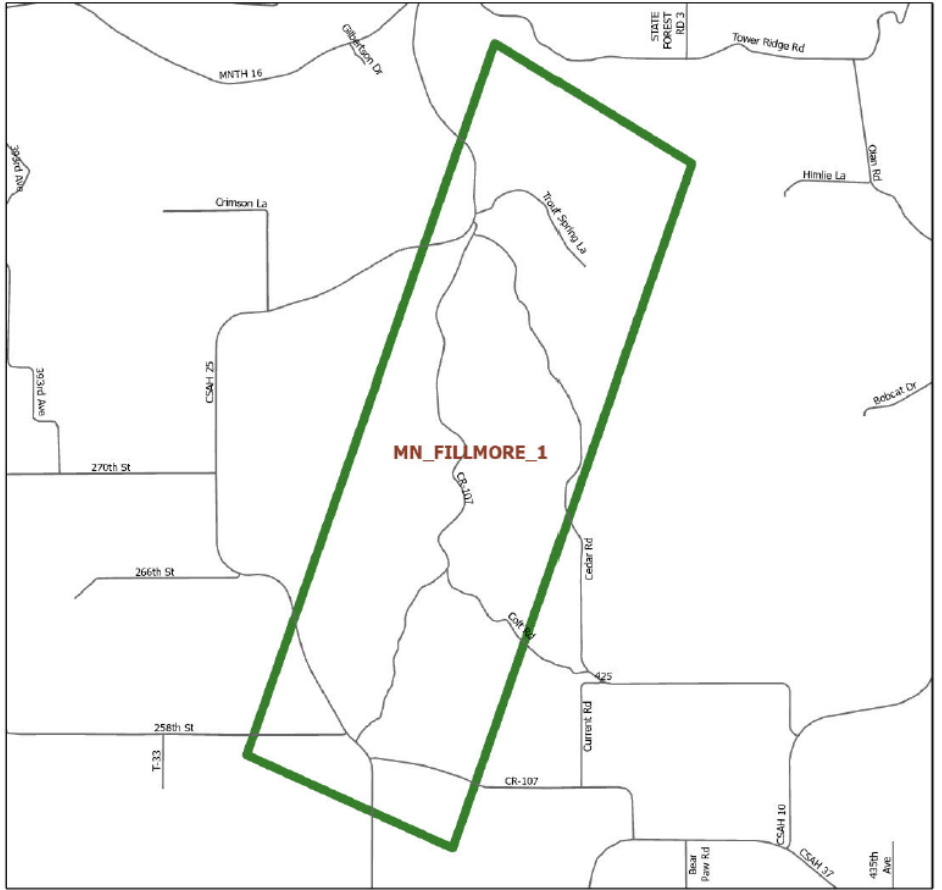


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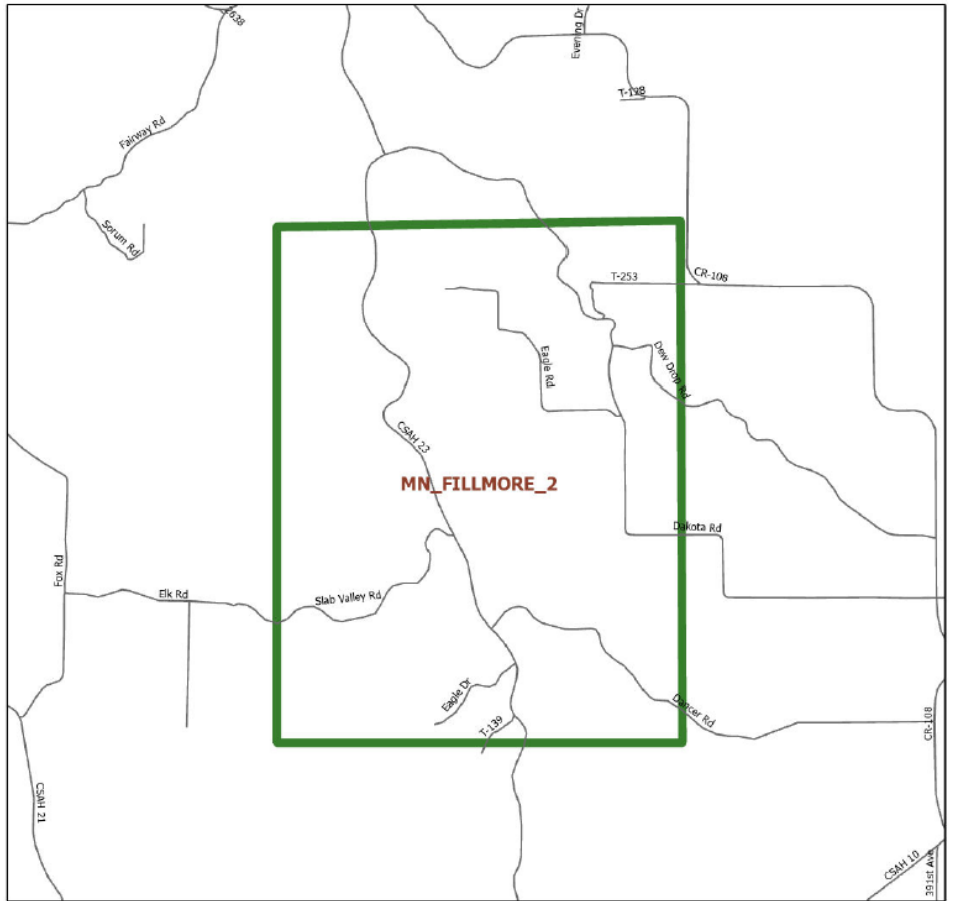
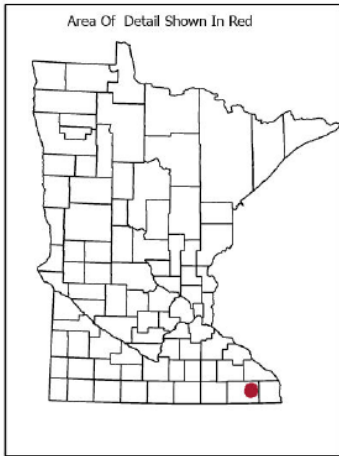
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- Layer
Management
-  Mating Disruption
 -  BtK



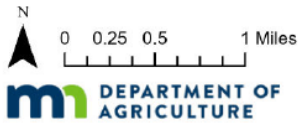
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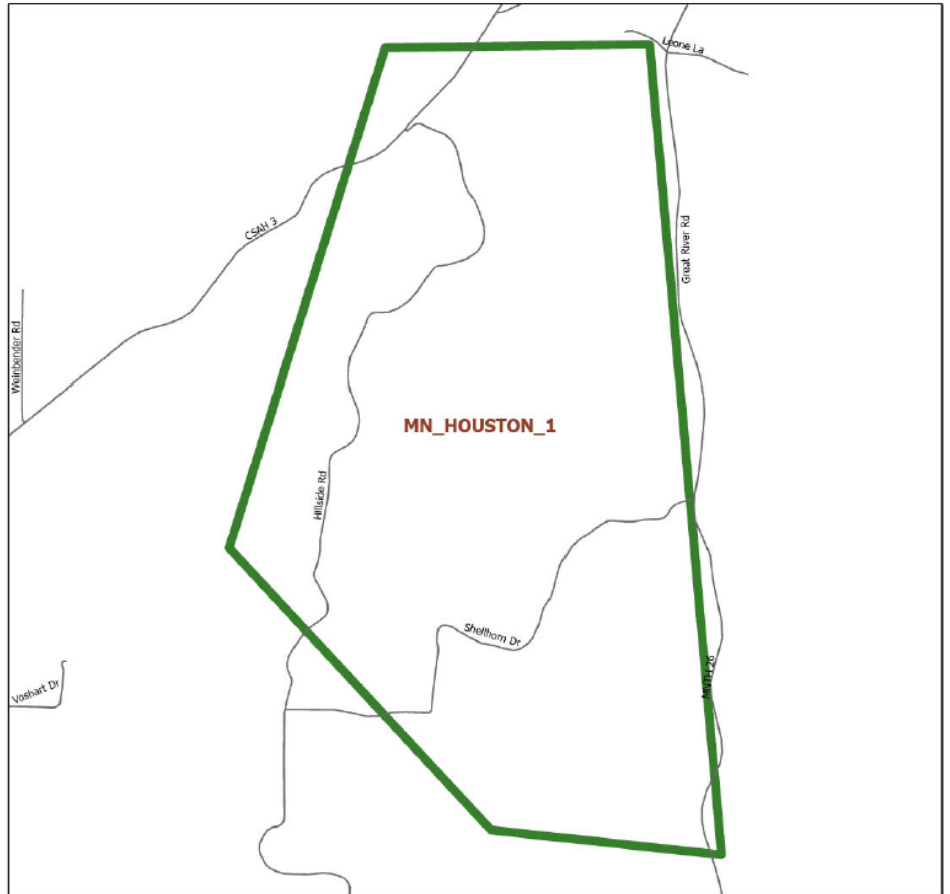
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Management

-  Mating Disruption
-  BtK





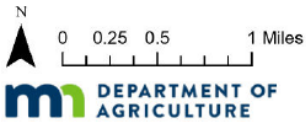
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Layer

Management

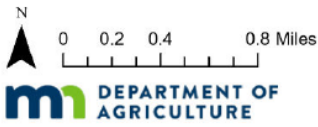
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-  BtK



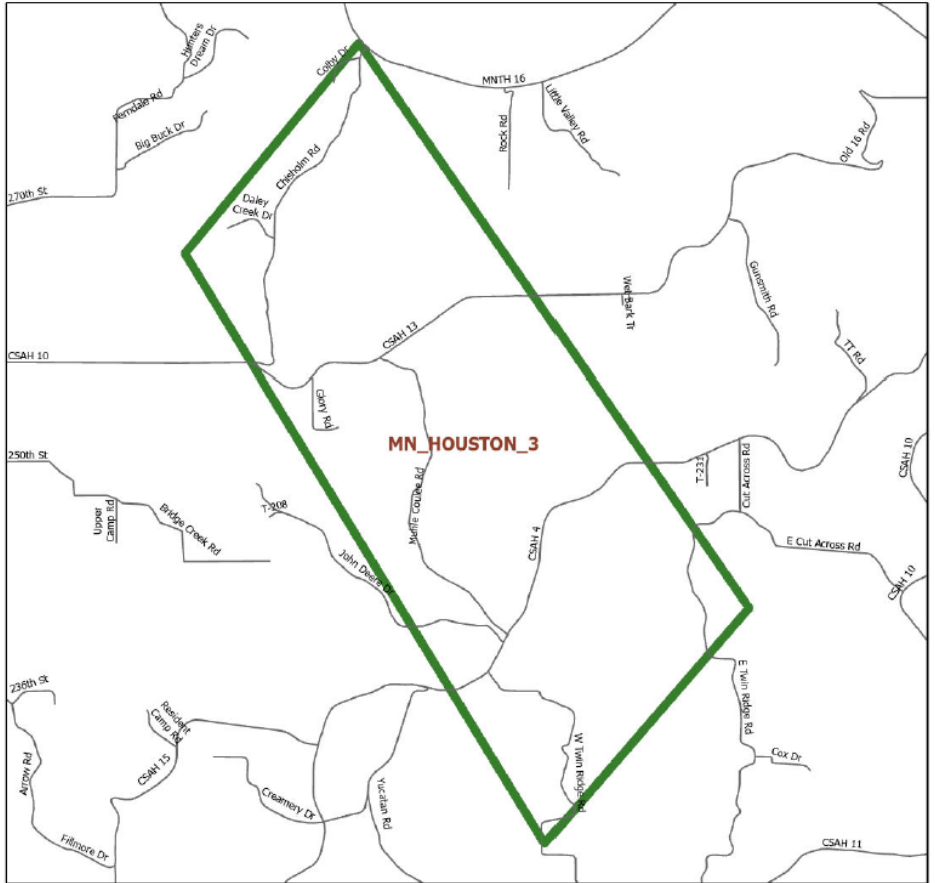
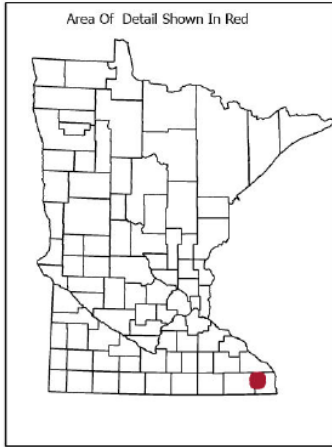
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- Layer
- Management
- Mating Disruption
 - BtK



2024 Spongy Moth Proposed Treatment Site MN Houston 3



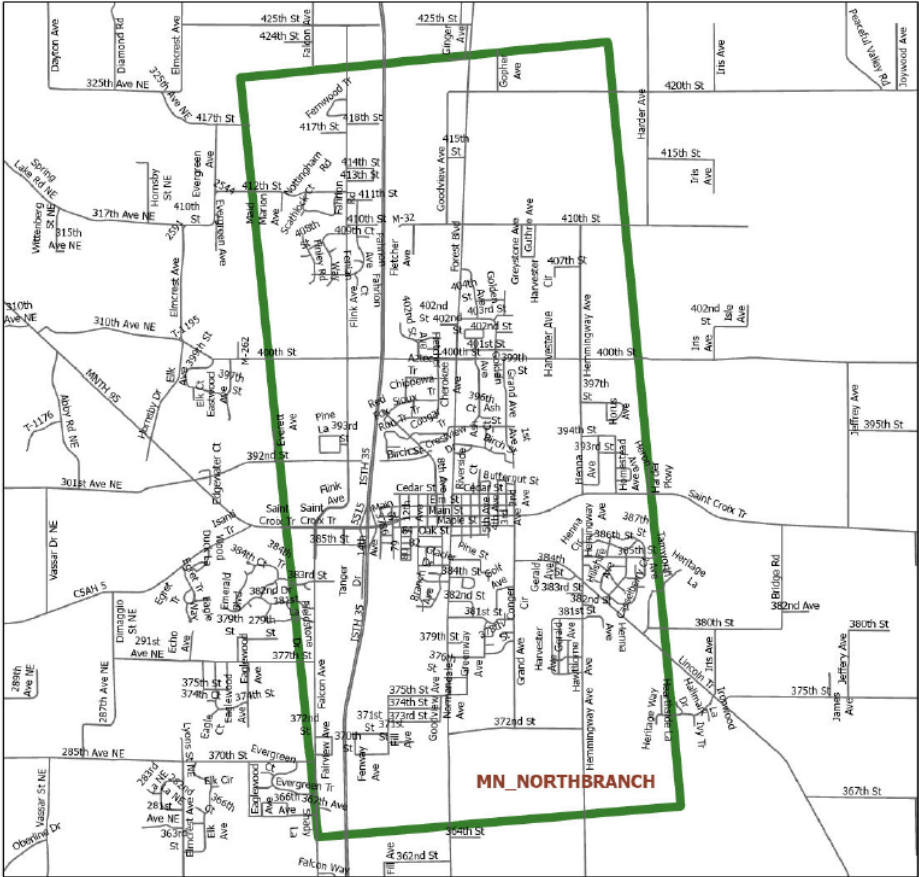
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Management
-  Mating Disruption
 -  BtK



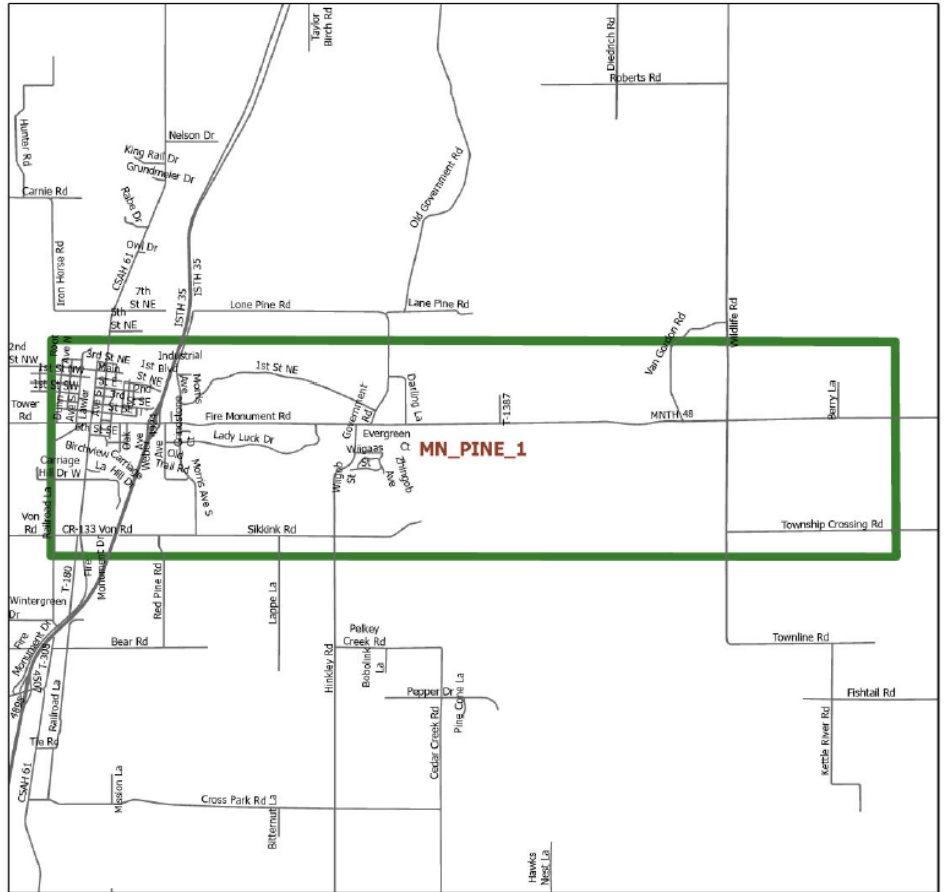
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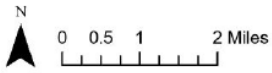
- Layer Management
- █ Mating Disruption
 - █ BtK



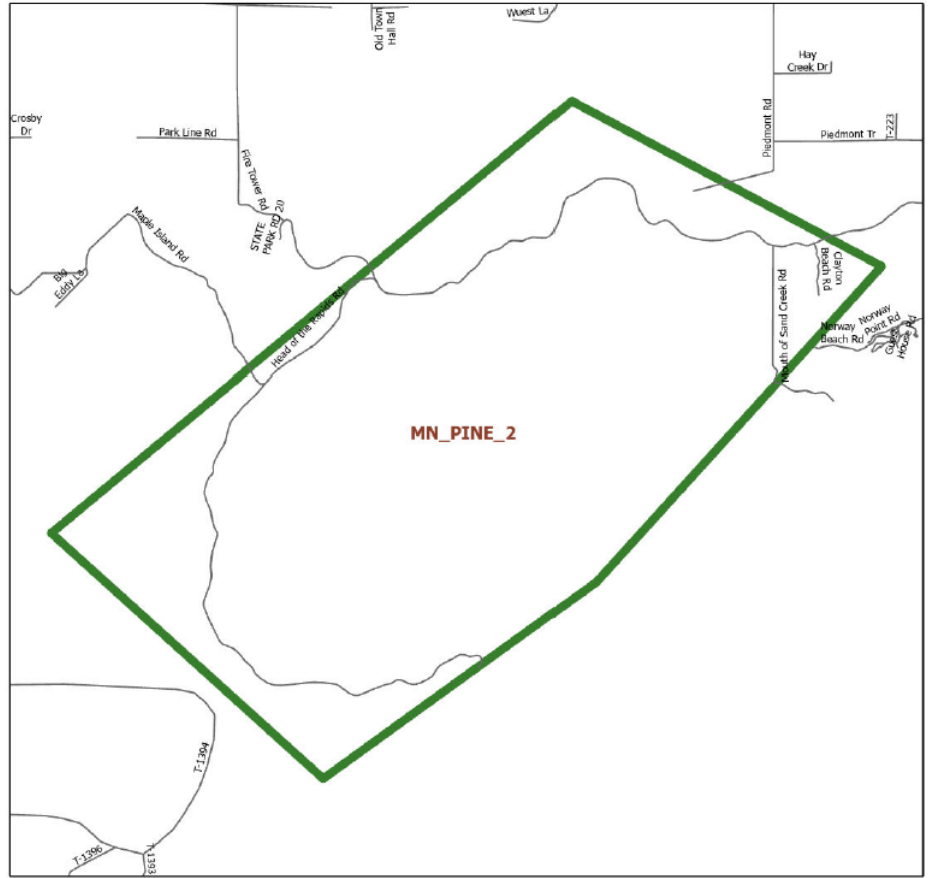
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- Layer Management
-  Mating Disruption
 -  BtK



2024 Spongy Moth Proposed Treatment Site MN Pine 2



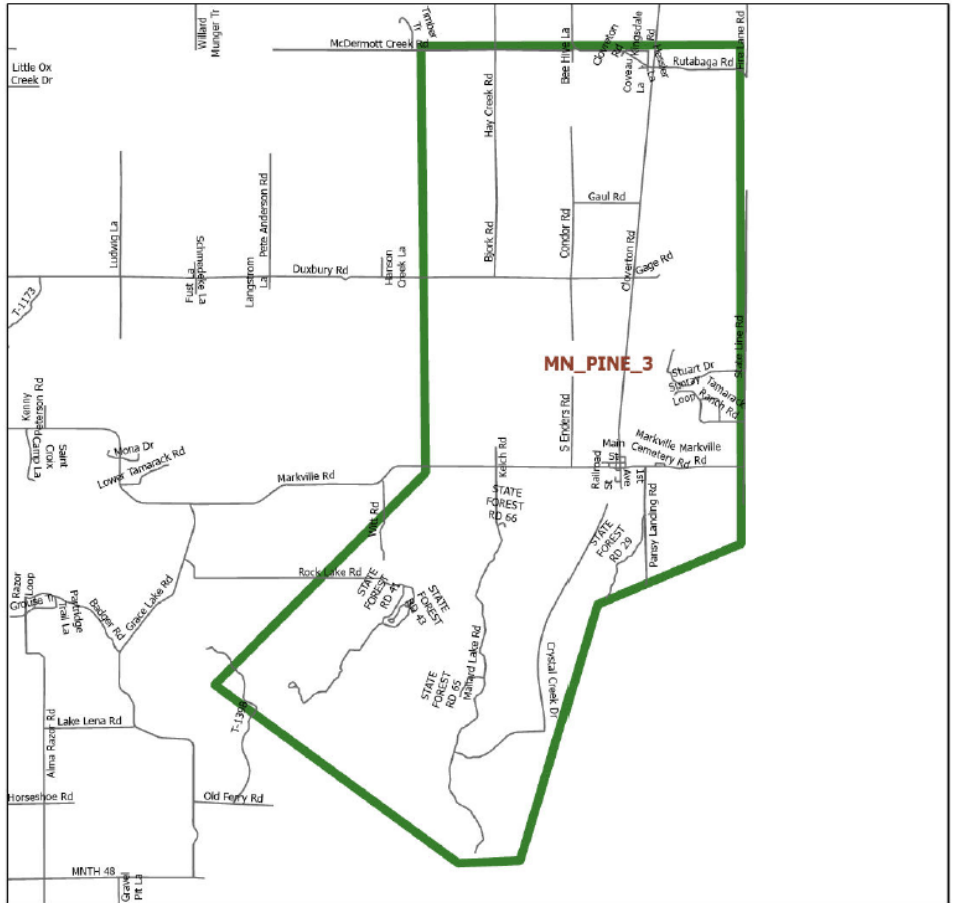
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 - BtK



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- Layer
- Management
-  Mating Disruption
 -  BtK




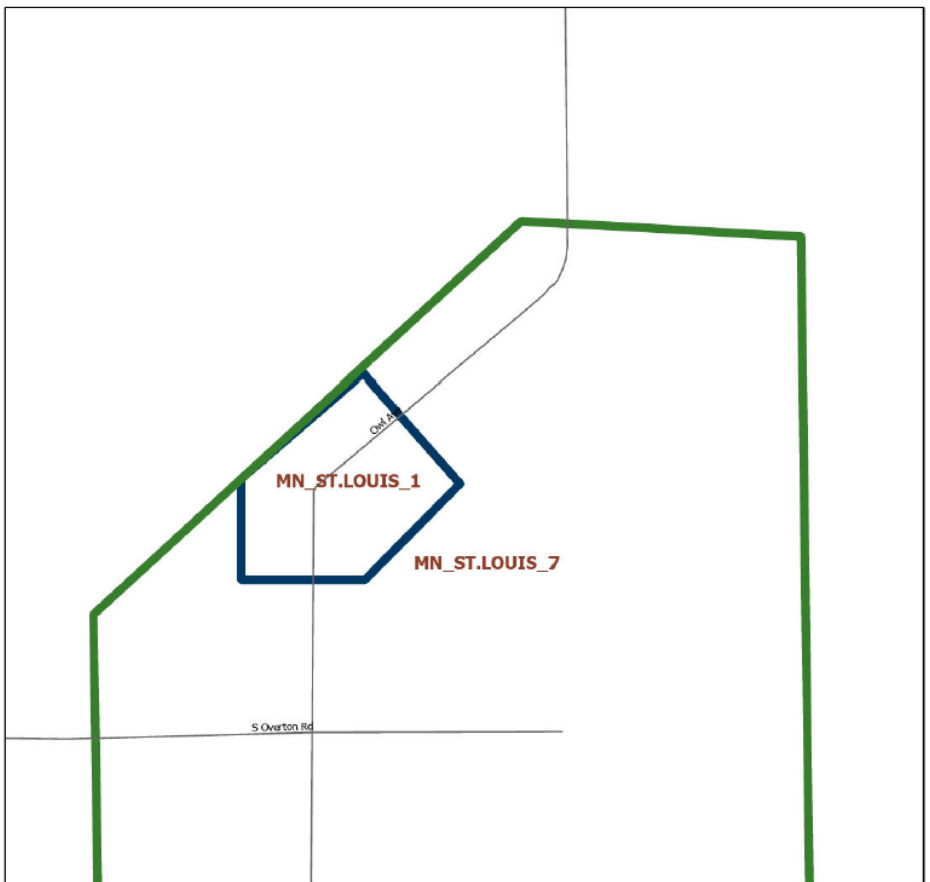
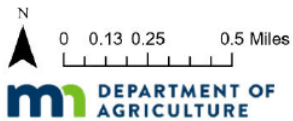
2024 Spongy Moth Proposed Treatment Site MN St. Louis 1



Layer

Management

-  Mating Disruption
-  BtK



2024 Spongy Moth Proposed Treatment Site MN St. Louis 2



- Layer
- Management
-  Mating Disruption
 -  BtK





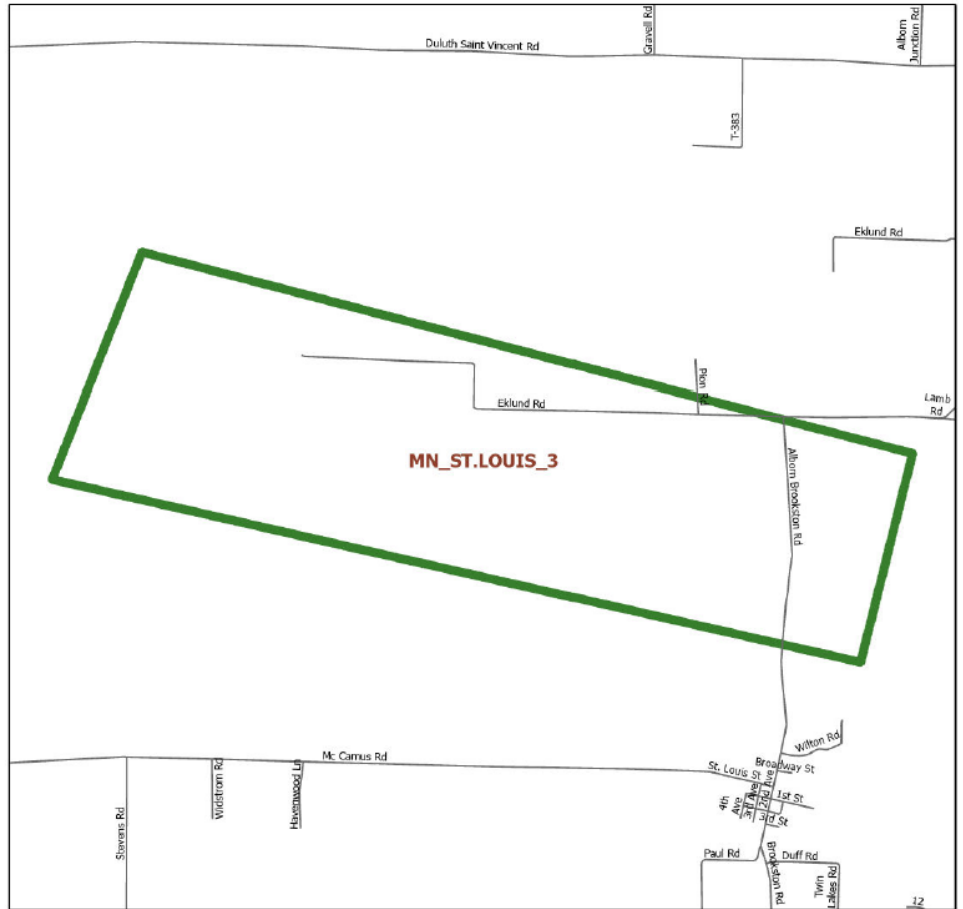
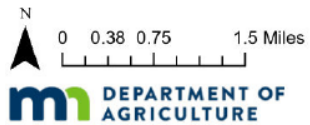
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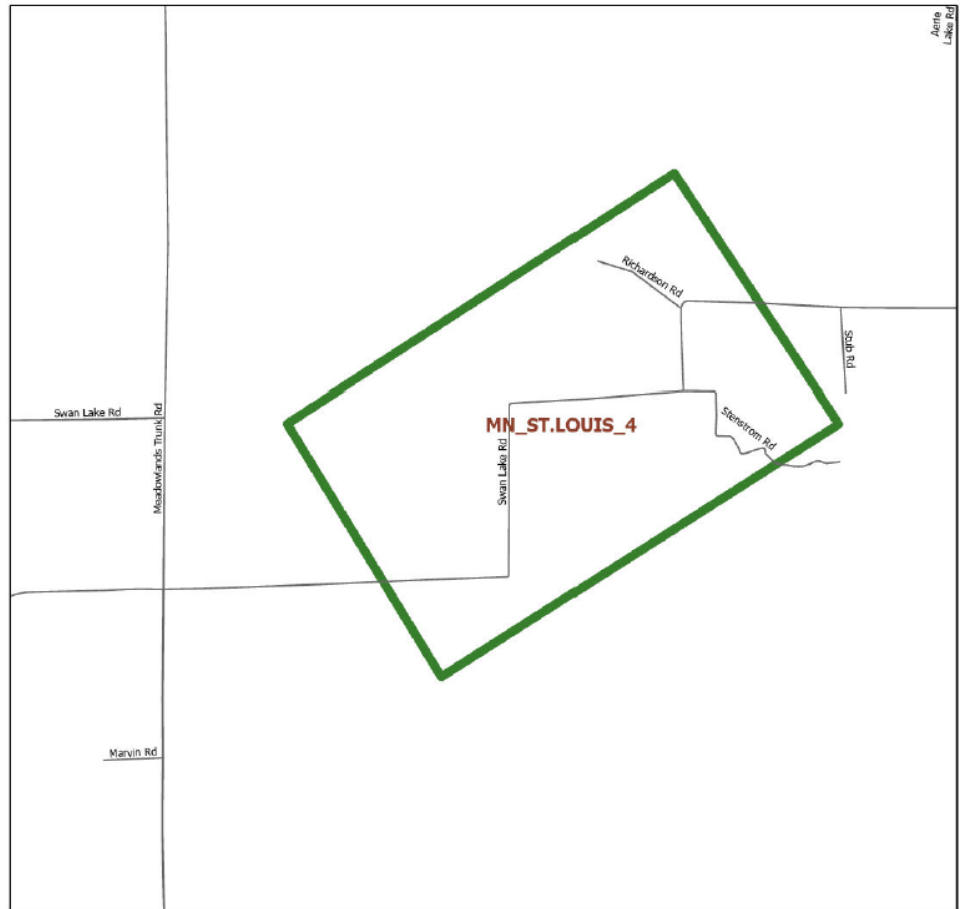
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Management

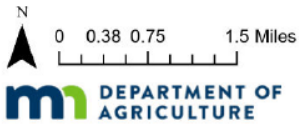
-  Mating Disruption
-  BtK



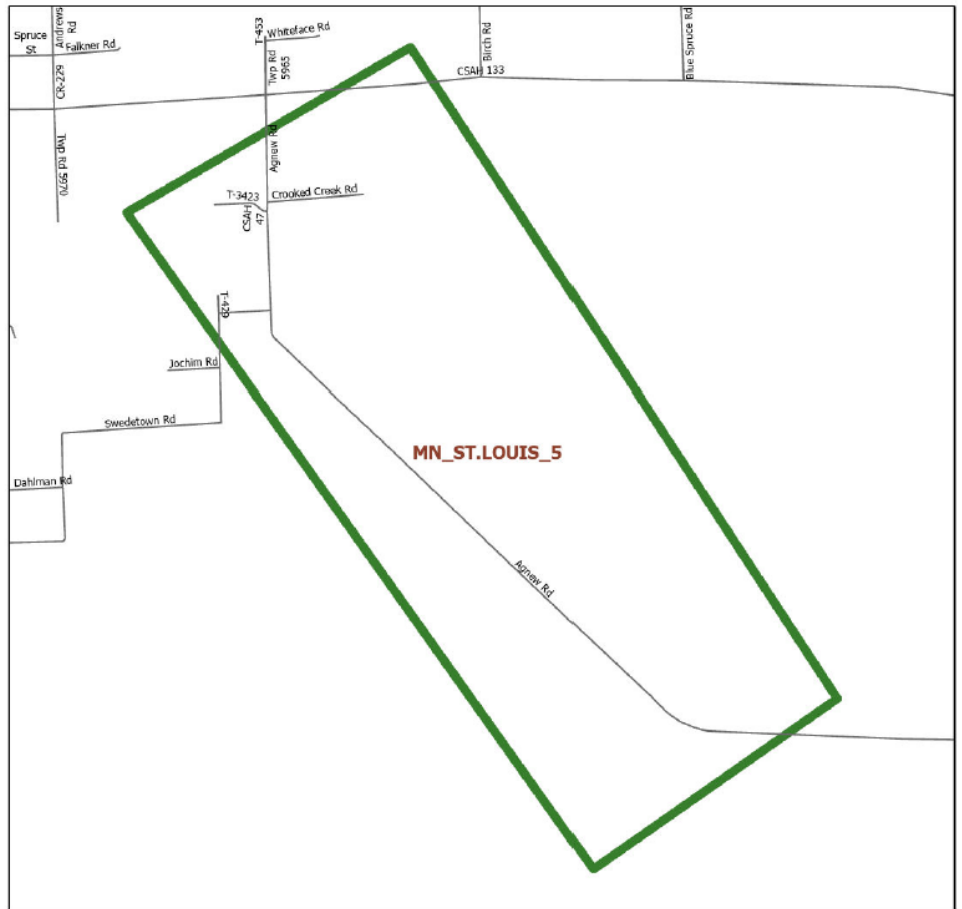
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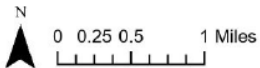
- Layer
- Management
- Mating Disruption
 - BtK



2024 Spongy Moth Proposed Treatment Site MN St. Louis 5



- Layer
- Management
- Mating Disruption
 - BtK



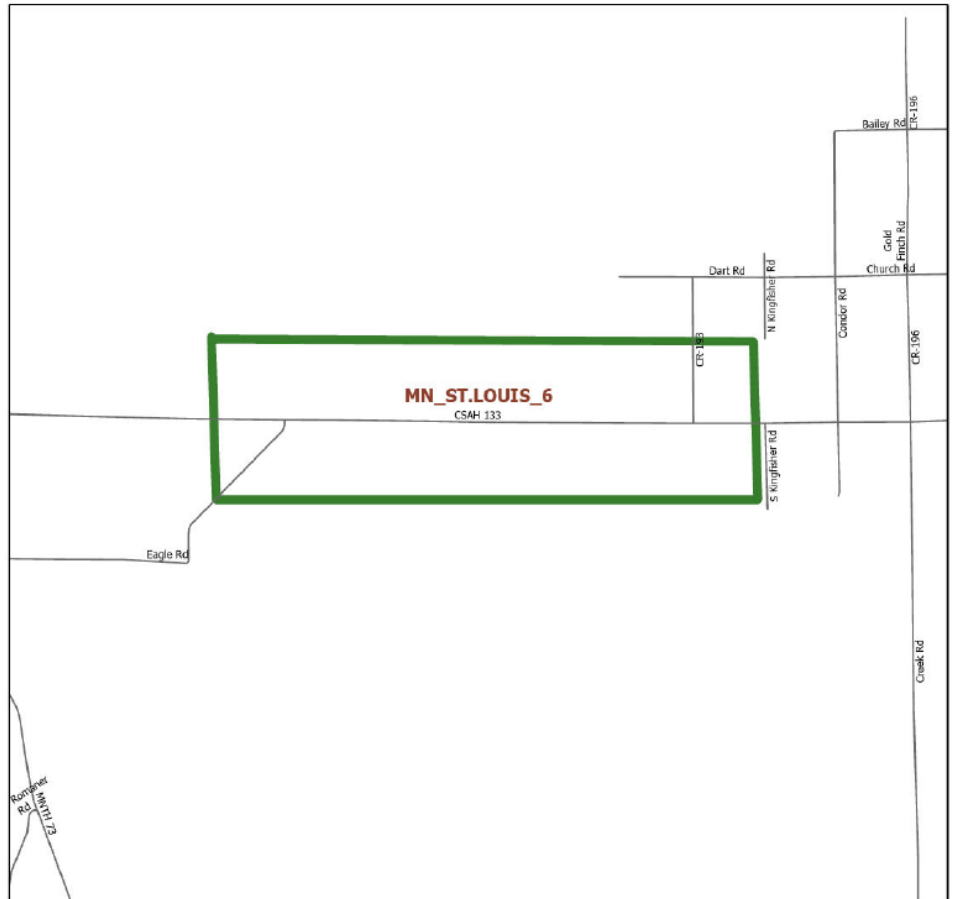
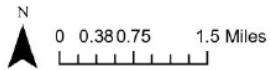
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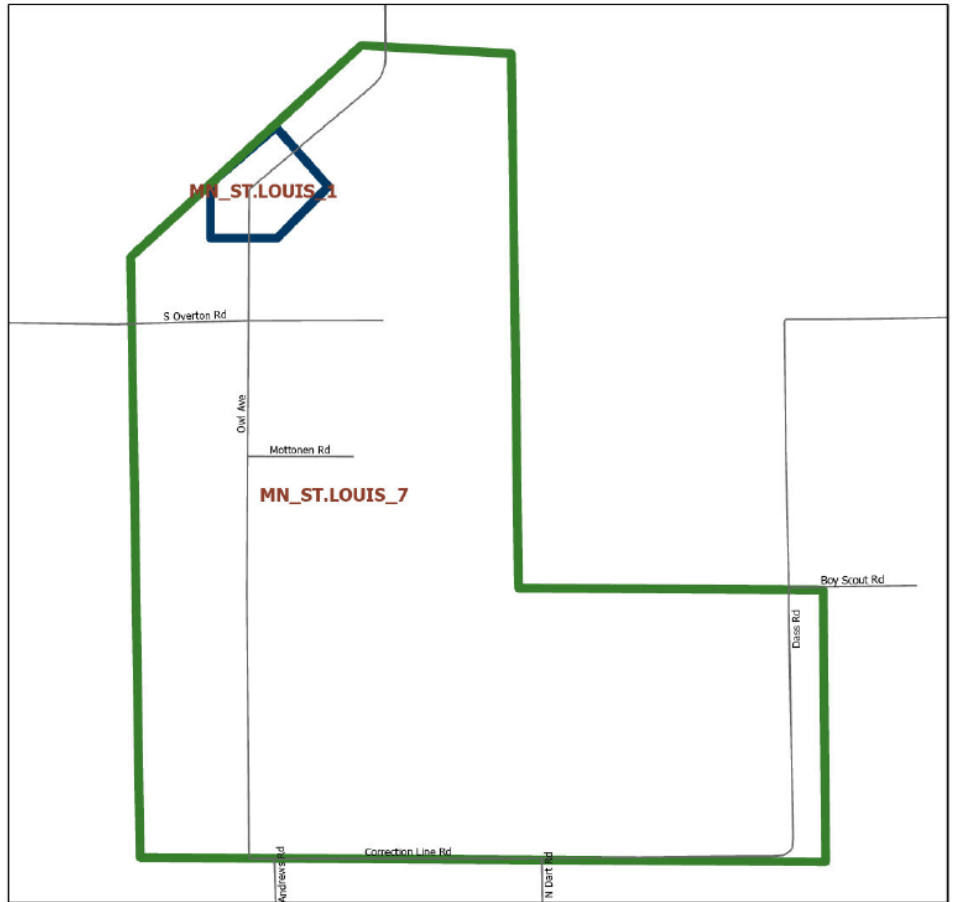
Layer

Management

-  Mating Disruption
-  BtK



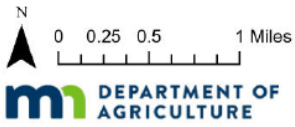
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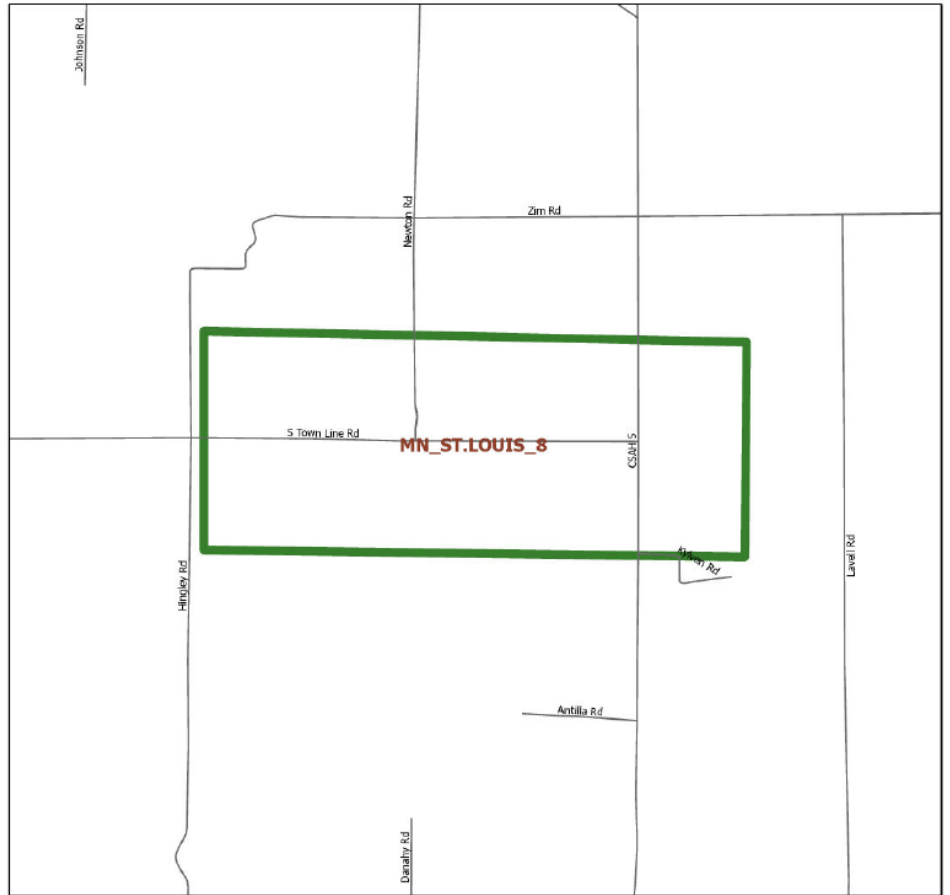
Layer

Management

- Mating Disruption
- BtK



2024 Spongy Moth Proposed Treatment Site MN St. Louis 8

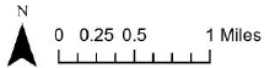


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Management

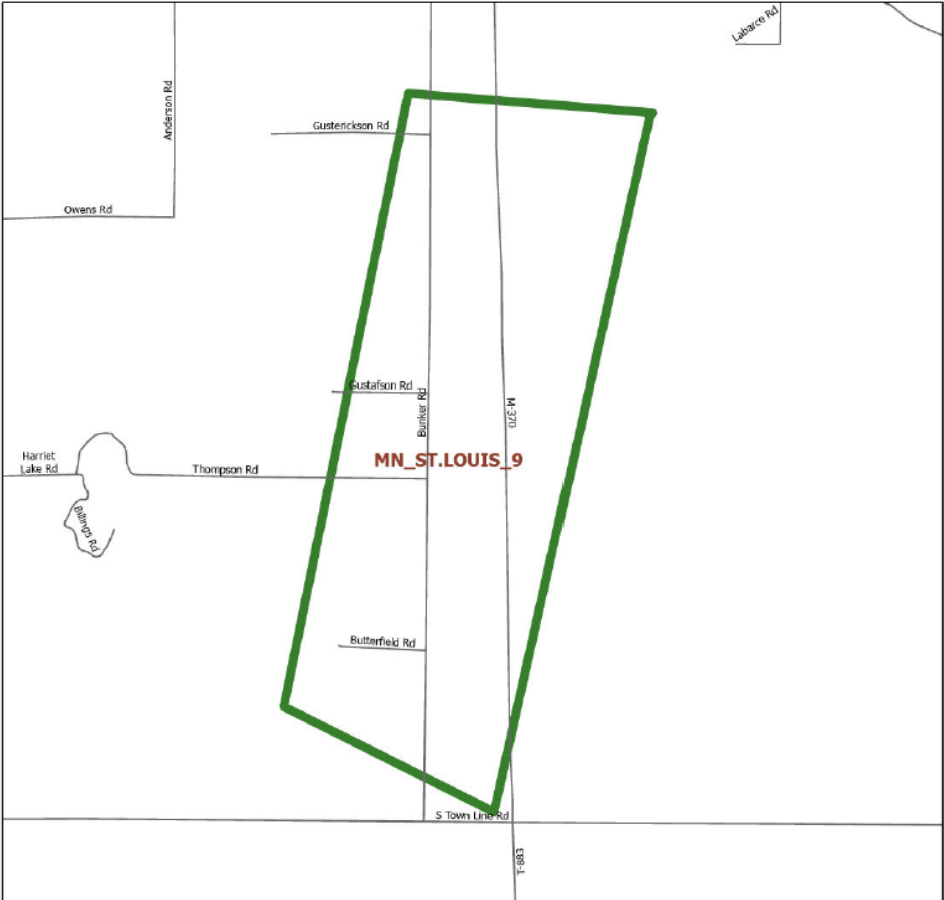
 Mating Disruption

 BtK

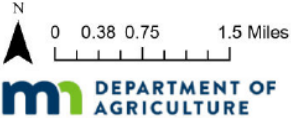


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2024 Spongy Moth Proposed Treatment Site MN St. Louis 9



- Layer
- Management
-  Mating Disruption
 -  BtK




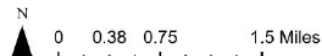
2024 Spongy Moth Proposed Treatment Site MN St. Louis 10



Layer

Management

-  Mating Disruption
-  BtK





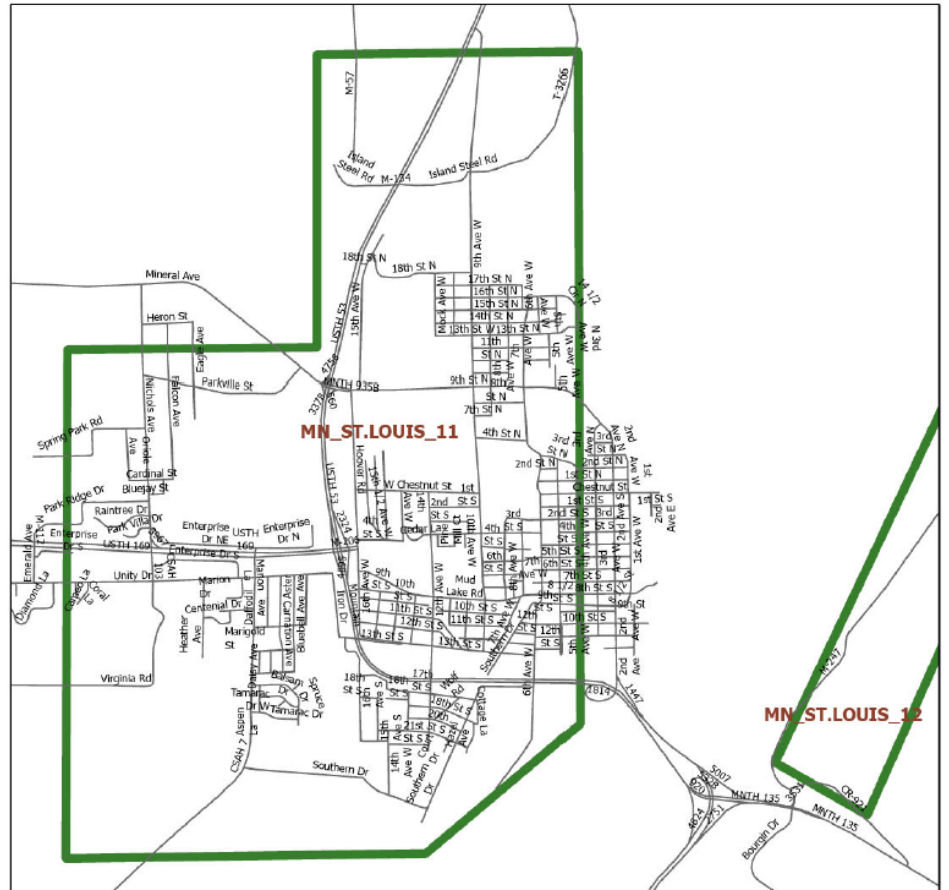
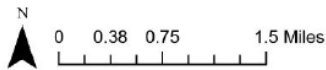
2024 Spongy Moth Proposed Treatment Site MN St. Louis 11



Layer

Management

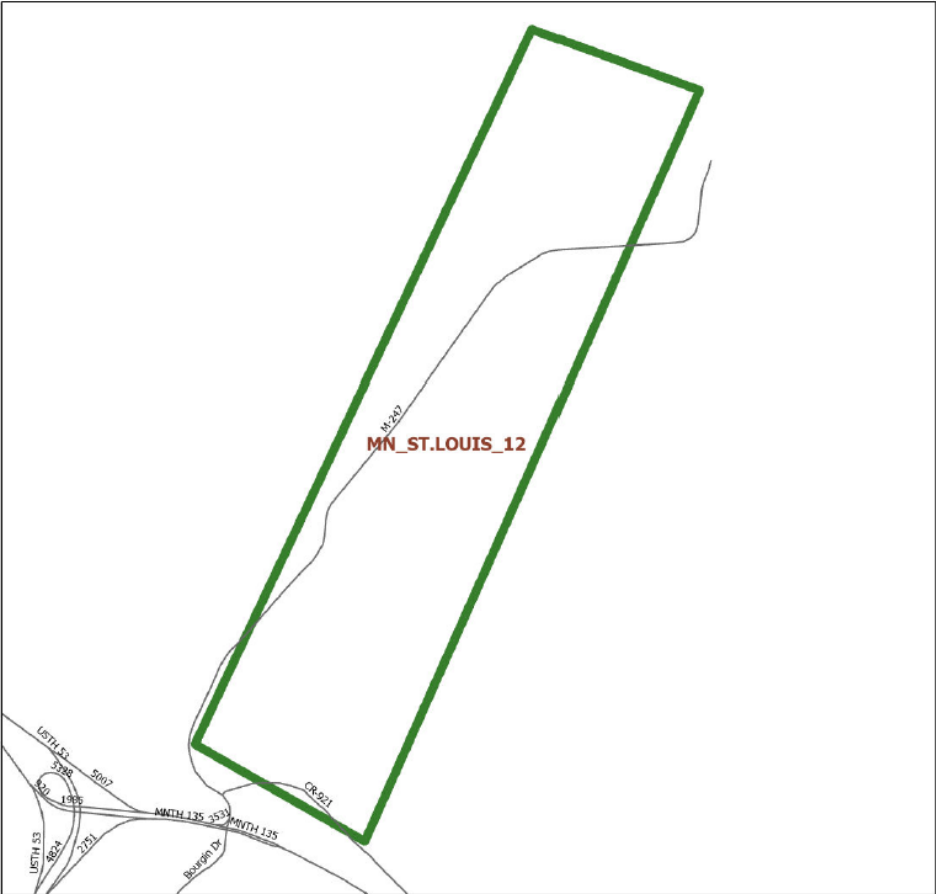
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-  BtK



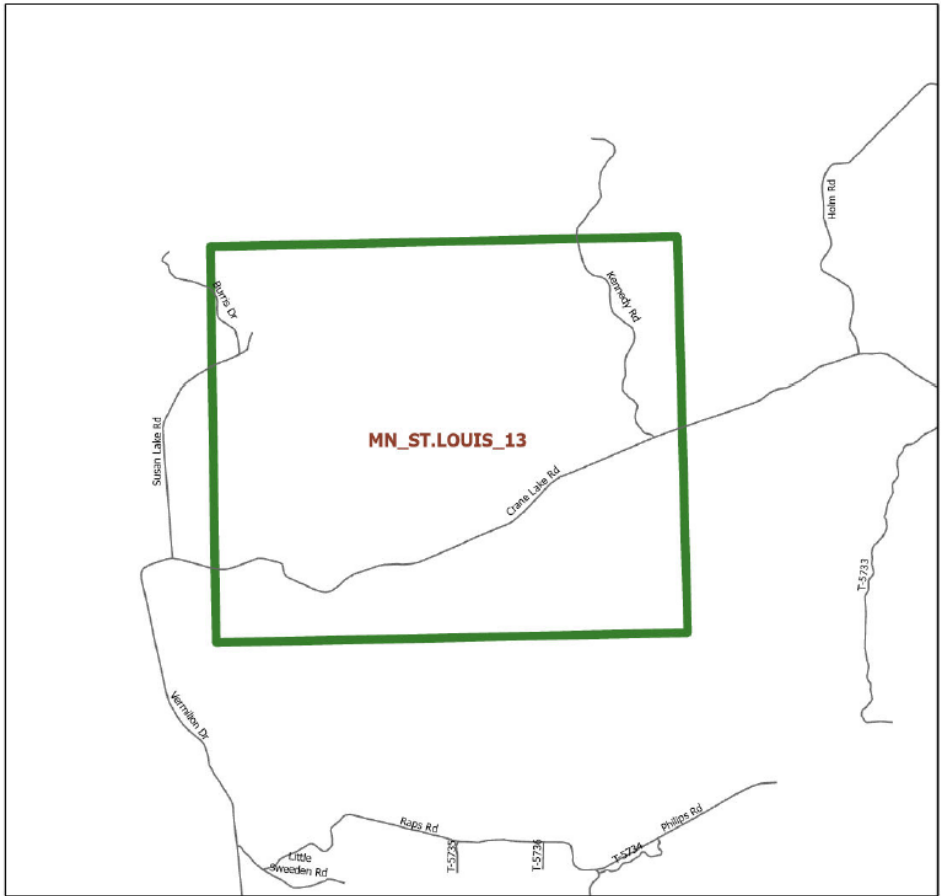
2024 Spongy Moth Proposed Treatment Site MN St. Louis 12



- Layer
- Management
- Mating Disruption
 - BtK





2024 Spongy Moth Proposed Treatment Site MN St. Louis 13



Layer

Management

-  Mating Disruption
-  BtK

