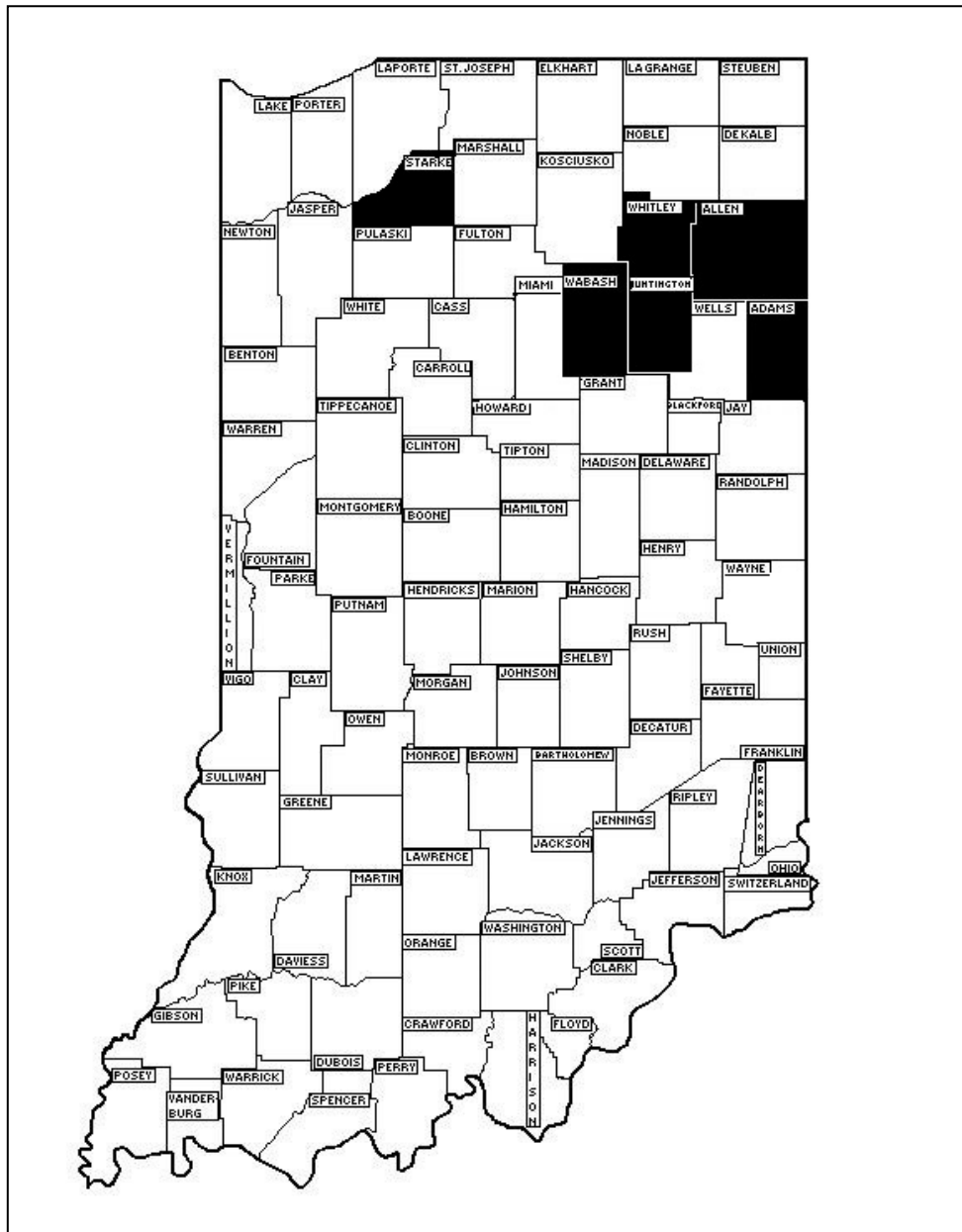


# Environmental Assessment Cooperative STS Spongy Moth Project for Indiana – 2024



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By

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## 1.0 Purpose and need for action

### 1.1. Proposed Action

The Indiana Department of Natural Resources (IDNR), Division of Entomology & Plant Pathology (DEPP) and Division of Forestry (DoF), proposes a cooperative project with the United States Department of Agriculture, Forest Service, State Private & Tribal Forestry (Forest Service, SP&TF) to treat Spongy Moth (*Lymantria dispar*) populations within the Slow-the-Spread (STS) Action Area. The proposed treatments are listed in table one. A total of 24,524 acres (1,115 Btk acres and 23,409 mating disruption acres) are proposed for this project (Table 1).

### 1.2. Project Objective

The objective of this cooperative project is to slow the spread of Spongy Moth populations by eliminating or decreasing reproducing populations from the proposed treatment sites.

### 1.3. Need for Action

Spongy Moth is not native to the United States, and it lacks effective natural controls. The caterpillars feed on the foliage of many host plants. Oaks are the preferred host species, but the caterpillars defoliate many species of trees and shrubs. When high numbers of spongy moth caterpillars are present, forests and trees suffer severe defoliation, which can result in reduced tree growth, branch dieback and even tree mortality. The high numbers of caterpillars also create a substantial public nuisance and can affect human health.

The STS analysis of the 2023 trapping data in Indiana identified potential problem areas (PPAs) at 78 locations in Indiana. The analysis identified higher or equivalent moth catches in delimiting survey grids placed at each site compared to detections and delimits in prior years and recommended action in these areas. Five sites were identified for proposed treatment in 2024 based on this data and having suitable habitat for spongy moth. Four sites are proposed for treatment in the cooperative STS spongy moth project, which are reviewed in this EA. The fifth site identified for proposed treatment in 2024 is reviewed in a separate document titled Environmental Assessment, Cooperative Eradication Spongy Moth Project for Indiana 2024.

The State of Indiana, with the IDNR, Division of Entomology and Plant Pathology as the lead agency, is dedicated to preserving urban and rural forested habitats from damage by spongy moth and to enforcing interstate and intrastate quarantines to further protect areas not currently infested by this pest. If no action is taken, the spongy moth population will increase and spread throughout the State of Indiana and defoliation will occur sooner. Therefore, the "no action" alternative is not preferred due to the desire of state officials to eliminate the isolated infestations, prevent human discomfort associated with infestations, delay damage to local plant communities and reduce

spread to adjacent non-infested areas. Through public involvement, participating citizens supported the proposed action.

**Table 1:** Proposed treatment locations by county, site name, treatment type and dosage, number of applications and estimated acres for 2024 spongy moth treatments in Indiana. Btk treatments are aerial application of *Bacillus thuringiensis var. kurstaki*. Mating disruption (MD) is aerial application of disparlure.

County	Site Name	Proposed Treatment	Application Rate/acre	Applications	Acres
Adams	Berne Btk 24	Btk	25 CLU <sup>1</sup>	2	497
Wabash	North Manchester Btk 24	Btk	25 CLU <sup>1</sup>	2	618
			<b>Total Btk</b>		1,115
Huntington/Allen/Whitley	Roanoke MD 24	Mating disruption	6 g <sup>2</sup>	1	13,137
Starke	Winona MD 24	Mating disruption	6 g <sup>2</sup>	1	10,272
			<b>Total MD</b>		24,524

<sup>1</sup>CLU= Cabbage looper units

<sup>2</sup> grams of disparlure (spongy moth mating pheromone)

#### 1.4. Decisions to be made and responsible officials.

The proposed action requires participation by the Forest Service, SP&TF, as a cooperator with the IDNR. 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 Forest Service, State, Private, and Tribal  
 Forestry 1992 Folwell Avenue  
 St. Paul, MN 55108

The responsible official for the Forest Service, SP&TF will make a decision 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 and Finding of No Significant Impact (FONSI) or other appropriate decision document, issued by the responsible official. If significant impacts are found and the project is to continue, an Environmental Impact Statement (EIS) would be prepared.

The responsible officials for the implementation of the *L. dispar* program with IDNR are:

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### 1.5. Scope of the analysis

Since 1996 the USDA has carried out its *L. dispar* management responsibilities through the Forest Service and Animal and Plant Health Inspection Service (APHIS) and pursuant to a programmatic decision based on a 1995 Environmental Impact Statement (EIS) for gypsy moth management. The Record of Decision (ROD) for that EIS was signed in January of 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, maintaining the three strategies of suppression, eradication, and slow-the-spread (STS).

Spongy moth management strategies vary based on the infestation status of an area and include eradication treatments in non-infested areas, suppression treatments in the generally infested area, and slow-the-spread treatments in transition areas. The transition area is also known as the STS Action Area, where *L. dispar* populations are small, isolated, and manageable before coalescing into larger populations. The proposed

treatments involved in this Environmental Assessment (EA) are all within the STS Action Area.

Implementation requires that a site-specific environmental analysis be conducted, and public input gathered to identify and consider local issues before any Federal or cooperative suppression, eradication, or slow-the-spread projects are authorized and implemented. As part of the analyses conducted for the SEIS, human health and ecological risk assessments were prepared (USDA 2012a, Volumes III and IV). These site-specific analyses are tiered to the programmatic EIS and SEIS and documented in accordance with Agency National Environmental Policy Act (NEPA) implementing procedures (USDA 2012b, ROD, p. 2). 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 environmental assessment provides a site-specific analysis of the alternatives and environmental impacts of treating spongy moth populations in Indiana.

#### 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 human environment (40 CFR, 1506.6 in Council of Environmental Quality 1992). Local issues discussed at the public meetings and in subsequent phone calls, letters and emails are discussed in Appendix A.

This public involvement summary pertains to both the four proposed slow the spread sites evaluated in this document and the one proposed eradication site discussed in the EA titled Environmental Assessment, Cooperative Eradication Spongy Moth Project for Indiana 2024.

On December 28, 2023 - 122 letter notifications were mailed to public officials and on January 9, 2024 – 9,415 postcard notifications were mailed to residents in the proposed treatment sites informing them of scheduled online public meetings. Legal notices were published in local newspapers informing the public about the upcoming meetings on the proposed treatment sites. An IDNR News Release was sent out on January 29, 2024, with information on the scheduled online public meetings and the public comment period. Information on the public meetings, proposed treatments and the comment period was also posted on the Indiana DNR, Div. of Entomology and Plant Pathology (DEPP) [on.IN.gov/spongymoth](https://www.in.gov/spongymoth) and on the [Indiana DNR-DEPP X \(Twitter\) page](#).

The online public meetings were held via Zoom (Example 1A, 1B) and a recorded video of the presentation shown during the meetings is available for viewing at - <https://www.youtube.com/watch?v=hn0jnm89QOw>

Three virtual public meetings and one hybrid (combined in person/virtual) meeting were held for citizens, public officials and interested individuals (Table 1). The proposed action and alternatives, including no action, were discussed. There was a total attendance of 81 citizens at the meetings.

Residents within proposed treatment sites will be mailed a notification approximately two weeks prior to treatment. DNR News Releases will be sent out to local media with a request to communicate the information to the general public. Phone calls will be made to public officials, emergency personnel and others identified during the public involvement process. Updates regarding the scheduled day of treatment will continue prior to and through treatment days via a combination of local media, phone calls, emails, and X (Twitter) as updated information becomes available based on spongy moth life stage development and weather conditions.

Information gathered from the public and from resource professionals was used to identify and evaluate issues and concerns used to formulate the alternatives. They are grouped into five categories; 1) Human Health and Safety, 2) Effects on Non-target Organisms and Environmental Quality, 3) Economic and Political Impacts of Treatment vs. Non Treatment, and 4) Likelihood of Success of the Project.

### 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 Chapter 4 and are summarized in Table 3.

#### **Issue 1 - Human Health and Safety.**

Three types of risk are addressed under this issue: 1) an aircraft accident during applications; 2) treatment materials and potential effects on people; and 3) the future effects of spongy moth infestations 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 non-target organisms, including threatened and endangered species that may be in the treatment site; 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 resource, nursery and Christmas tree producers, and recreational activities. An additional economic impact is a spongy moth quarantine imposed to regulate movement of products from the forest, nursery, and recreational industries to uninfested areas.



#### **Issue 4 - Likelihood of Success of the Project.**

The objective of this cooperative project is to slow the spread of spongy moth populations by eliminating or decreasing reproducing populations from the proposed treatment sites. Alternatives vary in their likelihood of success for the current situation. Each year, project success is evaluated by treatment types for delaying spongy moth impacts to Indiana and neighboring states.

#### 1.8. Summary of authorizing laws and policies

##### **State**

The Division Director (State Entomologist) may cooperate with a person in Indiana to locate, check, or eradicate a pest or pathogen (Indiana Code 14-24-2-1). The Division Director may, on the behalf of the department, enter into a cooperative agreement with the United States government, the government of another state, or an agency of the United States or another state to carry out this article (Indiana Code 14-24-2-2).

Aerial applicators must meet Indiana Pesticide Use and Application Law (Indiana Code 15-3-3.6) to provide safe, efficient, and acceptable applications of pesticides.

This project will be conducted in accordance with the National Pollutant Discharge Elimination System (NPDES) requirements and is operating under Indiana Pesticide General Permit ING870000.

The Non-Game and Endangered Species Conservation Law (Indiana Code 14-22-34).

Protection of Historic Properties (Indiana Code 14-21-1).

##### **Federal**

Authorization to conduct treatments for *L. dispar* 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. 115-334, Sec 8 [16 U.S.C. 2104], Forest Health Protection) reauthorizes the basic charter of the Cooperative Forestry Assistance Act of 1978.

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 courts regard federally funded state actions over which a federal agency conditions the use of the funds as federal actions.

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.

USDA Departmental *L. dispar* Policy (USDA 1990) assigns the Forest Service, SP&TF and APHIS responsibility to assist states in protecting non-federal lands from *L. dispar* damage.

Executive Order #12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. Consistent with this Executive Order, the Forest Service, SP&TF considered the potential for disproportionately high and adverse human health or environmental effects on any minority or low-income populations.

## 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. Processes used to formulate the alternatives

The ROD for the SEIS, to which this document is tiered, maintains the three strategies for *L. dispar* management (eradication, slow-the-spread, and suppression) that were allowed in the EIS. Therefore, the Forest Service and APHIS can assist in funding and carrying out eradication, suppression, and slow-the-spread projects. The ROD for the SEIS adds the insecticide tefubenozone 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 and eradication strategies: 1) Btk; 2) diflubenzuron; 3) Gypchek; 4) mass trapping; 5) mating disruption; 6) sterile insect release; and 7) tebufenozone.

Information pertinent to developing alternatives for managing spongy moth in Indiana have been solicited from various groups (Appendix C – Agencies and Persons Consulted). However, the framework for proposing and selecting appropriate treatment alternatives was developed within the STS program by IDNR staff in cooperation with Forest Service, SP&TF.

### 2.2. Alternatives eliminated from detailed study

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

### **Diflubenzuron (Dimilin)**

The label for Dimilin prohibits its use over wetlands and directly to water. This insecticide is a broad spectrum treatment and may increase the impact to nontarget species. Therefore, Dimilin is not considered for this project. In future projects, it may be evaluated for use.

### **Gypchek**

Gypchek has proven effective at reducing spongy moth at higher population levels. However, Gypchek is a costly alternative with a very 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 (USDA 2012a, Vol. II, App. A pp. 3 to 4). Environmental review of the sites did not determine that any threatened or endangered lepidopterans occurred within the treatment sites. Due to no threatened or endangered species occurring within the proposed treatment sites, Gypchek is not considered for this project. In future projects, it may be evaluated for use.

### **Mass trapping**

Mass trapping uses an intensive grid of traps to limit reproduction. Mass trapping is typically used on small spongy moth infestations of 100 acres or less (USDA 2012a, Vol. II, App. A, p. 5), and generally uses 9 or more traps per acre. This approach is very labor intensive, especially over large areas. Mass trapping has proven capable of eliminating or reducing spongy moth at very low population levels in small sites. The use of mass trapping can meet the project objective of eradicating spongy moth at small treatment sites. Due to the level of moth catches and the size of the areas proposed for treatment, mass trapping is not considered for this project. In future projects, it may be evaluated for use.

### **Sterile insect release**

Sterile insect release can be done for elimination of isolated spongy moth populations. There are obstacles using this alternative - the limited release period; the need to synchronize production of mass quantities of sterile pupae; and the logistical difficulties of repeated release over a 4-week period (USDA 2012a, Vol. II, App. A, p. 7). This treatment alternative is currently not available, and it has not been used since 1992 (USDA 2012a, Vol. II, App. A, p. 8). Given these obstacles, sterile insect release is not considered for this project. In future projects, it may be evaluated for use.

### **Tebufenozide (Mimic)**

This insecticide (an insect growth regulator) is selective against caterpillars (lepidopteran larvae), like Btk, but it has longer persistence in the environment than Btk.

Thus, it could have greater impact to nontarget caterpillar populations. Therefore, Mimic is not considered for this project. In future projects, it may be evaluated for use.

### 2.3. Alternatives considered in detail

#### **Alternative 1 - No action**

The no action alternative means no federal funding for any treatments. The state of Indiana may still complete some treatments at their discretion. Spongy moth will reproduce, and populations will begin to defoliate trees in the area. Spongy moth populations will be allowed to develop and spread to surrounding areas.

#### **Alternative 2 – Btk only**

Btk has been a commonly used treatment option in Cooperative Spongy Moth Projects in Indiana and other states. Btk is a naturally occurring soil-borne bacterium that is mass-produced and formulated into a commercial insecticide. The Btk strain is effective against caterpillars, including the spongy moth caterpillar. Caterpillars ingest Btk while eating the foliage. Once in the midgut, Btk becomes active and causes death within a few hours or days (USDA 2012a, Vol. II, App. A, p. 1).

Btk has proven effective at eliminating or reducing spongy moth at all levels of population. Btk has the potential to impact non target Lepidoptera and it is more expensive than MD. Therefore, Btk is typically applied to sites that have high spongy moth populations (greater than 30 moths captured in monitoring traps) or when life stages, such as egg masses, have been found. Btk applications can meet the project objective of slowing the spread of spongy moth at the proposed treatment sites.

This treatment option typically uses two applications of Btk at 25 cabbage looper units (CLU) per acre applied from air or ground. The applications would begin when leaf expansion is near 50% and when first and second instar caterpillars are present and feeding. This usually occurs between late April and late May in northern Indiana. Most commercial formulations of Btk are aqueous flowable suspension containing 48 or 76 CLU per gallon (Appendix D – Product Labels). For aerial application at 24 to 38 CLU, less than 3.0 quarts (3/4 gallon) of the product would be applied per acre.

#### **Alternative 3 - Mating disruption only**

This treatment option uses one aerial application of the spongy moth pheromone (disparlure), prior to the emergence of male moths. Application would occur in mid-June to early July. Mating disruption relies on the attractive characteristics of disparlure, the spongy moth sex pheromone. The objective of mating disruption is to saturate the treatment area with enough pheromone sources to confuse the male moths and prevent them from finding and mating with female moths.

Mating disruption works well at eliminating mating success of spongy moth in areas that have very low population levels where male moths have a difficult time locating and mating with widely dispersed females. As local populations build and more females are around, male moths can visually locate females and no longer rely on the pheromone to find females. So, mating disruption treatments are not as effective where monitoring traps catch 10 or more moths on average or where alternate life stages (egg masses, pupae) can be found relatively easily. Therefore, mating disruption can meet the project objective on some of the proposed sites but may not be able to meet that objective on other sites where higher level spongy moth populations have been found.

#### **Alternative 4 – Btk and/or Mating disruption (Proposed Action)**

The use of this alternative provides flexibility to select Btk or mating disruption alone or in combination for each site based on the following criteria: 1) spongy moth population level, 2) habitat type (urban, rural, open water or wetland), 3) nontarget organisms, 4) safety, and 5) cost and project efficiency. The use of this alternative can meet the objective of slowing the spread of spongy moth at all of the proposed treatment sites.

#### [2.4. Mitigation measures for the proposed action](#)

**The Cooperative Spongy Moth Project will implement the following safeguards and mitigations:**

- News releases of planned treatments and dates will be given to local news media.
- Implementation of a Work and Safety Plan.
- Prior to treatments, local safety authority will be notified by direct contact or phone calls.
- Prior to treatments, IDNR staff will communicate with private helipads and airports when application aircraft will be flying over the treatment sites.
- Prior to treatments, IDNR staff will communicate to and consult with aerial applicator regarding any aerial hazards (cell towers, etc.) and environmental concerns (T&E species locations, water, etc.) in and outside each treatment site to avoid.
- Employees of state and federal agencies monitoring the treatment will receive training on treatment methods to be able to answer questions from the public.
- Application of Btk will be suspended when school buses are in a treatment site or when children are outside on school grounds.

- The 76B formulation of Btk will be used because it is operationally more efficient and manages safety concerns by using a fewer number of loads to complete application.
- Aircraft will be calibrated for accurate application of treatment material.
- Applications will be timed based on larval development so that the most susceptible spongy moth life stage is targeted.
- Weather will be monitored during treatment to ensure effective deposition of the treatment material.
- The wind speeds during the application will be monitored by IDNR personnel and the aerial applicator will maintain the application within the boundaries of the proposed treatment sites.
- Treatment will be avoided or stopped if winds are above the guidelines stated in the Work and Safety Plan.
- Treatments will be stopped if drones are identified in a treatment site until the flight area is clear.
- Flight patterns during the Roanoke site treatment will be adjusted as necessary to avoid disruption to Bald Eagle nest habitat and to avoid aerial safety hazards.

### **Monitoring**

During the treatments, ground observers and/or aerial 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 and reviewed, post-treatment, to determine the effectiveness of the treatments.

## **3.0 Affected Environment**

### **3.1. Description of the proposed treatment sites**

The four proposed treatment sites in six counties in the STS Action Area were selected based on the male moth trapping surveys, STS analysis, egg mass surveys and available habitat. The population analysis that led to the 2024 proposed treatment sites is available upon request from the IDNR Administrative file.

Each proposed treatment site is described in Table 2 and the paragraphs below based on the number of acres, percent tree canopy within the site, previous treatments, the presence of schools, land use, presence of water sources, potential aerial safety hazards, presence of egg masses, tree composition and other areas of potential concern. Maps are in Appendix B.

Table 2. Descriptions of the 2024 proposed spongy moth treatment sites. Maps of proposed treatment sites are in Appendix B.

County	Site Name	Acres	Approx % tree canopy	Previous treatment	Land usage *	Water sources	Aerial hazards	Egg masses found
Adams	Berne Btk 24	497	15%	No	N, A, R, B	Yes	No	No
Wabash	North Manchester Btk 24	618	84%	No	N, A, R, B	Yes	Yes	Yes
Huntington/Allen/Whitley	Roanoke MD 24	13,137	16%	No	N, A, R, B	Yes	Yes	No
Starke	Winona MD 24	10,272	34%	No	N, A, R, B	Yes	Yes	No

\*N = Natural, A = Agricultural, R = Residential, B = Business

## ADAMS COUNTY

### Berne Btk 24

- The site contains 497 acres.
- Tree species composition includes oak, maple, hickory, walnut, cottonwood, basswood, crabapple, spruce, and other hardwoods.
- No egg masses were found in the site.
- The site contains woodlots, agricultural fields, residences, and businesses.
- The site has had no prior treatment.

### **Hazards**

- There are no known aerial hazards in the site.

### **Area Churches and Schools**

- There are no churches or schools in the site.

### **Other areas of concern including water sources**

- There are several ponds in the site.
- A drainage ditch starts in a woodlot in the southeast corner of the site flowing west and exiting the site (Wabash River drainage).
- There is a nursery stock grower (GrowJoy, Inc.) in the center of the site at 2952 W 500 S, Berne, IN.

## WABASH COUNTY

### North Manchester Btk 24

- The site contains 618 acres.
- Tree species composition includes oak, maple, beech, hickory, walnut, basswood, pine, spruce, and other hardwoods.
- Egg masses were found in the site.
- The site contains woodlots, agricultural fields, residences, and businesses.

- The site includes portions of the Town of North Manchester.
- The site has had no prior treatment.

#### **Hazards**

- There is a water tower on the west boundary of the site in Warvel Park.

#### **Area Churches and Schools**

- The site includes Manchester University campus.
- Manchester Jr-Sr High School is adjacent to the west boundary of the site.
- Manchester Elementary School is approximately 0.25 miles south of the site.
- There are many churches and day care centers within the site.

#### **Other areas of concern including water sources**

- The site includes Eel River along the east boundary and across the southeast corner.
- Warvel Park is in the west portion of the site.

### **HUNTINGTON, ALLEN & WHITLEY COUNTIES**

#### **Roanoke MD 24**

- The site contains 13,137 acres.
- Tree species composition includes oak, maple, beech, hickory, walnut, cottonwood, basswood, crabapple, willow, pine, spruce, and other hardwoods.
- No egg masses were found in the site.
- The site contains woodlots, agricultural fields, residences, and businesses.
- A portion of the Town of Roanoke is in the southern boundary of the site.
- The site has had no prior treatment.

#### **Hazards**

##### **\*Bald eagle nests were identified near the NE and SE boundaries of the site.**

- Indiana Michigan Power has a large substation that is bisected by the eastern boundary of the site. The substation has several transmission lines feeding into it.
- There is a transmission line running diagonally from the north-central portion of the site to the substation in the east-central portion of the site ~200' towers.
- There are four separate transmission lines entering the southeastern portion of the site and running to the substation in the northeastern corner of the site.
- There are three large radio towers along US24 just outside the northeast corner of the site, ~500' towers
- There are two cell phone towers in the central portion of the site on the west side of Huntington CR 300 E, ~300' towers
- There is a cell phone tower outside the eastern boundary of the site near the Indiana Michigan Power substation, ~200' tower
- There is a water tower inside the south-central portion of the site on the northwest side of Roanoake, ~150' tower
- There is a water tower outside the south-central boundary of the site, ~150' tower
- The General Motors Fort Wayne Assembly Plant is approximately 1.25 miles east of the southeast corner of the site.

#### **Area Churches and Schools**

- Pleasant Chapel Community Church is in the northwest corner of the site at 880 E. 1100N., Roanoke.



- Faith Lutheran Church is in the south-central portion of the site at 3416 E. 900 N., Roanoke.
- Seminary United Methodist Church is located in the south-central portion of the site at 285 Seminary St, Roanoke.
- St Joseph Catholic Church is located in the south-central portion of the site at 641 N. Main St, Roanoke.
- Roanoke Brethren Church is outside the south-central boundary of the site at 415 S. Main St, Roanoke.
- Roanoke Elementary School is outside the south-central boundary of the site at 423 W. Vine St, Roanoke.

**Other areas of concern including water sources**

- The Little River enters the northeastern corner of the site flowing south/southwest and exiting the southern border of the site (Wabash River drainage).
- Aboite Creek flows south into the northeastern corner of the site joining the Little River (Wabash River drainage).
- Calf Creek flows into the north-central portion of the site flowing southeast and joining the Little River in the northeastern corner of the site (Wabash River drainage).
- Cow Creek starts in the west-central portion of the site, flows south exiting the southern boundary of the site and then turns east back into the southern boundary of the block flowing to the Little River in the south-central portion of the site (Wabash River drainage).
- Roanoke Park is in the south-central portion of the site.
- Manasseh Stables horse boarding is inside the northeastern corner of the site on Huntington CR 400E.
- Law's Country Kennel animal boarding is inside the eastern boundary of the site near the substation.
- There is an equestrian farm on Whitley CR 700E approximately ¼ mile outside the northeastern boundary of the site.

**STARKE COUNTY**

**Winona MD 24**

- The site contains 10,272 acres.
- Tree species composition includes red oak, black cherry, maple, spruce, crabapple, and other hardwoods.
- No egg masses were found in the site.
- The site contains woodlots, agricultural fields, residences, and businesses.
- The site has had no prior treatment.

**Hazards**

- A cell tower is located just outside the northeast corner of the site.
- High power lines going east and west run along the northern boundary of the site.
- A high power line is located in the southeast portion of the site.

**Area churches and schools**

- No schools are in the site.

**Other areas of concern including water sources**

- A portion of Winona (Bass) Lake is in the western boundary of the site.

- There are several small ponds throughout the site.

### 3.2. Threatened and endangered species

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 and to avoid any negative impacts to federally listed endangered, threatened, candidate species, or their critical habitat, the IDNR consulted with the US Fish and Wildlife Service (USFWS). Individual treatment sites along with proposed methods were evaluated for potential concerns. The consultation between IDNR and USFWS determined that the spongy moth program is not likely to adversely affect any federally listed species. The consultation also stated, “unlikely that monarch butterfly larvae would be present during the spray periods”, even though USFWS did not make monarch butterfly a candidate species.

The IDNR Environmental Review Unit was also consulted regarding the proposed treatments and provided consultation on this federal and state funded project in accordance with the National Environmental Policy Act of 1969.

See Appendix C - Agencies and Persons Consulted for response letters from agencies. The letters of request for consultation to these agencies are on file in the IDNR administrative record.

### 3.3. Protection of historic properties

Section 106 of 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.

The State Historic Preservation Officer did not identify any historic properties that will be altered, demolished, or removed by the proposed project pursuant to Indiana Code 14-21-1. See Appendix C- Agencies and Persons Consulted for consultation letters from agencies. The letters of request for consultation to these agencies are on file in the IDNR administrative record.

## 4.0 Environmental consequences

This section is the scientific and analytic basis for the comparison of alternatives. It describes the probable consequences (effects) of each alternative for each issue. Environmental consequences are summarized in Table 3 for each combination of the alternatives and issues.

### 4.1. Comparison of environmental consequences of alternatives considered in detail

#### **Issue 1: Human Health and Safety**

##### **Alternative 1 – No action**

For this alternative, there would be no cooperative project, therefore risk of human contact with mating disruption or Btk and an aircraft accident during application would not exist. However, future impacts by spongy moth to human health will occur sooner under Alternative 1 if treatments are not 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 (USDA 2012a, Vol. IV, App. 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 (USDA 2012a, Vol. IV, App. L, pp. 3-4 to 3-5).

##### **Alternative 2 – Btk only**

A detailed analysis of the risks posed to humans by Btk, called Human Health Risk Assessment, was conducted for the Final SEIS (USDA 2012a, Vol. III, App. F., pp. 3-1 to 3-32). Human exposure to Btk provides little cause for concern about health effects. “There is no information from epidemiology studies or studies in experimental mammals to indicate Btk will cause severe adverse health effects in humans under any set of plausible exposure conditions” (USDA 2012a, Vol. III, App. F, p. 3-19). The only human health effects likely to be observed after exposure to Btk involve mild irritation of the skin, eyes, or respiratory tract (USDA 2012a, Vol. III, App. F, p. 3-19 to 3-32). “Given the reversible nature of the irritant effects of Btk and the low risks for serious health effects, cumulative effects from spray programs conducted over several years are not expected” (USDA 2012a, Vol. III, App. F, p. 3-32). Glare and O’Callaghan (2000) provide a comprehensive review of *Bacillus thuringiensis*, including Btk, and they conclude with this statement, “After covering this vast amount of literature, our view is a qualified verdict of safe to use.”

A slight risk of an accident always exists when conducting aerial applications. Btk uses one or two applications for slow the spread. To further reduce this risk, a detailed work and safety plan is required prior to program implementation, which outlines guidelines for aircraft inspections, Btk loading, and conditions for safe applications.

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

### **Alternative 3 – Mating disruption only**

A detailed analysis of the risks posed to humans by mating disruption, called Human Health Risk Assessment, was conducted (USDA 2012a, Vol. III, App. H, pp. 3-1 to 3-10). The toxicity of insect pheromones to mammals is relatively low, and their activity is target-specific. Therefore, the EPA does not foresee negative effects on humans and requires less rigorous testing of these products than of conventional insecticides. Once absorbed through direct contact, disparlure is very persistent in humans, and individuals exposed to disparlure may attract adult male moths for prolonged periods of time. This persistence is viewed as a nuisance and not a health risk (USDA 2012a, Vol. III, App. H, pp. 3-9). In acute toxicity tests, disparlure was not toxic to mammals, birds, or fish (USDA 2012a, Vol. III, App. H, pp. 4-1 to 4-8). Therefore, no effects to human health are anticipated.

Mating disruption using SPLAT® GM Organic involves the aerial application of amorphous polymer matrix droplets that are infused with spongy moth pheromone. The formulation of SPLAT GM consists of small waxy droplets, approximately 0.3 mm to 2.0 mm in size when released from a conventional aerial application system. All matrix ingredients in SPLAT GM Organic are cleared as food safe by the FDA and are biodegradable. The droplets are a grayish white in color and applied at a rate of 3 to 30 grams of active ingredient (disparlure) per acre (see Appendix D – Product Labels). Applications would most commonly be applied at a rate of either 6 or 15 grams (equivalent of approximately 1.2 teaspoons or 3.0 teaspoons) of pheromone per acre.

A slight risk of an accident always exists when conducting aerial applications. Mating disruption uses one application. To further reduce this risk, a detailed work and safety plan is required prior to program implementation, which outlines guidelines for aircraft inspections, product loading, and conditions for safe applications.

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

### **Alternative 4 – Btk and/or Mating disruption**

The human health and safety consequences stated above for Alternatives 2 and 3 apply to this alternative.

## **Issue 2: Effects on Nontarget Organisms and Environmental Quality**

### **Alternative 1 – No action**

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 (USDA 2012a, Vol. II, Ch.4, pp. 4 to 5). 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 (USDA 2012a, Vol. II, Ch.4, p. 5). In Indiana forests, maples and beech should become more prevalent as spongy moth caterpillars focus their feeding on oaks. The effects of defoliation depend on many factors, including defoliation severity, frequency, timing, tree health and vigor, and the role of secondary organisms, including insects and pathogens (USDA 2012a, Vol. IV, App. L, p. 4-5). Spongy moth infestations generally result in tree mortality losses of less than 15% of total basal area, but in some cases can exceed 50% (USDA 2012a, Vol. IV, App. L, p. 4-6).

Spongy moth defoliation and subsequent tree mortality (especially oak trees) caused by the feeding of millions of caterpillars has a variety of impacts on the environment. Some of these changes are detrimental to certain species and favorable to others during and after spongy moth outbreaks. Defoliation can result in changes to soil condition, microclimate, water quality, water yield, acorn production, and other environmental factors due to the loss of leaf tissue, the waste material produced by large number of feeding caterpillars, and the tree mortality that can follow outbreaks (USDA 2012a, Vol. II, Ch. 4, pp. 4 to 7). Some species of mammals, birds, terrestrial invertebrates, fish, and aquatic invertebrates are negatively impacted by spongy moth related feeding (USDA 2012a, Vol. II, Ch. 4, pp. 7 to 9). As an example, acorn production can drop during and immediately following an outbreak and this can reduce populations of white-footed mice (USDA 2012a, Vol. II, Ch. 4, p. 8). On the other hand, dead trees favor some species of birds that use dead wood as nesting sites or that feed on wood or bark infesting insects that thrive in dead and dying trees (USDA 2012a, Vol. II, Ch. 4, p. 8).

With Alternative 1 (No action), localized defoliating populations are expected on oak trees at the proposed treatment sites.

### **Alternative 2 – Btk only**

Using Btk is likely to maintain the forest condition in the short-term by eliminating spongy moth populations in the treatment sites, thus keeping populations from expanding and causing defoliation. However, in the long-term, spongy moth will likely become more widely distributed in Indiana even if this alternative is followed.

Btk may indirectly help in maintaining existing forest conditions, water quality, microclimate, and soil condition by delaying spongy moth population increases (USDA 2012a, Vol. II, Ch. 4, p. 10). The ecological risk assessment of the effects of Btk on nontarget organisms states that adverse effects due to Btk are unlikely in mammals and birds (USDA 2012a, Vol. III, App. F, pp. 4-2 to 4-3). The effects of Btk on birds, plants, soil microorganisms, or soil invertebrates other than insects are not of plausible concern (USDA 2012a, Vol. III, App. F, pp. 4-3 to 4-8). The Environmental Protection Agency classifies Btk as virtually nontoxic to fish (USDA 2012a, Vol. III, App. F, p. 4-8). No toxicity data are available on amphibians, though other strains of Btk appear to have low toxicity to this group (USDA 2012a, Vol. III, App. F, p. 4-9). Btk does not harm garden plants. In fact, it is a common garden insecticide against caterpillars such as the cabbage looper.

Btk has been shown to be toxic to several species of target and nontarget Lepidoptera (USDA 2012a, Vol. III, App. F, pp. 4-3 to 4-6). Btk selectively kills members of the insect order Lepidoptera that are actively feeding as caterpillars at or soon after the period of application, though not all non-target Lepidoptera are as sensitive to Btk as is spongy moth (USDA 2012a, Vol. III, App. F, pp. 4-4 to 4-6). Btk applications occur earlier than when most beneficial Lepidopteran caterpillars are active. Outside of the Lepidoptera, the negative impact of Btk on other insect orders is minor (USDA 2012a, Vol. III, App. F, pp. 4-6 to 4-7). It is, therefore, more “selective” than many insecticides that kill a wider array of insects. However, concerns still exist over its possible negative impact on native caterpillars, which may occur in the proposed treatment areas. Btk may impact nontarget species of spring-feeding caterpillars in the treatment site, but the impact to the local population is usually minimal as Btk rapidly degrades on the foliage within a few weeks, and the nontarget lepidopterans generally re-colonize treatment sites in less than 2 years (USDA 2012a, Vol. II, Ch. 4, pp. 13 to 14).

### **Alternative 3 – Mating disruption only**

Mating disruption using disparlure is likely to maintain the forest condition in the short-term (5 to 10 years) by eliminating or reducing spongy moth populations in the treatment site, 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 Indiana even if this alternative is followed.

Matrix ingredients in SPLAT® GM Organic are cleared as food safe by the FDA and are biodegradable.

Disparlure may indirectly help in maintaining existing forest conditions, water quality, microclimate, and soil condition (USDA 2012a, Vol. II, Ch. 4, p. 19) by delaying spongy moth population increases. The ecological risk assessment states that disparlure has a very low toxicity to mammals and birds (USDA 2012a, Vol. III, App. H, pp. 4-1 to 4-2).

Like other insect pheromones, disparlure is generally regarded as nontoxic to mammals, and no adverse effects are expected from exposure (USDA 2012a, Vol. II, Ch. 4, pp. 19).

In addition, it is not likely to cause toxic effects in aquatic species (USDA 2012a, Vol. III, App. H, pp. 4-3 to 4-5). One study found that disparlure caused unusually high mortality in water fleas (*Daphnia*). Later it was determined that the mortality was due to physical trapping in undissolved disparlure of the organisms at the water surface, not due to toxicity (USDA 2012a, Vol. III, App. H, pp. 4-4 to 4-8). This is an experimental artifact and is not likely to be encountered under operational use.

Disparlure is a pheromone component for some other species (USDA 2012a, Vol. III, App. H, pp. 2-1 to 2.2), and could disrupt mating in some other species of moths (nun moth, pink gypsy moth) in the genus *Lymantria* (USDA 2012a, Vol. III, App. H, p. 4-2). All of these species are Asian or Eurasian and are not known to occur in 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.

#### **Alternative 4 – Btk and /or mating disruption**

The nontarget and environmental consequences stated above for Alternatives 2 and 3 apply to this alternative.

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

#### **Alternative 1 – No action**

If no treatments were applied, the likely action would be to implement a quarantine in counties during the next year. Quarantine would regulate movement of firewood, logs, other timber products, mobile homes, recreational vehicles, trees, shrubs, Christmas trees, and outdoor household articles. This would 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 would become noticeable in the future, but it would be difficult to predict exactly when noticeable defoliation would occur. Requests for federal assistance to suppress *L. dispar* would be likely when defoliation occurs. Suppression projects are generally more expensive in total dollars than slow the spread projects because much larger areas are treated. The economic impact to state budgets and affected property owners would increase, as responsible agencies would need to administer and fund these suppression projects, and these types of projects are often cost shared with the property owners.

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. The economic impact of no action would allow spongy moth infestations to greatly advance ahead of the Transition Area (the area between infested areas and non-infested areas), thus devaluing the Slow The Spread Program accomplishments, and shift the STS line and infestations much further south.

**Alternatives 2 (Btk only), 3 (Mating disruption only), and 4 (Btk and/or Mating disruption)**

If treatments are applied, regulatory action is not likely for Adams, Huntington, Starke and Wabash counties during the next year and the impacts listed under Alternative 1 would be delayed for these counties. These proposed treatment sites are located within the STS Action Area and this alternative corresponds with the national strategy for managing spongy moth in these areas. Allen and Whitley counties are already under quarantine for spongy moth. Treatment of the reproducing population in these areas will reduce spread into Adams and Huntington Counties and delay those counties being quarantined. This corresponds to the STS program goal of reducing spread to 4.8 miles per year.

Economic analysis for this site-specific assessment shows the Benefit-Cost Ratio is 12:1:1.0 (Economic Analysis document is in the IDNR Administrative File).

The proposed treatment sites have been determined based on results from spongy moth surveys using STS protocols. The proposed treatment itself will have minimal socioeconomic effects, and it will not have disproportionate effects to any minority or low-income population. Aerial application of a pesticide may be controversial in the public arena. Through public outreach and scoping, the IDNR provides information and answers questions about the treatments concerning human health and environmental quality for residents within and near the proposed treatment sites. Also, political leaders are contacted about the proposed project.

**Issue 4: Likelihood of Success of the Project**

**Alternative 1 – No action**

The project objective would not be met with this alternative. Isolated spongy moth populations in the proposed treatment sites would continue to grow, and these populations would serve as a source for increased spread within the counties and into surrounding counties. If these isolated populations were allowed to grow and coalesce, spongy moth could spread through the state in 10 years (Sharov et al. 2002).

**Alternative 2 – Btk only**

Project success is likely with this alternative. Btk has proven effective at eliminating or reducing spongy moth at all population levels. However, this alternative is more expensive and has the potential for non-target impacts.



### **Alternative 3 – Mating disruption only**

Project success is likely with this alternative in eleven treatment sites with low spongy moth populations. However, two sites have *L. dispar* populations above the recommended level for treatment with mating disruption.

### **Alternative 4 – Btk and/or mating disruption**

Project success is optimized with this alternative when treatment selection criteria are used to select the most appropriate treatment for any individual site, Btk or mating disruption. This alternative is the best option because the project will likely be successful at all treatment sites, while minimizing costs and potential non-target impacts.

Treatment selection criteria used to evaluate each site are: 1) spongy moth population level, 2) habitat type (urban, rural, open water or wetland), 3) nontarget organisms, 4) safety, and 5) cost and project efficiency. Btk is selected for areas where alternate life stages are found and have higher population levels. MD is selected for areas with lower population levels

#### [4.2. Summary of alternatives considered in detail](#)

Under alternative one (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 in areas where spongy moth becomes established. In the long-term, the stands with established spongy moth would trend away from forests containing oaks to species less preferred by spongy moth caterpillars.

The proposed alternative offers the greatest probability of meeting the project objective (see Section 1.1 above). The short-term impact that applications of Btk might have on local non-target Lepidoptera populations should be minimal since under this alternative Btk is limited to two treatment sites (1,115 acres), a small percentage of the overall 24,524 acre project. No endangered or threatened species are likely to be adversely affected within the treatment areas, and we would anticipate that native Lepidoptera would rapidly recolonize the Btk treatment sites from the surrounding untreated areas. The mating disruption treatments should be successful because they are focused on sites with very low spongy moth populations.

The proposed alternative of Btk and MD treatments delays the immediate economic and political impacts created by a possible federal quarantine and offers the best chance for slowing the spread and establishment 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.

See Table 3 summarizing the alternatives and issues.

**Table 3:** Comparative matrix summarizing the alternatives and issues.

	<b>Issue 1 Human Health &amp; Safety</b>	<b>Issue 2 Effects on Nontarget Organisms &amp; Environmental Quality</b>	<b>Issue 3 Economic and Political Impacts</b>	<b>Issue 4 Likelihood of Success of the Project</b>
<b>Alternative 1- No action</b>	<ul style="list-style-type: none"> <li>- No risk of an aircraft accident or pesticide spill.</li> <li>- No risk of Btk contact with humans.</li> <li>- Spangy moth outbreaks will occur sooner along with the associated nuisance and health impacts to humans.</li> </ul>	<ul style="list-style-type: none"> <li>- No direct effect to nontarget organisms, including threatened and endangered species.</li> <li>- Future spangy moth impacts will occur sooner, which includes defoliation and reduction in the oak component of forest stands.</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would occur sooner with implementation of quarantines.</li> <li>- Spread of spangy moth through these counties and into adjacent counties would not be slowed.</li> <li>- Suppression projects and negative financial impacts from defoliation would occur sooner.</li> </ul>	<ul style="list-style-type: none"> <li>- The spread of spangy moth would not be slowed at the treatment sites and the project objective would not be met.</li> </ul>
<b>Alternative 2- Btk only</b>	<ul style="list-style-type: none"> <li>- Slight risk of aircraft accident and pesticide spill.</li> <li>- Contact with Btk may cause mild and temporary irritation (eye, skin &amp; respiratory).</li> <li>- Delay effect of spangy moth outbreaks on humans.</li> </ul>	<ul style="list-style-type: none"> <li>-There could be some impact on spring feeding caterpillars, temporarily reducing local populations.</li> <li>- No effect on Karner blue butterfly and Mitchell’s satyr as neither species is known to occur within the proposed Btk sites.</li> <li>- Not likely to adversely affect Indiana bat, northern long-eared bat, or monarch butterfly.</li> <li>- Delay the impact of spangy moth defoliation on environmental quality.</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would not be implemented in these counties during the current year and/or economic impacts to landowners would be delayed.</li> <li>- Slows the spread of spangy moth.</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely in the treatment sites.</li> </ul>
<b>Alternative 3- Mating disruption only</b>	<ul style="list-style-type: none"> <li>- Slight risk of aircraft accident.</li> <li>- No effect to human health.</li> <li>- Delay effect of spangy moth outbreaks on humans.</li> </ul>	<ul style="list-style-type: none"> <li>- No effects to nontarget organisms, including any threatened and endangered species known to occur within the sites.</li> <li>- Delay the impact of spangy moth defoliation on environmental quality.</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would not be implemented in these counties during the current year and/or economic impacts to landowners would be delayed.</li> <li>- Slows the spread of spangy moth.</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely in treatment sites with very low populations. However, in one site, mating disruption is likely to fail because local spangy moth populations are too high.</li> </ul>
<b>Alternative 4- Btk and/or Mating disruption</b>	<ul style="list-style-type: none"> <li>- Same as alternative 2 or 3 depending on the treatment at each site.</li> </ul>	<ul style="list-style-type: none"> <li>- Same as alternative 2 or 3 depending on the treatment at each site.</li> </ul>	<ul style="list-style-type: none"> <li>- Regulatory action would not be implemented in these counties during the current year and/or economic impacts to landowners would be delayed.</li> <li>-Slows the spread of spangy moth.</li> </ul>	<ul style="list-style-type: none"> <li>- Success is likely in all the treatment sites.</li> </ul>

### 4.3. Cumulative effects

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

These impacts (cumulative impacts) can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The total cumulative impacts are determined by analyzing the direct and indirect effects of the proposed action.

(a) Direct effects, which are caused by the action and occur at the same time and place.

(b) Indirect effects, which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Effects and impacts as used in these regulations are synonymous (40 CFR 1508.8).

The site-specific analysis of this environmental assessment is tiered to the programmatic EIS and SEIS and documented in accordance with the National Environmental Policy Act (NEPA) implementing procedures (USDA 2012b, ROD, p. 2). 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). The programmatic EIS and SEIS addressed cumulative impacts of the national STS spongy moth program and treatment options. Therefore, this document focuses on site specific issues that pertain to cumulative effects.

Btk treatments applied to an area for 3 consecutive years may cause delays in Lepidoptera populations recolonizing the area and may have greater impacts on some species with very small habitats (USDA 2012a. Vol. II Ch. 4 p. 13). These repeated Btk treatments in adjacent years would make cumulative effects more likely.

None of the proposed treatment sites have had any prior treatment.

Review of the proposed treatments and sites by the U.S. Fish & Wildlife Service and the Indiana Dept. of Natural Resources concluded that the 2024 proposed spongy moth program was not likely to adversely affect federally listed species.

The Indiana Dept. of Natural Resources, Division of Historic Preservation and Archeology concluded that no historic properties would be altered, demolished, or removed by the proposed project.

Therefore, a conclusion of “no cumulative effects” is made for this proposed project.

## 5.0 List of preparers and reviewers

### PREPARERS:

**Phil Marshall**, Forest Health Specialist, Division of Forestry, Indiana Department of Natural Resources, Vallonia State Nursery, 2782 W County Road 540 S, Vallonia, IN 47281.

EA Responsibility: Participated in writing and reviewing the environmental assessment and in the development of the proposed cooperative *L. dispar* project.

Experience and Education: Experience as Forest Health Specialist since 1974 and experience in *L. dispar* management since 1977. M.F., Duke University in Forest Entomology and Pathology; B.A., Catawba College in Pre-Forestry.

**Angela Rust**, Natural Resources Inspector, Division of Entomology and Plant Pathology, Indiana Department of Natural Resources, P.O Box 757, Tell City, Indiana 47586.

EA Responsibility: Participated in writing and reviewing the environmental assessment and in consultation of the proposed cooperative *L. dispar* project.

Experience and Education: Natural Resources Inspector with the Indiana Department of Natural Resources, Division of Entomology and Plant Pathology since 1995. B.S., Purdue University in Entomology.

**Patrick Engelken**, Entomologist, USDA Forest Service, Eastern Region, Forest Health Protection, State, Private and Tribal Forestry, 1992 Folwell Ave., St. Paul, MN 55108.

EA Responsibility: Participated in review of the environmental assessment and final development of the proposed cooperative *L. dispar* project.

Experience and Education: Forest entomologist with the USDA Forest Service in St. Paul, MN since 2020. M.S., Michigan State University in Entomology; B.S., Washburn University in Biology.

### REVIEWER:

**Megan Abraham**, State Entomologist, Division of Entomology and Plant Pathology, Indiana Department of Natural Resources, 402 W. Washington Street, Room 290W, Indianapolis, IN 46204.

EA Responsibility: Reviewer

Experience and Education: State Entomologist with the Indiana Department of Natural Resources, Director of the Division of Entomology and Plant Pathology, State Plant

Regulatory Official. M.S., Purdue University in Entomology; B.S., Purdue University in Wildlife Science with a minor in International Studies.

## 6.0 List of persons and agencies consulted

**Eric Biddinger**, Natural Resources Inspector, IDNR Entomology and Plant Pathology, 402 West Washington Street, Room W290, Indianapolis, IN 46204.

Consultation on treatment sites and proposed project.

**Kallie Bontrager**, Natural Resources Inspector, IDNR Entomology and Plant Pathology, 402 West Washington Street, Room W290, Indianapolis, IN 46204.

Consultation on treatment sites and proposed project.

**Vince Burkle**, Natural Resources Inspector, IDNR Entomology and Plant Pathology, 402 West Washington Street, Room W290, Indianapolis, IN 46204.

Consultation on treatment sites and proposed project.

**Tom Coleman**, Entomologist, STS Coordinator (2020), USDA Forest Service, FHP, 200 W. T. Weaver Blvd., Asheville, NC 28802. Consultation on proposed project.

**Susan Cooper**, Field Supervisor, U.S. Fish and Wildlife Service, 620 South Walker Street, Bloomington, IN 47403. Consultation on threatened and endangered species.

**Beth McCord**, Director, IDNR Division of Historic Preservation and Archaeology, 402 West Washington Street, Room W274, Indianapolis, IN 46204. Consultation on historical properties of concern.

**Kristy Stultz**, Natural Resources Inspector, IDNR Entomology and Plant Pathology, 402 West Washington Street, Room W290, Indianapolis, IN 46204.

Consultation on treatment sites and the proposed project.

**Rachel Van Voorhis**, Environmental Coordinator, Environmental Unit, IDNR Division of Fish and Wildlife, 402 West Washington Street, Room W273, Indianapolis, IN 46204.

Consultation with Rachel Van Voorhis and other IDNR staff on Natural Heritage Program data and IDNR concerns within the proposed project.

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USDA. 2012a. Gypsy Moth Management in the United States: A Cooperative Approach. Final Supplemental Environmental Impact Statement, Vols. I – V. USDA-Forest Service and USDA-APHIS. NA-MB-01-12.

USDA. 2012b. Gypsy Moth Management in the United States: A Cooperative Approach. Record of Decision. USDA-Forest Service and USDA-APHIS.

## 8.0 APPENDIX A: ISSUES, QUESTIONS AND CONCERNS FROM PUBLIC INVOLVEMENT

On December 28, 2023 - 122 letter notifications were mailed to public officials and on January 9, 2024 – 9,415 postcard notifications were mailed to residents in the proposed treatment sites informing them of scheduled online public meetings. Legal notices were published in local newspapers informing the public about the upcoming meetings on the proposed treatment sites. An IDNR News Release was sent out on January 29, 2024, with information on the scheduled online public meetings and the public comment period. Information on the public meetings, proposed treatments and the comment period was also posted on the Indiana DNR, Div. of Entomology and Plant Pathology (DEPP) website [on.IN.gov/spongymoth](https://on.IN.gov/spongymoth) and on the [Indiana DNR-DEPP X \(Twitter\) page](#).

The online public meetings were held via Zoom (Example 1A, 1B) and a recorded video of the presentation shown during the meetings is available for viewing at - <https://www.youtube.com/watch?v=hn0jnm89QOw>

Three virtual and one hybrid (joint virtual and in person) public meetings were held for citizens, public officials and interested individuals (Table 1). The proposed action and alternatives, including no action, were discussed. There was a total attendance of 81 citizens at the meetings.

At each of the public meetings, representatives from the Division of Entomology and Plant Pathology presented the proposed spongy moth project and answered and received questions and comments. The presentation explained:

- the life cycle, feeding habits and hosts of spongy moth.
- the identification of spongy moth.
- survey methods.
- spongy moth impacts and damage to the trees and forest.
- selection of proposed sites.
- selection of the treatment options.
- the timing and application of treatments.
- boundaries of the treatment sites with maps.
- the public comment period and decision process.

All public comments received by the public comment deadline of March 1, 2024, were considered in the final decision for the proposed treatments.

Information gathered from the public and from resource professionals was used to develop and review issues and concerns related to the project. They are grouped into two main categories; 1) issues used to formulate the alternatives in the environmental assessment (the four main issues), and 2) other issues and concerns.

The questions and comments received during and after the public meetings were categorized into four main issues:

- Human health and safety.
- Nontarget effects and environmental effects.
- Economic and political impacts.
- Likelihood of success of the proposed project, and the treatment options proposed.

These four issues were used to analyze each of the Alternatives in the Environmental Consequences (Section 4.0) in the Environmental Assessment. Recordings of the public meetings were made and are available in the Administrative File for the project.

After the decision on the proposed treatments is made and if treatments are conducted, residents will be mailed a notification approximately two weeks prior to treatment. DNR News Releases will be sent out to local media with a request to communicate the information to the public. Phone calls will be made to public officials and other interested individuals. Updates regarding the scheduled day of treatment will continue prior to and through treatment days via local media, phone calls, emails, and X (Twitter).

**Example 1A.** Copy of public meeting notification postcard with dates, times, and access information for the online Zoom meetings (front side).





**Example 1B.** Copy of public meeting notification postcard with dates, times, and access information for the online Zoom meetings (back side).

**Attention:** This is **Official Notification** from the  
Indiana Department of Natural Resources.

**To Residents Within or Near a Proposed spongy moth Treatment Site**  
*Virtual and hybrid* public meetings to discuss proposed IDNR spongy moth treatments  
will be held at the following times. Please attend to find out more information.

Date	Time	Location
Monday, Jan. 29	Noon Eastern (11 am Central)	Join us at <a href="http://www.zoomgov.us">www.zoomgov.us</a> Meeting ID: <b>160 815 2451</b> Or join by phone at <b>833-568-8864</b> (US Toll-free)
	6 pm Eastern (5 pm Central)	
Tuesday, Jan. 30	Noon Eastern (11 am Central)	
	6 pm Eastern (5 pm Central)	
<b>IN PERSON</b>		
Tuesday, Jan. 30	6 pm Eastern (5 pm)	North Manchester Library, 405 North Market Street, North Manchester, IN 46962

Meeting links and further information can be found at [on.IN.gov/spongymoth](http://on.IN.gov/spongymoth).  
If you require reasonable accommodation to attend this meeting, please direct your inquiries to  
[DEPP@dnr.IN.gov](mailto:DEPP@dnr.IN.gov) or call toll free 1-866-663-9684.

**Table 1.** Table of Online Public Meetings and Attendance

Date	Time	Attendance
Monday January 29	12 PM EST	14
Monday January 29	6 PM EST	8
Tuesday January 30	12 PM EST	13
Tuesday January 30	6 PM EST	46
	<b>Total</b>	<b>81</b>

## 9.0 APPENDIX B. MAPS OF PROPOSED TREATMENT SITES

Image 1: Table with list of maps of proposed treatment sites

COUNTY	SITE NAME	TREATMENT	MAP TYPE	PAGE
	Statewide - All Sites		Street	35
Adams	Berne Btk 24	Btk x 2	Aerial	36
Wabash	North Manchester Btk 24	Btk x 2	Aerial	37
Huntington/Allen/Whitley	Roanoke MD 24	MD 6 grams	Aerial	38
Starke	Winona MD 24	MD 6 grams	Aerial	39

Image 2: Map showing locations of four proposed treatments in northern Indiana.

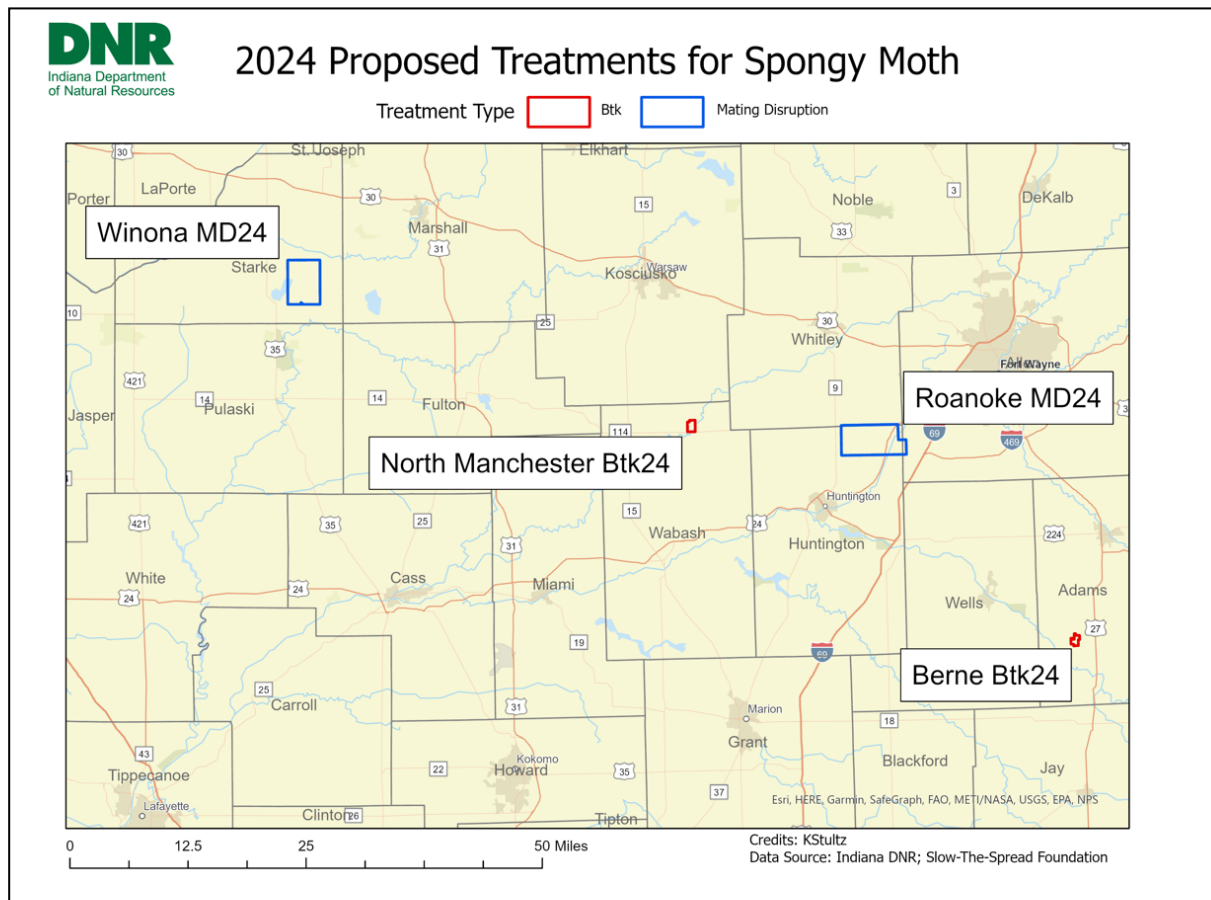


Image 3: Map showing the Berne proposed treatment site in Adams County.

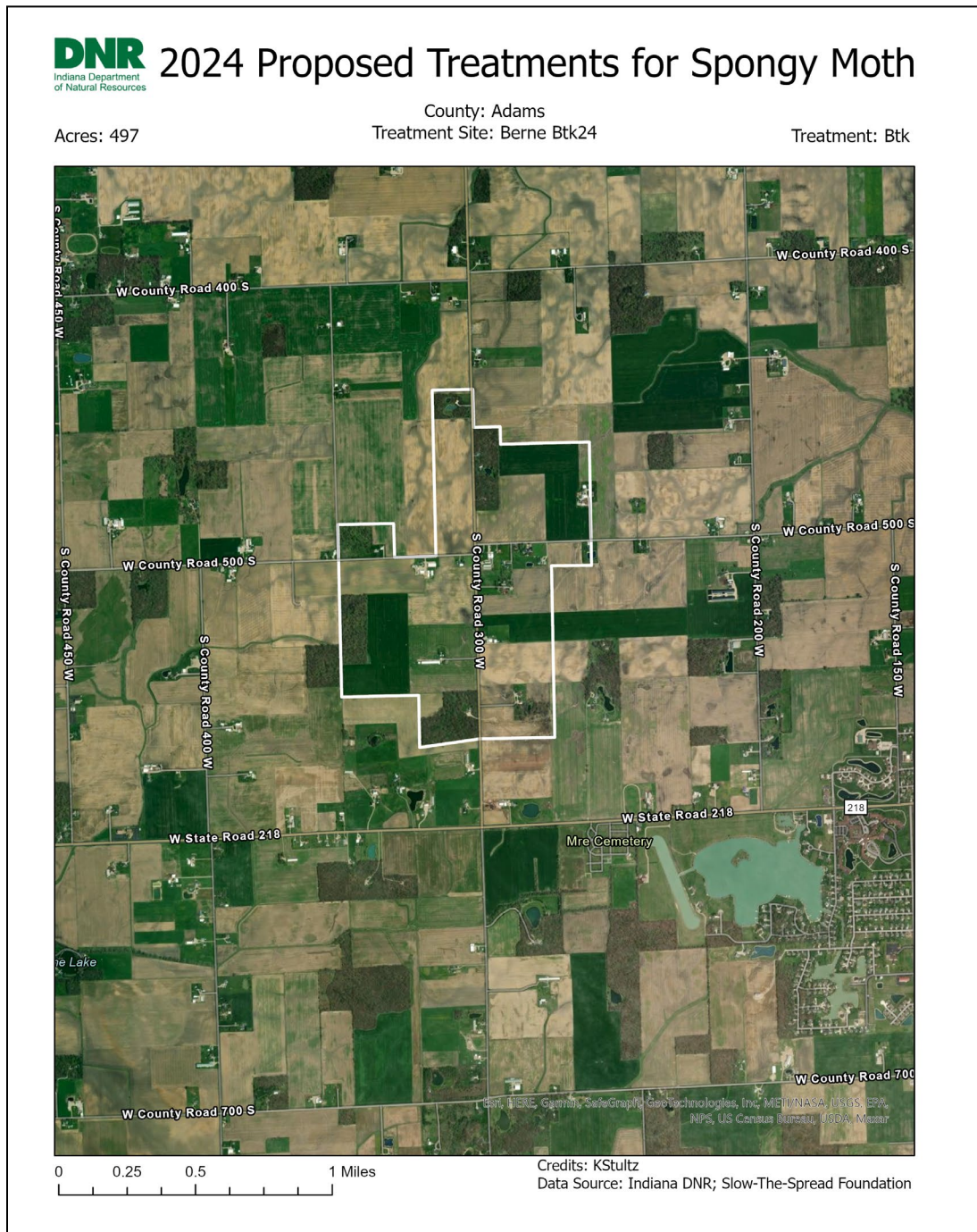


Image 4: Map showing the North Manchester proposed treatment site in Wabash County.



Image 5: Map showing the Roanoke proposed treatment site in Huntington/Allen/Whitley Counties.

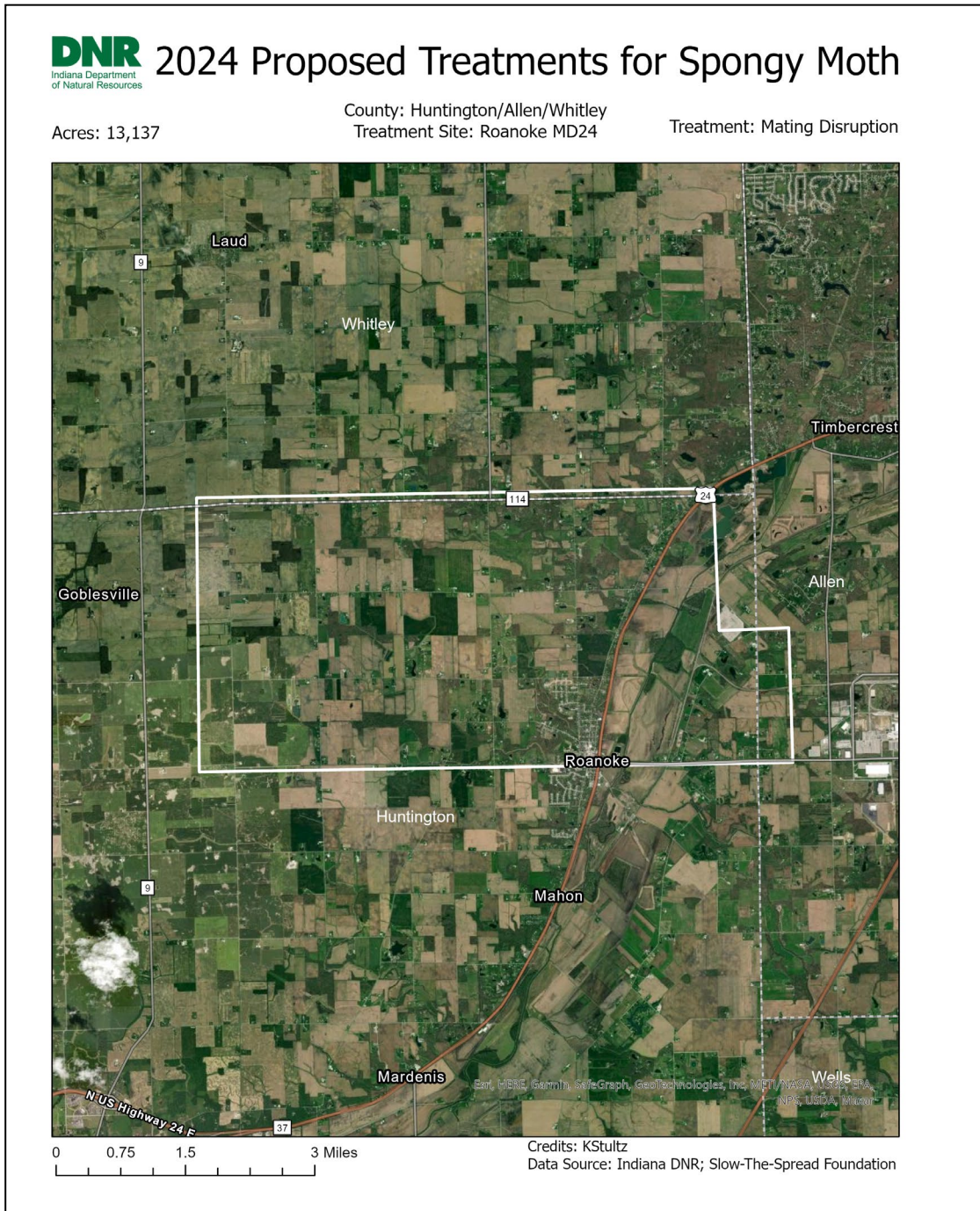
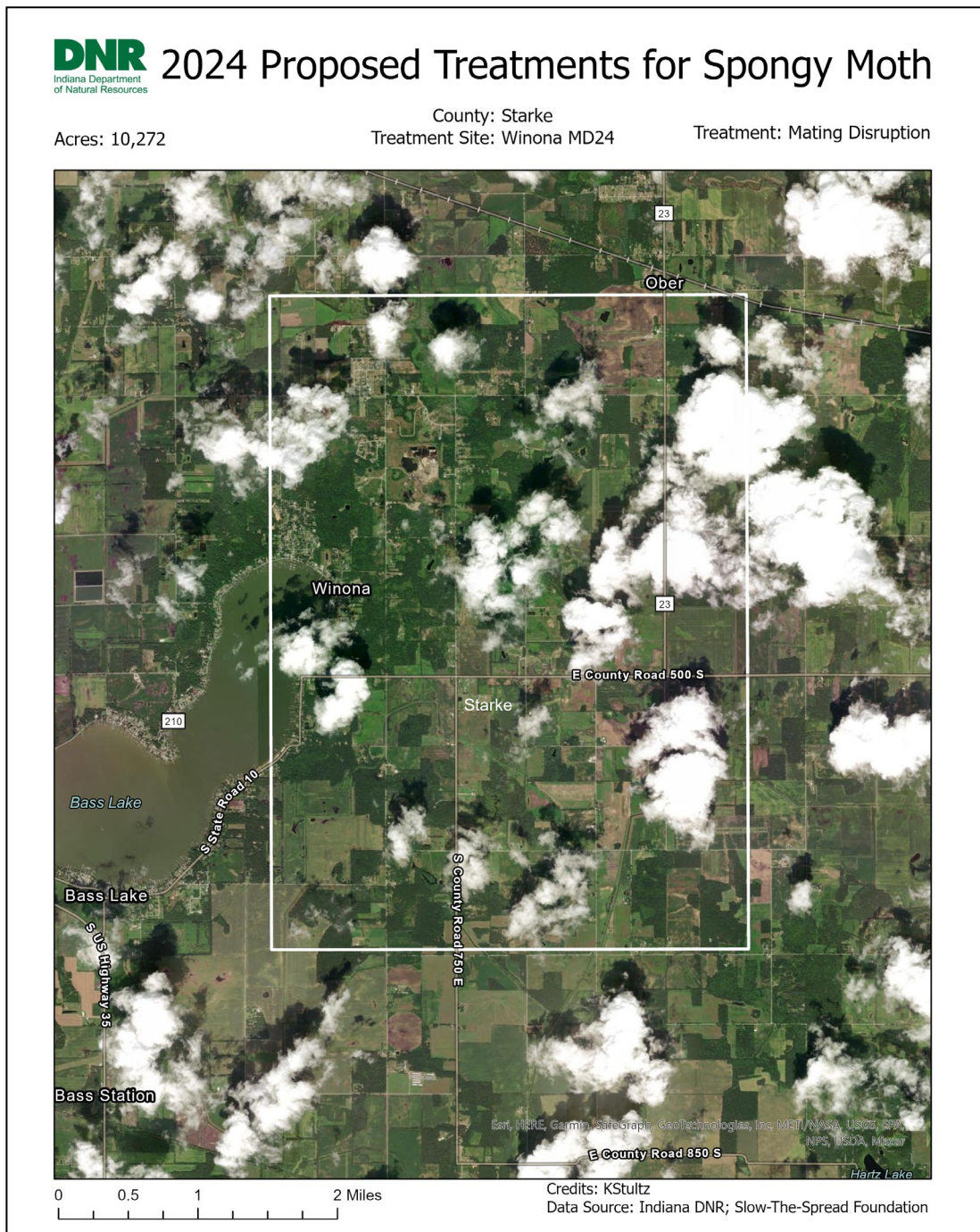


Image 6: Map showing the Winona proposed treatment site in Starke County.



## 10.0 APPENDIX C. AGENCIES AND PERSONS CONSULTED

Image 1: U.S. Fish & Wildlife Service (USFWS) response letter on the environmental review of the 2024 proposed spongy moth treatment sites. Letter continues on Images 2 and 3 below.

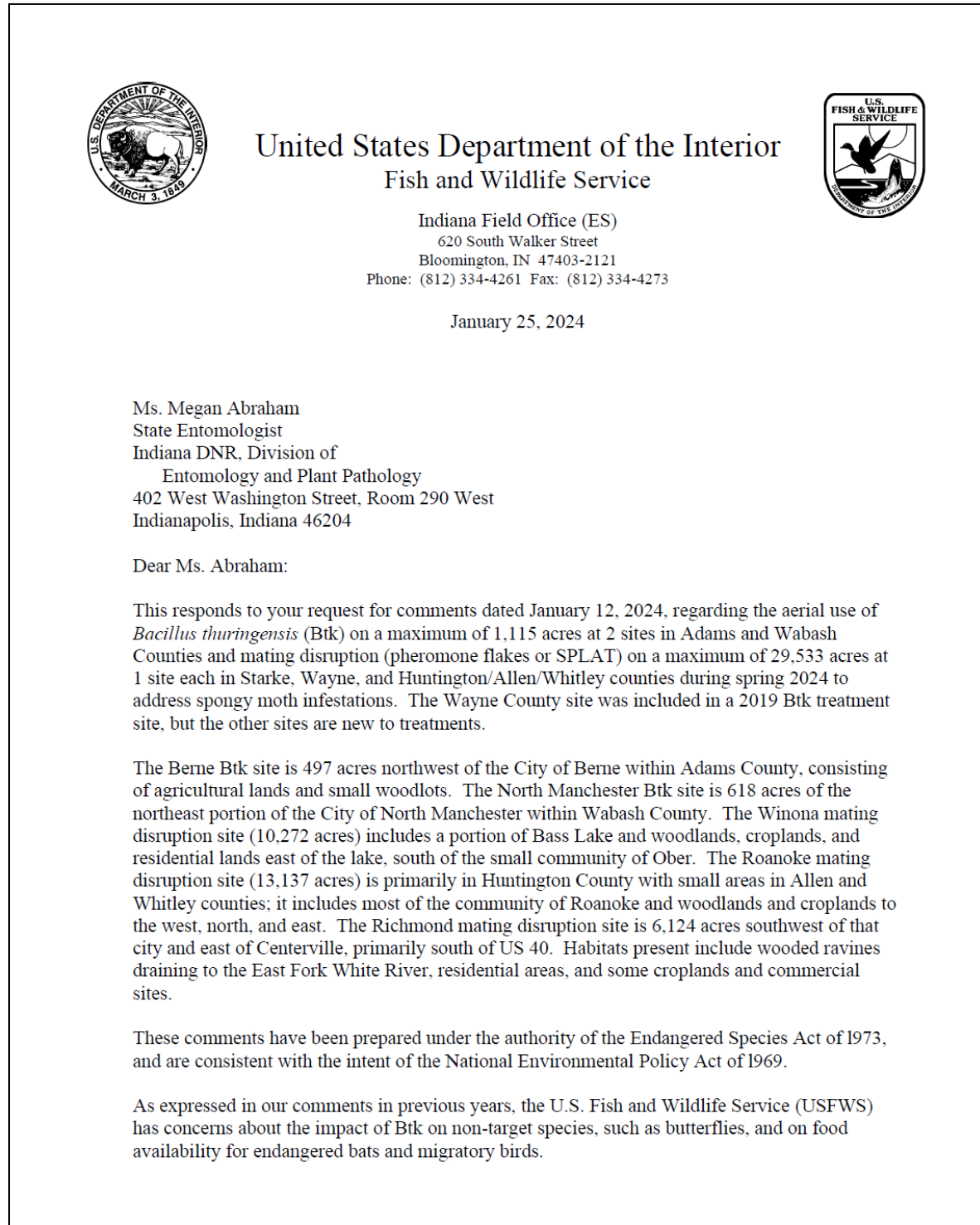


Image 2: Continuation of U.S. Fish & Wildlife Service response letter on the environmental review of the 2024 proposed spongy moth treatment sites. Letter continues on Image 3 below.

#### Endangered Butterflies

Spraying with Btk is of concern for 2 federally endangered species of Lepidoptera in Indiana, the Karner blue butterfly (*Lycaeides melissa samuelis*) and Mitchell's satyr butterfly (*Neonympha mitchellii*). In 2023, the Indiana DNR determined that the Karner blue butterfly has been extirpated within the State of Indiana, but the USFWS has not taken action on this issue. Mitchell's satyr is still considered extant within Indiana at a site in northern LaGrange County. Neither of these species occur within the 2 locations where Btk treatment is proposed. Treatment with mating disruption SPLAT is considered to be highly specific for spongy moths and is not known to have adverse impacts on the federally listed butterflies; however, neither species is present in the sites where SPLAT will be utilized.

On December 15, 2020, the U.S. Fish and Wildlife Service announced that the listing of the monarch butterfly (*Danaus plexippus*) under the Endangered Species Act as either endangered or threatened is warranted but precluded at this time, making the monarch a Candidate species. This species has generally been widespread, including throughout Indiana, until recent years and is likely to be present in varying numbers in all of the proposed spongy moth treatment areas, but most particularly in the more agricultural sites where its larval food consisting of milkweed species (*Asclepias* spp.) are most likely to be found. Spongy moth-specific mating disruption would not impact this species, but Btk treatment could affect feeding larvae if they are present during the spray period. We understand that specific spraying dates, which will occur twice in early to mid-May, are dependent upon observation of spongy moth larval instar stages and weather conditions. Therefore, it appears unlikely that monarch butterfly larvae would be present during the spray periods.

#### Other Endangered Species

The proposed treatment sites are within the range of the federally endangered Indiana bat (*Myotis sodalis*) and northern long-eared bat (*Myotis septentrionalis*) and the proposed endangered tricolored bat (*Perimyotis subflavus*) (all sites), and the threatened rabbitsfoot mussel (*Quadrula cylindrica cylindrica*) (North Manchester site).

Indiana bats hibernate in caves during the winter and then disperse to reproduce and forage during spring and summer in relatively undisturbed forested areas associated with water resources. Young are raised in nursery colony roosts in trees; various numbers of females and their pups roost together. Prior to hibernation Indiana bats feed intensively around forest near hibernacula to build up adequate fat reserves to survive hibernation.

The diet of Indiana bats consists entirely of insects, and based on previous studies they appear to be somewhat opportunistic feeders. Some studies have found lepidopterans as a major dietary component. It is possible that under some circumstances, extensive elimination of lepidopterans over a large habitat area has the potential to adversely affect the food base of an Indiana bat nursery colony.

During the summer, northern long-eared bats (NLEB) typically roost singly or in small colonies in cavities, crevices, or hollows or underneath bark of both live and dead trees and/or snags (typically  $\geq 3$  inches dbh). Males and non-reproductive females may also roost in cooler places,



Image 3: Final page of the U.S. Fish & Wildlife Service response letter on the environmental review of the 2024 proposed spongy moth treatment sites.

Page 3 of 3

like caves and mines. This bat seems opportunistic in selecting roosts, using tree species based on presence of cavities or crevices or presence of peeling bark. It has also been occasionally found roosting in structures like barns and sheds (particularly when suitable tree roosts are unavailable). They forage for insects in upland and lowland woodlots and tree lined corridors. During the winter, NLEBs predominately hibernate in caves and abandoned mine portals.

Tricolored bats hibernate in caves and mines, and in road-associated culverts or tree cavities in warmer southern U.S. states. During spring through fall they primarily roost among living and dead leaf clusters of live or recently dead deciduous hardwood trees, although buildings are occasionally used. During all seasons they most commonly roost singly or in small groups, and females (sometime several together) roost with their young (usually 2) until they are volant. They feed on a variety of insects in similar habitats to those used by Indiana and northern long-eared bats.

The rabbitsfoot mussel is known within the Eel River in the vicinity of the North Manchester treatment site.

The FWS concurs that the federally assisted 2024 spongy moth program is not likely to adversely affect any of these federally listed species. This precludes the need for further consultation on this project as required under Section 7 of the Endangered Species Act of 1973, as amended. If project plans are changed significantly, it will be necessary for the Federal agency to contact our office for further consultation.

If you have any questions regarding this information, please contact Elizabeth McCloskey at the Northern Indiana Suboffice at [elizabeth\\_mccloskey@fws.gov](mailto:elizabeth_mccloskey@fws.gov).

Sincerely yours,

*/s/ Elizabeth S. McCloskey*

Acting for Susan E. Cooper  
Field Supervisor

Sent via email January 25, 2024; no hard copy to follow.

Image 4: Response letter from the Indiana Department of Natural Resources Environmental Review Unit on the 2024 proposed spongy moth treatment sites. Letter continues on Image 5 below.

**THIS IS NOT A PERMIT**

State of Indiana  
DEPARTMENT OF NATURAL RESOURCES  
Division of Fish and Wildlife  
Early Coordination/Environmental Assessment

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**DNR#:** ER-26208

**Request Received:** January 12, 2024

**Requestor:**

Angela Rust  
Indiana Department of Natural Resources  
Division of Entomology and Plant Pathology  
P.O. Box 757  
Tell City, IN 47586

**Project:**

2024 Proposed Spongy Moth Treatment Sites

**County/Site Info:** Adams, Allen, Huntington, Starke, Wabash, Wayne, Whitley Counties

The Indiana Department of Natural Resources has reviewed the above referenced project per your request. Our agency offers the following comments for your information and in accordance with the National Environmental Policy Act of 1969.

If our agency has regulatory jurisdiction over the project, the recommendations contained in this letter may become requirements of any permit issued. If we do not have permitting authority, all recommendations are voluntary.

**Regulatory Assessment:**

This proposal may require the formal approval of our agency pursuant to the Flood Control Act (IC 14-28-1) for any proposal to construct, excavate, or fill in or on the floodway of a stream or other flowing waterbody which has a drainage area greater than one square mile. To determine if a permit will be required, the Indiana Floodplain Information Portal (INFIP) is a mapping application developed by the DNR, Division of Water to generate a Floodplain Analysis and Regulatory Assessment (FARA) that provides floodplain information. The portal is on the Division of Water's webpage at [infip.dnr.in.gov](http://infip.dnr.in.gov).

**Natural Heritage Database:**

The Natural Heritage Program's data have been checked. The Division of Nature Preserves does not anticipate any significant effects to the below-listed flora and communities, which have been documented within .5 mile of the project area:

Winona

Hidden-fruited Bladderwort (*Utricularia geminiscapa*), State endangered  
Sessile-leaved Bugleweed (*Lycopus amplexans*), State endangered  
Shining Ladies'-tresses (*Spiranthes lucida*), State threatened

Richmond

Softleaf Arrow-wood (*Viburnum molle*), State threatened  
Central Till Plain Dry Upland Forest, high-quality natural community  
Central Till Plain Mesic Upland Forest, high-quality natural community  
Bluegrass Mesic Upland Forest, high-quality natural community  
Wetland/Fen, high-quality natural community  
Waterfall and Cascade, geological feature

Image 5: Continuation of response letter from the Indiana Department of Natural Resources Environmental Review Unit on the 2024 proposed spongy moth treatment sites. Letter continues on Image 6 below.

Additionally, the following species of fauna have been documented within .5 mile of the project area:

Roanoke

Clubshell (*Pleurobema clava*), State endangered  
Purple Lilliput (*Toxolasma lividus*), State special concern  
Bald Eagle (*Haliaeetus leucocephalus*)

North Manchester

Greater Redhorse (*Moxostoma valenciennesi*), State endangered  
Rabbitsfoot (*Theiladerma cylindrica*), State endangered  
Northern Riffleshell (*Epioblasma rangiana*), State endangered  
Clubshell (*Pleurobema clava*), State endangered  
Wavyrayed Lampmussel (*Lampsilis fasciola*), State special concern  
Kidneyshell (*Ptychobranchus fasciolaris*), State special concern  
Purple Lilliput (*Toxolasma lividus*), State special concern

Winona

Plains Box Turtle (*Terrapene ornata ornata*), State endangered  
Rusty-patched Bumble Bee (*Bombus affinis*), State endangered

Richmond

Hooded Warbler (*Setophaga citrina*), State special concern  
Clamp-tipped Emerald (*Somatochlora tenebrosa*), State rare

**Fish and Wildlife Comments:**

To minimize impacts to the above-listed mussel species, avoid spraying and direct application of treatment materials over the stream. Specifically, avoid direct application over Eel River and other open waters. If treatment of riparian areas is necessary, avoid application nearby any open waters as much as possible.

The Division of Fish and Wildlife does not anticipate any significant effects to the Plains Box Turtle due to this project.

Since SPLAT is an insect mating disruption treatment and BTK only affects caterpillars, no effects are expected to the Hooded Warbler or other birds. Since these treatments will be aerially applied in an area where birds are below and insulated by the forest canopy in the summer, there should be no significant negative effects on the listed species.

The Bald Eagle is no longer a state species of special concern. However, this species is still federally protected (see <https://fws.gov/law/bald-and-golden-eagle-protection-act>). The documented Bald Eagle nest is more than 660ft from the proposed project, which is the minimum distance needed to reduce disturbance to nesting eagles. No significant negative effects are expected, but precautions may still be considered. To minimize impacts to Bald Eagles, follow the National Bald Eagle Management Guidelines found at [https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines\\_0.pdf](https://www.fws.gov/sites/default/files/documents/national-bald-eagle-management-guidelines_0.pdf). Please contact the US Fish and Wildlife Service if further consultation is needed regarding Bald Eagles.

In all, the devastating effects of uncontrolled spongy moth infestations are well documented. Effects on non-target species are possible and care should be taken near areas that could possibly possess endangered or threatened species, or special concern species. The effects on target species will depend on a variety of factors and are impossible to predict with certainty. However, controlling the spread of spongy moths is important to reduce the negative effects the caterpillars have on trees, particularly oaks.

Image 6: Final page of response letter from the Indiana Department of Natural Resources Environmental Review Unit on the 2024 proposed spongy moth treatment sites.

**Contact Staff:**

Our agency appreciates this opportunity to be of service. Please contact me at [RVanVoorhis@dnr.IN.gov](mailto:RVanVoorhis@dnr.IN.gov) or (317) 232-8163 if we can be of further assistance.

*Rachel Van Voorhis*  
Rachel Van Voorhis  
Environmental Coordinator  
Division of Fish and Wildlife


**Date:** February 6, 2024

Image 7: Response letter from the Indiana Department of Natural Resources, Division of Historic Preservation and Archaeology on the historical and archaeological review of 2024 proposed spongy moth treatment sites.



## 11.0 APPENDIX D. PRODUCT LABELS

Image 1: Manufacturer's product label for the Foray 76B insecticide. Label continues on images 2, 3 and 4.



**For the control of Lepidopterous Larvae**

**ACTIVE INGREDIENT:**  
*Bacillus thuringiensis* subsp. *kurstaki*, strain ABTS-351, fermentation solids, spores, and insecticidal toxins ..... 18.44%  
 Other Ingredients: ..... 81.56%  
 Total: ..... 100.00%

Potency: 16,700 Cabbage Looper Units (CLU)/mg of product (equivalent to 76 billion CLU/GAL.).  
 The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.

EPA Reg. No. 73049-49  
 EPA Est. No. 33762-IA-001

LIST NO. 60176

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**INDEX:**

- 1.0 First Aid
- 2.0 Precautionary Statements
  - 2.1 Hazards to Humans and Domestic Animals
  - 2.2 Personal Protective Equipment (PPE)
  - 2.3 Agricultural Use Requirements
  - 2.4 Non-Agricultural Use Requirements
  - 2.5 User Safety Recommendations
  - 2.6 Environmental Hazards
- 3.0 Directions for Use
- 4.0 Storage and Disposal
- 5.0 Agricultural Use Requirements
- 6.0 Non-Agricultural Use Requirements
- 7.0 Application
- 8.0 Mixing
- 9.0 Spray Volumes
- 10.0 General Agricultural Use Instructions
- 11.0 Table 1
- 12.0 General Non-Agricultural Use Instructions
  - 12.1 Ground Application
  - 12.2 Aerial Application
- 13.0 Table 2
- 14.0 Notice of Warranty

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**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

**1.0 FIRST AID**

<b>If on skin or clothing</b>	<ul style="list-style-type: none"> <li>Take off contaminated clothing.</li> <li>Rinse skin immediately with plenty of water for 15-20 minutes.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>
<b>If in eyes</b>	<ul style="list-style-type: none"> <li>Hold eye open and rinse slowly and gently with water for 15-20 minutes.</li> <li>Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye.</li> <li>Call a poison control center or doctor for treatment advice.</li> </ul>

**HOT LINE NUMBER**

Have the product container with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.

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**2.0 PRECAUTIONARY STATEMENTS**

**2.1 HAZARDS TO HUMANS AND DOMESTIC ANIMALS CAUTION**

Harmful if absorbed through the skin. Causes moderate eye irritation. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling. Remove and wash contaminated clothing before reuse.

**2.2 Personal Protective Equipment (PPE)**

Applicators and other handlers must wear:

- Long-sleeved shirt
- Long pants
- Waterproof gloves
- Shoes plus socks

Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions are available for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.

**2.3 Agricultural Use Requirements**

Mixers/loaders and applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic reactions. When handlers use closed systems, enclosed cabs, or aircraft in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides [40 CFR 170.240(d)(4-6)], the handler PPE requirements may be reduced or modified as specified in the WPS.

**IMPORTANT:** When reduced PPE is worn because a closed system is being used, handlers must provide all PPE specified above for "applicators and other handlers" and have such PPE immediately available for use in an emergency, such as a spill or equipment breakdown.

**2.4 Non-Agricultural Use Requirements**

Mixer/loaders and applicators not in enclosed cabs or aircraft must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

*CONTINUED*

Image 2: Manufacturer's product label for the Foray 76B insecticide. Label continues on images 3 and 4.

<p><b>2.5 User Safety Recommendations</b></p> <p>Users should:</p> <ul style="list-style-type: none"> <li>• Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet.</li> <li>• Remove clothing immediately if pesticide gets inside. Wash thoroughly and put on clean clothing.</li> <li>• Remove PPE immediately after handling the product. Wash outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.</li> </ul>	<p><b>5.0 AGRICULTURAL USE REQUIREMENTS</b></p> <p>Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. This Standard contains requirements for the protection of agricultural workers on farms, forests, nurseries, and greenhouses, and handlers of agricultural pesticides. It contains requirements for training, decontamination, notification, and emergency assistance. It also contains specific instructions and exceptions pertaining to the statements on this label about personal protective equipment (PPE) and restricted-entry interval. The requirements in this box only apply to uses of this product that are covered by the Worker Protection Standard.</p> <p>Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application.</p> <p>Do not enter or allow worker entry into treated areas during the restricted entry interval (REI) of 4 hours.</p> <p>PPE required for early entry to treated areas that is permitted under the Worker Protection Standard and that involves contact with anything that has been treated, such as plants, soil, or water, is:</p> <ul style="list-style-type: none"> <li>• Coveralls</li> <li>• Waterproof gloves</li> <li>• Shoes plus socks</li> </ul>
<p><b>2.6 Environmental Hazards</b></p> <p>For terrestrial agricultural uses, do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters.</p> <p>This product must not be applied aerially within 1/4 mile of any habitats of threatened or endangered lepidoptera. No manual application can be made within 300 feet of any threatened or endangered lepidoptera.</p>	<p><b>6.0 NON-AGRICULTURAL USE REQUIREMENTS</b></p> <p>The requirements in this box apply to uses that are NOT within the scope of the Worker Protection Standard for agricultural pesticides (40 CFR Part 170). The WPS applies when this product is used to produce agricultural plants on farms, forests, nurseries or greenhouses.</p> <p>For ground applications only. Exposure of unprotected persons can be mitigated by direct spraying. Spray should be allowed to dry undisturbed.</p>
<p><b>3.0 DIRECTIONS FOR USE</b></p> <p>It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the State or Tribal agency responsible for pesticide regulation.</p> <p>Do not apply this product through any type of irrigation system.</p>	<p><b>7.0 APPLICATION</b></p> <p>Apply Foray 76B by ground or aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather, spray equipment, and local experience.</p> <p>Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment- and weather-related factors determine the potential for spray drift. The applicator and the grower /treatment coordinator are responsible for considering all of these factors when making decisions.</p>
<p><b>4.0 STORAGE AND DISPOSAL</b></p> <p>Do not contaminate water, food or feed by storage or disposal of waste.</p> <p><b>Pesticide Storage:</b> Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 25° C (77° F).</p> <p><b>Pesticide Disposal:</b> To avoid wastes, use all material in this container by application according to label directions. If wastes cannot be avoided, offer remaining product to a waste disposal facility or pesticide disposal program (often such programs are run by state or local governments or by industry).</p> <p><b>Container Disposal:</b> Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after flow begins to drip. Repeat this procedure two more times. Once cleaned, offer container for recycling, if available. If recycling is not available, puncture and dispose of container in a sanitary landfill or by other procedures approved by state and local authorities.</p>	<p><b>8.0 MIXING</b></p> <p>Shake or stir Foray 76B before use. Fill spray or mixing tank half full of water. Begin agitation and pour Foray 76B into water while maintaining continuous agitation. Add other spray material (if any) and balance of water. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.</p> <p style="text-align: right;"><i>CONTINUED</i></p>

Image 3: Manufacturer's product label for the Foray 76B insecticide. Label continues on image 4.

To improve weather-fastness of the spray deposits for hard to wet crops, such as cole crops, use a spreader-sticker approved for use on growing crops. Combinations with commonly used spray tank adjuvants are generally not deleterious to Foray 76B, if the mix is used promptly. Before mixing in the spray tank, identify possible problems with physical compatibility by mixing all components in a small container in proportionate quantities.

**9.0 SPRAY VOLUMES**

**Ground Application:** Use amount of Foray 76B, as indicated in the tables that follow, in ground equipment with quantities of water sufficient to provide thorough coverage of plant parts to be protected. The amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.

**Aerial Application:** Use amount of Foray 76B, as indicated in the tables that follow, in aerial equipment undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected. In the western U.S., use a normal minimum of 5-10 gallons per acre; in the eastern regions, use a normal minimum of 2-3 gallons per acre. The minimum amount of water needed per acre will depend upon crop size, weather conditions, spray equipment used and local experience.

**10.0 GENERAL AGRICULTURAL USE INSTRUCTIONS**

Foray 76B is a biological insecticide for the control of lepidopterous larvae. It contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 76B must be ingested by the larvae to be effective. For consistent control, apply at first sign of newly hatched larvae (1st and 2nd instar larvae). Susceptible larvae that ingest Foray 76B cease feeding within a few hours and die within 2-5 days.

Foray 76B may be applied up to and on the day of harvest. For maximum effectiveness, follow the instructions listed below:

Monitor fields to detect early infestations.

Apply Foray 76B when eggs start hatching and larvae are small (early instars) and before significant crop damage occurs. Larvae must be actively feeding to be affected.

Repeat applications every 3 to 14 days to maintain control and protect new plant growth. Factors affecting spray interval include rate of plant growth, weather conditions, and reinfestations. Monitor populations of pests and beneficials to determine proper timing of applications.

Under conditions of heavy pest pressures or when large worms are present use the higher rate, shorten the application interval, and/or improve spray coverage to enhance control. When these conditions are present, consider use of a contact insecticide to enhance control. Thorough coverage is essential for optimum performance. Ground applicators equipped with directed drop nozzles can improve coverage.

**11.0 Table 1.**

Crop	Pests	Rate <sup>1</sup> (fl. oz./acre)	
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Ornamental Fruit, Nut & Citrus Trees <sup>2</sup>	Gypsy Moth <sup>2</sup>	13.5 - 67.5	
	Elm Spanworm		
	Spruce Budworm	13.5 - 50.5	
	Browntail Moth		
	Douglas Fir		
	Tussock Moth		
	Coneworm		
	Buck Moth		
	Tussock Moth		10.0 - 27.0
	Pine Butterfly		
	Bagworm		
	Leafroller		
	Tortrix		
	Mimosa Webworm		
	Tent Caterpillar		
Jackpine Budworm			
Blackheaded Budworm			
Saddled Prominent			
Saddleback Caterpillar			
Eastern & Western Hemlock Looper			
Orangestriped Oakworm			
Satin Moth			
	Redhumped	7.0 - 13.5	
	Caterpillar		
	Spring & Fall		
	Cankerworm		
	California Oakworm		
	Fall Webworm		

**Special Instructions**

<sup>1</sup>Use the higher recommended rates on advanced larval stages or under high density larval populations.

<sup>2</sup>In treating gypsy moth infested trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

This product can be mixed and used with other pesticides only in accordance with the most restrictive of label limitations and precautions. This product cannot be mixed with any product containing a label prohibition against such mixing. No label dosage rates may be exceeded.

**12.0 GENERAL NON-AGRICULTURAL USE INSTRUCTIONS**

Not for use on plants being grown for sale or other commercial use, or for commercial seed production, or for research purposes. For use on plants intended for aesthetic purposes or climatic modification and being grown in interior landscapes, ornamental gardens or parks, or on golf courses or lawns and grounds.

Not for use on trees being grown for sale or other commercial use, or for commercial seed production, or for the production of timber or wood products, or for research purposes except for wide-area public pest control programs sponsored by government entities, such as mosquito abatement, gypsy moth control, and Mediterranean fruit fly eradication.

Do not apply this product through any type of irrigation system.

Foray 76B contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 76B is a stomach poison and is effective against lepidopterous larvae. After ingestion, larvae stop feeding within hours and die 2-5 days later. Maximum activity is exhibited against early instar larvae. Apply Foray 76B by ground or aerial equipment.

CONTINUED



Image 4: Final page of the manufacturer's product label for the Foray 76B insecticide.

Shake or stir Foray 76B before use. Add some water to the mix tank, pour the specified amount of Foray 76B into the tank, and then add the remaining amount of water to obtain the proper mix ratio. Agitate as necessary to maintain the suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.

**12.1 Ground Application**

Use an adequate amount of tank mix to obtain thorough coverage without excessive run off. Use the indicated recommended per acre rates of Foray 76B in up to the following amounts of water:

High volume hydraulic sprayers	100 gallons
Mist blowers	10 gallons

**12.2 Aerial Application**

Apply Foray 76B, either alone or diluted with water, aerially at the rates shown in the application rates table. Spray volumes of 28-67.5 fluid ounces of product per acre give optimum coverage.

**13.0 Table 2.**

Crop	Pests	Rate <sup>1</sup> (fl. oz./acre)	
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Ornamental Fruit, Nut & Citrus Trees <sup>2</sup>	Gypsy Moth <sup>2</sup>	13.5 - 67.5	
	Elm Spanworm		
	Spruce Budworm	13.5 - 50.5	
	Browntail Moth		
	Douglas Fir Tussock Moth		
		Coneworm	10.0 - 27.0
		Buck Moth	
		Tussock Moth	
		Pine Butterfly	
		Bagworm	
		Leafroller	
		Tortrix	
		Mimosa Webworm	
		Tent Caterpillar	
		Jackpine Budworm	
Blackheaded Budworm			
Saddled Prominent			
Saddleback Caterpillar			
Eastern & Western Hemlock Looper			
Orangestriped Oakworm			
Satin Moth			
	Redhumped Caterpillar	7.0 - 13.5	
	Spring & Fall Cankerworm		
	California Oakworm		
	Fall Webworm		

**Special Instructions**

<sup>1</sup>Use the higher recommended rates on advanced larval stages or under high density larval populations.

<sup>2</sup>In treating gypsy moth infested trees and shrubs in urban, rural, and semi-rural areas, exposure of non-target vegetation including, but not limited to, native and ornamental species and food or feed crops is permitted.

**14.0 NOTICE OF WARRANTY**


To the extent consistent with applicable law, seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning the use of this product other than as indicated on the label. User assumes all risk of use, storage or handling not in strict accordance with accompanying directions.

*Foray* is a registered trademark of Valent BioSciences Corporation.



04-7294/R6 ©Valent BioSciences Corporation, July 2012

Image 5: Manufacturer's product label for SPLAT GM Organic mating disruption. Label continues on image 6.




**GM-O**<sup>TM</sup>

For Mating Disruption of  
*Lymantria dispar*, gypsy moth

**SPLAT (Specialized Pheromone & Lure Application Technology) is an amorphous polymer matrix for the sustained release of insect pheromones. SPLAT GM-O provides control by disrupting mating behavior.**

For Organic Production



**ACTIVE INGREDIENT:**  
Disparlure 13.00%  
(Z)-7,8-Epoxy-2-methylloctadecane: 87.00%  
**OTHER INGREDIENTS:**  
**TOTAL:** 100.00%

Net Contents: \_\_\_\_\_ Lbs \_\_\_\_\_ Kg  
Batch Number: \_\_\_\_\_

EPA Reg. No. 80286-12  
EPA Est. No. 80286-CA-004

**KEEP OUT OF REACH OF CHILDREN  
CAUTION**

Image 6: Final page of the manufacturer's product label for SPLAT GM Organic mating disruption.

<p><b>PRECAUTIONARY STATEMENTS</b></p> <p><b>HAZARDS TO HUMANS AND DOMESTIC ANIMALS. CAUTION:</b> Causes moderate eye irritation. Harmful if swallowed or absorbed through skin. Avoid contact with skin, eyes, or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco, or using the label. Remove contaminated clothing and wash before use.</p> <p><b>PERSONAL PROTECTIVE EQUIPMENT (PPE):</b> Applicators and other handlers must wear long-sleeved shirt and long pants, waterproof gloves, and shoes plus socks. Follow the manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry.</p> <p><b>ENVIRONMENTAL HAZARDS:</b> For terrestrial uses: Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark. Incidental applications to water under the following conditions are prohibited: 1) applications to streams, rivers, or other flowing waters; 2) direct applications to lakes, ponds, or reservoirs; 3) applications to marshes, wetlands, or other aquatic habitats; 4) applications to estuaries and coastal waters; 5) applications to coral reefs or mangroves; 6) applications to glaciers, ice sheets, or other permanent snows or ice; 7) applications to vernal pools, ponds, or other seasonal pools; 8) applications to any other aquatic habitat unless the manufacturer has provided specific directions for such use. Do not contaminate water when cleaning equipment or disposing of equipment washwaters or rinsate.</p> <p><b>DIRECTIONS FOR USE</b></p> <p>It is a violation of Federal Law to use this product in a manner inconsistent with its labeling. Always consult your pest control advisor, distributor or ISCA Technologies, Inc. for advice regarding the use of SPLAT GM-O.</p>	
<p><b>GENERAL</b></p> <p>SPLAT GM-O uses the pheromone of the gypsy moth (<i>Lymantria dispar</i>), to disrupt adult mating and thus reduce larval damage to trees.</p>	<p><b>TARGET PEST</b></p> <p>Gypsy moth.</p>
<p><b>AREA/WIDE CONTROL</b></p> <p>This product is only for use in wide-area gypsy moth control programs sponsored by government entities. Areas of application include, but are not limited to: forests, residential, municipal, and shade tree areas; recreational areas such as campgrounds, golf courses, parks, and parkways; ornamental and shade trees, shelterbelts, rights-of-way, and other easements. Area-wide or wide-area application of SPLAT GM-O is most effective. The efficacy of any mating disruption strategy will be reduced by the influx of adults from surrounding areas. It is for this reason that mating disruption works increasingly well with larger acreages, where the ratio of exposed borders to overall area treated is reduced. Always make application of SPLAT GM-O in consultation with your pest control advisor, distributor, or ISCA Technologies, Inc.</p> <p><b>Mode of Action:</b> Mating disruption. However, an exemption from the requirement of a tolerance is established for residues of (2S)-8-methoxy-2-methyltetrahydro-2H-pyridine on all food and feed crops that occur when it is used to treat trees, shrubs, and pastures and such use results in unintentional spray and drift to non-target vegetation including non-food, food, and feed crops.</p>	<p><b>RESTRICTIONS</b></p> <p>Do not apply to areas where the presence of male moths, their emergence and their movement, is being monitored through the use of pheromone traps. Do not apply to areas where the presence of male moths, their emergence and their movement, is being monitored through the use of pheromone traps. Do not apply to areas where the presence of male moths, their emergence and their movement, is being monitored through the use of pheromone traps.</p>
<p><b>MONITORING</b></p> <p>Monitor for pests on a regular basis so that timely intervention with insecticides or alternative controls are possible. Use gypsy moth pheromone baited monitoring traps made by ISCA Technologies or other suitable traps to monitor the presence of male moths, their emergence and their movement. Place monitoring traps before applying SPLAT GM-O to evaluate efficacy and longevity of the pheromone application. Monitor treated plots for the presence of gypsy moth and other pest species. Monitor pest population densities at the above economic threshold levels.</p>	<p><b>WARRANTY AND LIMITATION OF DAMAGES</b></p> <p>Read all directions carefully. All statements concerning the use of this product apply only when used as directed. ISCA Technologies warrants that this material conforms to the specifications on the label and is reasonably fit for the intended purpose referred to on the label. To the extent consistent with applicable law, ISCA Technologies makes no other express or implied warranty of merchantability or fitness for a particular purpose or any other express or implied warranty.</p> <p>ISCA Technologies, Inc., 1230 Spring St., Riverside, CA 92507 951-685-5008 www.iscatech.com</p>
<p><b>APPLICATION TIMING</b></p> <p>Apply SPLAT GM-O anytime in the two weeks preceding male flight and adult activity. Additional applications may be made if populations exceed the economic threshold. Consult your pest control advisor, distributor, or ISCA Technologies, Inc. for proper application timing.</p>	<p><b>PESTICIDE STORAGE</b></p> <p>Do not contaminate water, food or feed by storage and disposal. Store product sealed and refrigerated, if possible. If refrigerated, do not store with food. If refrigeration is not available, store product in a cool dry place, out of direct sunlight. Do not exceed 75°F for long-term storage. Avoid freezing. In case of leak or spill, wipe with paper towels and dispose of wastes as directed in this label.</p>
<p><b>APPLICATION CONDITIONS</b></p> <p>Apply SPLAT GM-O when the ambient air temperature is above 50°F. SPLAT GM-O will cure within 3-4 hours following application, after which it will become rain fast and UV resistant. Do not apply if rain is expected within 1-2 hours of application or the temperature is outside of this range.</p>	<p><b>PESTICIDE DISPOSAL</b></p> <p>Wastes resulting from the use of this product may be disposed of on site or at an approved waste facility.</p> <p>Nonrefillable container: Do not refill or reuse this container. Triple rinse (or equivalent) promptly after emptying. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities by burning, if burned, stay out of smoke.</p>
<p><b>APPLICATION RATE</b></p> <p>The application rate of SPLAT GM-O ranges from 23 grams to 230 grams of undiluted product per acre. This is equivalent to 3 grams to 30 grams of pheromone per acre (1400 to 14000 grains of 40 per acre). Do not exceed 150 grams of 40 per acre for multiple applications.</p>	<p><b>CONTAINER DISPOSAL</b></p> <p>Nonrefillable container: Do not refill or reuse this container. Triple rinse (or equivalent) promptly after emptying. Then offer for recycling if available, or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities by burning, if burned, stay out of smoke.</p>
<p><b>PREPARATION FOR USE</b></p> <p>Always check SPLAT GM-O 24 hours before using. If SPLAT GM-O has been stored in a refrigerated area and has hardened, allow at least 48 hours at room temperature to achieve a workable consistency. Always mix SPLAT GM-O thoroughly before use: a drill with a paint mixing paddle or similar device works best. Avoid mechanical mixing with sharp blades, which come into contact with the plastic container as this can introduce shards of plastic into the SPLAT GM-O formulation, which might interfere with product flowability and application.</p>	<p><b>CLEANING EQUIPMENT</b></p> <p>Clean equipment with water and citrus or fluorocarbon detergents.</p>
<p><b>APPLICATION EQUIPMENT</b></p> <p>SPLAT GM-O is applied either aerially or by ground with conventional application systems pressurized either by centrifugal pumps or positive displacement pumps, pressurized gas</p>	<p><b>POINT SOURCE PLACEMENT AND SPACING</b></p> <p>For ground applications, SPLAT GM-O droplet size can be varied depending on pest population and duration of control desired. A dense installation will require a higher density of point sources to achieve optimal mating disruption. With aerial applications, there is less control over the weather. In these cases there will be a range from approximately 300 to 2000 droplets per acre. When using SPLAT GM-O, the range in droplet size will usually be 300 to 1000 microns. This will provide area-wide, season-long management of low-density populations. To ensure proper application, please consult your pest control advisor, distributor, or ISCA Technologies, Inc.</p>