ENVIRONMENTAL ASSESSMENT

Cooperative STS Gypsy Moth Project
For Indiana - 2016

By

Indiana Department of Natural Resources
Division of Entomology & Plant Pathology

Indiana Department of Natural Resources
Division of Forestry

United States Department of Agriculture
Forest Service

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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 and Division of Forestry, proposes a cooperative project with the United States Department of Agriculture (USDA), Forest Service (USFS) to treat the gypsy moth populations at eight sites in seven counties that cover an estimated 28,667 acres (Table 1 below and maps in Appendix B). The preferred alternative for the cooperative project is Alternative 4: Btk and/or mating disruption.

Table 1. Number of Treatment Sites and Acres by County and Treatment Method for 2016.

COUNTY	TREATMENT SITES By Treatment Method		TREATMENT ACRES By Treatment Method	
	Mating Disruption	Btk Aerial	Mating Disruption	Btk Aerial
*Kosciusko	1	1	2,745	1,054
Laporte	0	1	0	1,716
St. Joseph	0	1	0	670
Whitley	0	1	0	799
Fulton/Marshall	1	0	10,262	0
Marshall	1	0	3,765	0
Marshall/Starke	1	0	7,656	0
Proposed Cooperative Project by Treatment	4	4	24,428	4,239
Total Cooperative Project	8		28,667	

*****There is a proposed state funded ground treatment at the Atwood Site in Kosciusko County with a proposed project area of seven trees.

1.2 Project Objective

The objective of this cooperative project is to slow the spread of the gypsy moth populations by eliminating reproducing populations from the proposed treatment sites. Over the past four years in Indiana, this objective has been successfully met, while implementing the Slow the Spread Program (STS) [see Gypsy Moth Slow the Spread Foundation, Inc., http://www.gmsts.org].

1.3 Need for Action

Gypsy moth (*Lymantria dispar*) 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 gypsy 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 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 gypsy moth and to enforcing interstate and intrastate quarantines to further protect areas not currently infested by this pest. If no action is taken, gypsy moth will increase and spread 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 (Appendix A).

1.4 Decisions to be Made and Responsible Officials

The preferred alternative in this document proposes cooperative participation of the IDNR and the USFS in treatment of gypsy moth populations in Indiana. The decision to be made by the responsible IDNR official is to choose which of the alternatives presented in this document best meets the objective of the proposed action, and thus the needs of the people of Indiana. In addition, the decision will have to be made as to whether or not any perceived significant environmental impacts could result from the implementation of this project. If there are none, the USFS will document this determination in a Decision Notice and FONSI (Finding of No Significant Impact). If significant environmental impacts are found and the project is to continue, an Environmental Impact Statement (EIS) would be prepared.

The alternatives analyzed for this environmental assessment are:
1) No cooperative project (No action),
2) Btk,
3) Mating disruption,
4) Btk and/or mating disruption (Preferred Alternative)

The responsible USFS official who will make this decision is

L. Carleen Yocum, Field Representative, USDA, Forest Service, State and Private Forestry, Northeastern Area, 1992 Folwell Avenue, St. Paul, MN 55108, (651) 649-5276.

The responsible officials for the implementation of the cooperative project are

Philip Marshall, State Entomologist, Indiana Department of Natural Resources, Division of Entomology and Plant Pathology, 402 West Washington Street, IGC South, Room W290, Indianapolis, IN 46204, (317) 232-4120.

John Seifert, State Forester, Indiana Department of Natural Resources, Division of Forestry, 402 West Washington Street, IGC South, Room W296, Indianapolis, IN 46204, (317) 232-4105.

1.5 Scope of the Analysis

Since 1996 the USDA has carried out its gypsy moth management responsibilities through the USFS 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 USFS in November 2012. It maintains the three strategies of suppression, eradication and slow-the-spread. These strategies depend upon the infestation status of the area: generally infested, non-infested, and transition. The counties involved in this environmental assessment (EA) are all within areas considered non-infested or transition.

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 gypsy 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 the 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.

Between January 8 and 22 , 2016 approximately 3,863 postcard notifications were sent to residents in the proposed treatment sites. On January 11, 2016 approximately 101 letters were sent to public officials informing them of the public meetings. Legal notices were published in local newspapers informing the public about the upcoming meetings on the proposed treatment sites. IDNR News Releases were sent out on February 1 and 15, 2016 with information on the scheduled public meetings and the public comment period. Information on the public meetings, proposed treatments and comment period was also posted on the Division website at gypsymoth.IN.gov

Eight public meetings were held for citizens, public officials and interested individuals. At each meeting, state officials presented alternatives for gypsy moth management. The discussion included identification and biology of gypsy moth, pest impacts, survey methods, and treatment

options. The proposed action and alternatives, including no action, were discussed. There was a total attendance of 42 citizens at the meetings (Appendix A).

After the decision on the proposed treatment is made and if treatment is conducted, residents will be mailed a notification approximately two weeks prior to treatment. IDNR 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 and other interested individuals. Updates regarding the scheduled day of treatment will continue prior to and through treatments via local media, phone calls, emails and Twitter.

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

1.7 Issues Used to Formulate the Alternatives

Each of the major issues is introduced in this section. Discussion pertaining directly to each issue as it relates to the alternatives can be found in Chapter 4.

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 gypsy moth infestations on people.

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

Issue 3 - Economic and Political Impacts of Treatment vs. Non-Treatment. Gypsy 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 gypsy 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 gypsy moth populations by eliminating 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 gypsy moth impacts to Indiana and neighboring states.

1.8 Other Issues and Concerns

Concerns and questions were discussed during the public meetings (see Appendix A). Also, other agencies were consulted (see Appendix C). Information from these sources was used to develop management guidelines, treatment constraints, and mitigating measures.

1.9 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 gypsy moth infestations is given in the Plant Protection Act of 2000 (7 U.S.C. section 7701 et.seq.).

The Cooperative Forestry Assistance Act of 1978 provides the authority for the USDA and state cooperation in management of forest insects and diseases. The law recognizes that the nation's capacity to produce renewable forest resources is significantly dependent on non-federal forestland. The 2014 Farm Bill (P.L. 113-79) 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 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 Gypsy Moth Policy (USDA 1990) assigns the USFS and APHIS responsibility to assist states in protecting non-federal lands from gypsy moth damage.

Executive Order #12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations states that a federal agency should consider 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

2.1 Process Used to Formulate the Alternatives

The ROD for the SEIS (USDA 2012b, ROD), to which this document is tiered, maintains the three strategies for gypsy moth management (eradication, slow-the-spread, and suppression) that were allowed in the EIS (USDA 1995) and the ROD (USDA 1996). Therefore, the USFS and APHIS can assist in funding and carrying out eradication, suppression, and slow-the-spread projects. The ROD for the SEIS adds the insecticide tefubenozide 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) tebufenozide.

Staff entomologists and administration within the IDNR, Division of Entomology and Plant Pathology and the Division of Forestry in cooperation with the USFS, formulated several alternatives to treat the gypsy moth populations in Indiana under eradication and slow-the-spread strategies (See Chapter 6, Persons and Agencies Consulted).

2.2 Alternatives Eliminated from Detailed Study

The following alternatives that are available 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. Btk is a less broad spectrum treatment option and can meet the project objective, and lessen 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 gypsy 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 the cost and limited availability 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 gypsy moth infestations of 100 acres or less (USDA 2012a, Vol. II, App. A, p. 5), and generally uses nine or more traps per acre. This approach is very labor intensive, especially over large areas. Mass trapping has proven capable of eliminating or reducing gypsy moth at very low population levels in small sites. The use of mass trapping can meet the project objective of eradicating gypsy 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 gypsy moth populations. There are obstacles using this alternative - the limited release period; need to synchronize production of mass quantities of sterile pupae; and the logistical difficulties of repeated release over a 4-week period (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. If no action is taken, the gypsy moth will reproduce and populations will begin to defoliate trees in the area. Gypsy moth populations will develop and spread to surrounding areas. This is not a preferred alternative because damage and regulatory action will occur sooner than if other alternatives are selected.

Alternative 2 - Btk. This treatment option uses one or two applications of Btk at 24 to 38 billion international units (BIU) 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. The second application would follow no sooner than four days after the first application. Most commercial formulations of Btk are aqueous flowable suspension containing 48 or 76 BIU per gallon (Appendix D – Product Labels). For aerial application at 24 to 38 BIU, less than 3.0 quarts (3/4 gallon) of the product would be applied per acre.

Btk has been a commonly used treatment option in Cooperative Gypsy 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 gypsy 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 may impact nontarget species of spring-feeding caterpillars in the treatment site, but the impact to the local population is usually very 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). Human exposure to Btk provides little cause for concern, though direct exposure to the spray may cause temporary eye and respiratory tract irritation in a few people (USDA 2012a, Vol. II, Ch. 4, pp. 10 to 12).

Btk has proven effective at eliminating or reducing gypsy moth at all levels of population. Thus, Btk applications can meet the project objective of slowing the spread of gypsy moth at the proposed treatment sites.

Alternative 3 - Mating disruption. This treatment option uses one aerial application of either pheromone flakes or SPLAT (Specialized Pheromone and Lure Application Technology) GM with the active ingredient (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 gypsy 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 is considered specific to gypsy moth and is not known to cause impacts to nontarget organisms (USDA 2012a, Vol. II, Ch. 4, pp. 19 to 20). 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).

Mating disruption using pheromone flakes involves the aerial application of plastic flake dispensers that are infused with the gypsy moth pheromone. The formulation of Disrupt II (see Appendix D – Product Labels) consists of small plastic flakes, approximately 1/32 inch x 3/32 inch (1 x 3 mm) in size, thus the name "pheromone flakes". A sticker, Micro-Tac, produced by Hercon is applied to the flakes as they are dispersed from the aircraft, which aids in the distribution of the flakes throughout all levels in the forest canopy where mating could potentially occur. The flakes are green in color and applied at a rate of 6 or 15 grams active ingredient (disparlure) per acre. At the high rate of 15 grams, 85 grams of flakes (2 flakes per square foot) are applied with 2 fluid ounces of sticker per acre. All of the ingredients in the Micro-Tac sticker are considered non-hazardous to public health when used as an additive in the insecticide formulation (40 CFR 180.1001).

Mating disruption using SPLAT GM involves the aerial application of amorphous polymer matrix droplets that are infused with the gypsy 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. The droplets are a grayish white in color and applied at a rate of 3 grams 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. All of the matrix ingredients are cleared as food safe by the FDA and are biodegradable.

Mating disruption has proven effective at eliminating or reducing gypsy moth at very low population levels for sites greater than 40 acres, and can meet the project objective of slowing the spread of gypsy moth at the proposed treatment sites.

Alternative 4 – Btk and/or Mating disruption (Preferred Alternative). The use of this alternative provides flexibility to select Btk or mating disruption alone or in combination for each site based on gypsy moth population level, and nontarget organisms. Mating disruption is generally used at very low populations, as determined from the STS decision algorithm (yt.ento.vt.edu/da/). Btk is generally used at low populations also determined from the STS decision algorithm and if egg masses have been found in a proposed treatment site. Professionals from the IDNR and USFS STS program review the information from each treatment site and make a decision to treat with mating disruption or Btk. The use of this alternative can meet the objective of slowing the spread of gypsy moth at the proposed treatment sites.

2.4 Comparative Summary of Alternatives

Table 2. Summary of Environmental Consequences for Alternatives by Issues from Chapter 4.

	Issue 1 Human Health & Safety (pgs. 15-16)	**Issue 2** Effects on Nontarget Organisms & Environmental Quality (pgs. 16-18)	**Issue 3** Economic and Political Impacts (pgs. 18-19)	**Issue 4** Likelihood of Success of the Project (page 19)
Alternative 1 No action	- No risk of an aircraft accident or spill. - No risk of Btk contact with humans. - Gypsy moth outbreaks will occur sooner along with the associated nuisance and health impacts to humans.	- No direct effect to nontarget organisms, including threatened and endangered species. - Future gypsy moth impacts will occur sooner, which includes defoliation and reduction in the oak component of forest stands.	- Regulatory action would occur sooner. - Spread of gypsy moth through these counties and into adjacent counties would not be slowed. - Suppression projects and negative financial impacts from defoliation would occur sooner.	- The spread of gypsy moth would not be slowed at the treatment sites and the project objective would not be met.
Alternative 2 Btk	- Slight risk of aircraft accident and pesticide spill. - Contact with Btk may cause mild and temporary irritation (eye, skin & respiratory) to a few people. - Delay effect of gypsy moth outbreaks on humans.	- Direct impact on spring feeding caterpillars, temporary reduction in local populations. - No effect on Karner blue butterfly and Mitchell's satyr as neither species is known to occur within the proposed Btk sites. - Not likely to adversely affect Indiana bat or monarch butterfly. - Delay the impact of gypsy moth defoliation on environmental quality.	- Regulatory action would not be implemented in these counties during the current year. - Slows the spread of gypsy moth.	- Success is likely in the treatment sites.
Alternative 3 Mating disruption	- Slight risk of aircraft accident. - No effect to human health. - Delay effect of gypsy moth outbreaks on humans.	- No effect to nontarget organisms, including any threatened and endangered species known to occur within the sites. - Delay the impact of gypsy moth defoliation on environmental quality.	- Regulatory action would not be implemented in these counties during the current year. - Slows the spread of gypsy moth.	- Success is likely in treatment sites with very low populations.
Alternative 4 Btk and/or Mating disruption	- Same as alternative 2 or 3 depending on the treatment at each site.	- Same as alternative 2 or 3 depending on the treatment at each site.	- Regulatory action would not be implemented in these counties during the current year. - Slows the spread of gypsy moth.	- Success is likely in the treatment sites.

3.0 AFFECTED ENVIRONMENT

3.1 Description of the Proposed Treatment Sites

Fulton/Marshall Counties: Fulton and Marshall Counties are approximately 525,439 acres and 10,262 acres are in the proposed treatment site. Thus a small portion of these counties is proposed for treatment. Only the forested areas will be treated, which is estimated to be 45% of the area in this site.

> **Argos 2016:** The proposed treatment site contains 10,262 acres. The site is composed of trees associated with rural residences and woodlots. Maple, ash, white oak, red oak, walnut, redbud, sycamore, birch, pine, spruce, fir, and other hardwood trees and shrubs are present. Houses and businesses occur within the site. County Line Landfill and Geneva Center (a church camp) occur within the site. The Town of Tiosa occurs within the site. Several ditches, creeks, and associated wetlands occur within the site. No schools occur within the site. A power line crosses the site from northwest to southeast. Seven cell phone and radio towers occur inside and outside the site along the west edge. The site was detected in 2015 and has had no prior treatment. No egg masses were detected in this site in 2015. Survey indicates a very low gypsy moth population, and mating disruption is proposed for this site.

Kosciusko County: This county is approximately 354,810 acres and 3,799 acres are in the proposed treatment sites. Thus a small portion of the county is proposed for treatment. Only the forested areas will be treated, which is estimated to be 30% of the area in these sites.

> **Atwood 2016:** The proposed treatment site contains 2,745 acres. The site is composed of trees associated with rural residences and woodlots. White oak, maple, ash, red oak, sycamore, river birch, walnut, and other hardwood trees and shrubs are present. Houses occur within the site. Hoffman Lake and the surrounding drainage basin occurs in the center of the site and a small lake occurs in the southeast corner of the site. The Town of Atwood occurs within the site. No schools occur within the site. There is a power line that crosses the northern part of the site from northwest to southeast as well as a cell tower in the southern part near US 30. This site was detected in 2015 and has had no prior treatment. Moth catch survey at this site indicated a very low population, and mating disruption is proposed for this site. Additional ground survey detected over 100 egg masses within seven trees at this site. Therefore, a state funded ground treatment with insecticide is proposed for the seven trees to eliminate the core population. The specific insecticide treatment has not yet been determined.

> **Pierceton 2016:** The proposed treatment site contains 1,054 acres. The site is composed of trees associated with rural residences and woodlots. Ash, white oak, red oak, sycamore, maple, hickory, white pine, blue spruce, and other hardwood trees and shrubs are present. Houses occur within the site. Ponds and wetlands areas occur within the site. No schools occur within the site. A power line runs through this site from northwest to southeast. There is a cell tower within the site on the south side as well as a tower outside the site to the east. This site was detected in 2015 and has had no prior treatment.

Over 200 egg masses were detected in this site in 2015. Survey indicates a low gypsy moth population, and Btk is proposed for this site.

Laporte County: This county is approximately 392,486 acres and 1,716 acres are in the proposed treatment site. Thus a small portion of the county is proposed for treatment. Only the forested areas will be treated, which is estimated to be 65% of the area in this site.

Laporte East 2016 : The proposed treatment site contains 1,716 acres. The site is composed of trees associated with urban residences and woodlots. White oak, red oak, maple, honeylocust, crabapple, spruce and other hardwood trees and shrubs are present. Houses and churches occur within the site. Ponds occur within the site. The City of LaPorte occurs within the site. There is one school in the northwest corner of the site and one school near the southern boundary of the site. A few parks occur within the site. A water tower occurs at the intersection of Eason Court and Webber Street. The site was detected in 2015 and has had no prior treatment. Egg masses were detected in this site in 2015. Survey indicates a low gypsy moth population, and Btk is proposed for this site.

Marshall County: This county is approximately 287,833 acres and 3,765 acres are in the proposed treatment site. Thus a small portion of the county is proposed for treatment. Only the forested areas will be treated, which is estimated to be 20% of the area in these sites.

Inwood 2016: The proposed treatment site contains 3,765 acres. The site is composed of trees associated with rural residences and woodlots. Red oak, maple, hickory, walnut, ash, locust, and other hardwood trees and shrubs are present. Houses and businesses occur within the site. Two ditches, creeks and a number of small wetlands occur within the site. The site is just east of the Town of Argos. The Argos Izaak Walton League property is in the eastern portion of the site. No schools occur within the site. There is a powerline in the northern portion of the site and a cell phone tower in the southeastern portion of the site. The site was detected in 2015 and has had no prior treatment. No egg masses were detected in this site in 2015. Survey indicates a very low gypsy moth population, and mating disruption is proposed for this site.

Marshall/Starke County: Marshall and Starke Counties are approximately 487,647 acres and 7,656 acres are in the proposed treatment site. Thus a small portion of these counties is proposed for treatment. Only the forested areas will be treated, which is estimated to be 55% of the area in this site.

Donaldson 2016: The proposed treatment site contains 7,656 acres. The site is composed of trees associated with rural residences and woodlots. Red oak, white oak, hickory, maple, ash, walnut, birch, cherry, pine, spruce, fir, and other hardwood trees and shrubs are present. Houses and businesses occur within the site. Lake Latonka, Yellow River, and numerous smaller lakes, ponds, ditches, and wetland areas occur in this site. Meominee Wetland Conservation Area is in the northern edge of the site. Schools occur within the site. A cell tower is to the north of the site. The site was detected in 2015 and has had no prior treatment. No egg masses were detected in this site in 2015. Survey indicates a very low gypsy moth population, and mating disruption is proposed for this

site.

St. Joseph County: This county is approximately 295,283 acres and 670 acres are in the proposed treatment site. Thus a small portion of the county is proposed for treatment. Only the forested areas will be treated, which is estimated to be 45% of the area in this site.

> **Lakeville 2016:** The proposed treatment site contains 670 acres. The site is composed of trees associated with rural residences and woodlots. Red oak, white oak, maple, ash, elm, walnut, white pine, redbud, blue spruce and other hardwood trees and shrubs are present. Houses occur within the site. Pleasant Lake and Riddles Lake occur in the central portion of the site. Several smaller ponds and wetlands areas and Heston Ditch occur within the site. The Town of Lakeville occurs along the northern portion of the site. No schools occur within the site. A cell phone tower occurs on the west side of the site. This site was detected in 2015 and has had no prior treatment. No egg masses were detected in this site in 2015. Survey indicates a low gypsy moth population, however Btk is proposed for this site due to high moth counts over previous years and the large amount of habitat with the site.

Whitley County: This county is approximately 216,262 acres and 799 acres are in the proposed treatment site. Thus a small portion of the county is proposed for treatment. Only the forested areas will be treated, which is estimated to be 25% of the area in this site.

> **Lorane 2016:** The proposed treatment site contains 799 acres. The site is composed of trees associated with rural residences and woodlots. Oak, hickory, maple, cherry, ash, crabapple, spruce, pine and other hardwood trees and shrubs are present. Houses occur within the site. Ponds occur within the site. No schools or churches occur within the site. A power line runs southeast to northwest through the site. This site was detected in 2013 and delimited in 2014 and 2015. The site was part of a 2014 Btk treatment. Egg masses were detected in this site in 2015. Survey indicates a low gypsy moth population, and Btk is proposed for this site.

3.2 Threatened and Endangered Species

Consultation with the staff of the U.S. Fish and Wildlife Service (USFWS) determined that, treating with *Bacillus thuringiensis* (Btk) is of concern for 2 federally endangered species of butterflies, the Karner blue butterfly (*Lycaeides melissa samueulis*) and Mitchell's satyr butterfly (*Neonympha mitchelii*). However, no populations of these butterfly species are known in the proposed Btk treatment sites (Appendix C – Letter from USFWS).

USFWS has initiated a status review of the monarch butterfly (*Danaus plexippus plexippus*) for possible listing under the Endangered Species Act. USFWS has determined that, "it appears unlikely that the monarch butterfly larvae would be present during the Btk spray periods." (Appendix C – Letter from U. S. Fish & Wildlife Service).

In review of the Indiana bat (*Myotis sodalist*) the USFWS determined 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. This species has been found in all of the treatment counties except Whitley but not within the specific treatment sites (Appendix C – Letter from USFWS). The northern long-eared bat (*Myotis septentrionalis*) is listed as threatened. At this time, no critical habitat has been proposed for the NLEB. This species is found in most of the treatment counties but we do not have specific information about its presence or absence in the treatment sites (Appendix C – Letter from USFWS).

Other federally threatened and endangered species of concern were reviewed but USFWS determined that the treatments were not likely to adversely affect these species (Appendix C – Letter from USFWS).

The IDNR, Division of Nature Preserves does not anticipate any impacts to the Menominee Wetland Conservation Area as a result of this project (Appendix C – Letter from IDNR, Div. of Fish and Wildlife). The IDNR, Division of Fish and Wildlife does not forsee any impacts to the animal species listed above as a result of this project as long as the chemicals are not sprayed directly over the Yellow River (Appendix C – Letter from IDNR, Div. of Fish and Wildlife).

3.3 Protection of Historic Properties

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. (Appendix C –Letter from IDNR, Division of Historic Preservation and Archaeology).

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 2 for each combination of the alternatives and issues.

4.1 Human Health and Safety (Issue 1).

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 gypsy moth to human health will occur sooner under Alternative 1 if treatments are not used to slow the spread of these gypsy moth populations. Gypsy 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). Gypsy 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. 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 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 gypsy moth outbreaks on humans would be delayed using this alternative.

Alternative 3 – Mating disruption. 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 expect 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.

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 gypsy 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.

4.2 Effects on Nontarget Organisms and Environmental Quality (Issue 2).

Alternative 1 – No action. The "no action alternative" would likely result in a more rapid build-up of gypsy moth populations and defoliation of susceptible forested areas, especially oak and aspen dominated forests. In other parts of the northeastern U.S., gypsy moth outbreaks have changed the structure of some forest ecosystems by killing a portion of the oak component and encouraging tree species that gypsy moth caterpillars avoid, such as red maple (USDA 2012a, Vol. II, Ch.4, pp. 4 to 5). Gypsy 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 gypsy 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). Gypsy 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).

Gypsy 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 gypsy 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 gypsy 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. Using Btk is likely to maintain the forest condition in the short-term (5 to 10 years) by eliminating gypsy moth populations in the treatment sites thus keeping populations from expanding and causing defoliation. However, in the long-term (10 to 15 years), gypsy 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 gypsy 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 U.S. E.P.A. 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 Bt 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 gypsy moth (USDA 2012a, Vol. III, App. F, pp. 4-4 to 4-6). 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.

The use of Btk is likely to maintain the forest condition in the short term by eliminating or reducing gypsy moth populations in the treatment sites, thus delaying gypsy moth from expanding and causing defoliation. In the long term, gypsy moth will become established in these counties even if this alternative is implemented.

Alternative 3 – Mating disruption. Mating disruption is likely to maintain the forest condition in the short-term (5 to 10 years) by eliminating gypsy moth populations in the treatment site thus keeping populations from expanding and causing defoliation. However, in the long-term (10 to 15 years), gypsy moth will likely become more widely distributed in Indiana even if this alternative is followed.

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 gypsy 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). 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.

Treatments with mating disruption are likely to maintain the forest condition in the short term by eliminating or reducing gypsy moth populations in the treatment sites, thus delaying gypsy moth from expanding and causing defoliation. In the long term, gypsy moth will become established in these counties even if this alternative is implemented.

Alternative 4 – Btk and /or Mating disruption. The nontarget and environmental consequences stated above for Alternatives 2 and 3 apply to this alternative.

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

Alternative 1 – No action. If no treatments were applied, the likely action would be to implement quarantine in these 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 gypsy moth 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 would increase, as responsible agencies would need to administer and fund these suppression projects.

Following defoliation, negative financial impacts are likely to occur for recreational industries such as resorts and campgrounds. Homeowners, private woodland owners, and forest based industries could be impacted by gypsy moth treatment costs, tree mortality, and adverse human health effects. The economic impact of no action would allow gypsy moth infestations to greatly advance ahead of the Transition Area, thus devaluing the STS accomplishments, and shift the STS line much further south.

Alternatives 2 (Btk), 3 (Mating disruption), and 4 (Btk and/or Mating disruption).
If treatments are applied, regulatory action is not likely for Kosciusko, Whitley, Fulton, Marshall or Starke Counties during the next year and the impacts listed under Alternative 1 would be delayed. Gypsy moths have not yet infested the areas proposed for treatment and this alternative corresponds with the national strategy for managing gypsy moth in these areas.

Economic analysis for this site-specific assessment show the Benefit-Cost Ratio is 6:1.

The proposed treatment sites have been determined based on results from gypsy moth surveys using STS protocols. The proposed treatment itself will have minimal effects, and it will not have disproportionate effects to any minority or low-income population.

4.4 Likelihood of Success of the Project (Issue 4).

Alternative 1 – No action. The project objective would not be met with this alternative. Gypsy moth would not be eliminated from the treatment sites, and its population would serve as a source for increased spread within the counties and into surrounding counties. If these populations were allowed to increase and expand, gypsy moth could spread through the state in 10 years (Sharov et al. 2002).

Alternative 2 - Btk. Project success is likely with this alternative. Btk has proven effective at eliminating or reducing gypsy moth at all levels of population.

Alternative 3 – Mating disruption. Project success is likely with this alternative in four treatment sites with very low gypsy moth populations. However, four sites have gypsy moth 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 determine the use of Btk or mating disruption alone or in combination for the site. From the data analysis by the STS program, the average rate of spread in Indiana during 2012-2015 was calculated to be 0.66 miles per year. Thus the STS treatments have been very successful in reducing the rate of spread compared to the program target of less than 4.8 miles/year. Treatment selection criteria used to evaluate each site are: 1) gypsy moth population level, 2) habitat type (urban, rural, open water or wetland), 3) nontarget organisms, 4) safety, and 5) cost and project efficiency.

4.5 Irreversible and Irretrievable Commitments of Resources

An irreversible commitment of resources results in the permanent loss of: 1) nonrenewable resources, such as minerals or cultural resources; 2) resources that are renewable only over long periods of time, such as soil productivity; or 3) a species (extinction) (USDA 1995, Vol. II, p. 4-93). For Alternatives 2, 3 and 4 there is an irreversible commitment of labor, fossil fuel, and money spent on the project.

An irretrievable commitment of resources is one in which a resource product or use is lost for a period of time while managing for another (USDA 1995, Vol. II, p. 4-93). No irretrievable commitments were identified for any alternative.

4.6 Cumulative Effects

Cumulative impacts are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future

actions regardless of what agency (federal or non-federal) or person undertakes such other actions. 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).

Seven of the eight proposed treatment sites have not had any prior treatments for gypsy moth. A small portion (34 acres) of the proposed Lorane site was treated with Btk in 2014. Thus, if this project is implemented, Btk treatments will not be occuring in consecutive years, and only a very small area would have Btk treatments in 2 out of 3 years. Therefore, our conclusion is there would be "no cumulative effects" for implementing this proposed project.

A separate state funded insecticide ground treatment is proposed for the Atwood Site in Kosciusko County. The insecticide treatment has not yet been determined. The proposed treatment may be done on seven trees at the site. Due to the limited area (seven trees) of the proposed ground treatment, our conclusion is there would be no additive effects and the state funded proposed treatment does not require a separate analysis.

4.7 Other Information

Mitigation

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

- News releases of treatments and dates will be given to local newspapers and radio/TV stations.
- Implementation of a Work and Safety Plan.
- 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.
- 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 a school ground.
- Aircraft will be calibrated for accurate application of treatment material.
- Applications will be timed so the most susceptible gypsy moth stage is targeted.

- Weather will be monitored during treatment to assure accurate 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.

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-base computer.

The treatment sites will be monitored, post-treatment, to determine the effectiveness of the treatments.

5.0 LIST OF PREPARERS & REVIEWERS

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Donna Leonard, Entomologist, STS Coordinator, USDA Forest Service, FHP, P.O. Box 2680, Asheville, NC 28802. Consultation on treatment site.

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

Zack Smith, Forest Programs Coordinator, IDNR Forestry, 402 West Washington Street, Room 296W, Indianapolis, IN 46204. Consultation on treatment site and development of cooperative project.

Christie Stanifer, Environmental Coordinator, Environmental Unit, IDNR Division of Fish and Wildlife, 402 West Washington Street, Room 264W, Indianapolis, IN 46204. Consultation with Christie Stanifer and other staff on Natural Heritage Program data and IDNR, Div. of Fish and Wildlife concerns within the proposed project.

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

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