Cooperative Gypsy Moth Eradication Program
Kitsap, King and Snohomish Counties
Washington State

Final

ENVIRONMENTAL ASSESSMENT

April 9, 2019

Prepared by

Washington State Department of Agriculture- Plant Protection Division-
Pest Program

In cooperation with

United States Department of Agriculture- Animal and Plant Health Inspection Service-
Plant Protection and Quarantine

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1.0 INTRODUCTION

The Washington State Department of Agriculture (WSDA), in cooperation with the United States Department of Agriculture-Animal and Plant Health Inspection Service (USDA-APHIS) proposes to take action to eradicate isolated infestations of gypsy moth in areas of Kitsap, King and Snohomish Counties, Washington State.

There are two types of gypsy moth—the European (also known as North American) and the Asian. The European gypsy moth (*Lymantria dispar*) (EGM) is established in the eastern half of the United States, and defoliates an average of 700,000 acres each year, causing millions of dollars in damage. The Asian gypsy moth (AGM) (including *Lymantria dispar asiatica*, *Lymantria dispar japonica*, *Lymantria albescens*, *Lymantria umbrosa*, and *Lymantria postalba*) is an exotic pest not known to occur in the United States. It is similar to the European gypsy moth, but AGM larvae feed on a much broader range of plant species. The European gypsy moth has more than 250 known host plants and prefers oak, while the AGM has a host range 500 host plants covering more than 100 plant families, and feeds on plant species such as larch, oak, poplar, alder, willow, and some evergreens. Another difference between the two gypsy moths is that female AGM can fly 20-25 miles, while European gypsy moth females cannot. The broad range of possible host plants, combined with the female's ability to fly long distances, could allow AGM to spread rapidly (APHIS, 2015).

Gypsy moth egg masses may be found on tree trunks, limbs, or leaves, as well as on stones, walls, logs, lawn furniture, and other outdoor objects. Each egg mass can contain hundreds to more than 1,000 eggs. The mass is covered with buff or yellowish fuzz made from the female's body hair. The egg masses average 1½ inches long and three-fourths of an inch wide. Eggs begin hatching in the spring. All of the damage caused by gypsy moths happens during the caterpillar stage, as the insects feed on leaves during this active period of growth. Once caterpillars stop feeding, they enter the pupal stage. This stage typically begins in June or July. Because egg hatch and pupation depend on weather and temperature, they may occur earlier or later in different areas. Adult moths emerge from their dark-brown pupal cases in 10 to 14 days. Gypsy moths do not feed in the moth stage (which lasts 1 to 3 weeks); they only mate and lay eggs. Eggs are laid between June and September, depending on weather and location. The eggs remain dormant during the winter and develop and hatch the following spring. (APHIS, 2015)

The European strain of gypsy moth was accidentally released in Medford, Massachusetts in 1869. Since that time, the European gypsy moth has spread throughout New England, and is now established in all or parts of 20 states, the District of Columbia and parts of Canada. Those areas now face costly suppression programs; as well as habitat loss, and a decreased quality of life. The Asian strain of gypsy moth is not established in North America. Establishment would have similar effects to EGM establishment; however, those effects would be at a substantially higher degree.

Since the inception of WSDA's gypsy moth trapping program in 1974, European gypsy moth has been detected every year with the exceptions of 1975 and 1976. Asian gypsy moth has been detected in 1991, 1993-1997, 1999, 2015 and 2018. Gypsy moth is introduced to Washington

State through a number of pathways including: visitors (automobiles, RV's), relocation (outdoor furniture etc.), shipping containers or other cargo, firewood, timber and rail cars from infested areas of North America. For over 40 years, WSDA has successfully detected new introductions of the gypsy moth, and successfully eradicated all reproducing populations.

2.0 PURPOSE AND NEED FOR ACTION

The purpose of the proposed action will be to prevent the establishment and spread of the gypsy moth. The proposed action will be designed to give the project the best chance for achieving the goal of eradicating the gypsy moth infestations while minimizing risks to human health and minimizing detrimental environmental consequences. Action needs to be taken in order to avoid the adverse economic, social, and ecological effects associated with large-scale gypsy moth infestations. Purposed action would be taken after evaluating treatment options available in the USDA Forest Service and APHIS 1995 Final Environmental Impact Statement (FEIS) for "Gypsy Moth Management in the United States: a cooperative approach" and 2012 Final Supplemental Environmental Impact Statement (FSEIS).

The proposed treatment sites are located in the Crosby and Gilberton areas of Kitsap County, Union Hill-Novelty Hill area of King County and Martha Lake area of Snohomish County (see Appendix B for maps). During the WSDA's 2018 summer trapping program, four adult male EGM were detected in traps around the Crosby site, nine at the Gilberton site and six at the Union Hill-Novelty Hill site. One adult male AGM was detected at the Martha Lake site.

Treatments available for eradication projects include: biological insecticides *Bacillus thuringiensis* var. *kurstaki* (Btk) and the gypsy moth nucleopolyhedrosis virus (Gypchek®); chemical insecticides diflubenzuron (Dimilin®) and tebufenozide (Mimic®); and treatments employing mass trapping, mating disruption, and sterile insect release techniques. A detailed description of these treatment options and the decision making process can be found in Section 3 of this Environmental Assessment (EA).

2.1 Related Documents

This EA is tiered to the FEIS and FSEIS in accordance with the National Environmental Policy Act of 1969 (NEPA) (42 United States Code (U.S.C.) § 4231 et seq.), the Council on Environmental Quality NEPA (40 Code of Federal Regulations (CFR) part 1500 et seq.) and APHIS' NEPA implementing regulations (7 CFR part 372). This EA provides the basic background information necessary for the site-specific analysis of the potential environmental effects of WSDA's proposed 2019 Cooperative Gypsy Moth Eradication Program. The FEIS, FSEIS, and this site-specific EA jointly constitute the environmental analysis and documentation required under NEPA.

Additional environmental analysis and documentation has been prepared to satisfy Washington State requirements under Chapter 43.21c of the Revised Code of Washington (RCW) (State Environmental Policy Act or SEPA), and Chapter 197-11 of the Washington Administrative Code (WAC) (SEPA rules).

Copies of the FEIS, FSEIS, EA and SEPA checklists are available for review at:

Washington State Department of Agriculture www.agr.wa.gov/gypsymoth

Washington State Library
6880 Capitol Blvd. S. Tumwater, WA 98501

Silverdale Library (Kitsap County)
3450 NW Carlton St.
Silverdale, WA 98383

Mill Creek Library (Snohomish County)
15429 Bothell Everett Hwy
Mill Creek, WA 98012

Redmond Regional Library (King County)
15990 NE 85th St.
Redmond, WA 98052

2.2 Decisions Made

There were three decisions made during the evaluation of this cooperative gypsy moth control project. The first decision made was to propose a gypsy moth control project (the absence of a control project is a **no-action alternative**). The second decision made was to tier this EA to the USDA 1995 FEIS and 2012 FSEIS. The third decision made was which tools would be used for the program areas.

2.3 Authorizing Laws and/or Policies

2.3.1 State Authorizing Laws

WSDA has authority under Chapter 17.24 of the Revised Code of Washington (RCW), Insect Pests and Plant Diseases, to eradicate or control insect pests that may endanger the agricultural and horticultural industries in the state of Washington.

2.3.2 Federal Authorizing Laws

The USDA is authorized to manage activities related to the gypsy moth for the Federal government. Two USDA agencies, the Forest Service and APHIS share this responsibility. Agency authorities are found in 7 CFR 2.8(a)(36) and 7 CFR 2.6(a)(38).

2.3.3 Environmental Laws and Other Regulations

Many environmental laws, authorities and Executive Orders (EO) of the President influence how actions to manage pests, including the gypsy moth, are implemented at the site-specific level. Such laws include the National Environmental Policy Act (NEPA);

the Washington State Environmental Policy Act (SEPA); the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); the Clean Water Act (CWA); the Endangered Species Act (ESA); the National Historical Preservation Act (NHPA); EO 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations"; EO 13045, "Protection of Children from Environmental Health Risks and Safety Risks"; and EO 13175, "Consultation and Coordination with Indian Tribal Governments".

3.0 TREATMENT ALTERNATIVES

3.1 Treatment Alternatives Considered

This EA is tiered to the USDA's 1995 FEIS and 2012 FSEIS. Strategies described in those documents depend upon the infestation status of the area: generally infested, transition, or uninfested. The three strategies of suppression, eradication, and slow the spread -or their absence- are included in the six alternatives described in the FEIS. The sixth alternative is the preferred alternative presented in the 1995 FEIS. The sixth alternative is comprised of all three strategies. Based on the infestation status of "no established population", Washington State's strategy in 2019 will be eradication.

WSDA is proposing to conduct an Integrated Pest Management (IPM) program to eradicate gypsy moth in Washington State. Evidence of an isolated reproducing population of gypsy moth in Washington State is a "trigger" to evaluate eradication options. IPM includes selecting those options and techniques that give the best chance of meeting the projects goal of eradication. The FEIS and FSEIS contain a range of alternatives from which WSDA has selected an IPM strategy. Treatment alternatives detailed in the FEIS and FSEIS include:

3.1.1 *Bacillus thuringiensis* var. *kurstaki* (Btk). This is a biological insecticide containing the bacterium Bt. The insecticide is effective primarily against caterpillars of many species of Lepidoptera (moths and butterflies).

3.1.2 Diflubenzuron (Dimilin®). This is an insect growth regulator that interferes with the growth of some immature insects.

3.1.3 Tebufenozide (Mimic®). This is an insect growth regulator that controls molting in various insects.

3.1.4 Gypsy moth virus (Gypcheck®). This is a nucleopolyhedrosis virus which occurs naturally and is specific to gypsy moth. Gypcheck® is an insecticide product made from the gypsy moth nucleopolyhedrosis virus.

3.1.5 Mass trapping. This treatment technique consists of deploying large numbers of pheromone traps used to attract the male gypsy moth and prevent them from mating with females, thereby causing a population reduction.

3.1.6 Mating disruption. This treatment technique consists of applying tiny plastic flakes or beads containing disparlure, a synthetic gypsy moth sex pheromone. The pheromone confuses male gypsy moths and prevents them from locating and mating with females.

3.1.7 Sterile insect technology. This treatment technique consists of an aerial release of a large number of sterile male gypsy moths; reducing the chance that female moths will mate with fertile males. The result is progressively fewer and fewer fertile egg masses being produced, and eventual elimination of the population.

After evaluating treatment options available in the FEIS and FSEIS, WSDA proposes three to five aerial applications of the insecticide *Bacillus thuringiensis* var. *kurstaki* (Btk) to 1,706 acres of vegetation at the core of the infestations (438 acres in Crosby, 299 acres in Gilberton, 270 acres in Union Hill-Novelty Hill and 699 acres in Martha Lake). The Btk applications will target young gypsy moth caterpillars (2nd instar) shortly after egg hatch in late April and early May 2019.

3.2 Alternatives Considered and Eliminated

The following treatment options were considered and not selected due to environmental or efficacy concerns. The no action alternative was dismissed at the Crosby, Gilberton and Union Hill-Novelty Hill sites due to the close proximity of multiple adult male EGM detections for two consecutive years. At the Martha Lake site, the no action alternative was dismissed due to the detection of an AGM.

Diflubenzuron (Dimilin®) is an insect growth regulator that has adverse impacts on a broader range of non-target species. While Btk primarily impacts moth and butterfly caterpillars, diflubenzuron may kill many other insects in addition to moth and butterfly caterpillars. Its use may adversely affect other insect populations and, therefore, it was not selected. Tebufenozide (Mimic®) would have similar impacts as diflubenzuron, therefore, it was also not selected. Gypsy moth virus (Gypcheck®) is very host-specific but is not widely available on the market; it is generally used in combination with other treatments in suppression projects, but is still experimental for eradication programs and, therefore, was not selected. Mass trapping has been used with some success to eradicate isolated populations, but at other times has failed. It is best employed following larval pesticide treatments in small, isolated low-level populations. Mating disruption is similar to mass trapping. It is best used in densely forested areas with isolated, low-level populations. Sterile insect releases have been approved but have rarely, if ever, been used in gypsy moth eradication efforts.

3.3 Preferred Treatment Alternative

The WSDA and USDA-APHIS gypsy moth eradication IPM strategy proposed for 2019 is aerial application of the biological insecticide Btk (Foray® 48B, EPA Reg. No. 73049-427) (treatment alternative 3.1.1). Foray® 48B is approved for organic agriculture. Treatments will begin at Crosby, Gilberton, Union Hill-Novelty Hill and Martha Lake in late April or early May 2019. Between three and five treatments will be conducted, by fixed-winged aircraft, five to ten days

apart. Each treatment of Btk will be made at the most effective label rate and no treatments will be applied directly to aquatic areas. Exact timing of treatments will depend on when foliage and early larval emergence occurs, along with weather condition at the time. Treatments will be followed up by visual inspection and removal of egg masses if found. Delimiting trapping will take place during the summers of 2019 and 2020 at the Crosby, Gilberton and Union Hill-Novelty Hill sites (EGM) and 2019, 2020, 2021 at the Martha Lake site (AGM).

This strategy will give the program the best chance of achieving the goal of eradicating the gypsy moth infestations while minimizing risks to human health, and minimizing detrimental environmental consequences.

4.0 AFFECTED ENVIRONMENT

4.1 Site Descriptions (see Appendix B for maps of each site)

Crosby (Kitsap County)

• Township/Range/Section: T24-0N R1-0W S04, S05, S08, S09

• Size: 438 acres

• Zoning: Rural Residential (1 Dwelling/5 Acres), Rural Wooded (1 Dwelling/20 Acres)

• Proposed Site: Residential housing, open spaces and one school

• Vegetation: Mix of coniferous, deciduous and ornamental trees

• Critical/Sensitive Areas: William Symington Lake is located within the northwest corner of the proposed treatment boundary. Big Beef Creek and Gold Creek run into William Symington Lake from the south and southwest respectively. Tin Mine Creek and Tin Mine Lake are located outside the southwest corner of the proposed treatment boundary.

The proposed Crosby treatment site will be treated under NPDES permit #WA0039047 issued to the WSDA by the Washington State Department of Ecology (ECY) for the purpose of invasive moth control.

• Catch History: 4 adult male EGM were detected in the area during the 2018 summer trapping season. 4 adult male EGM were detected in the area during the 2017 summer trapping season.

Gilberton (Kitsap County)

• Township/Range/Section: T25-0N R2-0E S19, S30 and T25-0N R1-0E S24, S25

• Size: 299 acres

• Zoning: Rural Residential (1 Dwelling/5 Acres), Urban Low Residential (5-9 Dwelling/1 Acre)

• Proposed Site: Residential housing, one school, church, community buildings and open space

• Vegetation: Mix of coniferous, deciduous and ornamental trees

• Critical/Sensitive Areas: Puget Sound is located outside the eastern boundary.

The proposed Gilberton treatment site will be treated under NPDES permit #WA0039047 issued to the WSDA by the Washington State Department of Ecology (ECY) for the purpose of invasive moth control.

• Catch History: Nine adult male EGM were detected in the area during the 2018 summer trapping season. One adult male EGM was detected in the area during the 2017 summer trapping season.

Union Hill-Novelty Hill (King County)

• Township/Range/Section: T25-0N R6-0E S13, S24 and T25-0N R7-0E S18

• Size: 270 acres

• Zoning: Rural Area, 1 Dwelling/5 Acres (RA-5)

• Proposed Site: Residential housing, open space

• Vegetation: Mix of coniferous, deciduous and ornamental trees

• Critical/Sensitive Areas: None

The proposed Union Hill-Novelty Hill treatment site will be treated under NPDES permit #WA0039047 issued to the WSDA by the Washington State Department of Ecology (ECY) for the purpose of invasive moth control.

• Catch History: Six adult male EGM were detected in the area during the 2018 summer trapping season. No adult male EGM were detected in the area during the 2017 summer trapping season.

Martha Lake (Snohomish County)

• Township/Range/Section: T27-0N R4-0E S01, S12 and T27-0N R5-0E S06, S07

• Size: 699 acres

• Zoning: Low Density Residential (LDR), Community Business (CB), Business Park (BP), Planned Community Business (PCB), Unincorporated Parcels

• Proposed Site: Residential housing, businesses, community/city buildings, open space, unincorporated parcels.

• Vegetation: Mix of coniferous, deciduous and ornamental trees

• Critical/Sensitive Areas: There is a biodiversity corridor and area located along the eastern proposed boundary. This corridor contains various open space areas providing a variety of habitats, mostly forested, from Everett to King County and I-5 to the Snoqualmie River. Martha Lake is located outside the northwestern boundary.

The proposed Martha Lake treatment site will be treated under NPDES permit #WA0039047 issued to the WSDA by the Washington State Department of Ecology (ECY) for the purpose of invasive moth control.

• Catch History: One adult AGM was detected during the 2018 trapping season.

4.2 Threatened, Endangered, and Sensitive Species

As required by Section 7 of the Endangered Species Act (1973), the USDA-APHIS conferred with both the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). USDA-APHIS has determined that the proposed eradication program at Crosby, Gilberton, Union Hill-Novelty Hill and Martha Lake will have no effect on any listed, designated, proposed, or candidate species or their critical habitat.

In addition, the WSDA consulted with the Washington State Department of Fish and Wildlife (WDFW) and the Washington State Department of Natural Resources (DNR). These agencies provided maps or other data intended to aide in the identification of habitats of concern and the presence of listed, proposed, candidate, threatened or endangered species. Additional information was gathered from the WDFW Priority and Habitats (PHS) Program, species experts, review of available literature, and site visits. The information provided by the resources listed above identified the following:

<u>Crosby</u>- No species of concern.

The information provided by WDFW from their Species of Greatest Conservation Need (SGCN) database found no moth or butterfly species of concern in the vicinity of the proposed site.

<u>Gilberton</u>- Pacific herring (*Clupea pallasi*) breeding area located along the shoreline of the proposed northeast boundary. Pacific herring is a State candidate species.

The information provided by WDFW from their Species of Greatest Conservation Need (SGCN) database found no moth or butterfly species of concern in the vicinity of the proposed site.

<u>Union Hill-Novelty Hill</u>- No species of concern.

The information provided by WDFW from their Species of Greatest Conservation Need (SGCN) database found no moth or butterfly species of concern in the vicinity of the proposed site.

Martha Lake- No species of concern.

The information provided by WDFW from their Species of Greatest Conservation Need (SGCN) database found no moth or butterfly species of concern in the vicinity of the proposed site.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 No Action Alternative

The gypsy moth is able to survive and reproduce in Washington State, as evidenced by numerous past isolated infestations. Many of the coniferous, deciduous, orchard and ornamental trees throughout the state are host to the gypsy moth and therefore, the vegetation could support a widespread gypsy moth infestation. The current infestations, if left unchecked, could spread across a large geographic area. The ecological and human health risk assessment for gypsy moth, should it become established, is detailed in the 2012 USDA FSEIS, vol. IV, appendix L (USDA Forest Service, 2004).

Trees in forests and orchards, residential and municipal shade trees and landscape plantings would be defoliated and eventually killed. Recreational and aesthetic values associated with trees and forested land would also be diminished. Species composition of the vegetation on forested land could change, affecting the quantity and variety of food available for wildlife.

Water quality could be adversely affected in a number of ways including: 1) increased siltation from rapid runoff of rainfall from defoliated areas; 2) increases in water temperature as it flows through areas made shadeless; and 3) nutrient overloading from the deposition of large quantities of caterpillar droppings.

The pesticide load in the environment would likely increase in quantity, variety, and net detrimental environmental impact as home and business owners respond to ever-increasing numbers of gypsy moth caterpillars, the damage they cause, and the nuisance they represent.

Human health impacts associated with the presence of large numbers of gypsy moth caterpillars have been reported. Health effects include itchy skin rashes, welts, and respiratory complaints. These allergic reactions have been attributed to the irritating nature of tiny hairs found on gypsy moth caterpillars (USDA, 2016).

Agricultural, horticultural and forestry enterprises are dependent upon markets beyond the borders of Washington State. These enterprises must be able to comply with the plant pest and disease regulations of the Federal government, other states, and international markets. The establishment and spread of the gypsy moth in Washington State would result in the imposition of quarantines. The levels of production and value of plant products would also be adversely affected.

5.2 Preferred Treatment Alternative

5.2.1 Human Health and Safety

The use of Btk for the eradication of isolated gypsy moth infestations is expected to have no adverse impact on human health or the environment. Various strains of *Bacillus thuringiensis* (Bt) are a naturally occurring bacterial component of soils worldwide. Modern aqueous formulations of Btk used in gypsy moth control programs contain no organic solvents and have an excellent safety record associated with their use in gypsy moth suppression and eradication programs. An exemption from the requirement of a tolerance has been established for residues of Btk in, or on, all raw agricultural commodities. This exemption stipulates that manufacturers of Btk test each lot for pathogenicity and vertebrate toxicity. See Appendix E for Sample Label and Safety Data Sheet (SDS).

A detailed risk assessment of the human health effects of Btk is detailed in the 2012 FSEIS vol. III, chapter 3 (USDA Forest Service, 2004).

Due to advances in scientific knowledge, the law requires that pesticides which were first registered before November 1, 1984 be reregistered to ensure that they meet today's more stringent standards. In March of 1998 the United States Environmental Protection Agency came out with a Reregistration Eligibility Decision (EPA, 1998) in which they concluded:

"Based on the reviews of the generic data for the active ingredient *Bacillus thuringiensis*, the Agency has sufficient information on the health effects of *Bacillus thuringiensis* and on its potential for causing adverse effects in fish and wildlife and the environment. The Agency has determined that *Bacillus thuringiensis* products, manufactured, labeled and used as specified in this Reregistration Eligibility Decision, will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, the Agency concludes that products containing *Bacillus thuringiensis* for all uses are eligible for reregistration" (EPA, 1998).

In the spring of 1999, Foray® 48B (Btk –based pesticide) was applied by aircraft to 52 square miles of Southern Vancouver Island to combat an infestation of gypsy moth. Approximately 80,000 residents lived in the spray zones. The Capital Health Region coordinated a human health study of possible short-term health effects. The resulting report (Capital Health Region, 1999) concluded:

"The results of this project did not show a relationship between aerial spraying of Foray® 48B and short-term human health effects. Although some people self-reported health problems that they attributed to the spray program, the research and surveillance methods used in this project did not detect any change in health status that could be linked to the spray program. Our results showed that many of the health complaints people reported during the spray were as common in people before the spray as they were

shortly after the spray. This conclusion is consistent with those of previous studies of the possible health effects of Btk- based pesticide spray programs."

Proposed applications of Btk in this program pose minimal risk to the general population, based on the large amount of available toxicity data, surveillance data, and long-term use without significant reports of adverse effects (USDA, 2016). Glare and O'Callaghan (2000) provided a comprehensive review of *Bacillus thuringiensis*, including Btk. They conclude with this statement, "After covering this vast amount of literature, our view is a qualified verdict of safe to use" (Glare and O'Callaghan, 2000). The World Health Organization's Environmental Health Report (1999) states "Bt products can be used safely for the control of insect pests of agricultural and horticultural crops as well as forests."

5.2.2 Non-Target Organisms

a. Animals

A detailed discussion of the ecological effects of Btk on non-target organisms may be found in the 1995 FEIS vol. II, chapter 4, pp. 52-55, and vol. IV, chapter 5, pp. 5-10.

As used in gypsy moth eradication projects, Btk has not been shown to adversely affect fish, birds, mammals, or most non-target insects, including honey bees (USDA, 1995, vol. II, chapter 4, pp. 54-55). It is expected that Btk may kill other lepidopteran larvae (leaf-eating caterpillars) if they are present in project areas when treatments occur. In turn, animals dependent on caterpillars as food theoretically may be affected. However, reductions in native caterpillar populations are expected to be temporary due to the brief residual effectiveness of Btk deposits on foliage (4 to 10 days), the high reproductive capacity of most lepidoptera, and recolonization from adjacent untreated areas (USDA, 1995, vol. II, chapter 4, pp. 54-55). The small size of the proposed treatment sites should aid in the recolonization process.

A study conducted in Oregon in connection with gypsy moth control programs in 1986 and 1987 found reduced numbers of caterpillars immediately following Btk treatments and reduced species diversity. This study also found that recovery in numbers of non-target caterpillars began the same season, but that recovery of species diversity lagged behind (Miller, 1990).

Vertebrates that feed on caterpillars in spring will have a reduced number of prey on which to feed for a short time. Reductions in caterpillar numbers from Btk applications forces a switch in diet for birds and mammals. In birds the number of nesting attempts per year may be reduced but not necessarily the overall production of fledglings per breeding territory in the year of application or subsequent years (Rodenhouse and Holmes 1992).

There is no evidence of significant adverse impacts of Btk on aquatic organisms. In a study conducted on a benthic stream community there was no evidence that addition of

Btk to stream mesocosms created adverse effects for these communities even at greater than 100 times expected exposure rates (Richardson and Perrin, 1994).

b. Plants

Btk is non-toxic to plants. Btk is sensitive to meteorological effects once it has been applied to plant surfaces. Btk is readily removed from plant surfaces by rain and is rapidly degraded by sunlight (USDA, 1995, vol. IV, chapter 7, p. 15).

Changes in soil productivity and fertility due to Btk are not likely. Btk persists for a relatively short time, B.t. occurs naturally in soils worldwide, and applications of insecticides containing B.t. do not appear to increase levels of B.t. in soil (USDA, 1995, vol. I, p. 19). For more information about the fate of Btk in the soil refer to 1995 FEIS, vol. IV, chapter 7, pp. 15-16.

c. Threatened, Endangered, and Sensitive Species

In reference to the species listed in the Affected Environment (section 4.2) of this EA, no threatened or endangered species occur on the proposed treatment sites. It has also been determined that Btk applications would have no effect on the candidate species listed.

6.0 GENERAL PRECAUTIONS

Steps will be taken to educate the public about gypsy moth; as well as assist the public in avoiding or reducing exposure during treatments:

• The Pesticide Sensitive Individuals database, maintained by the Pesticide Management Division of the WSDA, will be checked for people living in or near the proposed treatment areas who require advance notification.

• News media (news releases, social media promotions, radio notices).

• Open houses were held at the Crosby and Gilberton sites in early February. Due to weather conditions the open houses at the Martha Lake and Union Hill-Novelty Hill sites were cancelled.

• An open house Webinar was held in mid-February.

• WSDA staff met with the Kitsap County School District to discuss the eradication program

• The WSDA will provide notification, the day before scheduled applications, to any resident in the proposed treatment area requesting them (text messaging, robocall, email distribution list and email listserv).

• Information will be provided to residents of the treatment areas on ways to avoid or reduce exposure during treatments (social media posts and engagement, social media monitoring, direct mailings, posters/signage/brochures, video).

• During treatments on-site spray monitors will notify bicyclists, joggers and other pedestrians that they are approaching the treatment areas.

• Electronic road signs will be deployed in high-traffic areas before and during treatments. Example message: GYPSY MOTH SPRAYING, LOW FLYING AIRCRAFT

• Yard signs with information about treatments will be deployed throughout each treatment site. All yard signs will be posted on public property.

7.0 PREPARER

Rian Wojahn
Eradication Coordinator
Washington State Department of Agriculture
3939 Cleveland Ave. SE
Olympia, WA 98501

8.0 AGENCIES AND PERSONS CONSULTED/NOTIFIED

• USDA-Animal and Plant Health Inspection Service
• USDA-Forest Service
• National Marine Fisheries Service (NMFS), for review of the proposed treatment areas for the presence of sensitive species or habitats
• US Fish and Wildlife Service (USFWS), for review of the proposed treatment areas for the presence of sensitive species or habitats
• Federal Aviation Administration (FAA)
• Environmental Protection Agency (EPA)
• Washington State Department of Health
• King County Public Health Department
• Kitsap County Public Health Department
• Snohomish County Public Health Department
• Washington State Department of Natural Resources, for Forest Practices information
• Washington State Department of Natural Resources, Natural Heritage Program, for review of the proposed treatment areas for the presence of sensitive species or habitats
• Washington State Department of Fish and Wildlife, Priority Habitats and Species (PHS) database, for review of the proposed treatment areas for the presence of sensitive species or habitats
• Washington State Department of Fish and Wildlife, Ms. Ann Potter, for review of the proposed treatment areas for the presence of Species of Greatest Conservation Need (SGCN)
• Washington State Department of Archeology and Historic Preservation, Washington Information System for Architectural and Archeological Records Data (WISSARD) database, for review of the presence of historic properties
• Washington State Department of Ecology, for NPDES permit and SEPA review
• Elected Officials in King County
• Elected Officials in Snohomish County
• Elected Officials in Kitsap County

- Tulalip Tribe
- Snoqualmie Tribe
- Muckleshoot Tribe
- S'Klallam (Port Gamble) Tribe
- Suquamish (Port Madison) Tribe
- Kitsap County School District
- Snohomish County School District
- King County School District
- Homeless shelters in Kitsap, King and Snohomish
- Washington Invasive Species Council (WISC)

9.0 APPENDICES

A. References
B. Treatment Site Maps
C. Information and Outreach
D. Monitoring
E. Product Label & Safety Data Sheet

APPENDIX A

References

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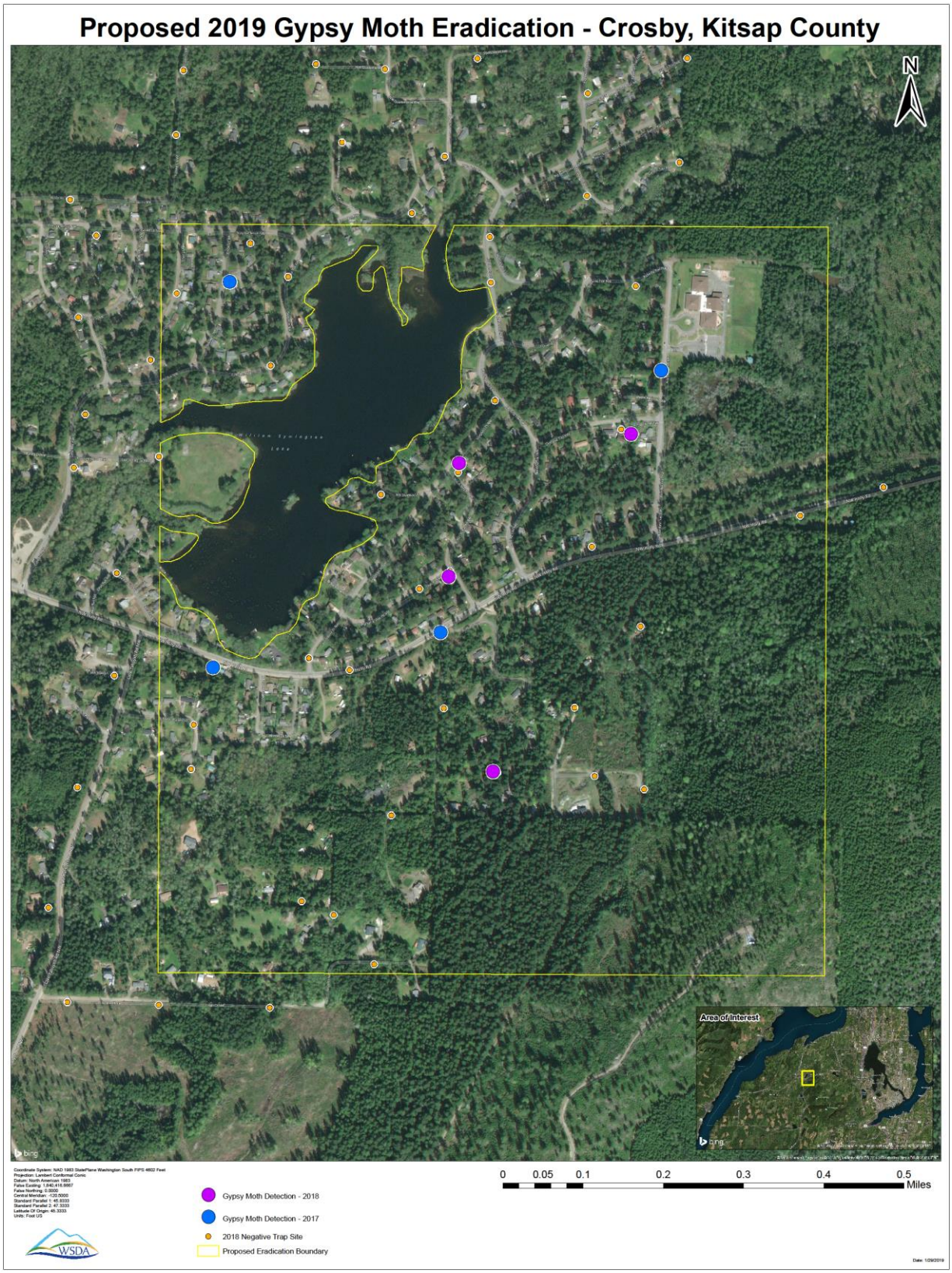
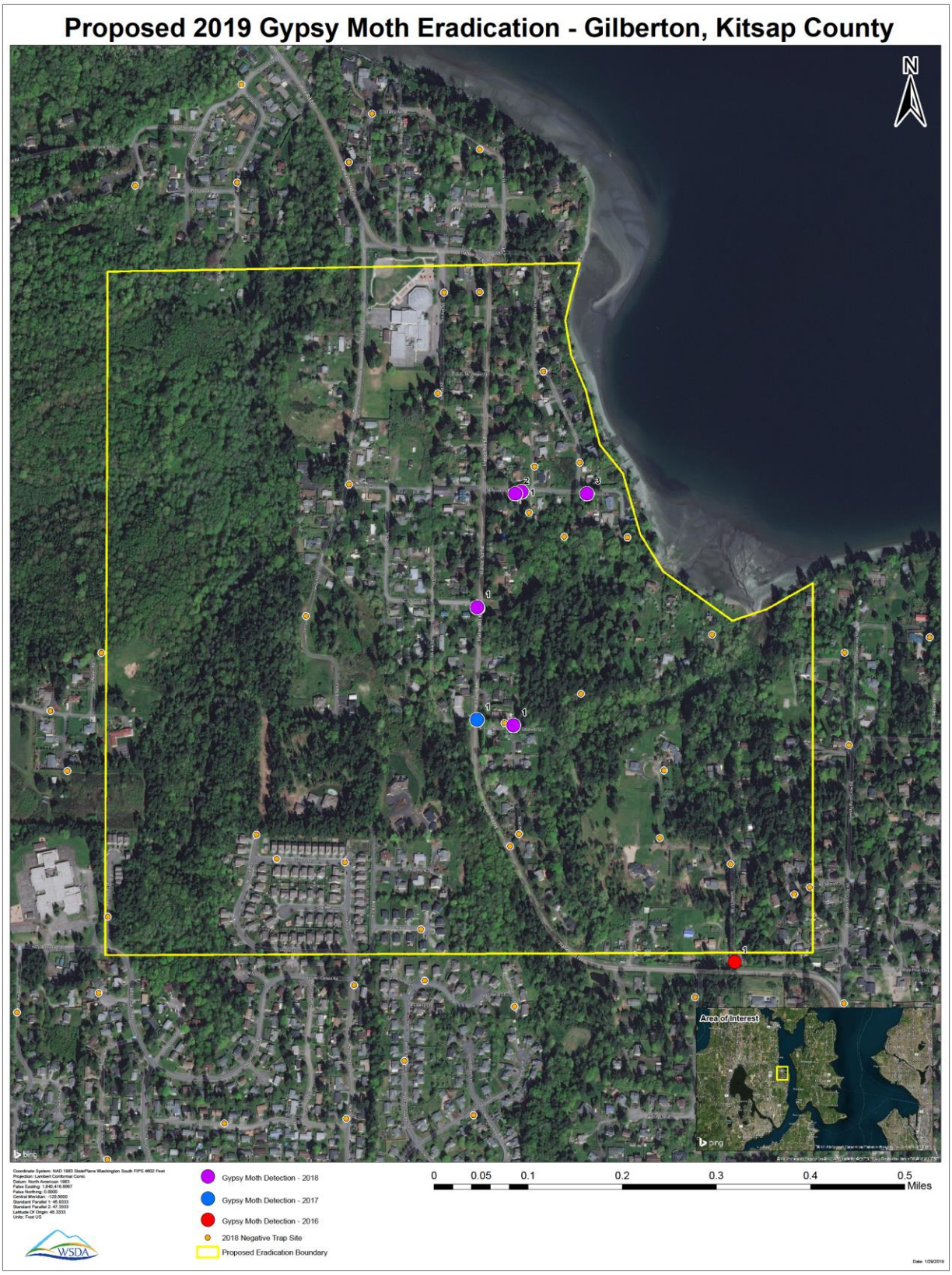
APPENDIX B

Treatment Site Maps

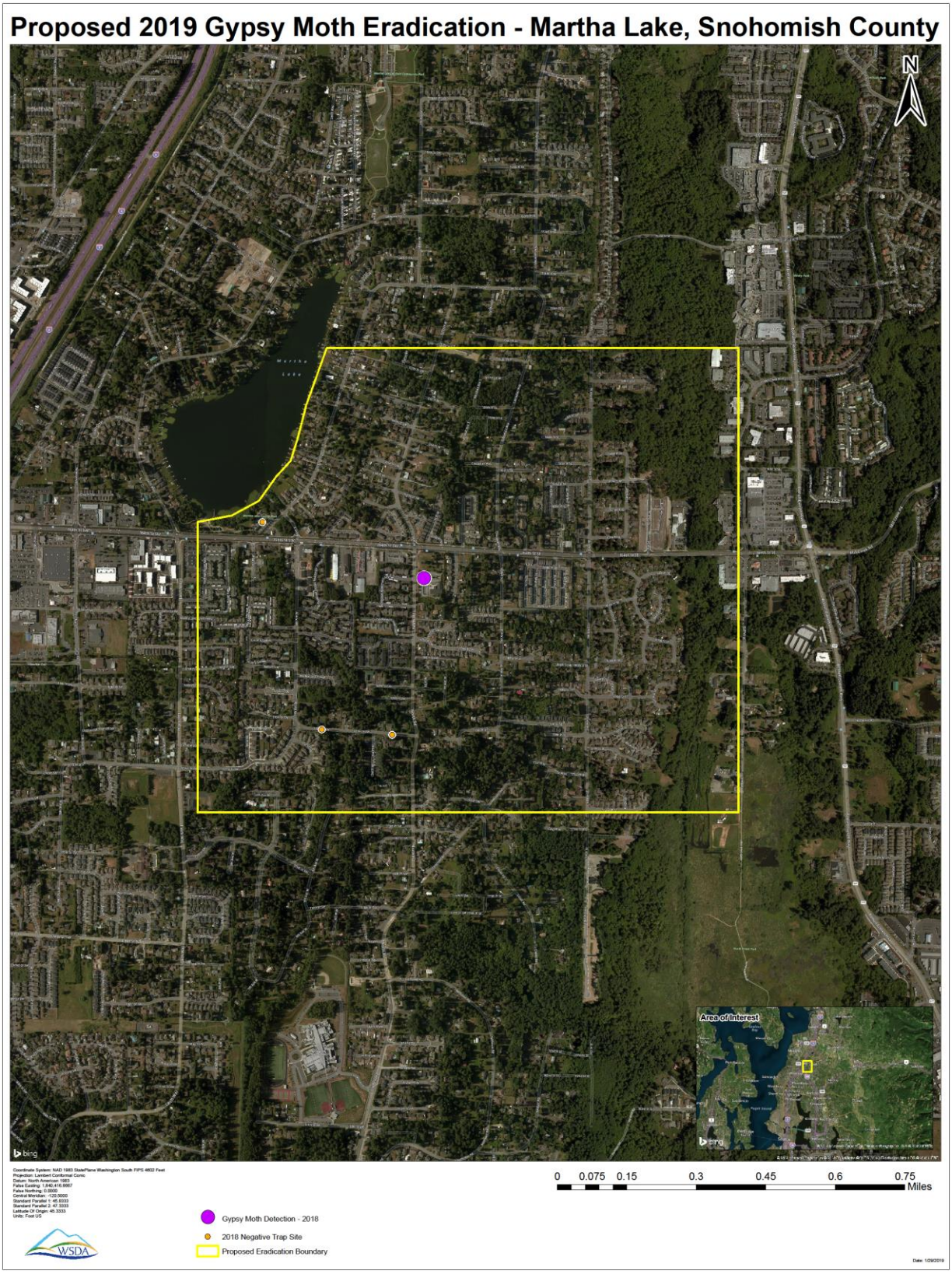
Crosby


Proposed 2019 Gypsy Moth Eradication - Crosby, Kitsap County
N
Area of Interest
Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 1,640,416.6667
False Northing: 0.0000
Central Meridian: -120.8000
Standard Parallel 1: 45.6333
Standard Parallel 2: 47.3333
Latitude Of Origin: 45.3333
Units: Foot US
Gypsy Moth Detection - 2018
Gypsy Moth Detection - 2017
2018 Negative Trap Site
Proposed Eradication Boundary
0 0.05 0.1 0.2 0.3 0.4 0.5
Miles
WSDA
Date: 1/29/2019

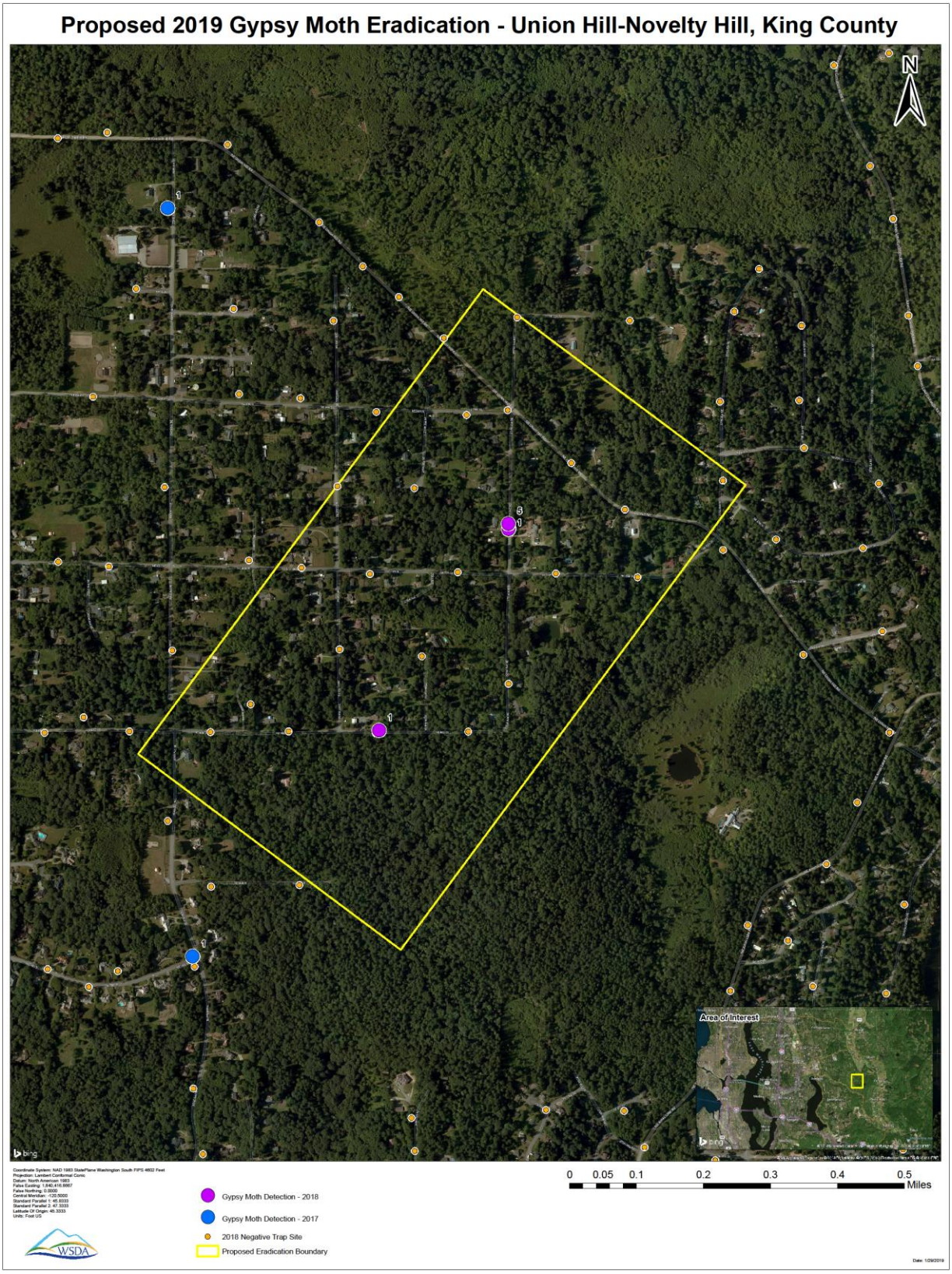
Gilberton


Proposed 2019 Gypsy Moth Eradication - Gilberton, Kitsap County
N
Area of Interest
Gypsy Moth Detection - 2018
Gypsy Moth Detection - 2017
Gypsy Moth Detection - 2016
2018 Negative Trap Site
Proposed Eradication Boundary
0 0.05 0.1 0.2 0.3 0.4 0.5
Miles
WSDA

Martha Lake


Proposed 2019 Gypsy Moth Eradication - Martha Lake, Snohomish County
N
Area of Interest
Coordinate System: NAD 1983 StatePlane Washington South FIPS 4602 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983
False Easting: 1,640,416.6667
False Northing: 0.0000
Central Meridian: -120.5000
Standard Parallel 1: 45.8333
Standard Parallel 2: 47.3333
Latitude Of Origin: 45.3333
Units: Foot US
0 0.075 0.15 0.3 0.45 0.6 0.75
Miles
Gypsy Moth Detection - 2018
2018 Negative Trap Site
Proposed Eradication Boundary
WSDA
Date: 1/29/2019

Union Hill-Novelty Hill



APPENDIX C

Information and Outreach

• Native American tribes in the areas of the proposed 2019 gypsy moth eradication program are contacted (December 17, 2018)

• Information about the proposed 2019 gypsy moth eradication program is emailed to stakeholders (December 18, 2018)

• WSDA issues a press release about the proposed gypsy moth eradication in the spring of 2019 (December 19, 2018)

• WSDA sends an informational postcard to residents around the proposed gypsy moth eradication sites. Nearly 20,000 postcards are mailed out (January 2, 2018)

• Information about the upcoming open houses is emailed to stakeholders (January 16, 2019)

• WSDA issues a press release about the upcoming open houses and proposed gypsy moth eradication (January 17, 2019)

• WSDA sends out invitation postcards for the upcoming open houses. Nearly 20,000 postcards are mailed out (January 24, 2019)

• WSDA holds open house meetings at Crosby and Gilberton. Information was provided about gypsy moth trapping, proposed eradication activities, and health effects (February 2, 2019)

• WSDA plans, but due to weather conditions, is unable to hold open house meetings at Martha Lake and Union Hill-Novelty Hill (February 9, 2019)

• WSDA holds an open house Webinar. Information was provided about gypsy moth trapping, proposed eradication activities, and health effects (February 13, 2019)

• WSDA sends out update to stakeholders (March 1, 2019)

• WSDA sends out Washington State Department of Health informational postcard to residents around the proposed gypsy moth eradication sites (March 13, 2019)

APPENDIX D

Monitoring

A WSDA and/or USDA-APHIS representatives will be present to monitor loading of the insecticide (Btk). WSDA and/or USDA-APHIS representatives will also be present in the treatment areas.

The treatment areas of Crosby, Gilberton and Union Hill-Novelty Hill (EGM sites) will be intensively monitored in the summers of 2019 and 2020. The Martha Lake treatment area (AGM site) will be intensively monitored in the summers of 2019, 2020 and 20121. Pheromone-baited traps will be used to determine the effectiveness of the treatments, assist in the eradication and delimit any residual populations of gypsy moth. Visual inspections for alternate life stages of the gypsy moth will also take place. Egg masses will be removed if found. The results of this monitoring will dictate the need for any future action.

APPENDIX E

Product Label

List No. 60181- 04-

Foray® 48B

BIOLOGICAL INSECTICIDE

FLOWABLE CONCENTRATE

For Commercial Forestry and Wide-Area Pest Treatment – Aerial Application Only

FOR ORGANIC PRODUCTION

Active Ingredient:

Bacillus thuringiensis subsp. *kurstaki*, Strain ABTS-351, fermentation solids, spores and insecticidal toxins . . . . . 12.65% **Other Ingredients** . . . . . 87.35% **Total**. 100.00%

Potency: 10,600 Cabbage Looper Units (CLU) per mg of product (equivalent to 48 billion CLU per gallon). 1 Use

The percent active ingredient does not indicate product performance and potency measurements are not federally standardized.

EPA Registration No. 73049-427 EPA Est. No. 33762-IA-001 **KEEP OUT OF REACH OF CHILDREN CAUTION**

FIRST AID	
If in eyes	• Hold eye open and rinse slowly and gently with water for 15 - 20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
HOT LINE NUMBER	
Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.	

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, using tobacco or using the toilet.

Personal Protective Equipment (PPE) Applicators and other handlers must wear:

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

Follow 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.

Agricultural Use Requirements:

Mixers/loaders and applicators must wear a NIOSH-approved particulate respirator with any R or P filter with NIOSH approval number prefix TC-84A; or a NIOSH-approved powered air purifying respirator with a HE filter with NIOSH approval number prefix TC-21C. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

Engineering Control

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 spill or equipment breakdown.

Non-agricultural Use Requirements:

Mixers/loaders and applicators must wear a NIOSH-approved particulate respirator with any R or P filter with NIOSH approval number prefix TC-84A; or a NIOSH-approved powered air purifying respirator with a HE filter with NIOSH approval number prefix TC-21C. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

USER SAFETY RECOMMENDATIONS

Users should:

- Remove clothing/PPE immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing.
- Remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing.

Environmental Hazards

Except under the forest canopy, 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.

This product must not be applied aerially within 1/4 mile of any habitats of threatened or endangered Lepidoptera.

DIRECTIONS FOR USE

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.

AGRICULTURAL USE REQUIREMENTS

Use this product only in accordance with its labeling and with the Worker Protection Standard, 40 CFR part 170. Refer to supplemental labeling under "Agricultural Use Requirements" in the Directions For Use section for information about this standard.

Refer to the Directions For Use (below) for further directions.

STORAGE AND DISPOSAL

Do not contaminate water, food or feed by storage or disposal.

Pesticide Storage: Store in a cool, dry place. Keep containers tightly closed when not in use. Store in temperatures above freezing and below 32 degrees C (90 degrees F).

Pesticide Disposal: To avoid wastes, use all material in this container by application according to label directions. If wastes can not 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).

Container Disposal: 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 the flow begins to drip. Repeat this procedure two more times. Offer for recycling if available. Offer for reconditioning, if appropriate.

Refillable Container: Refill this container with pesticide only. Do not use this container for any other purpose. Cleaning the container before final disposal is the responsibility of the person disposing of the container. Cleaning before refilling is the responsibility of the refiller. To clean the container before final disposal, empty the remaining contents from this container into application equipment or mix tank. Fill the container about 10 percent full with water. Agitate vigorously or recirculate water with pump for 2 minutes. Pour or pump rinsate into application equipment or rinsate collection system. Repeat this rinsing procedure two more times. Offer for recycling if available. Offer for reconditioning, if appropriate.

Warranty and Disclaimer

To the extent permitted by 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 risks of use, storage or handling not in strict accordance with accompanying directions.

DIRECTIONS FOR USE BOOKLET

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.

Apply this product only through aerial application.

AGRICULTURAL USE REQUIREMENTS

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.

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.

Do not enter or allow worker entry into treated areas during the restricted-entry interval (REI) of 4 hours.

PPE required for early entry to treated areas that is permitted under the Worker Protection Standard (that involves contact with anything that has been treated, such as plants, soil, or water) is: • Coveralls
• Waterproof gloves

• Shoes plus socks

NON-AGRICULTURAL USE REQUIREMENTS

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.

APPLICATION

Apply Foray 48B Biological Insecticide Flowable Concentrate (hereafter referred to as Foray 48B), undiluted or with quantities of water sufficient to provide thorough coverage of plant parts to be protected, only by aerial equipment. The amount of water needed per acre will depend upon crop size, weather, spray equipment, and local experience.

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.

HANDLING & MIXING

If Foray 48B is applied undiluted, the operator must ensure that the bulk quantity is well agitated and homogenous.

When Foray 48B is shipped by bulk tankers and transferred via a closed-loop mixing/loading system, the material is measured by passing through in-line flow meters directly into the aircraft, minimizing exposure to ground handling personnel.

In a similar manner, smaller containers of Foray 48B are also to be used with a closed-loop mixing/loading system to minimize the potential for accidental spills and exposure of ground handling personnel.

If dilution with water is needed for full coverage, fill tank with approximately 3/4 of the water required for dilution. Begin agitation and pump Foray 48B into the water while maintaining continuous agitation. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours.

When applying a diluted spray mixture, the use of a spreader-sticker will improve the weatherfastness of the spray deposits. Add the spray adjuvant to the tank after the Foray 48B is added, and before the final volume of water is added to complete the mixture. Reduce or momentarily halt tank agitation and then add the required amount of adjuvant to the diluted mix. Use a closed-loop system to siphon the required quantity of adjuvant or pour the adjuvant into the top hatch of the tank. Once added, close tank opening, and resume agitation; add the rest of the water to complete the spray mix.

Combinations with commonly used spray tank adjuvants are generally not deleterious to Foray 48B, 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. Check with an adjuvant supplier for advice on spray adjuvants that are compatible with biological pesticides such as Foray 48B to avoid incompatibilities.

SPRAY VOLUMES

Aerial Application: Use appropriate amount of Foray 48B, 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. The minimum amount of water needed per acre will depend upon size, weather conditions, spray equipment used and local experience.

GENERAL AGRICULTURAL USE INSTRUCTIONS

Foray 48B is a biological insecticide for the control of lepidopterous larvae. It contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 48B 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 48B cease feeding within a few hours and die within 2-5 days.

Foray 48B 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 48B when eggs start hatching and larvae are small (early instars) and before significant 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 reinfestation. 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 contact insecticide to enhance control. Thorough coverage is essential for optimum performance.

Crop	Pests	Rate[1] (fl. oz./acre)
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Seed Orchards, Non-Bearing Ornamental Fruit, Nut and Citrus Trees	Gypsy Moth & Asian Gypsy Moth	21 - 107
	Elm Spanworm Spruce Budworm Browntail Moth Douglas Fir Tussock Moth Coneworm Buck Moth	21 - 80

	Tussock Moths Pine Butterfly Bagworm Leafrollers Tortrix Mimosa Webworm Tent Caterpillar Jackpine Budworm Blackheaded Budworm Saddled Prominent Saddleback Caterpillar Eastern & Western Hemlock Looper Orangestriped Oakworm Satin Moth	16 - 43
	Redhumped Caterpillars Spring & Fall Cankerworm California Oakworm Fall Webworm	11 - 31

Special Instructions:

1 Use the higher rates on advanced larval stages or under high density larval populations.

Use and mix this product with other pesticides only in accordance with the most restrictive of label limitations and precautions. Do not mix this product with any product containing a label prohibition against such mixing. Do not exceed label dosage rates.

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 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 wide-area public pest control programs sponsored by government entities, such as mosquito abatement, Gypsy Moth control, and Mediterranean Fruit Fly eradication.

Foray 48B contains the spores and endotoxin crystals of *Bacillus thuringiensis kurstaki*. Foray 48B 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 48B only by aerial application.

Use Foray 48B with a closed-loop mixing/loading system that will minimize the potential for accidental spills and exposure of ground handling personnel.

If dilution with water is needed for full coverage, fill tank with approximately 3/4 of the water required for dilution. Begin agitation and pump Foray 48B into the water while maintaining continuous agitation. Agitate as necessary to maintain suspension. Do not allow diluted mixture to remain in the tank for more than 72 hours. Monitor to detect early infestations.

Crop	Pests	Rate[1] (fl. oz./acre)
Forests, Shade Trees, Ornamentals, Shrubs, Sugar Maple Trees, Seed Orchards, Non-Bearing Ornamental Fruit, Nut and Citrus Trees	Gypsy Moth & Asian Gypsy Moth	21 - 107
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	Tussock Moths Pine Butterfly Bagworm Leafrollers Tortrix Mimosa Webworm Tent Caterpillar Jackpine Budworm Blackheaded Budworm Saddled Prominent Saddleback Caterpillar Eastern & Western Hemlock Looper Orangestriped Oakworm Satin Moth	16 - 43
	Redhumped Caterpillars Spring & Fall Cankerworm California Oakworm Fall Webworm	11 - 31

Special Instructions:

1 Use the higher rates on advanced larval stages or under high density larval populations.

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Aerial Application

Apply Foray 48B, either alone or diluted with water, aerially at the rates per acre shown in the application rates table. Spray volumes of 32-107 fluid ounces of product per acre give optimum coverage. Best results are expected when Foray 48B is applied to dry foliage.

For smaller spray volumes, mix the proper number of teaspoons of Foray 48B from the following chart to attain the desired rates:

If the rate is:	**Add this amount per gallon of mix:**
8 fl. oz. (0.5 pt.)/acre	1/2 teaspoon
16 fl. oz. (1.0 pts.)/acre	1 teaspoon
24 fl. oz. (1.5 pts.)/acre	1-1/2 teaspoons
32 fl. oz. (2.0 pts.)/acre	2 teaspoons
48 fl. oz. (3.0 pts.)/acre	3 teaspoons
64 fl. oz. (4.0 pts.)/acre	4 teaspoons

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Valent BioSciences LLC 870 Technology Way
Libertyville, IL 60048