Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Box Tree Moth (*Cydalima perspectalis*) Cooperative Control Program in Select Counties in New York State

Final Environmental Assessment—May 2022

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List of Abbreviations and Acronyms

a.i.	active ingredient
APHIS	Animal and Plant Health Inspection Service
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
Btk	*Bacillus thuringiensis kurstaki*
BTM	Box tree moth
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DDVP	Dichlorvos or 2,2-dichlorovinyl dimethyl phosphate
DT_{50}	Dissipation half-life values
EA	Environmental Assessment
ESA	Endangered Species Act of 1973
Koc	Soil adsorption coefficient
MBTA	Migratory Bird Treaty Act of 1918
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NYS AGM	New York State Department of Agriculture and Markets Division of Plant Industry
oz	ounces
lb	pounds
PPE	Personal protective equipment
REI	Restricted-entry interval
RyR	Ryanodine receptors
SCLP	Straight-chain lepidopteran pheromones
SHPO	State Historic Preservation Officer
T&E	Threatened and endangered
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WHO	World Health Organization

I. Introduction

The U.S. Department of Agriculture (USDA), Animal and Plant Health Inspection Service (APHIS), in cooperation with the New York State Department of Agriculture and Markets, Division of Plant Industry (NYS AGM) is considering options for actions it can take to control the box tree moth (BTM), *Cydalima perspectalis* (Walker) (Order Lepidoptera: Family Crambidae) where it is detected.

The BTM is native to East Asia and has become a serious invasive pest in Europe, where it continues to spread. The caterpillars feed mostly on boxwood (*Buxus* sp.) with other natural hosts including mock orange (*Murraya paniculata*) and species of euonymus (*Euonymus* sp.) (USDA APHIS 2022). Heavy infestations can defoliate host plants. The caterpillars also feed on the bark, leading to girdling and plant death. The moths can have different physical characteristics. For instance, adult moths have white bodies with a brown head and abdomen, while the wings are white with an irregular thick brown border. However, some adults have brown wings with a small white streak on each forewing. The wingspan on adult moths is 1.5 to 1.75 inches. Larvae are green to yellow and have black heads. Older larvae develop brown stripes on the body. The 6th instar larvae are about 1.6 inches long (USDA APHIS 2022). Signs and symptoms of BTM damage to host plants include skeletonized leaves, defoliation and dryness, and death. Other signs include green-black frass and webbing (USDA APHIS 2022). The BTM cooperative control program, referred to as the "Program", provides pictures of the caterpillars, pupae, and adults, as well as signs and symptoms of the moth on the APHIS website (https://www.aphis.usda.gov/aphis/ourfocus/planthealth/plant-pest-and-disease-programs/pests-and-diseases/box-tree-moth). The site also provides additional information about APHIS' emergency response and details about the Program.

On April 30, 2021, the Canadian Food Inspection Agency notified APHIS of BTM detections at a nursery in St. Catharines, Ontario, Canada. Between August 2020 and April 2021, the nursery shipped boxwood plants that may have been infested with BTM to 25 retail facilities located in Connecticut, Massachusetts, Michigan, New York, Ohio, South Carolina, and a distribution center in Tennessee. APHIS confirmed the presence of the BTM in three facilities in Michigan, one in Connecticut, and one in South Carolina. APHIS issued a federal order on May 26, 2021, to halt the importation of host plants from Canada, including boxwood, euonymus, and holly. Plants for planting and all propagative plant material, except seeds, of these hosts are not authorized, pending pest risk analysis, to enter the United States from Canada. APHIS, in coordination with affected states, has destroyed the imported plants in the receiving facilities. APHIS is tracing imported plants that were sold to determine additional locations of potentially infested boxwood – to date, tracing has not found additional BTM infested plants. APHIS has provided BTM traps and lures for surveys in the receiving facilities and other locations that received potentially infested boxwood.

In July 2021, NYS AGM found five adult BTM in Niagara (NYS AGM 2022). On August 6, 2021, an NYS AGM inspector collected BTM larvae in a residential landscape in Youngstown, NY (Niagara County) (NYS AGM 2022). As of November 2021, BTM has been limited to Niagara County in New York. NYS AGM has issued stop sales orders at nurseries where BTM is found.

As of January 2022, the Program's communications liaison has visited every township/village within Niagara, Erie, Genesee, and Orleans Counties. The Program is in the process of creating a "Check Your Boxwoods for BTM" flyer to inform the public about the moth and explain how to check their plants for boxwood and report a potential find.

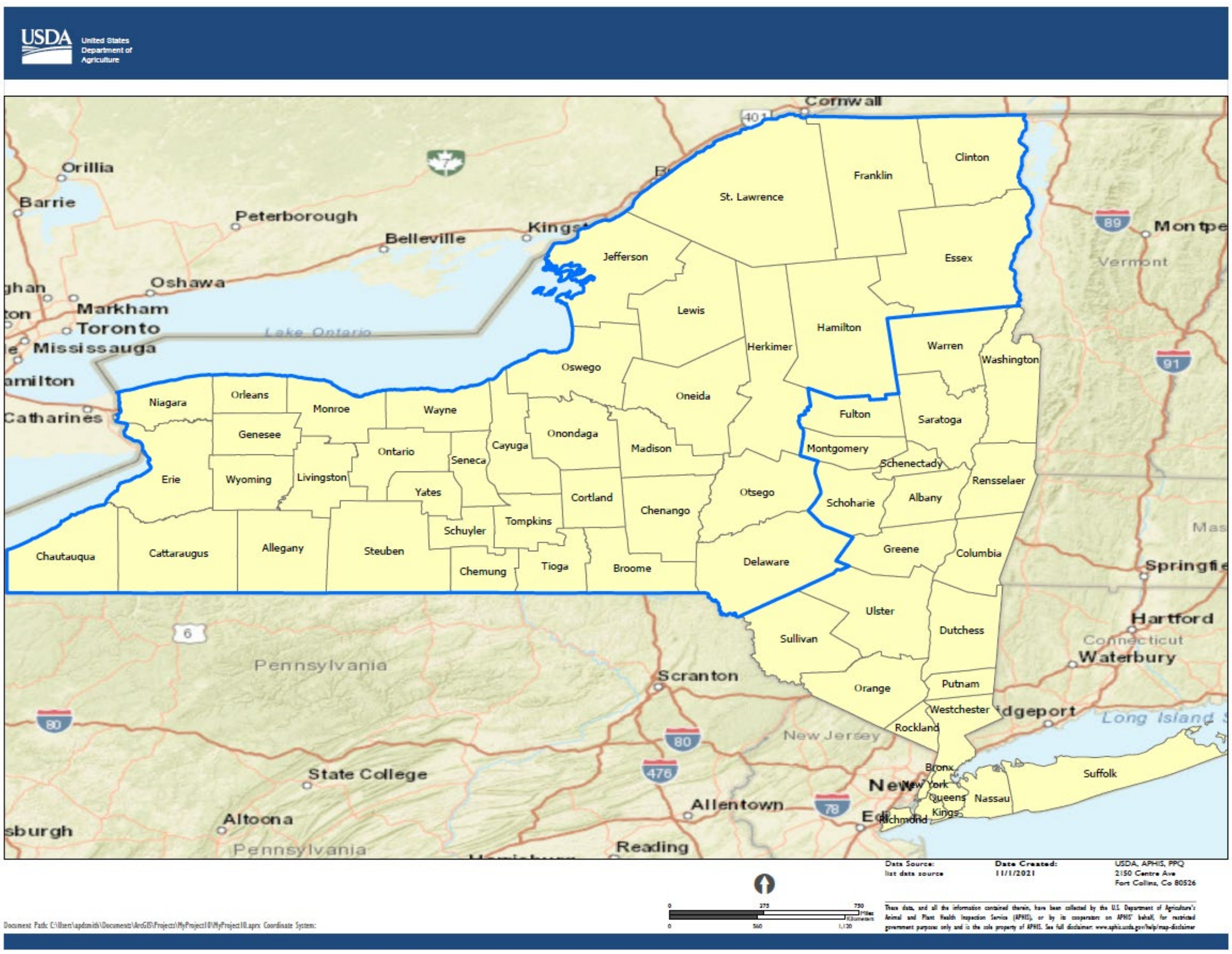

Figure 1. Proposed box tree moth cooperative control program area (outlined in blue).

A. Purpose and Need

APHIS, in cooperation with the State of New York Department of Agriculture and Markets (NYS AGM), proposes to control BTM in the state of New York. APHIS has the responsibility for taking actions to exclude, eradicate, and control plant pests under the Plant Protection Act of 2000 (7 United States Code (U.S.C.) 7701 et seq.). The BTM can cause adverse ecological and economic impacts in vulnerable areas. Because of this, APHIS and NYS AGM designed the Program to prevent further spread of BTM and control it in areas where it occurs. Spread can occur naturally and through the movement of nursery stock. Based on the BTM's spread potential, the Program area covers 37 counties in New York. Currently, the BTM is in Niagara County and Erie, Niagara, and Orleans Counties are under quarantine (New York State Regulations 2022).

The preferred alternative (proposed action) proposes a cooperative approach between APHIS and NYS AGM. APHIS prepared this environmental assessment (EA) to comply with the provisions of the National Environmental Policy Act of 1969 (NEPA) (42 U.S.C. §§ 4321 et seq.) as prescribed in implementing regulations adopted by the Council on Environmental Quality (CEQ) (40 Code of Federal Regulations (CFR) parts 1500-1508), USDA's NEPA regulations at 7 CFR part 1b, and APHIS NEPA implementing procedures (7 CFR part 372) for the purpose of evaluating the potential effects of the proposed action on the human environment (40 CFR § 1508.1(m)).

APHIS published the draft EA for the proposed BTM control program on March 29, 2022 at www.regulations.gov and on the APHIS website. A notice of availability was also published in the Niagara Gazette newspaper. The draft EA was available for a 30-day comment period. APHIS received two public comments on the draft EA. One comment was from the Canadian Food Inspection Agency (CFIA) and the other was from the Canadian Nursery Landscape Association. Both letters supported a control program for BTM and provided recommendations to APHIS based on experiences for addressing BTM in Canada. Both comment letters are available at regulations.gov for reference.

Both comment letters requested clarification on what plant hosts would be part of the preferred alternative. The proposed alternative regarding the removal of host plants and any chemical treatments applies only to *Buxus* spp. The federal order that APHIS issued on May 26, 2021 includes *Euonymus* spp. and *Ilex* spp. in addition to *Buxus* spp. *Euonymus* spp. and *Ilex* spp. are not considered preferred host plants for BTM reproduction, however BTM may be present on these species and there is a need to have them as part of the federal order to reduce the possibility of shipping BTM into BTM-free areas.

APHIS appreciates the comments from CFIA regarding the difficulty in removing *Buxus* spp. from private properties as part of the proposed control program. Host plant removal is one of the options available to APHIS to address BTM-infested *Buxus* spp. In addition to host plant removal, APHIS is also implementing survey, chemical treatments, and public outreach as part of an integrated approach to controlling BTM. In cases where landowners will not allow access for removal or chemical treatment of *Buxus* spp. APHIS will provide outreach regarding the threat of BTM and impacts to their host plants. APHIS recognizes that eradication is most likely not possible at this time but is proposing to control BTM and prevent further spread in New York State.

II. Alternatives

A. No Action Alternative

NEPA regulations require the scope of analysis to include a no action alternative in comparison to other reasonable courses of action. Under the no action alternative, APHIS would not participate in or fund the control of BTM in the state of New York. Other Federal or non-Federal entities, such as NYS AGM or property owners, could take control measures.

B. Slow-The-Spread Alternative

Under this alternative, APHIS would impose quarantine and conduct surveys with the goal of slowing the spread of BTM into other areas.

Quarantine

APHIS and NYS AGM use quarantines to prevent the spread of BTM into new areas. APHIS has the regulatory authority under the PPA to quarantine at the state level. NYS AGM has the regulatory authority (Title 1, Chapter 3, Subchapter C, Article 14) to quarantine within state boundaries. Currently, the NYS AGM has placed a quarantine on Erie, Niagara, and Orleans Counties (New York State Regulations 2022). The Program expands and contracts the quarantine boundary depending on where the BTM occurs. Under this quarantine, the movement of boxwood plants and other infested host species outside of the three counties is prohibited. This movement restriction will adjust according to the quarantine boundary. The Program sets the quarantine boundary to the county level due to the strong flight potential of the moth. Businesses within the quarantine boundary that sell or move boxwood are asked to enter and abide by a compliance agreement. Under the compliance agreement, the Program will trap and inspect host plants for BTM (all life stages) at nurseries and other locations selling the plants. At least two BTM traps (described below) are placed at the business location that is under a compliance agreement. All BTM host plants for sale inside the quarantine must be tagged with a red label stating that the material must remain within the quarantine boundary along with other program information. The Program will continue to monitor the movement of BTM host plants from businesses that refuse to enter a compliance agreement to ensure infested plants do not leave the quarantine boundary. Quarantine boundaries are removed when BTM has not been detected through survey for approximately 2-3 years; this variation in time depends on the number of BTM generations that occur in an area.

Survey
APHIS and NYS AGM survey areas where BTM host plants grow. This includes commercial nurseries, plant distribution and retail centers, and public and private/residential properties. APHIS and NYS AGM gain verbal or written permission from property owners/managers and residents prior to conducting surveys on their properties.

Trapping surveys occur when temperatures are greater than 51°F and adults are flying, typically between May and October. APHIS and NYS AGM conduct trapping surveys using plastic bucket traps (unitraps) containing a pheromone (5:1 (Z)-11-hexadecenal:(E)-11- hexadecenal) and an insecticidal strip containing dichlorvos (DDVP). Pheromone dispenser contains 0.000002 ounces (oz) of the pheromone compound and is loaded on a laminated pheromone dispenser. Surveyors place dispenser into a trap. Surveyors change or reload the pheromone dispensers with new pheromone every 1 to 2 weeks. The DDVP strips last between 8 and 12 weeks, depending on the location's climate. The pheromone is a natural chemical produced by the BTM and attracts adult moths to the trap. The DDVP strip kills moths that enter the trap. Surveyors place traps at least 66 feet apart, approximately 5 feet above the ground, and as close to hosts as possible. Surveyors also use visual detection looking for signs and symptoms of an infestation.

The delimiting survey, which could include both visual and trapping surveys, determines the extent of an infestation. The delimiting survey involves searching for infested hosts and adult moths within 6-12 miles of new detections. This survey identifies the outbreak area which is essential for planning, budget, policy, and operations. The delimitation boundary may or may not be within the quarantine boundary. The delimiting survey also helps APHIS and NYS AGM identify potentially impacted residents, businesses, and municipalities for public outreach. APHIS and NYS AGM may also survey locations outside the quarantine boundary and throughout northwest New York in areas considered higher risk by either agency.

C. Preferred Alternative – Control the Box Tree Moth

The Program is a joint effort between APHIS and NYS AGM. The Program involves quarantine and survey as described under Alternative B, and control actions, including host removal and pesticide treatments. In addition to the delimiting survey, the Program would conduct surveys of areas within the quarantine to identify infested boxwoods. All properties located inside the quarantine boundary are subject to control actions. The Program will require control action on boxwood plants when BTM is found at businesses that sell BTM host plants. The Program would request and require permission to perform control actions at other locations, such as residences or business lots. .

As mentioned, businesses within the quarantine boundary that sell or move BTM host plants are asked to enter and abide by a compliance agreement. Businesses that do not enter into a compliance agreement will still be monitored for BTM. Businesses that want to move or sell BTM host plants within the quarantine area must tag each plant with a red label stating that the plant cannot leave the quarantine area. Detection of larvae, pupae, and other signs of BTM will initiate control actions. This includes issuing a stop sale order or an emergency action notification. It also includes destroying all host material if BTM is found at the location. (see section "Host Removal" for additional details). The stop sale order can be rescinded after control actions are verified to be successful.

Host Removal

Host removal and destruction is a control action available to the Program. Host removal involves the full removal of the plant at the base of the plant nearest the ground or potting medium. Host removal and destruction of potted host material may include the pot and potting medium. The Program would remove all host plants from a BTM-infested property. The Program encourages property owners/managers and residents to voluntarily remove and destroy infested host plants. The removal and destruction of infested host plants destroys BTM's food source and egg sites, can destroy the eggs and larvae of the moth, breaks the moth's lifecycle, and reduces its population.

For nurseries with infested lots of plants, the Program recommends deep burial (under at least 2 meters (6.6 feet) of soil), chipping, or burning to dispose of removed plant material. All off-site disposal, chipping, and burning locations must be within the quarantine boundary. For deep burial, plants, including the pot and soil, are double bagged in plastic leak-proof bags and sealed and buried either onsite or at an approved landfill. Off-site transport of host material must be sealed in double bagged plastic leak-proof bags. For the off-site disposal of many plants, a plastic lined dumpster that can be sealed to appropriately prevent plant material from falling out and insects escaping may be used instead of double bagging. In the case of burning, the Program complies with local ordinances for guidelines and required documentation. The Program will consider alternative destruction options as needed and in accordance with APHIS-approved methods for destruction.

Pesticides

The Program proposes to use three pesticide formulations to treat the BTM larvae (caterpillars) on infested host plants: *Bacillus thuringiensis kurstaki* (Btk), chlorantraniliprole, and spinosad (Table 1). Pesticides for other life stages (eggs, pupae, and adults) are not available. Prior to making pesticide treatments to properties, the Program requires a single, one-time signed permission from the property owner/manager and/or resident for the first and future treatments. If no one is present during future applications, the Program would make the application and leave a door hanger with information about when the treatment occurred, and the pesticide used.

Property owners/managers and residents may opt to have all their BTM host plants (primarily boxwood) removed instead of receiving the pesticide treatment.

More than one pesticide application may be necessary, depending on the plant's level of infestation or the insect's population density in the area. BTM larvae are active from March through November. Applicators would make applications with ground equipment either in a backpack sprayer, or using a tractor/truck hose applicator, based on the use patterns described in the pesticide labels. The Program would survey the treatment area for approximately 2-3 years after the last treatment date using pheromone baited BTM traps and visual inspection to ensure that the treatment was effective, and the areas is BTM-free.

Table 1. Pesticides proposed for use in the box tree moth control program.

Product*	Formulation	Labelled uses
Acelepryn® EPA Registration Number 100-1489, June 13, 2019, Syngenta Crop Protection, LLC	Active ingredient: chlorantraniliprole 18.4% Other ingredients: 81.6%	Commercial ornamental plants grown in indoor and outdoor (both field grown and containerized plants) nurseries, greenhouses, shade houses, lath houses, hoop houses and retail nurseries. Outdoor landscape ornamentals in or around residential, commercial, recreational, and institutional properties.
Conserve® SC Turf and Ornamental EPA Reg. No. 62719-291, November 28, 2014, Dow AgroSciences LLC	Active ingredient: Spinosad (spinosyn A and spinosyn D) 11.6% Other ingredients: 88.4%	Fruit and vegetable crops, nut crops, row crops, grains and forage, trees, and flowers and ornamental in greenhouses or outdoors.
Javelin® WG EPA Reg. No. 70051-66, April 7, 2021, Certis USA LLC (Alternate brand names: Delfin®, Delfin® WG, Javelin® WG_6, Delfin® WG_6) FIFRA 2ee (NY Product # 0000252493)	Active ingredient: *Bacillus thuringiensis* subspecies *kurstaki* (Btk) strain SA-11, 85% Other ingredients: 15%	Fruit and vegetable crops, nut crops, row crops, grains and forage, trees, and flowers and ornamental in greenhouses or outdoors.

*Other products in the same chemical class and with the same use directions may be used in the program. Only products with the appropriate registration under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) will be used in the BTM control program.

Chlorantraniliprole (Chemical Abstract Service No. 500008-45-7) belongs to the anthranilic diamide chemical class. Acelepryn (18.4% chlorantraniliprole) is registered for use on ornamental plants commercially produced in indoor nurseries, greenhouses, outdoor nurseries (both field grown and containerized plants), shade houses, lath houses, hoop houses and retail nurseries. It is also registered for use on outdoor landscape ornamentals in or around residential, commercial, recreational, and institutional properties. For these registered uses, chlorantraniliprole is applied to control a range of pests including leaf-feeding caterpillars, beetle grubs, lace bugs, aphids, and leafminer. The label restricts applications to no more than 38.3 fluid ounces (equivalent to 0.5 pounds (lb) of active ingredient (a.i.)) per acre per year to plants produced or grown outdoors (field-grown or in containers). The foliar application rate to control leaf feeding caterpillars on commercial indoor and outdoor (field-grown and containerized ornamentals and ornamentals in the landscape is 2-16 fluid ounces (fl oz) per 100 gallons (0.026 - 0.208 lbs a.i. per 100 gallons). At the maximum application rate, approximately two applications could be made per year. On golf course greens, tee boxes and golf course fairways, the label imposes a 25 and 50-foot application buffer from water bodies, respectively. In New York, the label does not permit applications within 100 feet of a water body, which includes lakes, ponds, rivers, streams, wetlands, or drainage ditches. Program applicators would make foliar applications using ground equipment, including hand-wand and hand-gun sprayers, as specified on the label.

Javelin WG (85% *Bacillus thuringiensis subspecies kurstaki* (Btk) strain SA-11 (CAS No. 68038-71-1)) is a biological pesticide for the control of lepidopteran larvae, particularly the first and second instar stages. It is registered for use in organic production and is OMRI (Organic Materials Review Institute) certified. Btk is used on a wide range of fruit and vegetable crops, nut crops, row crops, grains and forage, trees, and flowers and ornamentals in greenhouses or outdoors. The formulation is labelled for aerial and ground application as well as through irrigation systems, but under the Program only ground applications (e.g., boom sprayers, hand/wand backpack sprayers, etc.) would occur. The labelled rate for ornamentals outdoors and in greenhouses is 0.25-1.50 lb. per 100 gallons of water. For Btk applications, the Program would time applications with the first and second instar stages. For heavy infestations, the Program would make a second application at least 5-10 days after the first application. Two to five BTM generations may occur per year, depending on climatic conditions (Wan et al. 2014) indicating the possibility the Program would need to reapply Btk within the same growing season. The label does not indicate a seasonal maximum pesticide load.

Conserve SC Turf and Ornamental (11.6% spinosad (spinosyn A and spinosyn D) (CAS No. 168316-95-8)) is registered for use on a wide range of fruit and vegetable crops, nut crops, tree farms, turf grass, and herbaceous and woody ornamentals to control a wide range of pests. For treatment of lepidopterous larvae on woody ornamentals growing outdoors, in nurseries or in greenhouses, the label rate is 6 fl oz/100 gallons (24 fl oz/acre). The maximum label rate is 22 fl oz per 100 gallons (88 fl oz per acre) on trees and ornamentals. Although the label permits both aerial and ground applications to ornamentals, applicators under the Program would use ground applications only. The Program would use ground applications through hand or power operated equipment such as a portable pump-up, backpack, or hydraulic. The minimum treatment interval for plants growing outside a greenhouse or structure is 7 days. Although there is not a seasonal maximum pesticide load indicated on the Conserve label, for lepidopterous pests, the label indicates to apply when larvae are small and actively feeding. The label indicates not to apply the formulation to blooming, pollen-shedding, nectar producing plant parts if bees may forage on the plant during this time.

D. Alternatives Considered but Dismissed

Biological control, or biocontrol, is the use of living organisms to control other living organisms. In the literature several insect species successfully parasitize BTM eggs, larvae, or pupae (USDA APHIS 2022). Similarly, laboratory studies found two entomopathogenic nematodes caused high mortality of BTM larvae. These entomopathogenic nematodes are not registered for use on BTM with the U.S. Environmental Protection Agency (USEPA). Because of a lack of USEPA registration, the Program does not propose to incorporate biocontrol in its control actions currently.

Cultural control is the modification of the environment to reduce the prevalence of pests and diseases. For the BTM, cultural control measure includes the removal of eggs and larvae by hand or through water-spraying. Manual removal is labor intensive and water spraying could damage plants. Although cultural control may be effective when only a few plants are lightly infested, it is not feasible for large plantings or widespread infestations. Because of this, the Program does not propose to include cultural control in its control actions.

III. Potential Environmental Consequences

The proposed program area includes 37 counties in New York, three of which currently are under quarantine (Erie, Niagara, and Orleans Counties) (New York State Regulations 2022). The primary host plant, boxwood, is a common landscape plant.

This section evaluates the potential environmental impacts associated with each of the alternatives. The no action alternative is compared to the potential of the slow-the-spread alternative and preferred alternative (control the BTM) to affect environmental quality, ecological resources, human health and safety, and the boxwood industry. The potential impacts may be direct, indirect, and of short or long duration. The impacts may also be either beneficial or adverse.

A. No Action Alternative

This section includes a short description of the environmental baseline for the environmental quality, ecological resources, human health and safety, and boxwood industry in the proposed program area. Impacts to the environmental baseline are discussed below under the no action alternative as well as to the other two alternatives considered in this final EA.

1. Environmental Quality

Environmental quality concerns air, water, and soil resources. Air pollutants in the Program area are primarily ozone (averaging less than one day per year in exceedance of acceptable ozone levels) and in a small portion of northern St. Lawrence County sulfur dioxide (NYS-DEC 2020). Causes of water impairment along the New York Great Lakes shoreline include polychlorinated biphenyls (PCBs), pesticides (Mirex), dioxin, pathogens, invasive species and phosphorous (USEPA 2014). General causes of impairment for rivers and streams in New York state include phosphorus, pathogens, fecal coliforms, pH, dissolved oxygen, pesticides, and sedimentation (USEPA 2014, NYS-DEC 2021). Agriculture, municipal discharges, urban runoff, streambank erosion, and atmospheric deposition are some of the top probable sources of river and stream impairment (USEPA 2014). Under the no action alternative, APHIS would not positively or negatively impact the air, water, and soil resources in the program area.

2. Ecological Resources

Ecological resources include plant and animal species and protected species as well as their habitats. Protected species refers to migratory birds protected under the Migratory Bird Treaty Act of 1918 (MBTA), as amended, bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA) and threatened and endangered species and their critical habitats as protected under the Endangered Species Act of 1973 (ESA), as amended.

The BTM is expected to damage and eventually cause mortality to boxwood and other host plants. The presence of the BTM would result in additional pesticide applications in residential properties, commercial and retail nurseries, and other areas as moth populations increase and spread. It’s difficult to quantify the potential increase in pesticide loading that would occur; however, APHIS anticipates pesticide applications would increase over the long term as moth populations increase and spread. In addition to increased pesticide loading, there is the potential for the use of pesticides that pose a higher comparative risk to human health and the environment than the three pesticides the Program proposes to use under the preferred alternative.

While other federal and non-federal entities may take control actions on their own, without APHIS participation, the BTM population would likely continue to increase and spread as people inadvertently move the moth through infested nursery stock and plant material. With limited state funding for BTM management, the moth could spread outside of its current range and expand to other areas of New York State and the United States. Since there are not any interstate regulations regarding quarantines or Federal restrictions for BTM infested areas, the moth is likely to spread under this alternative.

(1) Migratory Bird Treaty Act

Federal law prohibits an individual to pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess, offer for sale, sell, offer to purchase, purchase, deliver for shipment, ship, cause to be shipped, deliver for transportation, transport, cause to be transported, carry, or cause to be carried by any means whatever, receive for shipment, transportation or carriage, or export, at any time, or in any manner, any migratory bird or any part, nest, or egg of any such bird (16 U.S.C. §§ 703-712; 50 CFR § 21).

Flyways are the flight paths used by many birds while migrating between their breeding grounds and their overwintering sites. New York State is within the Atlantic Flyway for migratory birds. Under the no action alternative, APHIS will not improve habitat conditions for migratory birds, nor will it inadvertently disturb migratory birds.

(2) Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. § 668) prohibits the take of bald or golden eagles unless permitted by the U.S. Fish and Wildlife Service (USFWS). The term “take” is defined as “pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb” (50 CFR § 22.3). Disturb means to “agitate or bother to a degree that causes . . . injury . . . a decrease in its productivity . . . or nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior” (§ 22.3).

Most of New York State is designated as nonbreeding area for the bald eagle (*Haliaeetus leucocephalus*); there is a small location south of Lake Ontario where the bald eagle may reside year-round, but it is uncommon for the bald eagle to reside year-round in the state (Audubon 2022, The Cornell Lab 2022). New York State falls within the migration area for the golden eagle (*Aquila chrysaetos*), but not the breeding, non-breeding, or year-round range for the bird (The Cornell Lab 2022). The golden eagle is uncommon in the state (Audubon 2022).

APHIS conducted a literature review and did not find evidence of the BTM impacting bald eagles or golden eagles. Therefore, the no action alternative is unlikely to have any negative impacts on nesting bald and golden eagles, particularly since New York State is not within their breeding range.

(3) Endangered Species Act

Section 7 of the ESA and ESA’s implementing regulations require Federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally listed threatened and endangered (T&E) species or result in the destruction or adverse modification of critical habitat.

Federally listed species and species proposed for listing in the program area include mammal, bird, reptile, mussel, snail, insect, and plant species. The BTM's host range is mainly boxwood species (*Buxus* spp.) (USDA APHIS 2022). There are five T&E plant species in the proposed Program area; however, these plants are not known hosts of the BTM. The moth is not expected to harm directly other T&E species in the proposed Program area.

3. Human Health and Safety

The Program area encompasses several urban areas, including Buffalo, Rochester, and Syracuse, the second, third, and fifth largest cities in the state (US Census 2020).

Under the no action alternative, APHIS would not participate in the control of the BTM. Currently, the moth is found in Niagara County, including a residential property. Expansion of the moth to other areas could pose a threat to host plants growing on commercial, municipal, public, and residential properties as well as the commercial plant nurseries that grow/sell host plants. Commercial producers with the moth in their nursery crops may experience loss of market share, loss of property, increase in control costs, and compromised mental and physical health from increased stress. Homeowners and property managers would also experience damage and loss of landscape plants and could incur costs should they chose to treat the moth with commercially available products and replace damaged or dead plants.

As mentioned above, the presence of the BTM would result in additional pesticide applications in both residential, commercial, municipal, and other areas as moth populations increase and expand. In addition to increased pesticide loading there is the potential for the use of other pesticides that pose a higher comparative risk to human health and the environment than the three pesticides the Program proposes to use under the preferred alternative.

4. Boxwood Industry

The USDA National Agricultural Statistics Service (NASS) conducts a survey every five years that is designed to cover all operations from which $10,000 or more of horticultural products were produced and sold, or normally would have been sold, during the census-taking year. From this survey, in the United States, the value of boxwood sales in 2019 was $140.85 million (USDA NASS 2020). Hall et al. (2021) reviewed NASS data and found shifts occurred in the boxwood markets between 2009 and 2019. They observed the national boxwood market grew 23% from 2009-2014 and 11% from 2014-2019, showing a recent cooling in demand. Despite this, boxwood sales outpaced the growth of the entire nursery stock category reflecting the popularity of boxwood in the nursery marketplace. In New York, the value of boxwood sales in 2019 was $2.5 million (about 1.8 percent of total U.S. sales), with wholesale comprising most of the sales value at $1.98 million. In New York, the total number of operations was 57, with 27 wholesale operations and 40 retail sale operations. APHIS expects there are other commercial nurseries that grow and sell boxwood in New York that do not meet the minimum sales required to be part of the NASS survey.

BTM in commercial nursery production likely will require pesticide treatments to manage the moth. Pest management already occurs in nurseries; however, it is possible additional pesticide treatments or treatments with pesticides currently not used in an operation may be needed to manage the moth. This would be an expense to nursery businesses and a reduction in saleable inventory could occur. It is possible some nurseries may stop producing boxwood due to a moth infestation.

B. Slow-The-Spread Alternative

Under this alternative, the Program would impose quarantine and conduct surveys for BTM. These activities would slow the spread of the BTM into new areas through human-mediated movement but would not prevent its natural movement or control the insect.

1. Environmental Quality

Imposing quarantines for BTM under this alternative have no direct impact on environmental quality.

The Program expects negligible impacts to environmental quality from survey activities. Vehicle emissions associated with conducting surveys would be minor relative to the ongoing and future emissions from urbanization, highway traffic, and agricultural production. Future actions that could increase emissions (e.g., housing developments and road expansions leading to more traffic) are difficult to quantify because emissions from mobile sources are subject to changing fuel mileage and emissions standards and regulations. Nevertheless, the contribution from this slow-the-spread alternative would remain minor compared to the overall emissions in the Program area. Surveyors minimally disturb the soil as they walk to conduct visual inspections and service BTM traps; heavy machinery is not used during survey. These activities occur infrequently (trap service occurs every one-to-two weeks), and each occurs for short duration (averaging less than 30 minutes per site). Trap placement for detection usually occurs on previously disturbed properties, including plant nurseries, government and public lands, and residential properties with permission.

Although the traps used to detect BTM will be visible to the public, the Program does not expect the traps to be a significant visual disturbance. The Program places traps near host plants at an interval of approximately 66 feet. The Program traps during times adult BTM are present, which is usually between April through October. The traps contain a small amount of the pesticide DDVP (dichlorvos or 2,2-dichlorovinyl dimethyl phosphate). DDVP has a high vapor pressure, volatilizes to air, and dissipates rapidly through volatilization under field conditions (USEPA 2009). Some DDVP will volatize from the impregnated strips in the traps. DDVP has low persistence in the atmosphere (USEPA 2009). The use pattern of DDVP as a pesticide strip in traps and its rapid degradation in the atmosphere suggest that impacts to air quality are negligible. There is negligible impact to water resources from DDVP because of the Program's proposed use pattern and label instructions that indicate not to apply directly to water, to areas where surface water is present, or to intertidal areas (Plato Industries Incorporated 2013, Hercon Environmental 2016). Should a trap dislodge and fall into a waterbody, the small amount of DDVP in the strip and its rapid degradation through hydrolysis make significant impacts to surface water and groundwater unlikely (USEPA 2006). The use of DDVP strips in traps prevents them from contacting the soil. Should a trap dislodge, the strip will likely remain inside the trap and not fall out. Should the strip encounter soil, the small amount of DDVP in the strip and its rapid volatilization and degradation make significant impacts unlikely (USEPA 2006). APHIS disposes of traps with DDVP residue in accordance with label restrictions and addresses local variations in disposal. Residue levels in trap waste will be minimal because DDVP rapidly volatilizes and degrades, and traps contain a small quantity of DDVP. Little to no impacts to soil from disposal is anticipated.

2. Ecological Resources

Quarantine would have negligible impacts to ecological resources, other than slowing the spread of the BTM and the damage it causes to host plants.

The Program expects minimal impacts to ecological resources from survey activities. The placement and servicing of BTM traps may cause localized and temporary visual and sound disturbance but the Program does not expect this to be a significant impact to wildlife. The placing and servicing of traps may minimally impact vegetation from the inadvertent breakage of stems and branches during these activities.

The traps used during survey contain a small amount of the pesticide DDVP to kill adult BTM that enter the trap. In general, DDVP is moderately to highly toxic in oral, inhalation, or dermal acute exposures for vertebrates and invertebrates. In mammals, technical grade DDVP has high acute toxicity via dermal exposure and moderate acute toxicity from oral and inhalation exposures (USEPA 2006). DDVP is considered highly toxic to birds based on available acute oral toxicity data (Schafer et al. 1983, USEPA 2005b, Mohammad et al. 2008). DDVP is considered moderately to practically non-toxic to birds in subacute dietary exposures (WHO 1989, USEPA 2005b). DDVP is considered highly toxic to many terrestrial invertebrates due to its broad-spectrum activity. Toxicity to pollinators such as honey bees is high (WHO 1989, USEPA 2022). DDVP has also been shown to be highly toxic to butterflies and moths (USDA, APHIS, 2018).

There is a lack of significant exposure to non-target terrestrial vertebrates and invertebrates due to the formulation of DDVP and its use in traps in combination with a BTM lure. Removal of traps by a scavenging small mammal and subsequent exposure to DDVP has not been noted in previous trapping efforts in other APHIS domestic programs such as the exotic fruit fly and gypsy moth programs. In the case that a small mammal contacted a trap, it would be highly unlikely that it would consume the strip due to its fiber or paper composition. Any non-target terrestrial species exposure would be incidental and not expected to be significant for any group other than the target pest. Aquatic organisms are unlikely to be exposed to a toxic level of DDVP from Program uses based on the requirements for trap placement and the low amounts of DDVP in each trap. BTM traps are placed on boxwood plants or nearby shrubs and trees, not in waterbodies or where surface water is present, and not in intertidal areas below the mean high-water mark. Nevertheless, fish and aquatic invertebrates exhibit moderate to high toxicity to DDVP in acute and chronic exposure studies (Johnson and Finley 1980, WHO 1989, USEPA 2005b). The available DDVP toxicity data demonstrates a comparable range of sensitivities as with acute exposures in fish (Geng et al. 2005). There are four studies showing low toxicity of DDVP to most species of aquatic plants (USEPA 2005b, Yeh and Chen 2006). Information is not available regarding the effects of DDVP to terrestrial plants. Inhalation and dermal exposure would be low because DDVP is contained within the trap preventing significant exposure. The lack of exposure to terrestrial vertebrates suggests negligible risk to this group of organisms. Similarly, risk to aquatic vertebrates and invertebrates are expected to be negligible based on the use pattern for DDVP. Any non-target invertebrate exposure would be incidental and not expected to be significant for any group of terrestrial invertebrates other than the target pest.

3. Human Health and Safety

The compound 5:1 (Z)-11-hexadecnal:(E)-11-hexadecenal belongs to a group of compounds known as straight-chain lepidopteran pheromones (SCLP). Acute toxicity studies with this group of compounds have shown very low mammalian toxicity through multiple exposure routes. The lack of toxicity with these compounds has reduced data requirements for their registration by the USEPA (USEPA 2004). Sub-chronic and chronic studies are limited for this class of chemicals; however, given the low acute toxicity and pheromones occur naturally in the environment, human health risks are expected to be minimal. The reduced data requirements introduce uncertainty into potential long-term risks; however, the lack of significant exposure to the public (given its use in traps and the limited amount used in the proposed program) substantially reduces the potential for exposure and risk. Human health risks are expected to be minimal from using pheromone-baited traps in this program based on the long-term safety of SCLPs and the fact that it would be unlikely that humans would be exposed to the pheromone in the traps. The potential for exposure is most significant to workers who handle the concentrated product; however, following label requirements will minimize exposure.

APHIS evaluated the potential human health risks from the proposed use of the Hercon® Vaportape™ II DDVP and the Plato Industries Insecticide Strip formulations and determined that the risk to human health is negligible. The lack of risk to human health is based on the low probability of exposure to people. DDVP has high acute dermal toxicity, and moderate acute oral and inhalation toxicity to mammals. DDVP is a mild eye and skin irritant. The proposed use of DDVP-impregnated strips in traps, and adherence to label requirements, substantially reduces the potential for exposure to humans. Adverse health risks to workers are not expected based on the application method and low potential for exposure to DDVP when applied according to label directions, including PPE. Adverse health effects for a worker from accidental inhalation are not expected because both the assembly and placement of traps are outdoors. Adverse health risk for workers from accidental dermal exposure to a DDVP strip during trap assembly is not expected because risk estimates are below levels of concern. Risk estimates for a child (pre-teenager ages 10 to 12 years) from accidental dermal exposure to a DDVP strip are also below levels of concern.

4. Boxwood Industry

Quarantine would impact commercial and retail nurseries located within the quarantine boundary that grow or sell boxwood plants. These nurseries would not be allowed to move their BTM host plants outside of the quarantine boundary, limiting where they could sell these plants. These nurseries would likely experience some economic loss due to limitations imposed by quarantine.

The Program does not anticipate survey activities to impact BTM host plants or nurseries. The BTM traps are for detection purposes only and have no direct or indirect impacts to BTM host plants.

C. Preferred Alternative – Control the Box Tree Moth

This section considers the potential environmental consequences for the preferred alternative by summarizing information associated with environmental quality, ecological resources, human health and safety and the boxwood industry in the proposed program area. The specific location of a moth population is not likely to alter the type or frequency of any direct or indirect impacts. The preferred alternative includes the actions under the slow-the-spread alternative (described above) and adds pesticide treatments and host removal as control options.

1. Environmental Quality

The impacts of quarantine and survey to environmental quality are reviewed under the slow-the-spread alternative and are the same for this alternative.

Impact of Host Removal on Environmental Quality

The Program expects host removal to result in localized impacts to soil but does not expect host removal to contribute significantly to erosion and soil runoff into aquatic resources. Host removal will result in temporary soil surface disturbance or compaction. The most frequent types of ground disturbance would be from vehicles and Program personnel walking to conduct program actions and the removal of all host plants on a BTM-infested property. As reviewed above, vehicle emissions associated with getting to and from project sites and the use of machinery during host removal would be minor relative to the ongoing and future emissions.

Impact of Program Pesticides on Environmental Quality

The Program does not expect the three pesticides it proposes to use will impact air, soil and water quality because of the Program's use pattern and the pesticides' environmental fate. Below is a discussion of the pesticides' environmental fate properties, label requirements, and use patterns that influence exposure and risk to environmental quality.

(1) Btk

Btk is a naturally occurring bacterium that has selective insecticidal activity against certain butterflies and moths. *Bacillus* is a large group of bacteria that occurs naturally in soil, water, air, plants, and wildlife. After application, exposure to light, higher temperatures, and moisture decrease the amount of Btk remaining in the environment. Most studies regarding the environmental fate of Btk indicate that insects were only affected for approximately one week; however, other studies have shown that while persistence of Btk in the environment may decrease rapidly, the insecticidal activity can persist up to three months under certain environmental conditions (USDA APHIS 1995). Btk's persistence in water depends on organic matter content and salinity (USDA APHIS 1995). Btk has been found in aquatic field studies for up to 13 days, and in some studies up to four weeks, after application (USDA APHIS 1995). The Program does not anticipate aquatic exposure based on its proposed use pattern of using ground-based equipment to treat infested plants and potentially treat all host plants on a property.

Repeated use over years in an area could result in the accumulation of Btk spores in the soil, potentially above natural background levels in the soil (EFSA 2020). The Program does not expect an accumulation of Btk in soil because repeated use in one location over multiple years is not anticipated. Rather, the Program expects to make one or two treatments, 5-10 days apart to infested plants and host plants within two feet of infested plants. It's possible the Program would make additional applications as the BTM can have two to five generations within one year. The Program surveys treated areas for approximately 2-3 years to ensure the treatment was effective.

(2) Chlorantraniliprole

Chlorantraniliprole can be persistent in the environment. It is stable in aerobic soil. It is mobile in soil and the aqueous environment and can dissipate by leaching into groundwater and runoff to surface water. Chlorantraniliprole has a low vapor pressure and is unlikely to volatize to air (USEPA 2008, 2011a). Available data indicate that chlorantraniliprole residues do not persist on vegetation. Dissipation half-life values (DT_{50}) were typically less than 4 days on various crops (Malhat et al. 2012, Kar et al. 2013); but may persist for longer periods of time (DT_{50} = 17 days) on other crops (Szpyrka et al. 2017). A dislodgeable foliar residue study for chlorantraniliprole reported a maximum half-life of 30 days on foliage. The bioaccumulation for chlorantraniliprole is unlikely based on its low octanol/water partitioning coefficient (USEPA 2008). The product's label provides specifications that reduce environmental exposure. The label only permits 38.3 fluid ounces (equivalent to 0.5 pounds (lb) of active ingredient (a.i.)) per acre per year to plants produced indoors or outdoors in containers or grown outdoors. The label does not allow applications to water and advises having a vegetative buffer strip between treatment areas and surface waters. It also advises to avoid applications when rainfall is forecasted to occur within 48 hours.

(3) Spinosad

Spinosad persistence in the environment is variable in terrestrial and aquatic systems but in general is not persistent (USEPA 1998b, USDA APHIS 2014). Spinosad is not sensitive to hydrolysis but breaks down rapidly in water in the presence of light with reported photolytic half-lives of less than one day. The rapid photolytic breakdown of spinosad in laboratory studies has also been confirmed in microcosm studies (Cleveland et al. 2002). Degradation of spinosyn A and D in soil is rapid under aerobic conditions suggesting spinosad is susceptible to microbial degradation (Hale and Portwood 1996, USEPA 1998b). Spinosad also degrades quickly on plant surfaces with reported half-lives ranging from 2.0 to 11.7 days (CDPR 2002). Spinosad is not considered mobile based on the available soil adsorption (Koc) studies that have been conducted on a range of soil types (CDPR 2002, USEPA 2011b). Spinosad is not considered to be volatile based on the vapor pressure for both spinosyn A and D (Cleveland et al. 2002). The Conserve label does not allow application directly to water, to areas where surface water is present, or to the intertidal areas below the mean high water mark, reducing exposure potential of aquatic resources (Dow AgroSciences 2014).

2. Ecological Resources

The impacts of quarantine and survey to ecological resources are reviewed under the slow-the-spread alternative and are the same for this alternative.

Impacts of Host Removal on Ecological Resources

The removal of infested plants would disturb the soil, create sound pollution, and remove plants utilized by wildlife. Soil disturbance that occurs through host removal would impact soil-dwelling organisms associated with infested plants. The visual and sound disturbance during host removal would affect nearby wildlife, but the disturbance would be of short duration. The removal of infested plants removes habitat for wildlife (e.g., nesting birds, insects, etc.) and removes a potential food source. There are no known species, other than BTM, that use boxwood as a sole or primary source of food and the Program expects non-target species to find other plants for food and other habitat needs.

Impacts of Program Pesticides on Ecological Resources

Terrestrial vertebrate and invertebrate species on boxwood plants and other host plants during pesticide treatments would be exposed to the pesticide. Terrestrial vertebrate and invertebrate species exposed to the treated plants after treatment may also be exposed to the pesticide, depending on how soon contact happens.

The risk to terrestrial vertebrates is anticipated to be minimal based on the toxicity profiles for Btk, chlorantraniliprole, and spinosad and their proposed use pattern in the BTM control program. The Program expects direct and indirect effects to occur to some terrestrial invertebrates from pesticides during, as well as for a period after, application. Direct risk to nontarget organisms is defined as effects resulting from direct acute or chronic exposure to a pesticide. Indirect risk is defined as any impacts to prey items and vegetation that may serve as habitat or provide a food source for a group of organisms. The Program does not anticipate exposure to aquatic resources from the pesticides it proposes to use. The Program's use pattern and pesticide labels result in negligible residues in aquatic resources. Exposure potential is negligible to aquatic vertebrates and invertebrates.

Below is a discussion of potential impacts to ecological resources from the Program's use of Btk, chlorantraniliprole, and spinosad.

(1) Btk

The subspecies, *kurstaki*, is part of the *Bacillus thuringiensis* biopesticide group that has been registered for more than 45 years for a variety of agricultural and nonagricultural uses. Btk is widely used in agriculture, both conventional and organic, and as a transgene in genetically engineered crops to control pests on a variety of crops. Btk also has multiple nonagricultural uses. The specificity of Btk to certain insects is based on its mode of action which requires ingestion by lepidopteran larvae where, once in the midgut, the alkaline pH breaks down the crystalline proteins that produce the toxins which bind to the midgut cells in the larvae (Cooper 1994). The alkaline conditions and binding sites present in the midgut of lepidopteran larvae are not present in mammals and most other nontarget organisms.

Nontarget species (i.e., birds, mammals, amphibians, and reptiles) should not be affected by the proposed Btk treatments for this program. Available toxicity data for all terrestrial vertebrates indicate low toxicity (USEPA 1998a, WHO 1999, USDA FS 2004). Although no direct effects to birds and wild mammals are expected, there is the possibility of indirect effects through the loss of invertebrate prey items which may serve as a temporal input into their diet. Based on the available data, indirect effects have not been noted in studies with wild mammals (Innes and Bendell 1989, Belloco et al. 1992); however, one study reports indirect reproductive effects to birds that rely on caterpillars as a primary food source (USDA FS 2004). Slight effects on reproduction in spruce grouse (such as nestling growth rates) were seen when applications occurred over large, forested areas (Norton et al. 2001); nevertheless, in several other studies assessing impacts to a wide diversity of songbirds, no indirect effects on reproduction or other endpoints were noted (USDA FS 2004). Bird populations that may occur in these counties are not expected to be impacted by the loss of prey items. The potential treatment areas are relatively small compared to the foraging areas that birds may use. In addition, only some lepidopteran larvae will be impacted in the potential treatment areas, while other terrestrial insects will be available as prey items for birds.

Effects to most nontarget terrestrial invertebrates are not expected except for lepidopteran larvae, with early instars more sensitive than later instars. Impacts to some native lepidopteran larvae on treated plants may occur; however, the effects are minimized due to the expected small size of the treatment area which is infested plants and potentially all host plants on a property and the specificity of Btk to the larval stage of the insect. The proposed Btk applications are timed to coincide with the early larval stages of BTM, increasing the efficacy of treatments to BTM. Timing applications to coincide with the most sensitive life stage of BTM reduces the need for applications beyond the number proposed further reducing the risks to non-target Lepidoptera. Non-target Lepidoptera present in the treatment area as early larval stages may be impacted; however, there is variability in the sensitivity of moth and butterfly species to Btk (Peacock et al. 1998) so not all non-target lepidopteran species would be impacted. Btk is not effective against adult Lepidoptera and is less effective against later instar larvae therefore further reducing the risk to non-target Lepidoptera that may be present during treatment. Native Lepidoptera sensitive to Btk and present on plant hosts during treatment as early larval stages could be impacted; however, these impacts would be restricted to plants that receive treatment. There is one Federally listed T&E lepidopteran species in the Program area; however, boxwood is not listed as a host to this T&E species. The current label states no manual application can be made within 300 ft. of any threatened or endangered Lepidoptera (Certis USA LLC 2021). The short half-life of Btk and relatively small treatment areas suggest that risk to native Lepidoptera would be short term and that these areas would be recolonized quickly. Label requirements and other restrictions, where appropriate, will further reduce exposure risk to sensitive organisms.

In general, due to Btk's unique mode of action, toxicity to pollinators and beneficial insects are considered low based on laboratory and field studies testing honeybees, as well as other beneficial insects (USEPA 1998a, Sterk et al. 2002, USDA FS 2004, Bailey et al. 2005, Duan et al. 2008). Effects to honeybees are not expected based on the available published studies designed to evaluate short- and long-term effects from exposure to Btk or Bt-related proteins (USEPA 1998a, Sterk et al. 2002, Duan et al. 2008). These studies evaluated impacts to larval and adult honeybees from oral or contact exposures with no lethal or sublethal impacts noted at concentrations above those expected from the proposed use pattern for Btk in this program.

Btk is not expected to be of significant risk to aquatic resources in this program due to the low toxicity of Btk to aquatic organisms and the lack of significant exposure. Multiple freshwater and saltwater fish species were tested in the laboratory to determine what level of Btk exposure would result in any effect (Duan et al. 2008). The levels required to produce an effect were much higher than any potential off-site residues that would occur because of this program (USDA FS 2004). There have been laboratory studies supported by field data which suggest that exposure could result in some effects to aquatic invertebrates at environmental concentrations above expected values in this program (Kreutzweiser et al. 1992, Richardson and Perrin 1994, USDA FS 2004). However, studies showed that *Daphnia magna*, mayflies, stoneflies, copepods, and mysid shrimp were not affected when exposed to concentrations well above those expected in the environment after application of Btk (USDA FS 2004). Therefore, it is unlikely that fish and other aquatic organisms will be negatively impacted using Btk in the proposed BTM control program. In addition to the lack of effects to aquatic organisms from Btk exposure, the label does not allow application to water or where surface water is present which will reduce the potential for exposure and risk to aquatic resources.

(2) Chlorantraniliprole

Chlorantraniliprole is expected to have low acute and chronic toxicity to mammals and birds and no adverse short-term effects (USEPA 2012).

Available laboratory toxicity data for technical and formulated chlorantraniliprole suggests that the product is practically non-toxic to honeybees and bumble bees (*Bombus impatiens*) in acute oral or contact exposures (USEPA 2008, Gradish et al. 2010, EFSA 2013, Zhu et al. 2015). Chlorantraniliprole similarly had no observable toxicity to other invertebrates such as the hover fly *Episyrphus balteatus*, ladybird beetle larvae *Coccinella septempunctata*, green lacewing *Chrysoperla carnea*, the plant bug *Typhlodromus pyri*, and predatory mite *Orius laevigatus* (USEPA 2008, 2012). Chlorantraniliprole has low toxicity to most soil borne invertebrates. The lack of toxicity in other insect groups at rates that are toxic to the BTM is related to the activity of chlorantraniliprole, which is primarily through ingestion. Insects such Coleoptera and Lepidoptera would receive a larger dose from consuming treated plant material compared to many of the nontarget pests that have been evaluated. Impacts to sensitive terrestrial invertebrates that consume treated vegetation would be expected; however, at the highest labeled rate to control caterpillars on ornamental plants, the Program could make approximately two applications per year, per label maximum pesticide load limits. Additionally, chlorantraniliprole demonstrates low toxicity to plants (USEPA 2008).

Chlorantraniliprole toxicity to fish and amphibians is considered low based on available toxicity data that reports lethality occurring above solubility (USEPA 2012). Aquatic invertebrates are more sensitive to chlorantraniliprole in acute exposures compared to fish; acute and chronic toxicity is high for several test invertebrate species (USEPA 2012). Available aquatic plant toxicity data suggests low toxicity of chlorantraniliprole to freshwater and marine diatoms and algae, as well as aquatic macrophytes (USEPA 2008).

The proposed use pattern and aquatic label restrictions for BTM, and low toxicity to most nontarget aquatic organisms suggest that the acute and chronic risks of chlorantraniliprole to aquatic nontarget organism will be negligible. Label restriction in New York State do not permit applications within 100 feet of a water body, which includes lakes, ponds, rivers, streams, wetlands, or drainage ditches. Chlorantraniliprole does have a high potential for reaching surface water through runoff. Because of this, the label advises not to apply the product when rainfall is forecasted to occur within 48 hours further reducing the potential for exposure to aquatic nontarget organisms. Chlorantraniliprole applications directly to water are also prohibited.

(3) Spinosad

The Program does not anticipate harmful impacts to mammals, birds, and reptiles from spinosad applications, either through direct or indirect dermal, inhalation, and dietary routes of contact.

Insectivores may experience a decline in available insects to eat on treated plants but would have insects available nearby. The favorable toxicity profile for spinosad, its environmental fate, and the proposed use pattern in the BTM control program (ground-based applications to host material) indicate minimal risk to fish and wildlife. There is some risk to certain terrestrial invertebrates that are located on host plants during spinosad application or come in contact with treated plants, particularly until the spinosad application dries.

The acute and chronic toxicity of spinosad to wild mammals is expected to be low from oral, dermal and inhalation exposures based on the available data (USEPA 1998b, 2005a, 2011b). Spinosad is slightly toxic to birds on an acute oral basis and practically nontoxic on a subacute dietary basis (USEPA 2011b). No reptile toxicity data appears to be available for spinosad. USEPA's Office of Pesticide Programs uses the effects data for birds to represent sensitivity to reptiles. There is uncertainty in this assumption; however, based on the low toxicity of spinosad to birds and mammals, as well as aquatic vertebrates, toxicity to reptiles would also be expected to be low.

Spinosad toxicity to terrestrial invertebrates is variable based on the available toxicity data for pests, pollinators, and biocontrol agents (USDA APHIS 2014). Lepidoptera appear to be less sensitive to spinosad compared to pollinators, such as honeybees and bumblebees. For example, contact toxicity of fourth instar *Spodoptera littoralis* larvae to spinosad is reported as 4.74 micrograms (µg)/gram (g), which is lower than the 0.029 µg/g reported for the honeybee (Pineda et al. 2007). Honeybees and other native bees appear to be one of the more sensitive terrestrial invertebrates to spinosad (USEPA 2016a). Contact toxicity to spinosad decreases rapidly after applications are allowed to dry. Laboratory, greenhouse, and field studies have demonstrated that spinosad is nontoxic to bees 3 hours after application (Mayes et al. 2003). Studies using honeybees and bumblebees exposed to spinosad residues on alfalfa, strawberries, almonds, citrus, and kiwifruit have documented a lack of impacts to pollinators when applications are made when bees are not active, and after residues have weathered. The Conserve SC label does not allow applications to occur to blooming, pollen shedding, or nectar-producing parts of plants if bees may forage on the plants during this time (Dow AgroSciences 2014). In general, the common boxwood blooms from April to May, which overlaps with the timing of the first and possibly the second generations of the BTM (timing varies based on local climate) (USDA APHIS 2022).

The Program does not expect spinosad application to damage plants. No terrestrial phytotoxicity has been noted using spinosad at rates up to 0.18 pounds (lb) active ingredient (ai)/acre (ac) (USEPA 1998b, 2016a).

Spinosad has moderate acute toxicity to freshwater (bluegill sunfish) and estuarine fish (sheepshead minnow) based on the available toxicity data (USEPA 2011b). Spinosad has variable toxicity to aquatic invertebrates. Mosquito species, such as *Culex pipiens, Aedes aegypti*, and *A. albimanus* appear to be the most sensitive aquatic invertebrate taxa to spinosad, while the cladoceran *D. magna* was the least sensitive (USEPA 1998b, Bond et al. 2004). Spinosad has high acute toxicity in mollusks (USEPA 2011b). The label indicates spinosad is toxic to aquatic invertebrates and does not allow application directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark (Dow AgroSciences 2014). The Program follows additional buffer mitigations to protect certain aquatic T&E species (see below).

<u>*Impacts to Protected Species*</u>

(4) Migratory Bird Treaty Act

While BTM control activities may temporarily disturb migratory birds, APHIS expects this disturbance to be localized and of short duration. Some examples of anticipated disturbance associated with program activities includes the use of vehicles and human noise.

To minimize impacts to migratory birds, The Program will conduct as many activities as possible outside of the nesting season. However, the Program expects that some activities will take place during migratory bird breeding. For example, BTM larvae from the first generation emerge in Spring and pesticide treatments occur during the early instar stages. This could coincide with the nesting period for some migratory birds. In some instances, it may be possible to establish a buffer zone around ground-nesting breeding birds until nestlings have fledged or breeding behaviors are no longer observed. State agencies also may establish site-specific migratory bird conservation measures, as needed, prior to beginning any program activities. Commercial nurseries and landscaped areas are the affected environment in the BTM response program. These are typically highly managed areas and not conducive to migratory bird nesting.

(5) Bald and Golden Eagle Protection Act

If bald or golden eagles were discovered near a program area, the State agency responsible for the area would contact the USFWS and implement recommendations to avoid disturbance at nest sites. For bald eagles, APHIS would follow guidance as provided in the National Bald Eagle Management Guidelines (USDOI USFWS 2007). These guidelines include a 330 to 660-foot buffer from an active nest, depending on the visibility and level of activity near the nest. APHIS expects pesticide exposure to terrestrial and aquatic nontarget organisms to be negligible, and subsequently, the direct and indirect risks to eagles is very low. APHIS expects disturbance from other activities such as survey or accessing treatment sites will be of short duration and have negligible impacts to eagles. Proposed use sites are in commercial nurseries and landscaped areas that are not where eagles forage or nest.

(6) Endangered Species Act

Section 7 of the ESA and ESA's implementing regulations require Federal agencies to ensure their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of critical habitat. APHIS has considered the impacts of the proposed program regarding listed species in the proposed Program area.

The BTM is not known to feed on or use T&E plant species for any of its life stages. Program activities potentially could adversely affect listed species and their habitats. Possible adverse effects include toxicity of program pesticides to listed animal and plant species and trampling of listed plants during survey and treatment activities.

APHIS implements pesticide label requirements for buffers from water resources. The Program will also implement additional conservation measures to protect the bog turtle, *Clemmys muhlenbergii*; eastern massasauga rattlesnake, *Sistrurus catenatus*; clubshell mussel, *Pleurobema clava*; dwarf wedgemussel, *Alasmidonta heterodon*; northern riffleshell mussel, *Epioblasma torulosa rangiana*; rayed bean mussel, *Villosa fabalis*; longsolid mussel, *Fusconaia subrotunda*; and bog buck moth, *Hemileuca maia menyanthevora*.

APHIS submitted a biological assessment (BA) to the USFWS on January 10, 2022, requesting concurrence with its determinations that the BTM program may affect but is not likely to adversely affect these species with the implementation of the conservation measures. APHIS submitted an updated BA on May 23, 2022 after the USFWS provided additional conservation measure recommendations.

Contact and coordination between USFWS and treatment applicants would not be required for pesticide treatments occurring outside of habitats where listed species occur. These areas may include, but are not limited to residential gardens, urban areas, and other highly managed areas such as industrial sites, farmsteads, parking areas, parks, etc. If treatments occur in habitats where listed species may occur, then the Program will coordinate with USFWS personnel to ensure treatments do not affect listed species or critical habitats that are present in or near the treatment area. This process would only apply to listed species identified in the BA.

3. Human Health and Safety

The Program applies pesticides in a way that minimizes significant exposure to soil, water, and air. The risk to human health from the use of the three proposed pesticides in the Program is anticipated to be very low when used according to the Program's proposed use pattern. Exposure will be low to the public based on the proposed use pattern for each pesticide and lack of significant exposure. Significant dietary risk is not anticipated since no applications will be made to crops or host plants that would be consumed by people. Drinking water sources are also not anticipated to be impacted based on the proposed use pattern for each pesticide, label requirements to protect water resources, and favorable environmental fate data for most Program pesticides. Applicators are at the greatest risk of exposure to BTM pesticides; however, these risks are reduced by adhering to label requirements including the use of appropriate personal protective equipment (PPE). Program personnel and contractors are required to comply with all

USEPA use requirements and meet all recommendations for PPE during pesticide application. Adherence to label requirements and additional program measures designed to reduce exposure to workers (e.g., PPE requirements include long-sleeved shirt and long pants and shoes plus socks) and the public (e.g., mitigations to protect water sources and to limit spray drift, and restricted-entry intervals) result in low health risk to all human population segments from program use of pesticides. APHIS does not anticipate the pesticide formulations proposed for use in this program would persist in the environment or bioaccumulate.

(1) Btk

The impacts to human health from applications of Btk under the preferred alternative do not differ from those described in previous NEPA documents proposing the use of Btk to control the invasive gypsy moth (USDA APHIS 1995, USDA 2012). When the label is followed APHIS expects the human health risks to be minimal from Btk applications based on its long-term safety demonstrated through laboratory and monitoring studies (Noble et al. 1992, Aer'Aqua Medicine Ltd 2001, Siegel 2001, Pearce et al. 2002, Parks Canada 2003, USDA FS 2004, Otvos et al. 2005). Btk has low acute mammalian oral, dermal, and inhalation toxicity and pathogenicity (McClintock et al. 1995, World Health 1995, USEPA 1998a, Siegel. 2001, USDA 2004). The European Food Safety Authority (Alvarez et al. 2021) reports observations of allergenicity, indicated through increased immunoglobulin E (IgE) levels, in greenhouse workers exposed to products containing Btk; however, there were no effects on the occurrence of respiratory symptoms or lung function. Concerns have been raised regarding the pathogenicity of Btk and the production of enterotoxins (which are summarized in a publication from an anti-spray advocacy group) (Ginsberg 2006). Btk belongs to a group of bacteria within the *Bacillus* genus, including *Bacillus cereus*, linked to foodborne illness incidents via the production of enterotoxins which can cause gastrointestinal symptoms, such as diarrhea. The Centers for Disease Control report that *B. cereus* is responsible for approximately 0.6 percent of the total number of foodborne illness cases reported between 1988 and 1992, as well as between 1998 and 2002 (USEPA 1998a, CDC 2006). Btk has been shown to produce low levels of enterotoxin in cultures; however, no reported foodborne illness cases have been affirmatively linked to Btk biopesticides in more than 45 years of extensive use. Several biopesticide strains, including those found in Foray 48B and Foray XG (ABTS-351), exhibit mid-level enterotoxicity (Johler et al. 2018). Despite the presence of enterotoxins, the human health hazard potential for Btk strains such as SA-11, is low. The lack of pathogenicity may be related to the relatively low levels of an enterotoxin produced in Btk compared to *B. cereus* (Damgaard 1995), or the enterotoxins are not typically present in commercial formulations that are produced in North America. Siegel (2001) reported that enterotoxins may be degraded during the fermentation process or that the isolates used may not produce enterotoxins under conditions of fermentation. In addition, impacts of *B. cereus* enterotoxin are only realized in cases where the enterotoxin can multiply under appropriate conditions; this does not appear to occur for Btk in the environment. This is supported by a lack of gastrointestinal symptoms linked to Btk applications by workers or the public and laboratory studies that report no enterotoxin production in rats orally dosed with Btk or associated symptoms (USEPA 1998b, 2004, Wilcks A. 2006). The lack of reported gastrointestinal symptoms associated with Btk use in workers and the general public, as well as a lack of effects observed in laboratory studies, indicate that factors other than the presence of enterotoxin are required to cause symptoms similar to those in *B. cereus* (Federici and Siegel 2007). Immune response and infectivity data for Btk and results from surveillance studies suggest that immune-related adverse effects in the general public are unlikely (USDA FS 2004, Federici and Siegel 2007). Several epidemiology studies have been published based on surveillance data from large-scale Btk applications for gypsy moth control in populated areas in the United States, Canada, and New Zealand. These studies are summarized in several publications and indicate that no significant adverse effects were reported in the general population, including sensitive subgroups, such as children or people with asthma (Noble MA 1992, Aer'Aqua 2001, Siegel. 2001, Pearce MB 2002, Canada 2003, USDA 2004, Otvos I 2005).

Proposed applications of Btk in this program pose a minimal risk to the general population, based on a large amount of available toxicity data, surveillance data, and long-term use without significant reports of adverse effects. Glare and O'Callaghan (2000) provide a comprehensive review of B. *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." The World Health Organization's (WHO) Environmental Health Report states, "Bt products can be used safely for the control of insect pests of agricultural and horticultural crops as well as forests" (WHO 1999). Applicators who handle concentrated material may experience mild irritation of the eyes, skin, and respiratory tract. However, the risk to applicators is minimal when following label restrictions including the use of appropriate PPE.

(2) Chlorantraniliprole

Chlorantraniliprole is an anthranilic diamide insecticide that belongs to a class of compounds that acts on the ryanodine receptor. Ryanodine receptors (RyR) are ion channels that are responsible for the release of Ca (2+) from the sarco/endoplasmic reticulum which is in muscle and non-muscle cells (Van Petegem 2012). Ryanodine receptor modulating pesticides such as chlorantraniliprole were developed to control lepidopteran pests and insects primarily by disrupting normal muscle contraction pathways, leading to paralysis and eventual death. Chlorantraniliprole is highly selective to insect RyR compared to mammalian RyR, resulting in significantly reduced toxicity to mammals, including humans.

Chlorantraniliprole is not acutely toxic via the oral or inhalation routes of exposure. Chlorantraniliprole is not an eye or skin irritant and does not cause skin sensitization (USEPA 2020). Based on the results of short-term and acute dermal studies, chlorantraniliprole has relatively low dermal toxicity. Chlorantraniliprole has not been observed to be acutely genotoxic, neurotoxic, immunotoxic, carcinogenic, or developmentally toxic in mammalian animal studies. Chlorantraniliprole has not been observed to exhibit pre-or post-natal toxicity as there were no maternal or fetal effects in studies conducted in rats and rabbits. One chronic toxicity animal study (18-month carcinogenicity study in mice) produced adverse effects following chlorantraniliprole exposure at a dose of 935 milligrams (mg)/kilogram (kg)-body weight (bw)/day (USEPA 2020).

Chlorantraniliprole metabolism was studied extensively in rats, mice, and dogs. In rats, absorption of chlorantraniliprole was rapid, with peak concentrations occurring at 5-12 hours after low or high (10 or 200 mg/kg) oral single-dose administration. After a single dose, the plasma elimination half-lives ranged from 41 hours in males to 79 hours in female rats (USEPA 2020).

No acute dietary toxicity endpoint has been identified for chlorantraniliprole due to its low toxicity; therefore, an acute toxicity assessment by the USEPA has not been published. The results of the chronic analysis indicate that chronic dietary (food and drinking water) exposure and risk are not of concern. Chlorantraniliprole is classified as "not likely to be carcinogenic to humans;" therefore, an aggregate dietary assessment was neither required nor conducted by the USEPA (USEPA 2020).

Workers in the program are the most likely human population segment to be exposed to chlorantraniliprole. Short-term occupational exposure to chlorantraniliprole may occur through direct contact during application (mixing, loading, applying, and post-application activities). However, direct contact exposure is minimized by adherence to the label-required safety procedures and the proper use of PPE. Exposure to chlorantraniliprole through drift from ground spray applications is expected to be minimal. Only protected handlers may be allowed in the area during application, and workers are not permitted entry into treated areas during the 4-hour restricted-entry interval (REI).

Chlorantraniliprole exposure to the general public is not expected from program use based on label requirements and adherence to label and program standard operating procedures that prevent potential exposure. Only protected handlers may be in the area during application, and entry of the general public into the treated area is not allowed during the REI period. When treating golf course greens/tee boxes or fairways chlorantraniliprole should not be applied within 25 or 50 feet respectively of a water body (lake, pond, river, stream, wetland, or drainage ditch). Otherwise, chlorantraniliprole should not be applied within 100 feet of a water body (lake, pond, river, stream, wetland, or drainage ditch). The Program also notifies residents within treatment areas, or their designated representatives, prior to proposed operations to reduce the potential for incidental exposure. Label restrictions and program standard operating procedures reduce the potential exposure to chlorantraniliprole through direct contact with the general public, suggesting a lack of a significant exposure pathway. Chlorantraniliprole has environmental fate properties that suggest a potential for transport to surface and groundwater, especially in areas where soils are permeable or poorly drained, and the water table is shallow (DuPont 2014). However, the potential exposure of the general public to chlorantraniliprole from drinking water sources from program use is not expected based on adherence to the label requirements and proposed uses pattern for BTM. The lack of significant exposure to people, including applicators, and favorable mammalian toxicity profile suggests that the risks of chlorantraniliprole to human health will be negligible.

(3) Spinosad

The spinosad formulation proposed for use in the BTM program is Conserve SC Turf, and Ornamental that contains 11.6% Spinosyn A and D. Spinosad consists of spinosyn A and spinosyn D (A:D of 85:15), a fermentation product of *Saccharopolyspora spinosa* (Dow AgroSciences 2014).

Technical spinosad is classified as having low acute toxicity via the oral, dermal, and inhalation routes of exposure (Toxicity Category III or IV). Spinosad is not an eye or dermal irritant, nor has it been observed to be a neurological or immune toxicant. No hazard was identified for dermal exposure, so a quantitative dermal assessment by the USEPA was not conducted. No maternal or developmental effects were seen in rat or rabbit developmental studies. In the rat reproduction toxicity studies, offspring and parental toxicity were observed at the same doses (USEPA 2016b). Spinosad is not considered mutagenic, carcinogenic or immunotoxic based on available mammalian toxicity data ((USEPA 2021). The USEPA determined that the toxicity database for spinetoram (spinosad) is adequate for the Food Quality and Protection Act's additional safety factor consideration. Due to the lack of evidence of neurotoxicity or pre/postnatal susceptibility, the USEPA determined that no additional safety factors were needed to protect infants and children from incidental residential exposure.

USEPA assessed a "worst-case" residential exposure scenario as: (1) adult residential handler (inhalation exposure from applications to lawns and turf) and (2) child (1-2 years old, hand-to-mouth exposures from post-application exposure to turf). USEPA determined that these exposure scenarios were not of concern (USEPA 2016b). The exposure scenarios that USEPA evaluated would result in higher exposure than those that would be anticipated from the proposed BTM applications because of differences in use patterns. Risk would be even lower for the proposed BTM uses under these two worse case scenarios. The REI based on the acute toxicity categories and post-application assessment for spinosad, the Worker Protection Standard REI is 4-hours.

Based on the environmental fate, proposed application, label use restrictions, and toxicological profile of spinosad, human health risks associated with exposure are negligible. Occupation exposure risks can be further minimized by strict adherence to the label and required PPE.

4. Boxwood Industry

The impacts of quarantine and survey to boxwood production are reviewed under the slow-the-spread alternative and are the same for this alternative. In addition to the economic impacts described under the slow-the-spread alternative, nurseries would experience additional costs related to insecticide treatments.

The Program anticipates customers located within the quarantine boundary may experience a localized shortage of boxwood plants available for purchase and they may opt for alternative broadleaf evergreen shrubs to plant.

D. Other Considerations

1. Cumulative Impacts

Spinosad, chlorantraniliprole, and Btk have other labeled food and non-food uses. DDVP is used as a toxicant in other types of insect traps, including gypsy moth, spruce budworm, and forest tent caterpillar traps. Cumulatively, there would be an increase in spinosad, chlorantraniliprole, Btk, and DDVP use in relation to the BTM control program and non-APHIS uses; however, the effects to human health and the environment are expected to be incrementally negligible. Commercial nurseries and landscaped areas where BTM pesticide treatments may occur are disturbed areas that are highly managed. The additional activities proposed for BTM (survey and potential insecticide treatments) in these areas are not anticipated to result in significant cumulative impacts. In New York state, Btk is used to control gypsy moth (*Lymantria dispar dispar*) and DDVP may be used in gypsy moth traps. The European cherry fruit fly program uses spinosad for treatments in cherry orchards, but these use sites are different from the BTM control program and the Program does not expect overlap in exposures. APHIS has no other programs in the state of New York that use chlorantraniliprole, Btk, spinosad or DDVP. From a human health perspective, repeated exposure of these pesticides to workers would not be expected to result in significant cumulative effects due to the use of PPE and adherence to pesticide labels. Cumulative effects to the general population are also not anticipated since the likelihood of exposure is very low in this program because applications are made to non-food items and there is a very low likelihood of any residues in drinking water. A lack of cumulative effects would also be anticipated as it relates to other chemicals since the risk to workers and the general population is very low from the proposed use of these pesticides in the program.

Cumulative impacts from spinosad, chlorantraniliprole, Btk, and DDVP to aquatic and terrestrial nontarget organisms are expected to be negligible. The Program's proposed use pattern for these pesticides is not expected to result in significant risk to nontarget terrestrial vertebrates from direct effects or through impacts to available prey or habitat. The lack of significant ecological risk from the use of pesticides in this program would suggest that significant cumulative effects to nontarget organisms from other stressors would be incrementally minor.

Water quality data in the United States, including areas where BTM program activities may occur, show pesticide mixtures to be a common occurrence in surface water with varying impacts to aquatic organisms (Stone et al. 2014, USEPA 2014). Some of these bodies of water may be listed impaired under Section 303(d) of the Clean Water Act due to pesticides, or some another abiotic or biotic stressor (NYS-DEC 2021). The impact to water bodies from any pesticide residues that could occur from use in the BTM control program is expected to be incrementally negligible to water bodies that may already be impacted by other contaminants. The proposed method of application of Program pesticides mitigates any impacts from drift and makes runoff unlikely so that any residues that could potentially occur in water would not be expected to result in impacts to aquatic biota. The impacts of potential mixtures at any concentration are an area of uncertainty due to the large number of potential types of chemical mixtures that could occur, and the spatial and temporal variability in their occurrence. The low potential for risk to aquatic biota from Program applications suggests that mixture toxicity would not result in significant cumulative effects.

2. Executive Order 12898—Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations and Executive Order 13985—Advancing Racial Equity and Support for Underserved Communities through the Federal Government

Executive Order (EO) 12898 focuses Federal attention on the environmental and human health conditions of minority and low-income communities and promotes community access to public information and public participation in matters relating to human health and the environment. This EO requires Federal agencies to conduct their programs, policies, and activities that substantially affect human health or the environment in a manner so as not to exclude persons and populations from participation in or benefiting from such programs. It also enforces existing statutes to prevent minority and low-income communities from being subjected to disproportionately high or adverse human health or environmental effects. EO 13985 "advances equity for all, including people of color and others who have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality". It instructs Agencies "to assess whether, and to what extent, its programs and policies perpetuate systemic barriers to opportunities and benefits for people of color and other underserved groups".

The BTM has a limited host range, with boxwood being its primary host. Under the no action alternative, APHIS would not participate in control efforts and therefore would not pose affects on minority populations and low-income populations nor adversely affect underserved communities affected by persistent poverty and inequality.

Under the slow-the-spread alternative, the Program would impose quarantine which restricts the movement of BTM host plants outside of quarantine areas. The Program would also conduct surveys of public and private properties for the BTM. The Program expects commercial growers of BTM host plants located within the quarantine area to experience some economic impacts from quarantine restrictions. Property managers/owners may opt to change their plant selections to non-host plants. The Program does not expect quarantine or survey to disproportionally affect minority populations and low-income populations nor adversely affect underserved communities affected by persistent poverty and inequality. Quarantine and survey are driven by detections of BTM and presence of boxwood in an area regardless of income level. Areas where survey will occur includes commercial nurseries, plant distribution and retail centers, and public and private/residential properties. APHIS and NYS AGM gain verbal or written permission from property owners/managers and residents prior to conducting surveys on their properties.

Under the preferred alternative, the control efforts involve quarantine and survey as well as pesticide applications and host removal. Before the Program treats an area or removes host plants, it notifies property owners before it treats or removes plants. The notification process and information provided by the Program regarding reducing exposure to treatments will ensure that human health exposure and risk will be minimized, including minority and low-income populations and underserved communities. Based on the analysis of available toxicity data and the potential for exposure, the human health and environmental risk from the proposed applications are minimal and are not expected to have disproportionate adverse effects to any minority or low-income family. The Program anticipates host removal to cause visual landscape impacts and possibly financial costs should property managers/owners choose the replace plants with non-host species. The Program's goal is the control of the BTM and this involves working with local communities to inform them about the moth and its impact and the approach the Program uses to control the moth.

3. Executive Order 13045—Protection of Children from Environmental Health Risks and Safety Risks

This EO acknowledges that children, as compared to adults, may suffer disproportionately from environmental health and safety risks because of developmental stage, greater metabolic activity levels, and behavior patterns. This EO (to the extent permitted by law and consistent with the agency's mission) requires each Federal agency to identify, assess, and address environmental health risks and safety risks that may disproportionately affect children.

Under the no action alternative, APHIS would not participate in the moth's control and therefore would not take actions that would cause disproportionate affects to children.

Under the slow-the spread alternative, the Program would impose quarantine and conduct surveys for the BTM. The Program does not expect these activities would disproportionately affect children.

Under the preferred alternative, the pesticides proposed for use will not be used on food items and aquatic exposure is not expected, therefore no dietary exposure is expected. Notification to homeowners and residents on when applications occur will reduce exposure to children. Therefore, no disproportionate risks to children are anticipated from the use of pesticide formulations to control the BTM. The Program does not expect host removal to have any impacts to children.

4. Historical and Cultural Resources

EO 13175—*Consultation and Coordination with Indian Tribal Governments*, calls for agency communication and collaboration with Tribal officials for proposed Federal actions with potential Tribal implications. The Archaeological Resources Protection Act of 1979 (16 U.S.C. §§ 470aa-mm), secures the protection of archaeological resources and sites on public and Tribal lands. The Program is contacting the Tuscarora and Tonawanda Band of Seneca Nations. APHIS will contact the tribes to initiate a dialogue regarding proposed activities to control the BTM if the range of the moth expands into or near tribal property. If APHIS discovers any archaeological Tribal resources, it will notify the appropriate individuals.

The National Historic Preservation Act of 1966, as amended (16 United States Code (U.S.C.) §§ 470 et seq.), requires Federal agencies to consider the potential for impact to properties included in, or eligible for inclusion in the National Register of Historic Places (36 C.F.R. §§ 63 and 800) through consultation with interested parties where a proposed action may occur. This includes districts, buildings, structures, sites, and landscapes. The no action alternative and slow-the-spread alternative do not pose adverse effects to these resources.

APHIS has considered potential impacts of the preferred alternative under Section 106 of the National Historic Preservation Act. Section 106 requires federal agencies to consider the impacts of their actions on historic properties. Approximately 2,696 historic properties within the Program area are listed on the National Register of Historic Places, with many of these sites being structures (DOI NPS 2022). In Niagara County, where the BTM currently occurs, there are 94 historic properties. Based on the criteria defined in Section 106 of what constitutes an adverse effect, the proposed program will not harm buildings, structures, or objects listed. The Program applies pesticides to host plants, not to buildings or structures. Other Program actions (e.g., survey, removal of infested host material) will not directly affect buildings. The use of pesticides on historic properties may temporarily alter public accessibility to accommodate the pesticide's drying time. The Program will coordinate treatment times to minimize this potential impact. The removal of existing host plants from listed historic properties may alter the landscape appearance. The New York State Historic Preservation Officer (SHPO) or property manager for the historic site may opt to treat infested plants as opposed to host removal. Prior to implementing BTM control at a historic site, program personnel will contact the SHPO and appropriate officials.

IV. Listing of Agencies Consulted

Environmental and Risk Analysis Services
Policy and Program Development
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road, Unit 149
Riverdale, MD 20737

Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
4700 River Road
Riverdale, MD 20737

State Plant Health Director
Plant Protection and Quarantine
Animal and Plant Health Inspection Service
U.S. Department of Agriculture
500 New Karner Road, 2nd Floor
Albany, NY 12205

U.S. Fish and Wildlife Service
New York Field Office
3817 Luker Road
Cortland, NY 13045
Email: FW5ES_NYFO@fws.gov

New York State Department of Agriculture and Markets
10B Airline Drive
Albany, NY 12235

New York State Historic Preservation Office
OPRHP
P.O. Box 189
Waterford, NY 12188

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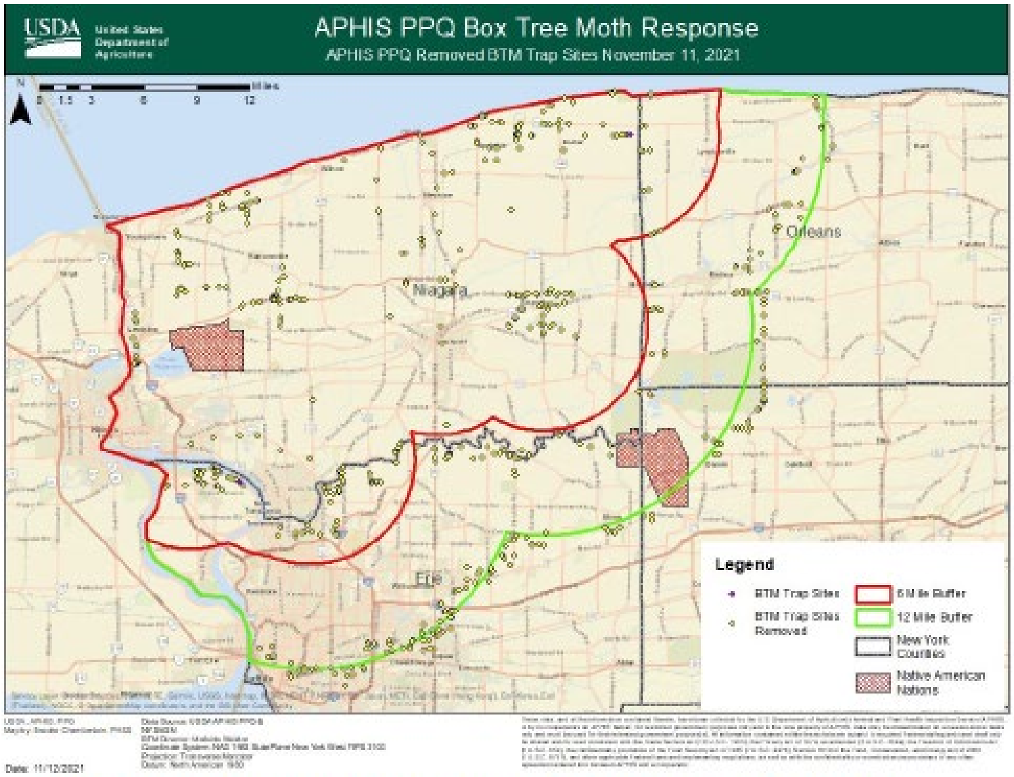
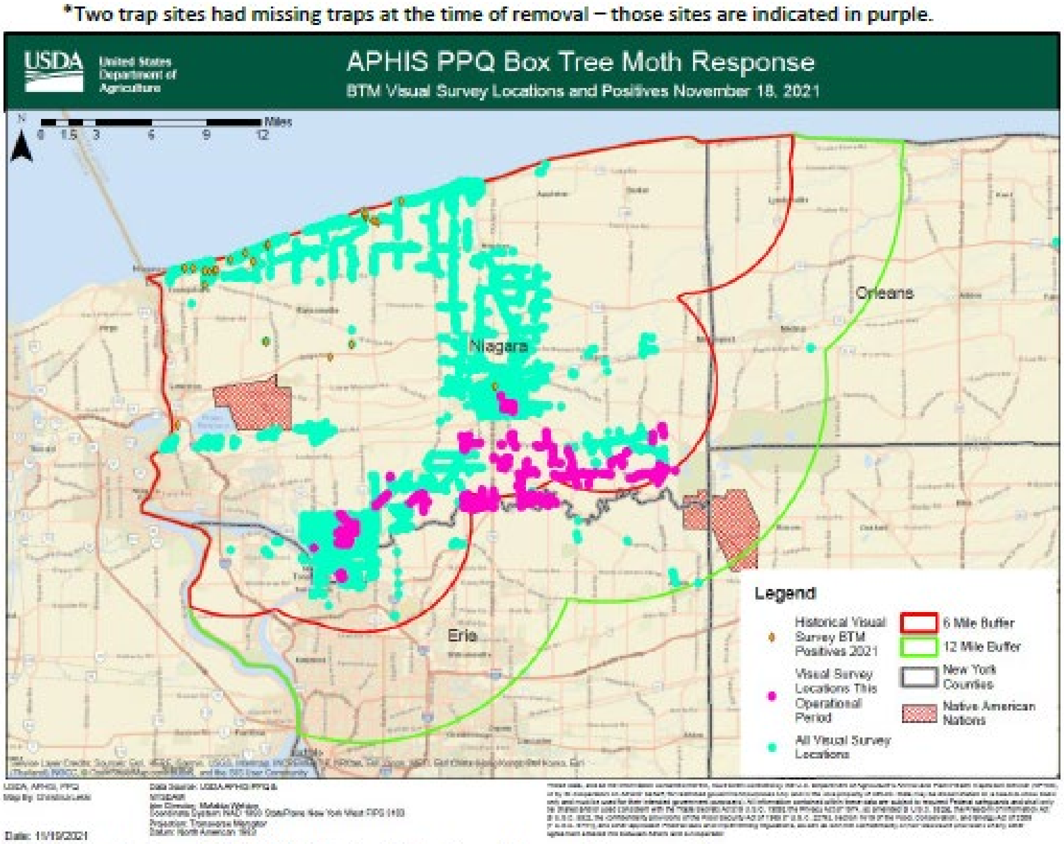
Appendix 1. Map of box tree moth distribution in New York



*Two trap sites had missing traps at the time of removal – those sites are indicated in purple.



*These maps do not reflect recent NYSAGM Positive Finds from this operational period